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UNIVERSITY OF MIAMI - ROSENSTIEL SCHOOL OF MARINE AND ATMOSPHERIC SCIENCE

DEPARTMENT OF MARINE GEOLOGY AND GEOPHYSICS

GEOCHEMICAL DETERMINATIONS OF GROUNDWATER FLOW IN EVERGLADES NATIONAL PARK

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Abstract

Water flow is an important component of the Everglades, and although surface water flow has been extensively monitored, little is known about the subsurface groundwater flow component. A direct connection between surface water and groundwater has always been assumed, with surface water levels equating to groundwater levels. However, the flux of groundwater flow within the Everglades has never been quantified. In light of the ongoing Everglades Restoration effort, interactions between groundwater and surface water should be known in order to evaluated the overall effects of the project. The aim of this project was to use chemical and isotopic data to constrain the estimates of groundwater flow within Everglades National Park (ENP).

Groundwater and surface water chemistry was investigated within four major areas of ENP: Shark Slough, Rocky Glades, Taylor Slough, and south of the C-111 canal. A total of 47 groundwater wells were sampled from various depths within the Surficial Aquifer, and one well from the top of the underlying Hawthorn formation. A total of 23 surface waters stations were also sampled. Both groundwater and surface waters were collected on a monthly basis for two years and nine months for the following constituents: stable isotopes of oxygen and hydrogen; major ion chemistry; and field parameters. In addition, groundwater samples were collected once a year for $^{3}H/^{3}He$ and CFCs, and the age of the groundwater was determined. Rainfall was collected at four locations for stable isotopes of oxygen and hydrogen.

Geochemical results suggested that waters from within the Rocky Glades tended to have the most negative $\delta^{18}O$ and δD values within ENP, and groundwater in this region is most likely recharged directly by precipitation. Shark Slough waters have the most positive $\delta^{18}O$ and δD values, indicating that the waters were exposed to evaporation. Groundwater in Shark Slough is most likely recharged by Everglades surface water and/or canal water that was exposed to evaporation prior to infiltration. The $\delta^{18}O$ and δD values of both groundwaters and surface waters from within the C-111 basin are variable, yet indicate exposure to evaporation. The isotopic composition ($\delta^{18}O$ and δD) of groundwater and surface water in Taylor Slough suggest they are a mixture of waters from the Rocky Glades, C-111 Basin, and precipitation. There was no geochemical evidence of an influence of Shark Slough waters into Taylor Slough.

The Hawthorn formation had high concentrations of ^{4}He relative to the overlying Surficial Aquifer. Elevated concentrations of ^{4}He, relative to atmospheric levels, within the Surficial Aquifer suggest that Hawthorn formation groundwater was recharging upward and mixing with the Surficial Aquifer water.

Horizontal groundwater flow rates within Taylor Sough were estimated to range from 370 and 1232 m/yr with an average of 738 m/yr using $^{3}H/^{3}He$ and CFC-12 age dating. These results were low to within the range of seepage velocities estimated from Darcy's Law (1022 to 1377 m/ry). Specific conductance measurements in wells from the C-111 basin, Taylor Slough and the Rocky Glades areas suggests that seawater intrusion extends five to six miles inland of Florida Bay. In addition, groundwater sampled from wells that are 100 feet deep or deeper within the Rocky Glades and C-111 basin areas

1.0 Introduction

Water flow is an important component of the Everglades, and although surface water flow has been extensively monitored, little is known about the subsurface groundwater flow component. A direct connection between surface water and groundwater has always been assumed, with surface water levels equating to groundwater levels. However, the flux of groundwater flow within the Everglades has never been quantified. In light of the ongoing Everglades Restoration effort, interactions between groundwater and surface water should be known in order to evaluated the overall effects of the project. For instance, a recharging of groundwater by the surface water results in a loss of surface water flow, while discharges of groundwater to the surface water represents an increase to the surface water flow. Furthermore, groundwater discharges from the Everglades into Florida Bay are currently unknown, yet need to be defined for present hydrodynamic models.

The aim of this project was to use chemical and isotopic data to constrain the estimates of groundwater flow within Everglades National Park (ENP), specifically along Taylor Slough, Shark Slough, and south of the C-111 canal. Major ion chemistry was used to identify different sources and mixtures of waters as well as the presence of salt water intrusion. Naturally occurring stable isotopes of oxygen and hydrogen ($^{18}O/^{16}O$ and $^{2}H/HD$) were used to determine the sources of groundwater recharge. Anthropogenic sources of $^{3}H/^{3}He$ and Chlorofluorocarbons (CFCs), were used to estimate groundwater ages. With the age of the groundwater known, then groundwater flow rates were determined.

Questions addressed in this research included:

- What is the dominant source(s) of groundwater recharge: Everglades surface water, canal water or precipitation?
- Is the groundwater recharged during the dry season, the wet season or throughout the year?
- Is there groundwater exchange between Taylor Slough and Shark Slough beneath the Rocky Glades?
- What are the groundwater flow rates beneath Shark Slough, Taylor Slough and the C-111 Basin?
- What is the quantity of groundwater discharging to the overlying Everglades surface waters along the saltwater interface?
- What is the quantity of freshwater flow into Florida Bay?

sea level in northwestern Dade County and reaches a maximum depth of more than 52m below sea level near Homestead. Beneath the Gray Limestone Aquifer is the less permeable, lower clastic unit of the Tamiami Formation.

Underlying the Surficial Aquifer in South Florida is a 180 m to 265 m thick sequence of phosphatic-rich carbonates and siliciclastics. Most of the sequence is included within the Miocene-Hawthorn Group, which is dominantly siliciclastics with varying proportions of clay, silt, sand, and limestone (Figure 2). The upper section may correspond locally with the Miocene-Pliocene Tamiami Formation. This thick sequence of sediments has low permeability and is an effective confining unit between the Surficial Aquifer and the deeper Floridan Aquifer System (Figure 2).

The Floridan Aquifer system is extensive, occurring throughout all of Florida (Miller, 1986). The aquifer consists of a thick sequence of Paleocene-Eocene, carbonate sediments containing beds of siliciclastics and siliciclastic-rich carbonates of the Suwannee Limestone, Ocala Limestone, Avon Park Formation, Oldsmar Formation and the Upper Cedar Keys Formations (Scott, 1992). In South Florida, the Floridan Aquifer is confined with the top of this system at a depth of 310 to 360 m below sea level. The aquifer is under artesian conditions with potentiometric heads of 10 to 16 m above sea level (Fish and Stewart, 1991), therefore, there is a strong potential for upward groundwater flow from the Floridan to the Surficial Aquifer. In South Florida, groundwater quality within the Floridan Aquifer is poor due to high concentrations of sodium and chloride, and is not considered potable (Beaven and Meyer, 1978).

Within ENP, groundwater flow is generally towards the south (Figure 3). Along the eastern edge of the ENP, groundwater flow is directed to the east in response to the presence of the canals. Groundwater levels within Everglades National Park vary seasonally (between 0.1 and 1m), with the highest water levels typically recorded in September during the wet season, and the lowest water levels recorded in April in the dry season (Fish and Stewart, 1991).

Groundwater and surface water flow within ENP has been greatly altered from natural conditions, and continues to be influenced by an extensive network of canals, levees, control structures and pump stations that extends from Lake Okechobee south to the Altantic Ocean. Through the use of a Natural System Model, Fennema and others (1994) have demonstrated that prior to water management, overland flow was continuous from Lake Okeechobee south through the water conservation areas and into Shark Slough of ENP. Under water management practices, overland flow has been greatly reduced to occur only in western Shark Slough.

Groundwater flow conditions were also significantly altered. Prior to water management practices, groundwater flow in Dade County was highest along the Atlantic Coastal Ridge which formed a hydraulic divide allowing water to flow both east and west (Fennema et al., 1994). Under managed conditions, the highest areas of groundwater flow were shifted westward along the canals and the dominant groundwater flow condition was to the east, increasing drainage from ENP. Groundwater seepage from ENP to the east is greatest from northeast Shark Slough along the L-31N (Fennema et

The principal governing factor in the variability of the isotopic composition of water is the evaporation and condensation cycle. During evaporation, the heavier isotopes (^{18}O and ^{2}H) are preferentially left behind and the lighter isotopes are concentrated in the water vapor. Water vapor is commonly depleted relative to sea water. During condensation, the reverse occurs, the heavier isotopes are rained out preferentially, making the resulting cloud vapor to be more depleted than sea water. The segregation of heavy and light isotopes between phases during evaporation and condensation is called isotope fractionation. This fractionation is represented by a fractionation factor α, At equilibrium, the fractionation between two species A and B is the ratio:

$$\alpha_{A-B} = \frac{R_A}{R_B} = \frac{\delta_A + 1000}{\delta_B + 1000}. \qquad (3)$$

The fractionation factor is temperature dependent. The fractionation factor for $^{18}0/^{16}O$ and for D/H between the phases of liquid water and vapor is 1.009 and 1.074, respectively, at 25°C (Craig and Gordon, 1965).

Most of the world's precipitation falls on a straight line in a plot of δ^2H versus $\delta^{18}O$. This line is called the meteoric water line (MWL) and is described by the equation (Craig, 1961):

$$\delta^2H = 8 * \delta^{18}O + 10. \qquad (4)$$

The line has a slope of 8 resulting from the fractionation of H, which is approximately 8 times that of O (Figure 4). An intercept of 10 is common for precipitation produced from seawater; however, the intercept value may vary for local sources of precipitation. Surface waters that have undergone evaporation tend to fall on a line with a slope less than 8 (Figure 4). Isotopic enrichment of the evaporating water body increases along the evaporation line away from the MWL as the amount of the water remaining approaches zero. The slope of the evaporation line is dependent upon the ambient humidity, and decreases from near 8 at 100% humidity to 3.7 for zero percent humidity (Gonfiantini, 1986). The length of the evaporation line indicates the limited amount of isotopic enrichment attained as a consequence of molecular exchange with atmospheric vapor (Figure 4). For instance, the relatively short line at 95% humidity indicates that the isotopic composition of an evaporating water body at this humidity changes little from its original composition (Figure 4).

2.4 Tritium/^{3}Helium

Tritium (^3H or T) is the radioactive isotope of hydrogen, that decays to ^3He with a half life of 12.43 years. Tritium is produced naturally by cosmic radiation in the upper atmosphere, where it is oxidized to form HTO and then transported to the earth's surface with the water cycle. Tritium content in water is expressed in tritium units (TU), with one TU defined as one atom of ^3H per 10^{18} atoms of ^1H. Present day concentrations of tritium in precipitation range from 2 to 20 TU in the Northern Hemisphere, and less than 10 TU in the tropics and Southern Hemisphere (Yurtsever and Araguas, 1993).

mantle source of helium comes from helium trapped within the mantle during the formation of the Earth and is released through tectonically active zones, typically along mid-oceanic ridges. Assuming that mantle derived sources of ^3He are insignificant, the tritogenic ^3He is separated from its other sources by simultaneous determinations of ^4He and neon.

2.5 Chlorofluorocarbons

Chlorofluorocarbons are synthetic gaseous compounds of fluorine and carbon. They were first manufactured in the 1930s and were widely used in industry for refrigeration, air conditioning, solvents, spray can aerosols, and in blown-foam plastics. The two most abundant CFCs include dichlorodifluoromethane (CCl_2F_2, CFC-12, Freon-12), and trichlorofluoromethane (CCl_3F, CFC-11, Freon-11), which make up 77% of the total CFC global market (Busenberg and Plummer, 1992).

The release of CFCs to the atmosphere was proportional to its production, which increased exponentially from 1956 to 1970 (Rowland and Molina, 1975; Figure 6). Annual production of CFC-12 and CFC-11 peaked in 1987 at 9 and 7 million metric tons, respectively (Plummer and Busenberg, 1999). CFCs are considered a prime contributor to statospheric ozone depletion, and under the Clean Air Act legislation, CFC production ceased in the USA as of January 1, 1996. Despite the discontinued production of CFCs, atmospheric concentrations of CFC-12 and CFC-11 as measured at Niwot Ridge, Colorado continued to increase to 537.6 and 264 ppt, respectively, in July 1998 (Figure 6). The rate of increase of CFCs in the atmosphere has slowed since 1988, and the maximum atmospheric concentrations are expected to plateau by mid-1999 (Plummer and Busenberg, 1999).

CFCs are soluble in water, and the groundwater dating technique makes use of the increase in atmospheric CFC concentration with time. Present-day recharging groundwater should have higher concentrations of CFCs than older water that has moved downgradient along its flow path. The use of CFCs to date groundwater utilizes Henry's Law which describes that the concentration of a gas dissolved in water (C) is proportional to the partial pressure of the gas in air (p) according to the equation:

$$C = k_h p \qquad (8)$$

where, K_h is Henry's law constant. K_h is dependent upon temperature and salinity of the recharging groundwater according to the equation:

$$\ln K_h = a_1 + a_2\left(\frac{100}{T}\right) + a_3 \ln\left(\frac{T}{100}\right) + S\left[b_1 + b_2\left(\frac{T}{100}\right) + b_3\left(\frac{T}{100}\right)^2\right] \qquad (9)$$

where, T is temperature in degrees Kelvin, S is salinity, and the terms $a_1, a_2, a_3, b_1, b_2, b_3$, are constants determined by Warner and Weiss (1985) for temperatures between 0 and 40°C and salinities between 0 and 40. The recharge temperature is determined from simultaneous measurements of neon and ^4He or can often be estimated as the mean

The well cluster located near ENP hydrostation E-146 was located in the vicinity of the salt water intrusion front along Taylor Slough, and approximately l0 miles south of TSB. This well cluster was installed with a portable drill rig mounted on a tripod courtesy of the USGS. This cluster consisted of three wells. Two of the wells were located immediately adjacent to E-146 to depths of 15 and 25 ft. In an effort to better define the extent of the salt water intrusion front, a third well was located approximately 900 ft south of E-146, and drilled to a depth of 27.5 ft. Rock core was collected from each borehole, and the depths of the wells correspond with the bottom of the Miami Limestone (15 ft), the bottom of the Fort Thompson Formation (25 ft), and within the Tamiami Sands (27.5 ft). Each well was constructed with the bottom 2.5 ft of 0.10 slotted, 1.5-inch inner diameter, Schedule 40 PVC well screen connected to solid riser pipe to about five feet above the hard limestone surface. Number 10 silica sand was placed around the well screen to about 4 feet above the screen. Grout was placed in the remaining annulus from the top of the sand pack to the top of the hard limestone. The 1.5-inch riser pipe was protected at the surface with 3-inch inner diameter PVC pipe driven at least 5 feet into the top of the limestone and grouted in place. The top of each well was covered with a well cap.

A third well cluster was installed adjacent to ENP hydrostation E-130 in order to better define the hydrologic conditions in Taylor Slough. Two wells were drilled to depths of 10 ft and *52.5* ft, with a portable drill rig mounted on a tripod courtesy of the USGS. Both wells were constructed of 1.5inch inner diameter PVC pipe. Five feet and 2.5 ft of 0.10 slotted well screen, was placed at the bottom of the 52.5 ft and 10 ft wells, respectively. Inspection of rock core obtained while drilling indicates that the 10 ft well is placed within the Miami Limestone, while the *52.5* ft well is placed within the Key Largo Limestone. Number 10 silica sand was placed around the well screen to about 4 feet above the screen, and the remaining annulus was filled with grout. The PVC riser pipe for each well extends to about *5* feet about the hard limestone surface and is grouted inside of 3-inch inner diameter solid PVC pipe.

During the C- 111 canal, levee removal project, four wells in cluster G-3319, located at the northern extent of Taylor Slough, were either damaged or destroyed. The original four wells included: G-3319A, G-3319B, G-3319C, and G-3319TW at depths of 30 ft, 81 ft, 181 ft, and 240 ft, respectively. Of these wells, G-3319TW (240 ft) and G-3319B (60 or 80 ft) were refurbished and considered adequate for sampling. In November 1997, two wells were installed approximately 0.5 miles to the west of the original G-3319 wells along the north side of the L31W levee. This location was selected as to be away from the truck operations associated with the C- 111 canal renewal project. The borings for these wells were advanced using a reverse, airrotary, truck mounted, drill rig to depths of 40 ft (well L-3 IW-40) and 14 ft (well L-31W- 14). The wells were constructed of 5 feet of 0.20 slotted, 2-inch inner diameter, Schedule 40 PVC well screen with solid riser pipe to about 3 feet above the ground surface. From inspection of drill cuttings, the shallow well was placed within the Miami Limestone, while the deeper well was placed in the Ft. Thompson Formation. Sand was packed around each well screen to about 6 feet above the screen, and the remaining annulus was grouted to the land surface. The top of each well was sealed within a 6-inch inner diameter PVC protective casing, and sealed with a locking cap.

has two buckets, one to collect dry deposition and the other to collected wet deposition. The instrument was equipped with a heated sensor, that when wet activated a mechanical arm that moved a cover from the wet collection bucket to the dry collection bucket, thereby exposing the wet collection bucket to rainfall. The heated sensor allowed for evaporation of rainfall that had collected on it, and once dry, the mechanical arm moved again to cover the wet collection bucket to prevent evaporation of the rainfall sample. This collector was installed behind the Iori Building within ENP.

The second type of collector consisted of a bottle-type collector equipped with a funnel. A piece of tygon tubing was attached to the bottom of the funnel. A loop was placed in the tubing, and the tubing was made long enough to reach the bottom of the bottle. This collection device was tested at the Redlands location outside ENP for several months (August 1997 to December 1997). Rainwater was collected in this device on a bi-weekly to monthly basis. A standard forestry 6-inch rain gauge was placed next to the bottle collector, and rainwater from the rain gauge was collected on a daily basis . Isotopic analysis of rainwater collected within the bottle-type collector and the rain gauge revealed no significant difference between the two collectors, therefore the bottle-type collector was deemed adequate for use in long-term (bi-weekly to monthly) precipitation collection. This collection device was placed at two locations; along the L-67 extension levee adjacent to wells G-3309, and at the end of the Aerojet Road adjacent to well G-3337 in January 1998.

3.4 Laboratory Analysis

Stable isotopes of $\delta^{18}O$ and δD were determined by mass spectrometry using the methods of Epstein and Mayeda (1953), and Friedman (1953), respectively. Tritium was determined by the helium ingrowth method and then helium and the noble gasses were determined by mass spectrometry according to Clarke et al. (1976). CFCs were determined by use of a purge-and-trap gas chromatography procedure as described by Bullister and Weiss (1988) and modified by Happell et al. (1997). Major anions (chloride and sulfate) were determined by ion chromatography according to USEPA Method 300.0 (USEPA, 1983). Major cations (calcium, magnesium, sodium, potassium) were determined by ion chromatography. Total alkalinity was determined by acid titration.

4.0 Results

4.1 Field Parameters

Statistical summary of the field parameters, specific conductance, salinity, temperature, and pH, for each groundwater and surface water sampling location is included in Table 3. A complete listing of the field parameters for each station collected each month is included in Appendix A. Specific conductance of shallow groundwater (<20m; <60 ft) can be used to determine the extent of salt water intrusion along ENP coastline (Figure 8). The salt water intrusion front is considered sharp along the C111 basin and Taylor Slough areas of ENP. The salt water intrusion front along Shark Slough and the western boundaries of ENP is most likely sharp as well, however, appears more diffuse

concentrations of the major cations and anions of each sample are plotted on a Piper diagram in Figure 9. The Piper diagram is a trilinear diagram in which the percentage of the total cations and anions in milliequivalents per liter of a water sample are plotted as points in each of the lower triangles. The points are then extended into the upper diamond by projecting them along lines parallel to the outside edges of the triangles. The intersection of the projected points represents the overall chemical composition of the water sample. The water samples fromm ENP plot in three major groups: 1) a calcium-bicarbonate type water indicative of fresh Everglades water; and 2) a sodium-chloride type water indicative of seawater; 3) saltwater mixing zone waters that plot between the freshwater and seawater types. Waters included in the seawater group are groundwaters from wells C111-100, Canepatch-GW, G-3317C, Sisal-E, EP8A, and E146-15, 25, and 27.5. Waters included in the mixing zone group include surface water from Canepatch and Tarpon Bay, and groundwater from wells EPGW, G-1603, G-3318B,C,TW, RB-1-20,RB-1-6, RB-1-27, and RB-1-GW. Note, there is no clear separation among the fresh water samples between the four major sampling regions (Shark Slough, Taylor Slough, Rocky Glades, and C-111 basin) within ENP. Instead, waters from all regions sampled within ENP appear to be chemically similar.

Four water samples plot independent of the three main groups (Figure 9). Groundwater samples G-3337 and G-3332B are both 100 ft wells located within the C-111 basin. Well G-3323B has moderate salinity (2.4) and is most likely affected by seawater intrusion; however, the sample also contains a high calcium concentration which causes it to plot away from the other seawater samples. Well G-3337 falls along a line on the Piper Diagram between the fresh Everglades waters and groundwater from G-3323B, suggesting that it is a mixture of these two types of waters.

Well G-3319TW is a deep well (240 ft) screened within the top of the Hawthorn Formation. Its plotted location on the Piper diagram indicates that groundwater of the Hawthorn Formation is chemically distinct from the Surficial Aquifer. Well G-3318B is located about 10 ft away from G-3319TW and is screened at 81ft. The water chemistry of this well as plotted on the Piper diagram falls along a line between the Surficial Aquifer fresh waters and G-3319TW suggesting it is a mixture of Surficial Aquifer groundwater and deep Hawthorn Formation groundwater. This result indicates that in the vicinity of G-3319TW, deep Hawthorn Formation groundwater is recharging upward into the Surficial Aquifer.

4.3 Stable Isotopes of Oxygen and Hydrogen

4.3.1 Precipitation

The $\delta^{18}O$ and δD of rainfall collected from the four sites is variable, and low with most oxygen and hydrogen values less than zero (Table 5; Figure 10). Both $\delta^{18}O$ and δD varies throughout the sampling period with no discernable trend with time (Figure 10). The isotopic composition of the rainfall is weighted against rainfall amount to obtain weighted mean values of $\delta^{18}O$ and δD of -2.82 and -10.58, respectively (Table 5).

4.4. Tritium/^{3}Helium and CFC Ages

Age of groundwaters were determined using $^3H/^3He$ dating techniques assuming a groundwater recharge temperature of 26°C (Table 7). The $^3H/^3He$ age dating technique is only useful in dating groundwaters that are approximately 60 years or younger. There were numerous wells that contained little to no tritium, and therefore, their age could only be defined as greater than 60 years. Most of these wells were deeper than 17 m (or 50 ft). The youngest age groundwaters were obtained for wells CYP2-10 and NP-67 and varied from 0 to 15.7 years.

The year a groundwater sample was removed from contact with the atmosphere was assumed to be the year of groundwater recharge, and was determined by subtracting the age of the groundwater from the year of sample collection. At the time of groundwater recharge, the recharging water was expected to contain a ^3H concentration equivalent to that of rainwater. As a check on the validity of the age measurements, the sum of ^3H and ^3He concentrations in each groundwater sample was plotted against its expected recharge date (Figure 18). On the same graph was plotted the ^3H concentrations measured in rainfall at the Rosenstiel School in Miami since 1964. The combined concentrations of ^3H and ^3He in the groundwater samples agrees well with the measured rainfall concentrations for groundwater determined to be recharged between 1999 and 1975. For groundwaters determined to be recharged prior to 1975, the ^3H and ^3He concentrations do not match well with the rainfall values. This discrepancy in the older groundwater samples is most likely do to dispersion of the 1963 tritium peak over time, as well as a mixing of waters with different ages. From these results, $^3H/^3He$ groundwater ages of 25 years or less were considered to be most reliable.

Groundwater ages as determined by CFC-11 and CFC-12, were completed assuming a recharge temperature of 26°C (Table 8). For the most part, the CFC-11 ages were older than the corresponding CFC-12 age for a groundwater sample (Figure 19). CFC-11 has been shown to take part in non-conservative processes such as adsorption and biodegradation (Russel and Thompson, 1983; Semprini et al., 1990; Lovely and Woodward, 1992), in particular in anoxic conditions. The detection of hydrogen sulfide gas in many of the wells during pumping suggest that anoxic conditions were prevalent in the Everglades' groundwaters. The removal of CFC-11 from the groundwater by adsoprtion and/or biodegradation could explain the older CFC-11 ages compared to the CFC-12 ages. From these results, the CFC-12 groundwater ages were accepted to be more accurate than the CFC-11 ages.

Concentrations of CFCs within most surface water samples were below those expected for equilibrium with present-day atmospheric conditions resulting in surface water ages of significantly more than 1 year (Table 9). Two groundwater samples and five surface water samples were supersaturated with CFC-12 suggesting that they were contaminated with an additional source of CFC-12 (Tables 8 and 9). The two groundwater samples (L-31W-14, and L-31W-40) were from shallow wells located next to the L31W canal. The surface water samples contaminated with CFC-12 were from the L31W canal (L31Wsw), the C-111 canal (G3167sw, G1603sw, G3323sw) and the

at depths < 30 m

4.4.4 ^{4}Helium

Concentrations of ^{4}He were determined in the groundwaters as part of the ^{3}H/^{3}He age dating process (Table 11). An excess of ^{4}He (Δ ^{4}He %) was used to represent an excess of helium compared to what was expected for equilibrium solubility between water and air (Mamyrin and Tolstikhin, 1984). (The percent excess of He was corrected by the neon concentration in the water sample, assuming that all observed neon is due to some air injection process.) As illustrated in Figure 22, there was an increase in the Δ ^{4}He % with depth in the Surficial Aquifer, with a high concentration observed in well G-3319TW. In addition, brackish groundwaters have higher Δ ^{4}He % values as compared to freshwater samples collected from a similar depth. A contour map of ^{4}He excess in shallow groundwater across ENP indicate low ^{4}He excess values in the central region of the Rocky Glades, with high values in shallow groundwaters within the saltwater intrusion zone (Figure 23).

5.0 Discussion

The following discussion of the project results is organized in terms of the project questions.

5.1 Dominant Source(s) of Groundwater Recharge

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The δ^{18}O and δD data indicate that shallow groundwater within Shark Slough, Taylor Slough and the C-111 Basin has higher isotopic values compared to the mean weighted rainfall value (Figure 13). In addition, the δ^{18}O and δD values of shallow groundwater from these areas plots along an evaporation line coincident with the overlying surface waters (Figure 13). These results indicate that the shallow groundwater within Shark Slough, Taylor Slough, and the C-111 Basin is recharged by the overlying surface water that has been exposed to evaporation prior to infiltration.

?

Groundwater within the Rocky Glades area of ENP has the lowest δ^{18}O and δD values. In addition, low concentrations of ^{4}He excess (<25 %) are observed in the shallow groundwater of the Rocky Glades (Figure 23). The combined low values of δ^{18}O, δD, and ^{4}He excess along with low ^{3}H/^{3}He and CFC-12 ages suggest that shallow groundwater within the Rocky Glades is recharged directly by local rainfall.

overstated - less evaporate has a greater proportion of local rainfall than shark slough, but does not look purely like rainfall

what correlation & physically unlikely

Deep groundwater has a low δ^{18}O and δD values and are similar to those obtained for rainfall (Figures 13 and 14). The deep groundwater is most likely recharged directly by rainfall. In order for the deep groundwater to have lower δ^{18}O and δD values than the overlying shallow groundwater, the deep groundwater is either recharged at times of high rain events, or is recharged upgradient of the study site.

There is geochemical evidence to suggest that deep groundwater from the Hawthorn Formation is recharging the overlying Surficial Aquifer. Groundwater from well G-3319TW, located in the Hawthorn Formation, has a significantly different major ion

the Surficial Aquifer. The Isotopic composition of Taylor Slough waters is variable and seems to be mainly a mixture of waters from the C-111 Basin, Rocky Glades, and rainfall, with no inputs from Shark Slough.

5.4 Flow rates beneath Shark Slough, Taylor Slough, and the C-111 Basin

Prior to a discussion of flow rates, it is important to discuss the discrepancies between the groundwater ages as determined by the $^3H/^3He$ and CFC age dating techniques. Assumptions inherent to both of these techniques include: no dispersion, no mixing of different age waters, and that the tracers act conservatively. Dispersion acts in some degree in all groundwater systems. Dispersion causes high concentrations of tritium to occur in groundwaters recharged on either side of the 1963-1964 tritium peak, resulting in pre-1963 waters appearing younger than actual, and younger than 1964 waters appearing older than actual. The result is a limited reliability of the $^3H/^3He$ ages of groundwaters recharged prior to 1970. Due to the generally smooth, increasing nature of the atmospheric CFC input function, the effects of dispersion tend to be less for CFCs (Plummer et al., 1993). Dispersion effects in CFC dating seems to be significant in waters recharged prior to 1973, resulting in the determination of CFC ages younger than actual. For waters recharged after 1973, the effects of dispersion seem to be minimal.

Mixing of waters with different ages affects the two age dating techniques in different ways. Mixing of young waters containing tritium with old waters with no tritium, preserves the $^3H/^3He$ ratio of the young water and the resultant mixture would appear erroneously young. Mixing of waters of different tritium concentrations produces a non-linear effect with a bias toward the water with the highest tritium content. Mixtures of water containing high concentrations of CFCs with no-CFC containing water will always appear younger than the true age (Plummer and Busenberg, 1999). For mixtures of waters recharged after 1973, the mixing effect is negigible and the CFC-determine age is similar to the true age of the water. The presence of a saltwater mixing zone, indicates that there is definitely a mixture of two water types, fresh and seawater. The determined age of groundwater within the saltwater mixing zone is considered suspect due to the likely potential for mixing of different age waters.

The differences in the ages as determined by CFC-12 and CFC-11, with the CFC-11 ages being older, suggest that CFC-11 is not conserved in the Everglades environment. CFC-11 has been shown to take part in non-conservative processes such as adsorption and biodegradation (Russell and Thompson, 1983; Semprini et al., 1990; Lovely and Woodward, 1992). The removal of CFC-11 from the groundwater by adsorption and/or biodegradation can explain the older CFC-11 ages compared to the CFC-12.

The older than expected ages of the Everglades surface waters is surprising given the supersaturated levels observed in the canals. Due to equilibrium of CFCs with the atmosphere, CFC-12 determined ages of surface waters is expected to be 1 year or less. Surface waters ages varied from 5.8 to 32 years throughout the Everglades. There are two potential processes for surface water ages to be this old. First, old

5.5 Quantity of Groundwater Discharge to the Overlying Everglades Surface Waters Along the Saltwater Intrusion Interface

Kohout and Cooper (Cooper et al., 1964) investigated seawater intrusion in the Biscayne Aquifer along the coastline of Biscayne Bay. The results of their research indicated that along the saltwater intrusion front, fresh groundwater flowed upward along the saltwater interface and discharged to the overlying surface water. In the case of the Biscayne Aquifer near the Cutler Ridge Area of Miami, fresh groundwater discharged directly into Biscayne Bay. Saltwater intrusion occurs about 6 km to 18 km inland of Florida Bay in the C-111 and Taylor Slough areas, respectively (Figure 8) at shallow depths. The detection of salty water further inland at deep wells within the Surficial Aquifer, indicate that saltwater intrusion is extensive throughout the entire depth of the Surficial Aquifer. This result suggests that there is no fresh groundwater flow into Florida Bay. In the southern Everglades, fresh groundwater is expected to discharge to the overlying Everglades' surface water along the position of the saltwater intrusion front. Does not consider conduit flow

The mean groundwater flow rate in Taylor Slough as determined in this investigation is 783 m/yr (+/- 327). Assuming that groundwater flows at this rate throughout the approximate 15 m (50 ft) thickness of the Biscayne Aquifer, and that the Biscayne Aquifer has a porosity of 0.25, then the discharge of an approximately 7 km width of Taylor Slough is estimated at 3.29×10^8 m^3/yr. Assuming that groundwater flows at the same rate in the C-111 basin, then a combined groundwater discharge for the Taylor Slough and C-111 basin (a cross-sectional distance of about 24 km), is approximately 1.1×10^9 m^3/yr.

5.6 Quantity of Freshwater Flow into Florida Bay

Nuttle et al. (2000) estimated the freshwater inflow into Florida Bay from discharge measurements at the Taylor Slough Bridge and the C-111 canal (S18C) to be 0.09 m/yr or 3.6×10^{11} m^3/yr (9 cm/yr over 2,000 km^2 of Florida Bay). The quantity of fresh groundwater discharge (1.1×10^9 m^3/yr) estimated in this study is two orders of magnitude less than that estimated by Nuttle et al. (2000). This result suggests, that groundwater discharges to the overlying surface water are low compared to the overall surface water flow.

highly uncertain

6.0 Acknowledgments

This project was completed as part of Rene' Price's dissertation. Funding for the project was provided by Everglades National Park and by the South Florida Water Management District. We wish to thank the many individuals of Everglades National Park who provided assistance in this project. In particular, Bob Zepp and James Smith for all of their help in accessing wells in Taylor Slough and the C-111 basin by helicopter and by air boat. Lucy Given coordinated use of a power boat out of Flamingo. George Shardt and Dewitt Smith provided water level and rainfall data from ENP. Individuals from the USGS were also instrumental in this project. We wish to thank Gene Shinn,

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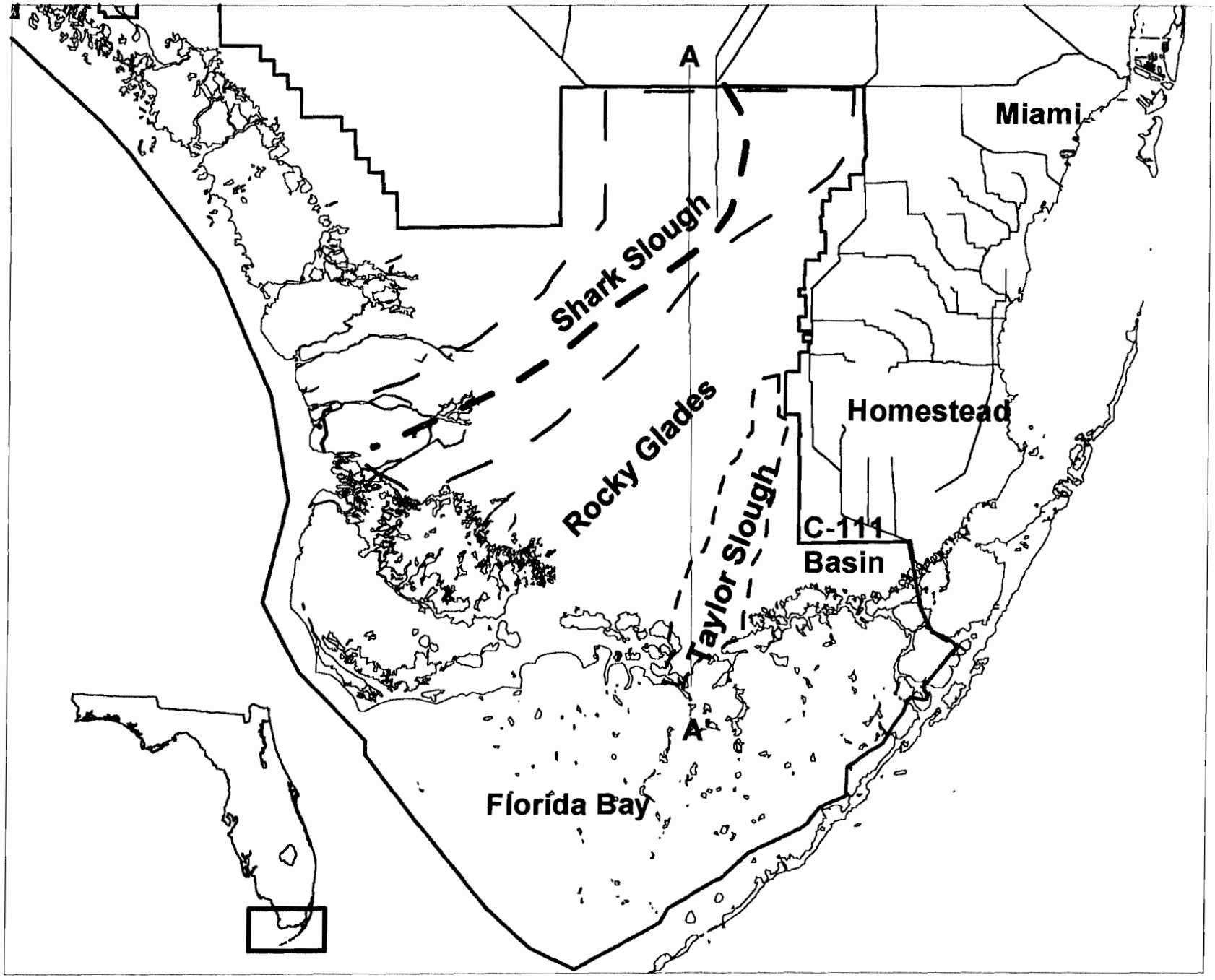


Figure 1. Research area includes the mainland portion of Everglades National Park. Heavy dashed line is the approximate western extent of the Biscayne Aquifer. Line A-A' is a hydrogeologic cross-section shown on Figure 2.

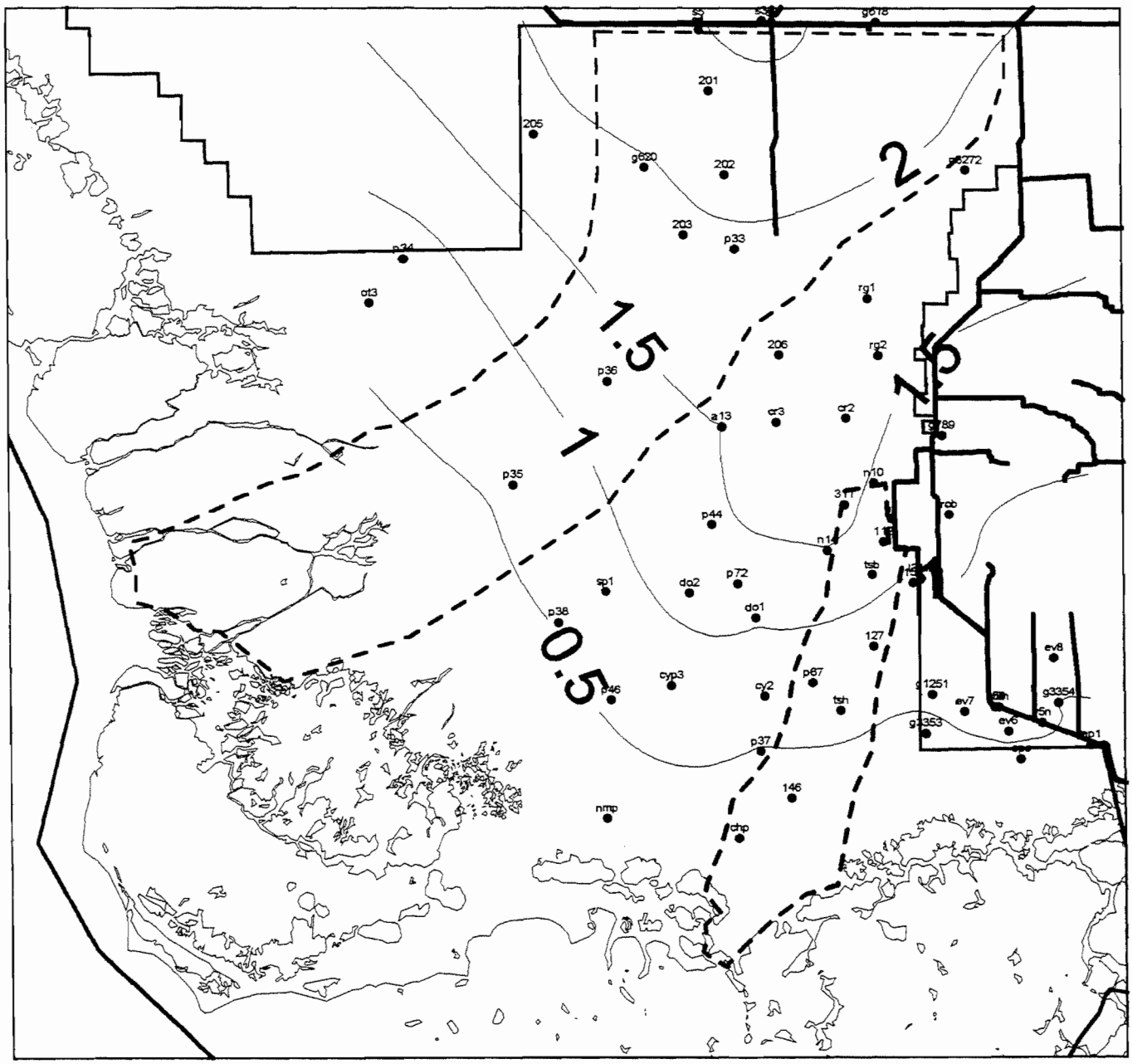


Figure 3. Potentiometric contours in meters for July 15, 1998.
Data courteous of Everglades National Park and USGS.

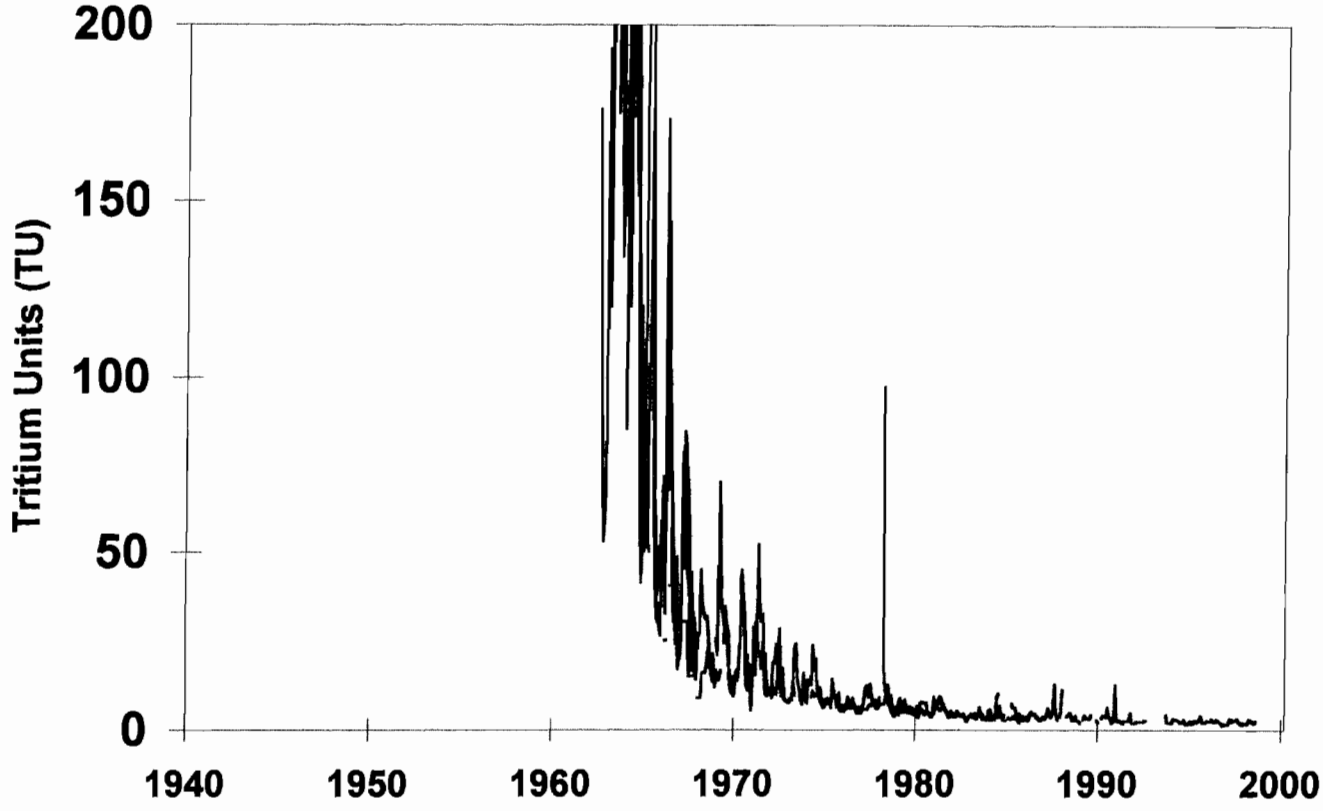


Figure 5. Atmospheric tritium concentrations as measured in Miami rainfall.

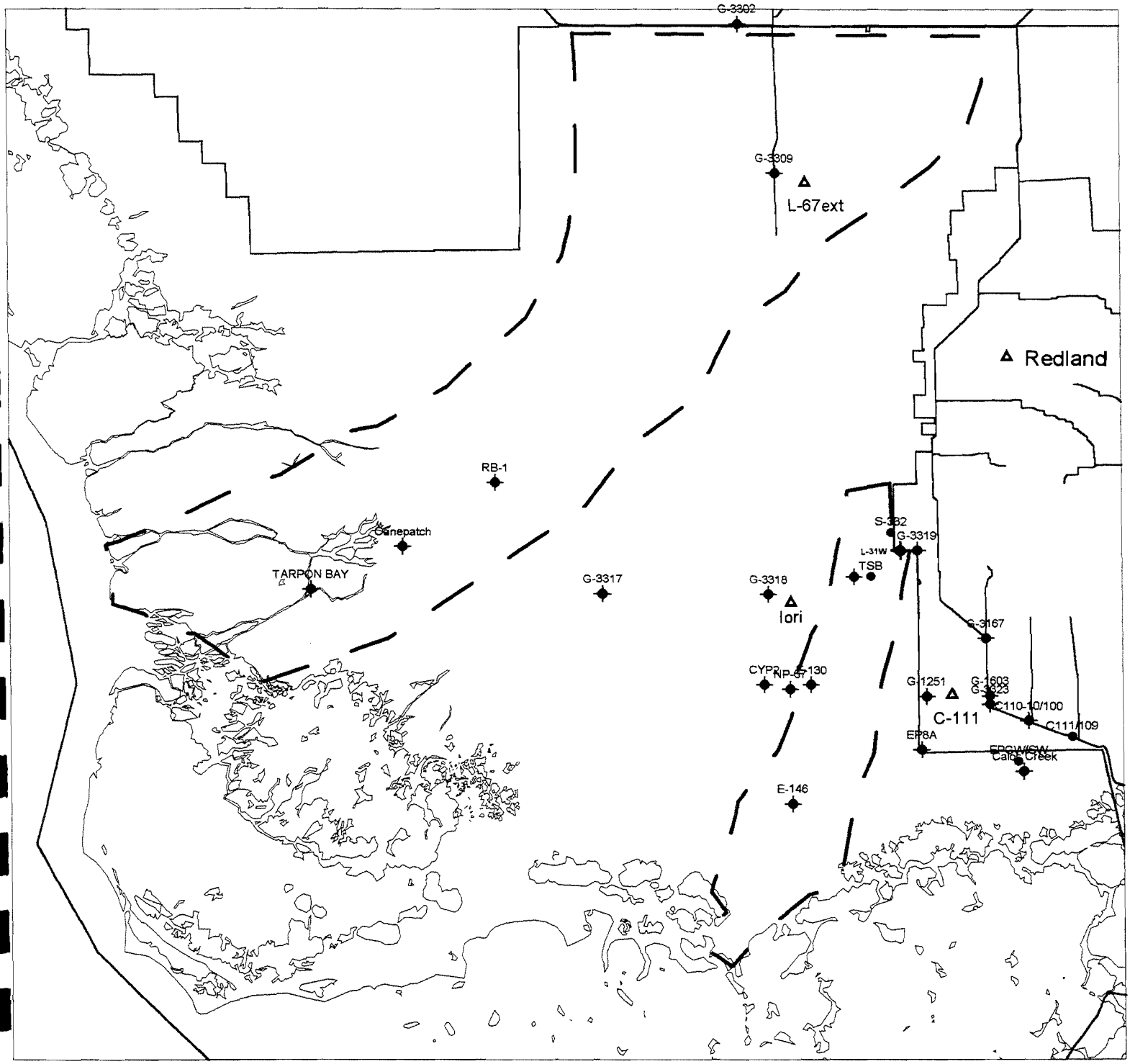


Figure 7. Site map showing sampling locations. Cirlces represent surface water sampling location, circles with cross represents groundwater cluster of 1 to 4 wells, and triangles represent rainfall sampling locations.

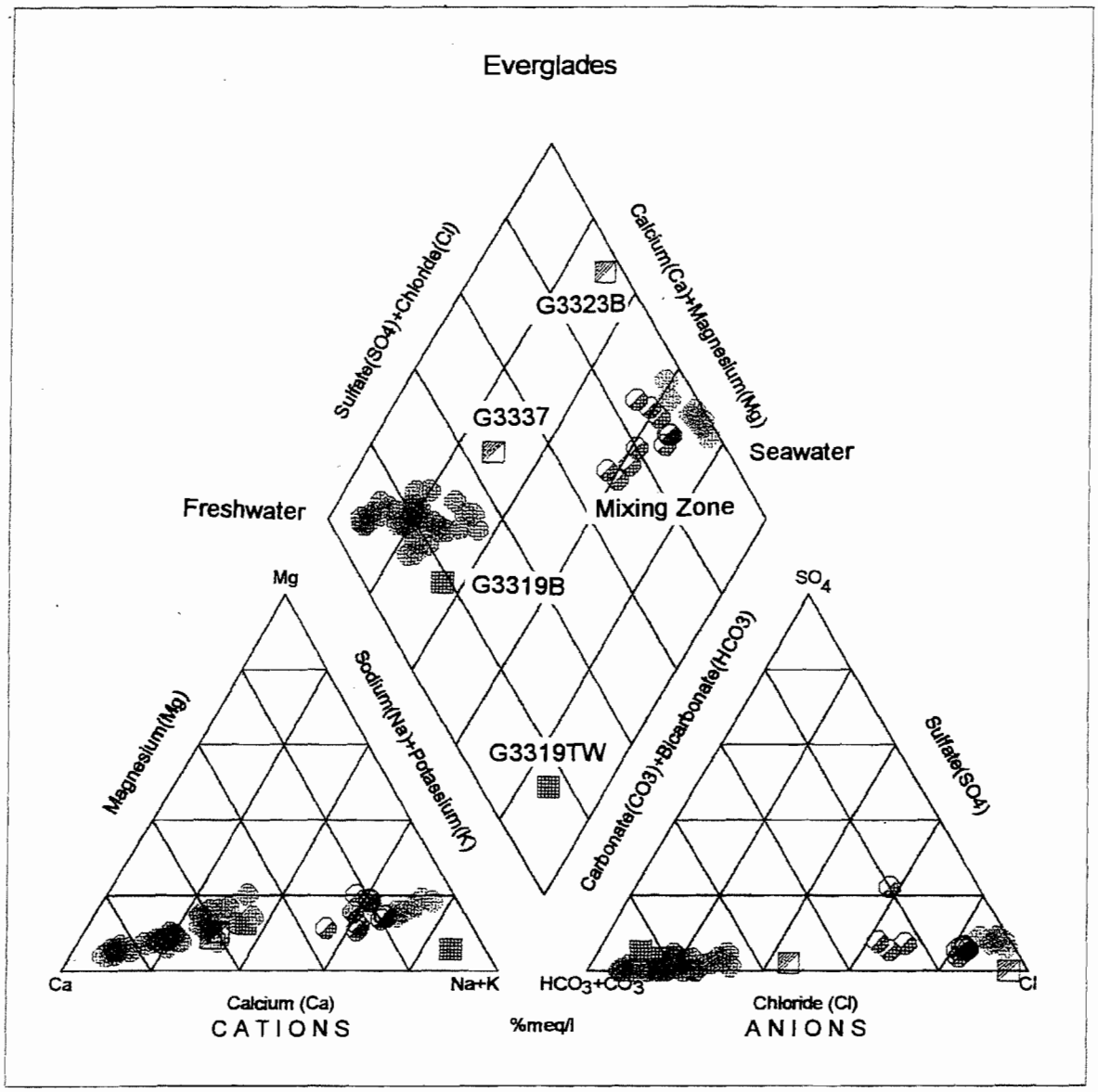


Figure 9. Piper diagram of mean cations and anions, in percent milliequivalents per liter, of groundwater and surface water stations.

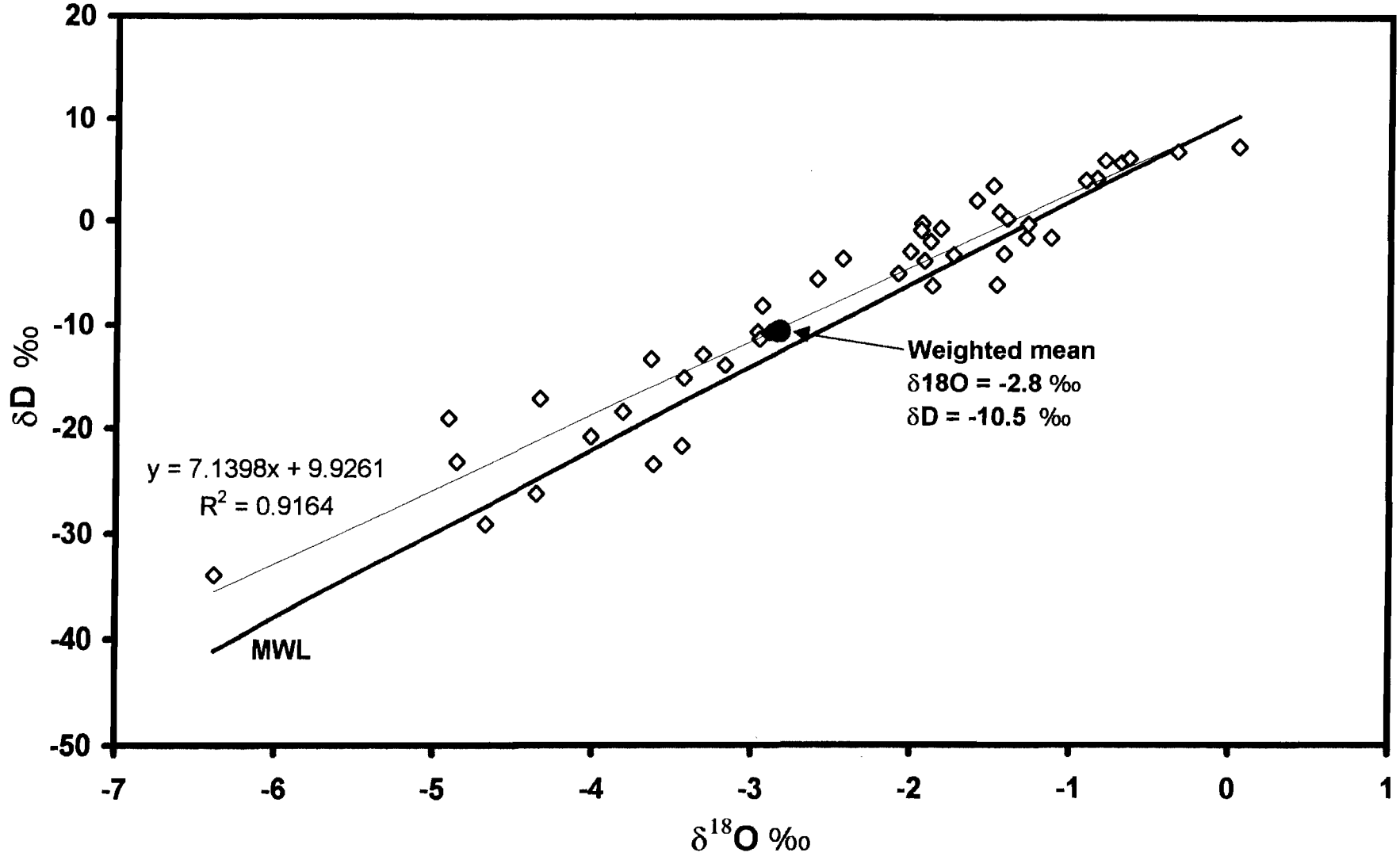


Figure 11. δD and $\delta^{18}O$ of rainfall samples collected from ENP and their weighted mean.

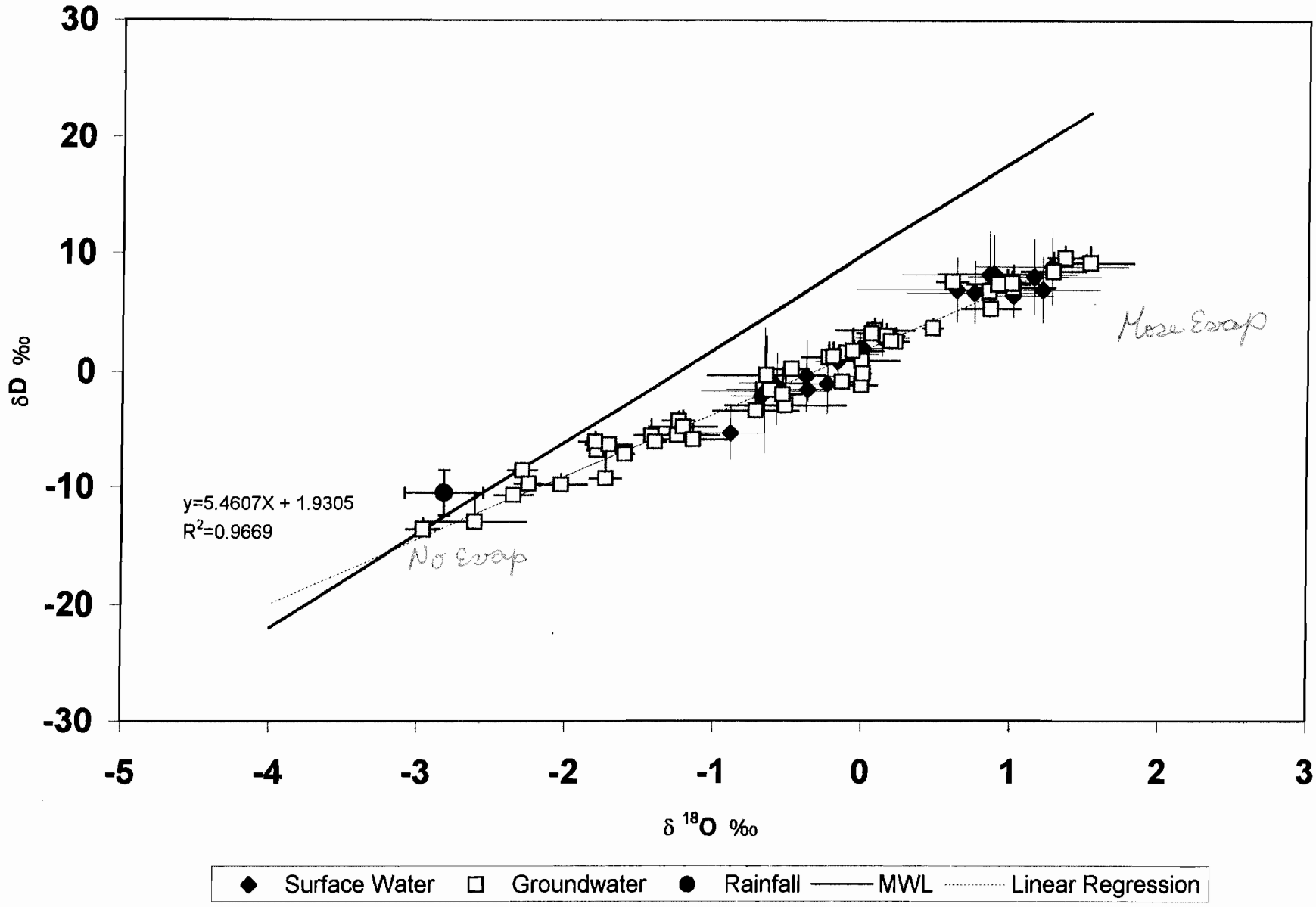


Figure 13. Mean δD and $\delta^{18}O$ of groundwater and surface waters collected in ENP. Error bars represent one standard error.

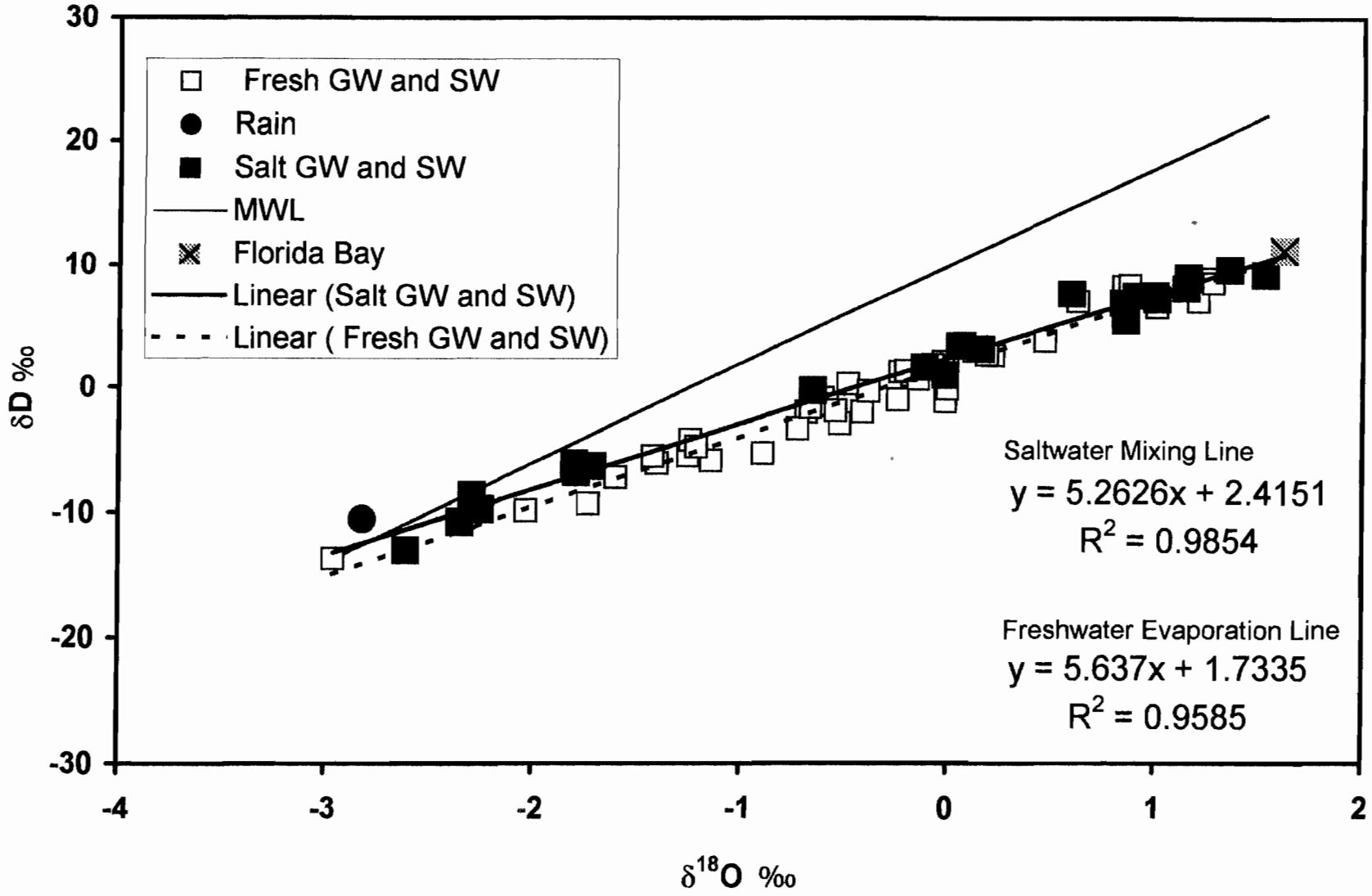


Figure 15. Mean δD and $\delta^{18}O$ of fresh and salty groundwater and surface water.

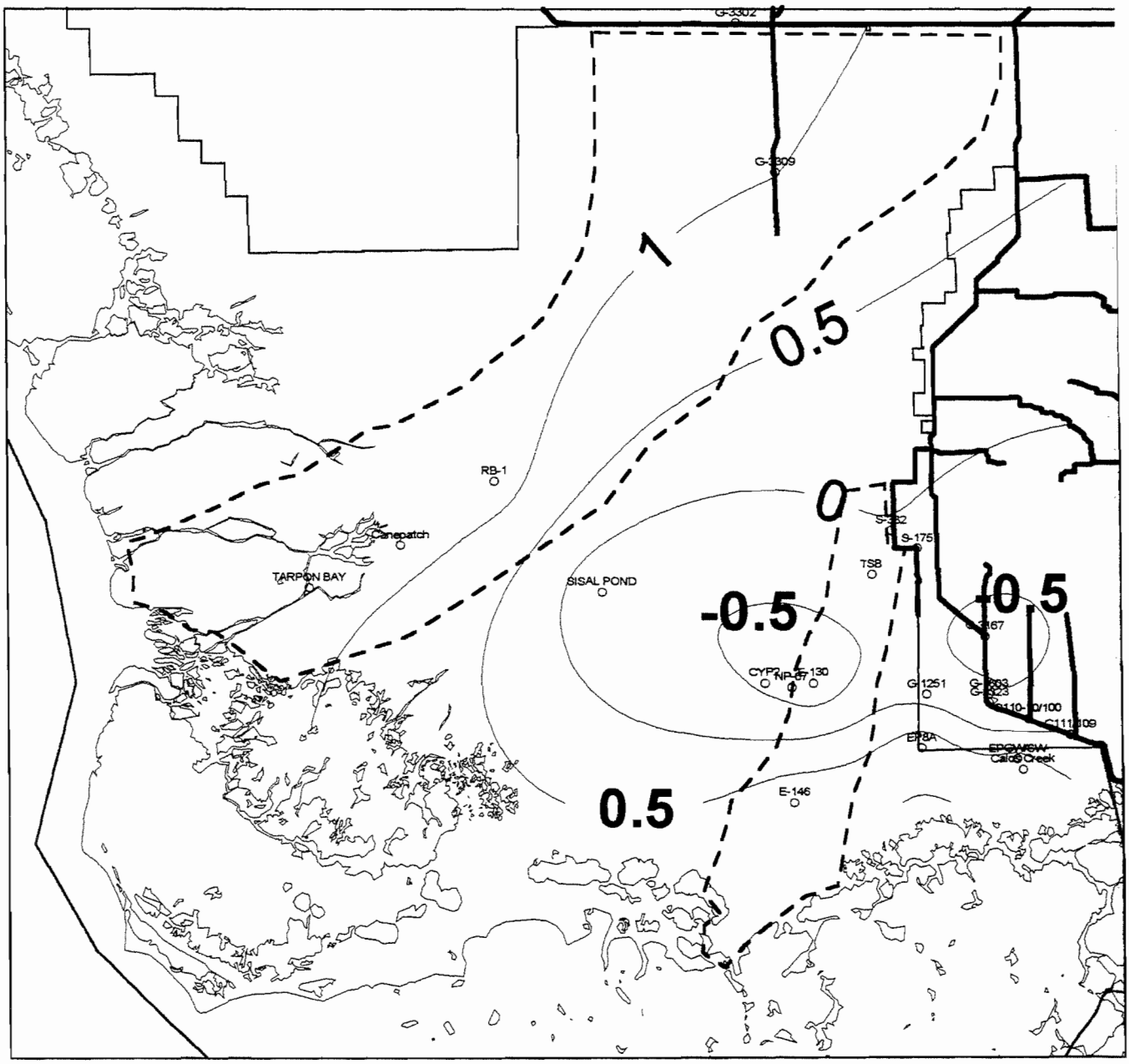


Figure 17a. Contours of mean oxygen isotopic composition of surface waters.

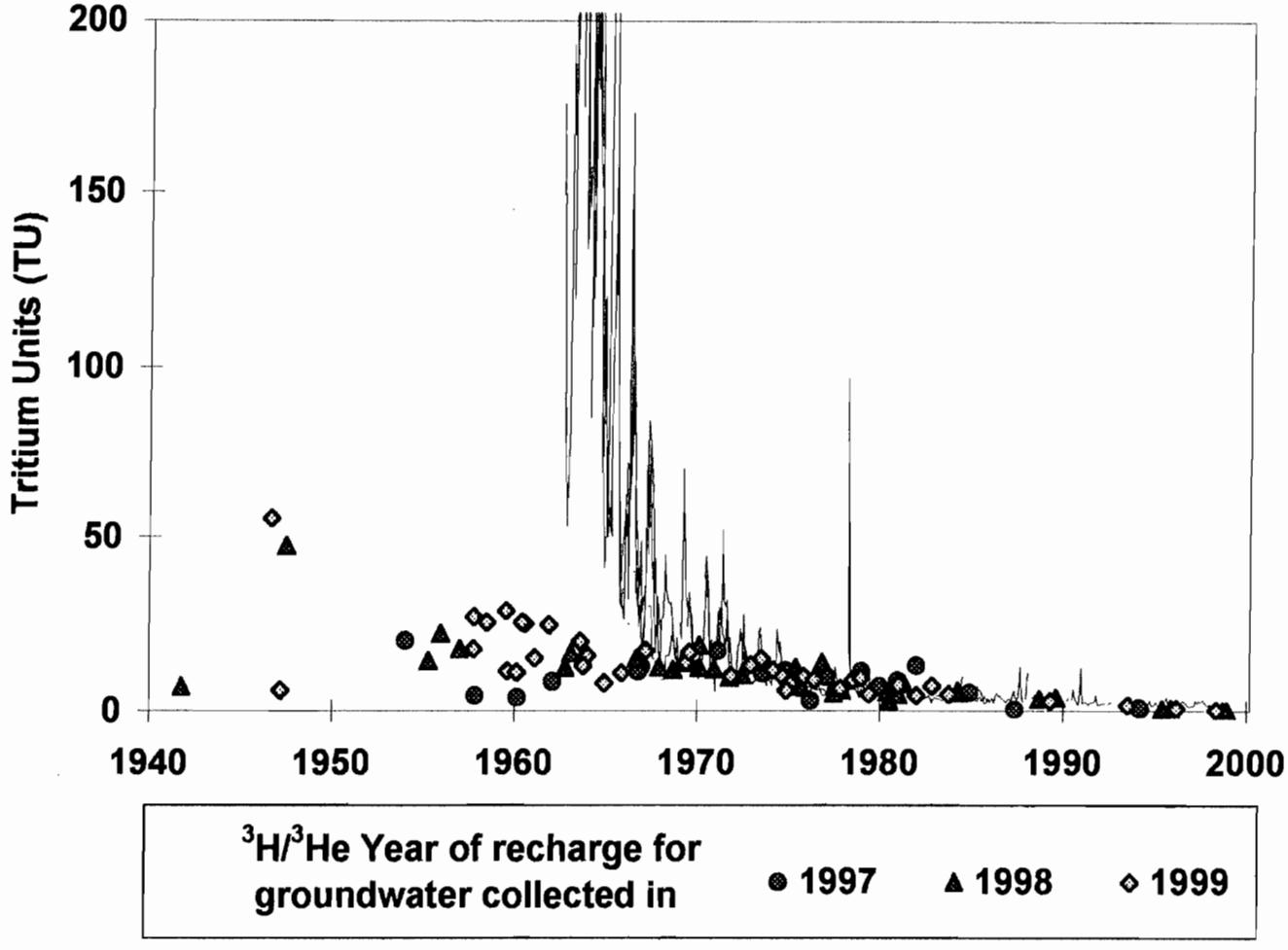


Figure 18. Year of groundwater recharged as determined by $^3H/^3He$ age compared to ^3H concentrations measured in Miami rainfall.

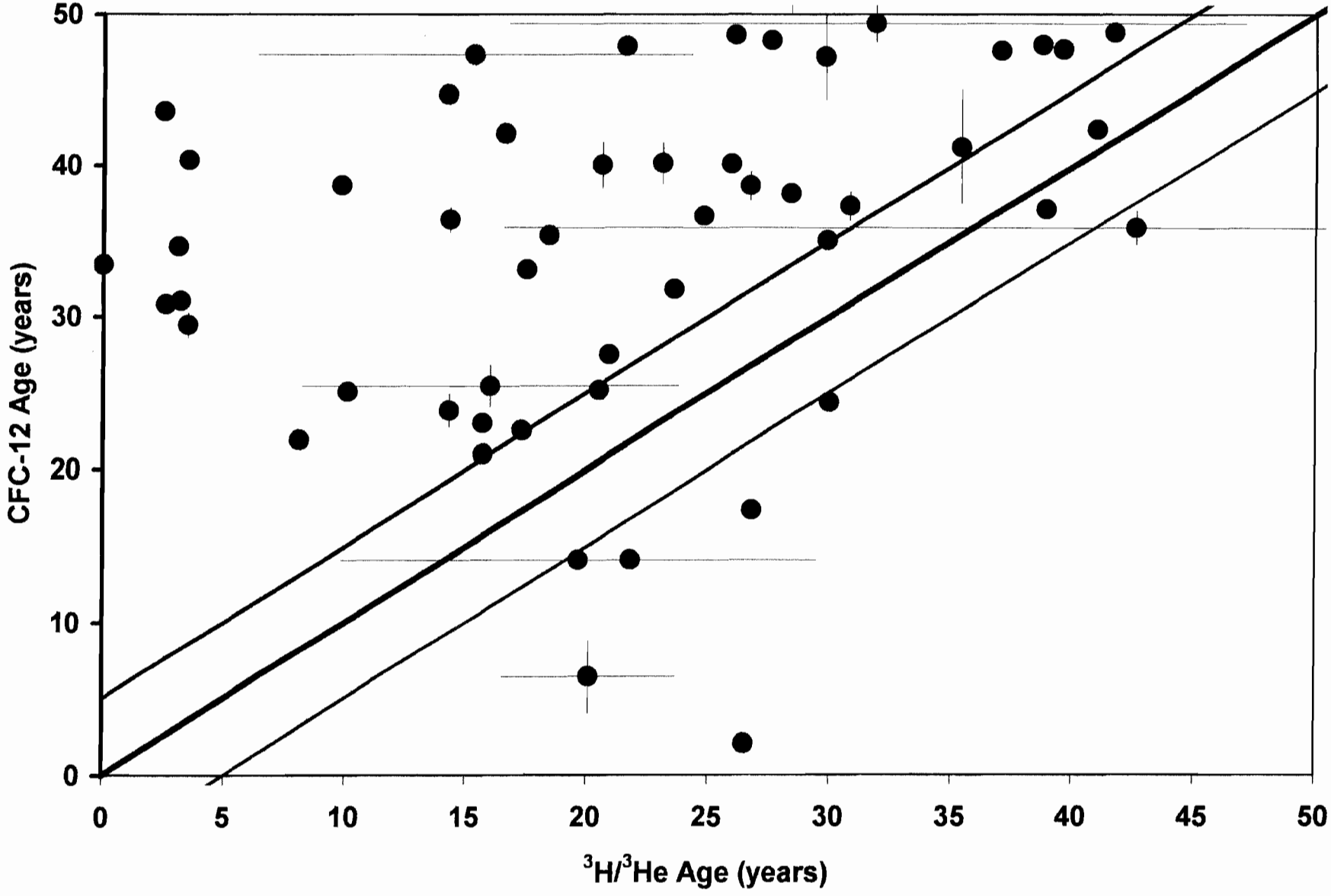


Figure 20. CFC-12 versus 3H/3He age (years) of groundwaters collected between 1997 and 1999. Bold line represents one to one line and dashed lines represent +/- 5 years.

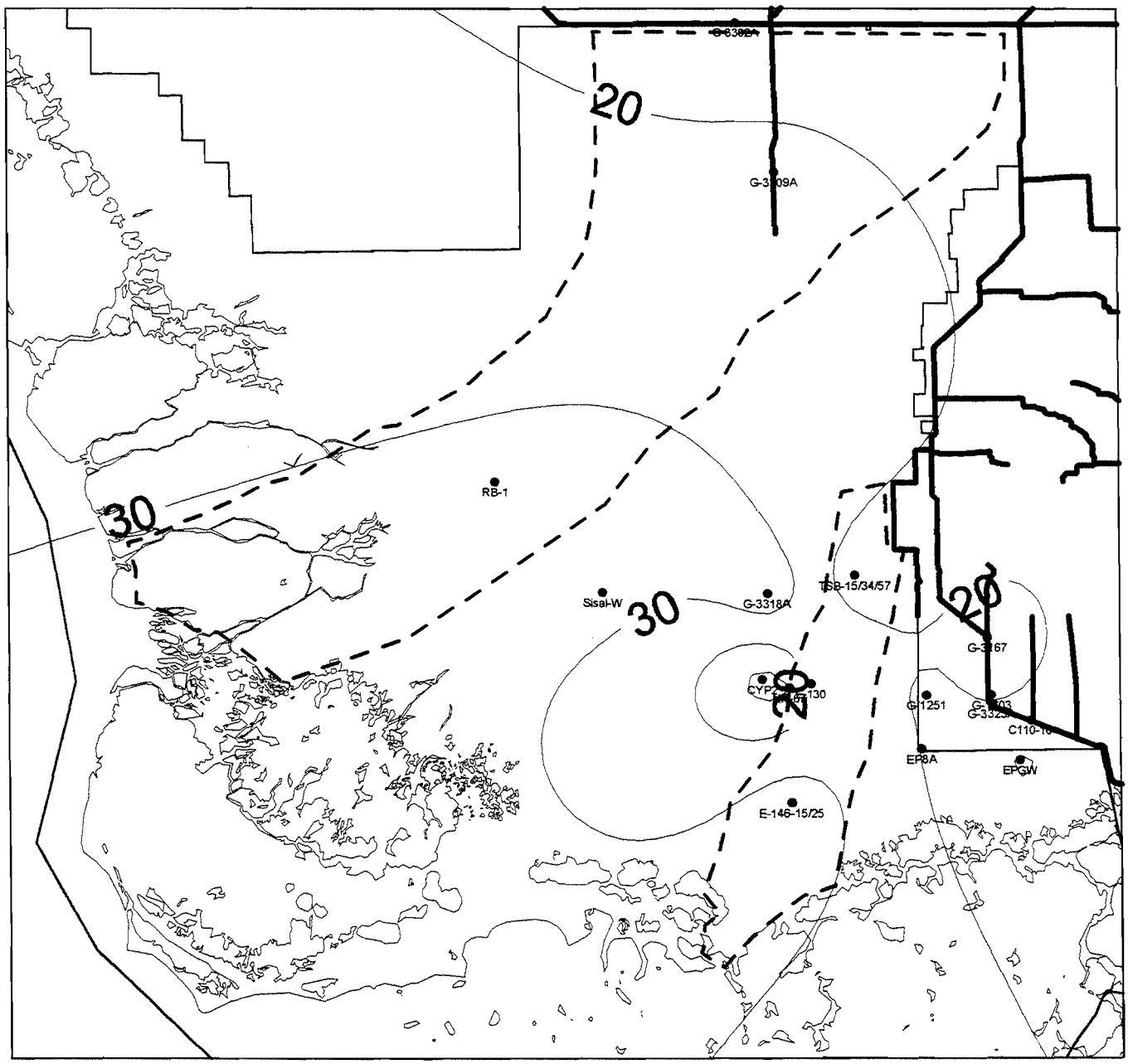


Figure 21b. Average tritium/helium-3 age of shallow groundwater in years.

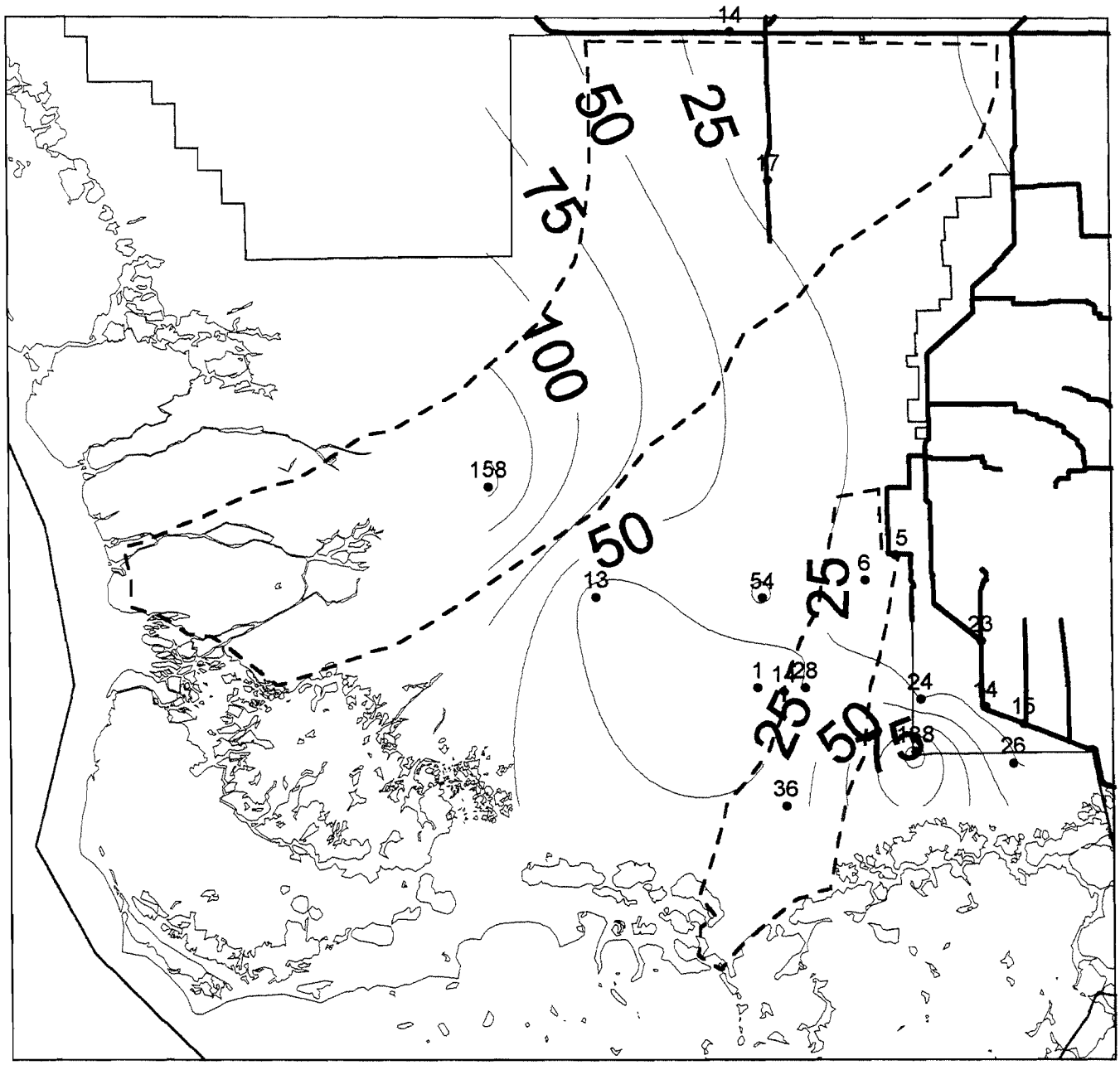


Figure 23. 4Helium excess (%) of shallow groundwaters in 1998.

Table 1. Summary of sampling locations.

Well Nest No./ Well No.	Depth (ft)	Surface Water Sample	Well Nest No./ Well No.	Depth (ft)	Surface Water Sample
Taylor Slough			**C-111 Basin**		
1 L-31W-14 L-31W-40 G-3319B G-3319TW	14 40 81 240	S-332 S-175	**8** G-3167	61	G-3167SW (C-111N)
2 TSB-15 TSB-34 TSB-57	15 34 57	TSB	**9** G-3336 G-1251 G-3337	38 5-59 100	G-1251SW (Aerojet Canal) Precipitation
3 NP-67 E-130-10 E-130-52.5	20 10 52.5	NP-67-SW E-130-SW	**10** G-1603 G-3323A G-3323B	60 15 100	G-1603SW (S-18C) G-3323SW
4 E-146-15 E-146-25 E-146-27.5	15 25 27.5	E-146-SW	**11** C-110-10 C-110-100	10 100	C111/110 C111/109
Shark Slough Wells			**12** EP-8A-GW **13** EP-GW/SW Calos Creek-GW	25 11 42	EP-8A-SW EP-SW Calos Creek-SW
5 G-3302A G-3302B G-3302C	14 84 123	G-3302SW (Tamiami Canal)	**Rocky Glades** **14** G-3318A G-3318B G-3318C G-3318TW	 23 77 161 223	lori Precipitation
6 G-3309A G-3309B G-3309C G-3309TW	20 64 130 175	G-3309SW (L-67 Ext Canal) Precipitation	**15** Sisal-W G-3317D G-3317C Sisal-E	12.5 8 - 28 150 44 - 100	Sisal Pond
7 RB-1-6 RB-1-20 RB-1-27 RB-1-GW Canepatch Tarpon Bay	6 20 27 22 56 70	RB-1-SW Canepatch-SW TarponBay-SW	**16** CYP2-10 NP-67	10 20	CYP2-SW NP-67SW

Table 3. Statistical summary of field parameters.

Sample		Conductivity µS/cm	Salinity	Temperature °C	pH
C110-10	Min	100	0.05	24.1	7.08
	Max	633	0.30	35.9	8.20
	Average	436	0.16	27.6	7.45
	StdDev	131	0.07	3.0	0.26
C110-100	Min	22000	16.00	24.8	5.85
	Max	30300	19.80	28.8	7.30
	Average	26293	18.36	26.1	6.71
	StdDev	1764	0.94	1.0	0.38
C111/109	Min	370	0.07	23.3	7.29
	Max	1462	0.80	31.7	8.78
	Average	568	0.22	27.2	7.89
	StdDev	301	0.17	2.5	0.40
C111/110	Min	400	0.10	23.9	7.16
	Max	1119	0.60	30.6	8.37
	Average	511	0.21	26.6	7.75
	StdDev	179	0.12	2.1	0.37
CALUS CREEK-GW	Min	2280	3.15	24.4	7.08
	Max	36900	27.40	25.6	7.36
	Average	20728	21.29	25.1	7.27
	StdDev	17701	12.09	0.4	0.12
CALUS CREEK-SW	Min	440	0.12	18.5	7.07
	Max	2370	0.20	32.8	8.22
	Average	898	0.18	28.5	7.48
	StdDev	757	0.04	5.2	0.45
CANEPATCH-GW	Min	19641	13.80	23.4	6.75
	Max	25900	16.30	26.9	8.05
	Average	22592	15.41	25.0	7.04
	StdDev	10982	0.66	0.8	0.28
CANEPATCH-SW	Min	290	0.02	17.5	6.89
	Max	16740	9.00	33.1	8.25
	Average	2482	0.96	26.7	7.50
	StdDev	4341	2.13	4.1	0.28
CYP2-10-GW	Min	190	0.00	21.9	6.71
	Max	450	0.10	31.9	7.80
	Average	330	0.07	26.6	7.34
	StdDev	65	0.04	2.6	0.30
CYP2-10-SW	Min	170	0.00	19.3	6.94
	Max	440	0.20	34.4	7.78
	Average	301	0.06	26.8	7.50
	StdDev	94	0.07	4.0	0.25
E-130-10	Min	435	0.20	23.1	5.43
	Max	526	0.20	27.4	7.64
	Average	452	0.20	25.9	6.88
	StdDev	27	0.00	1.3	0.67

Table 3. Statistical summary of field parameters.

Sample		Conductivity µS/cm	Salinity	Temperature °C	pH
G-1603GW	Min	395	0.10	24.9	6.88
	Max	2340	1.32	28.3	7.64
	Average	1836	1.08	25.7	7.27
	StdDev	464	0.25	0.8	0.21
G-1603SW	Min	410	0.12	23.3	6.94
	Max	843	0.40	29.2	8.38
	Average	498	0.19	26.5	7.59
	StdDev	87	0.06	1.9	0.41
G-3167GW	Min	480	0.15	24.8	6.69
	Max	1320	0.23	26.6	7.66
	Average	565	0.19	25.5	7.30
	StdDev	164	0.02	0.5	0.24
G-3167SW	Min	400	0.09	22.8	6.83
	Max	580	0.20	30.4	8.47
	Average	483	0.17	26.5	7.62
	StdDev	45	0.04	2.1	0.43
G-3302A	Min	140	0.00	22.5	6.51
	Max	722	0.23	28.4	409.00
	Average	462	0.15	25.3	23.95
	StdDev	124	0.06	1.7	82.02
G-3302B	Min	720	0.30	23.3	5.89
	Max	934	0.44	27.5	7.18
	Average	813	0.38	25.3	6.84
	StdDev	46	0.04	0.8	0.33
G-3302C	Min	740	0.20	22.3	6.32
	Max	970	0.45	26.6	7.28
	Average	835	0.36	25.4	6.94
	StdDev	48	0.07	0.9	0.28
G-3302SW	Min	220	0.00	19.5	6.65
	Max	630	0.26	35.9	7.84
	Average	404	0.14	26.2	7.36
	StdDev	124	0.07	4.0	0.31
G-3309A	Min	690	0.10	24.2	6.23
	Max	919	0.42	29.3	7.06
	Average	783	0.36	26.0	6.72
	StdDev	54	0.08	1.2	0.28
G-3309B	Min	890	0.40	23.2	5.95
	Max	1109	0.53	27.5	7.67
	Average	948	0.47	25.4	6.79
	StdDev	54	0.05	0.9	0.49
G-3309C	Min	650	0.20	23.9	6.09
	Max	887	0.42	26.3	7.45
	Average	762	0.35	25.0	6.98
	StdDev	56	0.06	0.7	0.43
G-3309SW	Min	275	0.08	18.0	6.29
	Max	630	1.00	31.7	7.74
	Average	443	0.20	25.9	7.24
	StdDev	99	0.20	4.3	0.40

Table 3. Statistical summary of field parameters.

Sample		Conductivity µS/cm	Salinity	Temperature °C	pH
G-3336	Min	400	0.09	23.3	6.69
	Max	520	0.20	27.1	7.71
	Average	463	0.18	25.0	7.22
	StdDev	32	0.03	1.0	0.25
G-3337	Min	400	0.13	23.0	7.11
	Max	570	0.20	25.9	7.94
	Average	496	0.19	24.8	7.65
	StdDev	33	0.03	0.6	0.21
L-31W-14	Min	400	0.10	23.7	6.93
	Max	580	0.20	29.2	7.58
	Average	450	0.18	25.9	7.31
	StdDev	51	0.04	1.7	0.21
L-31W-40	Min	201	0.00	24.1	7.39
	Max	462	1.00	26.4	11.10
	Average	398	0.23	25.2	8.49
	StdDev	77	0.25	0.6	1.39
NP-67-GW	Min	310	0.03	24.6	6.65
	Max	490	0.20	28.0	7.56
	Average	416	0.11	25.9	7.09
	StdDev	48	0.05	0.8	0.24
NP-67-SW	Min	180	0.00	20.9	6.80
	Max	594	0.20	33.5	7.92
	Average	366	0.09	26.6	7.35
	StdDev	106	0.08	3.9	0.32
RB-1-20	Min	4970	3.00	23.3	6.51
	Max	7420	4.60	27.4	7.65
	Average	6021	3.81	25.7	6.87
	StdDev	606	0.44	1.0	0.30
RB-1-27	Min	3570	2.20	23.4	6.49
	Max	5480	3.30	28.1	7.83
	Average	4544	2.78	25.9	7.00
	StdDev	575	0.32	1.1	0.34
RB-1-6	Min	4300	2.60	22.9	6.40
	Max	6990	4.48	28.2	7.66
	Average	5591	3.56	25.9	6.79
	StdDev	685	0.52	1.6	0.33
RB-1-GW	Min	5530	3.69	24.3	6.07
	Max	7530	4.95	27.9	7.19
	Average	6512	4.13	25.6	6.71
	StdDev	418	0.28	0.8	0.24
RB-1-SW	Min	276	0.01	18.6	6.57
	Max	1183	0.60	31.8	7.96
	Average	531	0.19	25.9	7.42
	StdDev	249	0.17	3.7	0.38
S-175	Min	390	0.09	22.0	7.14
	Max	643	0.20	31.1	8.47
	Average	470	0.18	26.3	7.62
	StdDev	50	0.03	2.8	0.29

Table 4. Statistical summary of major cations and anions.

Sample	Data	Alkalinity (mM)	Chloride (mg/L)	Sulfate (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Magnesium (mg/L)	Calcium (mg/L)
C110-10	Min	2.92	23.07	1.41	13.47	2.69	3.23	56.15
	Max	3.50	55.37	5.79	21.44	3.52	5.33	59.72
	Average	3.10	38.52	3.45	16.90	3.06	4.34	58.53
	StdDev	0.21	12.51	3.45	4.10	0.42	1.05	2.06
C110-100	Min	4.37	9221.90	1094.63	5037.10	65.26	633.46	584.57
	Max	4.67	10413.86	1228.61	5712.41	87.51	796.66	713.77
	Average	4.53	9755.16	1148.13	5398.90	73.57	708.16	648.04
	StdDev	0.12	410.38	1148.13	340.23	12.15	82.47	64.63
C111/109	Min	3.24	25.62	4.20	17.65	3.31	5.09	63.69
	Max	7.87	351.48	57.95	110.56	6.32	20.57	83.79
	Average	4.08	61.60	13.66	34.10	4.46	7.96	74.94
	StdDev	1.20	91.58	13.66	37.47	1.06	6.19	6.92
C111/110	Min	3.84	29.57	5.16	19.94	3.28	5.11	67.98
	Max	4.25	43.37	14.70	22.50	4.98	6.14	85.90
	Average	4.05	35.23	9.02	21.38	4.24	5.69	79.71
	StdDev	0.18	5.74	9.02	1.31	0.87	0.53	10.17
CALUS CREEK-GW	Min	4.13	593.81	110.95	718.40	21.88	106.63	118.32
	Max	5.71	14784.26	2012.39	718.40	227.21	636.75	519.95
	Average	4.97	7125.95	1030.75	718.40	124.55	371.69	319.13
	StdDev	0.75	6663.69	1030.75	0.00	145.19	374.85	284.00
CALUS CREEK-SW	Min	3.58	38.88	3.95	27.07	3.55	7.24	64.25
	Max	5.78	826.42	33.85	30.85	3.72	8.27	70.43
	Average	4.42	208.61	12.89	28.96	3.64	7.75	67.34
	StdDev	1.04	309.67	12.89	2.68	0.12	0.73	4.37
CANEPATCH-GW	Min	5.73	7886.52	1019.67	4293.29	134.43	604.15	381.96
	Max	6.78	8364.18	1226.88	4828.35	141.94	730.78	456.94
	Average	6.04	8084.87	1111.93	4530.37	138.58	639.72	420.25
	StdDev	0.30	137.60	1111.93	228.04	2.96	46.37	32.57
CANEPATCH-SW	Min	2.90	39.41	1.33	3.23	1.64	1.87	41.10
	Max	5.86	2449.63	336.02	1099.66	59.12	176.63	136.91
	Average	4.06	294.59	32.58	210.03	18.59	36.32	62.14
	StdDev	1.06	656.90	32.58	436.16	25.29	68.82	37.13
CYP2-10GW	Min	2.14	5.37	0.00	5.20	1.28	0.61	42.98
	Max	4.26	18.62	2.88	10.20	1.73	3.99	95.11
	Average	3.14	12.23	0.33	7.22	1.48	2.29	59.80
	StdDev	0.58	3.04	0.33	1.58	0.18	0.92	15.63
CYP2-10SW	Min	1.60	6.01	0.00	4.50	1.27	0.64	30.00
	Max	4.31	17.86	11.27	9.83	2.56	3.69	81.84
	Average	2.68	12.33	1.03	7.13	1.80	2.25	49.55
	StdDev	0.77	3.57	1.03	1.79	0.42	0.92	17.26
E-130-10	Min	4.47	13.01	0.00	8.76	4.20	3.61	91.51
	Max	4.80	14.97	0.05	8.90	4.31	4.27	94.38
	Average	4.66	13.81	0.01	8.83	4.26	3.94	92.95
	StdDev	0.14	0.84	0.01	0.10	0.08	0.47	2.03
E-130-52	Min	3.87	13.35	0.00	8.98	4.18	3.49	87.95
	Max	4.64	15.12	0.21	9.09	4.47	3.95	93.52
	Average	4.33	13.92	0.08	9.04	4.33	3.72	90.74
	StdDev	0.37	0.65	0.08	0.08	0.21	0.33	3.94
E-130-SW	Min	2.72	9.08	0.00	6.78	1.81	2.87	52.75
	Max	4.81	14.21	2.98	7.56	2.61	3.24	71.87
	Average	3.55	11.39	0.92	7.17	2.21	3.06	62.31
	StdDev	0.93	1.81	0.92	0.55	0.57	0.26	13.52
E-146-15	Min	5.47	4918.96	593.60	2729.32	33.54	337.04	544.69
	Max	5.95	5533.46	663.44	2906.79	37.75	350.91	550.81
	Average	5.72	5196.77	628.33	2818.06	35.65	343.97	547.75
	StdDev	0.18	281.46	628.33	125.49	2.97	9.81	4.33

Table 4. Statistical summary of major cations and anions.

Sample	Data	Alkalinity (mM)	Chloride (mg/L)	Sulfate (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Magnesium (mg/L)	Calcium (mg/L)
G-3302C	Min	4.96	28.01	0.00	50.83	4.66	17.43	51.46
	Max	8.71	61.40	0.14	57.20	5.43	23.19	130.78
	Average	7.68	55.22	0.01	54.26	4.90	19.54	116.89
	StdDev	1.00	7.23	0.01	2.23	0.22	1.77	24.96
G-3302SW	Min	2.14	12.38	0.06	10.63	1.01	3.48	39.34
	Max	5.54	78.17	20.75	51.09	3.69	15.90	71.46
	Average	3.54	41.84	7.08	32.34	2.73	11.13	59.78
	StdDev	1.05	23.18	7.08	15.78	1.07	4.79	10.78
G-3309A	Min	3.73	74.69	0.00	52.44	2.45	14.37	106.45
	Max	7.96	91.19	2.08	62.33	19.86	16.75	142.34
	Average	6.67	81.03	0.39	57.70	5.20	15.50	118.71
	StdDev	1.18	4.84	0.39	3.90	6.48	0.93	12.30
G-3309B	Min	6.85	79.62	0.07	40.66	1.37	10.30	92.68
	Max	8.49	95.49	2.98	64.38	3.59	16.75	145.31
	Average	8.09	90.63	1.34	57.83	2.40	15.15	130.82
	StdDev	0.52	4.78	1.34	8.14	0.73	2.18	18.79
G-3309C	Min	2.90	68.30	14.85	41.86	2.01	8.56	61.53
	Max	6.51	82.37	17.58	67.91	4.14	13.88	100.48
	Average	5.31	76.93	16.35	60.88	3.32	12.73	90.77
	StdDev	1.14	4.75	16.35	9.19	0.65	1.87	13.95
G-3309SW	Min	2.85	17.49	0.56	6.76	0.73	2.44	10.67
	Max	4.46	73.63	20.85	47.73	3.75	15.46	69.22
	Average	3.76	45.02	8.42	33.42	2.74	10.92	57.29
	StdDev	0.52	19.67	8.42	13.35	0.93	3.95	18.27
G-3309TW	Min	4.97	71.12	7.10	55.80	7.23	19.55	78.99
	Max	5.74	76.25	10.09	57.83	7.43	21.36	82.27
	Average	5.50	74.89	7.82	56.70	7.29	20.56	80.39
	StdDev	0.27	1.88	7.82	0.84	0.09	0.68	1.48
G-3317C	Min	2.08	47.59	5.41	210.41	4.69	30.58	101.52
	Max	3.20	1702.74	215.11	725.59	19.62	102.33	269.26
	Average	2.32	1341.37	156.04	562.45	11.41	79.22	215.41
	StdDev	0.26	389.21	156.04	162.91	4.01	21.88	52.09
G-3317D	Min	2.06	12.09	0.00	7.78	0.00	1.93	53.67
	Max	4.01	23.36	0.41	11.77	0.71	2.48	83.72
	Average	3.57	16.38	0.04	8.95	0.36	2.28	72.62
	StdDev	0.52	4.08	0.04	1.16	0.21	0.19	11.46
G-3318A	Min	3.46	9.83	0.00	3.01	0.22	1.09	71.46
	Max	4.16	16.02	0.17	14.88	0.65	2.78	87.74
	Average	3.86	12.48	0.02	7.66	0.30	2.19	78.17
	StdDev	0.19	1.95	0.02	3.07	0.15	0.49	5.11
G-3318B	Min	2.54	573.49	29.90	249.80	2.98	25.07	135.71
	Max	3.86	649.32	65.13	289.87	7.94	33.79	153.71
	Average	2.84	604.31	39.64	269.35	3.79	29.73	146.54
	StdDev	0.32	22.47	39.64	13.07	1.69	2.84	7.12
G-3318C	Min	2.04	495.34	63.94	380.16	6.57	31.75	145.05
	Max	3.33	869.28	114.60	419.80	12.59	44.54	172.34
	Average	2.81	794.23	88.13	400.19	7.71	37.28	152.93
	StdDev	0.26	89.33	88.13	16.77	1.90	3.83	8.81
G-3318TW	Min	2.34	674.89	65.49	320.08	9.31	45.39	114.79
	Max	3.27	829.84	108.77	370.25	10.95	57.21	203.81
	Average	2.83	732.24	79.34	346.79	9.89	49.60	132.31
	StdDev	0.23	42.61	79.34	17.38	0.51	3.66	31.89
G-3319B	Min	2.81	13.98	4.26	21.13	2.05	5.13	36.83
	Max	4.28	37.66	11.17	39.38	4.82	7.32	73.47
	Average	3.49	23.09	7.41	33.40	3.62	6.66	46.01
	StdDev	0.53	7.77	7.41	8.01	1.39	0.89	15.47
G-3319TW	Min	2.77	10.65	7.62	59.04	11.19	0.66	1.56
	Max	3.50	15.21	10.37	66.04	12.86	3.72	7.07
	Average	3.03	12.43	8.71	63.17	11.97	2.51	5.42
	StdDev	0.22	1.42	8.71	2.55	0.69	1.10	1.94

Table 4. Statistical summary of major cations and anions.

Sample	Data	Alkalinity (mM)	Chloride (mg/L)	Sulfate (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Magnesium (mg/L)	Calcium (mg/L)
S-332	Min	3.68	16.67	0.96	17.08	1.08	4.35	62.14
	Max	4.58	57.18	8.35	26.48	14.55	7.11	89.58
	Average	4.22	37.05	3.51	21.94	3.41	5.46	78.35
	StdDev	0.30	11.63	3.51	3.18	4.20	0.87	7.88
SISAL POND	Min	1.39	7.68	0.00	5.79	0.29	1.51	34.79
	Max	4.08	25.06	0.96	12.94	1.55	2.60	75.03
	Average	2.43	18.36	0.18	8.77	0.66	2.03	51.10
	StdDev	0.74	6.17	0.18	2.32	0.40	0.40	15.30
SISAL-E	Min	2.79	0.00	200.70	640.25	23.30	99.34	183.49
	Max	5.00	1567.86	252.50	726.66	26.39	126.64	244.21
	Average	3.10	1387.68	214.15	712.83	24.59	109.76	204.02
	StdDev	0.57	372.73	214.15	27.85	0.87	7.53	18.03
SISAL-W	Min	2.26	12.27	0.00	8.28	0.31	1.92	56.51
	Max	4.06	51.76	3.97	14.79	0.83	2.94	85.10
	Average	3.53	21.08	0.56	9.79	0.43	2.41	73.88
	StdDev	0.49	10.74	0.56	2.26	0.18	0.31	10.64
TARPON BAY-GW	Min	8.14	11564.02	1556.34	6348.09	221.65	837.48	397.99
	Max	9.78	12198.44	1790.56	7020.20	249.24	959.29	543.61
	Average	8.64	11754.70	1657.63	6712.25	235.58	881.42	448.52
	StdDev	0.49	223.49	1657.63	293.34	10.24	42.35	49.38
TARPON BAY-SW	Min	3.11	137.37	11.60	82.33	4.73	16.63	45.81
	Max	5.31	5519.64	822.82	6627.34	224.78	810.72	335.68
	Average	3.94	1285.83	191.00	1462.33	51.03	184.54	107.30
	StdDev	0.83	1740.37	191.00	2887.81	97.14	350.11	127.78
TSB	Min	2.22	15.82	0.00	0.17	1.16	4.76	48.62
	Max	8.15	56.75	6.31	25.54	2.25	6.58	74.16
	Average	3.98	37.29	2.52	18.13	1.87	5.37	61.91
	StdDev	1.41	10.57	2.52	7.66	0.38	0.61	8.08
TSB-15	Min	4.14	25.01	0.00	18.24	0.98	5.06	88.03
	Max	4.63	42.14	0.36	19.98	1.04	5.22	88.90
	Average	4.45	32.08	0.13	19.11	1.01	5.14	88.47
	StdDev	0.16	6.63	0.13	1.23	0.04	0.11	0.62
TSB-34	Min	3.97	28.86	0.00	22.49	0.70	4.39	77.16
	Max	4.33	35.47	0.15	22.59	0.74	5.45	79.63
	Average	4.14	31.30	0.03	22.54	0.72	4.92	78.40
	StdDev	0.14	2.61	0.03	0.07	0.03	0.75	1.75
TSB-57	Min	3.82	25.60	0.00	21.87	0.68	5.58	76.22
	Max	4.03	33.67	0.64	21.87	0.68	5.58	76.22
	Average	3.96	28.44	0.28	21.87	0.68	5.58	76.22
	StdDev	0.10	2.87	0.28	0.00	0.00	0.00	0.00

Table 6. Statistical summary of stable isotopes of oxygen and hydrogen.

Sample		δ18O ‰	δD ‰
C110-10	Min	-0.61	1.58
	Max	1.22	8.69
	Average	0.08	3.64
	StdDev	0.55	2.11
C110-100	Min	-0.23	-2.12
	Max	0.80	5.58
	Average	0.16	3.19
	StdDev	0.24	1.77
C111/109	Min	-1.58	-6.47
	Max	1.07	9.34
	Average	0.00	2.10
	StdDev	0.73	4.48
C111/110	Min	-1.71	-15.17
	Max	0.74	7.72
	Average	-0.24	-0.91
	StdDev	0.72	6.55
CALUS CREEK-GW	Min	0.53	4.85
	Max	1.27	10.01
	Average	0.97	7.63
	StdDev	0.34	2.08
CALUS CREEK-SW	Min	-1.06	-6.38
	Max	3.47	20.45
	Average	0.75	6.88
	StdDev	1.76	12.29
CANEPATCH-GW	Min	0.54	1.32
	Max	2.24	20.77
	Average	1.36	9.75
	StdDev	0.40	4.83
CANEPATCH-SW	Min	-3.82	-20.97
	Max	2.98	23.97
	Average	1.16	9.10
	StdDev	1.52	9.59
CYP2-10-GW	Min	-4.51	-33.45
	Max	0.76	6.10
	Average	-0.72	-3.27
	StdDev	0.99	7.96
CYP2-10-SW	Min	-4.28	-33.07
	Max	1.26	10.05
	Average	-0.58	-1.37
	StdDev	1.25	10.72
E-130-10	Min	-1.98	-11.14
	Max	-0.52	-4.71
	Average	-1.60	-7.13
	StdDev	0.40	1.90
E-130-52	Min	-2.08	-21.68
	Max	-1.41	-5.44
	Average	-1.73	-9.26
	StdDev	0.21	5.28

Table 6. Statistical summary of stable isotopes of oxygen and hydrogen.

Sample		δ18O ‰	δD ‰
G-1603SW	Min	-1.32	-13.83
	Max	0.68	7.09
	Average	-0.41	-1.90
	StdDev	0.58	4.66
G-3167GW	Min	-0.85	-8.87
	Max	-0.34	1.58
	Average	-0.62	-1.45
	StdDev	0.14	2.53
G-3167SW	Min	-3.05	-13.48
	Max	0.84	12.08
	Average	-0.68	-1.95
	StdDev	0.95	6.95
G-3302A	Min	0.08	-10.96
	Max	3.02	21.69
	Average	1.28	8.64
	StdDev	0.82	6.68
G-3302B	Min	-0.57	-11.28
	Max	0.63	9.15
	Average	0.22	2.68
	StdDev	0.29	4.27
G-3302C	Min	-0.60	-11.16
	Max	0.30	6.45
	Average	-0.20	1.38
	StdDev	0.21	3.99
G-3302SW	Min	-3.40	-22.50
	Max	4.40	21.11
	Average	1.21	7.11
	StdDev	1.59	11.00
G-3309A	Min	-0.02	-0.76
	Max	0.76	7.55
	Average	0.47	3.86
	StdDev	0.21	2.19
G-3309B	Min	-0.19	-2.90
	Max	0.50	5.46
	Average	0.19	2.70
	StdDev	0.20	2.49
G-3309C	Min	-1.79	-7.83
	Max	-0.56	-0.43
	Average	-1.24	-4.16
	StdDev	0.28	2.27
G-3309SW	Min	-0.64	-7.17
	Max	3.04	19.58
	Average	1.01	6.64
	StdDev	1.14	7.52
G-3309TW	Min	-1.59	-15.00
	Max	-1.19	-2.02
	Average	-1.42	-5.47
	StdDev	0.12	3.53

Table 6. Statistical summary of stable isotopes of oxygen and hydrogen.

Sample		δ18O ‰	δD ‰
G-3337	Min	-2.95	-10.27
	Max	-0.24	0.91
	Average	-1.71	-6.28
	StdDev	0.46	2.44
L-31W-14	Min	-2.43	-17.35
	Max	1.28	5.66
	Average	-0.52	-2.82
	StdDev	1.01	7.58
L-31W-40	Min	-1.05	-12.45
	Max	-0.16	1.35
	Average	-0.54	-1.83
	StdDev	0.32	4.16
NP-67-GW	Min	-1.82	-15.15
	Max	-0.91	-0.85
	Average	-1.40	-6.02
	StdDev	0.28	3.25
NP-67-SW	Min	-3.49	-31.09
	Max	0.39	7.81
	Average	-0.89	-5.21
	StdDev	0.87	8.70
RB-1-20	Min	-0.10	0.25
	Max	1.70	17.04
	Average	0.85	7.00
	StdDev	0.47	3.48
RB-1-27	Min	-0.47	-3.40
	Max	0.54	7.27
	Average	0.06	3.41
	StdDev	0.32	2.69
RB-1-6	Min	-0.41	3.01
	Max	1.58	13.40
	Average	1.00	7.67
	StdDev	0.51	3.27
RB-1-GW	Min	-0.52	1.84
	Max	2.39	10.05
	Average	0.91	7.56
	StdDev	0.63	2.13
RB-1-SW	Min	-3.40	-25.28
	Max	3.42	25.88
	Average	1.27	9.03
	StdDev	1.69	10.90
S-175	Min	-0.91	-4.78
	Max	0.98	10.07
	Average	-0.06	1.64
	StdDev	0.58	4.79
S-332	Min	-1.22	-5.74
	Max	1.36	12.83
	Average	-0.02	2.15
	StdDev	0.66	5.09

Table 7. Summary of $^3H/^3He$ Groundwater Ages.

Sample Year	Well	Depth to top of screen interval (ft)	3H-3He age (years)
1997	C110-10	5	15.7
1998	C110-10	5	14.3
1999	C110-10	5	20.5
	C110-10 Average		16.8
	C110-10 StdDev		3.3
1997	C110-100	90	59.8
1998	C110-100	90	35.4
1999	C110-100	90	>60
	C110-100 Average		47.6
	C110-100 StdDev		17.3
1997	CANEPATCH	46	>60
1998	CANEPATCH	46	nd
	CANEPATCH Average		>60
	CANEPATCH StdDev		#DIV/0!
1997	CYP2-10	5	3.5
1998	CYP2-10	5	0.0
1999	CYP2-10	5	15.7
	CYP2-10 Average		6.4
	CYP2-10 StdDev		8.2
1998	E-130-10	7.5	27.6
1999	E-130-10	7.5	41.0
	E-130-10 Average		34.3
	E-130-10 StdDev		9.5
1998	E-130-52.5	47.5	26.1
1999	E-130-52.5	47.5	nd
	E-130-52.5 Average		26.1
	E-130-52.5 StdDev		#DIV/0!
1998	E-146-15	12.5	31.9
1999	E-146-15	12.5	37.1
	E-146-15 Average		34.5
	E-146-15 StdDev		3.6
1998	E-146-25	22.5	38.7
1999	E-146-25	22.5	33.6
	E-146-25 Average		36.2
	E-146-25 StdDev		3.6
1998	E-146-27.5	25	30.5
1999	E-146-27.5	25	41.7
	E-146-27.5 Average		36.1
	E-146-27.5 StdDev		7.9
1998	EP8A	25	nd
1999	EP8A	25	nd
	EP8A Average		#DIV/0!
	EP8A StdDev		#DIV/0!
1998	EPGW	11	15.3
1999	EPGW	11	2.5
	EPGW Average		8.9
	EPGW StdDev		9.1

nd: no data due to analytical problems.

Table 7. Summary of $^{3}H/^{3}He$ Groundwater Ages.

Sample Year	Well	Depth to top of screen interval (ft)	3H-3He age (years)
1999	G-3309TW	172	39.6
	G-3309TW Average		34.7
	G-3309TW StdDev		6.9
1997	G-3317C	147	>60
1998	G-3317C	147	>60
1999	G-3317C	147	>60
	G-3317C Average		#DIV/0!
	G-3317C StdDev		#DIV/0!
1997	G-3317D	8	>60
1998	G-3317D	8	26.7
1999	G-3317D	8	20.9
	G-3317D Average		23.8
	G-3317D StdDev		4.1
1997	G-3318A	23	42.6
1998	G-3318A	23	28.4
1999	G-3318A	23	38.9
	G-3318A Average		36.6
	G-3318A StdDev		7.4
1997	G-3318B	74	>60
1998	G-3318B	74	>60
1999	G-3318B	74	>60
	G-3318B Average		#DIV/0!
	G-3318B StdDev		#DIV/0!
1997	G-3318C	158	>60
1998	G-3318C	158	>60
1999	G-3318C	158	>60
	G-3318C Average		#DIV/0!
	G-3318C StdDev		#DIV/0!
1997	G-3318TW	220	>60
1998	G-3318TW	220	>60
1999	G-3318TW	220	>60
	G-3318TW Average		#DIV/0!
	G-3318TW StdDev		#DIV/0!
1997	G-3319B	78	38.7
1998	G-3319B	78	26.8
1999	G-3319B	78	>60
	G-3319B Average		32.8
	G-3319B StdDev		8.4
1997	G-3319TW	237	>60
1998	G-3319TW	237	>60
1999	G-3319TW	237	55.9
	G-3319TW Average		55.9
	G-3319TW StdDev		#DIV/0!
1997	G-3323A	23	>60
1998	G-3323A	23	20.6
1999	G-3323A	23	16.6
	G-3323A Average		18.6

nd: no data due to analytical problems.

Table 7. Summary of $^{3}H/^{3}He$ Groundwater Ages.

Sample Year	Well	Depth to top of screen interval (ft)	3H-3He age (years)
	RB-1-GW StdDev		15.8
1997	SISAL-E	100	>60
1998	SISAL-E	100	>60
1999	SISAL-E	100	>60
	SISAL-E Average		>60
	SISAL-E StdDev		#DIV/0!
1997	SISAL-W	5	30.8
1998	SISAL-W	5	nd
1999	SISAL-W	5	34.5
	SISAL-W Average		32.7
	SISAL-W StdDev		2.6
1997	TARBPONBAY	60	43.7
1998	TARBPONBAY	60	nd
	TARBPONBAY Average		43.7
	TARBPONBAY StdDev		#DIV/0!
1998	TSB-15	12	9.8
1999	TSB-15	12	29.9
	TSB-15 Average		19.9
	TSB-15 StdDev		14.2
1998	TSB-34	29	2.6
1999	TSB-34	29	18.4
	TSB-34 Average		10.5
	TSB-34 StdDev		11.2
1998	TSB-57	52	3.1
1999	TSB-57	52	24.8

nd: no data due to analytical problems.

Table 8. Age of groundwaters in years as determined by CFC-12 and CFC-11.

Year Sampled	Well	Depth to top of screen interval (ft)	CFC-12 age years	CFC-11 age years
1998	EP8A	25	49.6	44.6
1999	EP8A	25	48.9	39.9
	EP8A Average		49.2	42.2
	EP8A StdDev		0.5	3.3
1998	EPGW	11	47.3	44.4
1999	EPGW	11	43.6	39.0
	EPGW Average		45.4	41.7
	EPGW StdDev		2.6	3.8
1997	G-1251	5	14.2	9.9
1998	G-1251	5	40.2	Super
1999	G-1251	5	25.1	32.9
	G-1251 Average		26.5	21.4
	G-1251 StdDev		13.1	16.3
1998	G-1603	10	Super	43.1
1999	G-1603	10	2.1	36.9
	G-1603 Average		2.1	40.0
	G-1603 StdDev		#DIV/0!	4.4
1997	G-3167	61	6.4	43.4
1998	G-3167	61	22.5	42.0
1999	G-3167	61	24.4	40.5
	G-3167 Average		17.7	41.9
	G-3167 StdDev		9.9	1.5
1997	G-3302A	14	25.5	28.1
1998	G-3302A	14	36.4	42.2
1999	G-3302A	14	21.9	39.0
	G-3302A Average		27.9	36.4
	G-3302A StdDev		7.6	7.4
1997	G-3302B	81	32.7	23.7
1998	G-3302B	81	62.1	43.1
1999	G-3302B	81	47.9	40.1
	G-3302B Average		47.5	35.6
	G-3302B StdDev		14.7	10.5
1997	G-3302C	120	28.9	18.9
1998	G-3302C	120	47.8	41.0
1999	G-3302C	120	47.3	42.3
	G-3302C Average		41.3	34.1
	G-3302C StdDev		10.8	13.2

Super: Sample supersaturated with CFCs with respect to current atmospheric values.

nd: no data due to analytical problems.

Table 8. Age of groundwaters in years as determined by CFC-12 and CFC-11.

Year Sampled	Well	Depth to top of screen interval (ft)	CFC-12 age years	CFC-11 age years
1998	G-3318TW	220	43.1	36.5
1999	G-3318TW	220	44.1	40.2
	G-3318TW Average		43.6	38.4
	G-3318TW StdDev		0.7	2.6
1998	G-3319B	78	17.4	42.0
1999	G-3319B	78	34.7	39.1
	G-3319B Average		26.0	40.5
	G-3319B StdDev		12.2	2.1
1998	G-3319TW	237	42.7	41.8
1999	G-3319TW	237	51.0	39.0
	G-3319TW Average		46.8	40.4
	G-3319TW StdDev		5.8	2.0
1997	G-3323A	23	37.1	42.7
1998	G-3323A	23	40.1	40.9
1999	G-3323A	23	42.2	40.3
	G-3323A Average		39.8	41.3
	G-3323A StdDev		2.6	1.2
1998	G-3323B	97	43.1	37.7
1999	G-3323B	97	43.2	42.4
	G-3323B Average		43.1	40.0
	G-3323B StdDev		0.0	3.3
1997	G-3336	35	14.2	9.9
1998	G-3336	35	33.1	42.6
1999	G-3336	35	31.1	39.7
	G-3336 Average		26.1	30.7
	G-3336 StdDev		10.4	18.1
1997	G-3337	97	46.3	42.3
1998	G-3337	97	38.8	38.9
1999	G-3337	97	32.9	24.9
	G-3337 Average		39.3	35.4
	G-3337 StdDev		6.7	9.2
1998	L-31W-14	11	SUPER	42.3
1999	L-31W-14	11	SUPER	36.4
	L-31W-14 Average		#DIV/0!	39.3
	L-31W-14 StdDev		#DIV/0!	4.2
1998	L-31W-40	39	SUPER	42.5
1999	L-31W-40	39	SUPER	37.6
	L-31W-40 Average		#DIV/0!	40.0
	L-31W-40 StdDev		#DIV/0!	3.5

Super: Sample supersaturated with CFCs with respect to current atmospheric values.

nd: no data due to analytical problems.

Table 9. CFC ages of surface water stations.

Surface Water Station	Sampling Date	CFC-12 Age years	CFC-11 Age years
C111/110	9/30/97	Super	22.4
C111/110	6/15/99	Super	14.6
CanepatchSW	12/15/98	9.9	16.1
CanepatchSW	3/16/99	9.5	15.7
CanepatchSW	6/11/99	12.7	15.2
CYP2-10SW	7/16/98	12.2	18.0
CYP2-10SW	6/17/99	12.4	18.2
E130SW	7/23/98	15.5	17.3
E130SW	6/24/99	12.8	17.0
E146SW	7/23/98	15.7	17.9
E146SW	6/24/99	12.8	17.0
EP8ASW	7/22/98	15.3	19.1
EP8ASW	6/24/99	11.0	16.6
EPSW	7/22/98	12.5	15.1
EPSW	6/24/99	5.8	13.4
G1251sw	7/15/98	16.2	21.2
G1251sw	6/15/99	13.2	17.6
G1603SW	6/15/99	4.1	25.0
G3167SW	7/15/98	Super	12.0
G3167SW	6/15/99	Super	20.6
G3302SW	7/17/98	Super	15.4
G3302SW	6/16/99	Super	14.8
G3309SW	7/17/98	Super	19.8
G3309SW	6/16/99	10.0	19.8
G3323SW	6/15/99	Super	17.8
L31W-SW	6/15/99	Super	22.4
L31W-SW	7/15/98	30.4	32.6
NP-67-SW	6/17/99	14.4	20.4
NP-67-SW	9/30/97	16.7	20.4
NP-67-SW	7/16/98	21.2	24.0
RB1SW	11/9/98	10.6	13.8
RB1SW	12/15/98	12.9	19.9
RB1SW	1/18/99	9.7	19.3
RB1SW	3/16/99	10.2	15.8
RB1SW	6/11/99	13.9	15.4
SISAL POND	9/30/97	14.2	17.4
SISAL POND	7/16/98	19.8	15.4
SISAL POND	6/17/99	12.1	14.4
TarponBaySW	7/28/98	11.1	14.9
TarponBaySW	3/16/99	8.1	14.3
Taylor Slough	7/16/98	17.8	14.0
Taylor Slough	7/28/98	15.3	18.1
Taylor Slough	1/5/99	11.1	20.1
Taylor Slough	6/17/99	9.8	15.2

Table 11. Statistical summary of ^{4}He and ^{3}He.

Year Sampled	Well	Depth to top of well screen (ft)	DEL He4 %	DEL He3 %
1997	C110-10	5	36.98	38.48
1998	C110-10	5	15.05	17.08
1999	C110-10	5	28.79	28.33
	C110-10 AVERAGE		26.94	27.96
	C110-10 STDDEV		11.08	10.71
1997	C110-100	90	118.22	43.88
1998	C110-100	90	126.77	53.53
1999	C110-100	90	212.50	130.84
	C110-100 AVERAGE		152.50	76.08
	C110-100 STDDEV		52.14	47.66
1997	CANEPATCH-GW	56	46.14	52.60
	CANEPATCH-GW AVERAGE		46.14	52.60
	CANEPATCH-GW STDDEV		#DIV/0!	#DIV/0!
1999	CANEPATCH-SW	0	51.09	53.43
	CANEPATCH-SW AVERAGE		51.09	53.43
	CANEPATCH-SW STDDEV		#DIV/0!	#DIV/0!
1997	CYP2-10	5	2.70	1.76
1998	CYP2-10	5	0.64	-0.17
1999	CYP2-10	5	13.40	14.39
	CYP2-10 AVERAGE		5.58	5.33
	CYP2-10 STDDEV		6.85	7.91
1998	E130-10	7.5	30.58	35.31
1999	E130-10	7.5	78.01	75.37
	E130-10 AVERAGE		54.30	55.34
	E130-10 STDDEV		33.54	28.33
1998	E130-52	47.5	25.50	30.59
1999	E130-52	47.5	10.05	-35.89
	E130-52 AVERAGE		17.78	-2.65
	E130-52 STDDEV		10.92	47.01
1998	E146-15	12.5	33.95	41.95
1999	E146-15	12.5	31.49	43.27
	E146-15 AVERAGE		32.72	42.61
	E146-15 STDDEV		1.74	0.93
1998	E146-25	22.5	39.90	47.24
1999	E146-25	22.5	30.38	34.13
	E146-25 AVERAGE		35.14	40.68
	E146-25 STDDEV		6.73	9.27
1998	E146-27.5	25	33.20	46.50
1999	E146-27.5	25	55.11	87.14
	E146-27.5 AVERAGE		44.16	66.82
	E146-27.5 STDDEV		15.49	28.74
1998	EP8A	25	148.30	31.31
1998	EP8A	25	127.62	21.72
	EP8A AVERAGE		137.96	26.51
	EP8A STDDEV		14.62	6.78
1998	EPGW	11	25.51	26.44
1999	EPGW	11	24.50	26.81
	EPGW AVERAGE		25.00	26.62
	EPGW STDDEV		0.72	0.26

Table 11. Statistical summary of ^{4}He and ^{3}He.

Year Sampled	Well	Depth to top of well screen (ft)	DEL He4 %	DEL He3 %
1997	G3317D	8	5.93	5.46
1998	G3317D	8	26.30	28.24
1999	G3317D	8	25.11	26.16
	G3317D AVERAGE		19.11	19.95
	G3317D STDDEV		11.43	12.59
1997	G3318A	23	29.96	31.67
1998	G3318A	23	53.61	55.76
1999	G3318A	23	79.63	74.37
	G3318A AVERAGE		54.40	53.93
	G3318A STDDEV		24.84	21.41
1997	G3318B	74	137.16	18.18
1999	G3318B	74	161.37	33.07
	G3318B AVERAGE		149.27	25.63
	G3318B STDDEV		17.12	10.53
1997	G3318C	158	234.02	-1.51
1999	G3318C	158	291.06	49.80
	G3318C AVERAGE		262.54	24.15
	G3318C STDDEV		40.33	36.28
1997	G3318TW	220	239.22	-0.37
1999	G3318TW	220	270.11	36.93
	G3318TW AVERAGE		254.67	18.28
	G3318TW STDDEV		21.84	26.38
1997	G3319B	78	54.54	11.96
1998	G3319B	78	67.21	29.11
1999	G3319B	78	89.97	44.79
	G3319B AVERAGE		70.58	28.62
	G3319B STDDEV		17.95	16.42
1997	G3319TW	237	156.62	31.78
1998	G3319TW	237		
1999	G3319TW	237	158.28	21.86
	G3319TW AVERAGE		157.45	26.82
	G3319TW STDDEV		1.18	7.02
1997	G3323A	23	12.67	16.86
1998	G3323A	23	13.79	17.70
1999	G3323A	23	18.77	21.29
	G3323A AVERAGE		15.08	18.61
	G3323A STDDEV		3.25	2.36
1997	G3323B	97	265.82	15.77
1999	G3323B	97	287.36	21.09
	G3323B AVERAGE		276.59	18.43
	G3323B STDDEV		15.23	3.76
1997	G3336	35	27.92	33.35
1998	G3336	35	12.51	13.73
1999	G3336	35	-0.19	2.21
	G3336 AVERAGE		13.41	16.43
	G3336 STDDEV		14.08	15.74
1997	G3337	97	111.77	29.40
1999	G3337	97	108.33	19.85
	G3337 AVERAGE		110.05	24.63
	G3337 STDDEV		2.43	6.75

Table 11. Statistical summary of ^{4}He and ^{3}He.

Year Sampled	Well	Depth to top of well screen (ft)	DEL He4 %	DEL He3 %
1998	TSB-15	12	12.51	10.45
1999	TSB-15	12	46.53	49.95
	TSB-15 AVERAGE		29.52	30.20
	TSB-15 STDDEV		24.06	27.93
1998	TSB-34	29	4.13	2.08
1999	TSB-34	29	20.89	22.73
	TSB-34 AVERAGE		12.51	12.41
	TSB-34 STDDEV		11.85	14.60
1998	TSB-57	52	0.47	1.54
1999	TSB-57	52	25.29	30.54
	TSB-57 AVERAGE		12.88	16.04
	TSB-57 STDDEV		17.55	20.50

List of Appendices

Appendix A Raw data of field parameters

Appendix B Graphs of water level elevations

Appendix C Raw data of major cations and anions

Appendix D Raw data of $\delta^{18}O$ and δD

Appendix E Graphs of $\delta^{18}O$ with time

A computer diskette with raw data files is included. Each file is a text file that is tab delimited. Each of the files and their descriptions are included below:

File Name	Description
Field	Raw data of field parameters of each groundwater and surface water sample as included in Appendix A. Columns include sample name, collection date, conductivity (µS/cm), salinity, temperature (Celcius), and pH.
OH	Raw data of stable isotopes of oxygen and hydrogen of each groundwater and surface water sample as included in Appendix D. Columns include sample name, collection date, $\delta^{18}O$ % and δD%.
Ions	Raw data of major cations and anions of each groundwater and surface water sample as included in Appendix C. Columns include sample name, collection date, total alkalinity (mM), chloride (mg/L), sulfate (mg/L), sodium (mg/L), potassium (mg/L), magnesium (mg/L), and calcium (mg/L).
Welllocs	Location of sampling stations in UTM coordinates. Columns include station name, easting, and northing.
Trihe age	$^3H/^3He$ age of the groundwaters samples in years as included in Table 7. Columns include sampling year, well name, depth to top of screen interval (ft), and $^3H/^3He$ age in years.
Cfc age	Age of groundwaters in years as determined by CFC-12 and CFC-11 as included in Table 8. Columns include sample year, well name, depth to top of screen interval (ft), CFC-12 age (years), and CFC-11 age (years).
Helium	Percent excess of ^4He and ^3He of groundwater samples as included in

Appendix A
Raw data of field parameters

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
C111/109	28-May-97	820	0.39	30.30	8.14
C111/109	25-Jun-97	400	0.09	28.00	7.51
C111/109	24-Jul-97	490	0.16	29.10	7.69
C111/109	21-Aug-97	440	0.12	31.60	7.60
C111/109	01-Oct-97	450	0.13	27.20	7.54
C111/109	20-Nov-97	370	0.07	24.90	7.73
C111/109	23-Jan-98	400	0.10	23.90	8.31
C111/109	26-Feb-98	470	0.20	25.00	7.76
C111/109	26-Mar-98	490	0.20	24.00	7.48
C111/109	23-Apr-98	503	0.20	25.60	7.59
C111/109	02-Jun-98	583	0.20	30.00	7.29
C111/109	12-Aug-98	487	0.20	31.70	7.59
C111/109	13-Jan-99	477	0.20	28.20	7.67
C111/109	12-Feb-99	428	0.20	26.00	8.10
C111/109	18-Mar-99	441	0.20	25.00	8.43
C111/109	23-Apr-99	1462	0.80	27.20	8.27
C111/109	13-May-99	4730	2.90	27.10	8.20
C111/109	21-Jul-99	500	0.16	32.70	7.79
C111/109	16-Sep-99	484	0.15	29.00	7.73
C111/109D	01-Oct-97	450	0.10	27.20	7.54
C111/110	01-Oct-97	470	0.14	26.80	7.46
C111/110	20-Nov-97	430	0.12	25.20	7.60
C111/110	23-Jan-98	480	0.20	23.90	8.14
C111/110	26-Feb-98	470	0.20	24.60	7.60
C111/110	26-Mar-98	486	0.20	24.20	7.34
C111/110	23-Apr-98	463	0.20	25.60	7.36
C111/110	02-Jun-98	562	0.20	29.00	7.16
C111/110	15-Jul-98	440	0.20	30.00	
C111/110	12-Aug-98	456	0.20	30.60	7.58
C111/110	21-Nov-98			25.90	8.02
C111/110	10-Dec-98	400	0.10	28.60	8.02
C111/110	13-Jan-99	436	0.20	26.60	7.66
C111/110	12-Feb-99	466	0.20	25.60	8.02
C111/110	18-Mar-99	471	0.20	25.20	8.37
C111/110	23-Apr-99	1119	0.60	27.10	8.13
C111/110	13-May-99	4330	2.60	27.40	7.89
C111/110	21-Jul-99	440	0.12	34.20	7.79
C111/110	20-Aug-99	405	0.09	28.50	
C111/110	16-Sep-99	406	0.09	30.60	7.52
CALUS CREEK-GW	10-Mar-97	2280		25.60	7.08
CALUS CREEK-GW	29-Apr-97	6820		25.00	7.32
CALUS CREEK-GW	25-Jun-97	4770	3.15	25.30	7.34
CALUS CREEK-GW	10-Feb-98	36800	27.30	24.40	7.36
CALUS CREEK-GW	01-Apr-98	36800	27.30	24.90	7.15
CALUS CREEK-GW	15-May-98	36900	27.40	25.30	7.35
CALUS CREEK-SW	10-Mar-97	1060		29.30	7.07
CALUS CREEK-SW	29-Apr-97	2370		32.30	8.22
CALUS CREEK-SW	25-Jun-97	440	0.12	32.80	7.83
CALUS CREEK-SW	10-Feb-98	470	0.20	18.50	7.35

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
CANEPATCH-SW	16-Apr-99	13680	9.00	28.60	8.25
CANEPATCH-SW	14-May-99	6590	4.10	28.60	7.59
CANEPATCH-SW	11-Jun-99	1720	1.00	30.50	7.50
CANEPATCH-SW	16-Jul-99	405	0.09	30.00	6.86
CANEPATCH-SW	17-Sep-99	258	-0.01	29.70	7.23
CANEPATCH-SW-D	06-Jun-98	1220	0.50	33.10	7.26
CYP2-10-GW	24-Feb-97	370		25.50	7.71
CYP2-10-GW	27-Mar-97	450		24.90	
CYP2-10-GW	03-May-97	400		25.30	7.59
CYP2-10-GW	27-May-97	380	0.08	26.60	7.30
CYP2-10-GW	23-Jun-97	190	0.00	30.00	7.80
CYP2-10-GW	29-Jul-97	240	0.00	31.90	7.62
CYP2-10-GW	26-Aug-97	250	0.00	30.80	7.60
CYP2-10-GW	25-Sep-97	258	0.00	29.50	7.44
CYP2-10-GW	04-Nov-97	310	0.10	27.00	7.09
CYP2-10-GW	25-Nov-97	340	0.05	26.40	6.99
CYP2-10-GW	11-Dec-97	290	0.10	25.90	7.57
CYP2-10-GW	28-Jan-98	330	0.10	21.90	7.55
CYP2-10-GW	27-Feb-98	300	0.10	24.40	7.31
CYP2-10-GW	25-Mar-98	296	0.10	22.90	6.87
CYP2-10-GW	28-Apr-98	339	0.10	24.10	6.71
CYP2-10-GW	03-Jun-98	419	0.10	26.60	6.98
CYP2-10-GW	16-Jul-98	326	0.10	28.10	7.18
CYP2-10-GW	13-Aug-98	358	0.10	29.30	7.35
CYP2-10-GW	10-Feb-99	367	0.10	24.90	7.33
CYP2-10-GW	19-Mar-99	381	0.10	26.10	7.55
CYP2-10-GW	20-May-99	402	0.10	25.90	7.37
CYP2-10-GW	17-Jun-99	352	0.00	26.30	7.41
CYP2-10-GW	22-Jul-99	300	0.02	31.50	7.34
CYP2-10-GW	18-Aug-99	307	0.02	30.10	
CYP2-10-GW	17-Sep-99	257	-0.01	30.90	7.53
CYP2-10-SW	24-Feb-97	400		27.10	7.43
CYP2-10-SW	27-Mar-97	420		26.80	
CYP2-10-SW	03-May-97	400		31.60	7.51
CYP2-10-SW	27-May-97	340	0.05	29.30	7.65
CYP2-10-SW	23-Jun-97	170	0.00	28.70	7.78
CYP2-10-SW	29-Jul-97	180	0.00	32.30	7.76
CYP2-10-SW	26-Aug-97	190	0.00	29.80	7.72
CYP2-10-SW	25-Sep-97	184	0.00	29.30	7.65
CYP2-10-SW	04-Nov-97	290	0.10	22.40	7.15
CYP2-10-SW	25-Nov-97	330	0.10	23.50	7.10
CYP2-10-SW	11-Dec-97	240	0.00	25.20	7.52
CYP2-10-SW	28-Jan-98	300	0.10	19.30	7.62
CYP2-10-SW	27-Feb-98	280	0.10	24.00	7.52
CYP2-10-SW	25-Mar-98	250	0.00	22.20	7.24
CYP2-10-SW	28-Apr-98	419	0.20	25.90	6.94
CYP2-10-SW	03-Jun-98	402	0.10	34.40	7.21
CYP2-10-SW	16-Jul-98	215	0.00	28.90	7.77
CYP2-10-SW	13-Aug-98	194	0.00	30.10	7.72

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
E-130-SW	03-Sep-98	290	0.10	31.20	7.88
E-130-SW	18-Nov-98		0.20	29.70	9.51
E-130-SW	13-Dec-98			26.20	8.25
E-130-SW	11-Feb-99	342	0.10	27.40	7.64
E-130-SW	24-Jun-99	342	0.00	34.50	7.73
E-130-SW	23-Jul-99	297	0.02	31.70	7.69
E-130-SW	17-Aug-99	287	0.01	30.30	
E-130-SW	09-Sep-99	254	-0.01	28.00	8.26
E-146-15	16-Dec-97	13580	8.90	26.10	6.68
E-146-15	04-Feb-98	16210	11.40	25.30	
E-146-15	25-Feb-98	16480	11.30	25.30	6.56
E-146-15	03-Apr-98	16110	11.00	26.30	6.45
E-146-15	04-Jun-98	17980	10.60	27.20	6.57
E-146-15	23-Jul-98	13940	9.10	26.80	5.96
E-146-15	03-Sep-98	14410	9.30	27.20	6.84
E-146-15	01-Oct-98	14790	10.30	27.40	6.81
E-146-15	18-Nov-98		0.20	27.30	5.28
E-146-15	13-Dec-98			27.40	5.85
E-146-15	11-Feb-99	15840	10.50	26.30	6.69
E-146-15	17-Mar-99	16070	10.80	25.70	6.87
E-146-15	22-Apr-99	15670	10.40	26.30	6.70
E-146-15	21-May-99	15420	10.10	26.50	6.78
E-146-15	24-Jun-99	15960	9.10	26.30	6.62
E-146-15	23-Jul-99	16740		27.40	6.66
E-146-15	17-Aug-99	16000		26.00	
E-146-15	09-Sep-99	16200		26.60	6.90
E-146-25	16-Dec-97	18500	12.30	25.50	6.61
E-146-25	04-Feb-98	19060	13.20	24.90	
E-146-25	25-Feb-98	19010	13.20	25.00	6.55
E-146-25	03-Apr-98	18900	13.20	26.30	6.58
E-146-25	04-Jun-98	22000	13.20	26.50	6.46
E-146-25	23-Jul-98	18450	12.30	26.50	5.97
E-146-25	03-Sep-98	18960	12.70	26.40	6.80
E-146-25	01-Oct-98	17930	12.60	27.00	6.83
E-146-25	18-Nov-98	17130		26.00	6.86
E-146-25	13-Dec-98			27.00	6.00
E-146-25	11-Feb-99	18760	12.60	25.80	6.72
E-146-25	17-Mar-99	18900	12.70	25.60	6.85
E-146-25	22-Apr-99	18800	12.60	26.00	6.72
E-146-25	21-May-99	18800	12.60	25.90	6.80
E-146-25	24-Jun-99	20900	12.60	26.30	6.54
E-146-25	23-Jul-99	19888		27.20	6.64
E-146-25	17-Aug-99	20700		26.00	
E-146-25	09-Sep-99	20700		26.30	6.79
E-146-25-D	04-Jun-98	22000	13.20	26.50	6.46
E-146-27.5	16-Dec-97	23531	16.50	25.10	6.70
E-146-27.5	04-Feb-98	24800	17.40	24.90	
E-146-27.5	25-Feb-98	24800	17.40	25.60	6.59
E-146-27.5	03-Apr-98	24300	17.40	25.90	6.56

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
EP8AGW	24-Jun-99	10830	6.30	27.00	6.84
EP8AGW	23-Jul-99	19850	13.70	26.40	6.90
EP8AGW	17-Aug-99	1510	0.86	25.90	7.11
EP8AGW	09-Sep-99	11290	7.71	26.60	6.88
EP8ASW	28-Jan-97	510		27.80	7.59
EP8ASW	29-Apr-97	4040		27.60	7.04
EP8ASW	25-Jun-97	260	0.00	32.50	8.25
EP8ASW	07-Aug-97	410	0.10	34.30	8.06
EP8ASW	27-Aug-97	340	0.05	32.60	8.12
EP8ASW	18-Dec-97	350	0.10	19.90	7.65
EP8ASW	10-Feb-98	340	0.05	23.30	7.91
EP8ASW	01-Apr-98	426	0.20	26.70	7.58
EP8ASW	22-Jul-98	1616		32.50	6.80
EP8ASW	01-Oct-98	338	0.10	31.60	7.89
EP8ASW	18-Nov-98	450		30.30	8.76
EP8ASW	13-Dec-98			24.60	7.72
EP8ASW	11-Feb-99	521	0.20	25.30	7.65
EP8ASW	17-Mar-99	1222	0.60	21.20	7.65
EP8ASW	21-May-99	6260	3.90	27.30	7.58
EP8ASW	24-Jun-99	382	0.00	30.80	7.65
EP8ASW	23-Jul-99	398	0.09	30.10	7.72
EP8ASW	17-Aug-99	394	0.08	30.30	7.06
EP8ASW	09-Sep-99	388	0.08	27.40	7.92
EPGW	28-Jan-97	1730		24.70	7.30
EPGW	10-Mar-97	1730		25.10	7.33
EPGW	29-Apr-97	1650		25.60	7.42
EPGW	25-Jun-97	1501	0.87	25.70	7.42
EPGW	07-Aug-97	1800	1.07	27.10	7.25
EPGW	27-Aug-97	1620	0.95	26.10	7.25
EPGW	18-Dec-97	1690	0.90	24.60	7.20
EPGW	10-Feb-98	1780	1.00	23.30	7.02
EPGW	01-Apr-98	1730	1.00	25.30	6.93
EPGW	15-May-98	1702	1.00	26.10	7.04
EPGW	22-Jul-98	1630		28.20	6.50
EPGW	01-Oct-98	1600	0.90	28.80	7.45
EPGW	18-Nov-98	848		27.50	7.63
EPGW	13-Dec-98			26.80	6.10
EPGW	11-Feb-99	1564	0.90	25.10	7.23
EPGW	17-Mar-99	1600	0.90	22.20	7.32
EPGW	22-Apr-99	1512	0.80	24.90	7.31
EPGW	21-May-99	1537	0.80	24.40	7.29
EPGW	24-Jun-99	1613	0.70	26.50	7.14
EPGW	23-Jul-99	1599	0.93	26.60	7.23
EPGW	17-Aug-99	1610	0.93	26.90	7.01
EPGW	09-Sep-99	1656	0.97	26.50	7.10
EPSW	28-Jan-97	600		28.10	8.14
EPSW	10-Mar-97	1460		27.90	8.23
EPSW	25-Jun-97	379	0.08	33.90	8.26
EPSW	07-Aug-97	430	0.12	31.50	8.02

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
G-1251SW	28-May-97	370	0.07	28.20	7.84
G-1251SW	25-Jun-97	280	0.01	29.80	
G-1251SW	24-Jul-97	260	0.00	30.60	7.55
G-1251SW	21-Aug-97	290	0.02	31.30	7.90
G-1251SW	02-Oct-97	279	0.01	28.50	7.80
G-1251SW	20-Nov-97	400	0.09	23.50	7.23
G-1251SW	18-Dec-97	330	0.10	17.20	8.17
G-1251SW	23-Jan-98	390	0.10	22.60	7.95
G-1251SW	26-Feb-98	380	0.10	22.90	7.58
G-1251SW	26-Mar-98	340	0.10	22.70	7.03
G-1251SW	23-Apr-98	419	0.20	25.00	7.54
G-1251SW	02-Jun-98	441	0.10	30.60	7.34
G-1251SW	15-Jul-98	415	0.10	28.80	
G-1251SW	12-Aug-98	411	0.10	30.60	7.39
G-1251SW	04-Oct-98	358	0.10	32.50	7.75
G-1251SW	21-Nov-98	349		24.60	6.89
G-1251SW	10-Dec-98	383	0.10	29.60	7.25
G-1251SW	13-Jan-99	415	0.20	27.60	7.59
G-1251SW	12-Feb-99	437	0.20	24.80	7.75
G-1251SW	18-Mar-99	425	0.20	23.90	8.18
G-1251SW	23-Apr-99	434	0.20	25.40	7.79
G-1251SW	13-May-99	423	0.20	29.70	7.93
G-1251SW	15-Jun-99	428	0.00	28.10	7.91
G-1251SW	21-Jul-99	373	0.07	31.80	7.66
G-1251SW	20-Aug-99	342	0.05	29.00	
G-1251SW	16-Sep-99	332	0.04	28.80	8.00
G-1603GW	28-Jan-97	1900		25.00	7.29
G-1603GW	24-Feb-97	2060	1.20	25.80	7.30
G-1603GW	27-Mar-97	2340		25.30	
G-1603GW	28-Apr-97	1950		25.30	7.64
G-1603GW	28-May-97	1870	1.12	25.50	7.24
G-1603GW	25-Jun-97	1840	1.10	25.40	
G-1603GW	24-Jul-97	2150	1.32	25.40	7.29
G-1603GW	21-Aug-97	1720	1.02	26.70	7.29
G-1603GW	02-Oct-97	1812	1.08	28.30	7.23
G-1603GW	20-Nov-97	1870	1.00	25.20	7.04
G-1603GW	23-Jan-98	1980	1.20	25.00	7.28
G-1603GW	26-Feb-98	1860	1.10	25.00	7.08
G-1603GW	26-Mar-98	2230	1.30	24.90	7.01
G-1603GW	23-Apr-98	2010	1.20	24.90	7.08
G-1603GW	02-Jun-98	1972	1.00	26.70	6.90
G-1603GW	15-Jul-98	1773	1.00	26.60	
G-1603GW	12-Aug-98	2030	1.10	25.30	7.35
G-1603GW	04-Oct-98	2220	1.30	26.10	7.53
G-1603GW	21-Nov-98	395		26.20	7.40
G-1603GW	10-Dec-98	1760	1.00	24.90	6.88
G-1603GW	13-Jan-99	456	0.10	26.40	7.42
G-1603GW	12-Feb-99	2040	1.20	25.10	7.35
G-1603GW	18-Mar-99	2090	1.20	26.30	7.49

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
G-3167GW	02-Jun-98	612	0.20	26.10	6.69
G-3167GW	15-Jul-98	518	0.20	26.40	
G-3167GW	12-Aug-98	527	0.20	25.40	7.39
G-3167GW	04-Oct-98	536	0.20	26.00	7.60
G-3167GW	21-Nov-98	1320		25.40	7.14
G-3167GW	10-Dec-98	515	0.20	25.10	7.66
G-3167GW	13-Jan-99	520	0.20	25.60	7.28
G-3167GW	12-Feb-99	481	0.20	24.90	7.29
G-3167GW	18-Mar-99	525	0.20	24.80	7.60
G-3167GW	23-Apr-99	525	0.20	26.30	7.50
G-3167GW	13-May-99	525	0.20	27.10	7.32
G-3167GW	15-Jun-99	560	0.00	27.40	7.46
G-3167GW	21-Jul-99	565	0.20	26.80	7.32
G-3167GW	20-Aug-99	574	0.21	26.30	
G-3167GW	16-Sep-99	574	0.21	25.80	
G-3167SW	28-Jan-97	470		22.80	7.95
G-3167SW	24-Feb-97	550		25.60	8.03
G-3167SW	27-Mar-97	580		26.60	
G-3167SW	28-Apr-97	570		26.80	8.47
G-3167SW	28-May-97	450	0.13	28.50	7.80
G-3167SW	25-Jun-97	400	0.09	26.80	
G-3167SW	24-Jul-97	520	0.18	27.20	7.48
G-3167SW	21-Aug-97	460	0.14	29.30	7.61
G-3167SW	02-Oct-97	478	0.15	26.00	7.35
G-3167SW	20-Nov-97	450	0.13	24.80	7.57
G-3167SW	23-Jan-98	470	0.20	24.00	7.65
G-3167SW	26-Feb-98	470	0.20	24.50	7.33
G-3167SW	26-Mar-98	483	0.20	24.20	7.03
G-3167SW	23-Apr-98	466	0.20	24.90	7.07
G-3167SW	02-Jun-98	564	0.20	27.80	6.83
G-3167SW	15-Jul-98	463	0.20	29.80	
G-3167SW	12-Aug-98	468	0.20	29.10	7.39
G-3167SW	04-Oct-98	443	0.20	30.40	7.73
G-3167SW	10-Dec-98	440	0.20	28.00	7.52
G-3167SW	13-Jan-99	485	0.10	24.80	7.29
G-3167SW	12-Feb-99	464	0.20	25.70	7.71
G-3167SW	18-Mar-99	477	0.20	24.80	8.12
G-3167SW	23-Apr-99	481	0.20	27.90	8.40
G-3167SW	13-May-99	535	0.20	28.50	7.76
G-3167SW	15-Jun-99	573	0.00	28.00	7.82
G-3167SW	21-Jul-99	511	0.17	32.70	7.81
G-3167SW	20-Aug-99	481	0.14	28.60	
G-3167SW	16-Sep-99	517	0.17	28.00	7.29
G-3302A	28-Jan-97	620		22.50	7.34
G-3302A	24-Feb-97	420		23.30	7.43
G-3302A	25-Mar-97	490		23.60	
G-3302A	01-May-97	400		25.00	7.47
G-3302A	26-May-97	400	0.09		7.37
G-3302A	30-Jun-97	460	0.14	26.20	7.25

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
G-3302B	20-Apr-99	827	0.40	26.00	7.08
G-3302B	18-May-99	825	0.40	25.60	7.19
G-3302B	16-Jun-99	844	0.20	25.50	
G-3302B	20-Jul-99	874	0.42	25.80	6.98
G-3302B	31-Aug-99	884	0.43	26.00	
G-3302B	15-Sep-99	882	0.43	26.10	7.08
G-3302BD	24-Feb-98				
G-3302C	28-Jan-97	820		25.30	7.04
G-3302C	24-Feb-97	820		24.30	7.14
G-3302C	25-Mar-97	910		25.90	
G-3302C	01-May-97	820		25.40	6.97
G-3302C	26-May-97	740	0.33		7.22
G-3302C	30-Jun-97	750	0.34	25.40	7.18
G-3302C	28-Jul-97	910	0.45	25.50	7.12
G-3302C	25-Aug-97	820	0.39	26.60	7.10
G-3302C	30-Sep-97	800	0.37	25.70	6.95
G-3302C	26-Nov-97	820	0.40	25.10	6.94
G-3302C	17-Dec-97	820	0.40	24.60	7.17
G-3302C	27-Jan-98	840	0.40	25.00	7.17
G-3302C	24-Feb-98	830	0.40	24.70	6.68
G-3302C	24-Mar-98	840	0.40	25.00	6.50
G-3302C	30-Apr-98	837	0.40	26.10	6.75
G-3302C	05-Jun-98	970	0.40	26.50	6.68
G-3302C	17-Jul-98	821	0.20	25.90	6.54
G-3302C	15-Aug-98	852	0.40	25.90	7.28
G-3302C	09-Oct-98	870	0.40	26.50	7.14
G-3302C	12-Dec-98	801	0.20	24.80	6.32
G-3302C	15-Jan-99	801	0.20	22.30	6.48
G-3302C	08-Feb-99	850	0.40	25.50	7.05
G-3302C	23-Mar-99	844	0.40	25.20	7.15
G-3302C	20-Apr-99	847	0.40	26.10	7.16
G-3302C	18-May-99	848	0.40	27.50	7.15
G-3302C	16-Jun-99	876	0.20	25.00	7.29
G-3302C	20-Jul-99	899	0.44	26.00	7.04
G-3302C	31-Aug-99	910	0.44	26.50	
G-3302C	15-Sep-99	912	0.45	25.90	7.22
G-3302C-D	27-Jan-98	840	0.40	25.00	7.17
G-3302SW	28-Jan-97	600		21.20	7.77
G-3302SW	24-Feb-97	380		24.00	7.55
G-3302SW	25-Mar-97	440		25.40	
G-3302SW	01-May-97	260		28.80	7.47
G-3302SW	26-May-97	480	0.15		7.84
G-3302SW	30-Jun-97	500	0.16	29.50	7.57
G-3302SW	28-Jul-97	630	0.26	30.10	7.44
G-3302SW	25-Aug-97	520	0.18	28.80	7.43
G-3302SW	30-Sep-97	470	0.20	28.50	7.31
G-3302SW	26-Nov-97	540	0.20	23.30	7.26
G-3302SW	17-Dec-97	510	0.20	19.50	7.53
G-3302SW	27-Jan-98	260	0.10	21.60	7.40

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
G-3309B	30-Apr-98	954	0.50	25.30	6.70
G-3309B	05-Jun-98	1109	0.50	26.20	6.60
G-3309B	17-Jul-98	930	0.50	26.00	5.95
G-3309B	15-Aug-98	976	0.50	25.40	7.17
G-3309B	09-Oct-98	920	0.50	26.50	7.67
G-3309B	20-Nov-98	919	0.50	25.60	6.02
G-3309B	12-Dec-98	921	0.40	23.20	6.01
G-3309B	15-Jan-99	906	0.40	24.90	6.12
G-3309B	08-Feb-99	983	0.50	25.60	7.37
G-3309B	23-Mar-99	982	0.50	26.30	7.05
G-3309B	20-Apr-99	990	0.50	25.00	7.06
G-3309B	18-May-99	986	0.50	25.30	7.18
G-3309B	16-Jun-99	1076	0.30	25.00	7.19
G-3309B	20-Jul-99	1046	0.54	26.70	6.95
G-3309B	31-Aug-99	1067	0.55	25.60	
G-3309B	15-Sep-99	1070	0.56	25.70	7.09
G-3309C	28-Jul-97	860	0.42	25.30	7.27
G-3309C	25-Aug-97	770	0.35	25.40	7.35
G-3309C	30-Oct-97	650	0.27	24.60	6.98
G-3309C	26-Nov-97	720	0.30	24.10	7.14
G-3309C	17-Dec-97	730	0.30	24.50	7.43
G-3309C	27-Jan-98	760	0.40	24.30	7.32
G-3309C	24-Feb-98	760	0.40	23.90	6.87
G-3309C	24-Mar-98	680	0.30	24.40	6.75
G-3309C	30-Apr-98	766	0.40	25.20	6.86
G-3309C	05-Jun-98	887	0.40	25.80	6.79
G-3309C	17-Jul-98	706	0.30	26.00	6.34
G-3309C	15-Aug-98	787	0.40	25.10	7.45
G-3309C	09-Oct-98	751	0.40	26.30	7.32
G-3309C	20-Nov-98	786	0.30	24.60	6.26
G-3309C	12-Dec-98	776	0.20	24.40	6.43
G-3309C	15-Jan-99	712	0.30	24.50	6.09
G-3309C	08-Feb-99	782	0.40	25.70	7.31
G-3309C	23-Mar-99	783	0.40	26.30	7.31
G-3309C	20-Apr-99	805	0.40	24.60	7.30
G-3309C	18-May-99	847	0.40	26.90	7.72
G-3309C	16-Jun-99	871	0.20	24.40	7.45
G-3309C	20-Jul-99	744	0.33	28.40	7.15
G-3309C	31-Aug-99	687	0.29	25.90	
G-3309C	15-Sep-99	795	0.36	25.30	7.34
G-3309SW	26-May-97	380	0.08		7.60
G-3309SW	30-Jun-97	510	0.17	30.60	7.57
G-3309SW	28-Jul-97	630	0.26	31.20	7.47
G-3309SW	25-Aug-97	570	0.21	29.60	7.46
G-3309SW	30-Oct-97	510	0.17	25.20	7.11
G-3309SW	26-Nov-97	510	0.17	21.90	7.03
G-3309SW	17-Dec-97	530	0.20	18.00	7.74
G-3309SW	27-Jan-98	440	0.20	20.40	7.60
G-3309SW	24-Feb-98	370	0.10	22.00	6.95

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
G-3317C	27-Feb-98	4610	2.90	24.60	7.53
G-3317C	25-Mar-98	4630	2.90	25.00	7.26
G-3317C	28-Apr-98	4650	2.90	25.20	7.34
G-3317C	02-Jun-98	4680	2.90	25.20	7.23
G-3317C	16-Jul-98	4610	2.80	26.00	
G-3317C	13-Aug-98	4770	2.90	25.60	7.53
G-3317C	19-Nov-98	3720	3.10	26.20	6.86
G-3317C	11-Dec-98	3760	2.50	25.00	7.10
G-3317C	14-Jan-99			25.20	7.53
G-3317C	10-Feb-99	4710	2.80	24.10	7.48
G-3317C	19-Mar-99	4750	2.90	25.60	7.63
G-3317C	21-Apr-99	4770	2.90	26.00	7.47
G-3317C	20-May-99	4760	2.90	24.40	7.56
G-3317C	17-Jun-99	5240	2.80	24.70	7.57
G-3317C	22-Jul-99	4920	3.25	26.30	7.15
G-3317C	18-Aug-99	5150	3.41	25.90	
G-3317C	17-Sep-99	5150	3.41	25.90	7.53
G-3317C-D	25-Mar-98				
G-3317D	24-Feb-97	370		24.10	7.36
G-3317D	24-Mar-97	400		24.90	7.33
G-3317D	28-Apr-97	340		24.60	7.50
G-3317D	27-May-97	270	0.00	25.30	7.54
G-3317D	23-Jun-97	280	0.01	26.10	7.39
G-3317D	29-Jul-97	380	0.08	26.60	7.35
G-3317D	26-Aug-97	320	0.04	26.50	7.33
G-3317D	25-Sep-97	370	0.07	26.90	7.21
G-3317D	04-Nov-97	380	0.10	25.30	6.96
G-3317D	25-Nov-97	380	0.10	25.10	6.81
G-3317D	11-Dec-97	380	0.10	26.50	7.03
G-3317D	28-Jan-98	385	0.10	23.20	7.34
G-3317D	27-Feb-98	380	0.10	23.30	7.13
G-3317D	25-Mar-98	380	0.10	23.80	6.66
G-3317D	02-Jun-98	367	0.10	26.00	6.43
G-3317D	16-Jul-98	404	0.10	28.70	7.84
G-3317D	13-Aug-98	346	0.10	29.00	7.44
G-3317D	19-Nov-98	426	0.10	27.60	7.26
G-3317D	11-Dec-98	386	0.10	26.90	7.27
G-3317D	14-Jan-99			27.60	7.56
G-3317D	10-Feb-99	407	0.10	24.00	7.23
G-3317D	19-Mar-99	408	0.10	24.40	7.33
G-3317D	21-Apr-99	407	0.10	26.60	7.20
G-3317D	20-May-99	407	0.10	23.90	7.31
G-3317D	17-Jun-99	354	0.00	26.50	7.53
G-3317D	22-Jul-99	372	0.07	28.00	7.04
G-3317D	18-Aug-99	390	0.08	26.80	
G-3317D	17-Sep-99	439	0.12	26.80	7.21
G-3318A	24-Mar-97	430		24.30	7.34
G-3318A	29-Apr-97	390		24.60	7.46
G-3318A	28-May-97	350	0.06	24.30	7.19

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
G-3318B	17-Jun-99	2260	1.00	24.50	7.53
G-3318B	22-Jul-99	2190	1.34	25.10	7.24
G-3318B	18-Aug-99	2220	1.36	25.00	
G-3318B	17-Sep-99	2230	1.37	25.70	7.32
G-3318C	24-Mar-97	2980		24.60	7.53
G-3318C	29-Apr-97	2640		24.60	7.63
G-3318C	28-May-97	2370	1.47	24.90	7.61
G-3318C	23-Jun-97	2440	1.52	25.10	7.94
G-3318C	29-Jul-97	2880	1.83	25.10	7.50
G-3318C	26-Aug-97	2670	1.68	25.00	7.54
G-3318C	25-Sep-97	2660	1.68	26.30	7.48
G-3318C	04-Nov-97	2670	1.50	24.60	7.34
G-3318C	25-Nov-97	2680	1.60	24.60	7.28
G-3318C	11-Dec-97	2680	1.60	24.90	7.37
G-3318C	28-Jan-98	2740	1.60	24.30	7.53
G-3318C	27-Feb-98	2730	1.60	24.60	7.45
G-3318C	25-Mar-98	2750	1.60	24.20	7.18
G-3318C	28-Apr-98	2730	1.60	24.70	7.24
G-3318C	03-Jun-98	3080	1.60	25.10	7.38
G-3318C	16-Jul-98	2680	1.50	25.20	7.58
G-3318C	13-Aug-98	2740	1.60	24.80	7.50
G-3318C	19-Nov-98	3080	1.20	24.80	7.26
G-3318C	11-Dec-98	2480	1.20	24.20	7.52
G-3318C	14-Jan-99			24.80	7.68
G-3318C	10-Feb-99	2690	1.60	24.60	7.48
G-3318C	19-Mar-99	2700	1.60	24.90	7.66
G-3318C	21-Apr-99	2710	1.60	24.60	7.42
G-3318C	20-May-99	2710	1.60	25.00	7.53
G-3318C	17-Jun-99	3000	1.40	24.60	7.59
G-3318C	22-Jul-99	2890		25.00	7.25
G-3318C	18-Aug-99	2940		25.40	
G-3318C	17-Sep-99	2940		25.10	7.60
G-3318TW	24-Mar-97	2650		24.90	7.31
G-3318TW	29-Apr-97	2240		24.80	7.72
G-3318TW	28-May-97	2160	1.33	25.30	7.69
G-3318TW	23-Jun-97	2190	1.35	24.90	7.85
G-3318TW	29-Jul-97	2670	1.68	25.50	7.61
G-3318TW	26-Aug-97	2290	1.42	24.90	7.57
G-3318TW	25-Sep-97	2400	1.49	25.80	7.62
G-3318TW	11-Dec-97	2420	1.40	25.00	7.39
G-3318TW	28-Jan-98	2490	1.50	24.30	7.71
G-3318TW	27-Feb-98	2480	1.50	24.80	7.52
G-3318TW	25-Mar-98	2480	1.50	24.30	7.27
G-3318TW	28-Apr-98	2500	1.50	24.90	7.28
G-3318TW	03-Jun-98	2820	1.50	25.30	7.41
G-3318TW	16-Jul-98	2450	1.40	25.30	7.11
G-3318TW	13-Aug-98	2490	1.40	24.90	7.64
G-3318TW	19-Nov-98	2450	1.00	24.60	7.12
G-3318TW	11-Dec-98	2400	1.10	24.60	6.91

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
G-3319TW	18-Mar-99	321	0.10	25.10	9.21
G-3319TW	23-Apr-99	324	0.10	26.60	9.21
G-3319TW	13-May-99	317	0.10	25.50	9.15
G-3319TW	15-Jun-99	334	0.00	25.70	9.28
G-3319TW	21-Jul-99	323	0.03	26.30	8.13
G-3319TW	19-Aug-99	329	0.04	24.90	
G-3319TW	16-Sep-99	331	0.04	26.10	9.00
G-3323A	29-May-97	550	0.20	25.00	7.11
G-3323A	30-Jun-97	500	0.16	24.90	7.14
G-3323A	24-Jul-97	600	0.23	25.20	7.11
G-3323A	21-Aug-97	550	0.20	26.80	7.12
G-3323A	02-Oct-97	522	0.18	26.50	6.98
G-3323A	20-Nov-97	600	0.30	25.40	6.91
G-3323A	23-Jan-98	590	0.30	25.50	7.11
G-3323A	26-Feb-98	520	0.20	25.10	7.24
G-3323A	26-Mar-98	507	0.20	25.00	6.87
G-3323A	23-Apr-98	492	0.20	25.10	7.20
G-3323A	02-Jun-98	582	0.20	26.50	6.80
G-3323A	15-Jul-98	585	0.30	27.30	
G-3323A	12-Aug-98	557	0.20	25.60	7.19
G-3323A	04-Oct-98	530	0.20	25.60	7.15
G-3323A	21-Nov-98	466		25.60	7.21
G-3323A	10-Dec-98	536	0.20	23.90	7.02
G-3323A	13-Jan-99	505	0.20	25.20	7.12
G-3323A	12-Feb-99	602	0.30	24.60	7.37
G-3323A	18-Mar-99	692	0.30	25.60	7.32
G-3323A	23-Apr-99	550	0.20	26.60	7.51
G-3323A	13-May-99	569	0.20	25.90	7.16
G-3323A	15-Jun-99	618	0.10	26.30	6.84
G-3323A	21-Jul-99	593	0.22	26.50	7.18
G-3323A	20-Aug-99	604	0.23	25.90	
G-3323A	16-Sep-99	601	0.23	26.10	7.04
G-3323B	29-May-97	3630	2.36	24.90	7.33
G-3323B	30-Jun-97	3630	2.36	25.30	7.31
G-3323B	24-Jul-97	4440	2.92	25.20	7.43
G-3323B	21-Aug-97	3980	2.60	26.70	7.44
G-3323B	02-Oct-97	4030	2.64	25.40	7.35
G-3323B	20-Nov-97	4060	2.40	24.90	7.23
G-3323B	23-Jan-98	4170	2.60	25.20	7.43
G-3323B	26-Feb-98	4200	2.60	24.90	7.42
G-3323B	26-Mar-98	4250	2.60	24.60	7.16
G-3323B	23-Apr-98	4260	2.70	25.00	7.30
G-3323B	02-Jun-98	4920	2.70	25.90	7.10
G-3323B	15-Jul-98	4240	2.60	26.70	
G-3323B	12-Aug-98	4390	2.70	25.10	7.18
G-3323B	04-Oct-98	4220	2.60	26.30	7.52
G-3323B	21-Nov-98			26.00	7.40
G-3323B	10-Dec-98	435	0.20	24.10	7.61
G-3323B	13-Jan-99		0.20	23.70	7.36

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
G-3336	02-Jun-98	511	0.20	25.00	6.69
G-3336	15-Jul-98	450	0.20	25.50	
G-3336	12-Aug-98	484	0.20	25.10	7.18
G-3336	04-Oct-98	484	0.20	25.60	7.43
G-3336	21-Nov-98				
G-3336	10-Dec-98	503	0.20	24.80	7.71
G-3336	13-Jan-99	493	0.20	24.50	7.12
G-3336	12-Feb-99	431	0.20	23.80	7.43
G-3336	18-Mar-99	462	0.20	24.20	7.49
G-3336	23-Apr-99	473	0.20	24.80	7.29
G-3336	13-May-99	448	0.20	27.00	7.33
G-3336	15-Jun-99	505	0.00	26.20	7.37
G-3336	21-Jul-99	528	0.18	26.90	7.20
G-3336	20-Aug-99	555	0.20	25.90	
G-3336	16-Sep-99	539	0.19	26.00	7.10
G-3336-D	23-Jan-98	430	0.20	24.20	7.37
G-3336-D	26-Feb-98	440	0.20	23.70	7.18
G-3337	28-Jan-97	500		25.30	7.71
G-3337	24-Feb-97	500		24.60	7.72
G-3337	27-Mar-97	520		25.10	
G-3337	28-Apr-97	500		24.80	7.80
G-3337	28-May-97	450	0.13	24.30	7.68
G-3337	25-Jun-97	450	0.13	24.80	
G-3337	24-Jul-97	550	0.20	25.30	7.73
G-3337	21-Aug-97	490	0.16	25.90	7.74
G-3337	02-Oct-97	491	0.16	25.10	7.58
G-3337	20-Nov-97	490	0.16	25.10	7.94
G-3337	18-Dec-97	490	0.20	23.00	7.82
G-3337	23-Jan-98	500	0.20	24.10	7.68
G-3337	26-Feb-98	500	0.20	24.30	7.43
G-3337	26-Mar-98	501	0.20	25.00	7.16
G-3337	02-Jun-98	570	0.20	25.30	7.11
G-3337	15-Jul-98	496	0.20	25.40	
G-3337	12-Aug-98	493	0.20	24.90	7.64
G-3337	04-Oct-98	489	0.20	25.40	7.73
G-3337	21-Nov-98				
G-3337	10-Dec-98	400	0.20	25.00	7.52
G-3337	13-Jan-99	486	0.20	23.90	7.62
G-3337	12-Feb-99	509	0.20	24.20	7.79
G-3337	18-Mar-99	511	0.20	25.30	7.88
G-3337	23-Apr-99	511	0.20	24.90	7.73
G-3337	13-May-99	523	0.20	25.60	7.79
G-3337	15-Jun-99	547	0.00	25.80	7.71
G-3337	21-Jul-99	538	0.18	26.30	7.33
G-3337	20-Aug-99	553	0.19	25.30	
G-3337	16-Sep-99	549	0.19	24.90	7.60
L-31W-14	17-Dec-97	410	0.10	23.70	7.53
L-31W-14	23-Jan-98	420	0.20	25.40	7.43
L-31W-14	26-Feb-98	400	0.10	24.90	7.30

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
NP-67-GW	27-Feb-98	400	0.10	25.90	7.08
NP-67-GW	25-Mar-98	400	0.10	25.10	6.65
NP-67-GW	28-Apr-98	405	0.10	25.30	7.29
NP-67-GW	03-Jun-98	490	0.20	26.60	
NP-67-GW	16-Jul-98	400	0.10	26.00	6.90
NP-67-GW	13-Aug-98	407	0.10	27.00	7.27
NP-67-GW	20-May-99	449	0.20	25.20	7.26
NP-67-GW-D	25-Nov-97	420	0.11	25.40	6.83
NP-67-GW-D	03-Jun-98	490	0.20	26.60	
NP-67-SW	24-Feb-97	420		26.10	7.90
NP-67-SW	27-Mar-97	460		27.90	
NP-67-SW	03-May-97	400		33.50	7.51
NP-67-SW	27-May-97	390	0.09	25.30	7.15
NP-67-SW	23-Jun-97	180	0.00	31.70	7.68
NP-67-SW	29-Jul-97	220	0.00	32.90	7.68
NP-67-SW	26-Aug-97	320	0.04	29.80	7.53
NP-67-SW	25-Sep-97	281	0.01	29.00	7.39
NP-67-SW	04-Nov-97	290	0.02	23.40	7.18
NP-67-SW	25-Nov-97	340	0.10	22.90	7.18
NP-67-SW	11-Dec-97	240	0.00	21.00	7.26
NP-67-SW	28-Jan-98	450	0.20	20.90	7.29
NP-67-SW	27-Feb-98	420	0.20	23.60	7.06
NP-67-SW	25-Mar-98	410	0.10	22.40	6.80
NP-67-SW	28-Apr-98	402	0.10	26.30	7.28
NP-67-SW	03-Jun-98	594	0.20	28.70	6.84
NP-67-SW	16-Jul-98	467	0.20	27.80	7.00
NP-67-SW	13-Aug-98	195	0.00	30.70	7.47
NP-67-SW	10-Feb-99	451	0.20	23.90	7.46
NP-67-SW	19-Mar-99	393	0.10	23.30	7.92
NP-67-SW	20-May-99	426	0.20	25.00	7.34
NP-67-SW	17-Jun-99	303	0.00	29.70	7.54
RB-1-20	01-Mar-97	6160		25.90	6.75
RB-1-20	31-Mar-97	5570		25.40	
RB-1-20	30-Apr-97	5670		25.40	6.97
RB-1-20	03-Jun-97	5400	3.59	25.40	7.24
RB-1-20	26-Jun-97	5900	3.94	27.00	6.92
RB-1-20	08-Aug-97	6840	4.60	26.60	6.75
RB-1-20	28-Aug-97	6570	4.41	26.80	6.76
RB-1-20	29-Sep-97	5810	3.88	27.40	6.82
RB-1-20	15-Dec-97	5670	3.50	23.30	7.46
RB-1-20	28-Feb-98	6400	4.10	25.40	6.77
RB-1-20	27-Mar-98	6200	4.00	25.80	6.71
RB-1-20	13-May-98	6400	4.10	26.10	6.51
RB-1-20	06-Jun-98	7420		26.30	6.58
RB-1-20	28-Jul-98	6330	3.90	26.00	6.58
RB-1-20	19-Aug-98	6320	3.90	26.10	6.81
RB-1-20	09-Nov-98	5990	3.80	25.90	6.76
RB-1-20	15-Dec-98			24.70	
RB-1-20	18-Jan-99	4990	3.00	24.50	

Appendix A. Field parameters of all samples.

Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
RB-1-6	09-Nov-98	5880	3.80	26.60	6.40
RB-1-6	15-Dec-98			24.90	
RB-1-6	18-Jan-99	4300	2.60	24.00	
RB-1-6	12-Feb-99	4510	2.70	24.10	7.66
RB-1-6	16-Mar-99	4480		23.60	6.51
RB-1-6	14-May-99	5520	3.40	27.10	6.88
RB-1-6	11-Jun-99	5270	3.20	26.10	6.68
RB-1-6	16-Jul-99	5960	3.98	28.00	6.65
RB-1-6	17-Sep-99	6220	4.16	27.50	6.75
RB-1-GW	01-Mar-97	6640		25.90	6.81
RB-1-GW	31-Mar-97	6600		25.70	
RB-1-GW	30-Apr-97	6600		25.20	6.90
RB-1-GW	03-Jun-97	6030	4.04	25.30	
RB-1-GW	26-Jun-97	5530	3.69	25.40	6.83
RB-1-GW	08-Aug-97	7330	4.95	25.90	6.76
RB-1-GW	28-Aug-97	6570	4.41	26.80	6.76
RB-1-GW	29-Sep-97	6500	4.36	25.90	6.77
RB-1-GW	15-Dec-97	6500	4.00	24.30	6.56
RB-1-GW	28-Feb-98	6410	4.20	27.90	6.55
RB-1-GW	27-Mar-98	6530	4.20	25.90	6.85
RB-1-GW	13-May-98	6590	4.20	26.00	6.46
RB-1-GW	06-Jun-98	7530	4.20	25.60	6.59
RB-1-GW	28-Jul-98	6430	4.00	25.60	6.07
RB-1-GW	19-Aug-98	6610	4.10	26.30	6.71
RB-1-GW	09-Nov-98	6180	4.00	25.80	6.82
RB-1-GW	15-Dec-98			24.90	
RB-1-GW	18-Jan-99	6280	3.90	24.60	
RB-1-GW	12-Feb-99	6440	3.90	24.30	6.77
RB-1-GW	16-Mar-99				
RB-1-GW	16-Apr-99	6430	4.00	25.40	7.19
RB-1-GW	14-May-99	6440	4.00	26.60	6.88
RB-1-GW	11-Jun-99	6530	4.00	25.80	6.71
RB-1-GW	16-Jul-99	6960	4.68		6.67
RB-1-GW	17-Sep-99	6970	4.69	26.20	6.86
RB-1-SW	01-Mar-97	720		26.30	7.57
RB-1-SW	31-Mar-97	810		26.60	
RB-1-SW	30-Apr-97	1070	0.60	25.60	7.86
RB-1-SW	03-Jun-97	680	0.29	27.70	7.58
RB-1-SW	26-Jun-97	276	0.01	31.80	7.55
RB-1-SW	08-Aug-97	420	0.11	29.70	7.37
RB-1-SW	28-Aug-97	370	0.07	28.80	7.74
RB-1-SW	29-Sep-97	370	0.07	28.00	7.44
RB-1-SW	15-Dec-97	440	0.20	19.90	7.71
RB-1-SW	28-Feb-98	380	0.10	24.10	6.91
RB-1-SW	27-Mar-98	385	0.10	23.60	7.10
RB-1-SW	13-May-98	518	0.20	27.10	6.88
RB-1-SW	06-Jun-98	612	0.20	30.80	6.94
RB-1-SW	28-Jul-98	406	0.10	29.50	6.57
RB-1-SW	19-Aug-98	330	0.10	29.50	7.39

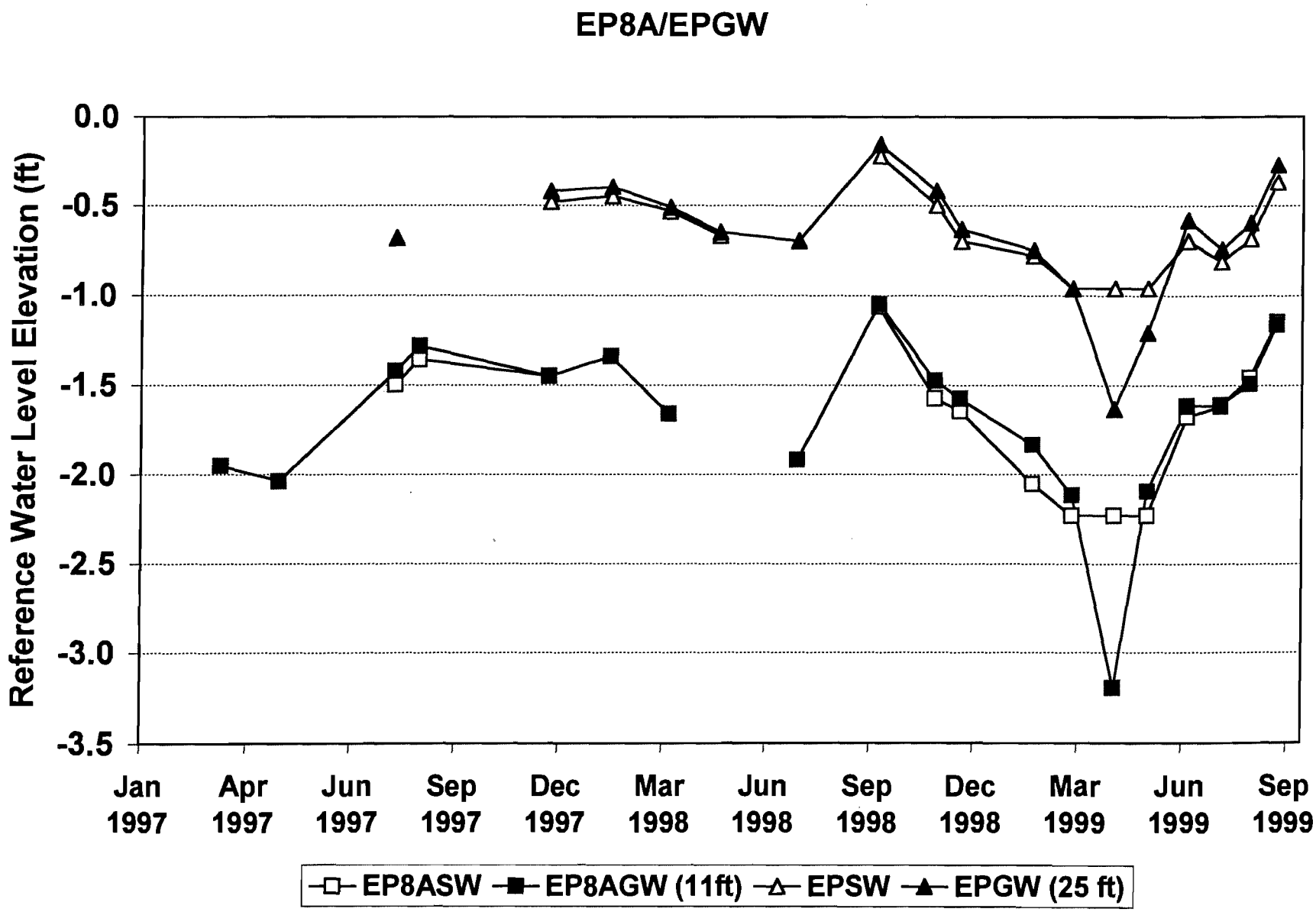
Appendix A. Field parameters of all samples.

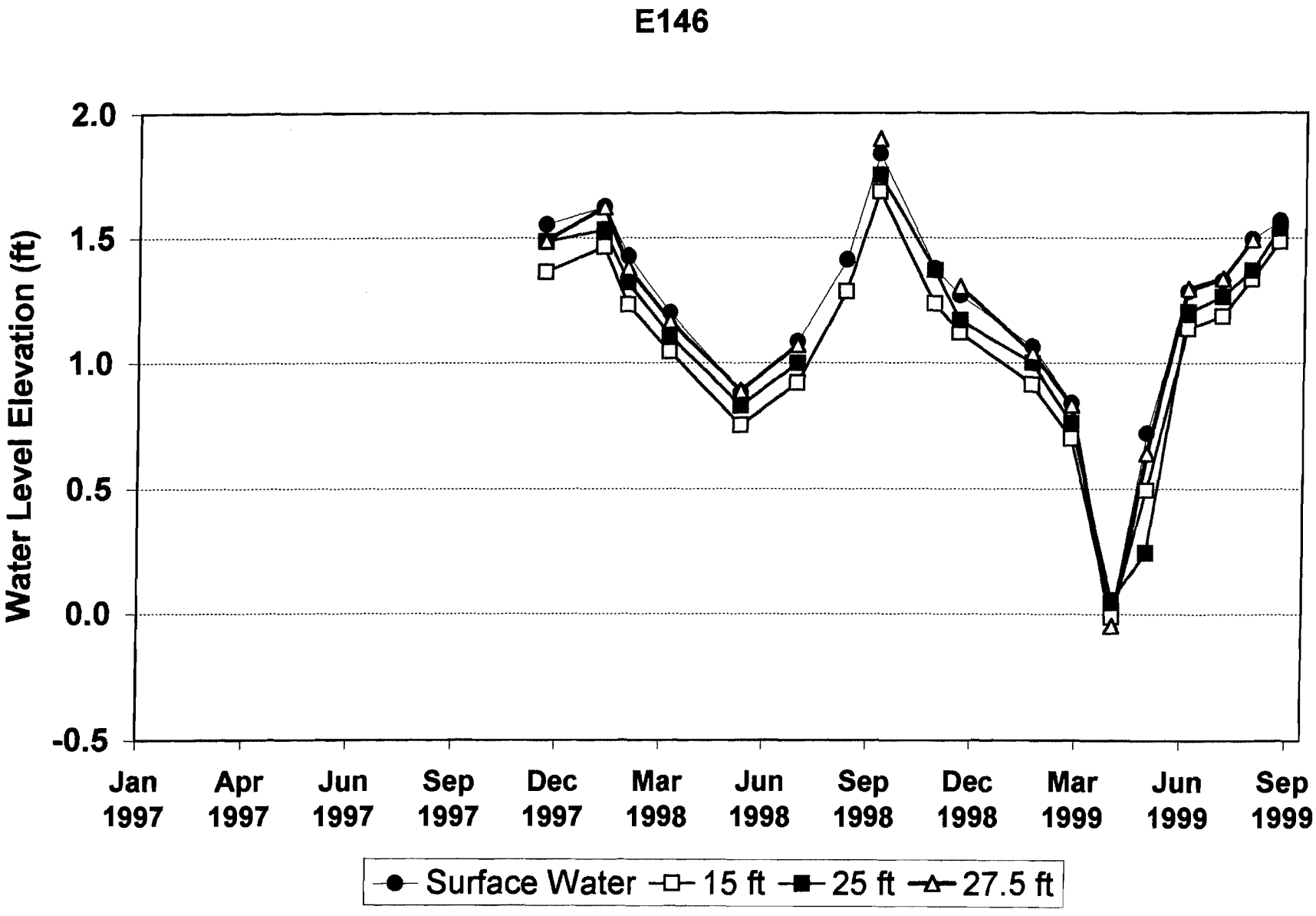
Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
S-332	16-Sep-99	482	0.15	30.30	7.49
SISAL POND	24-Feb-97	220		26.00	8.18
SISAL POND	24-Mar-97	250		25.40	8.02
SISAL POND	28-Apr-97	210		28.10	8.39
SISAL POND	27-May-97	200	0.00	29.60	8.06
SISAL POND	23-Jun-97	170	0.00	28.70	7.80
SISAL POND	29-Jul-97	280	0.01	30.00	7.87
SISAL POND	26-Aug-97	290	0.02	31.30	7.91
SISAL POND	25-Sep-97	200	0.00	31.60	8.14
SISAL POND	04-Nov-97	220	0.00	25.30	7.35
SISAL POND	25-Nov-97	280	0.10	24.90	7.68
SISAL POND	11-Dec-97	220	0.00	25.70	7.97
SISAL POND	28-Jan-98	319	0.10	21.80	8.00
SISAL POND	27-Feb-98	290	0.10	25.00	7.69
SISAL POND	25-Mar-98	320	0.10	23.90	7.48
SISAL POND	28-Apr-98	291	0.10	26.90	7.46
SISAL POND	02-Jun-98	244	0.00	29.90	7.00
SISAL POND	16-Jul-98	229	0.00	30.90	8.46
SISAL POND	13-Aug-98	305	0.10	30.80	7.78
SISAL POND	19-Nov-98				
SISAL POND	10-Feb-99	299	0.10	25.40	8.00
SISAL POND	19-Mar-99	271	0.10	24.90	8.20
SISAL POND	21-Apr-99	254	0.00	26.50	8.09
SISAL POND	20-May-99	262	0.00	28.90	7.93
SISAL POND	17-Jun-99	340	0.00	29.70	8.00
SISAL POND	22-Jul-99	304	0.02	31.70	7.56
SISAL POND	17-Sep-99	233	-0.03	32.30	8.09
SISAL POND-D	27-Feb-98	290	0.10	25.00	7.69
SISAL POND-D	28-Apr-98	291	0.10	26.90	7.46
SISAL-E	24-Feb-97	4490	2.70	24.10	7.38
SISAL-E	24-Mar-97	5010		24.90	7.41
SISAL-E	28-Apr-97	4530		24.10	7.66
SISAL-E	27-May-97	4130	2.71	24.60	7.51
SISAL-E	23-Jun-97	3840	2.50	24.60	7.55
SISAL-E	29-Jul-97	5034	3.34	24.90	7.46
SISAL-E	26-Aug-97	4520	2.98	25.20	7.48
SISAL-E	25-Sep-97	4530	2.99	25.40	7.44
SISAL-E	04-Nov-97	4500	2.70	24.10	7.54
SISAL-E	25-Nov-97	4520	2.70	24.10	7.22
SISAL-E	11-Dec-97	4500	2.70	26.40	7.38
SISAL-E	28-Jan-98	4620	2.90	23.50	7.53
SISAL-E	27-Feb-98	4610	2.90	24.60	7.51
SISAL-E	25-Mar-98	4610	2.90	24.60	7.24
SISAL-E	28-Apr-98	4610	2.90	24.60	7.24
SISAL-E	02-Jun-98	5220	2.90	25.00	7.19
SISAL-E	16-Jul-98	4550	2.80	26.80	7.36
SISAL-E	13-Aug-98	4680	2.80	25.30	7.50
SISAL-E	19-Nov-98				
SISAL-E	14-Jan-99			25.20	7.26

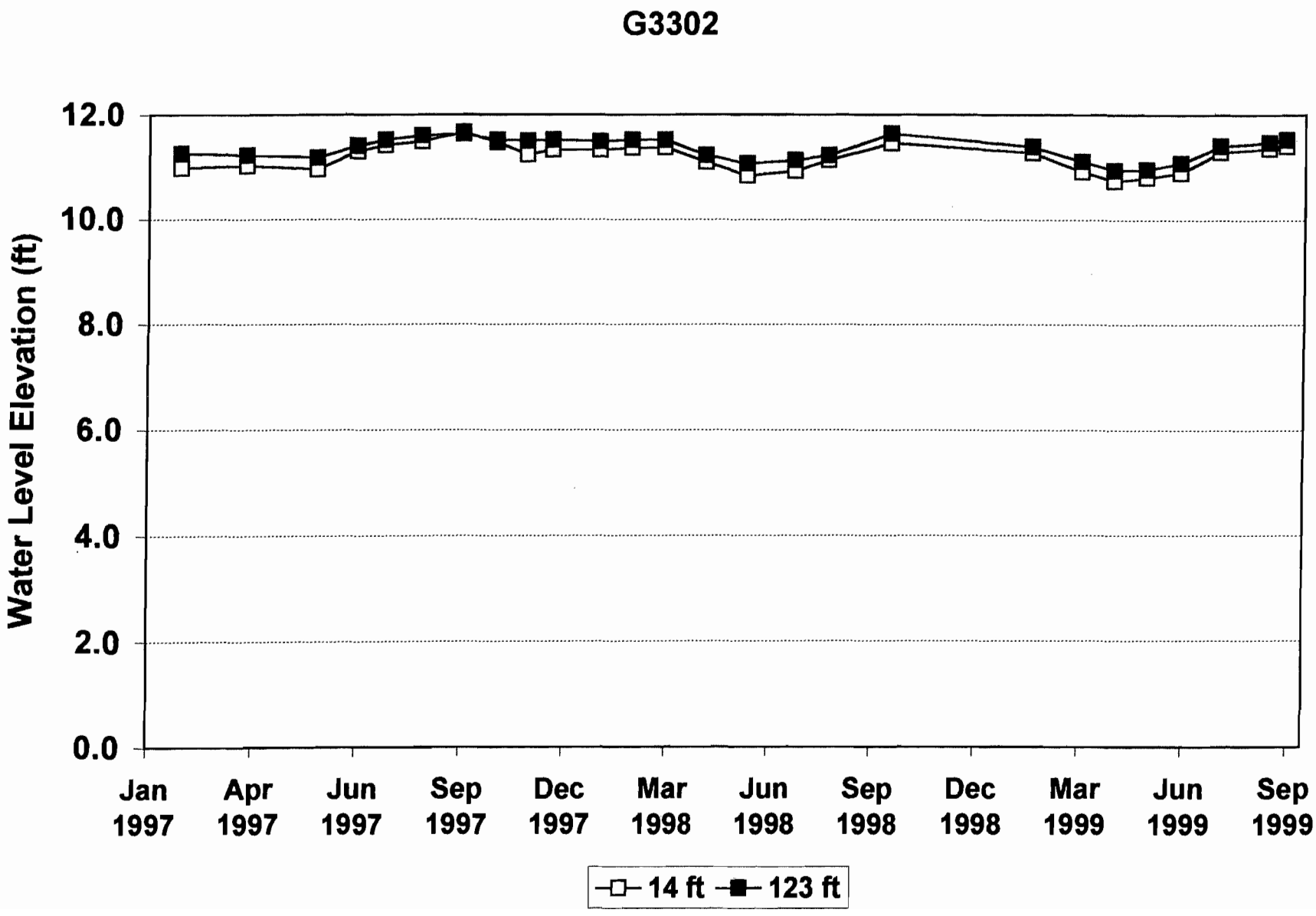
Appendix A. Field parameters of all samples.

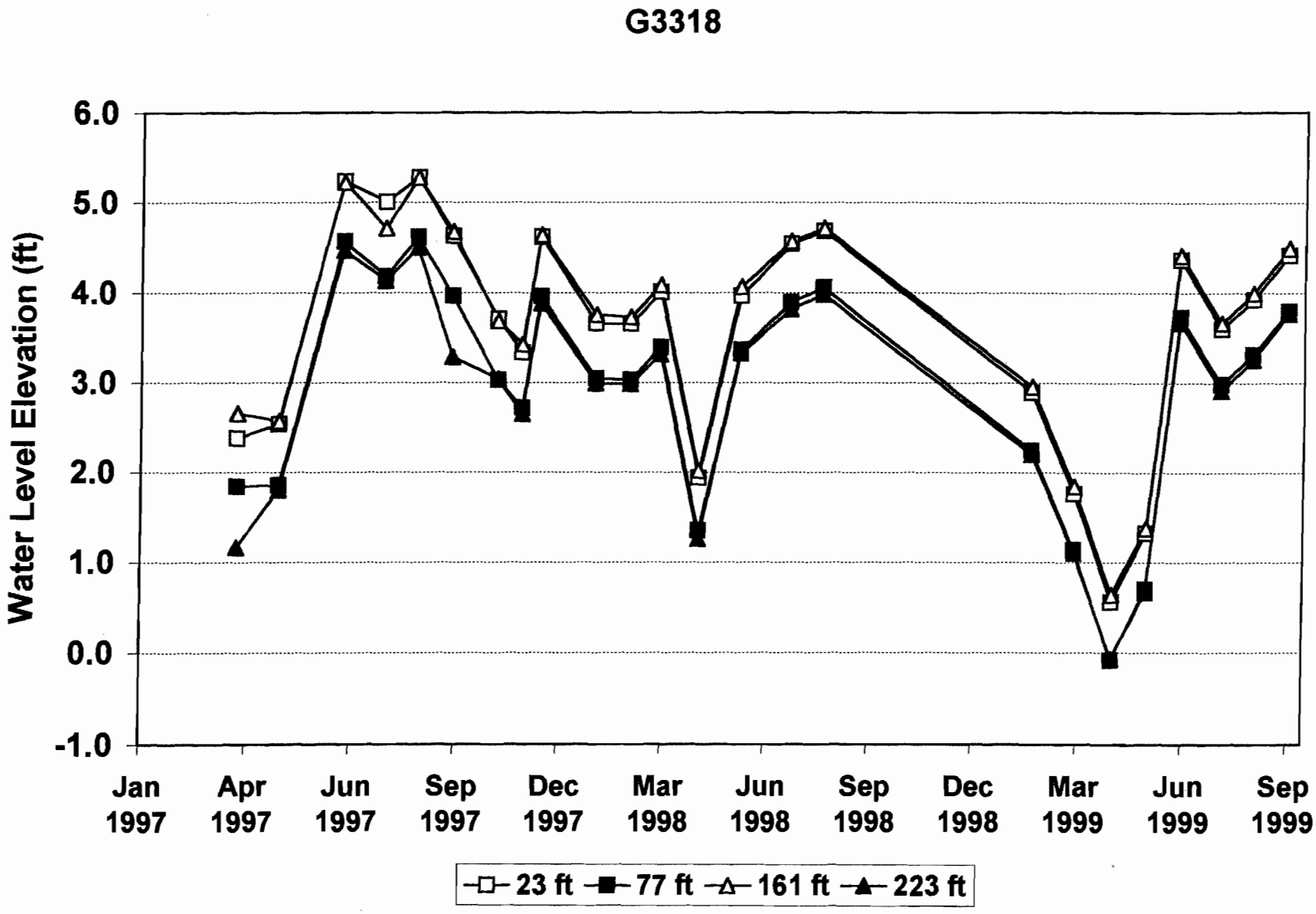
Name Sample	Date Collection	uS/cm Conductivity	PPT Salinity	oC Temperature	pH
TSB	16-Jul-98	414	0.10	32.50	8.42
TSB	13-Aug-98	430	0.20	34.10	7.94
TSB	19-Nov-98				
TSB	14-Jan-99	402	0.20	32.60	8.06
TSB	10-Feb-99	441	0.20	22.80	7.62
TSB	19-Mar-99	571	0.20	19.90	7.71
TSB	21-Apr-99	450	0.20	25.60	8.20
TSB	20-May-99	489	0.20	24.50	7.55
TSB	17-Jun-99	447	0.00	34.50	7.85
TSB	26-Jul-99	423	0.10	28.30	7.15
TSB	18-Aug-99	452	0.12	30.10	
TSB	17-Sep-99	256	-0.01	31.10	7.92
TSB-15	11-Dec-97	460	0.20	27.00	7.07
TSB-15	28-Jan-98	480	0.20	24.10	7.19
TSB-15	27-Feb-98	480	0.20	24.30	7.09
TSB-15	25-Mar-98	472	0.20	24.20	6.72
TSB-15	28-Apr-98	495	0.20	24.90	6.67
TSB-15	03-Jun-98	611	0.20	26.30	6.57
TSB-15	16-Jul-98	525	0.20	26.80	6.65
TSB-15	13-Aug-98	563	0.20	28.30	7.15
TSB-15	19-Nov-98				
TSB-15	11-Dec-98	486	0.20	25.20	6.23
TSB-15	14-Jan-99	486	0.20	24.80	7.22
TSB-15	10-Feb-99	518	0.20	24.60	7.01
TSB-15	19-Mar-99	479	0.20	24.90	7.23
TSB-15	21-Apr-99	477	0.20	26.10	7.21
TSB-15	20-May-99	480	0.20	25.30	7.29
TSB-15	17-Jun-99	574	0.00	24.80	7.27
TSB-15	26-Jul-99	553	0.19	26.50	6.92
TSB-15	18-Aug-99	532	0.18	27.70	
TSB-15	17-Sep-99	546	0.19	28.30	7.15
TSB-15-D	28-Jan-98	480	0.20	24.10	7.19
TSB-34	11-Dec-97	440	0.20	25.90	7.50
TSB-34	28-Jan-98	450	0.20	24.10	7.40
TSB-34	27-Feb-98	450	0.20	24.40	7.09
TSB-34	25-Mar-98	448	0.20	24.30	6.80
TSB-34	28-Apr-98	447	0.20	24.60	6.71
TSB-34	03-Jun-98	521	0.20	24.90	6.75
TSB-34	16-Jul-98	460	0.20	25.30	6.47
TSB-34	13-Aug-98	479	0.20	25.10	7.32
TSB-34	19-Nov-98				
TSB-34	11-Dec-98	454	0.20	24.60	6.41
TSB-34	14-Jan-99	489	0.20	25.00	7.16
TSB-34	10-Feb-99	471	0.20	24.90	7.27
TSB-34	19-Mar-99	467	0.20	24.80	7.36
TSB-34	21-Apr-99	467	0.20	25.30	7.25
TSB-34	20-May-99	473	0.20	25.30	7.30
TSB-34	17-Jun-99	504	0.00	24.50	7.46
TSB-34	26-Jul-99	513	0.17	25.00	6.99

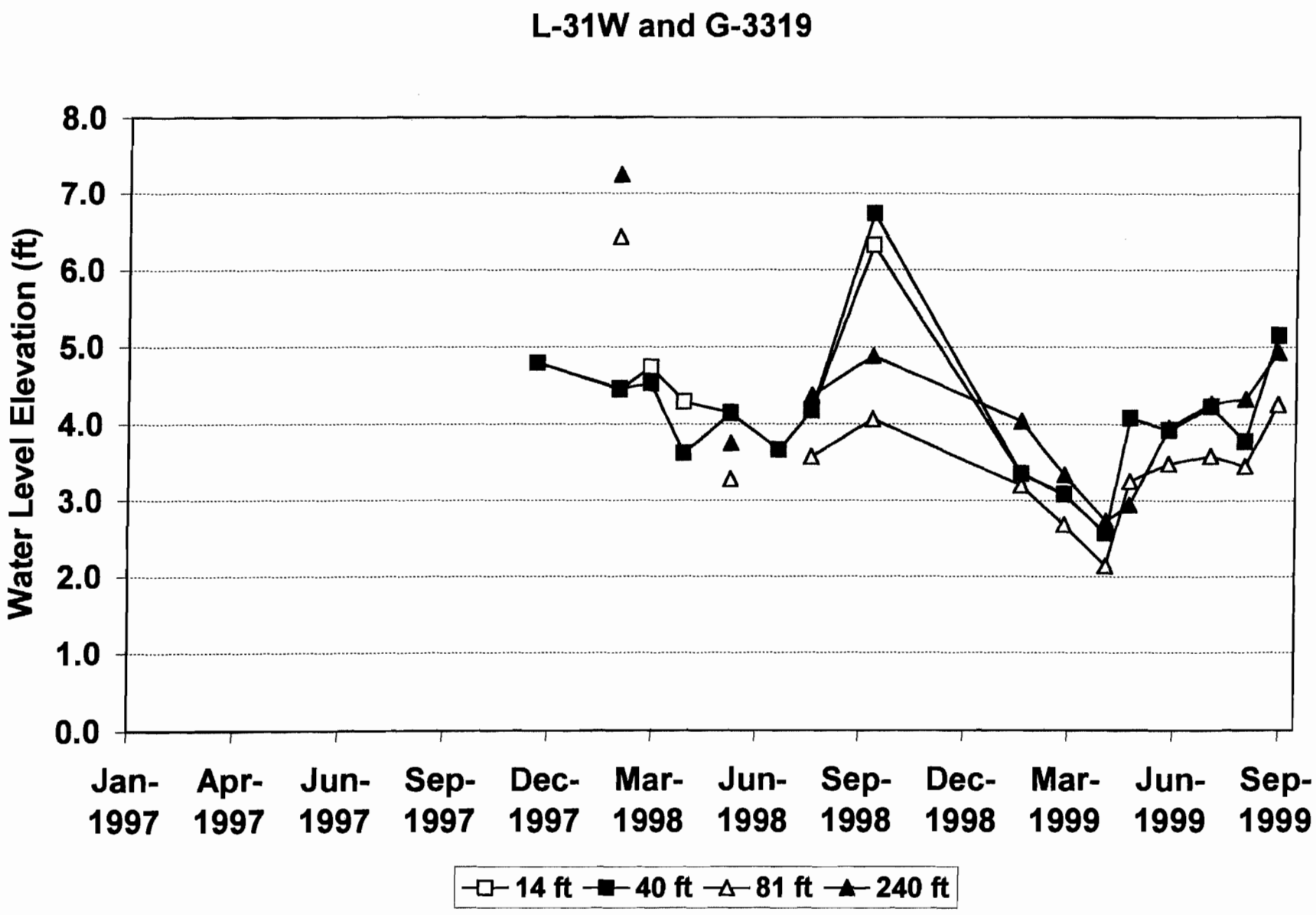
Appendix B
Graphs of water level elevations

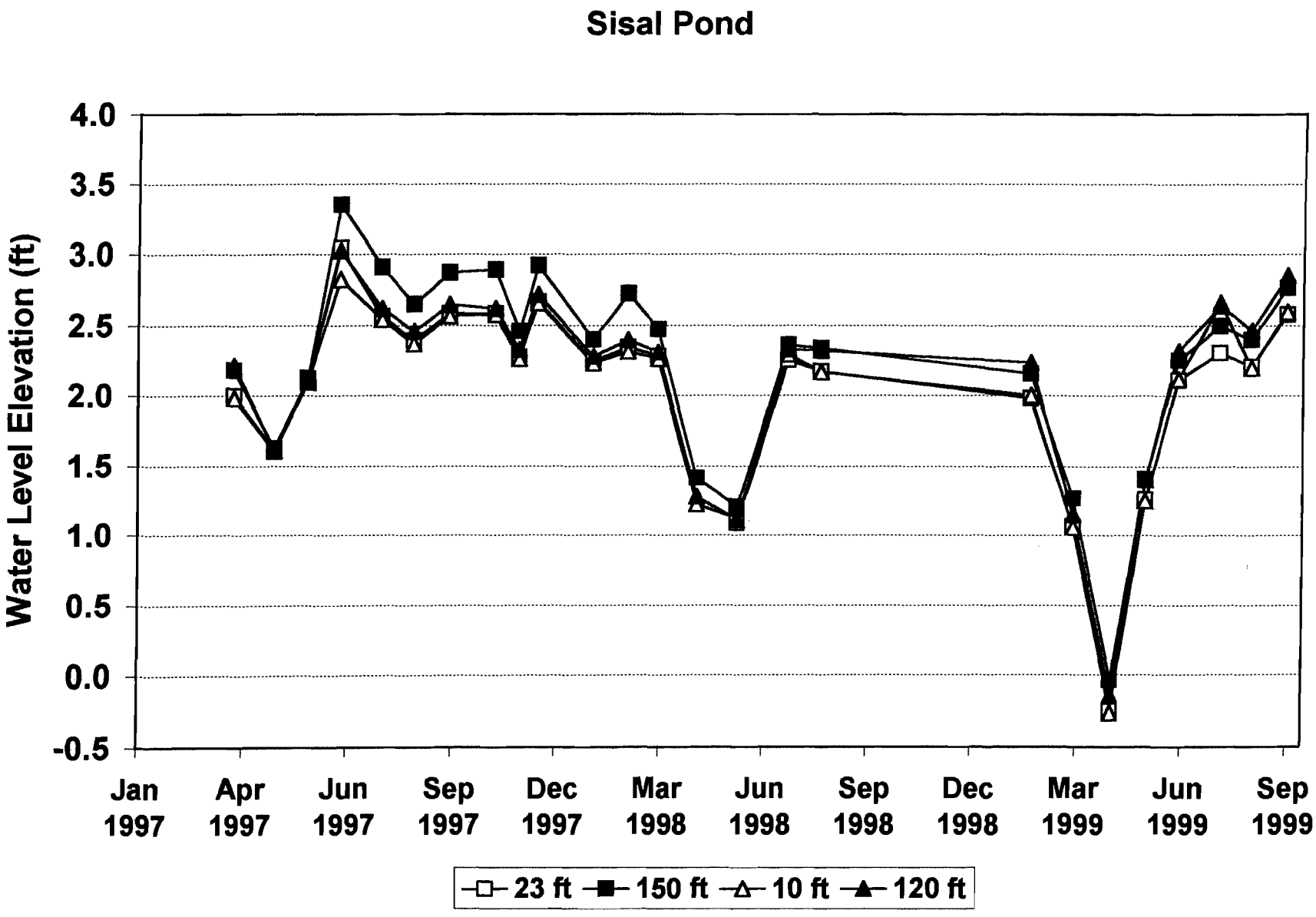

EP8A/EPGW
Reference Water Level Elevation (ft)
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
Jan 1997
Apr 1997
Jun 1997
Sep 1997
Dec 1997
Mar 1998
Jun 1998
Sep 1998
Dec 1998
Mar 1999
Jun 1999
Sep 1999
EP8ASW
EP8AGW (11ft)
EPSW
EPGW (25 ft)


E146
Water Level Elevation (ft)
2.0
1.5
1.0
0.5
0.0
-0.5
Jan 1997
Apr 1997
Jun 1997
Sep 1997
Dec 1997
Mar 1998
Jun 1998
Sep 1998
Dec 1998
Mar 1999
Jun 1999
Sep 1999
Surface Water
15 ft
25 ft
27.5 ft


G3302
Water Level Elevation (ft)
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 1997
Apr 1997
Jun 1997
Sep 1997
Dec 1997
Mar 1998
Jun 1998
Sep 1998
Dec 1998
Mar 1999
Jun 1999
Sep 1999
14 ft
123 ft


G3318
Water Level Elevation (ft)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
Jan 1997
Apr 1997
Jun 1997
Sep 1997
Dec 1997
Mar 1998
Jun 1998
Sep 1998
Dec 1998
Mar 1999
Jun 1999
Sep 1999
23 ft
77 ft
161 ft
223 ft


L-31W and G-3319
Water Level Elevation (ft)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Jan-1997
Apr-1997
Jun-1997
Sep-1997
Dec-1997
Mar-1998
Jun-1998
Sep-1998
Dec-1998
Mar-1999
Jun-1999
Sep-1999
14 ft
40 ft
81 ft
240 ft


Sisal Pond
Water Level Elevation (ft)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
Jan 1997
Apr 1997
Jun 1997
Sep 1997
Dec 1997
Mar 1998
Jun 1998
Sep 1998
Dec 1998
Mar 1999
Jun 1999
Sep 1999
23 ft
150 ft
10 ft
120 ft

Appendix C
Raw data of major cations and anions

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
EPGW	10-Mar-97	4.944	444.74	72.98	246.84	9.53	41.93	75.18
EPSW	10-Mar-97	3.243	409.81	20.14	234.96	10.75	29.45	40.30
G-3302A	24-Mar-97	3.742	38.90	1.59				
G-3302B	24-Mar-97	8.012	51.74					
G-3302C	24-Mar-97	8.143	57.16					
G-3317C	24-Mar-97	2.296	1542.39	215.11				
G-3317D	24-Mar-97	3.500	19.26		10.12	0.25	2.01	72.20
G-3318A	24-Mar-97	4.157	16.02					
G-3318B	24-Mar-97	2.678	618.02	53.27				
G-3318C	24-Mar-97	2.836	863.31	109.49				
G-3318TW	24-Mar-97	2.765	766.32	101.94				
SISAL POND	24-Mar-97	1.826	22.87					
SISAL-E	24-Mar-97	2.890	1560.33	228.52				
SISAL-W	24-Mar-97	3.349	20.58					
G-3302SW	26-Mar-97	3.159	42.31	4.10				
C111/109	27-Mar-97	3.410	44.84	8.72	26.54	3.85	6.29	61.37
CYP2-10GW	27-Mar-97	4.188	14.64	3.94	8.19	1.49	3.44	82.60
CYP2-10SW	27-Mar-97	3.874	15.67	1.05	8.37	1.31	2.59	77.45
G-1251GW	27-Mar-97	3.352	32.03	1.49	19.60	1.88	4.98	63.35
G-1251SW	27-Mar-97	3.376	32.15	1.29	19.64	1.82	4.98	62.78
G-1603GW	27-Mar-97	3.954	616.56	124.69	321.56	6.52	29.25	108.04
G-1603SW	27-Mar-97	4.530	55.85	5.57	33.91	2.86	8.95	81.74
G-3167GW	27-Mar-97	3.788	65.21	10.41	42.54	1.77	5.42	71.33
G-3167SW	27-Mar-97	4.204	47.79	11.54	30.78	4.59	8.18	78.68
G-3336	27-Mar-97	4.031	33.07	0.00	20.03	1.92	5.33	75.37
G-3337	27-Mar-97	3.161	74.66	5.02	31.39	1.88	5.10	65.02
NP-67-GW	27-Mar-97	4.596	14.80		8.32	3.15	3.68	89.19
NP-67-GW-D	27-Mar-97				8.26	3.08	3.67	89.30
NP-67-SW	27-Mar-97	4.121	16.85		9.33	3.31	3.52	83.54
TSB	27-Mar-97	4.338	37.18	2.03	25.26	1.34	6.15	79.69
CANEPATCH-GW	31-Mar-97							
CANEPATCH-SW	31-Mar-97							
RB-1-20	31-Mar-97			166.99				
RB-1-27	31-Mar-97		1587.47	187.02				
RB-1-6	31-Mar-97							
RB-1-GW	31-Mar-97							
RB-1-SW	31-Mar-97		177.66	4.85				
TARPON BAY-GW	31-Mar-97							
TARPON BAY-SW	31-Mar-97							
C111/109	28-Apr-97	3.455	351.48	57.95	191.80	8.45	23.36	64.92
G-1251GW	28-Apr-97				19.75	1.70	5.16	65.79
G-1251SW	28-Apr-97	3.632	33.04	1.05	20.07	1.63	5.26	64.15
G-1603GW	28-Apr-97	4.057			33.44	2.91	8.74	77.38
G-1603SW	28-Apr-97	4.771	585.22	73.89	294.63	6.55	26.91	101.61
G-3167GW	28-Apr-97	3.841	63.54	11.05	41.95	1.64	5.46	70.40
G-3167SW	28-Apr-97	4.626	63.07	5.61	39.66	2.65	10.77	76.90
G-3317C	28-Apr-97	2.304	1491.14	208.77	678.06	13.53	94.06	241.45
G-3317D	28-Apr-97	3.246	20.61		10.27	0.38	1.93	63.25
G-3336	28-Apr-97	4.188	32.93		19.80	1.66	5.25	75.17
G-3337	28-Apr-97	2.628	94.17	5.66	35.69	1.49	5.27	62.56
SISAL POND	28-Apr-97	1.635	23.91	0.96	12.26	0.36	2.02	30.67
SISAL POND-D	28-Apr-97	1.635			11.99	0.41	2.08	30.61
SISAL-E	28-Apr-97	2.933	1567.86	229.82	687.74	22.49	98.88	188.94
SISAL-W	28-Apr-97	3.009	21.23		10.71	0.36	1.92	59.59
CALUS CREEK-GW	29-Apr-97	5.524	1412.92	206.20	755.78	21.89	114.67	130.31

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
TSB	28-May-97	2.219	33.42	1.73	25.54	1.54	5.30	58.68
G-3323A	29-May-97	5.054	62.91	0.00	37.08	2.13	5.79	105.13
G-3323B	29-May-97	1.117	1575.69	0.00	303.76	13.26	59.90	550.58
G-3323SW	29-May-97	4.199	36.16	7.83	36.46	3.93	11.01	79.04
CANEPATCH-GW	3-Jun-97	5.853	8026.56	1222.84	4828.35	141.29	647.70	454.35
CANEPATCH-SW	3-Jun-97	4.993	2449.63	336.02	1099.66	41.80	176.63	136.91
RB-1-20	3-Jun-97	6.965	1769.53	207.39	1041.49	23.81	144.41	328.26
RB-1-27	3-Jun-97	5.364	2335.36	157.07	658.76	12.40	63.19	171.42
RB-1-6	3-Jun-97	7.077	2295.94	282.42	1076.37	23.97	149.03	257.87
RB-1-GW	3-Jun-97	7.274	3585.72	471.56	1188.13	26.08	163.98	368.38
RB-1-SW	3-Jun-97	3.485	146.50	14.44	94.58	7.01	19.62	62.73
TARPON BAY-GW	3-Jun-97	8.638	11651.63	1790.56	6999.26	232.28	860.99	437.45
TARPON BAY-SW	3-Jun-97	4.740			6627.34	224.78	810.72	335.68
CYP2-10GW	23-Jun-97	2.692	9.04	0.00	5.20	1.59	2.07	52.99
CYP2-10SW	23-Jun-97	2.410	9.23	0.00	5.05	1.45	2.07	45.85
G-3317C	23-Jun-97	2.399	1078.99	195.46	210.41	4.69	30.58	101.52
G-3317D	23-Jun-97	3.651	15.36	0.00	8.61	0.71	2.25	61.80
G-3318A	23-Jun-97	4.022	11.90	0.00	3.01	0.41	1.09	73.99
G-3318B	23-Jun-97	3.241	641.11	44.56	249.80	3.13	28.59	138.04
G-3318C	23-Jun-97	3.333	861.72	114.60	390.04	6.76	36.52	149.54
G-3318TW	23-Jun-97	3.273	767.39	90.38	340.91	9.97	49.38	117.55
NP-67-GW	23-Jun-97	5.176	16.88	0.00	8.98	3.68	4.27	98.96
NP-67-SW	23-Jun-97	2.660	8.77	0.00	4.96	1.43	1.98	51.62
SISAL POND	23-Jun-97	2.454	7.68	0.96	6.81	0.84	2.24	40.88
SISAL-E	23-Jun-97	3.470	1517.08	213.02	640.25	23.30	99.34	183.49
SISAL-W	23-Jun-97	3.342	31.37	2.37	14.79	0.83	2.94	62.65
C111/109	25-Jun-97	7.867	39.33	12.22	19.68	4.14	5.54	75.07
CALUS CREEK-GW	25-Jun-97	5.711	1352.90	180.07	718.40	21.88	106.63	118.32
CALUS CREEK-SW	25-Jun-97	3.900	51.31	7.09	30.85	3.72	8.27	64.25
EP8AGW	25-Jun-97	3.763			1873.55	11.08	201.07	472.86
EP8ASW	25-Jun-97	3.855	27.83	1.47	15.08	1.58	3.26	50.66
EPGW	25-Jun-97	5.528	395.12	63.09	242.83	10.90	43.14	81.48
EPSW	25-Jun-97	3.714	45.59	7.40	26.62	3.87	7.61	63.21
G-1251GW	25-Jun-97	3.389	29.49	2.41	16.02	1.93	4.40	52.30
G-1251SW	25-Jun-97	3.264	28.29	2.39	16.02	2.02	4.37	50.70
G-1603GW	25-Jun-97	8.204	578.15	73.68	301.89	6.76	29.54	105.13
G-1603SW	25-Jun-97	4.674	38.86	14.07	22.29	4.41	6.20	78.05
G-3167GW	25-Jun-97	4.448	67.09	9.16	40.05	1.52	5.76	65.25
G-3167SW	25-Jun-97	4.281	35.45	23.38	18.28	6.18	4.89	85.81
G-3336	25-Jun-97	4.829	32.70	0.00	18.16	1.64	5.57	76.73
G-3337	25-Jun-97	3.225	94.08	5.46	34.21	1.56	5.66	64.13
CANEPATCH-GW	26-Jun-97	6.781	7886.52	1226.88	4374.11	134.43	606.58	384.41
CANEPATCH-SW	26-Jun-97	3.013	39.41	2.60	25.69	1.64	7.94	41.10
RB-1-20	26-Jun-97	7.545		185.47	1192.17	23.38	130.35	249.21
RB-1-27	26-Jun-97	6.091	1303.35	153.42	713.08	12.40	76.67	189.34
RB-1-6	26-Jun-97	7.660	1972.14	256.00	1215.42	23.18	132.69	264.39
RB-1-GW	26-Jun-97	8.200	1860.29	211.81	1232.18	23.99	137.57	263.64
RB-1-SW	26-Jun-97	3.167	35.05	1.90	20.93	1.96	7.05	43.16
TARPON BAY-GW	26-Jun-97	9.775	11584.62	1724.18	7020.20	232.83	837.48	445.50
TARPON BAY-SW	26-Jun-97	3.422	474.86	91.55	218.67	8.77	32.85	47.69
G-3302A	30-Jun-97	5.167	43.27	0.00	27.23	2.93	12.17	75.86
G-3302B	30-Jun-97	8.726	53.37	0.00	47.45	3.13	17.77	45.13
G-3302C	30-Jun-97	8.708	57.19	0.00	52.05	4.96	21.27	51.46
G-3302SW	30-Jun-97	4.326	78.17	16.82	51.09	3.69	13.55	61.55
G-3309SW	30-Jun-97	4.461	73.08	15.91	6.76	0.73	2.44	10.67

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
RB-1-GW	8-Aug-97	7.773	1952.93	227.76	1192.13	22.60	133.84	273.81
RB-1-SW	8-Aug-97	3.324	37.58	0.00	25.22	2.59	7.73	47.41
TARPON BAY-GW	8-Aug-97	9.217	11571.86	1715.63	6618.19	249.24	895.00	432.78
TARPON BAY-SW	8-Aug-97	3.512	453.23	89.14				
C111/109	21-Aug-97							
G-1251GW	21-Aug-97	3.772	30.85	0.70	17.94	1.88	4.85	65.81
G-1251SW	21-Aug-97	3.839	30.23	11.20	18.14	1.98	4.98	63.45
G-1603GW	21-Aug-97	4.237	420.51	69.26	241.75	6.76	25.50	94.11
G-1603SW	21-Aug-97	4.203	32.30	15.95	20.09	5.67	5.20	79.68
G-3167GW	21-Aug-97	4.052	60.20	9.89	39.61	1.80	5.30	70.62
G-3167SW	21-Aug-97	4.242	30.35	13.45	18.46	4.97	6.04	75.39
G-3319B	21-Aug-97	4.279	33.36	4.71	21.13	2.15	5.13	73.47
G-3319TW	21-Aug-97	3.095	15.21	10.37	59.04	11.54	0.66	1.56
G-3323A	21-Aug-97	5.206	38.93	0.00	24.51	1.79	5.16	95.27
G-3323B	21-Aug-97	1.177	1460.83	0.00	265.68	12.08	52.73	478.68
G-3323SW	21-Aug-97	4.031	31.30		19.45	5.07	5.47	76.87
G-3336	21-Aug-97	4.961	30.49	0.00	20.16	1.72	5.71	84.05
G-3337	21-Aug-97	2.937	84.66	6.24	33.43	1.54	5.58	62.12
S-175	21-Aug-97	4.308	34.25	4.51	20.99	2.11	5.13	74.51
S-332	21-Aug-97	4.565	38.04	4.71	23.63	2.26	6.10	89.58
TSB	21-Aug-97	3.606	34.96	4.03	21.50	2.14	5.74	59.76
G-3302A	25-Aug-97	4.787	50.33	0.71	31.38	3.12	12.20	74.63
G-3302B	25-Aug-97	7.588	48.92	0.00	47.73	3.22	17.16	122.16
G-3302C	25-Aug-97	6.941	55.50	0.00	50.83	4.91	19.38	116.67
G-3302SW	25-Aug-97	4.343	69.02	18.61	24.39	3.64	14.85	57.80
G-3309A	25-Aug-97	7.163	78.78	0.00	53.02	19.86	16.39	109.18
G-3309B	25-Aug-97	8.331	94.99	0.89	60.28	1.37	16.75	140.32
G-3309C	25-Aug-97	2.896	82.37	17.24	64.90	3.40	12.91	98.00
G-3309SW	25-Aug-97	3.915	73.63	20.85	47.73	3.75	15.46	59.32
CYP2-10GW	26-Aug-97	2.752	11.20	0.00	5.55	1.63	1.99	46.53
CYP2-10SW	26-Aug-97	2.040	9.61	0.00	4.50	1.73	1.73	33.75
G-3317C	26-Aug-97	2.204	1123.68	135.83	496.21	10.24	74.83	198.88
G-3317D	26-Aug-97	2.861	16.59	0.00	7.78	0.37	1.93	53.67
G-3318A	26-Aug-97	3.836			7.05	0.23	2.11	72.18
G-3318B	26-Aug-97	2.804	582.21	43.80	274.17	3.76	25.07	152.13
G-3318C	26-Aug-97	2.864	850.98	87.13	384.50	7.59	35.98	146.49
G-3318TW	26-Aug-97	2.938	693.82	76.27	320.08	9.31	45.39	117.31
NP-67-GW	26-Aug-97	4.793	17.30	0.00	7.89	2.83	3.62	86.61
NP-67-SW	26-Aug-97	3.524	12.34	0.00	5.44	1.58	2.63	63.25
SISAL POND	26-Aug-97	4.082			9.96	1.55	2.01	75.03
SISAL-E	26-Aug-97	3.125	1447.90	210.18	722.83	23.81	105.85	186.73
SISAL-W	26-Aug-97	3.378	15.63	0.00	8.28	0.31	2.03	63.21
EP8AGW	27-Aug-97	3.630	3091.50	424.78	1557.38	8.83	158.24	448.96
EP8ASW	27-Aug-97	2.532	42.26	0.00	23.11	0.74	3.36	44.25
EPGW	27-Aug-97	5.404	451.25	120.08	222.14	10.79	42.96	80.84
EPSW	27-Aug-97	3.639	50.70	10.37	31.36	5.67	8.83	57.47
CANEPATCH-GW	28-Aug-97	6.236	8113.42	1197.87	4293.29	137.60	604.15	404.61
CANEPATCH-SW	28-Aug-97	3.092	54.03	3.84	35.18	2.58	9.82	44.21
RB-1-20	28-Aug-97	8.108	1825.40	206.72	1040.32	23.03	118.01	244.13
RB-1-27	28-Aug-97	5.802	1173.81	185.20	747.29	13.39	78.17	197.98
RB-1-6	28-Aug-97	8.287	1835.40	172.04	1187.46	26.12	134.28	279.84
RB-1-GW	28-Aug-97	8.038	1845.79	215.46	1083.84	23.30	123.63	246.85
RB-1-SW	28-Aug-97	3.046	37.79	2.79	25.27	2.66	7.66	46.45
TARPON BAY-GW	28-Aug-97	8.795	11650.21	1711.69	6348.09	231.48	869.32	397.99
TARPON BAY-SW	28-Aug-97	3.262	361.30	65.71	200.30	9.15	31.78	47.70

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
G-3317D	4-Nov-97	3.971	12.99	0.00	8.97	0.30	2.48	83.72
G-3318A	4-Nov-97	3.699	13.42	0.00	7.25	0.23	2.53	79.65
G-3318B	4-Nov-97	2.876	581.00	30.04	289.87	3.09	27.81	135.71
G-3318C	4-Nov-97	2.880	773.96	77.24	390.30	6.80	34.60	145.05
NP-67-GW	4-Nov-97	4.588	11.63	0.00	7.47	2.78	2.89	81.48
NP-67-SW	4-Nov-97	2.967	586.00	31.46	6.55	1.60	0.58	56.23
S-332	4-Nov-97	4.187	28.63	2.31	19.36	1.76	4.35	77.07
SISAL POND	4-Nov-97	2.180	10.99	0.07	6.95	0.42	1.56	41.56
SISAL-E	4-Nov-97	2.952		200.70	726.66	24.75	107.10	207.08
SISAL-W	4-Nov-97	4.007	18.23	0.00	9.02	0.39	2.59	85.10
C110-10	20-Nov-97	3.065	23.25	2.11	13.47	3.52	3.23	56.15
C110-100	20-Nov-97	4.378	9236.92	1228.61	5037.10	65.26	633.46	584.57
C111/109	20-Nov-97	3.284	26.40	6.04	18.31	3.31	5.09	63.69
C111/110	20-Nov-97	3.944	34.49	5.16	21.70	3.28	5.11	67.98
G-1251GW	20-Nov-97	3.700	27.05	0.27	17.91	1.92	4.57	61.56
G-1251SW	20-Nov-97	3.895	28.19	0.22				
G-1603GW	20-Nov-97	4.089	474.22	68.43	240.91	6.02	27.28	98.00
G-1603SW	20-Nov-97	4.603	41.87	3.50	27.31	3.13	6.64	81.72
G-3167GW	20-Nov-97	4.012	52.45	5.50	34.61	1.56	4.56	66.47
G-3167SW	20-Nov-97	4.113	28.09	12.71	19.58	4.85	6.07	80.95
G-3323A	20-Nov-97	5.118	69.79	0.67	38.03	1.92	5.79	95.91
G-3323B	20-Nov-97	1.217	1496.22	2.32	276.35	10.71	52.34	483.57
G-3323SW	20-Nov-97	3.871	46.62	3.36	28.83	3.13	6.35	81.12
G-3336	20-Nov-97	4.952	30.35	0.00	19.96	1.56	5.25	84.09
G-3337	20-Nov-97	2.715	86.93	4.67				
CYP2-10GW	25-Nov-97	3.666	11.75	0.06	7.70	1.28	2.43	68.78
CYP2-10SW	25-Nov-97	3.548	10.43	0.00	6.75	1.67	2.46	68.49
G-3317C	25-Nov-97	2.189	1409.44	140.33	645.92	19.62	80.14	234.33
G-3317D	25-Nov-97	4.011	12.09	0.00	8.50	0.30	2.39	82.25
G-3318A	25-Nov-97	3.811	9.83	0.05	7.29	0.22	2.32	80.45
G-3318B	25-Nov-97	2.728	589.42	30.75	271.62	3.15	30.03	152.05
G-3318C	25-Nov-97	2.892	766.08	79.70	416.85	12.59	31.75	151.45
NP-67-GW	25-Nov-97	4.472	12.20	0.03	7.93	2.60	2.99	86.31
NP-67GW-D	25-Nov-97	4.472	12.24	0.00	8.18	2.69	3.87	90.31
NP-67-SW	25-Nov-97	4.016	11.28	0.00	7.42	1.72	3.10	70.98
SISAL POND	25-Nov-97	2.535	14.04	0.00	8.91	0.43	2.10	56.40
SISAL-E	25-Nov-97	2.883	1461.92	205.92	726.18	24.30	111.24	207.60
SISAL-W	25-Nov-97	4.064	13.15	0.05	8.60	0.33	1.92	80.73
TSB	25-Nov-97	3.533	38.37	0.97	0.17	2.13	6.58	65.42
G-3302A	26-Nov-97	4.535	55.33	1.17	38.81	3.12	11.44	79.19
G-3302B	26-Nov-97	7.742	50.33	0.66	51.20	3.09	16.30	130.71
G-3302C	26-Nov-97	6.790	55.83	0.00	55.47	4.78	18.24	127.50
G-3302SW	26-Nov-97	4.215	62.61	9.25	43.55	3.26	13.29	70.15
G-3309A	26-Nov-97	6.575	88.17	2.08	62.33	3.68	16.75	110.07
G-3309B	26-Nov-97	7.930	94.39	1.33	63.87	2.58	15.79	143.53
G-3309C	26-Nov-97	5.070	77.47	16.07	64.18	3.54	13.27	94.50
G-3309SW	26-Nov-97	4.072	55.60	7.23	38.68	3.20	12.12	68.18
G-3309TW	26-Nov-97	5.635	75.75	7.58	55.80	7.25	20.28	78.99
S-175	26-Nov-97	4.255	35.43	2.13	24.37	1.96	6.52	77.85
S-175-D	26-Nov-97	4.269	35.22	2.11	24.35	1.94	6.60	77.23
S-332	26-Nov-97	4.454	37.34	1.32	26.48	1.85	7.11	79.71
CYP2-10GW	11-Dec-97	2.966	10.84	0.00	6.96	1.46	2.03	57.35
CYP2-10SW	11-Dec-97	2.398	10.84	0.00	7.10	2.39	2.16	43.95
G-3317C	11-Dec-97	2.192	1473.40	145.45	661.32	12.31	95.23	253.83
G-3317D	11-Dec-97	3.906	13.01	0.00	9.01	0.32	2.33	83.67

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
C111/110	23-Jan-98	4.248	31.41	12.59	22.50	4.47	5.82	85.25
G-1251GW	23-Jan-98	3.664	29.09	0.44	20.68	1.86	5.22	71.05
G-1251SW	23-Jan-98	3.490	29.15	0.71	20.82	1.94	5.25	66.18
G-1603GW	23-Jan-98	4.061	499.76	71.48	307.43	6.78	29.63	111.63
G-1603SW	23-Jan-98	3.476	29.10	10.73	21.14	4.25	5.60	84.35
G-3167GW	23-Jan-98	4.061	59.41	8.31	43.76	1.56	5.49	78.31
G-3167SW	23-Jan-98	4.135	28.34	13.63	21.14	4.59	5.72	86.07
G-3319B	23-Jan-98	2.896	14.40	9.68	29.42	2.05	7.32	37.96
G-3319TW	23-Jan-98	2.923	10.80	8.64	64.57	11.19	3.72	6.16
G-3323A	23-Jan-98	5.189	50.62	0.30	33.28	1.87	5.44	102.75
G-3323B	23-Jan-98	1.224	1478.18	2.51	319.18	10.96	47.81	532.35
G-3323SW	23-Jan-98	3.187	31.73	9.03	22.94	3.82	6.01	84.48
G-3336	23-Jan-98	3.885	28.18	0.72	20.12	1.90	5.00	76.61
G-3336-D	23-Jan-98		27.66	0.67	20.21	1.86	5.40	76.99
G-3337	23-Jan-98	2.385	84.95	4.81	36.48	1.59	5.89	69.43
L-31W-14	23-Jan-98	3.924	25.41	1.22	18.66	1.75	5.62	76.93
L-31W-40	23-Jan-98	1.242	27.55	3.98	20.63	2.70	2.05	45.39
S-175	23-Jan-98	4.068	29.30	2.37	21.07	1.77	5.72	80.19
S-332	23-Jan-98	3.958	22.95	0.96	17.08	1.08	4.59	81.09
G-3302A	27-Jan-98	4.139	35.86	0.21	29.39	2.48	9.21	68.90
G-3302B	27-Jan-98	5.639	48.67	0.00	51.58	3.13	16.58	131.50
G-3302C	27-Jan-98	8.356	55.49	0.00	55.58	4.78	18.98	127.51
G-3302C-D	27-Jan-98	8.058	55.38	0.00	55.65	4.82	19.10	127.61
G-3302SW	27-Jan-98	2.398	14.44	0.11	11.95	1.21	4.05	46.17
G-3309A	27-Jan-98	7.115	80.87	0.05	57.72	2.53	14.82	120.42
G-3309B	27-Jan-98	8.289	95.49	1.12	40.66	1.63	10.30	92.68
G-3309C	27-Jan-98	6.022	79.40	16.37	41.86	2.01	8.56	61.53
G-3309SW	27-Jan-98	3.377	40.23	5.33	29.12	2.63	9.75	59.40
G-3309TW	27-Jan-98	5.636	75.26	7.38	57.83	7.43	19.55	81.68
CYP2-10GW	28-Jan-98	3.213	13.29	0.00	8.74	1.67	3.12	65.18
CYP2-10SW	28-Jan-98	2.702	14.96	0.00	9.58	2.56	3.49	54.96
G-3317C	28-Jan-98	2.137	958.62	132.21	673.86	12.18	93.00	251.04
G-3317D	28-Jan-98	3.887	12.13	0.00	8.44	0.30	2.42	82.27
G-3318A	28-Jan-98	3.459	10.30	0.00	7.72	0.24	2.53	81.49
G-3318B	28-Jan-98	2.758	600.12	31.82	271.89	3.19	29.63	150.17
G-3318C	28-Jan-98	2.042	495.34	63.94	419.80	6.91	38.07	159.34
G-3318TW	28-Jan-98	2.338	697.14	67.19	370.25	9.76	48.78	126.11
NP-67-GW	28-Jan-98	4.061	12.38	0.00	8.45	2.78	3.72	87.42
NP-67-SW	28-Jan-98	4.713	11.97	0.05				
SISAL POND	28-Jan-98	2.889	16.46	0.06	10.54	0.55	2.45	62.71
SISAL-E	28-Jan-98	2.900	1462.07	208.32	725.38	24.48	108.94	207.60
SISAL-W	28-Jan-98	4.011	12.61	0.00	8.76	0.35	2.49	83.08
TSB	28-Jan-98	3.744	23.74	0.83	17.52	1.16	4.76	74.16
TSB-15	28-Jan-98	4.489	26.53	0.07	19.98	0.98	5.22	88.90
TSB-15-D	28-Jan-98	4.509	26.65	0.07	20.00	0.97	5.26	88.91
TSB-34	28-Jan-98	4.132	29.35	0.00	22.59	0.70	5.45	79.63
TSB-57	28-Jan-98	3.822	25.88	0.64	21.87	0.68	5.58	76.22
CANEPATCH-GW	30-Jan-98	5.860	7968.12	1066.95	4731.57	141.45	664.36	448.20
CANEPATCH-SW	30-Jan-98	5.428	77.13	3.13	51.67	3.31	11.38	58.07
E-130-10	04-Feb-98	4.466	13.01	0.00	8.76	4.20	4.27	94.38
E-130-52	04-Feb-98	4.630	13.67	0.14	8.98	4.18	3.95	93.52
E-130-SW	04-Feb-98	2.720	9.08	0.16	6.78	1.81	2.87	52.75
E-146-15	04-Feb-98	5.696	5533.46	663.37	2906.79	37.75	350.91	550.81
E-146-25	04-Feb-98	6.106	5854.35	778.35	3832.70	56.50	430.33	629.24
E-146-27.5	04-Feb-98	7.080	8443.73	1214.54	4972.43	105.25	599.17	615.78

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
NP-67-GW	27-Feb-98	4.313	12.88	0.05	7.42	2.72	3.05	70.32
NP-67-SW	27-Feb-98	4.412	12.38	0.09	7.34	2.43	3.14	75.12
S-332	27-Feb-98	4.020	41.65	1.71	28.03	2.06	7.95	64.07
SISAL POND	27-Feb-98	2.671	17.98	0.21	9.95	0.45	1.95	46.61
SISAL POND-D	27-Feb-98	2.691	17.95	0.11	10.08	0.59	1.98	48.19
SISAL-E	27-Feb-98	2.841	1432.36	207.57	684.55	25.20	104.40	182.44
SISAL-W	27-Feb-98	3.927	12.27	0.08	7.52	0.31	1.95	70.85
TSB	27-Feb-98	3.691	35.54	1.34	23.07	1.68	6.13	56.31
TSB-15	27-Feb-98	4.501	27.40	0.00	18.34	0.83	4.68	71.59
TSB-34	27-Feb-98	4.168	29.37	0.00	20.26	0.66	4.83	64.45
TSB-57	27-Feb-98	4.019	25.60	0.57	19.00	0.65	5.12	61.15
CANEPATCH-GW	28-Feb-98	5.940	7904.57	1069.16	4196.00	136.14	618.68	393.59
CANEPATCH-SW	28-Feb-98	3.377	60.40	2.09	39.95	2.75	11.88	52.96
RB-1-20	28-Feb-98	7.808	1833.92	133.71	1022.41	19.68	111.32	222.00
RB-1-27	28-Feb-98	7.605	1938.46	148.55	1076.58	23.70	118.90	196.23
RB-1-6	28-Feb-98	6.146	1320.12	152.33	747.93	13.99	76.28	181.00
RB-1-GW	28-Feb-98	7.462	2117.18	163.92	1098.27	21.18	118.39	234.44
RB-1-SW	28-Feb-98	3.065	33.58	1.28	23.98	2.35	9.33	44.21
TARPON BAY-GW	28-Feb-98	8.322	12028.59	1636.30	6750.06	243.27	879.10	387.03
TARPON BAY-SW	28-Feb-98	3.508	425.44	52.91	259.44	10.52	39.65	58.14
G-3302A	24-Mar-98		17.58	0.07	15.60	1.82	7.57	54.46
G-3302B	24-Mar-98		48.99	0.36	48.30	2.82	15.95	122.18
G-3302C	24-Mar-98	4.964	55.98	0.00	52.17	40.20	17.88	118.56
G-3302SW	24-Mar-98		12.38	0.22	9.49	0.68	2.99	34.92
G-3309A	24-Mar-98	6.688	79.21	0.00	52.88	2.30	15.12	111.82
G-3309B	24-Mar-98		88.16	1.23	56.64	2.05	15.20	129.25
G-3309C	24-Mar-98		68.30	16.01	55.78	2.53	12.06	84.07
G-3309SW	24-Mar-98		28.69	5.96	20.25	1.65	7.81	48.50
G-3309TW	24-Mar-98		76.24	7.57	53.26	5.95	22.36	72.87
CYP2-10GW	25-Mar-98	2.933	12.81	0.00	7.93	1.51	2.62	53.67
CYP2-10SW	25-Mar-98		14.17	0.00	8.53	1.97	2.80	40.59
G-3317C	25-Mar-98		1560.68	157.36	648.57	11.20	93.16	236.36
G-3317C-D	25-Mar-98		1552.65	157.98	646.33	10.70	92.80	234.15
G-3317D	25-Mar-98	3.843	13.21	0.00	7.90	0.28	2.04	73.87
G-3318A	25-Mar-98	3.611	11.10	0.00	7.41	0.26	2.25	76.02
G-3318B	25-Mar-98	3.857	600.23	31.55	254.96	2.77	29.02	138.42
G-3318C	25-Mar-98	2.791	801.04	79.67	393.06	6.25	36.44	145.08
G-3318TW	25-Mar-98		712.25	68.87	344.04	8.70	48.55	113.61
L-31W-14	25-Mar-98	3.986			18.71	1.43	5.40	72.70
L-31W-40	25-Mar-98		32.08	4.53	20.87	1.77	4.53	55.64
NP-67-GW	25-Mar-98	4.210	13.04	0.00	7.32	2.77	2.99	67.50
NP-67-SW	25-Mar-98		13.01	0.46	7.99	1.86	3.20	79.30
S-332	25-Mar-98	4.515	38.19	3.24	25.12	2.12	5.66	82.77
SISAL POND	25-Mar-98	3.095	19.79	0.00	10.91	0.41	2.15	56.20
SISAL-E	25-Mar-98		1452.15	212.39	680.32	19.65	102.51	182.49
SISAL-W	25-Mar-98		51.76	3.97	24.52	0.67	4.51	80.25
TSB	25-Mar-98		37.63	1.81	25.23	1.65	6.72	62.74
TSB-15	25-Mar-98	4.141	30.95	0.35	19.71	0.95	5.03	81.05
TSB-34	25-Mar-98	4.254	29.80	0.00	21.00	0.65	5.17	73.61
TSB-57	25-Mar-98		26.57	0.26	20.04	0.71	5.33	70.43
C110-10	26-Mar-98	3.156	45.51	5.70				
C110-100	26-Mar-98	4.672	9929.42	1129.39				
C111/109	26-Mar-98	4.303	33.05	10.59				
C111/110	26-Mar-98	3.910	31.77	10.82				
G-1251GW	26-Mar-98	3.527	29.44	0.83	17.74	1.39	4.80	64.22

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
S-175	23-Apr-98	3.956	48.22	4.85	29.96	1.70	8.33	64.44
S-332	23-Apr-98	3.926	49.71	4.56				
CYP2-10GW	28-Apr-98	3.559	13.88	0.05	7.85	1.14	2.59	69.21
CYP2-10SW	28-Apr-98	4.313	17.64	0.00	9.79	1.31	3.35	82.27
G-3317C	28-Apr-98	2.411	1501.92	159.78	654.65	11.62	89.52	238.23
G-3318A	28-Apr-98	3.991	12.64	0.04	7.46	0.22	2.14	76.56
G-3318B	28-Apr-98	2.832	609.42	32.47	256.82	3.08	27.62	139.63
G-3318C	28-Apr-98	2.993	824.67	82.65	396.30	5.76	34.95	146.89
G-3318TW	28-Apr-98	2.986	748.36	71.46	352.77	8.51	46.19	116.03
NP-67-GW	28-Apr-98	4.287	14.56	0.03	8.15	2.40	3.19	80.11
NP-67-SW	28-Apr-98	4.312	11.43	0.05	7.05	1.38	3.21	83.42
SISAL POND	28-Apr-98	2.583	23.97	0.11	12.19	0.49	2.22	50.02
SISAL POND-D	28-Apr-98	2.597	24.02	0.12	12.18	0.48	2.22	49.96
SISAL-E	28-Apr-98		1458.44	212.10	688.68	22.99	94.98	184.71
SISAL-W	28-Apr-98	3.673	17.42	0.05	9.20	0.34	2.01	71.96
TSB	28-Apr-98	3.999	48.14	3.39	30.97	1.73	8.55	65.60
TSB-15	28-Apr-98	4.627	32.84	0.00	20.76	0.86	4.96	85.44
TSB-34	28-Apr-98	3.971	32.40	0.15	21.16	0.69	4.86	73.89
TSB-57	28-Apr-98	4.030	29.54	0.00	20.00	0.61	5.03	71.00
G-3302A	30-Apr-98		18.78	0.05	15.74	1.78	7.64	56.17
G-3302B	30-Apr-98	8.160	51.33	0.00	48.72	2.74	16.44	123.60
G-3302C	30-Apr-98	7.880	58.57	0.00	52.64	4.08	18.60	119.56
G-3302SW	30-Apr-98	2.574	16.57	0.06	11.66	0.61	2.94	42.69
G-3309A	30-Apr-98	3.727	79.95	0.00	54.58	2.11	14.56	114.20
G-3309B	30-Apr-98	8.493	93.01	1.14	61.79	2.14	15.73	141.02
G-3309C	30-Apr-98	6.126	80.33	16.07	66.17	2.80	12.71	96.12
G-3309SW	30-Apr-98		17.49	0.56	12.25	0.68	3.38	44.91
G-3309TW	30-Apr-98	5.549	76.25	7.69	54.01	5.99	21.66	74.31
CANEPATCH-GW	13-May-98		8089.05	1051.84	4605.40	126.00	619.08	407.76
CANEPATCH-SW	13-May-98	4.318	127.29	6.43	84.88	4.01	18.43	60.44
RB-1-20	13-May-98	7.309	3638.11	304.11	1076.98	21.15	113.07	236.82
RB-1-27	13-May-98	5.786	1392.11	153.70	742.50	12.24	76.68	188.22
RB-1-6	13-May-98	7.547	1763.75	119.61	940.55	17.05	100.49	218.03
RB-1-GW	13-May-98	6.969	2111.04	163.80	1114.92	19.89	118.45	240.15
RB-1-SW	13-May-98	3.821	66.96	1.24	42.66	2.92	11.63	56.72
TARPON BAY-GW	13-May-98	8.35	11572.23	1623.13	6628.99	204.35	878.69	380.08
TARPON BAY-SW	13-May-98		3674.69	519.20	2073.13	62.87	271.91	145.39
CALUS CREEK-GW	15-May-98	4.181	14784.26	2001.99				
CALUS CREEK-SW	15-May-98	3.904	69.61	3.95				
EP8AGW	15-May-98		7334.68	638.56				
EPGW	15-May-98	5.357	407.97	49.12				
EPSW	15-May-98	3.732	85.44	5.76				
C110-10	02-Jun-98		53.60	2.05	30.86	2.90	7.33	67.13
C110-100	02-Jun-98	4.586	10061.75	1142.34	5198.47	145.70	693.66	570.92
C111/109	02-Jun-98		41.62	6.88	25.19	2.94	8.02	72.34
C111/110	02-Jun-98		34.87	7.87	20.63	2.60	5.93	73.77
G-1251GW	02-Jun-98	4.586	33.90	0.05	20.57	1.42	5.56	81.94
G-1251SW	02-Jun-98	2.937	29.12	8.82	17.25	1.82	4.81	53.72
G-1603GW	02-Jun-98	3.965	424.90	61.18	242.99	5.11	24.94	91.12
G-1603SW	02-Jun-98	4.203	33.40	11.48	19.69	4.25	6.46	75.00
G-3167GW	02-Jun-98	3.836	58.15	6.63	37.44	1.60	5.59	73.73
G-3167SW	02-Jun-98	4.186	31.59	12.97	19.90	4.60	6.46	78.76
G-3317C	02-Jun-98	2.378	1509.55	159.57	652.35	12.01	95.83	238.46
G-3317D	02-Jun-98	3.621	18.31	0.00	9.18	0.41	2.06	69.05
G-3323A	02-Jun-98	4.735	31.79	0.16	20.52	1.88	5.64	86.70

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
C110-10	15-Jul-98		55.37	2.82				
C110-100	15-Jul-98		9221.90	1139.47				
C111/110	15-Jul-98		43.33	6.81				
G-1251GW	15-Jul-98		31.98	0.00				
G-1251SW	15-Jul-98		33.11	0.89				
G-1603GW	15-Jul-98		453.56	60.75				
G-1603SW	15-Jul-98		42.90	7.21				
G-3167GW	15-Jul-98		57.00	6.18				
G-3167SW	15-Jul-98		47.70	10.74				
G-3319B	15-Jul-98		19.28	8.51				
G-3319TW	15-Jul-98		12.55	7.62				
G-3323A	15-Jul-98		57.40	0.31				
G-3323B	15-Jul-98		1482.46	2.42				
G-3323SW	15-Jul-98		43.31	6.21				
G-3336	15-Jul-98		32.95	0.00				
G-3337	15-Jul-98		73.16	3.21	33.40	1.55	6.07	75.74
L-31W-14	15-Jul-98		49.40	1.77				
L-31W-40	15-Jul-98		36.46	2.14				
S-175	15-Jul-98		47.27	2.87				
S-175-D	15-Jul-98		47.28	2.89				
S-332	15-Jul-98		41.14	1.72				
CYP2-10GW	16-Jul-98		13.09	0.90				
CYP2-10SW	16-Jul-98		9.70	1.54				
G-3317C	16-Jul-98		1483.38	153.39				
G-3317D	16-Jul-98		23.36	0.41				
G-3318A	16-Jul-98		13.71	0.00				
G-3318B	16-Jul-98		608.59	30.54				
G-3318C	16-Jul-98		819.54	78.67				
G-3318TW	16-Jul-98		746.90	67.33				
NP-67-GW	16-Jul-98		13.92	0.11				
NP-67-SW	16-Jul-98		14.36	0.13				
SISAL POND	16-Jul-98		23.87	0.19				
SISAL-E	16-Jul-98		1451.08	202.06				
SISAL-W	16-Jul-98		39.55	1.83				
TSB	16-Jul-98		43.82	1.63				
TSB-15	16-Jul-98		42.14	0.07				
TSB-34	16-Jul-98		35.47	0.00				
TSB-57	16-Jul-98		33.67	0.00				
TSB-D	16-Jul-98		43.81	1.61				
G-3302A	17-Jul-98		19.80	1.03				
G-3302B	17-Jul-98		51.07	0.00				
G-3302C	17-Jul-98		58.11	0.14				
G-3302SW	17-Jul-98		48.71	9.33				
G-3309A	17-Jul-98		77.28	0.21				
G-3309B	17-Jul-98		92.60	0.83				
G-3309C	17-Jul-98		73.24	14.85				
G-3309SW	17-Jul-98		25.94	4.69				
G-3309TW	17-Jul-98		76.09	7.10				
EP8AGW	22-Jul-98	3.36	6564.15	517.65	3493.98	30.82	401.16	615.32
EP8ASW	22-Jul-98	2.736	270.36	0.66	122.86	1.65	8.34	85.63
EPGW	22-Jul-98	5.149	334.49	43.34	221.67	9.10	41.08	81.33
EPSW	22-Jul-98	4.887	236.54	10.86	139.20	8.54	22.80	64.86
E-130-10	23-Jul-98		14.75	0.00				
E-130-52	23-Jul-98	3.865	13.35	0.00				
E-130-SW	23-Jul-98		12.72	1.47				

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
G-3302B	15-Aug-98	8.127	52.35	0.00	47.93	2.49	16.07	121.74
G-3302C	15-Aug-98	8.222	59.32	0.00	51.84	3.69	18.04	117.57
G-3302SW	15-Aug-98	3.505	50.20	3.57	31.88	2.04	8.88	55.00
G-3309A	15-Aug-98	6.661	79.91	0.13	52.90	2.04	14.83	107.55
G-3309B	15-Aug-98	8.339	92.99	0.76	61.25	2.28	15.83	138.81
G-3309C	15-Aug-98	6.165	80.79	16.35	64.75	2.65	12.64	96.01
G-3309SW	15-Aug-98	4.015	54.96	6.87	35.16	2.19	10.08	66.97
G-3309TW	15-Aug-98	5.662	76.38	7.20	53.51	5.63	21.28	73.19
CANEPATCH-GW	19-Aug-98		8372.13	1083.18	4522.30	115.28	605.23	442.48
CANEPATCH-SW	19-Aug-98		308.59	35.36	81.24	3.46	14.75	45.67
RB-1-20	19-Aug-98		2043.53	155.88	1064.96	17.07	115.01	231.09
RB-1-27	19-Aug-98		1364.37	152.44	731.73	11.55	76.59	185.70
RB-1-27-D	19-Aug-98		1353.45	148.91	752.65	12.15	78.76	190.18
RB-1-6	19-Aug-98		1796.10	106.52	945.30	16.57	103.39	217.82
RB-1-GW	19-Aug-98	7.651	2124.63	5.19	1126.55	18.87	122.35	238.21
RB-1-SW	19-Aug-98	2.626	39.25	2.37	20.46	1.64	7.50	43.46
TARPON BAY-GW	19-Aug-98	9.044	11704.81	1552.59	6463.18	177.10	895.23	404.80
TARPON BAY-SW	19-Aug-98	3.445	491.37	54.68	357.99	12.54	46.26	56.90
E-130-10	03-Sep-98		15.09	0.00	7.95	3.01	3.96	85.90
E-130-52	03-Sep-98		15.30	0.00	7.91	2.93	3.88	83.44
E-130-52-D	03-Sep-98		15.26	0.00	7.92	2.95	3.89	83.45
E-130-SW	03-Sep-98		13.59	0.07	7.32	1.92	3.23	52.35
E-146-15	03-Sep-98		5407.25	627.07				
E-146-25	03-Sep-98		6846.77	857.38				
E-146-27.5	03-Sep-98		9087.45	1210.77				
E-146-SW	03-Sep-98				9.22	0.59	2.68	49.77
E-146-15	01-Oct-98				2708.72	31.31	318.22	502.25
E-146-25	01-Oct-98				3555.96	51.04	440.48	553.04
E-146-27.5	01-Oct-98		8603.30	1100.42	4754.05	103.99	621.84	555.08
E-146-SW	01-Oct-98							
EP8AGW	01-Oct-98							
EP8ASW	01-Oct-98							
EPGW	01-Oct-98							
EPSW	01-Oct-98							
C110-10	04-Oct-98		24.70	1.34				
C110-100	04-Oct-98		10170.94	1086.84				
C111/110	04-Oct-98		17.65	4.94				
G-1251GW	04-Oct-98		31.06	0.93				
G-1251SW	04-Oct-98		31.22	2.16				
G-1603GW	04-Oct-98		636.79	83.80				
G-1603SW	04-Oct-98		32.06	11.23				
G-3167GW	04-Oct-98		63.80	8.00				
G-3167SW	04-Oct-98		30.22	20.99				
G-3319B	04-Oct-98		17.02	9.38				
G-3319TW	04-Oct-98		12.60	7.87				
G-3323A	04-Oct-98		35.99	0.04				
G-3323B	04-Oct-98		1521.56	3.39				
G-3323SW	04-Oct-98		32.45	10.06				
G-3336	04-Oct-98		31.30	0.07				
G-3337	04-Oct-98		86.14	4.87				
L-31W-14	04-Oct-98		24.53	0.46				
L-31W-40	04-Oct-98		37.40	1.62				
S-175	04-Oct-98		34.07	2.22				
S-332	04-Oct-98		36.44	1.83				
G-3302A	09-Oct-98							

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
G-1603GW	21-Nov-98		746.72	97.79				
G-1603SW	21-Nov-98							
G-3167GW	21-Nov-98							
G-3323A	21-Nov-98		55.46	0.04				
G-3323B	21-Nov-98		1588.97	4.71				
G-3323SW	21-Nov-98							
G-3336	21-Nov-98		131.50	10.93				
G-3337	21-Nov-98		33.43	0.48				
L-31W-14	21-Nov-98		33.47	3.99				
L-31W-40	21-Nov-98							
S-175	21-Nov-98		60.30	7.35				
S-332	21-Nov-98		38.28	8.36				
C110-10	10-Dec-98							
C110-100	10-Dec-98							
C111/110	10-Dec-98							
G-1251GW	10-Dec-98							
G-1251SW	10-Dec-98							
G-1603GW	10-Dec-98							
G-1603SW	10-Dec-98							
G-3167GW	10-Dec-98							
G-3167SW	10-Dec-98							
G-3319B	10-Dec-98							
G-3319TW	10-Dec-98							
G-3323A	10-Dec-98							
G-3323B	10-Dec-98							
G-3323SW	10-Dec-98							
G-3336	10-Dec-98							
G-3337	10-Dec-98							
L-31W-14	10-Dec-98							
L-31W-40	10-Dec-98							
G-3317C	11-Dec-98							
G-3317D	11-Dec-98							
G-3318A	11-Dec-98							
G-3318B	11-Dec-98							
G-3318C	11-Dec-98							
G-3318TW	11-Dec-98							
TSB-15	11-Dec-98							
TSB-34	11-Dec-98							
TSB-57	11-Dec-98							
G-3302A	12-Dec-98							
G-3302B	12-Dec-98							
G-3302C	12-Dec-98							
G-3309A	12-Dec-98							
G-3309B	12-Dec-98							
G-3309C	12-Dec-98							
E-130-10	13-Dec-98							
E-130-52	13-Dec-98							
E-130-SW	13-Dec-98							
E-146-15	13-Dec-98							
E-146-25	13-Dec-98							
E-146-27.5	13-Dec-98							
E-146-SW	13-Dec-98							
EP8AGW	13-Dec-98							
EP8ASW	13-Dec-98							
EPGW	13-Dec-98							

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
RB-1-27	18-Jan-99		1763.98	150.90				
RB-1-6	18-Jan-99		1288.44	59.36				
RB-1-GW	18-Jan-99		2063.42	154.97				
RB-1-SW	18-Jan-99		46.28	0.95				
TARPON BAY-GW	18-Jan-99		12453.22	1657.81				
TARPON BAY-SW	18-Jan-99		432.69	52.95				
G-3302A	08-Feb-99		25.72	0.50				
G-3302B	08-Feb-99		51.69	0.00				
G-3302C	08-Feb-99		58.63	0.00				
G-3302SW	08-Feb-99		16.42	0.04				
G-3302SW-D	08-Feb-99		16.37	0.06				
G-3309A	08-Feb-99		62.46	0.05				
G-3309B	08-Feb-99		96.63	1.00				
G-3309C	08-Feb-99		82.49	16.45				
G-3309SW	08-Feb-99		30.31	3.02				
G-3309TW	08-Feb-99		76.76	7.22				
G-3319B	09-Feb-99		16.43	9.59				
G-3319TW	09-Feb-99		12.41	7.90				
L-31W-14	09-Feb-99		35.60	0.68				
L-31W-40	09-Feb-99		37.27	1.41				
S-175	09-Feb-99		39.35	1.69				
S-332	09-Feb-99		34.80	0.98				
CYP2-10GW	10-Feb-99		15.26	0.00				
CYP2-10SW	10-Feb-99		20.49	0.16				
G-3317C	10-Feb-99		1517.89	159.14				
G-3317D	10-Feb-99		17.19	0.00				
G-3318A	10-Feb-99		13.23	0.04				
G-3318B	10-Feb-99		617.40	31.20				
G-3318C	10-Feb-99		836.69	80.59				
G-3318TW	10-Feb-99		755.63	69.39				
NP-67-SW	10-Feb-99		11.28	0.00				
SISAL POND	10-Feb-99		22.70	0.04				
SISAL-E	10-Feb-99		1462.41	202.89				
SISAL-W	10-Feb-99		17.11	0.08				
TSB	10-Feb-99		39.86	0.76				
TSB-15	10-Feb-99		34.32	0.00				
TSB-34	10-Feb-99		35.57	0.00				
TSB-57	10-Feb-99		31.29	0.00				
E-130-10	11-Feb-99		15.94	0.24				
E-130-52	11-Feb-99		15.05	0.10				
E-130-SW	11-Feb-99		22.16	0.65				
E-146-15	11-Feb-99		5228.37	614.34				
E-146-25	11-Feb-99		6695.53	822.23				
E-146-27.5	11-Feb-99		8950.87	1145.67				
E-146-SW	11-Feb-99		117.31	0.81				
EP8AGW	11-Feb-99		5938.08	459.18				
EP8ASW	11-Feb-99		86.00	0.19				
EPGW	11-Feb-99		352.81	39.89				
EPSW	11-Feb-99		106.48	7.33				
C110-10	12-Feb-99		29.30	2.71				
C110-100	12-Feb-99		10177.60	1096.29				
C111/109	12-Feb-99		33.98	6.42				
C111/110	12-Feb-99		36.63	5.13				
G-1251GW	12-Feb-99		31.53	0.64				
G-1251SW	12-Feb-99		31.30	0.50				

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
L-31W-14	18-Mar-99		35.06	0.63				
L-31W-40	18-Mar-99		35.70	1.41				
S-175	18-Mar-99		38.10	0.86				
S-332	18-Mar-99		41.54	0.77				
CYP2-10GW	19-Mar-99		16.13	0.08				
CYP2-10SW	19-Mar-99		16.43	0.09				
G-3317C	19-Mar-99		1512.43	156.81				
G-3317D	19-Mar-99		16.81	0.02				
G-3318A	19-Mar-99		13.10	0.00				
G-3318B	19-Mar-99		611.60	30.86				
G-3318C	19-Mar-99		828.97	78.67				
G-3318TW	19-Mar-99		754.02	69.04				
NP-67-SW	19-Mar-99		11.84	0.12				
SISAL POND	19-Mar-99		24.22	0.04				
SISAL-E	19-Mar-99		1469.90	201.90				
SISAL-W	19-Mar-99		17.37	0.10				
TSB	19-Mar-99		43.07	1.85				
TSB-15	19-Mar-99		34.20	0.00				
TSB-34	19-Mar-99		35.40	0.00				
TSB-57	19-Mar-99		31.83	0.08				
G-3302A	23-Mar-99		17.41	0.36				
G-3302B	23-Mar-99		51.85	0.00				
G-3302C	23-Mar-99		58.60	0.00				
G-3302SW	23-Mar-99		14.73	0.10				
G-3309A	23-Mar-99		62.24	0.11				
G-3309B	23-Mar-99		96.60	0.83				
G-3309C	23-Mar-99		82.88	16.37				
G-3309SW	23-Mar-99		26.44	2.79				
G-3309TW	23-Mar-99		76.82	7.16				
CANEPATCH-GW	16-Apr-99		8401.30	1066.72				
CANEPATCH-SW	16-Apr-99		4352.87	4078.87				
RB-1-20	16-Apr-99		1758.99	117.77				
RB-1-27	16-Apr-99		1605.23	143.85				
RB-1-27-D	16-Apr-99		1616.29	145.91				
RB-1-GW	16-Apr-99		2082.95	154.88				
RB-1-SW	16-Apr-99		174.67	12.32				
TARPON BAY-GW	16-Apr-99		11136.38	1469.79				
TARPON BAY-SW	16-Apr-99		11225.46	1488.39				
G-3302A	20-Apr-99		17.24	0.61				
G-3302B	20-Apr-99		51.95	0.00				
G3302C	20-Apr-99		58.83	0.00				
G-3302SW	20-Apr-99		19.52	0.16				
G-3309A	20-Apr-99		61.95	0.00				
G-3309B	20-Apr-99		96.11	0.63				
G-3309C	20-Apr-99		82.76	16.48				
G-3309SW	20-Apr-99		54.13	2.19				
G-3309TW	20-Apr-99		76.70	7.11				
G-3317C	21-Apr-99		1542.99	157.61				
G-3317D	21-Apr-99		16.85	0.00				
G-3318A	21-Apr-99		15.63	0.17				
G-3318B	21-Apr-99		612.89	30.82				
G-3318C	21-Apr-99		830.31	78.79				
G-3318TW	21-Apr-99		754.17	69.18				
SISAL POND	21-Apr-99		26.95	0.12				
SISAL-E	21-Apr-99		1443.95	200.81				

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
S-332	13-May-99							
CANEPATCH-GW	14-May-99		8522.62	1105.69				
CANEPATCH-SW	14-May-99		2104.31	259.61				
RB-1-20	14-May-99		1937.85	133.75				
RB-1-27	14-May-99		1569.50	142.77				
RB-1-6	14-May-99		1729.41	109.84				
RB-1-GW	14-May-99		2063.66	153.95				
RB-1-SW	14-May-99		106.32	3.53				
RB-1-SW-D	14-May-99		316.76	31.94				
TARPON BAY-GW	14-May-99							
TARPON BAY-SW	14-May-99		12802.11	1704.98				
G-3302A	18-May-99		19.00	3.19				
G-3302A-D	18-May-99		18.65	3.22				
G-3302B	18-May-99		51.99	0.00				
G-3302C	18-May-99		58.61	0.00				
G-3302SW	18-May-99		55.36	22.94				
G-3309A	18-May-99		61.51	0.00				
G-3309B	18-May-99		96.18	0.62				
G-3309C	18-May-99		96.14	21.60				
G-3309SW	18-May-99		52.25	3.42				
G-3309TW	18-May-99		76.96	7.10				
CYP2-10GW	20-May-99		17.64	1.28				
CYP2-10SW	20-May-99		16.44	6.16				
G-3317C	20-May-99		1564.91	155.72				
G-3317C-D	20-May-99		1570.94	155.85				
G-3317D	20-May-99		17.81	0.00				
G-3318A	20-May-99		13.52	0.00				
G-3318B	20-May-99		607.27	30.93				
G-3318C	20-May-99		918.72	87.08				
G-3318TW	20-May-99		756.22	69.22				
NP-67-GW	20-May-99		14.16	2.67				
NP-67-SW	20-May-99		16.21	4.09				
SISAL POND	20-May-99		27.28	0.12				
SISAL-E	20-May-99		1461.24	195.79				
SISAL-W	20-May-99		18.06	0.00				
TSB	20-May-99		40.47	24.24				
TSB-15	20-May-99		35.07	0.65				
TSB-34	20-May-99		36.80	0.00				
TSB-57	20-May-99		32.51	0.08				
E-130-10	21-May-99		14.50	0.00				
E-130-52	21-May-99		14.19	0.05				
E-146-15	21-May-99		4905.71	567.04				
E-146-25	21-May-99		6886.77	837.18				
E-146-27.5	21-May-99		9293.61	1204.76				
E-146-SW	21-May-99							
EP8AGW	21-May-99		7375.93	608.86				
EP8ASW	21-May-99		467.57	119.29				
EPGW	21-May-99		344.01	40.08				
CANEPATCH-GW	11-Jun-99		8623.04	1080.60				
CANEPATCH-SW	11-Jun-99		394.43	33.99				
CANEPATCH-SW-D	11-Jun-99		375.50	33.64				
RB-1-20	11-Jun-99		1865.72	125.09				
RB-1-27	11-Jun-99		1626.78	145.97				
RB-1-6	11-Jun-99		1629.73	93.49				
RB-1-GW	11-Jun-99		2089.76	153.36				

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
EP8ASW	24-Jun-99		22.53	0.45				
EPGW	24-Jun-99		317.66	35.93				
EPSW	24-Jun-99		70.29	25.07				
CANEPATCH-GW	16-Jul-99		7714.42	1092.85				
CANEPATCH-SW	16-Jul-99		41.98	1.67				
RB-1-20	16-Jul-99		1947.66	139.03				
RB-1-27	16-Jul-99		1550.65	144.65				
RB-1-27-D	16-Jul-99		1589.66	146.31				
RB-1-6	16-Jul-99		1763.04	108.23				
RB-1-GW	16-Jul-99		2075.04	152.87				
RB-1-SW	16-Jul-99		28.38	0.90				
TARPON BAY-GW	16-Jul-99		12220.93	1691.20				
TARPON BAY-SW	16-Jul-99		185.29	17.39				
40-MILE BEND	20-Jul-99	4.1125	72.28	3.44				
G-3302A	20-Jul-99		46.04	1.13				
G-3302B	20-Jul-99		51.58	0.00				
G-3302C	20-Jul-99		57.99	0.00				
G-3302SW	20-Jul-99		55.74	23.17				
G-3309A	20-Jul-99		56.89	0.14				
G-3309B	20-Jul-99		94.72	0.67				
G-3309C	20-Jul-99		71.78	15.12				
G-3309SW	20-Jul-99		56.56	16.32				
G-3309SW-D	20-Jul-99		54.93	16.36				
G-3309TW	20-Jul-99		75.42	6.90				
C110-10	21-Jul-99		96.98	24.61				
C110-100	21-Jul-99		6185.17	13.48				
C111/109	21-Jul-99		49.46	11.02				
C111/110	21-Jul-99		35.86	10.69				
G-1251GW	21-Jul-99		33.29	0.22				
G-1251SW	21-Jul-99		41.15	1.30				
G-1603GW	21-Jul-99		870.98	72.50				
G-1603SW	21-Jul-99		37.07	13.82				
G-3167GW	21-Jul-99		61.24	7.00				
G-3167SW	21-Jul-99		35.80	23.18				
G-3319B	21-Jul-99		16.10	9.65				
G-3319TW	21-Jul-99		12.27	8.98				
G-3323A	21-Jul-99		37.41	0.11				
G-3323B	21-Jul-99		2651.78	286.32				
G-3323SW	21-Jul-99		37.51	11.14				
G-3336	21-Jul-99		33.17	0.07				
G-3337	21-Jul-99		83.48	4.65				
L-31W-14	21-Jul-99		38.67	2.98				
L-31W-40	21-Jul-99		40.05	1.78				
S-175	21-Jul-99		38.91	2.45				
S-332	21-Jul-99		37.52	2.09				
CYP2-10GW	22-Jul-99		12.60	0.19				
CYP2-10SW	22-Jul-99		13.47	0.15				
G-3317C	22-Jul-99		1545.65	160.21				
G-3317D	22-Jul-99		19.44	0.14				
G-3318A	22-Jul-99		14.38	0.00				
G-3318B	22-Jul-99		370.85	41.93				
G-3318C	22-Jul-99		828.84	80.07				
G-3318TW	22-Jul-99		757.15	69.46				
SISAL POND	22-Jul-99		16.69	0.11				
SISAL-E	22-Jul-99		1435.71	198.79				

Appendix C. Summary of major cations, anions and alkalinity.

Name Sample	Date Collection	(mM) Alkalinity	(mg/L) Cl	(mg/L) SO4	(mg/L) Na	(mg/L) K	(mg/L) Mg	(mg/L) Ca
G-3323A	20-Aug-99							
G-3323B	20-Aug-99							
G-3323SW	20-Aug-99							
G-3336	20-Aug-99							
G-3337	20-Aug-99							
S-175	20-Aug-99							
G-3302A	31-Aug-99							
G-3302B	31-Aug-99							
G-3302C	31-Aug-99							
G-3302SW	31-Aug-99							
G-3309A	31-Aug-99							
G-3309B	31-Aug-99							
G-3309C	31-Aug-99							
G-3309SW	31-Aug-99							
G-3309TW	31-Aug-99							
E-130-10	09-Sep-99							
E-130-52	09-Sep-99							
E-130-SW	09-Sep-99							
E-146-15	09-Sep-99							
E-146-25	09-Sep-99							
E-146-27.5	09-Sep-99							
E-146-SW	09-Sep-99							
EP8AGW	09-Sep-99							
EP8ASW	09-Sep-99							
EPGW	09-Sep-99							

Appendix D
Raw data of $\delta^{18}O$ and δD

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
RB-1-27	01-Mar-97	0.01	4.03
RB-1-6	01-Mar-97	1.18	10.29
RB-1-GW	01-Mar-97	0.75	9.81
RB-1-SW	01-Mar-97	2.65	20.90
CALUS CREEK-GW	10-Mar-97	0.68	6.83
CALUS CREEK-SW	10-Mar-97	1.21	18.92
EP8AGW	10-Mar-97	-1.18	-2.43
EPGW	10-Mar-97	0.43	1.45
EPSW	10-Mar-97	2.685	27.11
G-3317C	24-Mar-97	-0.91	-7.69
G-3317D	24-Mar-97	-0.83	-2.98
G-3318A	24-Mar-97	-1.76	-9.03
G-3318B	24-Mar-97	-1.96	-9.23
G-3318C	24-Mar-97	-2.39	-7.81
G-3318TW	24-Mar-97	-2.01	-16.63
SISAL POND	24-Mar-97	0.49	-3.58
SISAL-E	24-Mar-97	-2.26	-4.33
SISAL-W	24-Mar-97	-1.11	-3.23
G-3302A	25-Mar-97	2.42	19.25
G-3302B	25-Mar-97	0.14	-1.99
G-3302C	25-Mar-97	-0.25	1.97
G-3302SW	25-Mar-97	2.47	18.12
C111/109	27-Mar-97	0.35	9.34
CYP2-10-GW	27-Mar-97	-0.79	-2.17
CYP2-10-SW	27-Mar-97	-0.94	-3.32
G-1251GW	27-Mar-97	-0.53	11.13
G-1251SW	27-Mar-97	-0.33	1.94
G-1603GW	27-Mar-97	-0.03	3.10
G-1603SW	27-Mar-97	0.33	-6.16
G-3167GW	27-Mar-97	-0.75	1.58
G-3167SW	27-Mar-97	-0.02	1.72
G-3336	27-Mar-97	-0.46	0.26
G-3337	27-Mar-97	-1.54	-6.12
NP-67-GW	27-Mar-97	-1.29	-5.68
NP-67-GW-D	27-Mar-97		
NP-67-SW	27-Mar-97	-0.13	0.16
TSB	27-Mar-97	-0.35	12.96
CANEPATCH-GW	31-Mar-97	0.95	18.03
CANEPATCH-SW	31-Mar-97	0.49	23.97
RB-1-20	31-Mar-97	1.24	9.74
RB-1-27	31-Mar-97	-0.08	4.92
RB-1-6	31-Mar-97	1.51	11.50
RB-1-GW	31-Mar-97	1.14	7.48
RB-1-SW	31-Mar-97	3.33	23.32
TARPON BAY-GW	31-Mar-97	1.00	7.94
TARPON BAY-SW	31-Mar-97	1.93	18.46
C111/109	28-Apr-97	1.07	8.65
G-1251GW	28-Apr-97	-0.07	4.63

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
G-3317C	27-May-97	-1.89	-10.21
G-3317D	27-May-97	0.61	0.23
NP-67-GW	27-May-97	-1.19	-5.40
NP-67-SW	27-May-97	0.36	-1.75
SISAL POND	27-May-97	1.37	7.23
SISAL-E	27-May-97	-1.71	-9.84
SISAL-W	27-May-97	0.89	-0.42
C111/109	28-May-97	1.01	2.43
G-1251GW	28-May-97	0.12	-3.53
G-1251SW	28-May-97	0.28	-0.89
G-1603GW	28-May-97	-0.04	0.14
G-1603SW	28-May-97	0.41	4.71
G-3167GW	28-May-97	-0.45	-6.83
G-3167SW	28-May-97	0.06	12.08
G-3318A	28-May-97	-1.79	-7.93
G-3318B	28-May-97	-1.90	-8.19
G-3318C	28-May-97	-2.28	-12.21
G-3318TW	28-May-97	-2.39	-8.53
G-3336	28-May-97	-0.14	1.75
G-3337	28-May-97	-1.84	-4.91
S-332	28-May-97	-0.75	
TSB	28-May-97	0.37	2.25
G-3323A	29-May-97	0.39	-2.86
G-3323B	29-May-97	-1.87	-13.54
G-3323SW	29-May-97	0.54	0.53
CANEPATCH-GW	03-Jun-97	1.47	2.18
CANEPATCH-SW	03-Jun-97	2.05	11.36
RB-1-20	03-Jun-97	1.29	5.15
RB-1-27	03-Jun-97	0.54	0.07
RB-1-6	03-Jun-97	1.52	3.07
RB-1-GW	03-Jun-97	1.37	3.97
RB-1-SW	03-Jun-97	1.68	7.99
TARPON BAY-GW	03-Jun-97	0.81	6.75
TARPON BAY-SW	03-Jun-97	2.02	18.57
CYP2-10-GW	23-Jun-97	-4.51	-33.45
CYP2-10-SW	23-Jun-97	-4.28	-33.07
G-3317C	23-Jun-97	-6.30	-41.33
G-3317D	23-Jun-97	-4.04	-23.77
G-3318A	23-Jun-97	-3.77	-19.87
G-3318B	23-Jun-97	-1.17	-7.75
G-3318C	23-Jun-97	-1.91	-7.35
G-3318TW	23-Jun-97	-1.99	-11.02
NP-67-GW	23-Jun-97	-1.47	-4.74
NP-67-SW	23-Jun-97	-3.49	-31.09
SISAL POND	23-Jun-97	-5.57	-39.78
SISAL-E	23-Jun-97	-1.93	-5.53
SISAL-W	23-Jun-97	-2.48	-12.20
C111/109	25-Jun-97	-1.58	-5.10

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
G-3336	24-Jul-97		
G-3337	24-Jul-97	-1.98	-6.56
S-175	24-Jul-97	-0.91	-4.12
S-332	24-Jul-97	-0.71	-5.29
TSB	24-Jul-97	-0.12	-3.14
G-3302A	28-Jul-97	0.87	8.91
G-3302B	28-Jul-97	0.30	-0.12
G-3302C	28-Jul-97	0.01	5.26
G-3302SW	28-Jul-97	0.46	0.30
G-3309A	28-Jul-97	0.50	3.30
G-3309B	28-Jul-97		-1.59
G-3309C	28-Jul-97	-1.37	-7.25
G-3309SW	28-Jul-97	0.11	0.68
CYP2-10-GW	29-Jul-97	-0.63	-4.47
CYP2-10-SW	29-Jul-97	-0.14	2.85
G-3317C	29-Jul-97	-4.00	-26.72
G-3317D	29-Jul-97	-2.04	-13.01
G-3318A	29-Jul-97	-2.96	-16.50
G-3318B	29-Jul-97	-1.93	-4.75
G-3318C	29-Jul-97	-2.40	-8.35
G-3318TW	29-Jul-97	-2.51	-9.45
NP-67-GW	29-Jul-97	-1.56	-7.04
NP-67-SW	29-Jul-97	-0.26	-2.44
SISAL POND	29-Jul-97	-1.25	-6.60
SISAL-E	29-Jul-97	-1.72	-6.70
SISAL-W	29-Jul-97	-2.01	-13.65
EP8AGW	07-Aug-97	-0.78	-3.92
EP8ASW	07-Aug-97	2.00	11.22
EPGW	07-Aug-97	0.28	3.71
EPSW	07-Aug-97	0.06	-0.91
CANEPATCH-GW	08-Aug-97	1.67	3.23
CANEPATCH-SW	08-Aug-97	0.98	1.34
RB-1-20	08-Aug-97	1.25	6.47
RB-1-27	08-Aug-97	0.25	1.97
RB-1-6	08-Aug-97	1.37	5.76
RB-1-GW	08-Aug-97	2.39	1.84
RB-1-SW	08-Aug-97	1.16	4.11
TARPON BAY-GW	08-Aug-97	0.67	9.11
TARPON BAY-SW	08-Aug-97	0.78	-5.43
C111/109	21-Aug-97		
G-1251GW	21-Aug-97	-0.69	-1.07
G-1251SW	21-Aug-97	-0.32	-0.97
G-1603GW	21-Aug-97	-0.14	1.67
G-1603SW	21-Aug-97	-1.32	-3.54
G-3167GW	21-Aug-97	-0.56	-1.53
G-3167SW	21-Aug-97	-1.38	-4.90
G-3319B	21-Aug-97	0.11	-1.02
G-3319TW	21-Aug-97	-3.60	-13.33

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
G-3318C	25-Sep-97	-2.17	-10.78
G-3318TW	25-Sep-97	-2.29	-10.46
NP-67-GW	25-Sep-97	-1.81	-11.96
NP-67-SW	25-Sep-97	-1.24	-10.31
SISAL POND	25-Sep-97	-0.10	-0.85
SISAL-E	25-Sep-97	-1.74	-7.94
SISAL-W	25-Sep-97	-1.71	-13.62
CANEPATCH-GW	29-Sep-97	1.63	7.49
CANEPATCH-SW	29-Sep-97	1.16	0.63
RB-1-20	29-Sep-97	1.28	4.98
RB-1-27	29-Sep-97	0.43	-3.40
RB-1-6	29-Sep-97	1.23	8.29
RB-1-GW	29-Sep-97	1.74	9.04
RB-1-SW	29-Sep-97	0.12	0.34
TARPON BAY-GW	29-Sep-97	0.67	4.82
TARPON BAY-SW	29-Sep-97	1.16	3.20
G-3302A	30-Sep-97	0.87	2.33
G-3302B	30-Sep-97	0.43	1.71
G-3302C	30-Sep-97	-0.06	0.32
G-3302SW	30-Sep-97	-3.40	-22.50
C110-10	01-Oct-97		
C110-100	01-Oct-97	0.80	-2.12
C111/109	01-Oct-97	-0.82	-6.47
C111/109D	01-Oct-97	-0.74	2.01
C111/110	01-Oct-97	-1.06	-4.06
G-3319B	01-Oct-97	-1.97	-15.27
G-3319TW	01-Oct-97	-3.17	-20.65
TSB	01-Oct-97	-0.54	-10.35
G-1251GW	02-Oct-97	0.38	-9.51
G-1251SW	02-Oct-97	-1.18	-3.70
G-1603GW	02-Oct-97	-0.02	-5.79
G-1603SW	02-Oct-97	-1.04	-13.83
G-3167GW	02-Oct-97	-0.42	0.50
G-3167SW	02-Oct-97	-0.83	-3.79
G-3323A	02-Oct-97	-0.35	-1.65
G-3323B	02-Oct-97	-2.22	-10.72
G-3323SW	02-Oct-97	-1.13	-3.88
G-3336	02-Oct-97	-0.38	-1.51
G-3337	02-Oct-97	-1.63	-9.14
S-175	02-Oct-97	-0.71	-4.52
S-332	02-Oct-97		
G-3309A	30-Oct-97	0.52	6.98
G-3309B	30-Oct-97	0.13	4.22
G-3309C	30-Oct-97	-0.56	-0.43
G-3309SW	30-Oct-97	0.45	5.59
G-3309TW	30-Oct-97	-1.40	-2.43
CYP2-10-GW	04-Nov-97	-0.54	-4.73
CYP2-10-SW	04-Nov-97	0.26	2.27

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
G-3309TW	26-Nov-97	-1.20	-15.00
S-175	26-Nov-97	0.29	4.05
S-175D	26-Nov-97	0.29	4.17
S-332	26-Nov-97	0.32	-1.66
CYP2-10-GW	11-Dec-97	-1.52	-8.37
CYP2-10-SW	11-Dec-97	-1.83	-10.32
G-3317C	11-Dec-97	-2.25	-8.97
G-3317D	11-Dec-97	-1.80	-5.25
G-3318A	11-Dec-97	-1.13	-12.09
G-3318B	11-Dec-97	-2.04	-7.34
G-3318C	11-Dec-97	-2.40	-10.29
G-3318TW	11-Dec-97	-2.20	-14.84
NP-67-GW	11-Dec-97	-1.82	-3.04
NP-67-SW	11-Dec-97	-2.04	-9.08
SISAL POND	11-Dec-97	-2.41	-10.04
SISAL-E	11-Dec-97	-1.93	-8.45
SISAL-W	11-Dec-97	-1.68	-7.39
TSB	11-Dec-97	-0.86	0.22
TSB-15	11-Dec-97	-1.14	3.21
TSB-34	11-Dec-97	-0.15	-4.76
TSB-57	11-Dec-97	-0.17	-1.13
CANEPATCH-GW	15-Dec-97	1.24	4.37
CANEPATCH-SW	15-Dec-97	0.22	1.75
RB-1-20	15-Dec-97	1.16	3.32
RB-1-27	15-Dec-97	0.43	3.07
RB-1-6	15-Dec-97	1.26	3.32
RB-1-GW	15-Dec-97	1.23	5.91
RB-1-SW	15-Dec-97	-0.07	8.27
TARPON BAY-GW	15-Dec-97	0.45	3.82
TARPON BAY-SW	15-Dec-97	0.29	-0.30
E-130-10	16-Dec-97	-1.77	-8.19
E-130-52	16-Dec-97	-1.41	-5.44
E-130-SW	16-Dec-97	-1.54	-6.11
E-146-15	16-Dec-97	1.01	5.77
E-146-25	16-Dec-97	-0.11	3.48
E-146-27.5	16-Dec-97	1.79	4.51
E-146-SW	16-Dec-97	0.08	8.59
G-3302A	17-Dec-97	0.10	2.26
G-3302B	17-Dec-97	0.33	-2.13
G-3302C	17-Dec-97	-0.15	-1.67
G-3302SW	17-Dec-97	0.20	-7.36
G-3309A	17-Dec-97	0.41	0.97
G-3309B	17-Dec-97	-0.08	-2.90
G-3309C	17-Dec-97	-1.18	-7.83
G-3309SW	17-Dec-97	-0.64	-6.74
G-3309TW	17-Dec-97	-1.46	-8.08
G-3319B	17-Dec-97	-2.02	-1.50
G-3319TW	17-Dec-97	-3.46	-12.46

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
G-3318A	28-Jan-98	-2.17	-8.84
G-3318B	28-Jan-98	-1.87	-7.30
G-3318C	28-Jan-98	-2.40	-12.60
G-3318TW	28-Jan-98	-2.29	-13.90
NP-67-GW	28-Jan-98	-1.38	-4.34
NP-67-SW	28-Jan-98	-1.15	-7.27
SISAL POND	28-Jan-98	-0.13	0.96
SISAL-E	28-Jan-98	-2.54	-3.81
SISAL-W	28-Jan-98	-1.68	-8.64
TSB	28-Jan-98	-1.59	-4.95
TSB-15	28-Jan-98	-0.47	-4.95
TSB-15-D	28-Jan-98	-0.32	-6.08
TSB-34	28-Jan-98	-0.32	-12.19
TSB-57	28-Jan-98	0.03	-11.71
CANEPATCH-GW	30-Jan-98	1.37	1.32
CANEPATCH-SW	30-Jan-98	1.35	11.21
E-130-10	04-Feb-98	-1.73	-7.56
E-130-52	04-Feb-98	-1.95	-16.04
E-130-SW	04-Feb-98	-1.27	-7.28
E-146-15	04-Feb-98	1.06	-0.91
E-146-25	04-Feb-98	1.33	-1.76
E-146-27.5	04-Feb-98	2.01	1.78
E-146-SW	04-Feb-98	-1.01	-6.74
CALUS CREEK-GW	10-Feb-98	1.18	7.12
CALUS CREEK-SW	10-Feb-98	-0.45	-2.68
EP8AGW	10-Feb-98	-0.77	-3.63
EP8ASW	10-Feb-98	-0.01	2.60
EPGW	10-Feb-98	0.36	-0.67
EPSW	10-Feb-98	-0.60	-2.80
G-3302A	24-Feb-98	0.08	4.96
G-3302B	24-Feb-98	-0.03	4.22
G-3302BD	24-Feb-98	-0.10	4.32
G-3302C	24-Feb-98	-0.42	2.64
G-3302SW	24-Feb-98	0.28	6.07
G-3309A	24-Feb-98	-0.02	4.15
G-3309B	24-Feb-98	-0.19	1.60
G-3309C	24-Feb-98	-1.13	-7.42
G-3309SW	24-Feb-98	0.20	1.54
G-3309TW	24-Feb-98	-1.19	-7.87
E-130-10	25-Feb-98	-1.84	-6.39
E-130-10-D	25-Feb-98	-1.80	-6.28
E-130-52	25-Feb-98	-1.99	-7.77
E-130-SW	25-Feb-98	-0.41	5.46
E-146-15	25-Feb-98	0.92	4.83
E-146-25	25-Feb-98	1.20	12.11
E-146-27.5	25-Feb-98	1.74	11.16
E-146-SW	25-Feb-98	0.72	17.17
C110-10	26-Feb-98	-0.56	2.29

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
TARPON BAY-SW	28-Feb-98	0.21	2.16
G-3302A	24-Mar-98	0.78	8.15
G-3302B	24-Mar-98	0.36	7.29
G-3302C	24-Mar-98	-0.14	6.45
G-3302SW	24-Mar-98	1.32	10.73
G-3309A	24-Mar-98	0.37	3.63
G-3309B	24-Mar-98	0.06	2.18
G-3309C	24-Mar-98	-1.51	-2.61
G-3309SW	24-Mar-98	0.86	8.32
G-3309TW	24-Mar-98	-1.33	-3.43
CYP2-10-GW	25-Mar-98	0.15	2.78
CYP2-10-SW	25-Mar-98	-0.41	4.99
G-3317C	25-Mar-98	-2.22	-7.19
G-3317C-D	25-Mar-98	-2.07	-8.50
G-3317D	25-Mar-98	-1.42	-3.76
G-3318A	25-Mar-98	-1.56	-8.42
G-3318B	25-Mar-98	-1.60	-5.62
G-3318C	25-Mar-98	-2.04	-8.47
G-3318TW	25-Mar-98	-2.17	-8.43
L-31W-14	25-Mar-98	-0.80	-2.34
L-31W-40	25-Mar-98	-0.57	-0.74
NP-67-GW	25-Mar-98	-1.22	-4.99
NP-67-SW	25-Mar-98	-0.75	-1.01
S-332	25-Mar-98	-0.06	2.55
SISAL POND	25-Mar-98	-0.26	3.15
SISAL-E	25-Mar-98	-1.71	-3.96
SISAL-W	25-Mar-98	-1.39	-6.76
TSB	25-Mar-98	0.37	3.33
TSB-15	25-Mar-98	-0.19	0.45
TSB-34	25-Mar-98	-0.26	0.94
TSB-57	25-Mar-98	-0.12	1.82
C110-10	26-Mar-98	-0.41	3.00
C110-100	26-Mar-98	0.33	4.20
C111/109	26-Mar-98	-0.50	-0.79
C111/110	26-Mar-98	-0.59	-0.87
G-1251GW	26-Mar-98	0.01	4.11
G-1251SW	26-Mar-98	-0.26	2.59
G-1603GW	26-Mar-98	-0.03	1.62
G-1603GW-D	26-Mar-98	-0.09	1.67
G-1603SW	26-Mar-98	-0.43	-0.56
G-3167GW	26-Mar-98	-0.63	-0.50
G-3167SW	26-Mar-98	-0.77	-2.87
G-3319B	26-Mar-98	-0.62	-2.04
G-3319TW	26-Mar-98	-2.89	-13.23
G-3323A	26-Mar-98	-0.17	-1.43
G-3323B	26-Mar-98	-2.38	-9.96
G-3323SW	26-Mar-98	-0.41	-3.35
G-3336	26-Mar-98	-0.33	1.39

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
G-3318A	28-Apr-98	-1.74	-9.25
G-3318B	28-Apr-98	-1.76	-7.27
G-3318C	28-Apr-98	-2.22	-5.04
G-3318TW	28-Apr-98	-2.20	-10.05
NP-67-GW	28-Apr-98	-1.13	-5.88
NP-67-SW	28-Apr-98	-0.92	-3.06
SISAL POND	28-Apr-98	0.51	6.79
SISAL POND-D	28-Apr-98	0.43	5.97
SISAL-E	28-Apr-98	-1.76	-3.02
SISAL-W	28-Apr-98	-1.17	-7.84
TSB	28-Apr-98	1.36	10.82
TSB-15	28-Apr-98	-0.26	1.04
TSB-34	28-Apr-98	-0.19	-3.25
TSB-57	28-Apr-98	-0.02	2.95
G-3302A	30-Apr-98	1.08	9.64
G-3302B	30-Apr-98	0.17	4.47
G-3302C	30-Apr-98	-0.21	-2.69
G-3302SW	30-Apr-98	2.92	15.49
G-3309A	30-Apr-98	0.67	7.55
G-3309B	30-Apr-98		
G-3309C	30-Apr-98	-1.30	-4.09
G-3309SW	30-Apr-98	3.04	19.58
G-3309TW	30-Apr-98	-1.59	-3.88
CANEPATCH-GW	13-May-98		
CANEPATCH-SW	13-May-98		
RB-1-20	13-May-98		
RB-1-27	13-May-98		
RB-1-6	13-May-98		
RB-1-GW	13-May-98		
RB-1-SW	13-May-98		
TARPON BAY-GW	13-May-98		
TARPON BAY-SW	13-May-98	2.27	9.91
CALUS CREEK-GW	15-May-98		
CALUS CREEK-SW	15-May-98		
EP8AGW	15-May-98		
EPGW	15-May-98		
EPSW	15-May-98	1.23	13.15
C110-10	02-Jun-98	0.25	4.43
C110-100	02-Jun-98	0.16	4.64
C111/109	02-Jun-98	0.02	4.17
C111/110	02-Jun-98	-0.33	-15.17
G-1251GW	02-Jun-98	0.12	3.32
G-1251SW	02-Jun-98	-1.28	-4.67
G-1603GW	02-Jun-98	-0.02	1.23
G-1603SW	02-Jun-98	-0.70	-3.15
G-3167GW	02-Jun-98	-0.65	-0.21
G-3167SW	02-Jun-98	-0.77	-3.07
G-3317C	02-Jun-98	-1.94	-6.65

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
CANEPATCH-SW	06-Jun-98	1.40	10.05
CANEPATCH-SW-D	06-Jun-98	1.91	11.71
RB-1-20	06-Jun-98	0.63	7.39
RB-1-27	06-Jun-98	-0.47	7.27
RB-1-6	06-Jun-98	1.03	11.65
RB-1-GW	06-Jun-98	1.12	9.81
RB-1-SW	06-Jun-98	2.73	13.58
TARPON BAY-GW	06-Jun-98	0.45	8.22
TARPON BAY-SW	06-Jun-98	1.66	12.49
C110-10	15-Jul-98	0.51	5.02
C110-100	15-Jul-98	0.23	5.58
C111/110	15-Jul-98	0.52	4.79
G-1251GW	15-Jul-98	-0.06	1.55
G-1251SW	15-Jul-98	-0.02	1.90
G-1603GW	15-Jul-98	-0.27	1.10
G-1603SW	15-Jul-98	0.36	1.36
G-3167GW	15-Jul-98		
G-3167SW	15-Jul-98		
G-3319B	15-Jul-98	-1.09	-3.04
G-3319TW	15-Jul-98	-2.48	-10.37
G-3323A	15-Jul-98	-0.42	-0.24
G-3323B	15-Jul-98	-2.72	-10.83
G-3323SW	15-Jul-98		
G-3336	15-Jul-98	-0.24	1.37
G-3337	15-Jul-98		
L-31W-14	15-Jul-98	0.53	5.66
L-31W-40	15-Jul-98	-0.43	0.04
S-175	15-Jul-98	0.39	4.43
S-175-D	15-Jul-98	0.40	4.75
S-332	15-Jul-98	0.24	3.64
CYP2-10-GW	16-Jul-98	-1.39	-3.62
CYP2-10-SW	16-Jul-98	-1.73	-5.67
G-3317C	16-Jul-98	-2.21	-7.63
G-3317D	16-Jul-98	0.18	3.69
G-3318A	16-Jul-98	-1.97	-8.96
G-3318B	16-Jul-98	-2.15	-6.20
G-3318C	16-Jul-98	-2.24	-10.80
G-3318TW	16-Jul-98	-2.30	
NP-67-GW	16-Jul-98	-1.00	-4.21
NP-67-SW	16-Jul-98	-1.13	-5.45
SISAL POND	16-Jul-98	0.29	5.55
SISAL-E	16-Jul-98	-1.67	-5.91
SISAL-W	16-Jul-98	0.47	5.01
TSB	16-Jul-98	0.30	4.66
TSB-15	16-Jul-98	0.37	3.90
TSB-34	16-Jul-98	-0.31	0.86
TSB-57	16-Jul-98	-0.26	-0.47
TSB-D	16-Jul-98	0.38	5.02

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
L-31W-40	12-Aug-98	-0.16	1.19
S-175	12-Aug-98	0.53	5.46
S-332	12-Aug-98	0.43	5.22
CYP2-10-GW	13-Aug-98	-0.38	0.83
CYP2-10-SW	13-Aug-98	0.37	6.88
G-3317C	13-Aug-98	-1.94	-9.16
G-3317D	13-Aug-98	-0.48	1.25
G-3318A	13-Aug-98	-1.71	-2.09
G-3318B	13-Aug-98	-1.59	1.17
G-3318C	13-Aug-98	-2.17	-1.83
G-3318TW	13-Aug-98	-2.32	-0.21
NP-67-GW	13-Aug-98	-1.34	
NP-67-SW	13-Aug-98	0.39	7.81
SISAL POND	13-Aug-98	-0.39	4.87
SISAL-E	13-Aug-98	-1.73	-6.86
SISAL-W	13-Aug-98	-0.44	1.87
TSB	13-Aug-98	0.58	5.63
TSB-15	13-Aug-98	0.97	6.36
TSB-34	13-Aug-98	0.09	3.41
TSB-57	13-Aug-98	0.22	2.93
TSB-57D	13-Aug-98	0.02	3.83
G-3302A	15-Aug-98	1.09	9.07
G-3302AD	15-Aug-98	0.91	7.53
G-3302B	15-Aug-98	0.24	9.15
G-3302C	15-Aug-98	-0.39	5.74
G-3302SW	15-Aug-98	0.92	8.05
G-3309A	15-Aug-98	0.44	4.56
G-3309B	15-Aug-98	0.27	4.12
G-3309C	15-Aug-98	-1.41	-5.18
G-3309SW	15-Aug-98	0.27	6.24
G-3309TW	15-Aug-98	-1.56	-4.28
CANEPATCH-GW	19-Aug-98		12.23
CANEPATCH-SW	19-Aug-98		13.14
RB-1-20	19-Aug-98		2.20
RB-1-27	19-Aug-98		0.74
RB-1-27D	19-Aug-98		0.61
RB-1-6	19-Aug-98		3.29
RB-1-GW	19-Aug-98		
RB-1-SW	19-Aug-98		13.16
TARPON BAY-GW	19-Aug-98		10.27
TARPON BAY-SW	19-Aug-98		13.37
E-130-10	03-Sep-98	-1.75	-5.38
E-130-52	03-Sep-98	-1.71	-7.72
E-130-52-D	03-Sep-98		
E-130-SW	03-Sep-98	-0.39	-0.52
E-146-15	03-Sep-98	1.04	11.89
E-146-25	03-Sep-98	1.43	9.20
E-146-27.5	03-Sep-98	2.01	13.56

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
E-130-10	18-Nov-98	-1.72	-8.95
E-130-52	18-Nov-98	-1.64	-7.82
E-130-SW	18-Nov-98	-0.11	1.65
E-146-15	18-Nov-98	0.92	7.21
E-146-25	18-Nov-98	1.10	8.62
E-146-27.5	18-Nov-98	1.72	11.21
E-146-SW	18-Nov-98	0.30	-0.32
EP8AGW	18-Nov-98	-0.99	-4.73
EP8ASW	18-Nov-98	-0.13	1.95
EPGW	18-Nov-98	-0.10	-0.15
EPSW	18-Nov-98	-0.28	1.15
G-3317C	19-Nov-98		
G-3317D	19-Nov-98		
G-3318A	19-Nov-98		
G-3318B	19-Nov-98		
G-3318C	19-Nov-98		
G-3318TW	19-Nov-98		
SISAL POND	19-Nov-98		
SISAL-E	19-Nov-98		
SISAL-W	19-Nov-98		
TSB	19-Nov-98		
TSB-15	19-Nov-98		
TSB-34	19-Nov-98		
TSB-57	19-Nov-98		
G-3302A	20-Nov-98		
G-3302B	20-Nov-98		
G-3302SW	20-Nov-98		
G-3309A	20-Nov-98		
G-3309B	20-Nov-98		
G-3309C	20-Nov-98		
G-3309SW	20-Nov-98		
G-3309TW	20-Nov-98		
C110-10	21-Nov-98	0.00	1.81
C110-100	21-Nov-98	0.00	3.74
C111/110	21-Nov-98	-0.52	-0.37
G-1251GW	21-Nov-98	-0.11	2.01
G-1251SW	21-Nov-98		
G-1603GW	21-Nov-98	-0.19	0.02
G-1603SW	21-Nov-98		
G-3167GW	21-Nov-98		
G-3323A	21-Nov-98	-0.16	-0.46
G-3323B	21-Nov-98	-2.25	-10.82
G-3323SW	21-Nov-98	-0.39	-0.87
G-3336	21-Nov-98	-2.07	-9.43
G-3337	21-Nov-98	-0.24	0.91
L-31W-14	21-Nov-98		
L-31W-40	21-Nov-98		
S-175	21-Nov-98	-0.87	-3.30

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
RB-1-27	15-Dec-98	0.42	4.96
RB-1-6	15-Dec-98	1.08	8.49
RB-1-GW	15-Dec-98	0.81	6.75
RB-1-SW	15-Dec-98	1.19	7.99
TARPON BAY-GW	15-Dec-98		
TARPON BAY-SW	15-Dec-98		
C110-10	13-Jan-99		
C110-100	13-Jan-99		
C111/109	13-Jan-99		
C111/110	13-Jan-99		
G-1251GW	13-Jan-99		
G-1251SW	13-Jan-99		
G-1603GW	13-Jan-99		
G-3167GW	13-Jan-99		
G-3167SW	13-Jan-99		
G-3319B	13-Jan-99		
G-3319TW	13-Jan-99		
G-3323A	13-Jan-99		
G-3323B	13-Jan-99		
G-3323SW	13-Jan-99		
G-3336	13-Jan-99		
G-3337	13-Jan-99		
L-31W-14	13-Jan-99		
L-31W-40	13-Jan-99		
S-175	13-Jan-99		
S-332	13-Jan-99		
G-3317C	14-Jan-99		
G-3317D	14-Jan-99		
G-3318A	14-Jan-99		
G-3318B	14-Jan-99		
G-3318C	14-Jan-99		
G-3318TW	14-Jan-99		
SISAL-E	14-Jan-99		
SISAL-W	14-Jan-99		
TSB	14-Jan-99		
TSB-15	14-Jan-99		
TSB-34	14-Jan-99		
TSB-57	14-Jan-99		
G-3302A	15-Jan-99		
G-3302B	15-Jan-99		
G-3302C	15-Jan-99		
G-3302SW	15-Jan-99		
G-3302SW-D	15-Jan-99		
G-3309A	15-Jan-99		
G-3309B	15-Jan-99		
G-3309C	15-Jan-99		
G-3302SW	15-Jan-99		
G-3309TW	15-Jan-99		

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
EP8AGW	11-Feb-99	-0.81	-1.38
EP8ASW	11-Feb-99	2.03	18.35
EPGW	11-Feb-99	-0.04	-2.15
EPSW	11-Feb-99	0.78	9.74
C110-10	12-Feb-99		
C110-100	12-Feb-99		
C111/109	12-Feb-99	-0.37	0.37
C111/110	12-Feb-99		
CANEPATCH-GW	13-Feb-99	1.22	11.11
CANEPATCH-SW	13-Feb-99	1.95	15.05
G-1251GW	12-Feb-99	-0.05	4.00
G-1251SW	12-Feb-99		
G-1603GW	12-Feb-99		
G-1603SW	12-Feb-99		
G-3167GW	12-Feb-99		
G-3167SW	12-Feb-99		
G-3323A	12-Feb-99	-0.17	-0.23
G-3323B	12-Feb-99	-2.26	-15.30
G-3323SW	12-Feb-99		
G-3336	12-Feb-99		
G-3337	12-Feb-99	-1.85	-8.73
G-3337-D	12-Feb-99		
RB-1-20	12-Feb-99	0.84	7.80
RB-1-27	12-Feb-99	0.52	5.46
RB-1-6	12-Feb-99	1.03	8.39
RB-1-GW	12-Feb-99	0.74	7.83
RB-1-SW	12-Feb-99	1.53	14.18
TARPON BAY-GW	12-Feb-99	0.48	7.21
TARPON BAY-SW	12-Feb-99	1.73	16.72
CANEPATCH-SW	16-Mar-99	2.98	18.01
RB-1-20	16-Mar-99	0.28	0.25
RB-1-27	16-Mar-99	-0.24	4.75
RB-1-6	16-Mar-99	0.86	3.01
RB-1-GW	16-Mar-99	0.76	8.61
RB-1-SW	16-Mar-99	3.42	6.45
TARPON BAY-SW	16-Mar-99	2.14	24.11
E-130-10	17-Mar-99	-0.52	-4.71
E-130-52	17-Mar-99	-1.63	-6.39
E-146-15	17-Mar-99	0.88	9.89
E-146-25	17-Mar-99	1.32	12.31
E-146-27.5	17-Mar-99	1.18	11.46
E-146-SW	17-Mar-99	3.01	19.50
EP8AGW	17-Mar-99	-0.14	6.29
EP8ASW	17-Mar-99	4.61	28.18
EPGW	17-Mar-99	-0.13	2.49
EPSW	17-Mar-99	5.69	30.67
C110-10	18-Mar-99	-0.61	1.58
C110-100	18-Mar-99	-0.23	4.10

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
RB-1-20	16-Apr-99		
RB-1-27	16-Apr-99		
RB-1-27-D	16-Apr-99		
RB-1-GW	16-Apr-99		
RB-1-SW	16-Apr-99		
TARPON BAY-GW	16-Apr-99		
TARPON BAY-SW	16-Apr-99		
G-3302A	20-Apr-99	2.67	15.03
G-3302B	20-Apr-99	0.26	4.76
G-3302C	20-Apr-99	-0.19	2.02
G-3302SW	20-Apr-99	4.40	20.44
G-3309A	20-Apr-99	0.69	4.14
G-3309B	20-Apr-99	0.27	5.10
G-3309C	20-Apr-99	-1.39	-1.09
G-3309SW	20-Apr-99	3.00	15.79
G-3309TW	20-Apr-99	-1.53	-2.02
G-3317C	21-Apr-99		
G-3317D	21-Apr-99		
G-3318A	21-Apr-99		
G-3318B	21-Apr-99		
G-3318C	21-Apr-99		
G-3318TW	21-Apr-99		
SISAL POND	21-Apr-99		
SISAL-E	21-Apr-99		
SISAL-W	21-Apr-99		
SISAL-W-D	21-Apr-99		
TSB	21-Apr-99		
TSB-15	21-Apr-99		
TSB-34	21-Apr-99		
TSB-57	21-Apr-99		
E-130-10	22-Apr-99		
E-130-52	22-Apr-99		
E-146-15	22-Apr-99		
E-146-25	22-Apr-99		
E-146-27.5	22-Apr-99		
EP8AGW	22-Apr-99		
EPGW	22-Apr-99		
C110-10	23-Apr-99	-0.05	3.17
C110-100	23-Apr-99	0.16	2.85
C111/109	23-Apr-99	0.94	5.80
C111/110	23-Apr-99	0.74	4.72
G-1251GW	23-Apr-99	0.18	2.98
G-1251SW	23-Apr-99	0.39	5.71
G-1603GW	23-Apr-99		
G-1603SW	23-Apr-99		
G-3167GW	23-Apr-99		
G-3167SW	23-Apr-99		
G-3319B	23-Apr-99		

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
G-3309B	18-May-99		
G-3309C	18-May-99		
G-3309SW	18-May-99		
G-3309TW	18-May-99		
CYP2-10-GW	20-May-99		
CYP2-10-SW	20-May-99		
G-3317C	20-May-99		
G-3317C-D	20-May-99		
G-3317D	20-May-99		
G-3318A	20-May-99		
G-3318B	20-May-99		
G-3318C	20-May-99		
G-3318TW	20-May-99		
NP-67-GW	20-May-99		
NP-67-SW	20-May-99		
SISAL POND	20-May-99		
SISAL-E	20-May-99		
SISAL-W	20-May-99		
TSB	20-May-99		
TSB-15	20-May-99		
TSB-34	20-May-99		
TSB-57	20-May-99		
E-130-10	21-May-99		
E-130-52	21-May-99		
E-146-15	21-May-99		
E-146-25	21-May-99		
E-146-27.5	21-May-99		
E-146-SW	21-May-99		
EP8AGW	21-May-99		
EP8ASW	21-May-99		
EPGW	21-May-99		
CANEPATCH-GW	11-Jun-99		
CANEPATCH-SW	11-Jun-99		
CANEPATCH-SW-D	11-Jun-99		
RB-1-20	11-Jun-99		
RB-1-27	11-Jun-99		
RB-1-6	11-Jun-99		
RB-1-GW	11-Jun-99		
RB-1-SW	11-Jun-99		
C110-10	15-Jun-99		
C110-100	15-Jun-99		
C111/100	15-Jun-99		
G-1251GW	15-Jun-99		
G-1251SW	15-Jun-99		
G-1603GW	15-Jun-99		
G-1603SW	15-Jun-99		
G-3167GW	15-Jun-99		
G-3167SW	15-Jun-99		

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

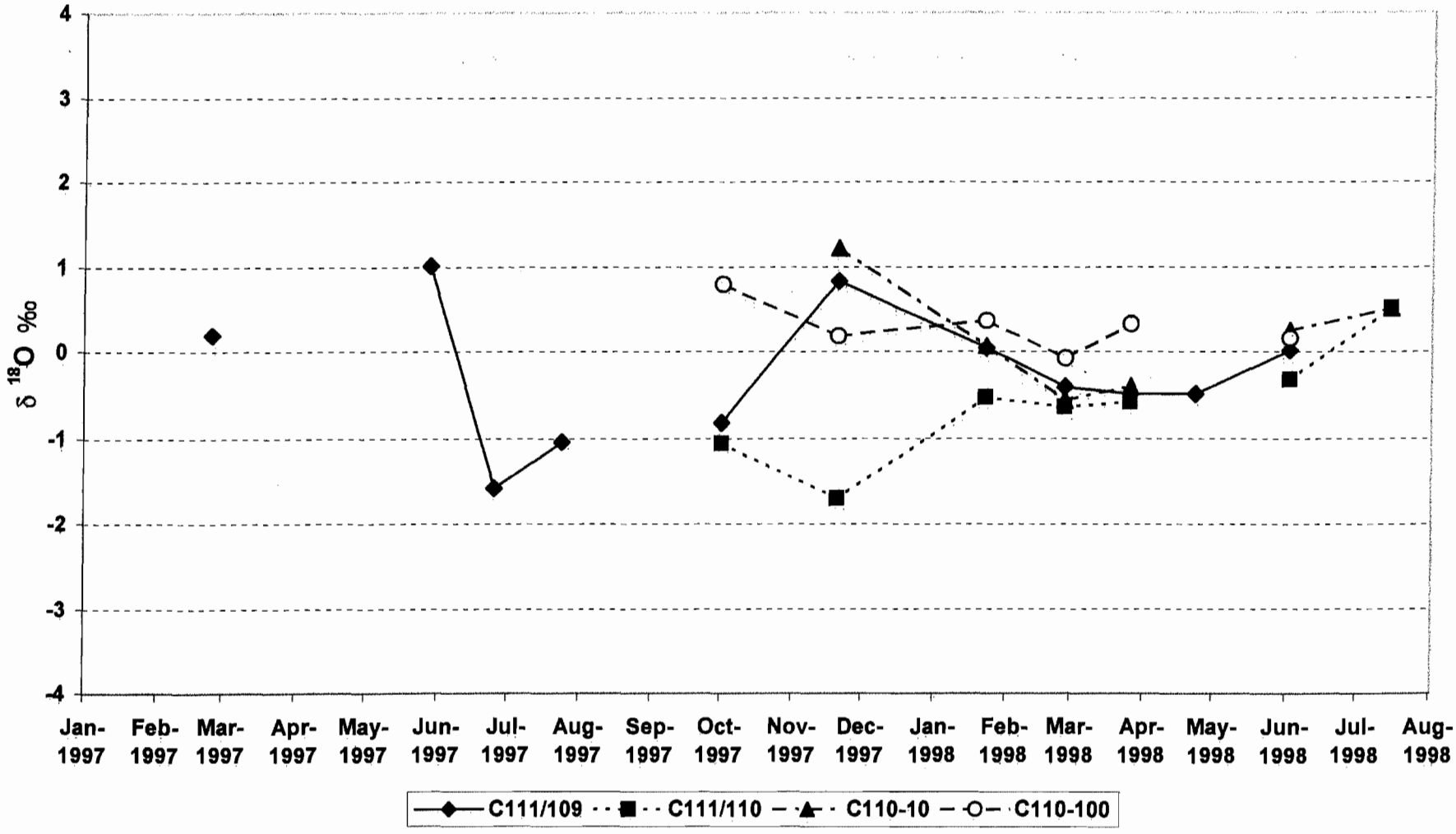
Name Sample	Date Collection	δ18O‰	δD‰
CANEPATCH-GW	16-Jul-99	1.22	11.86
CANEPATCH-SW	16-Jul-99		
RB-1-20	16-Jul-99	0.46	5.81
RB-1-27	16-Jul-99	0.15	5.64
RB-1-27D	16-Jul-99	0.15	5.55
RB-1-6	16-Jul-99	1.08	10.04
RB-1-GW	16-Jul-99	0.80	9.92
RB-1-SW	16-Jul-99		
TARPON BAY-GW	16-Jul-99	0.45	8.60
TARPON BAY-SW	16-Jul-99		
40-MILE BEND	20-Jul-99	-1.40	-6.37
G-3302A	20-Jul-99		
G-3302B	20-Jul-99		
G-3302C	20-Jul-99		
G-3302SW	20-Jul-99		
G-3309A	20-Jul-99		
G-3309B	20-Jul-99		
G-3309C	20-Jul-99		
G-3309SW	20-Jul-99		
G-3309SW-D	20-Jul-99		
G-3309TW	20-Jul-99		
C110-10	21-Jul-99	0.17	3.20
C110-100	21-Jul-99	0.10	3.62
C111/109	21-Jul-99	0.53	5.13
C111/110	21-Jul-99	0.39	3.64
G-1251GW	21-Jul-99	0.05	0.24
G-1251SW	21-Jul-99	1.95	13.22
G-1603GW	21-Jul-99	-0.27	3.27
G-1603SW	21-Jul-99		
G-3167GW	21-Jul-99	-0.85	-1.24
G-3167SW	21-Jul-99	-0.41	-0.02
G-3319B	21-Jul-99	-1.29	-4.46
G-3319TW	21-Jul-99	-2.94	-14.04
G-3323A	21-Jul-99		
G-3323B	21-Jul-99		
G-3323SW	21-Jul-99		
G-3336	21-Jul-99	-0.24	3.27
G-3337	21-Jul-99	-1.69	-6.36
L-31W-14	21-Jul-99		
L-31W-40	21-Jul-99		
S-175	21-Jul-99	-0.09	2.86
S-332	21-Jul-99	-0.04	3.38
CYP2-10-GW	22-Jul-99	0.76	6.10
CYP2-10-SW	22-Jul-99	1.26	10.05
G-3317C	22-Jul-99	-1.92	-7.84
G-3317D	22-Jul-99	-0.44	1.04
G-3318A	22-Jul-99	-1.40	-8.91
G-3318B	22-Jul-99	-1.94	-7.99

Appendix D. Summary of stable isotopes of oxygen and hydrogen.

Name Sample	Date Collection	δ18O‰	δD‰
L-31W-40	19-Aug-99		
C110-10	20-Aug-99		
C110-100	20-Aug-99		
C111/110	20-Aug-99		
G-1251GW	20-Aug-99		
G-1251SW	20-Aug-99		
G-1603GW	20-Aug-99		
G-1603SW	20-Aug-99		
G-3167GW	20-Aug-99		
G-3167SW	20-Aug-99		
G-3319B	20-Aug-99		
G-3323A	20-Aug-99		
G-3323B	20-Aug-99		
G-3323SW	20-Aug-99		
G-3336	20-Aug-99		
G-3337	20-Aug-99		
S-175	20-Aug-99		
G-3302A	31-Aug-99		
G-3302B	31-Aug-99		
G-3302C	31-Aug-99		
G-3302SW	31-Aug-99		
G-3309A	31-Aug-99		
G-3309B	31-Aug-99		
G-3309C	31-Aug-99		
G-3309SW	31-Aug-99		
G-3309TW	31-Aug-99		
E-130-10	09-Sep-99		
E-130-52	09-Sep-99		
E-130-SW	09-Sep-99		
E-146-15	09-Sep-99		
E-146-25	09-Sep-99		
E-146-27.5	09-Sep-99		
E-146-SW	09-Sep-99		
EP8AGW	09-Sep-99		
EP8ASW	09-Sep-99		
EPGW	09-Sep-99		
EPSW	09-Sep-99		
G-3302A	15-Sep-99		
G-3302B	15-Sep-99		
G-3302C	15-Sep-99		
G-3302SW	15-Sep-99		
G-3309A	15-Sep-99		
G-3309B	15-Sep-99		
G-3309C	15-Sep-99		
G-3309SW	15-Sep-99		
G-3309TW	15-Sep-99		
C110-10	16-Sep-99		
C110-100	16-Sep-99		

Appendix E
Graphs of $\delta^{18}O$ with time

C-111 BASIN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Apr-1997
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Jun-1997
Jul-1997
Aug-1997
Sep-1997
Oct-1997
Nov-1997
Dec-1997
Jan-1998
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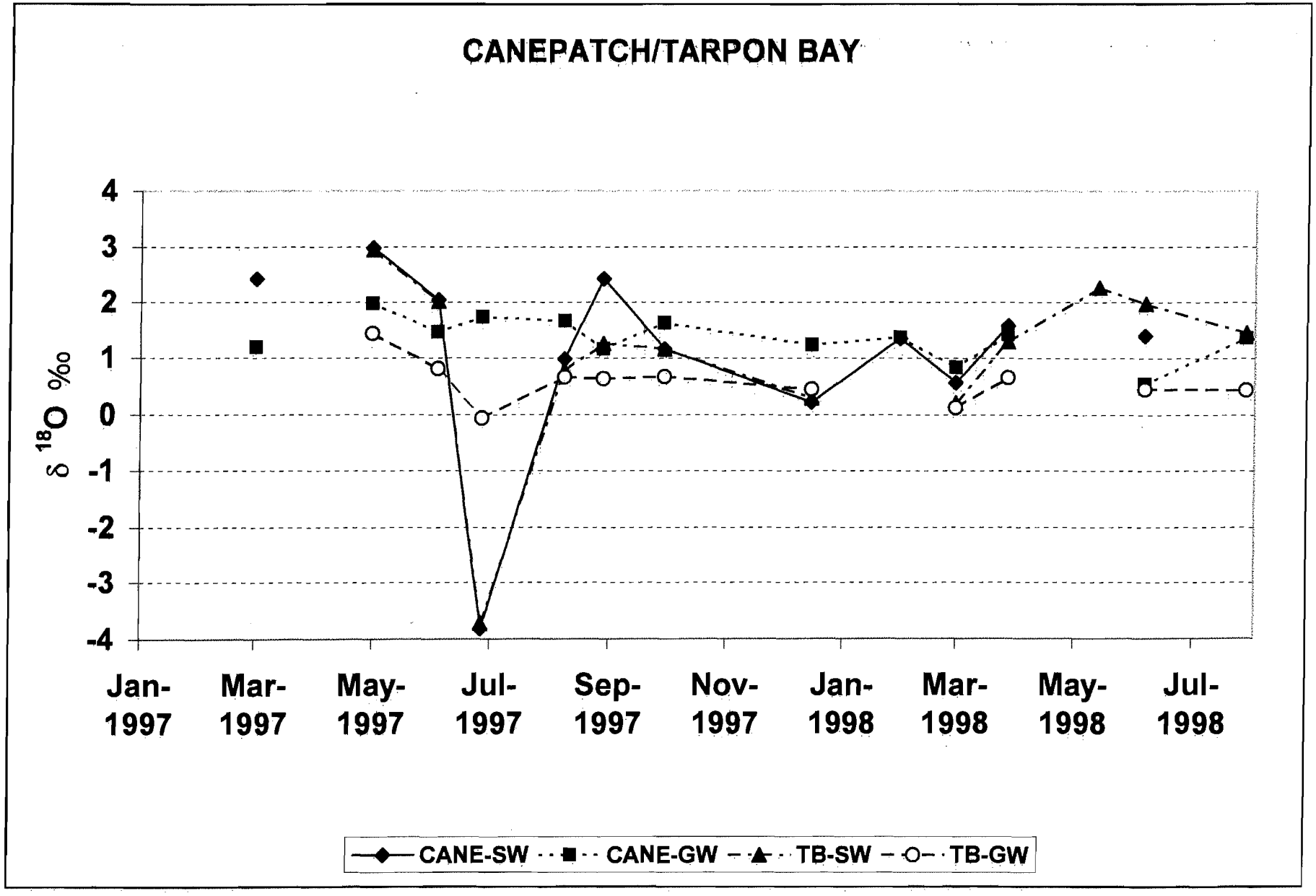
C111/110
C110-10
C110-100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δ 18O ‰
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-2
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-4
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Mar-1997
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Jul-1997
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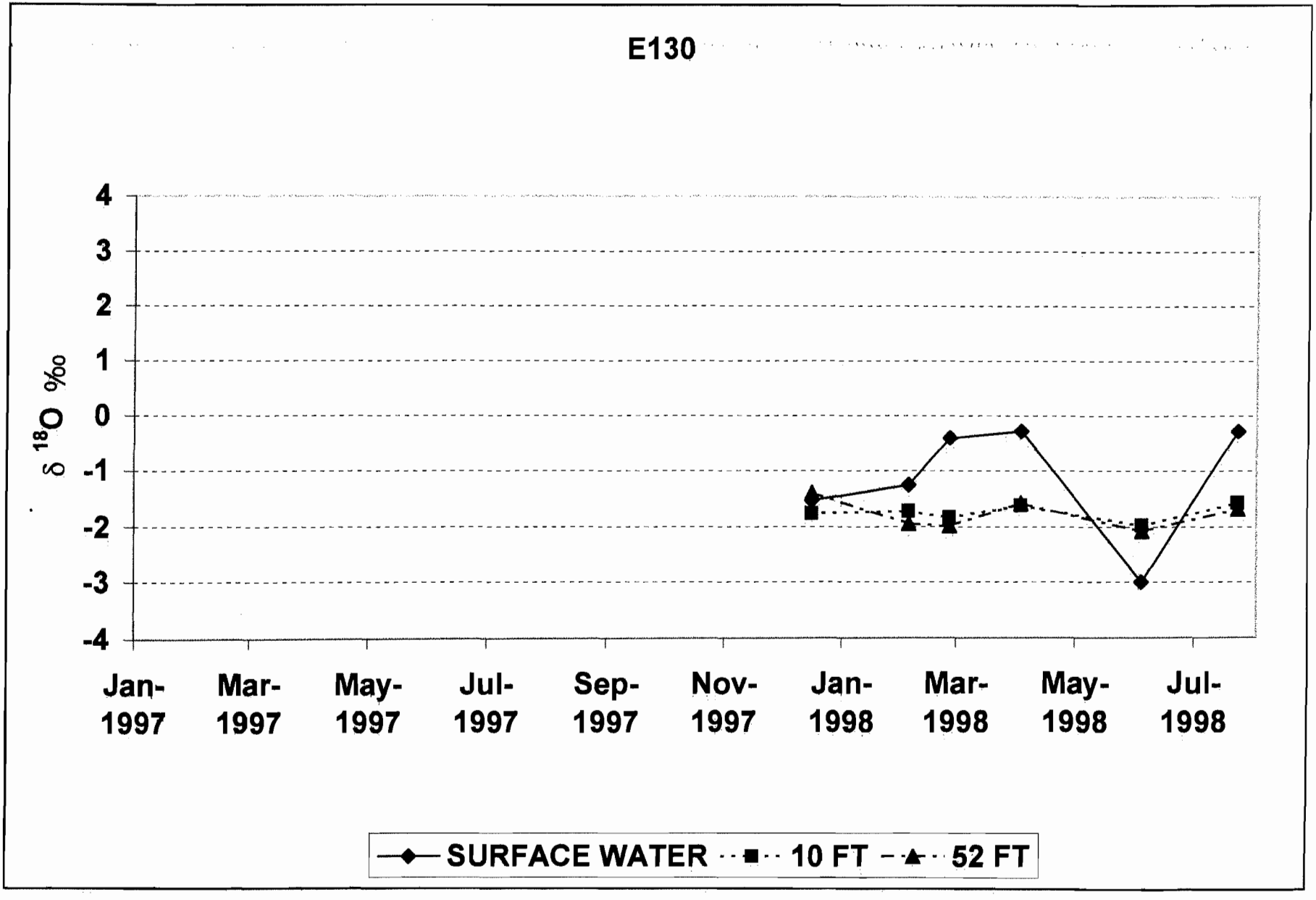
Jul-1998
CANE-SW
CANE-GW
TB-SW
TB-GW


E130
δ 18O ‰
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3
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-2
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-4
Jan-1997
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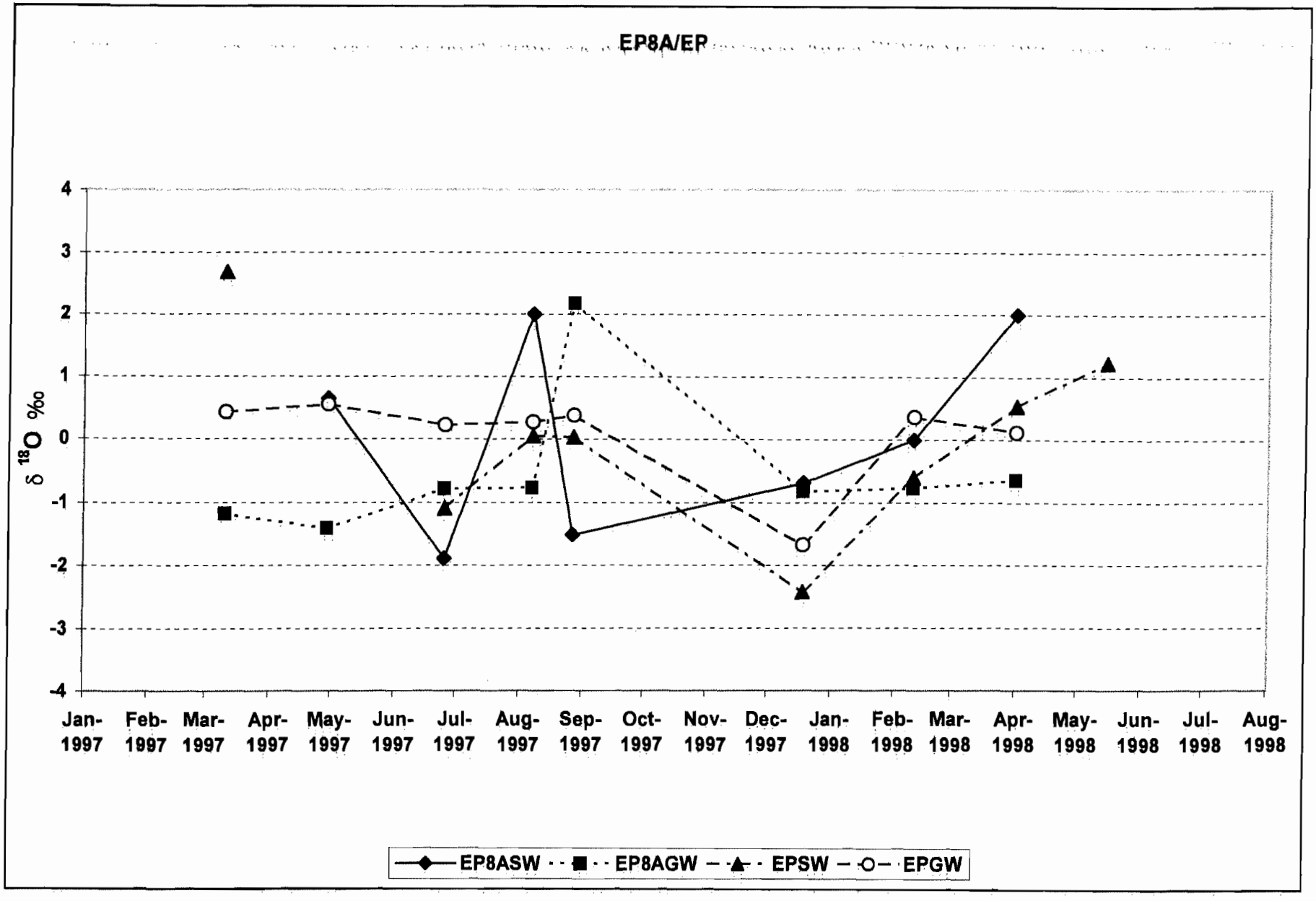
Nov-1997
Jan-1998
Mar-1998
May-1998
Jul-1998
SURFACE WATER
10 FT
52 FT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May-1997
Jun-1997
Jul-1997
Aug-1997
Sep-1997
Oct-1997
Nov-1997
Dec-1997
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Jun-1998
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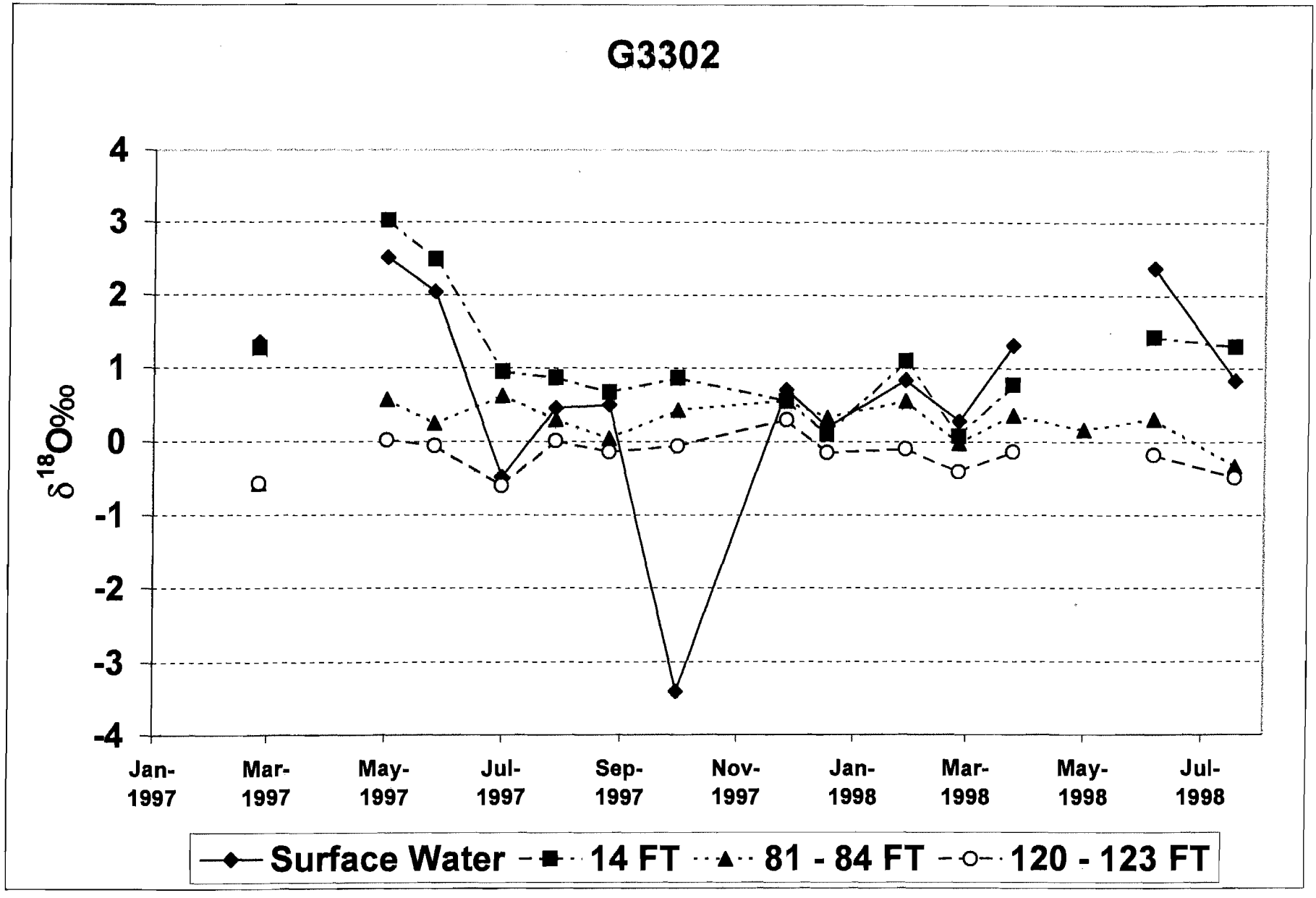
EP8AGW
EPSW
EPGW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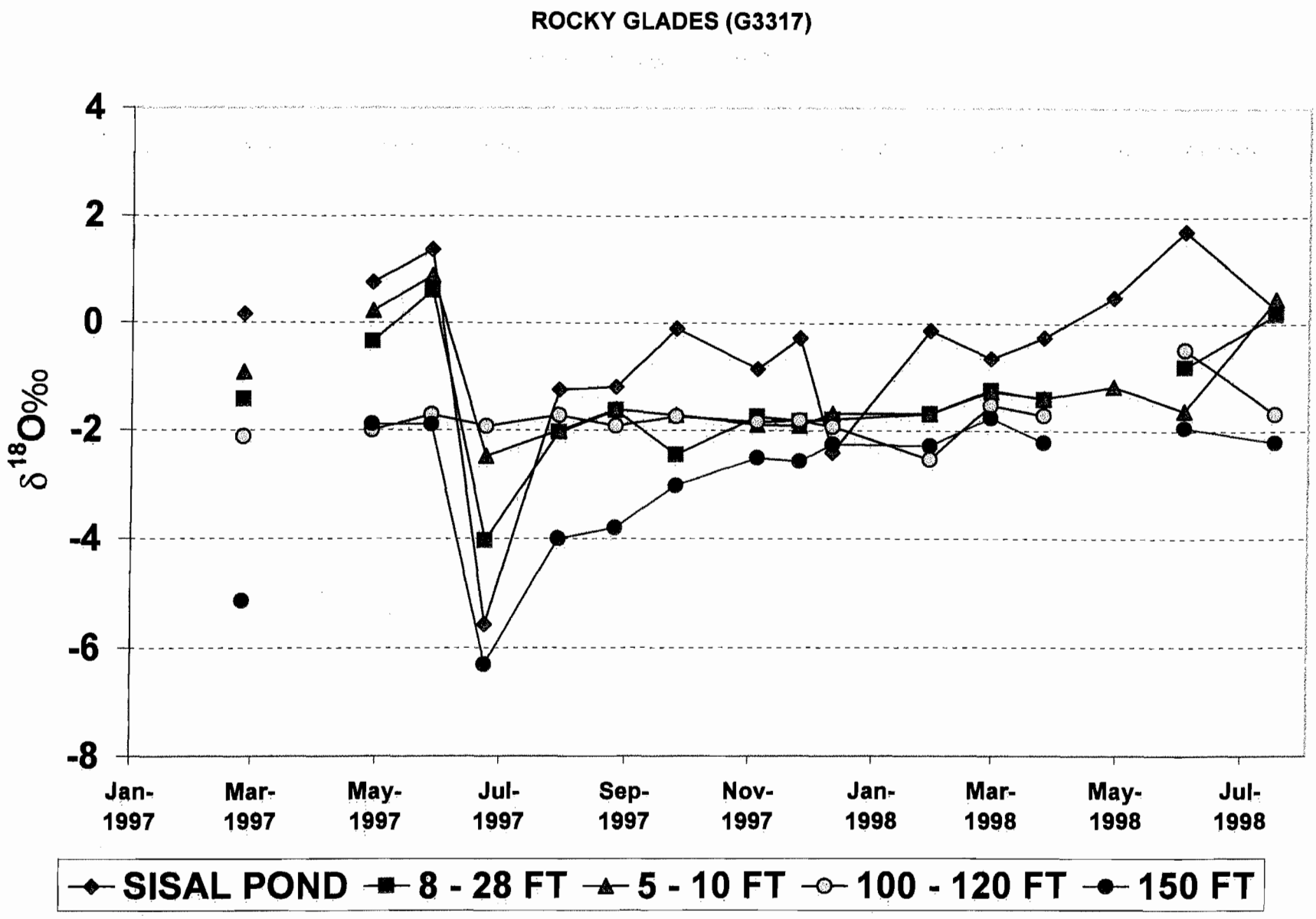
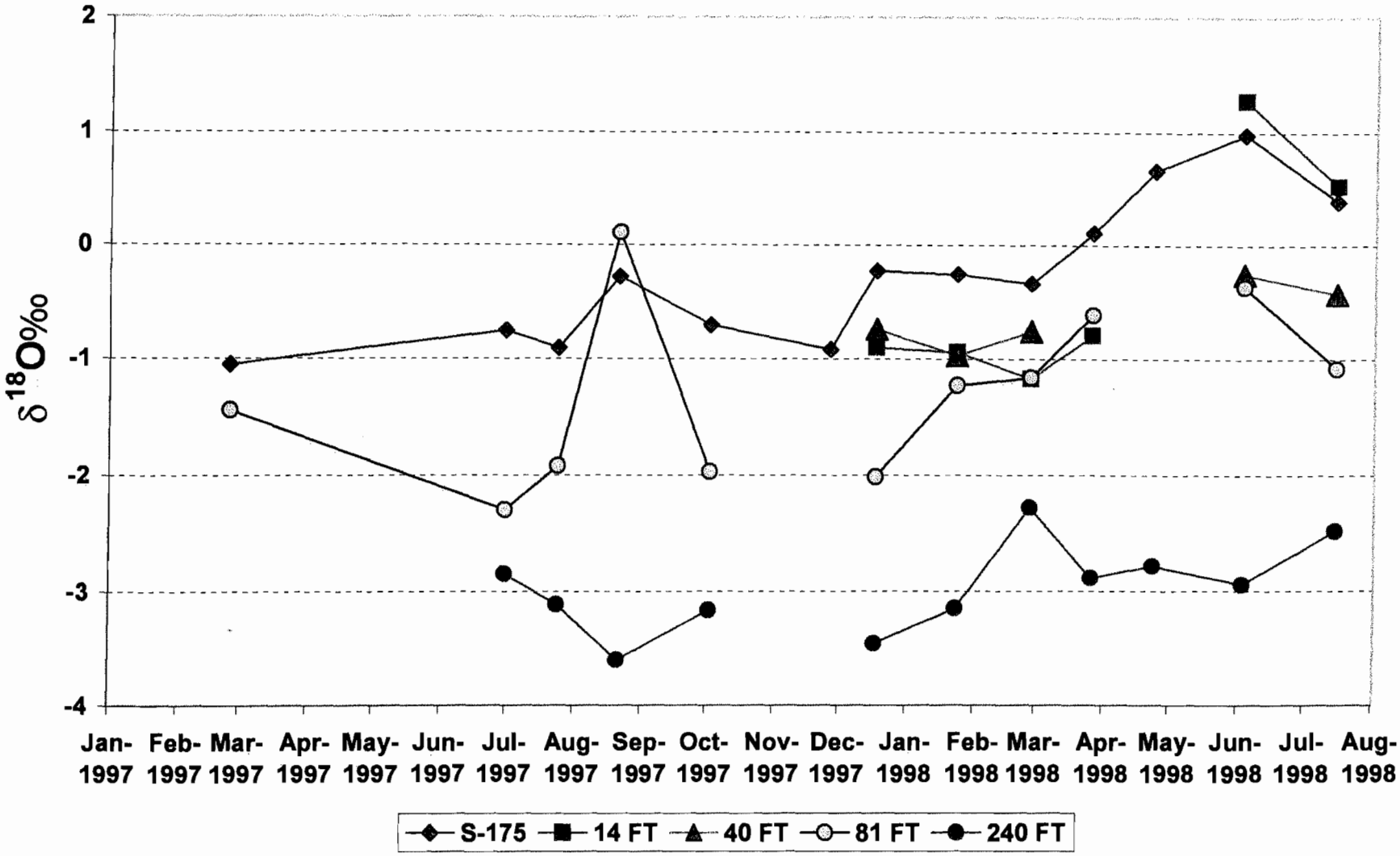
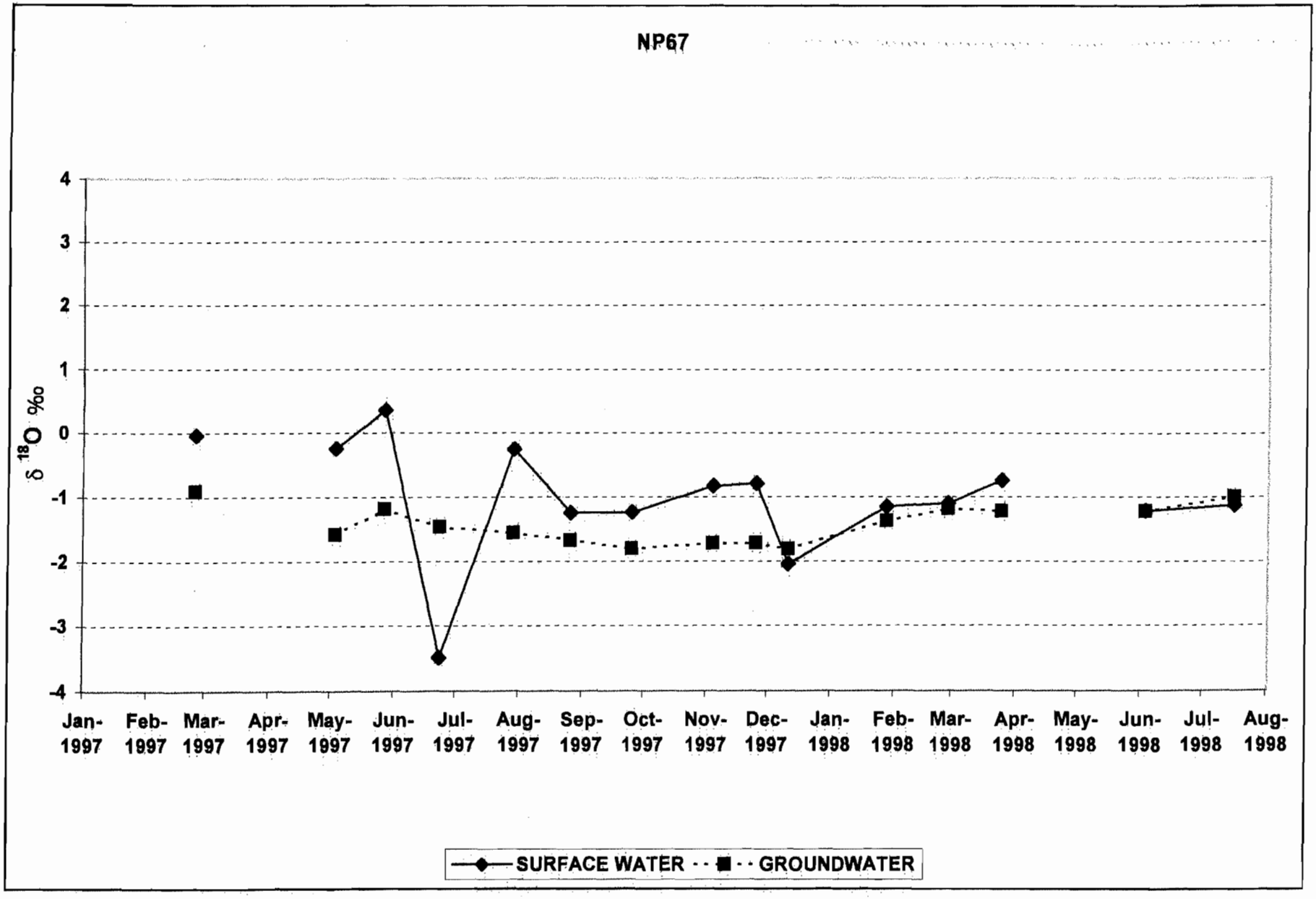
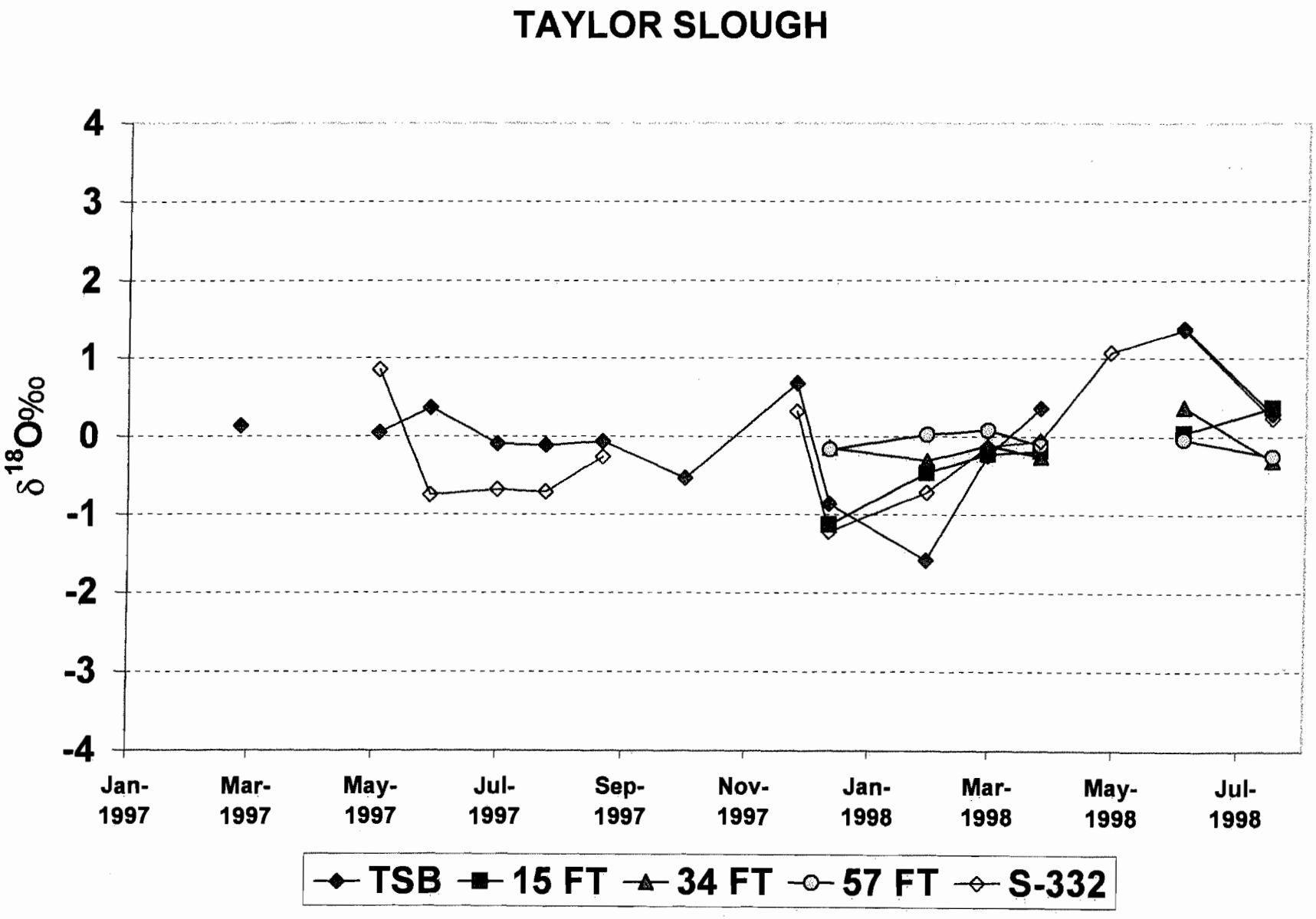
δ18O‰
Jan-1997
Mar-1997
May-1997
Jul-1997
Sep-1997
Nov-1997
Jan-1998
Mar-1998
May-1998
Jul-1998
Surface Water
14 FT
81 - 84 FT
120 - 123 FT


ROCKY GLADES (G3317)
4
2
0
-2
-4
-6
-8
δ18O‰
Jan-1997
Mar-1997
May-1997
Jul-1997
Sep-1997
Nov-1997
Jan-1998
Mar-1998
May-1998
Jul-1998
SISAL POND
8 - 28 FT
5 - 10 FT
100 - 120 FT
150 FT

G3319 and L31W




NP67
δ 18O ‰
4
3
2
1
0
-1
-2
-3
-4
Jan-1997
Feb-1997
Mar-1997
Apr-1997
May-1997
Jun-1997
Jul-1997
Aug-1997
Sep-1997
Oct-1997
Nov-1997
Dec-1997
Jan-1998
Feb-1998
Mar-1998
Apr-1998
May-1998
Jun-1998
Jul-1998
Aug-1998
SURFACE WATER
GROUNDWATER


TAYLOR SLOUGH
4
3
2
1
0
-1
-2
-3
-4
δ18O‰
Jan-1997
Mar-1997
May-1997
Jul-1997
Sep-1997
Nov-1997
Jan-1998
Mar-1998
May-1998
Jul-1998
TSB
15 FT
34 FT
57 FT
S-332