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NUTRIENT AND HYDROLOGIC LOADING TO UPPER KLAMATH LAKE, OREGON, 1991-1998

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For:

KLAMATH TRIBES NATURAL RESOURCES DEPARTMENT
U.S. BUREAU OF RECLAMATION COOPERATIVE STUDIES

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INTRODUCTION

Relationship between algal biomass, water quality, and fish.

Upper Klamath and Agency Lakes, a large, shallow, hypereutrophic lake system located in south-central Oregon (Fig. 1), exhibits many water quality problems typically associated with excessive algal production. These include extended periods of low dissolved oxygen, elevated pH, and toxic levels of un-ionized ammonia (Kann and Smith 1999; Perkins et al. 1999). These water quality problems are of great concern because of their potential impact on native fish populations in the lake, including the shortnose sucker (*Chasmistes brevirostris*), Lost River sucker (*Deltistes luxatus*), and interior redband trout (*Oncorhynchus mykiss* ssp.). Both sucker species were listed as endangered under the Endangered Species Act in 1988, and water quality degradation resulting from algal blooms had been identified as a probable major factor in their declines (Williams 1988). Moreover, based on harmful levels of dissolved oxygen, pH, and chlorophyll (algal biomass), both lakes have been designated as water quality limited for resident fish and aquatic life (ODEQ 303(d) List 1998).

All three of the above species, as well as native blue and tui chubs, were found in substantial numbers during fish kills occurring in 1995, 1996, and 1997 (BRD 1996; Perkins et al. 1999). Harmful water quality conditions associated with a period of high algal biomass (>150 $\mu g\ L^{-1}$ chlorophyll a) preceding the kills included extended periods (30-90 days) of high pH (9-10) and un-ionized ammonia (200-2000 $\mu g\ L^{-1}\ NH_3$). This was followed by a period of sharply decreased algal biomass characterized by low dissolved oxygen (<4 $mg\ L^{-1}$) throughout the water column that persisted for up to several days (Perkins et al. 1999). Repeated exposure to these water quality stressors has also been implicated in immune system suppression and subsequent mortality due to diseases and pathogens (e.g., *Flexibacter columnaris*; Perkins et al. 1999).

There is clearly a link between high algal biomass (blooms) and harmful water quality in Upper Klamath and Agency Lakes, and such algal blooms, dominated by the blue-green alga *Aphanizomenon flos-aquae* now occur annually from June through October (Kann 1998). The degraded water quality that results from these blooms is thus a significant threat to the long-term persistence of the endangered suckers and other aquatic life, not only because of catastrophic mortality events, but also because of reduced fitness and survival as a result of chronic stress. Overall reduction of algal biomass is then a critical element of any management program designed to allow recovery of fish populations.

Relationship between nutrients and algal biomass.

The general relationship between water quality dynamics and subsequent fish success in Upper Klamath Lake is as follows: physical-chemical factors (e.g., flushing rate, volume/depth, phosphorus and nitrogen concentration and supply rate, light dynamics, temperature) → algal biomass → habitat quality parameter of concern (e.g., pH, dissolved oxygen, un-ionized ammonia) → physiological tolerance → fish success (fish kills or chronic stress). Under this scenario, knowledge of mechanisms affecting the various linkages within the above relationship is key to management of ecosystem processes that will allow recovery of fish populations. As stated, one essential management goal is the reduction of algal biomass, and because increased

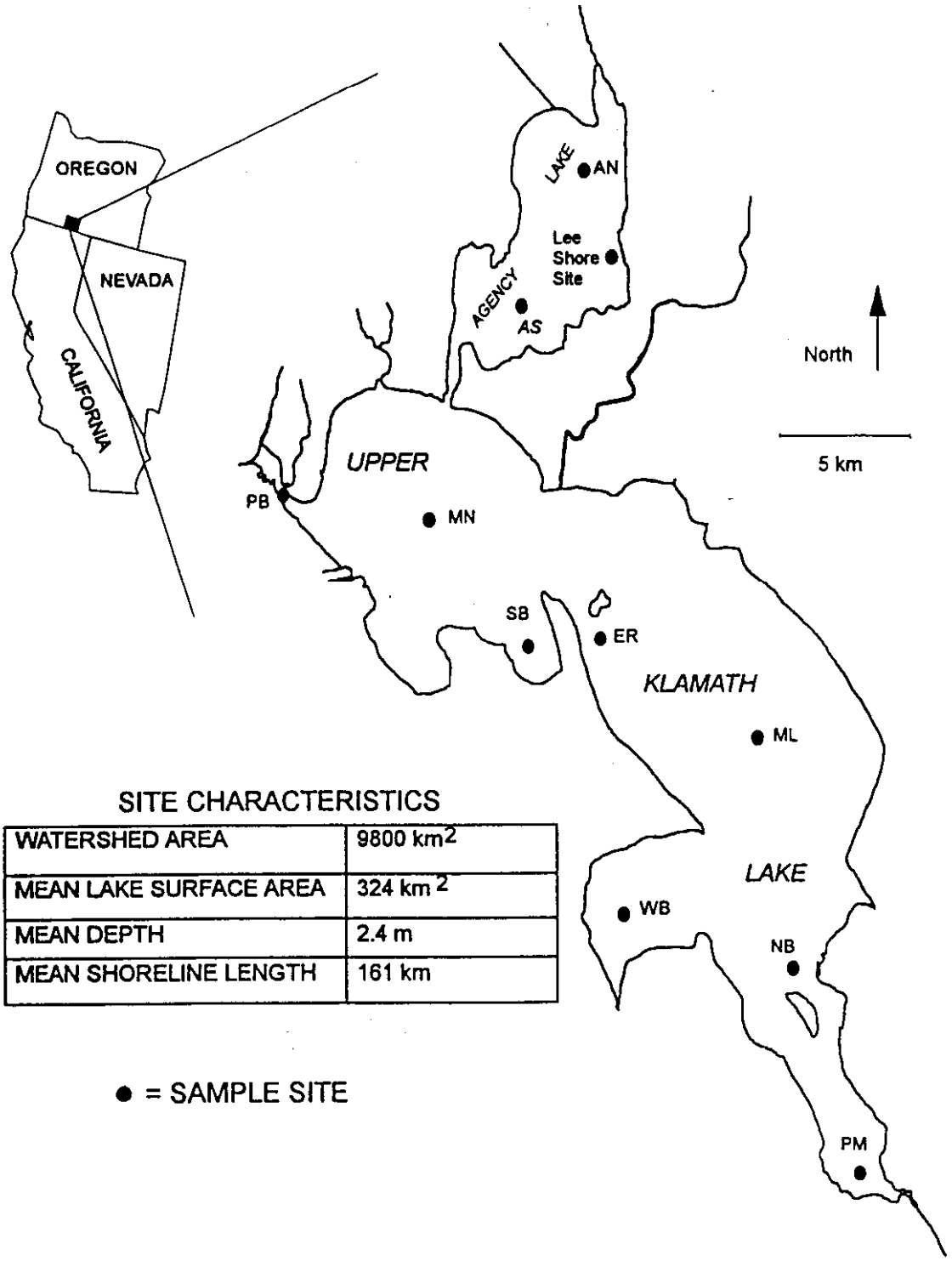

Fig. 1. Upper Klamath and Agency Lakes with in-lake sample site locations.

algal biomass is most often caused by increased nutrient enrichment by nitrogen (N) and phosphorus (P) (Carpenter et al. 1998, Cooke et al. 1993), knowledge of the in-lake concentration and source of these nutrients is crucial.

Although nitrogen can be important in structuring algal communities and determining biomass, P reduction has been shown to be the most effective long-term nutrient management option to control algal biomass (Sas et al. 1989). This is especially true for nitrogen-fixing species such as *Aphanizomenon,* which can augment their nitrogen needs in what may otherwise be a nitrogen limiting system. The chlorophyll-phosphorus relationships described by Kann (1993; 1998) and Walker (1995) also support phosphorus reduction as the management goal. In addition, in shallow hypereutrophic lakes, algal biomass in general and blue-green algae in particular show substantial reductions in response to reduction in P loading, even when P concentrations remain in the hypereutrophic range (>100 $\mu g\ L^{-1}$ total P) after restoration (Jeppesen et al. 1990; Seip et al. 1992). — Although Cooke & Welch 95 cite situations where no recovery after 10 years

Given the linkage between P and algal biomass, and between algal biomass and water quality deterioration, the role of P in driving primary production is of central importance. It is therefore desirable to make management decisions regarding phosphorus reduction and subsequent algal biomass reduction as they relate to water quality improvement. Phosphorus-based models form the core of current lake management models (e.g. Vollenweider 1975; OECD 1982; Reckhow and Chapra 1983; Walker 1987; Ryding and Rast 1989; Sas 1989), and such models first require nutrient loading studies and detailed lake phosphorus budgets.

F. Basic description of P dynamics in lakes

Factors affecting nutrient dynamics

Although historic accounts indicate the lake would have been considered eutrophic even 100 years ago, there have since been numerous land- and water-use alterations within the lake basin which have the potential to impact hydrologic regimes and nutrient export characteristics. The hydrology of the lake has been profoundly changed by water diversions in tributaries entering the lakes, by diversion of water out of the lakes, and by the construction of a dam at the lake's outlet in 1921. As a result, both the timing and quantity of lake flushing flows and nutrient retention dynamics have been altered, and lake surface elevation and volume are reduced below historic levels. As importantly, there have been major changes in the watershed including forest clear-cutting, grazing of >75,000 head of cattle in upstream flood plains, the degradation of riparian corridors, and the conversion of 35,000 acres of wetlands to pasture and agriculture on the lake periphery itself (Gearheart et al.1995; Risley and Laenen 1999). The Environmental Protection Agency (EPA Index of Watershed Indicators 1998) indicates that at least 110,000 acres of the watershed have been converted to irrigated pasture or other agricultural activities, and Risley and Laenen (1999) show an 11 fold increase in permitted irrigated land acreage between 1900 and the present. Due to the proximity of water sources and the ability to gravity convey water, most of these 110,000 acres occur in riparian and flood plain areas, with the majority being flood-irrigated. These watershed land-use changes are consistent with the types of activities that would cause altered hydrologic regimes (Poff et al. 1997) and increased nutrient loading (above historic background levels) both to tributaries and to lakes (Johnes et al. 1996; Carpenter and Cottingham 1997). An apparent shift in relative abundance from the eutrophic

Mention of changes in watershed and modification of lake levels

Where did the water from ?

green alga *Pediastrum* sp., to the nitrogen-fixing blue-green *Aphanizomenon flos-aquae* (S. Coleman and P. Bradbury, US Geological Survey, written communication) during the first 50 years of these land-use changes, is further indication of altered nutrient and hydrologic regimes in this system.

Past nutrient studies

Despite high background P levels in Upper Klamath Basin tributaries, data exists from numerous studies to indicate that P loading and concentrations are elevated substantially above these background levels (Miller and Tash 1967; USACE 1982; Campbell et al. 1993; USGS Water Resources Data 1992-1997, EPA Storet Data 1959-1997. One of the earliest nutrient loading studies (Miller and Tash 1967; updated by USACE 1982) indicates that despite accounting for only 12.4% of the water inflow, direct agricultural input from pumps and canals account for 31% of the annual external total phosphorus (TP) budget. Other studies show that drained and diked wetlands consistently pump effluent containing 3-10X the phosphorus (P) concentration of tributary inflows (Klamath Tribes 1994), and that nitrogen and phosphorus are liberated from drained wetland areas, leach into adjacent ditches, and are subsequently pumped to the lake or its tributaries (Snyder and Morace 1997). Coupled with the considerable but diffuse non-point contribution stemming from wetland loss, flood plain grazing, flood irrigation, and channel degradation, the TP input from anthropogenic sources likely accounts for a far greater percentage than that indicated by the 31% contributed due to direct pumping alone. Gearheart et al. (1995) estimated that over 50% of the annual TP load to the watershed could be reduced with management practices, and Anderson (1998) likewise estimates that in-lake TP concentration can be reduced by utilizing watershed management strategies. Walker (1985) also estimates that an increase in Agency Lake inflow concentration from 81 to 144 $\mu g\ L^{-1}$ P is an estimate of the anthropogenic impact.

In addition, there is evidence indicating that sediment regenerated P (internal loading) is also a large source of P in Upper Klamath Lake (Barbiero and Kann 1994; Laenen and LeTourneau 1996; Kann 1998). An important mechanism for release of phosphorus in shallow productive polymictic lakes is photosynthetically elevated pH (Welch 1992; Sondergaard 1988; Jacoby et al. 1982). Elevated pH increases phosphorus flux to the water column by solubilizing iron-bound phosphorus in both bottom and resuspended sediments as high pH causes increased competition between hydroxyl ions and phosphate ions decreasing the sorption of phosphate on iron. Evidence for this exists in Upper Klamath Lake where it was shown that the phosphorus associated with hydrated iron oxides in the sediment was the principal source of P to the overlying water, and that iron-phosphorus fractions decreased from May to June and July (Wildung et al. 1977). In addition the probability of achieving increased internal loading rates increases with pH, and it appears that ~9.3 is the pH level at which the probability of internal loading sharply increases (Kann 1998). Empirical evidence from Upper Klamath Lake along with supportive evidence from other lakes indicates that as the bloom progresses and elevated pH increases the flux of phosphorus to the water column, increased water column phosphorus concentration further elevates algal biomass and pH, setting up a positive feedback loop ($\uparrow P \rightarrow \uparrow$ Algal Biomass $\rightarrow \uparrow$ pH $\rightarrow \uparrow$ P).

Study goals

While it is clear that enough data exist to indicate that P loading and subsequent P concentration are both elevated considerably over background levels, the data have not been detailed enough to develop a dynamic lake nutrient budget that can be used to model in-lake water quality dynamics. The earliest attempt at a phosphorus and hydrologic budget that relied on rigorous inflow loading data was completed over 30 years ago (Miller and Tash 1967), and was only partially revised since then (USACE 1982). In addition, Miller and Tash (1967) did not provide a true mass-balance budget (in-lake mass was not included), include internal loading, or determine seasonal loading and retention patterns. USACE (1982) provided an internal loading estimate based on laboratory experiments, but also did not incorporate in-lake changes in mass, and relied extensively on Miller and Tash (1967) inflow data. Although useful for evaluating watershed restoration strategies, Gearheart et al. (1995) and Anderson (1998) phosphorus models are annual average steady-state models and are based only partly on detailed in-lake and inflow nutrient data. Previous work by Walker (1995) only included the Agency Lake subbasin.

Between 1991 and 1998 detailed in-lake and inflow nutrient loading data have been collected by the Klamath Tribes and US Bureau of Reclamation as part of a long-term water quality monitoring program in the Upper Klamath Basin. Utilizing this data, it is our goal here to develop detailed mass balances for phosphorus and nitrogen at both annual and seasonal time scales. These mass balance budgets will then form the basis for further modeling efforts to evaluate management decisions regarding phosphorus reduction and subsequent algal biomass reduction as they relate to water quality improvement.

DEVELOPMENT OF MASS BALANCE FOR WATER AND NUTRIENTS

Lake and inflow nutrient data

Lake data

Regular limnological measurements were made in Upper Klamath and Agency Lakes from January 1990 through September 1998 in order to monitor seasonal water quality, nutrient, phytoplankton, and zooplankton dynamics (Kann 1998). To coincide with collection of inflow nutrient loading data, the lake nutrient data collected between April 1991 and September 1998 were extracted from this larger data set. Samples were taken biweekly or occasionally weekly during the June-September growing period, and were taken approximately monthly during the winter-early spring period except when prevented by ice cover or dangerous storms. In general, 10 sites were sampled on each date, 2 in Agency Lake, and 8 in Upper Klamath Lake (Fig. 1). The exceptions to this were in 1990 when a subset of sites (ER, SB, MN, PB, and AS) in the northern portion of the lakes were sampled on some dates, and in 1996 when only 6 (PM, ML, ER, SB, MN, and AS) of the 10 sites were regularly sampled. Because the lake is polymictic and only undergoes weak and intermittent stratification, a depth-integrated water sample of the entire water column was taken coincidentally with the water quality profiles. This was accomplished by combining a minimum of three replicate hauls from a weighted 5-cm diameter plastic tube at each site. This composite sample was then mixed and portioned off to appropriate collection bottles for the analysis of total phosphorus (TP), soluble reactive phosphorus (SRP), nitrate+nitrite nitrogen (NO_3-N--NO_2-N), ammonia nitrogen (NH_4-N), and total nitrogen (TN).

Total inorganic nitrogen (TIN) was taken as the sum of NO_3-NO_2-N and NH_4-N. With the exception of TN which followed D'Elia et al. (1977), APHA (1985) was followed for all analyses. All sampling trips included field duplicates and blanks, and laboratory analysis included split samples as well as samples spiked with a known concentration of the parameter to be analyzed.

Utilization of these nutrient data in mass balance analyses required computing the lake-wide mean for each sample date. The Pelican Bay site PB (Fig. 1) was not included due to the direct influence of spring-water and wetland vegetation on the nutrient dynamics at this site. With the exception of utilizing the outlet site Fremont Bridge (FB) to represent lake nutrient concentration during the late fall through early spring period, only those dates when 3 or more sites were measured ($n \geq 3$) were included in the analyses. Based on a comparison of both log transformed ($\log_{10}$) and non-transformed data with the normal distribution using Kolmogorov-Smirnov one-sample tests (*cf.* Zar 1984), it was apparent that site specific nutrient data tended to be lognormally distributed within a sample date. Thus the geometric lake-wide mean provided the best estimate of lake-wide central tendency. Sensitivity of the mean to utilizing a subset of sample sites (e.g., such as in 1996 when only 6 sites were regularly sampled) in the computation of these sample date means was negligible based on a comparison of means computed from a reduced number of sample sites on a given date to means computed using all sites on that same date (data not shown). Lake wide mean nutrient concentrations are provided in Appendix 1.

Inflow data

Nutrient measurements were made at all major inflows to Upper Klamath Lake from April 1991 through September 1998 (Fig. 2; see data in Appendix 2). However, many of the minor and ephemeral inflows, as well as springs shown in Fig. 2 were sampled less frequently. Moreover, due to the lack of a direct connection to the lake many of these less frequently sampled sites were discontinued after the 1992 water year (WY). Additional samples were collected from agricultural pumps discharging to the lake from adjacent diked and drained wetlands or tributaries (Fig. 3). Pumps were visited on approximately a weekly schedule during the pumping period (late winter-mid spring), but because pumping was sporadic due to float-driven operation, samples could not always be collected.

Nutrient concentration data were collected by both the US Bureau of Reclamation (USBR) and the Klamath Tribes in the Wood River drainage (Campbell and Ehinger 1993, Campbell et al. 1993). Three of the major inflow stations, Sevenmile Canal (7MCA), Wood River Dike Rd. (WODR), and Wood River Weed Rd. (WOWR) (Fig. 2; sites 4, 41, and 42), were sampled monthly by USBR from 1991-1993. More frequent sampling at these same sites was initiated by the Klamath tribes in 1992, when samples were collected approximately weekly or biweekly during high runoff periods, and monthly during low runoff periods. When USBR and Klamath Tribes data coincided, an average value was used to characterize that date. Location information for these sites can be found in Campbell and Ehinger (1993)

As above, an approximately weekly or biweekly sampling frequency during high runoff periods, and monthly during low runoff periods, was initiated for the remaining major inflow, the Williamson River (WRST), its major tributary the Sprague River (SRKB), and the lake outflow

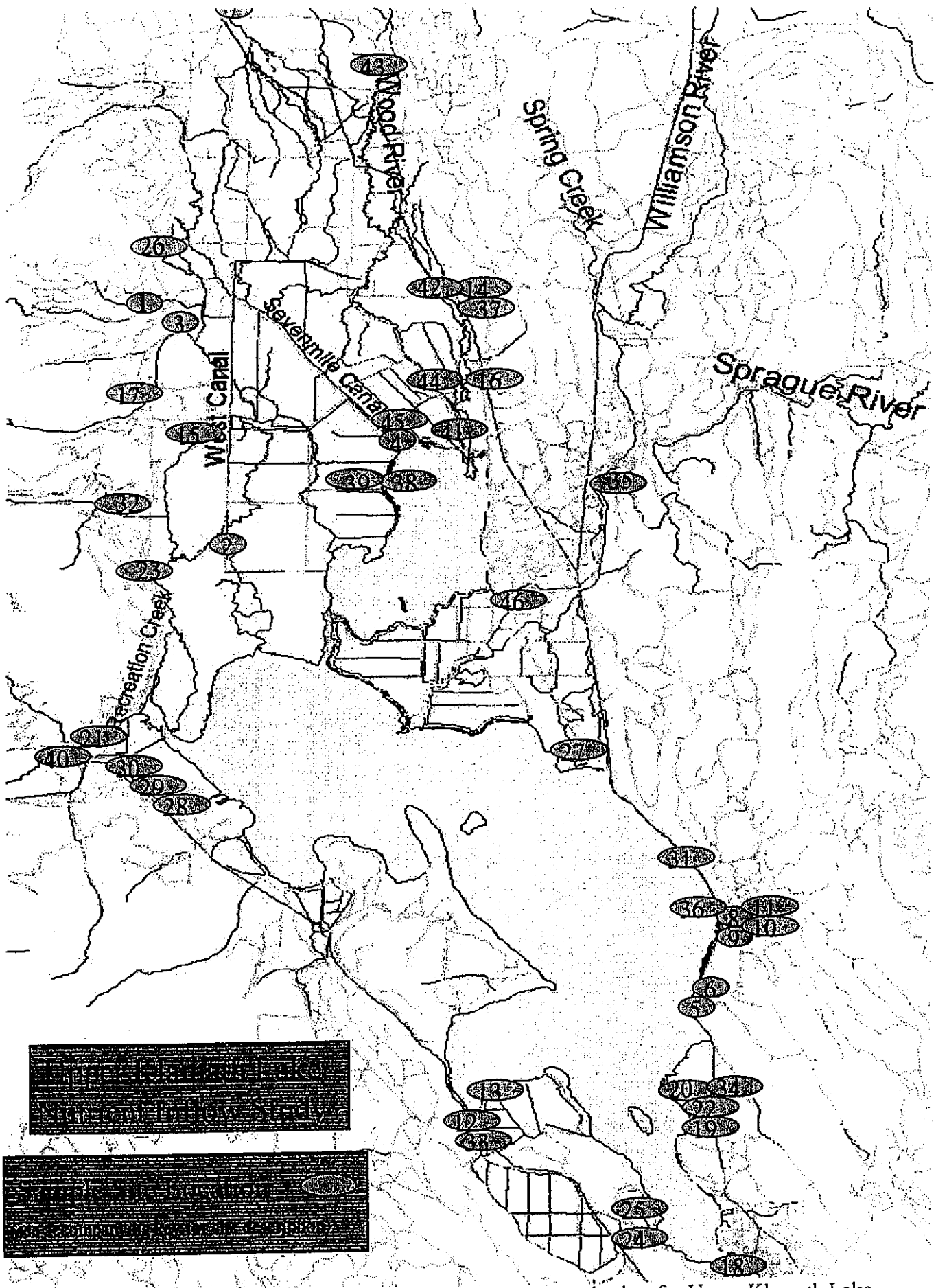

Fig. 2. Location of discharge measurements and nutrient sample sites for Upper Klamath Lake

Site #	Site Code	Description
1	3MCR	Threemile Creek
2	4MCA	Four Mile Canal
3	4MSP	Four Mile Spring
4	7MCA	Seven Mile Canal
5	ALGOMA BRIDG	Hwy 97 where Alogoma drains to UKL
6	ALGPU	Rattlesnake Point Pump (ALGOMA PUMP)
7	ANCR	Annie Creek at USFS Bridge near Snow park
8	BSCA	Barkely Canal
9	BSFD	Barkley Field
10	BSPU	Barkley Pump
11	BSSP	Barkley Springs @ Hagelstein Park
12	CACA	Caledonia Canal (Lakeside of Hwy 140)
13	CAPU	Caledonia Pump - Draining Caledonia marsh
14	CC62	Crooked Creek AT HWY 62 BRIDGE
15	CCLO	Crystal Creek LODGE CHANNEL
16	CCPA	Crooked Creek AT PAIGE'S
17	CHCR	Cherry Creek.
18	FRBR	Freemont Bridge at Outlet of Klamath Lake
19	HAFD	Hanks Field
20	HAMA	Hanks Marsh (in marsh east of 97)
21	HASP	Harriman Spring
22	HMPU	Hanks Marsh Pump (draining ag area below marsh)
23	MASP	Malone Spring
24	MCPS	McCornack Pump South
25	MCPU	McCornack Pump
26	MESP	Mares Egg Spring
27	MOCA	Modoc Canal
28	ODCR	Odessa Creek
29	ODESSA CANAL	Odessa Canal draining to pump
30	ODPU	Odessa Pump
31	OXSP	Ouxy Springs
32	ROCR	Rock Creek (Draining to Crystal Creek)
33	RYPU	Wocus,Caledonia Canal South Pmp (RUNNING Y PUMP SOUTH)
34	SPPU	Shady Pine Pump (discharging into the marsh)
35	SRKB	Sprague @ Kirchers
36	SUSP	Sucker Springs
37	TESP	Tecumseh SPRINGS
38	TULANA PUMP	TULANA PUMP (LAKESIDE)
39	TUPU	Tulana Ranch Pump (into Agency Lake south of sevenmile)
40	VACR	Varney Creek
41	WODR	Wood River @ AGENCY LAKE (Dike Rd.)
42	WOWR	Wood River (WEED ROAD)
43	WODX	Wood River Dixon Road
44	WRRPE	Wood River Ranch PUMP EAST (INTO WOOD RIVER)
45	WRRPW	Wood River Ranch PUMP WEST (INTO 7-MILE CANAL)
46	WRST	Williamsom River @ Store (Bridge Crossing on Modoc Pt. Rd.

Fig. 2 (continued). Sample site names and descriptions for location numbers on previous page.

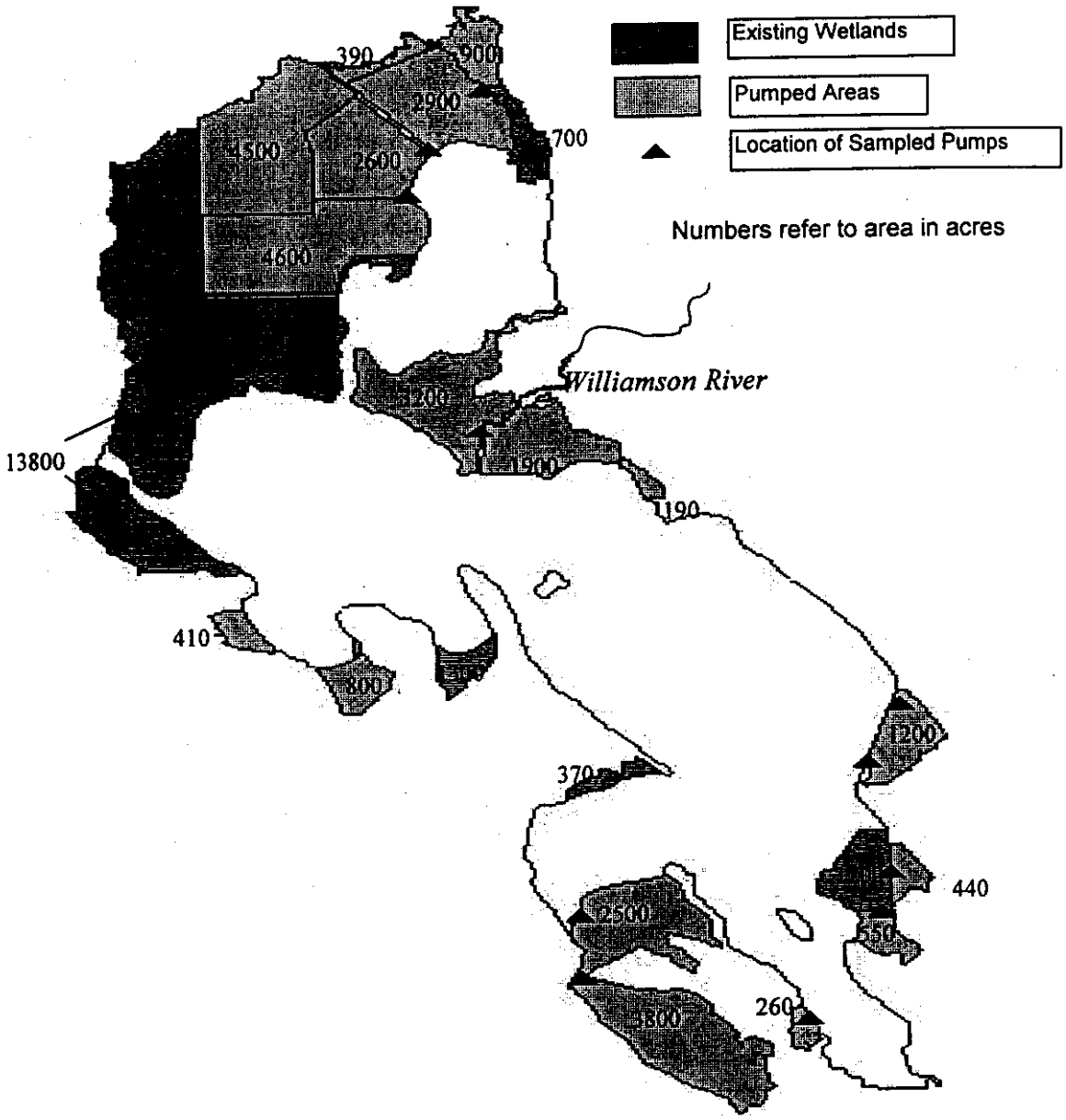

Fig. 3. Location of drained and diked agricultural areas adjacent to Upper Klamath and Agency Lakes.

(FB) (Fig. 2; sites 46, 5, and 18). Because the lake outflow site FB is near the lake sampling site PM, these sites were used interchangeably to represent lake outflow nutrient concentration (earlier statistical analyses showed no significant difference between the two sites). WRST is located at the Modoc Point Rd. Bridge at RM ~5.5; SRKB is located at Kirchers Bridge at RM ~0.5; and FB is located at Fremont Bridge at RM 0 of the Link River.

All inflow and outflow nutrient concentration data were derived from samples that were composited both cross-sectionally and with depth. This was accomplished at the major inflow sites by combining multiple hauls of a Van Dorn horizontal-style water sampler; with the combined sample mixed and portioned off to appropriate collection bottles for analytical analysis as above, and as outlined in Campbell and Ehinger (1993) and Campbell et al. (1993). Both lake and tributary concentration data were interpolated between adjacent sample dates to generate a daily record for input to the mass balance model.

Lake and inflow hydrologic data

Lake data

Daily lake elevation data for the period of this study (1991-1998) were obtained from the USBR Klamath Falls Project Office. Daily lake volume was then computed from the elevation-volume relationship developed from new bathymetric data collected in 1996 (Upper Klamath Lake/Agency Lake Mapping – 1997 Revised Area Capacity, Leon Bastekas note to files, PRJ1310). Lake volume used here was computed from the USBR elevation-capacity relationship as follows:

$$\text{lake volume} = (\text{active storage}) + (\text{dead storage}) - (\text{marsh storage}).$$

Daily precipitation records were obtained from the Oregon Climate Service, Corvallis Oregon for Station 4506 in Klamath Falls and Station 1571 in Chiloquin. Precipitation volume entering the lake was then computed from the mean of the two precipitation gaging sites multiplied by lake surface area (lake surface area was computed from elevation-area curves supplied by USBR).

Daily class A pan evaporation data obtained from the OSU Experiment Station located in Klamath Falls were corrected to approximate open-water evaporation by multiplying by 0.7 (Merrit 1968; Kadlec 1989). Long-term mean monthly evaporation values were used to fill in missing observations during the months of March, April, May and October. Evaporative loss from the lake surface was computed by multiplying daily open-water evaporation estimates by lake surface area to obtain total volume lost.

Daily lake outflow volume was computed from continuous daily stream-flow gaging stations located on the "A" Canal and Link River near the outlet of the lake. The total volume of lake outflow is equal to the sum of the "A" Canal and Link River gages (data obtained from USBR).

Inflow data – tributary flows

Daily inflow volume for the Williamson and Sprague Rivers was computed from continuous daily discharge data obtained from U.S. Geological Survey stream-flow gaging stations (USGS Gages 11502500 and 11501000, respectively). Continuous daily stage-height measurements were made by USBR at the Wood River Weed Rd. (WOWR) site from 1991-1996, and by Matthews (1999) thereafter. Daily inflow volume for WOWR was then computed from the stage-discharge relationship generated from instantaneous discharge measurements (measured at the same frequency as nutrient concentration data) and stage height readings (detailed methods are contained in Campbell and Ehinger 1993 and Matthews 1999).

Attempts to generate daily stage-discharge relationships at the Wood River Dike Rd. (WODR) and 7-Mile Canal (7MCA) stations failed due to the seasonal back-water affect of lake elevation on the recorders deployed at these stations. However, it was possible to measure instantaneous discharge at both locations, and these were also generally taken at the same frequency as the nutrient concentration data. The exception to this was at 7MCA, where, due to lower flows and close proximity to the lake, there were no detectable velocities on some sample dates. The nutrient concentration was then assumed to be influenced by the lake, and zero loading was assigned for these dates. At all other miscellaneous sites, instantaneous discharge was measured at the same time as concentration data were collected.

To generate complete daily flow records for the WODR and 7MCA sites the following procedure was used:

1. Each instantaneous discharge measurement was paired with the corresponding daily-mean flow at the WOWR station.

2. A regression equation was developed relating the station discharge to the WOWR discharge.

3. The regression equation was applied to generate a predicted discharge for each day of the record.

4. The residual was calculated (observed-predicted) for the days having instantaneous measurements.

5. The residuals were interpolated over time to generate a residual for each day in the record.

6. The daily discharge was calculated by adding the predicted flow (3) and the interpolated residual (5).

All regression analyses used in these procedures are shown in Appendix 3. In situations where the correlation between WOWR flow and the station flow is high (e.g., WODR), this procedure tends to track the Weed Road flow (with an appropriate adjustment in scale). In situations where the correlation is weak (e.g., 7MCA), this procedure approaches a direct interpolation of the instantaneous flows over time. A similar procedure was used to fill in missing discharge values for WOWR when the automatic stage recorder was temporarily inoperable. However, in this

case the regression equation calculated using Williamson River daily data was not able to predict WOWR flows greater than 300 cfs. This is because the Williamson River tends to have higher peaks relative to its mean during spring runoff than does the Wood River. Missing values occurring during periods when the correlation is poor (i.e., when Wood River flow is >300 cfs) then approach a directly interpolated value (see Appendix 3).

Inflow data – direct agricultural pumping

The volume of water pumped from adjacent diked and drained agricultural areas was estimated from Hubbard (1970) and Snyder and Morace (1997) by developing a regression between annual Williamson River volume and the annual agricultural unit area flow (UAF; annual pumped volume/area drained) for the WY's of 1965-1967, and 1985. Both studies provided detailed estimates of the volume pumped during the respective years; with Hubbard (1970) utilizing meters on all irrigation pumps, and Snyder and Morace (1997) using records of electricity use and then applying a rating curve that was developed between kilowatt/hours and volume for each measured pump. The calculations for estimation of pumped agricultural drainage for this study (WY's 1992-1998) are contained in Appendix 4, with the general procedure as follows:

1. Total annual agricultural volume discharged to the lakes was obtained for WY's 1965-1967 (Hubbard 1970). Because some pumped areas measured in Hubbard (1970) were no longer managed as pumped agricultural areas at the time of the Snyder and Morace (1997) study, the UAF for each year was calculated in order to standardize the values so that the data from both studies could be combined.

2. Pumped volume data were obtained for WY's 1993-1995; however, only enough data existed for WY 1995 to provide an estimate of total annual volume for the 4 areas represented by the pumping stations (data provided by J. Morace, USGS, Portland, Oregon). The average UA flow of the 4 measured areas was then used to estimate the volume pumped from remaining unmeasured agricultural areas (see Appendix 4). The total volume of measured and unmeasured areas combined was then divided by the total area to obtain the UAF for WY 1995.

3. A regression equation was developed relating UAF for each of the four WY's to total annual Williamson River discharge. The regression equation was then applied to total annual Williamson River volume for WY's 1992-1998 to generate a new predicted agricultural UAF for each WY.

4. The predicted UAF was then multiplied by the area of agricultural pumping to obtain total volume discharged to the lake for each WY. The agricultural area used to predict total volume was exclusive of the Wood and Thomas properties because the volume contributed by these areas is already included in the WODR and 7MCA station estimates.

5. This total annual volume was then apportioned to each month based on the average monthly fraction pumped from Hubbard (1970).

Inflow data – ground water

Groundwater inflow volume (including springs and seeps) was calculated as the residual of the lake water balance as follows:

$$GW = \text{outflow} + \text{evaporation} + \Delta \text{ lake storage} - \text{tributary inflow} - \text{agricultural inflow} - \text{precipitation}$$

Due to the difficulty in obtaining accurate discharge time series for some of the minor tributaries discharging directly to the lake (e.g., 4-Mile Canal) these were not estimated separately, but are included in the residual GW term here. In the summary tables and figures this term is denoted as "Springs". This term also includes all other error in measured discharge and lake hydrologic characteristics.

Nutrient budget construction

The above estimates of nutrient concentration and water volume were used in all subsequent determinations of nutrient mass. The nutrient mass from each surface inflow and outflow was computed as the product of daily estimated nutrient concentration and discharge. The nutrient mass contained within the lake was computed as the product of daily lake volume and daily estimated lake-wide mean nutrient concentration.

The nutrient mass from direct agricultural input from adjacent diked and drained wetlands was estimated at monthly intervals as the product of the weighted-average nutrient concentration of measured pumps (weighted by the area representing each pump having measured nutrient concentration data; Table 1) and the estimate of monthly water volume pumped from the contributing areas (derived as above).

The nutrient mass entering the lake from groundwater (springs, seeps, and small surface flow) was determined as the product of the GW volume estimate from the above equation and mean nutrient concentration of measured springs in proximity to the lake (Fig. 2; Table 2).

Atmospheric inputs (the sum of wetfall and dryfall) were estimated at fixed areal rates of 18 $kg/km^2\ yr^{-1}$ for phosphorus, and 1080 $kg/km^2\ yr^{-1}$ for nitrogen (USEPA 1975).

Estimates of the background and anthropogenic loads were made as follows:

1. Background load was estimated as the total inflow volume from all sources (tributary+precipitation+agric. pumping + springs) multiplied by the mean nutrient concentrations from the spring sources in Table 2 (63 $\mu g\ L^{-1}$ TP, etc.). Because many of the tributaries originate from springs (e.g., Wood River, Williamson River, etc), this provides an estimate of loading in the absence of anthropogenic inputs.

2. Anthropogenic load was then estimated as the difference between total inflow nutrient load and background load from (1) above.

Table 1. Mean nutrient concentrations in drained and diked agricultural areas.

Pump Location	Sample Size	Minimum	Maximum	Geometric Mean	Median		Area (m^2)	Weighting Factor	Weighted Mean
ALGPU	8	159	739	352	423				
BSPU[1]	9	256	1600	446	376	4856227.2	1.94E+09		
CAPU	12	105	426	186	170	10117140	1.88E+09		
HMPU	42	52	432	141	158	2225770.8	3.14E+08		
MCPU	11	86	636	321	440	1052182.6	3.38E+08		
ODPU	11	50	155	79	71	1659211	1.31E+08		
SPPU	14	141	636	330	367	1780616.6	5.88E+08		
TUPU	26	73	810	272	290	47348215	1.29E+10		
WRRPE	19	171	2220	703	755				
WRRPW[2]	22	243	1600	802	836	11735882	8.83E+09		
WRPU[3]	9	570	1700	975	920	12949939	1.26E+10		
WOPU[4]	9	80	320	185	210	15378053	2.84E+09		
					Total	109103238	4.24E+10		388
ALGPU	8	68	449	162	148				
BSPU[1]	7	105	350	195	211	4856227.2	8.68E+08		
CAPU	11	8	186	51	56	10117140	5.19E+08		
HMPU	36	20	303	86	98	2225770.8	1.91E+08		
MCPU	9	33	509	135	159	1052182.6	1.42E+08		
ODPU	10	3	25	12	16	1659211	2.05E+07		
SPPU	14	17	303	166	215	1780616.6	2.95E+08		
TUPU	24	45	467	159	188	47348215	7.53E+09		
WRRPE	17	44	1370	443	467				
WRRPW[2]	19	82	1280	440	466	11735882	5.18E+09		
WRPU[3]	9	390	1200	678	750	12949939	8.78E+09		
WOPU[4]	9	10	120	42	40	15378053	6.45E+08		
					Total	109103238	2.42E+10		222
ALGPU	8	1460	8740	3527	3530				
BSPU[1]	9	1140	5340	2468	2850	4856227.2	1.46E+10		
CAPU	12	167	3660	1764	2400	10117140	1.78E+10		
HMPU	42	220	1877	678	784	2225770.8	1.51E+09		
MCPU	11	669	3200	1197	1070	1052182.6	1.26E+09		
ODPU	11	1220	2390	1627	1580	1659211	2.70E+09		
SPPU	14	951	4280	2296	2575	1780616.6	4.09E+09		
TUPU	26	299	4870	1596	1880	47348215	7.56E+10		
WRRPE	19	1070	6130	2339	2140				
WRRPW[2]	22	1010	6680	2689	2565	11735882	2.95E+10		
WRPU[3]	9	2070	6270	3501	3646	12949939	4.53E+10		
WOPU[4]	9	2907	6212	4169	4495	15378053	6.41E+10		
					Total	109103238	2.56E+11		2351
ALGPU	8	78	5224	1249	1157				
BSPU[1]	7	58	1870	590	1247	4856227.2	4.47E+09		
CAPU	11	55	1094	345	359	10117140	3.49E+09		
HMPU	36	12	677	96	77	2225770.8	2.14E+08		
MCPU	9	10	1783	64	34	1052182.6	6.79E+07		
ODPU	10	10	257	52	58	1659211	8.70E+07		
SPPU	14	30	1092	316	473	1780616.6	5.62E+08		
TUPU	24	10	1056	121	110	47348215	5.71E+09		
WRRPE	17	16	2813	235	201				
WRRPW[2]	19	10	2398	160	172	11735882	2.32E+09		
WRPU[3]	9	1150	4366	2165	2033	12949939	2.60E+10		
WOPU[4]	9	30.25	612	158	140	15378053	2.42E+09		
					Total	109103238	4.74E+10		434

[1] Combined area and mean nutrient concentration used for BSPU and ALGPU.

[2] Combined area and mean nutrient concentration used for WRRPE and WRRPW.

[3] Data from USGS - Snyder and Morace, 1997

Table 2. Mean nutreint concentration in springs adjacent to lake.

Spring Location	Sample Size	Minimum	Maximum	Median	Geometric Mean	Overall Mean	Overall Sample Size
Total Phosphorus (ug/L)							
4MSP	5	69	84	76	77		
BSSP	1	63	63	63	63		
HASP	6	35	47	37	39		
MASP	6	69	136	84	88		
MESP	6	60	74	67	66		
ODCR	6	48	95	58	60		
OXSP	4	50	55	52	52		
SUSP	6	50	62	57	57	63	40
Soluble Reactive Phosphorus (ug/L)							
4MSP	4	70	83	72	74		
BSSP	1	50	50	50	50		
HASP	5	32	38	34	34		
MASP	5	61	75	71	69		
MESP	5	58	61	60	60		
ODCR	5	30	46	35	37		
OXSP	3	45	50	49	48		
SUSP	5	50	58	52	53	53	33
Total Nitrogen (ug/L)							
4MSP	5	50	179	50	78		
BSSP	1	255	255	255	255		
HASP	6	50	179	50	73		
MASP	6	50	521	138	126		
MESP	6	50	50	50	50		
ODCR	6	50	1060	175	196		
OXSP	4	50	165	50	67		
SUSP	6	50	474	102	107	119	40
Total Inorganic Nitrogen (ug/L)							
4MSP	4	21	46	27	29		
BSSP	1	83	83	83	83		
HASP	4	53	77	60	62		
MASP	4	10	39	36	26		
MESP	4	10	23	21	18		
ODCR	4	10	314	54	53		
OXSP	3	70	101	98	88		
SUSP	4	65	124	101	95	57	28

Internal Loading

Net nutrient retention was calculated as the residual of the phosphorus mass balance equation as follows:

$$\text{Net Retention} = \text{tributary inputs} + \text{atmospheric inputs} - \text{outputs} - \Delta \text{ lake storage}$$

Net retention reflects net losses from the water column resulting from sedimentation, atmospheric fixation (nitrogen), nutrient releases from bottom sediments, and the cumulative effects of errors in the other mass-balance terms. Negative retention values denote a source from within the lake. Net internal TP load ($TP_{int(net)}$) then equals -1×(net retention) and is defined as the difference between TP release from the sediments and specific sedimentation. The total or gross internal TP loading (TP_{int}) is then defined as $TP_{int(net)}$ + sedimentation. Assuming deposition of TP to the sediments is a function of phosphorus mass in the lake (Vollenweider 1969), specific sedimentation rate (s) can be empirically estimated from the mass balance equation using the time period when internal loading is assumed to be negligible (March-May). Although we did not intend to provide detailed estimates of internal loading in this report, a sedimentation rate of 0.01/day (.07/week) was calculated from positive retention values during the March through May period. The following equation was then used to approximate TP_{int}:

$$TP_{int} = TP_{int(net)} + (s \times TP_{lake}); \text{ where } s=0.01 \text{ and } TP_{lake}=\text{TP mass in lake}$$

The total annual or time period estimate of TP_{int} *is taken as the sum of all positive* TP_{int} *values* over the time period. This allows for an approximate estimate of internal TP loading for comparison to external sources.

Due to the generally biweekly time step for collection of nutrient concentration data, the water and nutrient balance time series have been formulated at biweekly intervals (Appendices 5 and 6).

WATER AND NUTRIENT BUDGETS

Hydrologic Budget

The Williamson River and Wood River together accounted for 67% (51 and 16%, respectively) of the mean 1992-1998 (WY's) total inflow; with springs and small ungaged tributaries contributing another 16% (Fig. 4; Table 3). 7-Mile canal, precipitation, and agricultural pumping accounted for the remaining 17% (Fig. 4; Table 3). Relative contributions from the various inflow sources were remarkably similar to Hubbard 1970 and USACE 1982. As expected given relatively small watershed size (drainage area; Table 3) and high percent of flow contributed by springs, the unit area flow is substantially higher for the Wood River and 7-Mile Canal (Fig. 4). Indicative of input from adjacent irrigated areas with water not originating from within the defined drainage area, as well as inflow from another spring-dominated yet small drainage area (Crooked Cr.), unit area flow is also substantially higher for the area below the Weed Rd. station on the Wood R (Fig. 4). A similar phenomenon affects 7-Mile Canal, where

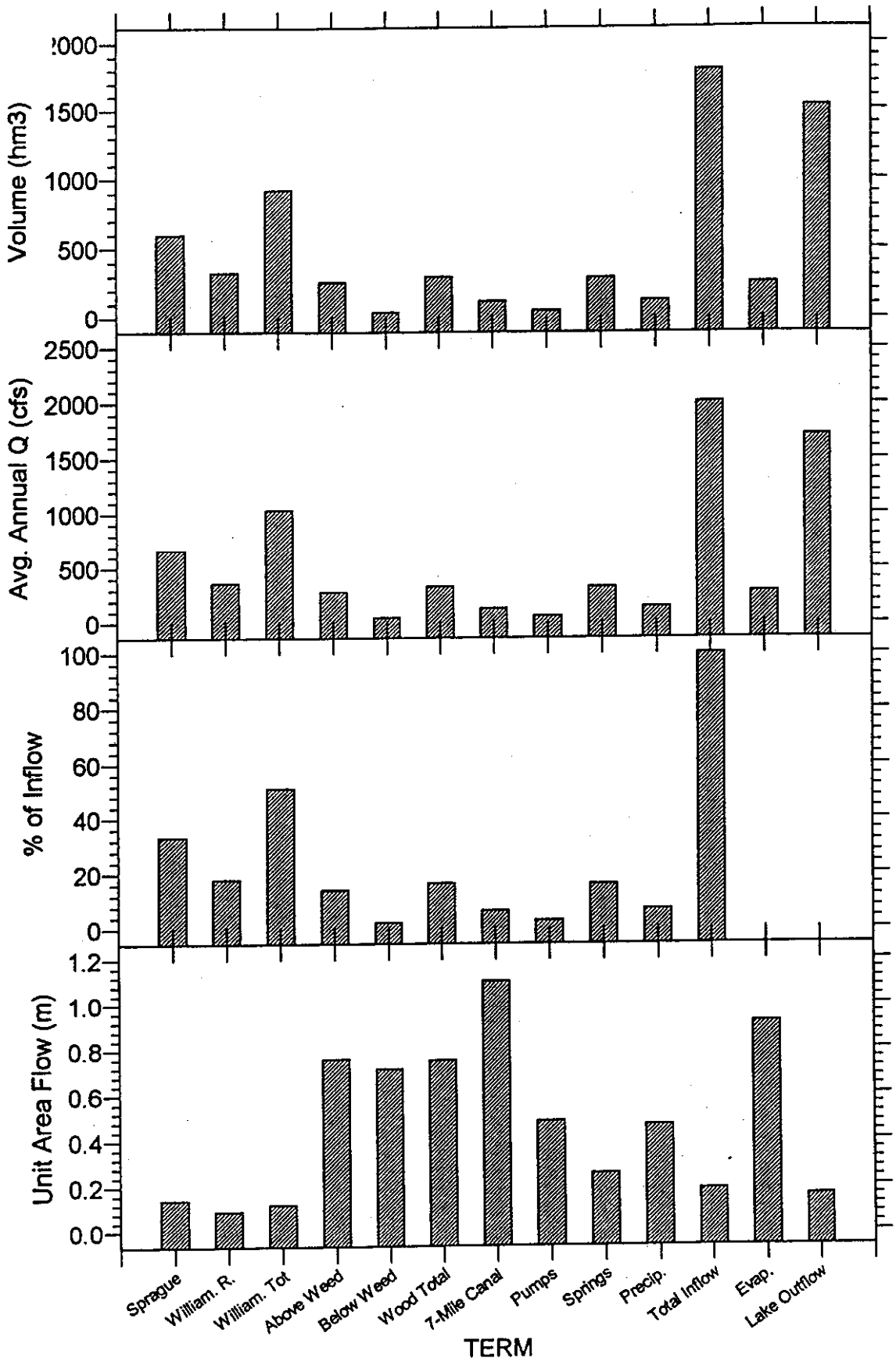

Fig. 4. Average annual water balances for water years 1992-1998.

Table 3. Annual flow and nutrient mass balance summary table -- all WY's combined and individual WY's (1992-98).

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
	* values are the annual average computed from all 7 water years	hm3	mean cfs	acre-ft X103	% Total	metric tons				% of total				ppb				km2	m	kg km-2			
						TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R.	321	359	260	18%	38	30	111	13	21%	23%	12%	3%	118	94	347	40	3501	0.092	10.8	8.6	31.8	3.7
	Wood River above Weed Rd.	253	283	205	14%	22	17	36	8	12%	14%	4%	2%	86	69	142	32	334	0.759	64.9	52.4	107.5	24.5
	Wood River Total	294	329	238	16%	35	29	72	10	19%	22%	8%	3%	120	98	246	34	391	0.752	90.0	73.8	184.8	25.9
	Agricultural Pumps	53	59	43	3%	21	12	124	23	11%	9%	13%	6%	388	222	2351	434	109	0.485	188.2	107.4	1139.3	210.5
	Precipitation	126	141	102	7%	5	5	293	293	3%	4%	32%	75%	39	39	2322	2322	271	0.485	18.0	18.0	1080.1	1080.1
	Total Inflow	1794	2009	1454	100%	182	128	929	389	100%	100%	100%	100%	101	71	518	217	9758	0.184	18.6	13.1	95.2	39.8
	Net Inflow	1545	1730	1252																			
	Storage Increase	20	22	16		-4	-2	-37	10														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	1668				105	89	198	95														

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
1992		hm3	mean cfs	acre-ft X103	% Total	metric tons				% of total				ppb				km2	m	kg km-2			
						TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R.	255	285	207	28%	32	25	18	8	28%	29%	3%	2%	126	97	71	32	3501	0.073	9.2	7.0	5.2	2.3
	Wood River above Weed Rd.	168	188	136	17%	15	12	28	16	13%	15%	5%	5%	88	74	166	97	334	0.504	44.1	37.2	83.8	49.1
	Wood River Total	204	228	185	21%	24	20	43	9	21%	24%	7%	2%	119	99	211	42	391	0.522	61.9	51.4	110.1	21.8
	Agricultural Pumps	48	54	39	5%	19	11	112	21	16%	13%	19%	6%	388	222	2351	434	109	0.439	170.3	97.2	1031.2	190.5
	Precipitation	74	83	60	7%	5	5	293	293	4%	6%	50%	84%	66	66	3975	3975	271	0.272	18.0	18.0	1082.2	1082.2
	Total Inflow	988	1108	801	100%	113	85	585	350	100%	100%	100%	100%	115	86	592	355	9758	0.096	11.4	8.4	30.7	8.0
	Net Inflow	714	800	579		113	85	585	350														
	Storage Increase	-62	-69	-50		-53	-23	-462	-64														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	914				57	49	109	52														

Table 3. (continued).

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
						metric tons				% of total				ppb				km2	m	kg km-2			
		hm3	mean cfs	acre-ft X103	% Total	TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R.	300	336	244	15%	32	27	91	12	16%	19%	8%	3%	106	90	301	40	3501	0.086	9.3	7.8	25.9	3.5
	Wood River above Weed Rd.	211	237	171	11%	22	16	30	7	10%	11%	3%	2%	102	74	141	32	334	0.633	64.8	47.0	89.1	20.4
	Wood River Total	266	298	215	14%	41	31	106	8	20%	22%	10%	2%	155	118	398	32	391	0.680	105.5	80.0	271.0	21.5
	Agricultural Pumps	53	59	43	3%	21	12	124	23	10%	8%	12%	6%	388	222	2351	434	109	0.485	188.1	107.4	1139.1	210.4
	Precipitation	144	162	117	7%	5	5	292	292	2%	3%	27%	71%	34	34	2028	2028	271	0.532	18.0	18.0	1079.3	1079.3
	Total Inflow	1941	2174	1574	100%	208	141	1066	409	100%	100%	100%	100%	113	78	431	65	9758	0.189	21.4	14.3	81.5	12.3
	Net Inflow	1697	1900	1376		208	141	1066	409														
	Storage Increase	184	184	133		5	8	135	152														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	1797				113	96	214	102														

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
						metric tons				% of total				ppb				km2	m	kg km-2			
		hm3	mean cfs	acre-ft X103	% Total	TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R.	245	275	199	23%	27	23	31	8	24%	27%	5%	2%	108	93	125	32	3501	0.070	7.8	6.5	8.8	2.2
	Wood River above Weed Rd.	209	234	169	19%	20	14	24	7	18%	17%	4%	2%	95	69	114	32	334	0.625	59.3	43.1	71.5	20.2
	Wood River Total	188	210	152	17%	22	18	30	7	20%	21%	5%	2%	119	95	160	36	391	0.480	57.0	45.8	76.8	17.1
	Agricultural Pumps	48	54	39	4%	19	11	113	21	17%	12%	20%	6%	388	222	2351	434	109	0.440	170.8	97.5	1034.2	191.1
	Precipitation	68	76	55	6%	5	5	292	292	4%	6%	51%	83%	71	71	4288	4288	271	0.252	18.0	18.0	1079.3	1079.3
	Total Inflow	1087	1218	881	100%	112	85	571	351	100%	100%	100%	100%	105	79	273	56	9758	0.107	11.3	8.5	29.3	6.2
	Net Inflow	814	911	660		112	85	571	351														
	Storage Increase	-206	-231	-167		-6	-8	-186	-186														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	1019				64	54	121	58														

ble 3. (continued).

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
		hm3	mean cfs	acre-ft X103	% Total	metric tons				% of total				ppb				km2	m	kg km-2			
						TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R	271	304	220	16%	28	25	98	9	16%	21%	10%	2%	102	93	362	32	3501	0.077	7.9	7.2	28.0	2.5
	Wood River above Weed Rd.	196	219	158	11%	17	14	35	8	10%	11%	4%	1%	85	69	176	26	334	0.587	49.8	40.6	103.4	15.2
	Wood River Total	240	269	194	14%	34	28	85	7	20%	23%	7%	2%	141	117	271	28	391	0.814	86.4	71.7	166.2	17.1
	Agricultural Pumps	52	58	42	3%	20	11	121	22	12%	9%	13%	6%	388	222	2351	434	109	0.473	183.6	104.8	1111.8	205.4
	Precipitation	141	158	115	8%	5	5	292	292	3%	4%	31%	77%	34	34	2070	2070	271	0.521	18.0	18.0	1079.3	1079.3
	Total Inflow	1726	1933	1399	100%	169	120	948	378	100%	100%	100%	100%	103	73	414	54	9758	0.167	17.3	12.2	69.1	9.0
	Net Inflow	1477	1654	1198		169	120	948	378														
	Storage Increase	220	246	178		65	14	699	15														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	1584				99	84	188	90														

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
		hm3	mean cfs	acre-ft X103	% Total	metric tons				% of total				ppb				km2	m	kg km-2			
						TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R	327	366	265	14%	49	39	92	24	20%	25%	8%	6%	149	120	281	74	3501	0.093	13.9	11.2	26.2	6.9
	Wood River above Weed Rd.	296	331	240	13%	23	19	49	8	10%	12%	4%	2%	79	63	166	28	334	0.886	69.6	55.5	147.3	23.1
	Wood River Total	339	379	275	15%	40	32	122	16	17%	20%	11%	4%	118	94	359	47	391	0.867	102.0	81.7	311.3	40.4
	Agricultural Pumps	56	62	45	2%	22	12	131	24	9%	8%	12%	6%	388	222	2351	434	109	0.510	198.1	113.0	1199.5	221.6
	Precipitation	160	179	130	7%	5	5	293	293	2%	3%	26%	76%	31	31	1831	1831	271	0.591	16.0	16.0	1062.2	1062.2
	Total Inflow	2257	2528	1830	100%	241	159	1137	419	100%	100%	100%	100%	113	73	402	60	9758	0.221	24.9	16.2	88.9	13.3
	Net Inflow	2012	2253	1631		241	159	1137	419														
	Storage Increase	-60	-67	-49		-22	4	-146	127														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	2097				131	112	249	119														

able 3. (continued).

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
		hm3	mean cfs	acre-ft	% Total	metric tons				% of total				ppb				km2	m	kg km-2			
				X103		TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R	411	460	333	17%	42	36	207	14	19%	22%	19%	3%	101	87	505	34	3501	0.117	11.9	10.2	59.3	4.0
	Wood River above Weed Rd.	360	403	292	15%	29	25	45	8	13%	15%	4%	2%	81	70	124	22	334	1.078	87.3	75.9	133.9	23.4
	Wood River Total	412	461	334	17%	45	39	78	16	20%	24%	7%	4%	109	94	184	39	391	1.054	115.2	99.4	193.7	41.5
	Agricultural Pumps	57	64	46	2%	22	13	134	25	10%	8%	12%	6%	388	222	2351	434	109	0.525	203.7	116.2	1233.2	227.8
	Precipitation	156	174	126	7%	5	5	292	292	2%	3%	27%	69%	31	31	1877	1877	271	0.575	18.0	18.0	1079.3	1079.3
	Total Inflow	2354	2636	1909	100%	220	164	1100	425	100%	100%	100%	100%	98	72	367	60	9758	0.232	22.7	16.7	85.1	14.0
	Net Inflow	2118	2372	1717		220	164	1100	425														
	Storage Increase	99	111	80		9	2	136	226														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	2198				138	117	262	125														

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
		hm3	mean cfs	acre-ft	% Total	metric tons				% of total				ppb				km2	m	kg km-2			
				X103		TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R.	434	486	352	20%	55	36	243	16	26%	25%	22%	4%	127	82	559	37	3501	0.124	15.8	10.2	69.3	4.6
	Wood River above Weed Rd.	333	373	270	15%	27	22	41	6	13%	16%	4%	2%	80	67	124	18	334	0.997	79.8	67.2	123.5	18.4
	Wood River Total	410	459	332	19%	40	33	84	9	19%	23%	8%	2%	97	81	157	21	391	1.049	102.2	84.8	184.7	22.1
	Agricultural Pumps	57	64	46	3%	22	13	134	25	11%	9%	12%	6%	388	222	2351	434	109	0.522	202.5	115.8	1226.4	226.8
	Precipitation	139	156	113	6%	5	5	292	292	2%	3%	27%	75%	35	35	2105	2105	271	0.513	18.0	18.0	1079.3	1079.3
	Total Inflow	2205	2469	1788	100%	208	143	1097	388	100%	100%	100%	100%	99	67	389	46	9758	0.218	21.5	14.5	84.8	10.1
	Net Inflow	1981	2219	1606		208	143	1097	388														
	Storage Increase	-18	-18	-13		-21	-7	-433	-219														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	2066				130	110	246	117														

drainage from the Wood River (e.g., Central Canal) is returned to 7-Mile, thus inflating the unit area water load.

Below average precipitation in 1992 and 1994 (the 1992 April snow pack was 26% of average) caused below average inflows to Upper Klamath Lake, with total inflows 55% and 61% of the 1992-1998 average (Table 3). The water years 1996, 1997, and 1998 had substantially higher inflow than the 7-year average from this study (126%, 131%, and 123%, respectively, while 1993 and 1995 were near the average (108% and 96%, respectively).

As expected when runoff is dominated by springs (versus snowmelt dominated), or by return flows originating from other drainages, the relative water contribution from the Wood River, 7-Mile Canal, and the Williamson R. proper (Williamson R. Total minus Sprague R.) are inflated during low flow years (Table 3). For example, in 1992 Wood River flow was nearly 1/2 that of the Williamson River, while during the next high flow year, 1993, it was only 1/4 of the Williamson River flow.

On an annual basis inflow volume only slightly exceeded outflow volume including evaporation (Table 3), but during the May-September period outflow exceeded inflow by ~1.3X in high flow years and ~2X in low flow years (e.g. 1994; Table 4).

Biweekly time series for major water balance terms are presented in Fig. 5 and Appendix 5. Significant seasonal inflow patterns are evident for all major sources, with the Williamson R. (due to the influence of snowmelt driven runoff from the Sprague River), showing the most pronounced springtime peaks in 1993 and 1995-1998 (Fig. 5). Substantial differences in timing and duration of the seasonal peak are also evident (e.g., as in 1998 when the bulk of the runoff occurred in late spring, as opposed to early spring in other years. The Wood R. and 7-Mile Canal also show seasonal peaks coinciding with snowmelt, but they are less pronounced than those occurring on the Sprague R. (Fig 5). Summertime declines in flow on all systems are influenced by irrigation withdrawal, and it is particularly evident in the spring-dominated Wood R. (which should have relatively constant flow once snowmelt declines) in the 1992 and 1994 water years.

Lake outflow during the snowmelt runoff period is determined by flood control needs and downstream anadromous fishery needs, and in summer months primarily by the irrigation withdrawal schedule on the "A" Canal. This usually causes two outflow peaks, one in late-winter/spring and the other during the irrigation season; the irrigation season outflow increase is accompanied by a decrease in lake volume (Fig. 5). Water residence time (lake volume/inflow) also follows a season pattern of low values during high runoff periods (ca. 50 days) and high values during low runoff periods (up to 300 days; Fig. 5 and Appendix 5). Residence time computed using net inflow (inflow-evaporation) yields significantly higher residence times during the summer months, particularly in 1992 and 1994 when residence time exceeded several thousand days (Appendix 5).

Nutrient Budget

The Williamson River and Wood River together accounted for 67% (48% and 19%, respectively) of the mean 1992-1998 (WY's) total phosphorus load; with springs and small

Table 4. Flow and nutrient mass balance summary table, May-September growing season.

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
						kg				% of total				ppb				km^2	m	$kg\ km^{-2}$			
1991		hm3	mean cfs	acre-ft X103	% Total	TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R	102	115	83	23%	17993	11187	-22864	730	35%	31%	-10%	0%	176	109	-223	7	3501	0.092	5.1	3.2	-6.5	0.2
	Wood River above Weed Rd.	45	50	36	10%	4321	3559	7521	2539	8%	10%	3%	2%	96	79	167	57	334	0.759	12.9	10.7	22.5	7.6
	Wood River Total	70	78	57	16%	9736	8791	20509	5542	19%	24%	9%	4%	140	126	294	79	391	0.752	24.9	22.5	52.5	14.2
	Agricultural Pumps	18	20	15	4%	7002	3996	42366	7832	14%	11%	18%	5%	388	222	2351	434	109	0.485	64.2	36.6	388.7	71.8
	Precipitation	21	23	17	5%	2043	2043	122601	122601	4%	6%	53%	82%	96	96	5907	5907	271	0.465	7.5	7.5	452.4	452.4
	Total Inflow	440	493	357	100%	51227	36624	232665	149055	100%	100%	100%	100%	116	83	528	338	9758	0.045	5.2	3.8	23.8	15.3
	Net Inflow	240	269	195																			
	Storage Increase	-319	-357	-259		32811	23792	225977	-77097														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	420				26315	22358	49925	23800														

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
						kg				% of total				ppb				km^2	m	$kg\ km^{-2}$			
1992		hm3	mean cfs	acre-ft X103	% Total	TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprague R	97	108	78	28%	13944	9217	8172	5453	30%	28%	3%	4%	144	95	84	56	3501	0.092	4.0	2.6	2.3	1.6
	Wood River above Weed Rd.	34	38	27	10%	3294	2588	8939	4967	7%	8%	4%	3%	96	77	266	148	334	0.759	9.9	7.8	26.8	14.9
	Wood River Total	58	64	47	17%	8791	8648	23525	4112	19%	20%	10%	3%	153	116	409	71	391	0.752	22.5	17.0	60.2	10.5
	Agricultural Pumps	18	20	15	5%	6952	3967	42095	7777	15%	12%	17%	5%	388	222	2351	434	109	0.485	63.7	36.4	386.0	71.3
	Precipitation	16	18	13	5%	2043	2043	122601	122601	4%	6%	50%	83%	126	126	7579	7579	271	0.465	7.5	7.5	452.4	452.4
	Total Inflow	341	382	277	100%	46619	33045	244796	147720	100%	100%	100%	100%	137	97	717	433	9758	0.035	4.8	3.4	25.1	15.1
	Net Inflow	122	136	99																			
	Storage Increase	-341	-382	-277		-15995	-11193	-120232	-60069														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	325				20390	17325	38685	18442														

able 4. (continued)

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
						kg				% of total				ppb				km²	m	kg km⁻²			
1993		hm3	mean cfs	acre-ft X103	% Total	TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprag	119	133	96	16%	12550	11681	23362	3576	17%	23%	6%	2%	106	98	196	30	3501	0.092	3.6	3.3	6.7	1.0
	Wood River above Weed Rd.	78	85	62	10%	7326	5212	13724	1778	10%	10%	3%	1%	96	68	180	23	334	0.759	22.0	15.6	41.1	5.3
	Wood River Total	95	106	77	13%	15648	10718	57779	1890	21%	21%	15%	1%	165	113	606	20	391	0.752	40.1	27.4	147.9	4.8
	Agricultural Pumps	20	22	16	3%	7879	4382	46498	8590	11%	9%	12%	6%	388	222	2351	434	109	0.485	70.4	40.2	426.3	78.8
	Precipitation	35	39	28	5%	2043	2043	122601	122601	3%	4%	31%	80%	59	59	3541	3541	271	0.485	7.5	7.5	452.4	452.4
	Total Inflow	732	820	594	100%	72862	50835	398323	152545	100%	100%	100%	100%	99	69	544	208	9758	0.075	7.5	5.2	40.8	15.6
	Net Inflow	543	608	440																			
	Storage Increase	-287	-321	-233		-16728	1776	115795	162467														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	696				43749	37172	83003	39569														

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
						kg				% of total				ppb				km²	m	kg km⁻²			
1994		hm3	mean cfs	acre-ft X103	% Total	TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprag	85	96	69	23%	8328	8568	5981	1709	22%	27%	3%	1%	98	100	70	20	3501	0.092	2.4	2.4	1.7	0.5
	Wood River above Weed Rd.	35	39	28	9%	2895	2561	6594	583	8%	8%	3%	0%	83	73	188	17	334	0.759	8.7	7.7	19.8	1.7
	Wood River Total	41	46	34	11%	4842	4509	9689	1089	13%	14%	4%	1%	117	109	234	26	391	0.752	12.4	11.5	24.8	2.8
	Agricultural Pumps	18	20	15	5%	6972	3979	42215	7799	19%	13%	18%	5%	388	222	2351	434	109	0.485	63.9	36.5	387.1	71.5
	Precipitation	20	22	16	5%	2043	2043	122601	122601	5%	7%	53%	86%	103	103	6184	6184	271	0.485	7.5	7.5	452.4	452.4
	Total Inflow	378	424	307	100%	37510	31340	232328	142672	100%	100%	100%	100%	99	83	614	377	9758	0.039	3.8	3.2	23.8	14.6
	Net Inflow	160	179	130																			
	Storage Increase	-419	-469	-339		-10257	-11225	12623	-29776														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	359				22480	19100	42650	20332														

Table 4. (continued)

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
1995		hm3	mean cfs	acre-ft X103	% Total	kg				% of total				ppb				km^2	m	$kg\ km^{-2}$			
						TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprag	103	116	84	16%	11246	9929	19112	3871	17%	20%	6%	3%	109	96	185	37	3501	0.092	3.2	2.8	5.5	1.1
	Wood River above Weed Rd.	68	74	54	10%	5102	4354	12393	1383	8%	9%	4%	1%	77	66	187	21	334	0.759	15.3	13.0	37.1	4.1
	Wood River Total	81	91	66	12%	16519	13062	30213	1956	26%	27%	9%	1%	203	161	372	24	391	0.752	42.3	33.4	77.3	5.0
	Agricultural Pumps	19	22	16	3%	7494	4276	45374	8362	12%	9%	13%	6%	388	222	2351	434	109	0.485	68.7	39.2	416.0	76.9
	Precipitation	24	27	20	4%	2043	2043	122601	122601	3%	4%	36%	81%	84	84	5010	5010	271	0.465	7.5	7.5	452.4	452.4
	Total Inflow	664	744	538	100%	64435	49190	338856	151930	100%	100%	100%	100%	97	74	510	229	9758	0.068	6.6	5.0	34.7	15.6
	Net Inflow	470	527	381																			
	Storage Increase	-289	-323	-234		49002	6079	522202	11711														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	640				40113	34082	78104	36280														

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
1996		hm3	mean cfs	acre-ft X103	% Total	kg				% of total				ppb				km^2	m	$kg\ km^{-2}$			
						TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Williamson River not including Sprag	113	126	92	16%	19304	13489	25205	6141	26%	26%	8%	4%	171	120	223	54	3501	0.092	5.5	3.9	7.2	1.8
	Wood River above Weed Rd.	112	125	91	16%	8683	7348	10359	2389	12%	14%	3%	1%	78	66	93	21	334	0.759	26.0	22.0	31.0	7.2
	Wood River Total	131	147	106	19%	14607	11879	23344	4155	20%	23%	7%	3%	112	91	178	32	391	0.752	37.4	30.4	59.8	10.6
	Agricultural Pumps	21	23	17	3%	8086	4614	48962	9045	11%	9%	15%	6%	388	222	2351	434	109	0.485	74.1	42.3	448.9	82.9
	Precipitation	29	32	23	4%	2043	2043	122601	122601	3%	4%	39%	78%	71	71	4282	4282	271	0.465	7.5	7.5	452.4	452.4
	Total Inflow	699	783	567	100%	73377	51392	316018	161394	100%	100%	100%	100%	105	73	452	231	9758	0.072	7.6	5.3	32.4	16.5
	Net Inflow	507	567	411																			
	Storage Increase	-338	-379	-274		47184	8140	310645	100063														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	671				42050	35728	79779	38032														

Table 4. (continued)

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
						kg				% of total				ppb				km^2	m	$kg\ km^{-2}$			
1997		hm3	mean cfs	acre-ft X10^3	% Total	TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Willamson River not including Sprag	104	117	85	18%	13382	11887	30947	4438	23%	25%	11%	3%	128	114	297	43	3501	0.092	3.8	3.4	8.8	1.3
	Wood River above Weed Rd.	125	140	101	20%	10216	7866	9568	2177	17%	17%	3%	1%	82	63	77	17	334	0.759	30.6	23.6	28.7	6.5
	Wood River Total	145	163	118	23%	14060	11503	10545	3147	24%	24%	4%	2%	97	79	73	22	391	0.752	36.0	29.4	27.0	8.1
	Agricultural Pumps	21	24	17	3%	8314	4744	50340	9300	14%	10%	17%	6%	388	222	2351	434	109	0.485	76.2	43.5	461.8	85.3
	Precipitation	32	36	26	5%	2043	2043	122601	122601	3%	4%	42%	80%	64	64	3847	3847	271	0.465	7.5	7.5	452.4	452.4
	Total Inflow	637	713	516	100%	59210	46988	292112	152723	100%	100%	100%	100%	93	74	459	240	9758	0.065	6.1	4.8	29.9	15.7
	Net Inflow	454	506	368																			
	Storage Increase	-240	-268	-194		47339	6731	617863	280660														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	605				37946	32241	71992	34320														

WY	TERM	FLOW				LOADS								FLOW-WEIGHTED- MEAN CONCENTRATION				Drainage Area	UNIT AREA EXPORT				
						kg				% of total				ppb				km^2	m	$kg\ km^{-2}$			
1998		hm3	mean cfs	acre-ft X10^3	% Total	TP	SRP	TN	TIN	TP	SRP	TN	TIN	TP	SRP	TN	TIN		FLOW	TP	SRP	TN	TIN
	Willamson River not including Sprag	153	172	124	18%	18514	14172	85058	5282	23%	26%	20%	3%	121	92	554	34	3501	0.092	5.3	4.0	24.3	1.5
	Wood River above Weed Rd.	111	124	90	13%	9288	7041	12994	1627	12%	13%	3%	1%	84	63	117	15	334	0.759	27.8	21.1	38.9	4.9
	Wood River Total	144	161	117	17%	14960	11182	24928	2528	19%	20%	6%	2%	104	78	173	18	391	0.752	38.3	28.6	63.8	6.5
	Agricultural Pumps	21	24	17	2%	8268	4718	50052	9249	10%	9%	12%	6%	388	222	2351	434	109	0.485	75.8	43.3	459.0	84.8
	Precipitation	34	39	28	4%	2043	2043	122601	122601	3%	4%	29%	79%	59	59	3555	3555	271	0.465	7.5	7.5	452.4	452.4
	Total Inflow	655	958	693	100%	79292	54507	422088	154216	100%	100%	100%	100%	93	64	494	180	9758	0.068	8.1	5.6	43.3	15.8
	Net Inflow	685	767	555																			
	Storage Increase	-246	-278	-200		25409	6995	212860	75723														
	Approximate Load Sources																						
	Background (estimated from total tributary inflow volume x spring concentration)	821				51460	43723	97631	46542														

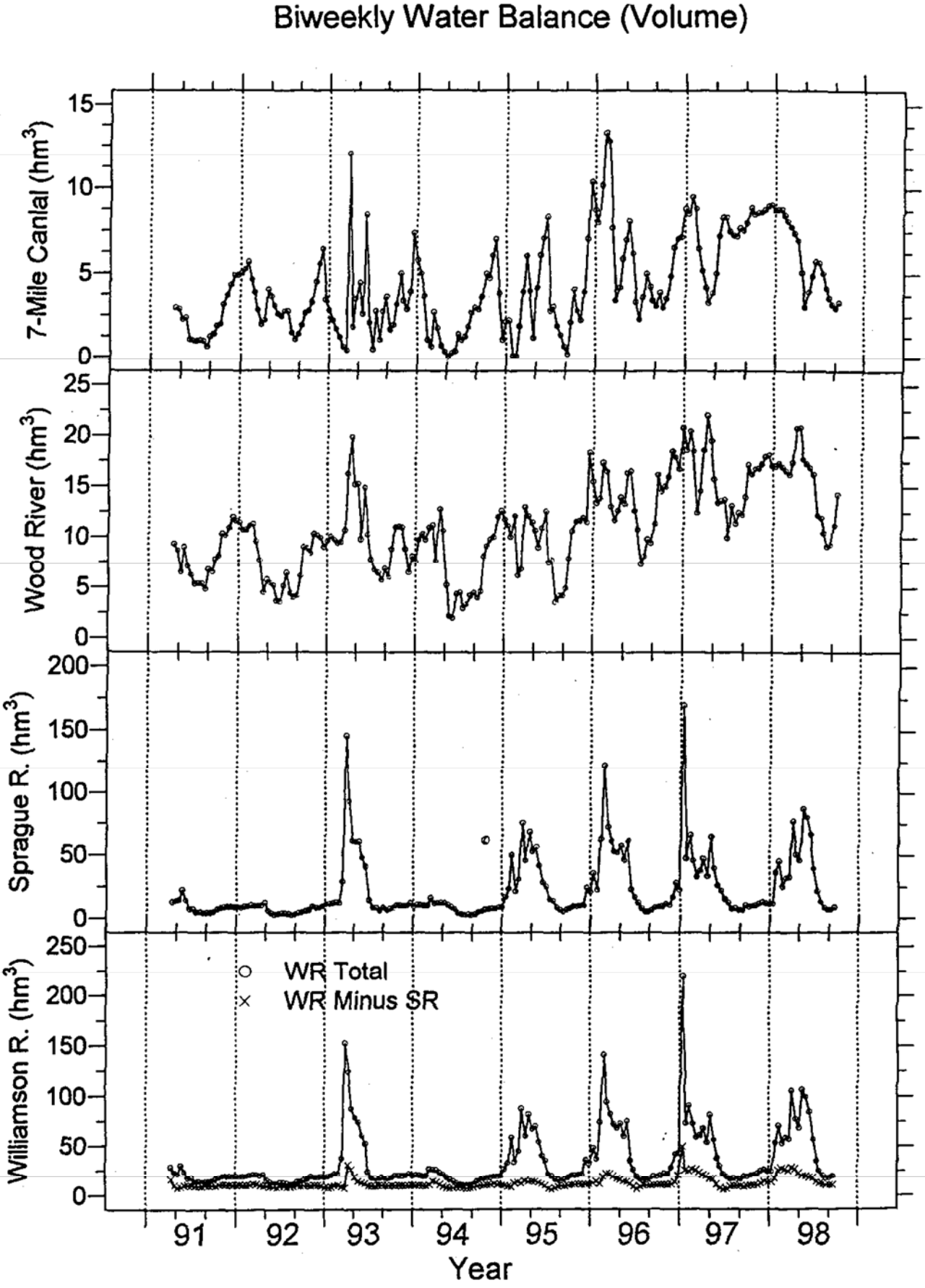

Fig. 5. Biweekly time series of water balance terms, 1991-1998.

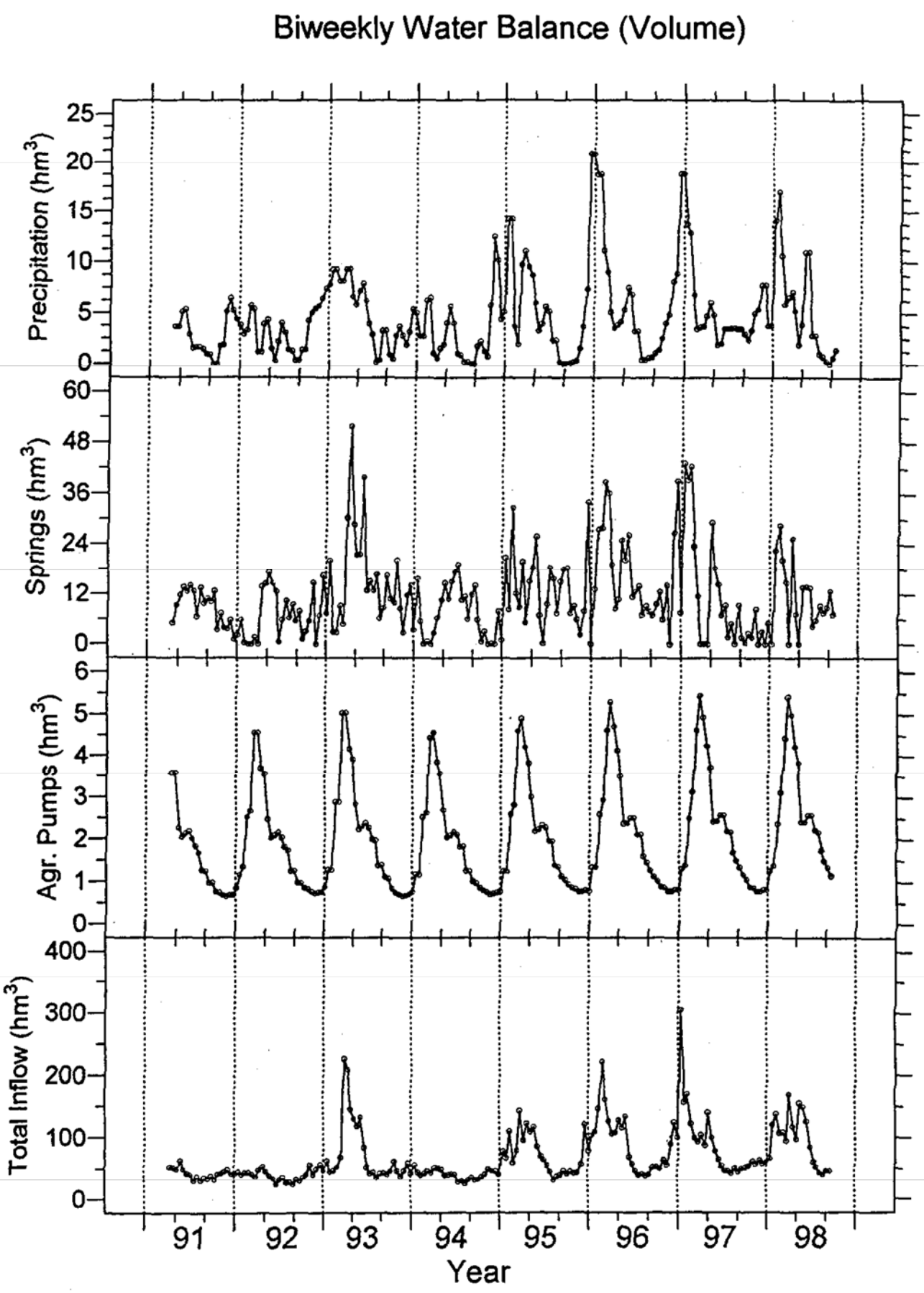

Fig. 5. (continued).

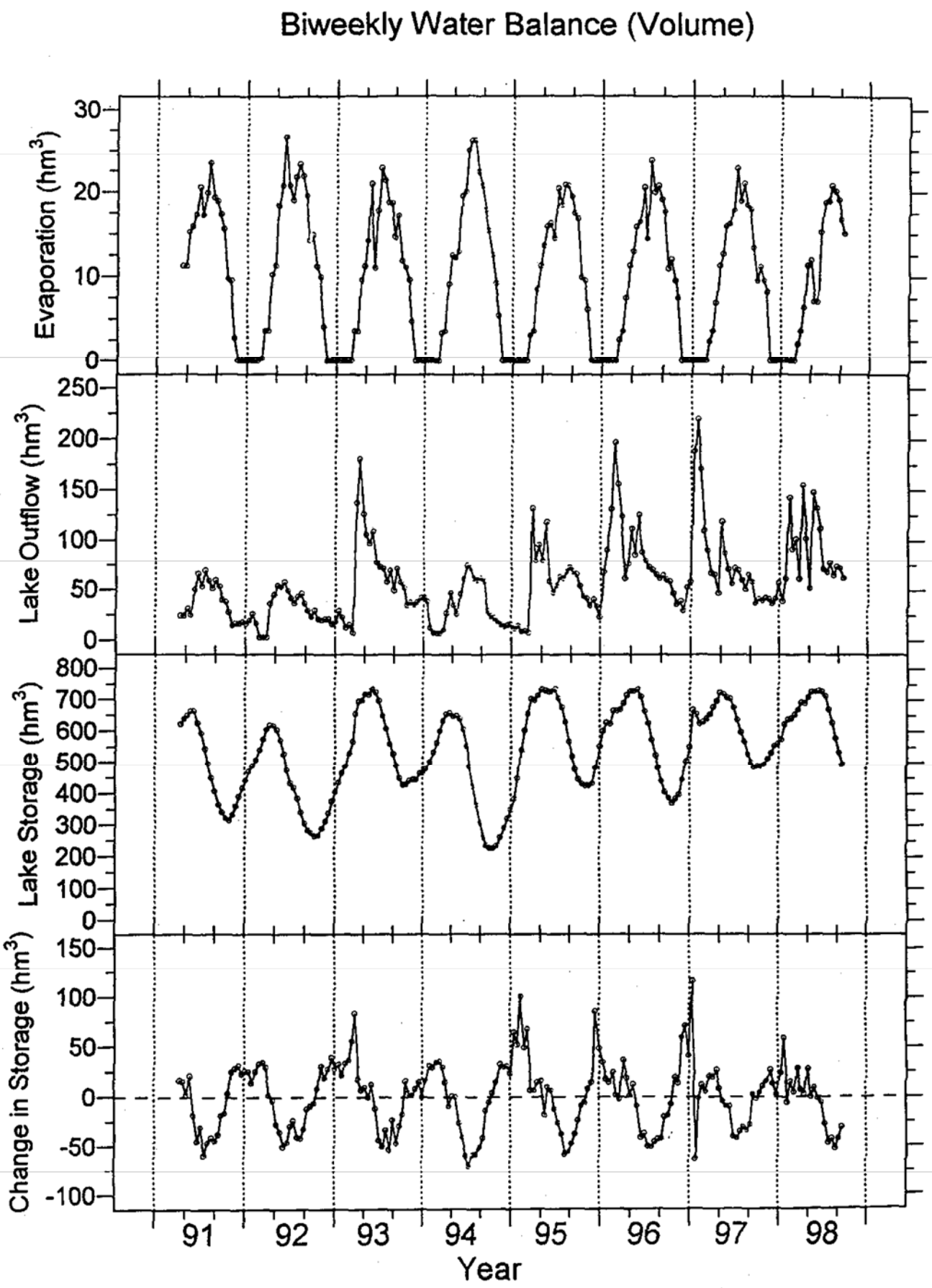

Fig. 5. (continued).

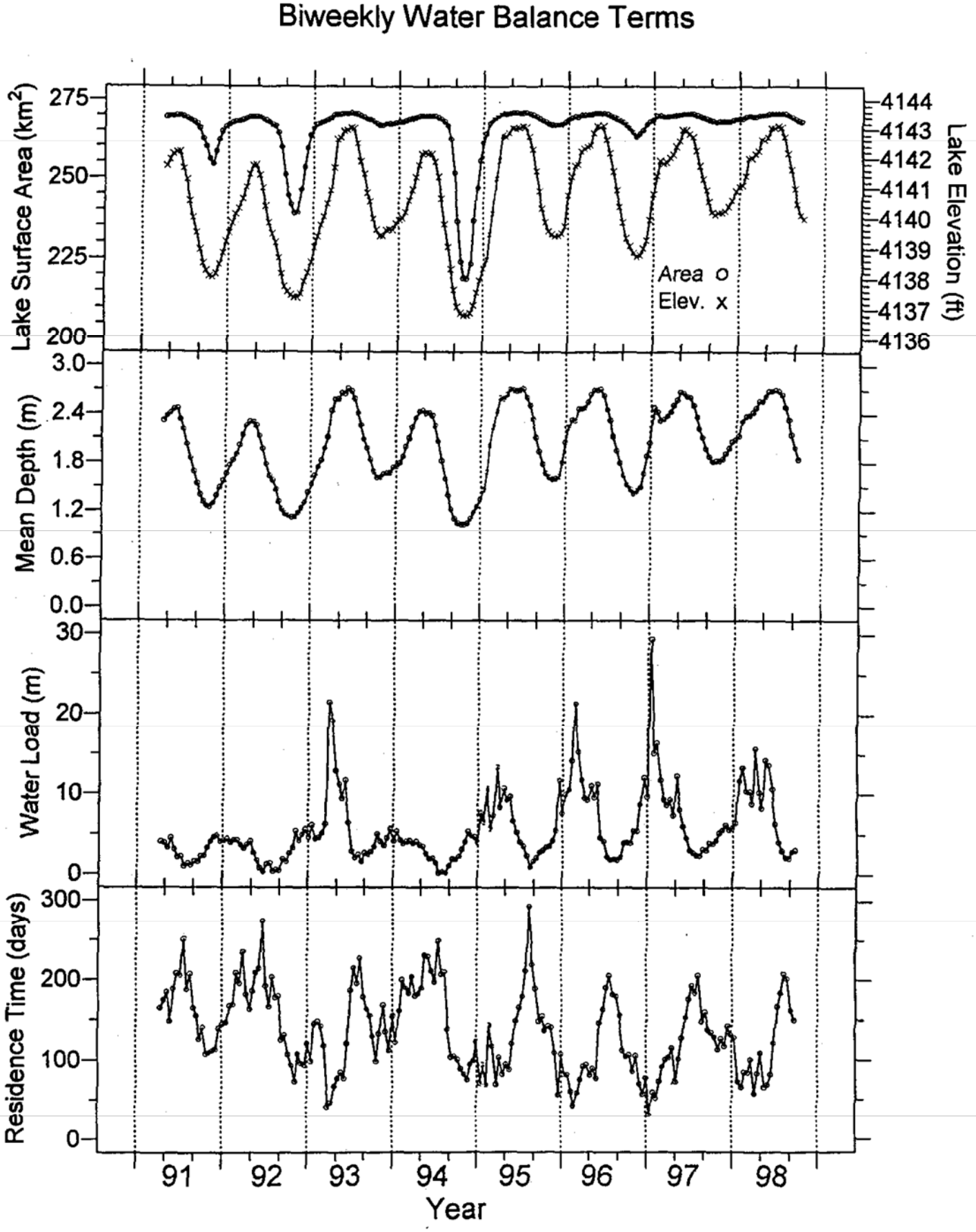

Fig. 5. (continued).

ungaged tributaries contributing another 10% (Fig. 6; Table 3). 7-Mile canal, precipitation, and agricultural pumping accounted for the remaining 23% (Fig. 6; Table 3). Unlike water contribution, where the Wood R., 7-Mile Canal, and Pumps contributed 25% of the water load, these same sources contributed 39% of the average annual TP load (Table 3). In contrast, springs contributed 16% of the water input, but contributed only 10% of the TP input. This appears to be partially due to the consistently higher volume weighted TP concentration occurring in the pump effluent, and Wood R. and 7-Mile Canal systems (Table 3; Fig 7). As stated above, these systems have small drainage areas and are influenced by return flows originating outside their respective drainages. This, combined with higher volume weighted concentrations, leads to substantially higher unit area export of TP (Fig. 6).

The average contribution of TP load from pumping was 11% and ranged between 9 and 17% over all years (Table 3). This occurred despite contributing an average of only 3% of the water load. During the peak pumping period occurring Feb-May, pumping can contribute as much as 32% of the total TP load (Appendix 6). It is important to note that these pumping estimates are not representative of the total pumping contribution because the load from pumps draining the Wood River Ranch is already included in the 7-Mile Canal and Wood R. loading estimates.

The disproportionate loadings form pumped areas as well as from the smaller 7-Mile Canal and Wood R. drainages illustrates the management importance of these areas. For example, these drainages combined are 606 km^2 in area, which is nearly 13 times smaller than the 7739 km^2 Williamson River watershed, yet they provide a TP load only 15% lower than the Williamson TP load (73 metric tons vs. 86 metric tons – average annual all years; Table 3).

The estimate of anthropogenic contribution to TP loading averaged for all 7 water years is 40%, with a range of 36 to 45% for individual years (Table 3). These values are very similar to the 40% anthropogenic TP contribution estimated by Walker (1985).

TP loads during the 1992 and 1994 drought years were 62% of the 1992-1998 average (Table 3); the water years 1996, 1997, and 1998 were 133%, 121%, and 115% of the 7-year average, while 1993 and 1995 were 114% and 93% of the average, respectively. The 1993 WY is of note because while flow was 108% of the 7-year average, TP load was 114% of the average. Other years (with the exception of 1996) tended to have percent of average TP loads lower than their respective percent of average water inputs. It may be that during several low flow years (e.g., 1991 and 1992), watershed sources of TP accumulate, and are then flushed in a following high flow year. Moreover, the volume weighted TP concentration of the Sprague R. in 1993 is higher than any other year (Table 3), indicating additional watershed contributions of TP. Because the Sprague R. watershed is impacted by wetland and riparian loss, flood plain grazing, agriculture, and channel degradation, it would be prone to TP export, especially during major runoff events.

Biweekly time series for major TP balance terms are presented in Fig. 8 and Appendix 6. As with flow, significant seasonal inflow patterns are evident for all major sources, with the Williamson R. (due to the influence of snowmelt driven runoff from the Sprague River), showing

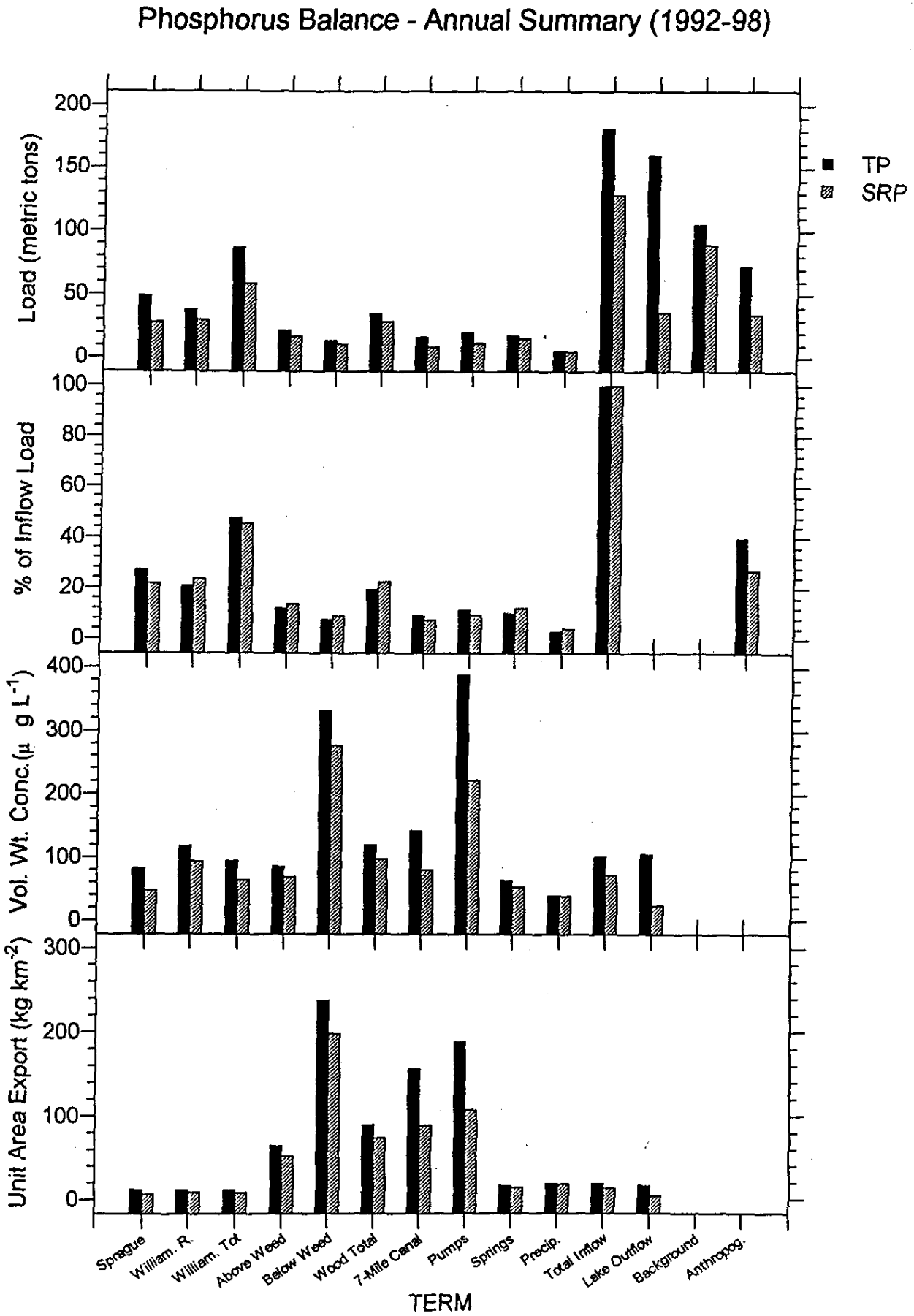

Fig. 6. Average annual phosphorus balance for water years 1992-1998

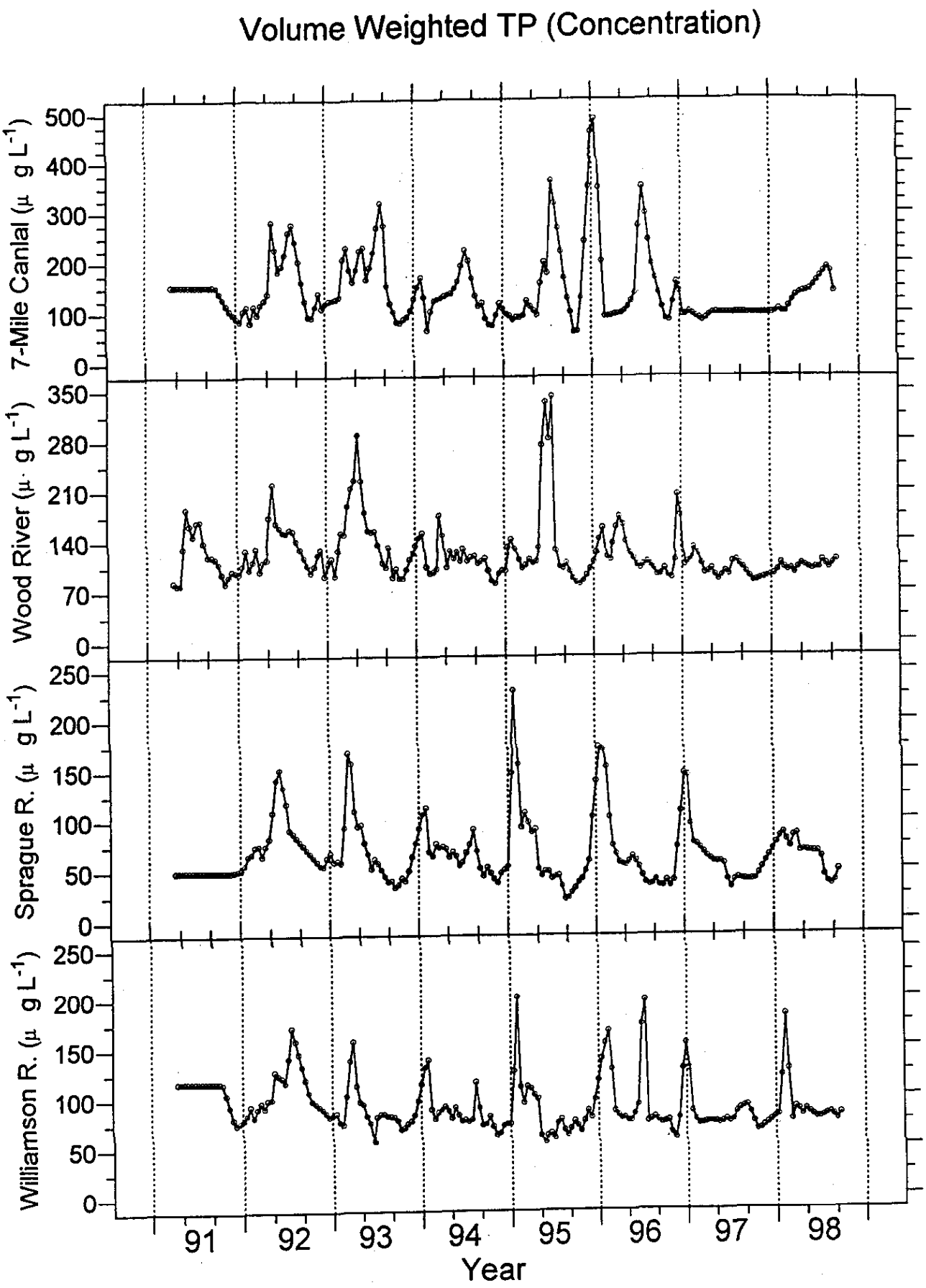

Fig. 7. Biweekly time series of volume weighted total phosphorus concentration (1991-1998).

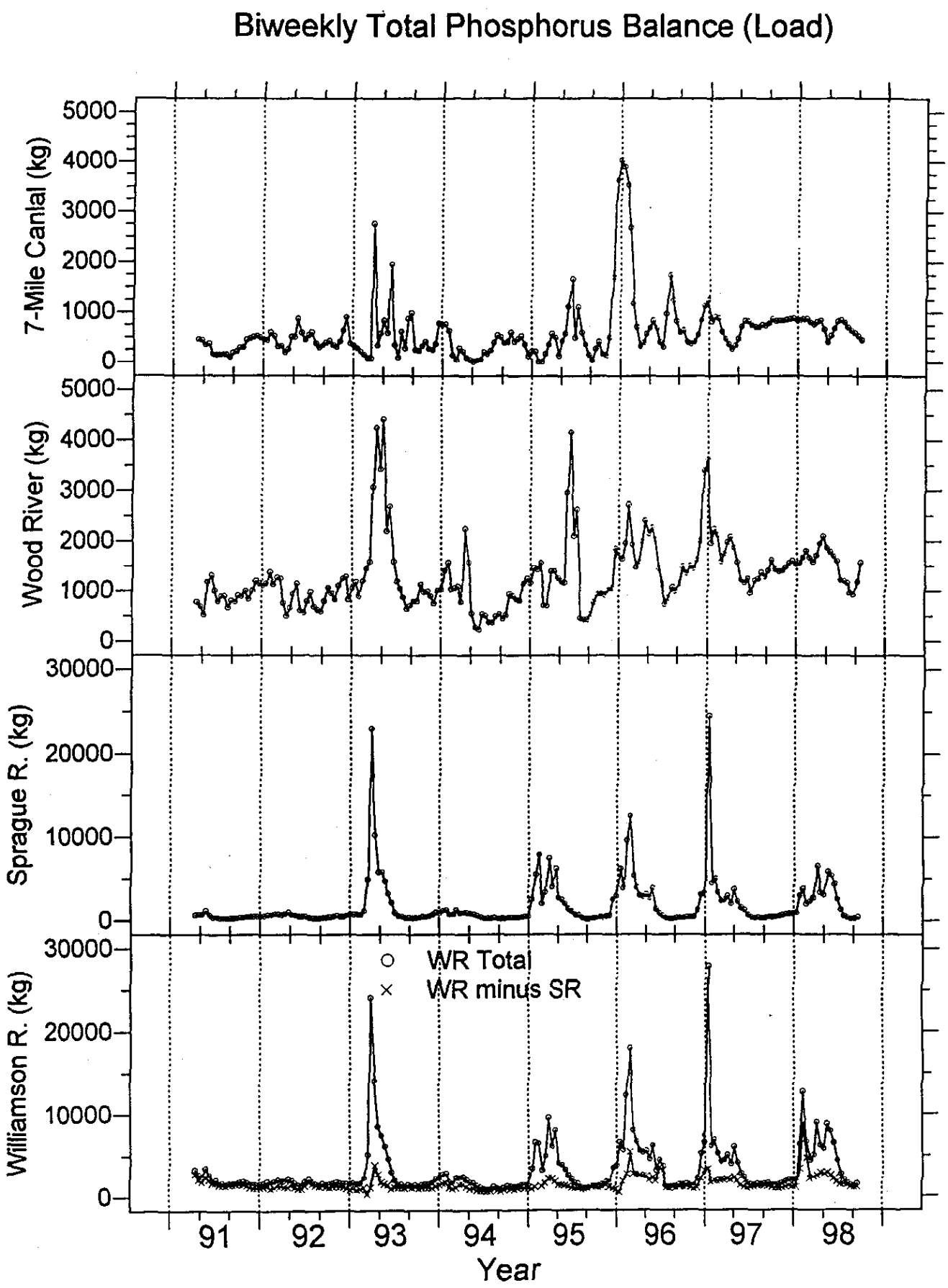

Fig. 8. Biweekly time series of phosphorus balance terms (1991-1998).

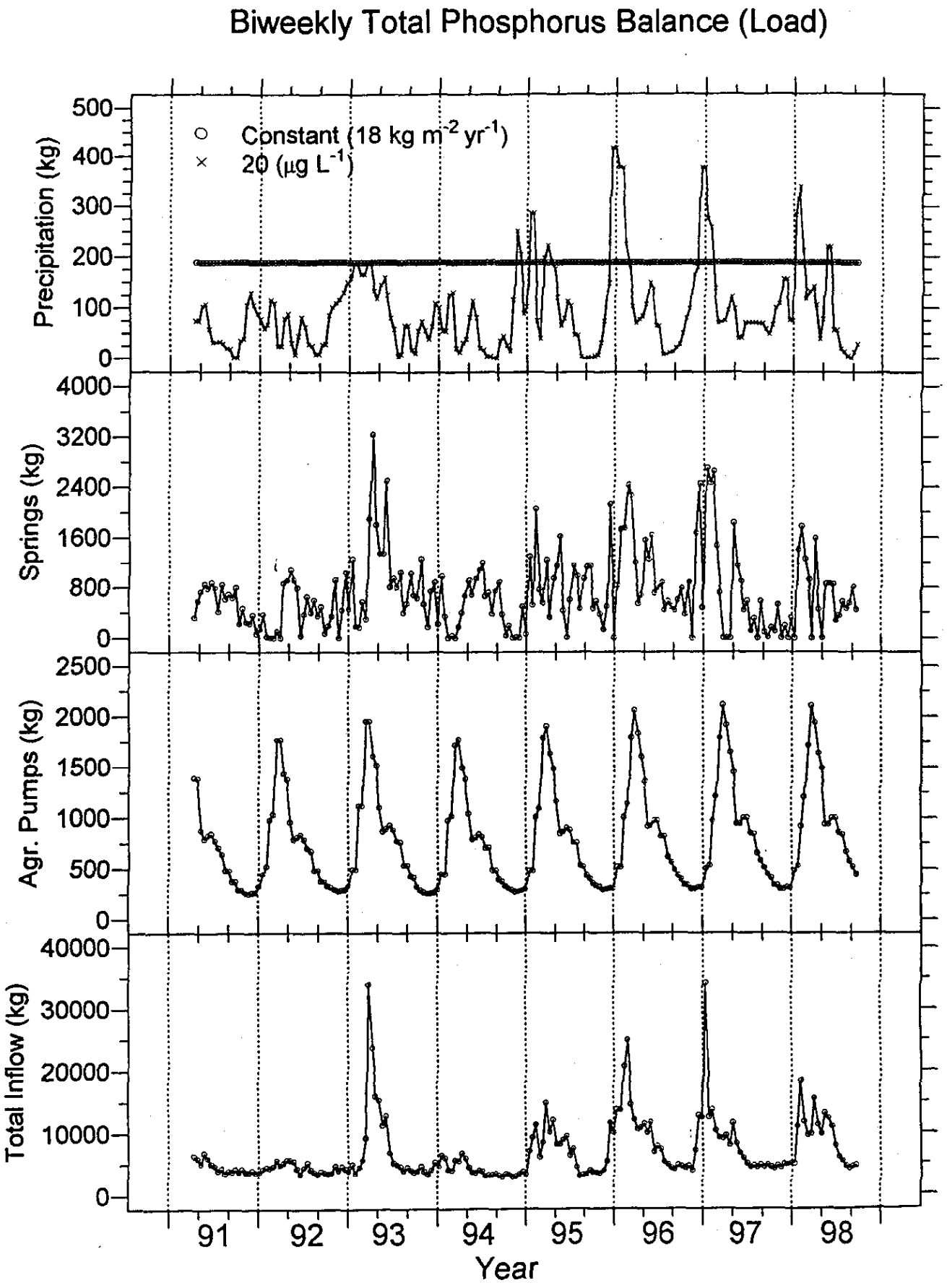

Fig. 8. (continued).

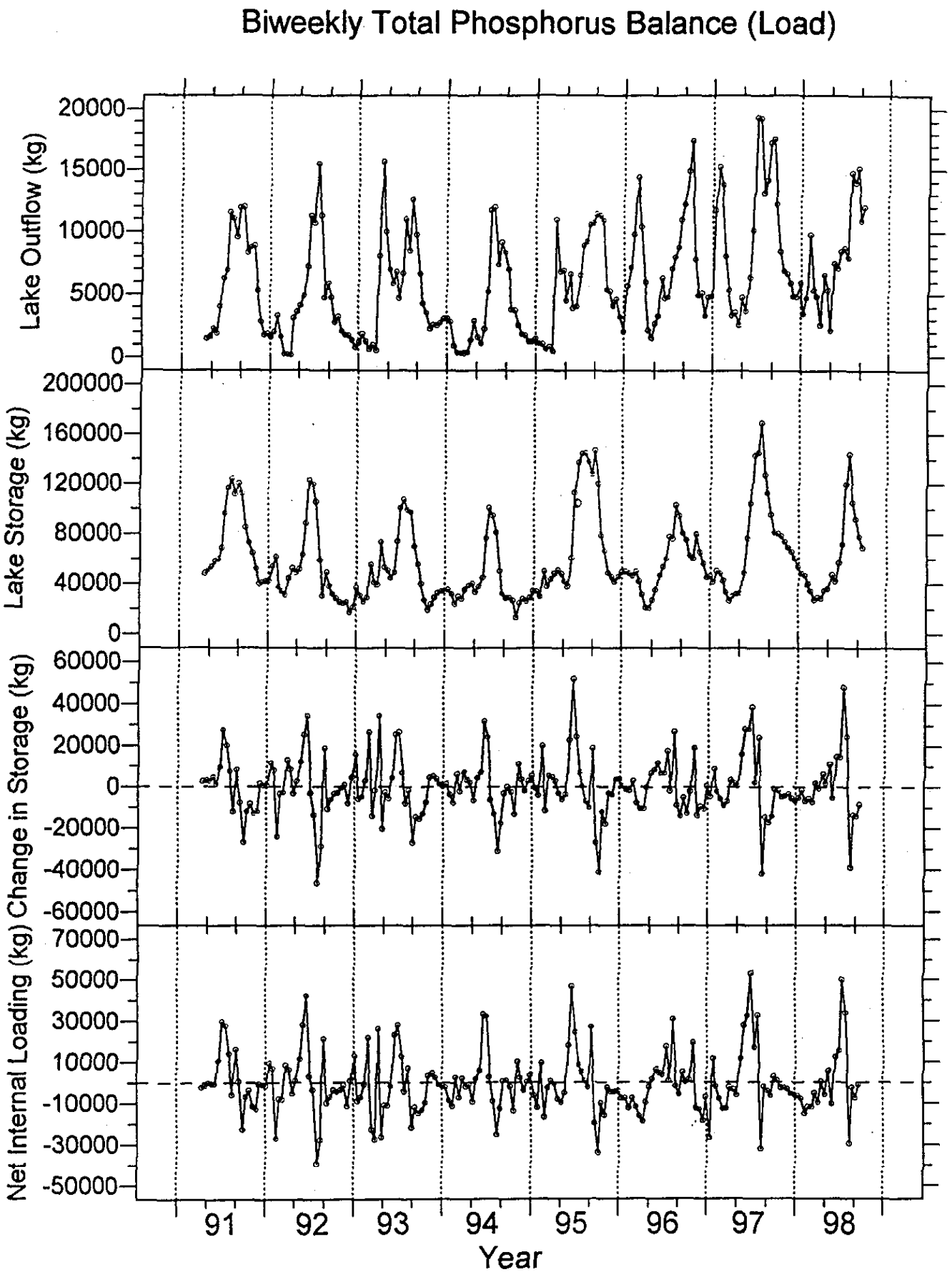

Fig. 8. (continued).

the most pronounced springtime peaks in 1993 and 1995-1998 (Fig. 8). The Wood R. and 7-Mile Canal also show some seasonal peaks coinciding with snowmelt, but they also show other midseason spikes likely due to irrigation return flow. It is evident that the Sprague River contributes the majority of the Williamson R. load during peak flows, but that the Williamson proper (minus Sprague) contributes the majority of the load during low flow summer months.

An estimate of the particulate phosphorus load (PP) was taken as the TP load minus the SRP load (Fig. 9). These data clearly show an increase in the loading of PP during high runoff events for the Williamson and Sprague Rivers. During these high flow events, which typically occur January-May, PP can increases to 60% of the TP load, compared to less than 5% during summer low flow periods (Fig. 9). There are also noticeable spikes of PP load occurring in the Wood R. and 7-Mile Canal systems, but they are not limited to high runoff periods. This pattern could be consistent with flood irrigation practices that would tend to be pulsed in nature, and where overland runoff could increase the proportion of particulates. The increase in PP loading as well as the increase in volume weighted concentration during elevated flows (Figs. 7 and 9) are both indicative of degraded watershed conditions. In a healthier watershed (e.g., intact riparian areas and flood plains) the concentration should tend to decrease at high flows through dilution, and particulate loading should only increase slightly.

Lake outflow TP load tends to increase during high runoff events in the winter and spring, as well as during the summer period when inflow load is low (Fig. 8). It is clear from this trend, and the increase in lake TP storage (at a time when lake water storage is decreasing), that TP is being internally loaded from the sediments. This is confirmed by the large net internal loading occurring during late spring and early summer of each year (Fig. 8). These large net internal loading events are generally followed by a substantial decline, indicating a large sedimentation event. Such events coincide with algal bloom crashes (Kann 1998). An estimate of the magnitude of the internal loading among years can be gained by summing all positive growing season internal loading values calculated using the 0.14/week (0.01.day) sedimentation rate. The values for each of the 1992 through 1998 water years are as follows:

WY	Int. Load	Ext. Load	Tot. Load	% Ext.	% Int.
1992	294	113	407	28%	72%
1993	265	208	473	44%	56%
1994	195	112	307	36%	64%
1995	394	169	563	30%	70%
1996	212	241	453	53%	47%
1997	376	220	596	37%	63%
1998	257	208	465	45%	55%
Average	285	182	466	39%	61%

On average, external loading was 39% of the total loading to the lake, while internal loading was 61%. On an annual basis there tends to be a net retention of TP in the lake due to the significant sedimentation events from algal crashes and the likely settling of PP during high runoff (e.g., annual average retention is 25 metric tons; Table 3). However, it is evident from the negative retention (positive internal loading) during the May through September period (Fig. 8; Table 4)

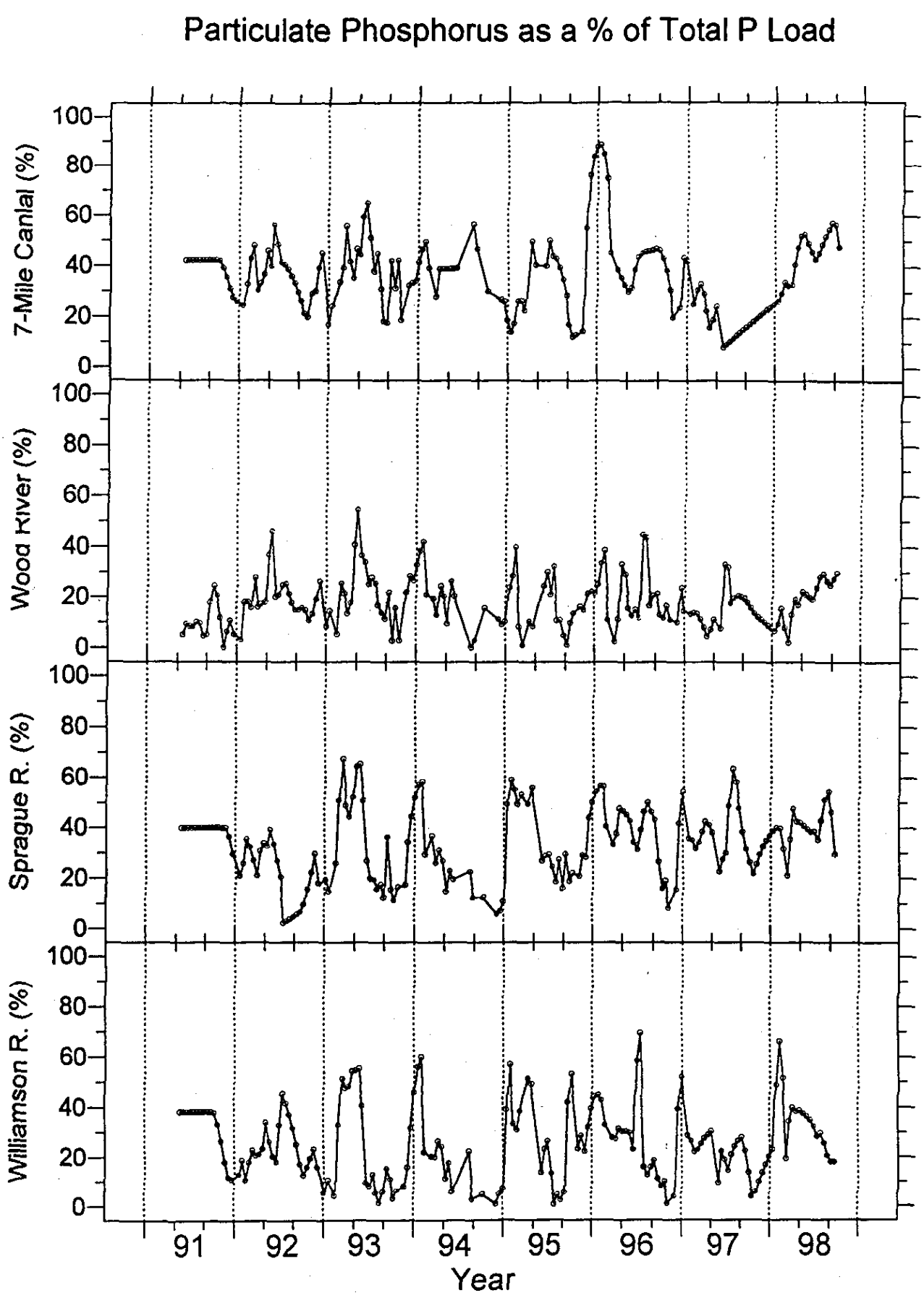

Fig. 9. Biweekly time series of particulate phosphorus load (PP) as a percent of the total phosphorus load (1991-1998).

that internal loading is a significant source of phosphorus to the lake. Although there is a high contribution of internal TP loading to lake TP concentration during the algal growing season, it has been noted that the mobilization of phosphorus from iron has the potential to respond rapidly when primary productivity and pH maxima are reduced (Marsden 1989). The rapid response may be due to a reversal of the positive feedback mechanism described earlier (see introduction).

Using a constant loading rate for the precipitation input (Fig. 8) causes error in the seasonal mass balance dynamics, and would most affect estimates of net internal loading during the summer months. It is likely that using a constant loading rate overestimates precipitation input during this period of low precipitation (Fig. 5). To determine the relative effect of this error a concentration of 20 $\mu g\ L^{-1}$ TP was applied to the precipitation volume to determine seasonal load distribution (Fig. 8). Given the magnitude of the net internal loading during the summer period, the error induced by an overestimation of precipitation TP load would likely be only 2-3% on the average.

The total nitrogen balance (Fig. 10 and 11; Tables 3 and 4) indicates that Upper Klamath Lake is a seasonally significant source of nitrogen. On an annual basis there is a net negative retention of TN (average annual = -143% of external inputs; Table 3). On a seasonal basis the 1992-1998 WY range is between –259% and –627% of external inputs (Table 4). This shows that internal sources of nitrogen far exceed external sources. The WY's 1995, 1996, and 1997 had internal nitrogen loading higher than other years, with 1997 nearly 2X higher than the average for this period. The main source for this increase in internal nitrogen loading is nitrogen fixation by the blue-green alga *Aphanizomenon flos-aquae* (Kann 1998). Another potential source is the mobilization of inorganic nitrogen from lake sediments during anaerobic bacterial decomposition.

Biweekly time series for SRP and TIN balance terms are presented in Appendix 6, but will not be discussed here. While these data will be useful for integrating with lake water quality and algal dynamics, the main purpose here was to construct a TP mass balance budget for integration with other TP loading models.

Additional exploration and statistical analysis will enhance our ability to understand dynamics in the Klamath Lake system, but the main purpose of this phase of the study was to formulate and present a mass balance budget for water and phosphorus. The mass balance models presented here are based on rigorous data collection and provide good representation of seasonal and interannual dynamics. They thus will provide a solid base for future nutrient, algal biomass, and water quality modeling efforts.

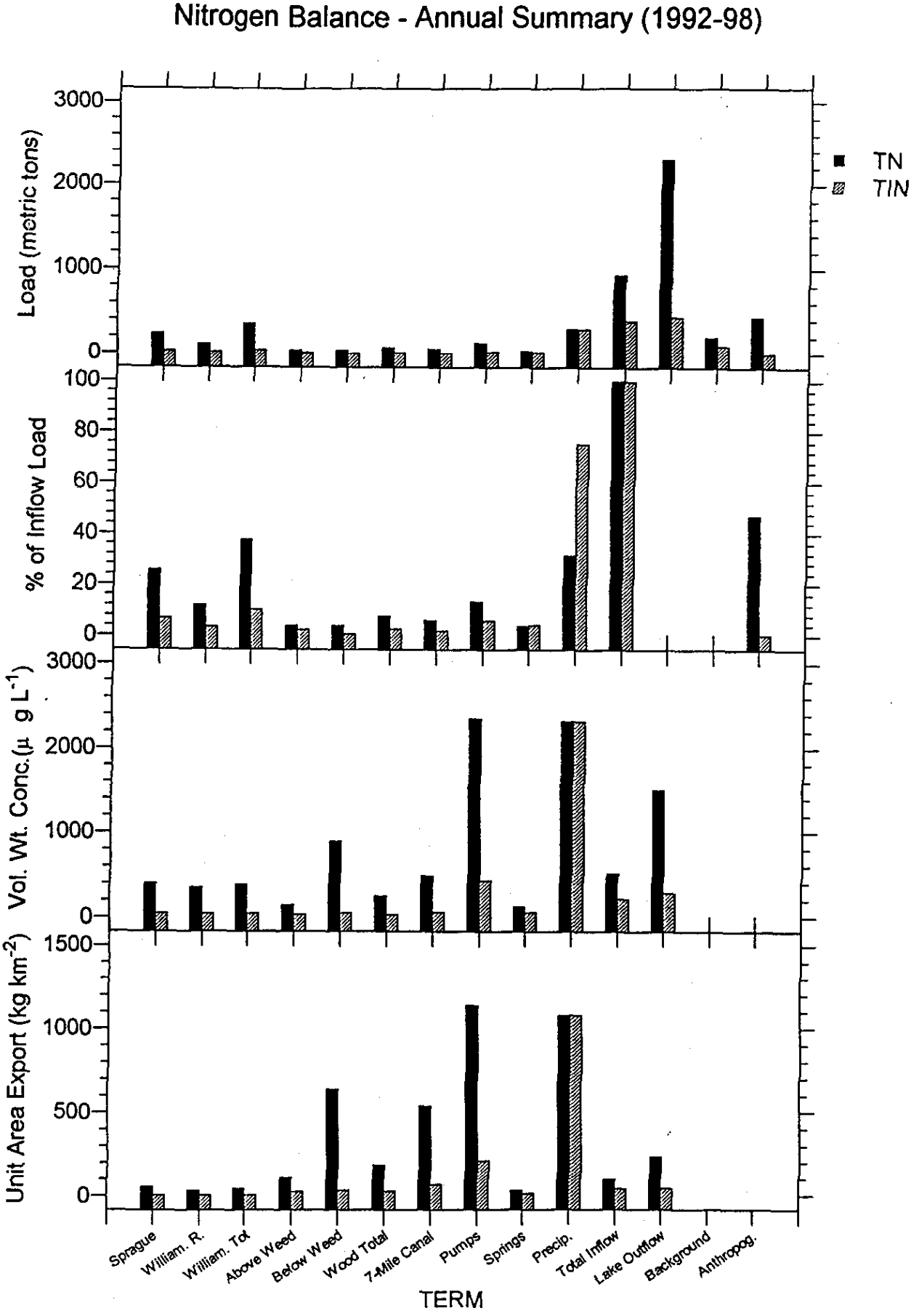

Fig 10. Average annual nitrogen balance for water years 1992-1998.

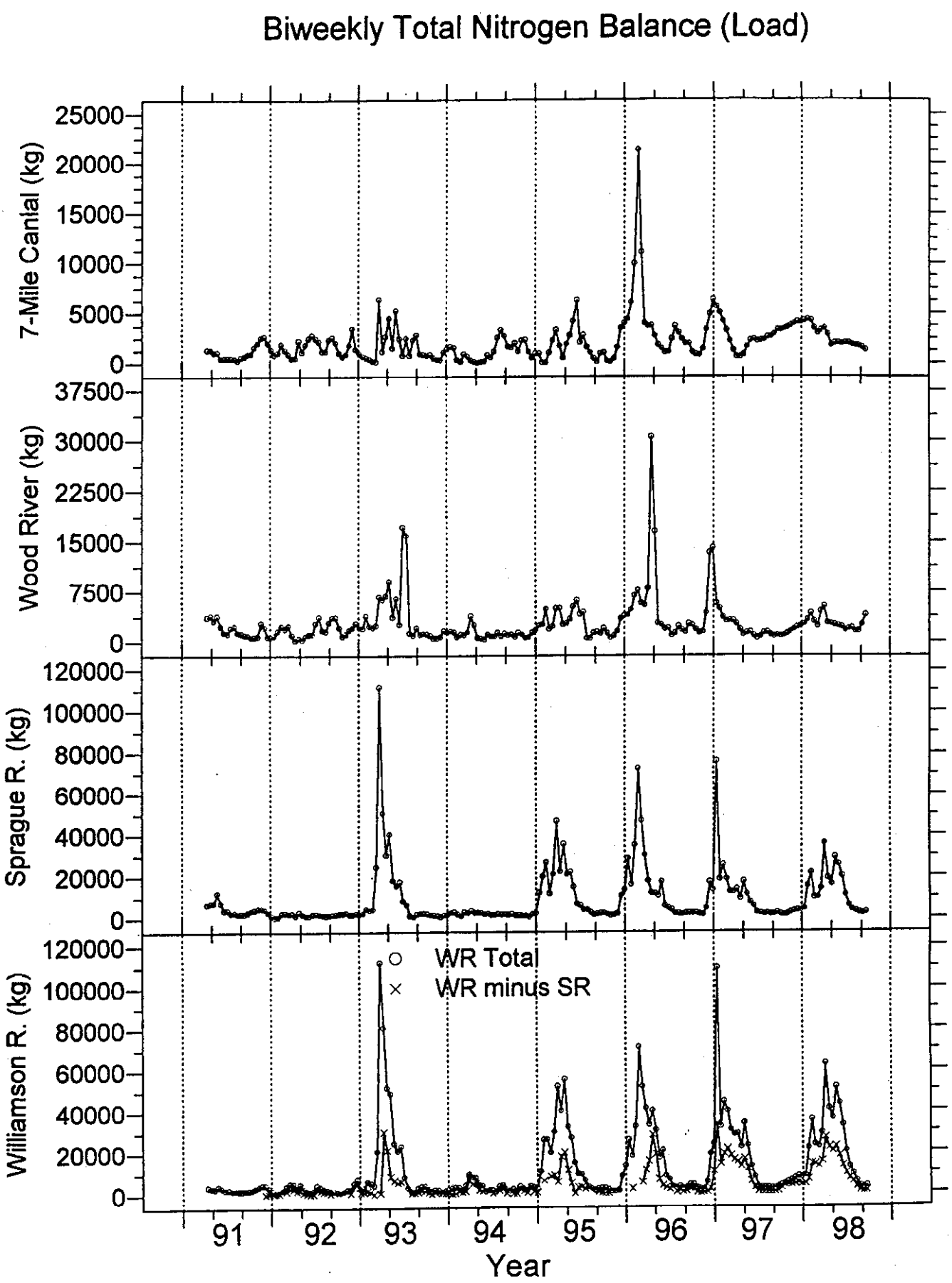

Fig. 11. Biweekly time series of nitrogen balance terms (1991-1998).

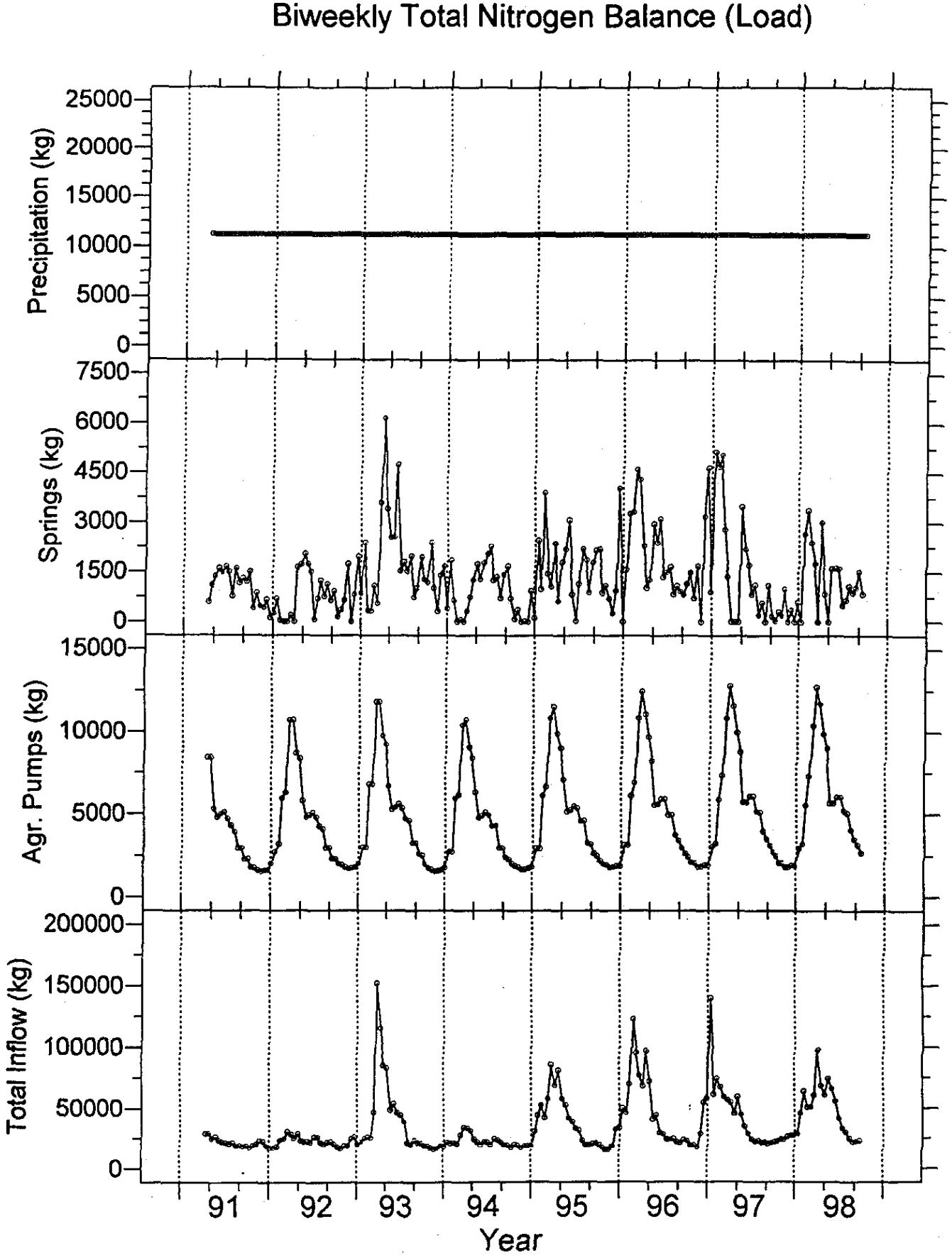

Fig. 11. (continued)

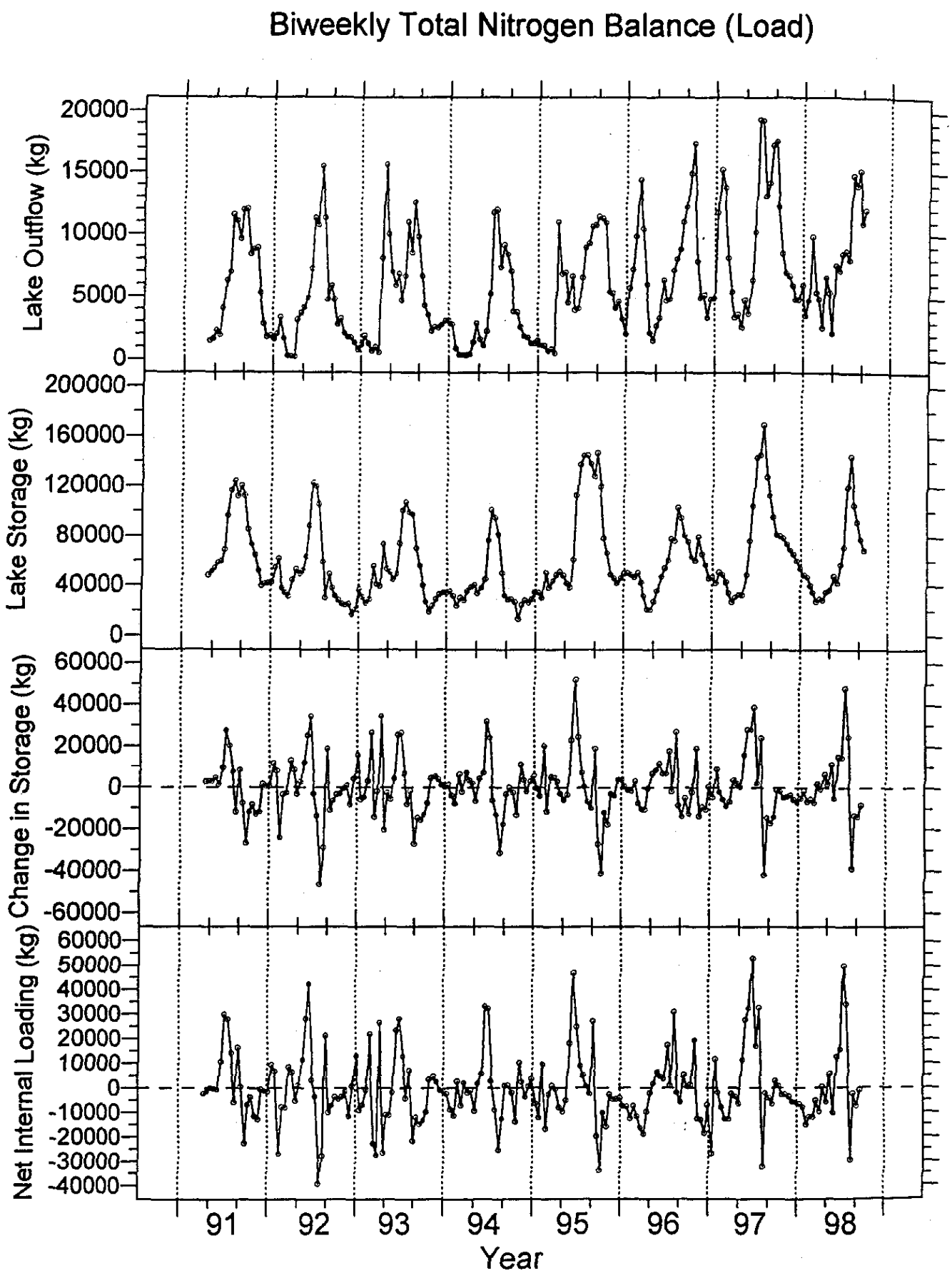

Fig. 11. (continued)

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APPENDICES

I. Lake-wide mean nutrient concentrations, 1991-1998.

II. Tributary nutrient loading and water discharge data, 1991-1998.

III. Estimation of daily flow for 7-Mile Canal, Wood R. at Dike Rd., and Wood R. at Weed Rd.

IV. Procedure for estimating flow and nutrient loads from agricultural pumps.

V. Biweekly time series for water balance terms.

VI. Biweekly time series for nutrient balance terms.

Appendix I. Lake-wide mean nutrient concentrations, 1991-1998.

Upper Klamath Lake Nutrient Data 1991-1998

Sample Date Means - all concentrations are ug L^{-1}

DATE	TP	SRP	TN	NO	NH	TP sample size	SRP sample size	NO sample size	NH sample size	TN sample size
24-Feb-91	66	5	907	113	95	8	8	8	8	8
02-Apr-91	74	4	1048	122	70	8	8	8	8	8
29-Apr-91	79	5	936	169	84	8	8	8	8	8
04-Jun-91	90	12	800	48	7	9	9	9	9	9
18-Jun-91	95	37	577	19		9	9	9	0	9
30-Jun-91	140	44	2072	5	30	5	5	5	5	5
16-Jul-91	202	49	2426		73	9	9	0	8	9
31-Jul-91	270	128	2186		174	9	9	0	9	9
13-Aug-91	244	66	1979		17	9	9	0	9	9
27-Aug-91	286	59	2869		11	9	9	0	9	9
10-Sep-91	351	81	2033		35	9	9	0	9	9
24-Sep-91	265	89	2388			9	8	0	0	9
08-Oct-91	241	74	2685		58	8	8	0	8	8
30-Oct-91	196	33	2395		160	8	8	0	8	8
20-Nov-91	107	18	1098	98	274	9	9	9	9	9
27-Feb-92	63	7	867	116	70	9	9	9	9	9
17-Mar-92	52	2	653	139	95	9	9	9	9	9
07-Apr-92	86	23	1040	168	100	8	8	8	8	8
22-Apr-92	81	26	899	110	20	8	8	8	8	8
05-May-92	76	24	744	87	41	9	9	9	9	9
19-May-92	108	34	950	15	14	9	9	9	9	9
02-Jun-92	125	12	2063	5	17	9	9	9	9	9
16-Jun-92	265	25	3425	5	43	9	9	9	9	9
01-Jul-92	272	92	2775	14	20	9	9	9	9	9
13-Jul-92	291	35	2436	5	14	9	9	9	9	9
28-Jul-92	215	29	2066	7	20	5	9	9	9	5
12-Aug-92	55	14	2117	9	11	9	9	9	9	9
25-Aug-92	179	17	1406	6	16	9	9	9	9	9
21-Sep-92	117	18	1166	8	10	9	9	9	9	9
07-Oct-92	116	12	1537	80	30	7	7	7	7	7
14-Oct-92	99	41	376	5	5	2	2	2	2	2
21-Oct-92	95	7	1116	96	86	6	6	6	6	6
10-Nov-92	78	6	1271	150	207	3	3	3	3	3
07-Jan-93	98	26	1174	123	219	4	4	4	4	4
01-Mar-93	105	34	939	124	349	4	4	4	4	4
20-Apr-93	77	10	561	5	5	9	9	9	9	9
10-May-93	70	13	519	5	9	9	9	9	9	9
02-Jun-93	56	23	467	9	25	9	9	9	9	9
16-Jun-93	93	13	1272	6	7	9	9	9	9	9
29-Jun-93	126	14	2508	5	5	9	9	9	9	9
13-Jul-93	190	24	2268	7	14	9	9	9	9	9
25-Jul-93	146	26	2044	8	18	9	9	9	9	9
11-Aug-93	198	40	1757	16	12	9	9	9	9	9
24-Aug-93	140	28	1574	16	120	9	9	9	9	9
07-Sep-93	128	25	2173	63	1036	9	9	9	9	9
19-Sep-93	104	24	1402	136	355	9	9	9	9	9
12-Oct-93	60	22	906	164	125	9	9	9	9	9
25-Oct-93	43	29	909	179	124	9	9	9	9	9
16-Nov-93	61	28	775	156	85	9	9	9	9	9
21-Mar-94	53	9	584	17	43	9	9	9	9	9
27-Apr-94	63	21	485	6	60	3	3	3	3	3
09-May-94	51	20	437	5	13	9	9	9	9	9
23-May-94	59	18	602	5	14	9	9	9	9	9
07-Jun-94	74	8	1178	5	13	9	9	9	9	9
20-Jun-94	136	10	2785	5	7	9	9	9	9	9
06-Jul-94	205	52	2175	9	9	9	9	9	9	9
18-Jul-94	208	111	2179	13	87	4	4	4	4	4
02-Aug-94	205	28	2059	10	30	9	9	9	9	9

Upper Klamath Lake Nutrient Data 1991-1998

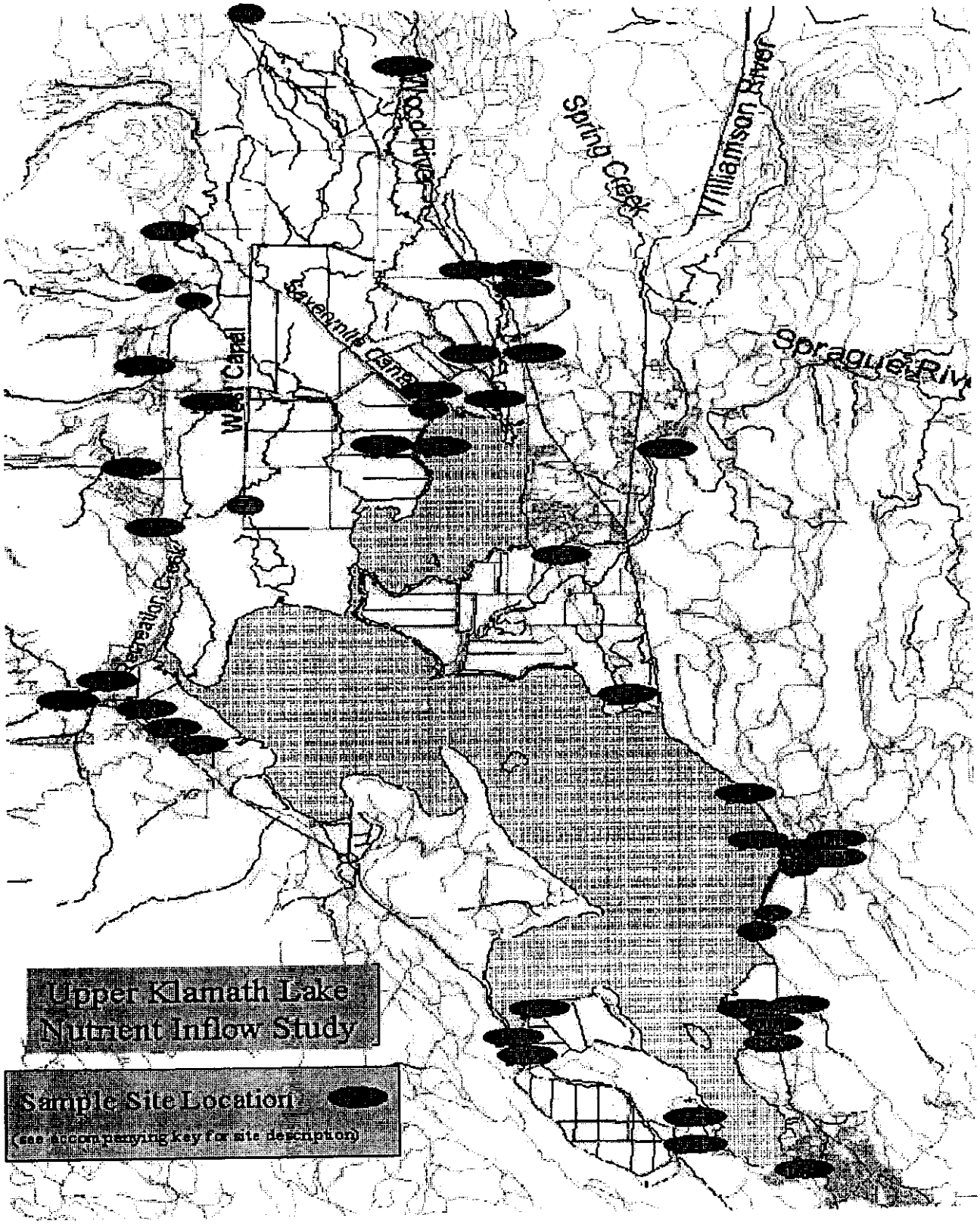
Sample Date Means - all concentrations are ug L^{-1}

DATE	TP	SRP	TN	NO	NH	TP sample size	SRP sample size	NO sample size	NH sample size	TN sample size
15-Aug-94	143	22	1747	19	23	9	9	9	9	9
31-Aug-94	106	15	1296	7	15	9	9	9	9	9
05-Sep-94	116	10	1380	5	5	1	1	1	1	1
12-Sep-94	120	11	1407	8	33	5	5	5	5	5
18-Sep-94	124		1590		45	1	0	0	1	1
26-Sep-94	127	10	1413	7	21	5	5	5	5	5
10-Oct-94	118	12	1366	5	6	5	5	5	5	5
17-Oct-94	122	10	1480	5	11	1	1	1	1	1
18-Oct-94	140	10	1620	5	24	1	1	1	1	1
24-Oct-94	42	11	1509	12	10	5	5	5	5	5
30-Oct-94	87	9	1630	5	45	1	1	1	1	1
09-Nov-94	106		1400		172	1	0	0	1	1
14-Nov-94	115	11	1640	18	164	1	1	1	1	1
21-Nov-94	99	11	1230	51	115	1	1	1	1	1
28-Nov-94	88	16	1580	33	200	1	1	1	1	1
21-Feb-95	101	14	974	13	20	1	1	1	1	1
26-Feb-95	61	7	1030	5	26	1	1	1	1	1
06-Mar-95	60	6	641	5	14	1	1	1	1	1
03-Apr-95	72	10	652	7	14	9	9	9	9	9
17-Apr-95	71	14	738	6	8	9	9	9	9	9
02-May-95	59	14	663	5	6	9	9	9	9	9
15-May-95	53	30	822	6	7	9	9	9	9	9
30-May-95	53	25	847	8	40	9	9	9	9	9
14-Jun-95	145	12	1911	5	5	9	9	9	9	9
26-Jun-95	170	27	2810	20	34	9	9	9	9	9
10-Jul-95	217	50	2403	5	11	9	9	9	9	9
24-Jul-95	195	67	2202	9	9	9	9	9	9	9
07-Aug-95	253	95	2247	5	23	9	9	9	9	9
21-Aug-95	200	86	2704	5	40	9	9	9	9	9
04-Sep-95	283	107	3139	5	38	9	9	9	9	9
18-Sep-95	313	122	2652	5	88	9	9	9	9	9
03-Oct-95	183	15	2181	5	28	9	9	9	9	9
17-Oct-95	176	53	2104	5	43	9	9	9	9	9
31-Oct-95	119	55	1548	17	201	9	9	9	9	9
19-Nov-95	106	43	1797	73	488	9	9	9	9	9
12-Dec-95	86	29	2420	227	839	1	1	1	1	1
01-Jan-96	85	21	1820	270	680	1	1	1	1	1
12-Feb-96	72	9	1430	253	193	1	1	1	1	1
25-Feb-96	74	8	1150	5	14	1	1	1	1	1
19-Mar-96	55	10	532	5	5	6	6	6	6	6
02-Apr-96	33	8	531	5	28	1	1	1	1	1
08-Apr-96	29	16	622	6	69	6	6	6	6	6
23-Apr-96	28	19	817	9	53	6	5	5	6	6
28-May-96	55	10	595	7	71	6	6	6	6	6
10-Jun-96	80	9	967	8	50	6	6	6	6	6
23-Jun-96	76	10	1160	5	464	6	6	6	6	6
07-Jul-96	110	11	1541	6	445	6	6	6	6	6
23-Jul-96	156	12	1843	9	49	6	6	6	6	6
01-Aug-96	125	33	2000	86	120	1	1	1	1	1
05-Aug-96	191	57	2396	15	115	5	5	5	5	5
19-Aug-96	223	106	1901	29	682	5	5	5	5	5
26-Aug-96	202	65	2440	39	1020	1	1	1	1	1
03-Sep-96	192	104	1656	55	249	6	6	6	6	6
15-Sep-96	194	67	2144	13	81	6	6	6	6	6
30-Sep-96	185	53	2250	7	373	6	6	6	6	6
15-Oct-96	137	80	2571	56	670	6	6	6	6	6
30-Oct-96	214	30	2027	34	810	6	6	6	6	6
01-Jan-97	79		1550		651	1	0	0	1	1

Upper Klamath Lake Nutrient Data 1991-1998										
Sample Date Means - all concentrations are ug L^{-1}										
DATE	TP	SRP	TN	NO	NH	TP sample size	SRP sample size	NO sample size	NH sample size	TN sample size
07-Jan-97	53	40	1460	57	37	1	1	1	1	1
28-Jan-97	83	51	1250	219	412	1	1	1	1	1
17-Feb-97	73	8	949	167	98	1	1	1	1	1
11-Mar-97	50	11	578	7	12	9	9	9	9	9
25-Mar-97	38	13	451	5	75	9	9	9	9	9
08-Apr-97	45	13	568	12	5	8	8	8	8	8
05-May-97	45	24	529	27	126	9	9	9	9	9
19-May-97	69	25	700	15	153	9	9	9	9	9
15-Jun-97	150	16	2212	5	350	9	9	9	9	9
01-Jul-97	228	24	2188	5	1127	9	9	9	9	9
15-Jul-97	238	53	2514	6	1014	9	9	9	9	9
29-Jul-97	301	96	2344	10	1644	8	8	8	8	8
11-Aug-97	226	89	2690	54	665	9	9	9	9	9
26-Aug-97	218	123	2296	65	664	8	8	8	8	8
08-Sep-97	194	48	2099	6	598	8	8	8	8	8
22-Sep-97	164	49	2062	5	677	8	8	8	8	8
13-Oct-97	165	41	2086	24	883	8	8	8	8	8
12-Jan-98	82		2000			1	0	0	0	1
01-Feb-98	68		1420	119		1	0	1	0	1
25-Feb-98	51		689	79		1	0	1	0	1
10-Mar-98	40	13	727	5	5	1	1	1	1	1
23-Mar-98	43	6	672	57	10	1	1	1	1	1
06-Apr-98	41	8	539	35	5	1	1	1	1	1
14-Apr-98	53	7	488	5	76	6	6	6	6	6
28-Apr-98	45	10	488	5	102	9	9	9	9	9
17-May-98	66	19	650	30	106	9	9	9	9	9
02-Jun-98	57	6	856	5	161	8	8	8	8	8
16-Jun-98	82	5	1133	5	437	9	9	9	9	9
29-Jun-98	100	10	1513	5	550	9	9	9	9	9
13-Jul-98	177	6	2544	5	875	8	8	8	8	8
27-Jul-98	225	83	1867	5	671	9	9	9	9	9
11-Aug-98	165	94	1795	30	608	9	9	9	9	9
24-Aug-98	165	62	1732	36	584	9	9	9	9	9
07-Sep-98	151	61	1237	5	40	9	9	9	9	9
21-Sep-98	144	45	1353	5	267	9	9	9	9	9
30-Sep-98	126	32	1222	6	323	9	9	9	9	9
20-Oct-98	114	16	1450	41	427	9	9	9	9	9

Appendix II. Tributary nutrient loading and water discharge data, 1991-1998.

Site #	Site Code	Description
1	3MCR	Threemile Creek
2	4MCA	Four Mile Canal
3	4MSP	Four Mile Spring
4	7MCA	Seven Mile Canal
5	ALGOMA BRIDG	Hwy 97 where Alogoma drains to UKL
6	ALGPU	Rattlesnake Point Pump (ALGOMA PUMP)
7	ANCR	Annie Creek at USFS Bridge near Snow park
8	BSCA	Barkely Canal
9	BSFD	Barkley Field
10	BSPU	Barkley Pump
11	BSSP	Barkley Springs @ Hagelstein Park
12	CACA	Caledonia Canal (Lakeside of Hwy 140)
13	CAPU	Caledonia Pump - Draining Caledonia marsh
14	CC62	Crooked Creek AT HWY 62 BRIDGE
15	CCLO	Crystal Creek LODGE CHANNEL
16	CCPA	Crooked Creek AT PAIGE'S
17	CHCR	Cherry Creek.
18	FRBR	Freemont Bridge at Outlet of Klamath Lake
19	HAFD	Hanks Field
20	HAMA	Hanks Marsh (in marsh east of 97)
21	HASP	Harriman Spring
22	HMPU	Hanks Marsh Pump (draining ag area below marsh)
23	MASP	Malone Spring
24	MCPS	McCornack Pump South
25	MCPU	McCornack Pump
26	MESP	Mares Egg Spring
27	MOCA	Modoc Canal
28	ODCR	Odessa Creek
29	ODESSA CANAL	Odessa Canal draining to pump
30	ODPU	Odessa Pump
31	OXSP	Ouxy Springs
32	ROCR	Rock Creek (Draining to Crystal Creek)
33	RYPU	Wocus,Caledonia Canal South Pmp (RUNNING Y PUMP SOUTH)
34	SPPU	Shady Pine Pump (discharging into the marsh)
35	SRKB	Sprague @ Kirchers
36	SUSP	Sucker Springs
37	TESP	Tecumseh SPRINGS
38	TULANA PUMP	TULANA PUMP (LAKESIDE)
39	TUPU	Tulana Ranch Pump (into Agency Lake south of sevenmile)
40	VACR	Varney Creek
41	WODR	Wood River @ AGENCY LAKE (Dike Rd.)
42	WOWR	Wood River (WEED ROAD)
43	WODX	Wood River Dixon Road
44	WRRPE	Wood River Ranch PUMP EAST (INTO WOOD RIVER)
45	WRRPW	Wood River Ranch PUMP WEST (INTO 7-MILE CANAL)
46	WRST	Williamsom River @ Store (Bridge Crossing on Modoc Pt. Rd.
* Refer to map on following page for location corresponding to site #.		


Upper Klamath Lake
Nutrient Inflow Study
Sample Site Location
(see Accompanying key for site description)
Williamson River
Spring Creek
Sprague River
Link River
Lake Ewauna
Recreation Canal
Ewauna Canal

VARIABLE	DESCRIPTION	UNITS
TP	Total Phosphorus	ug L^{-1} (micrograms per liter)
SRP	Soluble Reactive Phosphorus	ug L^{-1} (micrograms per liter)
NH	Ammonia Nitrogen (NH_4-N)	ug L^{-1} (micrograms per liter)
NO	Nitrate + Nitrite Nitrogen (NO_3-N + NO_2-N)	ug L^{-1} (micrograms per liter)
TN	Total Nitrogen	ug L^{-1} (micrograms per liter)
Q	Discharge	cfs (cubic feet per second)
STAFF	Staff Gage Reading	feet

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
07-Jan-92	7	3MCR		0.4	19		50	5	
30-Jan-92	30	3MCR			25	27	50	5	16
26-Mar-92	86	3MCR			25	21	50	26	15
27-Apr-92	118	3MCR			23	15	50	5	5
07-Oct-91	280	4MCA			89	49	334		
25-Nov-91	329	4MCA			53	41	315	12	5
07-Jan-92	7	4MCA			61		249	43	
10-Feb-92	41	4MCA			87	71	469	25	5
03-Mar-92	63	4MCA			77	18	596	5	5
26-Mar-92	86	4MCA			44	17	540	36	14
25-Nov-91	329	4MSP			69	71	126	5	21
07-Jan-92	7	4MSP			76		50	5	
29-Jan-92	29	4MSP			80	73	50	5	16
26-Mar-92	86	4MSP			84	83	179	28	18
27-Apr-92	118	4MSP			76	70	50	5	23
07-Oct-91	280	7MCA		53	153	88	460		
25-Nov-91	329	7MCA		140	109	78	608	101	20
07-Jan-92	7	7MCA		145	86		181	66	
29-Jan-92	29	7MCA		154	157	95	315	88	5
10-Feb-92	41	7MCA			107	61	438	31	5
03-Mar-92	63	7MCA			122	86	340	11	5
26-Mar-92	86	7MCA			98	64	275	17	16
02-Apr-92	93	7MCA			108	75	102	17	13
07-Apr-92	98	7MCA			118	78	172	33	5
16-Apr-92	107	7MCA			131	60	610	27	35
22-Apr-92	113	7MCA			132	61	619	5	5
27-Apr-92	118	7MCA			106	77	276	10	5
07-May-92	128	7MCA			141	82	304	5	5
13-May-92	134	7MCA			304	125	498	5	5
27-May-92	148	7MCA			252	124	800	22	5
09-Jun-92	161	7MCA			177	103	1230	50	50
29-Sep-92	273	7MCA			145	138	389	5	14
21-Oct-92	295	7MCA							
23-Nov-92	328	7MCA		243	165	67	651	5	41
09-Dec-92	344	7MCA			108	104	429	5	5
05-Jan-93	5	7MCA			123		302	41	
01-Feb-93	32	7MCA			125		295	66	
26-Feb-93	57	7MCA			133	78	274	51	17
12-Mar-93	71	7MCA		0	150	14	380	84	72
18-Mar-93	77	7MCA			248	99	426	65	74
26-Mar-93	85	7MCA		545	218	160	605	52	18
31-Mar-93	90	7MCA		0	217	159	602	42	36
06-Apr-93	96	7MCA		0	190	107	748	5	67
14-Apr-93	104	7MCA			156	81	662	5	25
20-Apr-93	110	7MCA		0	204	199	810	5	18
29-Apr-93	119	7MCA		205	190		1105	97	
05-May-93	125	7MCA		82	180	110	944	5	5
12-May-93	132	7MCA		55	232	97	365	54	11
18-May-93	138	7MCA		0	370	141	687	5	5
26-May-93	146	7MCA		331	262	84	404	5	5
23-Jun-93	174	7MCA		0	180	106	715	27	5
07-Jul-93	188	7MCA		22	202	136	1840	5	5
20-Jul-93	201	7MCA		0	224	179	676	18	5
17-Aug-93	229	7MCA		119	345	302	928	93	20
31-Aug-93	243	7MCA		75	146	90	523	31	
15-Sep-93	258	7MCA			146	97	538	34	15

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
28-Sep-93	271	7MCA			81	61	271	57	5
14-Oct-93	287	7MCA		207	81	63	176	19	20
21-Oct-93	294	7MCA		92	78	75	138	5	5
02-Nov-93	306	7MCA		132	75	72	159	5	5
02-Dec-93	336	7MCA		229	88	65	73	26	5
26-Jan-94	26	7MCA		109	178	87	451	5	5
11-Feb-94	42	7MCA		1	90	73	180	35	17
28-Feb-94	59	7MCA		43	55		218	66	
09-Mar-94	68	7MCA		104	121	74	380	70	5
01-Jun-94	152	7MCA		2	138	84	375	13	5
14-Jun-94	165	7MCA		83	148		630	23	
29-Jun-94	180	7MCA		20	163		488	45	
27-Jul-94	208	7MCA		54	233		1545	290	
07-Sep-94	250	7MCA		94	126	90	501	40	5
20-Sep-94	263	7MCA		149	110		429	39	
04-Oct-94	277	7MCA		142	125	84	410	37	12
17-Oct-94	290	7MCA		131	83	64	202	22	8
01-Nov-94	305	7MCA			76	58	420	41	5
15-Nov-94	319	7MCA		219	72	61	313	42	5
28-Nov-94	332	7MCA		117	99	70	276	58	5
12-Dec-94	346	7MCA			122	89	516	48	5
04-Jan-95	4	7MCA		85	99	87	400	81	14
18-Jan-95	18	7MCA		0	129	103	259	10	25
31-Jan-95	31	7MCA		0	136	73	736	72	28
14-Feb-95	45	7MCA		17	81	55	534	40	26
28-Feb-95	59	7MCA		102	100	78	566	23	14
16-Mar-95	75	7MCA		169	76	58	610	45	12
28-Mar-95	87	7MCA		190	126	61	435	28	14
11-Apr-95	101	7MCA		0	109	62	350	28	5
23-May-95	143	7MCA		200	90	75	464	14	5
06-Jun-95	157	7MCA		204	258	123	794	26	12
21-Jun-95	172	7MCA		33	115	66	697	28	5
05-Jul-95	186	7MCA		91	382	215	955	55	8
12-Sep-95	255	7MCA		11	134	128	573	5	5
26-Sep-95	269	7MCA		127	122	99	348	5	5
10-Oct-95	283	7MCA		94	65	69	84	5	5
24-Oct-95	297	7MCA		61	53	51	50	24	5
07-Nov-95	311	7MCA		79	77	58	50	20	5
03-Jan-96	3	7MCA		207	540	58	534	48	24
08-Feb-96	39	7MCA			172		653	37	
13-Feb-96	44	7MCA		428	90	49	1780	52	5
28-Feb-96	59	7MCA							
08-May-96	129	7MCA		217	99	71	216	5	5
03-Jun-96	155	7MCA		110	116	66	244	57	5
01-Jul-96	183	7MCA		56	146	80	577	34	5
15-Jul-96	197	7MCA		163	373	202	746	359	62
29-Jul-96	211	7MCA							
28-Aug-96	241	7MCA		86	205	108	688	123	5
09-Oct-96	283	7MCA		83	118	79	261	51	5
06-Nov-96	311	7MCA		165	71	65	110	31	10
25-Nov-96	330	7MCA		219	119	95	485	65	40
13-Dec-96	348	7MCA			173	88	755	48	20
08-Jan-97	8	7MCA			84	70	652	30	53
27-Jan-97	27	7MCA		289	102	72	454	45	24
19-Feb-97	50	7MCA		173	94	62	519	30	16
02-Apr-97	92	7MCA		86	82	71	159	32	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
07-May-97	127	7MCA		169	97	71	157	52	5
14-May-97	134	7MCA		242	98	91	256	43	5
13-Jan-98	13	7MCA		258	96		484		
02-Feb-98	33	7MCA			105		514	24	
26-Feb-98	57	7MCA			95		363	48	
24-Mar-98	83	7MCA							
07-Apr-98	97	7MCA		194	128	63	535	81	5
21-Apr-98	111	7MCA		76	135	62	616	24	5
09-Jun-98	160	7MCA		171	142	83	319	11	5
23-Jun-98	174	7MCA							
09-Jul-98	190	7MCA							
26-Aug-98	238	7MCA		80	193	80	562	85	5
16-Sep-98	259	7MCA							
30-Sep-98	273	7MCA			92	67	256	39	5
31-Mar-93	90	ALGOMA BRIDG			383	137	2740	22	941
18-Mar-93	77	ALGPU			432	325	3020	105	1920
22-Mar-93	81	ALGPU			159	121	1950	138	1000
29-Mar-93	88	ALGPU			177	158	2200	69	1030
05-Apr-93	95	ALGPU			413	168	7880	136	4510
12-Apr-93	102	ALGPU			276	137	8740	334	4890
15-Mar-94	74	ALGPU			454	68	4040	375	800
04-Apr-94	94	ALGPU			505	109	4550	448	603
07-Jun-95	158	ALGPU			739	449	1460	73	5
08-Feb-96	39	ANCR			46		917	13	
13-Feb-96	44	ANCR			53	31	1510	29	5
07-Oct-91	280	BSCA		3	102	69	239		
25-Nov-91	329	BSCA		3	80	74	453	79	99
09-Jan-92	9	BSCA		3	74		50	31	
29-Jan-92	29	BSCA			76	67	50	53	66
10-Feb-92	41	BSCA			75	60	203	69	62
26-Mar-92	86	BSCA			198	97	1220	44	14
28-Apr-92	119	BSCA			65	61	130	5	94
10-Feb-92	41	BSFD			350	109	1140	53	5
26-Mar-92	86	BSPU			414	173	1700	69	21
15-Mar-93	74	BSPU			338	319	2850	210	1660
18-Mar-93	77	BSPU			435	350	2590	148	1490
22-Mar-93	81	BSPU			280	211	3010	79	590
29-Mar-93	88	BSPU			376	233	3720	239	1630
05-Apr-93	95	BSPU			256	105	3480	57	1190
20-Dec-94	354	BSPU			767		1140	499	
12-Jan-95	12	BSPU			1600		5340	1240	
26-Mar-92	86	BSSP			63	50	255	24	59
07-Oct-91	280	CACA			675	174	11618		
25-Nov-91	329	CACA			119	24	4850	2160	75
09-Jan-92	9	CACA			117		4530	1830	
31-Jan-92	31	CACA			195	4	2750	750	290
26-Mar-92	86	CACA			131	51	2020	425	224
28-Apr-92	119	CACA			279	10	1775	12	5
05-Apr-93	95	CACA			230	44	3050	99	253
12-Apr-93	102	CACA			197	39	3820	75	488
19-Apr-93	109	CACA			140	26	2330	114	218
26-Apr-93	116	CACA			293		3390	294	
04-May-93	124	CACA			294	32	3490	64	5
10-May-93	130	CACA			173	21	2050	5	18
18-May-93	138	CACA			176	23	1620	16	32

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
26-May-93	146	CACA			191	37	1580	5	55
10-Jun-93	161	CACA			140	114	2360	212	145
23-Jun-93	174	CACA			260	13	3340	28	5
08-Jul-93	189	CACA			143	15	2860	107	5
19-Jul-93	200	CACA			193	29	2510	113	18
17-Aug-93	229	CACA			485	42	6920	2920	5
31-Aug-93	243	CACA			554	15	10035	648	5
15-Sep-93	258	CACA			266	12	6100	3570	19
28-Sep-93	271	CACA			149	19	3070	1290	76
14-Oct-93	287	CACA			120	14	2140	1010	60
21-Oct-93	294	CACA			102	29	2270	1730	55
02-Nov-93	306	CACA			73	28	1825	603	146
24-Jan-94	24	CACA			347	12	1680	5	5
09-Feb-94	40	CACA			192	72	2110	137	145
01-Mar-94	60	CACA			136		1860	312	
10-Mar-94	69	CACA			142	21	1730	339	25
15-Mar-94	74	CACA			130	23	1670	291	68
23-Mar-94	82	CACA			79	20	1210	197	71
29-Mar-94	88	CACA			68	9	960	30	52
04-Apr-94	94	CACA			103	8	1275	29	12
13-Apr-94	103	CACA			103	10	1345	20	8
19-Apr-94	109	CACA			79	8	797	25	5
26-Apr-94	116	CACA			91		838	98	
10-May-94	130	CACA			115		940	219	
31-May-94	151	CACA			116	51	198	5	5
13-Jun-94	164	CACA			151		3040	75	
29-Jun-94	180	CACA			115		1180	87	
12-Jul-94	193	CACA			131	94	1300	316	101
25-Jul-94	206	CACA			136		2160	49	
08-Aug-94	220	CACA			170	79	1590	191	78
24-Aug-94	236	CACA			188		1995	70	
06-Sep-94	249	CACA			173	13	1830	10	5
18-Oct-94	291	CACA			181	13	1900	81	12
31-Oct-94	304	CACA			137	14	1870	61	5
05-Apr-93	95	CAPU			263	8	2360	55	256
12-Apr-93	102	CAPU			155	17	2110	41	139
19-Apr-93	109	CAPU			247	56	1830	39	182
26-Apr-93	116	CAPU			147		2520	197	
04-May-93	124	CAPU			176	60	2440	169	85
10-May-93	130	CAPU			164	52	2360	290	69
18-May-93	138	CAPU			234	104	2620	390	108
26-May-93	146	CAPU			426	186	3180	1060	34
10-Jun-93	161	CAPU			253	152	3660	442	182
12-Oct-93	285	CAPU		66	105	97	167	24	31
06-Feb-95	37	CAPU			132	20	2490	96	715
07-Mar-95	66	CAPU			116	48	542	165	319
03-Dec-92	338	CC62		49	89		366	11	
04-Jan-93	4	CC62		49	99		114	5	
22-Jan-93	22	CC62		46	94		247	20	
07-Oct-91	280	CCLO			83	72	50		
25-Nov-91	329	CCLO			71	68	193	16	33
07-Jan-92	7	CCLO			51		50	5	
30-Jan-92	30	CCLO			64	54	50	5	31
26-Mar-92	86	CCLO			65	60	50	28	19
27-Apr-92	118	CCLO			83	65	50	10	19
21-Jan-93	21	CCPA		68	120		360	83	

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
01-Feb-93	32	CCPA		68	109		344	19	
10-Feb-93	41	CCPA			95	95	207	12	37
25-Feb-93	56	CCPA		69	131	87	50	5	13
05-Mar-93	64	CCPA		74	134	123	186	28	36
26-Mar-93	85	CCPA		58	118	95	297	28	12
31-Mar-93	90	CCPA		71	124	107	150	19	16
09-Apr-93	99	CCPA			128	71	245	5	25
14-Apr-93	104	CCPA		76	116	101	161	17	26
20-Apr-93	110	CCPA		75	171	81	101	5	18
05-May-93	125	CCPA		72	123	95	309	16	18
13-May-93	133	CCPA		61	173	87	50	62	23
18-May-93	138	CCPA		44	258	94	102	5	5
27-May-93	147	CCPA		79	128	87	50	5	5
10-Jun-93	161	CCPA		82	113	90	81	5	16
23-Jun-93	174	CCPA		50	106	89	141	19	16
07-Jul-93	188	CCPA		47	139	117	50	5	5
20-Jul-93	201	CCPA		69	129	103	102	5	16
05-Aug-93	217	CCPA		47	122	112	50	5	16
17-Aug-93	229	CCPA		75	120	126	131	5	12
31-Aug-93	243	CCPA		59	117	105	50	5	14
15-Sep-93	258	CCPA			118	114	139	37	30
28-Sep-93	271	CCPA			105	94	50	61	33
20-Oct-93	293	CCPA		71	100	94	50	12	16
02-Nov-93	306	CCPA		72	91	95	50	5	5
02-Dec-93	336	CCPA		77	118	104	50	34	12
25-Jan-94	25	CCPA		78	246	97	121	5	5
11-Feb-94	42	CCPA		75	98	97	50	33	43
28-Feb-94	59	CCPA		81	109		115	30	
09-Mar-94	68	CCPA		76	111	95	50	39	5
15-Mar-94	74	CCPA		76	114	96	105	28	39
23-Mar-94	82	CCPA		74	98	95	125	38	38
29-Mar-94	88	CCPA		74	116	97	167	56	35
19-Apr-94	109	CCPA		67	116	96	290	35	5
12-May-94	132	CCPA		47	107		168	15	
01-Jun-94	152	CCPA		46	119	101	50	11	18
14-Jun-94	165	CCPA		69	108		50	5	
29-Jun-94	180	CCPA		63	118		50	29	
12-Jul-94	193	CCPA		69	125	118	50	34	18
10-Aug-94	222	CCPA		37	145	111	180	25	14
23-Aug-94	235	CCPA		57	110		361	5	
21-Sep-94	264	CCPA		52	109		50	35	
04-Oct-94	277	CCPA		73	116	93	50	14	5
28-Nov-94	332	CCPA			121	100	176	33	5
22-Feb-95	53	CCPA			120	114	733	45	21
28-Mar-95	87	CCPA		72	120	106	146	19	12
25-Apr-95	115	CCPA		73	103	101	139	13	5
09-May-95	129	CCPA		73	128	107	383	5	5
23-May-95	143	CCPA		67	106	102	50	42	5
06-Jun-95	157	CCPA		61	130	117	133	5	10
21-Jun-95	172	CCPA		74	111	101	50	5	5
02-Jan-97	2	CCPA			136		201	22	
25-Nov-91	329	CHCR			37	15	217	10	5
07-Jan-92	7	CHCR			20		50	5	
30-Jan-92	30	CHCR			29	24	50	55	16
26-Mar-92	86	CHCR			24	21	109	15	14
27-Apr-92	118	CHCR			22	15	50	5	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
25-Feb-91	56	FRBR			91	8	1362	212	293
03-Apr-91	93	FRBR			57	5	1147	96	244
30-Apr-91	120	FRBR			71	3	1001	70	245
05-Jun-91	156	FRBR			80	6	715	5	5
19-Jun-91	170	FRBR			97	28	584		5
17-Jul-91	198	FRBR			176	20	3281	46	
01-Aug-91	213	FRBR			190	106	1804	177	
14-Aug-91	226	FRBR			182	52	2050	20	
28-Aug-91	240	FRBR			204	41	2524		
11-Sep-91	254	FRBR			234	52	1893	10	
25-Sep-91	268	FRBR			195	48	2463		
07-Oct-91	280	FRBR			240	45	3301		
09-Oct-91	282	FRBR			225	44	2289	5	
31-Oct-91	304	FRBR			408	18	3865	221	
21-Nov-91	325	FRBR			122	8	3350	864	148
25-Nov-91	329	FRBR			108	37	2469	1047	162
09-Jan-92	9	FRBR			92		2110	946	
31-Jan-92	31	FRBR			137	5	2245	939	292
10-Feb-92	41	FRBR			77	9	1710	311	313
28-Feb-92	59	FRBR			71	4	1440	139	298
03-Mar-92	63	FRBR			69	14	1320	190	293
18-Mar-92	78	FRBR			55	1	1252	148	287
26-Mar-92	86	FRBR			50	15	1280	204	284
02-Apr-92	93	FRBR			63	11	1180	83	275
08-Apr-92	99	FRBR			106	20	1220	108	260
14-Apr-92	105	FRBR			83	29	1086	150	286
23-Apr-92	114	FRBR			80	20	1120	32	278
28-Apr-92	119	FRBR			66	13	1130	41	211
06-May-92	127	FRBR			80	14	908	32	184
12-May-92	133	FRBR			87	24	738	5	85
20-May-92	141	FRBR			95	26	932	5	5
27-May-92	148	FRBR			102	36	1070	24	5
03-Jun-92	155	FRBR			139	13	2500	28	5
09-Jun-92	161	FRBR			165	113	2220	50	50
17-Jun-92	169	FRBR			287	18	3680	33	5
02-Jul-92	184	FRBR			234	63	3190	5	65
14-Jul-92	196	FRBR			492	18	4310	5	5
29-Jul-92	211	FRBR			222	33	2000	5	5
12-Aug-92	225	FRBR			54	10	2880	13	5
26-Aug-92	239	FRBR			197	12	1890	14	8
22-Sep-92	266	FRBR			113	13	1460	13	5
08-Oct-92	282	FRBR			109	13	1675	14	179
21-Oct-92	295	FRBR			93	13	1190	28	160
23-Nov-92	328	FRBR			77	4	1100	35	248
09-Dec-92	344	FRBR			41	16	1530	5	5
22-Dec-92	357	FRBR			56		1300	159	
05-Jan-93	5	FRBR			69		1390	272	
22-Jan-93	22	FRBR			53		1660	404	
02-Feb-93	33	FRBR			55		1940	493	
10-Feb-93	41	FRBR			44	13	1170	320	188
26-Feb-93	57	FRBR			72	12	1740	489	105
12-Mar-93	71	FRBR			68	4	1460	357	173
18-Mar-93	77	FRBR			69	13	1420	213	210
22-Mar-93	81	FRBR			57	13	1220	161	91
29-Mar-93	88	FRBR			58	10	760	43	20
05-Apr-93	95	FRBR			98	17	790	5	32

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
12-Apr-93	102	FRBR			106	10	874	5	13
19-Apr-93	109	FRBR			62	13	707	5	5
26-Apr-93	116	FRBR			64		668	58	
04-May-93	124	FRBR			66	4	833	5	5
10-May-93	130	FRBR			68	14	648	5	5
18-May-93	138	FRBR			54	11	457	5	5
26-May-93	146	FRBR			63	5	493	5	5
10-Jun-93	161	FRBR			62	16	1060	25	11
23-Jun-93	174	FRBR			57	7	1540	11	5
08-Jul-93	189	FRBR			161	9	5870	5	5
19-Jul-93	200	FRBR			150	19	2260	5	5
05-Aug-93	217	FRBR			138	21	1865	5	8
17-Aug-93	229	FRBR			274	22	2540	12	5
31-Aug-93	243	FRBR			101	20	1850	10	5
15-Sep-93	258	FRBR			76	12	1620	401	75
28-Sep-93	271	FRBR			68	16	411	245	191
14-Oct-93	287	FRBR			67	20	1210	118	193
21-Oct-93	294	FRBR			61	16	1250	383	199
02-Nov-93	306	FRBR			71	22	1290	96	196
30-Nov-93	334	FRBR			72	19	1210	178	272
24-Jan-94	24	FRBR			73	12	804	5	90
09-Feb-94	40	FRBR			42	12	1072	42	258
01-Mar-94	60	FRBR			53		699	92	
10-Mar-94	69	FRBR			43	5	545	76	5
15-Mar-94	74	FRBR			41	7	538	43	27
23-Mar-94	82	FRBR			36	7	586	56	22
29-Mar-94	88	FRBR			43	8	695	29	20
04-Apr-94	94	FRBR			47	7	795	15	5
13-Apr-94	103	FRBR			67	6	738	12	5
19-Apr-94	109	FRBR			61	6	735	19	5
26-Apr-94	116	FRBR			50		599	88	
10-May-94	130	FRBR			37	12	456	10	5
24-May-94	144	FRBR			47	10	658	23	5
31-May-94	151	FRBR			45	7	641	5	5
13-Jun-94	164	FRBR			80		2190	68	
29-Jun-94	180	FRBR			178		1030	113	
12-Jul-94	193	FRBR			171	37	2700	5	13
25-Jul-94	206	FRBR			102		2180	37	
08-Aug-94	220	FRBR			163	14	1640	15	13
24-Aug-94	236	FRBR			129		1520	48	
06-Sep-94	249	FRBR			116	10	1380	5	5
14-Sep-94	257	FRBR			125	13	1370	15	5
19-Sep-94	262	FRBR			124		1590	45	
05-Oct-94	278	FRBR			171	12	1400	44	5
12-Oct-94	285	FRBR			109	10	1200	5	5
18-Oct-94	291	FRBR			122	10	1480	11	5
31-Oct-94	304	FRBR			87	9	1630	45	5
10-Nov-94	314	FRBR			106		1400	172	
15-Nov-94	319	FRBR			115	11	1640	164	18
22-Nov-94	326	FRBR			99	11	1230	115	51
29-Nov-94	333	FRBR			88	16	1580	200	33
12-Dec-94	346	FRBR			83	10	1580	198	66
19-Dec-94	353	FRBR			87	10	1250	379	51
03-Jan-95	3	FRBR			97	11	1370	96	80
17-Jan-95	17	FRBR			77	6	964	116	106
31-Jan-95	31	FRBR			60	6	882	30	80

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
07-Feb-95	38	FRBR			78	9	1030	25	16
14-Feb-95	45	FRBR			68	13	828	27	5
22-Feb-95	53	FRBR			101	14	974	20	13
27-Feb-95	58	FRBR			61	7	1030	26	5
07-Mar-95	66	FRBR			60	6	641	14	5
13-Mar-95	72	FRBR			74	5	744	5	5
27-Mar-95	86	FRBR			91	7	908	5	5
08-May-95	128	FRBR			51	28	638	37	16
07-Jun-95	158	FRBR			75	23	1200	5	10
06-Jul-95	187	FRBR			142	24	2640	14	5
20-Jul-95	201	FRBR			143	26	2500	5	5
02-Aug-95	214	FRBR			162	43	3220	11	5
16-Aug-95	228	FRBR			146	35	2410	21	5
28-Aug-95	240	FRBR			150	53	2500	5	5
12-Sep-95	255	FRBR			188	70	3635	21	5
26-Sep-95	269	FRBR			146	60	1970	5	5
04-Oct-95	277	FRBR			282	4	4630	21	5
10-Oct-95	283	FRBR			78	25	1390	26	5
18-Oct-95	291	FRBR			159	34	3100	21	5
24-Oct-95	297	FRBR			124	47	1660	55	5
01-Nov-95	305	FRBR			131	71	1680	272	58
07-Nov-95	311	FRBR			117	42	1570	306	15
20-Nov-95	324	FRBR			121	51	2290	916	67
29-Nov-95	333	FRBR			111	62	2295	1	131
13-Dec-95	347	FRBR			86	29	2420	839	227
02-Jan-96	2	FRBR			85	21	1820	680	270
13-Feb-96	44	FRBR			72	9	1430	193	253
26-Feb-96	57	FRBR			74	8	1150	14	5
20-Mar-96	80	FRBR			44	6	518	5	5
03-Apr-96	94	FRBR			33	8	531	28	5
09-Apr-96	100	FRBR			20	11	442	73	5
24-Apr-96	115	FRBR			19		848	73	
29-May-96	150	FRBR			54	8	607	49	23
11-Jun-96	163	FRBR			52	9	750	63	15
24-Jun-96	176	FRBR			57	8	848	409	5
08-Jul-96	190	FRBR			102	6	1800	607	5
24-Jul-96	206	FRBR			116	7	1910	34	5
02-Aug-96	215	FRBR			125	33	2000	120	86
27-Aug-96	240	FRBR			202	65	2440	1020	39
04-Sep-96	248	FRBR			173	75	2350	111	14
16-Sep-96	260	FRBR			256	63	3720	41	5
01-Oct-96	275	FRBR			322	55	4200	877	5
16-Oct-96	290	FRBR			115	82	2140	545	154
31-Oct-96	305	FRBR			146	25	1650	537	95
13-Dec-96	348	FRBR			86	29	2420	839	227
02-Jan-97	2	FRBR			79		1550	651	
08-Jan-97	8	FRBR			53	40	1460	37	57
29-Jan-97	29	FRBR			83	51	1250	412	219
18-Feb-97	49	FRBR			73	8	949	98	167
12-Mar-97	71	FRBR			48	11	760	36	92
26-Mar-97	85	FRBR			52	10	476	63	5
09-Apr-97	99	FRBR			59	9	566	5	11
06-May-97	126	FRBR			32	16	171	58	5
20-May-97	140	FRBR			57	21	672	144	19
16-Jun-97	167	FRBR			227	9	3710	871	5
02-Jul-97	183	FRBR			328	6	3570	2250	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
16-Jul-97	197	FRBR			181	38	1940	762	5
30-Jul-97	211	FRBR			287	82	2240	1690	20
12-Aug-97	224	FRBR			270	81	3090	960	116
27-Aug-97	239	FRBR			249	167	2490	1015	77
09-Sep-97	252	FRBR			388	86	2720	1090	5
23-Sep-97	266	FRBR			216	84	2200	712	5
14-Oct-97	287	FRBR			169	44	1910	1020	26
13-Jan-98	13	FRBR			82		2000		
02-Feb-98	33	FRBR			68		1420		119
26-Feb-98	57	FRBR			51		689		79
10-Mar-98	69	FRBR			40	13	727	5	5
24-Mar-98	83	FRBR			43	6	672	10	57
07-Apr-98	97	FRBR			41	8	539	5	35
15-Apr-98	105	FRBR			65	4	529	60	5
29-Apr-98	119	FRBR			32	6	562	116	5
18-May-98	138	FRBR			62	13	662	109	48
03-Jun-98	154	FRBR			43	5	847	147	5
17-Jun-98	168	FRBR			154	4	867	321	5
30-Jun-98	181	FRBR			62	8	1390	574	5
14-Jul-98	195	FRBR			189	4	3205	1125	5
28-Jul-98	209	FRBR			194	59	1870	483	5
12-Aug-98	224	FRBR			245	82	2090	820	93
25-Aug-98	237	FRBR			136	78	1460	290	292
08-Sep-98	251	FRBR			172	62	1630	26	10
22-Sep-98	265	FRBR			226	44	2400	573	5
01-Oct-98	274	FRBR			158	38	1755	620	5
21-Oct-98	294	FRBR			103	10	1950	497	94
10-Feb-92	41	HAFD			575	234	3510	444	14
10-Feb-92	41	HAMA			114	8	1890	224	301
07-Oct-91	280	HASP			47	32	134		
25-Nov-91	329	HASP			35	34	179	5	48
07-Jan-92	7	HASP			36		50	5	
30-Jan-92	30	HASP			45	38	50	5	53
26-Mar-92	86	HASP			35	34	50	43	34
28-Apr-92	119	HASP			38	34	50	5	56
26-Mar-92	86	HMPU			214	163	1090	71	61
26-Feb-93	57	HMPU			291	119	2370	442	200
15-Mar-93	74	HMPU			513	321	2920	309	1590
18-Mar-93	77	HMPU			828	606	2210	99	1020
22-Mar-93	81	HMPU			241	136	1690	71	409
29-Mar-93	88	HMPU			197	103	1740	61	257
05-Apr-93	95	HMPU			428	119	3345	402	563
12-Apr-93	102	HMPU			386	130	2680	389	356
19-Apr-93	109	HMPU			329	171	1970	321	306
26-Apr-93	116	HMPU			224		1560	169	
06-May-93	126	HMPU			322	260	1465	53	131
10-May-93	130	HMPU			405	73	674	57	22
18-May-93	138	HMPU			460	220	586	22	30
23-Jun-93	174	HMPU			73	50	461	24	5
19-Jul-93	200	HMPU			81	63	189	14	5
05-Aug-93	217	HMPU			118	60	167	60	5
17-Aug-93	229	HMPU			54	47	141	16	5
15-Sep-93	258	HMPU			52	37	239	80	5
21-Oct-93	294	HMPU			93	64	890	68	47
24-Jan-94	24	HMPU			156	15	878	5	5
09-Feb-94	40	HMPU			52	34	604	12	75

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
01-Mar-94	60	HMPU			60		458	51	
10-Mar-94	69	HMPU			58	33	354	46	5
15-Mar-94	74	HMPU			77	47	391	49	27
23-Mar-94	82	HMPU			52	37	350	44	20
29-Mar-94	88	HMPU			65	43	415	42	38
04-Apr-94	94	HMPU			92	51	512	36	19
19-Apr-94	109	HMPU			138	70	946	36	13
26-Apr-94	116	HMPU			67		275	51	
31-May-94	151	HMPU			118	84	316	54	34
13-Jun-94	164	HMPU			76		513	28	
29-Jun-94	180	HMPU			87		537	98	
06-Feb-95	37	HMPU			633	214	2240	29	222
27-Mar-95	86	HMPU			151	87	1000	38	63
11-Apr-95	101	HMPU			122	72	723	29	19
14-Apr-95	104	HMPU			142		929	5	
24-Apr-95	114	HMPU			171	162	577	11	14
20-Jul-95	201	HMPU			95	76	476	72	14
12-Sep-95	255	HMPU			81	56	506	23	5
03-Jan-96	3	HMPU			285	251	1320	135	102
26-Feb-96	57	HMPU			609	467	1300	60	23
07-Oct-91	280	MASP			99	67	58		
25-Nov-91	329	MASP			72	71	241	5	31
09-Jan-92	9	MASP			69		50	5	
30-Jan-92	30	MASP			91	74	50	5	34
26-Mar-92	86	MASP			76	61	217	19	16
28-Apr-92	119	MASP			136	75	521	5	5
26-Feb-96	57	MCPS			626	409	2470	11	865
26-Mar-92	86	MCPU			86	33	1420	120	319
22-Mar-93	81	MCPU			188	60	898	13	5
29-Mar-93	88	MCPU			179	70	775	29	5
05-Apr-93	95	MCPU			351	180	1070	5	5
12-Apr-93	102	MCPU			441	159	1200	5	5
19-Apr-93	109	MCPU			458	229	1150	5	5
26-Apr-93	116	MCPU			440		669	111	
19-Apr-94	109	MCPU			636	509	990	41	5
26-Apr-94	116	MCPU			614		943	52	
26-Feb-96	57	MCPU			170	80	3200	23	1760
07-Oct-91	280	MESP			74	61	50		
25-Nov-91	329	MESP			60	60	50	5	13
07-Jan-92	7	MESP			65		50	5	
29-Jan-92	29	MESP			69	58	50	5	5
26-Mar-92	86	MESP			62	60	50	5	18
27-Apr-92	118	MESP			68	61	50	5	18
07-Oct-91	280	MOCA		5.1	180	131	380		
25-Nov-91	329	MOCA		5.3	55	43	223	5	5
09-Jan-92	9	MOCA		6.3	79		119	39	
29-Jan-92	29	MOCA		8.8	70	51	50	5	5
26-Mar-92	86	MOCA			209	209	642	250	14
28-Apr-92	119	MOCA			217	102	526	11	5
13-May-92	134	MOCA		1.6	264	206	333	5	5
27-May-92	148	MOCA			221	163	402	21	5
09-Jun-92	161	MOCA			160	130	544	34	50
29-Sep-92	273	MOCA			77	53	444	51	11
21-Oct-92	295	MOCA							
23-Nov-92	328	MOCA		2.1	90	48	264	5	5
09-Dec-92	344	MOCA			67	67	332	5	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
06-Apr-93	96	MOCA			166	106	712	5	129
13-Apr-93	103	MOCA			142	54	693	5	90
19-Apr-93	109	MOCA			171	91	472	5	36
26-Apr-93	116	MOCA			112		545	5	
04-May-93	124	MOCA			128	78	749	5	5
10-May-93	130	MOCA			151	98	379	14	5
18-May-93	138	MOCA			351	134	417	5	5
26-May-93	146	MOCA			102	70	300	5	5
10-Jun-93	161	MOCA			67	65	449	5	5
07-Oct-91	280	ODCR			62	46	50		
25-Nov-91	329	ODCR			50	44	214	21	53
08-Jan-92	8	ODCR			48		135	44	
30-Jan-92	30	ODCR			58	35	50	5	28
26-Mar-92	86	ODCR			58	30	1060	161	153
28-Apr-92	119	ODCR			95	33	740	5	5
10-Jun-93	161	ODESSA CANAL			72	29	1930	137	37
26-Mar-92	86	ODPU			74	16	1600	128	17
28-Apr-92	119	ODPU			155	21	2240	15	5
05-Apr-93	95	ODPU			111	11	1470	5	252
12-Apr-93	102	ODPU			64	16	1520	5	5
19-Apr-93	109	ODPU			50	3	1330	28	15
26-Apr-93	116	ODPU			59		1590	83	
04-May-93	124	ODPU			71	5	1580	35	5
10-May-93	130	ODPU			63	11	1220	59	13
18-May-93	138	ODPU			77	18	1480	53	31
26-May-93	146	ODPU			137	25	1830	19	5
19-Apr-95	109	ODPU			66	19	2390	5	79
09-Jan-92	9	OXSP			51		50	5	
29-Jan-92	29	OXSP			52	49	50	39	59
26-Mar-92	86	OXSP			50	50	50	20	50
28-Apr-92	119	OXSP			55	45	165	14	87
30-Jan-92	30	ROCR			17	4	50	5	15
26-Mar-92	86	ROCR			6	5	50	46	17
27-Apr-92	118	ROCR			8	1	183	5	5
19-Apr-95	109	RYPU			124	23	3720	5	53
15-Mar-93	74	SPPU			392	271	2900	59	1030
18-Mar-93	77	SPPU			355	237	2680	72	1020
22-Mar-93	81	SPPU			483	297	2470	58	453
29-Mar-93	88	SPPU			394	297	2680	73	617
05-Apr-93	95	SPPU			541	260	3880	33	599
12-Apr-93	102	SPPU			636	303	4280	5	826
19-Apr-93	109	SPPU			378	193	3800	447	574
18-May-93	138	SPPU			486	184	951	5	36
10-Mar-94	69	SPPU			141	70	1265	83	5
23-Mar-94	82	SPPU			197	116	1500	57	54
19-Apr-94	109	SPPU			322	159	1400	25	5
06-Feb-95	37	SPPU			220	128	1980	18	402
27-Feb-95	58	SPPU			353	269	2330	124	311
19-Apr-95	109	SPPU			159	17	2990	5	192
25-Nov-91	329	SRKB			49	30	542	34	5
07-Jan-92	7	SRKB			52		50	5	
31-Jan-92	31	SRKB			68	50	50	39	5
10-Feb-92	41	SRKB			65	40	283	45	5
03-Mar-92	63	SRKB			79	56	200	11	5
26-Mar-92	86	SRKB			61	50	260	22	16

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
02-Apr-92	93	SRKB			73	53	103	31	14
07-Apr-92	98	SRKB			78	53	132	25	5
16-Apr-92	107	SRKB			76	45	181	11	12
22-Apr-92	113	SRKB			85	63	261	5	5
27-Apr-92	118	SRKB			99	64	512	5	5
07-May-92	128	SRKB			115	82	134	5	5
12-May-92	133	SRKB			131	78	272	5	5
27-May-92	148	SRKB			163	102	383	11	5
09-Jun-92	161	SRKB			133	100	453	15	50
25-Jun-92	177	SRKB			135		645	12	
06-Jul-92	188	SRKB			93		447	31	
29-Sep-92	273	SRKB			69	64	389	25	5
21-Oct-92	295	SRKB							
23-Nov-92	328	SRKB			53	35	190	5	5
09-Dec-92	344	SRKB			57	60	253	5	5
22-Dec-92	357	SRKB			73		181	5	
05-Jan-93	5	SRKB			60		121	5	
22-Jan-93	22	SRKB			58		361	42	
02-Feb-93	33	SRKB			65		479	29	
10-Feb-93	41	SRKB			47	42	207	5	16
19-Feb-93	50	SRKB			96		361	16	
25-Feb-93	56	SRKB			94	47	335	5	57
12-Mar-93	71	SRKB			179	51	948	79	155
18-Mar-93	77	SRKB			229	113	1080	64	221
22-Mar-93	81	SRKB			147	70	691	44	124
29-Mar-93	88	SRKB			105	73	573	32	66
06-Apr-93	96	SRKB			116	53	522	5	27
12-Apr-93	102	SRKB			103	55	532	5	30
19-Apr-93	109	SRKB			88	42	512	5	27
26-Apr-93	116	SRKB			97		410	42	
04-May-93	124	SRKB			103	34	899	15	5
13-May-93	133	SRKB			65	26	288	5	5
18-May-93	138	SRKB			88	26	239	5	5
26-May-93	146	SRKB			76	32	267	5	5
10-Jun-93	161	SRKB			48	35	439	18	5
23-Jun-93	174	SRKB			63	52	404	9	5
08-Jul-93	189	SRKB			59	45	1050	5	5
19-Jul-93	200	SRKB			53	48	181	12	5
05-Aug-93	217	SRKB			48	35	50	5	5
17-Aug-93	229	SRKB			37	40	152	5	5
31-Aug-93	243	SRKB			43	25	320	5	5
15-Sep-93	258	SRKB			35	26	330	33	12
28-Sep-93	271	SRKB			32	33	232	24	5
14-Oct-93	287	SRKB			43	31	215	23	16
21-Oct-93	294	SRKB			43	40	50	5	5
02-Nov-93	306	SRKB			38	41	153	12	5
30-Nov-93	334	SRKB			65	42	50	29	15
24-Jan-94	24	SRKB			121	47	298	5	9
09-Feb-94	40	SRKB			55	49	147	18	40
28-Feb-94	59	SRKB			71		50	33	
09-Mar-94	68	SRKB			80	48	263	63	10
15-Mar-94	74	SRKB			82	54	234	36	25
23-Mar-94	82	SRKB			65	54	194	27	14
29-Mar-94	88	SRKB			73	54	224	29	17
04-Apr-94	94	SRKB			76	50	340	5	5
13-Apr-94	103	SRKB			67	47	223	26	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
19-Apr-94	109	SRKB			79	56	195	36	5
26-Apr-94	116	SRKB			60		189	25	
11-May-94	131	SRKB			70		256	14	
31-May-94	151	SRKB			65	51	198	5	5
14-Jun-94	165	SRKB			52		310	5	
29-Jun-94	180	SRKB			60		394	29	
12-Jul-94	193	SRKB			69	70	428	5	5
27-Jul-94	208	SRKB			76		839	15	
08-Aug-94	220	SRKB			98	72	471	29	14
24-Aug-94	236	SRKB			63		661	5	
06-Sep-94	249	SRKB			51	48	441	5	5
19-Sep-94	262	SRKB			42		427	21	
04-Oct-94	277	SRKB			56	47	186	10	5
17-Oct-94	290	SRKB			47	40	208	5	5
01-Nov-94	305	SRKB			41	37	135	30	5
16-Nov-94	320	SRKB			36	40	167	21	5
28-Nov-94	332	SRKB			49	45	50	36	5
12-Dec-94	346	SRKB			50	47	245	5	5
04-Jan-95	4	SRKB			57	49	299	31	23
13-Jan-95	13	SRKB			176		881	93	
17-Jan-95	17	SRKB			247	99	947	49	175
01-Feb-95	32	SRKB			190	83	533	35	56
14-Feb-95	45	SRKB			88	45	527	13	60
27-Feb-95	58	SRKB			98	49	568	16	16
14-Mar-95	73	SRKB			117	52	763	31	17
27-Mar-95	86	SRKB			73	42	425	20	14
11-Apr-95	101	SRKB			111	48	587	30	13
24-Apr-95	114	SRKB			60	28	420	17	5
09-May-95	129	SRKB			43	28	374	5	5
23-May-95	143	SRKB			47	35	427	18	5
06-Jun-95	157	SRKB			52	37	247	15	10
21-Jun-95	172	SRKB			42	30	220	17	5
05-Jul-95	186	SRKB			42	29	280	12	5
19-Jul-95	200	SRKB			47	41	243	5	5
02-Aug-95	214	SRKB			39	26	355	42	45
16-Aug-95	228	SRKB			22	21	179	22	5
28-Aug-95	240	SRKB			19	12	300	5	5
12-Sep-95	255	SRKB			27	21	318	5	5
26-Sep-95	269	SRKB			28	24	363	23	5
10-Oct-95	283	SRKB			37	26	215	5	5
24-Oct-95	297	SRKB			38	33	112	31	5
07-Nov-95	311	SRKB			46	32	116	5	5
29-Nov-95	333	SRKB			58	43	182	22	5
03-Jan-96	3	SRKB			175	81	827	64	43
08-Feb-96	39	SRKB			166		563	42	
13-Feb-96	44	SRKB			117	65	511	32	18
26-Feb-96	57	SRKB			78	55	716	5	12
03-Apr-96	94	SRKB			56	35	308	9	8
15-Apr-96	106	SRKB			56	28	216	23	5
08-May-96	129	SRKB			54	30	197	5	5
20-May-96	141	SRKB			65	35	284	14	11
03-Jun-96	155	SRKB			61	38	276	36	5
19-Jun-96	171	SRKB			55	40	194	21	5
01-Jul-96	183	SRKB			48	30	385	15	5
15-Jul-96	197	SRKB			38	22	164	5	5
29-Jul-96	211	SRKB			36	17	381	5	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
14-Aug-96	227	SRKB			33	18	303	5	5
29-Aug-96	242	SRKB			42	22	305	37	10
25-Sep-96	269	SRKB			31	27	235	19	5
10-Oct-96	284	SRKB			41	32	251	26	5
07-Nov-96	312	SRKB			29	30	100	5	5
26-Nov-96	331	SRKB			76	66	279	33	33
13-Dec-96	348	SRKB			114	62	677	14	27
02-Jan-97	2	SRKB			180		490	64	
08-Jan-97	8	SRKB			117	76	409	53	55
28-Jan-97	28	SRKB			77	49	374	5	82
18-Feb-97	49	SRKB			75	52	414	34	37
01-Apr-97	91	SRKB			62	35	281	27	14
07-May-97	127	SRKB			56	36	264	29	5
14-May-97	134	SRKB			58	47	305	23	5
11-Jun-97	162	SRKB			56	40	244	5	5
25-Jun-97	176	SRKB			34	24	119	13	5
08-Jul-97	189	SRKB			31	14	166	16	5
22-Jul-97	203	SRKB			41	14	226	13	5
03-Sep-97	246	SRKB			39	25	243	38	5
13-Oct-97	286	SRKB			39	31	106	14	5
13-Jan-98	13	SRKB			79		374		
02-Feb-98	33	SRKB			87		504	16	
26-Feb-98	57	SRKB			72		276	5	
10-Mar-98	69	SRKB			71	58	335	5	38
24-Mar-98	83	SRKB			96	48	517	20	39
07-Apr-98	97	SRKB			66	38	380	35	5
21-Apr-98	111	SRKB			68	39	358	27	5
09-Jun-98	160	SRKB			66	41	295	7	5
23-Jun-98	174	SRKB			67	41	271	12	5
09-Jul-98	190	SRKB			60	40	260	5	5
21-Jul-98	202	SRKB			38	20	286	5	5
11-Aug-98	223	SRKB			35	16	339	41	5
26-Aug-98	238	SRKB			33	15	232	34	5
16-Sep-98	259	SRKB			51	37	272	22	5
30-Sep-98	273	SRKB			36	33	200	5	5
07-Oct-91	280	SUSP			59	52	50		
25-Nov-91	329	SUSP			50	52	474	30	75
09-Jan-92	9	SUSP			55		50	5	
29-Jan-92	29	SUSP			59	55	50	5	60
26-Mar-92	86	SUSP			55	50	154	43	53
28-Apr-92	119	SUSP			62	58	165	5	119
03-Dec-92	338	TESP		7.9	74		240	5	
04-Jan-93	4	TESP		2.0	87		50	5	
22-Jan-93	22	TESP		2.7	87		254	24	
31-Mar-93	90	TULANA PUMP			132	75	592	26	5
14-Apr-93	104	TULANA PUMP			300	130	1160	5	5
05-May-93	125	TULANA PUMP			189	103	1030	26	5
06-Apr-93	96	TUPU			205	118	934	5	15
29-Apr-93	119	TUPU			382		1900	153	
06-May-93	126	TUPU			513	225	2840	670	30
17-Aug-93	229	TUPU			494	467	2220	168	15
15-Mar-94	74	TUPU			235	62	1650	113	11
23-Mar-94	82	TUPU			383	227	2220	549	38
29-Mar-94	88	TUPU			490	290	2860	1005	51
05-Apr-94	95	TUPU			752	385	3410	527	55
13-Apr-94	103	TUPU			639	247	3975	584	58

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
19-Apr-94	109	TUPU			721	303	2780	93	5
28-Feb-95	59	TUPU			305	206	1670	63	15
06-Mar-95	65	TUPU			142	109	883	106	12
16-Mar-95	75	TUPU			171	127	1860	68	5
28-Mar-95	87	TUPU			249	169	2220	138	20
11-Apr-95	101	TUPU			274	221	2450	245	17
14-Apr-95	104	TUPU			455		2730	5	
19-Apr-95	109	TUPU			810	413	4870	5	75
08-May-95	128	TUPU			73	45	684	27	5
23-May-95	143	TUPU			77	79	647	23	5
06-Jun-95	157	TUPU			261	94	1410	5	5
21-Jun-95	172	TUPU			176	167	1460	38	12
05-Jul-95	186	TUPU			446	297	1490	235	19
19-Jul-95	200	TUPU			605	230	3520	27	5
01-Apr-97	91	TUPU			80	54	501	63	16
07-May-97	127	TUPU			81	58	305	189	5
14-May-97	134	TUPU			77	89	299	96	5
28-Apr-92	119	VACR			21	7	189	5	5
25-Nov-91	329	WODR			100	89	370	44	18
07-Jan-92	7	WODR			96		50	5	
29-Jan-92	29	WODR			128	104	129	5	10
10-Feb-92	41	WODR			95	77	239	45	13
03-Mar-92	63	WODR			144	99	303	5	12
24-Mar-92	84	WODR			95	84	122	20	15
02-Apr-92	93	WODR			102	86	50	58	15
07-Apr-92	98	WODR			122	98	50	21	5
16-Apr-92	107	WODR			114	97	50	5	15
22-Apr-92	113	WODR			119	96	157	5	5
27-Apr-92	118	WODR			120	85	50	5	5
07-May-92	128	WODR			200	129	50	10	24
13-May-92	134	WODR					50	5	5
27-May-92	148	WODR			166	135	326	32	5
09-Jun-92	161	WODR			164	131	212	50	50
29-Sep-92	273	WODR			113	95	484	37	12
21-Oct-92	295	WODR							
23-Nov-92	328	WODR			143	101	258	10	10
09-Dec-92	344	WODR			90	100	438	5	5
22-Dec-92	357	WODR			89		186	5	
04-Jan-93	4	WODR			135		254	5	
21-Jan-93	21	WODR			68		274	16	
22-Jan-93	22	WODR			106		342	11	
25-Jan-93	25	WODR			90		380	24	
01-Feb-93	32	WODR			113		644	46	
02-Feb-93	33	WODR			79		233	22	
10-Feb-93	41	WODR			161	149	271	13	26
26-Feb-93	57	WODR			150	101	204	21	13
04-Mar-93	63	WODR		289	131	70	161	50	88
11-Mar-93	70	WODR		341	165	163	266	32	54
17-Mar-93	76	WODR		471	174	154	664	22	11
26-Mar-93	85	WODR		486	199	166	261	43	11
30-Mar-93	89	WODR		595	258	261	231	38	5
09-Apr-93	99	WODR		555	171	97	390	5	13
14-Apr-93	104	WODR		466	264	142	459	5	5
20-Apr-93	110	WODR			221	129	381	5	10
29-Apr-93	119	WODR		531	241		630	59	
06-May-93	126	WODR		382	363	131	593	5	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
12-May-93	132	WODR		375	319	153	360	11	5
18-May-93	138	WODR			188		251	5	5
26-May-93	146	WODR		445	193	119	555	5	5
23-Jun-93	174	WODR		226	145	110	278	9	5
07-Jul-93	188	WODR		173	171	113	6310	5	5
20-Jul-93	201	WODR		181	131	106	272	5	5
05-Aug-93	217	WODR		126	144	126	50	5	5
17-Aug-93	229	WODR		208	97	91	378	5	5
31-Aug-93	243	WODR		155	118	96	174	5	5
15-Sep-93	258	WODR			92	95	142	60	14
28-Sep-93	271	WODR			85	77	108	54	5
12-Oct-93	285	WODR		356	87	85	127	26	18
20-Oct-93	293	WODR		290	90	88	50	5	5
02-Nov-93	306	WODR		321	82	79	50	13	5
02-Dec-93	336	WODR			116	92	211	23	5
26-Jan-94	26	WODR		326	157	88	139	43	5
11-Feb-94	42	WODR		281	83	81	50	41	32
28-Feb-94	59	WODR		377	105		131	49	
09-Mar-94	68	WODR		317	91	77	50	44	5
15-Mar-94	74	WODR		210	96	84	142	32	19
23-Mar-94	82	WODR		224	97	87	196	48	25
29-Mar-94	88	WODR			141	112	281	40	16
05-Apr-94	95	WODR		426	194	142	300	17	5
13-Apr-94	103	WODR			181	144	344	23	11
19-Apr-94	109	WODR		267	125	95	167	16	5
26-Apr-94	116	WODR			91		50	21	
12-May-94	132	WODR		18	133		271	30	
31-May-94	151	WODR		40	112	92	125	5	5
14-Jun-94	165	WODR		151	129		287	5	
29-Jun-94	180	WODR		117	106		134	46	
12-Jul-94	193	WODR		61	140	123	308	44	14
27-Jul-94	208	WODR		98	104		450	29	
10-Aug-94	222	WODR		112	122	117	124	19	11
23-Aug-94	235	WODR		119	120		310	19	
07-Sep-94	250	WODR		106	107	114	233	5	5
20-Sep-94	263	WODR		106	113		256	23	
04-Oct-94	277	WODR		253	119	97	50	19	5
17-Oct-94	290	WODR		266	97	90	169	5	5
01-Nov-94	305	WODR			83	80	103	25	5
14-Nov-94	318	WODR		291	78	76	50	32	5
30-Nov-94	334	WODR		375	99	86	50	22	5
12-Dec-94	346	WODR			99	91	110	19	16
19-Dec-94	353	WODR		378					
04-Jan-95	4	WODR		295	99	87	173	28	17
13-Jan-95	13	WODR			162		265	42	
18-Jan-95	18	WODR		298	145	124	130	15	19
31-Jan-95	31	WODR		533	135	63	472	22	35
14-Feb-95	45	WODR		238	118	108	259	18	19
28-Feb-95	59	WODR		60	108	100	385	16	12
15-Mar-95	74	WODR		401	98	103	293	5	5
28-Mar-95	87	WODR		348	123	116	538	5	5
11-Apr-95	101	WODR		348	103	84	223	20	5
25-Apr-95	115	WODR		311	120	126	220	26	5
08-May-95	128	WODR		260	101	106	308	5	5
23-May-95	143	WODR		261	171	170	460	30	5
06-Jun-95	157	WODR		369	413	257	505	14	11

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
21-Jun-95	172	WODR		216	210	196	463	21	5
05-Jul-95	186	WODR		246	446	286	760	34	5
19-Jul-95	200	WODR		91	127	118	178	10	5
02-Aug-95	214	WODR		119	108	95	50	40	5
16-Aug-95	228	WODR		123	96	88	251	29	5
29-Aug-95	241	WODR		139	114	115	395	5	5
12-Sep-95	255	WODR		187	103	99	122	12	5
26-Sep-95	269	WODR		265	91	74	208	5	5
10-Oct-95	283	WODR	0.43	337	84	79	144	5	5
24-Oct-95	297	WODR	0.38	339	78	63	50	29	5
07-Nov-95	311	WODR	0.34	363	82	72	50	5	5
29-Nov-95	333	WODR	0.72	349	93	72	137	30	11
13-Dec-95	347	WODR	1.28	707					
03-Jan-96	3	WODR	2.3	374	117	92	280	30	16
08-Feb-96	39	WODR	2.72		166		395	31	
13-Feb-96	44	WODR	3.36	519	123	98	480	58	5
28-Feb-96	59	WODR	3.59	377	106	118	428	26	5
03-Apr-96	94	WODR	3.77		163	146	498	116	13
15-Apr-96	106	WODR			177	109	2730	130	17
08-May-96	129	WODR	4.15	352	151	119	134	5	5
20-May-96	141	WODR	4.38	549	124	115	165	23	12
03-Jun-96	155	WODR	4.19	359	121	97	127	37	5
19-Jun-96	171	WODR	3.55	388	107	99	181	33	5
01-Jul-96	183	WODR	2.99	228	103	83	190	13	5
15-Jul-96	197	WODR	2.42	205	100	24	50	5	5
29-Jul-96	211	WODR	1.79	301	112	95	236	5	5
13-Aug-96	226	WODR		273	107	87	215	46	5
28-Aug-96	241	WODR	1.69	299	104	79	104	17	5
24-Sep-96	268	WODR	0.22	455	87	81	183	43	5
09-Oct-96	283	WODR		409	104	85	132	25	5
07-Nov-96	312	WODR	0.2	475	84	79	50	48	14
25-Nov-96	330	WODR	0.65	561	101	95	169	27	19
13-Dec-96	348	WODR			242	178	1030	69	39
03-Jan-97	3	WODR	3.35		90		230	23	
08-Jan-97	8	WODR	3.81		111	97	332	16	57
28-Jan-97	28	WODR	2.67	620	109	94	172	5	24
18-Feb-97	49	WODR	2.76	313	133	115	259	15	15
01-Apr-97	91	WODR	3.43	672	92	89	109	21	12
07-May-97	127	WODR	4.05	387	103	89	50	22	5
14-May-97	134	WODR	4.11	389	82	96	132	23	5
11-Jun-97	162	WODR	3.88	404	91	55	50	5	5
26-Jun-97	177	WODR	3.42	233	99	70	50	26	5
08-Jul-97	189	WODR	2.78	419	88	76	50	17	5
22-Jul-97	203	WODR	3.25	327	115	91	127	13	5
03-Sep-97	246	WODR	1.29	399	100		50	18	5
13-Oct-97	286	WODR	1.12	501	82	71	50	18	5
14-Jan-98	14	WODR			93		160		
02-Feb-98	33	WODR	2.8		110		268	5	
26-Feb-98	57	WODR	2.96		94		113	5	
10-Mar-98	69	WODR	3.1	467	104	97	195	5	15
24-Mar-98	83	WODR	3.83		92	70	344	20	16
07-Apr-98	97	WODR	3.7	666	97	84	119	22	5
21-Apr-98	111	WODR	3.81	519	107	83	149	16	5
09-Jun-98	160	WODR	4.19	479	98	80	130	5	5
23-Jun-98	174	WODR	4.19	317	101	76	132	5	5
09-Jul-98	190	WODR	3.95	370	100	71	160	5	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
21-Jul-98	202	WODR	3.45	292	115	81	196	5	5
11-Aug-98	223	WODR	2.4	243	99	76	140	28	5
26-Aug-98	238	WODR	1.75						
16-Sep-98	259	WODR	1.15	440	112	79	289	17	5
30-Sep-98	273	WODR	0.92		108	64	220	17	10
10-Oct-95	283	WODX	2.18	206					
07-Nov-95	311	WODX	2.2	208					
29-Nov-95	333	WODX	2.18	216					
08-Feb-96	39	WODX			80		114	22	
13-Feb-96	44	WODX	2.34	240	71	67	199	5	5
10-Feb-93	41	WOWR			87	84	164	5	30
25-Feb-93	56	WOWR			105	65	50	13	5
05-Mar-93	64	WOWR			99	51	117	29	23
11-Mar-93	70	WOWR			117	104	194	30	61
18-Mar-93	77	WOWR			166	89	231	26	89
22-Mar-93	81	WOWR			136	75	337	39	17
30-Mar-93	89	WOWR			110	85	176	37	14
06-Apr-93	96	WOWR			119	65	234	5	36
13-Apr-93	103	WOWR			107	94	230	54	23
19-Apr-93	109	WOWR			221	88	50	5	19
26-Apr-93	116	WOWR			100		50	19	
29-Apr-93	119	WOWR			108		50	47	
05-May-93	125	WOWR			100	95	376	11	10
13-May-93	133	WOWR			95	72	50	17	23
18-May-93	138	WOWR			108	47	50	5	5
26-May-93	146	WOWR			117	44	121	5	5
23-Jun-93	174	WOWR			90	58	213	5	11
08-Jul-93	189	WOWR			87	67	1140	5	5
19-Jul-93	200	WOWR			91	82	50	5	5
05-Aug-93	217	WOWR			93	89	50	5	11
17-Aug-93	229	WOWR			86	85	104	5	5
31-Aug-93	243	WOWR			88	75	164	5	5
15-Sep-93	258	WOWR			76	64	108	30	18
28-Sep-93	271	WOWR			73	68	50	25	13
14-Oct-93	287	WOWR			70	68	54	12	18
21-Oct-93	294	WOWR			68	68	50	14	11
02-Nov-93	306	WOWR			81	80	50	15	5
30-Nov-93	334	WOWR			95	69	50	27	5
24-Jan-94	24	WOWR			149	56	136	5	5
11-Feb-94	42	WOWR			73	72	50	41	46
28-Feb-94	59	WOWR			86		50	42	
09-Mar-94	68	WOWR			81	71	50	42	5
15-Mar-94	74	WOWR			85	69	122	29	19
23-Mar-94	82	WOWR			73	70	104	27	20
29-Mar-94	88	WOWR			82	71	109	43	21
05-Apr-94	95	WOWR			87	65	355	12	5
13-Apr-94	103	WOWR			81	66	195	28	5
19-Apr-94	109	WOWR			90	69	195	20	5
26-Apr-94	116	WOWR			69		50	8	
12-May-94	132	WOWR			85		192	16	
31-May-94	151	WOWR			84	69	50	5	5
14-Jun-94	165	WOWR			76		232	5	
29-Jun-94	180	WOWR			81		165	36	
12-Jul-94	193	WOWR			83	67	50	5	5
27-Jul-94	208	WOWR			74		283	34	
10-Aug-94	222	WOWR			91	84	180	19	11

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
23-Aug-94	235	WOWR		52	84		805	5	
07-Sep-94	250	WOWR		45	78	79	125	5	5
21-Sep-94	264	WOWR		80	89		112	19	
04-Oct-94	277	WOWR		153	89	79	50	22	9
17-Oct-94	290	WOWR		189	86	74	169	5	5
01-Nov-94	305	WOWR		180	67	75	91	38	5
14-Nov-94	318	WOWR		245	63	65	50	23	5
30-Nov-94	334	WOWR		260	81	75	76	16	5
12-Dec-94	346	WOWR			87	74	50	10	10
16-Dec-94	350	WOWR		240					
04-Jan-95	4	WOWR		246	69	73	159	19	17
13-Jan-95	13	WOWR			113		174	15	
18-Jan-95	18	WOWR		250	97	79	50	18	12
31-Jan-95	31	WOWR		505	150	64	445	13	39
14-Feb-95	45	WOWR		248	87	72	137	5	19
28-Feb-95	59	WOWR		267	95	79	617	23	13
14-Mar-95	73	WOWR		297	81	66	220	22	10
28-Mar-95	87	WOWR		267	89	69	50	10	5
11-Apr-95	101	WOWR		280	77	59	82	21	5
25-Apr-95	115	WOWR		279	76	75	129	12	5
09-May-95	129	WOWR		288	69	54	154	5	5
23-May-95	143	WOWR		167	66	64	165	24	8
06-Jun-95	157	WOWR		139	90	75	50	5	10
21-Jun-95	172	WOWR		246	66	59	132	18	5
05-Jul-95	186	WOWR		209	75	56	360	28	5
19-Jul-95	200	WOWR		176	87	65	155	5	5
02-Aug-95	214	WOWR		137	74	69	305	28	5
16-Aug-95	228	WOWR		105	78	63	615	19	5
29-Aug-95	241	WOWR		118	83	67	168	43	5
12-Sep-95	255	WOWR		142	85	67	50	5	5
26-Sep-95	269	WOWR		224	86	91	50	5	5
10-Oct-95	283	WOWR	8.9	287	69	64	50	5	5
24-Oct-95	297	WOWR	9	288	66	60	50	23	5
07-Nov-95	311	WOWR		300	81	68	50	5	5
29-Nov-95	333	WOWR	9.22	307	78	62	50	20	10
14-Dec-95	348	WOWR	9.9	431					
03-Jan-96	3	WOWR	9.59	403	83	47	184	28	18
08-Feb-96	39	WOWR			108		925	19	
13-Feb-96	44	WOWR	9.8	430	91	59	193	26	5
28-Feb-96	59	WOWR	9.58	373	67	67	244	17	13
03-Apr-96	94	WOWR	9.69		70	71	130	37	14
15-Apr-96	106	WOWR	9.75	365	76	55	136	19	12
08-May-96	129	WOWR	9.46	305	73	68	50	5	11
20-May-96	141	WOWR		484	70	60	36	5	18
03-Jun-96	155	WOWR	9.86	330	81	62	114	28	10
19-Jun-96	171	WOWR	9.47	275	79	71	141	32	5
01-Jul-96	183	WOWR	9.44	252	79	61	133	10	10
15-Jul-96	197	WOWR	9.39	246	87	67	50	5	12
29-Jul-96	211	WOWR	9.31	238	81	71	199	5	5
13-Aug-96	226	WOWR	9	231	82	68	117	5	5
28-Aug-96	241	WOWR	8.87	268	80	64	101	14	5
25-Sep-96	269	WOWR	9.65	447	74	69	50	5	14
09-Oct-96	283	WOWR	9.46	377	78	74	85	5	12
07-Nov-96	312	WOWR	9.72	472	62	65	50	5	5
25-Nov-96	330	WOWR			88	74	168	23	19
13-Dec-96	348	WOWR			137	91	531	22	18

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
03-Jan-97	3	WOWR			70		155	12	
08-Jan-97	8	WOWR			72	71	115	5	30
27-Jan-97	27	WOWR		464	83	71	146	5	25
20-Feb-97	51	WOWR	10	500	76	78	156	5	5
01-Apr-97	91	WOWR	9.82	451	67	72	50	5	16
07-May-97	127	WOWR	9.36	324	80	70	50	11	5
14-May-97	134	WOWR	9.55	362	74	59	102	5	5
11-Jun-97	162	WOWR	9.75	363	84	52	50	5	5
25-Jun-97	176	WOWR	9.05	255	76	73	50	11	10
07-Jul-97	188	WOWR	9.18	270	90	72	124	17	10
22-Jul-97	203	WOWR	9.21	282	79	65	109	22	5
03-Sep-97	246	WOWR	9.62	339	88	62	50	7	10
13-Oct-97	286	WOWR		422	74	67	117	9	5
14-Jan-98	14	WOWR			81		129		
02-Feb-98	33	WOWR			83		227	5	
26-Feb-98	57	WOWR			79		50	5	
10-Mar-98	69	WOWR		429	74	75	50	5	20
24-Mar-98	83	WOWR			74	58	268	21	17
07-Apr-98	97	WOWR			79	67	92	16	5
21-Apr-98	111	WOWR		381	85	67	81	13	5
09-Jun-98	160	WOWR		358	84	63	129	5	5
23-Jun-98	174	WOWR		366	83	59	145	5	11
09-Jul-98	190	WOWR		336	91	61	170	5	5
21-Jul-98	202	WOWR	9.47	254	93	65	137	5	5
11-Aug-98	223	WOWR	9.1	217	83	68	121	14	5
26-Aug-98	238	WOWR	8.93	221	76	55	50	5	5
16-Sep-98	259	WOWR	9.55	305	80	69	116	18	11
30-Sep-98	273	WOWR	9.96		71	66	57	5	13
17-Aug-93	229	WRRPE			358	226	2360	94	18
05-Apr-94	95	WRRPE			1510	1170	3370	171	17
13-Apr-94	103	WRRPE			1620	1080	4470	773	23
31-May-94	151	WRRPE			233	131	1070	11	5
14-Jun-94	165	WRRPE			171		1370	35	
05-May-95	125	WRRPE			548		1210	222	
23-May-95	143	WRRPE			1220	970	2030	174	5
06-Jun-95	157	WRRPE			1570	1100	2290	170	31
21-Jun-95	172	WRRPE			1330	870	2690	86	64
05-Jul-95	186	WRRPE			1780	1370	3380	314	17
28-Feb-96	59	WRRPE			541	318	1990	50	5
15-Apr-96	106	WRRPE			2220	830	6130	2660	153
29-Aug-96	242	WRRPE			176	44	1570	175	5
07-Nov-96	312	WRRPE			230	167	1645	985	127
13-Dec-96	348	WRRPE			1060	318	5470	674	190
08-Jan-97	8	WRRPE			755	297	2140	264	172
28-Jan-97	28	WRRPE			707	467	2140	156	73
18-Feb-97	49	WRRPE			800	806	3030	5	18
25-Jun-97	176	WRRPE			646	299	1610	663	40
25-Nov-91	329	WRRPW			68	31	531	5	5
25-Mar-93	84	WRRPW			628	360	2610	321	502
31-Mar-93	90	WRRPW			562	443	2190	35	10
06-Apr-93	96	WRRPW			676	378	2360	56	199
14-Apr-93	104	WRRPW			912	396	2180	5	13
20-Apr-93	110	WRRPW			566	82	1750	18	11
29-Apr-93	119	WRRPW			682		2180	36	
05-May-93	125	WRRPW			714	368	2580	37	12
13-May-93	133	WRRPW			1000	522	2240	36	5

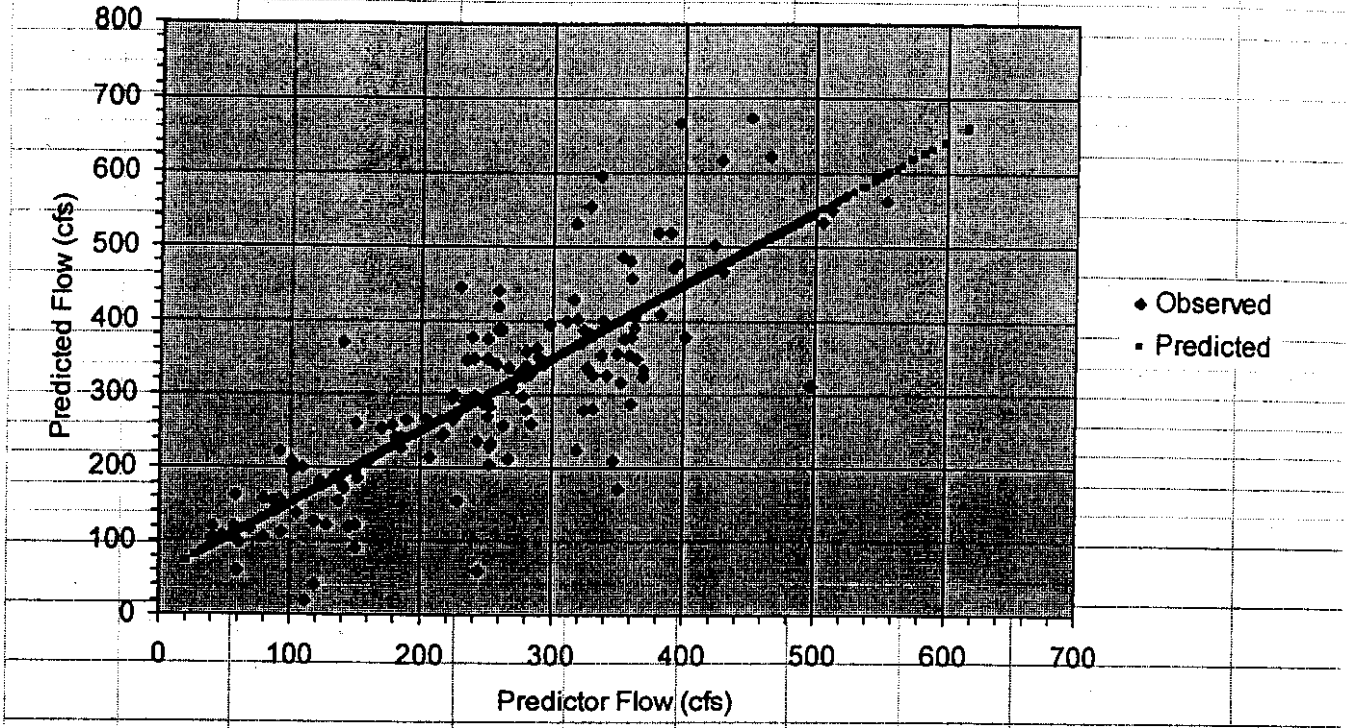
DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
18-May-93	138	WRRPW			1115	685	2380	118	19
26-May-93	146	WRRPW			1120	639	4100	592	5
05-Aug-93	217	WRRPW			243	221	1010	78	17
29-Mar-94	88	WRRPW			1400	1150	2950	154	18
05-Apr-94	95	WRRPW			1540	1280	3270	287	19
14-Jun-94	165	WRRPW			406		1120	88	
05-May-95	125	WRRPW			1020		4020	781	
08-May-95	128	WRRPW			902	762	2570	5	5
05-Jul-95	186	WRRPW			1600	1040	3610	368	15
28-Feb-96	59	WRRPW			873	512	2560	103	19
15-Apr-96	106	WRRPW			1310	466	6180	2260	138
13-Dec-96	348	WRRPW			798	236	4370	440	193
08-Jan-97	8	WRRPW			664	147	6680	314	172
28-Jan-97	28	WRRPW			551	480	2380	512	52
07-Oct-91	280	WRST			117	72	134		
25-Nov-91	329	WRST			74	65	252	17	5
07-Jan-92	7	WRST			80		50	5	
29-Jan-92	29	WRST			96	76	50	5	5
10-Feb-92	41	WRST			77	72	107	43	5
03-Mar-92	63	WRST			98	75	244	26	12
26-Mar-92	86	WRST			89	71	249	22	18
02-Apr-92	93	WRST			99	80	188	29	16
07-Apr-92	98	WRST			99	78	110	19	5
16-Apr-92	107	WRST			101	73	190	15	16
22-Apr-92	113	WRST			96	79	298	5	5
27-Apr-92	118	WRST			107	80	257	5	5
07-May-92	128	WRST			145	87	115	5	5
12-May-92	133	WRST			123	88	129	5	5
27-May-92	148	WRST			124	97	153	15	5
09-Jun-92	161	WRST			116	96	50	50	50
25-Jun-92	177	WRST			118		388	16	
06-Jul-92	188	WRST			177		304	24	
29-Sep-92	273	WRST			99	88	50	10	14
21-Oct-92	295	WRST							
23-Nov-92	328	WRST			88	66	149	5	5
09-Dec-92	344	WRST			84	83	512	19	9
22-Dec-92	357	WRST			80		169	11	
05-Jan-93	5	WRST			89		105	5	
02-Feb-93	33	WRST			72		402	21	
10-Feb-93	41	WRST			71	71	154	14	30
19-Feb-93	50	WRST			104		155	5	
25-Feb-93	56	WRST			106	69	236	5	31
12-Mar-93	71	WRST			144	64	625	61	131
18-Mar-93	77	WRST			183	105	948	67	206
22-Mar-93	81	WRST			165	79	706	50	132
30-Mar-93	89	WRST			117	70	589	57	38
06-Apr-93	96	WRST			112	54	700	5	50
13-Apr-93	103	WRST			102	41	648	5	9
19-Apr-93	109	WRST			94	46	567	5	17
26-Apr-93	116	WRST			95		542	32	
04-May-93	124	WRST			101	47	786	16	13
10-May-93	130	WRST			78	27	321	22	11
18-May-93	138	WRST			85	42	350	5	19
26-May-93	146	WRST			90	46	289	5	5
10-Jun-93	161	WRST			48	44	467	5	5
23-Jun-93	174	WRST			82	78	399	11	5

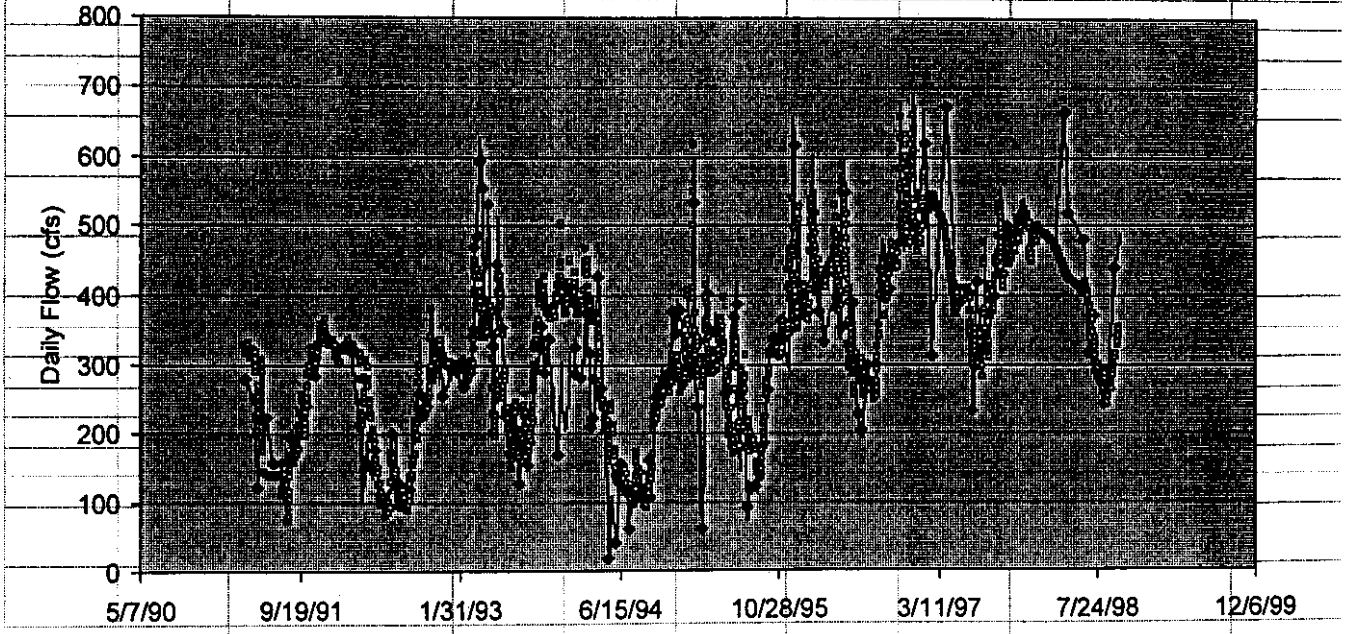
DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
08-Jul-93	189	WRST			84	70	207	5	5
19-Jul-93	200	WRST			86	80	114	5	5
05-Aug-93	217	WRST			83	81	50	5	5
17-Aug-93	229	WRST			82	83	118	5	5
31-Aug-93	243	WRST			83	69	222	19	5
15-Sep-93	258	WRST			81	70	256	55	13
28-Sep-93	271	WRST			74	70	162	25	5
14-Oct-93	287	WRST			61	63	94	23	17
21-Oct-93	294	WRST			80	69	50	25	12
02-Nov-93	306	WRST			73	72	119	17	5
30-Nov-93	334	WRST			84	71	50	32	10
24-Jan-94	24	WRST			148	53	154	5	5
09-Feb-94	40	WRST			74	74	160	38	33
28-Feb-94	59	WRST			84		50	47	
09-Mar-94	68	WRST			86	68	186	38	10
15-Mar-94	74	WRST			97	72	329	36	31
23-Mar-94	82	WRST			81	70	395	32	20
29-Mar-94	88	WRST			93	71	385	36	29
04-Apr-94	94	WRST			93	67	283	14	13
13-Apr-94	103	WRST			87	64	327	28	12
19-Apr-94	109	WRST			93	68	386	17	5
26-Apr-94	116	WRST			72		180	27	
11-May-94	131	WRST			94		261	11	
31-May-94	151	WRST			82	79	50	15	5
14-Jun-94	165	WRST			76		147	5	
29-Jun-94	180	WRST			79		150	27	
12-Jul-94	193	WRST			76	88	50	5	5
27-Jul-94	208	WRST			76		442	11	
08-Aug-94	220	WRST			130	91	416	32	12
23-Aug-94	235	WRST			84		159	5	
06-Sep-94	249	WRST			70	85	116	5	5
19-Sep-94	262	WRST			73		176	20	
04-Oct-94	277	WRST			85	78	50	5	5
17-Oct-94	290	WRST			70	71	247	5	5
01-Nov-94	305	WRST			61		130	17	5
14-Nov-94	318	WRST			64	62	50	5	5
28-Nov-94	332	WRST			73	73	253	26	5
30-Nov-94	334	WRST			73		183	44	
12-Dec-94	346	WRST			74	70	143	5	10
04-Jan-95	4	WRST			74	68	161	24	20
13-Jan-95	13	WRST			145		464	48	
17-Jan-95	17	WRST			240	89	989	30	164
31-Jan-95	31	WRST			124	83	432	12	53
14-Feb-95	45	WRST			89	60	479	19	63
27-Feb-95	58	WRST			103	73	741	17	16
15-Mar-95	74	WRST			121	64	598	32	18
27-Mar-95	86	WRST			92	45	593	5	14
11-Apr-95	101	WRST			119	58	787	28	11
24-Apr-95	114	WRST			69	39	522	31	5
08-May-95	128	WRST			54	37	451	33	5
23-May-95	143	WRST			57	52	296	31	5
06-Jun-95	157	WRST			69	55	250	5	5
21-Jun-95	172	WRST			55	39	223	15	5
05-Jul-95	186	WRST			71	56	360	5	5
19-Jul-95	200	WRST			82	83	149	5	5
02-Aug-95	214	WRST			69	66	193	42	5

DATE	JD	SITE$	STAFF	Q	TP	SRP	TN	NH	NO
16-Aug-95	228	WRST			62	59	50	39	5
28-Aug-95	240	WRST			63	64	170	14	5
12-Sep-95	255	WRST			76	66	158	5	5
26-Sep-95	269	WRST			76	12	151	11	5
10-Oct-95	283	WRST			65	63	118	5	5
24-Oct-95	297	WRST			68	57	50	24	5
07-Nov-95	311	WRST			90	62	50	13	5
29-Nov-95	333	WRST			77	62	50	22	5
03-Jan-96	3	WRST			134	75	559	49	40
08-Feb-96	39	WRST			175		421	44	
13-Feb-96	44	WRST			149	99	471	53	13
28-Feb-96	59	WRST			86	62	572	20	17
03-Apr-96	94	WRST			78	57	440	35	17
15-Apr-96	106	WRST			80	54	648	26	12
08-May-96	129	WRST			74	53	266	5	11
20-May-96	141	WRST			80	54	313	28	16
03-Jun-96	155	WRST			88	65	227	33	12
19-Jun-96	171	WRST			99	81	254	32	12
01-Jul-96	183	WRST			287	60	256	17	5
15-Jul-96	197	WRST			76	61	50	5	5
29-Jul-96	211	WRST			75	66	263	11	5
14-Aug-96	227	WRST			81	70	142	5	5
29-Aug-96	242	WRST			77	61	157	29	12
25-Sep-96	269	WRST			72	68	244	63	5
10-Oct-96	284	WRST			80	70	136	5	5
07-Nov-96	312	WRST			53	58	50	16	5
26-Nov-96	331	WRST			78	78	187	21	31
13-Dec-96	348	WRST			140	78	528	33	37
02-Jan-97	2	WRST			168		586	40	
08-Jan-97	8	WRST			94	67	426	26	49
28-Jan-97	28	WRST			78	56	462	5	58
18-Feb-97	49	WRST			72	57	568	14	34
01-Apr-97	91	WRST			75	54	414	27	21
07-May-97	127	WRST			74	51	419	44	5
14-May-97	134	WRST			72	74	410	25	9
11-Jun-97	162	WRST			77	57	252	5	5
25-Jun-97	176	WRST			73	61	109	22	19
08-Jul-97	189	WRST			76	66	158	18	5
22-Jul-97	203	WRST			86	67	144	34	5
03-Sep-97	246	WRST			91	65	131	23	10
13-Oct-97	286	WRST			64	63	234	5	5
13-Jan-98	13	WRST			82		350		
02-Feb-98	33	WRST			201		533	5	
26-Feb-98	57	WRST			67		374	5	
10-Mar-98	69	WRST			86	61	399	5	35
24-Mar-98	83	WRST			91	54	650	31	39
07-Apr-98	97	WRST			77	48	512	48	5
21-Apr-98	111	WRST			87	53	551	35	5
09-Jun-98	160	WRST			77	51	382	12	5
23-Jun-98	174	WRST			78	53	351	15	5
09-Jul-98	190	WRST			79	58	367	9	5
21-Jul-98	202	WRST			81	56	378	5	5
11-Aug-98	223	WRST			83	65	194	30	5
26-Aug-98	238	WRST			73	60	133	28	5
16-Sep-98	259	WRST			83	68	165	28	5
30-Sep-98	273	WRST			74	63	117	5	5

Appendix III. Estimation of daily flow for 7-Mile Canal, Wood R. at Dike Rd., and Wood R. at Weed Rd.

Daily Flow Estimation - Wood River @ Dike Road





◆ Observed • Regression —— Regression+Interpolated

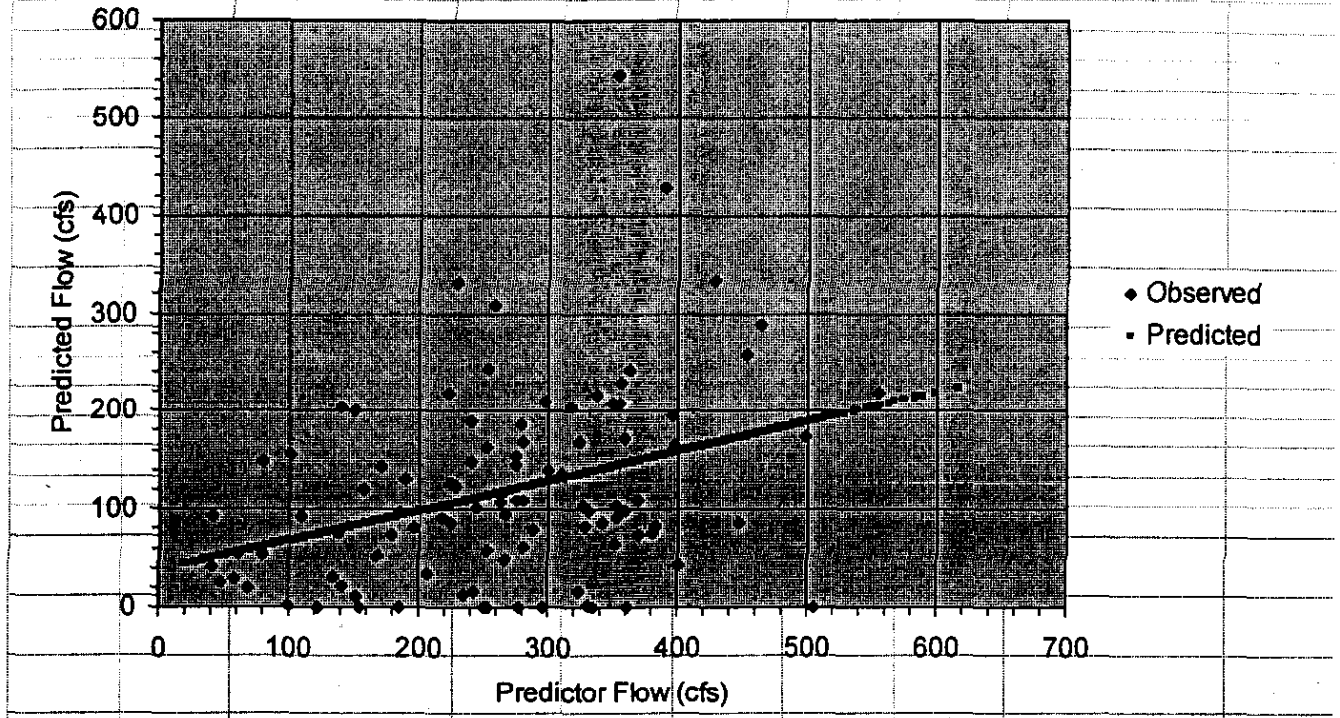
Y = Wood River Dike Road Flow (cfs)
X = Weed Road Flow (cfs)

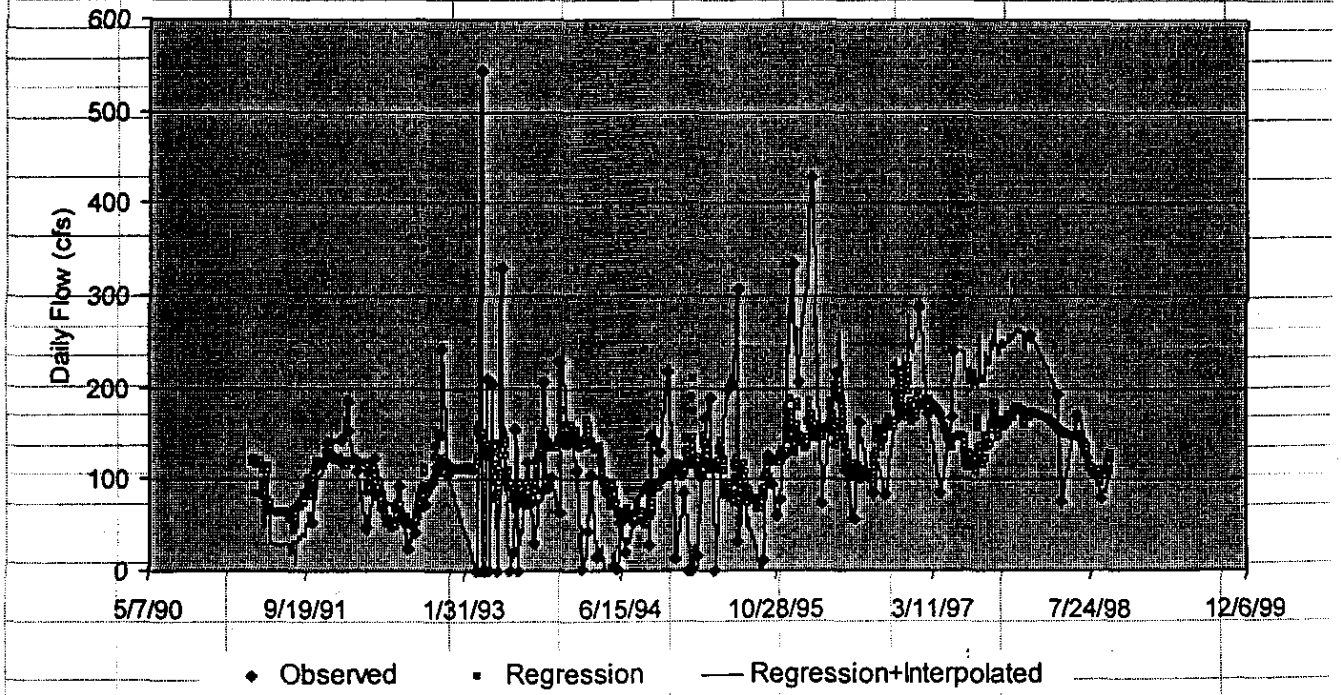
paired dates = 142
interpolated dates = 2598
missing dates = 0

R-Squared = .669 MSE = 6081.32800 DOF = 140
F = 282.46 Prob(>F) = .0000 Std Error = 77.98286

Variable	Coefficient	Std Error	Std Coef	t	Prob(>t)
Intercept	51.03				
1 weed.flo	.9853	.5862E-01	.8177	16.807	.0000

Daily Flow Estimation - 7-Mile Canal

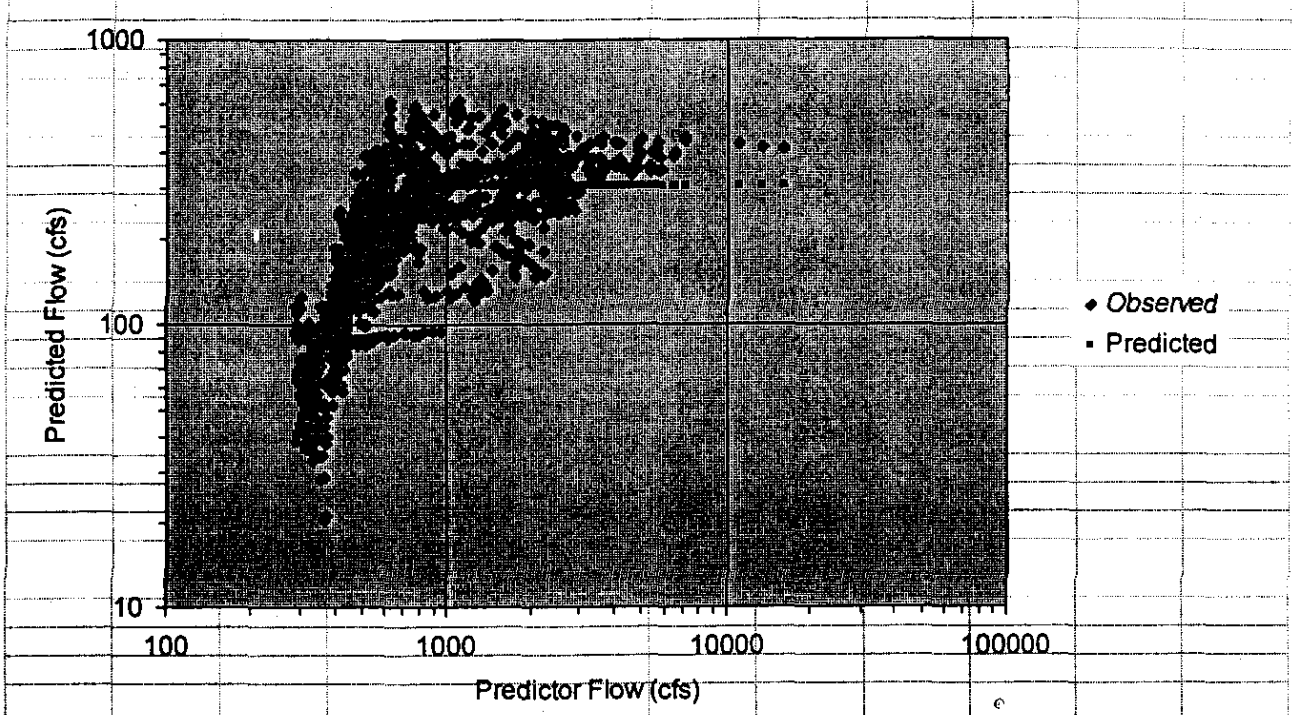


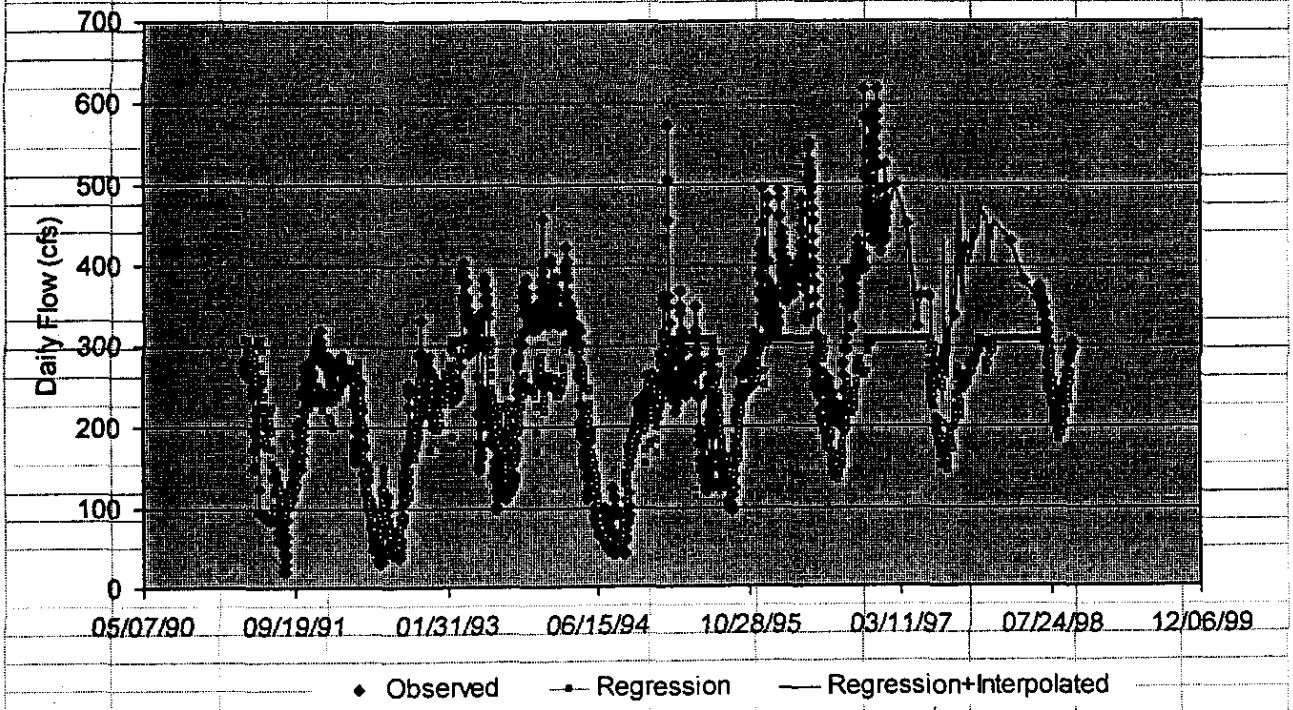


Y = 7-Mile Flow (cfs)
X = Weed Road (cfs)

				paired dates =	99
R-Squared = .119	MSE = 8482.12700	DOF = 97		*interpolated dates =*	*2641*
F = 13.09	Prob(>F) = .0008	Std Error = 92.09846		missing dates =	0
Variable	Coefficient	Std Error	Std Coef	t	Prob(>t)
Intercept	36.86				
1 weed.flo	.3036	.8391E-01	.3448	3.618	.0008

Daily Flow Estimation - Weed Road





◆ Observed —•— Regression —— Regression+Interpolated

Y = Weed Road Flow, cfs ln-transformed
X = Williamson River Flow, cfs, maximum = 800 cfln-transformed

paired dates = 2248
interpolated dates = 492
missing dates = 0

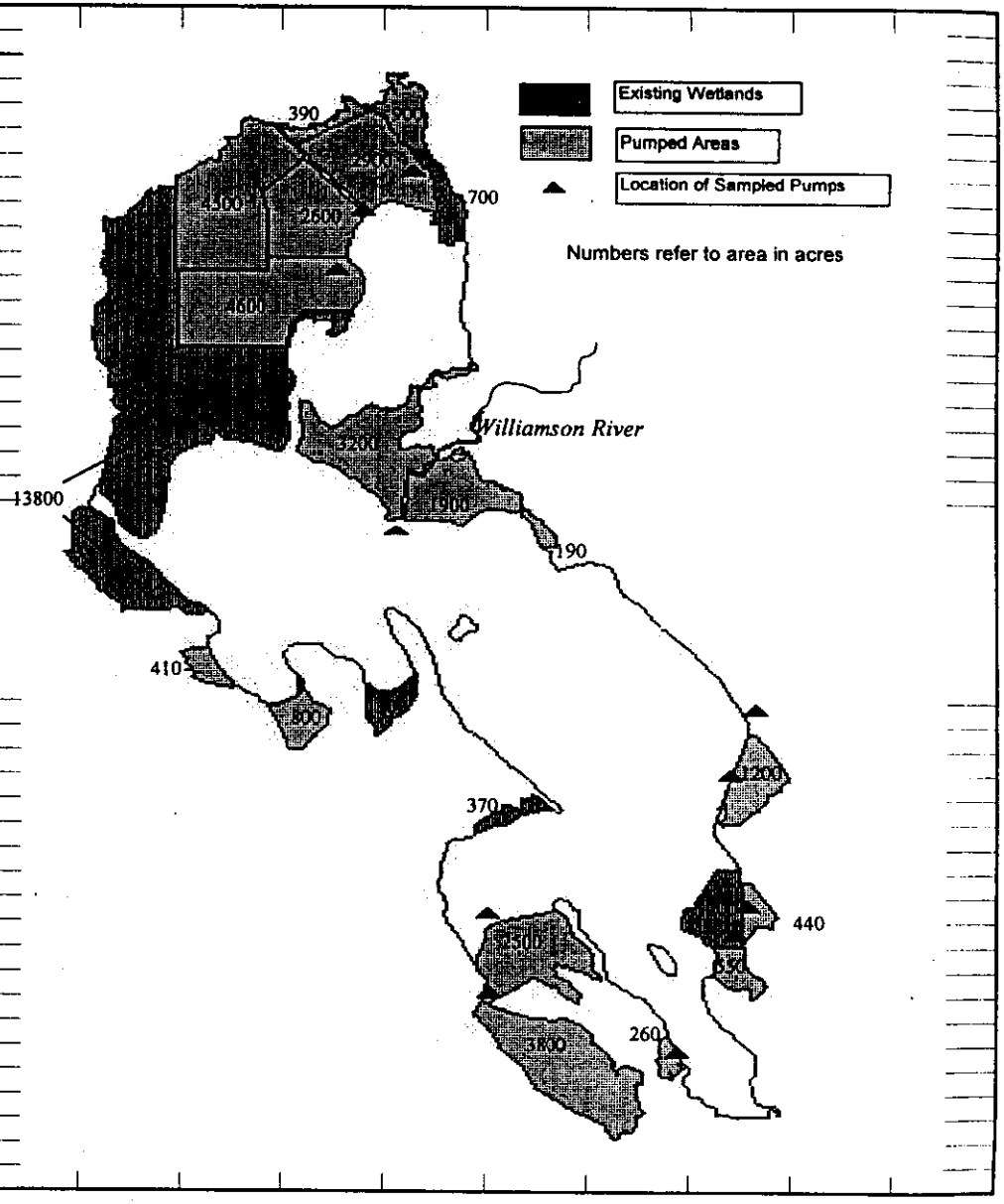
R-Squared = .677 MSE = .10646 DOF = 2245
F = 2353.05 Prob(>F) = .0000 Std Error = .32629

Variable	Coefficient	Std Error	Std Coef	t	Prob(>t)
Intercept	-79.03				
1 willq.fl	25.24	1.030	12.12	24.505	.0000
2 x^2	-1.879	.8188E-01	-11.35	-22.944	.0000

Appendix IV. Procedure for estimating flow and nutrient loads from agricultural pumps.

Pumped Agric. Area (site code)	Area (ac)	Area (mi2)	Area (km2)	Area (ha)
West of Agency (TUPU)	11700	18.28	47.35	4734.8
Tulana at Williamson Mouth (WRPU)	3200	5.00	12.95	1295.0
Goose Bay	1900	2.97	7.69	768.9
Goose2	190	0.30	0.77	76.9
Agoma+Barkley (ALGPU+BSPU)	1200	1.88	4.86	485.6
Shady Pine (SPPU)	440	0.69	1.78	178.1
Hanks (HMPU)	550	0.86	2.23	222.6
McCornack (MCPU)	260	0.41	1.05	105.2
Caledonia (CAPU)	2500	3.91	10.12	1011.7
Wocus (WOPU)	3800	5.94	15.38	1537.8
Ball	800	1.25	3.24	323.7
Odessa	410	0.64	1.66	165.9
Subtotal[1]	**26950.0**	**42.1**	**109.1**	**10906.3**
Wood (WRRPE+WRRPW)	3290	5.14	13.31	1331.4
Thomas	900	1.41	3.64	364.2
Subtotal	**4190**	**6.546875**	**16.9563015**	**1695.63015**
Total	31140.0	48.7	126.0	12601.9

[1] These are the values used for multiplying the predicted UA water loading by, because we have already included Wood and Thomas in our Wood R. estimate. If we wanted an estimate of the total pumped agricultural input, we would use line 19 (Total).



Raw Data from Snyder and Morace (1997) -- Provided by J. Morace, USGS, Portland, Oregon.								
Location	Date	Days	Cum Days	Volume (m3)	Cum Vol (m3)	CV/CD (m3/d)	Vol/Day (m3/d)	Vol/Day (cfs)
	8/22/95	5	335	46000	5686000		9200	3.8
	9/21/95	30	365	358000	6044000	16559	11933	4.9
Agency	9/22/94							
	10/21/94	29	29	63000	63000		2172	0.9
	11/21/94	31	60	0	63000		0	0.0
	12/21/94	30	90	0	63000		0	0.0
	1/23/95	33	123	0	63000		0	0.0
	2/21/95	29	152	0	63000		0	0.0
	3/16/95	23	175	3937000	4000000		171174	70.0
	4/4/95	19	194	5225000	9225000		275000	112.4
	4/19/95	15	209	2427000	11652000		161800	66.1
	5/24/95	35	244	4149000	15801000		118543	48.5
	6/22/95	29	273	4362000	20163000		150414	61.5
	6/23/95	1	274	77000	20240000		77000	31.5
	7/25/95	32	306	4999000	25239000		156219	63.9
	8/4/95	10	316	1067000	26306000		106700	43.6
	8/17/95	13	329	637000	26943000		49000	20.0
	9/22/95	36	365	4208000	31151000	85345	116889	47.8
Corral	4/5/93							
	4/6/93	1	1	59000	59000		59000	24.1
	5/14/93	38	39	2325000	2384000		61184	25.0
	7/12/93	59	98	395000	2779000		6695	2.7
	8/10/93	29	127	16000	2795000	22008	552	0.2
	3/22/94	224	224	325000	325000		1451	0.6
	4/7/94	16	240	400000	725000		25000	10.2
	4/13/94	6	246	197000	922000		32833	13.4
	5/5/94	22	268	0	922000		0	0.0
	9/22/94	140	408	640000	1562000	3828	4571	1.9
	3/16/95	175	175	208000	208000		1189	0.5
	5/24/95	69	244	917000	1125000		13290	5.4
	6/23/95	30	274	1579000	2704000		52633	21.5
	8/4/95	42	316	1051000	3755000		25024	10.2
	9/22/95	49	365	0	3755000	10288	0	0.0
Seven	4/5/93							0.0
	4/6/93	1	1	7600	7600		7600	3.1
	5/14/93	38	39	349000	356600		9184	3.8
	7/12/93	59	98	204000	560600		3458	1.4
	8/10/93	29	127	35000	595600	4690	1207	0.5
	2/21/94	195	195	24000	24000		123	0.1
	4/7/94	45	240	114000	138000		2533	1.0
	4/13/94	6	246	58000	196000		9667	4.0
	5/6/94	23	269	0	196000		0	0.0
	7/22/94	77	346	24000	220000		312	0.1
	9/22/94	62	408	850	220850	541	14	0.0
	10/21/94	29	29	7700	7700		266	0.1
	3/16/95	146	175	10000	17700		68	0.0
	5/24/95	69	244	59000	76700		855	0.3
	6/22/95	29	273	8600	85300		297	0.1
	6/23/95	1	274	9500	94800		9500	3.9
	7/25/95	32	306	223000	317800		6969	2.8
	8/4/95	10	316	0	317800		0	0.0
	8/23/95	19	335	0	317800		0	0.0
	9/22/95	30	365	0	317800	871	0	0.0

Raw Data from Snyder and Morace (1997) -- Provided by J. Morace, USGS, Portland, Oregon.								
Location	Date	Days	Cum Days	Volume (m3)	Cum Vol (m3)	CV/CD (m3/d)	Vol/Day (m3/d)	Vol/Day (cfs)
WOCUS	8/11/93							
	3/28/94	229	229	2820000	2820000		12314	5.0
	4/6/94	9	238	124000	2944000		13778	5.6
	4/20/94	14	252	76000	3020000		5429	2.2
	4/28/94	8	260	31000	3051000		3875	1.6
	5/5/94	7	267	27000	3078000		3857	1.6
	5/24/94	19	286	322000	3400000		16947	6.9
	5/26/94	2	288	23000	3423000		11500	4.7
	6/28/94	33	321	187000	3610000		5667	2.3
	7/29/94	31	352	396000	4006000		12774	5.2
	8/30/94	32	384	116000	4122000		3625	1.5
	9/29/94	30	414	8600	4130600	9977	287	0.1
	10/28/94	29	29	0	0		0	0.0
	11/30/94	33	62	0	0		0	0.0
	12/29/94	29	91	27000	27000		931	0.4
	1/30/95	32	123	220000	247000		6875	2.8
	3/1/95	30	153	641000	888000		21367	8.7
	3/16/95	15	168	487000	1375000		32467	13.3
	3/30/95	14	182	560000	1935000		40000	16.3
	4/4/95	5	187	36000	1971000		7200	2.9
	4/19/95	15	202	112000	2083000		7467	3.1
	5/1/95	12	214	47000	2130000		3917	1.6
	5/23/95	22	236	109000	2239000		4955	2.0
	5/31/95	8	244	84000	2323000		10500	4.3
	6/23/95	23	267	233000	2556000		10130	4.1
	6/29/95	6	273	1400	2557400		233	0.1
	8/1/95	33	306	477000	3034400		14455	5.9
	8/10/95	9	315	52000	3086400		5778	2.4
	8/30/95	20	335	186000	3272400		9300	3.8
	9/29/95	30	365	143000	3415400	9357	4767	1.9
WILL	Jul-93							
	3/21/94	263	263	2840000	2840000		10798	4.4
	4/6/94	16	279	313000	3153000		19563	8.0
	4/20/94	14	293	233000	3386000		16643	6.8
	5/6/94	16	309	142000	3528000		8875	3.6
	5/24/94	18	327	133000	3661000		7389	3.0
	6/20/94	27	354	145000	3806000		5370	2.2
	7/21/94	31	385	278000	4084000		8968	3.7
	8/22/94	32	417	140000	4224000		4375	1.8
	9/21/94	30	447	72000	4296000	9611	2400	1.0
	10/20/94	29	29	0	0		0	0.0
	11/18/94	29	58	0	0		0	0.0
	12/20/94	32	90	0	0		0	0.0
	1/20/95	31	121	0	0		0	0.0
	2/20/95	31	152	1700000	1700000		54839	22.4
	3/15/95	23	175	481000	2181000		20913	8.5
	4/4/95	20	195	625000	2806000		31250	12.8
	4/19/95	15	210	439000	3245000		29267	12.0
	4/21/95	2	212	63000	3308000		31500	12.9
	5/22/95	31	243	918000	4226000		29613	12.1
	5/24/95	2	245	43000	4269000		21500	8.8
	6/21/95	28	273	576000	4845000		20571	8.4
	6/23/95	2	275	50000	4895000		25000	10.2
	7/24/95	31	306	475000	5370000		15323	6.3
	8/7/95	14	320	159000	5529000		11357	4.6
	8/17/95	10	330	111000	5640000		11100	4.5

Steps to detremine UA water load for pumped agrcultural areas from USGS study (Snyder and Morace 1997)

1. Areas

Area	Agency	Tulana	Wocus	Other Ag.	Wood	Thomas
km2	47.35	12.95	15.38	33.39	13.31	3.64

2. Pumped Volumes (from USGS kw/hr - volume relationship)

WY	Agency (m3)	Tulana (m3)	Wocus (m3)	Total (m3)	Total (hm3)	Wood (m3)
1993				0	0.0	3390600
1994		4296000	4130600	8426600	8.4	1782850
1995	31151000	6044000	3415400	40610400	40.6	4072800

3. UA Pumped Volumes

WY	Agency (m)	Tulana (m)	Wocus (m)	Wood (m)	Average w/o Wood (m)	Average w/ Wood (m)
1993				0.255		0.255
1994		0.332	0.269	0.134	0.300	0.245
1995	0.658	0.467	0.222	0.306	0.449	0.413

4. Water Balance for Total Ag. Area (only enough comlete data exist to compute UA flow for WY 1995)

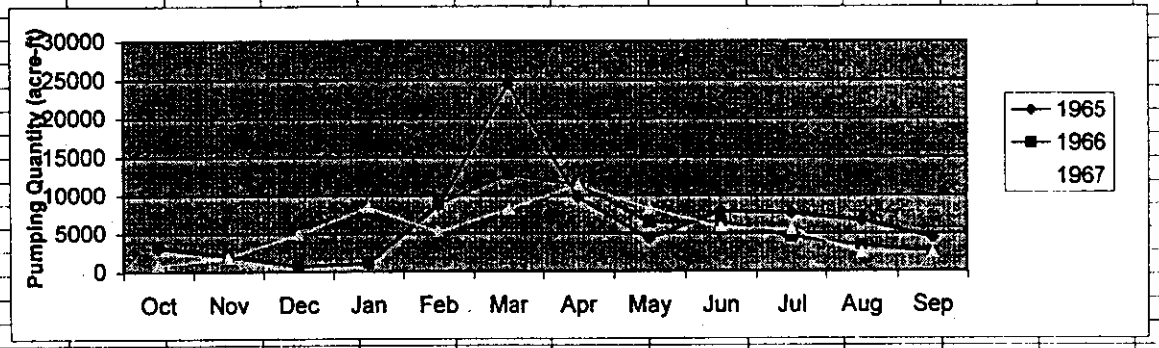
WY	Agency (hm3)	Tulana (hm3)	Wocus (hm3)	Wood (hm3)	Other Ag. Area[1] (hm3)	Thomas (hm3)	Total (hm3)	Final Ag Pump[2] (m)
1995	31.15	6.04	3.42	4.07	13.79	1.50	59.98	0.476

[1] computed using average UA of measured areas (0.413 m) multiplied by area of Other Ag. (33.39 km2)

[2] computed from total volume of measured and unmeasured areas divided by the total area (measured + unmeasured).

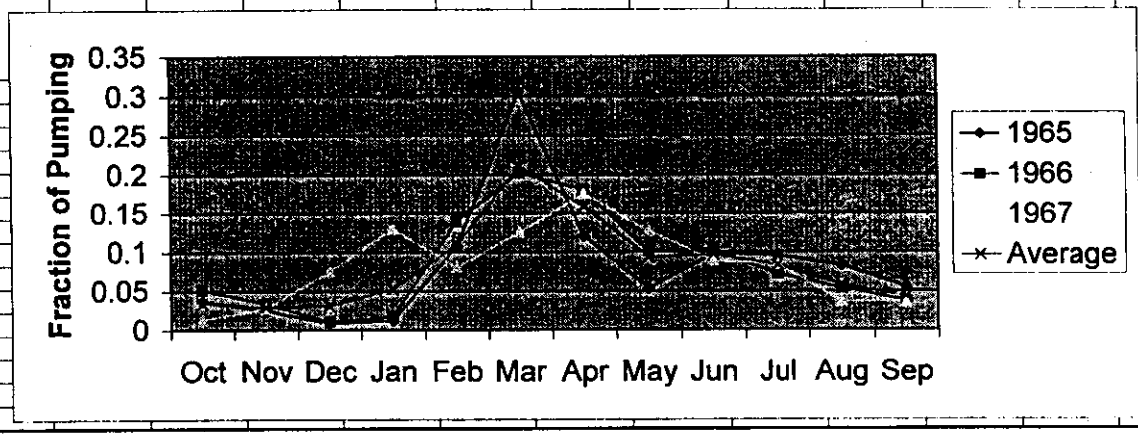
From Hubbard (1970) Agricultural Water Loading (acre-ft)

	Water Year		
Month	1965	1966	1967
Oct	3000	3260	861
Nov	2000	2140	1840
Dec	700	676	4860
Jan	1000	1100	8420
Feb	8610	8830	5220
Mar	24450	12800	8110
Apr	9650	11420	11420
May	4300	6380	8240
Jun	7850	6500	5770
Jul	7620	4550	5470
Aug	6640	3380	2380
Sep	4400	2380	2380
Total	80220	63416	64971
UA Flow (ft)*	1.952537	1.543532	1.58138
UA Flow (m)	0.595133	0.470468	0.482005



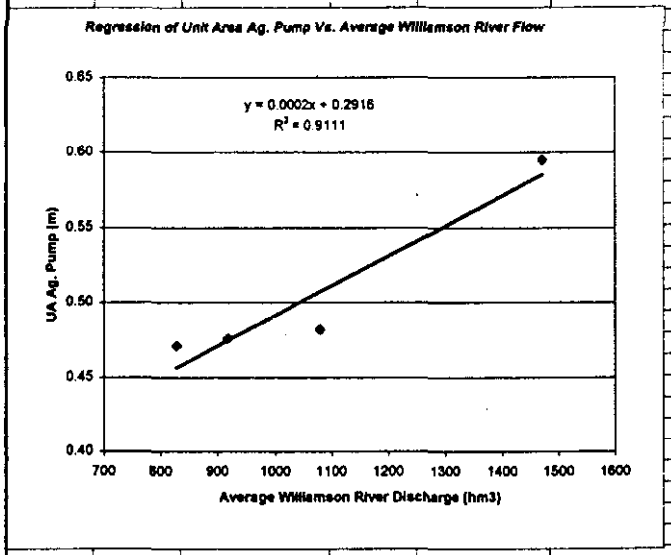
* UA load = total water volume divided by total area pumped (=41,085 acres; from Table 2 of Miller and Tash Klamath Lake Progress Report, March 1965-April 1966)

	Monthly Fraction			Use this for monthly apportionment
Oct	0.037397	0.051407	0.013252	0.034018603
Nov	0.024931	0.033745	0.02832	0.028999064
Dec	0.008726	0.01066	0.074803	0.031396126
Jan	0.012466	0.017346	0.129596	0.053135927
Feb	0.10733	0.139239	0.080344	0.108970897
Mar	0.304787	0.201842	0.124825	0.210484522
Apr	0.120294	0.180081	0.175771	0.158715219
May	0.053603	0.100606	0.126826	0.093677978
Jun	0.097856	0.102498	0.088809	0.096387514
Jul	0.094989	0.071748	0.084191	0.083642881
Aug	0.082772	0.053299	0.036632	0.057567652
Sep	0.054849	0.03753	0.036632	0.043003618
				1



Prediction of the pumped UA water load from Williamson River Flow.

	Water Year	Williamson R. Flow (hm3)	Pumped Agric. UA Flow (m)	Williamson R. Flow ((hm3/1e4))^3	Formula w/ no transformation	Formula w/ Williamson Cubed transformation	note: Williamson flow in hm3 is scaled by dividing by 1e4 prior to cubing in order to get readable slope.
Hubbard	1965	1471.5	0.595	3.18654E-03	0.58590876	0.591	
Hubbard	1966	827.2	0.471	5.65964E-04	0.45703458	0.463	
Hubbard	1967	1081.1	0.482	1.26373E-03	0.50782934	0.497	
USGS	1995	918.7	0.476	7.75440E-04	0.475343852	0.473	



Untransformed model

Dep Var: UA N: 4 Multiple R: 0.954547680 Squared multiple R: 0.911161273

Adjusted squared multiple R: 0.866741910 Standard error of estimate: 0.021721475

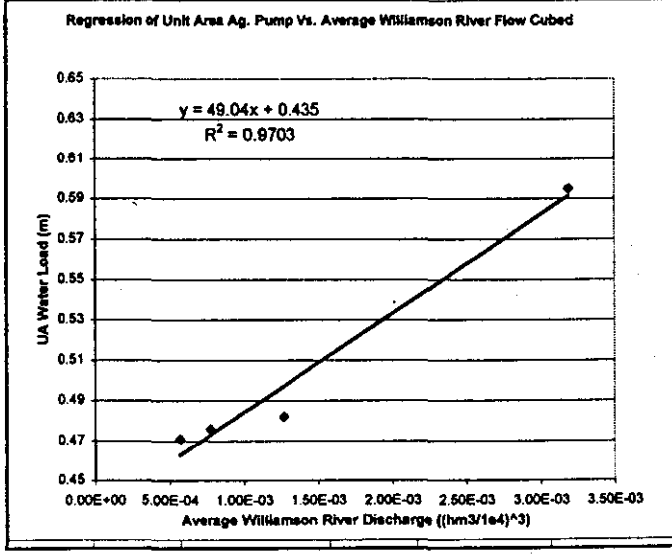
Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tai
CONSTANT	0.291572719	0.048574144	0.0	.	6.00263	0.0266
WRFLOW	0.000199537	0.000044057	0.954547680	1.00E+00	4.52910	0.0454

Analysis of Variance

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
Regression	0.009678355	1	0.009678355	2.05127E+01	0.045452320
Residual	0.000943645	2	0.000471822		

Durbin-Watson D Statistic 2.428

First Order Autocorrelation -0.266



Williamson flow cubed model

Dep Var: UA water load (m) N: 4 Multiple R: 0.985 Squared multiple R: 0.970

Adjusted squared multiple R: 0.956 Standard error of estimate: 0.013

Effect	Coefficient	Std Error	Std Coef	Tolerance	t	P(2 Tail)
CONSTANT	0.435	0.011	0.000	.	40.332	0.001
WRFLOW (hm3/1e4)	49.040	6.060	0.985	1.000	8.093	0.015

Effect	Coefficient	Lower < 95%>	Upper
CONSTANT	0.435	0.389	0.481
WRFLOW3	49.040	22.966	75.114

Analysis of Variance

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
Regression	0.010	1	0.010	65.489	0.015
Residual	0.000	2	0.000		

Durbin-Watson D Statistic 2.798

First Order Autocorrelation -0.435

Appendix V. Biweekly time series for water balance terms.

	Water Balance (million cubic meters - hm3)																					
Biweek	7-Mile Canal	Wood R. Weed Rd.	Wood R. Dike Rd.	Williamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	Evap-oration	Net Inflow	End Storage	Change in Storage	Inflow- Ch Stor.	Outlet	Mean Lake volume	Mean Lake Surface Area (km^2)	Water Load (m yr^{-1})	Mean Lake Depth (m)	Residence Time (Netin) (days)	Residence Time (Totin) (days)
04/14/91	2.94	9.46	9.28	28.59	12.47	16.12	5.00	3.57	49	3.63	53	11.3	42	631	17	24	24	623	269	4.04	2.31	209	165
04/28/91	2.66	9.20	8.62	23.40	13.46	9.94	9.23	3.57	48	3.63	51	11.3	40	646	16	24	24	639	270	3.87	2.37	223	174
05/12/91	2.25	7.20	6.48	21.49	13.98	7.51	11.68	2.26	44	5.07	49	15.2	34	649	2	32	32	648	270	3.29	2.40	267	184
05/26/91	2.35	7.53	8.93	30.23	22.23	8.00	13.55	2.04	57	5.32	62	15.9	47	670	21	25	25	662	270	4.50	2.45	199	148
06/09/91	1.03	3.17	7.02	23.80	13.86	9.94	12.53	2.12	46	2.87	49	17.3	32	652	-18	50	50	664	270	3.10	2.46	290	188
06/23/91	0.98	3.01	6.18	17.46	7.33	10.13	13.96	2.17	41	1.51	42	20.6	22	608	-44	66	66	627	269	2.09	2.33	406	208
07/07/91	0.97	2.97	5.33	17.89	7.45	10.44	12.57	1.99	39	0.57	40	17.3	23	577	-30	53	53	593	269	2.23	2.20	361	208
07/21/91	1.00	3.08	5.35	13.96	4.74	9.22	6.55	1.82	29	1.63	30	19.9	10	518	-59	69	69	543	269	1.01	2.02	735	251
08/04/91	0.95	2.91	5.32	14.13	4.79	9.33	13.47	1.66	36	1.44	37	23.5	13	473	-46	59	59	496	268	1.31	1.85	515	188
08/18/91	0.63	1.85	4.80	12.98	3.89	9.09	9.61	1.25	29	0.96	30	19.4	11	432	-41	52	52	450	267	1.08	1.68	570	207
09/01/91	1.21	3.78	6.73	13.68	4.07	9.61	10.94	1.23	34	0.69	35	18.9	16	388	-44	60	60	408	266	1.55	1.53	362	185
09/15/91	1.38	4.34	6.53	14.04	4.09	9.95	10.17	0.97	33	0.00	33	17.4	16	350	-38	53	53	365	262	1.56	1.39	326	155
09/29/91	1.86	5.93	7.72	14.49	4.79	9.70	12.66	0.97	38	0.00	38	15.6	22	332	-18	40	40	340	260	2.22	1.31	216	126
10/13/91	1.97	6.11	8.08	16.07	6.71	9.36	3.45	0.75	30	1.72	32	9.7	22	317	-16	38	38	322	256	2.27	1.26	202	141
10/27/91	3.14	8.66	10.28	17.84	7.48	10.37	7.29	0.73	39	1.85	41	9.5	32	320	4	28	28	316	254	3.25	1.24	140	108
11/10/91	3.67	8.90	10.11	19.08	8.50	10.58	3.91	0.67	37	5.12	43	2.7	40	346	25	15	15	332	258	4.03	1.29	117	109
11/24/91	4.31	9.52	10.86	19.44	8.73	10.71	3.66	0.65	39	6.42	45	0.0	45	374	29	17	17	361	262	4.52	1.38	111	111
12/08/91	4.88	10.35	11.95	19.62	9.21	10.61	5.63	0.67	43	5.23	48	0.0	48	406	31	17	17	391	265	4.75	1.48	114	114
12/22/91	4.89	9.91	11.56	19.31	8.90	10.41	1.04	0.68	37	4.34	42	0.0	42	429	24	18	18	418	266	4.09	1.57	140	140
01/05/92	5.00	9.78	11.41	19.43	9.01	10.42	2.17	0.85	39	3.82	43	0.0	43	455	26	17	17	442	267	4.17	1.66	145	145
01/19/92	5.24	9.05	10.67	19.15	8.55	10.59	5.82	1.15	42	2.89	45	0.0	45	481	25	20	20	471	268	4.38	1.76	147	147
02/02/92	5.67	9.09	10.69	19.55	9.23	10.32	0.36	1.34	38	3.30	41	0.0	41	495	15	26	26	489	268	3.98	1.83	167	167
02/16/92	4.63	9.37	11.09	19.67	9.40	10.27	0.00	2.52	38	5.75	44	0.0	44	521	25	18	17	509	268	4.25	1.90	163	163
03/01/92	3.87	9.51	11.24	20.56	10.22	10.34	0.00	2.66	38	5.42	44	0.3	44	554	33	11	3	540	268	4.23	2.01	174	173
03/15/92	2.83	9.30	9.53	21.37	9.73	11.64	1.60	4.55	40	1.17	41	3.6	37	588	34	3	3	573	269	3.63	2.13	214	196
03/29/92	1.96	9.19	7.66	21.10	9.80	11.30	0.00	4.55	35	1.17	36	3.6	33	617	30	3	3	605	269	3.18	2.25	258	232
04/12/92	2.21	8.57	4.46	19.77	10.03	9.74	13.75	3.69	44	3.87	48	10.2	38	619	2	36	36	618	269	3.64	2.30	230	181
04/26/92	4.01	7.92	5.69	20.96	11.76	9.21	14.45	3.54	49	4.32	53	11.3	42	616	-3	45	45	617	269	4.04	2.29	207	163
05/10/92	3.61	5.62	5.40	15.59	5.81	9.79	17.11	2.46	44	1.46	46	18.4	27	589	-27	54	54	604	269	2.64	2.24	311	185
05/24/92	3.08	3.79	5.17	13.31	4.02	9.29	14.49	2.02	38	0.31	38	20.8	18	554	-35	53	53	571	269	1.71	2.12	454	208
06/07/92	2.58	2.06	3.66	11.39	2.97	8.42	12.65	2.09	32	2.16	35	26.7	8	504	-50	58	58	528	268	0.76	1.97	943	214
06/21/92	2.45	1.55	3.55	11.52	3.33	8.18	0.61	2.15	20	4.02	24	20.8	4	458	-46	49	49	475	268	0.34	1.77	1889	274
07/05/92	2.74	2.41	5.12	12.85	3.64	9.21	5.84	2.03	29	3.06	32	19.0	13	429	-29	42	42	434	267	1.23	1.63	482	192
07/19/92	2.75	3.49	6.40	12.51	3.68	8.82	10.36	1.61	34	1.40	35	21.8	13	405	-24	37	37	419	266	1.32	1.57	435	166
08/02/92	1.45	1.97	4.36	11.40	3.20	8.20	6.36	1.73	25	1.25	27	23.3	3	365	-40	44	44	385	264	0.33	1.46	1633	203
08/16/92	1.07	1.79	4.02	10.61	2.41	8.20	9.52	1.24	26	0.36	27	21.9	5	324	-41	46	46	340	260	0.50	1.31	963	178
08/30/92	1.39	1.56	4.19	11.12	2.85	8.28	5.47	1.24	23	0.36	24	19.5	4	291	-32	37	37	305	251	0.44	1.21	1002	180
09/13/92	1.92	3.40	6.13	13.52	3.95	9.57	7.78	0.96	30	1.32	32	14.2	17	279	-12	29	29	283	244	1.86	1.16	228	125
09/27/92	2.64	6.23	8.98	14.08	4.48	9.60	1.20	0.96	26	1.40	29	14.8	14	270	-9	23	23	274	241	1.56	1.14	267	131
10/11/92	2.77	6.28	8.83	15.15	5.51	9.64	3.01	0.84	31	4.21	35	11.2	24	265	-6	29	29	266	239	2.58	1.12	158	107
10/25/92	3.30	6.41	8.45	16.98	6.77	10.21	5.46	0.81	35	4.97	40	9.9	30	273	9	21	21	267	239	3.28	1.12	125	94
11/08/92	4.49	8.39	10.34	19.38	9.45	9.93	14.60	0.76	50	5.40	55	4.1	51	304	31	20	20	289	246	5.39	1.18	80	74
11/22/92	5.57	8.25	10.15	18.63	8.35	10.28	0.00	0.72	35	5.72	41	0.0	41	324	19	21	21	313	253	4.20	1.23	107	107
12/06/92	6.43	9.21	9.92	18.51	8.24	10.27	6.83	0.73	42	6.44	49	0.0	49	351	28	21	21	338	259	4.92	1.30	97	97
12/20/92	3.44	8.86	9.02	18.85	9.33	9.52	16.48	0.75	49	7.40	56	0.0	56	390	39	17	17	376	263	5.54	1.43	94	94
01/03/93	2.81	8.60	9.57	18.59	10.81	7.78	7.32	0.86	39	7.80	47	0.0	47	419	28	19	19	405	266	4.61	1.52	121	121
01/17/93	2.21	8.38	10.03	18.95	11.30	7.65	20.06	1.27	53	9.26	62	0.0	62	451	33	29	29	436	267	6.04	1.63	99	99
01/31/93	1.68	8.41	9.69	20.11	11.89	8.22	2.88	1.27	36	9.26	45	0.0	45	473	22	23	23	465	268	4.38	1.74	145	145
02/14/93	1.21	8.59	9.39	21.90	12.44	9.46	2.75	2.88	38	8.17	46	0.0	46	507	33	13	13	488	268	4.51	1.82	148	148
02/28/93	0.61	8.38	9.48	21.77	12.11	9.66	9.06	2.88	44	8.17	52	0.0	52	544	37	15	15	529	268	5.06	1.97	142	142
03/14/93	0.40	8.51	10.60	37.20	28.93	8.27	4.71	5.02	58	9.26	67	3.6	64	599	56	8	8	566	269	6.18	2.11	125	118
03/28/93	12.01	12.39	16.17	152.29	145.10	7.20	30.20	5.02	216	9.28	225	3.6	221	683	84	138	138	656	270	21.41	2.43	42	41

	Water Balance (million cubic meters - hm3)																						
Biweek	7-Mile Canal	Wood R. Weed Rd.	Wood R. Dike Rd.	Williamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	Evap-oration	Net Inflow	End Storage	Change in Storage	Inflow- Ch Stor.	Outlet	Mean Lake volume	Mean Lake Surface Area (km^2)	Water Load (m yr^{-1})	Mean Lake Depth (m)	Residence Time (Netin) (days)	Residence Time (Totin) (days)
04/11/93	1.81	11.80	19.81	124.28	93.07	31.22	51.65	4.15	202	6.59	208	9.6	199	701	18	181	181	694	270	19.19	2.57	49	47
04/25/93	3.52	10.44	15.20	87.73	61.19	26.54	28.66	3.91	139	5.86	145	11.3	134	709	7	126	126	698	270	12.90	2.58	73	67
05/09/93	4.44	10.92	15.25	78.94	60.11	18.83	21.42	2.84	123	7.18	130	14.2	116	719	10	106	106	718	270	11.17	2.65	87	77
05/23/93	2.60	7.25	9.76	74.29	60.35	13.93	21.51	2.24	110	7.91	118	21.0	97	719	0	97	97	717	270	9.39	2.65	103	85
06/06/93	8.43	10.32	14.83	60.50	47.92	12.59	39.83	2.30	126	6.22	132	11.0	121	731	12	109	109	734	271	11.67	2.71	85	78
06/20/93	2.07	9.75	10.20	52.24	40.64	11.60	12.89	2.38	80	3.97	84	17.8	66	720	-12	77	77	724	270	6.36	2.68	154	121
07/04/93	0.46	6.49	7.74	23.98	14.49	9.49	15.06	2.27	50	2.88	52	22.8	30	676	-44	73	73	698	270	2.85	2.58	331	186
07/18/93	2.75	4.35	6.71	17.87	8.61	9.26	12.84	2.00	42	0.17	42	21.4	21	626	-50	71	71	649	270	2.03	2.41	434	215
08/01/93	1.04	5.01	6.40	17.15	8.09	9.05	16.61	1.95	43	0.39	44	18.8	25	592	-34	58	58	608	269	2.40	2.26	344	195
08/15/93	2.72	4.62	5.59	15.36	5.87	9.48	6.24	1.37	31	3.23	35	18.8	16	539	-53	69	69	560	269	1.55	2.08	491	227
08/29/93	3.59	5.51	6.79	18.03	6.27	9.76	6.60	1.37	38	3.23	42	14.8	27	516	-23	50	50	529	268	2.62	1.97	275	178
09/12/93	1.64	4.71	5.99	16.24	6.44	9.80	16.34	1.11	41	0.89	42	17.2	25	469	-47	72	72	491	268	2.43	1.83	276	163
09/26/93	1.95	7.95	8.79	17.54	7.71	9.83	10.80	1.06	40	0.50	41	11.9	29	440	-29	58	58	451	267	2.81	1.69	220	155
10/10/93	3.17	11.09	10.94	18.55	8.42	10.13	10.01	0.83	43	2.74	46	11.1	35	423	-17	52	52	430	267	3.43	1.61	171	130
10/24/93	5.00	12.27	11.03	20.44	10.54	9.91	20.10	0.74	57	3.64	61	9.7	51	439	16	35	35	431	267	5.02	1.61	118	99
11/07/93	3.39	11.35	10.93	20.19	10.20	9.99	8.52	0.69	44	2.77	46	4.8	42	443	4	38	38	441	267	4.08	1.65	148	133
11/21/93	2.89	11.24	8.80	19.99	9.99	10.00	2.71	0.65	35	1.90	37	0.0	37	445	2	35	35	444	267	3.81	1.66	168	168
12/05/93	3.92	11.86	8.48	20.11	10.16	9.95	11.74	0.66	43	3.14	46	0.0	46	453	8	38	38	445	267	4.50	1.67	135	135
12/19/93	7.37	13.27	8.05	21.96	12.18	9.77	14.05	0.68	52	5.39	57	0.0	57	468	15	42	42	463	267	5.61	1.73	113	113
01/02/94	5.78	11.60	7.57	19.85	9.58	10.28	3.38	0.75	37	5.01	42	0.0	42	468	0	42	42	467	268	4.13	1.74	154	154
01/16/94	4.98	12.55	9.66	20.72	10.78	9.94	15.56	1.15	52	2.70	55	0.0	55	485	16	38	38	479	268	5.34	1.79	122	122
01/30/94	3.66	12.04	10.26	20.41	10.47	9.94	5.42	1.15	41	2.70	44	0.0	44	516	31	13	13	501	268	4.24	1.87	161	161
02/13/94	1.03	11.34	9.72	19.86	9.91	9.96	0.00	2.51	33	6.22	39	0.0	39	545	29	10	8	533	268	3.82	1.99	190	190
02/27/94	0.66	12.09	10.69	20.41	10.59	9.82	0.52	2.61	35	6.49	42	0.0	42	580	34	7	7	563	269	4.04	2.10	190	190
03/13/94	2.72	12.85	11.16	26.89	16.16	10.73	0.00	4.42	45	1.01	46	3.3	43	615	35	8	7	601	269	4.16	2.23	196	182
03/27/94	1.75	11.22	7.66	26.29	12.04	14.25	2.67	4.56	43	0.59	44	3.6	40	645	30	10	10	633	270	3.86	2.35	222	204
04/10/94	0.70	11.02	12.75	25.78	12.41	13.37	6.25	3.84	49	1.52	51	9.1	42	659	15	27	27	654	270	4.04	2.42	219	180
04/24/94	0.34	8.46	10.63	23.48	12.45	11.03	10.56	3.55	49	1.90	50	12.5	38	650	-9	47	47	658	270	3.67	2.44	243	182
05/08/94	0.06	6.02	5.24	21.43	12.41	9.02	14.55	2.68	44	4.04	48	12.2	36	651	1	35	35	648	270	3.46	2.40	254	189
05/22/94	0.24	5.19	2.18	18.46	10.72	7.74	10.83	2.03	34	5.64	39	13.0	26	651	0	26	26	649	270	2.56	2.41	344	231
06/05/94	0.36	4.34	1.99	15.79	8.74	7.05	14.93	2.08	35	3.99	39	19.5	20	625	-26	46	46	640	270	1.90	2.37	457	229
06/19/94	1.36	2.67	4.31	14.22	7.11	7.11	17.14	2.16	39	1.03	40	20.0	20	584	-41	61	61	605	269	1.96	2.25	420	211
07/03/94	1.03	2.66	4.43	11.91	4.07	7.84	19.01	2.08	38	0.84	39	25.0	14	524	-60	74	74	553	269	1.39	2.06	539	197
07/17/94	1.22	2.47	2.90	10.81	3.09	7.72	10.50	1.81	27	0.17	27	26.2	1	454	-70	71	71	487	268	0.12	1.82	5420	249
07/31/94	1.79	2.31	3.27	10.42	2.71	7.71	11.31	1.81	29	0.17	29	26.2	3	395	-59	62	62	424	266	0.25	1.59	2321	206
08/14/94	2.65	3.31	4.17	10.23	3.16	7.07	5.94	1.25	24	0.00	24	22.4	2	336	-58	60	60	364	262	0.18	1.39	2783	210
08/28/94	2.96	2.64	4.46	10.45	2.80	7.64	11.84	1.25	31	0.00	31	20.8	10	285	-52	62	62	307	252	1.06	1.22	422	139
09/11/94	2.88	1.66	4.01	11.31	3.23	8.08	14.11	1.02	33	1.74	35	17.9	17	243	-41	58	58	261	236	1.90	1.11	213	104
09/25/94	3.61	2.60	4.58	14.00	4.97	9.03	5.92	0.96	29	2.22	31	15.4	16	230	-14	30	30	235	224	1.85	1.05	207	105
10/09/94	4.98	5.63	8.08	15.51	5.77	9.73	0.62	0.85	30	1.27	31	12.6	18	224	-5	24	24	226	219	2.23	1.03	189	101
10/23/94	4.71	6.47	9.10	16.98	6.95	10.03	3.00	0.79	35	0.75	35	9.3	26	228	4	22	22	226	219	3.11	1.03	121	89
11/06/94	6.02	7.42	9.73	17.73	7.41	10.32	0.00	0.75	34	5.79	40	5.4	35	243	15	20	19	234	223	4.04	1.05	95	82
11/20/94	6.98	7.73	9.95	18.08	7.68	10.41	0.10	0.70	36	12.51	48	0.0	48	276	32	18	16	261	237	5.33	1.10	76	76
12/04/94	3.81	8.20	11.95	18.76	7.54	11.22	0.00	0.71	35	10.19	45	0.0	45	305	29	16	14	291	247	4.80	1.18	90	90
12/18/94	1.03	8.34	12.55	18.64	8.45	10.19	7.85	0.73	41	4.40	45	0.0	45	335	30	15	15	320	255	4.62	1.25	99	99
01/01/95	2.09	7.85	11.69	19.12	8.71	10.41	0.93	0.77	35	5.10	40	0.0	40	359	24	16	16	349	261	3.97	1.34	123	123
01/15/95	2.20	9.21	11.08	26.96	17.11	9.85	20.67	1.24	62	14.25	76	0.0	76	424	65	12	12	384	264	7.55	1.46	70	70
01/29/95	0.09	9.15	10.03	32.72	23.85	8.87	8.29	1.24	52	14.25	67	0.0	67	476	52	14	14	450	267	6.50	1.68	95	95
02/12/95	0.08	11.53	12.06	58.31	50.01	8.30	32.73	2.59	106	3.72	109	0.0	109	576	101	9	9	541	268	10.64	2.01	69	69
02/26/95	1.85	8.79	8.18	33.84	21.69	12.15	12.15	2.81	57	1.96	59	0.0	59	626	49	10	10	603	269	5.70	2.24	144	144
03/12/95	3.90	9.10	6.81	44.35	31.23	13.12	8.84	4.60	69	9.75	78	3.1	75	693	67	8	8	656	270	7.27	2.43	122	117
03/26/95	6.01	9.78	12.94	67.31	75.41	11.90	19.80	4.90	131	11.05	142	3.6	138	700	7	132	132	703	270	13.35	2.60	71	69

	Water Balance (million cubic meters - hm3)																						
Biweek	7-Mile Canal	Wood R. Weed Rd.	Wood R. Dike Rd.	Williamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	Evap-oration	Net Inflow	End Storage	Change in Storage	Inflow- Ch Stor.	Outlet	Mean Lake volume	Mean Lake Surface Area (km^2)	Water Load (m yr^{-1})	Mean Lake Depth (m)	Residence Time (Netin) (days)	Residence Time (Totin) (days)
04/09/95	3.95	8.49	12.04	59.94	45.69	14.25	5.18	4.21	85	9.55	95	8.5	86	706	7	80	80	699	270	8.33	2.59	113	103
04/23/95	1.15	8.85	11.42	81.53	68.12	13.42	15.07	3.82	113	6.72	122	11.3	110	721	15	96	96	713	270	10.65	2.64	90	82
05/07/95	4.13	10.14	10.59	66.82	52.98	13.83	18.30	3.00	103	5.99	109	13.6	95	737	16	80	80	733	271	9.18	2.71	108	94
05/21/95	6.05	7.77	8.93	69.61	56.00	13.61	25.81	2.18	113	3.26	116	15.9	100	719	-18	118	118	729	271	9.63	2.69	102	88
06/04/95	7.04	5.46	10.84	53.52	41.32	12.21	6.87	2.22	80	3.94	84	16.3	68	729	10	58	58	725	270	6.58	2.68	149	120
06/18/95	8.26	6.01	12.48	39.80	28.39	11.40	0.15	2.32	63	5.62	69	14.5	54	735	7	48	48	728	270	5.22	2.69	188	148
07/02/95	2.77	6.27	7.43	35.20	25.40	9.80	9.58	2.27	57	5.15	62	20.4	42	723	-12	54	54	735	271	4.04	2.71	245	185
07/16/95	3.02	7.74	7.68	21.76	15.21	6.55	18.38	1.95	53	2.32	55	18.5	37	696	-26	63	63	705	270	3.53	2.61	270	179
07/30/95	1.87	5.20	3.57	19.43	13.87	5.56	15.71	1.95	43	2.32	45	20.9	24	659	-38	62	62	677	270	2.32	2.51	395	211
08/13/95	1.33	4.79	4.11	15.68	8.76	6.91	7.42	1.38	30	0.17	30	20.7	9	600	-58	68	68	629	269	0.91	2.33	940	293
08/27/95	0.64	3.88	4.17	15.10	6.74	8.37	14.99	1.34	36	0.00	36	19.5	17	545	-56	73	73	568	269	1.63	2.11	473	219
09/10/95	0.18	3.72	4.87	14.34	5.48	8.86	17.97	1.12	38	0.02	39	17.5	21	497	-47	68	68	520	268	2.04	1.94	346	189
09/24/95	2.09	6.60	7.84	15.79	6.65	9.14	18.26	1.03	45	0.03	45	16.8	28	460	-38	66	66	477	268	2.75	1.78	237	148
10/08/95	4.03	8.78	10.56	17.48	7.72	9.75	7.36	0.93	40	0.20	41	9.9	31	436	-24	54	54	445	267	2.99	1.67	203	154
10/22/95	2.76	9.26	11.50	19.65	9.34	10.31	9.17	0.85	44	0.33	44	9.5	35	427	-9	44	44	431	267	3.40	1.62	174	136
11/05/95	2.22	9.32	11.57	19.86	9.43	10.43	5.87	0.82	40	1.51	42	6.1	36	421	-8	41	41	425	267	3.50	1.59	166	142
11/19/95	3.87	10.06	11.87	20.40	9.73	10.67	2.14	0.75	39	3.65	43	0.0	43	429	8	35	35	426	267	4.18	1.60	140	140
12/03/95	7.02	11.15	11.47	21.04	10.24	10.80	7.87	0.78	48	7.33	55	0.0	55	444	15	41	41	433	267	5.43	1.62	109	109
12/17/95	10.35	13.66	18.33	35.52	24.53	10.99	33.93	0.79	99	20.84	120	0.0	120	530	86	34	34	484	268	11.67	1.81	57	57
12/31/95	8.73	12.21	15.51	32.38	21.25	11.14	0.00	0.79	57	20.84	78	0.0	78	578	48	30	24	552	269	7.60	2.06	99	99
01/14/96	7.96	12.21	13.37	47.82	35.79	12.03	13.21	1.34	84	18.75	102	0.0	102	613	34	68	68	601	269	9.93	2.23	82	82
01/28/96	10.13	11.41	13.80	37.11	23.02	14.09	27.50	1.34	90	18.75	109	0.0	109	631	18	91	91	628	270	10.51	2.33	81	81
02/11/96	13.28	13.65	17.31	73.89	62.65	11.24	27.85	2.59	135	11.14	146	0.0	146	645	15	131	131	625	269	14.15	2.32	60	60
02/25/96	12.76	13.47	16.47	140.54	121.84	18.71	38.72	2.93	211	9.07	220	0.0	220	669	24	197	197	665	270	21.30	2.46	42	42
03/10/96	7.67	12.81	12.98	93.90	72.20	21.69	36.10	4.61	155	5.08	160	2.6	158	671	2	156	156	665	270	15.25	2.46	59	58
03/24/96	3.39	12.68	11.68	81.97	60.84	21.13	19.10	5.29	121	3.48	125	3.6	121	668	-2	124	124	670	270	11.72	2.48	77	75
04/07/96	4.13	13.36	12.57	71.57	52.76	18.80	8.48	4.71	101	3.80	105	7.4	98	705	36	62	62	689	270	9.45	2.55	99	92
04/21/96	5.83	14.23	13.89	88.09	51.93	16.16	10.67	4.12	103	4.11	107	11.3	95	724	19	76	76	714	270	9.20	2.64	105	94
05/05/96	6.94	13.14	13.28	72.45	56.83	15.62	24.84	3.49	121	5.30	126	12.9	113	725	2	112	112	728	270	10.93	2.69	90	81
05/19/96	8.06	15.52	16.29	60.11	46.20	13.91	20.08	2.35	107	7.45	114	15.9	98	738	12	86	86	728	271	9.49	2.69	104	89
06/02/96	6.18	14.61	16.54	74.87	61.31	13.56	26.13	2.38	126	6.84	133	18.5	116	729	-9	126	126	734	271	11.23	2.71	88	77
06/16/96	3.30	9.24	12.61	35.04	23.21	11.83	11.33	2.50	65	3.21	68	20.5	47	687	-41	89	89	711	270	4.58	2.63	210	148
06/30/96	2.28	8.42	10.72	25.80	17.05	8.76	12.59	2.50	54	3.21	57	14.4	43	650	-37	80	80	663	270	4.13	2.46	217	163
07/14/96	3.59	8.48	7.30	18.82	12.53	6.29	13.90	2.10	46	0.40	46	23.7	22	600	-50	73	73	626	269	2.17	2.32	390	190
07/28/96	4.98	7.73	6.08	16.55	8.02	8.53	7.01	2.10	39	0.40	39	19.9	19	549	-51	70	70	572	269	1.86	2.13	418	205
08/11/96	4.19	7.62	9.76	15.09	5.51	9.58	9.11	1.59	40	0.80	40	20.7	20	504	-46	65	65	523	268	1.91	1.95	372	181
08/25/96	3.39	7.48	9.42	15.10	5.40	9.70	7.76	1.45	37	0.65	38	19.0	19	460	-43	62	62	482	268	1.83	1.80	360	179
09/08/96	3.05	8.62	11.30	16.13	6.50	9.63	6.90	1.26	39	1.06	40	17.6	22	418	-42	64	64	439	267	2.16	1.65	278	155
09/22/96	3.82	13.11	16.13	16.81	8.70	10.11	9.54	1.12	49	1.37	51	10.9	40	398	-20	60	60	405	266	3.92	1.52	142	112
10/06/96	2.93	12.10	14.49	18.79	9.05	9.74	12.44	1.01	50	2.47	52	12.0	40	379	-19	59	59	387	264	3.96	1.47	135	104
10/20/96	3.48	13.75	14.96	19.86	9.61	10.25	5.91	0.88	45	3.95	49	9.5	40	372	-7	47	47	372	263	3.92	1.41	132	106
11/03/96	4.82	13.86	15.92	22.26	11.58	10.68	13.99	0.86	58	4.84	63	7.5	55	391	19	36	36	384	264	5.45	1.45	97	86
11/17/96	6.50	16.30	18.45	21.44	10.94	10.50	0.00	0.77	47	8.13	55	0.0	55	405	14	42	39	397	265	5.44	1.50	101	101
12/01/96	7.00	17.18	17.85	27.68	16.74	10.94	26.72	0.78	80	8.89	89	0.0	89	464	59	30	30	445	267	8.69	1.67	70	70
12/15/96	7.11	15.37	16.73	41.28	28.36	12.92	39.07	0.81	105	18.78	124	0.0	124	536	71	53	53	505	268	12.04	1.89	57	57
12/29/96	8.77	18.37	20.78	42.92	22.89	20.03	7.52	0.81	81	18.78	100	0.0	100	576	41	59	59	550	269	9.67	2.05	77	77
01/12/97	8.49	15.01	18.57	218.87	169.65	49.21	43.13	1.29	290	13.69	304	0.0	304	692	116	188	188	668	270	29.39	2.48	31	31
01/26/97	9.46	15.76	20.40	72.82	47.50	25.32	39.28	1.37	143	12.84	156	0.0	156	629	-63	220	220	655	270	15.10	2.43	59	59
02/09/97	8.78	16.23	18.45	90.40	65.86	24.53	42.32	2.49	162	6.78	169	0.0	169	627	-2	171	171	625	269	16.38	2.32	52	52
02/23/97	6.44	16.92	12.38	72.38	45.76	26.61	23.41	3.12	118	3.41	121	0.0	121	639	12	110	110	629	269	11.73	2.34	73	73
03/09/97	5.14	16.69	14.51	58.89	33.23	25.66	11.47	4.61	95	3.57	98	2.3	96	645	6	90	90	640	270	9.28	2.37	93	91
03/23/97	4.14	16.09	16.55	60.62	37.51	23.11	0.00	5.44	89	3.65	92	3.6	89	665	21	68	67	654	270	8.59	2.42	103	99

	Water Balance (million cubic meters - hm3)																						
Biweek	7-Mile Canal	Wood R. Weed Rd.	Wood R. Dike Rd.	Williamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	Evap-oration	Net Inflow	End Storage	Change in Storage	Inflow- Ch Stor.	Outlet	Mean Lake volume	Mean Lake Surface Area (km^2)	Water Load ($m\ yr^{-1}$)	Mean Lake Depth (m)	Residence Time (Netin) (days)	Residence Time (Totin) (days)
04/06/97	3.24	15.42	21.99	67.82	47.08	20.74	0.00	4.92	98	4.66	103	6.9	96	685	20	76	65	677	270	9.25	2.51	99	92
04/20/97	3.83	13.79	19.50	53.84	33.92	19.93	0.00	4.24	81	6.01	87	11.3	76	711	26	50	47	696	270	7.35	2.58	128	111
05/04/97	4.98	12.13	15.72	81.53	64.64	16.89	29.17	3.72	135	4.83	140	12.6	127	720	8	119	119	724	270	12.28	2.68	80	72
05/18/97	7.20	11.88	13.36	56.24	39.62	16.63	18.25	2.42	97	1.90	99	15.9	83	715	-4	88	88	719	270	8.05	2.66	121	101
06/01/97	8.28	12.44	13.56	37.42	26.40	11.03	14.36	2.43	76	2.01	78	16.2	62	706	-9	71	71	708	270	5.97	2.62	160	127
06/15/97	8.25	12.41	13.67	29.84	22.15	7.49	7.02	2.57	61	3.45	65	17.8	47	696	-10	57	57	704	270	4.52	2.60	210	152
06/29/97	7.44	9.84	9.91	21.29	15.50	5.79	9.32	2.57	51	3.45	54	22.7	31	656	-40	72	72	677	270	3.02	2.51	303	175
07/13/97	7.22	9.19	13.06	18.72	12.54	6.18	1.68	2.19	43	3.48	46	18.9	27	614	-42	69	69	637	270	2.66	2.36	324	192
07/27/97	7.16	9.04	11.32	16.60	7.76	8.83	4.82	2.16	42	3.48	46	20.9	25	579	-35	60	60	596	269	2.39	2.22	339	183
08/10/97	7.63	10.68	12.36	17.23	8.09	9.14	0.00	1.68	39	3.43	42	18.4	24	549	-30	54	51	567	269	2.33	2.11	331	187
08/24/97	7.50	10.32	12.18	16.10	6.84	9.46	9.24	1.49	47	3.40	50	17.9	32	515	-34	66	66	527	268	3.11	1.96	230	148
09/07/97	7.96	11.92	13.94	16.65	6.86	9.79	1.40	1.32	41	2.87	44	13.3	31	487	-28	59	59	501	268	3.00	1.87	228	159
09/21/97	8.85	14.93	17.14	19.53	10.88	8.86	0.26	1.15	47	2.34	49	9.5	40	490	2	37	37	485	268	3.88	1.81	171	136
10/05/97	8.47	13.75	16.22	19.25	9.65	9.60	2.55	1.05	48	3.28	51	11.1	40	488	-2	41	41	489	268	3.86	1.82	172	135
10/19/97	8.54	14.05	16.72	20.51	10.15	10.37	1.64	0.87	48	4.96	53	9.5	44	492	4	40	40	489	268	4.26	1.82	156	128
11/02/97	8.57	14.20	16.79	21.10	10.71	10.38	8.32	0.66	58	5.35	61	8.2	53	503	11	42	42	494	268	5.14	1.84	131	113
11/16/97	8.71	14.76	17.20	22.19	11.93	10.26	0.00	0.77	49	7.73	57	0.0	57	518	16	41	41	512	268	5.51	1.91	127	127
11/30/97	8.95	15.62	17.91	24.90	12.83	12.07	2.95	0.77	55	7.73	63	0.0	63	545	26	37	37	531	268	6.14	1.98	118	118
12/14/97	9.01	15.89	18.05	26.16	12.14	14.01	0.00	0.81	54	3.71	58	0.0	58	558	13	45	41	553	269	5.61	2.06	134	134
12/28/97	8.72	15.01	17.05	24.27	11.20	13.07	4.97	0.81	56	3.71	60	0.0	60	560	2	57	57	560	269	5.78	2.08	132	132
01/11/98	8.72	15.08	16.99	24.62	11.70	12.93	0.00	1.25	52	14.07	66	0.0	66	584	24	42	39	572	269	8.37	2.13	122	122
01/25/98	8.71	15.44	17.20	53.16	36.33	16.84	22.45	1.37	103	16.90	120	0.0	120	642	58	61	61	622	269	11.60	2.31	73	73
02/08/98	8.39	15.23	16.86	70.37	44.85	25.52	28.37	2.36	126	10.56	137	0.0	137	636	-6	143	143	638	270	13.25	2.37	65	65
02/22/98	8.08	15.03	16.53	52.91	25.33	27.58	20.10	3.10	101	5.82	107	0.0	107	651	15	92	92	642	270	10.31	2.38	84	84
03/08/98	7.74	14.83	16.20	58.57	31.95	26.61	14.78	4.42	102	6.52	108	2.0	106	656	5	101	101	653	270	10.27	2.42	86	85
03/22/98	7.37	14.48	17.36	57.37	32.88	24.49	0.00	5.41	87	7.04	95	3.6	91	684	28	63	62	669	270	8.79	2.48	103	99
04/05/98	6.93	13.91	20.75	105.36	77.13	28.23	25.27	4.96	163	5.20	168	6.3	162	692	7	155	155	692	270	15.67	2.56	60	57
04/19/98	5.05	13.37	20.81	77.49	50.73	26.76	7.14	4.21	115	1.90	117	11.3	105	695	3	102	102	691	270	10.17	2.56	92	83
05/03/98	2.99	12.96	17.66	68.58	45.84	22.75	0.00	3.83	93	3.83	97	11.9	85	722	27	58	52	708	270	8.20	2.62	117	102
05/17/98	3.90	12.74	17.24	106.58	87.21	19.37	13.61	2.41	144	10.91	155	7.0	148	722	0	148	148	726	270	14.24	2.68	69	66
05/31/98	4.83	12.52	16.85	99.33	80.19	19.15	13.66	2.41	137	10.91	148	7.0	141	731	9	132	132	726	270	13.60	2.69	72	69
06/14/98	5.71	12.44	16.20	84.35	66.40	17.95	13.47	2.56	122	2.75	125	15.2	110	729	-2	112	112	729	270	10.60	2.70	93	82
06/28/98	5.60	12.19	12.15	56.53	39.07	17.46	4.18	2.56	81	2.75	84	18.6	65	724	-6	71	71	726	270	6.28	2.68	156	121
07/12/98	4.98	10.97	11.87	34.50	21.38	13.12	5.60	2.21	59	0.98	60	18.9	41	696	-27	88	88	713	270	3.98	2.64	242	186
07/26/98	4.12	8.98	10.42	24.89	13.09	11.80	9.09	2.15	51	0.68	51	20.7	31	650	-47	78	78	671	270	2.96	2.49	307	183
08/09/98	3.56	7.99	9.11	20.39	8.91	11.48	7.46	1.72	42	0.24	42	20.0	22	607	-43	65	65	628	269	2.17	2.33	392	207
08/23/98	3.16	7.54	9.29	17.54	7.12	10.42	8.74	1.48	40	0.00	40	19.0	21	554	-52	74	74	579	269	2.05	2.15	383	201
09/06/98	2.94	7.37	11.18	17.41	7.09	10.32	12.73	1.33	46	0.58	46	16.7	29	512	-43	72	72	533	268	2.86	1.99	253	161
09/20/98	3.27	8.46	14.22	19.10	8.82	10.28	7.10	1.14	45	1.37	46	15.0	31	481	-31	62	62	494	268	3.03	1.84	222	150

Appendix VI. Biweekly time series for nutrient balance terms.

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Wood Rd.	Wood R. Dike Rd.	Wood R. below Wood Rd.	Williamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
04/14/91	tp	449	710	775	64	3334	611	2723	313	1386	6256	187	6443	48096	2628	3815	1461	2354	-2354	4380	127	76	60
04/28/91	tp	437	625	885	60	2729	660	2069	579	1386	5615	187	6002	50901	2805	3197	1618	1579	-1579	5547	122	79	66
05/12/91	tp	344	455	519	64	2505	685	1820	732	878	4977	187	5164	53685	2784	2380	2284	96	-96	7420	113	83	72
05/26/91	tp	359	618	1173	557	3524	1069	2435	850	791	6697	187	6884	56208	4523	2362	1906	456	-456	7693	117	87	76
06/09/91	tp	157	328	1305	977	2775	679	2096	785	824	5846	187	6033	58542	1335	4696	4036	660	-660	7876	126	91	80
06/23/91	tp	150	270	1010	740	2035	359	1676	875	841	4912	187	5099	68898	9356	-4257	5285	-10322	10522	20168	121	113	95
07/07/91	tp	148	250	792	541	2066	365	1721	788	774	4586	187	4775	96360	27461	-22687	6842	-29628	29628	43119	118	167	130
07/21/91	tp	153	308	895	586	1627	232	1395	410	707	3792	187	3979	116425	20065	-16086	11551	-27638	27638	43937	132	225	167
08/04/91	tp	145	314	897	583	1647	235	1412	844	844	4178	187	4365	123830	7405	-3040	11022	-14063	14063	31399	118	262	186
08/18/91	tp	96	191	669	478	1514	191	1323	615	486	3380	187	3567	111841	-11989	15556	9590	5966	-5966	9692	115	259	185
09/01/91	tp	185	401	806	407	1595	199	1395	686	478	3753	187	3940	119922	8081	-4141	11945	-16086	16086	32875	111	309	201
09/15/91	tp	211	526	783	258	1637	200	1436	637	375	3644	187	3831	112173	-7748	11579	11990	-411	411	16115	110	320	225
09/29/91	tp	285	696	906	210	1690	235	1455	794	375	4050	187	4237	85239	-26934	31171	8352	22819	-22819	-10886	107	257	207
10/13/91	tp	298	555	894	339	1853	329	1524	217	292	3553	187	3740	73121	-12119	15858	8762	7096	-7096	3140	117	231	231
10/27/91	tp	440	739	994	255	1868	366	1502	457	285	4045	187	4232	64671	-8450	12682	8882	3800	-3800	5253	103	202	320
11/10/91	tp	470	770	841	70	1769	417	1352	245	261	3585	187	3772	51637	-13034	16806	5285	11521	-11521	-4292	96	149	361
11/24/91	tp	498	807	1003	196	1565	426	1137	230	251	3546	187	3733	39751	-11885	15619	2809	12810	-12810	-7245	91	106	169
12/08/91	tp	514	856	1194	338	1485	456	1029	353	258	3805	187	3992	41342	1590	2401	1761	640	-640	5147	89	102	105
12/22/91	tp	479	841	1140	299	1484	449	1035	85	263	3432	187	3619	41887	546	3073	1841	1233	-1233	4632	92	96	101
01/05/92	tp	453	866	1107	241	1531	463	1068	136	329	3556	187	3743	42463	575	3167	1592	1575	-1575	4370	92	93	96
01/19/92	tp	446	833	1147	314	1606	475	1134	365	446	4012	187	4199	53951	11489	-7290	2003	-6293	9293	16846	95	112	102
02/02/92	tp	594	860	1372	512	1810	596	1214	23	522	4320	187	4507	61731	7780	-3273	3310	-6583	6583	15225	115	125	126
02/16/92	tp	518	815	1131	316	1605	625	980	0	977	4231	187	4418	37547	-24184	28002	1607	26995	-26995	-21739	112	72	96
03/01/92	tp	314	742	1263	522	1650	752	1097	0	1033	4481	187	4648	33941	-3606	8254	238	8016	-8016	-3264	116	61	72
03/15/92	tp	320	719	1241	522	2046	727	1320	100	1766	5473	187	5660	31130	-2811	8471	193	8278	-8278	-3920	137	53	64
03/29/92	tp	191	725	761	37	1923	635	1287	0	1766	4641	187	4828	44008	12878	-8050	157	-8207	8207	14368	132	71	53
04/12/92	tp	257	531	499	-32	1946	751	1195	862	1431	4995	187	5182	52168	8160	-2979	3097	-6075	6075	13379	114	84	86
04/26/92	tp	500	657	657	0	2091	967	1124	906	1376	5529	187	5716	48837	-3331	9048	3622	5426	-5426	1411	114	79	81
05/10/92	tp	497	483	941	458	1983	631	1351	1073	954	5448	187	5635	51326	2489	3146	4122	-976	976	8162	123	87	76
05/24/92	tp	863	336	1135	799	1647	570	1077	906	786	5339	187	5526	63263	11938	-6411	4896	-11306	11306	20165	140	114	93
06/07/92	tp	583	187	608	421	1380	451	929	783	811	4174	187	4361	88328	25064	-20703	7229	-27932	27932	40296	129	175	125
06/21/92	tp	446	149	567	418	1345	446	898	38	836	3231	187	3418	122574	34246	-30629	11286	-42115	42115	59278	159	268	229
07/05/92	tp	530	264	784	520	1809	428	1381	366	788	4276	187	4463	119389	-3186	7649	10723	-3074	3074	19768	150	279	256
07/19/92	tp	594	398	971	573	2142	336	1806	651	702	5060	187	5247	105556	-13833	19081	15463	3618	-3618	11160	150	261	416
08/02/92	tp	378	220	684	464	1804	279	1525	400	670	3937	187	4124	59117	-46438	50562	11290	39273	-39273	-30996	155	162	259
08/16/92	tp	295	192	622	430	1542	201	1341	597	483	3539	187	3726	30253	-28864	32590	4752	27838	-27838	-23603	134	94	103
08/30/92	tp	336	156	592	436	1473	226	1247	343	483	3227	187	3414	48853	18600	-15186	5869	-21054	21054	27894	138	168	161
09/13/92	tp	389	330	794	464	1615	298	1318	488	361	3667	187	3854	37906	-10946	14800	4752	10048	-10048	-4741	121	136	162
09/27/92	tp	426	593	1060	467	1503	320	1184	75	373	3437	187	3624	31613	-6293	9917	2783	7134	-7134	-2708	123	117	120
10/11/92	tp	343	568	948	359	1483	371	1112	189	328	3289	187	3476	26122	-3491	6967	3213	3754	-3754	183	108	106	109
10/25/92	tp	305	598	828	229	1615	428	1187	342	315	3405	187	3592	25050	-3072	6664	2052	4611	-4611	-1104	97	92	96
11/09/92	tp	411	799	1099	300	1788	559	1229	916	294	4508	187	4695	24267	-783	5477	1758	3719	-3719	-322	91	80	87
11/22/92	tp	626	901	1237	436	1667	461	1206	0	278	3807	187	3994	24938	671	3323	1711	1612	-1612	1679	109	77	81
12/06/92	tp	893	859	1277	419	1595	450	1145	428	283	4477	187	4664	16769	-8170	12834	1325	11509	-11509	-9161	106	48	63
12/20/92	tp	375	799	834	35	1551	567	984	1033	291	4084	187	4271	20965	4196	75	781	-706	706	3641	84	54	47
01/03/93	tp	332	779	1041	261	1554	732	822	459	334	3720	187	3908	36572	15607	-11701	1142	-12843	12843	17963	95	87	61
01/17/93	tp	272	766	1168	402	1621	671	949	1258	492	4811	187	4998	30657	-5915	10913	1849	9063	-9063	-4771	92	68	63
01/31/93	tp	209	796	900	104	1551	714	837	181	492	3334	187	3521	25864	-4793	8314	1246	7068	-7068	-3447	94	55	54
02/14/93	tp	153	814	1200	386	1632	722	909	173	1118	4275	187	4462	28778	2912	1551	656	895	-895	3134	112	57	51
02/28/93	tp	81	838	1446	608	2250	1129	1121	569	1118	5484	187	5651	55169	26393	-20742	969	-21711	21711	29434	125	101	64

		Load Sources (kg)																			Concentrations in ppb		
Week	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	Willam-son R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
03/14/93	tp	82	937	1586	649	5153	4870	282	295	1950	9066	187	9253	40961	-14208	23461	552	22909	-22909	-17175	157	68	70
03/28/93	tp	2748	1715	3063	1349	24043	22965	1078	1893	1950	33696	187	33885	39239	-1721	35606	8061	27524	-27524	-22031	156	57	59
04/11/93	tp	336	1348	4241	2893	14077	10210	3867	3239	1612	23504	187	23691	73548	34307	-10615	15587	-26202	26202	36499	117	105	86
04/25/93	tp	569	1599	3421	1822	8517	5779	2738	1799	1520	15825	187	16012	53078	-20470	36482	10002	26480	-26480	-19049	114	75	79
05/09/93	tp	824	1143	4404	3262	7470	5760	1710	1343	1101	15142	187	15329	50344	-2731	18061	6983	11077	-11077	-4029	123	70	66
05/23/93	tp	579	792	2192	1400	6172	4691	1481	1349	866	11161	187	11348	44719	-5626	16973	5871	11102	-11102	-4842	101	62	60
06/06/93	tp	1937	1122	2661	1559	4602	3205	1397	2496	892	12909	187	12796	48854	4135	8661	6782	1879	-1879	4950	100	67	62
06/20/93	tp	344	932	1584	652	3002	2125	877	806	923	6661	187	6848	74100	25246	-18398	4706	-23106	23106	33480	83	103	61
07/04/93	tp	88	579	1188	609	1963	893	1070	944	881	5065	187	5251	100538	26438	-21187	6636	-27823	27823	41896	102	149	91
07/18/93	tp	604	433	1034	601	1512	493	1019	805	775	4731	187	4918	107169	6631	-1714	10961	-12674	12674	27678	112	171	154
08/01/93	tp	279	460	866	406	1455	414	1042	1042	758	4400	187	4587	99041	-8128	12715	8498	4217	-4217	9649	102	167	146
08/15/93	tp	863	460	631	172	1271	262	1008	391	533	3669	187	3876	97198	-1843	5719	12573	-6854	6854	20462	116	180	182
08/29/93	tp	981	479	709	230	1462	325	1157	539	533	4245	187	4432	70141	-27057	31489	9767	21722	-21722	-11902	111	136	196
09/12/93	tp	251	484	789	305	1330	257	1074	1025	429	3625	187	4012	55483	-14659	18670	6630	12040	-12040	-4273	93	118	93
09/26/93	tp	230	602	797	195	1375	262	1114	677	412	3492	187	3679	39949	-15534	19213	4279	14933	-14933	-9341	87	91	74
10/10/93	tp	325	1064	1122	38	1266	305	961	628	322	3662	187	3869	26826	-13123	16992	3534	13459	-13459	-9703	85	63	66
10/24/93	tp	412	886	982	96	1444	448	996	1260	266	4385	187	4572	19270	-7555	12128	2262	9866	-9866	-7166	77	44	65
11/07/93	tp	273	935	979	43	1513	409	1104	534	269	3568	187	3755	23722	4452	-697	2577	-3274	3274	6595	82	54	66
11/21/93	tp	251	1012	892	-120	1553	500	1053	170	252	3118	187	3305	28912	5190	-1885	2512	-4397	4397	8444	89	65	71
12/05/93	tp	360	1147	749	-398	1686	650	1036	736	256	3788	187	3975	32657	3745	230	2724	-2494	2494	7066	88	72	72
12/19/93	tp	773	1464	997	-467	2152	945	1207	881	264	5066	187	5253	33893	1236	4017	3033	984	-984	3761	97	72	72
01/02/94	tp	738	1426	1017	-409	2278	883	1395	212	290	4535	187	4722	34013	119	4603	3069	1534	-1534	3228	121	73	72
01/16/94	tp	751	1700	1399	-301	2713	1144	1569	978	447	6285	187	6472	35321	1306	5164	2797	2367	-2367	2578	121	73	73
01/30/94	tp	619	1692	1553	-138	2832	1182	1650	340	447	5791	187	5978	31565	-3756	9734	894	8840	-8840	-4421	142	61	71
02/13/94	tp	135	1054	1022	-33	1772	661	1091	0	974	3903	187	4090	23885	-7679	11769	380	11389	-11389	-8045	118	44	48
02/27/94	tp	43	972	1042	70	1634	686	948	33	1015	3768	187	3955	30059	6174	-2220	345	-2564	2564	6773	107	52	48
03/13/94	tp	279	1051	1082	32	2329	1243	1086	0	1717	5407	187	5594	28087	-1973	7567	337	7230	-7230	-3298	120	46	47
03/27/94	tp	215	885	783	-102	2330	878	1452	187	1771	5265	187	5452	35052	6965	-1513	399	-1911	1911	6819	123	54	39
04/10/94	tp	88	929	2239	1311	2368	912	1457	392	1491	6579	187	6766	38311	3259	3507	1358	2150	-2150	3214	133	58	50
04/24/94	tp	43	704	1574	870	2060	892	1168	862	1380	5720	187	5907	40205	1895	4012	2851	1160	-1160	4468	118	62	61
05/08/94	tp	8	450	546	96	1721	793	928	912	1042	4228	187	4415	33593	-6613	11028	1590	9438	-9438	-4735	96	52	46
05/22/94	tp	33	438	275	-162	1677	734	943	679	788	3452	187	3639	37806	4213	-574	1083	-1657	1657	6950	102	58	41
06/05/94	tp	49	363	232	-131	1315	564	751	936	806	3338	187	3525	44764	6958	-3433	2218	-5651	5651	11918	95	72	48
06/19/94	tp	201	208	538	330	1100	391	708	1075	836	3751	187	3938	76516	31752	-27813	5196	-33011	33011	43723	96	131	85
07/03/94	tp	166	213	500	287	931	237	694	1192	809	3596	187	3785	100641	24125	-20340	11699	-32039	32039	46129	94	192	158
07/17/94	tp	235	203	374	171	826	209	618	658	704	2799	187	2986	94346	-6295	9281	11932	-2652	2652	15860	103	208	167
07/31/94	tp	400	178	367	190	821	206	615	709	704	3001	187	3186	81087	-13249	16437	7353	9084	-9084	2269	105	208	119
08/14/94	tp	536	287	492	205	1189	288	901	372	484	3073	187	3260	49783	-31334	34594	9111	25483	-25483	-18518	127	148	151
08/28/94	tp	497	225	531	306	947	194	753	743	484	3202	187	3389	32106	-17657	21046	8353	12693	-12693	-8198	103	113	135
09/11/94	tp	384	132	440	307	823	169	654	885	396	2929	187	3116	28992	-3114	6231	7009	-779	779	4837	88	119	120
09/25/94	tp	407	226	513	287	1032	222	810	371	374	2997	187	2884	29021	29	2856	3800	-944	944	5007	93	126	128
10/09/94	tp	591	500	938	438	1268	306	962	39	331	3167	187	3354	26568	-2453	5807	3732	2074	-2074	1645	105	119	155
10/23/94	tp	416	546	899	353	1210	328	882	186	308	3022	187	3209	13348	-13219	16428	2559	13869	-13869	-12001	87	58	116
11/06/94	tp	462	518	826	308	1113	308	805	0	292	2693	187	2880	24398	11050	-8171	1830	-10001	10001	13417	79	100	95
11/20/94	tp	519	505	804	299	1166	290	876	8	271	2766	187	2953	27916	3518	-564	1726	-2291	2291	6199	77	101	106
12/04/94	tp	361	639	1135	497	1348	357	991	0	275	3119	187	3306	26182	-1734	5040	1256	3784	-3784	-119	89	86	91
12/18/94	tp	121	707	1242	535	1376	425	951	492	284	3516	187	3703	28961	2799	904	1255	-351	351	4408	86	86	85
01/01/95	tp	225	601	1157	556	1415	470	945	58	296	3153	187	3340	34359	5378	-2037	1450	-3487	3487	8296	91	96	91
01/15/95	tp	214	855	1458	602	3426	2529	897	1296	480	6874	187	7061	33835	-524	7585	1067	6498	-6498	-1761	111	80	92
01/29/95	tp	9	1066	1424	357	6596	5483	1112	320	480	9028	187	9215	29706	-4129	13344	1034	12310	-12310	-8152	172	62	71

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Wood Rd.	Wood R. Dike Rd.	Wood R. below Wood Rd.	William-son R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
02/12/95	tp	7	1486	1560	74	6472	7852	-1380	2053	1004	11085	187	11282	49699	19993	-8711	640	-9351	9351	16309	105	86	72
02/26/95	tp	168	795	706	-87	3223	2016	1206	762	1091	5952	187	6139	38167	-11532	17671	796	16874	-16874	-11531	105	61	83
03/12/95	tp	355	809	698	-111	4942	3371	1571	554	1787	8337	187	8524	43393	5226	3298	484	2815	-2815	3260	122	63	63
03/26/95	tp	563	823	1384	561	9555	7407	2148	1242	1903	14647	187	14834	48053	4661	10173	10934	-761	761	7489	112	69	83
04/09/95	tp	486	714	1383	669	6176	4028	2148	325	1633	10003	187	10190	50667	2614	7576	6804	772	-772	6321	117	72	85
04/23/95	tp	129	678	1253	575	8073	6210	1863	945	1483	11683	187	12070	47693	-2974	15044	6905	8139	-8139	-1462	105	66	72
05/07/95	tp	430	742	1187	445	4096	2736	1360	1147	1165	8027	187	8214	41610	-6083	14297	4510	9787	-9787	-3962	76	56	57
05/21/95	tp	576	526	1166	638	3843	2494	1349	1618	847	8051	187	8238	38081	-3529	11767	6607	5161	-5161	171	72	53	56
06/04/95	tp	1106	411	2959	2548	3287	2016	1271	431	862	8645	187	8832	60936	22855	-14023	3926	-17949	17949	26460	107	84	67
06/18/95	tp	1648	476	4153	3677	2544	1375	1169	9	901	9254	187	9441	112960	52025	-42584	4057	-46641	46641	62455	147	154	85
07/02/95	tp	492	434	2098	1664	2104	1071	1033	600	860	6175	187	6362	137370	24410	-18048	6519	-24567	24567	43799	108	190	120
07/16/95	tp	1092	612	2617	2005	1617	664	953	1153	756	7234	187	7421	144535	7165	257	8695	-8638	8638	26873	137	208	141
07/30/95	tp	592	427	451	23	1511	617	894	965	756	4295	187	4482	144855	321	4161	9208	-5047	5047	25327	101	220	149
08/13/95	tp	356	360	427	67	1049	298	751	466	537	2635	187	3022	137956	-6899	9921	10558	-637	637	19951	95	230	156
08/27/95	tp	142	308	427	119	944	143	801	940	521	2974	187	3161	126071	-9886	13047	10695	2352	-2352	15578	82	235	147
09/10/95	tp	31	312	531	220	964	123	861	1127	436	3108	187	3295	146983	16913	-15618	11404	-27022	27022	47599	81	296	167
09/24/95	tp	266	564	765	201	1199	182	1017	1145	402	3777	187	3964	119645	-27138	31102	11263	19839	-19839	-3060	84	261	171
10/08/95	tp	406	693	928	235	1248	246	1002	462	362	3405	187	3592	78574	-41271	44863	10903	33960	-33960	-22960	84	180	201
10/22/95	tp	169	629	939	311	1298	349	949	575	332	3312	187	3499	66418	-12156	15656	5381	10275	-10275	-976	75	156	123
11/05/95	tp	139	670	921	251	1518	388	1130	368	318	3265	187	3452	48636	-17782	21234	3250	15985	-15985	-9178	81	115	127
11/19/95	tp	497	806	1005	199	1766	477	1289	134	292	3695	187	3882	45660	-2975	6857	4109	2748	-2748	3644	95	106	119
12/03/95	tp	1689	875	1056	181	1685	804	1081	494	295	5219	187	5406	41721	-3939	9346	4609	4737	-4737	1104	108	94	113
12/17/95	tp	3624	1086	1853	765	3477	2526	951	2128	306	11388	187	11575	45428	3707	7868	3199	4669	-4669	1691	115	86	94
12/31/95	tp	4027	997	1714	717	3797	2959	839	0	306	9845	187	10032	49167	3739	6293	2016	4277	-4277	2607	171	85	85
01/14/96	tp	3890	1053	1650	597	6641	6201	440	828	518	13527	187	13714	49603	435	13279	5657	7622	-7622	-676	162	81	83
01/28/96	tp	3530	1093	1963	870	5737	3926	1811	1725	518	13473	187	13660	48333	-1270	14930	7137	7793	-7793	-1026	150	77	79
02/11/96	tp	2674	1421	2723	1302	12336	9613	2722	1747	1004	20483	187	20670	46670	-1663	22332	9789	12543	-12543	-6010	152	72	75
02/25/96	tp	1172	1113	1935	822	17976	12528	5448	2428	1137	24646	187	24833	49526	2856	21977	14337	7640	-7640	-707	117	74	73
03/10/96	tp	706	867	1478	610	8066	5358	2728	2263	1792	14324	187	14511	41796	-7730	22241	10382	11859	-11859	-6007	92	62	66
03/24/96	tp	317	870	1569	720	6710	4005	2705	1196	2054	11868	187	12055	31415	-10381	22436	5966	16470	-16470	-12072	98	47	48
04/07/96	tp	393	937	1995	1058	5643	3029	2614	532	1827	10389	187	10576	20941	-10474	21050	2094	18956	-18956	-16024	102	30	34
04/21/96	tp	563	1065	2402	1337	5398	2897	2501	669	1600	10632	187	10819	20468	-474	11293	1511	9782	-9782	-6917	104	28	20
05/05/96	tp	880	976	2149	1173	5538	3115	2424	1557	1355	11280	187	11467	27054	6587	4680	2656	2224	-2224	1583	93	37	24
05/19/96	tp	823	1113	2258	1146	4595	2700	1895	1259	914	9648	187	10035	35379	8324	1711	3280	-1569	1569	6522	92	48	38
06/02/96	tp	681	1090	2024	934	6240	3886	2354	1638	922	11508	187	11693	46923	11544	149	6289	-6141	6141	12710	91	64	50
06/16/96	tp	404	741	1453	712	3218	1366	1853	711	972	6756	187	6945	53674	6751	194	4685	-4491	4491	12006	104	78	53
06/30/96	tp	313	665	1134	468	4469	889	3580	789	972	7678	187	7865	60410	6735	1129	4784	-3655	3655	12113	142	93	60
07/14/96	tp	970	701	742	41	3722	551	3171	872	816	7122	187	7309	77899	17489	-10180	7056	-17237	17237	28142	156	130	97
07/28/96	tp	1736	651	857	206	1246	298	948	440	816	5094	187	5281	76170	-1728	7010	7973	-964	964	11627	132	139	114
08/11/96	tp	1240	619	1073	454	1168	192	976	571	816	4668	187	4855	103027	26857	-22002	8753	-30755	30755	45178	117	205	134
08/25/96	tp	824	604	998	394	1203	194	1010	486	562	4073	187	4260	94374	-8653	12912	10971	1942	-1942	11271	110	205	177
09/08/96	tp	596	580	1139	459	1232	260	972	433	488	3889	187	4076	80483	-13891	17967	12182	5785	-5785	5483	101	193	189
09/22/96	tp	639	997	1490	492	1387	299	1088	596	434	4547	187	4734	75324	-5159	9894	14841	-4947	4947	15492	92	189	247
10/06/96	tp	404	913	1351	438	1401	306	1094	780	394	4329	187	4516	62728	-12596	17112	17372	-260	260	9042	87	165	296
10/20/96	tp	382	1035	1503	468	1506	374	1132	370	341	4102	187	4289	60484	-2244	6532	7798	-1265	1265	9733	91	163	167
11/03/96	tp	417	940	1452	513	1405	386	1018	877	333	4484	187	4671	79333	18849	-14178	4936	-19113	19113	30220	78	203	137
11/17/96	tp	544	1111	1625	514	1256	425	831	0	301	3725	187	3912	65571	-13763	17675	5118	12557	-12557	-3377	79	162	132
12/01/96	tp	836	1545	2002	457	2171	1206	963	1876	302	6986	187	7173	56207	-9364	16537	3313	13224	-13224	-5355	87	121	112
12/15/96	tp	1125	1892	3396	1504	5264	3070	2214	2450	315	12569	187	12756	45659	-10548	23304	4792	18512	-18512	-12120	120	85	91
12/29/96	tp	1233	1972	3618	1646	6595	3355	3240	472	315	12232	187	12419	46177	519	11900	4850	7050	-7050	-586	151	80	83

		Load Sources (kg)																			Concentrations in ppb		
Week	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Elke Rd.	Wood R. below Weed Rd.	William-son R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
01/12/97	tp	811	1107	1962	855	27881	24487	3394	2705	502	33860	187	34047	41639	-4539	38586	11733	26853	-26853	-21023	117	60	62
01/26/97	tp	900	1241	2240	999	6194	4518	1676	2463	533	12329	187	12516	50406	8770	3747	15175	-11429	11429	18486	86	80	69
02/09/97	tp	877	1316	2120	804	6907	5032	1875	2654	968	13526	187	13713	48305	-2103	15816	13744	2072	-2072	4691	83	77	80
02/23/97	tp	612	1303	1595	292	5268	3408	1860	1468	1210	10153	187	10340	42639	-5665	16006	8052	7953	-7953	-1984	86	67	73
03/09/97	tp	466	1229	1748	519	4283	2352	1931	719	1790	9007	187	9193	33615	-9025	18218	5320	12898	-12898	-8192	95	52	59
03/23/97	tp	359	1135	1983	848	4461	2497	1963	0	2112	8914	187	9101	26662	-6953	16053	3322	12731	-12731	-8999	100	40	50
04/06/97	tp	270	1048	2084	1036	5041	2948	2094	0	1912	9306	187	9493	30085	3423	6071	3556	2515	-2515	1697	95	44	54
04/20/97	tp	334	986	1867	881	4002	2033	1969	0	1645	7847	187	8034	31979	1894	6140	2557	3583	-3583	894	96	45	55
05/04/97	tp	463	928	1572	644	6044	3720	2324	1829	1444	11352	187	11539	32448	469	11070	4745	6325	-6325	-1783	84	45	40
05/18/97	tp	702	911	1219	308	4110	2259	1851	1144	940	8115	187	8302	48404	15956	-7654	3657	-11311	11311	18068	83	68	42
06/01/97	tp	810	972	1162	190	2770	1510	1260	900	944	6587	187	6774	78451	28047	-21273	6304	-27577	27577	38280	87	108	89
06/15/97	tp	806	1023	1235	212	2259	1221	1037	440	999	5739	187	5926	104512	26081	-22135	10151	-32286	32286	46918	94	150	179
06/29/97	tp	727	775	954	179	1579	812	967	585	999	4844	187	5031	143128	38616	-33585	19309	-52894	52894	72932	96	216	270
07/13/97	tp	705	796	1204	408	1424	400	1024	105	851	4289	187	4476	145205	2076	2490	19214	-16815	16815	37143	100	236	277
07/27/97	tp	697	733	1238	505	1392	302	1090	302	839	4468	187	4655	169234	24030	-19374	13072	-32446	32446	56139	106	292	218
08/10/97	tp	743	871	1368	497	1500	326	1174	0	652	4263	187	4450	127337	-41897	46348	14098	32250	-32250	-14423	110	232	278
08/24/97	tp	729	673	1267	414	1431	262	1170	579	578	4604	187	4791	112784	-14553	19344	17210	2134	-2134	13656	99	219	262
09/07/97	tp	773	1037	1405	368	1500	265	1234	88	512	4277	187	4464	95595	-17190	21654	17531	4123	-4123	9260	104	196	299
09/21/97	tp	859	1250	1623	374	1622	413	1209	16	446	4566	187	4753	81522	-14072	18826	12227	6599	-6599	4815	97	166	327
10/05/97	tp	821	1084	1437	353	1421	375	1047	160	406	4247	187	4434	80402	-1120	5554	8435	-2881	2881	14137	89	165	204
10/19/97	tp	827	1045	1389	344	1346	402	944	103	339	4005	187	4192	78506	-1896	6067	6887	-799	799	11790	83	160	174
11/02/97	tp	828	1059	1404	344	1406	481	925	522	334	4493	187	4680	73782	-4724	9404	6630	2774	-2774	7555	81	147	157
11/16/97	tp	841	1117	1486	349	1540	608	932	0	299	4148	187	4333	69443	-4339	8672	5893	2779	-2779	6943	85	134	143
11/30/97	tp	863	1200	1557	357	1797	734	1063	185	299	4701	187	4888	66000	-3443	8331	4838	3493	-3493	5747	85	121	131
12/14/97	tp	868	1239	1599	359	1958	766	1192	0	313	4738	187	4925	60470	-5531	10455	4802	5654	-5654	2812	88	108	116
12/28/97	tp	839	1187	1538	351	1883	774	1108	312	313	4584	187	5071	53586	-6883	11955	5914	6041	-6041	1461	87	96	104
01/11/98	tp	838	1210	1561	350	1978	861	1097	0	484	4860	187	5047	48407	-5179	10227	3487	6740	-6740	37	94	83	90
01/25/98	tp	858	1258	1671	414	6393	2964	3429	1407	530	10659	187	11046	46812	-1595	12642	4715	7927	-7927	-1373	106	73	77
02/08/98	tp	868	1257	1806	550	12784	3827	8937	1779	915	18134	187	18321	40118	-6693	25014	9774	15240	-15240	-9624	144	63	69
02/22/98	tp	801	1214	1670	456	6589	1996	4694	1261	1204	11625	187	11812	34594	-5525	17336	5356	11980	-11980	-7137	115	53	58
03/08/98	tp	761	1149	1580	432	4433	2294	2140	927	1716	9417	187	9604	27355	-7239	16843	4831	12012	-12012	-8183	93	42	48
03/22/98	tp	806	1072	1714	642	5053	2714	2339	0	2100	9673	187	9860	29258	1904	7956	2549	5407	-5407	-1311	111	43	41
04/05/98	tp	838	1057	1947	890	9005	6491	2514	1585	1934	15309	187	15496	28451	-808	16304	6530	9774	-9774	-5791	94	41	42
04/19/98	tp	858	1087	2097	1010	6256	3393	2863	447	1836	11095	187	11282	34612	6162	5120	5330	-210	210	5055	97	50	52
05/03/98	tp	406	1100	1871	771	5881	3105	2776	0	1486	9644	187	9831	36362	1750	8081	2117	5964	-5964	-873	104	50	41
05/17/98	tp	537	1078	1783	706	6836	5858	2977	853	935	12944	187	13131	47392	11030	2101	7498	-5397	5397	12032	90	66	51
05/31/98	tp	675	1056	1699	644	7968	5344	2624	857	935	12134	187	12321	42157	-5235	17555	7117	10438	-10438	-4536	89	58	54
06/14/98	tp	813	1045	1599	554	6550	4393	2157	844	994	10800	187	10987	57046	14888	-3901	8435	-12337	12337	20323	88	78	76
06/28/98	tp	841	1020	1219	199	4400	2580	1820	262	994	7717	187	7904	71583	14537	-6633	8678	-15311	15311	25333	95	99	122
07/12/98	tp	793	977	1197	220	2716	1306	1410	351	857	5916	187	6103	119547	47964	-41861	7939	-49800	49800	66537	100	172	116
07/26/98	tp	693	823	1154	331	2007	564	1443	570	834	5258	187	5445	144045	24498	-19053	14752	-33805	33805	53971	104	222	190
08/09/98	tp	632	694	962	268	1875	323	1352	468	667	4404	187	4591	105112	-38933	43524	13916	29608	-29608	-14892	104	173	214
08/23/98	tp	591	605	939	333	1391	244	1147	548	574	4044	187	4231	91681	-13431	17661	15108	2553	-2553	10282	101	165	205
09/06/98	tp	527	568	1187	619	1312	263	1050	796	516	4342	187	4529	77691	-13990	18519	10877	7642	-7642	3235	95	152	151
09/20/98	tp	455	668	1574	906	1546	420	1126	445	443	4466	187	4653	69253	-8438	13091	11968	1123	-1123	6573	100	144	192
04/14/91	srp	259	691	796	105	2061	368	1693	266	791	4173	187	4360	2923	469	3891	118	3773	-3773		85	5	5
04/28/91	srp	252	629	712	83	1687	397	1290	492	791	3934	187	4121	3474	551	3570	106	3464	-3464		82	5	4
05/12/91	srp	199	469	539	70	1549	412	1137	622	500	3409	187	3596	4996	1524	2072	136	1936	-1936		77	6	4
05/26/91	srp	207	573	1112	539	2179	655	1524	722	452	4672	187	4859	6804	1807	3052	128	2925	-2925		82	10	5
06/09/91	srp	91	283	1183	900	1716	409	1307	667	470	4127	187	4314	13569	6765	-2451	367	-2818	2818		89	21	7

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	Williamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
06/23/91	srp	86	250	924	674	1259	216	1042	744	480	3493	187	3680	24207	10638	-6958	1506	-8464	8464		86	40	23
07/07/91	srp	85	236	727	491	1290	220	1070	670	442	3214	187	3401	26576	2370	1031	1319	-288	288		83	46	25
07/21/91	srp	68	260	805	545	1008	140	866	349	403	2851	187	2838	39100	12524	-9686	1692	-11378	11378		92	75	24
08/04/91	srp	64	254	811	557	1019	141	877	717	367	2998	187	3185	51383	12283	-9096	4643	-13940	13940		84	109	82
08/18/91	srp	55	158	636	460	936	115	821	523	278	2430	187	2617	27361	-24021	26638	3321	23317	-23317		82	63	64
09/01/91	srp	107	314	767	452	966	120	866	583	273	2716	187	2903	26056	-1305	4208	2622	1586	-1586		80	67	44
09/15/91	srp	122	352	642	290	1012	121	891	542	214	2532	187	2719	29426	3370	-651	2620	-3271	3271		77	84	49
09/29/91	srp	164	460	686	226	1045	141	904	674	214	2784	187	2971	27921	-1505	4476	1976	2500	-2500		74	84	49
10/13/91	srp	173	442	711	269	1155	198	957	184	167	2390	187	2577	20534	-7387	9964	1688	8276	-8276		79	65	44
10/27/91	srp	268	623	876	256	1251	221	1030	389	163	2948	187	3135	12306	-8228	11363	850	10513	-10513		75	38	31
11/10/91	srp	302	649	839	190	1300	251	1049	206	149	2796	187	2985	8624	-3683	6668	259	6409	-6409		75	25	18
11/24/91	srp	343	703	939	236	1285	258	1027	195	143	2905	187	3092	6413	-2211	5303	202	5100	-5100		75	17	12
12/09/91	srp	371	774	1067	293	1310	290	1021	300	147	3198	187	3383	5897	-516	3899	560	3339	-3339		74	15	34
12/22/91	srp	353	747	1079	332	1322	317	1005	55	150	2960	187	3147	5123	-774	3921	497	3424	-3424		79	12	27
01/05/92	srp	341	743	1127	384	1376	359	1018	116	187	3148	187	3335	4249	-874	4208	338	3871	-3871		81	9	20
01/19/92	srp	337	692	1110	418	1402	376	1026	310	254	3413	187	3600	3235	-1014	4614	254	4360	-4360		81	7	13
02/02/92	srp	399	697	1124	426	1471	443	1028	19	296	3311	187	3498	2675	-559	4057	177	3880	-3880		86	5	7
02/15/92	srp	296	696	927	231	1433	404	1029	0	556	3214	187	3400	4396	1723	1678	126	1552	-1552		85	8	7
03/01/92	srp	183	680	1062	383	1519	510	1009	0	590	3334	187	3521	3812	-585	4107	19	4088	-4088		87	7	6
03/15/92	srp	223	646	896	250	1582	531	1051	85	1006	3795	187	3982	2564	-1248	5230	31	5200	-5200		95	4	10
03/29/92	srp	127	628	639	11	1524	502	1022	0	1006	3298	187	3485	9077	6513	-3028	29	-3057	3057		94	15	10
04/12/92	srp	162	452	413	-39	1533	520	1013	733	817	3658	187	3845	14829	5752	-1907	643	-2550	2550		83	24	18
04/26/92	srp	270	554	539	-15	1604	641	963	770	785	3968	187	4155	15774	945	3209	1060	2150	-2150		82	26	24
05/10/92	srp	299	400	596	196	1312	425	886	911	545	3663	187	3850	16252	477	3372	811	2562	-2562		83	28	15
05/24/92	srp	378	277	615	338	1215	347	867	772	448	3428	187	3615	14514	-1738	5353	1383	3970	-3970		90	26	26
06/07/92	srp	300	156	487	330	1099	300	799	674	463	3023	187	3210	8145	-6369	9579	1963	7616	-7616		93	16	34
06/21/92	srp	261	119	449	330	1101	327	774	32	477	2319	187	2506	21512	13367	-10660	3030	-13690	13690		114	47	62
07/05/92	srp	315	177	591	414	1215	340	875	311	450	2682	187	3069	31288	9776	-6707	2040	-8747	8747		101	73	49
07/19/92	srp	364	261	726	467	1171	329	842	553	400	3217	187	3404	13325	-17963	21367	1059	20308	-20308		95	33	29
08/02/92	srp	242	162	539	377	1056	271	785	340	383	2560	187	2747	8839	-4485	7232	1255	5977	-5977		101	24	29
08/16/92	srp	197	154	512	359	972	194	779	507	278	2464	187	2651	4893	-3946	6597	731	5866	-5866		93	15	16
08/30/92	srp	236	128	503	375	1008	215	792	292	276	2315	187	2502	5031	138	2364	408	1956	-1956		99	17	11
09/13/92	srp	287	274	676	402	1212	281	930	414	217	2808	187	2993	4902	-129	3122	356	2766	-2766		93	18	12
09/27/92	srp	335	492	894	402	1248	299	949	64	213	2753	187	2940	4245	-657	3597	298	3298	-3298		99	16	13
10/11/92	srp	275	486	809	323	1298	335	963	160	187	2728	187	2915	7668	3423	-507	372	-879	879		89	29	13
10/25/92	srp	217	491	739	248	1361	362	999	291	160	2788	187	2975	1960	-5708	8683	270	8413	-8413		80	7	13
11/08/92	srp	288	675	955	279	1444	436	1008	778	168	3632	187	3819	1941	-19	3838	196	3640	-3640		73	6	10
11/22/92	srp	381	697	1004	307	1285	325	960	0	158	2828	187	3015	1351	-590	3606	128	3477	-3477		81	4	6
12/06/92	srp	493	726	946	221	1344	370	974	364	162	3309	187	3496	4829	3478	18	187	-169	169		78	14	9
12/20/92	srp	345	660	886	225	1535	544	991	878	166	3810	187	3997	7663	2855	1142	259	883	-883		76	20	16
01/03/93	srp	275	652	952	301	1471	592	879	390	191	3279	187	3466	10202	2518	948	281	667	-667		84	24	15
01/17/93	srp	206	640	999	359	1450	573	878	1069	281	4005	187	4192	9913	-289	4481	422	4059	-4059		76	22	14
01/31/93	srp	149	606	1009	401	1488	556	932	154	281	3081	187	3268	7922	-1991	5259	316	4943	-4943		86	17	14
02/14/93	srp	102	628	1136	508	1564	536	1028	147	638	3585	187	3772	6831	909	2863	169	2694	-2694		94	17	13
02/28/93	srp	49	561	1081	500	1511	554	957	484	638	3763	187	3950	17686	9055	-5106	185	-5291	5291		86	33	12
03/14/93	srp	36	633	1249	616	2516	1590	927	251	1113	5165	187	5352	4196	-13690	19043	64	18979	-18979		89	7	8
03/28/93	srp	1602	991	2651	1660	12621	11732	889	1609	1113	19596	187	19783	6833	2637	17146	1628	15518	-15518		91	10	12
04/11/93	srp	217	902	3489	2588	7298	5679	1620	2752	920	14677	187	14864	7715	883	13981	2388	11593	-11593		73	11	13
04/25/93	srp	304	865	2028	1143	3892	2765	1127	1528	867	8619	187	8806	7801	-114	8920	1435	7485	-7485		82	11	11
05/09/93	srp	459	982	2012	1030	3387	2046	1341	1141	628	7627	187	7814	9540	1939	5875	771	5105	-5105		62	13	7

Biweekly Nutrient Mass Balance

		Load Sources (kg)																			Concentrations in ppb		
Week	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	Willamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
05/23/93	srp	235	422	1391	970	2758	1625	1133	1146	495	6026	187	6213	13638	4098	2115	1131	985	-985		55	19	12
06/06/93	srp	684	529	1773	1245	2737	1574	1163	2122	509	7825	187	8012	14842	1204	6808	1110	5698	-5698		62	20	10
06/20/93	srp	169	584	1190	606	2716	1560	1156	687	527	5289	187	5476	9560	-5282	10758	1014	9744	-9744		66	13	13
07/04/93	srp	55	394	860	465	1800	716	1084	802	503	4020	187	4207	11859	2299	1907	571	1336	-1336		61	18	8
07/18/93	srp	334	319	772	453	1316	397	919	684	442	3548	187	3735	15635	3775	-40	888	-928	928		64	25	12
08/01/93	srp	193	424	720	296	1378	349	1030	885	432	3609	187	3796	18918	3282	514	1153	-639	639		64	32	20
08/15/93	srp	706	361	544	184	1253	217	1037	332	304	3140	187	3327	19589	673	2654	1472	1183	-1183		100	36	21
08/29/93	srp	810	446	629	181	1397	285	1113	458	304	3599	187	3786	13933	-5656	9442	1052	8389	-8389		94	27	21
09/12/93	srp	146	345	618	273	1128	164	964	871	245	3007	187	3194	11634	-2299	5493	1222	4271	-4271		73	25	17
09/26/93	srp	156	524	775	251	1225	221	1003	575	235	2968	187	3155	10453	-1181	4336	785	3551	-3551		74	24	14
10/10/93	srp	188	784	947	163	1246	271	975	533	184	3087	187	3284	9563	-890	4175	903	3271	-3271		71	23	17
10/24/93	srp	335	841	953	112	1355	376	980	1071	163	3678	187	4065	12717	3154	911	638	273	-273		68	29	18
11/07/93	srp	220	840	887	47	1440	416	1024	454	154	3154	187	3341	12807	90	3251	774	2477	-2477		72	29	21
11/21/93	srp	170	819	697	-122	1431	414	1017	144	144	2566	187	2773	11162	-1645	4418	731	3687	-3687		74	25	21
12/05/93	srp	240	832	536	-296	1422	427	995	625	146	2970	187	3157	8319	-2843	6000	726	5274	-5274		69	18	19
12/19/93	srp	509	900	734	-166	1470	525	945	748	151	3612	187	3799	7768	-550	4350	731	3619	-3619		69	17	17
01/02/94	srp	432	742	683	-59	1236	425	811	180	166	2697	187	2884	6934	-835	3718	663	3055	-3055		72	15	16
01/16/94	srp	400	753	862	109	1197	492	704	629	255	3543	187	3730	6311	-622	4352	533	3819	-3819		66	13	14
01/30/94	srp	311	697	902	205	1135	492	642	289	255	2892	187	3079	6190	-121	3200	155	3045	-3045		71	12	12
02/13/94	srp	82	769	807	38	1383	481	902	0	556	2828	187	3015	6017	-173	3188	94	3093	-3093		85	11	12
02/27/94	srp	48	866	866	0	1460	514	945	28	579	2961	187	3168	4438	-1579	4747	66	4681	-4681		85	8	9
03/13/94	srp	201	697	873	-24	1859	787	1072	0	980	3913	187	4100	3821	-617	4717	44	4673	-4673		87	6	6
03/27/94	srp	131	782	682	-100	1863	649	1213	142	1010	3829	187	4016	7323	3502	514	74	441	-441		69	11	7
04/10/94	srp	54	741	1695	954	1747	829	1118	333	851	4680	187	4867	10433	3110	1756	189	1568	-1568		95	16	7
04/24/94	srp	26	572	1256	684	1566	652	914	563	787	4196	187	4385	13192	2759	1626	299	1327	-1327		86	20	6
05/08/94	srp	5	415	494	79	1527	676	851	775	594	3395	187	3582	13284	93	3489	328	3161	-3161		77	20	9
05/22/94	srp	20	358	203	-155	1383	566	817	577	450	2633	187	2820	11693	-1591	4411	296	4115	-4115		78	16	11
06/05/94	srp	30	299	185	-114	1239	453	786	795	460	2709	187	2896	5842	-5851	8747	395	8352	-8352		77	9	9
06/19/94	srp	115	183	439	256	1161	402	759	913	478	3106	187	3293	6015	173	3121	985	2135	-2135		79	10	16
07/03/94	srp	88	180	494	314	1008	255	753	1013	462	3064	187	3251	23184	17169	-13918	1923	-15841	15841		80	44	26
07/17/94	srp	106	168	349	182	947	213	733	559	402	2383	187	2550	48143	24959	-22409	2454	-24863	24863		87	106	34
07/31/94	srp	157	171	394	222	931	192	739	602	402	2485	187	2672	15279	-32864	35537	1634	33903	-33903		87	39	26
08/14/94	srp	233	272	491	219	925	223	702	316	276	2242	187	2429	7524	-7755	10184	929	9255	-9255		93	22	15
08/28/94	srp	264	217	516	299	921	170	751	631	276	2609	187	2796	4563	-2961	5756	750	5006	-5006		84	16	12
09/11/94	srp	258	132	457	325	964	161	802	752	227	2857	187	2844	2584	-1979	4823	628	4195	-4195		80	11	11
09/25/94	srp	314	206	490	284	1147	236	910	315	213	2479	187	2666	2233	-351	3017	374	2642	-2642		85	10	13
10/09/94	srp	413	443	790	347	1209	268	941	33	189	2634	187	2821	2667	433	2388	289	2099	-2099		88	12	12
10/23/94	srp	311	484	819	335	1215	283	932	160	176	2680	187	2867	2479	-188	3055	220	2835	-2835		78	11	10
11/06/94	srp	356	549	791	242	1181	260	902	0	167	2495	187	2682	2416	-63	2745	180	2565	-2565		73	10	9
11/20/94	srp	427	522	772	250	1154	304	850	5	155	2512	187	2699	3032	615	2064	170	1913	-1913		70	11	11
12/04/94	srp	264	599	1009	410	1335	336	999	0	157	2755	187	2952	4095	1063	1889	190	1698	-1698		76	13	14
12/18/94	srp	90	616	1129	511	1310	396	914	416	162	3108	187	3295	3353	-742	4037	160	3877	-3877		76	10	11
01/01/95	srp	183	576	1037	460	1317	419	897	49	170	2756	187	2943	3903	550	2393	166	2226	-2226		80	11	10
01/15/95	srp	184	694	1112	418	2095	1280	814	1101	274	4786	187	4953	2845	-1058	6011	115	5896	-5896		77	7	10
01/29/95	srp	7	674	1019	346	2845	2251	594	442	274	4588	187	4775	2855	10	4765	87	4678	-4678		88	6	6
02/12/95	srp	5	769	941	172	4330	3541	790	1744	573	7593	187	7780	6218	3362	4418	79	4339	-4339		72	11	9
02/26/95	srp	124	657	650	-7	2225	1019	1207	847	623	4269	187	4456	4380	-1838	6294	123	6171	-6171		75	7	13
03/12/95	srp	275	668	691	23	3051	1580	1471	471	1020	5508	187	5695	4701	321	5373	48	5325	-5325		80	7	6
03/26/95	srp	358	857	1391	734	4950	3600	1350	1055	1086	8840	187	9027	8023	1322	7705	798	6907	-6907		87	9	6
04/09/95	srp	245	551	1241	690	3016	2028	988	276	932	5710	187	5897	8182	2159	3737	796	2942	-2942		67	12	10

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Okie Rd.	Wood R. below Weed Rd.	William-son R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
04/23/95	srp	77	579	1147	568	4109	2743	1366	803	846	6962	187	7169	10177	1994	5174	1611	3564	-3564		62	14	17
05/07/95	srp	288	674	1245	571	2536	1484	1054	975	665	5709	187	5896	14827	4650	1247	1991	-744	744		56	20	25
05/21/95	srp	441	447	1188	741	2966	1709	1287	1375	483	6484	187	6671	20178	5352	1319	3185	-1866	1866		58	28	27
06/04/95	srp	663	373	2239	1867	2838	1474	1364	368	492	6598	187	6785	15211	-4967	11752	1433	10320	-10320		82	21	25
06/18/95	srp	824	407	2908	2500	1960	980	980	8	514	6214	187	6401	12308	-2903	9304	1103	8201	-8201		99	17	23
07/02/95	srp	276	367	1660	1293	1552	758	794	510	502	4300	187	4487	26386	14078	-9391	1286	-10677	10677		79	37	24
07/16/95	srp	624	458	1774	1316	1402	501	901	979	432	5211	187	5398	39940	13555	-8156	1544	-9701	9701		99	57	25
07/30/95	srp	359	343	403	59	1501	503	998	837	432	3531	187	3718	52198	12257	-8540	1931	-10471	10471		83	79	31
08/13/95	srp	232	319	381	63	1003	217	786	396	307	2319	187	2506	54734	2536	-30	2704	-2735	2735		78	91	40
08/27/95	srp	102	250	407	157	922	120	802	799	297	2527	187	2714	51674	-3061	5775	3043	2732	-2732		70	95	42
09/10/95	srp	26	249	526	277	930	87	843	957	249	2668	187	2875	56271	4597	-1723	4143	-5866	5866		70	113	61
09/24/95	srp	233	511	690	179	896	149	549	973	229	2822	187	3009	36461	-19810	22818	4344	18474	-18474		63	79	66
10/08/95	srp	354	700	802	101	584	192	393	392	206	2338	187	2525	12615	-23847	26372	1617	24755	-24755		58	29	30
10/22/95	srp	172	579	836	256	1162	269	913	486	189	2866	187	3055	23070	10456	-7401	1362	-8763	8763		65	54	31
11/05/95	srp	119	589	771	183	1186	307	859	313	181	2551	187	2738	21928	-1143	3881	2398	1483	-1483		63	52	58
11/19/95	srp	223	668	854	186	1264	339	926	114	167	2622	187	2809	18416	-3512	6321	1598	4722	-4722		67	43	46
12/03/95	srp	404	696	831	135	1311	433	877	419	169	3134	187	3321	15290	-3126	6446	2305	4141	-4141		65	34	56
12/17/95	srp	595	780	1443	663	2371	1413	958	1806	175	6392	187	6579	14304	-986	7565	1350	6215	-6215		65	27	40
12/31/95	srp	502	621	1343	722	2305	1474	831	0	175	4324	187	4511	12371	-1933	8444	564	5880	-5880		75	21	24
01/14/96	srp	451	592	1237	645	3710	2830	880	704	296	6398	187	6585	10588	-1783	8368	1315	7053	-7053		76	17	19
01/28/96	srp	543	598	1304	706	3176	1704	1472	1465	296	6785	187	6972	8378	-2210	9162	1384	7796	-7796		75	13	15
02/11/96	srp	673	773	1669	896	7072	4195	2877	1484	573	11471	187	11658	5993	-2385	14044	1493	12551	-12551		85	9	11
02/25/96	srp	642	833	1722	889	12090	7445	4645	2083	649	17165	187	17352	5354	-639	17991	1685	16306	-16306		81	8	9
03/10/96	srp	413	864	1577	713	5784	3722	2063	1923	1022	10720	187	10907	6155	801	10106	1171	8935	-8935		69	9	7
03/24/96	srp	195	876	1551	674	4850	2672	2179	1018	1172	8786	187	8973	6177	21	8951	790	8161	-8161		72	9	6
04/07/96	srp	254	931	1775	844	4095	1889	2206	452	1043	7818	187	7805	10408	4231	3573	486	3087	-3087		75	15	8
04/21/96	srp	379	832	1605	773	3706	1515	2191	569	913	7171	187	7358	13271	2863	4495	812	3683	-3683		70	16	11
05/05/96	srp	475	820	1524	704	3669	1659	2211	1323	773	7966	187	8153	11319	-1952	10105	1097	9007	-9007		66	16	10
05/19/96	srp	564	999	1905	906	3210	1478	1733	1070	522	7270	187	7457	8866	-2453	9910	771	9139	-9139		68	12	9
06/02/96	srp	418	889	1768	879	4367	2220	2167	1392	526	8490	187	8677	6947	-1919	10596	1038	9559	-9559		67	10	8
06/16/96	srp	228	807	1234	627	2477	899	1578	804	555	5097	187	5284	6701	-246	5531	774	4756	-4756		79	10	9
06/30/96	srp	173	563	1000	437	1862	610	1251	671	555	4259	187	4446	6781	80	4366	638	3728	-3728		79	10	8
07/14/96	srp	526	541	410	-131	1137	335	801	741	466	3280	187	3467	6778	-3	3469	462	3007	-3007		72	11	6
07/28/96	srp	938	530	483	-47	1048	159	888	373	466	3306	187	3493	13072	6293	-2799	620	-3419	3419		85	24	9
08/11/96	srp	666	529	894	365	1020	96	924	465	352	3417	187	3604	39293	26221	-22617	2278	-24895	24895		86	78	35
08/25/96	srp	438	497	792	295	1014	104	910	413	321	2978	187	3165	32651	-6642	9807	3384	6422	-6422		80	71	55
09/08/96	srp	320	560	898	338	1005	147	858	368	279	2870	187	3057	37010	4360	-1302	4539	-5841	5841		74	89	70
09/22/96	srp	364	883	1297	414	1234	220	1014	506	247	3650	187	3837	24068	-12942	16779	3882	12897	-12897		74	61	65
10/06/96	srp	250	855	1195	340	1288	258	1030	663	225	3620	187	3807	24144	75	3732	3420	312	-312		73	64	58
10/20/96	srp	265	996	1256	260	1354	303	1051	315	195	3385	187	3572	23606	-538	4110	3421	689	-689		75	63	73
11/03/96	srp	335	946	1292	346	1391	356	1035	745	190	3954	187	4140	11695	-11911	16051	1420	14632	-14632		68	30	40
11/17/96	srp	473	1095	1525	430	1336	409	926	0	172	3505	187	3692	11960	265	3407	1010	2397	-2397		74	30	26
12/01/96	srp	838	1283	1802	519	2086	1024	1063	1424	172	6122	187	6309	13592	1612	4697	805	3892	-3892		76	29	27
12/15/96	srp	637	1325	2598	1273	3214	1784	1430	2081	180	8710	187	8897	16001	2409	6488	1516	4972	-4972		83	30	29
12/29/96	srp	714	1540	3092	1552	3171	1536	1634	401	180	7557	187	7744	20776	4775	2970	1932	1037	-1037		94	36	33
01/12/97	srp	614	1103	1985	881	14885	12459	2426	2298	286	20068	187	20255	29506	8731	11524	7459	4065	-4065		89	43	40
01/26/97	srp	674	1119	1943	824	4431	2905	1526	2093	304	9445	187	9632	31419	1913	7719	10079	-2360	2360		66	50	46
02/09/97	srp	609	1184	1830	646	5089	3275	1814	2255	553	10335	187	10522	15809	-15610	26132	7076	19057	-19057		64	25	41
02/23/97	srp	410	1299	1381	82	4111	2324	1787	1247	691	7841	187	8028	5610	-10199	18227	1595	16632	-16632		67	9	15
03/09/97	srp	331	1275	1554	278	3304	1548	1756	611	1021	6821	187	7008	6835	1225	5782	872	4910	-4910		72	11	10

		Load Sources (kg)																		Concentrations in ppb		
week	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	Willamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
03/23/97	srp	279	1196	1826	630	3341	1539	1801	0	1205	6650	187	6837	8441	1606	5232	715	4517	-4517		75	13	11
04/06/97	srp	228	1115	1991	876	3669	1697	1972	0	1091	6978	187	7165	8775	334	6831	632	6199	-6199		71	13	10
04/20/97	srp	271	984	1735	751	2852	1199	1654	0	939	5797	187	5984	12483	3708	2277	476	1801	-1801		71	18	10
05/04/97	srp	352	856	1399	544	4222	2310	1912	1554	824	6351	187	6538	16630	4147	4390	1664	2727	-2727		62	23	14
05/18/97	srp	600	752	1229	476	3506	1639	1867	972	536	6843	187	7030	17749	1119	5911	1568	4343	-4343		70	25	18
06/01/97	srp	745	696	1073	377	2503	1166	1337	765	539	5624	187	5811	14579	-3170	8981	1328	7654	-7654		74	21	19
06/15/97	srp	732	663	826	163	1754	887	868	374	570	4257	187	4444	11173	-3406	7850	702	7148	-7148		70	16	12
06/29/97	srp	652	663	649	-15	1282	428	854	497	570	3650	187	3836	15221	4048	-211	553	-765	765		72	23	8
07/13/97	srp	624	657	991	333	1217	205	1012	90	485	3407	187	3594	30117	14896	-11302	1166	-12471	12471		79	49	17
07/27/97	srp	610	598	994	396	1102	110	991	257	479	3441	187	3628	51865	21748	-18120	3114	-21234	21234		82	90	52
08/10/97	srp	641	585	1068	483	1138	137	1002	0	372	3240	187	3427	49220	-2645	6072	4101	1971	-1971		83	90	81
08/24/97	srp	621	651	1030	379	1056	136	919	492	330	3528	187	3715	61054	11834	-8119	7232	-15351	15351		76	119	110
09/07/97	srp	650	742	1133	390	1083	164	929	75	292	3233	187	3420	26329	-34726	38145	7986	30159	-30159		78	54	136
09/21/97	srp	712	945	1334	388	1258	282	976	14	254	3572	187	3759	23919	-2410	6169	3206	2963	-2963		76	49	66
10/05/97	srp	672	892	1209	317	1227	276	950	136	233	3476	187	3663	21544	-2375	6038	3022	3016	-3016		73	44	73
10/19/97	srp	667	933	1200	267	1294	314	980	87	194	3442	187	3629	19714	-1830	5459	1924	3535	-3535		71	40	49
11/02/97	srp	659	955	1232	276	1325	359	986	443	190	3849	187	4036	18773	-940	4976	1744	3232	-3232		69	37	41
11/16/97	srp	659	1005	1304	300	1390	430	980	0	171	3524	187	3711	17945	-828	4540	1572	2967	-2967		72	35	38
11/30/97	srp	667	1076	1403	327	1555	496	1059	157	171	3952	187	4139	17372	-573	4711	1311	3400	-3400		71	32	35
12/14/97	srp	661	1107	1456	350	1628	499	1129	0	179	3925	187	4112	16276	-1097	5209	1329	3880	-3880		73	29	32
12/28/97	srp	629	1058	1418	360	1507	439	1018	265	179	3997	187	4184	14826	-1450	5634	1675	3959	-3959		72	26	29
01/11/98	srp	619	1075	1455	380	1524	541	983	0	276	3873	187	4060	13869	-957	5017	1019	3998	-3998		75	24	26
01/25/98	srp	607	1113	1516	403	3279	1779	1500	1196	302	8900	187	7087	13509	-360	7446	1406	6040	-6040		67	21	23
02/08/98	srp	575	1111	1527	417	4327	2303	2024	1511	522	8463	187	8650	11659	-1850	10500	2907	7593	-7593		67	18	20
02/22/98	srp	543	1108	1538	430	3244	1364	1880	1071	687	7062	187	7269	10161	-1498	8767	1588	7180	-7180		70	16	17
03/08/98	srp	512	1105	1547	442	3579	1810	1769	768	979	7404	187	7591	8456	-1705	9297	1450	7846	-7846		73	13	14
03/22/98	srp	478	989	1490	501	3324	1755	1570	0	1196	6491	187	6678	4447	-4009	10687	612	10075	-10075		74	8	10
04/05/98	srp	442	858	1575	717	5443	3402	2041	1346	1104	9910	187	10097	5433	987	9110	1055	8055	-8055		61	8	7
04/19/98	srp	317	695	1739	844	3864	1949	1915	380	934	7233	187	7420	5443	10	7410	606	6803	-6803		63	8	6
05/03/98	srp	193	862	1460	598	3613	1799	1814	0	848	6114	187	6301	9014	3570	2730	307	2423	-2423		66	12	6
05/17/98	srp	275	833	1410	577	5540	3473	2066	725	533	8483	187	8670	13701	4688	3982	1497	2486	-2486		59	19	10
05/31/98	srp	369	805	1364	559	5098	3236	1860	728	533	8091	187	8278	5548	-8153	16431	1245	15186	-15186		59	8	9
06/14/98	srp	466	783	1294	511	4266	2712	1574	717	567	7332	187	7519	3668	-1880	9379	539	8840	-8840		60	5	5
06/28/98	srp	463	730	930	200	2961	1586	1395	223	567	5163	187	5350	6949	3281	2069	375	1713	-1713		64	10	5
07/12/98	srp	408	665	862	197	1952	846	1106	299	489	4005	187	4196	4226	-2724	6919	431	6489	-6489		66	6	6
07/26/98	srp	335	573	817	244	1416	322	1094	484	476	3526	187	3715	50245	46020	-42304	1948	-44251	44251		70	77	25
08/09/98	srp	288	532	709	177	1249	158	1092	397	391	3023	187	3210	56252	6008	-2798	4404	-7201	7201		72	93	68
08/23/98	srp	254	476	706	230	1107	111	996	465	326	2861	187	3048	35820	-20432	23480	5912	17568	-17568		71	65	80
09/06/98	srp	230	430	866	436	1077	141	936	678	296	3147	187	3334	31220	-4600	7934	5145	2789	-2789		69	61	71
09/20/98	srp	239	562	1107	545	1271	297	975	379	253	3249	187	3436	22239	-8981	12417	3437	8981	-8981		72	46	55
04/14/91	tn	1350	2746	3666	920	3817	8754	-2937	595	6390	17817	11218	29035	629428	-13241	42276	27370	14905	-14905		361	998	1119
04/28/91	tn	1314	2221	3879	1657	3124	7291	-4167	1098	6390	17805	11218	29023	607583	-21843	50866	25611	25255	-25255		373	940	1050
05/12/91	tn	1035	1460	3189	1729	2868	7568	-4700	1390	5306	13789	11218	25007	575313	-32270	57277	30097	27180	-27180		312	887	955
05/26/91	tn	1080	1878	3832	1955	4035	12036	-8001	1812	4792	15352	11218	26571	556789	-18524	43095	21285	21809	-21809		269	834	847
06/09/91	tn	472	967	2361	1394	3177	7506	-4328	1490	4987	12488	11218	23706	469701	-89088	112794	36471	76323	-76323		269	720	727
06/23/91	tn	450	592	1418	826	2330	3967	-1637	1661	5095	10954	11218	22173	729306	259606	-237433	44648	-282082	282082		269	1200	677
07/07/91	tn	445	371	1255	883	2388	4035	-1646	1495	4887	10270	11218	21488	1285574	556266	-534778	91403	-626181	626181		265	2227	1713
07/21/91	tn	459	448	2070	1621	1863	2565	-702	779	4279	9450	11218	20668	1215915	-69659	90327	199970	-109643	109643		330	2346	2885
08/04/91	tn	436	436	2308	1872	1866	2596	-710	1602	3898	10130	11218	21348	1002955	-212960	234306	130206	104103	-104103		285	2122	2196
08/19/91	tn	288	230	1394	1164	1733	2107	-374	1167	2945	7527	11218	18745	991976	-10979	29725	104570	-74845	74845		255	2297	2018

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	Willamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
09/01/91	tn	557	397	1243	846	1826	2202	-376	1302	2697	7825	11218	19044	997496	5822	13522	142007	-128485	128485		232	2571	2385
09/15/91	tn	636	456	1023	567	1874	2215	-342	1209	2273	7015	11218	18233	756901	-240597	258630	110661	148169	-148169		212	2160	2075
09/29/91	tn	857	534	936	403	1935	2595	-660	1506	2273	7509	11218	18727	828442	71541	-52614	95998	-148812	148812		199	2494	2381
10/13/91	tn	916	426	847	221	2206	3634	-1428	411	1767	5946	11218	17164	828853	411	16753	106368	-91612	91612		196	2619	2856
10/27/91	tn	1573	1936	698	-1236	2973	4048	-1075	866	1726	7840	11218	19058	779962	-48891	67949	86208	-18259	18259		200	2434	3108
11/10/91	tn	1992	3535	625	-2710	3817	4605	-788	465	1581	8680	11218	19898	592894	-187068	206966	54715	152251	-152251		232	1715	3741
11/24/91	tn	2526	2678	2809	131	4548	4726	-180	435	1522	11840	11218	23058	441316	-151578	174635	55833	118802	-118802		304	1179	3383
12/08/91	tn	2648	1120	2142	1022	4389	4303	86	670	1564	11412	11218	22631	593431	152114	-129483	40280	-169763	169763		266	1462	2412
12/22/91	tn	1977	737	770	33	3011	2746	265	123	1595	7476	11218	18694	749559	156128	-137434	42131	-179565	179565		200	1748	2306
01/05/92	tn	1325	840	642	-198	1747	1327	419	258	1969	5961	11218	17179	924110	174551	-157372	36486	-193858	193858		153	2029	2195
01/19/92	tn	814	880	882	2	964	435	529	693	2699	6052	11218	17271	1043845	119735	-102464	42047	-144510	144510		144	2171	2143
02/02/92	tn	1012	968	1603	614	1045	510	536	43	3159	6862	11218	18081	1059242	15397	2684	57848	-55165	55165		162	2138	2207
02/16/92	tn	1871	1114	2327	1213	2105	2171	-67	0	5917	12219	11218	23437	735659	-323583	347020	31466	315554	-315554		322	1413	1873
03/01/92	tn	1307	1197	1961	764	3937	2370	1567	0	6258	13464	11218	24682	461439	-274220	298902	4946	293955	-293955		351	834	1504
03/15/92	tn	866	960	2403	1443	5231	2068	3142	190	10691	19380	11218	30599	397404	-64035	94634	3931	90703	-90703		486	676	1297
03/29/92	tn	460	718	989	271	5159	2353	2806	0	10691	17299	11218	28517	539868	142464	-113946	3738	-117685	117685		491	874	1262
04/12/92	tn	502	867	238	-429	3120	1356	1765	1636	8668	14165	11218	25383	614722	74854	-49471	42720	-92191	92191		323	993	1189
04/26/92	tn	2237	1035	520	-515	4963	2914	2049	1719	8330	17759	11218	28988	524060	-90661	119649	49750	69899	-69899		365	851	1106
05/10/92	tn	1103	592	308	-284	2750	1863	887	2035	5779	11975	11218	23193	481150	-42910	66103	52619	13485	-13485		271	817	969
05/24/92	tn	1810	325	769	444	1830	1238	592	1723	4758	10690	11218	22109	745865	264715	-242607	46236	-288842	288842		286	1348	875
06/07/92	tn	2443	206	1065	858	1322	1210	112	1505	4909	11244	11218	22462	1264009	538144	-515682	105571	-621253	621253		347	2550	1629
06/21/92	tn	2779	374	1143	769	1997	1746	251	72	5059	11051	11218	22269	1469024	185015	-162746	147829	-310575	310575		545	3208	3002
07/05/92	tn	2448	1571	2730	1158	4459	2032	2426	695	4770	15100	11218	26319	1140790	-328234	354553	140938	213614	-213614		529	2662	3361
07/19/92	tn	2115	2423	3651	1228	3569	1630	1939	1235	4248	14819	11218	26038	926656	-214132	240170	144516	95654	-95654		438	2286	3904
08/02/92	tn	1149	701	1703	1002	2771	1385	1386	759	4059	10441	11218	21660	759906	-166752	188411	107675	80736	-80736		412	2083	2471
08/16/92	tn	1163	375	1608	1233	2131	1022	1109	1132	2924	8959	11218	20177	614198	-145706	165885	120579	45306	-45306		339	1898	2612
08/30/92	tn	2306	586	2825	2237	1766	1178	588	651	2924	10474	11218	21693	396514	-217684	239377	77177	162199	-162199		447	1361	2114
09/13/92	tn	2536	990	3567	2577	1577	1596	-21	925	2305	10911	11218	22129	345475	-51039	73168	50315	22853	-22853		360	1237	1712
09/27/92	tn	2006	907	3606	2699	1060	1769	-709	142	2257	9072	11218	20290	352986	7511	12779	35180	-22401	22401		326	1305	1513
10/11/92	tn	1013	390	2122	1732	920	2023	-1103	356	1963	6395	11218	17613	231191	-121795	139409	47465	91944	-91944		209	874	1611
10/25/92	tn	629	342	819	477	1450	2147	-697	649	1909	5456	11216	16675	313592	82401	-65727	27807	-93534	93534		156	1147	1307
11/08/92	tn	850	571	1116	545	2143	2518	-374	1737	1779	7625	11218	18843	381877	68285	-49442	23305	-72746	72746		154	1255	1158
11/22/92	tn	1784	706	1716	1006	2524	1613	711	0	1681	7705	11218	18923	360130	-21747	40671	23769	16902	-16902		220	1113	1120
12/06/92	tn	3443	774	2052	1278	5460	1771	3689	813	1716	13483	11216	24701	506992	146863	-124161	26991	-151152	151152		318	1449	1273
12/20/92	tn	1365	731	2738	2008	7237	2101	5137	1960	1761	15062	11218	26280	521416	12424	13857	23993	-10137	10137		310	1335	1441
01/03/93	tn	964	762	2074	1311	2707	1702	1005	671	2023	8638	11218	19856	504933	-16483	36339	24927	11412	-11412		221	1206	1341
01/17/93	tn	665	791	1986	1195	3128	2269	859	2386	2961	11146	11218	22365	676174	171241	-148876	43225	-192101	192101		212	1498	1479
01/31/93	tn	500	816	3811	2993	6275	4566	1709	343	2961	13910	11218	25129	894275	218101	-192972	39560	-232552	232552		390	1889	1730
02/14/93	tn	350	1007	2317	1310	5269	3857	1431	327	6769	15051	11218	26269	568350	-325925	352194	21048	331146	-331146		395	1121	1643
02/28/93	tn	171	702	2106	1404	4418	4261	157	1080	6769	14545	11218	25763	518918	-51435	77196	23854	53344	-53344		332	951	1571
03/14/93	tn	147	1305	2410	1105	20983	24711	-3728	560	11809	35910	11218	47128	867165	350250	-303121	12582	-315703	315703		620	1447	1596
03/28/93	tn	6359	3356	6707	3351	112214	111548	666	3592	11809	140881	11218	151900	563895	-303270	455170	151096	304074	-304074		652	625	1099
04/11/93	tn	1158	2519	6262	3762	80892	50555	30137	6145	9760	104037	11218	115255	604600	40705	74551	143717	-69166	69166		516	862	796
04/25/93	tn	2680	1099	6776	5677	51796	30402	21395	3412	9202	73868	11218	85086	390308	-214292	299378	96831	202547	-202547		531	551	787
05/09/93	tn	4465	2205	9008	6804	46908	40321	6587	2548	6665	71595	11218	82813	374804	-15505	96318	79831	16487	-16487		583	521	754
05/23/93	tn	1496	682	3688	3006	24714	18094	6621	2559	5256	37714	11218	48932	352040	-22783	71695	52088	19608	-19608		342	490	535
06/06/93	tn	5243	1230	6410	5180	21122	15532	5590	4738	5398	42912	11218	54130	509501	157461	-103330	82166	-185496	185496		341	697	756
06/20/93	tn	2447	1460	2597	1137	23227	17264	5963	1534	5588	35393	11218	46611	1186648	679147	-632536	89177	-721713	721713		444	1652	1151
07/04/93	tn	757	3186	17075	13908	8306	8321	-13	1792	5332	33263	11218	44482	1637163	448515	-404033	214429	-618462	618462		672	2422	2929
07/18/93	tn	2478	2448	15863	13415	3241	6490	-3249	1528	4693	27802	11218	39020	1360700	-276463	315483	317759	-2276	2276		659	2175	4468

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	William-son R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
08/01/93	tn	776	251	1281	1030	1537	1063	474	1976	4568	10158	11218	21377	1139956	-220744	242121	123371	118749	-118749		235	1925	2113
08/15/93	tn	2343	391	960	569	1131	503	626	742	3230	8405	11218	19624	916181	-223775	243399	144721	98678	-98678		268	1700	2091
08/29/93	tn	2607	696	2050	1354	2855	1770	1085	1023	3230	11965	11218	23183	922326	6145	17038	111089	-94051	94051		312	1788	2228
09/12/93	tn	916	590	1077	487	3803	2079	1724	1944	2596	10337	11218	21556	868967	-53359	74915	126533	-51618	51618		250	1852	1769
09/26/93	tn	827	654	1140	475	3864	2251	1613	1285	2493	9609	11218	20827	550462	-318505	339332	70177	269155	-269155		239	1251	1208
10/10/93	tn	770	946	1114	167	2558	1902	657	1191	1950	7582	11218	18801	401519	-148943	167744	35655	132089	-132089		174	949	883
10/24/93	tn	828	688	902	214	1555	1425	130	2391	1733	7409	11218	18626	396999	-2520	21148	42210	-21062	21062		129	909	1205
11/07/93	tn	495	779	556	-220	2050	1293	757	1013	1630	5747	11218	16965	367726	-31273	48238	48139	99	-99		131	830	1278
11/21/93	tn	339	717	550	-167	1784	1070	694	322	1528	4502	11218	15720	413846	46120	-30400	44310	-74711	74711		126	930	1255
12/05/93	tn	326	803	734	-69	1167	647	520	1396	1552	5176	11218	16395	531410	117564	-101169	45876	-147045	147045		121	1173	1210
12/19/93	tn	1060	1322	1585	263	1611	1286	325	1671	1599	7527	11218	18745	501168	-30242	48987	46914	2073	-2073		144	1070	1117
01/02/94	tn	1385	1293	1353	60	1993	1629	364	402	1757	6891	11218	18109	452752	-48417	66526	43045	23482	-23482		185	966	1017
01/16/94	tn	1674	1547	1550	3	2621	2499	122	1851	2707	10403	11218	21621	418420	-34332	55953	35092	20861	-20861		200	863	912
01/30/94	tn	1527	1527	1427	-99	3077	2876	201	645	2707	9363	11218	20801	466600	48181	-27580	10515	-38094	38094		229	904	838
02/13/94	tn	315	821	751	-70	3072	1717	1355	0	5900	10038	11218	21256	543906	77306	-56050	8066	-64116	64116		303	997	1009
02/27/94	tn	136	604	1055	451	1902	929	973	62	6145	9300	11218	20519	426660	-117047	137565	6147	131418	-131418		265	736	857
03/13/94	tn	909	734	1014	281	4199	2944	1255	0	10395	16517	11218	27735	341668	-85192	112927	4383	108544	-108544		366	556	612
03/27/94	tn	662	1245	1422	177	9617	2580	7038	317	10722	22740	11218	33959	365953	24285	9674	6080	3593	-3593		530	568	567
04/10/94	tn	264	2702	3828	1126	8318	3535	4783	744	9031	22184	11218	33402	349853	-16100	49502	20524	28977	-28977		450	531	761
04/24/94	tn	128	1547	2508	961	7791	2589	5202	1256	8354	20037	11218	31256	320690	-28963	60219	33498	26720	-26720		413	493	713
05/08/94	tn	22	804	818	14	4541	2653	1887	1731	6307	13218	11218	24437	287111	-33780	58217	19212	39004	-39004		301	441	550
05/22/94	tn	91	802	490	-312	3875	2578	1298	1288	4772	10516	11218	21735	384168	97057	-75322	14161	-89484	89484		312	590	536
06/05/94	tn	139	362	320	-42	1377	1878	-501	1778	4879	8492	11218	19710	687883	303716	-284006	35225	-319231	319231		242	1101	787
06/19/94	tn	792	514	1085	571	1830	2081	-252	2039	5073	10619	11218	22038	1553979	866098	-844058	112869	-956927	956927		276	2662	1844
07/03/94	tn	566	453	785	331	1716	1519	197	2262	4699	10228	11218	21446	1199564	-354415	375661	100786	275075	-275075		266	2289	1359
07/17/94	tn	1141	228	795	567	1049	1388	-339	1249	4261	8495	11218	19714	988500	-211064	230778	166969	63808	-63808		312	2178	2336
07/31/94	tn	2534	519	1318	799	3707	1998	1709	1345	4261	13165	11218	24383	818525	-169975	194358	136397	57961	-57961		460	2075	2204
08/14/94	tn	3313	781	868	87	4031	1731	2300	707	2932	11851	11218	23069	595261	-223264	246333	102549	143784	-143784		489	1771	1703
08/28/94	tn	2703	1637	1188	-449	2079	1706	373	1409	2932	10312	11218	21530	392765	-202497	224027	94930	129097	-129097		333	1380	1537
09/11/94	tn	1675	443	1004	561	1458	1554	-96	1679	2407	8223	11218	19442	341419	-51346	70787	82411	-11624	11624		247	1404	1409
09/25/94	tn	1567	288	1079	791	2165	2023	142	704	2264	7779	11218	18996	329517	-11902	30899	43899	-12999	12999		268	1436	1484
10/09/94	tn	1976	402	754	352	1355	1297	58	74	2006	6165	11218	17383	306918	-22599	39982	34280	5702	-5702		205	1369	1423
10/23/94	tn	1209	927	1314	387	3491	1368	2124	357	1862	8234	11218	19452	348555	41637	-22185	30493	-52677	52677		238	1527	1382
11/06/94	tn	2266	746	1068	322	2532	1106	1426	0	1787	7633	11218	18852	357341	8786	10066	30348	-20282	20282		223	1469	1575
11/20/94	tn	2302	454	578	124	1512	1182	330	12	1641	6044	11218	17262	355151	-2190	19452	23801	-4349	4349		169	1289	1491
12/04/94	tn	1138	569	642	72	3647	688	2959	0	1663	7090	11218	18308	481821	126670	-108362	20231	-128592	128592		201	1560	1471
12/18/94	tn	497	513	1315	802	2811	1876	932	934	1719	7275	11218	18493	434952	-46868	65362	22269	43093	-43093		178	1297	1502
01/01/95	tn	929	891	1709	818	2933	2400	533	110	1804	7485	11218	18703	486269	51337	-32634	20667	-53301	53301		216	1354	1303
01/15/95	tn	909	1470	2375	906	10741	12167	-1426	2458	2909	19393	11218	30612	433016	-53273	83885	14967	68918	-68918		312	1022	1283
01/29/95	tn	41	1789	2585	796	26258	20001	6258	986	2909	32780	11218	43998	425262	-7754	51752	13574	38178	-38178		626	894	936
02/12/95	tn	42	3931	4829	898	26323	26691	-368	3894	6077	41166	11218	52384	582222	156960	-104576	8546	-113122	113122		389	1010	963
02/26/95	tn	1020	2884	1855	-1029	20045	11815	8230	1445	6606	30971	11218	42189	644462	62240	-20051	8781	-28832	28832		545	1030	919
03/12/95	tn	2273	4045	2294	-1751	29685	20926	8959	1052	10621	46325	11218	57544	445927	-196535	256079	6286	249793	-249793		676	643	813
03/26/95	tn	3298	1548	4924	3376	52181	46643	5538	2355	11524	74282	11218	85500	453972	8045	77455	109455	-31999	31999		567	849	830
04/09/95	tn	1733	541	4936	4395	40299	22373	17926	618	9688	57472	11218	68690	486576	32604	36087	69350	-33264	33264		674	689	870
04/23/95	tn	516	888	2554	1666	55510	35549	19961	1793	6979	69351	11218	80570	510702	24127	56443	74687	-18244	18244		614	708	781
05/07/95	tn	1872	1406	2718	1309	32455	21061	11394	2176	7054	46275	11218	57493	533724	23022	34471	53815	-19344	19344		450	724	676
05/21/95	tn	2780	1223	3324	2102	27046	22026	5020	3079	5129	41349	11218	52568	597989	64264	-11697	89020	-100717	100717		367	832	754
06/04/95	tn	4192	656	5184	4528	14978	14934	44	618	5221	30394	11218	41612	875286	277298	-235686	59525	-295211	295211		378	1201	1022
06/18/95	tn	6236	522	6093	5571	9575	6770	2804	18	5453	27375	11218	38594	1625292	750008	-711412	67606	-779020	779020		434	2211	1423

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	Willamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
07/02/95	tn	2090	1245	4078	2833	9234	6015	3219	1139	5328	21869	11218	33087	1905385	280093	-247008	117721	-364727	364727		382	2636	2167
07/16/95	tn	2796	2214	4380	2166	6305	4059	2246	2187	4579	20247	11218	31466	1813870	-291515	322961	162521	160459	-160459		364	2317	2580
07/30/95	tn	1598	1090	512	-578	3229	3844	-615	1869	4579	11788	11218	23006	1463122	-150748	173754	168770	4984	-4984		277	2222	2729
08/13/95	tn	1037	1944	500	-1444	2286	2629	-343	883	3254	7960	11218	19178	1466431	3309	15869	198084	-182215	182215		266	2443	2926
08/27/95	tn	455	1788	1250	-538	1492	1521	-29	1783	3152	8132	11218	19350	1573928	107497	-88147	178212	-266359	266359		224	2891	2457
09/10/95	tn	115	451	1370	920	2363	1686	677	2137	2638	8625	11218	19843	1456618	-117310	137153	205528	-68375	68375		224	2930	3003
09/24/95	tn	935	333	1255	923	2451	2237	214	2172	2433	9247	11218	20465	1132070	-324548	345013	196278	148735	-148735		205	2464	2984
10/08/95	tn	1005	439	1911	1473	2400	2310	89	878	2191	8384	11218	19602	938645	-193425	213027	170470	42558	-42558		208	2153	3140
10/22/95	tn	202	463	1232	769	1790	1633	157	1090	2010	6324	11218	17542	813515	-125130	142672	98595	44077	-44077		144	1905	2256
11/05/95	tn	111	466	584	118	1000	1076	-76	896	1924	4318	11218	15536	679611	-133904	149440	89434	60006	-60006		107	1613	1676
11/19/95	tn	403	503	846	343	1020	1292	-272	255	1770	4295	11218	15513	771410	91799	-76286	64925	-141210	141210		110	1797	1879
12/03/95	tn	1553	593	1478	885	1283	1918	-636	936	1788	7038	11218	18256	966241	194831	-176575	93947	-270521	270521		148	2176	2300
12/17/95	tn	3472	1262	3391	2109	8404	10548	-2144	4038	1855	21158	11218	32376	1202587	236346	-203969	80606	-284575	284575		214	2270	2369
12/31/95	tn	3941	1820	3742	1921	13265	13385	-120	0	1855	22802	11218	34021	1069479	-133108	167129	48115	119014	-119014		397	1850	2037
01/14/96	tn	4377	3419	3937	518	25782	28321	-2559	1572	3139	36787	11218	50005	1040910	-28569	78574	120155	-41581	41581		463	1699	1767
01/28/96	tn	6037	6424	4683	-1742	18171	18013	2159	3272	3139	35302	11218	46521	989630	-51280	97801	148007	-50206	50206		393	1569	1634
02/11/96	tn	9912	10764	6777	-3987	32470	34998	-2528	3314	6060	58552	11218	69771	928948	-60682	130453	197838	-67385	67385		434	1439	1507
02/25/96	tn	21277	2986	7587	4601	70698	72253	-1355	4606	6882	111250	11218	122468	769667	-159281	281749	256699	25049	-25049		526	1150	1306
03/10/96	tn	11003	2917	5688	2771	51878	46728	5149	4294	10548	63712	11218	94930	519251	-250416	345346	154671	190475	-190475		539	774	992
03/24/96	tn	3989	2329	5430	3102	41263	30136	11127	2272	12435	65389	11218	76608	355455	-163795	240403	76167	164236	-164236		538	532	615
04/07/96	tn	3707	1881	7904	6023	33259	17737	15522	1009	11062	56941	11218	68159	427396	71940	-3781	31849	-35630	35630		561	607	517
04/21/96	tn	3731	1635	30468	28833	40110	11917	28193	1269	9669	85267	11218	96485	572357	144961	-48476	45792	-94268	94268		631	791	599
05/05/96	tn	2705	1140	16457	15317	30546	11633	18913	2955	8205	60867	11218	72086	537247	-35110	107196	90609	16587	-16587		503	741	811
05/19/96	tn	1811	785	2688	1903	17351	10722	6630	2389	5534	29774	11218	40992	480785	-56462	97454	61663	35791	-35791		279	652	716
06/02/96	tn	1453	1126	2455	1330	20749	17213	3535	3108	5584	33349	11218	44568	537464	56679	-12111	80134	-92246	92246		264	738	638
06/16/96	tn	1051	1155	1885	730	8301	5724	2577	1348	5884	18489	11218	29688	725653	188189	-158501	65080	-223581	223581		285	1056	734
06/30/96	tn	1105	1157	1965	808	6565	4686	1879	1496	5884	17017	11218	28235	878102	152449	-124214	72794	-197008	197008		316	1350	913
07/14/96	tn	2401	801	923	121	3182	3708	-526	1854	4941	13101	11218	24320	1004196	126099	-101777	121990	-223767	223767		287	1673	1881
07/28/96	tn	3670	916	1162	246	2450	2048	402	834	4941	13057	11218	24276	1060469	56271	-31995	132656	-164652	164652		337	1930	1895
08/11/96	tn	3016	1246	2217	971	3233	1932	1301	1084	3731	13281	11218	24500	1099737	39268	-14788	133998	-148764	148764		334	2184	2046
08/25/96	tn	2380	830	1638	808	2240	1845	394	923	3401	10581	11218	21799	1067769	-11968	33767	142428	-108659	108659		285	2363	2297
09/08/96	tn	1946	790	1361	571	2736	1911	825	821	2958	9822	11218	21040	777111	-310658	331696	159379	172319	-172319		254	1859	2473
09/22/96	tn	1918	882	2553	1670	4027	2248	1779	1135	2625	12258	11218	23476	872388	95277	-71800	211155	-282955	282955		248	2193	3506
10/06/96	tn	1052	754	2381	1627	3932	2173	1759	1480	2386	11231	11218	22449	901790	29402	-6953	233054	-240007	240007		226	2378	3972
10/20/96	tn	817	1062	1779	696	2506	2190	316	703	2066	7872	11218	19090	888751	-13039	32129	122678	-90548	90548		175	2389	2624
11/03/96	tn	770	869	1268	398	1831	1813	18	1664	2014	7546	11218	18765	806952	-81799	100564	64005	36559	-36559		130	2062	1783
11/17/96	tn	1352	1262	1432	169	1705	1523	183	0	1620	6309	11218	17528	886010	79059	-61531	71407	-132938	132938		134	2188	1835
12/01/96	tn	3317	3259	4206	947	5242	4674	569	3179	1826	17770	11218	28989	1074056	188048	-159059	61545	-220604	220604		222	2313	2084
12/15/96	tn	4862	6596	13270	6674	19006	17062	1943	4647	1907	43692	11218	54910	1246876	172818	-117906	123449	-241357	241357		416	2328	2343
12/29/96	tn	6291	6696	13972	7275	23876	13382	10494	895	1907	46941	11218	58159	972697	-274179	332339	118011	214327	-214327		581	1687	2013
01/12/97	tn	5578	2246	5618	3370	109359	75790	33570	5131	3039	126724	11218	139942	976185	3489	136454	279537	-143084	143084		443	1410	1486
01/26/97	tn	5017	2107	4863	2756	32485	18515	13970	4673	3226	50266	11218	61484	796805	-177361	238965	295708	-56843	56843		351	1270	1347
02/09/97	tn	4140	2408	3580	1171	44364	25344	19020	5035	5864	82962	11218	74201	670673	-127932	202132	202703	-570	570		368	1069	1186
02/23/97	tn	3245	2591	3017	426	39901	18555	21347	2785	7328	56277	11218	67495	541696	-129176	196671	108103	88568	-88568		478	848	966
03/09/97	tn	2169	2141	3094	953	30754	12430	18325	1364	10636	46218	11218	59436	394565	-147133	206569	76008	130561	-130561		510	612	843
03/23/97	tn	1253	1468	3032	1564	26511	12359	16152	0	12785	45580	11218	56799	311910	-82655	139453	45282	94171	-94171		514	469	675
04/06/97	tn	609	878	2554	1677	28700	13581	15109	0	11575	43439	11218	54657	377381	65471	-10814	33447	-44260	44260		443	551	512
04/20/97	tn	606	690	1733	1043	22365	9334	13031	0	9962	34666	11218	45884	391701	14320	31564	23478	8086	-8086		426	551	500
05/04/97	tn	782	606	1038	431	34046	17350	16696	3470	8741	48077	11218	59296	381962	-9739	69035	34023	35011	-35011		356	531	286
05/18/97	tn	1583	941	1270	329	23092	11226	11864	2171	5690	33606	11218	45025	492327	110364	-65339	32042	-97381	97381		347	686	366

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	Willam-son R.	Sprague R.	Willamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet .	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
06/01/97	tn	2206	1003	1332	329	12957	7399	5557	1706	5716	23921	11218	35140	1008726	516401	-481262	88046	-569308	569308		315	1428	1241
06/15/97	tn	2307	895	813	119	7825	5426	2399	835	6050	17831	11218	29049	1540405	531677	-502828	181782	-684390	684390		292	2212	2853
06/29/97	tn	2179	530	496	-34	3154	2378	776	1109	6050	12987	11218	24206	1437642	-102763	126969	261342	-134374	134374		257	2191	3651
07/13/97	tn	2210	1011	730	-281	2750	1983	767	200	5150	11040	11218	22258	1515394	77752	-55494	209651	-265145	265145		257	2487	3022
07/27/97	tn	2283	996	1247	251	2422	1666	757	574	5081	11606	11218	22825	1370647	-144547	167372	123666	43706	-43706		276	2368	2064
08/10/97	tn	2534	965	1297	312	2411	1865	546	0	3949	10192	11218	21410	1461199	90552	-68942	130992	-199934	199934		262	2664	2585
08/24/97	tn	2590	744	962	218	2186	1558	628	1099	3497	10333	11218	21552	1209838	-251361	272913	186878	84034	-84034		222	2349	2680
09/07/97	tn	2853	863	777	113	2228	1636	592	166	3098	9122	11218	20341	1030340	-179496	199839	151182	48657	-48657		221	2115	2581
09/21/97	tn	3290	1042	857	-185	3152	2152	1000	31	2699	10029	11218	21247	1011133	-19207	40454	94777	-54322	54322		214	2065	2538
10/05/97	tn	3257	1270	811	-459	3782	1506	2276	304	2469	10823	11218	21841	1013563	2430	19411	87753	-68342	68342		223	2077	2124
10/19/97	tn	3397	1500	865	-734	4734	1187	3548	195	2055	11247	11218	22465	1023680	10117	12348	77141	-64792	64792		233	2080	1945
11/02/97	tn	3518	1686	1109	-578	5296	1552	3736	969	2020	12034	11218	24152	1039156	15476	8676	81129	-72453	72453		233	2067	1922
11/16/97	tn	3692	1779	1420	-359	5963	2221	3742	0	1810	12685	11218	24104	1064421	25285	-1161	79543	-80705	80705		264	2054	1936
11/30/97	tn	3911	1911	1777	-134	7140	2925	4215	351	1810	14968	11218	26206	1111032	46611	-20405	72177	-92581	92581		270	2040	1950
12/14/97	tn	4055	1973	2087	114	7949	3245	4705	0	1897	15887	11218	27206	1130419	19387	7819	81132	-73313	73313		296	2027	1965
12/28/97	tn	4038	1891	2251	360	7800	3447	4353	591	1897	16577	11218	27795	1128030	-2389	30184	112876	-82691	82691		297	2014	1978
01/11/98	tn	4153	1927	2526	599	8354	4087	4267	0	2928	17962	11218	29180	1168219	40189	-11009	77398	-88407	88407		348	2001	1992
01/25/98	tn	4288	2365	3206	841	21732	15119	6613	2670	3210	35106	11218	46325	1042184	-126035	172360	109289	63071	-63071		341	1823	1778
02/08/98	tn	4207	3132	4184	1032	35594	21436	14158	3375	5540	52880	11218	64098	767977	-274207	338305	205372	132933	-132933		419	1207	1440
02/22/98	tn	3481	1917	2991	1074	23537	9603	13934	2392	7286	39669	11218	50887	508183	-259814	310702	92351	218351	-218351		394	780	1007
03/08/98	tn	2959	789	2306	1520	22583	9672	12910	1759	10389	39997	11218	51216	473157	-35006	86222	72367	13855	-13855		393	721	715
03/22/98	tn	3226	1970	4442	2471	29158	13787	15390	0	12714	49540	11218	60758	462607	-10550	71308	43480	27828	-27828		566	676	705
04/05/98	tn	3452	2746	5198	2452	62660	35687	26973	3007	11712	86029	11218	97247	379291	-83316	180563	95857	84706	-84706		527	548	619
04/19/98	tn	2837	1184	2739	1555	40643	18917	21926	849	9907	57175	11218	68394	338871	-40421	106814	54702	54112	-54112		496	488	536
05/03/98	tn	1736	1121	2591	1470	36372	16029	20343	0	8997	49695	11218	60914	382908	44037	16676	29198	-12320	12320		534	530	560
05/17/98	tn	1934	1275	2439	1164	51318	28927	22392	1619	5659	62969	11218	74187	469368	86460	-12273	92362	-104635	104635		438	650	626
05/31/98	tn	1968	1425	2292	867	43308	25270	18038	1625	5659	54872	11218	66090	607202	137833	-71743	97312	-169055	169055		400	831	736
06/14/98	tn	1926	1590	2125	535	32852	19741	13111	1602	6016	44521	11218	55740	797686	190485	-134745	94749	-229494	229494		364	1094	850
06/28/98	tn	2004	1750	1820	-130	20272	10771	9501	497	6016	30410	11218	41628	1073779	276093	-234464	73266	-307730	307730		375	1464	1033
07/12/98	tn	1997	1784	1838	54	12521	5637	6885	667	5190	22213	11218	33431	1720794	647015	-613584	147416	-761000	761000		375	2471	2153
07/26/98	tn	1829	1291	1928	637	9127	3693	5434	1081	5052	19018	11218	30236	1243953	-476841	507077	206095	298982	-298982		375	1915	2684
08/09/98	tn	1737	1018	1485	466	5516	2621	2695	887	4040	13665	11218	24883	1094786	-149157	174050	127736	46314	-46314		324	1804	1960
08/23/98	tn	1684	715	1524	810	3023	2137	886	1039	3477	10747	11218	21966	962928	-131858	153824	137110	16714	-16714		267	1737	1862
09/06/98	tn	1528	486	2483	1994	2456	1720	736	1514	3137	11118	11218	22336	851247	-311681	334017	110390	223627	-223627		244	1273	1533
09/20/98	tn	1303	574	3879	3005	3014	2317	697	845	2684	11725	11218	22944	846606	-4640	27583	119605	-92021	92021		262	1345	1922
04/14/91	tin	355	2157	2536	379	829	486	143	283	1550	5353	11218	16572	138194	20063	-3491	8200	-11691	11691		96	219	335
04/28/91	tin	346	1479	2248	770	515	525	-10	283	1550	4943	11218	16161	161632	23438	-7277	7889	-15166	15166		87	250	323
05/12/91	tin	272	745	1588	844	473	545	-72	862	960	3978	11218	15195	117483	-44149	39344	8365	30980	-30980		71	161	265
05/26/91	tin	284	874	1673	799	665	867	-202	769	685	4276	11218	15495	69960	-47523	63017	3788	59229	-59229		61	104	151
06/09/91	tin	124	446	846	400	524	541	-17	710	921	3126	11218	14344	33356	-36605	50949	1872	49077	-49077		53	51	37
06/23/91	tin	119	196	315	119	384	286	98	792	941	2551	11218	13769	24387	-8969	22738	5132	17607	-17607		47	40	78
07/07/91	tin	117	43	140	97	394	291	103	713	868	2229	11218	13448	29525	5138	8310	8672	-362	362		43	51	162
07/21/91	tin	121	73	326	255	307	185	122	371	790	1917	11218	13135	43638	14113	-978	16755	-17733	17733		54	84	242
08/04/91	tin	115	79	381	302	311	187	124	764	720	2291	11218	13509	55403	11766	1744	19386	-17642	17642		47	117	327
08/18/91	tin	76	37	181	143	286	152	134	556	544	1642	11218	12861	64897	9494	3367	21319	-17952	17952		42	150	411
09/01/91	tin	147	57	109	52	301	159	142	620	535	1712	11218	12930	71140	6242	6688	29397	-22709	22709		38	183	494
09/15/91	tin	167	65	121	56	309	160	149	576	420	1593	11218	12812	75815	4676	8136	30621	-22486	22486		37	216	574
09/29/91	tin	226	81	154	73	319	167	152	716	420	1637	11218	13055	62849	7033	6022	26565	-20543	20543		36	249	659
10/13/91	tin	238	131	159	29	354	262	92	196	326	1274	11218	12492	89407	6558	5934	28023	-22089	22089		38	282	739
10/27/91	tin	379	1458	161	-1297	393	292	101	414	319	1666	11218	12885	101093	11686	1198	22881	-21682	21682		36	316	825

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	William-son R.	Sprague R.	Willamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
11/10/91	tin	444	2906	139	-2767	420	332	88	222	292	1516	11218	12734	120469	19378	-8642	13182	-19824	19824		37	349	901
11/24/91	tin	521	2069	467	-1602	428	341	87	208	281	1905	11218	13124	157176	36707	-23583	16728	-40311	40311		45	420	1006
12/08/91	tin	535	571	384	-187	412	364	48	319	289	1939	11218	13157	238124	80948	-67791	20230	-88020	88020		40	587	1211
12/22/91	tin	418	190	246	56	352	361	-9	59	295	1369	11218	12587	323609	85485	-72698	22183	-95081	95081		36	754	1215
01/05/92	tin	305	238	330	92	304	375	-71	123	367	1430	11218	12648	419258	95649	-83001	20283	-103284	103284		35	921	1220
01/19/92	tin	192	265	389	124	250	364	-114	330	499	1660	11218	12878	522770	103513	-90634	24035	-114670	114670		35	1087	1225
02/02/92	tin	218	328	377	49	252	404	-152	21	584	1451	11218	12670	549537	26767	-14098	31897	-45995	45995		38	1109	1217
02/16/92	tin	210	537	533	-4	807	437	370	0	1093	2643	11218	13862	244454	-305084	318945	13627	305319	-305319		73	469	811
03/01/92	tin	113	746	371	-376	860	297	563	0	1156	2500	11218	13718	107146	-137308	151026	1604	149422	-149422		81	194	488
03/15/92	tin	41	583	219	-364	623	208	615	90	1975	3148	11218	14367	134832	27486	-13119	1407	-14526	14526		76	229	464
03/29/92	tin	35	378	311	-67	842	340	502	0	1975	3183	11218	14382	156467	21636	-7454	1350	-8804	8804		91	253	456
04/12/92	tin	87	348	192	-157	661	353	308	780	1601	3320	11218	14539	137461	-19006	33545	13535	20010	-20010		58	222	377
04/26/92	tin	134	552	102	-449	414	196	218	820	1539	3006	11218	14227	79912	-57549	71776	16354	55422	-55422		48	130	364
05/10/92	tin	43	308	130	-178	156	58	98	970	1068	2367	11218	13585	54861	-25051	38636	11669	26967	-26967		39	93	215
05/24/92	tin	46	149	110	-39	181	49	133	622	879	2039	11218	13258	14845	-40016	53274	2286	50988	-50988		39	27	43
06/07/92	tin	136	75	160	84	550	100	450	717	907	2470	11218	13688	15825	980	12706	2195	10513	-10513		55	31	38
06/21/92	tin	244	261	345	84	1101	210	892	34	935	2659	11218	13877	19683	4058	9619	3274	6345	-6345		127	43	66
07/05/92	tin	274	1409	1035	-374	1112	214	898	331	881	3633	11218	14851	12526	-7357	22206	2480	19729	-19729		106	29	59
07/19/92	tin	230	2158	1335	-823	969	201	768	589	785	3908	11218	15127	8980	-3546	18673	839	17834	-17834		88	22	23
08/02/92	tin	58	492	382	-110	773	161	613	362	750	2325	11218	13544	8785	-195	13739	459	13280	-13280		73	24	11
08/16/92	tin	15	29	59	30	616	110	506	540	540	1772	11218	12991	6500	-2285	15276	746	14530	-14530		49	20	16
08/30/92	tin	33	35	98	63	542	118	424	310	540	1523	11218	12742	6146	-354	13096	751	12345	-12345		53	21	21
09/13/92	tin	55	66	163	97	529	148	383	441	426	1614	11218	12832	5404	-741	13573	583	12990	-12990		42	19	20
09/27/92	tin	85	83	256	172	419	146	273	68	417	1245	11218	12463	14248	8843	3620	692	2928	-2928		43	53	30
10/11/92	tin	77	63	216	153	342	153	188	171	366	1172	11218	12390	13978	-272	12862	4441	8222	-8222		35	53	151
10/25/92	tin	51	71	111	40	323	154	169	310	353	1146	11218	12365	59297	45322	-32957	4068	-37025	37025		28	217	191
11/08/92	tin	168	179	197	18	299	167	132	828	329	1821	11218	13039	103286	43988	-30949	4451	-35400	35400		28	340	221
11/22/92	tin	333	266	267	1	222	106	115	0	311	1132	11218	12350	93401	-9885	22235	5545	16690	-16690		32	289	261
12/06/92	tin	380	267	281	14	315	82	233	387	317	1681	11218	12899	21488	-71913	84812	3670	81142	-81142		34	61	173
12/20/92	tin	84	243	186	-57	537	101	436	934	325	2067	11218	13285	53021	31533	-18248	851	-19100	19100		32	136	51
01/03/93	tin	66	289	338	49	601	143	458	415	374	1794	11218	13012	123924	70903	-57891	2992	-60883	60883		39	296	161
01/17/93	tin	74	324	522	198	663	177	505	1137	551	2967	11218	14185	176289	52364	-38179	7816	-45995	45995		41	391	267
01/31/93	tin	74	297	511	213	798	215	583	164	551	2097	11218	13315	217318	41029	-27714	8619	-36333	36333		54	459	377
02/14/93	tin	65	274	434	161	937	289	648	156	1251	2843	11218	14061	253807	36489	-22428	6027	-28455	28455		70	501	471
02/28/93	tin	39	204	371	168	920	671	249	515	1251	3096	11218	14314	258399	4592	9722	8629	1094	-1094		59	475	568
03/14/93	tin	45	579	1183	604	6119	6038	81	267	2182	9795	11218	21014	296315	37916	-16903	4409	-21312	21312		156	494	559
03/28/93	tin	1179	929	921	-8	28243	26454	1789	1712	2162	34238	11218	45457	61202	-235113	280570	29460	251109	-251109		139	90	214
04/11/93	tin	122	588	611	23	8283	5388	2895	2929	1603	13749	11218	24967	14529	-46673	71640	7527	64113	-64113		54	21	42
04/25/93	tin	199	379	325	-53	1789	1943	-153	1627	1700	5641	11218	16859	7724	-6805	23664	1653	22011	-22011		34	11	13
05/09/93	tin	103	240	183	-58	2261	1229	1031	1215	1231	4992	11218	16210	9637	1913	14297	1059	13238	-13238		35	13	10
05/23/93	tin	79	154	135	-19	1902	638	1264	1220	971	4307	11218	15526	16063	6426	7100	973	6127	-6127		33	25	10
06/06/93	tin	322	234	202	-32	627	689	-62	2259	997	4406	11218	15626	20321	2257	13369	2400	10968	-10968		27	28	22
06/20/93	tin	182	313	183	-130	595	832	-237	731	1032	2724	11218	13942	8317	-12004	25948	2280	23668	-23668		29	12	29
07/04/93	tin	17	95	99	4	340	185	155	854	985	2295	11218	13514	9383	1066	12448	1055	11393	-11393		36	14	14
07/18/93	tin	47	60	91	31	182	106	76	728	867	1915	11218	13134	14514	5131	8003	723	7279	-7279		35	23	10
08/01/93	tin	56	81	64	3	171	116	55	942	848	2061	11218	13300	16015	1501	11799	639	11160	-11160		35	27	11
08/15/93	tin	247	86	70	-16	154	60	94	354	597	1422	11218	12640	32982	16967	-4327	960	-5287	5287		38	61	14
08/29/93	tin	344	56	68	12	276	83	193	486	597	1772	11218	12990	247685	214703	-201713	802	-202515	202515		38	480	16
09/12/93	tin	90	103	119	17	851	148	503	927	480	2267	11218	13485	398954	149269	-135783	13089	-148872	148872		39	846	183
09/26/93	tin	105	344	584	240	929	292	638	613	461	2093	11218	13911	186976	-207978	221889	26400	195488	-195488		53	430	454

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	William-son R.	Sprague R.	Willamean-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
10/10/93	tin	132	366	414	48	621	277	344	568	360	2095	11218	13313	129675	-59301	72614	20591	52023	-52023		39	307	395
10/24/93	tin	136	336	266	-70	786	256	510	1140	320	2627	11218	13846	132551	2876	10970	15080	-4109	4109		34	302	431
11/07/93	tin	36	266	149	-117	522	168	354	483	301	1492	11218	12710	118068	-14483	27193	13663	13530	-13530		29	266	363
11/21/93	tin	53	301	164	-137	614	290	324	154	282	1266	11218	12484	140446	22377	-9693	12719	-22611	22611		34	316	360
12/05/93	tin	113	379	160	-218	788	418	370	666	287	2014	11218	13232	189230	48785	-35552	16206	-51759	51759		37	418	426
12/19/93	tin	199	394	256	-137	756	453	303	797	295	2304	11218	13522	153368	-35863	49385	15487	33898	-33898		35	327	369
1/02/94	tin	126	269	260	10	521	280	241	192	325	1443	11218	12661	111033	-42335	54998	11895	43100	-43100		35	237	281
1/16/94	tin	82	210	406	197	380	233	147	882	500	2250	11218	13468	71091	-39942	53410	7300	46111	-46111		33	147	190
01/30/94	tin	47	208	492	284	343	196	147	307	500	1690	11218	12908	66568	17477	-4569	1546	-6114	6114		36	172	123
2/13/94	tin	33	754	636	-119	1156	491	665	0	1090	2915	11218	14133	146890	58322	-44189	2055	-46244	46244		93	269	257
02/27/94	tin	41	670	696	-174	1255	680	575	30	1135	3158	11218	14376	95007	-51883	66259	1526	64733	-64733		89	184	213
03/13/94	tin	196	662	585	-77	1420	1132	288	0	1920	4122	11218	15340	46272	-48735	64075	786	63290	-63290		92	75	110
03/27/94	tin	119	554	474	-79	1558	602	956	151	1981	4283	11218	15502	39252	-7020	22522	741	21780	-21780		94	61	72
04/10/94	tin	40	395	434	39	1057	302	755	354	1668	3553	11218	14772	41734	2483	12289	691	11598	-11598		64	63	26
04/24/94	tin	17	236	282	46	682	445	236	599	1543	3123	11218	14342	42721	987	13354	1000	12354	-12354		53	66	21
05/08/94	tin	2	124	94	-30	459	395	64	625	1165	2545	11218	13764	14393	-28328	42092	660	41432	-41432		43	22	19
05/22/94	tin	6	79	30	-50	383	228	155	614	882	1915	11218	13133	12131	-2262	15395	532	14863	-14863		43	19	20
06/05/94	tin	7	48	24	-25	314	107	207	846	901	2093	11218	13312	11226	-905	14217	707	13510	-13510		42	18	15
06/19/94	tin	29	27	107	80	243	71	171	972	937	2288	11218	13506	7355	-3871	17377	761	16617	-16617		41	13	12
07/03/94	tin	26	27	176	149	164	41	123	1078	905	2348	11218	13566	8615	1261	12306	1116	11190	-11190		41	16	15
07/17/94	tin	35	26	152	126	129	35	94	596	787	1699	11218	12918	42342	33726	-20809	1290	-22098	22098		45	93	18
07/31/94	tin	59	42	148	106	268	70	198	641	787	1903	11218	13121	19022	-23320	36441	1399	35043	-35043		48	48	23
08/14/94	tin	97	89	135	46	406	123	283	337	542	1517	11218	12735	13998	-5024	17759	1585	16174	-16174		50	42	26
08/28/94	tin	120	58	98	40	293	77	216	672	542	1724	11218	12943	7327	-6671	19814	1214	18600	-18600		40	26	20
09/11/94	tin	127	21	51	29	147	42	105	800	445	1570	11218	12788	6889	1562	11226	755	10471	-10471		33	37	13
09/25/94	tin	169	51	72	22	140	61	79	336	418	1136	11218	12354	8609	-2280	14634	783	13871	-13871		32	29	26
10/09/94	tin	234	154	174	20	155	82	73	35	371	969	11218	12188	2714	-3896	16083	976	15107	-15107		32	12	41
10/23/94	tin	159	107	129	22	190	93	97	170	344	992	11218	12211	5258	2544	9666	385	9281	-9281		26	23	17
11/06/94	tin	261	269	264	-4	330	224	106	0	327	1182	11218	12400	27147	21889	-9489	1096	-10587	10587		35	112	57
11/20/94	tin	335	230	348	119	253	221	32	6	303	1245	11218	12463	46382	19235	-6772	2511	-9283	9283		35	168	157
12/04/94	tin	225	183	351	168	495	283	231	0	307	1378	11218	12596	75105	28723	-18126	2947	-19073	19073		42	246	214
12/18/94	tin	60	177	432	255	359	146	212	445	318	1613	11218	12831	136234	61129	-48298	4438	-52735	52735		33	406	299
01/01/95	tin	164	228	476	248	808	303	303	53	333	1632	11218	12851	75374	-60860	73711	5041	68670	-68670		46	210	318
01/15/95	tin	201	307	452	145	3043	2423	620	1172	537	5406	11218	16624	91278	15902	722	2247	-1526	1526		65	215	190
01/29/95	tin	8	347	422	75	5008	4485	521	470	537	6443	11218	17662	59955	-31320	48982	2676	46306	-46306		106	126	185
02/12/95	tin	6	491	605	114	4188	4290	-102	1856	1123	7779	11218	18997	21988	-37968	56965	505	56460	-56460		56	38	57
02/26/95	tin	94	254	209	-45	2052	1201	852	689	1220	4265	11218	15483	19396	-2591	18075	311	17764	-17764		62	31	33
03/12/95	tin	174	311	126	-186	1806	1261	546	502	1999	4607	11218	15826	13498	-5899	21724	173	21551	-21551		60	19	22
03/26/95	tin	309	251	133	-118	3262	3166	97	1123	2129	6956	11218	18174	14398	900	17274	1318	15955	-15955		46	21	10
04/09/95	tin	160	164	193	29	1629	1718	-89	294	1827	4163	11218	15322	12776	-1620	16942	1284	15658	-15658		45	18	16
04/23/95	tin	38	195	311	116	3075	2375	700	855	1659	5938	11218	17156	9272	-3506	20662	2884	17779	-17779		46	13	30
05/07/95	tin	115	144	236	92	2474	855	1619	1038	1303	5186	11218	16384	9006	-266	16650	3732	12918	-12918		43	12	47
05/21/95	tin	136	134	184	50	2589	826	1763	1464	947	5320	11218	16538	19634	10628	5910	5334	576	-576		38	27	45
06/04/95	tin	187	135	332	198	1414	977	437	390	985	3288	11218	14506	25551	5917	8590	1577	7013	-7013		38	35	27
06/18/95	tin	297	112	315	203	547	679	-133	8	1007	2175	11218	13393	18172	-7379	20772	759	20013	-20013		34	25	16
07/02/95	tin	109	162	218	56	598	526	73	543	984	2453	11218	13671	27362	9190	4481	961	3520	-3520		37	38	18
07/16/95	tin	177	193	239	46	221	225	-4	1042	846	2526	11218	13744	11871	-15491	29236	1042	28194	-28194		35	17	17
07/30/95	tin	91	95	94	-1	418	460	-42	891	846	2340	11218	13558	14679	2808	10751	752	9998	-9998		40	22	12
08/13/95	tin	51	142	167	25	712	592	120	421	601	1952	11218	13171	21085	6406	6765	1302	5463	-5463		52	35	19
08/27/95	tin	18	124	106	-18	519	147	371	850	582	2076	11218	13294	24119	3034	10260	1412	8848	-8848		41	44	19

		Load Sources (kg)																			Concentrations in ppb		
Biweek	Parameter	7-Mile Canal	Wood R. above Weed Rd.	Wood R. Dike Rd.	Wood R. below Weed Rd.	Williamson R.	Sprague R.	Williamson-Sprague	Springs	AgPump	Tributary Inflow	Precip	Total Inflow	End Storage	Change in Storage	Inflow-Ch Stor.	Outlet	Retent.	Net Internal	Total Internal	Tributary Inflow	Lake	Outflow
08/10/97	tin	438	258	240	-18	642	201	442	0	730	2050	11218	13269	434357	-470659	484127	72712	411415	-411415		58	792	1435
08/24/97	tin	443	214	257	43	568	221	347	524	646	2438	11218	13657	374927	-59430	73066	71136	1950	-1950		44	728	1085
09/07/97	tin	483	211	316	105	550	276	274	79	572	2000	11218	13219	299178	-75750	88968	84026	24942	-24942		47	614	1093
09/21/97	tin	552	238	394	156	512	378	134	15	499	1972	11218	13190	331175	31997	-18807	35995	-54802	54802		42	876	964
10/05/97	tin	542	203	373	170	354	267	87	145	456	1869	11218	13088	400936	69762	-56674	33394	-90068	90068		37	821	808
10/19/97	tin	560	194	384	190	235	207	28	93	380	1652	11218	12870	428688	27752	-14882	39681	-54563	54563		33	871	1001
11/02/97	tin	576	207	382	175	269	227	42	472	373	2071	11218	13289	395260	-33428	46718	40442	6276	-6276		32	786	958
11/16/97	tin	599	231	386	155	346	280	66	0	334	1666	11218	12884	363466	-31794	44678	35236	9442	-9442		34	701	858
11/30/97	tin	630	261	397	136	480	331	129	167	334	1989	11218	13207	335608	-27858	41066	28269	12797	-12797		34	618	764
12/14/97	tin	649	283	395	112	556	340	216	0	350	1950	11218	13168	296347	-39261	52429	27145	25284	-25284		38	531	657
12/28/97	tin	643	284	368	85	584	339	245	282	350	2226	11218	13445	250111	-46237	59681	32189	27492	-27492		37	447	564
01/11/98	tin	657	301	362	60	663	381	282	0	541	2223	11218	13441	211164	-38946	52387	17941	34446	-34446		46	362	462
01/25/98	tin	670	325	362	36	1592	1270	322	1273	593	4489	11218	15708	177740	-33424	49132	21581	27551	-27551		36	277	351
02/08/98	tin	659	338	350	12	2295	1663	632	1609	1023	5936	11218	17155	122125	-55615	72769	38368	34402	-34402		38	192	269
02/22/98	tin	646	349	338	-11	1873	995	878	1140	1346	5344	11218	16562	69687	-52438	69000	15420	53580	-53580		44	107	168
03/08/98	tin	633	361	327	-34	2248	1336	913	838	1919	5965	11218	17184	14518	-55169	72353	7091	65262	-65262		51	22	70
03/22/98	tin	614	436	455	18	3044	1656	1388	0	2349	6462	11218	17680	42635	28117	-10637	2075	-12712	12712		75	63	34
04/05/98	tin	589	434	657	222	6656	3972	2686	1433	2164	11501	11218	22719	28994	-13641	36560	8676	27884	-27884		61	42	56
04/19/98	tin	338	266	515	249	3747	1892	1855	405	1830	6835	11218	18054	62692	33698	-15644	5707	-21351	21351		58	90	56
05/03/98	tin	83	222	349	128	2557	1353	1204	0	1662	4851	11218	15870	82949	20257	-4387	5766	-10154	10154		53	115	111
05/17/98	tin	93	189	287	98	3258	2070	1188	772	1045	5454	11218	16673	97925	14977	1696	21152	-19456	19456		35	136	143
05/31/98	tin	97	157	227	70	2423	1479	944	775	1045	4567	11218	15786	118261	20356	-4570	20396	-24937	24937		30	162	154
06/14/98	tin	101	135	172	36	1565	898	667	764	1111	3713	11218	14932	293663	175382	-160450	22609	-183059	183059		27	403	203
06/28/98	tin	155	176	122	-55	1073	590	483	237	1111	2699	11218	13917	395582	101919	-88002	28580	-116582	116582		32	547	403
07/12/98	tin	204	126	119	-7	523	253	270	318	959	2123	11218	13341	596761	201179	-187837	55474	-243312	243312		33	657	810
07/26/98	tin	223	94	116	22	298	152	147	515	933	2066	11218	13304	448299	-148462	181786	88313	93453	-93453		35	690	881
08/09/98	tin	240	122	212	90	502	275	227	423	746	2124	11218	13342	390431	-57868	71210	42622	28588	-28588		43	643	654
08/23/98	tin	256	118	265	166	599	309	291	495	842	2279	11218	13497	344192	-46239	59736	58109	1627	-1627		47	621	789
09/06/98	tin	246	105	299	193	575	259	316	722	560	2421	11218	13639	44421	-299771	313411	25888	287522	-287522		42	87	360
09/20/98	tin	214	210	329	119	808	246	562	403	496	2050	11218	13268	123083	78662	-85394	15282	-80676	80676		39	256	246