SYNOPTIC WATER-QUALITY EXPERIMENTS ON THE COLORADO RIVER IN THE GRAND CANYON, ARIZONA

UNITED STATES GEOLOGICAL SURVEY

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SYNOPTIC WATER-QUALITY EXPERIMENTS ON THE COLORADO RIVER IN THE GRAND CANYON, ARIZONA

by

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U.S. Department of the Interior

Geological Survey

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ACKNOWLEDGEMENTS

The authors of this report wish to thank the volunteers who assisted us on the river during the November 1990 and June 1991 synoptic experiments. We especially wish to pay tribute to the team leaders for their diligence in making field measurements, collecting water samples, and caring for their people while the synoptic experiments were underway.

CONVERSION FACTORS

Metric units (International System) in this report may be converted to inch-pound units by using the following conversion factors:

Multiply metric unit	*By*	*To obtain inch-pound unit*
centimeter (cm)	0.3937	inch
cubic meter (m^3)	35.31	cubic foot
gram (g)	0.03527	ounce, avoirdupois
gram per cubic meter (g/m^3)	62.45×10^{-6}	pound per cubic foot
gram per cubic meter per hour [(g/m^3)/h]	62.45×10^{-6}	pound per cubic foot per hour
kilogram (kg)	2.205	pound, avoirdupois
kilogram per square centimeter (kg/cm^2)	14.22	pound per square inch
liter (L)	0.2642	gallon
meter (m)	3.281	foot
meter per second (m/s)	3.281	foot per second
microgram (μg)	35.27×10^{-8}	ounce, avoirdupois
microliter (μL)	26.42×10^{-8}	gallon
micrometer (μm)	39.37×10^{-6}	inch
milligram (mg)	35.27×10^{-5}	ounce, avoirdupois
milliliter (mL)	26.42×10^{-5}	gallon
millimeter (mm)	0.03937	inch
square centimeter (cm^2)	0.155	square inch
square kilometer (km^2)	0.3861	square mile
square meter (m^2)	10.76	square foot
square millimeter (mm^2)	1.550×10^{-3}	square inch

Inch-pound units in this report may be converted to metric units (International System) by using the following conversion factors:

Multiply inch-pound unit	*By*	*To obtain metric unit*
acre-foot (acre-ft)	1.233	cubic meter
cubic foot per second (ft^3/s)	0.028317	cubic meter per second
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
ounce, fluid	0.02957	liter
pound, avoirdupois (lb)	453.6	gram
pound per square inch (psi)	703.1	kilogram per square meter
square inch (in^2)	6.452	square centimeter
square mile (mi^2)	2.59	square kilometer

Degree Celsius (°C) may be converted to degree Fahrenheit (°F) by using the following equation:

$$°F = 9/5(°C) + 32.$$

Degree Fahrenheit (°F) may be converted to degree Celsius (°C) by using the following equation:

$$°C = 5/9(°F - 32).$$

SYNOPTIC WATER-QUALITY EXPERIMENTS ON THE COLORADO RIVER IN THE GRAND CANYON, ARIZONA

ABSTRACT

Two water-quality synoptic experimental studies were made on the Colorado River in the Grand Canyon. Field measurements and the collection of water samples for laboratory analysis were made at 10 mainstem and 6 tributary sites every 6 hours over a 48 hour period on November 5-6, 1990 and again on June 18-20, 1991. Field measurements included discharge, alkalinity, water temperature, light penetration, pH, specific conductance, and dissolved oxygen. Water samples were collected for the laboratory analysis of major ions (Ca, Mg, Na, K, Sr, Cl, SO_4, SiO_2), trace elements (Al, As, B, Ba, Cd, Co, Cr, Cu, Li, Mn, Mo, Ni, Pb, Se, Ti, U, Fe, and Hg), nutrients (PO_4, NO_3, NH_4, NO_2, total dissolved nitrogen, total dissolved phosphorus and dissolved organic carbon). Biological measurements included drift (benthic invertebrates and detrital material), benthic invertebrates from river bottom, phytoplankton and zooplankton. Analysis of phytoplankton and zooplankton samples was not complete at the time of this report, and are not included.

This report contains all available results at the time of preparation (December 1991). The results are primarily presented in tabular form, but some figures showing time-plots also are included.

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INTRODUCTION

Studies concerned with large river systems, especially large impounded systems, are in their infancy (Petts, 1984, Ward and Stanford, 1979). Thus, there is an often meager understanding of physical, chemical, and biological water-quality constituents for any given downstream length of the system that is influenced by dam operation. The Colorado River is no exception. Beginning in western Wyoming, the Colorado River (there called the Green River) flows through seven states and 2250 river kilometers to the Gulf of Mexico. On its way to the sea it drains about 647,500 square kilometers. Most of this drained area is in arid climates where the annual precipitation is less than 25 centimeters. Thus, the water of the Colorado River is extremely valuable from an agriculture as well as an urban standpoint. This high value of water has resulted in the construction of 13 storage reservoirs on the Colorado River and its tributaries. Lake Mead, perhaps the best known reservoir, was formed in 1936 when Hoover Dam was closed. Lake Powell, the most recent, was formed in 1963 when Glen Canyon Dam was closed.

Between Glen Canyon Dam and upriver Lake Mead is the Grand Canyon of the Colorado River which encompasses Grand Canyon National Park. There the river flows through its bedrock channel between vertical canyon walls, and over a number of rapids. The river bed elevation drops about 670 feet within the 632 river kilometers between Lees Ferry Arizona and the mouth of Diamond Creek. Prior to 1960, before the closing of Glen Canyon Dam, fewer than 1000 people had taken river trips through the Grand Canyon. Today (1991) over 25,000 make the journey annually on rafts and boats. This use of the river has resulted in careful control of boaters and other users by the National Park Service. But, it also resulted in a need for camping sites along the river, and an

urgent need to evaluate human impact including that of altering the quality of the river water.

Coupled to human use of the river in the Grand Canyon is the operation of Glen Canyon Dam. The dam was constructed for flood control, power generation and water storage to meet demands of the lower basin states and Mexico. Much controversy related to the dam is concerned with high daily fluctuations in water release for hydroelectric power generation. For example within a 24-hour period discharge from the dam may commonly vary between 140 and 850 cubic meters per second (m^3/s). This flow variation causes riverbank and erosion of sediment deposits used for camping and makes river rafting difficult. As a result there has been, for over a decade, public concern about the effects of Glen Canyon Dam on the Colorado River in the Grand Canyon. The dam and reservoir also have reduced sediment transport to the downriver area, resulting in increased light penetration through the water. Water from Lake Powell is removed for electric power generation from penstocks located in the upper part of the hypolimnion (elevation 322 m). This water has a temperature of about 8 degrees Celsius (^{o}C)throughout the year. Pre-dam water temperatures ranged from about 0 to 26 ^{o}C (U.S. Department of Interior, 1988).

Physical alterations in the river channel are not the only concern. Several fish native to the river are now on the U.S. Fish and Wildlife Service Endangered List, and increased light has permitted profuse production of *Cladophera glomerata* especially in the Lees Ferry area. The *Cladophera* production has resulted in organic loading to the river. There also is evidence that nitrogen and phosphorus concentrations in the river have decreased since the filling of Lake Powell (Gloss and others, 1980). These chemical and biological water quality concerns have been known since dam closure and have been the subject of past studies.

Mindful of public concern about discharge regulation from Glen Canyon Dam, the Congress directed the U.S. Bureau of Reclamation (USBR) to undertake studies of the river and its channels. The first Glen Canyon study began in 1982, and concluded in 1987. It was known as the Glen Canyon Environmental Study I (GCES-I). The study resulted in a number of scientific papers and a study summary (U.S. Department of the Interior, 1988). A review of GCES-I was provided by the National Academy of Science (Marzolf and others, 1987). In 1988 the Congress extended the GCES-I study (renamed GCES-II) to include a wider array of study topics and to address specific studies that were inconclusive during the GCES-I study. Moreover, during the period of the GCES-II studies the Congress ordered the Secretary of Interior to propose and conduct adjusted flows, called interim flows, and to evaluate the consequences of these flows on the Grand Canyon environment. The interim flows were begun in August 1991.

During the winter of 1989-1990 the U.S. Geological Survey (USGS) Water Resources Division (WRD) prepared a proposal for scientific investigations on the Colorado River. The USGS proposal included a number of studies to be conducted in the Grand Canyon and on Lake Powell near the dam. Among the water-quality work proposed was a study to determine the chemical and biological resources and characteristics of the river between Glen Canyon Dam and Lake Mead.

Past water-quality work, including that accomplished during GCES-I, provided some insight about the chemical and biological resources of the river in the Grand Canyon, but was inconclusive regarding river-reach understanding. As a result, synoptic experiments were designed by USGS scientists to obtain selected chemical and biological information along the Grand Canyon corridor of the river including the major tributaries. The goal of the synoptic experiments was to obtain a study-length (Lake Powell forebay to upriver Lake Mead and major tributaries) understanding of selected chemical and biological constituents so that process-oriented studies could be designed in the future. In addition, sampling was organized on a temporal basis so that interpretive information

could be obtained to develop a better understanding of the influence of variable discharge (daily cyclic water releases from Glen Canyon Dam) and diel variation. The experimental design was to make field measurements and collect samples every 6 hours over a 48 hour period. In the original plan synoptic experiments were to be conducted during low light, low tributary flow (November); high light, low tributary flow (June) and high light, high tributary flow (August). We conducted synoptic experiments on November 5-6, 1990, and June 18-20, 1991. The August 1991 synoptic experiment was cancelled.

METHODS

A total of 9 mainstem river sites, 6 tributary sites, and 1 site in the forebay of Lake Mead, were selected for sampling during each synoptic experiment (fig. 1). To minimize sampling variance the river sites were sampled immediately upstream from the tributary mouth to insure the sampling of a thoroughly mixed reach, and the tributary site sampled near its mouth (table 1). During the November 1990 synoptic experiment the collection of water samples and field measurements began at 0600 hours on November 5, and ended at 2400 hours on November 6. In June 1991 the collection of water samples and field measurements began at 1200 hours on June 18 and ended at 0600 hours on June 20. During each experiment water samples were collected and field measurements were made 8 times at 6 hour intervals. A listing of field measurements and sample collection is shown in table 2 along with the references for the technique used for analysis. All water samples for chemical analysis were collected using the discharge weighted depth- and width-integrated equal discharge increment (EDI) method (Edwards and Glisson, 1988). At cableways and non-wadable tributary sites boats having a boom and winch assembly were used and samples were collected with a modified US D-77 sampler (Edwards and Glisson, 1988). At wadable tributary sites a US DH-77 (hand held)

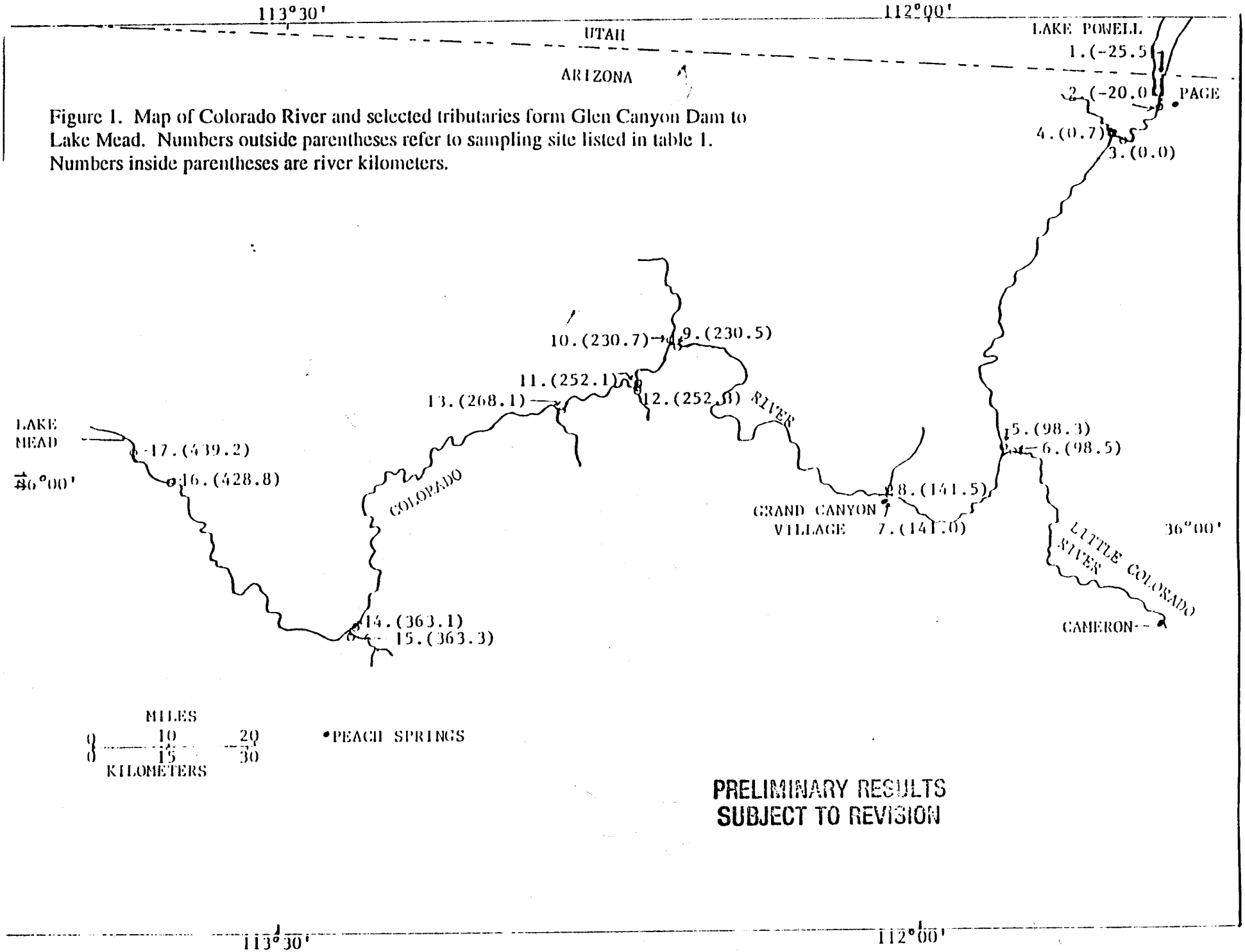

Figure 1. Map of Colorado River and selected tributaries form Glen Canyon Dam to Lake Mead. Numbers outside parentheses refer to sampling site listed in table 1. Numbers inside parentheses are river kilometers.

Table 1. Sampling site names and river kilometers for Colorado River synoptic experiments. (Note: Lee's Ferry is river kilometer 0.0)

Sampling site	River Kilometer	Site No. for fig. 1
Lake Powell Forebay	-25.5	1
Colorado River at Glen Canyon USGS gage	-20.0	2
Colorado River at Lees Ferry USGS gage	0.0	3
Paria River near mouth	0.7	4
Colorado River upstream from Little Colorado River at USGS gage	98.3	5
Little Colorado River near mouth	98.5	6
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	141.0	7
Bright Angel Creek near mouth	141.5	8
Colorado River upstream from Kanab Creek	230.5	9
Kanab Creek near mouth	230.7	10
Colorado River upstream from Havasu Creek	252.1	11
Havasu Creek near mouth	252.3	12
Colorado River at National Canyon USGS gage	268.1	13
Colorado River upstream from Diamond Creek USGS gage	363.1	14
Diamond Creek near mouth	**363.3**	**15**
Colorado River near Travertine Cleft (June 1991 only)	428.8	16
Colorado River near Columbine Falls (November 1990 only)	439.2	17

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Table 2. Measurement and constituent list for synoptic experiments on Colorado River and major tributaries.

Measurement/ constituent	Filter pore size	Preser- vative	Instru- ument	Reference
Field Measurements				
Alkalinity	none	n/a	1	Kramer (1982)
Discharge	none	n/a	2	Buchanan and Somers (1969)
Dissolved oxygen	none	n/a	3	Am. Public Health Assoc. (1985)
Light	none	n/a	4	Wetzel (1983)
Sample collection	none	n/a	5	Leenheer and others (1988)
pH	none	n/a	7	Am. Public Health Assoc. 1985)
Chemical				
Major ions				
Ca, Fe, Mg, Na, SiO_2	0.4 µm	HNO_3	ICP-AES	Garbarino and Taylor (1979)
Cl, SO_4	0.45 µm	n/a	IC	Fresenius and others (1988)
Nutrients				
PO_4	do	Chill	UV-Vis	Fishman and
$NO_3 + NO_2$	do	do	do	Friedman (1985)
NH_4	do	do	do	do
Tot.Diss. N	do	do	do	do
Tot. Diss. P	do	do	do	do
DOC	do	do	IR	Menzel and Vaccaro (1964)

Trace elements				
Al, As, B,	0.4 µm	HNO_3	ICP-MS	Taylor (1989)
Ba, Be,Cd,	do	do	do	Garbarino and
Co, Cr, Cu,	do	do	do	Taylor (in press)
Li,Fe, Mn,	do	do	do	
Mo,Sr, V,	do	do	do	Taylor and
Zn, Pb,	do	do	do	others 1990)
				Taylor and others (1990)
Se	do	do	AA	Fishman and Friedman (1985)
Hg	do	CR_2O_7/ H_2SO_4	AF	Fresenuis and others(1988)
				Thompson and Godden (1975)
Biological				
Drift	250 µm	ethanol		Britton and Greeson (1987)
Benthic invert.	0.5 mm	do		do
Phytoplankton	n/a	do		do

---

1. Gran Titration
2. Price meter
3. Yellow Springs Inst. Model 54
4. Secchi Disk
5. US D-77 and US DH-77
6. Orion Model SA 250
7. Amber Science Model 604

ICP-AES	Inductively coupled plasma-atomic emission spectrometry
IC	Ion chromatography
UV-Vis	Ultraviolet-visible absorption spectrophotometry
IR	Infrared absorption spectrophotometry
ICP-MS	Inductively coupled plasma-mass spectrometry
AA	Atomic absorption spectrometry
AF	Atomic fluorescence spectrometry

sampler was used. The US D-77 sampler has a capacity of 2 liters. A Teflon* bag of that volume was placed in the sampler bottle to avoid metallic contamination. In addition, the sampler was coated with an epoxy paint. All sampling equipment was handled with Teflon gloves to avoid contamination. At each vertical in the river, 1-1.5 liters of water was collected. At the boat-sampled mainstem sites, sampling verticals were located at predetermined flow centroids having equally spaced areas. Sample collection at cableways was made at five centroids of flow which were predetermined for given stage/discharge relations. At wading stations the five discharge centroids were determined from discharge measurements made at the time of sampling. After a sample was collected using the US D-77 or US DH-77 sampler, it was transferred to a graduated cylinder by passing through a 63 micrometer (μm) mesh nylon screen to remove sand-sized suspended matter, and the volume recorded. The water was then transferred into a Teflon coated stainless steel churn splitter (U S Geological Survey Water-quality memorandum 76.24.T, 1976) for compositing. When all five centroids of flow were sampled, the churn contained about 7.5 liters of sample water. The churn with the contained water was then removed to a processing site (often within a tent) and aliquots subsampled as the churn paddle was in motion, ensuring a mixed sample. Water for trace element analysis (table 2) was filtered through a 0.4 μm Nucleopore filter housed in an all Teflon vacuum sample holder, using ultraclean techniques. Water for nitrogen, phosphorus and dissolved organic carbon was filtered through a 0.45 μm silver-membrane filter. Specific sample preparation protocol and field measurement procedures are described in Taylor, Averett and Garbarino (Appendix A).

FIELD. Field measurements included water temperature measured with a calibrated hand-held alcohol thermometer. Temperature measurements were made every six hours when water samples were collected, but also at more frequent periods when time permitted. Water temperature was measured near the river or tributary surface (where

each depth-integrated water sample was collected. Temperature was recorded to the nearest 0.5 °C, after a 3 minute thermometer equilibration period. The pH was measured using a Orion Model SA 250 digital meter which was calibrated using buffers of pH 4.01, 7.0 and 10.00. Water for the measurement of pH and specific conductance was taken at the surface (grab) from the stream cross-section and the pH determined immediately. Specific conductance was measured using an Amber Science Model 604 meter with a 515 conductivity cell. Specific conductance was measured immediately after sample collection. Alkalinity was determined using the Gran titration method, employing a 0.16 N standard sulfuric acid solution. Light was measured during daytime hours using a Secchi disk 30 centimeters (cm) in diameter. Dissolved oxygen (DO) was measured in the river and tributaries using a Yellow Springs Meter Model 54. The DO was reported to the nearest 0.1 milligrams per liter (mg/l). At boat sampling and measuring sites and in tributaries where wading was possible discharge was measured directly using a Price Current meter. At cableways, discharge was determined from stage readings and rating curves, as all cableways have historic stage/discharge records.

Biological samples consisted of drift (benthic invertebrates and detrital material), benthic invertebrates from the river and tributary bottom, and water samples for phytoplankton and zooplankton identification collected as part of the water samples for chemical analysis. Phytoplankton and zooplankton samples have not been analyzed at the time of this report and thus are not included. During the synoptic experiments drift was collected at each site using a net having a 250 µm mesh opening, a 10 cm orifice diameter, and measuring 90 cm in length. Two nets were set in parallel just below the water surface and held in place by steel rods driven into the stream bottom. The nets were set at the beginning of each six hour synoptic experiment period and remained in the stream for one hour. Because of rapidly fluctuating water levels it was often necessary to adjust the depth of the net orifice during the hour of collection. Water velocity was measured in front of each net to facilitate in the calculation of the amount of

water passing through the net during the hour of collection. After collection the contents of each net were composited into jars and preserved with a 50/50 mixture of water and ethanol. At Lee's Ferry and upstream from both the Kanab Creek and Diamond Creek sites, a drift net having a mesh size of 250 µm, an orifice diameter of 0.5 m and a length of 1.6 m. was towed behind a boat in the river center for a 15 minute period. While in tow the top of the net orifice was just below the water surface.

Wide fluctuations in water levels in the Colorado River downstream from Glen Canyon Dam result in streamside areas that are wet for only a short period of each day, and thus do not support benthic invertebrates. Sampling for benthic invertebrates was thus conducted on the stream bottom only during the lowest flow encountered during the 48-hour synoptic experiment period. A kick net having a mesh opening of 0.5 mm and measuring 1.1 x 1.0 m was used for collecion (Britton and others 1987, p. 152). A stream bottom area of one meter was disturbed and the material washed into the net. The invertebrates on the net were removed on site and preserved in a 50/50 mixture of ethanol and water.

In the laboratory benthic invertebrates were separated from detrital material and identified to genus and whenever possible species at the University of Pittsburgh Pymatuning Laboratory of Ecology. Keys used for identification of the invertebrates were primarily from Merritt and Cummins (1984). The ash-free weight of the detrital material was then determined using the technique described in Britton and Greeson (1987, p. 129-130).

LABORATORY. Several laboratory instrumental methods were used for the analysis of samples collected during the synoptic experiments. Techniques were selected based on their optimal use for specific measurement criteria, primarily accuracy, precision, sensitivity and selectivity. These techniques have been developed over a period of several years for the specific application to environmental water analysis.

Major cations were determined using inductively coupled plasma-atomic emission spectrometric (ICP-AES) analysis. Specific details of the methodology and techniques are described in Garbarino and Taylor, 1979. The elements Ca, Fe, Mg, Si, Na and Sr were determined simultaneously on a sample aliquot that had been filtered (0.4 μm) and acidified (HNO_3) in the field, using ultraclean procedures. Potassium was determined on the same aliquot by an air/acetylene flame atomic absorption spectrometric technique (Fishman and Friedman, 1985).

Selected trace elements including: Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Li, Mn, Mo, Ni, Pb, Tl, U, V, and Zn, were determined using state-of-the-art inductively coupled plasma-mass spectrometric techniques described by Taylor, 1989; Taylor and others (1990) and Garbarino and Taylor (in press). These elements were also determined simultaneously on a single sample aliquot that was field filtered (0.4 μm) and acidified (HNO_3). Selenium was determined on the same aliquot by a hydride generation atomic absorption spectrometric technique (Fishman and Friedman, 1985).

Mercury was determined on a total dissolved basis, using a cold-vapor atomic fluorescence spectrometric procedure (Thompson and Godden, 1975, and Roth, unpublished data) similar to that described by Fresenius and others, 1988. Samples for mercury determinations were field filtered (0.4 μm) and preserved with a mixture of potassium dichromate and nitric acid.

Nutrient determinations included dissolved ammonium ion, dissolved nitrate, dissolved nitrite and dissolved orthophosphate. Ammonium, nitrate, nitrite and phosphate were determined using the salicylate-hypochlorite absorption spectrophotometric procedure; sulfanilamide/N-1-napthylethylenediamine dihydrochloride with Cd reduction absorption spectrophotometric procedure; sulfanilamide/N-1-napthylethylenediamine dihydrochloride absorption spectrophotometric procedure; and phosphomolybdate absorption spectrophotometric procedure, respectively (Fishman and Friedman, 1985). Also, total dissolved nitrogen

composite sample (see Appendix), for the respective synoptic. In addition, Secchi disk light penetration data is included in these tables.

Nutrient data for the November, 1990, and June, 1991, synoptics are listed in tables 7 and 8, respectively. The nutrient determinations are all made on dissolved constituents (i.e. all samples filtered through a 0.45 μm silver membrane filter) and include the following specific determinations reported as milligrams per liter (mg/L) as either nitrogen or phosphorus: ammonium ion (NH_4^+), nitrite ion ($NO_2^=$), nitrate ion (NO_3^-), total dissolved nitrogen, orthophosphate ion ($PO_4^{\equiv}$) and total dissolved phosphorus.

Major anions and dissolved organic carbon (DOC) are tabulated in tables 9 and 10, respectively, for the November, 1990, and June, 1991, synoptic experiments. Anions include sulfate (SO_4), and chloride (Cl) reported in mg/L. Dissolved organic carbon is also reported as mg/L.

Metals are divided into two groupings. Major metals including: Ca, Mg, Na, K, SiO_2 and Sr, are listed in tables 11 and 12, for the November, 1990, and June, 1991, synoptics experiments, respectively. These determinations are all reported as mg/L. Trace metals are listed in tables 13 and 14, for the same respective synoptics and include: Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Hg, Li, Mn, Mo, Ni, Pb, Tl, U, V and Zn.

Tables 15 and 16 list results of the taxanomic, functional goupings, numbers and biomass of benthic invertebrates from drift samples for each sampling period from the November, 1990, and June, 1991, synoptics, respectively. Detrital biomass collected with 10 cm diameter nets are reported in tables 17 and 18, representing the respective synoptic experiments. Results of similar detrital biomass determinations collected using 0.5 m diameter nets are listed in table 19 for the appropriate synoptic experiments.

Tabulations of water discharge in cubic meters per second (m^3/s) over the synoptic sampling periods are listed in tables 20 and 21, for the November, 1990 and June 1991 synoptic experiments, respectively. Hydrographs plotted from this discharge

data are plotted in Figures 2 - xx, and show the degree of variation in water release from the dam over the period of time during each synoptic sampling.

Suspended sediment concentrations are tabulated in tables 22 and 23, for the November, 1990 and June, 1991 synpotic experiments, respectively.

* Use of tradenames does not imply endorsement by the U.S. Geological Survey.

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SUMMARY OF DATA - TABLES 3-23 AND FIGURES 2 AND 3

Table 3. Selected field measurements made at specific positions in the river cross-section for the November 1990 synoptic experiment

Field measurements, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Position ft.	Temp. deg.C	Cond. uS	DO mg/L
Colorado River at Glen Canyon USGS gage	11-5-90	600	600	9.0	798	6.6
			550	8.5	800	6.2
			500	8.5	800	6.3
			450	8.5	802	6.1
			400	8.5	803	6.1
			350	8.5	803	6.1
			300	8.5	808	6.0
			250	8.5	808	6.0
			200	8.5	804	6.2
	11-5-90	1200	600	8.5	808	6.1
			550	8.5	808	6.5
			500	8.5	809	6.4
			450	8.5	808	6.3
			400	8.5	808	6.3
			350	8.5	809	6.3
			300	8.5	809	6.4
			250	8.5	809	6.5
			200	8.5	809	6.4
	11-5-90	1800	600	8.5	811	6.4
			550	8.5	811	6.2
			500	8.5	810	6.2
			450	8.5	812	6.1
			400	8.5	813	6.2
			350	8.5	813	6.1
			300	-	814	6.2
			250	-	813	6.2
			200	9.0	813	6.2
	11-5-90	2400	550	8.5	817	6.4
			500	8.5	816	6.2
			450	8.5	816	6.4
			400	8.5	815	6.3
			350	8.5	815	6.4
			300	8.5	815	6.3
			250	8.5	815	6.3

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 3. Selected field measurements made at specific positions in the river cross-section for the November 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Position ft.	Temp. deg.C	Cond. uS	DO mg/L
Colorado River at Glen Canyon USGS gage	11-6-90	600	550	8.5	800	9.8
			500	8.5	801	9.7
			450	8.5	802	9.6
			400	8.5	803	9.4
			350	8.5	803	9.3
			300	8.5	803	9.3
			250	8.5	804	9.3
	11-6-90	1200	600	8.5	824	6.1
			550	8.5	824	6.0
			500	8.5	825	6.0
			450	8.5	824	5.9
			400	8.5	825	5.9
			350	8.5	825	5.8
			300	8.5	824	5.8
			250	8.5	825	5.8
	11-6-90	1800	600	8.5	820	6.2
			550	8.5	820	6.1
			500	8.5	821	6.2
			450	8.5	826	6.1
			400	8.5	824	6.1
			350	8.5	822	6.0
			300	8.5	823	6.0
			250	8.5	822	6.1
	11-6-90	2400	500	8.5	818	6.4
			450	8.5	818	6.5
			400	8.5	817	6.4
			350	8.5	818	6.4

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 3. Selected field measurements made at specific positions in the river cross-section for the November 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Position ft.	Temp. deg.C	Cond. uS	DO mg/L
Colorado River at Lees Ferry USGS gage	11-5-90	600	REW	7.9	792	-
		1200	REW	9.0	800	-
		1800	REW	8.5	786	10.4
		2400	REW	8.0	822	7.6
	11-6-90	600	REW	7.0	870	-
		1200	REW	8.5	820	12.6
		1800	REW	8.5	822	7.3
		2400	REW	8.5	828	-
Paria River near mouth	11-5-90	600	Comp	5.0	911	-
		1200	Comp	11.0	942	-
		1800	Comp	11.0	969	-
		2400	Comp	7.5	988	-
	11-6-90	600	Comp	7.0	978	-
		1200	Comp	8.0	956	10.4
		1800	Comp	7.0	943	-
		2400	Comp	6.0	981	-
Colorado River upstream from Little Colorado River at USGS gage	11-5-90	600	REW	8.5	-	9.3
		1200	REW	8.5	726	9.4
		1800	REW	8.5	875	9.4
		2400	REW	8.8	863	9.2
	11-6-90	600	REW	8.0	891	9.7
		1200	REW	8.2	864	10.4
		1800	REW	8.0	841	10.4
		2400	REW	8.0	842	10.2
Little Colorado River near mouth	11-5-90	600	Comp	12.5	4150	9.6
		1200	Comp	15.5	4140	8.9
		1800	Comp	16.0	4040	9.1
		2400	Comp	16.5	4140	8.8
	11-6-90	600	Comp	11.5	2750	10.0
		1200	Comp	11.5	2650	9.8
		1800	Comp	12.0	2700	9.9
		2400	Comp	12.0	2820	9.8

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 3. Selected field measurements made at specific positions in the river cross-section for the November 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Position ft.	Temp. deg.C	Cond. uS	DO mg/L
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	11-5-90	600	Comp	9.4	943	6.7
		1200	Comp	9.0	971	8.4
		1800	Comp	-	874	-
		2400	Comp	-	1040	10.6
	11-6-90	600	Comp	9.0	1060	9.0
		1200	Comp	8.5	1120	10.8
		1800	Comp	9.0	1200	10.2
		2400	Comp	8.5	915	12.0
Bright Angel Creek at mouth	11-5-90	600	Comp	-	-	-
		1200	Comp	9.5	365	8.3
		1800	Comp	10.5	360	10.0
		2400	Comp	9.0	412	13.6
	11-6-90	600	Comp	9.0	390	10.3
		1200	Comp	9.0	369	9.6
		1800	Comp	9.5	347	10.0
		2400	Comp	8.5	354	11.0
Colorado River upstream from Kanab Creek	11-5-90	600	Comp	-	-	-
		1200	Comp	-	-	-
		1800	Comp	-	-	-
		2400	Comp	-	-	-
	11-6-90	600	Comp	-	-	-
		1200	Comp	-	-	-
		1800	Comp	-	-	-
		2400	Comp	-	-	-
Kanab Creek near mouth	11-5-90	600	Comp	-	-	-
		1200	Comp	-	-	-
		1800	Comp	-	-	-
		2400	Comp	-	-	-
	11-6-90	600	Comp	-	-	-
		1200	Comp	-	-	-
		1800	Comp	-	-	-
		2400	Comp	-	-	-

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 3. Selected field measurements made at specific positions in the river cross-section for the November 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Position ft.	Temp. deg.C	Cond. uS	DO mg/L
Colorado River upstream from Havasu Creek	11-5-90	600	REW	10.9	932	-
			100	10.0	-	-
			80	-	-	-
			60	10.8	-	-
			20	10.0	-	-
	11-5-90	1200	100	9.8	-	-
			90	9.8	-	-
			60	10.0	-	-
			40	9.8	-	-
			20	9.9	-	-
	11-5-90	1800	105	10.0	-	-
			80	10.0	-	-
			60	10.0	-	-
			40	10.0	-	-
			20	10.0	-	-
	11-5-90	2400	105	10.0	-	-
			60	10.0	-	-
			30	10.0	-	-
			20	10.0	-	-
	11-6-90	600	80	9.7	-	-
			60	9.7	-	-
			40	9.7	-	-
	11-6-90	1200	95	9.8	-	-
			60	9.7	-	-
			30	9.8	-	-
	11-6-90	1800	80	9.6	-	-
			60	9.6	-	-
			40	9.6	-	-
			20	9.6	-	-
	11-6-90	2400	75	9.5	-	-
			60	9.3	-	-

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 3. Selected field measurements made at specific positions in the river cross-section for the November 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Position ft.	Temp. deg.C	Cond. uS	DO mg/L
Havasu Creek near mouth	11-5-90	600	Comp	12.5	730	10.0
		1200	Comp	13.5	729	9.9
		1800	Comp	14.0	729	9.6
		2400	Comp	13.5	723	9.7
	11-6-90	600	Comp	13.0	720	9.7
		1200	Comp	13.0	714	9.9
		1800	Comp	12.5	729	10.0
		2400	Comp	12.5	734	9.8
Colorado River at National Canyon USGS gage	11-5-90	600	Comp	10.0	890	10.8
		1200	Comp	10.0	933	10.8
		1800	Comp	-	-	-
		2400	Comp	10.0	931	9.8
	11-6-90	600	Comp	-	-	-
		1200	Comp	10.0	974	10.4
		1800	Comp	10.0	941	10.6
		2400	Comp	10.0	945	9.4
Colorado River upstream from Diamond Creek USGS gage	11-5-90	600	Comp	-	-	-
		1200	Comp	-	-	-
		1800	Comp	-	-	-
		2400	Comp	-	-	-
	11-6-90	600	Comp	-	-	-
		1200	Comp	-	-	-
		1800	Comp	-	-	-
		2400	Comp	-	-	-
Diamond Creek near mouth	11-5-90	600	Comp	-	-	-
		1200	Comp	-	-	-
		1800	Comp	-	-	-
		2400	Comp	-	-	-
	11-6-90	600	Comp	-	-	-
		1200	Comp	-	-	-
		1800	Comp	-	-	-
		2400	Comp	-	-	-

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 3. Selected field measurements made at specific positions in the river cross-section for the November 1991 synoptic experiment--Continued

Field measurements. Colorado River Synoptic Experiment. November 1990

Site Name	Date	Time	Position ft.	Temp. deg.C	Cond. uS	DO mg/L
Colorado River near Columbine Falls	11-5-90	600	REW	10.5	956	10.6
			27	10.5	946	9.9
			82	10.6	945	9.9
			138	10.5	945	10.6
			202	10.4	843	10.6
			267	10.5	944	10.6
	11-5-90	1200	REW	10.8	976	10.9
			27	11.0	925	10.8
			82	10.6	933	10.9
			138	10.6	932	11.0
			202	10.8	933	11.0
			267	11.0	935	10.9
	11-5-90	1800	REW	11.0	983	10.8
			27	11.0	947	10.7
			82	10.8	946	10.8
			138	10.9	944	10.9
			202	11.0	945	10.8
			267	11.1	945	10.8
	11-5-90	2400	REW	11.0	924	10.8
			27	11.0	917	10.7
			82	11.1	921	10.8
			138	11.0	913	10.8
			202	11.0	916	10.8
			267	11.0	914	10.8

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 3. Selected field measurements made at specific positions in the river cross-section for the November 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Position ft.	Temp. deg.C	Cond. uS	DO mg/L
Colorado River near Columbine Falls	11-6-90	600	REW	10.5	921	10.8
			27	10.5	886	10.8
			82	10.4	885	10.9
			138	10.5	886	10.9
			202	10.5	885	10.9
			267	10.5	886	10.8
	11-6-90	1200	REW	10.5	934	11.0
			27	10.5	894	10.9
			82	10.5	896	11.0
			138	10.3	897	11.0
			202	10.4	898	11.0
			267	10.5	897	11.0
	11-6-90	1800	REW	10.5	964	10.9
			27	10.5	924	10.8
			82	10.5	927	10.9
			138	10.6	928	10.9
			202	10.5	928	11.0
			267	10.5	928	10.9
	11-6-90	2400	REW	10.4	964	10.9
			27	10.5	937	10.8
			82	10.4	936	10.9
			138	10.5	938	11.0
			202	10.4	936	11.0
			267	10.3	934	11.0

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment

Field measurements. Colorado River Synoptic Experiment. June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Colorado River at Glen Canyon USGS gage	6-18-91	1200	225	7.5	967	9.6
			305	7.5	978	9.6
			375	7.5	959	9.6
			430	7.5	968	9.6
			495	7.5	959	9.6
		1800	225	7.0	959	8.1
			305	7.5	958	8.2
			375	8.0	969	8.2
			430	7.5	965	8.2
			495	8.0	969	8.2
		2400	265	7.7	945	9.0
			340	7.5	949	9.0
			390	7.5	949	9.0
			440	7.5	950	9.0
			490	7.5	955	9.0
	6-19-91	600	270	7.5	943	8.6
			345	7.5	944	8.6
			395	7.5	945	8.7
			440	7.5	943	8.7
			495	7.5	946	8.7
		1200	225	7.5	961	7.6
			305	7.5	962	7.6
			375	8.0	958	7.6
			450	8.0	953	7.6
			495	8.0	955	7.6
		1800	225	7.5	958	7.8
			305	7.5	956	7.8
			375	7.5	954	7.8
			430	7.5	959	7.9
			495	7.5	950	7.9
		2400	275	7.5	938	7.9
			350	7.5	935	8.0
			395	7.5	939	8.0
			440	7.5	942	8.0
			495	7.5	941	7.8

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Colorado River at Glen Canyon USGS gage	6-20-91	600	275	7.5	946	7.7
			350	7.5	947	7.6
			395	7.5	949	7.6
			440	7.5	948	7.7
			495	7.5	948	7.7
Colorado River at Lees Ferry USGS gage	6-18-91	1200	Comp	10.0	930	9.7
		1800	Comp	9.0	933	8.0
		2400	Comp	8.0	937	8.5
	6-19-91	600	Comp	8.5	931	10.5
		1200	Comp	9.7	920	-
		1800	Comp	9.5	924	8.4
		2400	Comp	8.0	921	8.6
	6-20-91	600	Comp	8.5	916	10.8
Paria River near mouth	6-18-91	1200	Comp	29.0	511	7.0
		1800	Comp	23.5	512	7.3
		2400	Comp	19.5	521	7.6
	6-19-91	600	Comp	17.5	519	8.2
		1200	Comp	28.5	509	6.8
		1800	Comp	24.4	513	7.1
		2400	Comp	17.5	521	8.0
	6-20-91	600	Comp	14.0	518	8.7
Colorado River upstream from Little Colorado River at USGS gage	6-18-91	1200	440	10.2	949	10.1
			380	10.1	950	10.1
			350	10.4	955	10.1
			295	10.2	942	10.1
			255	10.2	944	10.1
		1800	REW	12.0	975	9.8
		2400	REW	10.4	970	10.6
	6-19-91	600	REW	9.3	983	13.1
		1200	REW	10.0	981	10.3
		1800	REW	10.5	995	9.9
		2400	REW	10.4	993	9.4
	6-20-91	600	-	-	-	-

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Little Colorado River near mouth	6-18-91	1200	0.8	21.0	4400	8.2
			13.5	21.5	4400	8.2
			27.0	21.0	4400	8.2
			45.0	21.0	4400	8.2
			69.5	21.0	4400	8.2
		1800	45.0	23.0	4400	7.4
		2400	30.0	22.0	4600	6.5
	6-19-91	600	30.0	21.0	4500	8.0
		1200	7.5	23.0	4500	7.7
		1800	0.8	23.5	4400	7.0
		2400	0.8	21.0	4500	7.8
	6-20-91	600	-	-	-	-
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	6-18-91	1200	Comp	12.0	972	9.8
		1800	Comp	12.0	950	9.9
		2400	Comp	12.0	900	10.0
	6-19-91	600	Comp	12.0	950	9.5
		1200	Comp	11.2	900	10.8
		1800	Comp	12.0	900	10.7
		2400	Comp	12.0	900	10.1
	6-20-91	600	Comp	12.0	950	10.9
Bright Angel Creek near mouth	6-18-91	1200	Left	20.5	310	8.3
			Mid	22.5	310	8.4
			Right	21.5	310	8.4
		1800	Mid	22.0	307	8.7
		2400	Mid	19.5	318	8.6
	6-19-91	600	Mid	17.0	323	8.2
		1200	Mid	21.5	315	7.1
		1800	Mid	19.5	309	7.3
		2400	Mid	18.0	330	8.4
	6-20-91	600	Mid	15.7	330	8.4

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Colorado River upstream from Kanab Creek	6-18-91	1200	40	-	1040	11.2
			86	13.0	1050	11.8
			101	13.0	1044	11.2
			125	13.0	1050	10.1
			180	13.0	1038	10.2
		1800	40	13.0	-	11.1
			86	13.0	-	10.8
			101	13.0	-	11.1
			125	13.0	-	11.0
			180	13.0	997	11.0
		2400	101	12.5	-	11.8
	6-19-91	600	101	12.0	983	10.8
		1200	40	12.0	-	10.2
			86	12.0	-	12.7
			101	12.0	-	12.6
			125	12.0	-	12.4
			180	12.0	-	12.4
		1800	40	12.0	-	11.4
			86	12.0	-	11.4
			101	12.0	-	11.5
			125	12.0	-	11.6
			180	12.0	-	11.6
		2400	101	12.0	-	11.3
	6-20-91	600	40	11.5	992	11.0
			86	11.0	991	10.9
			101	11.0	987	11.0
			125	11.0	992	11.0
			180	11.5	992	10.9

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Kanab Creek near mouth	6-18-91	1200	5.3	27.0	1190	7.4
			6.8	26.0	-	7.6
			7.4	26.0	-	7.5
			8.1	26.0	-	7.6
			9.6	27.0	-	7.5
		1800	4.6	21.5	1203	6.9
			6.8	21.5	1206	7.3
			7.5	21.5	1204	7.3
			8.4	21.5	1208	7.3
			10.3	21.5	1210	7.2
		2400	4.6	22.0	1219	7.5
	6-19-91	600	4.6	21.0	1199	7.1
			6.8	21.0	1199	7.7
			7.5	21.0	1198	7.7
			8.4	21.0	1198	7.8
			10.3	21.0	1199	7.8
		1200	4.6	26.5	1201	6.9
			6.8	26.5	1203	7.2
			7.5	26.5	1203	7.1
			8.4	27.0	1206	7.3
			10.3	27.0	1202	6.9
		1800	4.6	21.0	1221	7.4
			6.8	21.0	1217	7.5
			7.5	21.0	1219	7.7
			8.4	21.0	1222	7.7
			10.3	21.0	1227	7.5
		2400	4.6	20.5	1245	7.6
			6.8	20.0	1241	7.7
			7.5	20.0	1244	7.9
			8.4	20.0	1234	7.9
			10.3	20.5	1250	7.7
	6-20-91	600	4.6	19.0	1234	7.8
			6.8	19.0	1236	8.0
			7.5	19.0	1229	8.0
			8.4	19.0	1244	8.0
			10.3	19.0	1237	7.6

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Colorado River upstream from Havasu Creek	6-18-91	1200	-	-	-	-
		1800	-	-	-	-
		2400	-	-	-	-
	6-19-91	600	-	-	-	-
		1200	-	-	-	-
		1800	-	-	-	-
		2400	-	-	-	-
	6-20-91	600	-	-	-	-
Havasu Creek near mouth	6-18-91	1200	Comp	20.0	704	9.0
		1800	Comp	19.0	704	9.3
		2400	Comp	-	725	9.6
	6-19-91	600	Comp	17.0	731	9.4
		1200	Comp	21.0	709	9.0
		1800	Comp	19.0	702	9.4
		2400	Comp	17.5	718	9.2
	6-20-91	600	Comp	16.0	724	9.5

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Colorado River at National Canyon USGS gage	6-18-91	1200	180	14.0	1087	9.1
			210	14.0	1010	10.0
			243	14.0	1087	9.7
			273	13.5	1083	9.6
			313	13.5	993	9.7
		1800	170	13.8	1025	9.5
			210	13.5	1018	9.6
			250	13.5	1012	12.8
			290	13.5	1017	9.6
			325	13.5	1022	9.8
		2400	170	13.3	968	10.4
			210	13.5	993	14.0
			250	13.5	966	10.5
			290	13.5	975	11.4
			325	13.5	965	9.7
	6-19-91	600	185	13.0	990	-
			212	12.8	990	10.2
			244	12.8	991	-
			280	12.8	990	-
			320	12.5	990	-
		1200	190	13.5	986	10.1
			220	13.5	987	10.2
			250	13.5	978	10.4
			280	13.5	985	10.6
			320	13.5	983	10.1
		1800	185	13.5	933	10.5
			215	13.5	933	10.6
			250	13.5	932	10.1
			280	13.0	934	10.2
			315	-	936	10.2
		2400	185	12.8	937	10.6
			215	12.8	931	10.1
			250	12.8	935	10.7
			280	12.8	931	10.8
			315	12.8	930	10.5

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Colorado River at National Canyon USGS gage	6-20-91	600	170	12.7	958	11.3
			210	12.8	957	11.0
			245	12.9	962	11.2
			280	12.7	961	10.8
			320	12.8	961	10.8
Colorado River upstream from Diamond Creek USGS gage	6-18-91	1200	105	14.5	1025	10.1
			130	14.5	1010	10.1
			145	14.5	1022	10.1
			165	14.5	1034	10.1
			190	14.5	1011	10.1
		1800	105	14.5	1005	12.7
			125	14.5	1020	12.8
			145	14.5	1011	12.8
			165	14.5	999	17.8
			190	14.5	1011	12.7
		2400	105	14.5	1012	10.7
			125	14.5	1013	10.7
			145	14.5	1010	10.5
			165	14.5	1010	10.7
			190	14.5	1015	10.4
	6-19-91	600	100	14.5	1040	11.2
			125	14.0	1040	11.2
			145	14.0	1040	11.2
			170	14.0	1040	11.2
			195	14.0	1043	11.0
		1200	105	13.5	1057	9.8
			130	14.0	1036	9.9
			145	13.5	1050	9.9
			165	14.0	1037	9.8
			190	14.0	1049	10.0
		1800	105	14.5	1042	10.2
			125	14.5	1072	10.1
			145	14.5	1193	10.1
			165	14.5	1128	10.1
			190	14.5	1086	10.1

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment--Continued

Field measurements, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Colorado River upstream from Diamond Creek USGS gage	6-19-91	2400	105	14.5	1085	10.0
			125	14.5	986	10.0
			145	14.5	985	9.9
			165	14.5	987	9.9
			190	14.5	1014	9.9
	6-20-91	600	100	14.5	1054	10.8
			125	14.0	1010	10.8
			145	14.0	1013	10.8
			170	14.0	1016	10.7
			195	14.0	1012	10.8
Diamond Creek near mouth	6-18-91	1200	Comp	28.5	753	8.4
		1800	Comp	23.5	772	8.0
		2400	Comp	21.0	783	7.9
	6-19-91	600	Comp	20.0	781	8.3
		1200	Comp	28.5	761	8.9
		1800	Comp	22.0	791	8.4
		2400	1.5	20.0	790	8.2
	6-20-91	600	2.5	18.0	785	8.8
Colorado River near Travertine Cleft	6-18-91	1200	70	21.4	1080	9.7
			110	19.9	1100	9.7
			170	19.7	1080	9.7
			240	19.7	1060	9.7
			320	19.9	1080	9.6
		1800	70	21.1	1000	9.7
			110	19.4	1020	9.7
			170	18.9	1010	9.7
			240	19.6	1025	9.6
			320	18.5	1020	9.6
		2400	70	17.5	1025	9.6
			110	17.3	1025	9.7
			170	16.7	1015	9.8
			240	16.9	1020	9.8
			320	17.4	1020	9.8

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 4. Selected field measurements made at specific positions in the river cross-section for the June 1991 synoptic experiment --Continued

Field measurements. Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Position ft	Temp. deg.C	Conductivity uS	DO mg/L
Colorado River near Travertine Cleft	6-19-91	600	70	16.7	1020	10.0
			110	16.1	1020	10.0
			170	16.0	1000	10.0
			240	16.2	1000	10.0
			320	16.2	1000	10.0
		1200	70	21.0	1050	9.7
			110	20.5	1470	9.7
			170	22.0	1120	9.7
			240	21.5	1060	9.6
			320	21.7	1060	9.6
		1800	70	19.3	1080	9.4
			110	19.3	1050	8.9
			170	19.3	1080	9.6
			240	19.0	1070	9.7
			320	18.6	1045	9.8
		2400	70	17.6	1060	9.8
			110	16.9	1060	9.8
			170	17.0	1100	9.9
			240	16.8	1100	9.8
			320	16.4	1080	9.7
	6-20-91	600	70	16.2	1060	9.8
			110	16.2	1050	9.9
			170	15.7	1070	9.9
			240	15.8	1070	9.8
			320	16.0	1080	9.8

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 5. Selected field measurements and dissolved organic carbon (DOC) determined from a composite of water samples from the river cross-section for the November 1990 synoptic experiment

pH, Alkalinity and DOC, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	pH	Alkalinity meq/L	DOC mg C/L
Colorado River at Glen Canyon USGS gage	11-5-90	600	8.26	2680	2.5
		1200	8.12	2604	2.9
		1800	8.25	2851	2.8
		2400	8.06	2674	2.6
	11-6-90	600	8.23	2645	2.6
		1200	8.18	2731	3.1
		1800	8.08	2701	2.8
		2400	8.12	2721	2.7
Colorado River at Lees Ferry USGS gage	11-5-90	600	8.10	-	2.9
		1200	8.06	-	2.9
		1800	8.16	-	2.8
		2400	8.11	-	2.7
	11-6-90	600	8.42	-	-
		1200	7.99	-	2.6
		1800	8.14	-	2.7
		2400	8.25	-	2.9
Paria River near mouth	11-5-90	600	8.22	-	1.2
		1200	8.55	-	1.1
		1800	8.47	-	1.0
		2400	8.58	-	1.5
	11-6-90	600	8.58	-	1.3
		1200	8.21	-	1.3
		1800	8.44	-	1.5
		2400	8.60	-	1.1
Colorado River upstream from Little Colorado River at USGS gage	11-5-90	600	8.02	2659	3.0
		1200	8.12	2782	3.1
		1800	8.14	2706	2.6
		2400	7.63	2729	2.9
	11-6-90	600	8.83	2830	2.6
		1200	7.68	2867	2.9
		1800	7.74	2821	2.9
		2400	7.85	2801	2.7

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 5. Selected field measurements and dissolved organic carbon (DOC) determined from a composite of water samples from the river cross-section for the November 1990 synoptic experiment--continued

pH, Alkalinity and DOC, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	pH	Alkalinity meq/L	DOC mg C/L
Little Colorado River near mouth	11-5-90	600	8.05	5964	0.4
		1200	7.97	6137	0.2
		1800	8.00	6517	1.1
		2400	7.89	-	1.2
	11-6-90	600	7.99	-	-
		1200	8.27	-	2.9
		1800	8.08	-	-
		2400	8.16	-	-
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	11-5-90	600	8.12	2826	-
		1200	7.98	2788	2.4
		1800	8.41	2744	2.6
		2400	8.53	2727	1.8
	11-6-90	600	8.37	2878	2.8
		1200	7.79	2774	2.6
		1800	8.28	3239	2.8
		2400	8.16	3019	2.8
Bright Angel Creek at mouth	11-5-90	600	8.41	3891	-
		1200	8.91	3680	-
		1800	8.16	3458	-
		2400	8.47	3649	-
	11-6-90	600	8.47	3425	-
		1200	8.50	3575	-
		1800	8.38	3322	-
		2400	8.53	3657	-
Colorado River upstream from Kanab Creek	11-5-90	600	8.27	3140	2.6
		1200	8.12	2795	2.9
		1800	8.20	2837	2.8
		2400	8.33	3285	2.7
	11-6-90	600	8.36	2868	2.5
		1200	8.46	2943	2.6
		1800	8.17	3158	2.7
		2400	8.36	2963	2.5

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 5. Selected field measurements and dissolved organic carbon (DOC) determined from a composite of water samples from the river cross-section for the November 1990 synoptic experiment--continued

pH, Alkalinity and DOC, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	pH	Alkalinity meq/L	DOC mg C/L
Kanab Creek near mouth	11-5-90	600	8.40	3158	0.6
		1200	8.45	2766	0.8
		1800	8.44	2933	0.5
		2400	8.45	2953	0.3
	11-6-90	600	8.40	2889	0.5
		1200	8.56	2661	0.5
		1800	8.31	2726	0.4
		2400	8.41	2884	0.5
Colorado River upstream from Havasu Creek	11-5-90	600	8.48	-	3.2
		1200	-	-	2.6
		1800	-	-	2.7
		2400	-	-	2.8
	11-6-90	600	-	-	2.6
		1200	-	-	2.7
		1800	-	-	2.8
		2400	-	-	2.7
Havasu Creek near mouth	11-5-90	600	8.46	5533	2.0
		1200	7.88	6213	1.5
		1800	8.41	5630	1.4
		2400	8.43	5613	1.9
	11-6-90	600	8.44	5668	2.4
		1200	8.37	5595	1.0
		1800	8.44	5770	1.3
		2400	8.49	5823	2.6
Colorado River at National Canyon USGS gage	11-5-90	600	8.41	2808	-
		1200	8.44	2834	2.4
		1800	-	-	-
		2400	8.40	2832	2.4
	11-6-90	600	-	-	-
		1200	8.41	2928	2.5
		1800	8.41	2971	2.3
		2400	8.41	2979	2.4

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 5. Selected field measurements and dissolved organic carbon (DOC) determined from a composite of water samples from the river cross-section for the November 1990 synoptic experiment--continued

pH, Alkalinity and DOC, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	pH	Alkalinity meq/L	DOC mg C/L
Colorado River upstream from Diamond Creek USGS gage	11-5-90	600	8.42	-	2.5
		1200	8.47	2853	2.7
		1800	8.19	2944	2.8
		2400	8.39	3078	2.3
	11-6-90	600	8.44	2934	2.4
		1200	8.40	3056	3.0
		1800	8.23	2956	2.6
		2400	8.35	-	2.5
Diamond Creek near mouth	11-5-90	600	8.62	5835	-
		1200	8.70	5493	2.3
		1800	8.79	5713	2.5
		2400	-	-	-
	11-6-90	600	8.71	5534	<0.1
		1200	8.73	5549	-
		1800	8.69	5465	1.3
		2400	-	-	-
Colorado River near Columbine Falls	11-5-90	600	8.46	3114	2.7
		1200	8.43	3365	2.7
		1800	8.45	3052	2.7
		2400	8.43	2970	2.5
	11-6-90	600	8.49	2985	2.6
		1200	8.42	3019	2.9
		1800	8.43	3035	2.5
		2400	8.44	3056	2.6

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 6. Selected field measurements and dissolved organic carbon (DOC) determined from a composite of water samples from the river cross-section for the June 1991 synoptic experiment

pH, Alkalinity and DOC, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	pH	Alkalinity meq/L	DOC mg C/L
Colorado River at Glen Canyon USGS gage	6-18-91	1200	8.08	2864	2.5
		1800	7.96	2814	2.4
		2400	7.64	2870	2.4
	6-19-91	600	7.84	2824	2.4
		1200	7.93	2786	2.5
		1800	7.75	2820	2.5
		2400	7.67	2770	2.5
	6-20-91	600	7.71	2824	2.5
Colorado River at Lees Ferry USGS gage	6-18-91	1200	8.09	2747	2.6
		1800	8.10	2800	2.6
		2400	8.04	2756	2.6
	6-19-91	600	8.14	2793	2.6
		1200	8.10	2760	2.8
		1800	8.16	2789	2.7
		2400	8.03	2780	2.6
	6-20-91	600	8.26	2758	2.5
Paria River near mouth	6-18-91	1200	8.50	2114	0.9
		1800	8.63	2083	1.2
		2400	8.49	2123	0.8
	6-19-91	600	8.42	2212	1.2
		1200	8.56	2104	0.8
		1800	8.46	2067	1.3
		2400	8.44	2157	1.3
	6-20-91	600	8.41	2163	1.0
Colorado River upstream from Little Colorado River at USGS gage	6-18-91	1200	8.13	2800	2.7
		1800	8.20	2804	2.7
		2400	8.40	2827	2.6
	6-19-91	600	8.03	2783	2.7
		1200	8.02	2749	2.6
		1800	8.07	2816	-
		2400	8.10	2846	2.7
	6-20-91	600	-	-	2.7

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 6. Selected field measurements and dissolved organic carbon (DOC) determined from a composite of water samples from the river cross-section for the June 1991 synoptic experiment --continued

pH, Alkalinity and DOC, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	pH	Alkalinity meq/L	DOC mg C/L
Little Colorado River near mouth	6-18-91	1200	8.02	6797	0.7
		1800	8.02	6660	-
		2400	7.88	6607	1.2
	6-19-91	600	8.25	7257	0.5
		1200	7.98	6641	0.3
		1800	8.13	6595	0.1
		2400	8.06	6591	0.1
	6-20-91	600	-	-	-
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	6-18-91	1200	8.16	2817	2.7
		1800	8.17	2804	2.6
		2400	8.19	2861	2.6
	6-19-91	600	8.25	2917	2.6
		1200	8.19	2882	2.7
		1800	8.15	2863	2.9
		2400	8.20	2866	2.6
	6-20-91	600	8.18	3007	2.5
Bright Angel Creek near mouth	6-18-91	1200	8.81	3292	1.1
		1800	8.79	3219	0.8
		2400	8.61	3370	0.9
	6-19-91	600	8.02	3361	1.0
		1200	8.87	3309	1.0
		1800	8.77	3291	1.0
		2400	8.65	2900	1.0
	6-20-91	600	8.70	3444	0.9
Colorado River upstream from Kanab Creek	6-18-91	1200	8.22	2941	2.5
		1800	7.48	2872	2.7
		2400	8.18	2911	2.8
	6-19-91	600	8.21	2854	2.6
		1200	8.12	2861	2.7
		1800	8.25	2913	2.5
		2400	8.26	2868	2.4
	6-20-91	600	8.18	2887	2.6

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 6. Selected field measurements and dissolved organic carbon (DOC) determined from a composite of water samples from the river cross-section for the June 1991 synoptic experiment--continued

pH, Alkalinity and DOC, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	pH	Alkalinity meq/L	DOC mg C/L
Kanab Creek near mouth	6-18-91	1200	8.30	2169	0.8
		1800	8.24	2131	1.0
		2400	8.23	2382	0.9
	6-19-91	600	8.03	2439	0.9
		1200	8.42	2219	0.9
		1800	8.37	2291	0.8
		2400	8.09	2475	0.9
	6-20-91	600	8.22	2521	0.9
Colorado River upstream from Havasu Creek	6-18-91	1200	-	-	-
		1800	-	-	-
		2400	-	-	-
	6-19-91	600	-	-	-
		1200	-	-	-
		1800	-	-	-
		2400	-	-	-
	6-20-91	600	-	-	-
Havasu Creek near mouth	6-18-91	1200	8.58	5562	<0.1
		1800	8.42	5534	1.1
		2400	8.42	4813	<0.1
	6-19-91	600	8.50	5822	0.1
		1200	8.52	5614	<0.1
		1800	8.54	5571	0.1
		2400	8.60	5796	1.1
	6-20-91	600	8.58	5915	1.1
Colorado River at National Canyon USGS gage	6-18-91	1200	8.37	3331	-
		1800	8.43	2947	2.6
		2400	8.43	2831	2.6
	6-19-91	600	8.26	2892	2.6
		1200	8.19	2796	2.6
		1800	8.25	2853	2.6
		2400	8.32	2837	2.6
	6-20-91	600	8.24	2897	2.7

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 6. Selected field measurements and dissolved organic carbon (DOC) determined from a composite of water samples from the river cross-section for the June 1991 synoptic experiment--continued

pH, Alkalinity and DOC, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	pH	Alkalinity meq/L	DOC mg C/L
Colorado River upstream from Diamond Creek USGS gage	6-18-91	1200	8.29	2978	2.8
		1800	8.28	3160	3.1
		2400	8.31	2942	2.6
	6-19-91	600	8.34	3097	2.5
		1200	8.32	2909	2.7
		1800	8.32	2981	2.8
		2400	8.38	3028	3.2
	6-20-91	600	8.32	2930	2.9
Diamond Creek near mouth	6-18-91	1200	8.50	6441	-
		1800	8.25	6293	2.3
		2400	8.27	6265	1.2
	6-19-91	600	8.29	6205	-
		1200	8.50	5863	2.1
		1800	8.47	6466	2.2
		2400	8.21	6155	-
	6-20-91	600	8.26	6216	1.5
Colorado River near Travertine Cleft	6-18-91	1200	8.28	2954	2.4
		1800	8.31	2948	2.6
		2400	8.30	2948	2.4
	6-19-91	600	8.23	3023	2.4
		1200	8.45	2880	2.6
		1800	8.33	2982	3.0
		2400	8.24	3000	2.5
	6-20-91	600	8.25	2958	2.8

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 7. Dissolved nutrient concentrations for the November 1990 synoptic experiment

Nutrients, Colorado River Synoptic Experiment, November 1990
(N = nitrogen, P = phophorous)

Site Name	Date	Time	NO3 mg N/L	NO2 mg N/L	NH4 mg N/L	T.diss.N mg N/L	PO4 mg P/L	T.diss.P mg P/L
Colorado River at Glen Canyon USGS gage	11-5-90	600	0.33	<0.01	<0.02	0.5	<0.01	0.002
		1200	0.34	<0.01	<0.02	0.4	<0.01	<0.001
		1800	0.34	<0.01	<0.02	0.5	<0.01	0.002
		2400	0.35	<0.01	<0.02	0.5	<0.01	<0.001
	11-6-90	600	0.34	<0.01	<0.02	0.3	<0.01	0.001
		1200	0.35	<0.01	<0.02	0.2	<0.01	0.001
		1800	0.35	<0.01	<0.02	0.5	<0.01	<0.001
		2400	0.35	<0.01	<0.02	0.6	<0.01	<0.001
Colorado River at Lees Ferry USGS gage	11-5-90	600	0.34	<0.01	<0.02	0.4	<0.01	0.001
		1200	0.33	<0.01	<0.02	0.4	<0.01	<0.001
		1800	0.34	<0.01	<0.02	0.5	<0.01	0.001
		2400	0.35	<0.01	0.02	0.5	<0.01	0.001
	11-6-90	600	0.35	<0.01	<0.02	0.5	<0.01	<0.001
		1200	0.35	<0.01	<0.02	0.4	<0.01	<0.001
		1800	0.34	<0.01	<0.02	0.5	<0.01	<0.001
		2400	0.35	<0.01	0.02	0.5	<0.01	<0.001
Paria River near mouth	11-5-90	600	0.91	<0.01	0.04	1.0	<0.01	0.005
		1200	0.89	<0.01	<0.02	0.9	<0.01	0.001
		1800	0.85	0.05	0.03	1.0	0.06	0.040
		2400	0.92	<0.01	0.02	0.9	<0.01	0.053
	11-6-90	600	0.91	<0.01	<0.02	1.0	<0.01	0.004
		1200	0.87	0.03	0.03	1.0	0.03	0.062
		1800	0.83	<0.01	<0.02	0.9	<0.01	0.038
		2400	0.87	0.02	<0.02	0.9	<0.01	0.108
Colorado River upstream from Little Colorado River at USGS gage	11-5-90	600	0.33	<0.01	<0.02	0.5	<0.01	0.004
		1200	0.33	<0.01	<0.02	0.6	<0.01	0.004
		1800	0.32	<0.01	<0.02	0.5	<0.01	<0.001
		2400	0.32	<0.01	<0.02	0.4	<0.01	<0.001
	11-6-90	600	0.32	<0.01	<0.02	0.5	0.01	0.002
		1200	0.32	<0.01	<0.02	0.4	<0.01	0.020
		1800	0.32	<0.01	<0.02	0.5	<0.01	<0.001
		2400	0.34	<0.01	<0.02	0.4	<0.01	0.021

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 7. Dissolved nutrient concentrations for the November 1990 synoptic experiment Continued

Nutrients. Colorado River Synoptic Experiment. November 1990
(N = nitrogen, P = phophorous)

Site Name	Date	Time	NO3 mg N/L	NO2 mg N/L	NH4 mg N/L	T.diss.N mg N/L	PO4 mg P/L	T.diss.P mg P/L
Little Colorado River near mouth	11-5-90	600	0.32	<0.01	<0.02	0.4	0.01	0.018
		1200	0.32	<0.01	<0.02	0.4	<0.01	0.006
		1800	0.32	<0.01	<0.02	-	<0.01	-
		2400	0.32	<0.01	<0.02	-	0.02	-
	11-6-90	600	1.01	0.08	<0.02	-	0.03	-
		1200	0.85	<0.01	<0.02	-	0.03	-
		1800	0.76	0.02	<0.02	-	0.03	-
		2400	0.71	0.03	<0.02	-	0.03	-
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	11-5-90	600	0.35	<0.01	<0.02	0.6	<0.01	0.002
		1200	0.34	<0.01	<0.02	0.5	<0.01	0.021
		1800	0.38	<0.01	<0.02	0.4	<0.01	0.001
		2400	0.36	<0.01	<0.02	-	<0.01	0.008
	11-6-90	600	0.35	<0.01	<0.02	0.4	<0.01	0.023
		1200	0.34	<0.01	<0.02	0.1	<0.01	0.001
		1800	0.36	<0.01	<0.02	0.6	0.03	0.045
		2400	0.35	<0.01	<0.02	0.7	0.03	0.022
Bright Angel Creek at mouth	11-5-90	600	-	-	-	-	-	-
		1200	-	-	-	-	-	-
		1800	-	-	-	-	-	-
		2400	-	-	-	-	-	-
	11-6-90	600	-	-	-	-	-	-
		1200	-	-	-	-	-	-
		1800	-	-	-	-	-	-
		2400	-	-	-	-	-	-
Colorado River upstream from Kanab Creek	11-5-90	600	0.30	0.02	0.02	0.6	0.05	<0.001
		1200	0.32	<0.01	<0.02	0.5	<0.01	0.005
		1800	0.32	<0.01	<0.02	0.5	<0.01	0.006
		2400	0.32	<0.01	<0.02	0.5	<0.01	0.011
	11-6-90	600	0.32	<0.01	<0.02	0.5	<0.01	0.004
		1200	0.32	<0.01	<0.02	0.5	0.01	0.003
		1800	0.32	<0.01	<0.02	0.4	0.01	0.002
		2400	0.32	<0.01	<0.02	0.5	0.01	0.003

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 7. Dissolved nutrient concentrations for the November 1990 synoptic experiment Continued

Nutrients. Colorado River Synoptic Experiment. November 1990
(N = nitrogen, P = phophorous)

Site Name	Date	Time	NO3 mg N/L	NO2 mg N/L	NH4 mg N/L	T.diss.N mg N/L	PO4 mg P/L	T.diss.P mg P/L
Kanab Creek near mouth	11-5-90	600	0.19	<0.01	<0.02	0.5	<0.01	<0.001
		1200	0.16	<0.01	<0.02	0.3	<0.01	0.001
		1800	0.00	<0.01	<0.02	0.3	<0.01	0.003
		2400	0.20	<0.01	<0.02	0.3	<0.01	<0.001
	11-6-90	600	0.20	<0.01	<0.02	0.3	<0.01	0.001
		1200	0.17	<0.01	<0.02	0.2	<0.01	0.004
		1800	0.19	<0.01	<0.02	0.3	<0.01	0.004
		2400	0.20	<0.01	<0.02	0.4	<0.01	0.002
Colorado River upstream from Havasu Creek	11-5-90	600	0.34	<0.01	<0.02	0.5	<0.01	0.007
		1200	0.34	<0.01	<0.02	0.5	<0.01	<0.001
		1800	0.33	<0.01	<0.02	0.6	<0.01	0.002
		2400	0.33	<0.01	<0.02	0.4	<0.01	0.002
	11-6-90	600	0.33	<0.01	<0.02	0.4	<0.01	0.001
		1200	0.33	<0.01	0.02	0.5	0.02	0.003
		1800	0.32	<0.01	<0.02	0.5	<0.01	0.002
		2400	0.32	<0.01	<0.02	0.4	<0.01	0.005
Havasu Creek near mouth	11-5-90	600	0.28	<0.01	<0.02	0.3	<0.01	0.001
		1200	0.26	<0.01	<0.02	0.2	<0.01	<0.001
		1800	0.26	<0.01	<0.02	0.3	<0.01	0.002
		2400	0.25	<0.01	<0.02	0.3	<0.01	0.001
	11-6-90	600	0.27	<0.01	<0.02	0.3	<0.01	<0.001
		1200	0.26	<0.01	<0.02	0.3	<0.01	0.001
		1800	0.26	<0.01	<0.02	0.1	<0.01	0.002
		2400	0.25	<0.01	<0.02	0.3	<0.01	<0.001
Colorado River at National Canyon USGS gage	11-5-90	600	0.32	<0.01	<0.02	0.5	0.02	0.001
		1200	0.32	<0.01	<0.02	0.5	<0.01	0.004
		1800	-	-	-	-	-	-
		2400	0.32	<0.01	<0.02	0.5	<0.01	<0.001
	11-6-90	600	-	-	-	-	-	-
		1200	0.31	0.01	0.02	0.4	0.03	0.003
		1800	0.32	<0.01	<0.02	0.5	0.01	0.007
		2400	0.32	<0.01	<0.02	0.4	<0.01	0.002

PRELIMINARY RESULTS SUBJECT TO REVISION

Table 7. Dissolved nutrient concentrations for the November 1990 synoptic experiment Continued

Nutrients, Colorado River Synoptic Experiment, November 1990
(N = nitrogen, P = phophorous)

Site Name	Date	Time	NO3 mg N/L	NO2 mg N/L	NH4 mg N/L	T.diss.N mg N/L	PO4 mg P/L	T.diss.P mg P/L
Colorado River upstream from Diamond Creek USGS gage	11-5-90	600	0.32	<0.01	<0.02	0.5	<0.01	0.031
		1200	0.33	<0.01	<0.02	0.4	0.01	0.003
		1800	0.33	<0.01	<0.02	0.4	<0.01	0.004
		2400	0.33	<0.01	<0.02	0.4	<0.01	0.004
	11-6-90	600	0.33	<0.01	<0.02	0.4	0.01	0.004
		1200	0.33	<0.01	<0.02	0.5	<0.01	0.005
		1800	0.33	<0.01	<0.02	0.4	<0.01	0.002
		2400	0.32	<0.01	<0.02	0.5	<0.01	0.003
Diamond Creek near mouth	11-5-90	600	-	-	-	-	-	-
		1200	0.33	<0.01	<0.02	0.3	<0.01	<0.001
		1800	0.34	<0.01	<0.02	0.2	<0.01	0.001
		2400	-	-	-	-	-	-
	11-6-90	600	0.40	<0.01	<0.02	0.4	<0.01	<0.001
		1200	0.33	<0.01	<0.02	0.3	<0.01	0.003
		1800	0.33	<0.01	<0.02	0.5	<0.01	0.018
		2400	-	-	-	-	-	-
Colorado River near Columbine Falls	11-5-90	600	0.32	<0.01	<0.02	0.5	<0.01	0.010
		1200	0.31	<0.01	0.02	0.5	0.02	0.007
		1800	0.31	<0.01	<0.02	0.4	<0.01	0.082
		2400	0.32	<0.01	<0.02	0.6	0.01	0.007
	11-6-90	600	0.32	<0.01	<0.02	0.6	<0.01	0.004
		1200	0.33	<0.01	<0.02	0.5	<0.01	0.002
		1800	0.33	<0.01	<0.02	0.5	<0.01	0.002
		2400	0.33	<0.01	<0.02	0.5	<0.01	0.005

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 8. Dissolved nutrient concentrations for the June 1991 synoptic experiment

Nutrients, Colorado River Synoptic Experiment, June 1991
(N = nitrogen, P = phophorous)

Site Name	Date	Time	NO3 mg N/L	NO2 mg N/L	NH4 mg N/L	T.diss.N mg N/L	PO4 mg P/L	T.diss.P mg P/L
Colorado River at Glen Canyon USGS gage	6-18-91	1200	0.39	<0.01	<0.02	0.40	0.01	0.004
		1800	0.38	<0.01	<0.02	0.49	<0.01	0.004
		2400	0.37	<0.01	<0.02	0.37	<0.01	0.006
	6-19-91	600	0.36	<0.01	<0.02	0.54	<0.01	0.004
		1200	0.35	<0.01	<0.02	0.58	<0.01	0.009
		1800	0.37	<0.01	<0.02	0.46	0.01	0.005
		2400	0.36	<0.01	<0.02	0.47	<0.01	0.011
	6-20-91	600	0.38	<0.01	<0.02	0.42	<0.01	0.013
Colorado River at Lees Ferry USGS gage	6-18-91	1200	0.38	<0.01	<0.02	0.85	<0.01	0.004
		1800	0.54	0.01	<0.02	0.80	<0.01	0.003
		2400	0.38	<0.01	<0.02	0.70	<0.01	0.002
	6-19-91	600	0.37	<0.01	<0.02	0.50	<0.01	0.002
		1200	0.37	<0.01	<0.02	0.30	<0.01	0.005
		1800	0.38	<0.01	<0.02	0.46	<0.01	0.003
		2400	0.36	<0.01	0.03	0.41	<0.01	<0.001
	6-20-91	600	0.37	<0.01	<0.02	0.50	<0.01	0.001
Paria River near mouth	6-18-91	1200	1.06	0.01	<0.02	0.99	0.01	0.013
		1800	1.05	0.01	<0.02	1.14	<0.01	0.035
		2400	1.08	0.01	<0.02	0.95	<0.01	0.010
	6-19-91	600	1.08	0.01	<0.02	1.04	0.01	0.008
		1200	1.04	0.01	<0.02	1.02	0.01	0.053
		1800	1.04	0.02	<0.02	0.90	0.01	0.015
		2400	1.04	0.01	<0.02	1.04	0.01	0.050
	6-20-91	600	1.06	0.01	<0.02	1.01	0.01	0.031
Colorado River upstream from Little Colorado River at USGS gage	6-18-91	1200	0.37	<0.01	0.02	0.51	<0.01	0.008
		1800	0.36	<0.01	<0.02	0.51	<0.01	0.014
		2400	0.35	<0.01	0.02	0.47	<0.01	0.017
	6-19-91	600	0.39	<0.01	<0.02	0.45	<0.01	0.008
		1200	0.28	<0.01	<0.02	0.53	<0.01	0.008
		1800	0.37	<0.01	<0.02	0.37	<0.01	0.018
		2400	0.37	<0.01	<0.02	0.86	<0.01	0.010
	6-20-91	600	0.34	<0.01	<0.02	0.66	<0.01	0.006

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 8. Dissolved nutrient concentrations for the June 1991 synoptic experiment--Continued

Nutrients, Colorado River Synoptic Experiment, June 1991
(N = nitrogen, P = phophorous)

Site Name	Date	Time	NO3 mg N/L	NO2 mg N/L	NH4 mg N/L	T.diss.N mg N/L	PO4 mg P/L	T.diss.P mg P/L
Little Colorado River near mouth	6-18-91	1200	0.24	<0.01	0.02	0.18	<0.01	0.003
		1800	0.22	<0.01	<0.02	0.26	<0.01	<0.001
		2400	0.16	<0.01	<0.02	0.18	<0.01	0.014
	6-19-91	600	0.24	<0.01	<0.02	0.38	<0.01	0.013
		1200	0.22	<0.01	<0.02	0.25	<0.01	0.015
		1800	0.22	<0.01	0.02	0.28	<0.01	0.001
		2400	0.17	<0.01	<0.02	0.36	<0.01	0.001
	6-20-91	600	-	-	-	-	-	-
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	6-18-91	1200	0.35	<0.01	0.02	0.35	<0.01	0.019
		1800	0.36	<0.01	0.02	0.41	<0.01	0.005
		2400	0.35	<0.01	0.02	0.45	0.01	0.010
	6-19-91	600	0.37	<0.01	0.02	0.68	<0.01	0.007
		1200	0.38	<0.01	0.02	0.50	<0.01	0.006
		1800	0.39	<0.01	0.02	0.37	<0.01	0.009
		2400	0.36	<0.01	<0.02	0.47	<0.01	0.007
	6-20-91	600	0.37	<0.01	<0.02	0.47	<0.01	0.001
Bright Angel Creek near mouth	6-18-91	1200	<0.02	<0.01	<0.02	<0.10	0.01	0.033
		1800	<0.02	<0.01	<0.02	0.12	<0.01	0.036
		2400	<0.02	<0.01	<0.02	<0.10	0.01	0.034
	6-19-91	600	<0.02	<0.01	<0.02	<0.10	<0.01	0.032
		1200	<0.02	<0.01	<0.02	<0.10	0.01	0.032
		1800	<0.02	<0.01	<0.02	0.16	<0.01	0.037
		2400	<0.02	<0.01	<0.02	0.11	<0.01	0.029
	6-20-91	600	<0.02	<0.01	<0.02	<0.10	<0.01	0.029
Colorado River upstream from Kanab Creek	6-18-91	1200	0.36	<0.01	0.02	0.41	<0.01	0.014
		1800	0.36	<0.01	0.02	0.49	<0.01	0.013
		2400	0.37	<0.01	<0.02	0.51	<0.01	0.014
	6-19-91	600	0.32	<0.01	0.02	0.47	<0.01	0.007
		1200	0.35	<0.01	0.02	0.42	<0.01	0.010
		1800	0.34	<0.01	0.02	0.57	<0.01	0.006
		2400	0.37	<0.01	0.02	0.68	<0.01	0.006
	6-20-91	600	0.38	<0.01	0.02	0.51	<0.01	0.001

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 8. Dissolved nutrient concentrations for the June 1991 synoptic experiment--Continued

Nutrients, Colorado River Synoptic Experiment, June 1991
(N = nitrogen, P = phophorous)

Site Name	Date	Time	NO3 mg N/L	NO2 mg N/L	NH4 mg N/L	T.diss.N mg N/L	PO4 mg P/L	T.diss.P mg P/L
Kanab Creek near mouth	6-18-91	1200	<0.02	<0.01	0.02	<0.10	<0.01	0.017
		1800	<0.02	<0.01	<0.02	<0.10	<0.01	-
		2400	<0.02	<0.01	0.02	0.10	<0.01	0.014
	6-19-91	600	<0.02	<0.01	<0.02	0.32	<0.01	0.001
		1200	<0.02	<0.01	<0.02	0.18	<0.01	0.004
		1800	<0.02	<0.01	<0.02	<0.10	<0.01	0.005
		2400	<0.02	<0.01	0.02	0.19	<0.01	0.002
	6-20-91	600	<0.02	<0.01	<0.02	<0.10	0.01	0.013
Colorado River upstream from Havasu Creek	6-18-91	1200	-	-	-	-	-	-
		1800	-	-	-	-	-	-
		2400	-	-	-	-	-	-
	6-19-91	600	-	-	-	-	-	-
		1200	-	-	-	-	-	-
		1800	-	-	-	-	-	-
		2400	-	-	-	-	-	-
	6-20-91	600	-	-	-	-	-	-
Havasu Creek near mouth	6-18-91	1200	0.11	<0.01	<0.02	0.12	<0.01	0.015
		1800	0.08	<0.01	<0.02	0.11	<0.01	0.011
		2400	0.13	<0.01	<0.02	0.14	<0.01	0.009
	6-19-91	600	0.14	<0.01	<0.02	0.15	<0.01	0.001
		1200	0.13	<0.01	<0.02	0.14	<0.01	0.011
		1800	0.13	<0.01	<0.02	0.12	<0.01	0.010
		2400	0.15	<0.01	<0.02	0.32	<0.01	0.009
	6-20-91	600	0.16	<0.01	<0.02	0.16	<0.01	0.002
Colorado River at National Canyon USGS gage	6-18-91	1200	0.39	<0.01	0.02	0.73	<0.01	0.002
		1800	0.39	<0.01	0.02	0.31	<0.01	0.007
		2400	0.36	<0.01	<0.02	0.41	<0.01	0.009
	6-19-91	600	0.39	<0.01	0.02	0.44	<0.01	0.009
		1200	0.38	<0.01	<0.02	0.47	<0.01	0.009
		1800	0.35	<0.01	0.03	0.41	0.01	0.009
		2400	0.37	<0.01	0.03	0.81	<0.01	0.017
	6-20-91	600	0.36	<0.01	0.02	0.49	<0.01	0.013

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 8. Dissolved nutrient concentrations for the June 1991 synoptic experiment--Continued

Nutrients, Colorado River Synoptic Experiment, June 1991
(N = nitrogen, P = phophorous)

Site Name	Date	Time	NO3 mg N/L	NO2 mg N/L	NH4 mg N/L	T.diss.N mg N/L	PO4 mg P/L	T.diss.P mg P/L
Colorado River upstream from Diamond Creek USGS gage	6-18-91	1200	0.38	<0.01	<0.02	0.48	0.01	0.004
		1800	0.38	<0.01	<0.02	0.46	<0.01	0.011
		2400	0.14	<0.01	<0.02	0.53	<0.01	0.005
	6-19-91	600	0.38	<0.01	0.02	0.44	<0.01	0.012
		1200	-	-	-	0.46	-	0.056
		1800	0.37	<0.01	0.02	0.47	<0.01	0.034
		2400	0.36	<0.01	0.02	0.51	<0.01	0.041
	6-20-91	600	0.52	<0.01	<0.02	0.53	0.01	0.005
Diamond Creek near mouth	6-18-91	1200	0.35	<0.01	<0.02	0.32	<0.01	0.003
		1800	0.34	<0.01	<0.02	0.35	<0.01	0.002
		2400	0.45	<0.01	<0.02	0.34	<0.01	0.005
	6-19-91	600	0.42	<0.01	<0.02	0.48	<0.01	0.009
		1200	-	-	-	0.37	-	<0.001
		1800	0.39	<0.01	<0.02	0.52	<0.01	<0.001
		2400	0.44	<0.01	<0.02	0.60	<0.01	0.002
	6-20-91	600	0.42	<0.01	<0.02	0.44	<0.01	0.001
Colorado River near Travertine Cleft	6-18-91	1200	0.49	<0.01	0.02	0.45	<0.01	0.025
		1800	0.37	<0.01	0.02	0.54	<0.01	0.010
		2400	0.38	<0.01	0.02	0.50	<0.01	0.007
	6-19-91	600	0.38	<0.01	0.02	0.47	<0.01	0.006
		1200	0.35	<0.01	0.02	0.41	<0.01	0.019
		1800	0.36	<0.01	0.02	0.48	<0.01	0.017
		2400	0.36	<0.01	0.03	0.56	<0.01	0.007
	6-20-91	600	0.34	<0.01	0.02	0.33	<0.01	0.006

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 9. Major anion concentrations for the November 1990 synoptic experiment

Anions, Colorado River Synoptic Experiment, November 1990

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site Name	Date	Time	Cl mg/L	SO4 mg/L
Colorado River at Glen Canyon USGS gage	11-5-90	600	43.6	217
		1200	45.6	221
		1800	46.3	228
		2400	46.2	228
	11-6-90	600	45.4	230
		1200	49.1	235
		1800	47.5	231
		2400	47.4	232
Colorado River at Lees Ferry USGS gage	11-5-90	600	44.3	223
		1200	44.5	228
		1800	46.2	231
		2400	47.5	234
	11-6-90	600	47.1	231
		1200	47.5	231
		1800	46.4	229
		2400	48.5	232
Paria River near mouth	11-5-90	600	13.8	345
		1200	13.7	344
		1800	14.1	368
		2400	13.9	374
	11-6-90	600	13.9	380
		1200	13.8	355
		1800	14.3	383
		2400	13.8	373
Colorado River upstream from Little Colorado River at USGS gage	11-5-90	600	51.2	227
		1200	51.5	227
		1800	53.3	235
		2400	53.3	233
	11-6-90	600	56.7	238
		1200	54.8	228
		1800	51.6	233
		2400	50.3	230

Table 9. Major anion concentrations for the November 1990 synoptic experiment--continued

Anions, Colorado River Synoptic Experiment, November 1990

PRELIMINARY RESULTS SUBJECT TO REVISION

Site Name	Date	Time	Cl mg/L	SO4 mg/L
Little Colorado River near mouth	11-5-90	600	1250	179
		1200	1250	180
		1800	1260	172
		2400	1160	170
	11-6-90	600	680	243
		1200	600	194
		1800	630	165
		2400	690	161
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	11-5-90	600	77.4	228
		1200	79.0	227
		1800	84.1	233
		2400	93.6	234
	11-6-90	600	102.4	230
		1200	132.0	228
		1800	141.3	226
		2400	81.7	221
Bright Angel Creek at mouth	11-5-90	600	-	-
		1200	-	-
		1800	-	-
		2400	-	-
	11-6-90	600	-	-
		1200	-	-
		1800	-	-
		2400	-	-
Colorado River upstream from Kanab Creek	11-5-90	600	80.5	224
		1200	90.8	227
		1800	92.7	226
		2400	86.7	227
	11-6-90	600	80.4	219
		1200	83.1	224
		1800	85.0	215
		2400	89.9	222

Table 9. Major anion concentrations for the November 1990 synoptic experiment--continued

Anions, Colorado River Synoptic Experiment, November 1990

PRELIMINARY RESULTS SUBJECT TO REVISION

Site Name	Date	Time	Cl mg/L	SO4 mg/L
Kanab Creek near mouth	11-5-90	600	17.7	533
		1200	17.9	545
		1800	18.0	532
		2400	18.0	550
	11-6-90	600	18.0	562
		1200	17.8	541
		1800	17.8	548
		2400	17.4	548
Colorado River upstream from Havasu Creek	11-5-90	600	78.5	231
		1200	84.3	227
		1800	90.1	220
		2400	88.1	218
	11-6-90	600	84.4	224
		1200	82.8	226
		1800	83.1	223
		2400	90.7	219
Havasu Creek near mouth	11-5-90	600	46.0	44
		1200	47.8	46
		1800	47.4	45
		2400	46.9	45
	11-6-90	600	46.4	44
		1200	46.2	44
		1800	47.3	45
		2400	47.8	45
Colorado River at National Canyon USGS gage	11-5-90	600	70.4	215
		1200	72.3	217
		1800	-	-
		2400	86.2	221
	11-6-90	600	-	-
		1200	87.6	213
		1800	82.0	209
		2400	82.1	219

Table 9. Major anion concentrations for the November 1990 synoptic experiment--continued

Anions, Colorado River Synoptic Experiment, November 1990

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site Name	Date	Time	Cl mg/L	SO4 mg/L
Colorado River upstream from Diamond Creek USGS gage	11-5-90	600	78.7	217
		1200	83.8	214
		1800	94.4	217
		2400	85.6	217
	11-6-90	600	88.3	212
		1200	96.6	214
		1800	88.6	221
		2400	76.1	220
Diamond Creek near mouth	11-5-90	600	49.0	28
		1200	47.3	27
		1800	48.2	28
		2400	-	-
	11-6-90	600	48.3	28
		1200	47.8	28
		1800	48.4	27
		2400	-	-
Colorado River near Columbine Falls	11-5-90	600	88.5	221
		1200	92.5	223
		1800	95.9	222
		2400	85.8	223
	11-6-90	600	75.5	219
		1200	79.1	222
		1800	89.0	225
		2400	91.4	223

Table 10. Major anion concentrations for the June 1991 synoptic experiment

PRELIMINARY RESULTS
SUBJECT TO REVISION

Anions, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Cl mg/L	SO4 mg/L
Colorado River at Glen Canyon USGS gage	6-18-91	1200	57.4	246
		1800	57.6	248
		2400	56.4	246
	6-19-91	600	56.9	250
		1200	59.2	254
		1800	58.8	254
		2400	54.1	240
	6-20-91	600	58.0	252
Colorado River at Lees Ferry USGS gage	6-18-91	1200	58.1	250
		1800	57.3	244
		2400	57.7	246
	6-19-91	600	59.0	254
		1200	56.7	249
		1800	58.4	252
		2400	55.3	240
	6-20-91	600	57.0	250
Paria River near mouth	6-18-91	1200	11.2	128
		1800	11.1	125
		2400	11.2	130
	6-19-91	600	11.2	130
		1200	11.3	127
		1800	11.9	134
		2400	11.7	136
	6-20-91	600	11.4	133
Colorado River upstream from Little Colorado River at USGS gage	6-18-91	1200	58.3	249
		1800	60.8	253
		2400	62.7	256
	6-19-91	600	62.0	258
		1200	61.2	257
		1800	61.9	257
		2400	62.2	256
	6-20-91	600	61.2	256

Table 10. Major anion concentrations for the June 1991 synoptic experiment--continued

Anions, Colorado River Synoptic Experiment, June 1991

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site Name	Date	Time	Cl mg/L	SO4 mg/L
Little Colorado River near mouth	6-18-91	1200	1290	174
		1800	1310	179
		2400	1320	174
	6-19-91	600	1310	177
		1200	1300	180
		1800	1300	179
		2400	1260	183
	6-20-91	600	-	-
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	6-18-91	1200	68.6	252
		1800	70.2	253
		2400	72.0	256
	6-19-91	600	89.7	257
		1200	70.5	253
		1800	74.3	267
		2400	71.9	249
	6-20-91	600	95.0	261
Bright Angel Creek at mouth	6-18-91	1200	-	-
		1800	-	-
		2400	-	-
	6-19-91	600	-	-
		1200	-	-
		1800	-	-
		2400	-	-
	6-20-91	600	-	-
Colorado River upstream from Kanab Creek	6-18-91	1200	100.0	255
		1800	76.0	257
		2400	79.1	248
	6-19-91	600	70.2	254
		1200	68.6	253
		1800	68.0	247
		2400	82.7	254
	6-20-91	600	71.1	256

Table 10. Major anion concentrations for the June 1991 synoptic experiment--continued

Anions, Colorado River Synoptic Experiment, June 1991

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site Name	Date	Time	Cl mg/L	SO4 mg/L
Kanab Creek near mouth	6-18-91	1200	19.3	579
		1800	18.3	563
		2400	18.1	541
	6-19-91	600	18.4	542
		1200	18.6	541
		1800	18.7	549
		2400	18.8	542
	6-20-91	600	18.4	558
Colorado River upstream from Havasu Creek	6-18-91	1200	-	-
		1800	-	-
		2400	-	-
	6-19-91	600	-	-
		1200	-	-
		1800	-	-
		2400	-	-
	6-20-91	600	-	-
Havasu Creek near mouth	6-18-91	1200	47.4	35
		1800	47.5	35
		2400	46.8	35
	6-19-91	600	47.1	35
		1200	48.0	35
		1800	47.6	35
		2400	47.9	35
	6-20-91	600	48.8	36
Colorado River at National Canyon USGS gage	6-18-91	1200	79.1	254
		1800	88.8	251
		2400	74.3	249
	6-19-91	600	-	-
		1200	-	-
		1800	-	-
		2400	-	-
	6-20-91	600	-	-

Table 10. Major anion concentrations for the June 1991 synoptic experiment--continued

Anions, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Cl mg/L	SO4 mg/L
Colorado River upstream from Diamond Creek USGS gage	6-18-91	1200	70.8	248
		1800	71.1	246
		2400	76.0	245
	6-19-91	600	79.0	243
		1200	81.9	243
		1800	92.7	243
		2400	76.6	252
	6-20-91	600	83.6	251
Diamond Creek near mouth	6-18-91	1200	55.5	33
		1800	57.9	35
		2400	58.5	36
	6-19-91	600	56.3	34
		1200	-	-
		1800	57.5	35
		2400	56.4	34
	6-20-91	600	55.4	33
Colorado River near Columbine Falls	6-18-91	1200	-	-
		1800	-	-
		2400	-	-
	6-19-91	600	-	-
		1200	-	-
		1800	-	-
		2400	-	-
	6-20-91	600	-	-

PRELIMINARY RESULTS SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment
Units of mg/L

Colorado River at Glen Canyon USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	6.2e+01	2.5e+01	6.6e+01	3.4e+00	8.1e+00	7.8e-01
05NOV90	1200	6.5e+01	2.5e+01	6.8e+01	<1.0e-01	8.3e+00	8.0e-01
05NOV90	1800	6.4e+01	2.5e+01	6.7e+01	<1.0e-01	8.2e+00	7.9e-01
05NOV90	2400	6.8e+01	2.7e+01	7.1e+01	<1.0e-01	8.6e+00	8.4e-01
06NOV90	0600	6.1e+01	2.4e+01	6.4e+01	<1.0e-01	8.0e+00	7.6e-01
06NOV90	1200	6.9e+01	2.8e+01	7.4e+01	3.1e+00	8.6e+00	8.6e-01
06NOV90	1800	6.4e+01	2.5e+01	6.9e+01	<1.0e-01	8.2e+00	7.9e-01
06NOV90	2400	6.6e+01	2.7e+01	7.0e+01	3.3e+00	8.2e+00	8.2e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Colorado River at Lees Ferry USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	5.6e+01	2.3e+01	5.8e+01	<1.0e-01	7.5e+00	6.9e-01
05NOV90	1200	6.3e+01	2.5e+01	6.4e+01	<1.0e-01	8.1e+00	7.6e-01
05NOV90	1800	6.0e+01	2.4e+01	6.2e+01	<1.0e-01	8.0e+00	7.4e-01
05NOV90	2400	6.0e+01	2.4e+01	6.2e+01	<1.0e-01	7.8e+00	7.3e-01
06NOV90	0600	7.0e+01	2.7e+01	7.1e+01	<1.0e-01	8.8e+00	8.5e-01
06NOV90	1200	6.4e+01	2.5e+01	6.6e+01	<1.0e-01	8.2e+00	7.8e-01
06NOV90	1800	6.2e+01	2.5e+01	6.4e+01	<1.0e-01	8.1e+00	7.5e-01
06NOV90	2400	6.3e+01	2.5e+01	6.6e+01	<1.0e-01	8.1e+00	7.7e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Paria River near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	7.6e+01	3.9e+01	6.2e+01	4.0e+00	>1.0e+01	1.6e+00
05NOV90	1200	8.8e+01	4.1e+01	6.7e+01	<1.0e-01	>1.0e+01	1.8e+00
05NOV90	1800	8.5e+01	4.3e+01	7.0e+01	4.2e+00	>1.0e+01	1.8e+00
05NOV90	2400	8.4e+01	4.1e+01	7.0e+01	<1.0e-01	>1.0e+01	1.8e+00
06NOV90	0600	7.6e+01	3.7e+01	6.5e+01	<1.0e-01	>1.0e+01	1.6e+00
06NOV90	1200	8.1e+01	3.9e+01	6.7e+01	<1.0e-01	>1.0e+01	1.6e+00
06NOV90	1800	8.9e+01	4.5e+01	7.5e+01	4.5e+00	>1.0e+01	1.8e+00
06NOV90	2400	7.7e+01	4.0e+01	6.8e+01	4.6e+00	>1.0e+01	1.6e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Colorado River upstream from Little Colorado River at USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	6.4e+01	2.6e+01	7.0e+01	3.5e+00	7.9e+00	7.9e-01
05NOV90	1200	6.6e+01	2.7e+01	7.3e+01	<1.0e-01	8.0e+00	8.2e-01
05NOV90	1800	6.3e+01	2.5e+01	6.7e+01	<1.0e-01	7.6e+00	7.6e-01
05NOV90	2400	6.6e+01	2.6e+01	7.2e+01	<1.0e-01	7.8e+00	8.2e-01
06NOV90	0600	6.1e+01	2.4e+01	6.5e+01	<1.0e-01	7.4e+00	7.3e-01
06NOV90	1200	5.8e+01	2.3e+01	6.1e+01	<1.0e-01	7.1e+00	6.9e-01
06NOV90	1800	6.2e+01	2.5e+01	6.5e+01	<1.0e-01	7.6e+00	7.5e-01
06NOV90	2400	6.2e+01	2.5e+01	6.8e+01	<1.0e-01	7.6e+00	7.8e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Little Colorado River near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	7.9e+01	5.7e+01	>1.0e+01	<1.0e-01	>1.0e+01	7.9e-01
05NOV90	1200	7.9e+01	6.7e+01	1.0e-01	6.2e+00	>1.0e+01	8.8e-01
05NOV90	1800	8.4e+01	7.0e+01	1.0e-01	<1.0e-01	>1.0e+01	9.4e-01
06NOV90	0600	1.6e+02	3.8e+01	4.7e+02	4.7e+00	1.0e+01	2.8e+00
06NOV90	1200	1.5e+02	3.7e+01	4.4e+02	4.8e+00	9.9e+00	2.6e+00
06NOV90	1800	1.3e+02	3.4e+01	4.1e+02	4.7e+00	9.5e+00	2.2e+00
06NOV90	2400	1.4e+02	3.7e+01	4.5e+02	4.8e+00	>1.0e+01	2.3e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Colorado River upstream from Kanab Creek

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	6.8e+01	2.9e+01	9.1e+01	3.6e+00	8.4e+00	8.3e-01
05NOV90	1200	6.6e+01	2.8e+01	9.5e+01	3.4e+00	8.4e+00	8.1e-01
05NOV90	1800	7.3e+01	3.1e+01	1.0e+02	3.7e+00	9.5e+00	9.0e-01
05NOV90	2400	6.4e+01	2.7e+01	8.9e+01	3.7e+00	7.9e+00	7.8e-01
06NOV90	0600	6.1e+01	2.6e+01	8.3e+01	3.6e+00	7.8e+00	7.5e-01
06NOV90	1200	7.2e+01	3.0e+01	9.7e+01	3.5e+00	8.7e+00	8.8e-01
06NOV90	1800	6.9e+01	2.9e+01	9.5e+01	3.5e+00	8.5e+00	8.4e-01
06NOV90	2400	6.8e+01	2.9e+01	1.0e+02	3.7e+00	8.5e+00	8.3e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Kanab Creek near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	1.3e+02	6.5e+01	2.9e+01	5.2e+00	8.7e+00	1.4e+00
05NOV90	1200	1.4e+02	7.0e+01	3.2e+01	5.5e+00	9.4e+00	1.5e+00
05NOV90	1800	1.5e+02	7.4e+01	3.3e+01	5.6e+00	9.9e+00	1.6e+00
05NOV90	2400	1.4e+02	7.0e+01	3.2e+01	5.7e+00	9.3e+00	1.5e+00
06NOV90	0600	1.5e+02	7.5e+01	3.4e+01	5.7e+00	9.7e+00	1.7e+00
06NOV90	1200	1.4e+02	7.3e+01	3.3e+01	5.8e+00	9.4e+00	1.6e+00
06NOV90	1800	1.4e+02	6.9e+01	3.1e+01	5.7e+00	9.1e+00	1.5e+00
06NOV90	2400	1.4e+02	6.9e+01	3.1e+01	5.8e+00	9.0e+00	1.5e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Colorado River upstream from Havasu Creek

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	7.1e+01	2.9e+01	9.0e+01	3.6e+00	8.7e+00	8.6e-01
05NOV90	1200	6.2e+01	2.6e+01	8.4e+01	3.3e+00	7.9e+00	7.6e-01
05NOV90	1800	7.3e+01	3.0e+01	1.1e+02	3.4e+00	8.9e+00	8.9e-01
05NOV90	2400	7.3e+01	3.0e+01	1.0e+02	3.3e+00	9.1e+00	8.9e-01
06NOV90	0600	6.9e+01	2.9e+01	9.5e+01	3.5e+00	8.4e+00	8.5e-01
06NOV90	1200	7.5e+01	3.0e+01	9.7e+01	3.3e+00	>1.0e+01	9.0e-01
06NOV90	1800	7.3e+01	3.0e+01	9.7e+01	3.5e+00	8.9e+00	8.9e-01
06NOV90	2400	6.4e+01	2.7e+01	8.9e+01	3.4e+00	8.2e+00	7.7e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Havasu Creek near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	5.2e+01	4.6e+01	3.3e+01	4.4e+00	>1.0e+01	3.1e-01
05NOV90	1200	5.6e+01	4.8e+01	3.6e+01	4.2e+00	>1.0e+01	3.2e-01
05NOV90	1800	5.6e+01	4.8e+01	3.5e+01	4.4e+00	>1.0e+01	3.2e-01
05NOV90	2400	5.6e+01	4.9e+01	3.5e+01	4.4e+00	>1.0e+01	3.2e-01
06NOV90	0600	5.4e+01	4.7e+01	3.5e+01	4.4e+00	>1.0e+01	3.1e-01
06NOV90	1200	5.8e+01	4.9e+01	3.6e+01	4.5e+00	>1.0e+01	3.3e-01
06NOV90	1800	5.9e+01	4.9e+01	3.6e+01	4.4e+00	>1.0e+01	3.3e-01
06NOV90	2400	5.6e+01	4.6e+01	3.4e+01	4.3e+00	>1.0e+01	3.1e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Colorado River at National Canyon USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	7.5e+01	3.0e+01	9.0e+01	3.8e+00	>1.0e+01	8.9e-01
05NOV90	1200	6.9e+01	2.8e+01	8.7e+01	3.6e+00	8.4e+00	8.4e-01
05NOV90	2400	6.9e+01	2.9e+01	9.6e+01	3.4e+00	8.8e+00	8.4e-01
06NOV90	1200	7.1e+01	3.0e+01	1.0e+02	3.5e+00	8.9e+00	8.7e-01
06NOV90	1800	6.6e+01	2.8e+01	9.1e+01	3.5e+00	8.4e+00	8.1e-01
06NOV90	2400	7.0e+01	3.0e+01	9.3e+01	3.6e+00	9.0e+00	8.5e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Colorado River upstream from Diamond Creek USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	7.2e+01	3.0e+01	9.3e+01	3.7e+00	8.7e+00	8.7e-01
05NOV90	1200	6.3e+01	2.7e+01	8.7e+01	3.5e+00	7.9e+00	7.7e-01
05NOV90	1800	6.8e+01	2.9e+01	9.6e+01	3.5e+00	8.4e+00	8.2e-01
05NOV90	2400	4.5e-02	7.8e-03	<1.0e-02	<1.0e-01	<4.0e-02	<1.0e-03
06NOV90	0600	7.5e+01	3.1e+01	1.0e+02	3.6e+00	9.4e+00	9.0e-01
06NOV90	1200	7.1e+01	3.0e+01	1.0e+02	3.6e+00	9.6e+00	8.5e-01
06NOV90	1800	7.1e+01	3.0e+01	9.7e+01	3.5e+00	9.0e+00	8.6e-01
06NOV90	2400	6.9e+01	2.9e+01	8.8e+01	3.6e+00	8.5e+00	8.4e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Diamond Creek near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	1800	3.6e+01	3.8e+01	7.0e+01	4.3e+00	>1.0e+01	2.8e-01
06NOV90	0600	3.8e+01	3.7e+01	6.8e+01	4.4e+00	>1.0e+01	2.8e-01
06NOV90	1200	3.7e+01	3.8e+01	7.1e+01	4.6e+00	>1.0e+01	2.8e-01
06NOV90	1800	3.5e+01	3.7e+01	6.8e+01	4.0e+00	>1.0e+01	2.8e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 11. Major metal concentrations for the November 1990 synoptic experiment--Continued
Units of mg/L

Colorado River near Columbine Falls

Date	Time	Ca	Mg	Na	K	SiO2	Sr
05NOV90	0600	7.2e+01	3.0e+01	9.7e+01	3.8e+00	>1.0e+01	8.7e-01
05NOV90	1200	6.7e+01	2.9e+01	9.4e+01	3.6e+00	8.2e+00	8.2e-01
05NOV90	1800	7.1e+01	3.0e+01	1.0e+02	3.8e+00	9.9e+00	8.6e-01
05NOV90	2400	6.8e+01	2.9e+01	9.4e+01	3.6e+00	8.3e+00	8.4e-01
06NOV90	0600	7.1e+01	2.9e+01	8.9e+01	3.8e+00	>1.0e+01	8.6e-01
06NOV90	1200	7.2e+01	3.0e+01	9.2e+01	3.7e+00	8.7e+00	8.7e-01
06NOV90	1800	6.8e+01	2.8e+01	9.2e+01	3.4e+00	8.2e+00	8.1e-01
06NOV90	2400	7.1e+01	3.0e+01	<1.0e-02	3.5e+00	8.7e+00	8.6e-01
06NOV90	2400	7.2e+01	2.9e+01	9.9e+01	3.5e+00	8.9e+00	8.8e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment
Units of mg/L

Colorado River at Glen Canyon USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	7.8e+01	2.9e+01	8.4e+01	3.6e+00	7.9e+00	9.5e-01
18Jun91	1800	7.7e+01	2.9e+01	8.5e+01	3.6e+00	7.8e+00	9.7e-01
18Jun91	2400	7.6e+01	2.8e+01	8.2e+01	3.7e+00	7.8e+00	9.4e-01
19Jun91	0600	7.3e+01	2.7e+01	7.9e+01	3.6e+00	7.6e+00	9.1e-01
19Jun91	1200	7.8e+01	2.9e+01	8.3e+01	3.6e+00	7.7e+00	9.5e-01
19Jun91	1800	7.4e+01	2.7e+01	8.0e+01	3.7e+00	7.6e+00	9.1e-01
19Jun91	2400	7.4e+01	2.7e+01	7.9e+01	3.8e+00	7.7e+00	9.2e-01
20Jun91	0600	7.8e+01	2.9e+01	8.5e+01	4.0e+00	8.0e+00	9.8e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Colorado River at Lees Ferry USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	7.1e+01	2.6e+01	7.6e+01	3.7e+00	7.2e+00	8.7e-01
18Jun91	1800	7.4e+01	2.7e+01	8.1e+01	3.6e+00	7.7e+00	9.3e-01
18Jun91	2400	7.6e+01	2.8e+01	8.2e+01	3.7e+00	7.8e+00	9.4e-01
19Jun91	0600	7.3e+01	2.7e+01	7.9e+01	3.6e+00	7.5e+00	9.2e-01
19Jun91	1200	7.3e+01	2.7e+01	7.8e+01	3.7e+00	7.4e+00	9.0e-01
19Jun91	1800	7.2e+01	2.7e+01	7.9e+01	3.7e+00	7.6e+00	9.1e-01
19Jun91	2400	7.5e+01	2.8e+01	8.1e+01	3.7e+00	7.7e+00	9.3e-01
20Jun91	0600	7.4e+01	2.7e+01	7.9e+01	3.7e+00	7.4e+00	9.2e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Paria River near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	3.9e+01	2.1e+01	3.1e+01	3.4e+00	1.0e+01	9.0e-01
18Jun91	1800	3.9e+01	2.2e+01	3.3e+01	3.6e+00	9.1e+00	9.5e-01
18Jun91	2400	3.8e+01	2.2e+01	3.2e+01	3.3e+00	1.1e+01	9.2e-01
19Jun91	0600	4.0e+01	2.2e+01	3.2e+01	3.1e+00	8.0e+00	9.4e-01
19Jun91	1200	4.0e+01	2.2e+01	3.3e+01	3.2e+00	8.4e+00	9.5e-01
19Jun91	1800	3.9e+01	2.3e+01	3.3e+01	3.6e+00	2.0e+01	9.2e-01
19Jun91	2400	4.0e+01	2.3e+01	3.5e+01	3.3e+00	8.5e+00	9.8e-01
20Jun91	0600	4.0e+01	2.2e+01	3.2e+01	3.2e+00	8.8e+00	9.3e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Colorado River upstream from Little Colorado River USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	7.4e+01	2.7e+01	8.0e+01	4.2e+00	7.6e+00	9.3e-01
18Jun91	1800	7.4e+01	2.7e+01	8.0e+01	4.0e+00	7.5e+00	9.2e-01
18Jun91	2400	7.7e+01	2.8e+01	8.3e+01	4.3e+00	7.7e+00	9.4e-01
19Jun91	0600	7.5e+01	2.8e+01	8.2e+01	3.5e+00	7.7e+00	9.4e-01
19Jun91	1200	7.5e+01	2.8e+01	8.1e+01	4.2e+00	7.5e+00	9.3e-01
19Jun91	1800	<1.0e-03	<1.0e-03	<1.0e-02	4.0e+00	<4.0e-02	<1.0e-03
19Jun91	2400	7.5e+01	2.8e+01	8.3e+01	3.7e+00	7.6e+00	9.4e-01
20Jun91	0600	7.5e+01	2.8e+01	8.0e+01	3.7e+00	8.9e+00	9.2e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Little Colorado River near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	9.4e+01	6.6e+01	7.7e+02	6.2e+00	1.5e+01	9.0e-01
18Jun91	1800	8.9e+01	6.4e+01	7.5e+02	6.8e+00	1.5e+01	8.8e-01
18Jun91	2400	9.0e+01	6.6e+01	7.7e+02	6.0e+00	1.5e+01	8.9e-01
19Jun91	0600	1.1e+02	5.7e+01	7.4e+02	6.2e+00	1.5e+01	9.0e-01
19Jun91	1200	9.6e+01	6.5e+01	7.5e+02	6.1e+00	1.5e+01	8.9e-01
19Jun91	1800	9.2e+01	6.7e+01	7.8e+02	3.2e+00	1.5e+01	9.1e-01
19Jun91	2400	9.4e+01	6.6e+01	7.4e+02	6.2e+00	1.5e+01	9.0e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Colorado River at Grand Canyon USGS Gage (Phantom Ranch)

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	7.5e+01	2.8e+01	8.5e+01	3.9e+00	7.5e+00	9.2e-01
18Jun91	1800	7.5e+01	2.8e+01	8.6e+01	3.6e+00	7.5e+00	9.2e-01
18Jun91	2400	7.5e+01	2.8e+01	8.7e+01	3.6e+00	7.5e+00	9.2e-01
19Jun91	0600	7.7e+01	2.9e+01	9.7e+01	3.8e+00	8.0e+00	9.5e-01
19Jun91	1200	7.8e+01	2.9e+01	8.8e+01	3.9e+00	7.8e+00	9.5e-01
19Jun91	1800	7.5e+01	2.8e+01	8.7e+01	3.8e+00	7.5e+00	9.1e-01
19Jun91	2400	7.3e+01	2.7e+01	8.6e+01	3.8e+00	7.4e+00	9.0e-01
20Jun91	0600	7.6e+01	2.9e+01	9.8e+01	4.4e+00	7.8e+00	9.3e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Bright Angel Creek near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	3.6e+01	1.8e+01	2.6e+00	8.0e-01	5.0e+00	4.5e-02
18Jun91	1800	3.5e+01	1.8e+01	2.5e+00	1.0e+00	4.9e+00	4.6e-02
18Jun91	2400	3.6e+01	1.8e+01	2.6e+00	9.0e-01	4.9e+00	4.7e-02
19Jun91	0600	3.6e+01	2.4e+01	3.9e+00	9.0e-01	5.2e+00	4.7e-02
19Jun91	1200	3.7e+01	1.8e+01	2.7e+00	8.0e-01	5.1e+00	4.8e-02
19Jun91	1800	3.3e+01	2.3e+01	3.7e+00	9.0e-01	4.9e+00	4.4e-02
19Jun91	2400	3.8e+01	1.9e+01	2.7e+00	8.0e-01	5.3e+00	4.7e-02
20Jun91	0600	3.9e+01	1.9e+01	2.7e+00	8.0e-01	5.4e+00	4.8e-02

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Colorado River upstream from Kanab Creek

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	7.3e+01	3.2e+01	9.8e+01	3.7e+00	7.6e+00	9.2e-01
18Jun91	1800	7.3e+01	3.2e+01	8.8e+01	3.8e+00	7.6e+00	9.1e-01
18Jun91	2400	7.5e+01	2.9e+01	9.3e+01	3.9e+00	7.7e+00	9.2e-01
19Jun91	0600	7.6e+01	2.9e+01	8.6e+01	4.3e+00	7.8e+00	9.3e-01
19Jun91	1200	8.0e+01	2.9e+01	8.4e+01	3.8e+00	1.3e+01	9.2e-01
19Jun91	1800	7.6e+01	2.9e+01	9.2e+01	3.7e+00	8.9e+00	9.7e-01
19Jun91	2400	7.6e+01	3.3e+01	9.6e+01	4.2e+00	7.9e+00	9.5e-01
20Jun91	0600	7.7e+01	2.9e+01	9.2e+01	3.6e+00	8.6e+00	9.7e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Kanab Creek near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	1.3e+02	7.1e+01	3.4e+01	6.2e+00	7.8e+00	1.6e+00
18Jun91	1800	1.2e+02	6.9e+01	3.3e+01	6.4e+00	7.3e+00	1.5e+00
18Jun91	2400	1.4e+02	6.0e+01	3.4e+01	6.1e+00	6.8e+00	1.7e+00
19Jun91	0600	1.3e+02	6.4e+01	3.0e+01	6.5e+00	5.6e+00	1.5e+00
19Jun91	1200	1.3e+02	7.3e+01	3.5e+01	6.9e+00	7.2e+00	1.7e+00
19Jun91	1800	1.3e+02	6.9e+01	3.3e+01	6.8e+00	7.1e+00	1.6e+00
19Jun91	2400	1.4e+02	7.2e+01	3.4e+01	6.5e+00	7.1e+00	1.7e+00
20Jun91	0600	1.5e+02	7.5e+01	3.6e+01	6.1e+00	7.4e+00	1.8e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Havasu Creek near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	5.1e+01	4.4e+01	3.5e+01	4.8e+00	1.9e+01	3.1e-01
18Jun91	1800	5.0e+01	4.5e+01	3.6e+01	4.8e+00	1.9e+01	3.1e-01
18Jun91	2400	5.1e+01	4.1e+01	3.3e+01	4.7e+00	1.7e+01	3.0e-01
19Jun91	0600	5.7e+01	4.4e+01	3.6e+01	4.6e+00	1.8e+01	3.3e-01
19Jun91	1200	5.3e+01	4.5e+01	3.6e+01	4.6e+00	1.9e+01	3.2e-01
19Jun91	1800	5.3e+01	4.6e+01	3.7e+01	4.7e+00	1.9e+01	3.3e-01
19Jun91	2400	5.5e+01	4.4e+01	3.6e+01	4.5e+00	1.9e+01	3.2e-01
20Jun91	0600	5.3e+01	4.1e+01	3.3e+01	4.5e+00	1.7e+01	3.0e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Colorado River at National Canyon USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	7.2e+01	2.7e+01	8.8e+01	4.0e+00	7.2e+00	8.8e-01
18Jun91	1800	7.3e+01	2.9e+01	9.6e+01	4.3e+00	7.5e+00	9.0e-01
18Jun91	2400	6.3e+01	2.5e+01	7.7e+01	4.0e+00	6.5e+00	7.9e-01
19Jun91	0600	8.0e+01	3.1e+01	1.0e+02	4.1e+00	8.0e+00	1.0e+00
19Jun91	1200	8.2e+01	3.2e+01	1.0e+02	4.1e+00	8.4e+00	1.0e+00
19Jun91	1800	8.0e+01	3.0e+01	9.6e+01	4.1e+00	8.2e+00	1.0e+00
19Jun91	2400	8.0e+01	3.1e+01	9.7e+01	3.9e+00	8.3e+00	1.0e+00
20Jun91	0600	7.9e+01	3.0e+01	1.0e+02	3.9e+00	8.5e+00	9.9e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Colorado River upstream from Diamond Creek USGS Gage

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	7.9e+01	3.0e+01	8.9e+01	4.7e+00	9.4e+00	9.5e-01
18Jun91	1800	7.7e+01	3.0e+01	9.3e+01	5.1e+00	8.4e+00	9.6e-01
18Jun91	2400	7.9e+01	3.0e+01	9.4e+01	4.5e+00	8.1e+00	9.6e-01
19Jun91	0600	7.9e+01	3.0e+01	1.0e+02	4.2e+00	8.4e+00	9.8e-01
19Jun91	1200	8.0e+01	3.1e+01	1.0e+02	5.7e+00	8.4e+00	1.0e+00
19Jun91	1800	7.7e+01	3.0e+01	1.0e+02	1.6e+01	8.3e+00	9.7e-01
19Jun91	2400	7.3e+01	2.8e+01	9.0e+01	6.1e+00	7.8e+00	9.2e-01
20Jun91	0600	7.6e+01	2.9e+01	9.3e+01	7.8e+00	7.5e+00	9.2e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Diamond Creek near mouth

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	3.4e+01	3.4e+01	8.3e+01	5.2e+00	2.3e+01	2.9e-01
18Jun91	1800	3.5e+01	3.8e+01	8.3e+01	5.4e+00	2.2e+01	3.0e-01
18Jun91	2400	3.8e+01	3.7e+01	8.7e+01	5.3e+00	2.5e+01	3.2e-01
19Jun91	0600	3.6e+01	3.4e+01	8.0e+01	5.1e+00	2.3e+01	3.0e-01
19Jun91	1200	3.2e+01	3.5e+01	8.4e+01	5.2e+00	2.4e+01	2.9e-01
19Jun91	1800	3.3e+01	3.5e+01	8.2e+01	5.5e+00	2.4e+01	2.8e-01
19Jun91	2400	3.8e+01	3.6e+01	8.6e+01	5.4e+00	2.5e+01	3.2e-01
20Jun91	0600	3.4e+01	3.1e+01	7.2e+01	5.3e+00	2.0e+01	2.7e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 12. Major metal concentrations for the June 1991 synoptic experiment--Continued
Units of mg/L

Colorado River near Travertine Cleft

Date	Time	Ca	Mg	Na	K	SiO2	Sr
18Jun91	1200	8.1e+01	3.1e+01	1.1e+02	4.2e+00	1.1e+01	1.0e+00
18Jun91	1800	7.8e+01	3.0e+01	9.9e+01	3.9e+00	8.4e+00	9.8e-01
18Jun91	2400	7.0e+01	2.8e+01	8.1e+01	3.8e+00	7.2e+00	8.7e-01
19Jun91	0600	7.7e+01	3.0e+01	9.4e+01	4.0e+00	8.5e+00	9.7e-01
19Jun91	1200	6.9e+01	3.1e+01	8.9e+01	3.9e+00	7.6e+00	8.9e-01
19Jun91	1800	6.4e+01	2.5e+01	8.0e+01	3.8e+00	6.6e+00	7.9e-01
19Jun91	2400	8.1e+01	3.1e+01	1.0e+02	4.2e+00	8.3e+00	1.0e+00
20Jun91	0600	7.9e+01	3.0e+01	1.1e+02	4.1e+00	8.3e+00	9.9e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment
Units of ug/L

Colorado River at Glen Canyon USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	1.1e+00	<6.0e-01	8.1e+01	9.5e+01	<2.0e-02	1.7e-01	5.8e-01
05Nov90	1200	7.7e-01	1.8e+00	1.1e+02	9.5e+01	2.0e-02	1.0e-01	7.3e-01
05Nov90	1800	1.7e+00	1.8e+00	1.1e+02	9.5e+01	9.3e-02	1.1e-01	8.0e-01
05Nov90	2400	1.0e+00	1.5e+00	1.2e+02	9.9e+01	9.6e-02	1.1e-01	6.8e-01
06Nov90	0600	1.2e+00	1.6e+00	1.0e+02	9.5e+01	2.2e-02	1.4e-01	7.5e-01
06Nov90	1200	1.3e+00	<6.0e-01	8.5e+01	1.0e+02	<2.0e-02	<1.0e-01	5.3e-01
06Nov90	1800	9.0e-01	1.6e+00	1.1e+02	9.9e+01	2.0e-02	1.0e-01	6.9e-01
06Nov90	2400	1.1e+00	<6.0e-01	8.9e+01	1.0e+02	<2.0e-02	1.1e-01	5.5e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	2.5e-01	1.1e+00	<5.000E-03	2.9e-02	2.8e+01	5.6e-01	5.4e+00
05Nov90	1200	8.0e-01	1.7e+00	<5.000E-03	2.9e-02	3.3e+01	4.9e-01	5.1e+00
05Nov90	1800	4.2e-01	2.3e+00	<5.000E-03	3.3e-02	3.4e+01	7.4e-01	5.6e+00
05Nov90	2400	3.9e-01	1.8e+00	<5.000E-03	3.5e-02	3.4e+01	6.0e-01	5.2e+00
06Nov90	0600	2.4e-01	1.9e+00	<5.000E-03	3.4e-02	3.4e+01	7.8e-01	4.9e+00
06Nov90	1200	<2.0e-01	1.4e+00	<5.000E-03	2.9e-02	2.9e+01	6.5e-01	5.7e+00
06Nov90	1800	2.0e-01	1.9e+00	<5.000E-03	2.8e-02	3.3e+01	6.1e-01	5.1e+00
06Nov90	2400	<2.0e-01	1.2e+00	<5.000E-03	4.1e-02	3.0e+01	6.3e-01	5.5e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.1e+01	1.3e-01	<3.0e-00	6.8e-02	4.1e+00	2.0e+00	2.1e+00
05Nov90	1200	1.3e+01	6.0e-02	3.0e+00	5.0e-02	4.8e+00	2.6e+00	2.4e+00
05Nov90	1800	1.4e+01	1.6e-01	3.0e+00	9.4e-02	4.6e+00	2.9e+00	3.1e+00
05Nov90	2400	1.4e+01	6.0e-02	3.0e+00	5.0e-02	4.7e+00	2.5e+00	2.3e+00
06Nov90	0600	1.4e+01	6.0e-02	3.0e+00	5.0e-02	5.2e+00	2.3e+00	2.6e+00
06Nov90	1200	1.1e+01	6.3e-02	<3.0e-00	<5.0e-02	4.3e+00	2.1e+00	5.2e+00
06Nov90	1800	1.3e+01	6.0e-02	3.0e+00	6.6e-02	5.0e+00	2.3e+00	2.9e+00
06Nov90	2400	1.2e+01	<6.0e-02	3.0e+00	<5.0e-02	4.5e+00	2.2e+00	2.8e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Colorado River at Lees Ferry USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	9.5e+00	2.1e+00	1.3e+02	9.6e+01	9.5e-02	1.7e-01	7.0e-01
05Nov90	1200	1.0e+01	1.3e+00	8.6e+01	9.3e+01	<2.0e-02	<1.0e-01	5.4e-01
05Nov90	1800	1.2e+01	1.1e+00	1.3e+02	9.4e+01	4.8e-02	1.5e-01	7.5e-01
05Nov90	2400	1.3e+01	8.2e-01	1.3e+02	9.8e+01	5.3e-02	1.3e-01	7.5e-01
06Nov90	0600	6.0e+00	7.7e-01	8.7e+01	9.4e+01	3.4e-02	<1.0e-01	4.9e-01
06Nov90	1200	2.6e+01	1.7e+00	1.3e+02	9.8e+01	2.0e-02	2.2e-01	7.6e-01
06Nov90	1800	2.3e+01	1.8e+00	1.3e+02	9.4e+01	6.6e-02	1.7e-01	7.4e-01
06Nov90	2400	1.1e+01	1.4e+00	1.2e+02	9.4e+01	6.7e-02	1.8e-01	6.4e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	2.6e-01	2.1e+00	<5.000E-03	3.5e-02	3.9e+01	2.0e+00	5.0e+00
05Nov90	1200	<2.0e-01	1.7e+00	6.800E-03	5.2e-02	2.9e+01	1.7e+00	5.1e+00
05Nov90	1800	2.3e-01	1.9e+00	<5.000E-03	5.4e-02	3.9e+01	1.5e+00	5.3e+00
05Nov90	2400	3.3e-01	1.7e+00	5.000E-03	4.7e-02	3.9e+01	1.3e+00	5.0e+00
06Nov90	0600	<2.0e-01	1.8e+00	<5.000E-03	6.3e-02	2.8e+01	1.1e+00	5.2e+00
06Nov90	1200	2.6e-01	1.9e+00	1.940E-02	3.9e-02	3.7e+01	1.8e+00	5.1e+00
06Nov90	1800	2.3e-01	1.9e+00	1.380E-02	3.3e-02	3.9e+01	2.1e+00	5.2e+00
06Nov90	2400	4.4e-01	2.2e+00	<5.000E-03	3.4e-02	3.9e+01	1.6e+00	5.5e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.4e+01	6.0e-02	3.0e+00	5.0e-02	4.6e+00	2.7e+00	3.0e+00
05Nov90	1200	1.2e+01	7.0e-02	3.0e+00	<5.0e-02	5.4e+00	2.0e+00	2.0e+00
05Nov90	1800	1.5e+01	6.0e-02	3.0e+00	5.0e-02	4.9e+00	2.6e+00	2.9e+00
05Nov90	2400	1.5e+01	6.0e-02	<3.0e-00	5.0e-02	5.0e+00	2.7e+00	2.9e+00
06Nov90	0600	1.2e+01	<6.0e-02	4.0e+00	<5.0e-02	5.0e+00	2.1e+00	2.8e+00
06Nov90	1200	1.4e+01	1.4e-01	3.0e+00	5.0e-02	5.3e+00	2.6e+00	2.7e+00
06Nov90	1800	1.5e+01	7.6e-02	3.0e+00	5.0e-02	4.9e+00	2.7e+00	3.3e+00
06Nov90	2400	1.4e+01	6.2e-02	3.0e+00	5.0e-02	4.6e+00	2.6e+00	2.9e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Paria River near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	1.2e+01	2.3e+00	1.0e+02	7.8e+01	<2.0e-02	<1.0e-01	7.3e-01
05Nov90	1200	2.0e-01	3.4e+00	1.3e+02	8.3e+01	1.2e-01	1.0e-01	1.4e+00
05Nov90	1800	1.7e+02	2.9e+00	1.1e+02	8.3e+01	<2.0e-02	1.0e-01	9.2e-01
05Nov90	2400	1.3e+02	2.9e+00	1.4e+02	7.9e+01	8.6e-02	1.2e-01	9.1e-01
06Nov90	0600	4.5e+00	3.1e+00	1.4e+02	7.6e+01	4.7e-02	1.0e-01	9.5e-01
06Nov90	1200	4.5e+02	3.1e+00	1.4e+02	7.5e+01	3.8e-02	1.0e-01	1.2e+00
06Nov90	1800	1.0e+08	3.5e+00	1.1e+02	8.0e+01	8.4e-02	2.1e-01	1.4e+00
06Nov90	2400	2.6e+00	8.7e-01	1.1e+02	7.4e+01	<2.0e-02	<1.0e-01	7.2e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	4.7e-01	8.8e-01	2.050E-02	4.5e-02	3.3e+01	8.7e+00	2.1e+00
05Nov90	1200	1.2e+00	3.1e+00	9.957E-01	4.0e-02	4.1e+01	3.9e+01	1.3e+00
05Nov90	1800	7.7e-01	1.5e+00	1.690E-01	4.0e-02	3.5e+01	1.2e+01	2.0e+00
05Nov90	2400	1.0e+00	1.7e+00	1.171E-01	6.5e-02	4.2e+01	1.2e+01	1.6e+00
06Nov90	0600	6.7e-01	1.8e+00	<5.000E-03	8.6e-02	4.4e+01	9.3e+00	1.8e+00
06Nov90	1200	9.0e-01	2.0e+00	4.137E-01	4.2e-02	4.5e+01	2.0e+01	1.4e+00
06Nov90	1800	1.6e+00	2.9e+00	1.233E+00	6.5e-02	3.7e+01	4.5e+01	1.3e+00
06Nov90	2400	3.8e-01	9.6e-01	1.120E-02	3.5e-02	3.6e+01	7.7e+00	1.8e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.3e+01	2.1e-01	<3.0e-00	6.7e-02	4.9e+00	1.6e+00	2.2e+01
05Nov90	1200	1.8e+01	1.0e+00	<3.0e-00	5.0e-02	4.9e+00	3.3e+00	9.4e+00
05Nov90	1800	1.6e+01	2.9e-01	<3.0e-00	5.6e-02	5.4e+00	2.0e+00	4.9e+00
05Nov90	2400	1.6e+01	1.4e-01	<3.0e-00	5.0e-02	5.5e+00	2.1e+00	4.9e+00
06Nov90	0600	1.7e+01	6.0e-02	<3.0e-00	5.0e-02	5.3e+00	1.7e+00	1.2e+01
06Nov90	1200	1.6e+01	3.5e-01	<3.0e-00	5.0e-02	5.6e+00	2.4e+00	6.2e+00
06Nov90	1800	1.6e+01	1.4e+00	<3.0e-00	<5.0e-02	5.5e+00	3.7e+00	1.7e+01
06Nov90	2400	1.3e+01	7.0e-02	<3.0e-00	5.1e-02	5.1e+00	1.3e+00	4.3e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Colorado River upstream from Little Colorado River at USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	2.5e+01	1.0e+00	1.1e+02	9.5e+01	5.2e-02	<1.0e-01	6.5e-01
05Nov90	1200	9.6e+00	9.1e-01	1.0e+02	9.8e+01	2.2e-02	<1.0e-01	6.1e-01
05Nov90	1800	4.5e+00	7.6e-01	9.5e+01	1.0e+02	5.8e-02	<1.0e-01	6.0e-01
05Nov90	2400	1.0e+01	6.3e-01	1.0e+02	9.4e+01	<2.0e-02	<1.0e-01	5.4e-01
06Nov90	0600	1.0e+01	9.8e-01	1.1e+02	9.6e+01	<2.0e-02	<1.0e-01	5.7e-01
06Nov90	1200	1.6e+01	8.9e-01	1.1e+02	9.3e+01	<2.0e-02	<1.0e-01	6.1e-01
06Nov90	1800	3.3e+00	7.7e-01	8.5e+01	9.6e+01	<2.0e-02	<1.0e-01	5.4e-01
06Nov90	2400	1.4e+01	8.0e-01	8.9e+01	9.2e+01	<2.0e-02	<1.0e-01	4.5e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	3.9e-01	1.7e+00	2.900E-02	1.6e-01	4.1e+01	4.1e+00	4.9e+00
05Nov90	1200	<2.0e-01	2.6e+00	1.620E-02	1.8e-01	3.7e+01	2.7e+00	5.2e+00
05Nov90	1800	<2.0e-01	2.0e+00	<5.000E-03	1.4e-01	3.4e+01	2.6e+00	4.7e+00
05Nov90	2400	3.2e-01	1.6e+00	1.120E-02	1.0e-02	3.6e+01	2.8e+00	4.8e+00
06Nov90	0600	<2.0e-01	1.8e+00	9.100E-03		4.2e+01	3.0e+00	4.7e+00
06Nov90	1200	<2.0e-01	1.7e+00	1.010E-02	1.2e-01	4.1e+01	2.3e+00	4.4e+00
06Nov90	1800	<2.0e-01	1.7e+00	<5.000E-03		3.1e+01	1.4e+00	4.4e+00
06Nov90	2400	<2.0e-01	1.8e+00	2.260E-02	1.3e-01	3.4e+01	1.9e+00	4.5e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.8e+01	1.8e+00	<3.0e-00	7.2e-02	4.1e+00	2.3e+00	3.9e+00
05Nov90	1200	1.3e+01	2.8e+00	<3.0e-00	<5.0e-02	5.3e+00	2.1e+00	3.0e+00
05Nov90	1800	1.3e+01	3.2e+00	3.0e+00	5.6e-02	4.4e+00	1.9e+00	3.5e+00
05Nov90	2400	1.3e+01	3.2e+00	<3.0e-00	<5.0e-02	5.1e+00	2.1e+00	2.2e+00
06Nov90	0600	1.3e+01	4.3e+00	3.0e+00	6.1e-02	5.1e+00	2.0e+00	2.6e+00
06Nov90	1200	1.2e+01	4.1e+00	3.0e+00	<5.0e-02	5.2e+00	1.8e+00	3.4e+00
06Nov90	1800	1.1e+01	3.5e+00	3.0e+00	<5.0e-02	4.8e+00	1.8e+00	2.5e+00
06Nov90	2400	1.2e+01	3.4e+00	<3.0e-00	<5.0e-02	5.2e+00	2.0e+00	2.9e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Little Colorado River near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	1.0e+08	5.4e+00	3.9e+02	9.5e+01	1.4e-01	1.7e-01	1.0e+00
05Nov90	1200	9.1e+01	7.1e+00	4.1e+02	8.8e+01	9.4e-02	3.1e-01	8.0e-01
05Nov90	1800	1.1e+01	9.3e+00	3.9e+02	8.6e+01	7.0e-02	1.1e-01	7.1e-01
05Nov90	2400	<2.0e-01	<6.0e-01	<4.0e-01	<1.0e-01	<2.0e-02	<1.0e-01	<8.0e-03
06Nov90	0600	1.7e+00	8.9e-01	2.1e+02	3.1e+02	3.6e-02	4.3e-01	9.4e-01
06Nov90	1200	2.0e+00	<6.0e-01	2.2e+02	3.2e+02	9.1e-02	4.3e-01	8.9e-01
06Nov90	1800	1.9e+00	<6.0e-01	2.4e+02	3.3e+02	9.1e-02	3.0e-01	1.0e+00
06Nov90	2400	2.2e+00	<6.0e-01	2.7e+02	3.8e+02	1.5e-01	3.6e-01	9.6e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	1.8e+00	1.4e+01	3.465E-01	1.4e-01	1.6e+02	1.2e+01	1.6e+00
05Nov90	1200	1.7e+00	1.4e+01	4.790E-02	1.5e-01	2.0e+02	3.2e+00	2.4e+00
05Nov90	1800	1.1e+00	1.2e+01	9.300E-03	1.2e-01	1.6e+02	1.4e+00	2.2e+00
05Nov90	2400	<2.0e-01	<2.0e-02		1.5e-01	<3.0e-02	<6.0e-02	<9.0e-02
06Nov90	0600	1.4e+00	5.1e+00	<5.000E-03		5.1e+01	1.9e-01	4.0e+00
06Nov90	1200	1.1e+00	4.4e+00	<5.000E-03		5.7e+01	2.0e-01	3.6e+00
06Nov90	1800	1.2e+00	4.6e+00	<5.000E-03		7.0e+01	1.3e-01	4.0e+00
06Nov90	2400	1.3e+00	4.5e+00	<5.000E-03		7.9e+01	1.4e-01	4.3e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.8e+01	3.7e+00	<3.0e-00	1.9e-01	5.5e+00	2.2e+00	4.1e+00
05Nov90	1200	1.7e+01	3.4e+00	<3.0e-00	2.7e-01	4.6e+00	3.0e+00	3.6e+00
05Nov90	1800	1.5e+01	5.1e+00	<3.0e-00	1.9e-01	5.1e+00	<7.0e-02	2.1e+00
05Nov90	2400	<3.0e-02	<6.0e-02	<3.0e-00	<5.0e-02	<6.0e-02	<7.0e-02	<8.0e-02
06Nov90	0600	2.1e+01	6.9e-02	<3.0e-00	1.6e-01	2.2e+01	1.7e+00	2.9e+00
06Nov90	1200	1.9e+01	1.1e-01	<3.0e-00	1.7e-01	2.1e+01	1.6e+00	2.4e+00
06Nov90	1800	2.1e+01	1.4e-01	<3.0e-00	1.4e-01	2.0e+01	2.0e+00	2.4e+00
06Nov90	2400	1.9e+01	<6.0e-02	<3.0e-00	1.6e-01	1.9e+01	1.9e+00	2.7e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Colorado River upstream from Kanab Creek

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	8.6e+00	1.8e+00	1.2e+02	9.5e+01	8.1e-02	<1.0e-01	5.8e-01
05Nov90	1200	4.6e+01	1.2e+00	1.2e+02	9.5e+01	3.7e-02	2.6e-01	5.6e-01
05Nov90	1800	2.3e+02	1.1e+00	1.2e+02	9.7e+01	7.9e-02	<1.0e-01	6.7e-01
05Nov90	2400	2.7e+00	2.2e+00	1.2e+02	9.7e+01	7.6e-02	<1.0e-01	5.4e-01
06Nov90	0600	1.7e+01	1.2e+00	1.2e+02	9.6e+01	4.9e-02	<1.0e-01	6.0e-01
06Nov90	1200	1.2e+01	1.4e+00	1.2e+02	9.5e+01	<2.0e-02	2.6e-01	5.4e-01
06Nov90	1800	1.5e+01	1.9e+00	1.1e+02	9.8e+01	6.5e-02	<1.0e-01	6.0e-01
06Nov90	2400	3.0e+01	2.0e+00	1.2e+02	9.9e+01	8.0e-02	<1.0e-01	6.1e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	<2.0e-01	1.6e+00	6.100E-03	2.9e-02	4.5e+01	7.3e-01	5.0e+00
05Nov90	1200	<2.0e-01	1.8e+00	2.510E-02	2.8e-02	4.4e+01	1.2e+00	4.9e+00
05Nov90	1800	5.3e-01	1.8e+00	1.358E-01	2.8e-02	4.5e+01	4.9e+00	4.5e+00
05Nov90	2400	<2.0e-01	1.6e+00	<5.000E-03	2.4e-02	4.6e+01	5.4e-01	5.0e+00
06Nov90	0600	2.2e-01	1.6e+00	1.560E-02	4.5e-02	4.7e+01	1.2e+00	5.0e+00
06Nov90	1200	4.8e-01	1.5e+00	<5.000E-03	2.9e-02	4.5e+01	9.8e-01	5.5e+00
06Nov90	1800	<2.0e-01	1.7e+00	6.800E-03	3.1e-02	4.5e+01	1.1e+00	4.8e+00
06Nov90	2400	<2.0e-01	1.9e+00	1.620E-02	2.8e-02	4.8e+01	1.8e+00	5.0e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.2e+01	6.3e-02	3.0e+00	5.3e-02	4.7e+00	2.0e+00	2.5e+00
05Nov90	1200	1.2e+01	<6.0e-02	3.0e+00	5.9e-02	4.9e+00	2.0e+00	2.4e+00
05Nov90	1800	1.3e+01	2.7e-01	<3.0e-00	<5.0e-02	4.8e+00	2.5e+00	4.5e+00
05Nov90	2400	1.2e+01	8.8e-02	3.0e+00	7.0e-02	5.1e+00	2.1e+00	2.2e+00
06Nov90	0600	1.3e+01	1.0e-01	3.0e+00	6.1e-02	4.9e+00	2.1e+00	2.5e+00
06Nov90	1200	1.2e+01	<6.0e-02	3.0e+00	<5.0e-02	4.3e+00	2.1e+00	2.7e+00
06Nov90	1800	1.2e+01	1.0e-01	3.0e+00	6.7e-02	4.8e+00	1.9e+00	2.3e+00
06Nov90	2400	1.2e+01	1.8e-01	<3.0e-00	7.4e-02	4.9e+00	2.0e+00	2.3e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Kanab Creek near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	2.6e+00	<6.0e-01	1.1e+02	3.6e+01	4.9e-02	3.0e-01	1.1e+00
05Nov90	1200	3.6e+00	<6.0e-01	1.1e+02	3.5e+01	3.6e-02	<1.0e-01	1.0e+00
05Nov90	1800	2.9e+00	<6.0e-01	1.3e+02	3.7e+01	5.4e-02	1.4e-01	1.2e+00
05Nov90	2400	4.4e+00	<6.0e-01	1.3e+02	3.5e+01	4.2e-02	<1.0e-01	1.2e+00
06Nov90	0600	5.9e+00	<6.0e-01	1.2e+02	3.6e+01	4.7e-02	1.1e-01	1.1e+00
06Nov90	1200	9.0e+00	6.1e-01	1.4e+02	3.5e+01	6.8e-02	3.2e-01	1.2e+00
06Nov90	1800	7.2e+00	<6.0e-01	1.2e+02	3.5e+01	3.8e-02	1.0e-01	1.0e+00
06Nov90	2400	7.8e+00	<6.0e-01	1.2e+02	3.7e+01	3.4e-02	<1.0e-01	1.1e+00

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	2.8e-01	2.4e-01	1.340E-02	2.9e-02	2.8e+01	1.6e+01	5.2e+00
05Nov90	1200	2.6e-01	1.3e-01	1.220E-02	2.5e-02	3.0e+01	1.5e+01	5.3e+00
05Nov90	1800	<2.0e-01	<2.0e-02	8.900E-03	2.6e-02	3.1e+01	1.7e+01	5.5e+00
05Nov90	2400	<2.0e-01	1.6e-01	1.120E-02	2.7e-02	3.2e+01	1.6e+01	5.3e+00
06Nov90	0600	<2.0e-01	1.0e-01	1.100E-02	2.9e-02	3.2e+01	1.6e+01	5.5e+00
06Nov90	1200	4.4e-01	4.7e-01	8.300E-03	2.8e-02	3.3e+01	1.7e+01	5.6e+00
06Nov90	1800	<2.0e-01	1.8e-01	1.840E-02	2.5e-02	3.1e+01	1.7e+01	5.3e+00
06Nov90	2400	<2.0e-01	1.8e-01	1.300E-02	3.1e-02	3.1e+01	1.7e+01	5.3e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	2.3e+01	1.4e-01	4.0e+00	1.2e-01	6.3e+00	7.2e-01	4.8e+00
05Nov90	1200	2.3e+01	1.3e-01	5.0e+00	8.4e-02	6.5e+00	8.4e-01	4.7e+00
05Nov90	1800	2.6e+01	2.0e-01	4.0e+00	9.8e-02	6.4e+00	8.2e-01	5.2e+00
05Nov90	2400	2.4e+01	8.6e-02	4.0e+00	7.5e-02	6.4e+00	7.1e-01	5.1e+00
06Nov90	0600	2.4e+01	1.3e-01	4.0e+00	1.1e-01	6.4e+00	7.1e-01	4.8e+00
06Nov90	1200	2.4e+01	<6.0e-02	3.0e+00	8.3e-02	6.1e+00	8.5e-01	5.9e+00
06Nov90	1800	2.4e+01	1.4e-01	4.0e+00	1.4e-01	6.5e+00	7.3e-01	5.7e+00
06Nov90	2400	2.5e+01	1.4e-01	4.0e+00	1.2e-01	6.0e+00	7.8e-01	4.5e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Colorado River at National Canyon USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	1.0e+08	2.4e+00	1.2e+02	1.0e+02	5.5e-02	1.8e-01	9.8e-01
05Nov90	1200	5.5e+01	1.6e+00	1.2e+02	9.9e+01	6.6e-02	<1.0e-01	6.3e-01
05Nov90	2400	6.7e+01	1.3e+00	1.1e+02	9.2e+01	5.7e-02	<1.0e-01	5.8e-01
06Nov90	1200	2.4e+00	1.5e+00	1.1e+02	9.7e+01	<2.0e-02	1.6e-01	5.8e-01
06Nov90	1800	2.7e+00	1.3e+00	1.2e+02	9.3e+01	<2.0e-02	1.8e-01	5.8e-01
06Nov90	2400	9.5e+01	2.0e+00	1.3e+02	9.5e+01	<2.0e-02	2.8e-01	6.3e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	9.4e-01	2.4e+00	5.150E-01	2.8e-02	4.4e+01	2.0e+01	4.6e+00
05Nov90	1200	2.8e-01	1.6e+00	2.560E-02	8.0e-03	4.9e+01	1.5e+00	4.9e+00
05Nov90	2400	3.6e-01	1.5e+00	4.260E-02	8.0e-03	4.2e+01	2.0e+00	5.1e+00
06Nov90	1200	3.3e-01	1.9e+00	<5.000E-03	1.0e-02	4.1e+01	7.1e-01	5.2e+00
06Nov90	1800	2.2e-01	1.5e+00	<5.000E-03	7.0e-03	4.4e+01	7.4e-01	4.8e+00
06Nov90	2400	6.0e-01	1.4e+00	5.530E-02	9.0e-03	4.6e+01	2.5e+00	5.2e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.3e+01	6.6e-01	3.0e+00	7.4e-02	4.4e+00	3.3e+00	5.4e+00
05Nov90	1200	1.3e+01	2.0e-01	<3.0e-00	7.7e-02	5.2e+00	2.2e+00	2.6e+00
05Nov90	2400	1.2e+01	8.4e-02	3.0e+00	<5.0e-02	4.9e+00	2.2e+00	2.6e+00
06Nov90	1200	1.3e+01	<6.0e-02	3.0e+00	6.6e-02	4.0e+00	2.1e+00	3.9e+00
06Nov90	1800	1.2e+01	<6.0e-02	<3.0e-00	<5.0e-02	4.3e+00	1.9e+00	2.3e+00
06Nov90	2400	1.3e+01	<6.0e-02	3.0e+00	<5.0e-02	4.9e+00	2.4e+00	2.8e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Colorado River upstream from Diamond Creek USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	3.5e+00	<6.0e-01	1.3e+02	9.9e+01	<2.0e-02	<1.0e-01	5.6e-01
05Nov90	1200	5.0e+00	9.9e-01	1.1e+02	9.9e+01	<2.0e-02	<1.0e-01	5.9e-01
05Nov90	1800	5.4e+00	8.8e-01	1.1e+02	1.0e+02	<2.0e-02	2.3e-01	5.8e-01
05Nov90	2400	1.9e+00	<6.0e-01	5.8e+00	<1.0e-01	<2.0e-02	<1.0e-01	<8.0e-03
06Nov90	0600	1.7e+02	9.2e-01	1.2e+02	1.0e+02	2.5e-02	<1.0e-01	6.3e-01
06Nov90	1200	3.3e+02	1.1e+00	1.2e+02	1.0e+02	9.2e-02	2.1e-01	7.8e-01
06Nov90	1800	7.4e+01	<6.0e-01	1.1e+02	9.9e+01	<2.0e-02	1.8e-01	6.4e-01
06Nov90	2400	5.6e+00	1.9e+00	1.2e+02	1.0e+02	<2.0e-02	<1.0e-01	5.8e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	3.0e-01	1.4e+00	2.500E-02	3.1e-02	5.1e+01	5.8e-01	5.1e+00
05Nov90	1200	2.3e-01	1.2e+00	5.500E-03	8.5e-02	4.5e+01	4.6e-01	5.0e+00
05Nov90	1800	4.6e-01	1.3e+00	7.400E-03	9.2e-02	4.4e+01	3.9e-01	4.8e+00
05Nov90	2400	<2.0e-01	<2.0e-02	<5.000E-03	9.3e-02	1.5e-01	1.9e-01	<9.0e-02
06Nov90	0600	4.2e-01	1.4e+00	1.125E-01	1.2e-01	4.5e+01	3.9e+00	4.7e+00
06Nov90	1200	4.9e-01	1.5e+00	2.052E-01	1.2e-01	5.2e+01	8.0e+00	4.5e+00
06Nov90	1800	2.8e-01	1.3e+00	4.500E-02	1.1e-01	4.3e+01	2.0e+00	5.1e+00
06Nov90	2400	<2.0e-01	1.1e+00	<5.000E-03	1.1e-01	4.4e+01	5.7e-01	5.1e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.2e+01	1.2e-01	<3.0e-00	<5.0e-02	5.1e+00	2.3e+00	2.9e+00
05Nov90	1200	1.1e+01	<6.0e-02	3.0e+00	<5.0e-02	4.4e+00	2.0e+00	2.3e+00
05Nov90	1800	1.2e+01	<6.0e-02	3.0e+00	5.1e-02	4.3e+00	2.2e+00	2.0e+00
05Nov90	2400	<3.0e-02	7.4e-02	<3.0e-00	6.1e-02	8.0e-02	<7.0e-02	6.6e-01
06Nov90	0600	1.1e+01	2.4e-01	3.0e+00	<5.0e-02	4.9e+00	2.1e+00	3.0e+00
06Nov90	1200	1.3e+01	3.3e-01	<3.0e-00	6.5e-02	5.4e+00	2.8e+00	3.1e+00
06Nov90	1800	1.1e+01	1.7e-01	3.0e+00	<5.0e-02	4.8e+00	2.0e+00	2.6e+00
06Nov90	2400	1.1e+01	7.1e-02	3.0e+00	5.6e-02	4.3e+00	1.8e+00	2.0e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Diamond Creek near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	1800	1.3e+01	2.5e+01	4.7e+02	8.8e+01	<2.0e-02	<1.0e-01	3.1e-01
06Nov90	0600	1.3e+01	2.4e+01	4.8e+02	9.0e+01	4.9e-02	<1.0e-01	3.4e-01
06Nov90	1200	6.7e+01	2.3e+01	4.8e+02	8.6e+01	5.8e-02	<1.0e-01	4.0e-01
06Nov90	1800	5.3e+00	2.4e+01	5.0e+02	8.5e+01	6.6e-02	<1.0e-01	3.2e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	1800	<2.0e-01	5.5e-01	<5.000E-03	8.3e-02	8.9e+01	4.8e+00	2.6e+00
06Nov90	0600	<2.0e-01	6.3e-01	9.300E-03	1.1e-01	9.0e+01	5.2e+00	2.5e+00
06Nov90	1200	2.3e-01	5.7e-01	5.570E-02	1.0e-01	9.0e+01	1.2e+01	2.6e+00
06Nov90	1800	2.6e-01	5.9e-01	<5.000E-03	8.5e-02	9.7e+01	4.5e+00	2.7e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	1800	4.9e+00	8.7e-02	<3.0e-00	9.1e-02	7.2e+00	3.5e+00	5.2e-01
06Nov90	0600	5.5e+00	1.5e-01	<3.0e-00	8.2e-02	8.3e+00	3.3e+00	6.3e-01
06Nov90	1200	5.7e+00	3.7e-01	<3.0e-00	1.2e-01	8.0e+00	3.7e+00	6.4e-01
06Nov90	1800	5.5e+00	1.4e-01	<3.0e-00	1.3e-01	7.0e+00	3.6e+00	6.6e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Colorado River near Columbine Falls

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	4.8e+02	<6.0e-01	1.2e+02	1.1e+02	2.4e-02	<1.0e-01	8.0e-01
05Nov90	1200	2.2e+01	1.0e+00	1.5e+02	1.0e+02	<2.0e-02	<1.0e-01	5.1e-01
05Nov90	1800	4.1e+02	<6.0e-01	1.2e+02	1.1e+02	4.5e-02	<1.0e-01	8.1e-01
05Nov90	2400	1.1e+01	2.3e+00	1.4e+02	1.1e+02	<2.0e-02	<1.0e-01	5.1e-01
06Nov90	0600	4.9e+02	<6.0e-01	1.1e+02	1.1e+02	3.6e-02	1.5e-01	8.1e-01
06Nov90	1200	5.2e+01	<6.0e-01	1.2e+02	1.1e+02	3.3e-02	<1.0e-01	5.5e-01
06Nov90	1800	2.8e+01	7.1e-01	1.2e+02	1.1e+02	2.3e-02	1.5e-01	6.0e-01
06Nov90	2400	1.2e+01	1.6e+00	1.3e+02	1.1e+02	<2.0e-02	<1.0e-01	6.3e-01
06Nov90	2400	1.2e+01	1.6e+00	1.3e+02	1.1e+02	<2.0e-02	<1.0e-01	6.3e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	6.9e-01	1.7e+00	3.033E-01	3.1e-02	4.9e+01	1.0e+01	4.2e+00
05Nov90	1200	3.6e-01	1.8e+00	1.780E-02	3.0e-02	5.6e+01	2.3e+00	4.5e+00
05Nov90	1800	6.8e-01	1.7e+00	2.598E-01	4.1e-02	4.7e+01	8.5e+00	4.4e+00
05Nov90	2400	5.1e-01	1.7e+00	2.350E-02	3.0e-02	5.3e+01	1.6e+00	4.7e+00
06Nov90	0600	5.8e-01	1.7e+00	3.486E-01	4.1e-02	4.7e+01	1.4e+01	4.2e+00
06Nov90	1200	2.9e-01	1.3e+00	3.320E-02	5.0e-02	4.8e+01	3.1e+00	5.4e+00
06Nov90	1800	3.1e-01	1.3e+00	2.320E-02	3.5e-02	4.6e+01	6.8e+00	5.0e+00
06Nov90	2400	2.5e-01	1.3e+00	1.080E-02	3.3e-02	4.7e+01	1.6e+00	5.1e+00
06Nov90	2400	2.5e-01	1.3e+00	6.100E-03	3.3e-02	4.7e+01	1.6e+00	5.1e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.1e+01	4.1e-01	<3.0e-00	<5.0e-02	5.5e+00	2.9e+00	3.4e+00
05Nov90	1200	1.2e+01	1.2e-01	3.0e+00	<5.0e-02	4.2e+00	2.2e+00	3.5e+00
05Nov90	1800	1.2e+01	4.0e-01	<3.0e-00	<5.0e-02	5.0e+00	2.5e+00	3.4e+00
05Nov90	2400	1.2e+01	1.1e-01	3.0e+00	<5.0e-02	4.2e+00	2.1e+00	2.3e+00
06Nov90	0600	1.2e+01	9.6e-01	3.0e+00	5.3e-02	5.0e+00	2.8e+00	3.8e+00
06Nov90	1200	1.1e+01	1.4e-01	3.0e+00	<5.0e-02	4.6e+00	2.0e+00	2.5e+00
06Nov90	1800	1.1e+01	1.2e-01	3.0e+00	<5.0e-02	4.7e+00	2.2e+00	2.5e+00
06Nov90	2400	1.1e+01	6.5e-02	<3.0e-00	<5.0e-02	5.3e+00	2.2e+00	2.3e+00
06Nov90	2400	1.1e+01	6.5e-02	<3.0e-00	<5.0e-02	5.3e+00	2.2e+00	2.3e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Colorado River upstream from Havasu Creek

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	1.4e+02	1.9e+00	1.3e+02	9.6e+01	<2.0e-02	<1.0e-01	5.7e-01
05Nov90	1200	1.3e+02	1.1e+00	1.3e+02	9.5e+01	<2.0e-02	<1.0e-01	5.9e-01
05Nov90	1800	3.7e+01	1.7e+00	1.3e+02	9.5e+01	2.8e-02	<1.0e-01	5.7e-01
05Nov90	2400	1.2e+02	1.8e+00	1.2e+02	9.4e+01	5.5e-02	<1.0e-01	6.3e-01
06Nov90	0600	1.8e+01	1.0e+00	1.3e+02	9.5e+01	3.0e-02	<1.0e-01	5.1e-01
06Nov90	1200	4.6e+02	1.4e+00	1.3e+02	9.8e+01	8.7e-02	<1.0e-01	7.5e-01
06Nov90	1800	9.5e+01	1.3e+00	1.3e+02	9.6e+01	5.4e-02	<1.0e-01	4.8e-01
06Nov90	2400	1.9e+02	1.9e+00	1.3e+02	9.9e+01	5.0e-02	<1.0e-01	6.0e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	5.0e-01	1.9e+00	7.800E-02	2.9e-02	5.0e+01	4.0e+00	4.8e+00
05Nov90	1200	5.2e-01	1.9e+00	6.470E-02	2.6e-02	4.8e+01	2.6e+00	5.6e+00
05Nov90	1800	2.5e-01	1.8e+00	1.400E-02	3.3e-02	4.7e+01	1.0e+00	5.0e+00
05Nov90	2400	4.5e-01	1.9e+00	6.490E-02	2.7e-02	4.8e+01	3.1e+00	4.8e+00
06Nov90	0600	2.4e-01	1.9e+00	7.000E-03		4.6e+01	8.9e-01	5.0e+00
06Nov90	1200	5.6e-01	2.0e+00	2.920E-01	3.1e-02	4.8e+01	1.3e+01	4.1e+00
06Nov90	1800	3.3e-01	1.8e+00	4.550E-02	3.3e-02	4.9e+01	2.7e+00	4.9e+00
06Nov90	2400	3.2e-01	2.2e+00	1.053E-01	4.9e-02	5.3e+01	5.6e+00	5.1e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	1.3e+01	2.3e-01	<3.0e-00	<5.0e-02	4.4e+00	2.3e+00	5.7e+00
05Nov90	1200	1.3e+01	1.9e-01	<3.0e-00	9.0e-02	4.5e+00	2.2e+00	3.3e+00
05Nov90	1800	1.3e+01	1.0e-01	<3.0e-00	<5.0e-02	4.6e+00	2.0e+00	2.2e+00
05Nov90	2400	1.3e+01	1.6e-01	<3.0e-00	<5.0e-02	4.6e+00	2.2e+00	3.5e+00
06Nov90	0600	1.3e+01	1.0e-01	<3.0e-00	6.0e-02	4.4e+00	1.9e+00	2.8e+00
06Nov90	1200	1.3e+01	5.0e-01	<3.0e-00	5.4e-02	4.5e+00	2.6e+00	4.2e+00
06Nov90	1800	1.2e+01	2.0e-01	<3.0e-00	<5.0e-02	4.7e+00	2.1e+00	2.7e+00
06Nov90	2400	1.3e+01	3.1e-01	<3.0e-00	5.3e-02	4.6e+00	2.3e+00	3.2e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 13. Trace metal concentrations for the November 1990 synoptic experiment--Continued
Units of ug/L

Havasu Creek near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
05Nov90	0600	3.3e+00	1.5e+01	3.5e+02	1.1e+02	1.1e-01	<1.0e-01	4.0e-01
05Nov90	1200	2.9e+00	1.7e+01	3.3e+02	1.1e+02	3.8e-02	<1.0e-01	4.1e-01
05Nov90	1800	3.4e+00	1.6e+01	3.6e+02	1.1e+02	5.3e-02	<1.0e-01	4.6e-01
05Nov90	2400	5.3e+00	1.6e+01	3.6e+02	1.1e+02	7.2e-02	<1.0e-01	4.0e-01
06Nov90	0600	3.6e+00	1.7e+01	3.8e+02	1.0e+02	2.7e-02	<1.0e-01	3.8e-01
06Nov90	1200	3.6e+00	1.7e+01	3.2e+02	1.1e+02	5.7e-02	<1.0e-01	4.6e-01
06Nov90	1800	3.1e+00	1.6e+01	3.2e+02	1.1e+02	4.0e-02	<1.0e-01	4.8e-01
06Nov90	2400	3.7e+00	1.6e+01	3.3e+02	1.1e+02	8.2e-02	<1.0e-01	3.7e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
05Nov90	0600	6.7e-01	2.5e-01	8.900E-03	7.8e-02	1.5e+02	9.3e-01	1.3e+00
05Nov90	1200	4.4e-01	<2.0e-02	<5.000E-03	8.5e-02	1.4e+02	8.7e-01	1.1e+00
05Nov90	1800	8.6e-01	<2.0e-02	<5.000E-03	7.8e-02	1.5e+02	9.1e-01	1.1e+00
05Nov90	2400	7.8e-01	2.5e-01	6.600E-03	8.3e-02	1.6e+02	1.2e+00	1.2e+00
06Nov90	0600	7.9e-01	2.6e-01	<5.000E-03	7.4e-02	1.5e+02	8.8e-01	1.2e+00
06Nov90	1200	1.0e+00	2.6e-01	<5.000E-03	7.7e-02	1.2e+02	1.0e+00	1.3e+00
06Nov90	1800	5.5e-01	<2.0e-02	<5.000E-03	7.2e-02	1.3e+02	1.0e+00	1.1e+00
06Nov90	2400	7.2e-01	2.9e-01	<5.000E-03	7.1e-02	1.5e+02	1.2e+00	1.2e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
05Nov90	0600	9.1e+00	<6.0e-02	<3.0e-00	<5.0e-02	3.6e+00	5.9e+00	3.3e+00
05Nov90	1200	9.6e+00	<6.0e-02	<3.0e-00	<5.0e-02	3.9e+00	5.6e+00	1.1e+00
05Nov90	1800	9.5e+00	<6.0e-02	<3.0e-00	8.9e-02	4.2e+00	6.2e+00	9.9e-01
05Nov90	2400	9.3e+00	<6.0e-02	<3.0e-00	<5.0e-02	3.7e+00	6.0e+00	1.7e+00
06Nov90	0600	9.7e+00	8.0e-02	<3.0e-00	<5.0e-02	3.6e+00	5.9e+00	1.1e+00
06Nov90	1200	9.1e+00	1.6e-01	<3.0e-00	1.8e-01	5.7e+00	5.8e+00	1.1e+00
06Nov90	1800	9.5e+00	3.1e-01	<3.0e-00	<5.0e-02	3.8e+00	5.8e+00	1.3e+00
06Nov90	2400	9.2e+00	1.1e-01	<3.0e-00	<5.0e-02	3.6e+00	5.8e+00	9.1e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment
Units of ug/L

Colorado River at Glen Canyon USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	4.7e+00	<6.0e-01	9.2e+01	1.1e+02	2.8e-02	<1.0e-01	<8.0e-03
18Jun91	1800	3.1e+00	7.0e-01	9.1e+01	1.1e+02	4.7e-02	<1.0e-01	<8.0e-03
18Jun91	2400	2.6e+00	6.8e-01	8.3e+01	1.0e+02	2.1e-02	<1.0e-01	<8.0e-03
19Jun91	0600	2.0e+00	7.6e-01	8.1e+01	1.0e+02	<2.0e-02	<1.0e-01	3.8e-02
19Jun91	1200	3.3e+00	<6.0e-01	8.9e+01	1.1e+02	2.2e-02	<1.0e-01	<8.0e-03
19Jun91	1800	1.9e+00	<6.0e-01	8.4e+01	1.1e+02	2.1e-02	<1.0e-01	<8.0e-03
19Jun91	2400	2.9e+00	1.1e+00	9.0e+01	1.1e+02	5.1e-02	<1.0e-01	2.9e-02
20Jun91	0600	2.2e+00	<6.0e-01	9.0e+01	1.1e+02	2.3e-02	<1.0e-01	<8.0e-03

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	1.0e+00	<5.000e-03		3.3e+01	5.5e-01	4.8e+00
18Jun91	1800	<2.0e-01	9.6e-01	8.100e-03		3.2e+01	4.1e-01	4.6e+00
18Jun91	2400	<2.0e-01	9.0e-01	8.000e-03		2.9e+01	3.0e-01	4.4e+00
19Jun91	0600	<2.0e-01	9.5e-01	<5.000e-03		2.9e+01	3.6e-01	4.1e+00
19Jun91	1200	<2.0e-01	1.0e+00	<5.000e-03		3.2e+01	4.3e-01	4.9e+00
19Jun91	1800	<2.0e-01	8.3e-01	6.700e-03		2.9e+01	3.6e-01	4.2e+00
19Jun91	2400	<2.0e-01	1.1e+00	<5.000e-03		3.2e+01	3.0e-01	4.9e+00
20Jun91	0600	<2.0e-01	8.6e-01	6.800e-03		3.1e+01	3.0e-01	4.5e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	1.4e-01	4.0e+00	<5.0e-02	5.9e+00	1.4e+00	5.6e+00
18Jun91	1800	<3.0e-02	2.4e-01	4.0e+00	<5.0e-02	5.8e+00	1.8e+00	5.6e+00
18Jun91	2400	<3.0e-02	1.2e-01	3.0e+00	<5.0e-02	5.5e+00	1.4e+00	5.6e+00
19Jun91	0600	2.7e-01	2.1e-01	3.0e+00	9.6e-02	5.5e+00	1.7e+00	6.2e+00
19Jun91	1200	<3.0e-02	2.2e-01	3.0e+00	<5.0e-02	5.8e+00	1.6e+00	6.1e+00
19Jun91	1800	7.3e-01	1.9e-01	3.0e+00	1.0e-01	6.0e+00	1.5e+00	6.7e+00
19Jun91	2400	4.5e-01	<6.0e-02	3.0e+00	6.2e-02	5.6e+00	1.8e+00	4.6e+00
20Jun91	0600	<3.0e-02	1.6e-01	3.0e+00	<5.0e-02	5.5e+00	1.4e+00	5.0e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Colorado River at Lees Ferry USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	3.9e+00	<6.0e-01	1.0e+02	1.1e+02	4.6e-02	1.6e-01	1.5e-01
18Jun91	1800	3.6e+00	<6.0e-01	8.5e+01	1.1e+02	<2.0e-02	<1.0e-01	3.4e-02
18Jun91	2400	3.0e+00	8.1e-01	9.0e+01	1.1e+02	4.4e-02	<1.0e-01	5.6e-02
19Jun91	0600	2.4e+00	<6.0e-01	8.3e+01	1.1e+02	2.1e-02	1.0e-01	4.9e-02
19Jun91	1200	2.0e+00	<6.0e-01	7.8e+01	1.1e+02	5.4e-02	<1.0e-01	<8.0e-03
19Jun91	1800	2.5e+00	<6.0e-01	8.5e+01	1.1e+02	4.0e-02	<1.0e-01	1.8e-02
19Jun91	2400	2.6e+00	<6.0e-01	8.8e+01	1.1e+02	3.9e-02	<1.0e-01	<8.0e-03
20Jun91	0600	2.6e+00	<6.0e-01	8.9e+01	1.0e+02	3.4e-02	<1.0e-01	<8.0e-03

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	1.4e+00	5.500e-03		3.6e+01	7.8e-01	5.0e+00
18Jun91	1800	<2.0e-01	1.2e+00	1.430e-02	3.2e-02	3.1e+01	6.6e-01	4.5e+00
18Jun91	2400	<2.0e-01	1.4e+00	<5.000e-03	4.3e-02	3.3e+01	5.4e-01	5.0e+00
19Jun91	0600	<2.0e-01	1.3e+00	<5.000e-03	3.2e-02	3.1e+01	5.1e-01	4.4e+00
19Jun91	1200	<2.0e-01	1.3e+00	<5.000e-03	2.4e-02	3.1e+01	7.2e-01	4.5e+00
19Jun91	1800	<2.0e-01	1.2e+00	5.500e-03	3.3e-02	3.1e+01	6.1e-01	4.6e+00
19Jun91	2400	<2.0e-01	1.0e+00	9.300e-03	4.3e-02	3.0e+01	4.5e-01	4.8e+00
20Jun91	0600	<2.0e-01	1.1e+00	<5.000e-03	4.7e-02	3.0e+01	4.1e-01	4.4e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	2.7e+00	<6.0e-02	3.0e+00	1.2e-01	6.3e+00	1.6e+00	9.0e+00
18Jun91	1800	7.1e-01	3.6e-01	3.0e+00	1.5e-01	6.5e+00	1.7e+00	7.3e+00
18Jun91	2400	1.7e+00	2.1e-01	3.0e+00	1.8e-01	6.0e+00	1.7e+00	7.0e+00
19Jun91	0600	5.7e-01	2.1e-01	3.0e+00	1.5e-01	5.8e+00	1.4e+00	7.8e+00
19Jun91	1200	<3.0e-02	3.4e-01	3.0e+00	1.5e-01	5.7e+00	1.5e+00	6.6e+00
19Jun91	1800	1.1e+00	3.0e-01	3.0e+00	1.2e-01	5.9e+00	1.5e+00	6.3e+00
19Jun91	2400	1.7e-01	<6.0e-02	4.0e+00	6.8e-02	6.0e+00	1.2e+00	5.2e+00
20Jun91	0600	<3.0e-02	2.1e-01	3.0e+00	<5.0e-02	5.8e+00	1.1e+00	4.8e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Paria River near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	2.2e+02	2.4e+00	6.6e+01	7.4e+01	4.8e-02	<1.0e-01	9.6e-02
18Jun91	1800	6.8e+00	2.3e+00	6.5e+01	7.0e+01	3.3e-02	<1.0e-01	<8.0e-03
18Jun91	2400	3.5e+02	2.3e+00	6.4e+01	7.6e+01	7.0e-02	<1.0e-01	9.5e-02
19Jun91	0600	1.3e+01	2.0e+00	6.6e+01	8.0e+01	<2.0e-02	<1.0e-01	1.8e-02
19Jun91	1200	7.7e+00	2.2e+00	6.2e+01	7.5e+01	2.5e-02	<1.0e-01	2.2e-02
19Jun91	1800	1.0e+06	2.5e+00	6.7e+01	8.1e+01	8.2e-02	<1.0e-01	3.3e-01
19Jun91	2400	6.2e+00	2.2e+00	6.4e+01	7.6e+01	<2.0e-02	<1.0e-01	<8.0e-03
20Jun91	0600	1.6e+02	1.8e+00	6.4e+01	7.7e+01	2.3e-02	<1.0e-01	5.5e-02

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	4.3e-01	8.5e-01	2.267e-01	3.4e-02	1.9e+01	4.2e+00	1.3e+00
18Jun91	1800	4.0e-01	6.3e-01	<5.000e-03	3.0e-02	1.8e+01	8.0e-01	1.3e+00
18Jun91	2400	6.1e-01	1.0e+00	2.969e-01	3.4e-02	1.8e+01	4.8e+00	1.2e+00
19Jun91	0600	4.0e-01	9.9e-01	1.740e-02	3.3e-02	1.9e+01	4.0e-01	1.3e+00
19Jun91	1200	4.6e-01	6.2e-01	<5.000e-03	3.8e-02	1.7e+01	1.1e+00	1.1e+00
19Jun91	1800	1.4e+00	2.1e+00	1.091e+00	3.9e-02	2.0e+01	1.7e+01	1.3e+00
19Jun91	2400	3.1e-01	7.7e-01	6.800e-03	3.6e-02	1.8e+01	4.8e-01	1.2e+00
20Jun91	0600	3.9e-01	9.2e-01	1.450e-01	4.5e-02	1.8e+01	2.3e+00	1.2e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	2.7e-01	<3.0e-00	<5.0e-02	2.7e+00	3.2e+00	4.0e+00
18Jun91	1800	<3.0e-02	1.2e-01	<3.0e-00	<5.0e-02	2.8e+00	3.0e+00	2.8e+00
18Jun91	2400	<3.0e-02	4.1e-01	<3.0e-00	<5.0e-02	2.9e+00	3.8e+00	4.3e+00
19Jun91	0600	<3.0e-02	<6.0e-02	<3.0e-00	<5.0e-02	2.8e+00	2.8e+00	3.7e+00
19Jun91	1200	<3.0e-02	1.3e-01	<3.0e-00	5.8e-02	2.6e+00	3.1e+00	2.8e+00
19Jun91	1800	<3.0e-02	9.8e-01	<3.0e-00	5.7e-02	2.8e+00	6.9e+00	9.5e+00
19Jun91	2400	<3.0e-02	3.5e-01	<3.0e-00	<5.0e-02	2.7e+00	2.6e+00	3.0e+00
20Jun91	0600	<3.0e-02	2.1e-01	<3.0e-00	<5.0e-02	2.6e+00	2.6e+00	3.2e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Little Colorado River near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	2.2e+01	3.0e+00	2.7e+02	5.1e+01	7.7e-02	4.9e-01	<8.0e-03
18Jun91	1800	7.6e+00	3.4e+00	3.0e+02	5.1e+01	1.2e-01	6.8e-01	<8.0e-03
18Jun91	2400	7.4e+00	5.9e+00	2.9e+02	5.1e+01	1.5e-01	5.0e-01	<8.0e-03
19Jun91	0600	2.7e+01	3.9e+00	2.9e+02	5.4e+01	9.6e-02	4.6e-01	<8.0e-03
19Jun91	1200	3.1e+01	7.5e+00	3.9e+02	4.9e+01	7.2e-02	<1.0e-01	8.4e-02
19Jun91	1800	1.2e+01	4.3e+00	3.2e+02	5.3e+01	9.3e-02	4.1e-01	<8.0e-03
19Jun91	2400	9.1e+00	5.2e+00	3.4e+02	4.8e+01	9.1e-02	4.5e-01	<8.0e-03

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	1.1e+00	2.3e+00	<5.000e-03	4.5e-02	1.4e+02	9.2e-01	1.8e+00
18Jun91	1800	7.3e-01	2.5e+00	<5.000e-03	4.6e-02	1.5e+02	6.4e-01	1.9e+00
18Jun91	2400	8.7e-01	3.8e+00	<5.000e-03	5.1e-02	1.5e+02	7.6e-01	1.9e+00
19Jun91	0600	8.6e-01	2.4e+00	1.260e-02	4.2e-02	1.5e+02	1.5e+00	2.1e+00
19Jun91	1200	6.2e-01	1.8e+00	2.140e-02	5.7e-02	1.5e+02	1.1e+00	2.6e+00
19Jun91	1800	6.8e-01	2.4e+00	<5.000e-03	4.2e-02	1.6e+02	7.8e-01	2.0e+00
19Jun91	2400	9.8e-01	2.1e+00	<5.000e-03	5.2e-02	1.5e+02	9.8e-01	2.1e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	3.5e-01	<3.0e-00	3.6e-01	5.7e+00	3.3e+00	3.0e+00
18Jun91	1800	3.4e-01	3.5e-01	<3.0e-00	3.6e-01	5.3e+00	2.6e+00	3.6e+00
18Jun91	2400	<3.0e-02	1.2e+01	<3.0e-00	3.8e-01	5.4e+00	2.8e+00	6.1e+00
19Jun91	0600	<3.0e-02	2.0e-01	3.0e+00	3.9e-01	5.7e+00	2.6e+00	3.7e+00
19Jun91	1200	4.8e+00	2.9e-01	<3.0e-00	3.8e-01	5.3e+00	2.4e+00	2.8e+00
19Jun91	1800	<3.0e-02	1.2e+00	<3.0e-00	3.4e-01	5.8e+00	2.3e+00	4.0e+00
19Jun91	2400	<3.0e-02	3.1e-01	3.0e+00	4.0e-01	5.9e+00	3.0e+00	2.6e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Colorado River upstream from Little Colorado River USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	1.9e+01	6.5e-01	8.8e+01	1.1e+02	<2.0e-02	<1.0e-01	5.4e-02
18Jun91	1800	1.4e+01	<6.0e-01	9.2e+01	1.1e+02	9.3e-02	<1.0e-01	2.8e-02
18Jun91	2400	1.4e+01	<6.0e-01	9.4e+01	1.1e+02	4.4e-02	1.2e-01	4.2e-02
19Jun91	0600	2.0e+01	1.3e+00	1.1e+02	1.1e+02	<2.0e-02	<1.0e-01	1.2e-01
19Jun91	1200	5.8e+01	9.3e-01	1.1e+02	1.1e+02	<2.0e-02	1.3e-01	2.2e-01
19Jun91	1800	<2.0e-01	<6.0e-01	<4.0e-01	<1.0e-01	<2.0e-02	<1.0e-01	<8.0e-03
19Jun91	2400	1.4e+01	7.0e-01	1.1e+02	1.1e+02	<2.0e-02	<1.0e-01	1.4e-01
20Jun91	0600	2.3e+02	<6.0e-01	5.6e+01	1.2e+02	1.3e-01	6.9e-01	1.0e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	1.3e+00	1.610e-02	3.2e-02	3.2e+01	7.4e+00	4.5e+00
18Jun91	1800	<2.0e-01	1.2e+00	1.870e-02	3.3e-02	3.4e+01	5.8e+00	4.7e+00
18Jun91	2400	<2.0e-01	8.5e-01	1.430e-02	3.9e-02	3.5e+01	4.8e+00	5.0e+00
19Jun91	0600	5.7e+00	1.0e+00	1.220e-02	6.8e-02	3.3e+01	5.9e+00	7.0e+00
19Jun91	1200	3.0e-01	1.0e+00	2.720e-02	4.9e-02	3.9e+01	6.2e+00	4.7e+00
19Jun91	1800	<2.0e-01	<2.0e-02		8.0e-02	<3.0e-02	<6.0e-02	<9.0e-02
19Jun91	2400	<2.0e-01	1.1e+00	<5.000e-03	6.2e-02	4.1e+01	3.7e+00	5.1e+00
20Jun91	0600	1.2e+00	1.1e+00	2.116e-01	6.1e-02	2.2e+01	1.3e+01	6.7e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	5.3e+00	<3.0e-00	<5.0e-02	5.4e+00	1.2e+00	6.7e+00
18Jun91	1800	3.7e-01	1.0e+01	3.0e+00	6.1e-02	5.9e+00	1.6e+00	7.9e+00
18Jun91	2400	<3.0e-02	<6.0e-02	3.0e+00	6.7e-02	6.0e+00	1.5e+00	7.3e+00
19Jun91	0600	3.2e+00	2.8e+01	3.0e+00	1.6e-01	5.7e+00	1.9e+01	8.8e+00
19Jun91	1200	3.1e+00	<6.0e-02	3.0e+00	1.4e-01	6.1e+00	2.3e+00	8.0e+00
19Jun91	1800	<3.0e-02	<6.0e-02	3.0e+00	<5.0e-02	<6.0e-02	<7.0e-02	<8.0e-02
19Jun91	2400	3.0e+00	<6.0e-02	3.0e+00	1.2e-01	6.4e+00	1.9e+00	1.0e+01
20Jun91	0600	1.2e+00	1.4e+00	3.0e+00	8.2e-01	5.3e+00	6.0e+00	1.0e+01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Colorado River at Grand Canyon USGS Gage (Phantom Ranch)

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	4.5e+00	<6.0e-01	1.1e+02	1.1e+02	<2.0e-02	1.6e-01	2.3e-01
18Jun91	1800	3.3e+00	7.9e-01	9.4e+01	1.1e+02	3.1e-02	<1.0e-01	7.4e-02
18Jun91	2400	5.5e+00	1.6e+00	1.0e+02	1.1e+02	1.0e-01	<1.0e-01	6.6e-02
19Jun91	0600	4.7e+01	1.0e+00	9.7e+01	1.1e+02	2.7e-02	2.1e-01	<8.0e-03
19Jun91	1200	9.5e+00	1.1e+00	1.1e+02	1.1e+02	3.3e-02	<1.0e-01	1.3e-01
19Jun91	1800	5.0e+00	1.1e+00	9.9e+01	1.1e+02	4.3e-02	1.1e-01	1.1e-02
19Jun91	2400	3.8e+00	<6.0e-01	9.6e+01	1.1e+02	3.0e-02	2.1e-01	<8.0e-03
20Jun91	0600	3.9e+00	9.4e-01	1.1e+02	1.1e+02	2.0e-02	<1.0e-01	<8.0e-03

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	1.2e+00	<5.000e-03	5.3e-02	3.9e+01	1.4e+01	4.5e+00
18Jun91	1800	<2.0e-01	1.0e+00	<5.000e-03	3.3e-02	3.4e+01	8.6e+00	4.6e+00
18Jun91	2400	2.4e-01	7.6e-01	<5.000e-03	4.9e-02	3.3e+01	5.6e+00	6.6e+00
19Jun91	0600	3.3e-01	1.0e+00	3.770e-02	3.9e-02	3.7e+01	5.4e+00	4.6e+00
19Jun91	1200	<2.0e-01	9.1e-01	<5.000e-03	2.4e-02	3.7e+01	1.5e+01	7.4e+00
19Jun91	1800	<2.0e-01	9.7e-01	<5.000e-03	3.1e-02	3.6e+01	7.0e+00	5.2e+00
19Jun91	2400	<2.0e-01	9.9e-01	<5.000e-03	4.0e-02	3.5e+01	4.3e+00	4.9e+00
20Jun91	0600	<2.0e-01	6.9e-01	<5.000e-03	2.9e-02	3.8e+01	3.0e+00	6.6e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	1.8e+00	<6.0e-02	3.0e+00	1.2e-01	6.2e+00	1.8e+00	6.5e+00
18Jun91	1800	3.2e-01	<6.0e-02	3.0e+00	<5.0e-02	5.9e+00	1.6e+00	5.2e+00
18Jun91	2400	3.2e+00	3.7e-01	3.0e+00	2.2e-01	5.6e+00	2.7e+00	5.4e+00
19Jun91	0600	<3.0e-02	2.4e-01	3.0e+00	1.0e-01	6.4e+00	2.2e+00	6.2e+00
19Jun91	1200	3.5e+00	1.5e-01	3.0e+00	1.8e-01	5.7e+00	2.5e+00	4.4e+00
19Jun91	1800	3.3e-01	6.8e-02	<3.0e-00	6.5e-02	6.1e+00	1.4e+00	5.6e+00
19Jun91	2400	4.0e-01	<6.0e-02	3.0e+00	6.1e-02	6.0e+00	1.8e+00	5.4e+00
20Jun91	0600	3.8e+00	2.0e-01	3.0e+00	1.6e-01	5.7e+00	2.3e+00	4.3e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Bright Angel Creek near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	1.3e+01	1.3e+00	3.0e+01	1.0e+02	<2.0e-02	1.9e-01	2.0e-01
18Jun91	1800	8.4e+00	2.0e+00	2.2e+01	1.1e+02	<2.0e-02	<1.0e-01	1.8e-01
18Jun91	2400	7.4e+00	1.2e+00	2.6e+01	1.1e+02	<2.0e-02	1.5e-01	2.2e-01
19Jun91	0600	6.0e+00	1.1e+00	2.3e+01	1.1e+02	3.1e-02	<1.0e-01	9.3e-02
19Jun91	1200	4.8e+00	1.7e+00	2.2e+01	1.0e+02	<2.0e-02	<1.0e-01	1.3e-01
19Jun91	1800	4.7e+00	1.3e+00	2.1e+01	1.0e+02	<2.0e-02	<1.0e-01	<8.0e-03
19Jun91	2400	5.0e+00	6.6e-01	2.0e+01	1.1e+02	4.9e-02	<1.0e-01	1.6e-01
20Jun91	0600	5.1e+00	1.1e+00	2.5e+01	1.1e+02	3.0e-02	1.1e-01	1.1e-01

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	1.6e+00	2.5e+00	1.000e-02	3.4e-02	7.0e+00	2.0e+00	3.5e-01
18Jun91	1800	1.1e+00	7.2e-02	5.400e-03	3.0e-02	5.4e+00	1.6e+00	2.6e-01
18Jun91	2400	1.6e+00	3.1e-01	<5.000e-03	2.6e-02	7.1e+00	1.6e+00	3.6e-01
19Jun91	0600	1.8e+00	<2.0e-02	6.800e-03		5.6e+00	1.3e+00	2.2e-01
19Jun91	1200	9.4e-01	7.2e-02	5.400e-03	2.8e-02	6.0e+00	1.3e+00	3.2e-01
19Jun91	1800	1.2e+00	<2.0e-02	1.630e-02	3.1e-02	5.7e+00	1.5e+00	1.5e-01
19Jun91	2400	1.4e+00	1.7e-01	<5.000e-03	3.9e-02	5.1e+00	1.4e+00	7.5e-01
20Jun91	0600	1.4e+00	2.6e-01	<5.000e-03	2.6e-02	6.4e+00	1.3e+00	2.3e-01

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	2.5e+00	<6.0e-02	<3.0e-00	7.4e-02	6.7e-01	4.4e+00	6.5e+00
18Jun91	1800	2.7e+00	1.2e-01	<3.0e-00	8.8e-02	6.1e-01	4.7e+00	5.5e-01
18Jun91	2400	2.2e+00	<6.0e-02	<3.0e-00	8.6e-02	6.6e-01	4.3e+00	3.1e+00
19Jun91	0600	<3.0e-02	<6.0e-02	<3.0e-00	<5.0e-02	4.9e-01	5.2e+00	6.9e-01
19Jun91	1200	2.7e+00	<6.0e-02	<3.0e-00	5.2e-02	6.5e-01	4.1e+00	1.0e+00
19Jun91	1800	<3.0e-02	<6.0e-02	<3.0e-00	<5.0e-02	6.3e-01	3.4e+00	4.9e-01
19Jun91	2400	2.8e+00	4.4e-01	<3.0e-00	2.3e-01	7.4e-01	5.5e+00	1.7e+00
20Jun91	0600	6.4e-01	<6.0e-02	<3.0e-00	<5.0e-02	6.0e-01	3.7e+00	1.2e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Colorado River upstream from Kanab Creek

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	2.5e+01	1.6e+00	9.6e+01	1.1e+02	3.4e-02	<1.0e-01	<8.0e-03
18Jun91	1800	7.4e+01	8.4e-01	1.1e+02	1.1e+02	2.8e-02	1.5e-01	<8.0e-03
18Jun91	2400	3.4e+01	1.1e+00	1.1e+02	1.1e+02	3.1e-02	1.6e-01	<8.0e-03
19Jun91	0600	3.1e+01	9.8e-01	9.7e+01	1.2e+02	2.3e-02	<1.0e-01	<8.0e-03
19Jun91	1200	1.0e+06	1.7e+00	9.4e+01	1.3e+02	1.0e-01	<1.0e-01	4.9e-01
19Jun91	1800	1.4e+02	1.0e+00	8.1e+01	1.2e+02	3.0e-02	<1.0e-01	<8.0e-03
19Jun91	2400	4.0e+01	6.7e-01	9.9e+01	1.1e+02	<2.0e-02	<1.0e-01	<8.0e-03
20Jun91	0600	6.8e+01	1.0e+00	9.3e+01	1.1e+02	<2.0e-02	<1.0e-01	<8.0e-03

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	7.6e-01	1.630e-02	3.5e-02	3.8e+01	2.7e+00	5.1e+00
18Jun91	1800	2.1e-01	1.2e+00	2.860e-02	3.8e-02	3.9e+01	2.4e+01	4.8e+00
18Jun91	2400	<2.0e-01	2.9e-01	2.050e-02	3.8e-02	3.4e+01	8.1e+00	4.6e+00
19Jun91	0600	<2.0e-01	5.7e-01	2.730e-02	3.3e-02	3.8e+01	7.3e+00	4.8e+00
19Jun91	1200	8.5e-01	1.7e+00	8.013e-01	3.1e-02	3.7e+01	5.1e+01	4.0e+00
19Jun91	1800	<2.0e-01	7.5e-01	1.054e-01	4.0e-02	3.0e+01	8.2e+00	4.2e+00
19Jun91	2400	<2.0e-01	3.9e-01	2.590e-02	3.5e-02	3.1e+01	4.8e+00	4.7e+00
20Jun91	0600	<2.0e-01	5.8e-01	4.770e-02	3.8e-02	3.5e+01	5.5e+00	5.0e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	1.5e-01	3.0e+00	1.2e-01	6.0e+00	1.6e+00	2.8e+00
18Jun91	1800	<3.0e-02	3.3e-01	3.0e+00	7.5e-02	6.5e+00	2.3e+00	3.9e+00
18Jun91	2400	<3.0e-02	9.6e-01	3.0e+00	7.0e-02	6.3e+00	1.6e+00	3.0e+00
19Jun91	0600	<3.0e-02	<6.0e-02	3.0e+00	8.3e-02	6.0e+00	1.7e+00	2.9e+00
19Jun91	1200	<3.0e-02	1.3e+00	3.0e+00	9.3e-02	6.0e+00	5.6e+00	7.9e+00
19Jun91	1800	<3.0e-02	2.2e-01	3.0e+00	7.7e-02	6.1e+00	1.8e+00	3.1e+00
19Jun91	2400	<3.0e-02	1.2e-01	3.0e+00	<5.0e-02	5.7e+00	1.0e+00	3.1e+00
20Jun91	0600	<3.0e-02	1.2e-01	3.0e+00	5.4e-02	6.1e+00	1.9e+00	3.2e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Kanab Creek near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	2.1e+01	1.1e+00	1.0e+02	3.2e+01	2.0e-02	<1.0e-01	<8.0e-03
18Jun91	1800	2.3e+00	<6.0e-01	9.0e+01	3.1e+01	<2.0e-02	1.9e-01	<8.0e-03
18Jun91	2400	4.1e+00	<6.0e-01	9.6e+01	3.4e+01	<2.0e-02	<1.0e-01	<8.0e-03
19Jun91	0600	3.4e+00	<6.0e-01	9.0e+01	3.3e+01	2.2e-02	1.6e-01	<8.0e-03
19Jun91	1200	7.9e+00	<6.0e-01	1.0e+02	3.4e+01	5.3e-02	<1.0e-01	<8.0e-03
19Jun91	1800	3.8e+00	<6.0e-01	8.6e+01	3.4e+01	<2.0e-02	<1.0e-01	<8.0e-03
19Jun91	2400	2.4e+01	<6.0e-01	9.8e+01	3.3e+01	6.0e-02	<1.0e-01	<8.0e-03
20Jun91	0600	4.9e+01	<6.0e-01	9.6e+01	3.0e+01	<2.0e-02	1.2e-01	<8.0e-03

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	8.9e-02	2.070e-02	3.8e-02	2.3e+01	3.7e+00	4.6e+00
18Jun91	1800	<2.0e-01	1.9e-01	1.440e-02	1.5e-01	2.1e+01	2.9e+00	4.4e+00
18Jun91	2400	<2.0e-01	4.2e-02	6.200e-03	2.6e-02	2.2e+01	2.9e+00	4.2e+00
19Jun91	0600	<2.0e-01	7.8e-02	7.100e-03	4.0e-02	2.2e+01	2.7e+00	3.9e+00
19Jun91	1200	<2.0e-01	5.5e-02	1.820e-02	3.9e-02	2.1e+01	3.9e+00	5.1e+00
19Jun91	1800	<2.0e-01	<2.0e-02	1.300e-02	3.6e-02	2.3e+01	2.9e+00	4.2e+00
19Jun91	2400	<2.0e-01	3.4e-01	2.950e-02	3.4e-02	2.4e+01	3.3e+00	4.1e+00
20Jun91	0600	<2.0e-01	<2.0e-02	5.690e-02	3.4e-02	2.3e+01	4.1e+00	3.9e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	1.1e-01	4.0e+00	1.1e-01	6.2e+00	7.4e-01	5.9e+00
18Jun91	1800	<3.0e-02	<6.0e-02	3.0e+00	6.0e-02	6.4e+00	4.7e-01	6.3e+00
18Jun91	2400	<3.0e-02	8.8e-02	4.0e+00	9.3e-02	6.2e+00	3.1e-01	5.6e+00
19Jun91	0600	2.3e+00	1.0e-01	3.0e+00	1.0e-01	6.0e+00	6.9e-01	5.8e+00
19Jun91	1200	<3.0e-02	1.0e-01	4.0e+00	1.2e-01	5.9e+00	7.6e-01	5.7e+00
19Jun91	1800	<3.0e-02	9.9e-02	4.0e+00	1.3e-01	6.2e+00	6.9e-01	5.6e+00
19Jun91	2400	<3.0e-02	2.5e-01	3.0e+00	8.4e-02	6.0e+00	6.0e-01	8.7e+00
20Jun91	0600	<3.0e-02	3.6e-01	4.0e+00	1.8e-01	6.6e+00	7.7e-01	6.7e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Havasu Creek near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	7.6e+00	1.4e+01	3.0e+02	1.1e+02	9.8e-02	<1.0e-01	6.8e-02
18Jun91	1800	7.5e+00	1.4e+01	3.0e+02	1.1e+02	<2.0e-02	<1.0e-01	4.7e-02
18Jun91	2400	7.0e+00	1.4e+01	2.8e+02	1.2e+02	3.4e-02	2.1e-01	1.7e-01
19Jun91	0600	7.2e+00	1.2e+01	3.0e+02	1.2e+02	4.4e-02	<1.0e-01	7.6e-02
19Jun91	0600	7.2e+00	1.4e+01	3.2e+02	1.2e+02	1.0e-01	1.8e-01	8.9e-02
19Jun91	1200	7.8e+00	1.3e+01	2.9e+02	1.1e+02	6.3e-02	<1.0e-01	1.2e-01
19Jun91	1800	7.9e+00	1.2e+01	3.3e+02	1.0e+02	1.1e-01	<1.0e-01	<8.0e-03
19Jun91	2400	1.2e+01	1.4e+01	3.0e+02	1.1e+02	1.2e-01	<1.0e-01	7.0e-02
20Jun91	0600	6.7e+00	1.2e+01	3.2e+02	1.1e+02	6.4e-02	<1.0e-01	6.7e-02

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	6.0e-01	5.1e-01	<5.000e-03	3.3e-02	1.3e+02	3.8e-01	1.1e+00
18Jun91	1800	5.0e-01	<2.0e-02	<5.000e-03	3.2e-02	1.1e+02	2.4e-01	1.2e+00
18Jun91	2400	6.3e-01	3.0e-02	<5.000e-03	3.7e-02	1.4e+02	4.0e-01	1.4e+00
19Jun91	0600	3.7e-01	<2.0e-02	6.000e-03	3.7e-02	1.1e+02	4.3e-01	1.2e+00
19Jun91	0600	7.3e-01	3.7e-01	6.000e-03	3.7e-02	1.4e+02	4.6e-01	1.3e+00
19Jun91	1200	8.0e-01	1.0e-01	1.130e-02	4.3e-02	1.3e+02	3.9e-01	1.4e+00
19Jun91	1800	5.4e-01	7.1e-01	6.500e-03	3.9e-02	1.4e+02	3.4e-01	1.1e+00
19Jun91	2400	5.9e-01	3.9e-01	6.500e-03	3.8e-02	1.3e+02	5.6e-01	1.0e+00
20Jun91	0600	5.6e-01	2.8e-01	<5.000e-03	4.3e-02	1.4e+02	3.3e-01	1.0e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	6.9e-01	<6.0e-02	<3.0e-00	<5.0e-02	4.2e+00	6.5e+00	1.4e+00
18Jun91	1800	7.1e-01	<6.0e-02	<3.0e-00	<5.0e-02	3.8e+00	6.3e+00	6.3e-01
18Jun91	2400	2.4e+00	1.8e-01	<3.0e-00	<5.0e-02	4.6e+00	8.2e+00	1.2e+00
19Jun91	0600	5.6e-01	<6.0e-02	<3.0e-00	7.2e-02	3.9e+00	5.6e+00	1.3e+00
19Jun91	0600	8.5e-01	<6.0e-02	<3.0e-00	5.2e-02	4.1e+00	7.2e+00	3.0e+00
19Jun91	1200	1.5e+00	9.0e-02	<3.0e-00	9.8e-02	4.4e+00	8.2e+00	5.3e-01
19Jun91	1800	<3.0e-02	1.3e-01	<3.0e-00	<5.0e-02	3.9e+00	5.9e+00	1.7e+00
19Jun91	2400	1.9e-01	<6.0e-02	<3.0e-00	<5.0e-02	4.1e+00	6.5e+00	1.1e+00
20Jun91	0600	5.6e-01	1.1e-01	<3.0e-00	<5.0e-02	3.9e+00	5.7e+00	1.2e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Colorado River at National Canyon USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	3.1e+00	9.1e-01	9.7e+01	1.1e+02	2.2e-02	1.2e-01	4.9e-02
18Jun91	1800	2.9e+00	1.5e+00	9.4e+01	1.1e+02	<2.0e-02	1.8e-01	<8.0e-03
18Jun91	2400	6.0e+00	6.9e-01	9.9e+01	1.1e+02	<2.0e-02	2.0e-01	2.1e-01
19Jun91	0600	4.7e+00	1.0e+00	9.5e+01	1.1e+02	<2.0e-02	2.5e-01	1.2e-01
19Jun91	1200	4.0e+00	1.0e+00	1.0e+02	1.0e+02	2.8e-02	<1.0e-01	<8.0e-03
19Jun91	1800	6.5e+00	<6.0e-01	1.0e+02	1.0e+02	5.1e-02	1.4e-01	<8.0e-03
19Jun91	2400	3.2e+00	8.7e-01	8.2e+01	1.1e+02	<2.0e-02	2.4e-01	<8.0e-03
20Jun91	0600	6.2e+01	9.7e-01	8.9e+01	1.1e+02	7.4e-02	<1.0e-01	7.2e-02

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	3.4e-01	7.1e-01	<5.000e-03	3.8e-02	4.0e+01	7.5e-01	4.9e+00
18Jun91	1800	<2.0e-01	7.1e-01	7.300e-03	1.0e-01	3.7e+01	6.6e+00	5.0e+00
18Jun91	2400	4.3e-01	9.4e-01	<5.000e-03	4.0e-02	4.0e+01	8.1e+00	5.0e+00
19Jun91	0600	2.3e-01	5.6e-01	6.400e-03	1.7e-02	3.5e+01	4.6e+00	5.0e+00
19Jun91	1200	3.7e-01	4.9e-01	<5.000e-03	3.9e-02	3.0e+01	3.9e+00	4.8e+00
19Jun91	1800	3.9e-01	7.9e-01	<5.000e-03	3.2e-02	3.1e+01	3.4e+00	4.8e+00
19Jun91	2400	4.4e-01	6.0e-01	<5.000e-03	3.2e-02	3.3e+01	2.9e+00	5.0e+00
20Jun91	0600	3.3e-01	8.9e-01	5.290e-02	5.8e-02	3.4e+01	4.5e+00	5.0e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	<6.0e-02	3.0e+00	<5.0e-02	6.1e+00	2.3e+00	3.3e+00
18Jun91	1800	<3.0e-02	<6.0e-02	4.0e+00	<5.0e-02	6.1e+00	1.8e+00	3.2e+00
18Jun91	2400	1.0e+00	<6.0e-02	3.0e+00	<5.0e-02	6.1e+00	2.6e+00	3.1e+00
19Jun91	0600	<3.0e-02	<6.0e-02	7.0e+00	<5.0e-02	5.9e+00	2.0e+00	2.5e+00
19Jun91	1200	9.4e-01	<6.0e-02	3.0e+00	<5.0e-02	5.4e+00	2.3e+00	4.0e+00
19Jun91	1800	1.2e+00	9.7e-02	4.0e+00	6.5e-02	5.4e+00	2.5e+00	3.1e+00
19Jun91	2400	<3.0e-02	<6.0e-02	3.0e+00	<5.0e-02	6.1e+00	2.6e+00	3.5e+00
20Jun91	0600	<3.0e-02	9.6e-02	3.0e+00	6.6e-02	6.1e+00	2.5e+00	3.9e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Colorado River upstream from Diamond Creek USGS Gage

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	3.7e+02	9.2e-01	9.4e+01	1.2e+02	<2.0e-02	<1.0e-01	1.8e-02
18Jun91	1800	4.4e+00	6.3e-01	9.9e+01	1.1e+02	<2.0e-02	<1.0e-01	<8.0e-03
18Jun91	2400	3.9e+00	1.5e+00	9.6e+01	1.1e+02	3.5e-02	<1.0e-01	<8.0e-03
19Jun91	0600	1.3e+01	7.1e-01	1.1e+02	1.1e+02	<2.0e-02	<1.0e-01	<8.0e-03
19Jun91	1200	5.4e+00	<6.0e-01	1.0e+02	1.2e+02	2.6e-02	<1.0e-01	<8.0e-03
19Jun91	1800	1.1e+01	1.3e+00	1.0e+02	1.1e+02	2.9e-02	<1.0e-01	<8.0e-03
19Jun91	2400	1.6e+01	1.4e+00	1.0e+02	1.1e+02	<2.0e-02	<1.0e-01	<8.0e-03
20Jun91	0600	4.9e+00	1.3e+00	1.1e+02	1.1e+02	4.0e-02	<1.0e-01	<8.0e-03

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	8.8e-01	1.602e-01	4.4e-02	3.5e+01	1.0e+01	4.7e+00
18Jun91	1800	<2.0e-01	6.0e-01	<5.000e-03	3.3e-02	3.5e+01	1.2e+00	5.0e+00
18Jun91	2400	<2.0e-01	4.8e-01	<5.000e-03	3.5e-02	3.1e+01	1.3e+00	4.8e+00
19Jun91	0600	<2.0e-01	6.1e-01	1.230e-02	4.2e-02	4.0e+01	1.3e+01	4.5e+00
19Jun91	1200	<2.0e-01	1.4e+00	<5.000e-03	4.8e-02	3.6e+01	1.0e+01	4.5e+00
19Jun91	1800	<2.0e-01	7.7e-01	6.900e-03	6.1e-02	3.7e+01	4.5e+00	4.9e+00
19Jun91	2400	<2.0e-01	4.4e-01	1.230e-02	3.7e-02	3.5e+01	3.7e+00	4.7e+00
20Jun91	0600	<2.0e-01	4.8e-01	<5.000e-03	4.3e-02	3.5e+01	3.2e+00	4.7e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	4.4e-01	3.0e+00	8.8e-02	6.1e+00	2.3e+00	3.8e+00
18Jun91	1800	<3.0e-02	1.1e-01	3.0e+00	7.3e-02	5.8e+00	1.4e+00	2.6e+00
18Jun91	2400	<3.0e-02	6.5e-02	3.0e+00	<5.0e-02	5.6e+00	1.3e+00	2.7e+00
19Jun91	0600	<3.0e-02	1.7e-01	3.0e+00	7.5e-02	6.4e+00	1.8e+00	3.2e+00
19Jun91	1200	<3.0e-02	1.1e-01	3.0e+00	5.8e-02	6.4e+00	1.6e+00	3.2e+00
19Jun91	1800	<3.0e-02	5.8e-01	3.0e+00	7.8e-02	5.9e+00	1.7e+00	2.8e+00
19Jun91	2400	<3.0e-02	6.5e-02	3.0e+00	6.9e-02	5.8e+00	1.5e+00	2.6e+00
20Jun91	0600	<3.0e-02	1.9e-01	3.0e+00	7.2e-02	6.3e+00	1.7e+00	3.6e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Diamond Creek near mouth

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	1.3e+01	1.9e+01	6.2e+02	8.2e+01	1.5e-01	<1.0e-01	<8.0e-03
18Jun91	1800	1.0e+01	2.0e+01	6.6e+02	9.0e+01	1.5e-01	<1.0e-01	5.7e-02
18Jun91	2400	<2.0e-01	<6.0e-01	<4.0e-01	<1.0e-01	<2.0e-02	<1.0e-01	<8.0e-03
19Jun91	0600	1.1e+01	1.7e+01	6.7e+02	8.5e+01	1.4e-01	<1.0e-01	7.8e-02
19Jun91	1200	1.2e+01	2.1e+01	6.6e+02	8.4e+01	1.2e-01	2.8e-01	1.4e-01
19Jun91	1800	1.0e+01	1.7e+01	5.9e+02	8.5e+01	1.4e-01	1.0e-01	1.1e-01
19Jun91	2400	2.0e+01	1.9e+01	7.1e+02	8.3e+01	1.8e-01	3.5e-01	<8.0e-03
20Jun91	0600	1.6e+01	1.7e+01	6.8e+02	8.1e+01	1.8e-01	2.3e-01	4.8e-02

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	3.1e-01	<5.000e-03	3.3e-02	1.1e+02	1.4e+00	2.4e+00
18Jun91	1800	<2.0e-01	2.4e-01	8.100e-03	2.9e-02	1.1e+02	1.4e+00	2.5e+00
18Jun91	2400	<2.0e-01	<2.0e-02	8.200e-03	4.8e-02	<3.0e-02	<6.0e-02	<9.0e-02
19Jun91	0600	<2.0e-01	5.1e-01	<5.000e-03	4.3e-02	1.2e+02	1.1e+00	2.2e+00
19Jun91	1200	3.4e-01	5.0e-01	5.700e-03	4.0e-02	1.3e+02	1.4e+00	3.1e+00
19Jun91	1800	<2.0e-01	2.6e-01	8.300e-03	4.3e-02	9.3e+01	1.3e+00	2.4e+00
19Jun91	2400	2.6e-01	<2.0e-02	1.000e-02	3.4e-02	1.2e+02	1.5e+00	2.4e+00
20Jun91	0600	<2.0e-01	3.1e-01	1.100e-02	4.3e-02	9.7e+01	1.2e+00	2.6e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	<3.0e-02	<6.0e-02	<3.0e-00	<5.0e-02	8.6e+00	5.3e+00	6.3e-01
18Jun91	1800	<3.0e-02	<6.0e-02	<3.0e-00	5.4e-02	8.4e+00	5.2e+00	1.4e+00
18Jun91	2400	<3.0e-02	<6.0e-02	<3.0e-00	<5.0e-02	<6.0e-02	<7.0e-02	<8.0e-02
19Jun91	0600	3.0e-01	8.4e-02	<3.0e-00	<5.0e-02	7.8e+00	3.8e+00	1.1e+00
19Jun91	1200	1.6e+00	1.5e-01	<3.0e-00	8.1e-02	9.0e+00	6.3e+00	1.1e+00
19Jun91	1800	<3.0e-02	<6.0e-02	<3.0e-00	<5.0e-02	8.3e+00	3.7e+00	1.5e-01
19Jun91	2400	<3.0e-02	1.6e-01	<3.0e-00	8.7e-02	8.8e+00	4.8e+00	7.7e-01
20Jun91	0600	2.9e+00	1.5e-01	<3.0e-00	6.1e-02	7.6e+00	4.2e+00	7.7e-01

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 14. Trace metal concentrations for the June 1991 synoptic experiment--Continued
Units of ug/L

Colorado River near Travertine Cleft

Date	Time	Al	As	B	Ba	Be	Cd	Co
18Jun91	1200	3.2e+02	7.9e-01	9.4e+01	1.2e+02	4.0e-02	<1.0e-01	<8.0e-03
18Jun91	1800	5.4e+01	<6.0e-01	9.9e+01	1.2e+02	5.5e-02	2.8e-01	3.6e-02
18Jun91	2400	1.3e+01	1.1e+00	9.6e+01	1.1e+02	<2.0e-02	2.2e-01	1.3e-01
19Jun91	0600	6.6e+01	1.0e+00	1.0e+02	1.1e+02	<2.0e-02	1.1e-01	<8.0e-03
19Jun91	1200	3.3e+00	1.4e+00	1.2e+02	1.1e+02	6.1e-02	<1.0e-01	1.9e-02
19Jun91	1800	1.9e+01	6.7e-01	9.9e+01	1.2e+02	2.0e-02	3.0e-01	1.4e-01
19Jun91	2400	9.8e+00	<6.0e-01	1.0e+02	1.2e+02	5.6e-02	3.3e-01	1.2e-01
20Jun91	0600	3.7e+01	7.5e-01	1.0e+02	1.1e+02	5.8e-02	1.0e-01	<8.0e-03

Date	Time	Cr	Cu	Fe	Hg	Li	Mn	Mo
18Jun91	1200	<2.0e-01	7.9e-01	2.211e-01	5.8e-02	3.0e+01	5.2e+00	4.1e+00
18Jun91	1800	<2.0e-01	7.7e-01	3.150e-02	4.0e-02	4.1e+01	3.2e+00	5.2e+00
18Jun91	2400	<2.0e-01	6.7e-01	1.370e-02	3.5e-02	3.6e+01	1.7e+00	5.1e+00
19Jun91	0600	<2.0e-01	6.8e-01	3.970e-02	3.6e-02	3.2e+01	2.7e+00	5.0e+00
19Jun91	1200	7.8e+00	5.3e-01	<5.000e-03	4.0e-02	3.6e+01	1.3e-01	4.9e+00
19Jun91	1800	<2.0e-01	6.5e-01	1.660e-02		3.7e+01	6.5e+00	5.0e+00
19Jun91	2400	<2.0e-01	7.6e-01	8.100e-03	3.3e-02	4.5e+01	4.2e+00	5.5e+00
20Jun91	0600	<2.0e-01	6.5e-01	2.440e-02	2.8e-02	3.6e+01	2.7e+00	4.9e+00

Date	Time	Ni	Pb	Se	Tl	U	V	Zn
18Jun91	1200	2.4e+00	1.4e-01	3.0e+00	5.3e-02	5.5e+00	2.2e+00	3.0e+00
18Jun91	1800	<3.0e-02	<6.0e-02	3.0e+00	<5.0e-02	6.3e+00	1.9e+00	3.3e+00
18Jun91	2400	<3.0e-02	<6.0e-02	3.0e+00	5.3e-02	5.8e+00	1.6e+00	3.9e+00
19Jun91	0600	2.9e+00	1.5e-01	3.0e+00	1.1e-01	5.4e+00	1.6e+00	3.6e+00
19Jun91	1200	<3.0e-02	<6.0e-02	3.0e+00	<5.0e-02	6.0e+00	2.1e+01	2.8e+00
19Jun91	1800	<3.0e-02	<6.0e-02	3.0e+00	<5.0e-02	6.0e+00	1.8e+00	3.2e+00
19Jun91	2400	<3.0e-02	<6.0e-02	3.0e+00	5.4e-02	5.9e+00	2.6e+00	3.4e+00
20Jun91	0600	2.0e+00	1.2e-01	3.0e+00	<5.0e-02	5.8e+00	1.7e+00	3.5e+00

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic invertebrates captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site: COLORADO RIVER
Date: 11/15/90 0850-0950 hrs
Location: at GLEN CAN GAGE RKM -20
Type line: DRIFT L-NET #125

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
313 Cyclopoid crowned																					
	20	219	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	243
	0.002	1.150	0.131																		1.283
305 Cladocera																					
	0	18	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
		2.190	1.995																		4.185
365 Hydra																					
	0	13	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
		0.532	0.350																		0.882
950 Oligochaeta																					
	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.013			0.24																0.279
306 Chydorid cladoceran																					
	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	0.006	0.122																			0.128
410 Chironomidae (adult)																					
	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.10	0.18	0.29															0.563
Total weights & numbers in each of 20 columns:																					
	21	252	14	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.008	4.035	2.476	0.10	0.42	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 292

Total weight: 7.3195

Total number & weight of Terrestrials: 3 0.5634

Total number & weight of Aquatics: 289 6.7561

Total number & weight of Behavioral Drifters: 267 5.5956

Total number & weight of Accidental Drifters: 25 1.7239

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	3	267	0	19	0	3	0	0
	0.000	0.279	5.596	0.000	0.882	0.000	0.563	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	19	3	0	0	0	3	267	0	0
	0.882	0.279	0.000	0.000	0.000	0.563	5.596	0.000	0.000

GlenCanyon 11/15/90 0850-0950 hrs. Sample #52
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PRELIMINARY RESULTS
SUBJECT TO REVISION

Glen Canyon 111590 1325-1425 hrs. Sample #47
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 111590 1325-1425 hrs
Location: GLEN CAN GAGE RKM -20
Type time: DRIFT & NET #105

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
515 Corixoidea criteroid																					
	42	327	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	441
	1.004	2.095	0.065																		2.155
503 Daphnia																					
	0	89	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121
		10.83	15.956																		26.787
411 Chironomidae (chirom)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
206 Chydorid cladoceran																					
	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	0.038	0.243																			0.249
963 Hydra																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.123																			0.123
295 Terrestrial mite																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
950 Oligochaeta																					
	0	0	4	1	2	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	10
			0.233	0.08	0.24		0.24		0.49			1.44									2.729

Total weights & numbers in each of 20 columns:

43	492	38	2	2	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0
0.010	13.403	16.255	0.18	0.24	0.00	0.24	0.00	0.49	0.00	0.00	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 580

Total weight: 32.2610

Total number & weight of Terrestrials: 0 0.0000

Total number & weight of Aquatics: 580 32.2610

Total number & weight of Behavioral Drifters: 565 29.1910

Total number & weight of Accidental Drifters: 15 3.0699

	Shredder	Col gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	10	565	0	6	0	0	1	0
	0.000	2.729	29.191	0.000	0.244	0.000	0.000	0.097	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	3	10	1	0	1	0	565	0	0
	0.123	2.729	0.097	0.000	0.122	0.000	29.191	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PRELIMINARY RESULTS
SUBJECT TO REVISION

Single net

Site: COLORADO RIVER
Date: 11/19/90 1915-2005 hrs
Location: GLEN CAN GAGE RKM-20
Type line: DRIFT NET #44

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
513 Cyclopoid copepod																					
	4	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
	0.000	0.095																			0.095
903 Daphnia																					
	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.730																			0.730
918 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
Total weights & numbers in each of 20 columns:																					
	4	25	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.836	0.000	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 30
Total weight: 1.0124

Total number & weight of Terrestrials: 2 0.1873
Total number & weight of Aquatics: 28 0.8251

Total number & weight of Behavioral Drifters: 28 0.8251
Total number & weight of Accidental Drifters: 2 0.1873

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	28	0	0	0	2	0	0
	0.000	0.000	0.825	0.000	0.000	0.000	0.187	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	2	28	0	0
	0.000	0.000	0.000	0.000	0.000	0.187	0.825	0.000	0.000

Composite of two nets

Site: COLORADO RIVER
Date: 11/18/90 1905-2005 hrs
Location: GLEN CAN GAGE RKM-20
Type line: DRIFT #40

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
903 Daphnia																					
	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.243	0.997																		1.241
813 Cyclopoid copepod																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
Total weights & numbers in each of 20 columns:																					
	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.249	0.997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 5
Total weight: 1.2459

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 5 1.2459

Total number & weight of Behavioral Drifters: 5 1.2459
Total number & weight of Accidental Drifters: 0 0.0000

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	5	0	0	0	0	0	0
	0.000	0.000	1.246	0.000	0.000	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	0	5	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	1.246	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PRELIMINARY RESULTS SUBJECT TO REVISION

Single net

Site: COLORADO RIVER
Date: 11/6/90 0120-0120 hrs
Location: GLEN CAN GAGE RKM-20
Type line: DRIFT L-NET #61

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
910 Gammarus																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.79															0.794
903 Daphnia																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.365																			0.365
963 Hydra																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.082																			0.082
440 Orthocladiinae																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.003																			0.003
910 Oligochaeta																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.082																			0.082

Total weights & numbers in each of 20 columns:

0	8	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.532	0.000	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 9
Total weight: 1.3264

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 9 1.3264

Total number & weight of Behavioral Drifters: 5 1.1629
Total number & weight of Accidental Drifters: 4 0.1635

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	3	3	0	2	0	0	0	0
	0.794	0.085	0.365	0.000	0.082	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Planit	Parasite	---
MODE of attachment tots (1 - 9):	2	4	0	0	0	0	3	0	0
	0.082	0.880	0.000	0.000	0.000	0.000	0.365	0.000	0.000

Single net

Site: COLORADO RIVER
Date: 11/6/90 0120-0220 hrs
Location: GLEN CAN GAGE RKM-20
Type line: DRIFT L-NET #50

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.003																			0.003
903 Daphnia																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			0.243

Total weights & numbers in each of 20 columns:

0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.247	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 3
Total weight: 0.2468

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 3 0.2468

Total number & weight of Behavioral Drifters: 3 0.2468
Total number & weight of Accidental Drifters: 0 0.0000

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	2	0	0	0	0	0	0
	0.000	0.003	0.243	0.000	0.000	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Planit	Parasite	--
MODE of attachment tots (1 - 9):	0	1	0	0	0	0	2	0	0
	0.000	0.003	0.000	0.000	0.000	0.000	0.243	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PRELIMINARY RESULTS
SUBJECT TO REVISION

Single net

Site: COLORADO RIVER
Date: [illegible] 0745-0835 hrs
Location: GLEN CAN GAGE RKM-20
Type line: DRIFT NET #126

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
813 Cyclopoid copepod																					
	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.012																			0.012
904 Chydorid cladoceran																					
	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.006																				0.006
410 Chironomidae (adult)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
950 Oligochaeta																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.08																	0.083
Total weights & numbers in each of 20 columns:																					
	1	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.006	0.012	0.000	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 9
Total weight: 0.2174

Total number & weight of Terrestrials: 1 0.0967
Total number & weight of Aquatics: 8 0.1207

Total number & weight of Behavioral Drifters: 7 0.0374
Total number & weight of Accidental Drifters: 2 0.1800

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	7	0	0	0	1	0	0
	0.000	0.083	0.037	0.000	0.000	0.000	0.097	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	1	0	0	0	1	7	0	0
	0.000	0.083	0.000	0.000	0.000	0.097	0.037	0.000	0.000

Composite of two nets

Site: COLORADO RIVER
Date: [illegible] 0735-0835 hrs
Location: GLEN CAN GAGE RKM-20
Type line: DRIFT #103

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
903 Daphnia																					
	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5
		0.365	0.997																		1.362
813 Cyclopoid copepod																					
	2	14	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
	0.000	0.074	0.098																		0.172
863 Hydra																					
	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
	0.029	0.082																			0.110
410 Chironomidae (adult)																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
						0.29															0.289
900 Ostracoda																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
Total weights & numbers in each of 20 columns:																					
	3	20	6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.029	0.642	1.420	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 50
Total weight: 2.3799

Total number & weight of Terrestrials: 2 0.6156
Total number & weight of Aquatics: 28 1.7663

Total number & weight of Behavioral Drifters: 24 1.5342
Total number & weight of Accidental Drifters: 6 0.8457

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	24	0	3	0	2	0	0
	0.000	0.122	1.534	0.000	0.110	0.000	0.614	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	3	0	0	0	1	2	24	0	0
	0.110	0.000	0.000	0.000	0.122	0.614	1.534	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PRELIMINARY RESULTS
SUBJECT TO REVISION

Composite of two nets

Site: COLORADO RIVER
Date: 11/6/90 1355-1455 hrs
Location: at GLEN CAN GAGE RKM - 2.0
Type line: DRIFT #39

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
813 Cyclopoid copepod																					
	5	17	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
	0.001	0.089	0.163																		0.253
905 Daphnia																					
	1	50	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71
	0.006	6.095	9.973																		16.06
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.196																			0.196
863 Hydra																					
	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.123	0.117	0.08																	0.323
910 Physa																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.003																			0.003
Total weights & numbers in each of 20 columns:																					
	6	73	27	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.006	6.475	10.253	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 107
Total weight: 16.8366

Total number & weight of Terrestrials: 2 0.1939
Total number & weight of Aquatics: 105 16.6427

Total number & weight of Behavioral Drifters: 98 16.3166
Total number & weight of Accidental Drifters: 9 0.5200

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	98	1	6	0	2	0	0
	0.000	0.000	16.317	0.003	0.323	0.000	0.196	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	0	0	0	0	2	98	0	0
	0.326	0.000	0.000	0.000	0.000	0.196	16.317	0.000	0.000

Single net

Site: COLORADO RIVER
Date: 11/6/90 1355-1455 hrs
Location: at GLEN CAN GAGE RKM - 2.0
Type line: DRIFT LINE NET #45

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
813 Cyclopoid copepod																					
	145	594	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	739
	0.015	3.120																			3.135
813 Cyclopoid copepod																					
	138	407	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	545
	0.014	2.138																			2.152
704 Chydorid cladoceran																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			0.243
950 Oligochaeta																					
	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
											1.01										1.007
905 Daphnia																					
	1	34	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
	0.006	4.138	0.997																		5.141
Total weights & numbers in each of 20 columns:																					
	284	1037	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
	0.035	9.638	0.997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 1324
Total weight: 11.6773

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 1324 11.6773

Total number & weight of Behavioral Drifters: 1323 10.6703
Total number & weight of Accidental Drifters: 1 1.0070

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	1323	0	0	0	0	0	0
	0.000	1.007	10.670	0.000	0.000	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	1	0	0	0	0	1323	0	0
	0.000	1.007	0.000	0.000	0.000	0.000	10.670	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site: COLORADO RIVER
Date: 11/6/90 1835-1955 hrs
Location: at GLEN CAN GAGE TRKM-20
Type line: DRIFT B-NET #42

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
813 Cyclopoid copepod																					
	61	365	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	430
	0.006	1.917	0.131																		2.054
905 Greptoleperis (Cladocera)																					
	0	19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
		2.312	0.997																		3.309
410 Chironomidae (adult)																					
	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.10		0.58															0.675

Total weights & numbers in each of 20 columns:

61	384	6	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.006	4.229	1.128	0.10	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 456

Total weight: 6.0381

Total number & weight of Terrestrials: 3 0.6746

Total number & weight of Aquatics: 453 5.3634

Total number & weight of Behavioral Drifters: 430 2.0540

Total number & weight of Accidental Drifters: 24 3.9841

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	453	0	0	0	3	0	0
	0.000	0.000	5.363	0.000	0.000	0.000	0.675	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	21	3	430	0	0
	0.000	0.000	0.000	0.000	3.309	0.675	2.054	0.000	0.000

Site: COLORADO RIVER
Date: 11/6/90 1835-1955 hrs
Location: at GLEN CAN GAGE TRKM-20
Type line: DRIFT B-NET #46

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
813 Cyclopoid copepod																					
	296	999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1293
	0.030	5.247																			5.277
813 Cyclopoid copepod																					
	0	127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	127
		0.667																			0.667
903 Daphnia																					
	0	46	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52
		5.598	2.992																		8.590
906 Chydorid cladoceran																					
	3	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
	0.018	2.069																			2.086
850 Oligochaeta																					
	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.041			0.12																0.160
810 Hydracarina																					
	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	0.006	0.122																			0.128

Total weights & numbers in each of 20 columns:

298	1191	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.054	15.743	2.992	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 1496

Total weight: 16.9072

Total number & weight of Terrestrials: 0 0.0000

Total number & weight of Aquatics: 1496 16.9072

Total number & weight of Behavioral Drifters: 1492 16.6198

Total number & weight of Accidental Drifters: 4 0.2874

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	1492	0	2	0	0	0	0
	0.000	0.160	16.620	0.000	0.128	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	2	0	0	2	0	1492	0	0
	0.000	0.160	0.000	0.000	0.128	0.000	16.620	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible] GAGE [illegible]
Type line: DRIFT D-NET #65

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
813 Cyclopoid copepod																					
	11	42	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
	0.001	0.221																			0.222
905 Daphnia																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			0.243
Total weights & numbers in each of 20 columns:																					
	11	44	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.001	0.464	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 55
Total weight: 0.4651

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 55 0.4651

Total number & weight of Behavioral Drifters: 55 0.4651
Total number & weight of Accidental Drifters: 0 0.0000

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	55	0	0	0	0	0	0
	0.000	0.000	0.465	0.000	0.000	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment totals (1 - 9):	0	0	0	0	0	0	55	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	0.465	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible] GLEN CAN GAGE RKM-20
Type line: DRIFT B-NET #87

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
905 Daphnia																					
	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.365	0.997																		1.362
813 Cyclopoid copepod																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
906 Chydorid cladoceran																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.365																			0.365
Total weights & numbers in each of 20 columns:																					
	0	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.735	0.997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 9
Total weight: 1.7327

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 9 1.7327

Total number & weight of Behavioral Drifters: 9 1.7327
Total number & weight of Accidental Drifters: 0 0.0000

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	9	0	0	0	0	0	0
	0.000	0.000	1.733	0.000	0.000	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	0	9	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	1.733	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site: COLORADO RIVER
Date: 11/5/90 [illegible]
Location: at LEES FERRY Run 5
Type line: DRIFT #11

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
500 Aquatic Diptera Adults																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
440 Orthocladiinae																					
	0	1	11	9	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
		0.003	0.155	0.32		0.12															0.603
598 Cnephia																					
	0	11	5	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
		0.057	0.159	0.17		0.38															0.755
813 Cyclopoid copepod																					
	23	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
	0.002	0.095																			0.097
860 Nematoda																					
	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.608	1.496																		2.104
890 Gammarus																					
	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.40																	0.398
951 Hydra																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.161																			0.041

Total weights & numbers in each of 20 columns:

23	37	20	13	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.002	0.896	1.811	0.88	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 95
Total weight: 4.0957

Total number & weight of Terrestrials: 1 0.0969
Total number & weight of Aquatics: 94 3.9988

Total number & weight of Behavioral Drifters: 85 1.8535
Total number & weight of Accidental Drifters: 10 2.2422

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	2	30	61	0	1	0	1	0	0
	0.398	2.707	0.853	0.000	0.061	0.000	0.097	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planct	Parasite	---
MODE of attachment tots (1 - 9):	21	32	0	0	0	1	41	0	0
	0.797	3.105	0.000	0.000	0.000	0.097	0.097	0.000	0.000

Site: COLORADO RIVER
Date: 11/5/90 [illegible]
Location: at LEES FERRY Run 5
Type line: DRIFT #164

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Cnephia																					
	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.005		0.08	0.19																0.280
440 Orthocladiinae																					
	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.014					0.29													0.304
890 Gammarus																					
	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
									3.01												3.011
850 Oligochaeta																					
	0	5	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		0.123	0.292	0.08																	0.498
813 Cyclopoid copepod																					
	52	124	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181
	0.005	0.651	0.163																		0.820
904 Chydorid cladoceran																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122

Total weights & numbers in each of 20 columns:

52	129	11	2	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
0.005	0.900	0.469	0.17	0.19	0.00	0.00	0.29	3.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 197
Total weight: 5.0346

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 197 5.0346

Total number & weight of Behavioral Drifters: 188 4.5367
Total number & weight of Accidental Drifters: 9 0.4978

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	11	185	0	0	0	0	0	0
	3.011	0.802	1.222	0.000	0.000	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planct	Parasite	---
MODE of attachment tots (1 - 9):	3	12	0	0	0	0	182	0	0
	0.280	3.813	0.000	0.000	0.000	0.000	0.962	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site: COLORADO RIVER
Date: [illegible]
Location: at LEES FERRY [illegible]
Type line: DRIFT #135

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
850 Oligochaeta																					
	0	2	12	7	2	1	0	0	1	1	0	1	0	0	0	0	0	0	1	0	
	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	31
		0.082	0.700	0.58	0.24	0.17			0.49	0.71		1.44							17.37		
	35.41										1245.14	1777.58									3079.915
998 Aquatic insect egg																					
	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
	0.264																				0.264
440 Orthocladiinae																					
	0	0	1	5	10	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
			0.014	0.18	0.71	0.74															1.644
411 Chironomidae (pupae)																					
	0	0	5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
			0.214	0.10	0.18	0.29															0.777
410 Chironomidae (adult)																					
	0	2	7	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
		0.025	0.300	0.19	0.53																1.051
911 Limnaeidae (Gastropoda)																					
	0	3	4	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10
		0.010	0.056	0.04	0.07		0.20														0.369
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
813 Cyclopoid copepod																					
	0	27	198	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	245
		0.142	6.474	2.18																	8.797
960 Diptera (terrestrials & larvae)																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.058	0.08																	0.142
770 Salididae																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.399																		0.399
955 Lepidoptera (terrestrials & larvae)																					
	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
							1.13														1.128
903 Daphnia																					
	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
	0.006	0.608	0.499																		1.113
890 Gammarus																					
	0	0	8	16	2	2	0	1	0	2	0	0	0	1	0	0	0	0	0	0	32
			0.369	3.19	0.86	1.59		2.05		8.46				12.41							29.129

Total weights & numbers in each of 40 columns:

46	39	239	53	19	10	2	1	1	3	0	1	0	1	0	0	0	0	1	0	
0.270	0.867	9.609	6.54	2.59	2.79	1.32	2.05	0.49	9.17	0.00	1.44	0.00	12.41	0.00	0.00	0.00	0.00	17.37	0.00	
1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	
35.41										1245.14	1777.58									

Cumulative total number of specimens: 419

Total weight: 3125.0541

Total number & weight of Terrestrials: 18 2.6458

Total number & weight of Aquatics: 401 3122.4083

Total number & weight of Behavioral Drifters: 306 40.6818

Total number & weight of Accidental Drifters: 113 3084.3703

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	32	53	252	10	1	0	18	53	0
	29.129	081.559	9.910	0.369	0.399	0.000	2.646	1.041	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planke	Parasite	---
MODE of attachment tots (1 - 9):	10	85	8	1	45	18	252	0	0
	0.369	310.689	0.777	0.399	0.264	2.646	9.910	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: at LEES FERRY [illegible]
Type line: DRIFT #177

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
910 Physa																					
	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.003	0.028	0.04	0.07																0.138
800 Collembola																					
	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.009	0.080																		0.089
890 Gammarus																					
	0	1	10	13	7	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	34
		0.015	0.711	2.59	3.01	0.79	1.32	2.05													10.495
904 Chydorid cladoceran																					
	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.487																			0.487
863 Hydra																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041
903 Daphnia																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
440 Orthocladiinae																					
	0	5	18	13	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
		0.017	0.254	0.46	0.28	0.25															1.266
410 Chironomidae (adult)																					
	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
			0.056	0.39																	0.472
411 Chironomidae (pupae)																					
	0	0	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
			0.128	0.19	0.36																0.677
813 Cyclopoid copepod																					
	54	184	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	255
	0.006	0.966	0.556																		1.528
850 Oligochaeta																					
	0	2	6	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10
		0.082	0.350	0.08			0.24														0.758
998 Aquatic insect egg																					
	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
	0.100																				0.100

Total weights & numbers in each of 20 columns:

71	201	60	34	14	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	
0.105	1.863	2.193	3.75	3.72	1.04	1.57	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 386

Total weight: 16.2937

Total number & weight of Terrestrials: 6 0.4724

Total number & weight of Aquatics: 330 15.8213

Total number & weight of Behavioral Drifters: 336 13.8969

Total number & weight of Accidental Drifters: 50 2.3968

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	34	55	260	5	2	0	6	24	0
	10.495	2.112	2.136	0.138	0.163	0.000	0.472	0.777	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planke	Parasite	---
MODE of attachment tots (1 - 9):	6	86	7	0	18	9	260	0	0
	0.179	12.518	0.677	0.000	0.221	0.561	2.136	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 111515D 1850-1350 [illegible]
Location: [illegible] LEES FERRY [illegible]
Type time: DR #166

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	14
			0.300	0.68																	0.976
440 Orthocladiinae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.036
550 Oligochaeta																					
	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
					0.48																0.476
553 Aphidae, Phylloxeridae (nymph & adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
911 Limnaeidae (Gastropoda)																					
	0	5	3	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	11
		0.017	0.062		0.14			0.27													0.492
800 Collembola																					
	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.019	0.040																		0.049
804 Chydorid cladoceran																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
813 Cyclopoid copepod																					
	152	304	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	459
	0.016	1.497	0.098																		1.710
Total weights & numbers in each of 20 columns:																					
	152	311	15	8	6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
	0.016	1.744	0.805	0.71	0.62	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 493
Total weight: 4.1849

Total number & weight of Terrestrials: 15 1.3010
Total number & weight of Aquatics: 478 2.5838

Total number & weight of Behavioral Drifters: 461 1.8676
Total number & weight of Accidental Drifters: 32 2.3173

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	7	460	15	0	0	15	0	0
	0.000	0.560	1.832	0.492	0.000	0.000	1.301	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	11	5	0	0	0	17	460	0	0
	0.492	0.511	0.000	0.000	0.000	1.350	1.832	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Site: COLORADO RIVER
Date: 111515D 1850-1350 [illegible]
Location: [illegible] LEES FERRY [illegible]
Type time: DRIFT #14

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
550 Oligochaeta																					
	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4
			0.175						0.49												0.669
890 Gammarus																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.20																	0.199
903 Daphnia																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
910 Physa																					
	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
							0.20														0.156
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
		0.872	0.649																		1.522
800 Collembola																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040
813 Cyclopoid copepod																					
	3	11	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
	0.000	0.058	0.131																		0.189
863 Hydra																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.123																			0.123
440 Orthocladiinae																					
	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.003	0.042																		0.046
410 Chironomidae (adult)																					
	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.128	0.10																	0.225
911 Limnaeidae (Gastropoda)																					
	0	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.010	0.028	0.07																	0.110
500 Aquatic Diptera Adults																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
501 Aquatic Diptera Pupae																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.006																		0.006
Total weights & numbers in each of 20 columns:																					
	3	29	21	4	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	
	0.000	1.310	1.524	0.37	0.00	0.00	0.20	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 59
Total weight: 3.8914

Total number & weight of Terrestrials: 16 2.0713
Total number & weight of Aquatics: 43 1.8201

Total number & weight of Behavioral Drifters: 24 0.5555
Total number & weight of Accidental Drifters: 35 3.3359

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	9	19	8	4	0	16	2	0
	0.199	0.755	0.311	0.305	0.244	0.000	2.071	0.006	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	11	11	0	0	1	17	19	0	0
	0.428	0.920	0.000	0.000	0.122	2.111	0.311	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 111590 0005-0015 hr
Location: at LEES FERRY 3RKM.5
Type line: DRIFT #12

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
235 Daphnia																					
	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.008																			0.008
315 Cyclopoid copepod																					
	8	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
	0.001	0.042	0.065																		0.108
560 Nematoda																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
911 Limnaeidae (Gastropoda)																					
	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.003			0.07			0.29													0.364
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.679																			0.679
440 Orthocladiinae																					
	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.042	0.04																	0.078
410 Chironomidae (adult)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.027

Total weights & numbers in each of 20 columns:

8	22	5	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
0.001	1.454	0.108	0.13	0.07	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 39
Total weight: 2.0559

Total number & weight of Terrestrials: 8 0.2752
Total number & weight of Aquatics: 31 1.2807

Total number & weight of Behavioral Drifters: 27 0.7967
Total number & weight of Accidental Drifters: 12 1.2613

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	5	23	3	0	0	8	0	0
	0.000	0.200	0.717	0.364	0.000	0.000	0.775	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf Sk	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	3	5	0	0	0	8	23	0	0
	0.364	0.200	0.000	0.000	0.000	0.775	0.717	0.000	0.000

Site: COLORADO RIVER
Date: 111590 0005-0015 hr
Location: at LEES FERRY 3RKM.5
Type line: DRIFT #10

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
911 Limnaeidae (Gastropoda)																					
	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
		0.003							0.41												0.412
500 Collembola																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.009																			0.009
813 Cyclopoid copepod																					
	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	0.000	0.011																			0.011
560 Nematoda																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				1.26																	1.263
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.194																			0.194
863 Hydra																					
	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	0.029	0.082	0.117																		0.227
440 Orthocladiinae																					
	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	0.000					0.12															0.124

Total weights & numbers in each of 20 columns:

3	8	2	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0.029	0.298	0.117	1.26	0.00	0.12	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 16
Total weight: 2.2359

Total number & weight of Terrestrials: 2 0.1939
Total number & weight of Aquatics: 14 2.0420

Total number & weight of Behavioral Drifters: 5 0.1343
Total number & weight of Accidental Drifters: 11 2.1046

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	4	3	2	5	0	2	0	0
	0.000	1.395	0.011	0.412	0.227	0.000	0.194	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sk	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	3	0	0	0	3	3	0	0
	0.640	1.386	0.000	0.000	0.000	0.203	0.011	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/6/90 0825-0525 hrs
Location: @ LEES FERRY RKM 3
Type line: DRIFT #159

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
598 Cnephia																					
	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.053	0.17																	0.215
953 Aphidae, Phylloseridae (nymph & adult)																					
	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.485																			0.485
890 Gammarus																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.20																	0.199
440 Orthocladiinae																					
	0	24	30	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	61
		0.083	0.423	0.11	0.14	0.12	0.20														1.075
411 Chironomidae (pupae)																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.29															0.289
570 Tipulidae																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.000																			0.000
800 Collembola																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040
903 Daphnia																					
	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.365	1.496																		1.861
863 Hydra																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.082																			0.082
911 Limnaeidae (Gastropoda)																					
	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.017																			0.017
813 Cyclopoid copepod																					
	68	217	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	279
	0.006	1.140	0.065																		1.211
850 Oligochaeta																					
	1	23	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
	0.029	0.940	0.817	0.08																	1.869

Total weights & numbers in each of 20 columns:

61	280	52	7	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.035	3.112	2.895	0.55	0.14	0.41	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 405

Total weight: 7.3469

Total number & weight of Terrestrials: 5 0.4847

Total number & weight of Aquatics: 400 6.8622

Total number & weight of Behavioral Drifters: 351 4.5642

Total number & weight of Accidental Drifters: 54 2.7827

FUNCTIONAL group totals (1 - 9):	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	2	101	289	5	2	0	5	1	0
	0.200	2.954	3.290	0.017	3.082	0.000	0.485	0.289	0.000

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
	11	102	1	0	0	6	285	0	0
	0.317	3.144	0.289	0.000	0.000	0.525	3.072	0.000	0.000

Site: COLORADO RIVER
Date: 11/6/90 0825-0525 hrs
Location: @ LEES FERRY RKM 3
Type line: DRIFT #165

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
598 Cnephia																					
	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
		0.014											6.03								6.046
850 Oligochaeta																					
	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
				0.08							1.01										1.090
440 Orthocladiinae																					
	0	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.056		0.07																0.125
953 Aphidae, Phylloseridae (nymph & adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
863 Hydra																					
	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.117	0.17																	0.233
890 Gammarus																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.79															0.794
903 Daphnia																					
	8	37	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
	0.047	4.503	1.496	1.26																	7.308
813 Cyclopoid copepod																					
	32	116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	148
	0.003	0.609																			0.613

Total weights & numbers in each of 20 columns:

40	157	9	4	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
0.050	5.223	1.669	1.51	0.07	0.79	0.00	0.00	0.00	0.00	1.01	0.00	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 216

Total weight: 16.3594

Total number & weight of Terrestrials: 1 0.0969

Total number & weight of Aquatics: 213 16.2625

Total number & weight of Behavioral Drifters: 207 14.8887

Total number & weight of Accidental Drifters: 7 1.4707

FUNCTIONAL group totals (1 - 9):	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	1	7	201	0	4	0	1	0	0
	0.794	1.218	13.967	0.000	0.283	0.000	0.097	0.000	0.000

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
	8	5	0	0	0	1	197	0	0
	6.330	2.012	0.000	0.000	0.000	0.097	7.920	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: LEES FERRY RKM 5
Type line: DRIFT #173

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
820 Gammarus																					
	0	0	4	11	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
			0.284	2.19	0.43	0.79															3.699
813 Cyclopoid copepod																					
	34	234	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	281
	0.003	1.229	0.425																		1.658
440 Orthocladiinae																					
	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
				0.07		0.25															0.318
411 Chironomidae (pupae)																					
	0	0	1	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
			0.043			0.58															0.621
410 Chironomidae (adult)																					
	0	0	0	0	2	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
					0.36	0.29															0.644
903 Dachnia																					
	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.608	0.997																		1.606
Total weights & numbers in each of 20 columns:																					
	34	239	20	13	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.003	1.837	1.750	2.26	0.79	1.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 315
Total weight: 8.5457

Total number & weight of Terrestrials: 3 0.6444
Total number & weight of Aquatics: 312 7.9013

Total number & weight of Behavioral Drifters: 309 7.2806
Total number & weight of Accidental Drifters: 6 1.2652

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	17	4	288	0	0	0	3	3	0
	3.699	0.318	3.263	0.000	0.000	0.000	0.644	0.621	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	21	3	0	0	3	288	0	0
	0.000	4.017	9.621	0.000	0.000	0.644	3.263	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: LEES FERRY RKM 5
Type line: DRIFT #176

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	0	0	0	1	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	2
					0.18	0.29															0.467
440 Orthocladiinae																					
	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.014	0.04		0.12															0.173
813 Cyclopoid copepod																					
	4	31	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
	0.000	0.163	0.229																		0.392
904 Chydorid cladoceran																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
501 Aquatic Diptera Pupae																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.003																		0.003
910 Physa																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.20															0.196
890 Gammarus																					
	0	0	4	4	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	10
			0.284	0.80		0.79					5.75										7.625
Total weights & numbers in each of 20 columns:																					
	4	32	13	5	1	3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	
	0.000	0.284	0.530	0.83	0.18	1.21	0.20	0.00	0.00	0.00	5.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 60
Total weight: 8.9769

Total number & weight of Terrestrials: 2 0.4667
Total number & weight of Aquatics: 58 8.5102

Total number & weight of Behavioral Drifters: 56 8.3119
Total number & weight of Accidental Drifters: 4 0.6650

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	10	3	43	1	0	0	2	1	0
	7.625	0.173	0.514	0.196	0.000	0.000	0.467	0.003	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	1	14	0	0	0	2	43	0	0
	0.196	7.801	0.000	0.000	0.000	0.467	0.514	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/6/90 1850-1950 hrs
Location: LEES FERRY Reach 5
Type line: DR #167

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
813 Cyclopoid copepod																					
	44	576	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	642
	0.005	3.025	0.719																		3.749
903 Daphnia																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
440 Orthocladiinae																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.014																		0.014
550 Oligochaeta																					
	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.117		0.12																0.236
411 Chironomidae (pupae)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.065																		0.065
410 Chironomidae (adult)																					
	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.128																		0.128
890 Gammarus																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.071																		0.071
998 Aquatic insect egg																					
	166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	166
	0.973																				0.973

Total weights & numbers in each of 20 columns:

210	577	30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.977	3.167	1.093	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 818
Total weight: 5.3356

Total number & weight of Terrestrials: 3 0.1284
Total number & weight of Aquatics: 815 5.2072

Total number & weight of Behavioral Drifters: 645 3.9559
Total number & weight of Accidental Drifters: 173 1.3797

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	4	643	0	0	0	3	167	0
	0.071	0.250	3.871	0.000	0.000	0.000	0.128	1.016	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	5	1	0	166	3	643	0	0
	0.000	0.321	0.043	0.000	0.973	0.128	3.871	0.000	0.000

Site: COLORADO RIVER
Date: 11/6/90 1850-1950 hrs
Location: LEES FERRY Reach 3
Type line: DRIFT #168

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
998 Aquatic insect egg																					
	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
	0.076																				0.076
813 Cyclopoid copepod																					
	16	53	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
	0.002	0.278	0.163																		0.443
440 Orthocladiinae																					
	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.016		0.07																0.085
850 Oligochaeta																					
	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.17																	0.167

Total weights & numbers in each of 20 columns:

29	53	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.078	0.278	0.178	0.17	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 91
Total weight: 0.7715

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 91 0.7715

Total number & weight of Behavioral Drifters: 76 0.5287
Total number & weight of Accidental Drifters: 15 0.2428

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	4	74	0	0	0	0	13	0
	0.000	0.252	0.443	0.000	0.000	0.000	0.000	0.076	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	4	0	0	13	0	74	0	0
	0.000	0.252	0.000	0.000	0.076	0.000	0.443	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/7/90 0013-0113 w.s
Location: LEES FERRY RKM 3
Type line: DRIFT #157

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
850 Oligochaeta																					
	0	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
		0.041	0.117										2.05								2.210
813 Cyclopoid copepod																					
	1	21	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
	0.000	0.110	0.065																		0.176
440 Orthocladiinae																					
	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.014	0.07																	0.085
410 Chironomidae (adult)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097

Total weights & numbers in each of 20 columns:

1	22	5	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0.000	0.151	0.196	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 32

Total weight: 2.5678

Total number & weight of Terrestrials: 1 0.0967

Total number & weight of Aquatics: 31 2.4711

Total number & weight of Behavioral Drifters: 27 0.2611

Total number & weight of Accidental Drifters: 5 2.3067

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	7	24	0	0	0	1	0	0
	0.000	2.295	0.176	0.000	0.000	0.000	0.097	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	7	0	0	0	1	24	0	0
	0.000	2.295	0.000	0.000	0.000	0.097	0.176	0.000	0.000

Colorado River e
Lees Ferry 11/7/90 0013-0113 Sample #171
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Paria River 11/5/90 0600-1200 hrs _____
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Paria River 11/5/90 0600-1200 hrs Sample # 152
THE DATA FROM THIS SAMPLE IS CURRENTLY BEING UPDATED AND WILL BE INCORPORATED AS SOON AS POSSIBLE.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: PARIA RIVER
Date: 11/5/90 12:10-1:30 hrs
Location: Paria River Rkm-3
Type line: DRIFT #153

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	33	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
		3.199	5.194																		8.393
500 Aquatic Diptera Adults																					
	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.194	0.974																		1.168
14 Beetle sp.																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.11																	0.109
995 Terrestrial mite																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.365																			0.365
959 Hymenoptera (terrestrial & adults & pupae)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.111																			0.111
963 Homoptera (terrestrials & nymphs and adults)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.433																		0.433
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
440 Orthocladiinae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.036
410 Chironomidae (adult)																					
	0	1	9	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
		0.012	0.385	0.39																	0.784
Total weights & numbers in each of 20 columns:																					
	0	42	29	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	3.890	6.986	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 77
Total weight: 11.6076

Total number & weight of Terrestrials: 72 10.8977
Total number & weight of Aquatics: 5 0.5098

Total number & weight of Behavioral Drifters: 2 0.1447
Total number & weight of Accidental Drifters: 75 11.2627

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	0	0	3	0	72	0	0
	0.000	0.145	0.000	0.000	0.365	0.000	10.898	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	1	1	0	3	72	0	0	0
	0.000	0.036	0.109	0.000	0.365	10.898	0.000	0.000	0.000

Site: PARIA RIVER
Date: 11/5/90 12:40-1:10 hrs
Location: Paria River Rkm-3
Type line: DRIFT #154

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
14 Beetle sp.																					
	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
					0.54																0.536
440 Orthocladiinae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.036
410 Chironomidae (adult)																					
	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
			0.385	0.10																	0.482
958 Thysanoptera (thrips)																					
	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.029	0.045																		0.074
995 Terrestrial mite																					
	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.608																			0.608
598 Cnephia																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.027																		0.027
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	19	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
		1.842	3.246																		5.088
Total weights & numbers in each of 20 columns:																					
	0	27	21	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	2.479	3.703	0.13	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 52
Total weight: 6.8510

Total number & weight of Terrestrials: 43 5.6440
Total number & weight of Aquatics: 9 1.2070

Total number & weight of Behavioral Drifters: 4 0.3985
Total number & weight of Accidental Drifters: 48 6.2526

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	3	1	0	5	0	43	0	0
	0.000	0.572	0.027	0.000	0.608	0.000	5.644	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	1	1	2	0	5	43	0	0	0
	0.027	0.036	0.536	0.000	0.608	5.644	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: PARIA RIVER
Date: 111590 18:55-1555 hrs
Location: Paria River RKM.2
Type line: DRIFT #138

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
14 Baetis sp.																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.11																	0.109
410 Chironomidae (adult)																					
	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.29																	0.290
500 Aquatic Diptera Adults																					
	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.097	0.325																		0.422
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.388	0.649	0.72																	1.757
Total weights & numbers in each of 20 columns:																					
	0	5	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.485	0.974	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 13

Total weight: 2.5773

Total number & weight of Terrestrials: 12 2.4682

Total number & weight of Aquatics: 1 0.1091

Total number & weight of Behavioral Drifters: 1 0.1091

Total number & weight of Accidental Drifters: 12 2.4682

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	0	0	0	0	12	0	0
	0.000	0.109	0.000	0.000	0.000	0.000	2.468	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skn	Plankt	Parasite	---
MODE of attachment tota (1 - 9):	0	0	1	0	0	12	0	0	0
	0.000	0.000	0.109	0.000	0.000	2.468	0.000	0.000	0.000

Paria River 111590 1855-1955 hrs Sample # 139
THE DATA FROM THIS SAMPLE IS CURRENTLY BEING UPDATED AND WILL BE INCORPORATED AS SOON AS POSSIBLE.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: [illegible] RIVER
Date: [illegible]
Location: [illegible]
Type line: DRIFT #155

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.775																			0.775
500 Aquatic Diptera Adults																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
995 Terrestrial mite																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
410 Chironomidae (adult)																					
	0	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
			0.128	0.39																	0.515
10 Beetlidae																					
	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.065		0.27																0.334
950 Formicidae (ants)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.050																			0.050
Total weights & numbers in each of 20 columns:																					
	0	10	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.948	0.518	0.39	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 21 — Total weight: 2.1210

Total number & weight of Terrestrials: 17 1.6657 — Total number & weight of Aquatics: 4 0.4553

Total number & weight of Behavioral Drifters: 3 0.3336 — Total number & weight of Accidental Drifters: 18 1.7874

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	3	0	0	1	0	17	0	0
	0.000	0.334	0.000	0.000	0.122	0.000	1.666	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	3	0	1	17	0	0	0
	0.000	0.000	0.334	0.000	0.122	1.666	0.000	0.000	0.000

Site: PARIA RIVER
Date: [illegible]
Location: [illegible]
Type line: DRIFT #147

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.086																		0.086
964 Aquatic Hymenoptera																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
500 Aquatic Diptera Adults																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.649																		0.649
231 Hydropsyche																					
	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
									1.39			3.72									5.113
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.194	1.298																		1.492
14 Beetle sp.																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.27																0.268
Total weights & numbers in each of 20 columns:																					
	0	3	8	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	
	0.000	0.249	2.033	0.00	0.27	0.00	0.00	0.00	1.39	0.00	0.00	3.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 14 — Total weight: 7.6633

Total number & weight of Terrestrials: 10 2.2272 — Total number & weight of Aquatics: 4 5.4361

Total number & weight of Behavioral Drifters: 1 0.2682 — Total number & weight of Accidental Drifters: 13 7.3951

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	2	0	0	0	10	0	1
	0.000	0.268	5.113	0.000	0.000	0.000	2.227	0.000	0.055

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	2	0	1	1	0	10	0	0	0
	5.113	0.000	0.268	0.055	0.000	2.227	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: PARIA RIVER
Date: 11/6/90 0805-0905 hrs
Location: Paria River Rank
Type line: DRIFT #158

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
		1.551																			1.551
610 Chironomidae (adult)																					
	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.171																		0.171
958 Thysanoptera (thrips)																					
	0	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.010	0.045																		0.055
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
964 Aquatic Hymenoptera																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
963 Homoptera (terrestrials & nymphs and adults)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				1.07																	1.072
Total weights & numbers in each of 20 columns:																					
	0	19	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	1.738	0.217	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 25
Total weight: 3.0260

Total number & weight of Terrestrials: 23 2.8490
Total number & weight of Aquatics: 2 0.1770

Total number & weight of Behavioral Drifters: 0 0.0000
Total number & weight of Accidental Drifters: 25 3.0260

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	1	0	23	0	1
	0.000	0.000	0.000	0.000	0.122	0.000	2.849	0.000	0.055

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	1	1	23	0	0	0
	0.000	0.000	0.000	0.055	0.122	2.849	0.000	0.000	0.000

Site: PARIA RIVER
Date: 11/6/91 0805-0905 hrs
Location: Paria River Rank
Type line: DRIFT #166

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	45	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
		4.362	5.194																		9.556
16 Beetle sp.																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.27																0.268
995 Terrestrial mite																					
	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.608																			0.608
950 Formicidae (ants)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.188																		0.188
440 Orthocladiinae																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.07																0.071
610 Chironomidae (adult)																					
	0	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.012	0.257	0.10																	0.366
Total weights & numbers in each of 20 columns:																					
	0	51	23	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	4.983	5.638	0.10	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 77
Total weight: 11.0573

Total number & weight of Terrestrials: 70 10.1096
Total number & weight of Aquatics: 7 0.9477

Total number & weight of Behavioral Drifters: 2 0.3393
Total number & weight of Accidental Drifters: 75 10.7180

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	0	0	5	0	70	0	0
	0.000	0.339	0.000	0.000	0.608	0.000	10.110	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	1	1	0	5	70	0	0	0
	0.000	0.071	0.268	0.000	0.608	10.110	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Paria River 11/6/90 1215-1315 hrs Sample # 144
THE DATA FROM THIS SAMPLE IS CURRENTLY BEING UPDATED AND WILL BE INCORPORATED AS SOON AS POSSIBLE.

Paria River 11/6/90 1215-1315 hrs Sample # 149
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Paria River 11/6/90 1845-1945 hrs Sample # 180
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Paria River 11/6/90 1845-1945 hrs Sample # 181
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

PARIA River 111690 2345-0045 hrs Sample #178
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PARIA River 111690 2345-0045 Sample # 182
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/5 /90 0835-0935 SAMPLE # 23B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/5 /90 0835-0935 hrs SAMPLE # 13B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/5/90 1352-1452 SAMPLE #1B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/5/90 1352-1452 W.B. SAMPLE #1B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/5/90 1915- SAMPLE # 4B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Colorado River upstream from the Little Colorado River 11/5/90 1915- h.s.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/6/90 0105-0205 hr. SAMPLE # 12B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/6/90 0105-0205 SAMPLE # 7B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/ 6/90 0705 - 0805 hrs SAMPLE # 28B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/6/90 0705 - 0805 hrs. SAMPLE # 15B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/6/90 1252-1352 hrs. SAMPLE # 18B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/6/90 1252-1352 SAMPLE # 22B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/6/90 1900-2000 SAMPLE #27B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/6/90 1500-2000 h-s SAMPLE #26B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/7/90 COSB-0158 hrs SAMPLE # 21B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER
11/7/90 COSB-0158 hrs. SAMPLE # 16B
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: LITTLE COLORADO RIVER
Date: 111590 0925 hrs
Location: Little Colorado River RKM 58.5
Type line: DRIFT RIGHT NET #71

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.097	0.974																		1.071

Total weights & numbers in each of 20 columns:

0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.097	0.974	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 4
Total weight: 1.0708

Total number & weight of Terrestrials: 4 1.0708
Total number & weight of Aquatics: 0 0.0000

Total number & weight of Behavioral Drifters: 0 0.0000
Total number & weight of Accidental Drifters: 4 1.0708

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	0	0	4	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	1.071	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	4	0	0	0
	0.000	0.000	0.000	0.000	0.000	1.071	0.000	0.000	0.000

Site: Little Colorado River
Date: 111590 0925 hrs
Location: Little Colorado River RKM 58.5
Type line: DRIFT LEFT NET #72

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.388																			0.388

Total weights & numbers in each of 20 columns:

0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.388	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 4
Total weight: 0.3877

Total number & weight of Terrestrials: 4 0.3877
Total number & weight of Aquatics: 0 0.0000

Total number & weight of Behavioral Drifters: 0 0.0000
Total number & weight of Accidental Drifters: 4 0.3877

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	0	0	4	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	0.388	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	4	0	0	0
	0.000	0.000	0.000	0.000	0.000	0.388	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

LITTLE COLORADO RIVER 11/5/90 1240-1340 HRS SAMPLE # 9B

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE, BUT WILL BE INCORPORATED AS SOON AS IT BECOMES AVAILABLE.

LITTLE COLORADO RIVER 11/5/90 1240-1340 HRS SAMPLE # 5B

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE, BUT WILL BE INCORPORATED AS SOON AS IT BECOMES AVAILABLE.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

LITTLE COLORADO RIVER 11/5/90 1815-1915 HRS SAMPLE #10B

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE,
BUT WILL BE INCORPORATED AS SOON AS IT BECOMES AVAILABLE.

Little Colorado River 11/5/90 1815-1915 Sample #

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

LITTLE COLORADO RIVER 11/6/90 0020-0120 HRS SAMPLE # 8B

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE, BUT WILL BE INCORPORATED AS SOON AS IT BECOMES AVAILABLE.

LITTLE COLORADO RIVER 11/6/90 1140-1240 HRS SAMPLE # 3B

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE, BUT WILL BE INCORPORATED AS SOON AS IT BECOMES AVAILABLE.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

LITTLE COLORADO RIVER 11/6/90 1800-2400 HRS SAMPLE # N/A

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE, BUT WILL BE INCORPORATED AS SOON AS IT BECOMES AVAILABLE.

Flash Floods occurred during this interval; No samples were aquired.

LITTLE COLORADO RIVER 11/7/90 0000-0600 HRS SAMPLE # N/A

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE, BUT WILL BE INCORPORATED AS SOON AS IT BECOMES AVAILABLE.

Flash Floods occured during this interval; No samples were aquired.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/8/90 (0630-0730 hrs)
Location: at PHANTOM RANCH (RM 87)
Type line: DRIFT NETS #69

Composite of two nets

Total lengths in each length category (second line also ... ns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.014															0.014
813 Cyclopoid copepod	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.011																0.011
598 Cnephia	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.009	0.027	0.08														0.119
863 Hydra	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																0.041
Total weights & numbers in each of 20 columns:	0	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.061	0.041	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 8
Total weight: 0.1841

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 8 0.1841

Total number & weight of Behavioral Drifters: 7 0.1432
Total number of Accidental Drifters: 1 0.0409

	Shredder	Col-gath	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	1	0	0	0	0
	0.000	0.014	0.041	0.000	0.000	0.000	0.000

	Cling	Burrow	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	5	1	0	0	2	0	0
	0.160	0.014	0.000	0.000	0.033	0.000	0.000

Site: COLORADO RIVER
Date: 11/5/90 (1210-1310 hrs)
Location: at PHANTOM RANCH (RM 87)
Type line: DRIFT NET #123

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae	0	0	7	13	7	8	6	0	0	0	0	0	0	0	0	0	0	0	0	0	41
			0.099	0.46	0.50	0.99	1.17														3.223
410 Chironomidae (adult)	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.043	0.19																	0.236
401 Tanypodinae	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.014																		[illegible]
550 Empididae	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.036
598 Cnephia	0	74	184	56	20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	337
		0.351	4.887	4.62	3.85	1.14															14.852
500 Aquatic Diptera Adults	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
863 Hydra	1	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
	0.029	0.286	0.175																		[illegible]
953 Aphidae, Phylloxeridae (nymph & adult)	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.194	0.325																		0.518
905 Daphnia	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			0.243
810 Hydracarina	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			[illegible]
269 Allotrichia?	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.104																		0.104
813 Cyclopoid copepod	29	136	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167
	0.003	0.714	0.065																		0.783
Total weights & numbers in each of 20 columns:	30	224	200	72	27	11	6	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.032	2.129	5.712	5.32	4.35	2.12	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 570
Total weight: 20.8367

Total number & weight of Terrestrials: 7 0.8516
Total number & weight of Aquatics: 563 19.9851

Total number & weight of Behavioral Drifters: 547 19.0986
Total number & weight of Accidental Drifters: 23 1.7382

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	41	506	0	15	1	7	0	0
	0.000	3.220	15.878	0.000	0.783	0.104	0.852	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	348	41	0	1	4	7	169	0	0
	15.342	3.220	0.000	0.104	0.293	0.852	1.026	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River at Phantom Ranch 11/5/90 1800-2400 hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 11/6/90 0000-0100 hrs
Location: at PHANTOM RANCH
Type Line: DRIFT #120

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4
					0.07	0.12	0.39														0.586
411 Chironomidae (pupae)																					
	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.10	0.36																0.452
410 Chironomidae (adult)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
890 Gammarus																					
	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
						0.79			3.01												3.805
810 Hydracarina																					
	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	0.006	0.243																			0.249
598 Enephia																					
	0	3	11	5	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	24
		0.014	0.292	0.41	0.58	0.38	0.67														2.342
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
863 Hydra																					
	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.164																			0.164
813 Cyclopoid copepod																					
	5	80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86
	0.001	0.420	0.033																		0.453
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
Total weights & numbers in each of 20 columns:																					
	6	90	13	7	6	3	3	0	1	0	0	0	0	0	0	0	0	0	0	0	
	0.006	0.851	0.649	0.61	1.00	1.30	1.06	0.00	3.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 129

Total weight: 8.4818

Total number & weight of Terrestrials: 3 0.4309

Total number & weight of Aquatics: 126 8.0509

Total number & weight of Behavioral Drifters: 116 7.1860

Total number & weight of Accidental Drifters: 13 1.2959

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	2	4	110	0	7	0	3	3	0
	3.805	0.586	2.795	0.000	0.413	0.000	0.431	0.452	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planet	Parasite	---
MODE of attachment tots (1 - 9):	28	6	3	0	3	3	86	0	0
	2.505	4.321	0.452	0.000	0.249	0.431	0.453	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River at Phantom Ranch 11/6/90 0600-1200 hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Colorado River at Phantom Ranch 11/6/90 1200-1800 hrs
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River at Phantom Ranch 11/6/90 1800-2400 hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Colorado River at Phantom Ranch 11/7/90 0000-0600 hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: Bright Angel
Date: 11/5/90 0842-0942 hrs
Location: BRIGHT ANGEL RKM 19.5
Type line: DRIFT CENTER 2 NETS #156

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
14 Baetis sp.	0	11	7	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
		0.058	0.229	0.11	0.27	0.55															1.214
440 Orthocladiinae	0	0	4	7	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	16
			0.056	0.25	0.28			0.29													0.880
98 Ephemeroptera subimagos	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
					0.27	0.55															0.818
401 Tanypodinae	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.042																		0.042
953 Aphidae, Phylloxeridae (nymph & adult)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.194																			0.194
410 Chironomidae (adult)	0	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.012	0.214	0.10																	0.323
800 Collembola	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.017																			0.017
265 Ochrotrichia	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.104		1.18																1.281
205 Trichoptera adults	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.505																		0.505
900 Ostracoda	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		0.730	1.496																		2.226
198 Plecoptera nymph (filipalian, slender)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040
243 Glossosomatidae Culoptila	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.069	0.414																		0.483
869 Microcylloepus (larvae)	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.040	0.13																	0.174
592 Simulium	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.005		0.08	0.19																0.280
392 Petrophila (=Paraguyractus)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.34															0.335
850 Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
																5.97					5.912
998 Aquatic insect egg	*9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*19
	0.111																				0.111

Total weights & numbers in each of 20 columns:

19	26	31	11	9	3	0	1	0	0	0	0	0	0	0	1	0	0	0	0
0.111	1.085	3.140	0.67	2.19	1.44	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 101

Total weight: 14.8953

Total number & weight of Terrestrials: 13 1.8398

Total number & weight of Aquatics: 88 13.0555

Total number & weight of Behavioral Drifters: 40 2.3739

Total number & weight of Accidental Drifters: 61 12.5215

FUNCTIONAL group totals (1 - 9):	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	1	49	3	18	3	3	15	19	0
	0.040	10.309	0.280	0.991	0.042	1.281	1.840	0.111	0.000

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
	13	17	21	3	32	15	0	0	0
	1.271	6.851	1.216	1.281	2.420	1.857	0.000	0.000	0.000

Site: Bright Angel
Date: 11/5/90 1434-1534 hrs
Location: BRIGHT ANGEL RKM 19.5
Type line: DRIFT NETS 2 COMPOSITED MIDSTREAM #163

Composite of two nets

MODE of attachment tots (1 - 9):

Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
26	24	11	2	38	75	0	0	0
5.037	1.352	1.154	0.384	1.610	16.134	0.000	0.000	0.000

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)	0	7	23	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40
		0.087	0.984	0.68	0.53																2.281
961 Diptera (terrestrials & adults)	0	3	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.291	1.298			2.10															3.686
14 Baetis sp.	0	2	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		0.011	0.065	0.22	0.80																1.099
98 Ephemeroptera subimagos	0	0	0	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
				0.11	0.80	1.10															2.014
953 Aphidae, Phylloxeridae (nymph & adult)	0	4	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
		0.388	2.922																		3.309
440 Orthocladiinae	0	0	1	15	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	24
			0.014	0.46	0.43	0.25	0.39														1.542
411 Chironomidae (pupae)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.012	0.043																		0.055
269 Allotrichia?	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.023	0.104	0.28	0.59																0.995
261 Leucotrichia	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
				0.28	1.77																2.047
869 Microcylloepus (larvae)	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.159																		0.159
205 Trichoptera adults	0	0	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.757	0.67	1.39																2.817
900 Ostracoda	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.487	0.499																		0.985
592 Simulium	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.027	0.17	0.19																0.384
800 Collembola	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.017																			0.017
810 Hydracarina	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			0.243
392 Petrophila (=Paraguyractus)	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
				0.08	0.35	0.67															[illegible]
243 Glossosomatidae Culoptila	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.046	0.311																		0.356
265 Ochrotrichia	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.104	0.28																	0.384
958 Thysanoptera (thrips)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
998 Aquatic insect egg	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
	0.182																				0.182

Total weights & numbers in each of 20 columns:

31	29	54	30	23	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0
0.182	1.614	7.285	3.22	6.86	4.11	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 176

Total weight: 23.6607

Total number & weight of Terrestrials: 73 16.1170

Total number & weight of Aquatics: 103 9.5437

Total number & weight of Behavioral Drifters: 37 3.0245

Total number & weight of Accidental Drifters: 139 20.6362

FUNCTIONAL group totals (1 - 9):	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	0	40	4	18	6	2	73	33	0
	0.000	3.663	0.384	3.657	1.239	0.384	14.117	0.237	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued Bright Angel 11/6/90 01:30-02:30hrs RKM 191.5 Drift #140

Composite of two nets

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Tot
16 Baetis sp.	0	3	10	5	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
		0.016	0.327	0.55	1.36	1.65															3.879
410 Chironomidae (adult)	0	0	12	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
			0.514	0.58																	1.094
953 Aphidae, Phylloxeridae (nymph & adult)	0	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
		0.388	2.272																		2.660
595 Simuliidae (adults)	0	2	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.194	0.97[illegible]	0.72	1.30																3.192
500 Aquatic Diptera Adults	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.72																	0.720
411 Chironomidae (pupae)	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.043	0.19																	0.236
951 Diptera (terrestrials & adults)	0	0	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
			1.948	1.44	1.30																4.691
205 Trichoptera adults	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.252	0.67																	0.922
900 Ostracoda	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.243	1.496																		1.739
231 Hydrenyrke	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.08																	0.077
900 Collembola	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.017																			0.017
460 Orthocladiinae	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.014	0.04																	0.050
392 Petrophila (=Paragyractus)	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.08	0.17																0.251
243 Glossosomatidae Culoptila	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.023																			0.023
646 Stenelmis	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040
Total weights & numbers in each of 20 columns:	0	16	45	21	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.881	2.879	5.06	4.12	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 91

Total weight: 19.5900

Total number & weight of Terrestrials: 48 13.2785

Total number & weight of Aquatics: 43 6.3115

Total number & weight of Behavioral Drifters: 28 3.9268

Total number & weight of Accidental Drifters: 63 15.6612

	Shredder	Col gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	35	1	6	0	0	48	3	0
	0.000	5.685	0.077	0.313	0.000	0.000	13.279	0.236	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	--
MODE of attachment tots (1 - 9):	5	2	29	0	5	50	0	0	0
	0.390	0.050	4.115	0.000	1.739	13.296	0.000	0.000	0.000

Bright Angel
11/6/90 08:30-09:30
BRIGHT ANGEL RKM 191.5
DRIFT 2 NETS COMBINED #106

Composite of two nets

18 in each length category (second line also, if > 20 columns) followed by calculated weights:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Tot
16 Baetis sp.	0	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.016	0.065	0.11	0.27																0.458
953 Aphidae, Phylloxeridae (nymph & adult)	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.388	0.325																		0.712
410 Chironomidae (adult)	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.012	0.171	0.10																	0.280
411 Chironomidae (pupae)	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.086	0.10																	0.186
460 Orthocladiinae	0	0	3	14	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
			0.042	0.50	0.36	0.12															1.020
265 Ochrotrichia	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.28																	0.280
900 Ostracoda	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.608	1.496																		2.104
910 Physa	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.028																		0.028
261 Leucotrichia	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.59																0.589
592 Simulium	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.17				1.08													1.243
669 Microcylloepus (larvae)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.13																	0.134
392 Petrophila (=Paragyractus)	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.08	0.17	0.34															0.586
850 Oligochaeta	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
										1.01	1.44										2.445
Total weights & numbers in each of 20 columns:	0	13	17	22	8	2	0	1	0	0	1	1	0	0	0	0	0	0	0	0	
	0.000	1.024	2.213	1.46	1.39	0.46	0.00	1.08	0.00	0.00	1.01	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 65

Total weight: 10.0624

Total number & weight of Terrestrials: 11 0.2927

Total number & weight of Aquatics: 54 9.0627

Total number & weight of Behavioral Drifters: 33 2.7214

Total number & weight of Accidental Drifters: 32 7.3410

	Shredder	Col gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	40	3	7	0	1	11	3	0
	0.000	6.027	1.243	1.337	0.000	0.280	0.993	0.182	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	10	25	10	1	8	11	0	0	0
	2.580	3.465	0.641	0.280	2.104	0.993	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Composite of two nets

Bright Angel 11/6/90 1345-1445 hrs
Drift 2 nets #143

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	31	60	57	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	153
		0.355	2.568	5.51	0.71		0.43														9.608
411 Chironomidae (pupae)																					
	0	3	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
		0.037	0.171	0.29	0.18																0.676
59 Ephemeroptera imagos																					
	0	0	0	0	3	20	7	0	0	0	0	0	0	0	0	0	0	0	0	0	30
					0.83	11.00	7.00	*													18.828
205 Trichoptera adults																					
	0	0	1	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
			0.252	4.69	5.56																10.503
14 Baetis sp.																					
	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.005	0.035	0.11																	0.147
440 Orthocladiinae																					
	0	0	1	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
			0.014	0.18	0.14																0.334
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.291	0.974																		1.265
269 Alisotrichia?																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.104																		0.104
243 Glossosomatidae Culoptila																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.104	0.28																	0.384
265 Ochrotrichia																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.104																		0.104
350 Oligochaeta																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.12																0.119
592 Simulium																					
	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.053		0.19																0.246
392 Petrophila (=Paragyractus)																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.34															0.335
669 Microcylloepus (larvae)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040

Total weights & numbers in each of 20 columns:

0	38	76	74	16	21	8	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.718	4.416	11.06	7.71	11.34	7.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 253

Total weight: 42.6720

Total number & weight of Terrestrials: 201 40.1842

Total number & weight of Aquatics: 32 2.4878

Total number & weight of Behavioral Drifters: 34 0.7272

Total number & weight of Accidental Drifters: 219 41.9449

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	12	3	4	0	2	201	11	0
	0.000	0.600	0.246	0.758	0.000	0.207	40.184	0.676	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planit	Parasite	---
MODE of attachment tots (1 - 9):	7	9	16	2	0	201	0	0	0
	1.004	0.453	0.823	0.207	0.000	40.184	0.000	0.000	0.000

PRELIMINARY RESULTS SUBJECT TO REVISION

Bright Angel
11/6/90 1600-1700 hrs
BRIGHT ANGEL RKM 141.5
DRIFT 2 NETS #151

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
14 Baetis sp.																					
	1	3	12	1	5	11	6	0	0	0	0	0	0	0	0	0	0	0	0	0	39
	0.000	0.016	0.392	0.11	1.34	6.05	6.00														13.911
440 Orthocladiinae																					
	0	0	2	8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
			0.028	0.28	0.28																0.598
410 Chironomidae (adult)																					
	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.043	0.19																	0.236
411 Chironomidae (pupae)																					
	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.043	0.19																	0.236
592 Simulium																					
	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
					0.19	0.38															0.572
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
800 Collembola																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.009																			0.009
269 Alisotrichia?																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.023																			0.023
243 Glossosomatidae Culoptila																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.207																		0.207
231 Hydropsyche																					
	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
								0.92													0.922
669 Microcylloepus (larvae)																					
	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.119																		0.119
900 Ostracoda																					
	0	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
		0.608	2.992																		3.600
392 Petrophila (=Paragyractus)																					
	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.15																	0.155
913 Plaidium																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
951 Hemiptera nymphs and adults																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.86																	0.857
640 Elmidae (larvae)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040
350 Oligochaeta																					
	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
											1.01										1.007

Total weights & numbers in each of 20 columns:

1	12	28	16	10	12	6	1	0	0	1	0	0	0	0	0	0	0	0	0
0.000	0.874	3.864	1.79	1.82	6.43	6.00	0.92	0.00	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 87

Total weight: 22.7083

Total number & weight of Terrestrials: 5 1.1902

Total number & weight of Aquatics: 82 21.5181

Total number & weight of Behavioral Drifters: 55 15.0797

Total number & weight of Accidental Drifters: 32 7.6286

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	67	4	7	0	1	5	3	0
	0.000	19.164	1.616	0.479	0.000	0.023	1.190	0.236	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planit	Parasite	---
MODE of attachment tots (1 - 9):	11	16	42	1	11	6	0	0	0
	2.011	1.724	14.167	3.021	[illegible]	1.122	[illegible]	[illegible]	[illegible]

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued Bright Angel 11/7/90 0115-0215 RKM 141.5 Drift 2 nets #150

Composite of two nets

Total weights in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
14 Baetis sp.	0	4	10	3	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	28
		0.021	0.327	0.33	1.07	2.20	3.00														6.549
953 Aphidae, Phylloxeridae (nymph & adult)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.097	0.325																		0.422
205 Trichoptera adults	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
				0.67																	0.670
592 Simulium	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
								1.08													1.078
269 Allotrichia?	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.023																			0.023
900 Ostracoda	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
		0.852	1.705																		2.556
440 Orthocladiinae	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.04	0.14																0.178
261 Leucotrichia	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.28																	0.280
401 Anypodinae	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.016
411 Chironomidae (pupae)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
392 Petrophila (=Paragyractus)	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.15	0.17																0.327
469 Microcylloepus (larvae)	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.040	0.13	0.33																0.506
800 Collembola	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.009																			0.009
570 Tubulidae	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.000																			0.000
Total weights & numbers in each of 20 columns:	0	15	17	10	8	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	1.002	2.729	1.64	1.72	2.20	3.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 58

Total weight: 13.3662

Total number & weight of Terrestrials: 3 1.0917

Total number & weight of Aquatics: 55 12.2745

Total number & weight of Behavioral Drifters: 32 8.2068

Total number & weight of Accidental Drifters: 26 5.1614

	Shredder	Col gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	43	1	7	1	1	3	1	0
	0.000	9.982	1.078	1.113	0.036	0.023	1.092	0.043	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	8	4	29	1	12	4	0	0	0
	2.191	0.178	6.992	0.023	2.882	1.100	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River upstream from Kanab Cr. 11/15/90 0702-0812 hrs Sample# 102
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Colorado River upstream from Kanab Cr. 11/15/90 0702-0812 hrs. Sample# 119
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/5/90 1242-1541 ...
Location: Upstream from Kanab C. RKM 230.5
Type line: DRIFT N-NET #121

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Cnephia	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.005	0.053	0.25																	0.306
596 Simuliidae (pupae)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.08																	0.083
610 Chironomidae (adult)	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.025	0.043																		0.068
611 Chironomidae (pupae)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
953 Aphidae, Phylloxeridae (nymph & adult)	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.194	0.649																		0.843
958 Thysanoptera (thrips)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.019																			0.019
964 Aquatic Hymenoptera	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
813 Cyclopoid copepod	2	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32
	0.000	0.159																			0.158

Total weights & numbers in each of 20 columns:

2	38	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.456	0.745	0.33	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 50
Total weight: 1.7089

Total number & weight of Terrestrials: 9 0.9300
Total number & weight of Aquatics: 41 0.7789

Total number & weight of Behavioral Drifters: 38 0.4633
Total number & weight of Accidental Drifters: 12 1.2456

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	38	0	0	0	9	2	1
	0.000	0.000	0.463	0.000	0.000	0.000	0.930	0.260	0.055

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	0	1	1	0	9	32	0	0
	0.588	0.000	0.178	0.055	0.000	0.930	0.158	0.000	0.000

Site: COLORADO RIVER
Date: 11/5/90 1242-1545 ...
Location: Upstream from Kanab C. RKM 230.5
Type line: CR L NET #110

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.194	0.649																		0.843
610 Chironomidae (adult)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
598 Cnephia	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.17																	0.165
916 Diptera (terrestrial pupae)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.058																		0.058

Total weights & numbers in each of 20 columns:

0	2	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.194	0.708	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 8
Total weight: 1.1653

Total number & weight of Terrestrials: 6 0.9982
Total number & weight of Aquatics: 2 0.1651

Total number & weight of Behavioral Drifters: 2 0.1651
Total number & weight of Accidental Drifters: 6 0.9982

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	2	0	0	0	6	0	0
	0.000	0.000	0.165	0.000	0.000	0.000	0.998	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	2	0	0	0	0	6	0	0	0
	0.165	0.000	0.000	0.000	0.000	0.998	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/15/91 1815-1906 hrs
Location: Upstream from Kanab Cr. Rm 230.5
Type line: DRIFT NET #A5

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
528 Cnemia	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.005	0.027	0.17																	0.216
101 Tanypodinae	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.003																			0.003
865 Hydra	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.041	0.058																		0.099
322 Petrocimia (Paraenarctia)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.026																		0.026

Total weights & numbers in each of 20 columns:

0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.042	0.110	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 8
Total weight: 0.3247

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 5 0.3247

Total number & weight of Behavioral Drifters: 4 0.1965
Total number & weight of Accidental Drifters: 4 0.1283

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	4	1	3	0	0	0	0
	0.000	0.000	0.196	0.026	0.103	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	0	0	0	1	0	0	0	0
	0.321	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000

Site: COLORADO RIVER
Date: 11/15/91 1815-1906 hrs
Location: Upstream from Kanab Cr. Rm 230.5
Type line: DRIFT NET #A8

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
528 Cnemia	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.055	0.17																	0.218
990 Gammarus	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
														15.44							15.443
410 Chironomidae (adult)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
953 Aphidae, Phylloxeridae (nymph & adult)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
865 Hydra	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041
958 Thysanoptera (thrips)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010

Total weights & numbers in each of 20 columns:

0	2	4	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
0.000	0.051	0.421	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.44	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 9
Total weight: 16.0787

Total number & weight of Terrestrials: 3 0.3770
Total number & weight of Aquatics: 6 15.7017

Total number & weight of Behavioral Drifters: 5 15.6608
Total number & weight of Accidental Drifters: 4 0.4179

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	0	4	0	1	0	3	0	0
	15.443	0.000	0.218	0.000	0.043	0.000	0.377	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	5	1	0	0	0	3	0	0	0
	0.259	15.443	0.000	0.000	0.000	0.377	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/5/90 2310-0005 hrs
Location: Upstream from Kanab Cr. Rkm 233.5
Type time: DR E #79

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Cheumia	0	0	5	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
			0.133	0.17		0.76															1.056
863 Hydra	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.082																			0.082
953 Aphidae, Phylloxeridae (nymph & adult)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.097	0.325																		0.422

Total weights & numbers in each of 20 columns:

0	3	6	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.179	0.457	0.17	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 15
Total weight: 1.5591

Total number & weight of Terrestrials: 2 0.4215
Total number & weight of Aquatics: 11 1.1376

Total number & weight of Behavioral Drifters: 9 1.0558
Total number & weight of Accidental Drifters: 4 0.5033

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	9	0	2	0	2	0	0
	0.000	0.000	1.056	0.000	0.082	0.000	0.422	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	11	0	0	0	0	2	0	0	0
	1.138	0.000	0.000	0.000	0.000	0.422	0.000	0.000	0.000

Site: COLORADO RIVER
Date: 11/3/90 2310-0005 hrs
Location: Upstream from Kanab Cr. Rkm 233.5
Type time: R-DR #1

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Cheumia	0	0	12	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
			0.319	0.41	0.77																1.502
440 Orthocladiinae	0	0	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.028	0.04		0.12	0.20														0.383
590 Simuliidae (larvae)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
810 Hydracarina	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
813 Cyclopoid copepod	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.016																			0.016
953 Aphidae, Phylloxeridae (nymph & adult)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
863 Hydra	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041
890 Gammarus	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
						1.59								12.41							13.997

Total weights & numbers in each of 20 columns:

0	6	15	6	4	3	1	0	0	0	0	0	0	1	0	0	0	0	0	0
0.000	0.183	0.672	0.45	0.77	1.71	0.20	0.00	0.00	0.00	0.00	0.00	0.00	12.41	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 36
Total weight: 16.3900

Total number & weight of Terrestrials: 1 0.3246
Total number & weight of Aquatics: 35 16.0654

Total number & weight of Behavioral Drifters: 33 15.9028
Total number & weight of Accidental Drifters: 3 0.4872

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	3	5	25	0	2	0	1	0	0
	13.997	0.183	1.523	0.000	0.163	0.000	0.325	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	23	8	0	0	1	1	3	0	0
	1.548	14.380	0.000	0.000	0.122	0.325	0.016	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: Upstream from Kanab Cr., Rm 230.5
Type line: DB-C #76

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
863 Hydra																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.058																		0.058
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
598 Cnephia																					
	0	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.005	0.080	0.17																	0.250

Total weights & numbers in each of 20 columns:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0	3	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.136	0.158	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 9
Total weight: 0.4525

Total number & weight of Terrestrials: 1 0.0096
Total number & weight of Aquatics: 8 0.4296

Total number & weight of Behavioral Drifters: 6 0.2498
Total number & weight of Accidental Drifters: 3 0.1897

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	6	0	2	0	1	0	0
	0.000	0.000	0.250	0.000	0.180	0.000	0.010	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	0	0	0	1	1	0	0	0
	0.308	0.000	0.000	0.000	0.122	0.010	0.000	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: Upstream from Kanab Cr. Rm 230.5
Type line: DB-R #86

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
598 Cnephia																					
	0	2	13	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
		0.009	0.345	0.33	0.19																0.878
810 Hydracarina																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			0.243
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
863 Hydra																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041
813 Cyclopoid copepod																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.033																		0.033
890 Gammarus																					
	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
												7.60									7.596

Total weights & numbers in each of 20 columns:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0	7	14	4	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
0.000	0.400	0.378	0.33	0.19	0.00	0.00	0.00	0.00	0.00	0.00	7.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 27
Total weight: 8.8969

Total number & weight of Terrestrials: 2 0.1066
Total number & weight of Aquatics: 25 8.7904

Total number & weight of Behavioral Drifters: 22 8.5061
Total number & weight of Accidental Drifters: 5 0.3908

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	0	21	0	3	0	2	0	0
	7.596	0.000	0.910	0.000	0.284	0.000	0.107	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	21	1	0	0	2	2	1	0	0
	0.919	7.596	0.000	0.000	0.243	0.107	0.033	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: Upstream from Kanab C. [illegible]
Type line: DRIFT #91

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Cnemia																					
	0	7	53	16	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83
		0.033	1.408	1.16	1.54	0.38															4.517
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
563 Hydra																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.082																			0.082
955 Aphidae, Phylloxeridae (nymph & adult)																					
	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	0.007	0.097																			0.104
813 Cyclopoid copepod																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
Total weights & numbers in each of 20 columns:																					
	1	12	53	16	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.007	0.227	1.408	1.16	1.54	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 89
Total weight: 4.7179

Total number & weight of Terrestrials: 3 0.1138
Total number & weight of Aquatics: 86 4.6041

Total number & weight of Behavioral Drifters: 84 4.5223
Total number & weight of Accidental Drifters: 5 0.1955

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	84	0	2	0	3	0	0
	0.000	0.000	4.522	0.000	0.082	0.000	0.114	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	85	0	0	0	0	3	1	0	0
	4.599	0.000	0.000	0.000	0.000	0.114	0.005	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: Upstream from Kanab C. [illegible]
Type line: DRIFT #96

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Cnemia																					
	0	1	16	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
		0.005	0.425	0.17	0.39																0.980
955 Aphidae, Phylloxeridae (nymph & adult)																					
	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.221	0.325																		0.615
890 Gammarus																					
	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
													9.80								9.804
Total weights & numbers in each of 20 columns:																					
	0	4	17	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	0.000	0.296	0.750	0.17	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 26
Total weight: 11.3998

Total number & weight of Terrestrials: 4 0.6154
Total number & weight of Aquatics: 22 10.7844

Total number & weight of Behavioral Drifters: 22 10.7844
Total number & weight of Accidental Drifters: 4 0.6154

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	0	21	0	0	0	4	0	0
	9.804	0.000	0.980	0.000	0.000	0.000	0.615	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	21	1	0	0	0	4	0	0	0
	0.980	9.804	0.000	0.000	0.000	0.615	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/5/90 2355-0100 [illegible]
Location: Upstream from Kanab Cr. [illegible]
Type line: DRIFT #104

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.06	0.07	0.12															0.253
440 Chironomidae (adult)	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.29																	0.290
441 Chironomidae (pupae)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.175
573 Antocha	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.01																	0.009
598 Cricotopus	0	0	6	5	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	14
			0.159	0.41	0.19		1.33														2.026
820 Gammarus	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
										4.23											4.232
255 Aphidae, Chaitophoridae (nymph & adult)	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.194	0.325																		0.518
258 Thysanoptera (thrips)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
16 Baetis sp.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.55															0.550
Total weights & numbers in each of 20 columns:	0	3	7	10	3	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	28
	0.000	0.203	0.484	0.75	0.44	0.67	1.33	0.00	0.00	4.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.1133

Cumulative total number of specimens: 28

Total weight: 8.1133

Total number & weight of Terrestrials: 7 0.8182

Total number & weight of Aquatics: 21 7.2951

Total number & weight of Behavioral Drifters: 19 7.1084

Total number & weight of Accidental Drifters: 9 1.0049

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	5	14	0	0	0	7	1	0
	4.232	0.789	2.096	0.000	0.000	0.000	0.818	0.178	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sk	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	15	4	2	0	0	7	0	0	0
	2.105	[illegible]	0.723	0.000	0.000	0.818	0.000	0.000	0.000

Kanab Cr. 11/5/90 0638-0740 hrs. [illegible] Sample #79.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: [illegible]
Date: [illegible]
Location: KANAB CR [illegible]
Type line: DRIFT R #35

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	10T
252 Arrenurus (spiders)	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.147																			0.147
Total weights & numbers in each of 20 columns:																					
	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.000	0.147	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 1 — Total weight: 0.1468

Total number & weight of Terrestrials: 1 0.1468 — Total number & weight of Aquatics: 0 0.0000

Total number & weight of Behavioral Drifters: 0 0.0000 — Total number & weight of Accidental Drifters: 1 0.1468

	Shredder	Col gath	Col filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	0	0	1	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	0.147	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf Sk	Planct	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	1	0	0	0
	0.000	0.000	0.000	0.000	0.000	0.147	0.000	0.000	0.000

Site: Kanab Cr
Date: [illegible]
Location: KANAB CR [illegible]
Type line: DRIFT L-NET #73

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	10T
540 Orthocladiinae	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.014	0.04																	0.050
410 Chironomidae (adult)	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.086																		0.086
810 Hydracarina	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			0.243
251 Aphidae, Phylloxeridae (nymph & adult)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.194																			0.194
964 Aquatic Hymenoptera	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.111																			0.111
Total weights & numbers in each of 20 columns:																					
	0	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.000	0.548	0.100	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 10 — Total weight: 0.6832

Total number & weight of Terrestrials: 4 0.2795 — Total number & weight of Aquatics: 6 0.4037

Total number & weight of Behavioral Drifters: 2 0.0497 — Total number & weight of Accidental Drifters: 8 0.6334

	Shredder	Col gath	Col filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	0	0	2	0	4	0	2
	0.000	0.050	0.000	0.000	0.243	0.000	0.279	0.000	0.111

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sk	Planct	Parasite	---
MODE of attachment tots (1 - 9):	0	2	0	2	2	4	0	0	0
	0.000	0.050	0.000	0.111	0.243	0.279	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: [illegible]
Date: [illegible]
Location: KANAB CR [illegible]
Type time: [illegible]

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Orthocladiinae																					
	0	2	5	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	9
		0.037	0.071	0.04	0.07																0.184
410 Chironomidae (adult)																					
	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.012																			0.012
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.027																			0.027
958 Thysanoptera (thrips)																					
	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.010	0.045																		0.055
244 Aquatic Hymenoptera																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
590 Simuliidae (larvae)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
Total weights & numbers in each of 20 columns:																					
	0	7	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.186	0.116	0.04	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 15
Total weight: 0.4056

Total number & weight of Terrestrials: 4 0.1643
Total number & weight of Aquatics: 11 0.2443

Total number & weight of Behavioral Drifters: 10 0.1890
Total number & weight of Accidental Drifters: 5 0.2196

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	9	1	0	0	0	4	0	1
	0.000	0.184	0.045	0.000	0.000	0.000	0.164	0.000	0.055

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	--
MODE of attachment tots (1 - 9):	1	9	0	1	0	4	0	0	0
	0.005	0.184	0.000	0.055	0.000	0.164	0.000	0.000	0.000

Site: [illegible]
Date: [illegible]
Location: KANAB CR [illegible]
Type time: [illegible]

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.025	0.043																		0.068
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.027																			0.027
592 Simulium																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.027																		0.027
598 Cnephia																					
	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.17	0.19																0.358
260 Hydroptilidae																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.104																		0.104
Total weights & numbers in each of 20 columns:																					
	0	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.122	0.173	0.17	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 9
Total weight: 0.6524

Total number & weight of Terrestrials: 4 0.1646
Total number & weight of Aquatics: 5 0.4879

Total number & weight of Behavioral Drifters: 4 0.3844
Total number & weight of Accidental Drifters: 5 0.2681

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	4	0	0	1	4	0	0
	0.000	0.000	0.384	0.000	0.000	0.104	0.165	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	--
MODE of attachment tots (1 - 9):	5	0	0	0	0	4	0	0	0
	0.488	0.000	0.000	0.000	0.000	0.165	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: [illegible]
Date: [illegible]
Location: KANAB CR RKM 2.35 [illegible]
Type time: DRIL #80

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
528 Cnemia	0	0	1	4	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	7
			0.027	0.33	0.39																0.742
592 Simulium	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.08		0.38															0.461
440 Orthocladiinae	0	1	2	0	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	5
		0.003	0.049		0.07																0.123
601 Tanypodinae	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.014																		0.014
610 Chironomidae (adult)	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.025	0.086	0.10																	0.207
613 Chironomidae (pupae)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
958 Thysanoptera (thrips)	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.019																			0.039
953 Aphidae, Phylloxeridae (nymph & adult)	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.291	0.325																		0.615
984 Aquatic Hymenoptera	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
	0.006	0.166																			0.173

Total weights & numbers in each of 20 columns:

1	13	15	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.006	0.523	0.522	0.51	0.46	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 37
Total weight: 2.6648

Total number & weight of Terrestrials: 13 0.8610
Total number & weight of Aquatics: 24 1.6037

Total number & weight of Behavioral Drifters: 18 1.3770
Total number & weight of Accidental Drifters: 19 1.0878

FUNCTIONAL group totals (1 - 9):	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	0	9	9	0	1	0	13	3	4
	0.000	0.173	1.204	0.000	0.014	0.000	0.861	0.043	0.170

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skb	Plankt	Parasite	---
	9	[illegible]	[illegible]	4	1	13	0	3	0
	1.204	[illegible]	0.043	0.170	0.014	0.861	0.000	0.000	0.000

Site: [illegible]
Date: [illegible]
Location: KANAB CR RKM 2.35 [illegible]
Type time: DRIL #86

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae	0	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		0.003	0.071	0.04																	0.113
610 Chironomidae (adult)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
				0.10																	0.027
598 Cnemia	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.053	0.25																	0.331
810 Hydracarina	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.006																				0.006
958 Thysanoptera (thrips)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.019																			0.019
500 Aquatic Diptera Adults	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						2.10															2.107

Total weights & numbers in each of 20 columns:

1	3	7	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.006	0.023	0.124	0.38	0.00	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 17
Total weight: 2.6290

Total number & weight of Terrestrials: 4 2.2126
Total number & weight of Aquatics: 13 0.4163

Total number & weight of Behavioral Drifters: 12 0.4105
Total number & weight of Accidental Drifters: 5 2.2185

FUNCTIONAL group totals (1 - 9):	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	0	7	5	0	1	0	4	0	0
	0.000	0.110	0.301	0.000	0.006	0.000	2.213	0.000	0.000

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skb	Plankt	Parasite	---
	5	7	0	0	1	4	0	0	0
	0.301	0.110	0.000	0.000	0.006	2.213	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: [illegible]
Date: [illegible]
Location: KANAB CR [illegible]
Type time: DR N #07

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
500 Aquatic Diptera Adults																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.174																			0.174
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.325																			0.325
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010

Total weights & numbers in each of 20 columns:

0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.233	0.325	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 4

Total weight: 0.5291

Total number & weight of Terrestrials: [illegible] 0.5291

Total number & weight of Aquatics: 0 0.0000

Total number & weight of Behavioral Drifters: 3 0.0000

Total number & weight of Accidental Drifters: 4 0.5281

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9)	0	0	0	0	0	0	4	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	0.528	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planct	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	4	0	0	0
	0.000	0.000	0.000	0.000	0.000	0.528	0.000	0.000	0.000

Site: [illegible]
Date: [illegible]
Location: KANAB CR [illegible]
Type time: DRIFT C NET #77

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	1	3	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6
		0.003	0.042	0.07																	0.117
598 Cnemia																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.053																		0.053
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.291																			0.291

Total weights & numbers in each of 20 columns:

0	6	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.426	0.095	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 13

Total weight: 0.5923

Total number & weight of Terrestrials: 4 0.3004

Total number & weight of Aquatics: 9 0.2918

Total number & weight of Behavioral Drifters: 8 0.1702

Total number & weight of Accidental Drifters: 5 0.4221

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	6	2	0	1	0	4	0	0
	0.000	0.117	0.053	0.000	0.122	0.000	0.300	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planct	Parasite	---
MODE of attachment tots (1 - 9):	2	6	0	0	1	4	0	0	0
	0.053	0.117	0.000	0.000	0.122	0.300	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: Kawab C
Date: [illegible]
Location: KAWAB CR RKM 230.1
Type line: DR-8 #59

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.07																0.071
410 Chironomidae (adult)																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.025	0.043																		0.068
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.629	0.325																		1.954
958 Thysanoptera (thrips)																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.029																			0.029
964 Aquatic Hymenoptera																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
941 Diptera (terrestrials & adults)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.72																	0.720
955 Ephemeroptera (terrestrials & larvae)																					
	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.001																				0.001

Total weights & numbers in each of 20 columns:

1	13	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.001	0.788	0.367	0.72	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 18
Total weight: 1.9665

Total number & weight of Terrestrials: 16 1.8201
Total number & weight of Aquatics: 2 0.1264

Total number & weight of Behavioral Drifters: 1 0.0711
Total number & weight of Accidental Drifters: 17 1.8954

	Shredder	Col gath	Col filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	0	0	0	0	16	0	1
	0.000	0.071	0.000	0.000	0.000	0.000	1.820	0.000	0.055

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	1	0	1	0	16	0	0	0
	0.000	0.071	0.000	0.055	0.000	1.820	0.000	0.000	0.000

Site: Kawab C
Date: [illegible]
Location: KAWAB CR RKM 230.1
Type line: DRIFT 1 NET #67

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	0	8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
			0.313	0.14																	0.255
401 Tanypodinae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.015
14 Baetis sp.																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		0.582	0.974																		1.555
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
813 Cyclopoid copepod																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.013																		0.013

Total weights & numbers in each of 20 columns:

0	8	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.596	1.119	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

Cumulative total number of specimens: 25
Total weight: 1.8940

Total number & weight of Terrestrials: 10 1.5651
Total number & weight of Aquatics: 15 0.3289

Total number & weight of Behavioral Drifters: 14 0.2933
Total number & weight of Accidental Drifters: 11 1.6007

	Shredder	Col gath	Col filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	13	1	0	1	0	10	0	0
	0.000	0.261	0.033	0.000	0.036	0.000	1.565	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	12	1	0	1	10	1	0	0
	0.000	0.255	0.005	0.000	0.036	1.565	0.033	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Kawab Cr. 11/6/90 1247-1341 hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESLUTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: Kawab Cr.
Date: 11/6/90 1249-1335 hrs
Location: KAWAB CR RKM 2.50 R
Time Line: 08:8 #82

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.012	0.066	0.10																	0.175
411 Chironomidae (pupae)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
440 Orthocladiinae																					
	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
			0.056	0.07																	0.125
401 Tanypodinae																					
	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.003	0.016																		0.019
953 Aphidae, Phyllaxeridae (nymph & adult)																					
	1	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
	0.007	0.775	0.649																		1.432
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
598 Cnephia																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.027	0.08																	0.107

Total weights & numbers in each of 20 columns:

1	11	11	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.007	0.801	0.875	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 27

Total weight: 1.9334

Total number & weight of Terrestrials: 16 1.6362

Total number & weight of Aquatics: 11 0.2972

Total number & weight of Behavioral Drifters: 8 0.2368

Total number & weight of Accidental Drifters: 19 1.6966

	Shredder	Col gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	6	2	0	2	0	16	1	0
	0.000	0.128	0.109	0.000	0.018	0.000	1.636	0.043	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sw	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	2	6	1	0	2	16	0	0	0
	0.109	0.128	0.043	0.000	0.018	1.636	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Kanab Crk. 11/6/90 1748-1855 L-S
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: Kanab
Date: 11/6/90 2345-0040 L-S
Location: KANAB CR RKM 2307
Type line: OR 8 85

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	2	4	3	3	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	18
		0.007	0.056	0.11	0.21	0.62	0.20														1.196
430 Chironomidae (adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.012																			0.012
598 Cheumia																					
	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
			0.027		0.19																0.219
590 Simuliidae (larvae)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.009																			0.009
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.194	0.325																		0.518
Total weights & numbers in each of 20 columns:																					
	0	7	6	3	4	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.223	0.408	0.11	0.41	0.62	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 26

Total weight: 1.9560

Total number & weight of Terrestrials: 4 0.5309

Total number & weight of Aquatics: 22 1.4251

Total number & weight of Behavioral Drifters: 22 1.4251

Total number & weight of Accidental Drifters: 4 0.5309

	Shredder	Col gath	Col filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	18	4	0	0	0	4	0	0
	0.000	1.196	0.229	0.000	0.000	0.000	0.531	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	...
MODE of attachment tots (1 - 9):	4	18	0	0	0	4	0	0	0
	0.229	1.196	0.000	0.000	0.000	0.531	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Kanab Crk. 11/6/90 - 11/7/90 2395-0090 hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 115.90 @ 8 45 - 9 45 hrs
Location: upstream from Havasu Cr. RM 252.1
Type line: DRIFT #22

Composite of two nets

Total lengths in each length category (serous line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.649																		0.649
410 Chironomidae (adult)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
411 Chironomidae (pupae)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
588 Tipulidae adults																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						2.10															2.097
598 Gnophia S. [illegible]																					
	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.17	0.19																0.358
813 Cyclopoid copepod																					
	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
	0.000	0.011	0.033																		0.043
563 Hydra																					
	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.327																			0.327
890 Gammarus																					
	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
						0.79						7.60									8.390

Total weights & numbers in each of 20 columns:

3	10	3	3	2	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0
0.000	0.338	0.682	0.26	0.37	2.89	0.00	0.00	0.00	0.00	0.00	7.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 22

Total weight: 12.1386

Total number & weight of Terrestrials: 4 2.8426

Total number & weight of Aquatics: 18 9.2960

Total number & weight of Behavioral Drifters: 9 8.7912

Total number & weight of Accidental Drifters: 13 3.3474

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	2	0	7	0	8	0	4	1	0
	8.390	0.000	0.401	0.000	0.327	0.000	2.843	0.178	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sk	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	11	2	1	0	0	4	4	0	0
	0.685	8.390	0.178	0.000	0.000	2.843	0.043	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/15/90 845-945
Location: upstream [illegible]
Time line: DRIFT #23

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
	0.007	0.291	0.649																		0.947
963 Hemiptera (terrestrials & nymphs and adults)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					2.11																2.111
598 Chaoborus [illegible]																					
	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.027	0.08	0.19																0.302
640 Orthocladiinae																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.07																0.071
610 Chironomidae (adult)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.096																		0.096
16 Baetis sp.																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.27																0.268
811 Cyclopoid copepod																					
	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.005	0.065																		0.071

Total weights & numbers in each of 20 columns:

1	4	7	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.007	0.298	0.827	0.08	2.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 17
Total weight: 3.8552

Total number & weight of Terrestrials: 9 3.1635
Total number & weight of Aquatics: 8 0.7117

Total number & weight of Behavioral Drifters: 8 0.7117
Total number & weight of Accidental Drifters: 9 3.1435

FUNCTIONAL group totals (1 - 9):	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	0	2	4	0	0	0	8	9	0	0
	0.000	0.339	0.572	0.000	0.000	0.000	3.143	0.000	0.000

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
	3	1	1	0	0	9	3	0	0
	0.302	0.071	0.268	0.000	0.000	3.143	0.071	0.000	0.000

Site: COLORADO RIVER
Date: 11/15/90 1445-1545
Location: upstream [illegible]
Time line: DRIFT #17

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
961 Diptera (terrestrials & adults)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
811 Cyclopoid copepod																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.016																			0.016
863 Hydra																					
	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.164	0.058																		0.222
610 Chironomidae (adult)																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.043	0.10																	0.139
598 Chaoborus																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.053																		0.053
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.291	0.974																		1.265
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010

Total weights & numbers in each of 20 columns:

0	11	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.480	1.453	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 20
Total weight: 2.0292

Total number & weight of Terrestrials: 10 1.7384
Total number & weight of Aquatics: 10 0.2908

Total number & weight of Behavioral Drifters: 5 0.0689
Total number & weight of Accidental Drifters: 15 1.9603

FUNCTIONAL group totals (1 - 9):	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	0	0	5	0	5	0	10	0	0
	0.000	0.000	0.069	0.000	0.222	0.000	1.738	0.000	0.000

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
	7	0	0	0	0	10	3	0	0
	0.275	0.000	0.000	0.000	0.000	1.738	0.016	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River Upstream from Havasu Ck. 11/6/90 0000-2600hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 11/6/90 0855-955
Location: Upstream from Havasu Ck. Reach 152.1
Type time: DRIFT-1 #18

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Gammarus																					
	0	0	15	12	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	37
			0.398	0.99	1.35	0.76	0.67														4.161
440 Orthocladiinae																					
	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.04			0.20														0.231
863 Hydra																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
			0.058																		0.058
313 Cyclopoid copepod																					
	0	26	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
		0.137	0.033																		0.169
813 Cyclopoid copepod																					
	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.000																				0.000
953 Anhinae, Phylloneridae (nymph & adult)																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.194	0.325																		0.518
958 Thysanoptera (thrips)																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.029																			0.029
963 Homoptera (terrestrials & nymphs and adults)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.433																		0.433

Total weights & numbers in each of 20 columns:

1	31	19	13	7	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.359	1.267	1.03	1.35	0.76	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 75

Total weight: 5.6000

Total number & weight of Terrestrials: 7 0.9801

Total number & weight of Aquatics: 68 4.6200

Total number & weight of Behavioral Drifters: 67 4.5616

Total number & weight of Accidental Drifters: 8 1.0354

	Shredder	Col-path	Col-filt	Scraper	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	65	0	1	0	7	0	0
	0.000	0.231	4.330	0.000	0.058	0.000	0.980	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Planktonic	Parasite	---
MODE of attachment tots (1 - 9):	58	2	0	0	0	7	28	0	0
	4.219	0.231	0.000	0.000	0.000	0.980	0.169	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Composite of two nets

Site: COLORADO RIVER
Date: 11/5/90 1920-2025
Location: Upstream Swim Beach
Time Time: DRIFT 2 #27

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	8
		0.388	0.974																		1.362
815 Cyclopoid copepod																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.011	0.033																		0.044
961 Diptera (terrestrials & adults)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
410 Chironomidae (adult)																					
	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
			0.171	0.10	0.18																0.446
928 Cheumatopsyche																					
	0	0	6	11	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	20
			0.359	0.91		0.26	0.67														2.491
Total weights & numbers in each of 20 columns:																					
	0	6	15	12	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.528	1.642	1.00	0.18	0.26	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 37
Total weight: 4.6660

Total number & weight of Terrestrials: 14 2.1318
Total number & weight of Aquatics: 23 2.5342

Total number & weight of Behavioral Drifters: 23 2.5342
Total number & weight of Accidental Drifters: 14 2.1318

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	23	0	0	0	14	0	0
	0.000	0.000	2.534	0.000	0.000	0.000	2.132	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planktonic	Parasite	---
MODE of attachment tots (1 - 9):	20	0	0	0	0	14	3	0	0
	2.491	0.000	0.000	0.000	0.000	2.132	0.043	0.000	0.000

Composite of two nets

COLORADO RIVER
11/5/90 1920-2025
Location: Upstream Swim Beach
Time Time: DRIFT-1 #25

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
928 Cheumatopsyche																					
	0	0	2	0	1	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	8
			0.053		0.19	1.14			1.64	2.39											5.418
595 Simuliidae (adults)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					1.30																1.304
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.388																			0.388
563 Homoptera (terrestrials & nymphs and adults)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.433																		0.433
958 Thysanoptera (thrips)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.019																			0.019
961 Diptera (terrestrials & adults)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
890 Gammarus																					
	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
									3.01												3.011
815 Cyclopoid copepod																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.033																		0.033
957 Coleoptera (terrestrials & adults & larvae)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				1.36																	1.362
952 Araneida (spiders)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.147																			0.147
440 Orthocladiinae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.036
410 Chironomidae (adult)																					
	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.086	0.10																	0.182
Total weights & numbers in each of 20 columns:																					
	0	7	7	3	2	3	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3
	0.000	0.556	0.929	1.49	1.50	1.14	0.00	0.00	4.65	2.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 25
Total weight: 12.6566

Total number & weight of Terrestrials: 14 4.1593
Total number & weight of Aquatics: 11 8.4974

Total number & weight of Behavioral Drifters: 11 8.4974
Total number & weight of Accidental Drifters: 14 4.1593

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	1	9	0	0	0	14	0	0
	3.011	0.036	5.451	0.000	0.000	0.000	4.159	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planktonic	Parasite	---
MODE of attachment tots (1 - 9):	8	2	0	0	0	14	1	0	0
	5.418	3.047	0.000	0.000	0.000	4.159	0.033	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/6/90 0855-1955 hrs
Location: Upstream from Havasu Creek [illegible]
Type line: DRIFT-2 #19

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Cambarus [illegible]	0	1	18	24	10	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	55
		0.005	0.478	1.98	1.95	0.38			1.64												6.414
410 Chironomidae (adult)	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.043	0.10																	0.139
440 Orthocladinae	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.003																			0.003
958 Thysanoptera (thrips)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.019																			0.019
961 Diptera (terrestrials & adults)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
964 Aquatic Hymenoptera	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
959 Hymenoptera (terrestrial & adults & pupae)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
815 Cyclopoid copepod	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		0.042	0.033																		0.075
810 Hydracarina	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
890 Gammarus	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.20																	0.199
Total weights & numbers in each of 20 columns:	0	15	21	26	10	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.302	0.878	2.28	1.95	0.38	0.00	0.00	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 76

Total weight: 7.4068

Total number & weight of Terrestrials: 6 0.5386

Total number & weight of Aquatics: 68 6.8681

Total number & weight of Behavioral Drifters: 66 6.6911

Total number & weight of Accidental Drifters: 8 0.7156

	Shredder	Col-goth	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	1	64	0	1	0	6	0	1
	0.199	0.003	6.489	0.000	0.122	0.000	0.539	0.000	0.055

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	55	2	0	1	1	6	9	0	0
	5.414	1.203	0.000	0.055	0.122	0.539	0.075	0.000	0.000

Colorado River:
Upstream from Havasu Cr. 11/6/90 1392-1442 Sample #16
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible]
Type time: DRIFT-1 #15

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.027	1.623																		1.723
598 [illegible]																					
	0	0	12	8	8	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	31
			0.319	0.66	1.54	0.76	0.67														3.944
440 Orthocladiinae																					
	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
					0.14																0.142
410 Chironomidae (adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
813 Cyclopoid copepod																					
	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.016	0.033																		0.048
961 Diptera (terrestrials & adults)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
495 Simuliidae (adults)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					1.30																1.306

Total weights & numbers in each of 20 columns:

0	4	20	8	11	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.113	2.362	0.66	2.99	0.76	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 46
Total weight: 7.5261

Total number & weight of Terrestrials: 9 3.3916
Total number & weight of Aquatics: 37 4.1344

Total number & weight of Behavioral Drifters: 37 4.1344
Total number & weight of Accidental Drifters: 9 3.3916

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	35	0	0	0	9	0	0
	0.000	0.142	3.992	0.000	0.000	0.000	3.392	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf Sk	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	31	2	0	0	0	9	4	0	0
	3.944	0.142	0.000	0.000	0.000	3.392	0.048	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible]
Type time: DRIFT-1 #20

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
810 Hydracarina																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.365																			0.365
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
		0.679	0.974																		1.652
961 Diptera (terrestrials & adults)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.649																		0.649
598 [illegible]																					
	0	0	10	12	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
			0.266	0.99	0.58	0.38															2.213
440 Orthocladiinae																					
	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
				0.11		0.12															0.230
410 Chironomidae (adult)																					
	0	1	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.012	0.171	0.19	0.18																0.559
813 Cyclopoid copepod																					
	0	24	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
		0.126	0.098																		0.224
863 Hydra																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041
262 Hydroptila																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.104																		0.104

Total weights & numbers in each of 20 columns:

0	36	23	17	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	1.223	2.261	1.29	0.76	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 82
Total weight: 6.0336

Total number & weight of Terrestrials: 20 2.8563
Total number & weight of Aquatics: 62 3.1773

Total number & weight of Behavioral Drifters: 57 2.6678
Total number & weight of Accidental Drifters: 25 3.3658

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	4	53	0	4	1	20	0	0
	0.000	0.230	2.437	0.000	0.406	0.104	2.856	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sk	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	28	4	0	0	3	20	27	0	0
	2.358	0.230	0.000	0.000	0.365	2.856	0.224	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Location: Upstream from Havasu Cr. Rkm 252.1
Type line: DRIFT-2 #21 18:42-1942

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.485	0.974																		1.459
958 Thysanoptera (thrips)																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.029																			3.029
440 Orthocladiinae																					
	3	0	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
			0.014	0.11	0.14																0.263
410 Chironomidae (adult)																					
	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.043	0.29																	0.333
411 Chironomidae (pupae)																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.043	0.10																	0.139
963 Diptera (terrestrials & adults)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.649																		0.649
810 Hydracarina																					
	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	0.006	0.243																			0.249
813 Cyclopoid copepod																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.011																			0.011
598 Gomphus [illegible]																					
	0	0	14	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
			0.372	0.66	0.19	0.38															1.604

Total weights & numbers in each of 20 columns:

1	12	22	15	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.006	0.767	2.095	1.15	0.33	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 56

Total weight: 4.7359

Total number & weight of Terrestrials: 17 2.4695

Total number & weight of Aquatics: 37 2.2664

Total number & weight of Behavioral Drifters: 32 1.8777

Total number & weight of Accidental Drifters: 22 2.8582

	Shrewler	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	6	26	0	3	0	17	2	0
	0.000	0.263	1.615	0.000	0.249	0.000	2.469	0.139	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Planit	Parasite	---
MODE of attachment tots (1 - 9):	24	5	2	0	3	17	2	0	0
	1.604	0.263	0.139	0.000	0.249	2.469	0.011	0.000	0.000

COLORADO RIVER
Date: 11/3/90 01:00-0233 hrs
Location: Upstream from Havasu Cr. Rkm 252.1
Type line: DRIFT-1 #26

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.388	0.325																		0.712
959 Hymenoptera (terrestrial & adults & pupae)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.78																0.778
598 Gomphus [illegible]																					
	0	1	5	12	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
		0.005	0.133	0.99	0.77	0.38															2.278
440 Orthocladiinae																					
	0	0	2	4	6	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	15
			0.028	0.14	0.43	0.12	0.39														1.112
410 Chironomidae (adult)																					
	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.086	0.10																	0.182
411 Chironomidae (pupae)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
550 Empididae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.036
890 Gammarus																					
	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.142		0.43			2.05													2.625
813 Cyclopoid copepod																					
	0	11	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
		0.058	0.131																		0.189

Total weights & numbers in each of 20 columns:

0	16	16	19	12	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.450	0.844	1.36	2.41	0.50	0.39	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 68

Total weight: 8.0082

Total number & weight of Terrestrials: 9 1.6729

Total number & weight of Aquatics: 59 6.3353

Total number & weight of Behavioral Drifters: 57 6.2030

Total number & weight of Accidental Drifters: 11 1.8052

	Shrewler	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	4	15	38	0	1	0	9	1	0
	2.625	1.112	2.447	0.000	0.036	0.000	1.673	0.097	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Planit	Parasite	---
MODE of attachment tots (1 - 9):	23	19	1	0	1	9	15	0	0
	2.278	3.736	0.097	0.000	0.036	1.673	0.189	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/13/90 0100-0230 hrs
Location: [illegible]
Type line: DRIFT #24

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
990 Gammarus																					
	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
				0.20							5.75										5.949
813 Cyclocyclid coleoptera																					
	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.016	0.015																		0.048
558 Cheumatopsyche [illegible]																					
	0	0	4	10	8	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	33
			0.106	0.83	1.54	2.65	2.00	1.08													8.200
440 Orthocladiinae																					
	0	0	1	2	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
			0.014	0.07	0.28	0.37															0.740
411 Chironomidae (pupae)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
410 Chironomidae (adult)																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.043	0.10																	0.139
956 Coleoptera (terrestrials & larvae)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.18																	0.182
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.097	0.325																		0.422
963 Homoptera (terrestrials & nymphs and adults)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				1.07																	1.072
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
Total weights & numbers in each of 20 columns:																					
	0	5	8	17	12	10	3	1	0	0	1	0	0	0	0	0	0	0	0	0	
	0.000	0.122	0.520	2.54	1.83	3.02	2.00	1.08	0.00	0.00	5.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 57

Total weight: 16.8583

Total number & weight of Terrestrials: 7 1.8243

Total number & weight of Aquatics: 50 15.0339

Total number & weight of Behavioral Drifters: 49 14.9372

Total number & weight of Accidental Drifters: 8 1.9210

	Shredder	Col-goth	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	2	10	37	0	0	0	7	1	0
	5.949	0.740	8.248	0.000	0.000	0.000	1.824	0.097	0.000

	Cling	Burrow	Swim	Climb	Scrawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	33	12	1	0	0	7	4	0	0
	8.200	6.689	0.097	0.000	0.000	1.824	0.048	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Single net

State: Havasu C
Date: 11/5/90 06:27-0727
Location: HAVASU CR. Rkm 252.3
Type time: DRIFT L-BANK #53

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
16 Baetis sp																					
	0	3	4	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
			0.131	0.65	0.54	0.55															1.872
950 Formicidae (ants)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.45																	0.446
813 Cyclopoid copepod																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
10 Baetidae																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.033																		0.033
592 Simulium																					
	0	1	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
		0.005	0.159	0.17	0.19																0.522
440 Orthocladiinae																					
	0	0	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
			0.042	0.07	0.14																0.256
410 Chironomidae (adult)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.086																		0.086
831 Heteroelmis (adult)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			1.105																		1.105

Total weights & numbers in each of 20 columns:

0	2	18	11	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.010	1.556	1.34	0.87	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 37
Total weight: 4.3239

Total number & weight of Terrestrials: 3 0.5318
Total number & weight of Aquatics: 34 3.7921

Total number & weight of Behavioral Drifters: 32 2.6872
Total number & weight of Accidental Drifters: 5 1.6367

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	23	11	0	0	0	3	0	0
	0.000	3.265	0.527	0.000	0.000	0.000	0.532	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	12	7	14	0	0	3	1	0	0
	1.627	0.256	1.904	0.000	0.000	0.532	0.005	0.000	0.000

Single net

Site: Havasu C.
Date: 11/5/90 06:23-0723
Location: HAVASU CR. Rkm 252.3
Type time: DRIFT R-BANK #56

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
							0.20														0.196
401 Tanypodinae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.036
16 Baetis sp.																					
	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
				0.33	0.27																0.595
831 Heteroelmis (adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.552																		0.552
592 Simulium																					
	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.005	0.106																		0.111

Total weights & numbers in each of 20 columns:

0	1	5	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.005	0.659	0.36	0.27	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 12
Total weight: 1.4899

Total number & weight of Terrestrials: 0 0.0000
Total number & weight of Aquatics: 12 1.4899

Total number & weight of Behavioral Drifters: 10 0.9018
Total number & weight of Accidental Drifters: 2 0.5881

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	6	5	0	1	0	0	0	0
	0.000	1.343	0.111	0.000	0.036	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	6	1	4	0	1	0	0	0	0
	0.663	0.196	0.595	0.000	0.036	0.000	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: [illegible]
Date: [illegible]
Location: HAVASU Cr. [illegible]
Type line: DRIFT LEFT #58

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	0	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
			0.042	0.04	0.14																0.220
410 Chironomidae (adult)																					
	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.012	0.043	0.10																	0.152
592 Simulium																					
	0	2	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.009	0.055	0.25	0.19																0.503
253 Aphidae, Phylloxeridae (nymph & adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
958 Thysanoptera (thrips)																					
	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.010	0.045																		0.055
14 Beetle sp.																					
	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
				0.11	0.80																0.914
631 Heteremis (adult)																					
	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			1.657																		1.657
Total weights & numbers in each of 20 columns:																					
	0	4	11	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.032	2.166	0.49	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 27
Total weight: 3.8215

Total number & weight of Terrestrials: 6 0.5315
Total number & weight of Aquatics: 21 3.2940

Total number & weight of Behavioral Drifters: 18 1.6367
Total number & weight of Accidental Drifters: 9 2.1888

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	13	8	0	0	0	6	0	0
	0.000	2.791	0.503	0.000	0.000	0.000	0.532	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	11	6	4	0	0	6	0	0	0
	2.160	0.220	0.914	0.000	0.000	0.532	0.000	0.000	0.000

Site: [illegible]
Date: [illegible]
Location: HAVASU Cr. [illegible]
Type line: DRIFT R-NET #49

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	2	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.007	0.014	0.18																	0.199
410 Chironomidae (adult)																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.025	0.043																		0.068
14 Beetle sp.																					
	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.005	0.033																		0.038
964 Aquatic Hymenoptera																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
958 Thysanoptera (thrips)																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.029																			0.029
592 Simulium																					
	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
			0.186																		0.186
Total weights & numbers in each of 20 columns:																					
	0	9	10	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.121	0.276	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 24
Total weight: 0.5748

Total number & weight of Terrestrials: 6 0.0965
Total number & weight of Aquatics: 18 0.4783

Total number & weight of Behavioral Drifters: 17 0.4230
Total number & weight of Accidental Drifters: 7 0.1518

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	10	7	0	0	0	6	0	1
	0.000	0.237	0.186	0.000	0.000	0.000	0.096	0.000	0.055

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	8	2	1	0	6	0	0	0
	0.186	0.199	0.038	0.055	0.000	0.096	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Havasu Cr. 11/5/90 1817-1917 hrs. Drift

THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: Havasu Cr.
Date: 11/5/90 1817-1917 hrs
Location: HAVASU CR. RKM 452.3
Type line: DRIFT R BANK #3B

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
14 Baetis sp.																					
	0	2	1	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
		0.011	0.033	0.33	0.80	0.55															1.725
953 Aphidae, Phylloxeridae (nymph & adult)																					
	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	0.007	0.077	0.325																		0.429
410 Chironomidae (adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
651 Heteroleptis (adult)																					
	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			1.657	2.72																	4.381
961 Diptera (terrestrials & adults)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.194																			0.194
440 Orthocladiinae																					
	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.003			0.07	0.12															0.198
592 Simulium																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.053																		0.053

Total weights & numbers in each of 20 columns:

1	6	8	5	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.007	0.305	2.111	3.05	0.88	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 26

Total weight: 7.0221

Total number & weight of Terrestrials: 6 0.6656

Total number & weight of Aquatics: 20 6.3567

Total number & weight of Behavioral Drifters: 15 1.9761

Total number & weight of Accidental Drifters: 11 5.0460

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	18	2	0	0	0	6	0	0
	0.000	6.304	0.053	0.000	0.000	0.000	0.665	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	3	10	0	0	6	0	0	0
	4.434	0.198	1.725	0.000	0.000	0.665	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: Havasu Cr.
Date: 11/6/90 0627-0727
Location: HAVASU CR. Rkm 252.5
Type time: DRIFT LEFT NET #56

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
531 Heteroleis (adult)																					
	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			2.210																		2.210
14 Baetis sp.																					
	0	0	1	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
			0.033	0.33	0.80																1.164
98 Ephemeroptera subimagos																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.27																0.268
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.386	0.325																		0.712
563 Homoptera (terrestrials & nymphs and adults)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				1.07																	1.072
719 Anisoptera (nymph)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.057																			0.057
440 Orthocladiinae																					
	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
			0.071	0.04																	0.106
410 Chironomidae (adult)																					
	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.012		0.10																	0.109
592 Simulium																					
	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.005		0.08	0.19																0.280

Total weights & numbers in each of 20 columns:

0	7	11	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.462	2.638	1.61	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 30
Total weight: 5.9791

Total number & weight of Terrestrials: 9 2.1615
Total number & weight of Aquatics: 21 3.8176

Total number & weight of Behavioral Drifters: 16 1.5505
Total number & weight of Accidental Drifters: 14 4.4286

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	17	3	0	1	0	9	0	0
	0.000	3.480	0.280	0.000	0.057	0.000	2.162	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---

Site: Havasu Cr.
Date: 11/6/90 0015 - 0119
Location: HAVASU CR. Rkm 252.5
Type time: LEFT DR-NET #55

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
531 Heteroleis (adult)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			1.105																		1.105
440 Orthocladiinae																					
	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.028	0.07	0.07																0.171
410 Chironomidae (adult)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.027
411 Chironomidae (pupae)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.175
592 Simulium																					
	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.009	0.053																		0.063
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
14 Baetis sp.																					
	0	1	2	7	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
		0.005	0.065	0.76	1.34	1.10															1.275

Total weights & numbers in each of 20 columns:

0	4	8	10	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.112	1.232	0.93	1.59	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 31
Total weight: 4.9844

Total number & weight of Terrestrials: 2 0.1936
Total number & weight of Aquatics: 29 4.7908

Total number & weight of Behavioral Drifters: 26 3.5082
Total number & weight of Accidental Drifters: 5 1.4762

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	24	4	0	0	0	2	1	0
	0.000	4.550	0.065	0.000	0.000	0.000	0.194	0.178	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	6	5	18	0	0	2	0	0	0
	1.168	0.171	3.453	0.000	0.000	0.194	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: Havasu Cr
Date: 11/6/90 0915-0115 hrs
Location: HAVASU CR. Rkm 252.3
Type line: DRIFT RIGHT #59

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.028	0.04	0.07																0.135
401 Tanypodinae	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.12															0.123
410 Chironomidae (adult)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
592 Simulium	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.027																		0.027
953 Aphidae, Phylloxeridae (nymph & adult)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
959 Hymenoptera (terrestrial & adults & pupae)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.189																		0.189
14 Beetle sp.	0	0	0	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
				0.22	0.80	1.10															2.123
Total weights & numbers in each of 20 columns:	0	1	4	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.097	0.244	0.35	0.88	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 16
Total weight: 2.7904

Total number & weight of Terrestrials: 3 0.3827
Total number & weight of Aquatics: 13 2.4077

Total number & weight of Behavioral Drifters: 12 2.2842
Total number & weight of Accidental Drifters: 4 0.5062

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	11	1	0	1	0	3	0	0
	0.000	2.258	0.027	0.000	0.123	0.000	0.383	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	1	4	7	0	1	3	0	0	0
	0.027	0.135	2.123	0.000	0.123	0.383	0.000	0.000	0.000

Site: Havasu Cr
Date: 11/6/90 0613-0717 hrs
Location: HAVASU CR. Rkm 252.3
Type line: DRIFT RIGHT #63

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
631 Heteroleuis (adult)	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			1.105																		1.105
758 Nebrus	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.399																		0.399
953 Aphidae, Phylloxeridae (nymph & adult)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.097	0.325																		0.422
592 Simulium	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
			0.153	0.08																	0.215
410 Chironomidae (adult)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
411 Chironomidae (pupae)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
440 Orthocladiinae	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.014																		0.014
371 Hydatrichia	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.023																			0.023
14 Beetle sp.	0	0	1	4	12	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
			0.033	0.44	3.22	4.40															8.087
10 Beetidae	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
Total weights & numbers in each of 20 columns:	0	3	11	5	14	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.125	2.008	0.52	3.57	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 41
Total weight: 10.6262

Total number & weight of Terrestrials: 3 0.5993
Total number & weight of Aquatics: 38 10.0269

Total number & weight of Behavioral Drifters: 33 8.3221
Total number & weight of Accidental Drifters: 8 2.3041

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	29	6	0	1	1	3	1	0
	0.000	9.212	0.215	0.000	0.399	0.023	0.599	0.178	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	8	1	27	1	0	4	0	0	0
	1.320	0.014	8.270	0.023	0.000	0.999	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: Havasu Cr
Date: 11/6/90 0613-0713 hrs
Location: HAVASU CR. Rkm 452.5
Type line: DRIFT LEFT #64

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
592 Simulium [illegible]	0	1	4	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.005	0.106	0.17		0.38															0.655
592 Simulium	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.38															0.379
14 Beetle sp.	0	0	1	5	2	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	12
			0.035	0.33	0.54	2.75	1.00														4.647
950 Formicidae (ants)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.45																	0.446
945 Homoptera (terrestrials & nymphs and adults)	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.328	0.865																		1.193
206 Trichoptera larvae	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.039																		0.039
440 Orthocladiinae	0	0	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
			0.028	0.11	0.14																0.277
410 Chironomidae (adult)	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.043	0.10																	0.139
411 Chironomidae (pupae)	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.043	0.10																	0.139
631 Heteroleptis (adult)	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			1.105																		1.105
Total weights & numbers in each of 20 columns:	0	4	16	11	4	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	48
	0.000	0.332	2.262	1.24	0.68	3.51	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 41
Total weight: 9.0197

Total number & weight of Terrestrials: 8 1.7787
Total number & weight of Aquatics: 33 7.2410

Total number & weight of Behavioral Drifters: 28 5.9580
Total number & weight of Accidental Drifters: 13 3.0617

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	21	9	0	0	0	8	2	0
	0.039	6.029	1.034	0.000	0.000	0.000	1.779	0.139	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ste	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	11	7	16	1	0	8	0	0	0
	2.139	0.277	4.286	0.039	0.000	1.279	0.000	0.000	0.000

Site: Havasu Cr
Date: 11/6/90 1215-1315 hrs
Location: HAVASU CR. Rkm 452.5
Type line: DRIFT 1-NET #62

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
631 Heteroleptis (adult)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.552																		0.552
953 Aphidae, Phylloxeridae (nymph & adult)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
440 Orthocladiinae	0	1	5	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
		0.003	0.071	0.04	0.21																0.323
410 Chironomidae (adult)	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.012	0.171																		0.184
592 Simulium	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.053	0.08																	0.136
371 Hydrachnia	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.021																			0.023
14 Beetle sp.	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.033	0.11	0.54																0.678
98 Ephemeroptera subimagos	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.55															0.550
Total weights & numbers in each of 20 columns:	0	4	13	3	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
	0.000	0.136	0.880	0.23	0.75	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 26
Total weight: 2.5426

Total number & weight of Terrestrials: 7 0.8306
Total number & weight of Aquatics: 19 1.7120

Total number & weight of Behavioral Drifters: 17 1.1367
Total number & weight of Accidental Drifters: 9 1.4059

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	15	3	0	0	1	7	0	0
	0.000	1.553	0.136	0.000	0.000	0.023	0.831	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ste	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	4	10	4	1	0	7	0	0	0
	0.688	0.323	0.678	0.023	0.000	0.831	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: Havasu Cr
Date: 11/1/90 1213-1313 hrs
Location: HAVASU CR. RKM 252.3
Type line: DRIFT RIGHT #66

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
592 Simulium [illegible]																					
	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.080																		0.080
531 Heterelmis (adult)																					
	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			2.210																		2.210
653 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.194																			0.194
440 Orthocladiinae																					
	0	1	3	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.003	0.042	0.11			0.20														0.348
410 Chironomidae (adult)																					
	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.025	0.043	0.10																	0.164
14 Beetle sp.																					
	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
				0.11	0.80																0.914
Total weights & numbers in each of 20 columns:																					
	0	5	11	5	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.000	0.222	2.575	0.31	0.80	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 25
Total weight: 3.9094

Total number & weight of Terrestrials: 6 0.3582
Total number & weight of Aquatics: 19 3.5512

Total number & weight of Behavioral Drifters: 15 1.3414
Total number & weight of Accidental Drifters: 10 2.5680

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	16	3	0	0	0	6	0	0
	0.000	3.471	0.080	0.000	0.000	0.000	0.358	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ske	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	8	4	0	0	6	0	0	0
	2.289	0.348	0.914	0.000	0.000	0.358	0.000	0.000	0.000

Site: Havasu Cr
Date: 11/1/90 1800 hrs
Location: HAVASU CR. RKM 252.3
Type line: DRIFT LEFT NET #108

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	0	5	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8
			0.071	0.04		0.12	0.20														0.425
410 Chironomidae (adult)																					
	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.025		0.19																	0.218
411 Chironomidae (pupae)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
631 Heterelmis (adult)																					
	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			2.210																		2.210
401 Tanypodinae																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.014																		0.014
640 Elmidae (larvae)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040
14 Beetle sp.																					
	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
				0.11	0.27	0.55															0.927
592 Simulium [illegible]																					
	0	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.053		0.19	0.38															0.625
Total weights & numbers in each of 20 columns:																					
	0	2	13	4	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0.000	0.025	2.387	0.34	0.64	1.05	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 26
Total weight: 4.6367

Total number & weight of Terrestrials: 4 0.2182
Total number & weight of Aquatics: 22 4.4185

Total number & weight of Behavioral Drifters: 15 1.9771
Total number & weight of Accidental Drifters: 11 2.6596

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	16	4	0	1	0	4	1	0
	0.000	3.602	0.625	0.000	0.014	0.000	0.218	0.178	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ske	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	9	8	4	0	1	4	0	0	0
	2.874	0.425	1.105	0.000	0.014	0.218	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: Havasu Cr
Date: 111190 0810-1910 hrs
Location: HAVASU CR. RKM 252.3
Type line: DRIFT RIGHT #65

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
631 Heteroleptis (adult)																					
	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				1.36	2.67																4.033
592 Simulium																					
	0	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.080			0.38	0.67														1.126
965 Homoptera (terrestrials & nymphs and adults)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.433																		0.433
440 Orthocladiinae																					
	0	2	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
		0.007	0.056	0.14	0.14																0.348
410 Chironomidae (adult)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
411 Chironomidae (pupae)																					
	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.19																	0.193
14 Beetle sp.																					
	0	0	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.033	0.11	0.80																0.966

Total weights & numbers in each of 20 columns:

0	2	9	8	7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.007	0.602	1.81	1.80	0.58	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 28
Total weight: 7.2548

Total number & weight of Terrestrials: 2 0.6104
Total number & weight of Aquatics: 26 6.6444

Total number & weight of Behavioral Drifters: 22 2.4183
Total number & weight of Accidental Drifters: 6 4.8365

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	19	5	0	0	0	2	2	0
	0.000	5.327	1.124	0.000	0.000	0.000	0.610	0.193	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	7	12	7	0	0	2	0	0	0
	5.157	0.348	1.140	0.000	0.000	0.610	0.000	0.000	0.000

Site: Havasu Cr
Date: 111190 0932-0132 hrs
Location: HAVASU CR. RKM 252.3
Type line: DRIFT RIGHT #61

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
440 Orthocladiinae																					
	0	0	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.028	0.04		0.12		0.29													0.477
592 Simulium																					
	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.055	0.17	0.19																0.411
592 Simulium																					
	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.027			0.38															0.405
410 Chironomidae (adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
631 Heteroleptis (adult)																					
	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			2.762																		2.762
14 Beetle sp.																					
	0	0	0	2	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
				0.22	0.27	2.20															2.686

Total weights & numbers in each of 20 columns:

0	0	11	5	2	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.000	2.915	0.42	0.46	2.70	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 25
Total weight: 6.7850

Total number & weight of Terrestrials: 1 0.0428
Total number & weight of Aquatics: 24 6.7422

Total number & weight of Behavioral Drifters: 19 3.9800
Total number & weight of Accidental Drifters: 6 2.8050

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	17	7	0	0	0	1	0	0
	0.000	5.926	0.816	0.000	0.000	0.000	0.043	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	12	5	7	0	0	1	0	0	0
	3.579	0.477	2.686	0.000	0.000	0.043	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: [illegible]
Date: [illegible]
Location: HAVASUCR.
Type line: DRIFT LEFT #60

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
16 Baetis sp.																					
	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
				0.11	0.80																0.914
10 Baetidae																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
440 Orthocladiinae																					
	0	1	8	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	14
		0.003	0.113	0.11			0.39														0.614
410 Chironomidae (adult)																					
	0	0	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.043	0.10	0.53																0.673
411 Chironomidae (pupae)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
631 Heteroleptis (adult)																					
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			1.105																		1.105
592 Simulium																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.027	0.08																	0.109
573 Antocha																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.01																	0.009
Total weights & numbers in each of 20 columns:																					
	0	2	12	7	7	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.009	1.287	0.40	1.52	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 30

Total weight: 3.6064

Total number & weight of Terrestrials: 5 0.6727

Total number & weight of Aquatics: 25 2.9338

Total number & weight of Behavioral Drifters: 21 1.6422

Total number & weight of Accidental Drifters: 9 1.9643

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	22	2	0	0	0	5	1	0
	0.000	2.647	0.109	0.000	0.000	0.000	0.673	0.178	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	5	16	6	0	0	5	0	0	0
	1.223	0.614	1.097	0.000	0.000	0.673	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/5/90 0655-0755 hrs
Location: NATL CANYON
Type line: DRIFT #133

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.388	0.325																		0.712
958 Thysanoptera (thrips)																					
	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.019	0.091																		0.110
813 Cyclopoid copepod																					
	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.016	0.033																		0.048
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
410 Chironomidae (adult)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
411 Chironomidae (pupae)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.18																0.178
890 Gammarus																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
				0.20													22.93				23.134
Total weights & numbers in each of 20 columns:																					
	0	10	4	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
	0.000	0.544	0.448	0.30	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.93	0.00	0.00	0.00	

Cumulative total number of specimens: 18
Total weight: 24.4005

Total number & weight of Terrestrials: 10 0.9190
Total number & weight of Aquatics: 8 23.4815

Total number & weight of Behavioral Drifters: 6 23.1821
Total number & weight of Accidental Drifters: 12 1.2184

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	2	0	4	0	1	0	10	1	0
	23.134	0.000	0.048	0.000	0.122	0.000	0.919	0.178	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	2	1	0	1	10	4	0	0
	0.000	23.134	0.178	0.000	0.122	0.919	0.048	0.000	0.000

Site: COLORADO RIVER
Date: 11/5/90 0655-0755 hrs
Location: NATL CANYON
Type line: DRIFT NET #127

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.012	0.043	0.10																	0.152
440 Orthocladiinae																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.07																0.071
592 Simulium																					
	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.053	0.25																	0.301
813 Cyclopoid copepod																					
	3	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
	0.000	0.053	0.033																		0.086
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.194	0.974																		1.168
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
890 Gammarus																					
	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
							1.32														1.325
633 Heteroleptis (larvae)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.13																	0.134
Total weights & numbers in each of 20 columns:																					
	3	15	7	5	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.390	1.102	0.48	0.07	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 32
Total weight: 3.3670

Total number & weight of Terrestrials: 9 1.3292
Total number & weight of Aquatics: 23 2.0377

Total number & weight of Behavioral Drifters: 21 1.7821
Total number & weight of Accidental Drifters: 11 1.5849

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	2	19	0	1	0	9	0	0
	1.325	0.205	0.386	0.000	0.122	0.000	1.329	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	6	2	0	0	1	9	14	0	0
	0.435	1.396	0.000	0.000	0.122	1.329	0.086	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible] NAIL CANYON [illegible]
Type line: DRIFT #136

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	1	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	3
		0.194	0.325																		0.518
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
813 Cyclopoid copepod																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.011																			0.011
964 Aquatic Hymenoptera																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055
956 Coleoptera (terrestrials & larvae)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.18																	0.182

Total weights & numbers in each of 20 columns:

0	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.269	0.325	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 8
Total weight: 0.7757

Total number & weight of Terrestrials: 5 0.7099
Total number & weight of Aquatics: 3 0.0658

Total number & weight of Behavioral Drifters: 2 0.0105
Total number & weight of Accidental Drifters: 6 0.7652

FUNCTIONAL group totals (1 - 9):	Shrekker	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	0	0	2	0	0	0	5	0	1
	0.000	0.000	0.011	0.000	0.000	0.000	0.710	0.000	0.055

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
	0	0	0	1	0	5	2	0	0
	0.000	0.000	0.000	0.055	0.000	0.710	0.011	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible] NAIL CANYON [illegible]
Type line: DRIFT #132

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.194	0.649																		0.843
958 Thysanoptera (thrips)																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.019	0.045																		0.065
961 Diptera (terrestrials & adults)																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.325	0.72																	1.044
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
410 Chironomidae (adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043

Total weights & numbers in each of 20 columns:

0	5	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.355	1.062	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 11
Total weight: 2.1164

Total number & weight of Terrestrials: 10 1.9947
Total number & weight of Aquatics: 1 0.1217

Total number & weight of Behavioral Drifters: 0 0.0000
Total number & weight of Accidental Drifters: 11 2.1164

FUNCTIONAL group totals (1 - 9):	Shrekker	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
	0	0	0	0	1	0	10	0	0
	0.000	0.000	0.000	0.000	0.122	0.000	1.995	0.000	0.000

MODE of attachment tots (1 - 9):	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
	0	0	0	0	1	10	0	0	0
	0.000	0.000	0.000	0.000	0.122	1.995	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River at National Canyon 11/6/90 1800-2400
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 11/6/90 0045-0145 hrs
Location: NATL CANYON Reach 2
Type line: DRIFT #33

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.388																			0.388
610 Chironomidae (adult)																					
	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.043	0.29																	0.333
813 Cyclopoid copepod																					
	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.026	0.098																		0.124
863 Hydra																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041
440 Orthocladiinae																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.12															0.123
592 Simulium																					
	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.080	0.17																	0.245

Total weights & numbers in each of 20 columns:

0	10	7	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.455	0.221	0.46	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 23

Total weight: 1.2562

Total number & weight of Terrestrials: 8 0.7206

Total number & weight of Aquatics: 15 0.5335

Total number & weight of Behavioral Drifters: 14 0.4927

Total number & weight of Accidental Drifters: 9 0.7615

	Shredder	Col-path	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	15	0	1	0	8	0	0
	0.000	0.123	0.369	0.000	0.041	0.000	0.721	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Planit	Parasite	--
MODE of attachment tots (1 - 9):	6	1	0	0	0	8	8	0	0
	0.286	0.123	0.000	0.000	0.000	0.721	0.124	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Single net

Site: COLORADO RIVER
Date: [illegible]
Location: @ HAIL CANYON [illegible]
Type line: DRIFT #29

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
592 Simulium	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.027	0.17																	0.192
953 Aphidae, Phylloxeridae (nymph & adult)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
813 Cyclopoid copepod	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	0.000	0.005	0.033																		0.038
440 Orthocladiinae	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
						0.12															0.123

Total weights & numbers in each of 20 columns:

1	1	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.005	0.384	0.17	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 8
Total weight: 0.6779

Total number & weight of Terrestrials: 1 0.3246
Total number & weight of Aquatics: 7 0.3532

Total number & weight of Behavioral Drifters: 7 0.3532
Total number & weight of Accidental Drifters: 1 0.3246

	Shredder	Col-goth	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	4	0	0	0	1	0	0
	0.000	0.123	0.230	0.000	0.000	0.000	0.325	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	3	1	0	0	0	1	3	0	0
	0.192	0.123	0.000	0.000	0.000	0.325	0.038	0.000	0.000

Single net

Site: COLORADO RIVER
Date: [illegible]
Location: @ HAIL CANYON [illegible]
Type line: DRIFT #35

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.194																			0.194
410 Chironomidae (adult)	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.086																		0.086
440 Orthocladiinae	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
					0.36																0.355
592 Simulium	0	1	4	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
		0.005	0.106	0.25	0.58																0.937
813 Cyclopoid copepod	1	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
	0.000	0.037	0.131																		0.168
863 Hydra	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.082																			0.082
958 Thysanoptera (thrips)	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.019	0.045																		0.065
810 Hydracarina	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122

Total weights & numbers in each of 20 columns:

1	15	11	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.458	0.368	0.25	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 38
Total weight: 2.0073

Total number & weight of Terrestrials: 7 0.3441
Total number & weight of Aquatics: 31 1.6633

Total number & weight of Behavioral Drifters: 28 1.4598
Total number & weight of Accidental Drifters: 10 0.5475

	Shredder	Col-goth	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	5	23	0	3	0	7	0	0
	0.000	0.355	1.104	0.000	0.203	0.000	0.344	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ski	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	13	5	0	0	1	7	12	0	0
	1.018	0.355	0.000	0.000	0.122	0.344	0.168	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible] NATL CANYON [illegible]
Type line: DRIFT #32

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
592 Simulium	0	0	4	4	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	13
			0.106	0.33	0.58		1.33														2.345
813 Cyclopoid copepod	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
	0.000	0.011	0.065																		0.076
440 Orthocladiinae	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
					0.14	0.12															0.266
810 Hydracarina	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.243																			0.243
953 Aphidae, Phylloxeridae (nymph & adult)	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.649																		0.649
863 Hydra	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041
410 Chironomidae (adult)	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.086																		0.086
958 Thysanoptera (thrips)	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.029																			0.029
240 Physcophilidae	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.003																			0.003

Total weights & numbers in each of 20 columns:

0	9	10	4	5	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.326	0.906	0.33	0.72	0.12	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 31

Total weight: 3.7375

Total number & weight of Terrestrials: 7 0.7637

Total number & weight of Aquatics: 24 2.9739

Total number & weight of Behavioral Drifters: 20 2.6870

Total number & weight of Accidental Drifters: 11 1.0506

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	3	17	0	4	0	7	0	0
	0.000	0.266	2.421	0.000	0.287	0.000	0.764	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	15	3	0	0	2	7	4	0	0
	2.389	0.266	0.000	0.000	0.243	0.764	0.076	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible] NATL CANYON [illegible]
Type line: DRIFT #31

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
592 Simulium	0	1	2	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		0.005	0.053	0.41		0.38															0.850
813 Cyclopoid copepod	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	0.000	0.005	0.033																		0.038
410 Chironomidae (adult)	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.043	0.10																	0.139
953 Aphidae, Phylloxeridae (nymph & adult)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.196																			0.196
863 Hydra	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041

Total weights & numbers in each of 20 columns:

1	5	4	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.245	0.129	0.51	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 17

Total weight: 1.2620

Total number & weight of Terrestrials: 4 0.3356

Total number & weight of Aquatics: 13 0.9286

Total number & weight of Behavioral Drifters: 12 0.8877

Total number & weight of Accidental Drifters: 5 0.3742

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	12	0	1	0	4	0	0
	0.000	0.000	0.888	0.000	0.041	0.000	0.333	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	--
MODE of attachment tots (1 - 9):	10	0	0	0	0	4	3	0	0
	0.891	0.000	0.000	0.000	0.000	0.333	0.038	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible] 1835-1935 hrs
Location: [illegible] NATL CANYON [illegible]
Type line: DRIFT #34

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
		0.685	0.974																		1.459
410 Chironomidae (adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
440 Orthocladiinae																					
	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.014	0.04																	0.050
592 Simulium																					
	0	0	0	5	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	9
				0.61		1.14		1.08													2.628
813 Cyclopoid copepod																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.011	0.033																		0.043
958 Thysanoptera (thrips)																					
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.029																			0.029
Total weights & numbers in each of 20 columns:																					
	0	10	6	6	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.524	1.063	0.45	0.00	1.14	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 26
Total weight: 4.2507

Total number & weight of Terrestrials: 12 1.5302
Total number & weight of Aquatics: 14 2.7206

Total number & weight of Behavioral Drifters: 14 2.7206
Total number & weight of Accidental Drifters: 12 1.5302

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	12	0	0	0	12	0	0
	0.000	0.050	2.671	0.000	0.000	0.000	1.530	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	9	2	0	0	0	12	3	0	0
	2.628	0.050	0.000	0.000	0.000	1.530	0.043	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible] NATL CANYON [illegible]
Type line: DRIFT #28

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
813 Cyclopoid copepod																					
	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	0.000	0.005																			0.005
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
592 Simulium																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.08																	0.08
Total weights & numbers in each of 20 columns:																					
	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.005	0.325	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 4
Total weight: 0.4125

Total number & weight of Terrestrials: 1 0.3246
Total number & weight of Aquatics: 3 0.0879

Total number & weight of Behavioral Drifters: 3 0.0879
Total number & weight of Accidental Drifters: 1 0.3246

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	3	0	0	0	1	0	0
	0.000	0.000	0.088	0.000	0.000	0.000	0.325	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	1	0	0	0	0	1	2	0	0
	0.083	0.000	0.000	0.000	0.000	0.325	0.005	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: [illegible] NATL CANYON [illegible]
Type line: DRIFT #37

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.388																			0.388
410 Chironomidae (adult)																					
	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
			0.128	0.19																	0.322
440 Orthocladiinae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.04																	0.036
592 Simulium																					
	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.053		0.19																0.246
800 Collembola																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.009																			0.009
813 Cyclopoid copepod																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.005																			0.005
Total weights & numbers in each of 20 columns:																					
	0	6	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.402	0.182	0.23	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 15

Total weight: 1.0048

Total number & weight of Terrestrials: 9 0.7095

Total number & weight of Aquatics: 6 0.2953

Total number & weight of Behavioral Drifters: 5 0.2866

Total number & weight of Accidental Drifters: 10 0.7182

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	4	0	0	0	9	0	0
	0.000	0.044	0.251	0.000	0.000	0.000	0.710	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	3	1	0	0	0	10	1	0	0
	0.246	0.036	0.000	0.000	0.000	0.718	0.005	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River
Upstream from Diamond Cr. 111S150 0800-0900 Sample #4
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 111S150 0900-0500 hrs
Location: Upstream from Diamond Cr. RKM 363.1
Type line: DRIFT #7

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
955 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.194	0.649																		0.843
964 Aquatic Hymenoptera																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.055																			0.055

Total weights & numbers in each of 20 columns:

0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.249	0.649	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 5

Total weight: 0.8984

Total number & weight of Terrestrials: 4 0.8431

Total number & weight of Aquatics: 1 0.0553

Total number & weight of Behavioral Drifters: 0 0.0000

Total number & weight of Accidental Drifters: 5 0.8984

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	0	0	4	0	1
	0.000	0.000	0.000	0.000	0.000	0.000	0.843	0.000	0.055

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	1	0	4	0	0	0
	0.000	0.000	0.000	0.055	0.000	0.843	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River
Upstream from Diamond Cr. 11/5/90 @ 1155 hr. Sample #3
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 11/5/90 11:55-2:50 hrs
Location: Upstream from Diamond Cr Rkm 363.1
Type line: DRIFT #8

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	10T
440 Orthocladiinae																					
	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
					0.14																0.142
598 Cricotia																					
	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.055	0.17																	0.218
863 Hydra																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.041																			0.041
556 Chaitifera																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.014																		0.014

Total weights & numbers in each of 20 columns:

0	1	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.041	0.067	0.17	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 8

Total weight: 0.4155

Total number & weight of Terrestrials: 0 0.0000

Total number & weight of Aquatics: 8 0.4155

Total number & weight of Behavioral Drifters: 6 0.3605

Total number & weight of Accidental Drifters: 2 0.0550

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	4	0	2	0	0	0	0
	0.000	0.142	0.218	0.000	0.055	0.000	0.000	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ske	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	5	2	0	0	1	0	0	0	0
	0.259	0.142	0.000	0.000	0.014	0.000	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River
upstream from Diamond Crk. 11/5/90 1700-1800hrs Sample # 107
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Colorado River upstream from Diamond Crk. 11/6/90 0000-0600hrs
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River upstream from Diamond Crk 11/6/90 0600-1200 L.t.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 11/6/90 0600-1200 L.t.
Location: upstream from Diamond Cr. River 363.1
Type line: DRIFT #101

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
410 Chironomidae (adult)																					
	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.128	0.10																	0.225
205 Trichoptera adults																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.252																		0.252
206 Trichoptera larvae																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.039																		0.039
640 Elmidae (larvae)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040
953 Aphidae, Phyllozeridae (nymph & adult)																					
	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.097	0.649																		0.746
598 Cnemia																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.19																0.193
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010
Total weights & numbers in each of 20 columns:																					
	0	2	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.107	1.108	0.10	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 12

Total weight: 1.5042

Total number & weight of Terrestrials: 9 1.2332

Total number & weight of Aquatics: 3 0.2710

Total number & weight of Behavioral Drifters: 1 0.1926

Total number & weight of Accidental Drifters: 11 1.3116

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	1	1	0	0	0	9	0	0
	0.039	0.040	0.193	0.000	0.000	0.000	1.233	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	2	0	0	1	0	9	0	0	0
	0.232	0.000	0.000	0.039	0.000	1.233	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Ta[redacted] 5. [redacted] fun[redacted]al g[redacted]ing [redacted]ber[redacted]d bi[redacted]s of [redacted]hic [redacted]nisi[redacted]
captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: 11/13/90 @ 2130-2145 hrs.
Location: upstream from Diamond Cr. [illegible]
Type line: 0129

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
598 Cnephia																					
	0	1	0	9	9	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	30
		0.005		0.74	1.73	2.27	3.33														8.083
810 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
956 Coleoptera (terrestrials & larvae)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.146																		0.146
205 Trichoptera adults																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.252																		0.252
964 Aquatic Hymenoptera																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.111																			0.111
800 Collembola																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.009																			0.009
952 Araneida (spiders)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.147																			0.147
632 Ordobrevia (larvae)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.13																	0.134
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
		1.066	0.325																		1.391
958 Thysanoptera (thrips)																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.019	0.045																		0.065
440 Orthocladiinae																					
	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.014	0.07	0.07																0.156
410 Chironomidae (adult)																					
	0	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.012	0.128	0.19																	0.334
813 Cyclopoid copepod																					
	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.011	0.098																		0.109
265 Ochrotrichia																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.104																		0.104

Total weights & numbers in each of 20 columns:

0	22	12	14	10	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	1.501	1.113	1.14	1.80	2.27	3.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 69

Total weight: 11.1613

Total number & weight of Terrestrials: 24 2.3353

Total number & weight of Aquatics: 45 8.8260

Total number & weight of Behavioral Drifters: 39 8.3476

Total number & weight of Accidental Drifters: 30 2.8137

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	6	35	0	1	1	24	0	2
	0.000	0.299	8.191	0.000	0.122	0.104	2.335	0.000	0.111

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	31	4	0	3	1	25	5	0	0
	8.216	0.156	0.000	0.214	0.122	2.344	0.109	0.000	0.000

Colorado River upstream from Diamond Crk 11/7/90 0000-0600 hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Composite of two nets

Site: Diamond C.
Date: [illegible]
Location: [illegible] DIAMOND CREEK [illegible]
Type line: DRIFT NET #112

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325

Total weights & numbers in each of 20 columns:

0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.000	0.325	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 1

Total weight: 0.3246

Total number & weight of Terrestrials: 1 0.3246

Total number & weight of Aquatics: 0 0.0000

Total number & weight of Behavioral Drifters: 0 0.0000

Total number & weight of Accidental Drifters: 1 0.3246

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	0	0	1	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	0.325	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	1	0	0	0
	0.000	0.000	0.000	0.000	0.000	0.325	0.000	0.000	0.000

Composite of two nets

Site: COLORADO RIVER
Date: [illegible]
Location: AT COLUMBINE FALLS [illegible]
Type line: DRIFT #122 14'FROM LB ACROSS FROM CAMPGROUND, INNER NET

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)	0	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		0.194	2.272																		2.466
958 Thysanoptera (thrips)	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.029																			0.029
592 Simulium	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.053	0.08	0.19																0.325
410 Chironomidae (adult)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
669 Microcylloepus (larvae)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.040																		0.040
981 Diptera (terrestrials & adults)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097

Total weights & numbers in each of 20 columns:

0	6	11	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.320	2.408	0.08	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 19

Total weight: 3.0028

Total number & weight of Terrestrials: 14 2.6348

Total number & weight of Aquatics: 5 0.3681

Total number & weight of Behavioral Drifters: 4 0.3283

Total number & weight of Accidental Drifters: 15 2.6745

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	4	1	0	0	14	0	0
	0.000	0.000	0.328	0.040	0.000	0.000	2.635	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	5	0	0	0	0	14	0	0	0
	0.368	0.000	0.000	0.000	0.000	2.635	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River at Columbine Falls 111590 0720-0820 water net
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Site: COLORADO RIVER
Date: 111590 0915-1015 [illegible]
Location: [illegible] COLUMBINE FALLS [illegible] 2685
Type line: DRIFT #115

Composite of two nets

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.325																		0.325
961 Diptera (terrestrials & adults)																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					1.30																1.30
Total weights & numbers in each of 20 columns:																					
	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.000	0.325	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 2

Total weight: 1.6288

Total number & weight of Terrestrials: 2 1.6288

Total number & weight of Aquatics: 0 0.0000

Total number & weight of Behavioral Drifters: 0 0.0000

Total number & weight of Accidental Drifters: 2 1.6288

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	0	0	2	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	1.629	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skm	Plankt	Parasite	--
MODE of attachment tots (1 - 9):	0	0	0	0	0	2	0	0	0
	0.000	0.003	0.000	0.000	0.000	1.629	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Single net

Site: COLORADO RIVER
Date: 11/5/90 1330-1430 hrs
Location: AA COLUMBINE FALLS RKM 368.5
Type line: DRIFT OUTER NET #116

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	7	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
		0.679	2.597																		3.275
958 Thysanoptera (thrips)																					
	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.010	0.091	0.13																	0.226
410 Chironomidae (adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
800 Collembola																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.009																			0.009
830 Hydracarina																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
961 Diptera (terrestrials & adults)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
Total weights & numbers in each of 20 columns:																					
	0	11	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.915	2.730	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 23
Total weight: 3.7719

Total number & weight of Terrestrials: 21 3.6415
Total number & weight of Aquatics: 2 0.1304

Total number & weight of Behavioral Drifters: 0 0.0000
Total number & weight of Accidental Drifters: 23 3.7719

	Shredder	Col gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	0	0	1	0	21	0	0
	0.000	0.009	0.000	0.000	0.122	0.000	3.642	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sko	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	1	22	0	0	0
	0.000	0.000	0.000	0.000	0.122	3.650	0.000	0.000	0.000

Single net

Site: COLORADO RIVER
Date: 11/5/90 1330-1430
Location: AA COLUMBINE FALLS RKM 368.5
Type line: DRIFT #126 30'FROM RB

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
		0.679	4.220																		4.899
958 Thysanoptera (thrips)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.019																			0.019
592 Simulium																					
	0	0	1	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6
			0.027	0.08	0.58		0.67														1.353
410 Chironomidae (adult)																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.10																	0.097
961 Diptera (terrestrials & adults)																					
	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.194	0.325																		0.518
440 Orthocladiinae																					
	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
					0.07																0.071
Total weights & numbers in each of 20 columns:																					
	0	11	15	2	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0.000	0.892	4.571	0.18	0.65	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Cumulative total number of specimens: 33
Total weight: 6.9566

Total number & weight of Terrestrials: 26 5.5329
Total number & weight of Aquatics: 7 1.4236

Total number & weight of Behavioral Drifters: 7 1.4236
Total number & weight of Accidental Drifters: 26 5.5329

	Shredder	Col gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	1	6	0	0	0	26	0	0
	0.000	0.071	1.353	0.000	0.000	0.000	5.533	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sko	Plankt	Parasite	--
MODE of attachment tots (1 - 9):	6	1	0	0	0	26	0	0	0
	1.353	0.071	0.000	0.000	0.000	5.533	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Single net

River: COLORADO RIVER
Date: 11/5/90 1925-2025 hrs
Location: at COLUMBINE FALLS RKM 3685
Type time: DRIFT INNER NET #113

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloaeridae (nymph & adult)	0	9	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
		0.872	1.948																		2.820
410 Orthocladiinae	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
			0.014		0.07																0.085
522 Simulium	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.08																	0.083
958 Thysanoptera (thrips)	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
		0.029																			0.029
261 Diptera (terrestrials & adults)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
411 Chironomidae (pupae)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043

Total weights & numbers in each of 20 columns:

0	13	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.999	2.005	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 23
Total weight: 3.1565

Total number & weight of Terrestrials: 19 2.9459
Total number & weight of Aquatics: 4 0.2106

Total number & weight of Behavioral Drifters: 3 0.1678
Total number & weight of Accidental Drifters: 20 2.9887

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	2	1	0	0	0	19	1	0
	0.000	0.085	0.083	0.000	0.000	0.000	2.946	0.043	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skb	Planktonic	Parasite	---
MODE of attachment tots (1 - 9):	1	2	1	0	0	19	0	0	0
	0.083	0.085	0.043	0.000	0.000	2.946	0.000	0.000	0.000

Single net

River: COLORADO RIVER
Date: 11/5/90 1125-2025 hrs
Location: at COLUMBINE FALLS RKM 3685
Type time: DRIFT outer net #103

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
958 Thysanoptera (thrips)	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
		0.038	0.091																		0.129
953 Aphidae, Phylloaeridae (nymph & adult)	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
		0.368	1.298																		1.666
410 Chironomidae (adult)	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.10	0.18																0.274
950 Formicidae (ants)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.050	0.188																		0.238
630 Staphylinidae (adult only)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				1.36																	1.352
760 Corixidae	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
					2.31		5.69														7.799

Total weights & numbers in each of 20 columns:

0	9	7	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.477	1.577	1.46	2.29	0.00	5.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 21
Total weight: 11.6884

Total number & weight of Terrestrials: 18 2.3281
Total number & weight of Aquatics: 3 9.1603

Total number & weight of Behavioral Drifters: 0 0.0000
Total number & weight of Accidental Drifters: 21 11.6884

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	1	2	18	0	0
	0.000	0.000	0.000	0.000	1.362	7.799	2.328	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Skb	Planktonic	Parasite	---
MODE of attachment tots (1 - 9):	1	0	2	0	0	18	0	0	0
	1.362	0.000	7.799	0.000	0.000	2.328	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River at Columbine Falls 11/6/90 0720-0820 [illegible]
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

Composite of two nets

Site: COLORADO RIVER
Date: 11/6/90 [illegible]
Location: at COLUMBINE FALLS 2KM [illegible]
Type line: DRIFT NTTA

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

FEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
353 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.027	1.298																		1.325
592 Simulium																					
	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
						0.38															0.379
761 Diptera (terrestrials & adults)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
513 Cyclopoid copepod																					
	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.005	0.033																		0.038

Total weights & numbers in each of 20 columns:

0	3	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.199	1.331	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 9

Total weight: 1.7092

Total number & weight of Terrestrials: 6 1.4923

Total number & weight of Aquatics: 3 0.4169

Total number & weight of Behavioral Drifters: 3 0.4169

Total number & weight of Accidental Drifters: 6 1.4923

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	3	0	0	0	6	0	0
	0.000	0.000	0.417	0.000	0.000	0.000	1.492	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	1	0	0	0	0	6	2	0	0
	0.379	0.000	0.000	0.000	0.000	1.492	0.038	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Single net

Site: COLORADO RIVER
Date: 11/6/90 0930-0940 hrs
Location: at COLUMBINE FALLS RKM 3685
Type time: DRIFT OUTER NET #78

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
958 Thysanoptera (thrips)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.019																			0.019
410 Chironomidae (adult)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
953 Aphidae, Phylloxeridae (nymph & adult)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.027																			0.027
995 Terrestrial mite	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
592 Simulium	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.08																	0.085

Total weights & numbers in each of 20 columns:

0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.258	0.043	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 6

Total weight: 0.3632

Total number & weight of Terrestrials: 4 0.1590

Total number & weight of Aquatics: 2 0.2043

Total number & weight of Behavioral Drifters: 1 0.0826

Total number & weight of Accidental Drifters: 5 0.2807

FUNCTIONAL group totals (1 - 9):

Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
0	0	1	0	1	0	4	0	0
0.000	0.000	0.085	0.000	0.122	0.000	0.159	0.000	0.000

MODE of attachment tots (1 - 9):

Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
1	0	0	0	1	4	0	0	0
0.085	0.000	0.000	0.000	0.122	0.159	0.000	0.000	0.000

Single net

Site: COLORADO RIVER
Date: 11/6/90 1300-1400 hrs
Location: at COLUMBINE FALLS RKM 3685
Type time: DRIFT #131

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOT
953 Aphidae, Phylloxeridae (nymph & adult)	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.194	0.974																		1.168
958 Thysanoptera (thrips)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010

Total weights & numbers in each of 20 columns:

0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.203	0.974	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 6

Total weight: 1.1773

Total number & weight of Terrestrials: 6 1.1773

Total number & weight of Aquatics: 0 0.0000

Total number & weight of Behavioral Drifters: 0 0.0000

Total number & weight of Accidental Drifters: 6 1.1773

FUNCTIONAL group totals (1 - 9):

Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
0	0	0	0	0	0	6	0	0
0.000	0.000	0.000	0.000	0.000	0.000	1.177	0.000	0.000

MODE of attachment tots (1 - 9):

Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	--
0	0	0	0	0	6	0	0	0
0.000	0.000	0.000	0.000	0.000	1.177	0.000	0.000	0.000

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Site: COLORADO RIVER
Date: [illegible]
Location: at COLUMBINE FALLS RKM 368.5
Type line: DRIFT OUTER NET #78

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
958 Thysanoptera (thrips)																					
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		0.019																			0.019
410 Chironomidae (adult)																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.043																		0.043
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.097																			0.097
995 Terrestrial mite																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.122																			0.122
592 Simulium																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.08																	0.083

Total weights & numbers in each of 20 columns:

0	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.238	0.043	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 6

Total weight: 0.3632

Total number & weight of Terrestrials: 4 0.1590

Total number & weight of Aquatics: 2 0.2043

Total number & weight of Behavioral Drifters: 1 0.0826

Total number & weight of Accidental Drifters: 5 0.2807

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	1	0	1	0	4	0	0
	0.000	0.000	0.083	0.000	0.122	0.000	0.159	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sko	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	1	0	0	0	1	4	0	0	0
	0.083	0.000	0.000	0.000	0.122	0.159	0.000	0.000	0.000

Site: COLORADO RIVER
Date: [illegible]
Location: at COLUMBINE FALLS RKM 368.5
Type line: DRIFT #131

Single net

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

SPEC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
953 Aphidae, Phylloxeridae (nymph & adult)																					
	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
		0.194	0.974																		1.168
958 Thysanoptera (thrips)																					
	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0.010																			0.010

Total weights & numbers in each of 20 columns:

0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.203	0.974	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 6

Total weight: 1.1773

Total number & weight of Terrestrials: 6 1.1773

Total number & weight of Aquatics: 0 0.0000

Total number & weight of Behavioral Drifters: 0 0.0000

Total number & weight of Accidental Drifters: 6 1.1773

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non-feed	Parasite
FUNCTIONAL group totals (1 - 9):	0	0	0	0	0	0	6	0	0
	0.000	0.000	0.000	0.000	0.000	0.000	1.177	0.000	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Sko	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	0	0	0	0	0	6	0	0	0
	0.000	0.000	0.000	0.000	0.000	1.177	0.000	0.000	0.000

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Single ne:

Site: COLORADO RIVER
Date: 11/6/90 1800-2400 hrs
Location: at COLUMBINE FALLS RKM 306.5
Time time: DRIFT #130 INSIDE NET

Total lengths in each length category (second line also, if > 20 columns) followed by calculated weights:

TFC	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	101
253 Aphidae, Phylloxeridae (nymph & adult)																					
	0	6	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
		0.388	4.869																		5.257
258 Thysanoptera (thrips)																					
	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
		0.067	0.181																		0.249
592 Simulium																					
	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
				0.08		0.38															0.461
261 Diptera (terrestrials & adults)																					
	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
			0.974																		0.974
440 Orthocladiinae																					
	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
			0.014	0.07		0.12															0.209
820 Cernotina																					
	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			0.071																		0.071
410 Chironomidae (adult)																					
	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		0.012	0.043	0.19																	0.249
299 Trichoptera pupae																					
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0.67																	0.670

Total weights & numbers in each of 20 columns:

0	12	25	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.467	6.153	1.02	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Cumulative total number of specimens: 45

Total weight: 8.1597

Total number & weight of Terrestrials: 37 6.7282

Total number & weight of Aquatics: 8 1.4116

Total number & weight of Behavioral Drifters: 7 0.7414

Total number & weight of Accidental Drifters: 38 7.5983

	Shredder	Col-gath	Col-filt	Scrape	Pred	Pierce	Terrest	Non feed	Parasite
FUNCTIONAL group totals (1 - 9):	1	4	2	0	0	0	37	1	0
	0.071	0.209	0.461	0.000	0.000	0.000	6.728	0.670	0.000

	Cling	Burrow	Swim	Climb	Sprawl	Surf-Ska	Plankt	Parasite	---
MODE of attachment tots (1 - 9):	3	5	0	0	0	37	0	0	0
	1.152	0.280	0.000	0.000	0.000	6.728	0.000	0.000	0.000

Colorado River at Columbine Falls 11/6/90 1800-2400 hrs
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 15. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the November 1990 synoptic experiment--Continued

Colorado River at Columbine Falls 11/7/90 0000-0600 hrs.
THE DATA FROM THIS SAMPLING PERIOD IS PRESENTLY UNAVAILABLE
BUT WILL BE ENTERED AS SOON AS IT IS RECEIVED.

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 16. Taxa, functional grouping, numbers, and biomass of benthic organisms captured in 10 cm orifice diameter drift nets for the June 1991 synoptic experiment

PRELIMINARY RESULTS
SUBJECT TO REVISION

JUNE 1991 SYNOPTIC EXPERIMENT BENTHIC DRIFT DATA UNAVAILABLE AT THIS DATE, DECEMBER 18, 1991.

Table 17. Detrital biomass collected with 10 cm orifice diameter drift nets for the November 1990 synoptic experiment

PRELIMINARY RESULTS SUBJECT TO REVISION

LOCATION OF NETS	MONTH-DAY YEAR-TIME	SAMPLE APPEARANCE	DRY WT SAMPLE (g)	LOSS ON IGNITION (g)	VOLUME OF WATER (l)	BIOMASS (mg/l)
COLORADO RIVER AT GLEN CANYON USGS GAGE	11-5-90 0850-0950	FILAMENTOUS ALGAE	2.5905	0.5957	23660	0.0252
COLORADO RIVER AT GLEN CANYON USGS GAGE	11-5-90 1325-1425	FILAMENTOUS ALGAE FEW TWIGS & DETRITUS	2.0926	0.2553	22600	0.0113
COLORADO RIVER AT GLEN CANYON USGS GAGE	11-5-90 1855-1955	LIGHT GREEN FILAMENTOUS ALGAE *	1.7390	0.0999	16180	0.0062
COLORADO RIVER AT GLEN CANYON USGS GAGE	11-6-90 0120-0220	TAN FILAMENTOUS ALGAE & DETRITUS	1.7458	0.0325	3160	0.0103
COLORADO RIVER AT GLEN CANYON USGS GAGE	11-6-90 0735-0835	ALGAE LIGHT GREEN TAN & TWIGS	2.5675	0.5512	19220	0.0287
COLORADO RIVER AT GLEN CANYON USGS GAGE	11-6-90 1355-1455	LIGHT GREEN FILAMENTOUS ALGAE	1.8113	0.0890	12460	0.0071
COLORADO RIVER AT GLEN CANYON USGS GAGE	11-6-90 1855-1955	LIGHT GREEN FILAMAMENTOUS ALGAE & GRASS	0.9389	0.0546	11120	0.0049
COLORADO RIVER AT LEES FERRY USGS GAGE	11-5-90 0005-0105	LIGHT GREEN ALGAE	0.9198	0.0588	19570	0.0030
COLORADO RIVER AT LEES FERRY USGS GAGE	11-5-90 0641-0741	LIGHT GREEN FILAMENTOUS ALGAE*	1.0074	0.1210	43690	0.0028
COLORADO RIVER AT LEES FERRY USGS GAGE	11-5-90 0830-0930	LONG GREEN FILAMENTOUS ALGAE & DETRITUS*	2.4560	0.5455	25600	0.0213
COLORADO RIVER AT LEES FERRY USGS GAGE	11-5-90 1230-1330	FILAMENTOUS ALGAE & DETRITUS	6.5343	3.1791	72960	0.0436
COLORADO RIVER AT LEES FERRY USGS GAGE	11-5-90 1830-1930	GREEN FILAMETOUS ALGAE TWIGS DARK DETRITUS	1.1949	0.2639	12810	0.0206
COLORADO RIVER AT LEES FERRY USGS GAGE	11-6-90 2400-0100	LIGHT GREEN FILAMENTOUS ALGAE DARK DETRITUS*	1.0121	0.1340	19570	0.0068
COLORADO RIVER AT LEES FERRY USGS GAGE	11-6-90 0013-0113	LIGHT GREEN FILAMENTOUS ALGAE*	0.9014	0.0522	8990	0.0058
COLORADO RIVER AT LEES FERRY USGS GAGE	11-6-90 0825-0925	LIGHT TAN FILAMENTOUS ALGAE DETRITUS & TWIGS	2.0890	0.2683	60680	0.0044
COLORADO RIVER AT LEES FERRY USGS GAGE	11-6-90 1155-1215	VERY COARSE DARK GREEN FILAMENTOUS ALGAE	1.9619	1.5025	44480	0.0338
COLORADO RIVER AT LEES FERRY USGS GAGE	11-6-90 1830-1930	GREEN FILAMENTOUS ALGAE TWIGS DETRITUS	2.2079	0.3158	28910	0.0109
PARIA RIVER NEAR MOUTH	11-5-90 0022-0122	LEAVES TWIGS LEAFY BROWN COARSE DETRITUS	3.2800	1.4380	24560	0.0586
PARIA RIVER NEAR MOUTH	11-5-90 0622-0722	BROWN TAN FILAMENTOUS ALGAE LEAVES DETRITUS	2.3915	0.6126	24560	0.0249
PARIA RIVER NEAR MOUTH	11-5-90 1210-1310	LEAVES TWIGS & COARSE BROWN DETRITUS	3.2817	1.4925	14560	0.1025
PARIA RIVER NEAR MOUTH	11-5-90 1855-1955	LEAF TWIGS & ALGAE COARSE DETRITUS	2.0129	0.2049	24560	0.0083
PARIA RIVER NEAR MOUTH	11-6-90 0805-0905	TWIGS COARSE DETRITUS	4.1958	2.1141	38260	0.0553
PARIA RIVER NEAR MOUTH	11-6-90 1215-1315	LEAVES TWIGS GRASS COARSE BROWN DETRITUS	2.4583	0.5905	38260	0.0154
PARIA RIVER NEAR MOUTH	11-6-90 1330-1430	LEAVES GRASS TWIGS DETRITUS	2.7467	1.2670	19130	0.0662
PARIA RIVER NEAR MOUTH	11-6-90 2345-0045	LEAVES TWIGS AND VERY COARSE DETRITUS	5.2640	3.0247	38260	0.0791
COLORADO RIVER UPSTREAM FROM LITTLE COLORADO RIVER USGS GAGE	11-5-90 0835-0935	LIGHT GREEN FILAMENTOUS ALGAE DARK DETRITUS *	1.0097	0.1099	15037	0.0073

Table 17. Detrital biomass collected with 10 cm orifice diameter drift nets for the November 1990 synoptic experiment-Continued

PRELIMINARY RESULTS SUBJECT TO REVISION

COLORADO RIVER UPSTREAM FROM LITTLE COLORADO RIVER USGS GAGE	11-5-90 1352-1452	GREEN FILAMENTOUS ALGAE	1.8517	0.1727	25534	0.0068
COLORADO RIVER UPSTREAM FROM LITTLE COLORADO RIVER USGS GAGE	11-5-90 1915-2015	LIGHT GREEN DETRITUS & FILAMENTOUS ALGAE	2.2715	0.3588	14749	0.0243
COLORADO RIVER UPSTREAM FROM LITTLE COLORADO RIVER USGS GAGE	11-6-90 0105-0205	DARK GREEN DETRITUS	3.2037	0.9649	11646	0.0829
COLORADO RIVER UPSTREAM FROM LITTLE COLORADO RIVER USGS GAGE	11-6-90 0705-0805	DARK GREEN FILAMENTOUS ALGAE DARK DETRITUS	3.2638	1.7351	16815	0.1032
COLORADO RIVER UPSTREAM FROM LITTLE COLORADO RIVER USGS GAGE	11-6-90 1252-1352	DARK GREEN DETRITUS & FILAMENTOUS ALGAE	4.1361	1.6753	30873	0.0543
COLORADO RIVER UPSTREAM FROM LITTLE COLORADO RIVER USGS GAGE	11-6-90 1900-2000	DARK GREEN FILAMENTOUS ALGAE	3.0262	1.0092	9110	0.1108
COLORADO RIVER UPSTREAM FROM LITTLE COLORADO RIVER USGS GAGE	11-7-90 0058-0158	DARK GREEN FILAMENTOUS ALGAE	2.6857	0.6734	30962	0.0217
LITTLE COLORADO RIVER NEAR MOUTH	11-5-90 0725-0825	DARK GREEN DETRITUS	2.6040	0.5710	17794	0.0321
LITTLE COLORADO RIVER NEAR MOUTH	11-5-90 1240-1340	DARK GREEN DETRITUS	2.4752	0.4795	17794	0.0269
LITTLE COLORADO RIVER NEAR MOUTH	11-6-90 0020-0120	DARK GREEN DETRITUS	3.7923	1.9075	32830	0.0581
LITTLE COLORADO RIVER NEAR MOUTH	11-6-90 0620-0720	DARK GREEN DETRITUS & GRASS	1.7464	0.6420	37279	0.0172
LITTLE COLORADO RIVER NEAR MOUTH	11-6-90 1140-1240	DARK GREEN DETRITUS	1.8419	0.5572	11566	0.0482
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	11-5-90 0630-0730	VERY LIGHT GREEN TAN FILAMENTOUS ALGAE	0.8588	0.0549	15660	0.0035
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	11-5-90 1210-1310	VERY FINE DARK DETRITUS	2.8927	1.3096	7320	0.1789
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	11-6-90 0000-0100	GREY GREEN MED DETRITUS	1.9605	0.7297	7320	0.0997
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	11-6-90 0645-0745	VERY FINE DARK DETRITUS	1.8704	0.7322	8260	0.0886
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	11-6-90 1200-1300	COARSE BROWN GREEN DETRITUS LEAVES	2.7086	1.3180	19130	0.0689
BRIGHT ANGEL CREEK NEAR MOUTH	11-5-90 0842-0942	FINE TO MEDIUM GREY GREEN DETRITUS	1.1452	0.1603	15500	0.0103
BRIGHT ANGEL CREEK NEAR MOUTH	11-5-90 1434-1534	LIGHT GREEN FINE DETRITUS SMALL TWIGS	1.0034	0.1648	16730	0.0099
BRIGHT ANGEL CREEK NEAR MOUTH	11-6-90 0836-0936	DARK BROWN DETRITUS & TWIGS	1.1543	0.2175	12760	0.0170
BRIGHT ANGEL CREEK NEAR MOUTH	11-6-90 1345-1445	BROWN GREEN TWIGS DETRITUS PIECE EQUESTRIUM	0.9238	0.0730	17260	0.0042
BRIGHT ANGEL CREEK NEAR MOUTH	11-6-90 1800-1900	BROWN GREEN TWIGS DETRITUS PIECE EQUESTRIUM	1.1354	0.2501	15500	0.0161
BRIGHT ANGEL CREEK NEAR MOUTH	11-7-90 0115-0215	LEAVES TWIGS BROWN & TAN DETRITUS	1.2075	0.2487	15500	0.0160
COLORADO RIVER UPSTREAM FROM KANAB CREEK	11-5-90 0702-0802	VERY FINE DETRITUS DARK GREY GREEN ALGAE	2.5753	0.4238	8860	0.0478
COLORADO RIVER UPSTREAM FROM KANAB CREEK	11-5-90 1242-1342	VERY FINE DETRITUS DARK GREY GREEN ALGAE	3.2165	0.9492	21350	0.0445
COLORADO RIVER UPSTREAM FROM KANAB CREEK	11-5-90 1815-1906	FILAMENTOUS ALGAE & DARK GREEN DETRITUS	1.9647	0.5036	11300	0.0446
COLORADO RIVER UPSTREAM FROM KANAB CREEK	11-6-90 2316-0005	DARK GREEN FILAMENTOUS ALGAE & DETRITUS	1.9304	0.1787	11450	0.0156
COLORADO RIVER UPSTREAM FROM KANAB CREEK	11-6-90 0705-0800	TAN GRASS SEEDS & DARK DETRITUS	1.6752	0.0408	7590	0.0054
COLORADO RIVER UPSTREAM FROM KANAB CREEK	11-6-90 1200-1300	VERY FINE FILAMENTOUS ALGAE DARK DETRITUS	0.9340	0.0589	7220	0.0082
COLORADO RIVER UPSTREAM FROM KANAB CREEK	11-6-90 1730-1830	LIGHT TAN MEDIUM FINE DETRITUS	0.9308	0.0410	5690	0.0072
COLORADO RIVER UPSTREAM FROM KANAB CREEK	11-6-90 2335-0100	FINE DETRITUS	4.0305	2.0354	21300	0.0956
KANAB CREEK NEAR MOUTH	11-5-90 0638-0740	TAN DETRITUS	1.7735	0.0287	13760	0.0021

Table 17. Detrital biomass collected with 10 cm orifice diameter drift nets for the November 1990 synoptic experiment-Continued

PRELIMINARY RESULTS
SUBJECT TO REVISION

KANAB CREEK NEAR MOUTH	11-5-90 1225-1325	MEDIUM FINE DARK DETRITUS	1.7063	0.0061	11900	0.0005
KANAB CREEK NEAR MOUTH	11-5-90 1821-1927	FINE REDDISH TAN DETRITUS TWIG & LEAF	1.7720	0.0192	14480	0.0013
KANAB CREEK NEAR MOUTH	11-5-90 2326-0023	VERY FINE DETRITUS	0.8770	0.0035	5385	0.0006
KANAB CREEK NEAR MOUTH	11-6-90 0715-0815	BROWN DETRITUS	1.7082	0.0144	9640	0.0015
KANAB CREEK NEAR MOUTH	11-6-90 1247-1341	VERY FINE BROWN DETRITUS	0.9051	0.0253	6250	0.0040
KANAB CREEK NEAR MOUTH	11-6-90 1740-1835	DARK TAN DETRITUS	0.9178	0.0185	7550	0.0025
KANAB CREEK NEAR MOUTH	11-6-90 2345-0040	DARK GREEN FILAMENTOUS ALGAE & DETRITUS	1.0796	0.1659	6450	0.0257
COLORADO RIVER UPSTREAM FROM HAVASU CREEK	11-5-90 0845-0945	DARK GREEN FILAMENTOUS ALGAE & DETRIRUS	5.4050	2.4437	20196	0.1210
COLORADO RIVER UPSTREAM FROM HAVASU CREEK	11-5-90 1445-1515	DARK GREEN FILAMENTOUS ALGAE & DETRITUS	1.0475	0.1414	12500	0.0113
COLORADO RIVER UPSTREAM FROM HAVASU CREEK	11-5-90 1920-2025	DARK GREEN FILAMENTOUS ALGAE	1.9944	0.8222	12500	0.0658
COLORADO RIVER UPSTREAM FROM HAVASU CREEK	11-6-90 0855-0955	DARK GREEN FILA ALGAE & DETRITUS	1.9196	0.1617	25000	0.0065
COLORADO RIVER UPSTREAM FROM HAVASU CREEK	11-6-90 1342-1442	GREEN DETRITUS GRASS & FILAMENTOUS ALGAE	2.1618	0.3622	25000	0.0145
COLORADO RIVER UPSTREAM FROM HAVASU CREEK	11-6-90 1842-1942	DARK GREEN FILAMENTOUS ALGAE & DETRITUS	2.2037	0.3744	21340	0.0175
COLORADO RIVER UPSTREAM FROM HAVASU CREEK	11-7-90 0100-0230	GRASS FILAMENTOUS ALGAE & DETRITUS	4.2283	2.1464	29560	0.0726
HAVASU CREEK NEAR MOUTH	11-5-90 0627-0727	DARK DETRITUS & LEAVES	1.8370	0.1003	22250	0.0045
HAVASU CREEK NEAR MOUTH	11-5-90 1241-1341	DARK DETRITUS	1.7930	0.0548	26868	0.0020
HAVASU CREEK NEAR MOUTH	11-5-90 1817-1917	DARK DETRITUS & LEAVES	1.8125	0.0935	24560	0.0038
HAVASU CREEK NEAR MOUTH	11-6-90 0019-0119	DARK DETRITUS & LEAVES	1.9209	0.1604	25090	0.0064
HAVASU CREEK NEAR MOUTH	11-6-90 0612-0700	LEAVES & FINE DETRITUS	1.8622	0.1532	25090	0.0061
HAVASU CREEK NEAR MOUTH	11-6-90 1213-1313	NET LEAVES DETRITUS & TWIGS	1.8634	0.1972	19870	0.0099
HAVASU CREEK NEAR MOUTH	11-6-90 1816-1916	LEAF TWIG DARK GREEN DETRITUS	1.8917	0.1758	24110	0.0073
HAVASU CREEK NEAR MOUTH	11-7-90 0032-0132	TAN & DARK GREEN DETRITUS	1.8548	1.0450	12280	0.0851
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	11-6-90 0045-0145	FILAMENTOUS DARK GREEN ALGAE & DETRITUS	2.7370	0.7151	32803	0.0218
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	11-6-90 1254-1354	DARK GREEN DETRITUS FILAMENTOUS ALGAE	3.6875	1.2992	32390	0.0401
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	11-6-90 1835-1935	FILAMENTOUS DARK GREEN DETRITUS	2.4556	0.4940	36030	0.0137
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	11-7-90 0036-0106	FILAMENTOUS ALGAE & DARK GREEN DETRITUS	2.3551	0.4844	29540	0.0164
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	11-5-90 0800-0900	DARK DETRITUS & TWIGS	2.9549	0.6323	15280	0.0414
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	11-5-90 1155-1250	DARK GREEN DETRITUS & FILAMENTOUS ALGAE	2.3005	0.3230	6140	0.0526
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	11-6-90 1220-1420	FINE GREEN DETRITUS SEED PODS & GRASS	3.3901	0.9168	39140	0.0234
COLORADO RIVER NEAR COLUMBINE FALLS (NOV. 1990 ONLY)	11-5-90 0915-1015	FINE DETRITUS BROWN	2.1809	0.8783	15570	0.0564
COLORADO RIVER NEAR COLUMBINE FALLS (NOV. 1990 ONLY)	11-5-90 1330-1430	FINE GREEN GREY DETRITUS	8.6795	2.5855	32560	0.0794
COLORADO RIVER NEAR COLUMBINE FALLS (NOV. 1990 ONLY)	11-5-90 1925-2025	DARK DETRITUS	3.0404	0.6125	31680	0.0193

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 17. Detrital biomass collected with 10 cm orifice diameter drift nets for the November 1990 synoptic experiment-Continued

COLORADO RIVER NEAR COLUMBINE FALLS (NOV. 1990 ONLY)	11-6-90 0100-0200	DARK DETRITUS	1.2705	0.3014	12280	0.0245
COLORADO RIVER NEAR COLUMBINE FALLS (NOV. 1990 ONLY)	11-6-90 0720-0820	DARK DETRITUS	4.0505	1.4869	25580	0.0581
COLORADO RIVER NEAR COLUMBINE FALLS (NOV. 1990 ONLY)	11-6-90 1300-1400	DARK GREEN GREY FINE DETRITUS	8.3422	4.3662	24560	0.1778

* DENOTES SINGLE NET COLLECTION

Table 18. Detrital biomass collected with 10 cm orifice diameter drift nets for the June 1991 synoptic experiment

PRELIMINARY RESULTS
SUBJECT TO REVISION

LOCATION OF NETS	MONTH-DAY YEAR-TIME	SAMPLE APPEARENCE	DRY WT SAMPLE (g)	LOSS ON IGNITION (g)	VOLUME OF WATER (l)	BIOMASS (mg/l)
COLORADO RIVER AT GLEN CANYON USGS GAGE	6-18-91 1332-1432	TAN DETRITUS GRASS & LEAVES	1.646	0.605	21060	0.029
COLORADO RIVER AT GLEN CANYON USGS GAGE	6-18-91 1920-2020	TAN FILAMENTOUS ALGAE	0.968	0.159	11152	0.014
COLORADO RIVER AT GLEN CANYON USGS GAGE	6-19-91 0115-0215	PINK FILAMENTOUS ALGAE	0.840	0.028	6166	0.005
COLORADO RIVER AT GLEN CANYON USGS GAGE	6-19-91 0754-0819	TAN FILAMENTOUS ALGAE	0.937	0.064	5733	0.011
COLORADO RIVER AT GLEN CANYON USGS GAGE	6-19-91 1110-1215	DARK DETRITUS TWIGS & ALGAE	1.096	0.304	24010	0.013
COLORADO RIVER AT GLEN CANYON USGS GAGE	6-19-91 1815-1915	TAN DETRITUS & TWIGS	1.224	0.332	17781	0.019
COLORADO RIVER AT GLEN CANYON USGS GAGE	6-19-91 2400-0100	GREEN FILAMENTOUS ALGAE	0.836	0.009	7002	0.001
COLORADO RIVER AT GLEN CANYON USGS GAGE	6-20-91 0754-0824	GREEN FILAMENTOUS ALGAE	0.857	0.034	6057	0.006
COLORADO RIVER AT LEES FERRY USGS GAGE	6-18-91 1424-1526	DETRITUS FILAMENTOUS ALGAE & LEAVES	2.584	0.738	16334	0.045
COLORADO RIVER AT LEES FERRY USGS GAGE	6-18-91 1803-1903	DARK DETRITUS & TWIGS	1.295	0.347	10232	0.034
COLORADO RIVER AT LEES FERRY USGS GAGE	6-18-91 2400-0100	DARK GREEN DETRITUS	1.077	0.106	12011	0.009
COLORADO RIVER AT LEES FERRY USGS GAGE	6-19-91 0600-0700	FILAMENTOUS ALGAE & GRASS	0.850	0.035	23355	0.001
COLORADO RIVER AT LEES FERRY USGS GAGE	6-19-91 1800-1900	FILAMENTOUS ALGAE	2.375	1.404	14858	0.094
COLORADO RIVER AT LEES FERRY USGS GAGE	6-20-91 0614-0714	FILAMENTOUS AND GRASSES	0.891	0.026	14858	0.002
PARIA RIVER NEAR MOUTH	6-18-91 1240-1341	TAN FILAMENTOUS ALGAE & DETRITUS	3.685	1.045	33276	0.031
PARIA RIVER NEAR MOUTH	6-18-91 1828-1929	TAN FILAMENTOUS ALGAE DARK DETRITUS	3.453	1.184	33274	0.036
PARIA RIVER NEAR MOUTH	6-19-91 0030-0130	TAN DETRITUS & FILAMENTOUS ALGAE	2.659	0.578	29180	0.020
PARIA RIVER NEAR MOUTH	6-19-91 0600-0700	GREEN DETRITUS *	1.144	0.167	16370	0.010
PARIA RIVER NEAR MOUTH	6-19-91 1231-1331	TAN DETRITUS FILAMENTOUS ALGAE & TWIGS	6.173	2.458	18684	0.132
PARIA RIVER NEAR MOUTH	6-19-91 1833-1933	DARK GREEN TAN DETRITUS & LEAVES	8.638	5.007	29716	0.168
PARIA RIVER NEAR MOUTH	6-20-91 0042-0142	BROWN DETRITUS *	1.557	0.623	13000	0.048
PARIA RIVER NEAR MOUTH	6-20-91 0631-0731	DARK DETRITUS TWIGS & ALGAE	1.865	0.131	26160	0.005
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER USGS GAGE	6-18-91 1415-1515	DARK DETRITUS FILAMENTOUS & LEAF	13.094	7.359	21353	0.345
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER USGS GAGE	6-18-91 1800-1900	FINE DARK BROWN DETRITUS	9.949	6.282	30250	0.208

PRELIMINARY RESULTS
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Table 18. Detrital biomass collected with 10 cm orifice diameter drift nets for the June 1991 synoptic experiment--Continued

COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER USGS GAGE	6-19-91 0203-0303	DARK GREEN DETRITUS FILAMENTOUS ALGAE	4.403	1.923	5676	0.339
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER USGS GAGE	6-19-91 0600-0700	GREEN FILAMENTOUS ALGAE DARK DETRITUS	7.270	3.295	11370	0.290
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER USGS GAGE	6-19-91 1312-1412	DARK GREEN DETRITUS & GRASS	7.159	2.443	4840	0.505
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER USGS GAGE	6-19-91 1800-1900	DARK GREEN DETRITUS FILAMENTOUS ALGAE	7.178	3.617	76156	0.047
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER USGS GAGE	6-20-91 0815-0915	BROWN GREEN DETRITUS FILAMENTOUS ALGAE	7.745	3.728	32384	0.115
LITTLE COLORADO RIVER NEAR MOUTH	6-18-91 1210-1310	DARK GREEN DETRITUS	0.915	0.014	7936	0.002
LITTLE COLORADO RIVER NEAR MOUTH	6-18-91 1745-1845	DARK TAN DETRITUS	2.226	0.282	24556	0.011
LITTLE COLORADO RIVER NEAR MOUTH	6-18-91 2345-0045	DARK GREEN TAN DETRITUS	1.858	0.062	24556	0.003
LITTLE COLORADO RIVER NEAR MOUTH	6-19-91 0555-0655	TAN FILAMENTOUS DETRITUS	1.810	0.058	23132	0.003
LITTLE COLORADO RIVER NEAR MOUTH	6-19-91 1130-1230	TAN & DARK GREEN DETRITUS	1.951	0.141	21712	0.006
LITTLE COLORADO RIVER NEAR MOUTH	6-19-91 1800-1900	DARK GREEN DETRITUS	2.115	0.284	18515	0.015
LITTLE COLORADO RIVER NEAR MOUTH	6-19-91 2350-0050	DARK DETRITUS	0.914	0.020	9560	0.002
LITTLE COLORADO RIVER NEAR MOUTH	6-20-91 0600-0700	DARK GREEN DETRITUS	1.048	0.079	8799	0.009
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	6-18-91 1130-1230	DARK GREEN DETRITUS & TWIG	15.263	7.827	7998	0.979
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	6-19-91 0013-0113	BROWN GREEN DETRITUS FILAMENTOUS ALGAE	1.930	0.657	2224	0.295
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	6-19-91 0605-0705	DARK GREEN DETRITUS & EQUESTRIUM	3.739	1.091	34880	0.031
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	6-19-91 1211-1311	DARK GREEN DETRITUS	4.445	2.223	11121	0.200
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	6-19-91 1753-1855	DARK GREEN DETRITUS	5.066	2.253	68508	0.033
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	6-19-91 2417-0117	DARK DETRITUS FILAMENTOUS ALGAE	6.520	2.203	88972	0.025
COLORADO RIVER AT GRAND CANYON USGS GAGE (PHANTOM RANCH)	6-20-91 0550-0650	DARK GREEN DETRITUS	2.513	0.875	19662	0.045
BRIGHT ANGEL CREEK NEAR MOUTH	6-18-91 1100-1200	DARK DETRITUS TWIGS & ALGAE	2.513	0.669	40750	0.016
BRIGHT ANGEL CREEK NEAR MOUTH	6-18-91 1800-1900	DARK GREEN DETRITUS LEAVES TWIGS	2.825	0.821	17794	0.046
BRIGHT ANGEL CREEK NEAR MOUTH	6-18-91 2400-0100	DARK GREEN DETRITUS	2.725	0.691	31320	0.022
BRIGHT ANGEL CREEK NEAR MOUTH	6-19-91 0600-0700	BROWN DETRITUS GRASS & TWIGS	2.800	0.721	37000	0.019
BRIGHT ANGEL CREEK NEAR MOUTH	6-19-91 1157-1257	DARK GREEN DETRITUS & TWIGS	1.511	0.535	17616	0.030
BRIGHT ANGEL CREEK NEAR MOUTH	6-19-91 1805-1905	BROWN GREEN DETRITUS & GRASS	2.330	0.342	28826	0.012
BRIGHT ANGEL CREEK NEAR MOUTH	6-19-91 2400-0100	BROWN DETRITUS AND LEAVES	2.360	0.864	17616	0.049
BRIGHT ANGEL CREEK NEAR MOUTH	6-20-91 0600-0700	BROWN GREEN DETRITUS MOSS	1.447	0.397	15570	0.026
COLORADO RIVER UPSTREAM FOM KANAB CREEK	6-19-91 0630-0730	DARK GREEN DETRITOUS TWIGS LEAVES	8.415	1.454	38658	0.038
COLORADO RIVER UPSTREAM FOM KANAB CREEK	6-20-91 0643-0743	DARK GREEN DETRITUS	9.442	6.035	21690	0.278
KANAB CREEK NEAR MOUTH	6-18-91 1237-1337	REDDISH TAN FILAMENTOUS ALGAE DETRITUS	1.913	0.108	28114	0.004
KANAB CREEK NEAR MOUTH	6-18-91 1836-1940	TAN DETRITUS	1.770	0.060	34160	0.002

PRELIMINARY RESULTS
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Table 18. Detrital biomass collected with 10 cm orifice diameter drift nets for the June 1991 synoptic experiment--Continued

KANAB CREEK NEAR MOUTH	6-19-91 0026-0126	TAN PINK SLIME	1.860	0.059	45820	0.001
KANAB CREEK NEAR MOUTH	6-19-91 0630-0730	TAN PINK DETRITUS	1.895	0.080	32030	0.002
KANAB CREEK NEAR MOUTH	6-19-91 1214-1314	TAN DETRITUS LEAVES TWIGS	1.934	0.202	30072	0.007
KANAB CREEK NEAR MOUTH	6-19-91 1832-1932	TAN DETRITUS & SMALL TWIGS	1.741	0.078	35590	0.002
KANAB CREEK NEAR MOUTH	6-20-91 0036-0136	TAN PINK DETRITUS	1.752	0.021	42974	0.000
KANAB CREEK NEAR MOUTH	6-20-91 0646-0740	TAN DETRITUS STRAW	0.890	0.006	16193	0.000
HAVASU CREEK NEAR MOUTH	6-18-91 1230-1330	BROWN DETRITUS	1.468	0.081	20460	0.004
HAVASU CREEK NEAR MOUTH	6-18-91 2347-0047	TAN DETRITUS	0.879	0.010	23800	0.000
HAVASU CREEK NEAR MOUTH	6-19-91 0546-0646	DARK TAN DETRITUS	0.886	0.021	22200	0.001
HAVASU CREEK NEAR MOUTH	6-19-91 1140-1240	DETRITUS TWIGS	0.828	0.033	25400	0.001
HAVASU CREEK NEAR MOUTH	6-19-91 1800-1900	TAN DETRITUS	0.901	0.007	24000	0.000
HAVASU CREEK NEAR MOUTH	6-19-91 2400-0030	DARK GREEN DETRITUS	0.889	0.006	22500	0.000
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	6-18-91 1400-1450	DARK DETRITUS & FILAMENTOUS ALGAE	10.737	6.389	18684	0.342
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	6-18-91 1955-2010	DARK GREEN BROWN DETRITUS FILAMENTOUS A	26.032	13.442	11120	1.209
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	6-19-91 0142-0202	DARK DETRITUS & TWIGS	36.242	25.616	14590	1.756
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	6-19-91 0752-812	DARK DETRITUS & FILAMENTOUS ALGAE	8.144	5.809	5813	0.999
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	6-19-91 1356-1426	DARK GREEN DETRITUS FILAMENTOUS ALGAE	18.265	11.487	17884	0.642
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	6-19-91 1842-1857	DARK DETRITUS	0.999	0.150	5050	0.030
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	6-20-91 0112-0127	DARK GREEN DETRITUS	9.217	4.903	13612	0.360
COLORADO RIVER AT NATIONAL CANYON USGS GAGE	6-20-91 0715-0735	DARK DETRITUS TWIGS	10.648	6.048	13700	0.441
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	6-18-91 1238-1338	DARK DETRITUS FILAMENTOUS ALGAE	53.653	28.185	46980	0.600
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	6-18-91 1907-2007	DARK GREEN DETRITUS FILAMENTOUS ALGAE	24.422	14.523	48756	0.298
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	6-19-91 0113-0133	DARK DETRITUS FILAMENTOUS ALGAE	10.916	5.846	40750	0.143
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	6-19-91 0600-0700	DARK GREEN DETRITUS & TWIGS	19.833	6.483	69666	0.093
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	6-19-91 1200-1300	DARK BROWN DETRITUS	86.043	45.509	66980	0.679
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	6-19-91 1800-1900	DARK GREEN BROWN DETRITUS FILAMENTOUS A	28.276	16.624	28830	0.577
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	6-19-91 2348-0048	DARK DETRITUS	7.325	2.754	20108	0.137
COLORADO RIVER UPSTREAM FROM DIAMOND CREEK USGS GAGE	6-20-91 0600-0700	DARK DETRITUS	24.869	10.310	75448	0.137
COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-18-91 1235-1335	DARK GREEN DETRITUS	1.286	0.296	7607	0.039
COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-18-91 1807-1907	DARK DETRITUS TWIGS	14.077	9.612	28382	0.339
COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-19-91 0055-0155	BROWN GREEN DETRITUS	3.049	1.368	15750	0.087
COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-19-91 0625-0725	FINE DARK BROWN DETRITUS GRASS	11.893	5.780	56408	0.102

PRELIMINARY RESULTS
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Table 18. Detrital biomass collected with 10 cm orifice diameter drift nets for the June 1991 synoptic experiment--Continued

COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-19-91 1128-1228	DARK BROWN DETRITUS *	6.803	3.527	13613	0.259
COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-19-91 1225-1330	FINE DARK BROWN DETRITUS *	7.132	4.158	7607	0.547
COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-19-91 1822-1922	DARK BROWN DETRITUS GRASS	15.614	8.397	20196	0.416
COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-20-91 0035-0135	DARK GREEN DERTRITUS SMALL TWIGS	26.403	16.512	27848	0.593
COLORADO RIVER AT TRAVERTINE CLEFT (JUNE 1991 ONLY)	6-20-91 0645-0745	VERY FINE GRAINED DARK DETRITUS	16.104	9.497	35588	0.267
* DENOTES SINGLE NET COLLECTION						

PRELIMINARY RE[illegible]
SUBJECT TO REVISION

Table 19. Detrital biomass collected with a 0.5 m orifice diameter drift net for the November 1990 and June 1991 synoptic experiments

NOVEMBER 1990

LOCATION OF NETS	MONTH-DAY YEAR-TIME	SAMPLE APPEARENCE	DRY WT SAMPLE (g)	LOSS ON IGNITION (g)	VOLUME WATER (l)	BIOMASS (mg/l)
COLORADO RIVER AT LEES FERRY USGS GAGE	11-5-90 1116-1131	FILAMENTOUS ALGAE DARK DETRITUS	2.441	1.109	155698	0.007
COLORADO RIVER AT LEES FERRY USGS GAGE	11-6-90 1445-1500	FILAMEMTOUS ALGAE DETRITUS	5.138	2.889	151388	0.019
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	11-5-90 0800-0815	GREEN FILAMENTOUS ALGAE & TWIGS	2.747	1.097	113137	0.010
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	11-5-90 1800-1815	DARK GREEN FILAMENTOUS ALGAE	1.964	0.887	94820	0.009
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	11-6-90 0123-0138	DARK GREEN FILAMENTOUS ALGAE & TWIGS	1.772	0.788	129840	0.006
COLORADO RIVER UPSTREAM FROM THE DIAMOND CREEK USGS GAGE	11-5-90 1525-1540	FILAMENTOUS ALGAE DARK GREEN DETRITUS	4.331	2.174	150850	0.014
COLORADO RIVER UPSTREAM FROM THE DIAMOND CREEK USGS GAGE	11-5-90 2108-2123	DARK GREEN DETRITUS	7.568	4.745	109905	0.043
COLORADO RIVER UPSTREAM FROM THE DIAMOND CREEK USGS GAGE	11-6-90 0215-0233	DARK GREEN DETRITUS	7.468	4.871	154620	0.032
COLORADO RIVER UPSTREAM FROM THE DIAMOND CREEK USGS GAGE	11-6-90 1118-1133	DARK GREEN DETRITUS	8.044	4.977	107750	0.046
COLORADO RIVER UPSTREAM FROM THE DIAMOND CREEK USGS GAGE	11-6-90 2130-2145	DARK GREEN DETRITUS AND ALGAE	2.774	1.458	99130	0.015

JUNE 1991

LOCATION OF NETS	MONTH-DAY YEAR-TIME	SAMPLE APPEARENCE	DRY WT SAMPLE (g)	LOSS ON IGNITION (g)	VOLUME WATER (l)	BIOMASS (mg/l)
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	6-18-91 0215-0230	DARK DETRITUS & FILAMENTOUS ALGAE	12.478	7.724	274762	0.028
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	6-18-91 1305-1310	DARK DETRITUS LONG FILAMENTOUS ALGAE	22.236	15.369	91587	0.168
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	6-18-91 2010-2015	FILAMENTOUS ALGAE DARK GREEN DETRITUS	6.568	4.363	61058	0.071
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	6-19-91 0215-0230	DARK GREEN DETRITUS	1.982	1.039	204724	0.005
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	6-19-91 0800-0815	DARK DETRITUS FILAMENTOUS ALGAE	10.428	8.002	280150	0.029
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	6-19-91 1400-1410	FILAMENTOUS ALGAE DARK DETRITUS	8.909	6.692	91946	0.073
COLORADO RIVER UPSTREAM FROM THE LITTLE COLORADO RIVER AT USGS GAGE	6-20-91 0230-0245	DARK DETRITUS FILAMAMENTOUS ALGAE TWIGS	28.361	20.685	204725	0.101
COLORADO RIVER UPSTREAM FROM THE DIAMOND CREEK USGS GAGE	6-18-91 1900-1915	DARK DETRITUS & ALGAE	21.972	15.783	188562	0.084
COLORADO RIVER UPSTREAM FROM THE DIAMOND CREEK USGS GAGE	6-19-91 0600-0615	DARK DETRITUS FILAMENTOUS ALGAE SAND	90.970	39.521	226275	0.175

Table 20. Water discharge of the Colorado River and selected tributaries for the November 1990 synoptic experiment

Discharge data, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Discharge m3/sec
Colorado River at Glen Canyon USGS gage	11-5-90	600	51
		1200	314
		1800	357
		2400	88
	11-6-90	600	49
		1200	259
		1800	337
		2400	89
Colorado River at Lees Ferry USGS gage	11-5-90	600	67
		1200	259
		1800	294
		2400	326
	11-6-90	600	79
		1200	275
		1800	245
		2400	286
Paria River near mouth	Composite	-	0.27
Colorado River upstream from Little Colorado River at USGS gage	11-5-90	600	74
		1200	67
		1800	100
		2400	96
	11-6-90	600	241
		1200	300
		1800	186
		2400	111
Little Colorado River near mouth	Composite	-	6.3

PRELIMINARY RESULTS
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Table 20. Water discharge of the Colorado River and selected tributaries for the November 1990 synoptic--Continued

Discharge data, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Discharge m3/sec
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	11-5-90	600	138
		1200	107
		1800	107
		2400	116
	11-6-90	600	122
		1200	286
		1800	320
		2400	214
Bright Angel Creek at mouth	Composite	-	0.40
Colorado River upstream from Kanab Creek	11-5-90	600	252
		1200	139
		1800	108
		2400	79
	11-6-90	600	74
		1200	-
		1800	79
		2400	294
Kanab Creek near mouth	Composite	-	0.11
Colorado River upstream from Havasu Creek	11-5-90	600	-
		1200	241
		1800	204
		2400	164
	11-6-90	600	119
		1200	130
		1800	156
		2400	-

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 20. Water discharge of the Colorado River and selected tributaries for the November 1990 synoptic--Continued

Discharge data. Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Discharge m3/sec
Havasu Creek near mouth	Composite	-	2.12
Colorado River at National Canyon USGS gage	11-5-90	600	255
		1200	241
		1800	-
		2400	113
	11-6-90	600	-
		1200	85
		1800	170
		2400	227
Colorado River upstream from Diamond Creek USGS gage	11-5-90	600	146
		1200	174
		1800	193
		2400	177
	11-6-90	600	153
		1200	168
		1800	159
		2400	142
Diamond Creek near mouth	Composite	-	0.045
Colorado River near Columbine Falls	11-5-90	600	105
		1200	134
		1800	102
		2400	99
	11-6-90	600	98
		1200	129
		1800	110
		2400	91

PRELIMINARY
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Table 21. Water discharge of the Colorado River and selected tributaries for the June 1991 synoptic experiment

Discharge data, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Discharge m3/sec
Colorado River at Glen Canyon USGS gage	6-18-91	1200	821
		1800	799
		2400	213
	6-19-91	600	190
		1200	813
		1800	801
		2400	189
	6-20-91	600	189
Colorado River at Lees Ferry USGS gage	6-18-91	1200	654
		1800	815
		2400	595
	6-19-91	600	166
		1200	665
		1800	827
		2400	592
	6-20-91	600	167
Paria River near mouth	Composite	-	0.093
Colorado River upstream from Little Colorado River at USGS gage	6-18-91	1200	549
		1800	265
		2400	620
	6-19-91	600	815
		1200	513
		1800	261
		2400	631
	6-20-91	600	759
Little Colorado River near mouth	Composite	-	6.14

PRELIMINARY RESULTS
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Table 21. Water discharge of the Colorado River and selected tributaries for the June 1991 synoptic experiment--Continued

Discharge data, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Discharge m3/sec
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	6-18-91	1200	745
		1800	462
		2400	274
	6-19-91	600	742
		1200	688
		1800	450
		2400	270
	6-20-91	600	753
Bright Angel Creek at mouth	Composite	-	0.62
Colorado River upstream from Kanab Creek	6-18-91	1200	810
		1800	966
		2400	481
	6-19-91	600	396
		1200	578
		1800	900
		2400	538
	6-20-91	600	328
Kanab Creek near mouth	Composite	-	0.099
Colorado River upstream from Havasu Creek	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-

PRELIMINARY RESULTS
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Table 21. Water discharge of the Colorado River and selected tributaries for the June 1991 synoptic experiment--Continued

Discharge data, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Discharge m3/sec
Havasu Creek near mouth	Composite	-	1.87
Colorado River at National Canyon USGS gage	6-18-91	1200	317
		1800	770
		2400	705
	6-19-91	600	479
		1200	328
		1800	736
		2400	668
	6-20-91	600	467
Colorado River upstream from Diamond Creek USGS gage	6-18-91	1200	561
		1800	496
		2400	391
	6-19-91	600	841
		1200	705
		1800	532
		2400	405
	6-20-91	600	813
Diamond Creek near mouth	Composite	-	0.051
Colorado River near Travertine Clefts	6-18-91	1200	303
		1800	388
		2400	402
	6-19-91	600	425
		1200	671
		1800	546
		2400	450
	6-20-91	600	510

PRELIMINARY RESULTS
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Table 22. Suspended sediment concentrations at Colorado River and tributary cross-sections for the November, 1990 synoptic experiment

Sediment Concentrations, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Concentration mg/L
Colorado River at Glen Canyon USGS gage	11-5-90	600	30.0
		1200	10.0
		1800	20.0
		2400	10.0
	11-6-90	600	<10
		1200	<10
		1800	<10
		2400	<10
Colorado River at Lees Ferry USGS gage	11-5-90	600	<10
		1200	<10
		1800	<10
		2400	10.0
	11-6-90	600	<10
		1200	<10
		1800	20.0
		2400	20.0
Paria River near mouth	11-5-90	600	80.0
		1200	160.0
		1800	120.0
		2400	170.0
	11-6-90	600	186.0
		1200	200.0
		1800	190.0
		2400	460.0
Colorado River upstream from Little Colorado River at USGS gage	11-5-90	600	40.0
		1200	20.0
		1800	<10
		2400	<10
	11-6-90	600	10.0
		1200	80.0
		1800	40.0
		2400	<10

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 22. Suspended sediment concentrations at Colorado River and tributary cross-sections for the November, 1990 synoptic experiment--Continued.

Sediment Concentrations, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Concentration mg/L
Little Colorado River near mouth	11-5-90	600	960.0
		1200	930.0
		1800	980.0
		2400	8280.0
	11-6-90	600	133000.0
		1200	97900
		1800	81100.0
		2400	58100.0
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	11-5-90	600	150.0
		1200	20.0
		1800	60.0
		2400	10.0
	11-6-90	600	60.0
		1200	100.0
		1800	6600.0
		2400	5040.0
Bright Angel Creek at mouth	11-5-90	1000	10.0
	11-6-90	245	20.0
		1600	20.0
		see label	<10
Colorado River upstream from Kanab Creek	11-5-90	600	110.0
		1200	70.0
		1800	140.0
		2400	100.0
	11-6-90	600	110.0
		1200	10.0
		1800	70.0
		2400	70.0

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 22. Suspended sediment concentrations at Colorado River and tributary cross-sections for the November, 1990 synoptic experiment--Continued.

Sediment Concentrations, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Concentration mg/L
Kanab Creek near mouth	11-5-90	600	10.0
		1200	10.0
		1800	30.0
		2400	190.0
	11-6-90	600	<10
		1200	40.0
		1800	20.0
		2400	<10
Colorado River upstream from Havasu Creek	11-5-90	600	150.0
		1200	110.0
		1800	150.0
		2400	160.0
	11-6-90	600	110.0
		1200	120.0
		1800	<10
		2400	110.0
Havasu Creek near mouth	11-5-90	600	60.0
		1200	20.0
		1800	30.0
		2400	70.0
	11-6-90	600	70.0
		1200	70.0
		1800	70.0
		2400	70.0
Colorado River at National Canyon USGS gage	11-5-90	600	120.0
		1200	130.0
		1800	-
		2400	110.0
	11-6-90	600	-
		1200	140.0
		1800	60.0
		2400	70.0

PRELIMINARY RESULTS
SUBJECT TO REVISION

Table 22. Suspended sediment concentrations at Colorado River and tributary cross-sections for the November, 1990 synoptic experiment--Continued.

Sediment Concentrations, Colorado River Synoptic Experiment, November 1990

Site Name	Date	Time	Concentration mg/L
Colorado River upstream from Diamond Creek USGS gage	11-5-90	600	230.0
		1200	240.0
		1800	290.0
		2400	220.0
	11-6-90	600	170.0
		1200	220.0
		1800	190.0
		2400	70.0
Diamond Creek near mouth	11-5-90	600	30.0
		1200	10.0
		1800	20.0
		2400	-
	11-6-90	600	30.0
		1200	250.0
		1800	60.0
		2400	-
Colorado River near Columbine Falls	11-5-90	600	470.0
		1200	460.0
		1800	250.0
		2400	380.0
	11-6-90	600	300.0
		1200	330.0
		1800	370.0
		2400	290.0

PRELIMINARY RESULTS
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Table 23. Suspended sediment concentrations at Colorado River and tributary cross-sections for the June, 1991 synoptic experiment

Sediment Concentrations, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Concentration mg/L
Colorado River at Glen Canyon USGS gage	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Colorado River at Lees Ferry USGS gage	6-18-91	1200	-
		1800	40.0
		2400	40.0
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Paria River near mouth	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Colorado River upstream from Little Colorado River at USGS gage	6-18-91	1200	-
		1800	80.0
		2400	40.0
	6-19-91	600	110.0
		1200	110.0
		1800	30.0
		2400	20.0
	6-20-91	600	50.0

PRELIMINARY RESULTS
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Table 23. Suspended sediment concentrations at Colorado River and tributary cross-sections for the June, 1991 synoptic experiment--Continued.

Sediment Concentrations, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Concentration mg/L
Little Colorado River near mouth	6-18-91	1200	250.0
		1800	190.0
		2400	170.0
	6-19-91	600	100.0
		1200	-
		1800	220.0
		2400	250.0
	6-20-91	600	-
Colorado River at Grand Canyon USGS gage (Phantom Ranch)	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Bright Angel Creek near mouth	6-18-91	1200	-
		1800	30.0
		2400	60.0
	6-19-91	600	80.0
		1200	-
		1800	20.0
		2400	50.0
	6-20-91	600	30.0
Colorado River upstream from Kanab Creek	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-

PRELIMINARY RESULTS
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Table 23. Suspended sediment concentrations at Colorado River and tributary cross-sections for the June, 1991 synoptic experiment.

Sediment Concentrations, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Concentration mg/L
Kanab Creek near mouth	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Colorado River upstream from Havasu Creek	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Havasu Creek near mouth	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Colorado River at National Canyon USGS gage	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-

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Table 23. Suspended sediment concentrations at Colorado River and tributary cross-sections for the June, 1991 synoptic experiment.

Sediment Concentrations, Colorado River Synoptic Experiment, June 1991

Site Name	Date	Time	Concentration mg/L
Colorado River upstream from Diamond Creek USGS gage	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Diamond Creek near mouth	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-
Colorado River near Travertine Cleft	6-18-91	1200	-
		1800	-
		2400	-
	6-19-91	600	-
		1200	-
		1800	-
		2400	-
	6-20-91	600	-

PRELIMINARY RESULTS
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PRELIMINARY RESULTS
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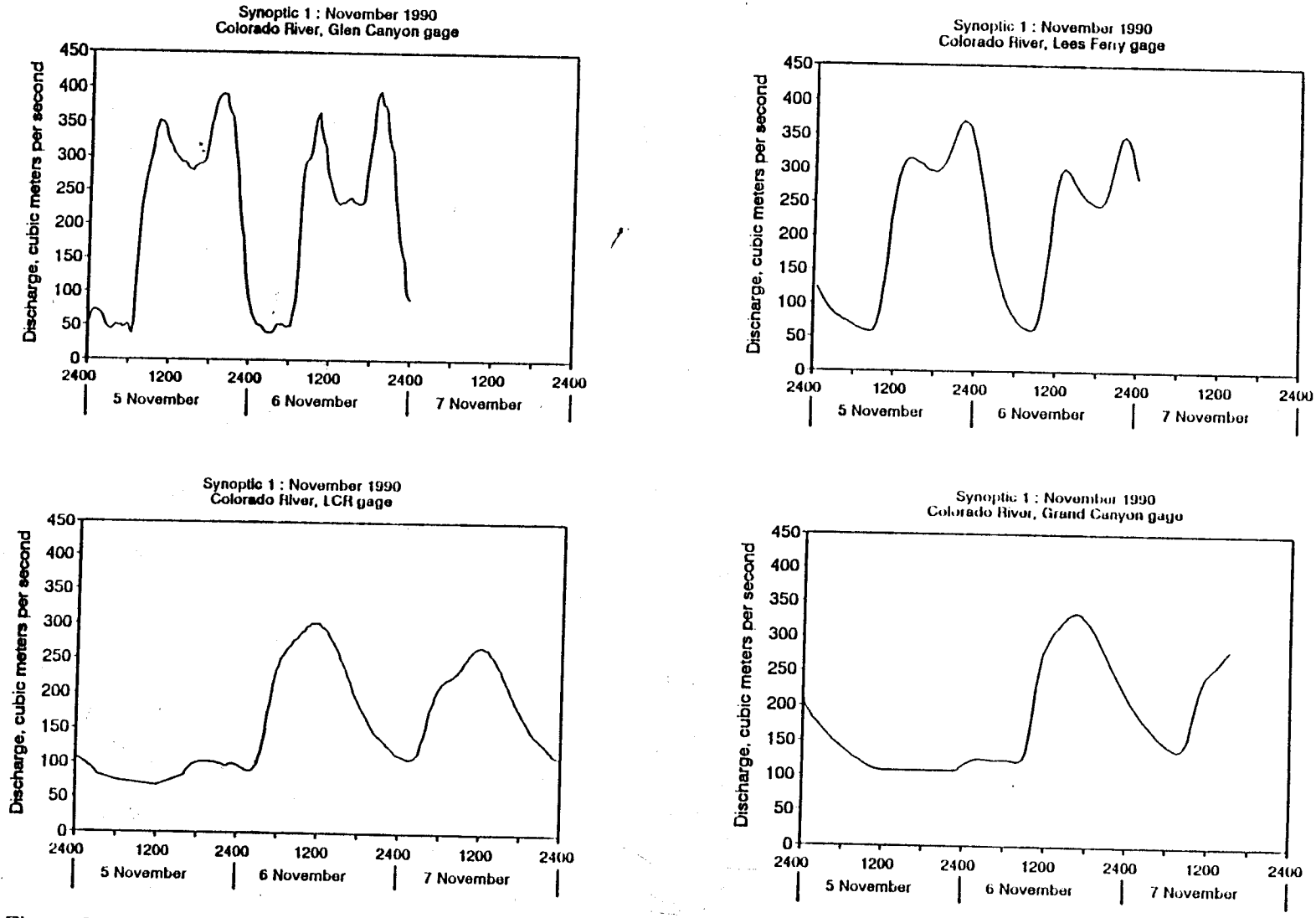

Figure 2. Discharge hydrographs for the Colorado River and selected tributaries for the November 1990 synoptic experiment. Smooth hydrographs without data points determined from U.S.G.S. gaging station continuous record. Hydrographs with rectangular points determined at site during sampling.

PRELIMINARY RESULTS
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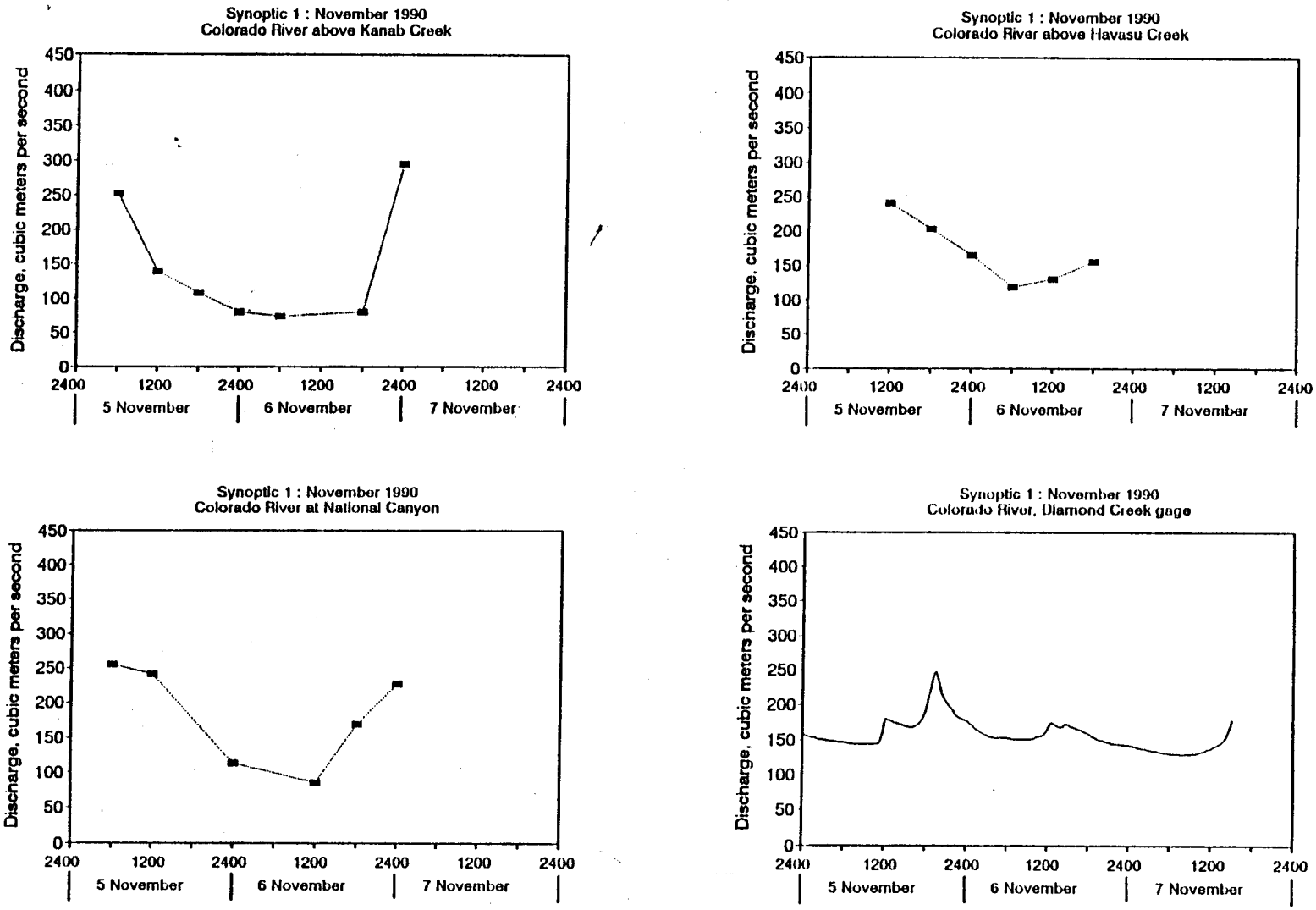

Figure 2. Discharge hydrographs for the Colorado River and selected tributaries for the November 1990 synoptic experiment. Smooth hydrographs without data points determined from U.S.G.S. gaging station continuous record. Hydrographs with rectangular points determined at site during sampling.--Continued

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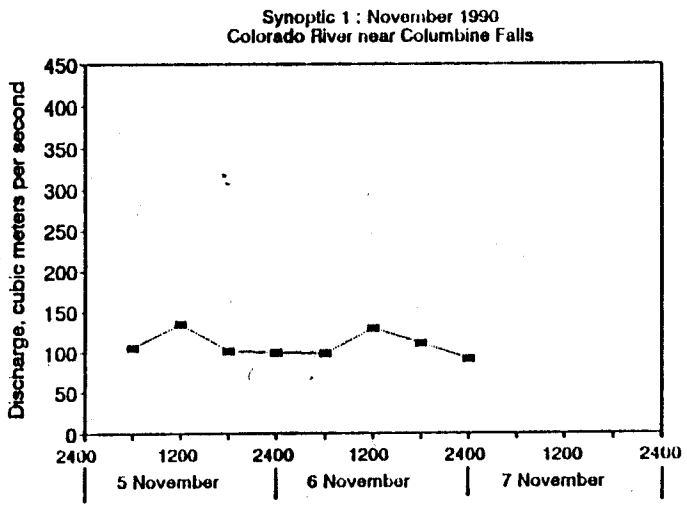

Figure 2. Discharge hydrographs for the Colorado River and selected tributaries for the November 1990 synoptic experiment. Smooth hydrographs without data points determined from U.S.G.S. gaging station continuous record. Hydrographs with rectangular points determined at site during sampling.--Continued

PRELIMINARY RESULTS
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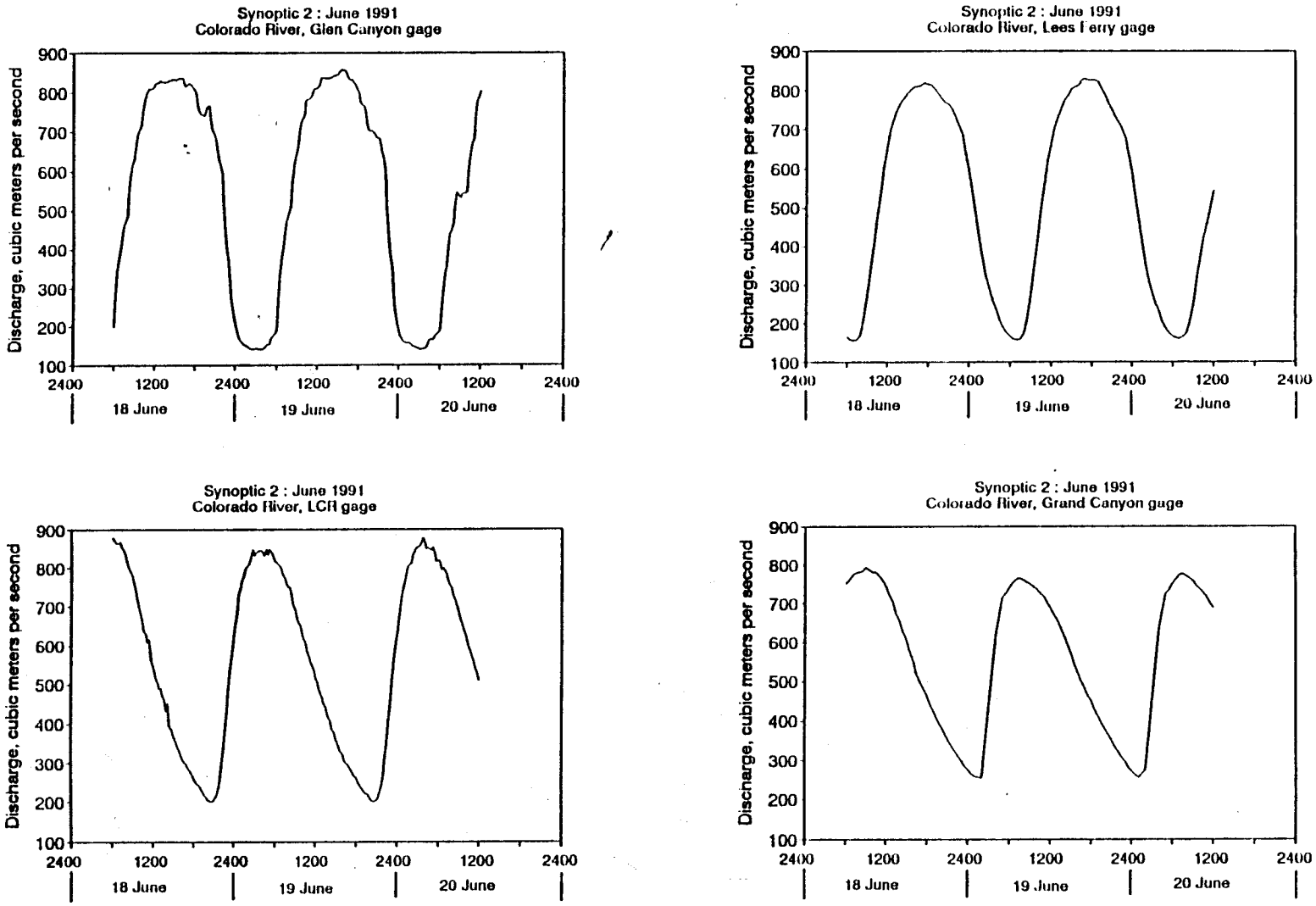

Figure 3. Discharge hydrographs for the Colorado River an selected tributaries for the June 1991 synoptic experiment. Smooth hydrographs without data points determined from U.S.G.S. gaging station continuous record. Hydrographs with rectangular data points determined at site during sampling.

PRELIMINARY RESULTS
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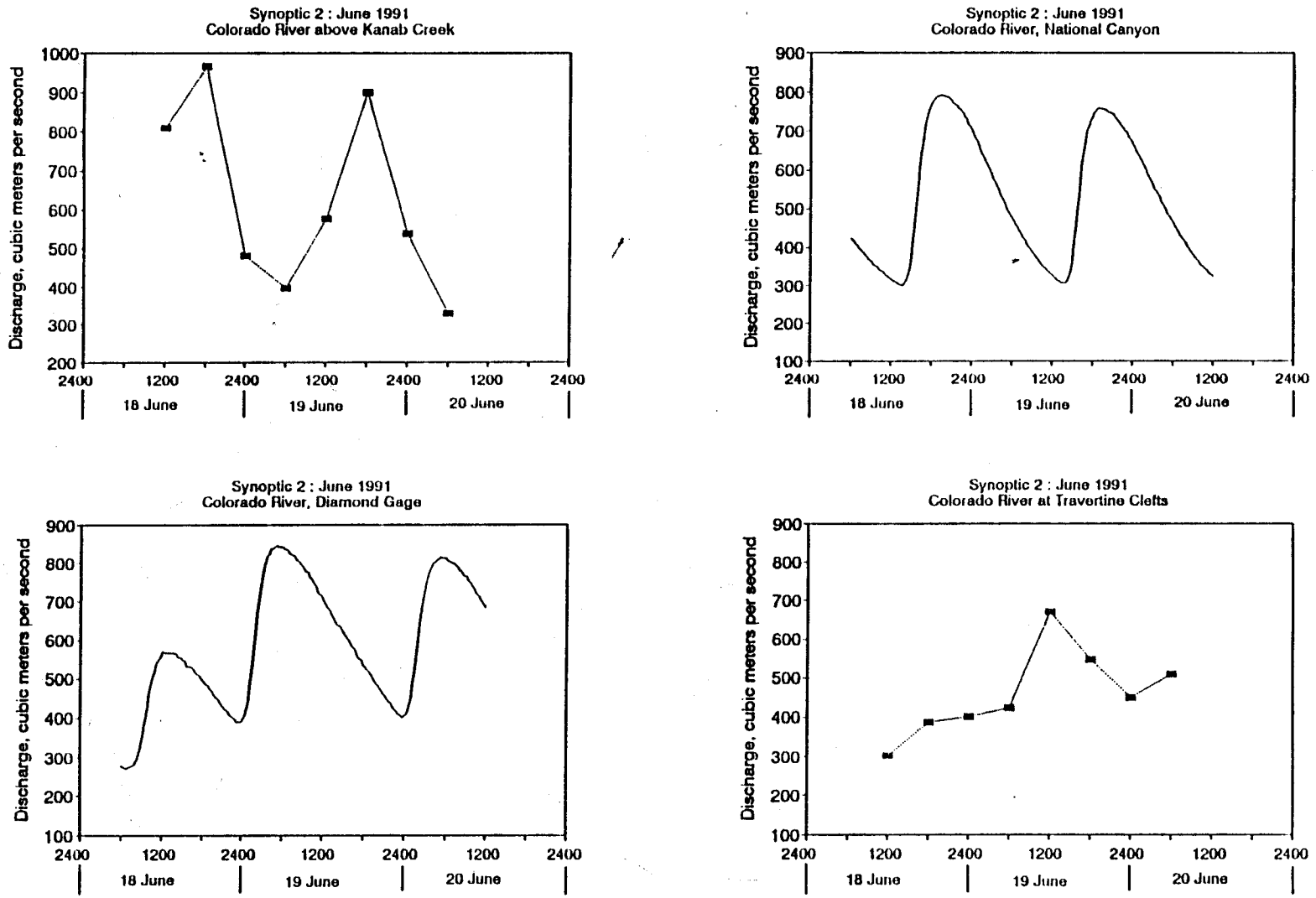

Figure 3. Discharge hydrographs for the Colorado River and selected tributaries for the June 1991 synoptic experiment. Smooth hydrographs without data points determined from U.S.G.S. gaging station continuous record. Hydrographs with rectangular data points determined at site during sampling.--Continued

APPENDIX

WATER QUALITY

SYNOPTIC EXPERIMENT FIELD GUIDE

U.S. Geological Survey

Water Resources Division

Colorado River Water-Quality Study

1991

Prepared by

H.E. Taylor , R.C. Averett and J.R. Garbarino

PRELIMINARY RESULTS
SUBJECT TO REVISION

PRELIMINARY RESULTS
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INTRODUCTION

The material contained in this guide is designed to provide uniform state-of-the-science instructions for making water-quality field measurements and collecting and processing water-quality samples for laboratory analysis. The guidelines are somewhat specific for synoptic experiments on the Colorado River, but with little modification can be used in a variety of study areas.

The Colorado River system is one of the most majestic rivers in the world. Beginning in western Wyoming, the river flows 1400 miles before reaching the sea in the Gulf of California. Draining the arid west, the river is heavily used for irrigation, recreation, and power production and thus is one of the most important rivers in the Nation. There are a total of 13 reservoirs on the river mainstem and major tributaries. The Colorado River formed the Grand Canyon, which is one of Nations most heavily visited national parks. As such the river and its attendant watershed are protected along much of their lengths between Glen Canyon Dam and Lake Mead. The Grand Canyon ecosystem is extremely fragile, and is undergoing somewhat rapid change since the filling of Lake Powell and subsequent controlled flow releases for power generation from Glen Canyon Dam.

In recent years there has been much public concern about use of the river between Glen Canyon Dam and Lake Mead. Of particular concern has been the flow release-rates over short time periods. Because of power generation needs, the flow often varies between 10,000 to 22,000 cubic feet per second (cfs) over a 24-hour period. Whitewater rafting is a major activity on the river, and this flow regime results in several problems for this sport. One problem is that many of the camping beaches are eroding, and the supply of new sand has been arrested because of Glen Canyon Dam. Another problem of water-quality concern is that of excessive plant production resulting from clear water since sediment discharge has stopped. In the early 1980's the US Bureau of Reclamation initiated a multi-agency study of the effects of the dam on the river. This study led to a number of reports, and to the formation of a National Academy Committee to review the findings. In 1989 Congress ordered the Department of Interior to conduct a environmental impact study (EIS) on the effects of the dam and dam releases on the river. The study for which this field guide is prepared is concerned with the EIS. However, the US Geological Survey has proposed a decade-long study designed to provide an in-depth analysis of Lake Powell and the river to upper Lake Mead. The synoptic experiments underway at this time will also provide a water-quality data base for the long-term USGS study.

The term "synoptic" refers to a snapshot in time. An example is a TV weathermap that shows the weather across the Nation at a given time. Our purpose of the synoptic experiments in the Colorado River study is to make measurements and collect water-quality samples in a similar fashion at fixed times along particular reaches of the river. It is important that the procedures used are consistent, and that the work is done at prescribed times.

THE COLORADO RIVER AND LAKE POWELL

Before Glen Canyon Dam was closed in 1965 (full pool in Lake Powell did not occur until 1983) the Colorado River responded to local climatic conditions. High discharge was in the spring following snowmelt, and low flow was in the autumn. Water temperature had a seasonal regime, ususally > 20 degrees Celsius in late summer, and near 4 degrees Celsius in January. During

spring snowmelt, and during local storms, the river often carried significant sediment loads. Thus, bars and beaches were formed and light penetration into the water was reduced to a few centimeters near the surface. Today, because of Glen Canyon Dam and Lake Powell, the hydrologic regime of the river in the Grand Canyon has changed. Spring snowmelt is captured behind the dam, water reaching the river from Lake Powell is taken from the hypolimnion of the reservoir and often is near 8 degrees Celsius for some distance downriver from the dam. The water temperature at the dam is often only doubled some 225 miles downstream at Diamond Creek. There is essentially no sediment entering the river from the dam, and thus light penetration through the water is extensive, often reaching the river bottom for a considerable distance downriver from the dam. Summer water discharge from the dam is considerably more, and spring snowmelt discharge is considerably less than under historical conditions.

The colder, clearer water has greatly altered the biological regime of the Colorado River between Glen Canyon Dam and Lake Mead. Of particular significance is the profuse production of the algae *Cladophora glomerata*. Production of this algae is most prevalent between Glen Canyon Dam and Lees Ferry (16 river miles), but photosynthesis in the river may exceed respiration as far downstream as the Little Colorado River (78 river miles below the dam). The colder water also has provided for a trophy rainbow trout fishery. The clearer, colder water has led to the disappearance of several native fish species, and several other native fish are on the endangered list. *Cladophora glomerata* grows in long strands, and the fluctuating discharge from dam release breaks off parts of the strands. They then become coarse particulate organic matter (CPOM) that moves through the system somewhat intact because the low temperature slows bacterial decomposition. Complete segments of *Cladophora glomerata* are commonly observed as far downstream as Diamond Creek. When decomposition does take place it adds to the fine particulate organic matter (FPOM) or to the dissolved organic carbon (DOC).

The above briefly describes some of the problems and changes in the Colorado River in the Grand Canyon resulting from the operation of Glen Canyon Dam. In order to understand the water-quality of the river, the following measurements and water sample collection will be made as a part of the synoptic experiments. During each synoptic period field measurements and water-sample collection will occur every 6 hours over a 48-hour period.

FIELD MEASUREMENTS

TEMPERATURE - Temperature will be measured each time samples are collected at each of the respective sampling locations. The general rule of thumb is "you never have too much temperature data"; therefore, whenever possible measure both the water temperature and ambient air temperature and record date, time, sampling site and measurement location on the provided form. All temperatures should be measured at the surface with a calibrated alcohol thermometer to the nearest 0.5 ^{o} C. (NO mercury thermometers should be used in the Colorado River system). The thermometer should be allowed to equilibrate for at least 3 minutes prior to reading temperature. Care must be taken to read the thermometer while the bulb remains submerged.

Where possible horizontal temperature profiles (across stream) should be made at least once during each sampling period. A minimum of 3 and preferable 5 equally spaced temperatures should be measured across the river or stream, in a line perpendicular to the velocity vector of the stream. A minimum of elapsed time should be expended while making these measurements to insure that as close to a steady-state condition as possible exists during the cross-sectional profile measurement.

pH - pH is a measurement of the hydrogen ion activity or concentration in an aqueous solution. It is a logarithmic function which usually ranges from 1 to 14 units (acidic to alkaline, respectively). A pH of 7.00 represents a neutral solution. pH must be measured either *in situ* or rapidly after sample collection to minimize changes due to degassing of CO_2, precipitation (such as carbonates), or other chemical and physical reactions that cause the pH of the water sample to change.

The pH will be measured using an Orion Model SA 250 digital pH meter, with the appropriate combination electrode and automatic temperature compensation probe. The meter will be calibrated before EACH use with two buffers, pH 7.00 and pH 10.0 using the autocalibration mode. The following procedure is used to calibrate the pH meter:

1. Connect the electrode and ATC probe (if appropriate) to the appropriate connectors on the pH meter. Slide the mode switch to the pH 0.01 position. Check the saturated KCl level in the electrode and fill from supplied bottle, if necessary. Uncover filling solution hole in the electrode before measurements are made.

2. Rinse the electrode and probe thoroughly, and gently wipe dry with a tissue.

3. Transfer a small portion of pH 7.00 buffer to a clean cup and submerse electrode and probe stirring vigorously to dislodge bubbles.

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4. Press the CAL button and observe the display alternating between .1. and approximately 7. Wait for a stable reading and press ENTER. The display will hold for about 3 seconds and then advance to .2., indicating that the meter is ready for the pH 10.00 buffer. Do not dispose of pH 7.00 buffer.

5. Rinse electrodes with deionized water and submerge in pH 10.00 buffer stirring to remove air bubbles. When stable pH is achieved press ENTER. After the second buffer has been entered, the letters PH will be displayed indicating the meter is ready for pH measurement.

6. Remove electrodes and rinse with deionized water. Dry electrodes with a tissue. Use a clean cup and transfer a small portion of the pH 4.01 buffer to a cup. Submerse electrodes with vigorous stirring to remove bubbles.

7. Rinse electrode and probe with deionized water, dry and resubmerse in the pH 10.00 buffer. Record observed pH in the Field Notebook. Repeat same procedure with the pH 7.00 and pH 10.00 buffers.

8. Rinse and dry a final time and place in sample and measure pH.

NOTE - ALWAYS BE SURE METER READINGS HAVE STABILIZED BEFORE RECORDING FINAL PH READING.

All measured pH's should be recorded in the permanent record to the nearest 0.01 pH unit.

SPECIFIC CONDUCTANCE - Specific conductance is a measure of the total ionic strength of an aqueous solution. It is determined by the measurement of solution resistance, reference at 25 ^{o}C. The determination is easily made in the field, and gives results that are useful for a general indication of the dissolved-solids concentration.

As with pH, specific conductance may change with time after sample collection, therefore, measurements should be made *in situ*, or as rapidly as possible after sample collection or compositing. When using the Model 515 dip cell, care must be used to insure that the cell is immersed to a depth of at least 5 cm above its bottom (the end opposite the cable connection). The cell should be rapidly moved in an up-and-down motion to dislodge any trapped air bubbles.

The calibration of the Model 604 Digital Conductivity Meter should be field checked by the following procedure:

1) Measure the provided specific conductance reference standard by submersing the cell to the proper depth in the standard solution and turn main power switch to the "on" position. Function switch should be placed to the "on 25 C" position and the range switch should be placed at "2000". At sites where the specific conductance is known to be high, appropriate adjustments to measuring procedures should be made to accommodate these types of samples.

2) After moving the cell up and down several times to dislodge air bubbles, read conductivity immediately after display stabilizes.

3) Record date, time and meter reading for the standard solution on the provided form.

4) Calibration standard should be checked before each sampling period.

Samples should be measured with the same meter settings as used in the calibration procedure. To prevent erroneous meter readings, care must be taken not to submerse the cell totally in water when readings are made. Each time a specific conductance measurement is made, water and air temperature should be recorded at the same location.

ALKALINITY - Alkalinity is the acid neutralizing capacity of an aqueous solution. Along with pH, it is the basis of measurement of carbonate and bicarbonate concentrations in natural waters. Carbon dioxide loss, precipitation and other chemical and physical reactions may cause the alkalinity of some waters to change dramatically within several hours or even minutes after sample collection. Consequently, field measurement of alkalinity is usually more reliable than when measured in the laboratory. If the pH of the sample is >8.3 then appreciable carbonate will be present, resulting in two endpoints for the Gran's titration curve.

All samples for alkalinity titration should be field filtered prior to titration. Filtration should be carried out using the supplied syringe filters attached to a 60 ml plastic syringe using the following procedure:

1) Remove the plunger from a clean syringe, attach a disk filter and fill to 55 ml with sample, avoiding contamination.

2) Expel sample through the filter until the syringe plunger is aligned with the 50 ml mark on the syringe barrel.

3) Expel exactly 50 ml of sample through the filter into the titration vessel (beaker).

4) Immediately rinse the syringe with deionized water and return the syringe to a plastic bag to prevent contamination.

5) If the filter plugs with suspended sediment, note the volume of sample transferred from the reading on the syringe barrel, refill the syringe as instructed in steps 1 and 2, expel additional sample into the titration vessel such that the total volume expelled equals exactly 50 ml.

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Alkalinity on the filtered sample is determined by titration with a 0.16 N standard sulfuric acid solution to an end-point of pH 3.5. The following procedure must be used to perform the alkalinity titration and data recording:

1) Calibrate the pH meter according to the instructions under pH Section. Rinse electrodes thoroughly and dry lightly with a clean laboratory tissue.

2) Place electrode into 50 ml sample with stirring bar on magnetic stirrer and record initial pH.

3) Fill digital burette with 0.16 N H_2SO_4 or insert cartridge, where appropriate.

4) The delivery tube from the burette must be placed below the surface of the sample. Rotate the delivery knob of the burette so that a volume of acid is added to the sample.

5) After each increment of acid is added to the sample continue stirring for at least 30 seconds and then turn off stirring motor and read sample pH after the meter stabilizes.

6) Record both the volume increment of acid added and the pH after each addition. The pH of the sample will be extremely sensitive to small additions of acid, so great care must be used to insure accurate readings are obtained.

7) After reaching a pH of 5.5, add smaller increments of acid until reaching a pH of 4.5, this will usually be only 1 or 2 units on the digital pipette. (If starting pH is >8.3 then smaller increments will need to be added immediately continuing until reaching a pH of 7.5. Larger increments can then be added until reaching pH 5.5).

8) After completion of titration, thoroughly rinse all equipment with deionized water and store for next sampling period. Alkalinity, carbonate and bicarbonate values will be calculated from the titration data at a later date.

DISCHARGE - Use conventional stream discharge measurement procedures.

DISSOLVED OXYGEN - Oxygen dissolved in surface water is a combination of oxygen from the air (dissolved by diffusion) and oxygen produced from aquatic plants during the process of photosynthesis. The solubility of oxygen is dependent on the partial pressure of oxygen in the air, the temperature of the water, and the chemical composition of the water. The measurement of dissolved oxygen provides a great deal of insight to biological and chemical processes underway in a river or lake. The longitudinal extent of photosynthesis or respiration in a river can be estimated by measuring the *in situ* dissolved oxygen. With the use of a dissolved oxygen meter the task is simple. The meter probe is placed in flowing water in an area where the water surface is unbroken, and the dissolved oxygen measured and recorded.

Locate an area near the river bank that has a steady unbroken flow. Calibrate the dissolved oxygen meter and place the probe about 6-12 inches below the water surface and measure and record the dissolved oxygen. Measurements should be made at 1 hour intervals whenever possible. At times this will not be possible as the meter will be used elsewhere but, whenever possible make the measurements every hour. Record the data with date, military time, and note the light conditions, such as bright sunlight, cloudy, or dark. Also, qualitatively note the degree of darkness. This is important in the Grand Canyon, because of the influence of the steep canyon walls on light intensity.

Operate meter as follows:

1. Check mechanical zero on meter.
2. Turn meter on, allow at least 1 hour warm-up.
3. Check membrane for air bubbles and smoothness.
4. Dip calibration chamber in water and pour off excess.
5. Insert probe into wet chamber making sure no water leaks in and no droplets of water are on membrane.
6. Place in water and allow time for temperature of air in chamber to equilibrate.
7. Read barometric pressure and temperature in calibration chamber.
8. Determine the DO saturation value from Oxygen Solubility table; apply a salinity correction if necessary. Record all information.
9. Check redline and zero; adjust if necessary.
10. Select scale and adjust calibration knob to DO value obtained from saturation table.
11. Remove probe from calibration chamber and place in water, making measurements in water velocities of at least 1 ft/sec.
12. Read and record value to nearest 0.1 mg/l.

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SECCHI DISK: The measurement of light penetration through the water column provides insight to water clarity and depth of the euphotic zone. Under ideal circumstances a submarine photometer is used. This equipment is, however, expensive and delicate. We will use a photometer at several stations, including Lake Powell. At most river stations we will use a Secchi disk, which is simply a black and white disk that is lowered into the water and the depth at which it disappears is noted.

Locate a site where the water is slowly flowing, such as the site for the measurement of photosynthesis. Select as deep a site as possible, which often will mean working from the back of a boat, or from a vertical bank. Lower the Secchi disk into the water in a vertical manner until it disappears from sight. Then slowly raise the Secchi disk until it just reappears. Note and record the water depth in meters that the disk reappears to your sight; this is the Secchi Disk reading.

PHOTOSYNTHESIS AND RESPIRATION Photosynthesis (P) is the process whereby chlorophyll containing plants synthesize cellular material. Respiration (R) is the process whereby organisms break down cellular material to obtain energy and material. Photosynthesis occurs in the presence of light, whereas respiration occurs constantly in the light and in the dark. A useful measurement in determining processes in aquatic ecosystems is the P/R ratio. Another useful measurement is that of primary production which can be measured by dissolved oxygen uptake and release during daylight hours. Primary production is simply gross and net photosynthesis and is measured either with the carbon-14 method, or more simply with the oxygen light-and-dark bottle method. The oxygen light-and-dark bottle method will be used during the Synoptic Experiments on the Colorado River. This technique consists of using paired 300 ml biochemical oxygen demand (BOD) bottles filled with unfiltered river water. One bottle is left uncovered so that light may penetrate through the glass and trigger photosynthesis (light bottle). The other bottle (dark) is first covered with black electricians tape to prevent light passage, and then covered with aluminum foil to reflect heat. The initial dissolved oxygen (I_b) is determined for the bottles, and they are then suspend in the water. A general rule of thumb is to suspended two pairs of bottles (two light and two dark) every meter in depth from the surface to the bottom. After a period of incubation the bottles are retrieved, and the final dissolved oxygen (L_b and D_b) is determined.

Locate an area where the flow is minimal and at least one meter in depth. Obtain paired light and dark bottles. Fill a container having a capacity of 8-10 liters with water from the selected site, and let stand for 15-30 minutes. After this period determine the dissolved oxygen concentration which is the initial concentration and designated as I_b. Also record the water temperature. Carefully fill the light and dark bottles with water from the container being careful not to agitate and increase the dissolved oxygen concentration. Stopper the bottles insuring there are no bubbles or air space in the bottle. Immediately suspend the paired bottles, two pair (two light and two dark) per each meter of depth, starting just below the surface. Incubate the bottles for about 4 hours; 1000 to 1400, are generally the best hours. After incubation remove the bottles and immediately determine the dissolved oxygen in each bottle and record as D_b, or L_b. Construct a table as follows for the dissolved oxygen values:

Dissolved Oxygen Temp._____

Time in: _____ Time out: _____

Depth	I_b	L_b	D_b
Surface	____	____	____
1 meter	____	____	____
2 meters	____	____	____
do.	____	____	____

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Note that the I_b dissolved oxygen value will be the same for all bottles. The change in dissolved oxygen (absolute values) in the light bottle is net photosynthesis. The change in dissolved oxygen in the dark bottle is due to respiration. If we add the change in dissolved oxygen in the dark bottle to the change in dissolved oxygen in the light bottle the result is gross photosynthesis. It is extremely important to measure the dissolved oxygen carefully, and immediately upon on retrieval of the bottles. The amount of dissolved oxygen in the water is a function of pressure and temperature. The meter must be calibrated to pressure and the temperature of the water determined at each reading. If you must hold the bottles out of the water for a short time either in establishing them for suspension or upon retrieval, keep them cool and in the dark. There are several ways to suspend the 300 ml BOD bottles. The best method is to suspend them in a horizontal manner. An apparatus for doing so is shown in figure 1(see appendix), and will be provided.

FIELD OBSERVATIONS - One of the most important pieces of information a researcher can have is accurate field notes of observations made during a period of intense study such as the Synoptic Experiments. Such notes fill important gaps in our knowledge, and help explain anomalies in the data and findings. They also provide important insight to the data. There is no easy way to tell you what to record, nor what to look for as a part of your field notes. The best rules of thumb are threefold: 1) Field notes are extremely important and thus deserve dedicated time to record. Do not rely upon your memory. One way to remember as well as to extend the time between writing is to carry a small dictating devise and speak into it from time to time. Then, when the opportunity arises, you can record your notes on paper; 2) Watch the river. What is moving downstream? Is there a concentration of foam? Any insect activity above the river surface? Any unusual flow regimes?; 3) Observe the sampling and sample processing procedures. Often flow conditions require modifications. Be certain that such modifications are recorded. Also, if someone makes a measurement error that cannot be repeated, note that in your field notes. All researchers look for anomalies and high and low values in the data. We must be certain that such values are real, and not a sampling artifact. We ask that you specifically note the occurrence of fronds of *Cladophora* moving past your sampling site, the occurrence and time extent of sediment-laden water (which can occur from storms in the tributary drainages or along the mainstem below Glen Canyon Dam), and the time of extreme high and extreme low water. At the extreme high and low water measurements it is important to record the dissolved oxygen and water temperature. Finally, we must have the weather at the site recorded every three hours. Note cloud cover, periods and extent of rainstorms, and air temperature.

CHEMICAL SAMPLE COLLECTION

DISCHARGE WEIGHTED SAMPLING PROCEDURE - Sampling at all sections will be by the Equal Discharge Increment (EDI) method using the D-77 (metals and organics) sampler, with a Teflon bag liner inside the plastic bottle, at both cable and boat sampled mainstem sections. The DH-81 sampler, with a Teflon bag liner is used at tributary sections. In all cases, as nearly as possible equal volumes of sample (1 - 1.5 liters each) will be collected from verticals at the mid-points of each of five equal discharge increments in the cross-section.

At each cableway section, a table is provided in the appendix which, for a range of discharges, lists the five positions along the cable at which to locate the sampling verticals. Before sampling, determine the discharge at the station by reading the staff gage and consulting the rating table for the gage (appendix). Next determine the correct position of the sampling vertical by interpolation in the table provided. At the boat-sampled mainstem stations, sampling verticals will be located at the centroids of equal-area increments. This will necessitate measurement of a cross-sectional depth profile before the 48-hour sampling period begins. Plot the cross-section and determine the five approximate centroids of volume. Attempt to hold the boat at these same sampling verticals (distances from the bank) during each of the sampling periods.

At wading sections, the five centroids of discharge will be determined from the discharge measurements made at the time of sampling. Transit rates should be held as constant as possible within each vertical to insure that a representative depth-integrated sample is obtained. Do not allow the sampler to sit on the river bottom before retrieval (move at a constant transit rate). It is not necessary that transit rates for each vertical be the same.; however, once a transit rate is selected for each vertical, it must remain constant for the entire upward or downward transit.

COMPOSITING - Samples from each vertical will be collected in Teflon bags. Be careful to insure samples and sampling equipment are handled with polyethylene gloves. Transfer sample from each vertical to the graduated cylinder (sieving the sample through the

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provided nylon sieves) and measure the volume and record. Also record the Price current meter clicks and total time of the vertical transect for each vertical. After recording volume, transfer sample to the Teflon-coated stainless steel churn for compositing. When all five verticals are completed, about 7.5 liters of sample should be in the churn. Use standard churn splitting procedures, consulting the attached table for splitting procedures.

NOTE - "TAYLOR" DEIONIZED WATER MUST BE USED IN ALL SAMPLE PROCESSING PROCEDURES. OTHER DEIONIZED WATER MAY BE USED FOR TITRATIONS, ETC.

MAJOR CONSTITUENTS - The dissolved components of water samples can be classified according to their general indigenous concentration levels. Those constituents present at concentration levels generally greater than 1 mg/L comprise the bulk of ionic materials that contribute to the specific conductance and the dissolved solids. Accurate measurement of these materials are necessary to characterize the general water chemistry of the samples.

Calcium, magnesium, sodium, and potassium are categorized as major constituent cations. Anions such as chloride, sulfate and silica (reported as SiO_2) are the corresponding counter ions. These coupled with hydrogen ion (determined from pH measurements) and carbonate/bicarbonate (determined from alkalinity titrations) represent the major water chemistry constituents. Even though these are dissolved materials and should be relatively homogeneously distributed in water samples, differences in surface and ground-water sources can result in rather significant concentration gradients of these materials in natural waters. Therefore, discharge weighted, depth and width-integrated sampling techniques are required to insure that statistically representative samples are obtained.

After sampling and compositing (see GENERAL CHEMICAL SAMPLING SECTION), a 500 ml subsample for the major cations determination (see sampling flow chart in appendix) is split from the composite churn into a sample rinsed Teflon bottle. This same subsample is used for trace metals processing, and the filtration process is described in that section. A 250 ml subsample for major anion determination is split from the composite churn into a sample rinsed, black capped, polyethylene bottle which will not be preserved other than by chilling (keep sample on ice at approx. 4 ^{o}C.). Rinse bottle with about 20 ml of sample and discard (this is a MUST for all subsamples), before filling to top, try not to leave an air space in bottle..

NUTRIENTS - Nutrients represent an important group of constituents that are extremely important in controlling the biological productivity of the river system. They consist of elements that are necessary for the growth of plants and ultimately animals. In excess, some nutrients can create potentially obnoxious situations by promoting algal blooms and other conditions and cause nuisance conditions such as taste and odor.

Nutrients, as discussed here consist of nitrogen containing species, ammonium, nitrate, nitrite and organic nitrogen; and phosphorus expressed as both orthophosphate and total phosphorus species. ALL nutrients will be determined as present in the DISSOLVED phase. Therefore, all samples for nutrients analysis must be field FILTERED.

After sampling and compositing (in churn), a subsample will be filtered through a 0.45 µm silver-membrane filter (the same filtering procedure and apparatus used for dissolved organic carbon), into 3 precleaned, opaque, 250 ml polyethylene brown bottles. Discard the first 20 ml of sample filtered. The appropriate labels are affixed to the bottles and the samples are immediately stored chilled in an ice chest. One bottle will be labeled for "Nutrients", the second bottle "Total Nitrogen" for organic nitrogen and the third bottle "Total Phosphorus" for total phosphorus species. After filtering, the silver filter must be carefully removed from the holder and stored chilled in a labeled petri-dish for suspended organic carbon determinations (see SOC instructions). If possible, all samples should be filtered through a single silver membrane filter; however, if the suspended sediment concentration is so high that the filter clogs quickly, the filter may be changed (Note - only 3 silver filters have been provided for each sample period). See DOC section for specific instructions on using the pressure filtration apparatus.

DISSOLVED ORGANIC CARBON - Dissolved organic carbon (DOC) is the organic carbon passing through a 0.45 µm silver membrane filter. This measurement quantifies the chemically reactive fraction and gives the mass of organic carbon dissolved in a water sample. It is a reliable measure of the many simple and complex organic molecules making up the dissolved organic load. The procedure for processing sample for DOC involves pressure filtering the sample through a .45 µm silver membrane filter housed in a stainless steel pressure filteration apparatus (Gelman Instrument Model 4280).

The procedure for filtration is as follows:

1. A silver filter is inserted into the lower section of the barrel filter using forceps (care must be used to avoiding damage to the filter. Note - do NOT use the same Teflon coated forceps that are used to handle the Nucleopore filters described below. Make sure the gaskets are properly aligned and hand tighten the middle section of sampler onto the base with filter.

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2. About 150 ml of sample is poured into the filter apparatus and the top section is hand threaded onto the top of the barrel and the gas line is connected to the nitrogen cylinder.

3. The regulator is carefully adjusted to 25 pounds per square inch (higher pressures may rupture cell walls, invalidating DOC measurements).

4. Sample is filtered into a 125 ml brown glass bottle. The first 20 - 25 ml of filtered sample is used to rinse the bottle and cap, and is subsequently discarded.

5. Fill the bottle completely and cap tightly. Label and chill immediately.

6. If the filter is not clogged sufficiently to inhibit filtration, this same filter and apparatus can be used to filter nutrient samples (see section on nutrients below).

TRACE ELEMENTS - Inorganic materials in the dissolved aqueous phase at concentration levels below 1 mg/L are classified as trace elements. These consist of cationic or anionic species that pass through a filtration process with a particle size cutoff of 0.4 micrometers (µm).

Often biologically toxic inorganic materials are present at trace concentration levels. In addition, a complete understanding of water chemistry processes requires a general knowledge of the trace elemental composition of the dissolved phase. The following trace elements will be determined in the aqueous phase: Al, As, B, Ba, Cd, Co, Cr, Cu, Fe, Hg, Li, Mn, Mo, Ni, Pb, Se, Tl and U. Additional information on the association of trace metals with specific size fractions of suspended material will determined on the residues retained on filters, and the special samples collected for field flow fractionation (FFF) measurements.

Two subsamples of the discharge weighted depth and width integrated composite (from churn) are collected in a sample rinsed 500 ml Teflon holding bottle and a 250 ml Teflon holding bottle. These samples are filtered through 0.4 µm Nucleopore filters housed in an all Teflon apparatus. The procedure for filtration is as follows:

1. Extreme care must be used during filtration and when handling filter apparatus to avoid contamination. At all times equipment must be stored in plastic bags to prevent dust contamination, and plastic gloves must be worn by the operator.

2. Set up filtration apparatus using filter holder and vacuum system.

3. Place membrane filter in apparatus using Teflon-coated tweezers. Be careful to orient filter in the holder so that the shiny side is up. Filters are packed with shiny side down, between paper spacers. Use care to avoid puncturing the filter with the tweezers. Grip the filter at the edge and avoid wrinkling filter when tightening filter holder.

4. Rinse filter with about 50 ml of 0.1 % HNO_3, the rinse solution is prepared by dosing 0.5 ml of concentrated high purity HNO_3 from Teflon dosing bottle (1 dose) into the 500 ml bottle that is provided marked ACID RINSE (use safety glasses). Fill bottle with deionized water, and shake to mix thoroughly. Vacuum filter to dryness, then rinse filter with about 100 ml of deionized water (**rinse water is prepackaged in each of the RED capped bottles**) (vacuum filter to dryness). Dispose of acid rinse and water rinse into waste bottle and discard into provided waste storage.

5. Vigorously shake sample in Teflon holding bottle and pour about 20 ml into filter funnel. Filter into 250 ml RED capped bottle. Remove bottle from the apparatus, screw on cap and shake vigorously and discard.

6. Pour additional sample into filter funnel and continue filtering until bottle is approximately 7/8ths full. Cap bottle tightly and label. This will be the first trace element/major cation sample.

7. After filtration is completed, carefully remove sediment loaded filter with Teflon coated tweezers from the filter holder and place in labeled Petri dish.

8. Repeat the identical procedures outlined in steps 3-7 to prepare the **replicate** trace element/major cation sample and its corresponding filter.

9. Repeat steps 3 and 4 to prepare a third filter for the Hg determination sample. Deionized rinse water is contained in the brown glass bottle. Use a 10 ml portion from the Hg determination holding bottle to rinse a 125 ml CLEAR glass bottle with filtered sample (7/8 full). **Discard sample rinse and fill this bottle with filtered sample. After filtration is complete, rinse a 125 ml BROWN glass bottle with 10 milliliters of filtered sample, shake and discard, and then continue filtering from the "Hg determination holding bottle" until this bottle is 7/8 full.**

10. If any of the filters are clogged sufficiently where the filtration process is slowed to the point of inhibiting further sample processing, use a new filter and go back to item 4, and rinse the new filter with 0.1 % HNO_3, deionized H_2O and sample.

11. After filtration is completed, carefully remove sediment loaded filter with Teflon coated tweezers from the filter holder and place in labeled Petri dish. If extra filters were used in any of the steps, place them with the Hg filter in a third petri dish for later disposal. When completed there should be three petri dishes with filters, one for each trace element sample and a third for disposal (includes Hg filter).

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12. Both of the trace element/major cation sample bottles should be acidified with concentrated HNO_3, using the Teflon calibrated dosing bottle (**be sure to wear safety glasses**). Use TWO (2) doses of acid from the dosing bottle for each sample bottle. This represents a total of 1 ml of concentrated HNO_3 per 250 ml of sample (each dose from the HNO_3 dosing bottle is 1/2 ml). Tighten lids on bottles and shake to homogenize acid.

13. The **CLEAR** 125 ml Hg determination sample **ONLY** should be preserved with $K_2Cr_2O_4$-HNO_3 preservative. The brown 125 ml Hg determination sample is chilled.

14. When completed, there should be two **RED** capped sample bottles for trace element/major cations, one **CLEAR** glass Hg determination sample bottle and one **BROWN** glass Hg determination sample bottle, each appropriately labeled.

15. Each of the Petri dishes holding the filters from the filtration procedures should be identified and labeled with time, date, bar code numbers of samples processed through the filter and any comments in a corresponding fashion to the sample collected.

16. When all filtration is completed, thoroughly rinse all apparatus with deionized water and place in the appropriate plastic bags for storage.

17. Specific details of the entire procedure and the samples generated should be carefully recorded in the field notebook. Do not assume that information will be obvious, record **ALL** pertinent data.

BLANKS - Once per day, process a single portion of deionized water (as if it were a sample) through all sample handling procedures. This will generate a total of two blank samples for trace elements, mercury, nutrients, DOC, etc.

FIELD FLOW FRACTIONATION SAMPLE - A sample is collected for the study of colloidal size fraction particles and their associated composition. These samples will be subsampled from the composited sample (from churn) directly into one of the small (60 ml) polyethylene screw capped bottles. Be sure and label the bottle immediately after filling and chill immediately.

SEDIMENT SIZE DISTRIBUTION AND CONCENTRATION - A sample is collected for the measurement of the size distribution and concentration of suspended matter (<63 μm). These samples are subsampled from the composited sample (from churn) into one of the 1 liter bottles. Use chloroform to preserve the samples, if available (10 ml per sample bottle). If it is not available, keep unpreserved sample chilled until transport to the laboratory. The bottle is tightly capped and labeled.

BIOLOGICAL SAMPLE COLLECTION

DRIFT - The term drift refers to material and organisms moving with the current. In many instances it is living benthic invertebrates, but also consists of parts of plants and animals. Most often we measure the near-surface drift, which consists mostly of organic material rather than bedload or other denser-than-water particles. The most common way to measure drift is to place nets having a given orifice and mesh size into the current of the stream for a given time period. In our case we place the nets near the shoreline (because of the water depth of the river) using reinforcement bar (rebar) driven into the river bottom to hold the nets. The nets we use have an orifice opening of 100 mm (4-inches) and a mesh having pore openings of 250 microns. The top of the net orifice is maintained just below the surface of the water. Since the river stage rises and falls rapidly and on an irregular basis, the nets may need to be moved several times to keep them at the surface of the water. After being in the river for one hour the nets are removed and the contents placed into containers and preserved. Note: In order to quantify the drift it is necessary to know the velocity of the water entering the net in feet per second (fps). Thus, before the net or rebar are removed, this measurement must be made. Also, once the nets are in place there should be no upstream disturbance. The nets should only capture natural drift, not that caused by sampling or other upstream activity.

Locate a somewhat shallow area (<2 feet in depth) and in an area where the water is visibly moving downstream. Drive two rebar stakes about 4 inches apart into the river bottom until they are steady. Repeat the procedure at another similar site. Place the nets between the rebar with the top of the net just above the water line. Secure the nets with an elastic cord, by squeezing the rebar rods together against the opening of the net. Be certain that the safety cord of the net is looped over one of the rebar stakes to prevent loss of the net should it slip from between the two rebar rods. Note and record the time the net is set, using military time. Because of fluctuating river levels it may be necessary to raise or lower the nets on the two rebar stakes during the set period. After one hour, remove the nets from the river, and wash the contents into the plastic container attached to the end of the net. Remove the drift contents from the plastic container by unscrewing the lid, and place into a sample jar. Consolidate the contents of all nets into a single jar if possible. If not possible, use another jar and mark it "2 of 2" on the label. The velocity in feet per second must be measured and

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recorded on the label for each net. Preserve with a 50/50 mixture of water and ethyl alcohol. Label the contents with the following information 1) drift, 2)location of station, 3) time nets were set, 4) feet per second in front of nets and 5) date. Place the label INSIDE the sample bottle, and close the lid tightly. Finally, seal the lid to the bottle with a wrap or two of electrician's tape.

BIOLOGICAL PIGMENTS - The most useful biological pigment for determining phytoplankton biomass is Chlorophyll *a*. This pigment is found in all oxygen-producing algae, both phytoplankton and periphyton.

The major problem in collecting Chlorophyll *a* in remote field areas such as the Grand Canyon is that the sample must be frozen immediately after collection. Thus we must by necessity limit the collection of Chlorophyll *a* samples to specific sampling stations during our synoptic experiments. The method consists of passing a known amount of water through a glass filter, rolling the filter with its contents inside, placing the rolled filter and contents into a darkened bottle or vial, and freezing until laboratory analysis with a spectrophotometer.

Collect a water sample using a depth integrated sampler, or a water bottle (sample may be removed from a churn splitter.) Place a glass 47mm diameter filter onto a filter funnel and vacuum or pressure a known amount of water through the filter. Use no more than 25 psi with the pressure apparatus. Observe and record the amount of water passing through the filter. Remove the filter and roll tightly with the contents inside. Place in a darkened bottle or vial and immediately freeze. Keep frozen until analysis. The amount of water to pass through the filter is empirical, and must be determined for each sampling circumstance. Often the filter clogs when there is still water in the funnel. If this happens, note the amount of water that passed through the filter. Next, discard this water, save the filter, and the water in the funnel above the filter. With a new filter in place, add the saved water to the funnel and again filter. Another technique is to add water to the funnel in small amounts until the filter clogs. The goal is to filter as much water as possible, but under ideal circumstances a liter is sufficient.

BENTHIC INVERTEBRATES FROM STREAM BOTTOM - Earlier it was mentioned that because of temperature and other changes in the Colorado River the benthic invertebrate community is small and in some instances may be absent. The purpose of this sampling procedure is too obtain insight to their location, and the types that might be present. We do this with a kick net, which is a qualitative sampler. The net is held in the stream by its brailles, and a person immediately upstream from the net dislodges the stream bottom material. This material with its associated organisms are washed into the net. The net is removed from the water and the organisms placed in a bottle containing 50/50 mixture of alcohol and water. Benthic organisms are most often the immature stages of aquatic insects. They must be in the water at all times, for they breathe through gills. Thus, they will not be found on the stream bottom between the high and low water areas of the river. If they are found at all, they will be on the stream bottom, especially riffle areas, that are present (wet) during low flows. Thus, sample for them ONLY during the lowest flow time of each day. This may be at night. Repeat, sample only below the low water line.

At low flow, select a riffle area less than a meter in depth. Have one person hold the net brailles, insuring that the bottom edge of the net is firm against the stream bottom. The second person disrupts the stream bottom in front of the net. Standard practice is to disrupt approximately a square meter of stream bottom. When completed raise the net upward and in an upstream direction. Be careful not to lose the contents. Place the net on a flat surface and remove the organisms with a pair of forceps. Place the organisms in a bottle containing a 50/50 mixture of alcohol and water. Label the bottle, noting the date, time, depth of water, location of sampling site, size and type of stream bottom material, and approximate size of stream bottom area disturbed. Place the label inside of the bottle. Seal the bottle to the lid with electricians tape.

RESPONSIBILITIES OF TEAM LEADERS

The Team Leader at each of the sampling sites will be responsible for the successful completion of all aspects of the Synoptic experiment sampling program. This will include personnel safety both on the water and ashore. While underway, on the river, the contractor Boat Captain will be responsible for safety matters involving transportation of personnel and equipment to the sampling sites. In addition, the Boat Captain will assume responsibility for boat safety during all boat sampling activities. The Team Leader must interact closely with the Boat Captain to assure project objectives are met within appropriate safety considerations.

FIELD NOTES - The Team Leader will be responsible for maintaining a log book describing all activities involving team members, including:

1. Transportation of equipment, personnel and samples to and from sampling sites.
2. An event-by-event log of training, sampling, sample processing, preservation, and all other aspects of the synoptic sampling experiment.

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3. Notes recording observations of weather conditions, river and tributary conditions (visual turbidity, debris, beach and shoreline conditions and fish and insect activity), sampling or sample processing problems and any other observations that will be of value in interpreting the quality of samples collected or evaluating the performance of team members.

4. Field record of physical measurements acquired during the sampling periods, including temperature (water and air), pH, specific conductance, and any field computations necessary to establish transit rates or nozzle sizes for depth-integrated sampling.

5. A log of all photographs (fully annotated) taken to record sampling activities.

These logs will be submitted to Project management and become a permanent record of the synoptic experiment.

ADHERENCE TO SAMPLING AND SAMPLE PROCESSING PROCEDURES - It is the team leaders responsibility to assure that all procedures for making field measurements and collecting and processing samples are strictly followed. This is an extremely important responsibility as a successful synoptic experiment is predicated on consistent implementation of measurement and sample collection techniques, so that results can be interpreted satisfactorily. All water samples for chemical analysis will be labeled with the appropriate preprinted labels and secured to their respective bottle (see labeling instructions). Samples for biological material will have their labels placed inside the bottle or container.

LOGISTICS - the team leader is responsible for managing all logistics relating to his sampling site. This will include assignment of duties and responsibilities to all team members, training of team members, overseeing collection and processing of samples, quality control of samples from his site and transportation of samples and records to the laboratory. All samples will be transferred from the sampling site as quickly as possible to the appropriate demarcation point for transport to the laboratory. All samples will be kept chilled or preserved with the appropriate preservative. It is the TEAM LEADERS RESPONSIBILITY to see to it that all samples arrive at the laboratory in a timely fashion.

REPORTING - Each team leader will be responsible for preparing a final confidential report which will be submitted within 15 days following the sampling trip to Project management (Bennett, Taylor and Averett). This report will include observations and comments concerning the overall experiment, problems encountered at their respective sampling site (technical and personnel) and comments regarding improvements in future synoptic experiments. This report will kept confidential to allow team leaders to candidly evaluate the performance of their respective sampling teams. These reports will be used to assist in interpreting data from the synoptic experiment and will be used in planning future studies.

SAFETY

Personnel SAFETY issues come FIRST. Under NO circumstances will safety procedures be compromised. Life jackets must be worn at all times when working on or near the river, cableways or lakes, even when wading or working near shore.

CAMP PROCEDURES AND WILDERNESS ETIQUETTE

Most of the work we will be doing during the Synoptic Experiments will be in Grand Canyon National Park, or in the Glen Canyon National Recreation Area. As such we will be conducting research as guests of the Nation. We must follow all National Park Service rules on camping, swimming, boating and must follow the wilderness rule of leaving nothing but footprints, taking nothing but pictures. Please use extreme common sense in this fragile and beautiful ecosystem. Let the record clearly show that we, employees of the U.S. Geological Survey, are sensitive to the land, to the water, and can conduct first-rate research in the most fragile of ecosystems.

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APPENDIX

NATIONAL PARK SERVICE RULES

This is an abbreviated list of river regulations drawn from the Colorado River Management Plan. If you have any questions, please ask the head boatman or trip leader.

1. Life jackets must be worn at all times while on the river and kept properly fastened and adjusted to fit.

2. Cans, rubbish, and other refuse must be carried out. Liquid garbage must be strained through a fine mesh screen into the river and the solids placed in garbage bags.

3. The use of soap is restricted to the mainstem of the Colorado River only and may not be used within 100 yards of the confluence of any tributary.

4. All human waste must be carried out of the canyon. The head boatman will explain the toilet system to be used at camp and the day toilet system to be used while not in camp. Urination must be on the wet sand below the high water line. After going to the toilet or handling food, wash hands with soap and water.

5. Walk on established trails and do not create multiple trails. Do not blaze new hiking routes or sleep in fragile desert zones.

6. Water purification: To disinfect visually clear water, add 8 drops of liquid chlorine bleach per gallon, mix, and let stand uncovered for at least two hours. To disinfect cloudy, sediment-laden water, settle overnight or use flocculating procedures, add 10-12 drops of liquid chlorine bleach per gallon, mix, and let stand uncovered for at least two hours. Water may also be filtered with a pump having a nominal pore size of 0.45 microns or less. An alternative to chemical and filtration treatment is to boil river water for a minimum of 1 minute prior to use. The head boatman will ensure that purified drinking water is identified and accessible for those who desire it.

7. Prior to the trip launch, the head boatman will give all passengers an orientation covering safety, Park regulations, and health procedures.

8. All natural, historical, archeological, and wildlife resources in Grand Canyon National Park are not to be disturbed.

9. An Arizona Game and Fish Department fishing license is required for all fishing. Fishing or use of soap at the Little Colorado River confluence is prohibited.

10. Ground-to-air radios may only be used to report a MEDICAL EMERGENCY.

<u>Non-Park Service Notes:</u>

1. The head boatman is responsible for your safety and scheduling the trip. You can help the boatman by: communicating about trip and daily scheduling needs, which equipment must be accessible or requires safe storage, and assisting with loading and unloading the boat. Adjustments to the schedule may have to be made in response to flows. Let the guide/cook set up the kitchen and toilet before you select your camping site. Don't get on the boat at night without the boatman's permission. If you are going for a walk by yourself(s), let the guide know where you are going and when you will return. If everyone helps out with routine camp and research chores, then the trip will operate smoothly.

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2. Please keep the research tents clean. Use a ground cloth to protect the bottom, keep the zippered doors to the inside and away from sand, and stake them down. Please return them clean and dry.

3. Black bags and ammo-cans must be returned at the end of the trip.

4. Consumption of alcoholic beverages on the boats or during work hours is prohibited.

5. Don't leave anything below the high water line!

6. For your health and safety: Most accidents happen on land -- wear your shoes. Because of scorpions be certain to shake out your shoes in the morning and lay out your bag just when you are ready to go to bed (not before). Keep your distance from red ants -- their bite can cause pain. If you see a rattlesnake, let the head boatman know about it and do not attempt to move it yourself. Don't dive into the river -- wade in slowly. Don't leave the boat until it has been beached by the boatman and secured. Your life jacket is your best friend -- clip it to the duffel pile, a tree, or put a rock on it on land.

7..Dehydration and sunburn are common problems on the river. Make sure that you drink large amounts of water and protect skin by applying sun screen and wearing protective clothing. If you find yourself getting stupid or crabby, you are probably dehydrated!

ALCOHOLIC BEVERAGES

Team leaders are also responsible for assuring that alcoholic beverages are consumed only during non-working hours. For the synoptic studies, working hours include the entire 48-hour sampling period plus the following 1) preparation time, 2) training and test drive periods, 3) breaking camp and loading and unloading boats, and 4) while raft is in transit. These rules assure that we follow National Park Rules concerning consumption of alcoholic beverages while in the Grand Canyon. We ask that all team members respect these rules.

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DISCHARGE AND SAMPLING TABLES FOR CABLEWAYS

09404200 Colorado River abv Diamond Creek approx 220' wide

Note: at 15 & 27.000 flow vertical angles of 5 to 12 deg occurred using a 100C suspension weight.

Q		Centroids(ft)					
5.770	LEW	110	130	150	70	190	REW
Vel		1.5	1.9	2.0	2.0	1.5	
Depth		28	30	30	30	30	
10.300		105	125	145	165	190	
Vel		2.2	3.2	3.2	3.0	2.5	
Depth		28	33	32	33	33	
15.350		105	130	145	165	190	
Vel		3.3	4.0	4.0	4.0	3.6	
Depth		30	36	34	36	36	
27.170		100	125	145	170	195	
Vel		4.5	6.0	6.3	6.0	5.1	
Depth		32	39	41	39	40	

Q - ft^3/sec

Vel - ft/sec

Depth - ft

GAGE HEIGHT (FEET)	DISCHARGE IN CUBIC FEET PER SECOND 0	1	2	3	4	5	6	7	8	9	10
40	--	--	--	--	2500	3260	4020	5280	6670	8700	14700
50	11300	14000	17000	19800	22700	25900	29500	33400	37600	42000	35300
60	46600	--	--	--	--	--	--	--	--	--	--

PRELIMINARY RESULTS
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09404120 Colorado River abv National Canyon approx 250-280' wide

Q		Centroids (ft)					
5,800	REW	75	105	140	170	210	LEW
Vel		2.0	2.4	2.9	2.6	2.3	
Depth		16	15	14	14	13	
8,630		90	120	150	180	220	
Vel		2.1	3.4	3.0	3.3	2.9	
Depth		20	17	17	17	16	
13,030		70	110	145	180	220	
Vel		2.6	3.9	4.0	3.9	2.9	
Depth		22	19	20	19	19	
15,530		85	120	155	180	225	
Vel		2.9	4.3	4.1	4.4	4.0	
Depth		24	22	21	21	20	
20,440		85	115	150	180	215	
Vel		4.0	5.3	5.4	5.4	5.0	
Depth		25	24	24	23	23	
26,880		70	110	150	190	225	
Vel		2.7	6.0	6.0	6.0	5.2	
Depth		28	27	26	25	25	

Q - ft^3/sec
Vel - ft/sec
Depth - ft

GAGE HEIGHT (FEET)	DISCHARGE IN CUBIC FEET PER SECOND 0	1	2	3	4	5	6	7	8	9	10
30	--	--	--	1780	2290	2900	3610	4430	5360	6410	8300
40	7590	8920	10400	12000	13800	15800	17900	20300	22800	25500	20900
50	28500	31900	35500	39500	43700	48200	53100	58100	63400	69000	46500
60	75000	81300	87900	94900	102000	110000					

PRELIMINARY RESULTS
SUBJECT TO REVISION

09383100 Colorado River abv LCR Reach approx 310-350' wide

Q		Centroids (ft)					
5.520	LEW	425	360	320	280	240	REW
Vel		1.5	2.0	2.3	2.3	1.8	
Depth		9	12	13	12	13	
7.070		430	370	330	280	250	
Vel		1.9	2.3	2.4	2.7	2.4	
Depth		10	11	13	13	15	
13.320		430	365	320	280	230	
Vel		2.9	3.6	3.9	3.8	2.5	
Depth		12	15	17	16	17	
17.200		440	380	35	295	255	
Vel		3.0	3.9	4.8	4.9	4.5	
Depth		13	15	17	17	18	

Q - ft^3/sec
Vel - ft/sec
Depth - ft

GAGE HEIGHT (FEET)	DISCHARGE IN CUBIC FEET PER SECOND 0	1	2	3	4	5	6	7	8	9	10
20	--	2870	3990	5100	6700	8900	11000	14100	17300	20800	23800
30	24300	28100	32000	36000	40800	45700	50900	56300	61800	65500	45000
40	69300	73100	76800	80600	84400	88200	92000				

PRELIMINARY RESULTS
SUBJECT TO REVISION

09402500 Colorado River nr Grand Canyon approx 300' wide

Q		Centroids (ft)					
5,610	REW	150	190	230	280	340	LEW
Vel		1.5	2.0	1.8	1.8	1.3	
Depth		15	16	14	13	13	
8,620		150	190	230	280	340	
Vel		2.1	2.3	2.3	2.2	1.8	
Depth		18	18	16	15	15	
15,650		150	200	250	300	350	
Vel		2.8	3.4	3.3	3.4	3.2	
Depth		21	20	19	19	19	
17,000		155	200	245	295	350	
Vel		3.2	3.6	3.6	3.5	3.1	
Depth		22	21	20	20	20	

Q - ft^3/sec
Vel - ft/sec
Depth - ft

GAGE HEIGHT (FEET)	DISCHARGE IN CUBIC FEET PER SECOND 0	1	2	3	4	5	6	7	8	9	10
0	--	--	3110	4230	5490	6930	8550	10400	12200	14200	16700
10	16500	19100	21900	25000	28400	32000	36000	40200	44800	49800	38500
20	55000	60700	66700	73100	79900	87000					

PRELIMINARY RESULTS
SUBJECT TO REVISION

09379910 Colorado River blw Glen Canyon Dam approx 430' -490' wide

Q		Centroids (ft)				
5,060	LEW	275	350	395	440	495
Vel		3.1	3.0	3.0	2.7	2.1
Depth		4	6	8	8	7
11,600		260	335	390	440	490
Vel		4.0	4.3	4.5	4.5	3.5
Depth		5	9	11	11	10
13,700		250	330	390	445	515
Vel		4.3	4.7	4.5	4.2	2.5
Depth		7	10	11	11	11
15,300		250	325	385	435	495
Vel		4.4	4.6	4.8	4.8	3.8
Depth		7	10	12	12	12
26,300		225	305	370	430	500
Vel		5.5	6.1	6.1	6.1	4.7
Depth		9	13	14	15	14
27,400		225	305	375	430	495
Vel		5.4	6.1	5.9	5.9	4.9
Depth		9	13	15	16	15

Q - ft^3/sec
Vel - ft/sec
Depth - ft

GAGE HEIGHT (FEET)	DISCHARGE IN CUBIC FEET PER SECOND 0	1	2	3	4	5	6	7	8	9	10
20	--	--	--	--	--	--	--	563	1570	3110	4400
30	4890	6900	8940	11700	14600	17800	21300	25000	29200	34000	34700
40	39600	45400	52000	58100	65000						

PRELIMINARY RESULTS
SUBJECT TO REVISION

09380000 Colorado River @ Lees Ferry approx 300' wide

Q		Centroids (ft)					
3,140	REW	315	380	430	470	515	LEW
Vel		0.50	0.70	0.70	0.60	0.72	
Depth		17	17	17	22	20	
9,040		320	385	435	480	520	
Vel		1.2	1.6	1.6	1.8	1.8	
Depth		19	20	25	26	21	
13,400		300	360	415	465	515	
Vel		2.1	2.1	2.3	2.2	2.1	
Depth		21	20	24	26	23	
16,500		290	350	405	455	510	
Vel		2.5	2.7	2.7	2.4	2.3	
Depth		21	21	23	28	25	
26,600		280	345	405	460	510	
Vel		3.3	3.6	3.7	3.5	3.5	
Depth		23	23	25	29	27	

Q - ft^3/sec
Vel - ft/sec
Depth - ft

GAGE HEIGHT (FEET)	DISCHARGE IN CUBIC FEET PER SECOND 0	1	2	3	4	5	6	7	8	9	10
0	--	--	--	--	--	1260	2660	4750	7640	11400	9900
10	16200	22100	29100	37400	47000	58000	70500	83100	98500	116000	

PRELIMINARY RESULTS
SUBJECT TO REVISION