

Record # 18711

**University of Miami  
Rosenstiel School of Marine and Atmospheric Science**

**Detection, Mapping, and Analysis of Freshwater Springs  
In Western Biscayne Bay, Florida**

**By**

**Christina Joy Gonzalez**

**An Internship Report**

**Submitted to the Faculty of the University of Miami Rosenstiel School of Marine  
and Atmospheric Science in partial fulfillment of the requirements for the degree of  
Master of Arts**

**Miami, Florida  
June 2006**

**Christina Joy Gonzalez  
Detection, Mapping, and Analysis  
of Freshwater Springs in Western  
Biscayne Bay, Florida**

**M.A. Marine Geology and Geophysics  
June 2006**

**Abstract of a Master's Internship report at the University of Miami Rosenstiel School of Marine and Atmospheric Science. Thesis supervised by Dr. Harold Wanless, Dr. Peter Swart, and Dr. Larry Peterson. Number of pages in text: 153**

A project entitled "DETECTION, MAPPING, AND CHARACTERIZATION OF GROUNDWATER DISCHARGES TO BISCAYNE BAY SFWMD CONTRACT C-15870" was initiated in January 2004 under a joint effort between NOAA and the University of Miami, under a grant from the South Florida Water Management District (SFWMD) in order to document, categorize, and describe the nature of existing artesian springs in Biscayne Bay, Florida. The study, which spanned one year in duration, accomplished the goals of finding and documenting existing springs, studying their nature, and analyzing the sediments and water chemistry of the spring waters. We found that a few existing larger springs and many ephemeral smaller springs flow readily during the wet season and after large rain events, and diminish or cease in flow during the dry season, or when canal flood gate structures are open, because of a decrease in the fresh water head of the underlying water tables of the mainland. Water analysis revealed that spring water salinities ranged from 8 to 31 ppt and were slightly acidic in the wet season, with a pH just below 7.0. Analysis also revealed silicon contents consistent with a groundwater source. Sediment analyses revealed a foraminifera assemblage pattern similar to that which would exist from a freshwater gradient to a more saline water environment. Scanning electron microscope analyses revealed extensive dissolution on foraminifera tests, primarily those associated with samples obtained from closer to the springs. This dissolution coincides with the foraminifera salinity tolerability range, as well as with the low pH of the spring waters. Despite all the data obtained during the brief period of this project, recommendations include further study into the nature of these springs, exact documentation of flow and spring water sources, and a more extensive study into the increased dissolution of the carbonate sediments of Biscayne Bay.

## **Acknowledgements**

I would first like to express my sincere gratitude and appreciation for my advisor and good friend, Dr. Hal Wanless, without whom my success would not be possible. I am grateful for his contributions to my endeavors, his patience, and for always believing in me. I would also like to thank the members of my committee, Dr. Peter Swart and Dr. Larry Peterson, who have both provided me their insights and knowledge and aided in valuable components of this work.

I wish to thank my friends at home and school, those who have seen and stayed near me through the thick and the thin, and helped me out in the field and lab when I needed it. I would like to say thank you to those at RSMAS and UM main campus for their support, their field assistance, and their encouragement, most of all. I would also like to thank Hector Casanova and Chuck Featherstone from NOAA for their assistance in the field, provision of necessary equipment, instrument data retrieval and analyses of water samples. Scanning electron microscopy work would not have been possible without the assistance of Pat Blackwelder and Pratik Joshi.

I could not have completed this work without my family, my in-laws, who have endured my absence for a long, long time, and my sister, who has wanted me to finish as long as I have. Last but not least, I would like to thank my husband, who gave me the opportunity to continue my education and has been there in every way possible. He has helped direct me and keep me on my path even when I faltered, and who will forever be, my guiding light.

Thanks over and over to all of you. I love you.

## TABLE OF CONTENTS

|                                                                                                                               | <u>Page</u> |
|-------------------------------------------------------------------------------------------------------------------------------|-------------|
| Abstract                                                                                                                      | ii          |
| Acknowledgements                                                                                                              | iii         |
| Table of Contents                                                                                                             | iv          |
| <br>                                                                                                                          |             |
| I. Introduction                                                                                                               | 1           |
| I.1 Internship Description                                                                                                    | 2           |
| I.2 Historical Information                                                                                                    | 2           |
| I.3 Recent Information                                                                                                        | 4           |
| I.4 Project "DETECTION, MAPPING, AND CHARACTERIZATION<br>OF GROUNDWATER DISCHARGES TO BISCAYNE BAY SFWMD<br>CONTRACT C-15870" |             |
| I.4.A Project Objectives                                                                                                      | 7           |
| I.4.B Project Complications                                                                                                   | 8           |
| II. Methods                                                                                                                   |             |
| II.1 Resources                                                                                                                | 9           |
| II.2 Field Work                                                                                                               | 9           |
| II.3 Lab Work                                                                                                                 | 15          |
| II.4 Scanning Electron Microscopy (SEM)                                                                                       | 15          |
| III. Results                                                                                                                  |             |
| III.1 Located Springs                                                                                                         | 17          |
| III.2 Water Sample and YSI Analysis                                                                                           | 25          |
| III.3 Sediment Sample Analysis                                                                                                | 26          |
| III.4 SEM analysis                                                                                                            | 28          |
| IV. Conclusions and Discussion                                                                                                | 35          |
| V. Recommendations                                                                                                            | 42          |
| References                                                                                                                    | 45          |
| <br>                                                                                                                          |             |
| List of Figures and Tables:                                                                                                   |             |
| Figure 1: Historic photo of early 1900's spring in Biscayne Bay                                                               | 3           |
| Figure 2: Photo of historical (1938) spring in Biscayne Bay                                                                   | 6           |
| Figure 3: Surveyed spring locations                                                                                           | 10          |
| Figure 4: Photo of YSI within BBS21                                                                                           | 13          |
| Figure 5: Radial transect sediment sampling sketch                                                                            | 14          |
| Figure 6: Photo of active spring observed Dec. 31, 1997                                                                       | 18          |
| Figure 7: Photo by J. Ricisak of BBS 21 Spring                                                                                | 19          |

## List of Figures cont...

|                                                                  |    |
|------------------------------------------------------------------|----|
| Figure 8: Photo of BBS21 from above the water                    | 20 |
| Figure 9: BBS21 Spring sketch                                    | 21 |
| Figure 10: Photo of small spring: BBS26                          | 23 |
| Figure 11: Photos of spring "Tequesta" at Deering Estate         | 24 |
| Table 1: Dissolution counts on foram tests                       | 31 |
| Figure 12: SEM photo of <i>A. becarii</i> crystal structure      | 32 |
| Figure 13: EDS spectrum of <i>A. becarii</i> test                | 32 |
| Figure 14: SEM photo of <i>Quinqueloculina sp.</i> test          | 33 |
| Figure 15: EDS spectrum of <i>Quinqueloculina sp.</i> test       | 33 |
| Figure 16: SEM photo of <i>Triloculina sp.</i> test              | 34 |
| Figure 17: SEM photo of dissolution on an <i>A. becarii</i> test | 34 |

## Appendices:

- Appendix 1: Springs Map and coordinates
- Appendix 2: Sediment component graphs and foraminifera assemblage graphs
- Appendix 3: YSI water chemistry data and graphs
- Appendix 4: Nutrient Analyses
- Appendix 5: Spring photographs
- Appendix 6: SEM photographs

## I. INTRODUCTION

This internship was the result of a joint effort between the Atlantic Oceanographic and Meteorological Laboratory of the National Oceanic and Atmospheric Administration (NOAA-AOML) and the University of Miami (UM), under a grant from the South Florida Water Management District (SFWMD), to improve existing knowledge on groundwater springs discharging into Biscayne Bay, Florida. The project, entitled "DETECTION, MAPPING, AND CHARACTERIZATION OF GROUNDWATER DISCHARGES TO BISCAYNE BAY SFWMD CONTRACT C-15870" spanned from January 2004 to December 2004.

The objectives of the study were to identify existing historical springs and to detect and categorize flows from present-day springs that discharge into the Bay. The study also aimed to identify additional information that would lead to further identification and to an evaluation of the significance of the presence of such springs. Using various techniques, including field observations, water property measurements and sediment analysis, the following types of information were obtained: (a) locations of points of discharge of some historical springs and springs that are occasionally active, (b) nature of flow discharges at currently active springs, (c) spatial distribution of parameter values about a spring, (d) water quality analysis of the spring flow, and (e) faunal distributions around springs and the significance of dissolution on the abundance and preservation of such distributions.

All sediment collections and analyses were conducted by Dr. Harold Wanless of the Department of Geological Sciences at the University of Miami and myself. Water samples were collected with the aid of AOML personnel and analyzed by Chuck Featherstone of NOAA-AOML for ammonia levels and nutrients. An instrument called a YSI was used occasionally to collect such data as salinity, chlorophyll, water velocity flow, turbidity, and temperature through time. A handheld pH meter, provided by AOML, was used to take water temperature and pH recordings.

Several difficulties were encountered during the course of the project, which affected the amount of information collected and analyzed. A detailed description of project complications is contained in section I.4 of this text. Nevertheless, the information collected and analyzed was used to the furthest extent in order to quantify as much about the springs as possible. One major point of interest that resulted from the project was the study of foraminiferal distributions around and near to the springs, and an analysis of dissolution effects on foraminifera tests as a result of their location in reference to the springs. The scanning electron microscope (SEM) at the University of Miami was used in order to view dissolution fabrics among differing foraminiferal tests.

## **I.2 Historical Information**

Prior to drainage of the Everglades and associated lowering of the levels of freshwater on the mainland, offshore artesian springs were nearly continuously flowing, and some of them had structures built to which boats would tie up while filling up casks of freshwater (Figure 1). Kohout and Kolipinski (1967) document that fresh groundwater discharge affected salinities as much as 5 kilometers east of the shoreline in the Cutler area during both the wet and dry seasons.

Artesian flow of groundwater is recognized as an important component of historical freshwater input throughout western Biscayne Bay by Dole, 1914; Weiss, 1948; Woodmansee, 1949; D. Moore, 1963; Kohout 1967; Hoffmeister, 1974.

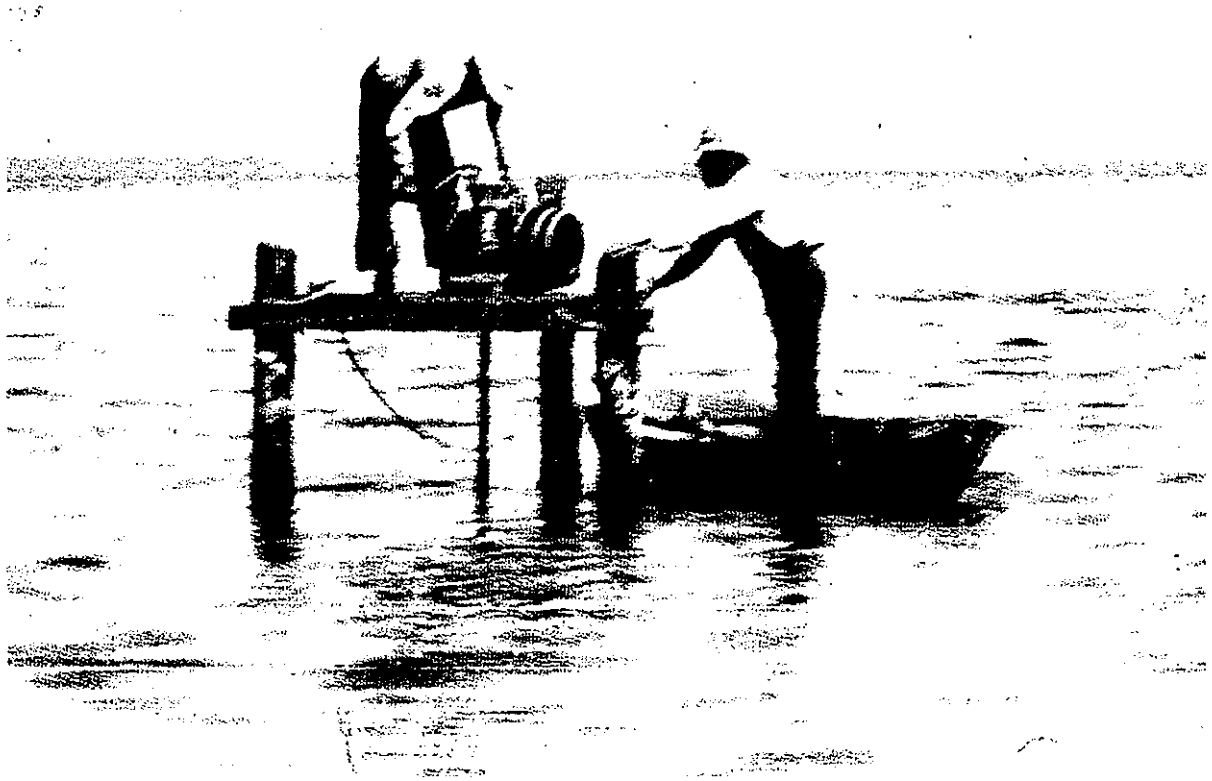


**Figure 1: Historic photo (early 1900's) of Biscayne Bay fishermen tied up to a flowing spring of the time, photo courtesy of the Historic Museum of South Florida**

An aerial photograph from December 20, 1938 clearly shows a spring discharging offshore in southern Biscayne Bay, south of Turkey Point (Figure 2). Reported freshwater near the Cape Florida Lighthouse on Key Biscayne has been examined, and it is concluded by the authors that this was a freshwater pond exposing the surficial groundwater lens of the island. There is a long, low depression about 1 km west of the lighthouse that is purported to be the natural depression from which freshwater was derived.

### **I.3 Recent Information**

H. Wanless personally observed near shore springs just south of the concrete jetty south of the Deering Estate in the 1960s and 1970s. By the late 1960s these were only active during the summer wet season. This area has now been filled.

H. Wanless and L. Tedesco observed numerous springs 100-400 m offshore between Convoy Point and Black Point in the wet summer seasons of 1993 and 1994. One of these was positioned with GPS at N25° 35.632' and W80° 18.275' (Wanless, 2001).

Historically dredged tidal ponds in the Mangrove fringe on the Montgomery Botanical Center property (just south of Snapper Creek Canal) had over 100 distinct, flowing freshwater springs flowing into the ponds during the wet summer of 1993-94 (personal communication of H. Wanless with Dr. Terrence Walters, former Executive Director, Montgomery Botanical Center). These were observed after cleaning the organic muck from the ponds following Hurricane Andrew. Although the dredging had undoubtedly broken the crust surface of the limestone, this observation illustrates the extensive network of karst conduits in the surficial limestone.

On October 7, 2003 H. Wanless flew the near shore zone of western Biscayne Bay from Snapper Creek Canal south to Card Sound seeking to identify springs by slicks on the slightly rippled bay surface. This was a time of recent heavy rains and high water levels on the mainland of South Florida. He identified 16 slicks and located them by GPS. Most of the slicks had visible dark karst holes associated with them. In addition to the 16 areas located, there looked to be 2-3 slicks in the area south of Turkey Point, but flight space restrictions prevented over-flight verification.

USGS field data suggest that 'ground-water discharge to Biscayne Bay may occur as far offshore as 500m' (Langevin, 2001), however most fresh ground-water seepage is thought to occur within 300 m of the shoreline (ibid).

John Ricisak from the Department of Environmental Resources Management (DERM) of Miami-Dade County government, identified a large (nearly 4 feet wide) spring and numerous smaller springs flowing in the shallow water of western Biscayne Bay just south of the Deering Estate property, located between the C-100 canal and the north side of the Old Cutler Road LLC facility located at 17777 Old Cutler Road. He mentioned that the springs flow intermittently and had observed them for years, including a month before the beginning of this project (personal communication with J. Ricisak).

Todd Garland of Matrix Films spoke of swimming in the entrance of the C-100 canal (on the south side of the Deering Estate property) and observing flowing freshwater springs in the area as a child (personal communication with T. Garland). Although the result of dredging this canal may have broken the limestone to allow groundwater seepage, this example also illustrates the karstic nature of the underlying Biscayne Bay bedrock.

Ernie Lent, a naturalist for the Deering Estate, identified a large spring at the terminal end of a small natural canal which is located within the mangrove swamp on the east side of the Deering Estate property. He had observed this spring in previous years, but became more interested in its significance when he was informed of the project. He also pointed out that numerous small springs are present in the shallow area on the north side



FIGURE 2. Spring in southern Biscayne Bay discharging on December 20, 1938.

of the boat basin at Deering Estate, and that during low tide, numerous small spring-like features in the Deering Estate boat basin emit fresh water, in which local manatees are observed to hover over and drink (personal communication with E. Lent).

#### **I.4 Project "DETECTION, MAPPING, AND CHARACTERIZATION OF GROUNDWATER DISCHARGES TO BISCAYNE BAY SFWMD CONTRACT C-15870"**

##### **I.4.A Project Objectives**

It was the purpose of this project to define the distribution, persistence and nature of flow of springs that are currently present and/or active in the vicinity of western Biscayne Bay. Initial objectives of the project included: 1) locating historic springs and categorizing their current status, 2) locating any present springs and categorizing their nature, 3) determine the condition of all such springs, and identify controls on their nature, 4) analyze the discharges from such springs and determine the water quality and salinities of discharging waters, as well as flow volume and velocity, 5) study the identified springs over a course of one year and determine whether changes in flow and water quality occurs over the seasons (primarily wet and dry seasons in South Florida), 6) study the sediments around and near the springs and determine what, if any, changes occur in their mineralogy as a result of the presence of such springs, 7) identify source locations for the water discharging from the springs, and 8) identify any information that would be valuable for current land use and management projects.

Many but not all of these objectives were met as a result of project complications and a short project time period. Some analyses, such as work done on the SEM, were

conducted after the project completion, and it is the hope that the results of these analyses will prove useful in addition to the information that was obtained during the course of the project.

#### **I.4.B Project Complications**

The length of the proposed research to be done on the artesian springs of Biscayne Bay was one year from the start date of January 2004. Unfavorable weather conditions (high winds) and the lack of a boat from the winter into late spring delayed field work for the first 3 months of the year. Weather conditions, field assistance, and boat availability continued to be an issue for a large portion of the first half of the year. A canoe was bought in the spring and was used for 99% of the field work. Wind conditions started to develop a spring/summer pattern in the early summer, when rain and thunderstorms patterns typical of South Florida began to occur. Due to the high probability of early afternoon summer thunderstorms, field work was usually restricted to the mornings.

Data collection in the field involving the YSI unit was not always consistent due to equipment malfunctions. For each field day in which the YSI was used, parameters which could be monitored were, and analysis was done with whatever data was available.

Procuring field assistance is always a factor involved in field work. For the first half of the project term I relied on the assistance of H. Wanless and an occasional student, either from the graduate or undergraduate geology program. Field days increased when AOML granted staff member Hector Casanova permission to assist me in the field as much as possible. Overall, my initial intent to spend an average of 1-2 days a week in the field over the course of one year turned into a maximum of only about 40 total days, in which some weeks had many field days, and many weeks had none.

In late November, 2004, we were told about several springs offshore within central Biscayne Bay, and we planned to visit one of these sites. However, we were unable to acquire the coordinates for the location and were unable to arrange a visit.

## **II. Methods**

### **II.2 Resources**

Historical information was available through personal references, literature, and the Historical Museum of South Florida, as well as from other local agencies working on projects associated with groundwater flow and freshwater springs. A detailed description of historical information is provided in Section I.2 of this report. All water collection equipment and the YSI were provided by NOAA-AOML. With the exception of the water quality measurements, all lab work was conducted in the Geological Sciences Department at UM, and in the SEM facility in the Nanoscience Sector of the UM Chemistry Department.

### **II.2 Field Work**

The majority of the field work was conducted in the shallow waters of western Biscayne Bay, just south of the C-100 canal (located on the southern boundary of the Deering Estate) (Figure 3), with use of a canoe. A few field days with a motor boat made available by Biscayne National Park or NOAA were spent looking for historical springs and possible springs located in deeper waters in the Bay, but yielded unfavorable results, and so most of the focus was on the shallow waters near the Deering Estate where J. Ricisak (DERM) had personally mentioned observing numerous springs. As mentioned, for the majority of the project I was aided by Hector Casanova of NOAA-AOML, and

used the assistance of other students, as well as H. Wanless, when Hector was not available.

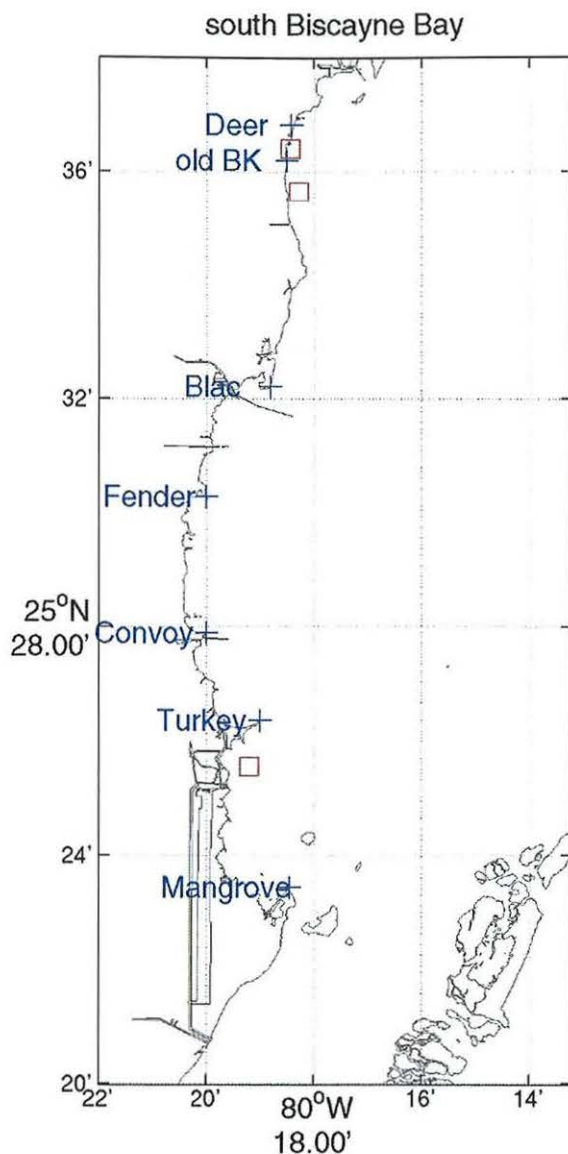


Figure 3. Surveyed spring locations.

Bottom square: first historical spring (25° 25' 33" N, 80° 19' 11.5" W). Middle square: second historical spring (25° 35' 38" N, 80° 18' 16.5" W). Top square: spring noted by John Ricisak (N25° 36' 23.2" and W080° 18' 25.8").

Two days of field work were spent looking for possible springs based on an aerial helicopter survey done by H. Wanless the previous year, identifying "slicks" over darker

areas in the limestone and marking the relative GPS positions of the features. The main conclusion of this is that it is virtually impossible to locate any surface feature near the documented GPS point unless the water is absolutely flat, and that no springs (either active or historical) could be found because there was no accuracy of the GPS points since the helicopter was moving when the points were marked.

When looking for a spring in deeper water, we would go to the GPS coordinates marked on the helicopter survey and search an area with a radius of nearly 30 feet around the original coordinate looking for any signs of a spring. This would include probing the sea floor for deeper sediment patches (sediment often fills karstic holes in the limestone), looking for visible "slicks" (differences in the surface water pattern) on the water surface which may indicate a disturbance beneath, and searching for water mixing zones within the actual water. These water mixing zones are categorized by a "shleran" [blurry] feature, which is created when salt water mixes with fresher water.

When surveying the area by canoe (work restricted to the area near and south of the Deering Estate, we (a field assistant and myself) would paddle around and again look for either 1) a "slick" or surface disturbance on the surface of the water, 2) a small hole in the sediment that seemed not to be filled in, and 3) (actual sign of a spring) a blurry column of water coming through the water. Surface and schleran features were only observable during very calm days with no wind, when one may see from the water surface down to the sediment. The entire area near the Deering Estate, including north of the Deering Estate boat basin, east to Chicken Key, within the boat basin, and south of the Deering Estate and Chicken Key to nearly 300 meters south of the C-100 canal were surveyed for any signs of springs. J. Ricisak gave me a photo taken from his flats boat of a large

spring in the area south of the canal which ultimately led to the discovery of the largest spring found in this study, which we appropriately called "Ricisak" spring in gratitude for his contribution. Each spring found had its coordinates recorded and was given a name in the format BBS# (Biscayne Bay Spring #). The number assigned was the order in which the spring was found.

In addition to marking a found spring with the GPS, the following information would be obtained: 1) photos taken, above the surface and below the surface of the spring, 2) weather conditions, 3) area features (sediment type, relative water depth, canals in the area, etc.), 4) water temperature and pH (often of both near surface and at the base of the spring), 5) nature of the spring (flowing, not flowing, flow velocity-when possible, etc.), 6) water samples collected for nutrients and ammonia, 7) water quality parameters collected, 8) surface sediment samples collected, 9) a notation of local canal opening/closing, and 10) previous rain/dry events and 11) local tide condition.

Water samples were collected per NOAA-AOML sampling procedure, kept on ice, and brought back to AOML within 48 hours for analyses. Sediment samples of the top 1-2 cm were "scooped" up, capped, labeled and iced and brought back to the lab at UM for analyses. Water grab samples from on top of and near springs were analyzed for pH and temperature. Recording of in-situ salinity (conductivity), temperature, water depth (height of water above the pressure sensor), velocity, turbidity, and chlorophyll data time series began in October 2004 with use of a YSI ADV 6600 instrument (a columnar water data logger about 0.8 m in length). The YSI instrument was deployed and left over the course of 3 hours to one week on different field excursions and collected and stored



**Figure 4: YSI instrument deployed within a conduit of BBS21**

various water quality measurements (Figure 4). Results were later retrieved from the device, downloaded, and saved on readable format.

Surface sediment samples were collected along pre-determined radial transects around a spring. A sediment sample was collected from sediments within the center of the spring, where the water was actually flowing out, and to the N, S, E, and W sides of the spring at the edge, 1 meter distance and 4 meters distance. The sediment samples were

labeled BBSS(Letter) (Biscayne Bay Spring Sediment sample and letter [A-M] according to where the sample was taken) (Figure 5). Sediment samples were collected in this manner only for the two largest springs (Ricisak Spring and BBS22.) Most other springs had sediment samples collected from only the center of the spring or alongside one edge, as the smaller springs were usually 0.1-0.8 cm in diameter.

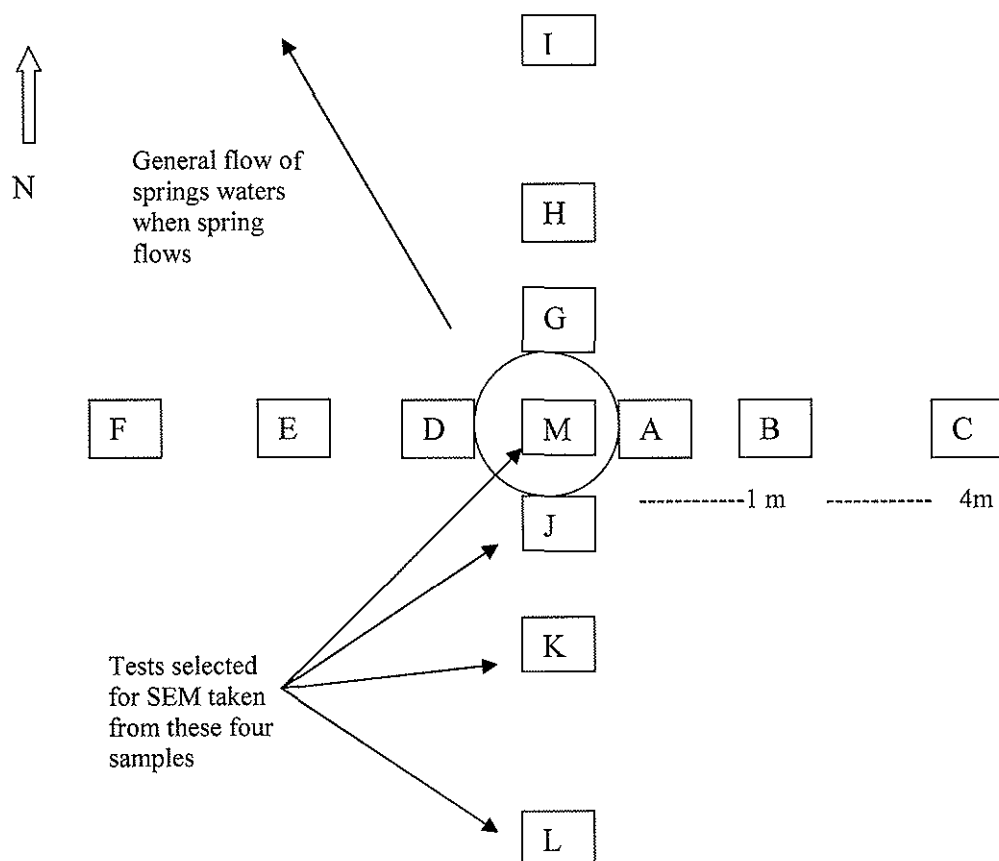


**Figure 5. Radial transects and number assignments for surface sediment sample collected from BBS21 and BBS22.**

### **II.3 Lab work**

NOAA-AOML analyzed all water samples at their AOML lab. Water samples were analyzed for salinity, nutrients, and ammonia. All water sample analyses are included in Appendix 4 of this report. The YSI instrument data were downloaded from each field day by H. Casanova and sent to me for review. YSI data is tabulated in Appendix 3.

Sediment samples were wet sieved into grain size fractions: > 4 mm, 4-2 mm, 2-1 mm, 1-0.5 mm, 0.5-0.25 mm, 0.25-0.125 mm, 0.125-0.063 mm, and < 0.063 mm, put in aluminum weigh boats [for each spring and size category] and dried in an oven on low temperature. The sample fractions were then weighed and analyzed under a compound binocular microscope for temporal and spatial gradients in preserved skeletal fauna (with a focus on benthic foraminifera). An overall composition analysis was estimated and recorded in an excel spreadsheet. Relative abundance, verses an exact count, of all constituents was recorded as follows:

Groupings: 15%, 50%, 100%

15% means 15% or less of sample is composed of xyz

50% means 50% - 15 % of sample is composed of xyz

100% is 100% - 50% of sample is composed of xyz

The relative abundance of each foram species was recorded in the same manner, as were all non-foraminiferal constituents for each size fraction of each sample. Graphs were produced for each sample: one graph for foraminiferal composition, and one for all other sediment components. All graphs may be viewed in Appendix 2.

### **II.4 Scanning Electron Microscopy (SEM)**

A variety of foraminiferal tests were initially selected from the dried sediment samples to look at under the Scanning Electron Microscope (SEM) in order to analyze if there was preferential dissolution for certain species and/or for different size groups closer to and

farther away from the springs. I selected a variety of tests from the center of the two larger springs [BBS21 (Ricisak Spring) and BBS22], as well as specimens from the edge of the springs, at 1 m and 4 m distance away from each of the springs. The initial test was to observe the following: 1) any signs of dissolution, 2) species most prone to dissolution, 3) dissolution changes associated with different size tests, and 4) noticeable changes in dissolution as one moves from the center of the spring(s) to a distance of 4 meters away from the spring(s).

Between 3 and 12 individual tests of each *Ammonia* sp. OR *Elphidium* sp. AND from the Miliolid family were carefully segregated from the size fractions of 1.0-0.50 mm, 0.5-0.250 mm, and 0.25-0.125 mm from 4 different sediment location samples from both of the springs and placed on small stubs (which have carbon tape on top for adhering the samples). The tests selected for this study were from samples taken from the center of the two springs, from along the south edge of the springs, and from 1 m and 4 m away from the springs along a transect on the south side of the springs (Figure 5, arrows). These sample locations were chosen because spring waters being emitted would usually (more often than not) flow in a northwest direction, and the object of the study was to see a change in dissolution patterns closer to and farther away from the springs. It is possible that if spring waters flowed over all the sample locations, the differences in these patterns might not be as obvious. Once the samples were mounted, they were gold coated with a sputter coater in order to increase conductivity for the electron beam of the SEM.

All tests collected were viewed at 80x, and at magnification so as to see the fine crystalline microstructure, and recorded as either having a visible dissolution fabric or not.

In order to be able to correctly identify dissolution fabrics on foraminifera tests, I self induced dissolution on foraminifera tests from both groups (*Elphidium/Ammonium*) and the Miliolids in order to compare these tests with those unaltered in the sample. The tests were bleached in order to remove organics, and dipped in either acid solution with a pH of 7 or pH 4. All the samples were taken from Ricisak spring sediment samples, each sample containing two Miliolid tests from 1.0-0.50 mm size fraction, and two *Ammonium* sp. tests and two Miliolid tests from the 0.5-0.25 mm size fraction.

The results of this work can be viewed in Table 1 in the results section of this report.

### **III. Results**

#### **III.1 Located Springs**

The historical spring noted in the 1938 photo, located in the embayment south of Turkey Point in southwestern Biscayne Bay, occurred emanating from a sediment-filled and seagrass covered karst depression. It was located on February 26, 2004 by the pattern of sediment filled karst holes in the area. Within the seagrass karst patch we found one area that was bare sediment. Probing through the sediment sequence below the bare patch, we found the sediment much looser than elsewhere across the sediment-filled karst hole. There was no active flow from the bare patch or elsewhere in the karst depression on the day of our visit. The site is located at 25° 25' 33" N and 80° 19' 11.5" W.

A second historically active spring site located at 25° 35' 38" N and 80° 18' 16.5" W, along western Biscayne Bay about 200 meters offshore and about one km south of the former Burger King headquarters, was observed by H. Wanless to be active during the

summers of 1993 to 1997 (Figure 6). This site was relocated on March 31, 2004. It also is associated with a sediment-filled seagrass-covered karst depression in a water depth of about 1 m. There are several small barren depressions in the karst depression. None of them were flowing on the day visited. We took surface sediment samples along a landward to seaward transect across the site. The site location is indicated in Figure 3.

The spring identified by J. Ricisak from Miami-Dade County D.E.R.M. was easily identified in the field by use of lining up a photograph of the spring provided by Mr. Ricisak with the same background in the field (Figure 7). The spring site is located in



**Figure 6:** Underwater photograph of one of several springs active on December 31, 1997, observed by H. Wanless in western Biscayne Bay just south of the former Burger King headquarters (25° 35' 38" N and 80° 18' 16.5" W). This spring seeped from conduits in the limestone up through the overlying Holocene sediment. Notice the algal scum mat and the lack of the seagrass, *Halodule wrightii*, in the immediate vicinity of the small spring. This is the second historical spring described in the text. Red mangrove leaf on front right side of sediment dome is about 8 cm in length. Photo by H. Wanless.

less than one meter of water about 100 meters seaward of the shoreline. The area is largely covered by the seagrass *Thalassia testudinum* with patches of *Hallandale wrightii* or no seagrass cover (the latter having less than 10 cm of sediment cover over the limestone rock surface. The spring site is about 2.5 by 3 meters across. The sediment cover is absent exposing a karsted rock surface about 1.5 meters in depth, with a complex of interconnected small (arm diameter) karst conduits extending downward. We made bottom sediment sampling traverses (N, S, E, and W) from the center of the spring outwards. The GPS coordinates of the spring are N25° 36' 23.2" and W080° 18' 25.8".



**Figure 7:** Upwelling observed in Biscayne Bay (view is looking nw), north of the old Burger King headquarters (photo by John Ricisak). It is located at N25° 36' 23.2" and W080° 18' 25.8".

The overall features of Ricisak Spring are best seen on a clear day with flat water, where the water surface feature is seen above the water (Figure 8). Ricisak Spring was instrumented for multiple parameter measurements. The spring had dimensions of approximately 2 meters by 3 meters and was surrounded by plant growth (primarily

less than one meter of water about 100 meters seaward of the shoreline. The area is largely covered by the seagrass *Thalassia testudinum* with patches of *Hallandale wrightii* or no seagrass cover (the latter having less than 10 cm of sediment cover over the limestone rock surface. The spring site is about 2.5 by 3 meters across. The sediment cover is absent exposing a karsted rock surface about 1.5 meters in depth, with a complex of interconnected small (arm diameter) karst conduits extending downward. We made bottom sediment sampling traverses (N, S, E, and W) from the center of the spring outwards. The GPS coordinates of the spring are N25° 36' 23.2" and W080° 18' 25.8".



**Figure 7:** Upwelling observed in Biscayne Bay (view is looking nw), north of the old Burger King headquarters (photo by John Ricisak). It is located at N25° 36' 23.2" and W080° 18' 25.8".

The overall features of Ricisak Spring are best seen on a clear day with flat water, where the water surface feature is seen above the water (Figure 8). Ricisak Spring was instrumented for multiple parameter measurements. The spring had dimensions of approximately 2 meters by 3 meters and was surrounded by plant growth (primarily

seagrasses and green algae species). Within the spring multiple exit holes were observed in the bottom, so that the spring consists of, potentially, multiple-hole flows (Figure 9).

Ricisak Spring and two other springs were observed to flow almost continually during the wet season, and intermittently during the dry season, usually in conjunction with an outgoing tide. Flow is greatest after a heavy rain event and just before peak low tide. This is a response to the less dense fresh water being able to “push” its way out of the karst conduits against the more dense saline water as the salt water retreats with an outgoing tide. Flow out of the springs was determined through observation to be at a rate



**Figure 8: BBS21 (“Ricisak”) as viewed from the canoe looking north on a calm day during low tide. Water depth at edge of the spring is approximately 1ft.**

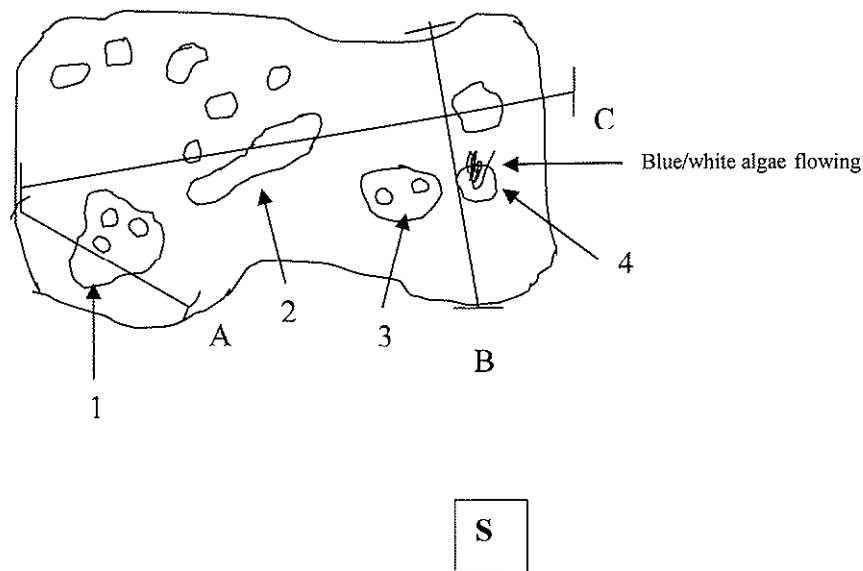


Figure 9: BBS 21 ("Ricisak") Spring Sketch. Details below.

**Ricisak Spring details:**

Hole 1: Hole 63 cm diameter

1 m depth from water line to hole bottom, 45 min past low tide

49 cm depth from top of the main hole to "nostril"

Nostril diameter 18 cm (three of them)

Hole 3: Hole 45 cm diameter

26 cm depth from nostril 1 bottom to top of main hole

36 cm depth from nostril 2 bottom to top of main hole

1 m 46 cm depth from waterline to bottom of main hole, 55 min past low tide

Diameter upper nostril: 11 cm

Diameter lower nostril: 17 cm

Hole 4: Hole 16 cm diameter

66 cm depth from top of hole to water line, 1 hr. 5 min past low tide

Hole is very deep, unable to measure

Transect A: 1.5 m

Transect B: 1.5 m

Transect C: 2.3 m

**BBS22:**

Hole is 10 cm diameter

18 cm depth from top of hole to bottom of hole

52 cm depth from top of hole to water line, 1 hr. 20 min past low tide

of 15-20 cm/sec during low tide in the wet season. This flow would create a visible surface disturbance on the overlying water. Flow at other times would not be enough to create a surface disturbance on the water.

There is a direct correlation between the opening and closing on the local flood gates, in particular those close to the location of the springs, and the flow velocity of the spring waters. Springs flow more readily during the wet season after heavier rain events, and when the water tables are high. However, when the flood gates are opened to alleviate the high water tables and prevent mainland flooding, the flow of the springs diminishes in strength or disappears completely.

Numerous smaller springs were found on the north side of the boat basin off the Deering Estate property, within the boat basin of the Deering Estate, and many within the general area of the two larger springs found (Ricisak Spring and BBS22). Most of these smaller springs ranged in size from 0.2 cm to 0.8 cm diameter and were observed only on very calm days without wind. Only 5 of the springs produce a surface feature and can only be seen as a blurry column of water coming from a small hole (Figure 10). When the flood gates were open or during the dry season, these smaller springs did not flow and their sediment openings would quickly become filled with sediment.

The spring noted by E. Lent of the Deering Estate, located at the terminal end of one of the natural canals on the Deering Estate property, was observed on two occasions, one day when it was not flowing and one day when it was. Todd Garland of Matrox Films was present the second visit to this spring and used his scuba underwater light in order to see within the spring more clearly. This canal actually has 2-3 springs, one large opening that extends nearly 10 feet down before making a narrow turn horizontally along the

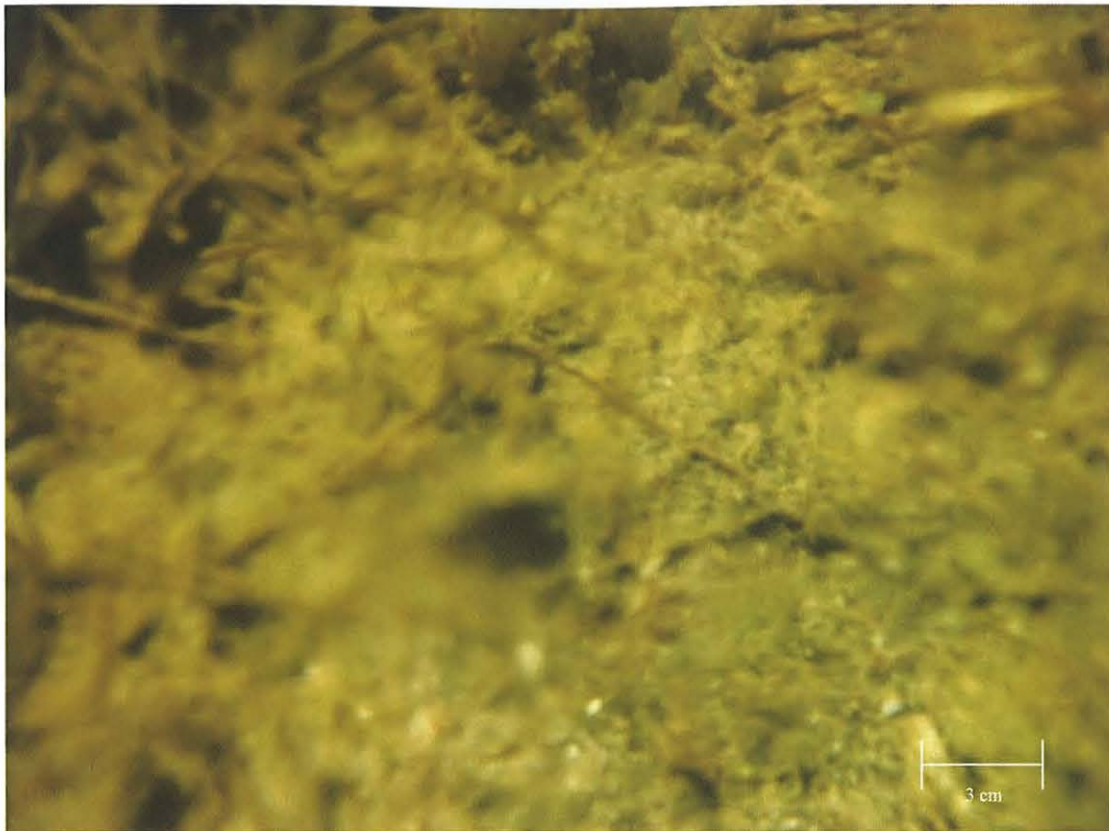


**Figure 10: BBS26 – one of the smaller springs located only on windless days, where the blurry column may be observed coming from a small opening in the sediment.**

bedrock, and 1-2 smaller springs scattered within the mangrove roots in the surrounding area (Figure 11). The walls of the large spring are covered with oysters and fine sediment. When the spring is flowing, the smallest of disturbances stirs this sediment and makes it impossible to see clearly through the turbidity. The smaller springs within this canal are observed only by their surface features as the fine sediment of the area and high organic content makes finding their source near impossible. An interesting fact for the area of these springs is the presence of an archeological Tequesta Indian site only 5 or so meters away. It would be interesting to know if this spring was present at the time the Tequesta Indians inhabited South Florida, and whether they used this site for bathing, fishing and swimming.

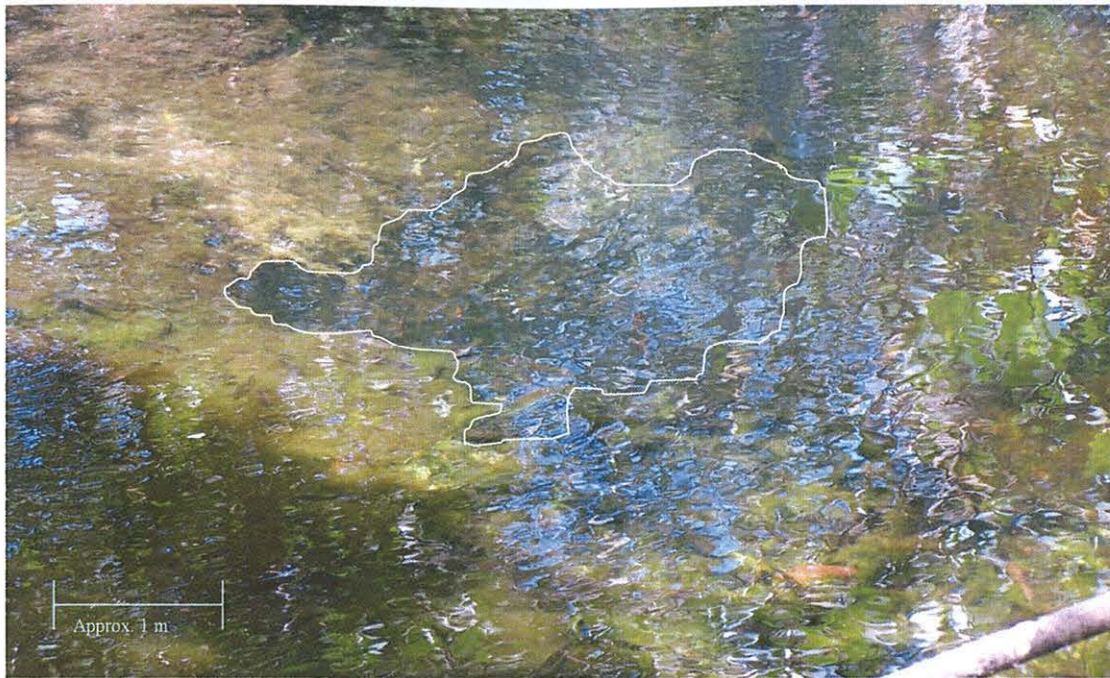


**Figure 11: BBS “Tequesta” large spring (outlined) within natural canal on Deering Estate property (above) and smaller spring surface feature located among mangrove roots nearby (below-arrow).**



### III.2 Water Sample and YSI analyses

A YSI ADV 6600 was first used in October, but the instrument failed and was later replaced. Data collection with the YSI began in November. All YSI data collected are included in Appendix 3 of this report.

A clear tidal signal is seen with the water depth ranging from 1.08 meters to 1.56 meters. A salinity signal is also observed which correlates with the tidal signal. Highest salinity values, e.g. 23 ppt, are seen to correspond to high tide instances and the lowest salinity values, e.g. 10 ppt, are seen to correspond to the low tide instances. The daily heating cycle of water in Biscayne Bay is seen in the temperature signal where temperature ranges from a high of approximately 28.5 °C to a low of 26° C.

During periods of high tides, salinity values, 29 to 30 ppt, typical of western Biscayne Bay values, were observed at the entrance of the Ricisak Spring. During the periods of low tide, low salinity values of 9-10 ppt, were observed. Lowest salinity values were observed approximately mid point between high and low tides (ebb) and low to high tides (flood).

The pH readings taken from surface waters at the springs and from waters at the spring mouths (where the water first comes out) reveal a slight increase in acidity of spring waters as compared to the surrounding environment. The pH of spring waters ranged from 6.7 to 7.9 whereas normal marine seawater is generally in the range of 8.2. Away from the springs but in the general area, the pH ranged from 7.8 to 8.2.

The nitrate plus nitrite ( $\text{NO}_3 + \text{NO}_2$ ) total values in micro Moles ( $\mu\text{M}$ ) ranged from below detectable limits (BDL) to 1.4  $\mu\text{M}$  for the water samples that were collected. The phosphate levels ( $\text{PO}_4$ ) ranged from 0.05 to 1.5  $\mu\text{M}$ . Silica (Si) ranged from 13.7 to 80.3

$\mu\text{M}$ , and Ammonium ( $\text{NH}_4$ ) ranged from BDL to  $75.8 \mu\text{M}$  (this high value may be an outlier, as it is the next largest value above a recorded 16.8).

Water sample analyses are tabulated in Appendix 4 of this report.

### III.3 Sediment Sample Analysis

Sediment data are tabulated and presented in graphical form in Appendix 2. Separate graphs are provided for a) benthic foraminiferal composition and b) all other sediment components. The main components of the sediment samples were seagrass fragments, quartz sand, foraminifera tests and other carbonate grains, such as bivalve fragment and gastropods (abundant through the larger size fractions). An important fact to note is that the sediment samples taken from the center of the springs had virtually no seagrass and were composed primarily of quartz grains and carbonate components, such as bivalves and gastropods (whole and fragmented), *Halimeda* fragments and other algal pieces, and ostracods.

The most common (usually occurring as greater than 15% of the sample) foraminifera present in almost all the samples were *Ammonia beccarii* (ornate), *Ammonia beccarii* (v. *parkinsoniana*), *Triloculina rotunda*, *Triloculina oblonga*, and *Triloculina trigonula*. Many other species of foraminifera were present but in minor amounts. There were some positive correlations (in both springs) with species content and distance from the center of the spring. In general, *Triloculina species* tests and *Quinqueloculina species* tests (similar genera in Family Miliolidae) increase in frequency the farther from the center of the spring you go. However, the exception to this trend is *Triloculina rotunda*, whose frequency does not change respective to distance from the spring. *Ammonia species* tests and *Elphidium species* tests are most abundant near the center of the springs, but still

constitute a large percentage of total foraminiferal tests in all of the other sediment samples.

Various literature (Bock, et al., (1963), Scott, et al., (2001), and Sen Gupta, (1999)) suggest environmental preferences of foraminiferal species. Generally recognized paleoecological traits of some of more important benthic foraminifera have assisted in the evaluations that follow:

- a. *A. beccarii*: Florida Bay studies show greater abundances closer to mainland, where there is freshwater runoff from land [Bock et al., 1963 and Rose et al., 1977]. *A. beccarii* was also associated with estuarine assemblages in foraminifera studies conducted along the coast of South Carolina [Scott et al., 2001]. Scott et al. (2001) noted that this species did appear, however, in hypersaline, normal marine, and salt marsh environments as well. Studies from Scott et al., (2001) also define *A. beccarii* as a pollutant indicator.
- b. *A. beccarii* v. *parkinsoniana* was observed in the greatest quantities closest to the FL mainland in FL Bay studies [Bock et al., 1963].
- c. *T. trigonula* is widespread in FL Bay studies, absent only from restricted areas of the Bay and deeper waters [Bock et al., 1963].
- d. *T. oblonga* is present in lagoonal habitats world-wide [Scott et al, 2001].
- e. *T. rotunda* is widespread and tolerant, and appears in FL Bay near fresh water regions [Rose et al., 1977].
- f. *E. discoidale* is indicative of brackish water environments [Bock et al., (1961), Rose et al., (1977) and Scott et al., (2001).].

The greater abundance of *Ammonia species* and lesser abundance of members of the Miliolid group (*Quinqueloculina species* and *Triloculina species*) closer to the spring and the increase in abundance of the Miliolid group as you move farther from the spring, signals that there is a change in the salinity and/or acidity (which often go hand in hand) of the water coming from the springs.

The greatest numbers of foraminifera were observed in the east-west transects sediment samples (samples A, B, and C and J, K, and L) for both springs. This correlates with the fact that the water emitted from the springs generally flows north to northwest depending on tide and wind conditions. Many of the foraminifera species common in the marine environment and in my sediment samples are unable to tolerate large salinity fluxes, and so it makes sense there is a general decrease in overall foraminiferal tests in those sediment samples directly in the path of spring waters.

### III.4 SEM results

The scanning electron microscope (SEM) was used in order to view foraminiferal tests at greater magnifications. At a magnification of 80x, the whole test is visible but microcrystalline structure is not. Microcrystalline structure becomes visible at greater magnifications (usually above 1200x) and dissolution fabrics (when present) start to become clear. In fact, whereas a test may appear to be free of a dissolution fabric at 80x magnification, it may show an extensive matrix at a much higher magnification, such as 2000x. It is important, therefore, to increase magnification on the image until the fine microcrystalline structure can be seen clearly.

Rossinsky (1984) noted in his master's thesis that *Ammonia* and *Elphidium* tests are the more robust of the foraminifera tests and hence more capable of resisting dissolution. The *Elphidium/Ammonium sp.* group appeared to have less dissolution on their tests than tests from the Miliolid group closer to the center of the springs, and there was a decrease in the presence of dissolution fabrics with Miliolid tests farther from the springs (no change in the *Elphidium/Ammonium sp.* group as distance increases from the springs).

There is no real significant influence of size on dissolution. It is possible that the two size fractions used (0.5-0.25 mm and 0.25-0.125 mm) are not spaced far enough apart to pick up on the effects of size on dissolution. Obviously, the more surface area on a test, the more area to be dissolved, but the question remains whether or not actual size contributes to a faster or slower dissolution rate.

During my experiments I also observed changes in the microcrystalline structure between species. Sen Gupta (1999) illustrates the varying structure/composition of different foraminiferal family groups: Order Rotaliidae (ex. *Ammonia becarii*) is composed of numerous crystals of elongate low-Mg calcite, forming a bilamellar wall and Order Miliolidae (exs. *Quinqueloculina* and *Triloculina* species) are composed of elongate high-Mg calcite crystals. This is supported by my findings of varying crystal structures through the SEM. *A. becarii* sp. tends to have very small crystals, packed in a columnar fashion where the surface of a test shows only the top portions of the crystals. A view of the internal arrangement reveals this structure (Figure 12). An energy dispersive spectroscopy, or EDS spectrum for short, of the *A. becarii* test reveals that the Mg peak is low on this species (Figure 13). It is important to note that the height of the peak in a spectrum is the relative intensity concentration and can not be compared against a different element peak in the same spectrum. This means that although two different elements (such as Ca and Mg) may have different peak heights within a spectrum, they may or may not have the same concentrations in the sample (a complicated mathematical equation within the computer system actually computes a concentration to deliver the peak, but this information is not available). The value of using EDS is to compare spectrums of two or more locations on a single sample, or to compare against spectrums

from different samples. Different heights of the same element among different samples do give an indication of relative concentration. For instance, a higher Mg peak in one spectrum compared to a lower Mg peak in another spectrum is a good indication that the first spectrum represents a higher concentration of the element Mg in the sample it is derived from.

The crystalline structure of a member from the Miliolid family, however, is quite different. For instance, a *Quinqueloculina sp.* test reveals a pattern very similar to a brick wall, where the largest rectangular surface of each brick is visible on the outside surface of the test (Figure 14). This species reveals a higher magnesium peak on the EDS spectrum than that of the *Ammonia sp.* (Figure 15). Different members of the Miliolid group have similar structures, although their "brick-like" structure may differ from more elongate or rectangular to more cube-like. Photos of various foraminiferal tests and their microcrystalline structures may be viewed in Appendix 6.

Foraminiferal structure commonly changes from one layer to the next on a test. I have observed that the lower layers, usually observed after dissolution of the top-most layer, are usually more needle-like in the Miliolid group (Figure 16), and an EDS spectrum reveals that the magnesium level is lower in the needle-like crystals than in the brick-like crystals. Dissolution in the *Ammonia species* and *Elphidium species* does not reveal as much of a lower layer, but entails more an "acidic-like" weathering away of the actual crystals (Figure 17).

Those tests which I self induced dissolution on showed similar fabrics to those tests I had already observed under SEM. Very little dissolution was observed at a pH of 7, and when present, only on the Miliolids. At a pH of 4, dissolution on both groups of tests

**TABLE 1. Foram tests with and without dissolution as viewed under SEM.**

| <b>SITE</b>  | <b>SIZE FRACTION<br/>(mm)</b> | <b># TESTS<br/>INSPECTED</b> | <b># Test Show<br/>Dissolution</b> | <b># Tests Show NO<br/>Dissolution fabric</b> |
|--------------|-------------------------------|------------------------------|------------------------------------|-----------------------------------------------|
| <b>BBS21</b> | 0.5-0.25                      | 14 Miliolids                 | 8                                  | 6                                             |
| <b>M</b>     |                               | 14 Am./Elp.                  | 4                                  | 10                                            |
| <b>M</b>     | 0.25-0.125                    | 12 Miliolids                 | 8                                  | 4                                             |
|              |                               | 12 Am./Elp.                  | 3                                  | 9                                             |
| <b>J</b>     | 0.5-0.25                      | 12 Miliolids                 | 9                                  | 3                                             |
|              |                               | 12 Am./Elp.                  | 2                                  | 10                                            |
| <b>J</b>     | 0.25-0.125                    | 14 Miliolids                 | 8                                  | 6                                             |
|              |                               | 14 Am./Elp.                  | 3                                  | 11                                            |
| <b>K</b>     | 0.5-0.25                      | 14 Miliolids                 | 9                                  | 5                                             |
|              |                               | 14 Am./Elp.                  | 0                                  | 14                                            |
| <b>K</b>     | 0.25-0.125                    | 13 Miliolids                 | 5                                  | 8                                             |
|              |                               | 13 Am./Elp.                  | 1                                  | 11                                            |
| <b>L</b>     | 0.5-0.25                      | 15 Miliolids                 | 2                                  | 13                                            |
|              |                               | 15 Am./Elp.                  | 1                                  | 13                                            |
| <b>L</b>     | 0.25-0.125                    | 6 Miliolids                  | 1                                  | 5                                             |
|              |                               | 6 Am./Elp.                   | 0                                  | 6                                             |
| <b>BBS22</b> | 0.5-0.25                      | 11 Miliolids                 | 9                                  | 2                                             |
| <b>M</b>     |                               | 11 Am./Elp.                  | 4                                  | 7                                             |
| <b>M</b>     | 0.25-0.125                    | 11 Miliolids                 | 8                                  | 3                                             |
|              |                               | 11 Am./Elp.                  | 3                                  | 8                                             |
| <b>J</b>     | 0.5-0.25                      | 10 Miliolids                 | 8                                  | 2                                             |
|              |                               | 10 Am./Elp.                  | 2                                  | 8                                             |
| <b>J</b>     | 0.25-0.125                    | 8 Miliolids                  | 5                                  | 3                                             |
|              |                               | 7 Am./Elp.                   | 2                                  | 5                                             |
| <b>K</b>     | 0.5-0.25                      | 6 Miliolids                  | 3                                  | 3                                             |
|              |                               | 7 Am./Elp.                   | 2                                  | 5                                             |
| <b>K</b>     | 0.25-0.125                    | 5 Miliolids                  | 2                                  | 3                                             |
|              |                               | 3 Am./Elp.                   | 0                                  | 3                                             |
| <b>L</b>     | 0.5-0.25                      | 10 Miliolids                 | 2                                  | 8                                             |
|              |                               | 10 Am./Elp.                  | 1                                  | 9                                             |
| <b>L</b>     | 0.25-0.125                    | 9 Miliolids                  | 4                                  | 5                                             |
|              |                               | 9 Am./Elp.                   | 0                                  | 9                                             |

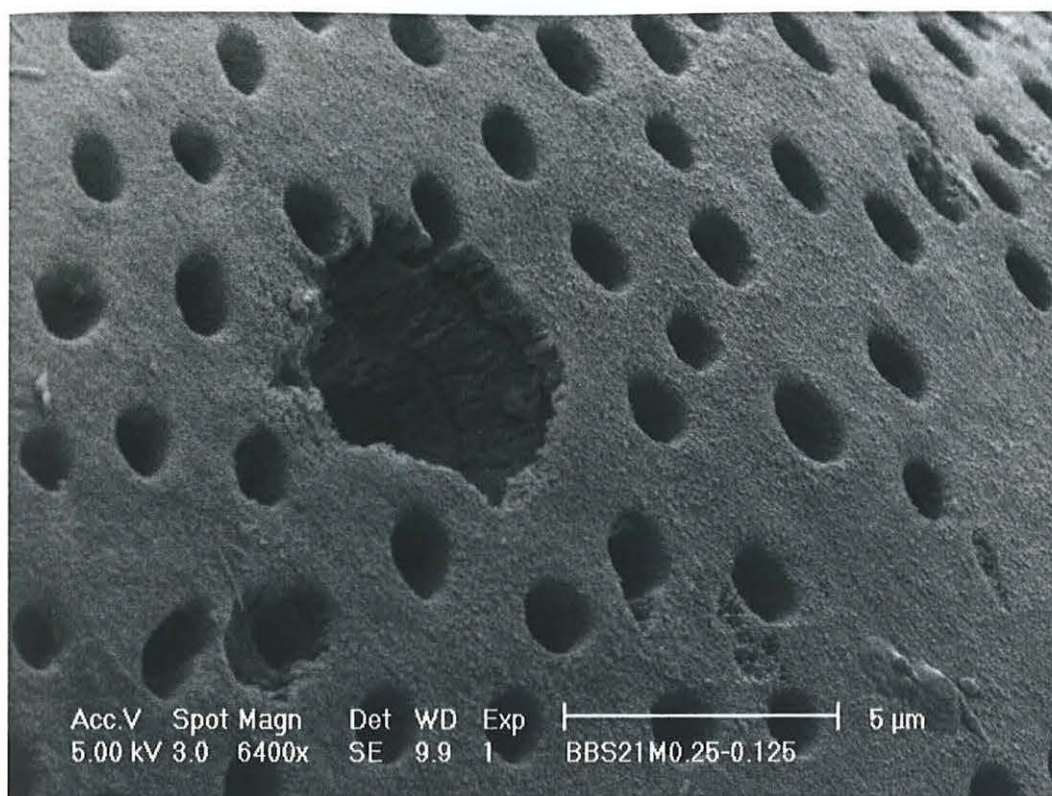


Figure 12: SEM photo of the internal crystal arrangement of an *Ammonia becarii* test

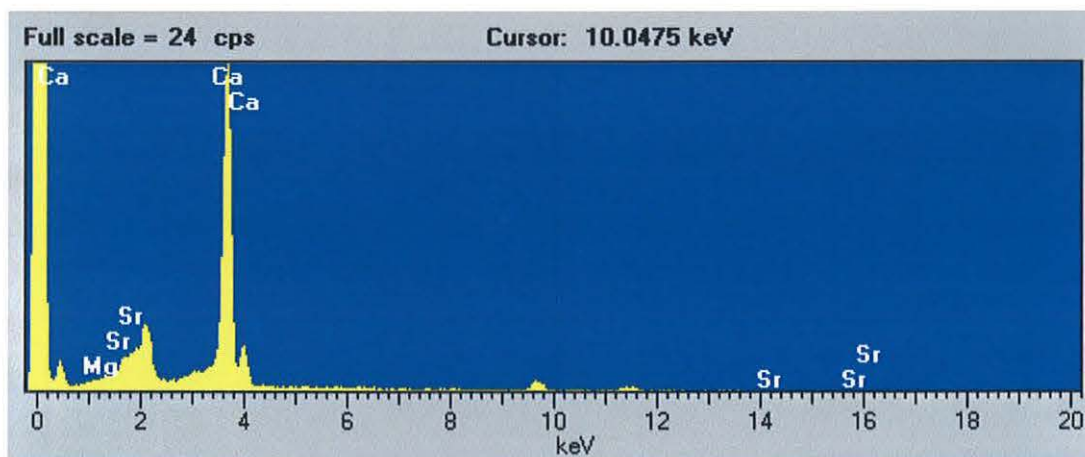


Figure 13: Spot EDS on the outer surface of an *Ammonia becarii* test. Notice the low peak of magnesium.

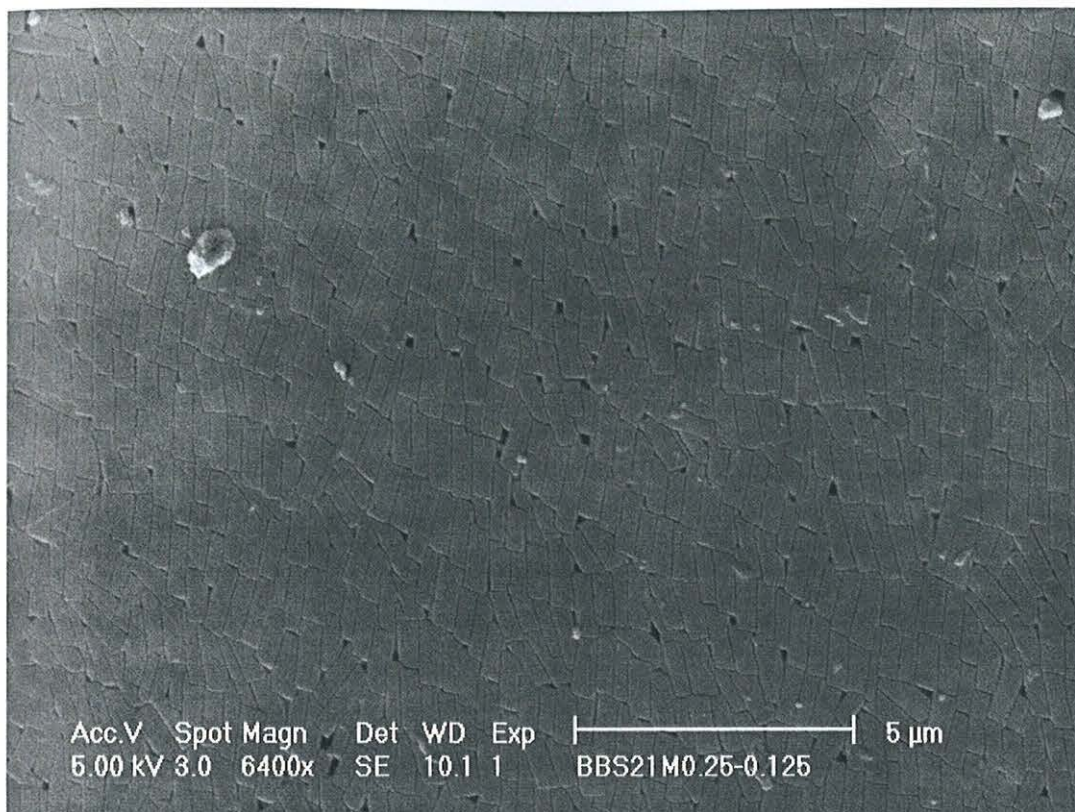


Figure 14: SEM photo of outside crystalline structure of a *Quinqueloculina* sp., a member of the Miliolid group.

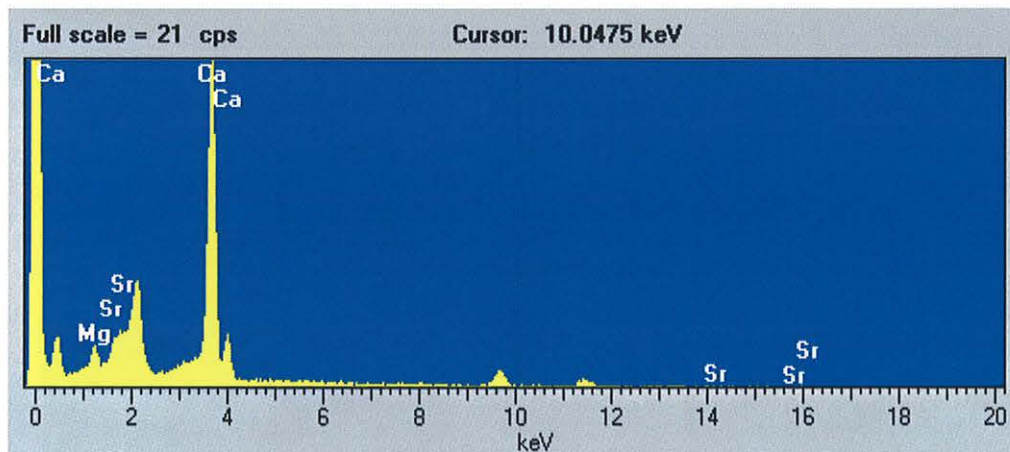


Figure 15: Spot EDS of the outer surface of foram test in Figure 14 above. Notice a magnesium peak greater than that of an *Ammonia* sp. test.

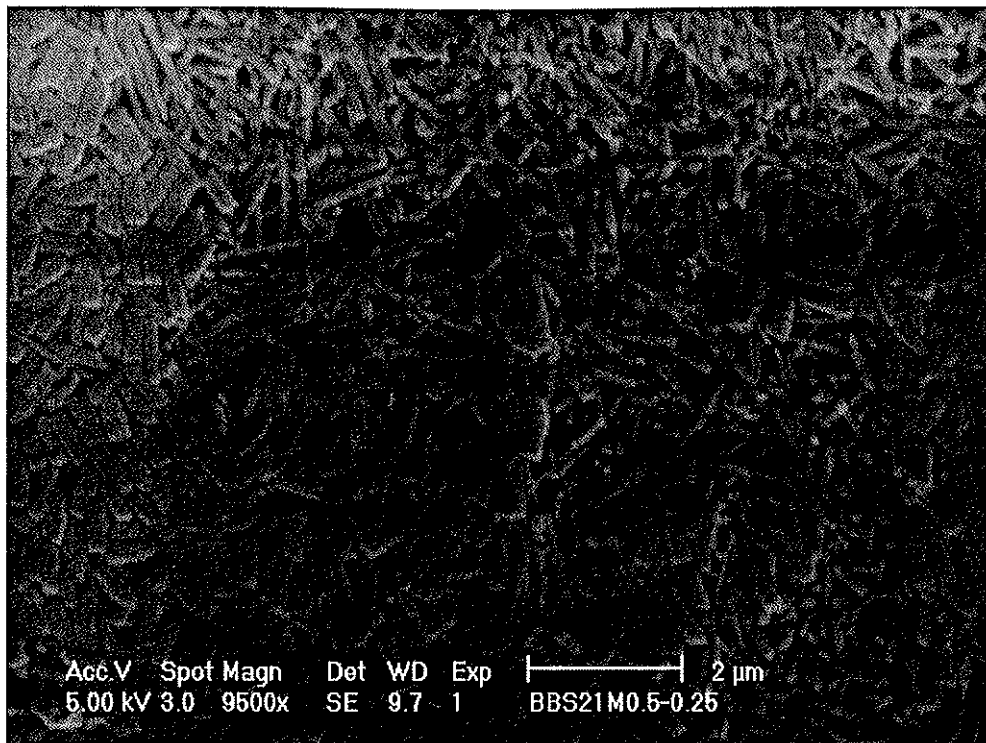


Figure 16: SEM photo of the surface of a *Triloculina* sp. (Miliolid) revealing a needle-like crystal structure underneath a partially dissolved brick-like structure

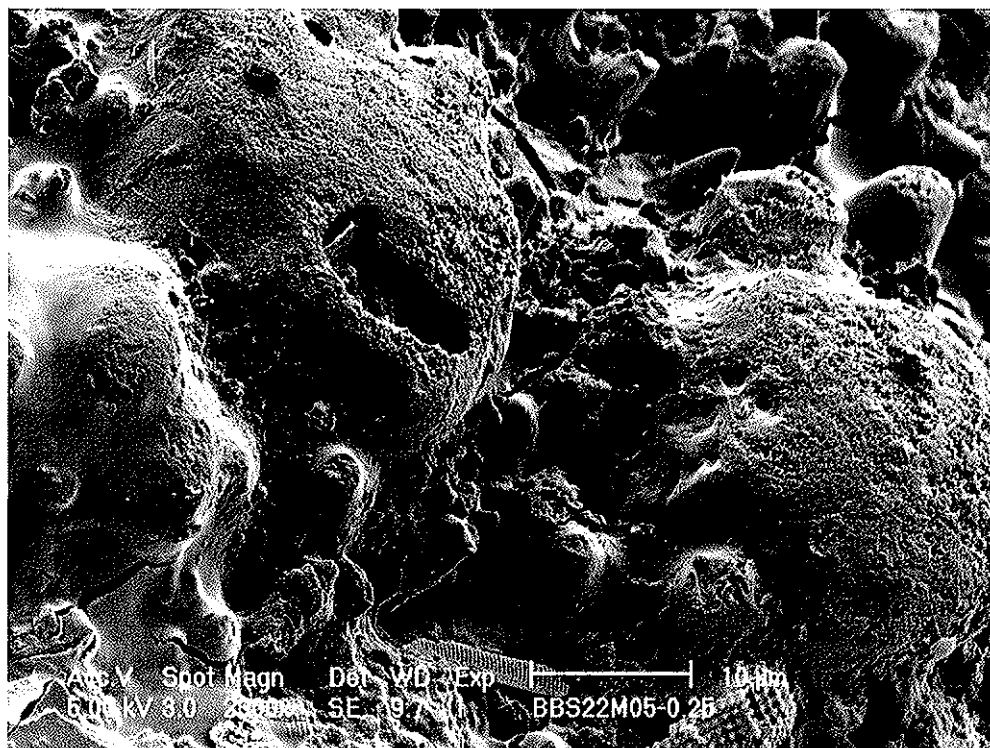


Figure 17: Dissolution feature of "weathered away" look on the surface an *Ammonia beccarii* test

was observable. The dissolution fabrics resembled the fabrics observed on the samples used in this study, with only slight variances where portions of a test were dissolved more readily (Figures 18-24).

#### IV. Conclusions and Discussion

We have recognized two types of spring outlets on the bottom of western Biscayne Bay. The first type (Figure 6) is where water seeps up through the soft sediment cover to the surface. If not active, these can be difficult to locate (a local gradient in benthic vegetation near the spring and the looseness of the underlying sediment sequence are the primary dry-season characteristics).

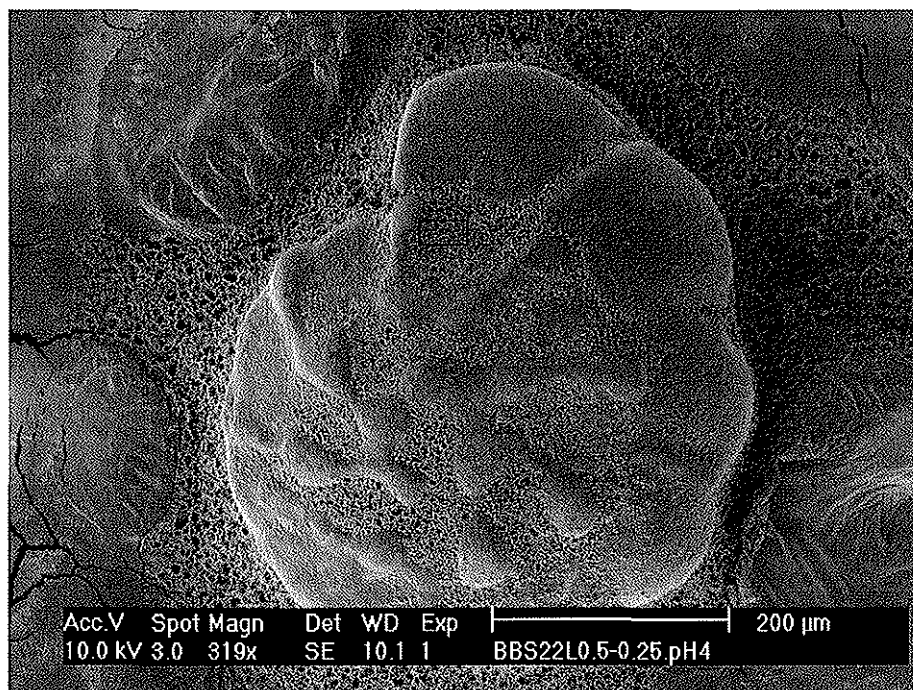


Figure 18. *Ammonium sp.* test induced with pH 4. Dissolution is observable at this low magnification.

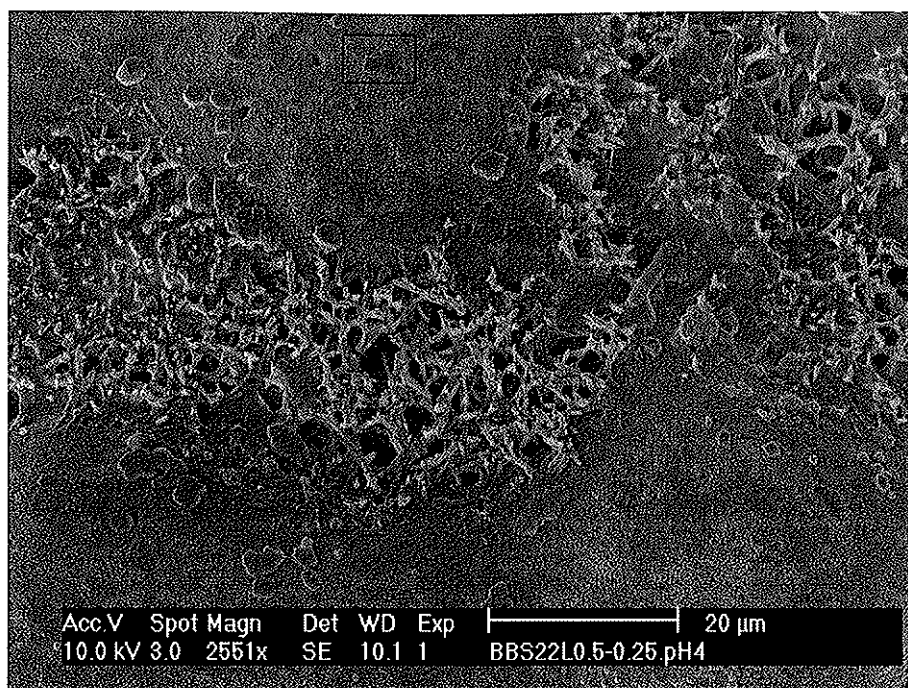


Figure 19. Magnification of boxed area in fig. 18. Center area of image is more heavily dissolved than top and bottom portions.

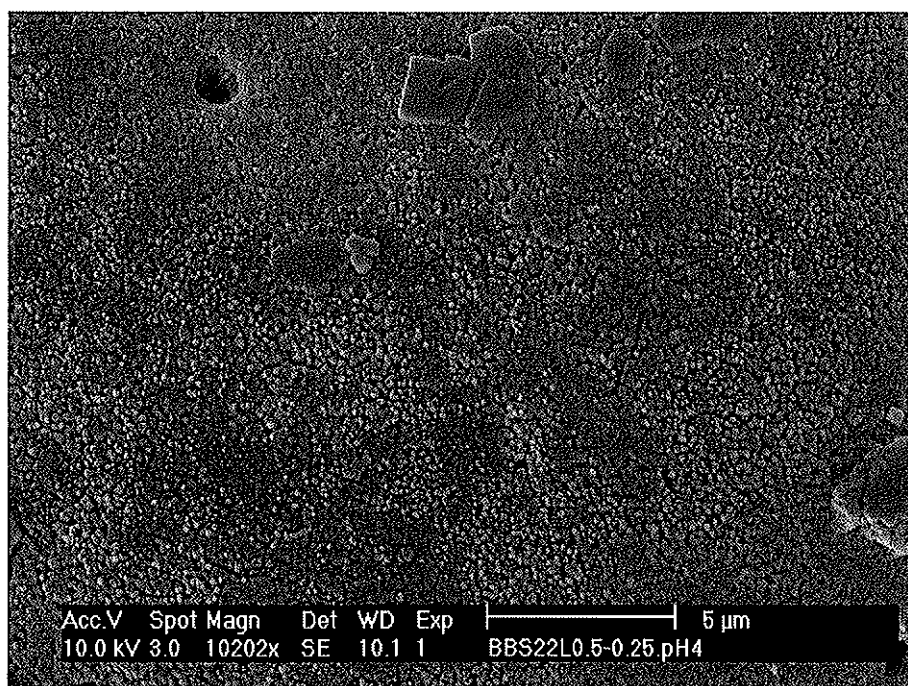


Figure 20. Magnification of boxed area in fig. 19. Dissolution resembling the dissolution matrices on non-altered tests in the study (see Appendix 6 last photo)

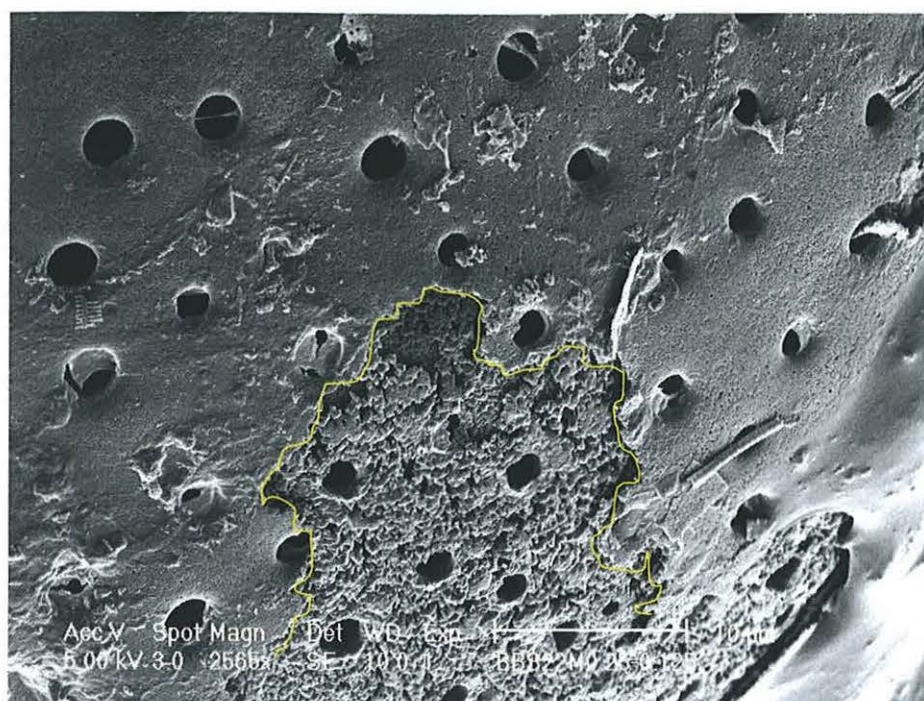


Figure 21. Dissolution fabric of an *Ammonium sp.* test from study sample (outlined area).

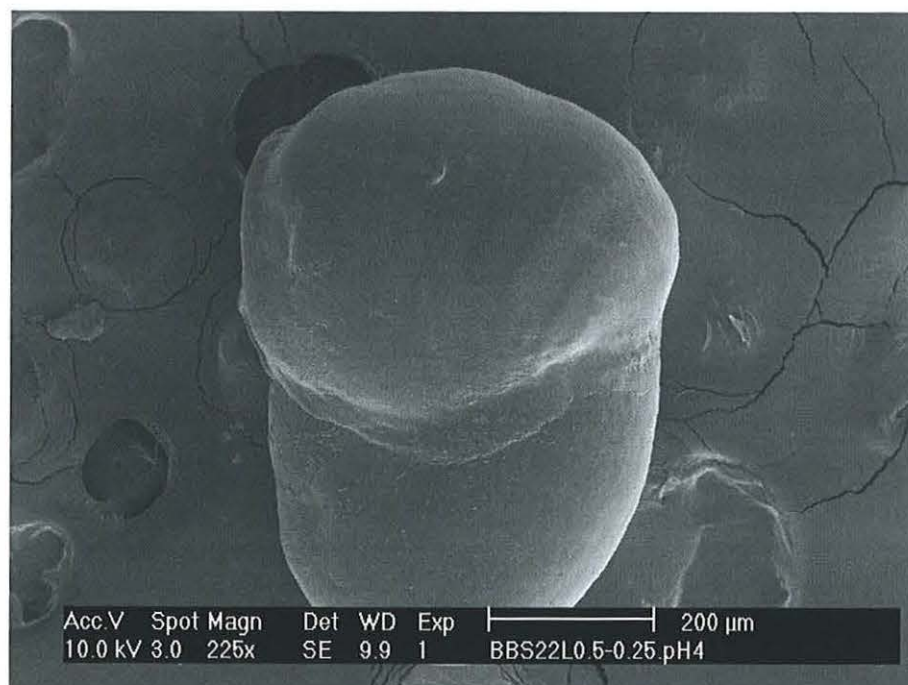


Figure 22. *Triloculina sp.* (Miliolid) test that was immersed in pH 4.

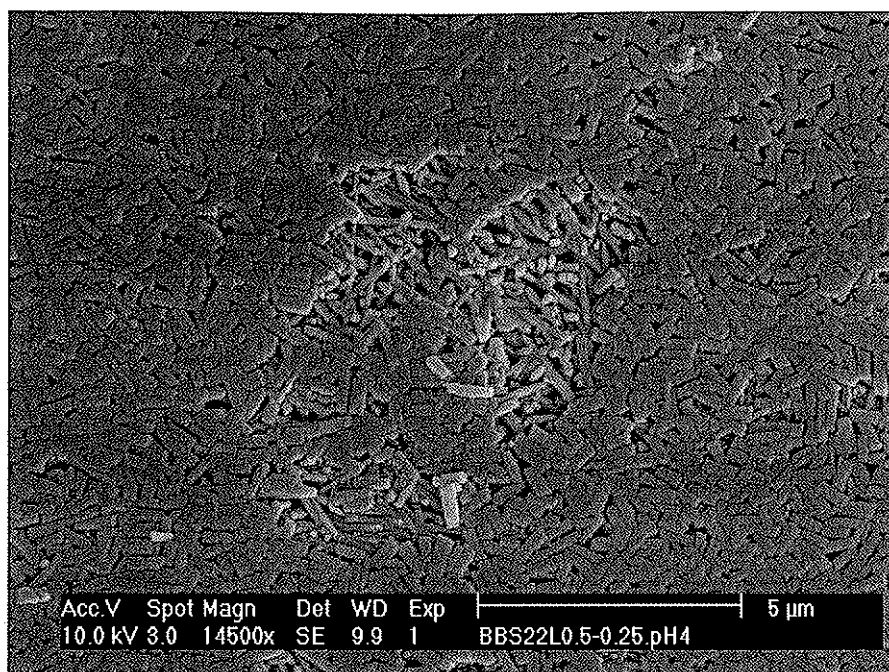


Figure 23. Magnification of boxed area in fig. 17. Dissolution fabric appears to be similar to that in unaltered test (fig. 16).

The second type is where the spring has washed away the Holocene sediment sequence creating a hole exposing the limestone surface and associated karst conduits (Figure 7).

The best way to observe a spring is when the water is glassy and there is visible schleren (blurry water mixing zone that can be seen where fresher artesian spring water is mixing with the ambient Bay water). These schleren can then be followed to the spring source. In very shallow water, spring discharge can also be seen as a disturbance on the water surface.

Springs can be divided into two types: larger persistent springs and smaller ephemeral springs. The larger persistent springs are 1-4 meters across and have flow throughout the year, even through the dry season. These persistent springs form depressions in the bottom surface because the soft sediment sequence overlying the rock has been washed

out exposing the limestone surface and the rock conduit maze through which the springs discharge. In the dry season these springs have discernable flow only near low tide; in the wet season they flow throughout most of the tidal cycle. Discharge can be strong even during the dry season. In the wet season, when the nearby flood gates are opened, the flow of the persistent springs greatly diminishes. About five of the discovered springs are persistent.

Ephemeral springs are less than 15 centimeters across and have visible flow only during the wet season during times when the canal flood gates are closed, which increases the freshwater head from the adjacent mainland. Most of these springs emanate through small openings in the soft sediment. These sites are invisible when the springs are not flowing. During the month of October, the area offshore Deering Estate and south for about a mile had many areas where there were 1 to 4 small springs flowing per square meter.

This study focused on areas where the natural bottom (limestone and overlying sediment) has not been disturbed. There is also abundant freshwater spring discharge through the limestone walls and bottoms of the numerous channels cut into the nearshore bottom (in association with the SFWMD flood-control canals and channels dredged for boat access. In addition freshwater springs occur within the dredged boat harbors (such as at Deering Estate), dredges ponds (as at Montgomery Botanical Center) and in natural channels adjacent to mangroves (as at the Deering Estate).

Most of this offshore fresh groundwater flow is through an open interconnected network of conduits in the limestone. Within ½ kilometer of cut channels springs tend not to occur on the natural bay-bottom surface, suggesting that there is a maze of

groundwater conduits touching one another underneath the bedrock, and that water drawn from one area can directly affect the nearby area. When flood channel gates are opened, even the most persistent springs drastically reduce flow.

Spring flow during dry season was observed to be affected by the tides in Biscayne Bay. Flow was significantly reduced during the high tides and increased during the low tides. This suggests that the pressure head created by the tides is adequate to significantly reduce and possibly (almost) eliminate spring flow.

Chemical analysis from water samples taken from many of the springs, including the two larger springs (Ricisak spring and BBS22) revealed no significant levels of Nitrate and Nitrate, Phosphate, or Ammonium. Higher levels of Ammonium and Phosphate (nutrients) would indicate higher organic content of the waters, such as sewage. If there were much higher levels of nitrate and nitrite, it would suggest a possible pollution source such as fertilizers in the water. The silica content of the water samples was high, which could be one of two things. First, the higher Si content, used in correlation with the lower salinities recorded at the spring mouths, could indicate that indeed, the water emitted from the springs is fresh. High Si content is often associated with fresh water. Of course, the high water runoff from the land and proximity of the canals also contribute to freshwater discharge into the area. The second possible explanation is that the Si content is due to the concentration of diatoms in the samples collected (diatoms are composed of  $\text{SiO}_2$ ). Diatoms were present in the water column, as they were seen attached to the surfaces of some foraminifera when viewed under SEM (lower center of fig. 17 and second photo in Appendix 6). However, this second possible explanation is

more likely if the water sample came from farther offshore and there was a known diatom bloom. Since this was not the case, the first explanation must be more valid.

Quartz is the main sediment component near the spring mouths because most of the carbonate has been dissolved away by the low pH of the water. The lack of organics surrounding the larger springs (those > 0.8 cm) provide evidence that spring flow is strong enough to blow out the organics on top of the spring. Foraminiferal species distribution analyses loosely correlates to a brackish to fresh water influence in the center of the spring grading to more normal saline assemblage.

It is concluded that there is considerable dissolution of carbonate grains in the western portions of Biscayne Bay, as observed by the high quartz content of the sediments and visible dissolution on carbonate components such as foraminifera tests.

The observable dissolution on the foraminifera tests, as viewed through the scanning electron microscope, correlates well to the foraminifera species distribution analyses. Dissolution is more prevalent on those species less resistant to living with salinity fluxes and lower pH waters near the spring. *Ammonia sp.* and *Elphidium sp.* (those foraminifera more dominant than members of the Miliolid family closer to the spring) appear to be more robust in test structure and capable of withstanding dissolution, but it can be suggested that overall mineralogy is the primary factor on preferential dissolution of foraminifera tests. *Ammonia sp.* tests have a lower Mg peak (have less Mg in the calcite structure) than Miliolids in EDS scans under SEM. Higher amounts of Mg in Mg-calcite relate to a thermodynamically less stable calcium carbonate (Walter, 1983 and Burton, 1988). The differences in microstructure of a calcium carbonate structure may also contribute to preferential dissolution, as suggested by Walter (1983). A higher

microstructural complexity may contribute to greater amounts of dissolution. Some Miliolids and other foraminifera such as *Articulina sp.*, which have elevated surface features such as ridges on their test, had more extensive dissolution on those raised portions verses the flatter areas of the test.

## **V. Recommendations**

Artesian groundwater spring discharge is an extremely important source of leakage from the mainland in areas where fresh groundwater has significant head near the coast. Springs are especially important and easily recognized in the area from about two kilometers north to four kilometers south of the Deering Estate area of Cutler.

The large volume of water recognized as discharging through artesian spring conduits has very significant implications for the proposed re-establishment of freshwater sheet flow through the coastal wetlands of central and south Biscayne Bay. The groundwater spring conduits play an important role in how introduced water flows into Biscayne Bay under increased freshwater head.

This study has encountered multiple difficulties in detecting and characterizing groundwater spring discharge in Biscayne Bay. Despite these difficulties, significant data have been obtained. To more fully characterize groundwater flows, both wet and dry season observations are required. The present exploratory study has obtained data primarily in the dry season. A project of one year in duration is a very short time to locate, sample and instrument springs to obtain both wet season and dry season data. It is recommended that scientists continue to secure funding and time for future sediment data

analysis and spring measurements during varying levels of the adjacent fresh groundwater.

It is recommended that there be a follow up effort to document the volumes of discharge through groundwater conduits under varying freshwater head conditions. It would be a good idea to arrange with SFWMD a schedule where the flood gates could be controlled (opened and closed) in conjunction with the springs studies in order to more fully understand and document these effects of water table levels and submarine groundwater flow.

In interviews with people in their seventies and eighties who grew up along Biscayne Bay, we have heard descriptions of many near-shore springs that were active from the Brickell area (north of Rickenbacker Causeway) south past Coconut Grove. None of these are reported as active today, but they should be checked out during wet-season high-water periods.

H. Wanless indicated in a report to Miami-Dade County (1983) that there are indications of increased dissolution on the western side of Biscayne Bay. It would be more conclusive to the study on dissolution rates and effects on the sediments of Biscayne Bay to use X-Ray Diffraction on samples such as the ones I collected and to effectively and quantitatively describe actual sediment mineralogy along transects close to and far from the springs and to correlate such findings with more conclusive water chemistry parameters.

It is important to better understand the groundwater conduit connections and emergence of water from artesian springs offshore because the presence of such affects patterns of freshwater discharge. Higher water heads (not just sheet flow), which may be

created with the Comprehensive Everglades Restoration Project (CERP), could greatly influence the presence and extent of groundwater flow and emergence through offshore artesian springs, possibly reverting the current marine environment of Biscayne Bay back to an estuarine environment.

## REFERENCES

- Bock, W.D., Lynts, G.W., Smith, S., Wright, R., Hay, W.W., and Jones, J.I., 1963. A Symposium Of Recent South Florida Foraminifera, Memoir 1: Miami Geological Society, 245 p.
- Burton, E.A., 1988. Laboratory Investigation of The Effects of Seawater Chemistry on Carbonate Mineralogy, University of Miami, Miami, Florida, Ph.D. Thesis, 306 p.
- Dole, R.B., 1914. Some chemical characteristics of seawater at Tortugas and around Biscayne Bay, Florida. Papers from Tortugas Laboratory, Carnegie Inst., Washington D.C., vol. 5, no. 182, p. 69-78.
- Hoffmeister, J.E., 1974. *Land from the Sea: The Geologic Story of South Florida*. University of Miami Press, 143 p.
- Kohout, F.A. 1967. Relation of seaward and landward flow of ground water to the salinity of Biscayne Bay. M.S. Thesis, Univ. Coral Gables, 98 p.
- Kohout, F.A., and Kolipinski, M.C., 1967. Biological zonation related to groundwater discharge along the shore of Biscayne Bay, Miami, Florida. In: G.H. Lauff (ed.) Estuaries, American Association for the Advancement of Science, No. 83, pp. 488-499.
- Moore, D.R., 1963. Distribution of the sea grass, *Thalassia*, in the United States. Bull. Mar. Sci., vol. 13, no. 2, p. 322-332.
- Langevin, C.D., 2001. Simulation of Ground-Water Discharge to Biscayne Bay. U.S.G.S. Water Resources Investigations Report 00-4251, 127p., plus maps.
- Rose, P.R., and Lidz, B., 1977. Diagnostic Foraminifera Assemblages of Shallow-Water Modern Environments: South Florida and the Bahamas: Sedimenta VI, Miami, FL, University of Miami CSL, 55 p.
- Rossinsky, V. Jr., 1984. Sedimentation and Holocene History of the Loxahatchee River Estuary, Jupiter, Florida, Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, FL, M.S. Thesis, 241 p.
- Sen Gupta, B.K., Editor, 1999. Modern Foraminifera: Kluwer Academic Publishers, Netherlands, 371 p.
- Scott, D.B., Medioli, F.S., and Schafer, C.T., 2001. Monitoring in Coastal Environments Using Foraminifera and Thecamoebian Indicators: Cambridge, UK, Cambridge University Press, 177 p.

Walter, L.M., 1983. The Dissolution Kinetics of Shallow Water Carbonate Grain Types, University of Miami, Miami, FL, Ph.D. Thesis, 318 p.

Wanless, H.R., 1969. Sediments of Biscayne Bay – Distribution and Depositional History. Technical Rept. 69-2, Institute of Marine Science, University of Miami, Miami, FL 260 p. (also as 1967 M.S. Thesis)

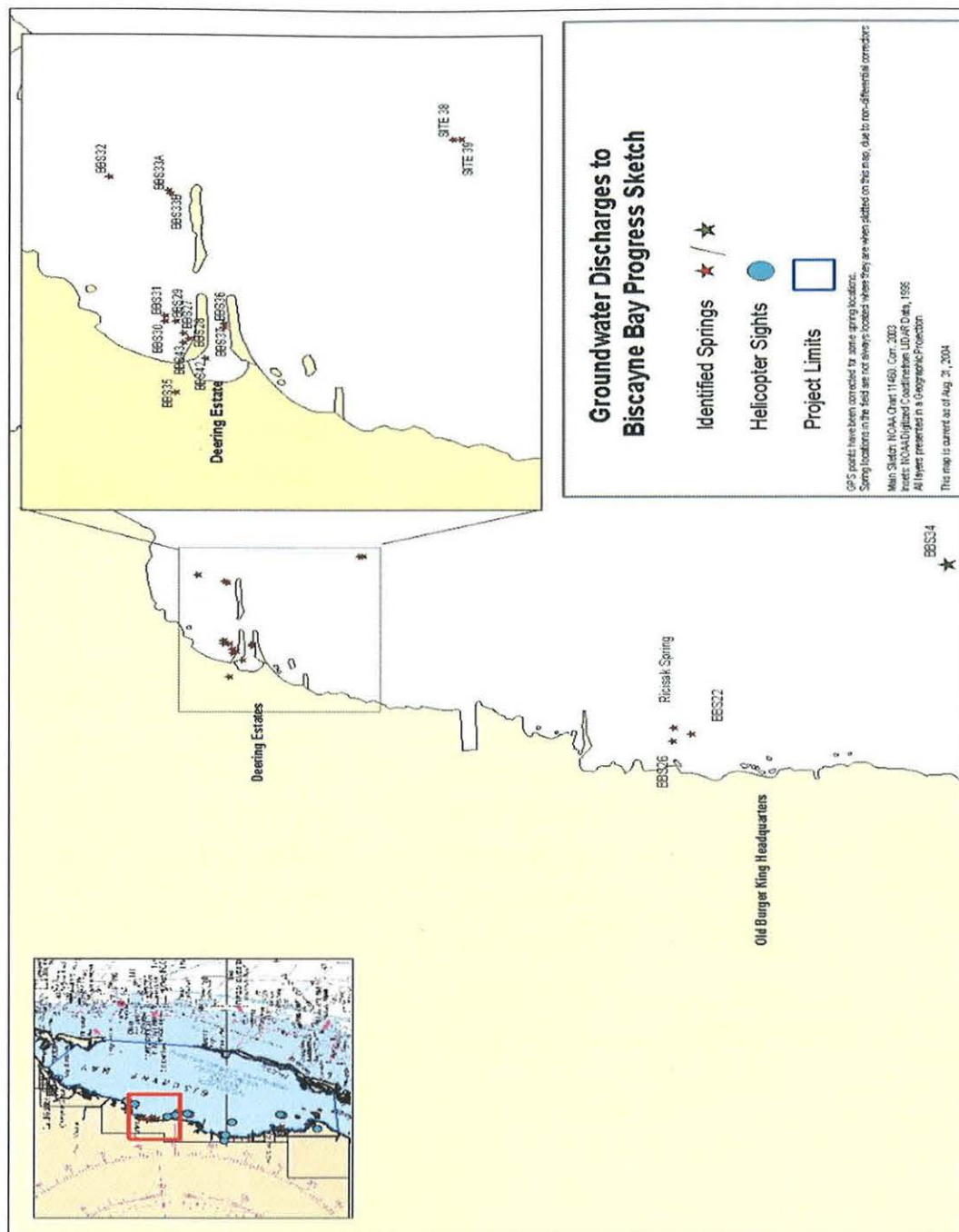
Wanless, H.R., Cottrell, D., Parkinson, R., and Burton, E. 1983. Final Report to Dade County and Florida Sea Grant: Sources and Circulation of Turbidity Biscayne Bay, Florida, unpublished, 499 p.

Wanless, H.R., 2001. Geology, Sedimentology, Climate and Sea Level, p. 109-134, in Biscayne Bay Partnership Initiative Survey Team Reports, Miami, 319p.

Weiss, C.M., 1948. The seasonal occurrence of sedentary marine organisms in Biscayne Bay, Florida. Ecology, v. 29, no. 2, p. 153-172.

Woodmansee, R.A., 1949. The Zooplankton off Chicken Key in Biscayne Bay, Florida. M.S. Thesis, Univ. Miami, Coral Gables, FL.

## **APPENDIX 1: Spring Maps and Coordinates**



**Map of identified spring locations. Points indicated on this map do not correlate with actual locations for all the spring most likely due to differences between field equipment calibrations and computer programs. Plot and Sketch created in Arcinfo 9.0.**

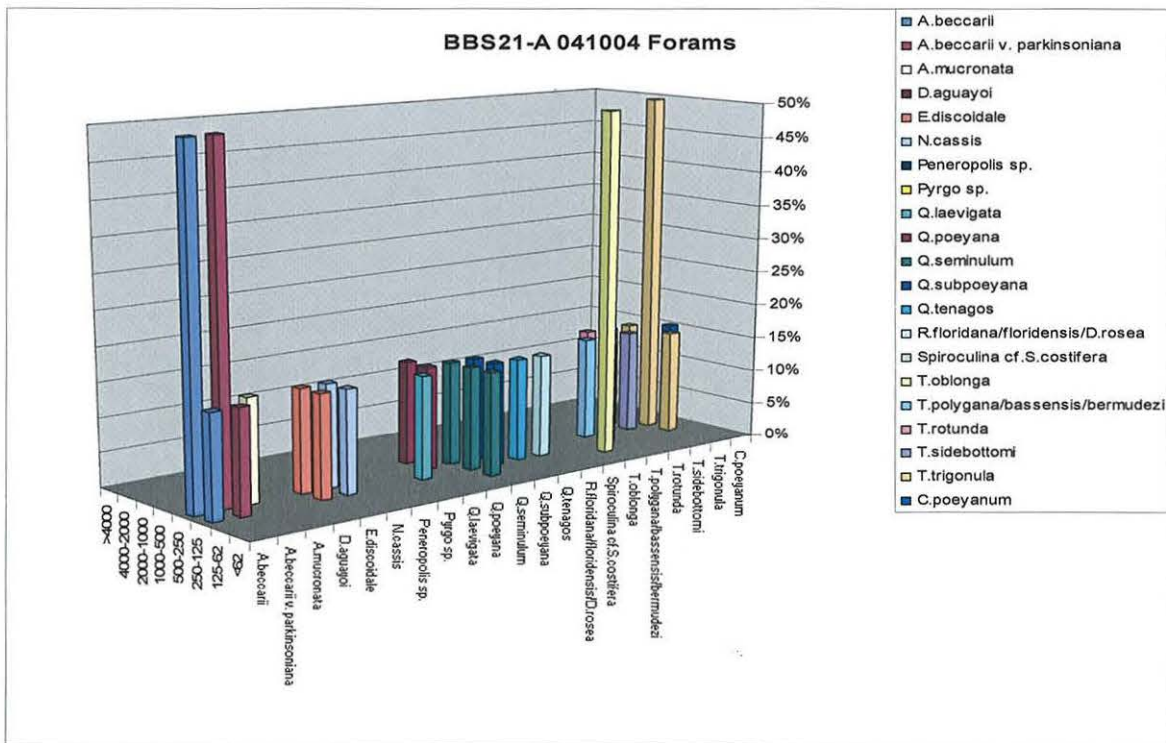
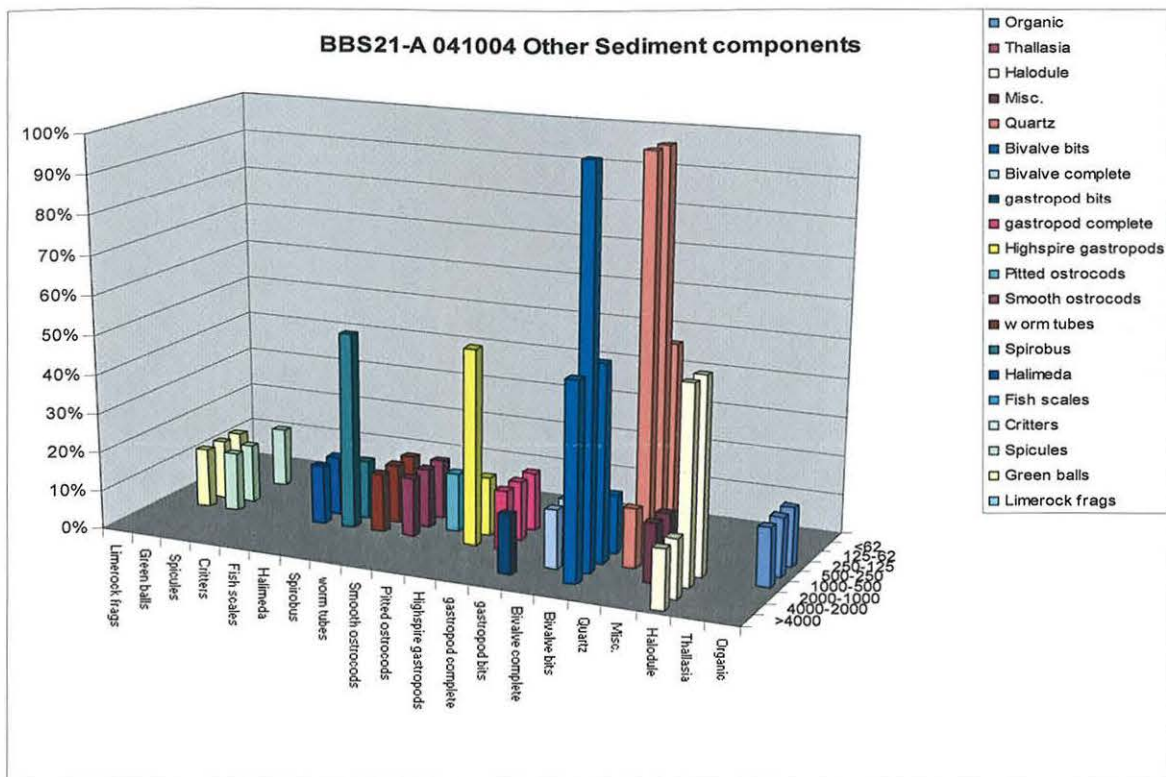
**programs. Plot and Sketch created in Arcinfo 9.0.**

# Identified spring locations.

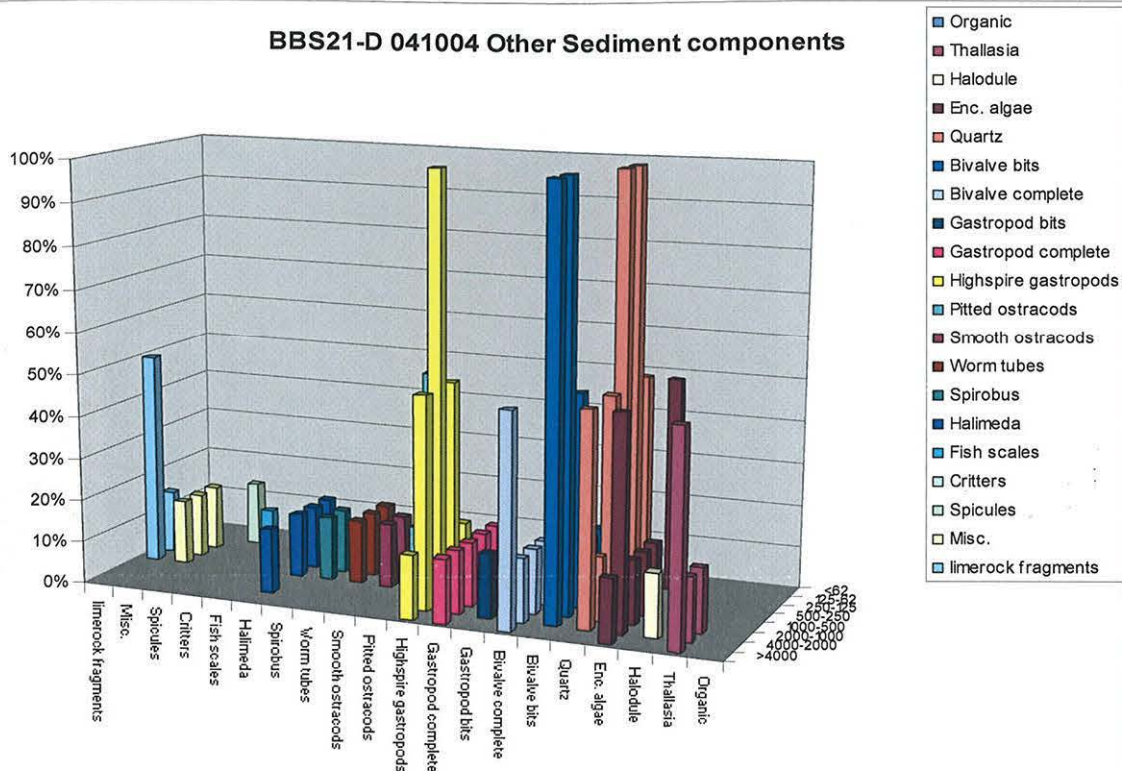
| SAMPLE | LATITUDE       | LONGITUDE    | NAME            |
|--------|----------------|--------------|-----------------|
| 1      | 25.42583333    | -80.31986111 | DEC1938         |
| 2      | 25.59388889    | -80.30458333 | Wanless-Tedesco |
| 21     | 25.60608333    | -80.30741667 | BBS21 (Ricisak) |
| 22     | 25.60569444    | -80.30761110 | BBS22           |
| 26     | 25.60611111    | -80.30783333 | BBS26           |
| 37     | 25.61541666    | -80.30497222 | BBS37           |
| 27     | 25.61586111    | -80.30497222 | BBS27           |
| 29     | 25.61594444    | -80.30480555 | BBS29           |
| 30     | 25.61605555    | -80.30480555 | BBS30           |
| 31     | 25.61605555    | -80.30472222 | BBS31           |
| 28     | 25.61580555    | -80.30505555 | BBS28           |
| 32     | 25.61663888    | -80.30269444 | BBS32           |
| 33     | 25.61602777    | -80.30288888 | BBS33A          |
| 33     | 25.61600000    | -80.30294444 | BBS33B          |
| 34     | 25.60002777    | -80.30238888 | BBS34           |
| 35     | 25.61594444    | -80.30583333 | BBS35           |
| 38     | 25.61305555    | -80.30213888 | SITE 38         |
| 39     | 25.61297222    | -80.30213888 | SITE 39         |
| 36     | 25.61541666    | -80.30483333 | BBS36           |
| 40     | 25°36'55.9"    | 80°18'19.5"  | BBS40           |
| 41     | 25°36'55.9"    | 80°18'20.4"  | BBS41           |
| 42     | 25°36'55.3"    | 80°18'19.2"  | BBS42           |
| 43     | Not documented |              | BBS43(Tequesta) |

**APPENDIX 2: Sediment Component and Foraminiferal graphs**  
Label Format: DYMTYR (day/month/year)

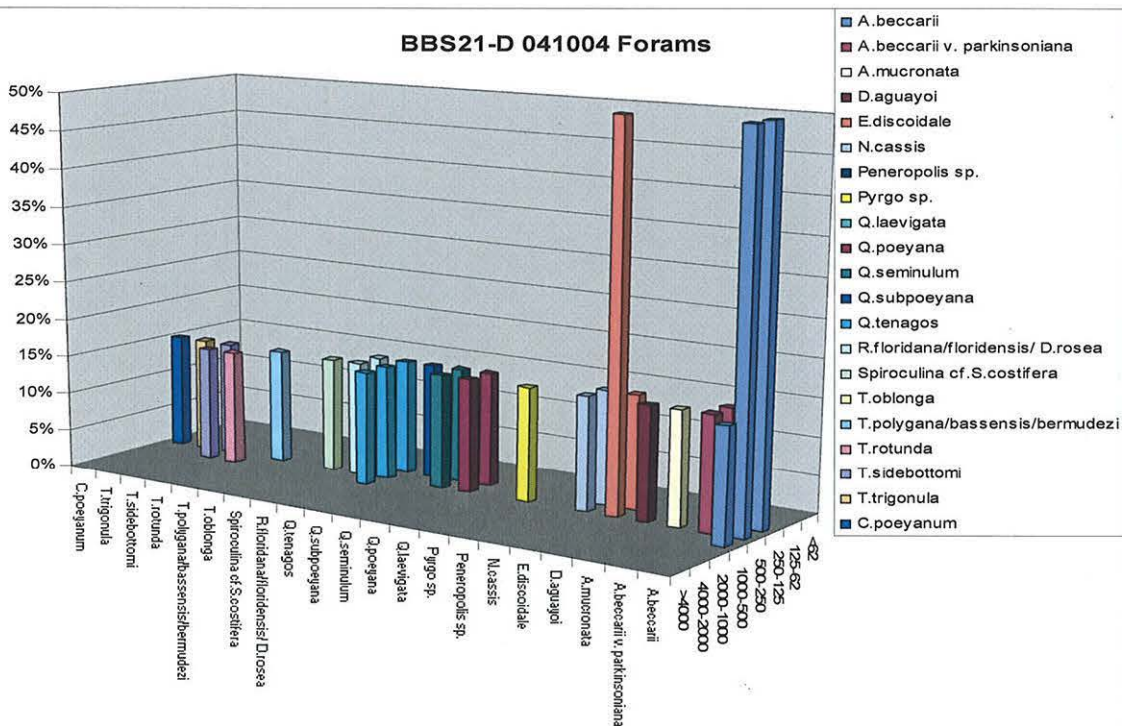
**BBS 21. Sediment sample component analyses and foraminifera species assemblages of different size fractions for sediment samples taken along edge of spring (samples A, D, G, and J)**



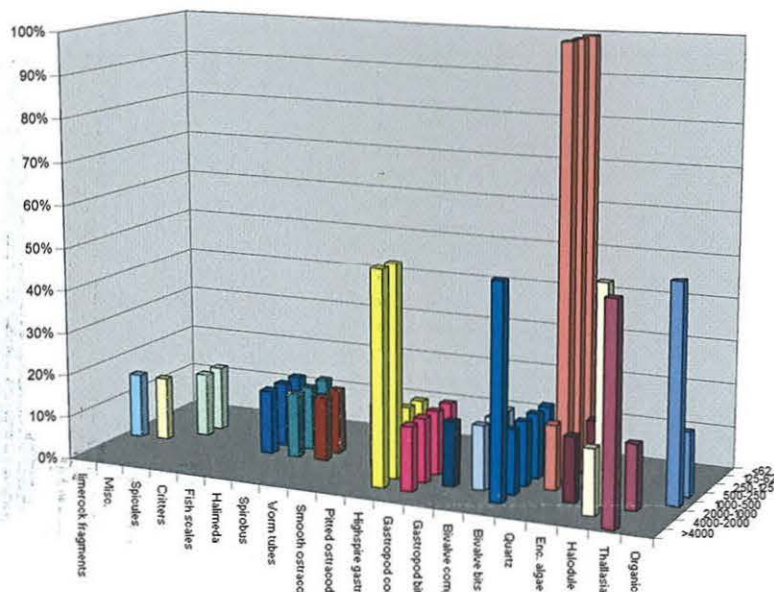
### BBS21-D 041004 Other Sediment components



### BBS21-D 041004 Forams

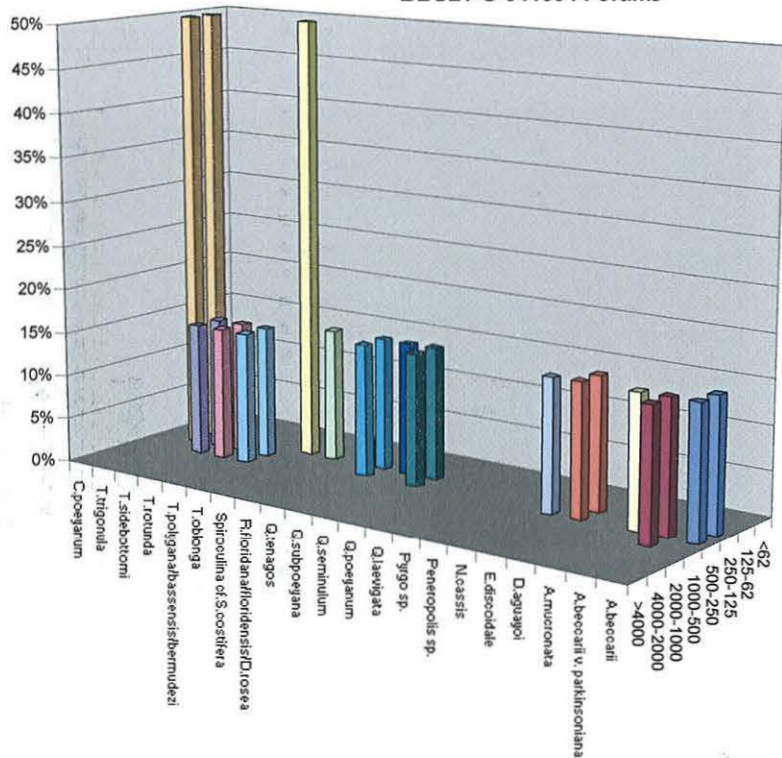


BBS21-G 041004 Other Sediment components



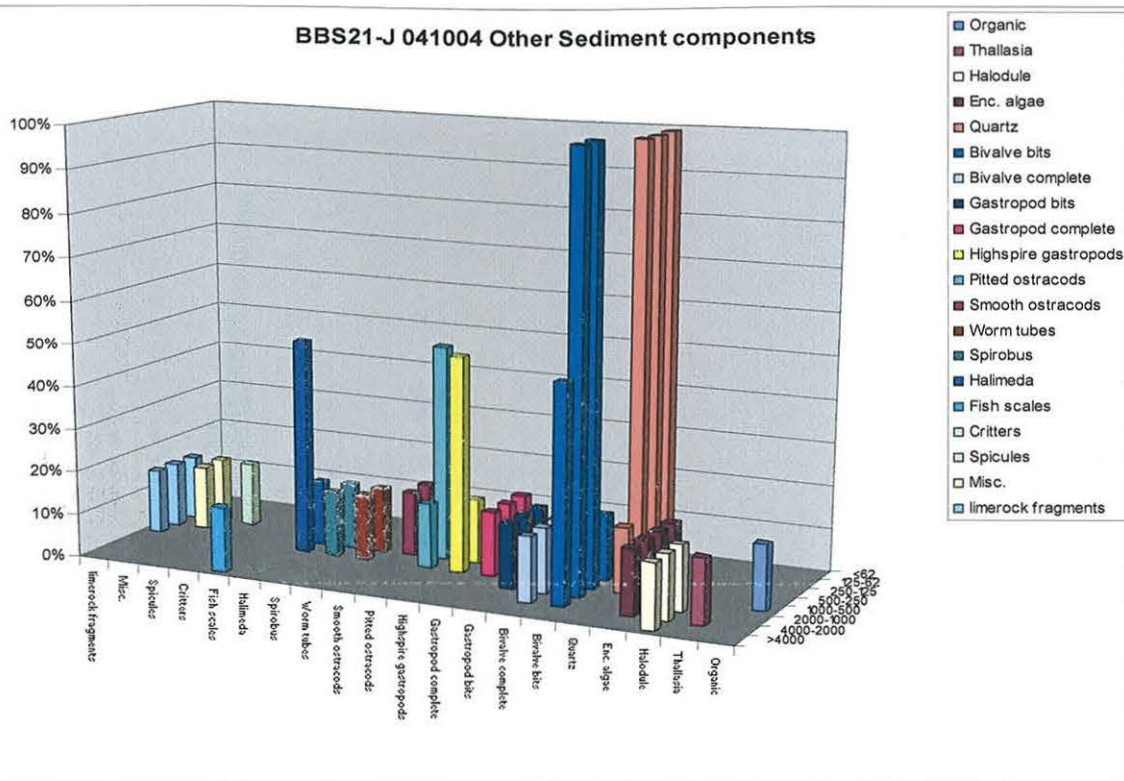
- Organic
- Thalassia
- Halodile
- Enc. algae
- Quartz
- Bivalve bits
- Bivalve complete
- Gastropod bits
- Gastropod complete
- Highspire gastropods
- Pitted ostracods
- Smooth ostracods
- Worm tubes
- Spirobus
- Halimeda
- Fish scales
- Critters
- Spicules
- Misc.
- limerock fragments

BBS21-G 041004 Forams

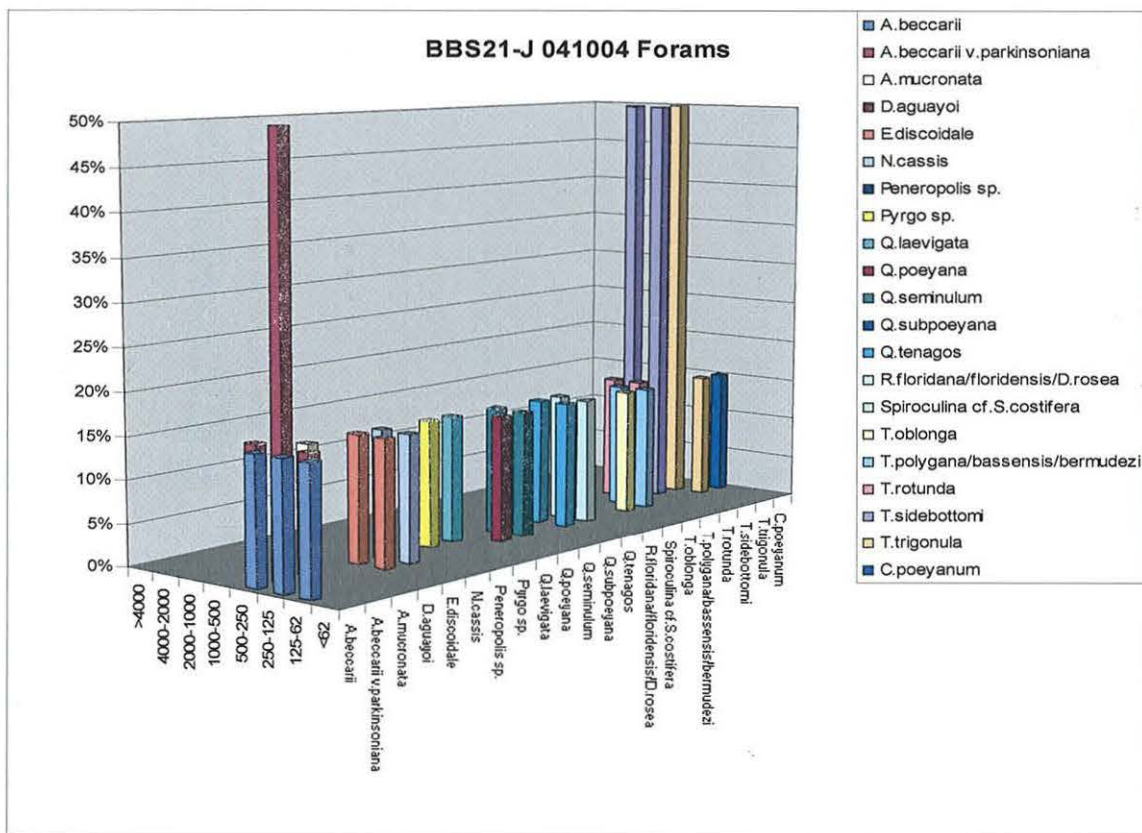


- A. beccarii
- A. beccarii v. parkinsoniana
- A. mucronata
- D. aguayoi
- E. discoidale
- N. cassis
- Penetropolis sp.
- Pyrgo sp.
- Q. laevigata
- Q. poeyanum
- Q. seminulum
- Q. subpoeyana
- Q. tenagos
- R. floridana/floridensis/D. rosea
- Spiroculina cf. S. costifera
- T. oblonga
- T. polygona/bassensis/bermudezi
- T. rotunda
- T. sidebottomi
- T. trigonula
- C. poeyanum

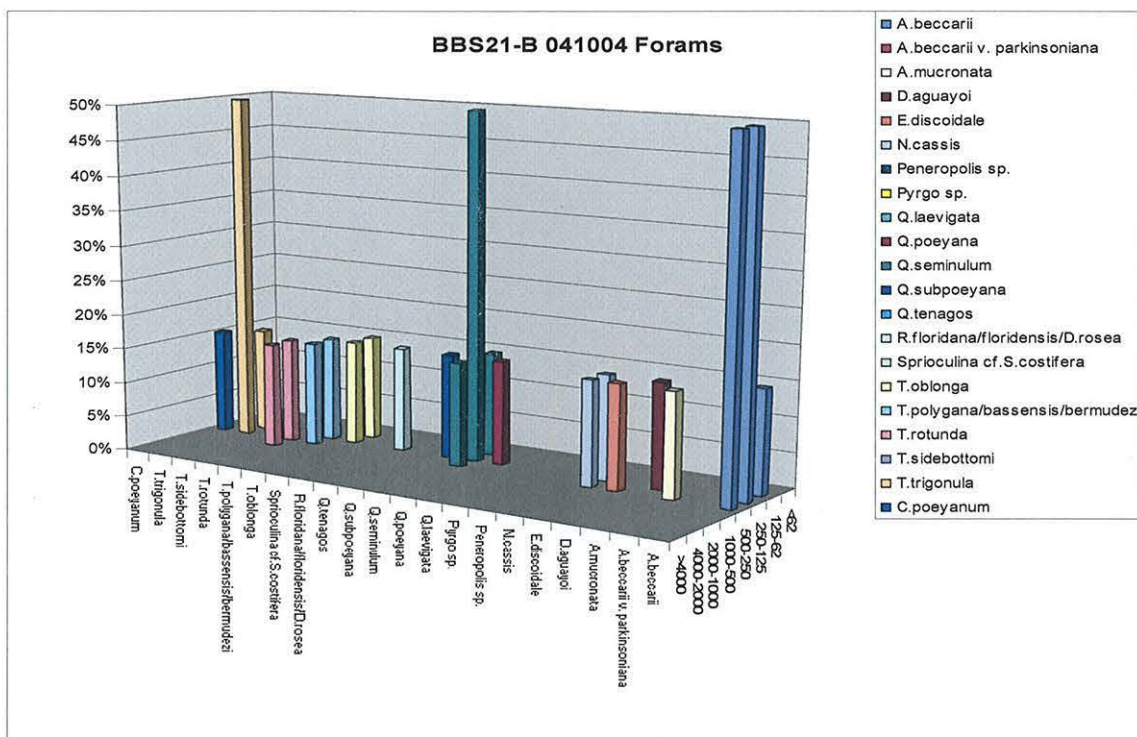
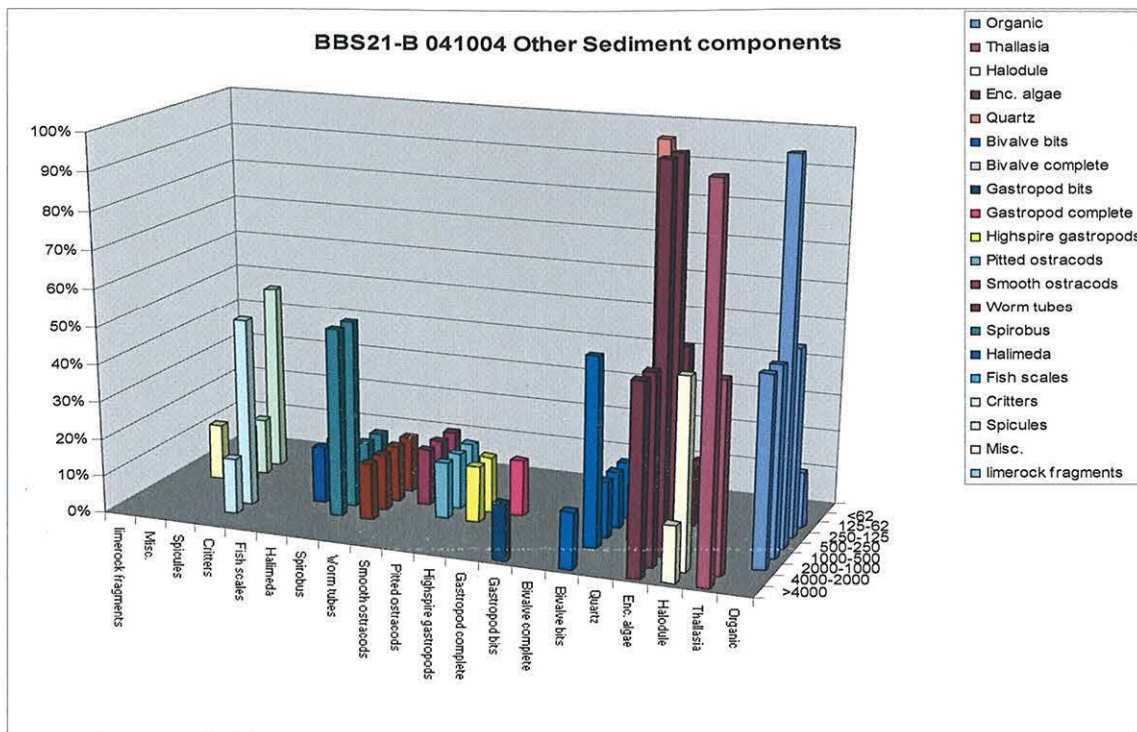
BBS21-J 041004 Other Sediment components



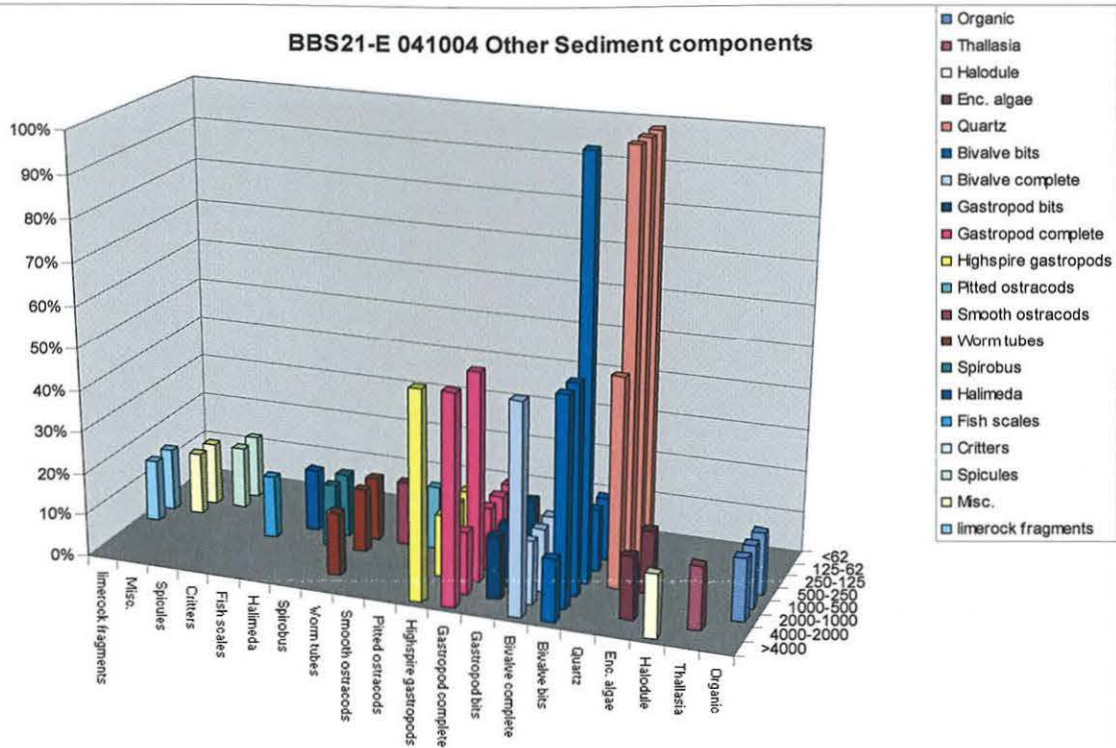
BBS21-J 041004 Forams



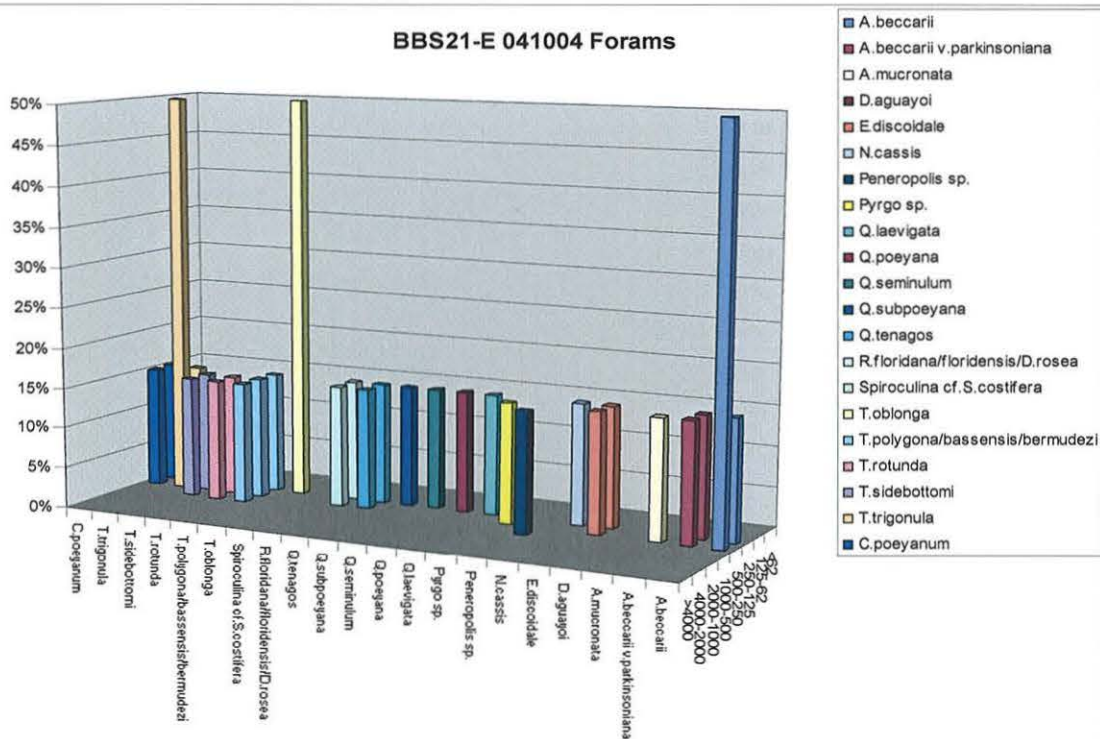
**BBS 21. Sediment sample component analyses and foraminifera species assemblages of different size fractions for sediment samples taken from 1 m distance of spring (samples B, E, H, and K)**



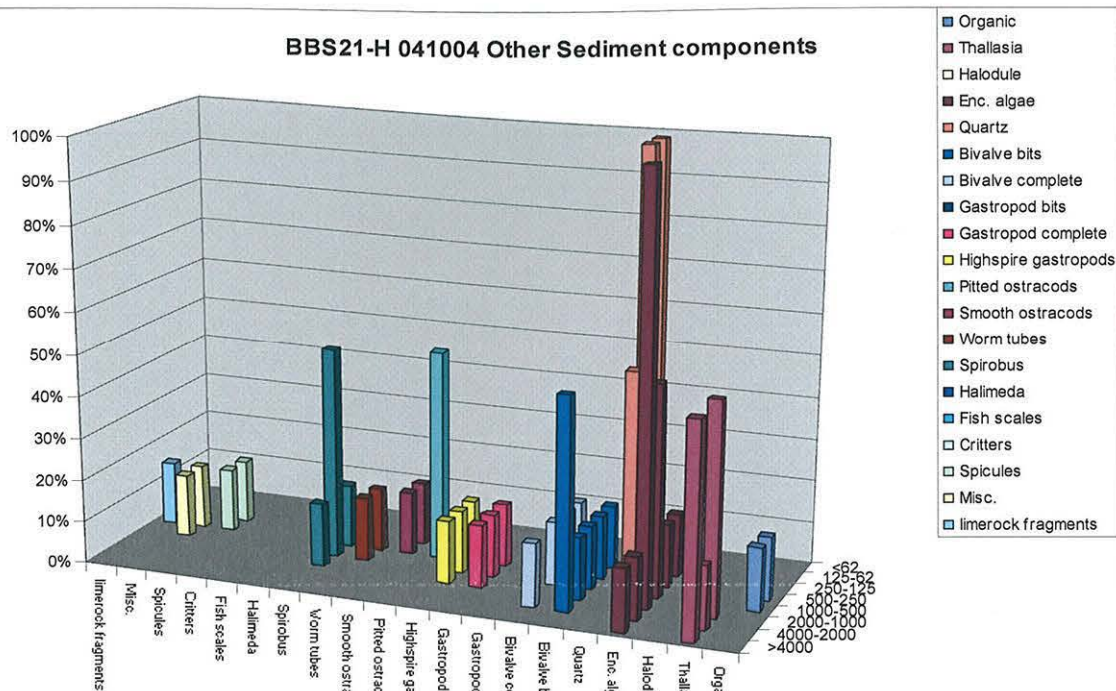
BBS21-E 041004 Other Sediment components



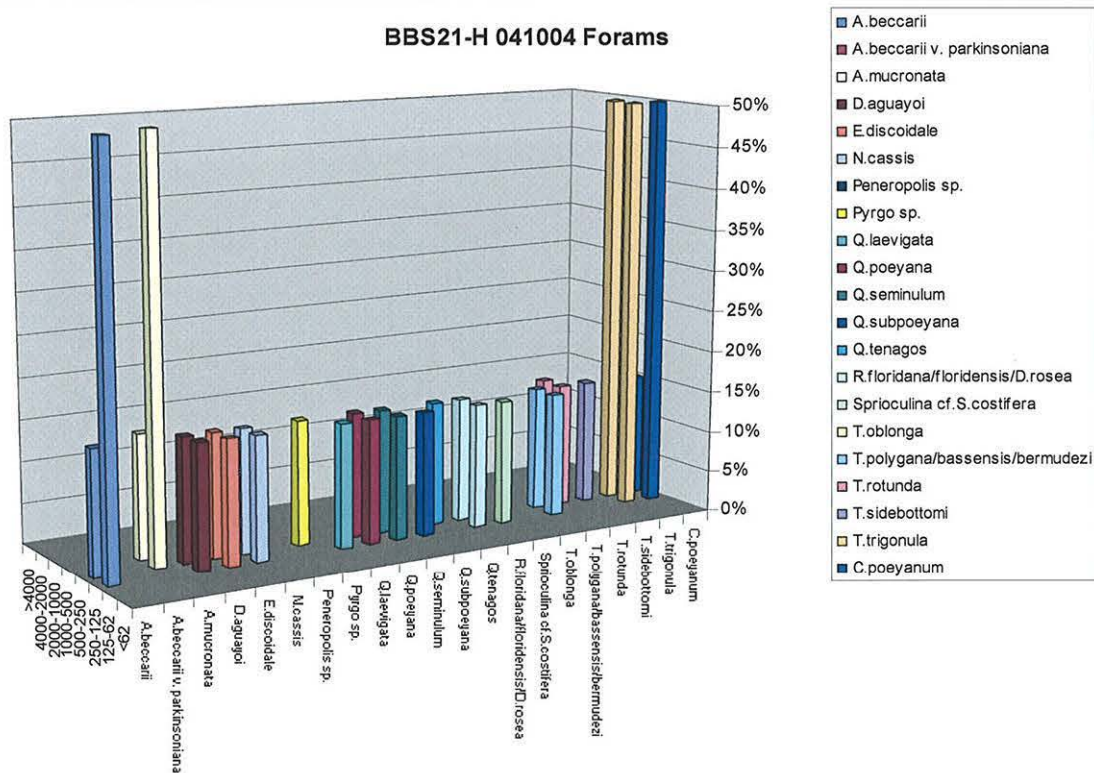
BBS21-E 041004 Forams



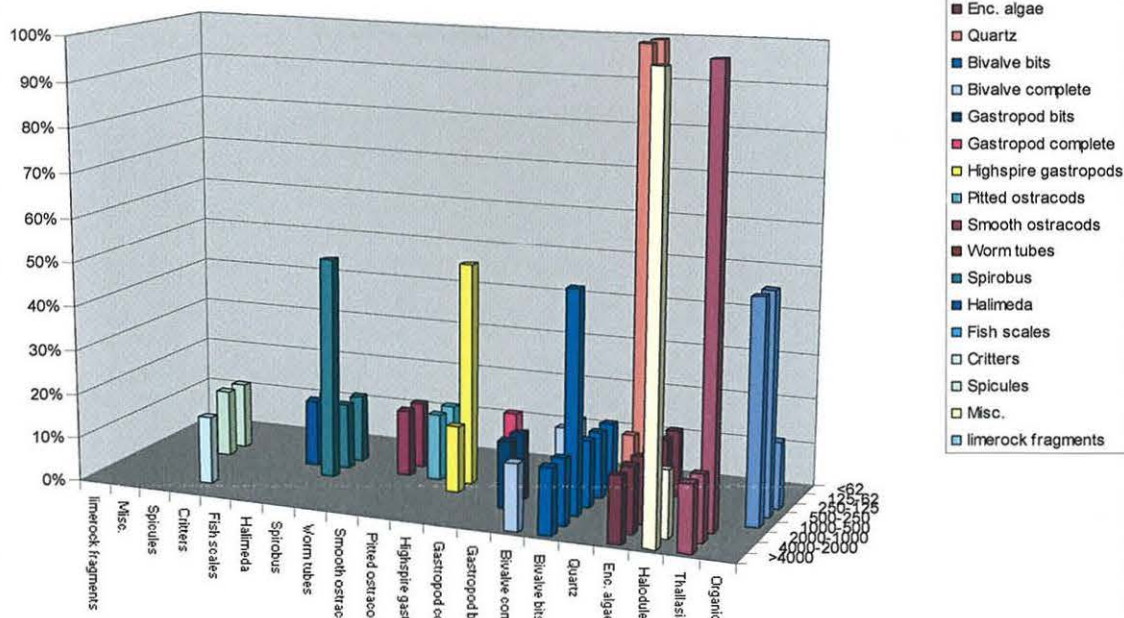
### BBS21-H 041004 Other Sediment components



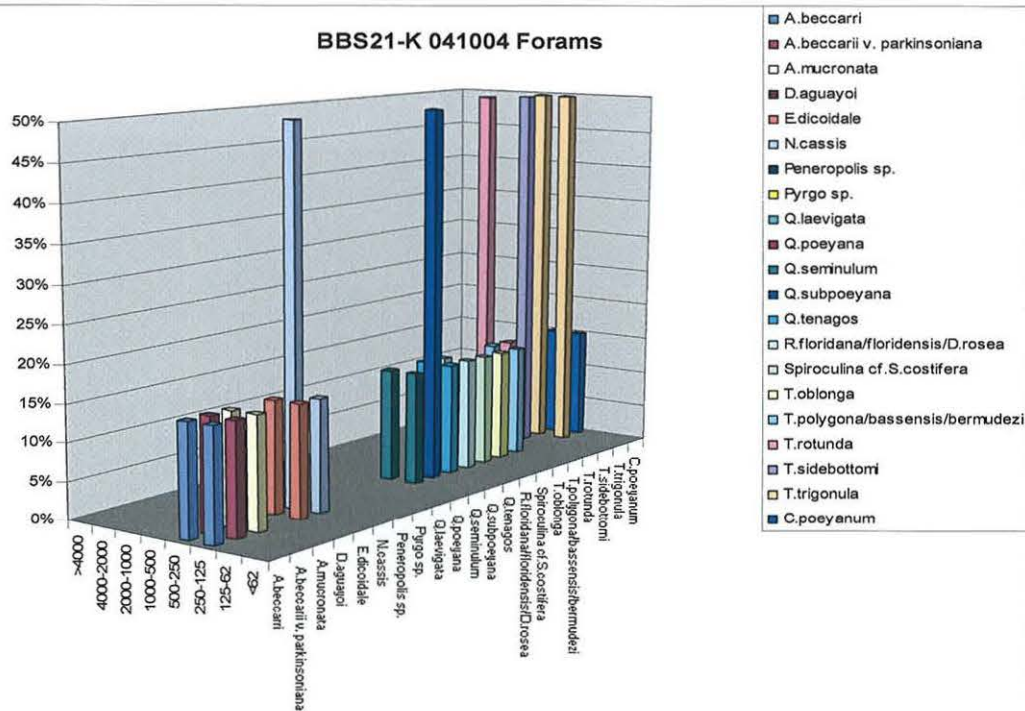
### BBS21-H 041004 Forams



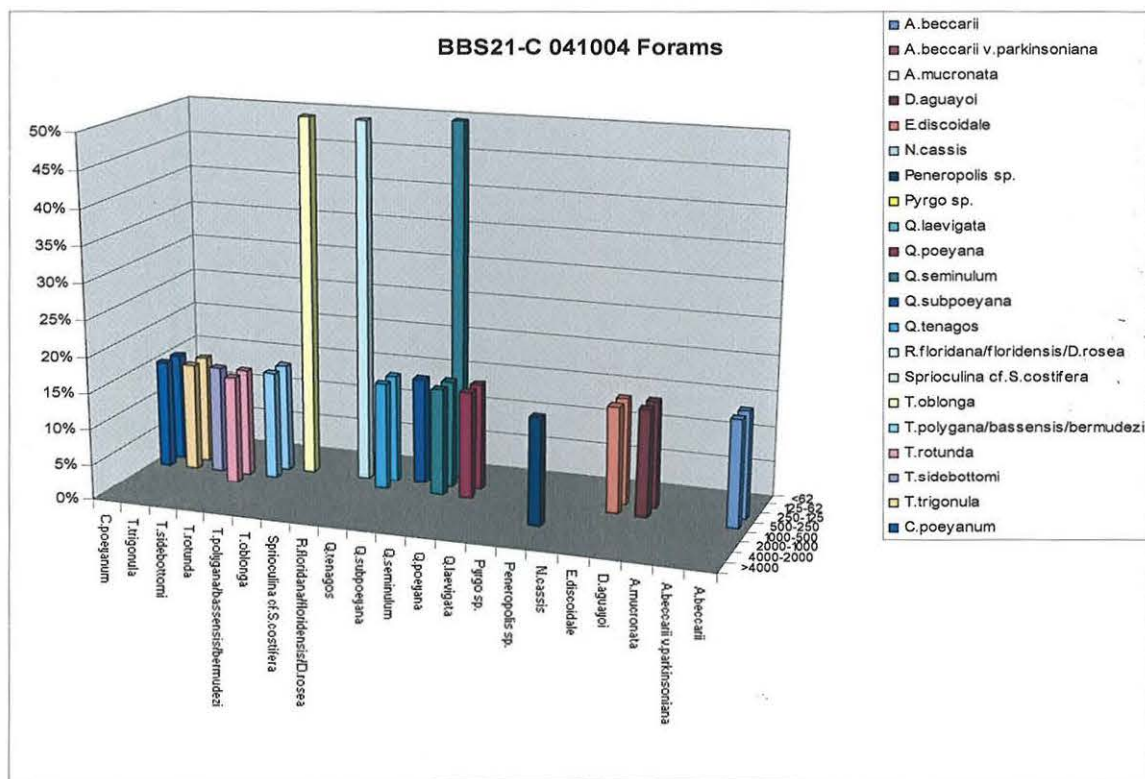
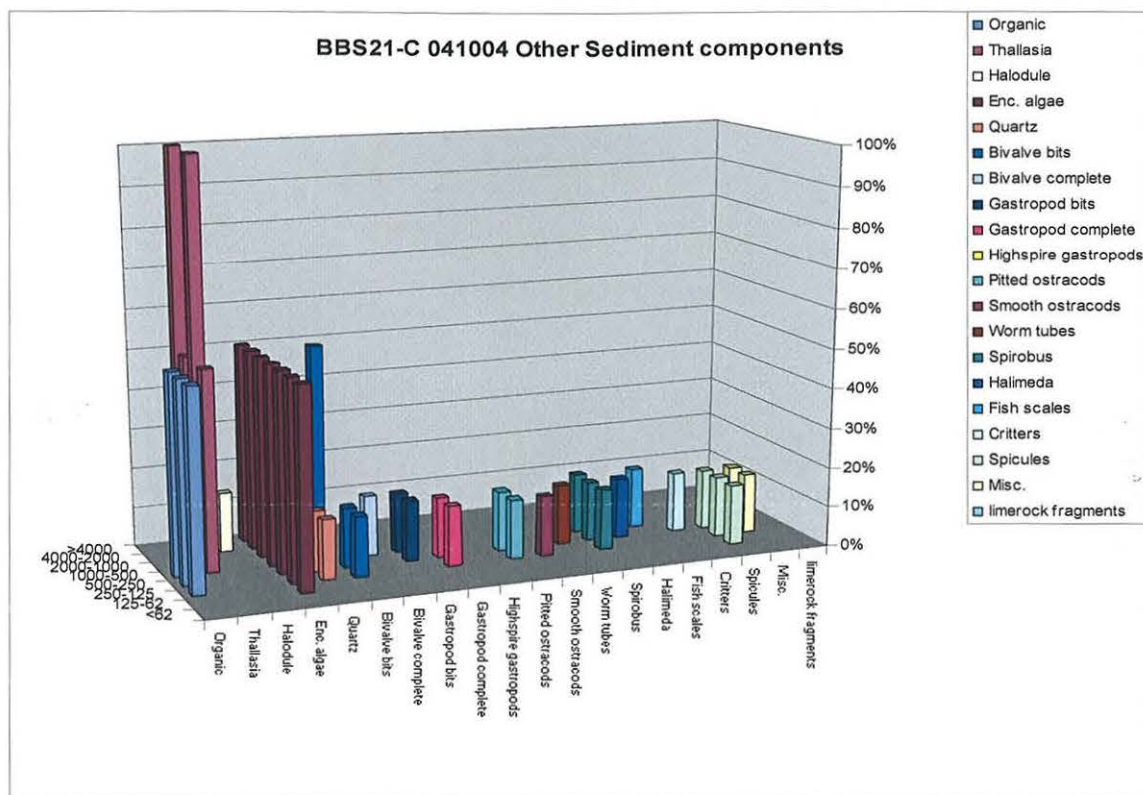
BBS21-K 041004 Other Sediment components



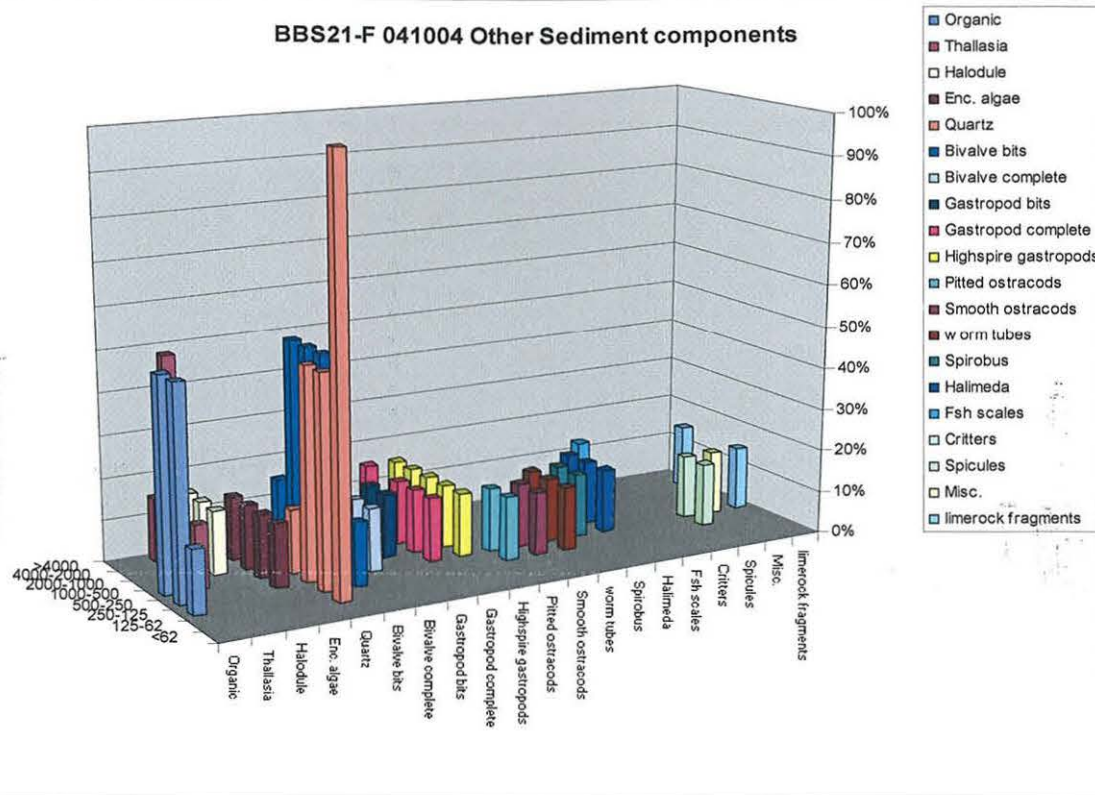
BBS21-K 041004 Forams



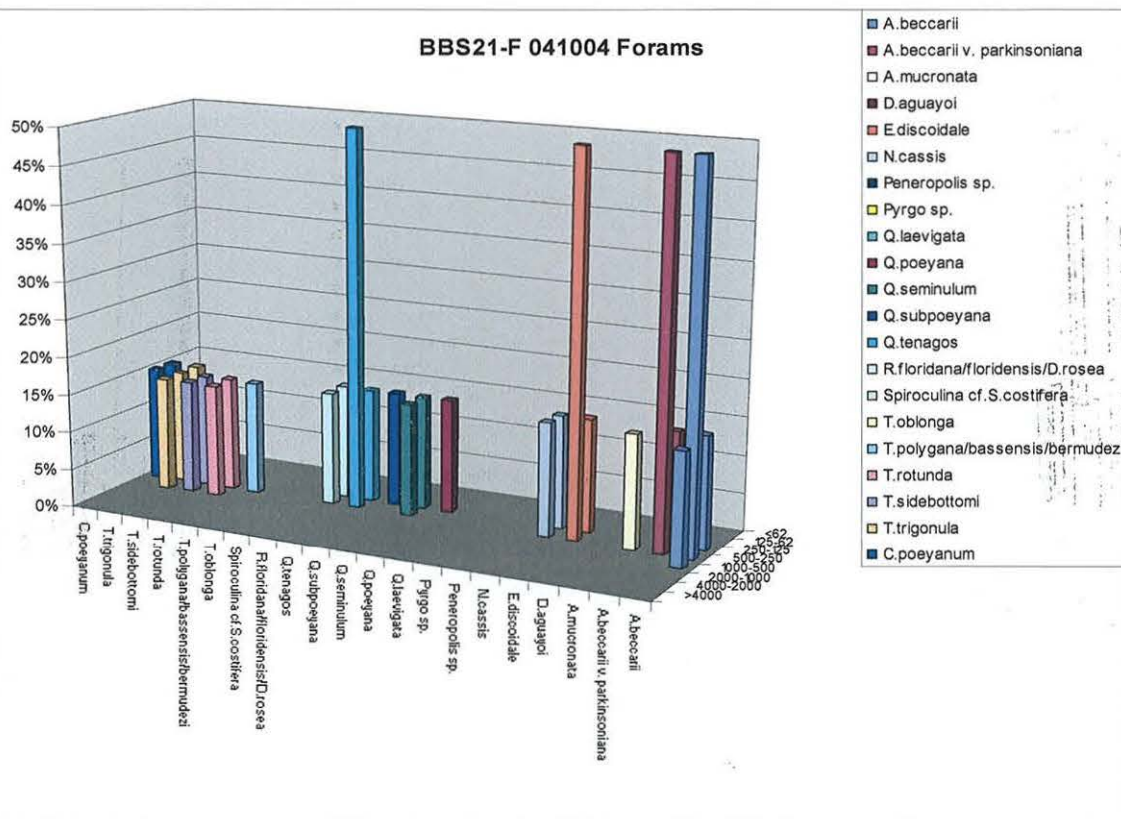
**BBS 21. Sediment sample component analyses and foraminifera species assemblages of different size fractions for sediment samples taken from 4 m distance of spring (samples C, F, I, and L)**



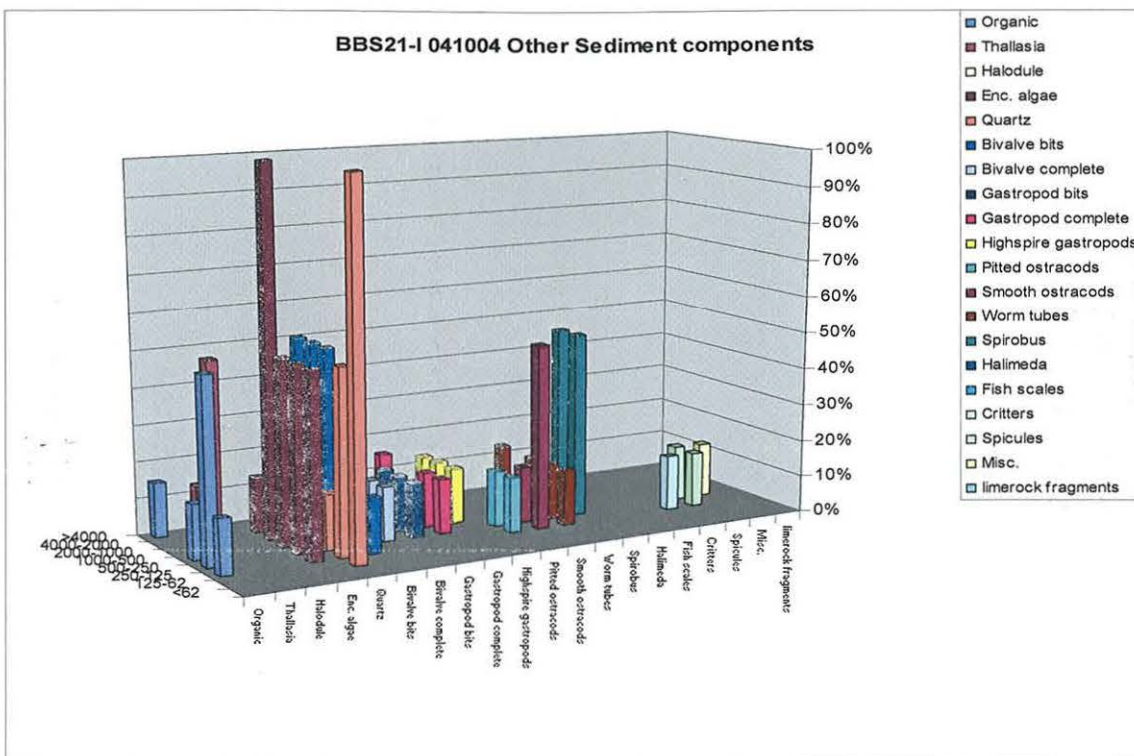
BBS21-F 041004 Other Sediment components



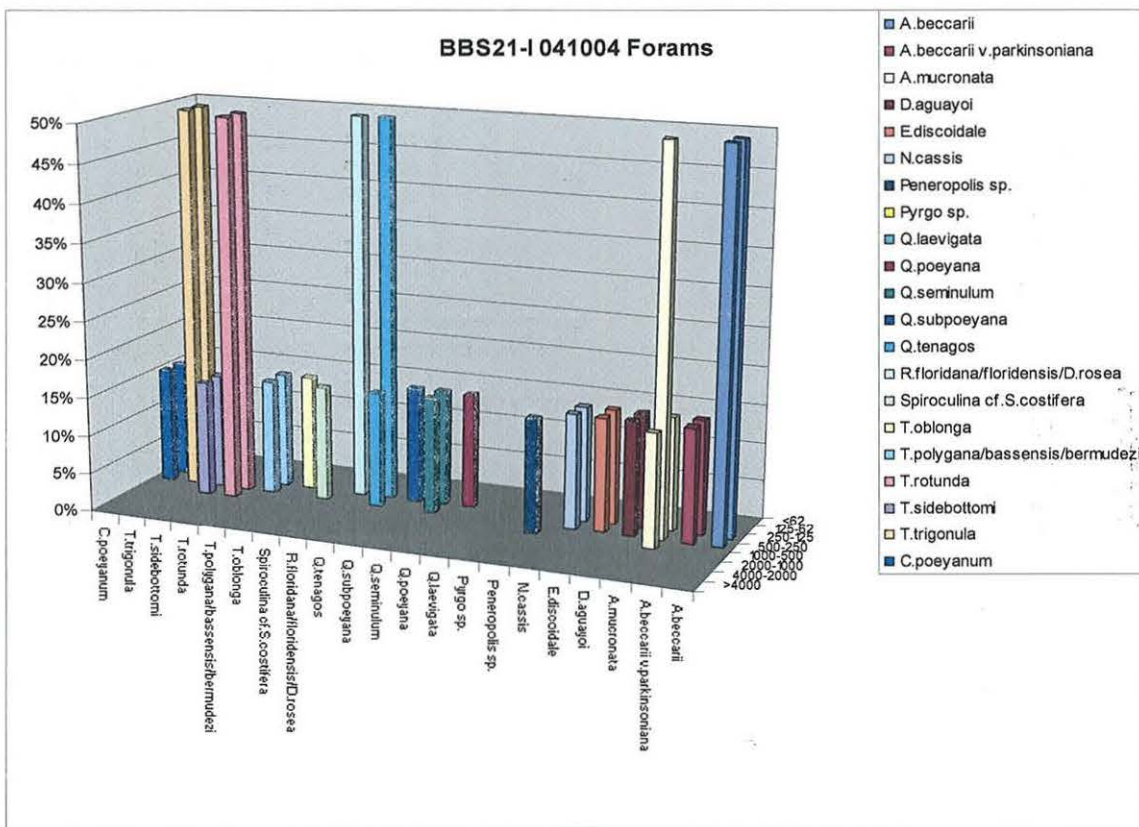
BBS21-F 041004 Forams



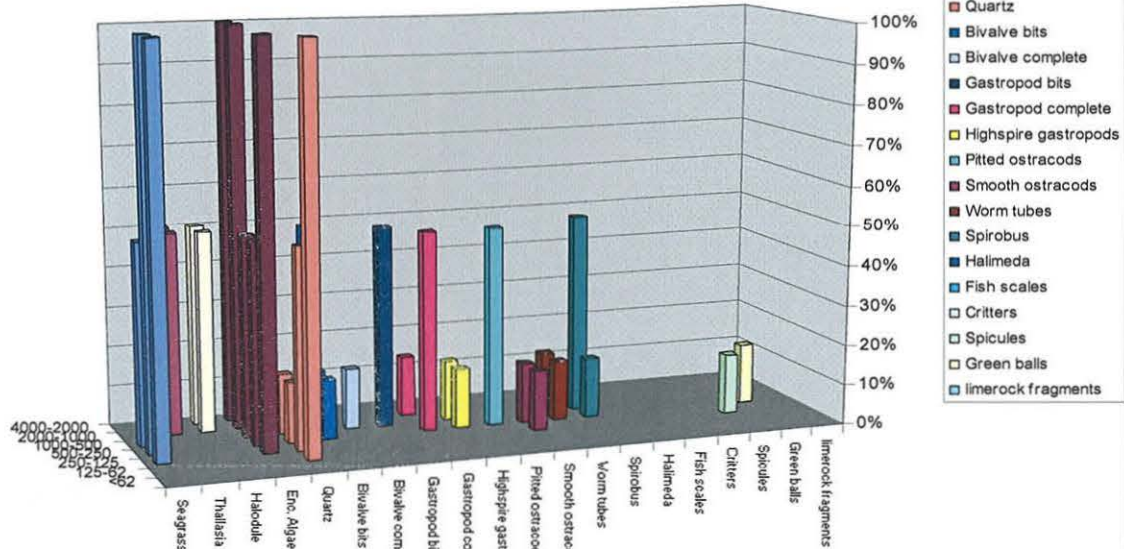
BBS21-I 041004 Other Sediment components



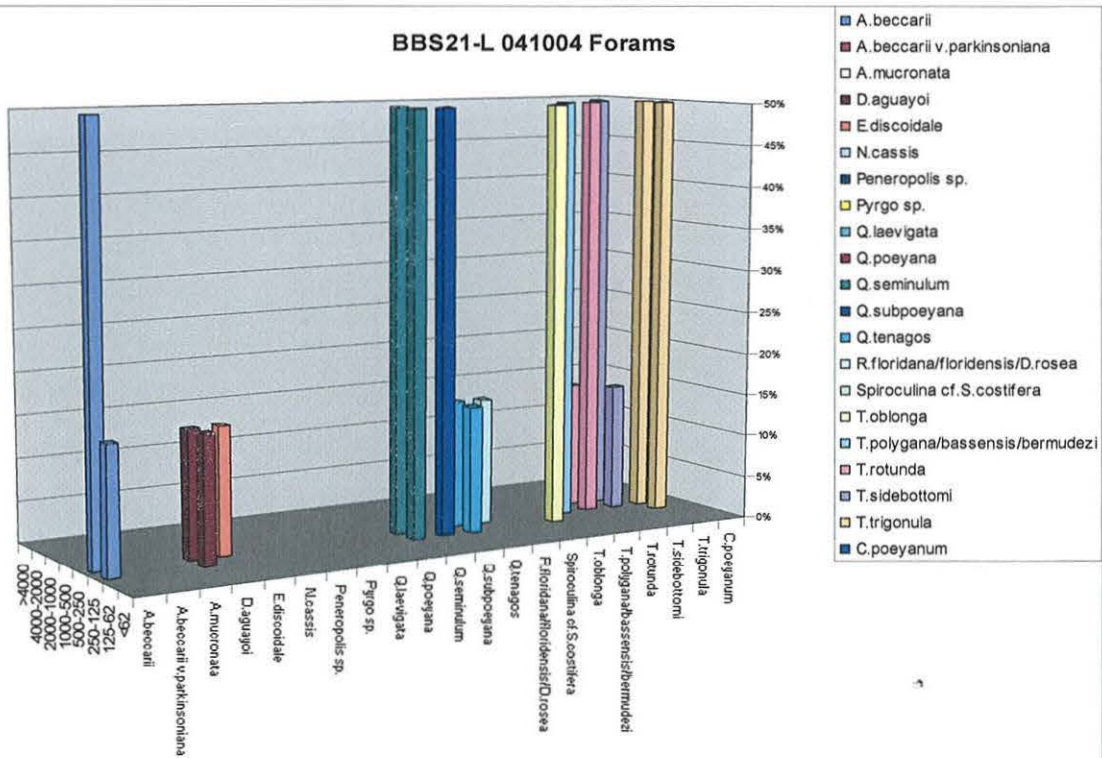
BBS21-I 041004 Forams



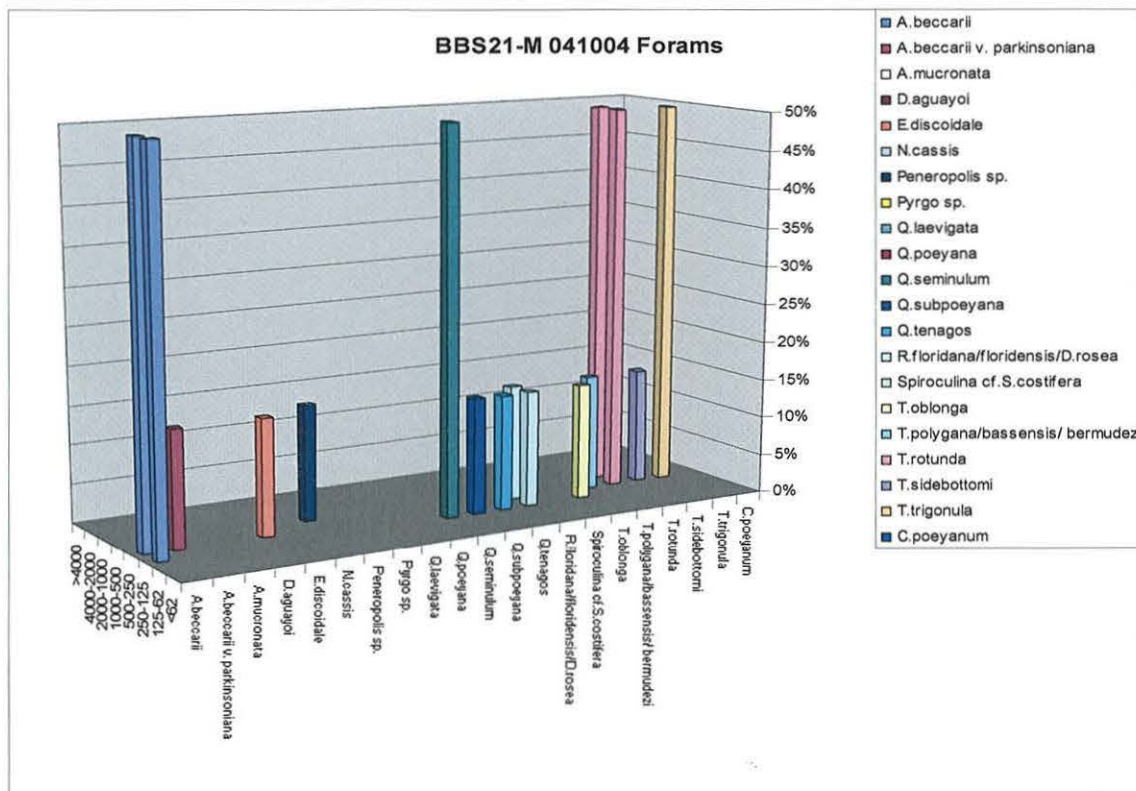
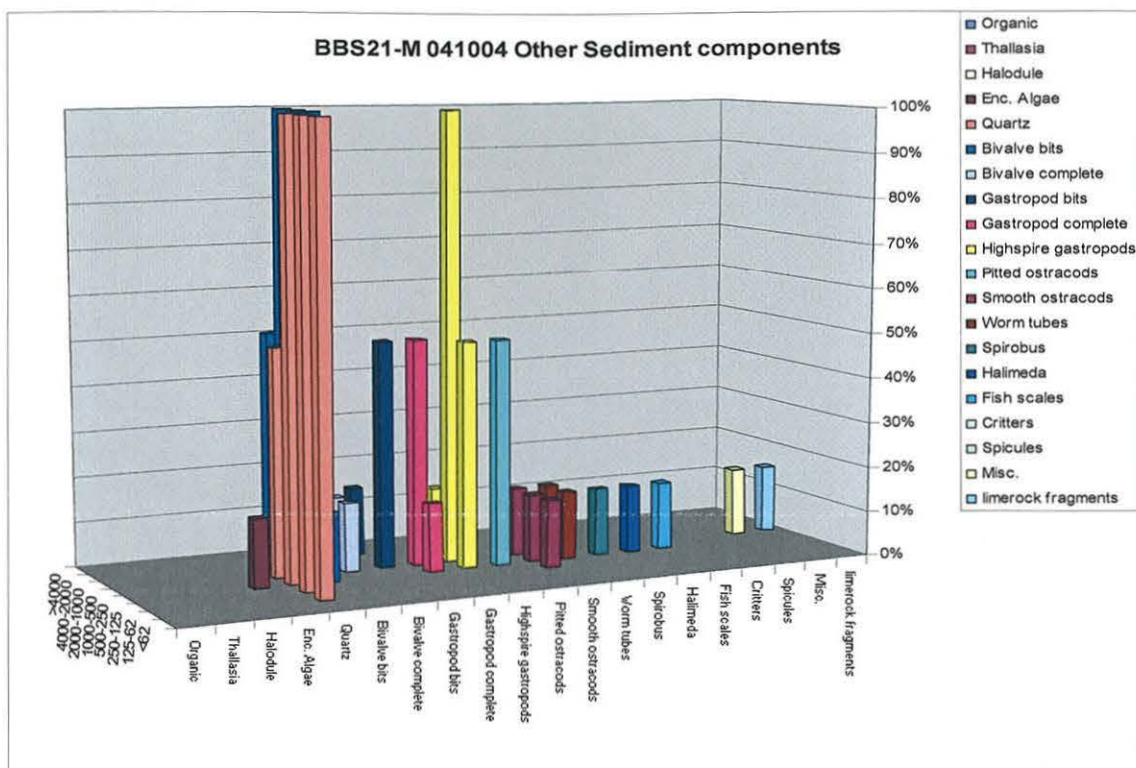
### BBS21-L 041004 Other Sediment components



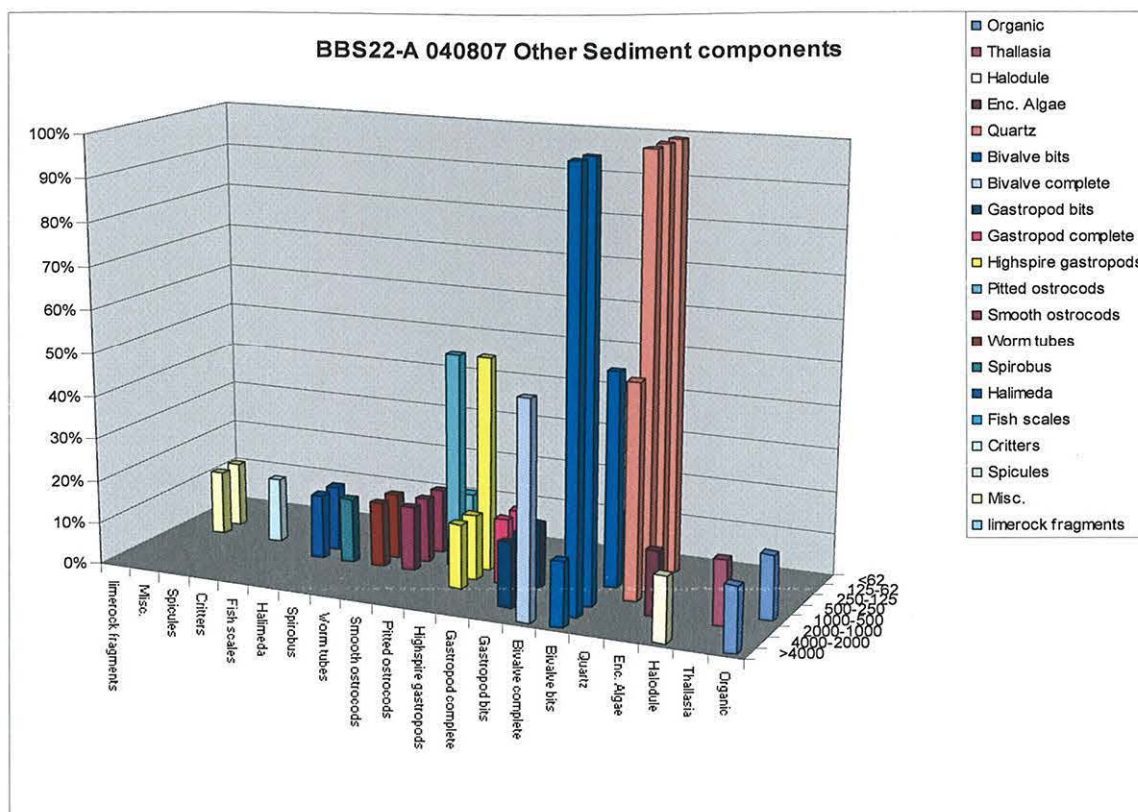
### BBS21-L 041004 Forams



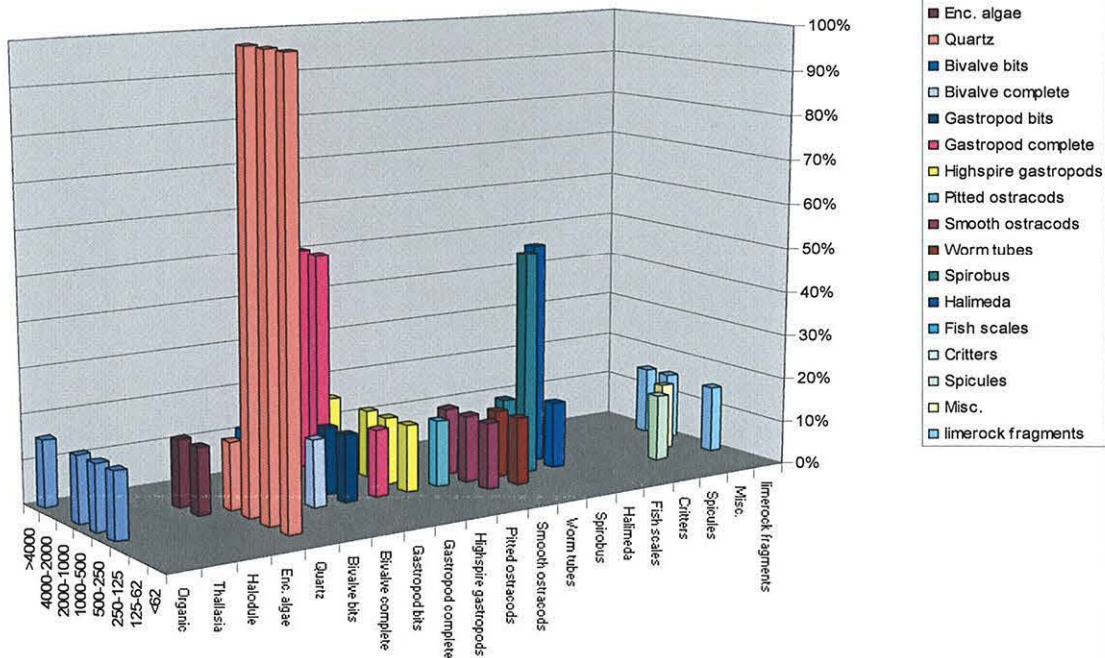
**BBS 21. Sediment sample component analyses and foraminifera species assemblages of different size fractions for sediment samples taken from the center of the spring (sample M)**



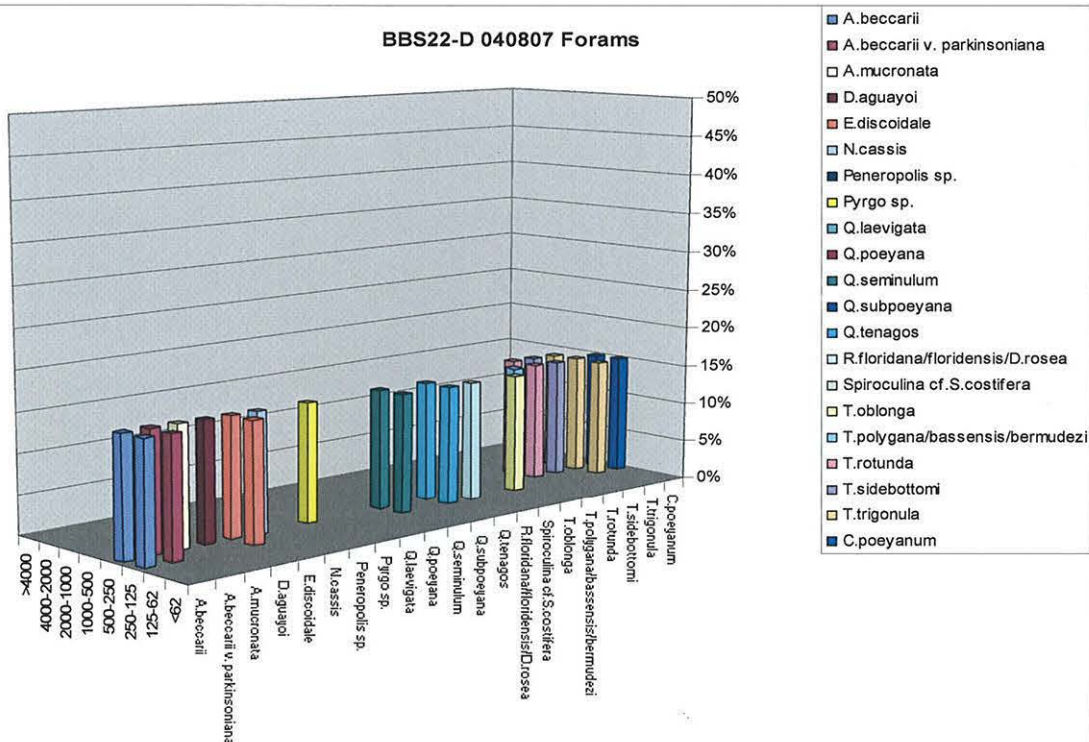
**BBS 22. Sediment sample component analyses and foraminifera species assemblages of different size fractions for sediment samples taken along edge of spring (samples A, D, G, and J)**

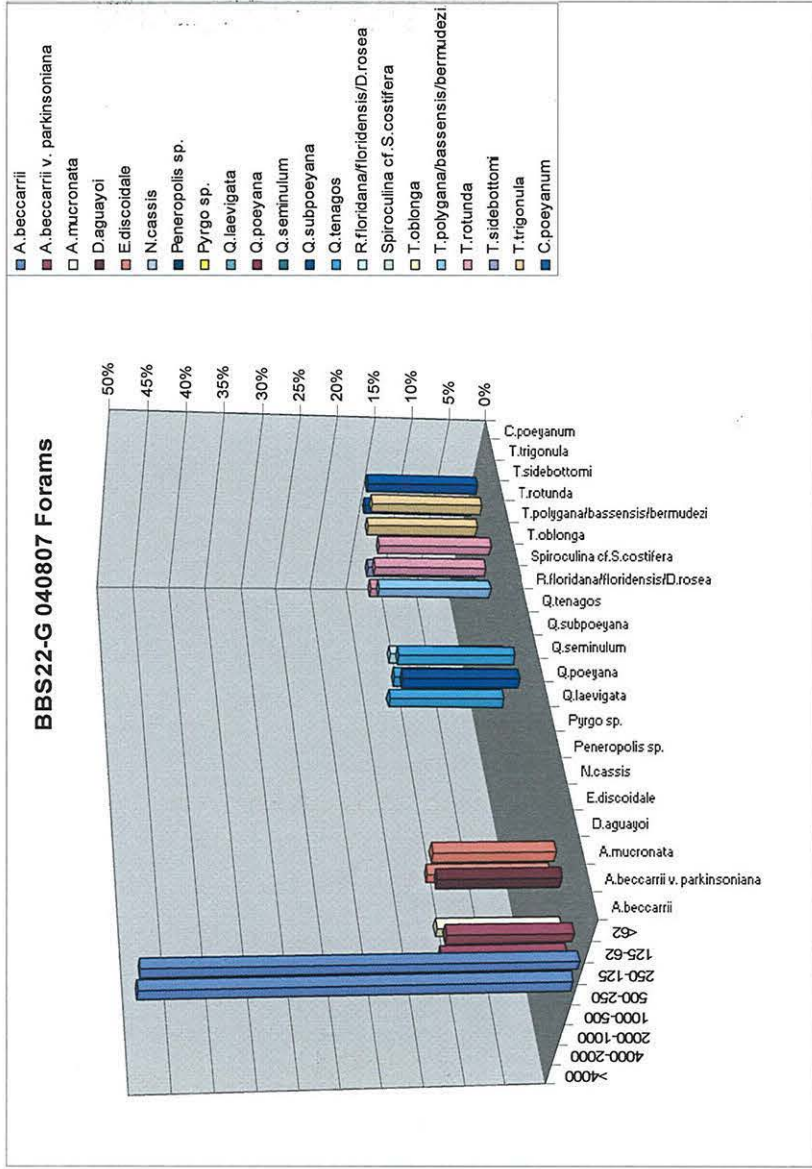


### BBS22-D 040807 Other Sediment Components

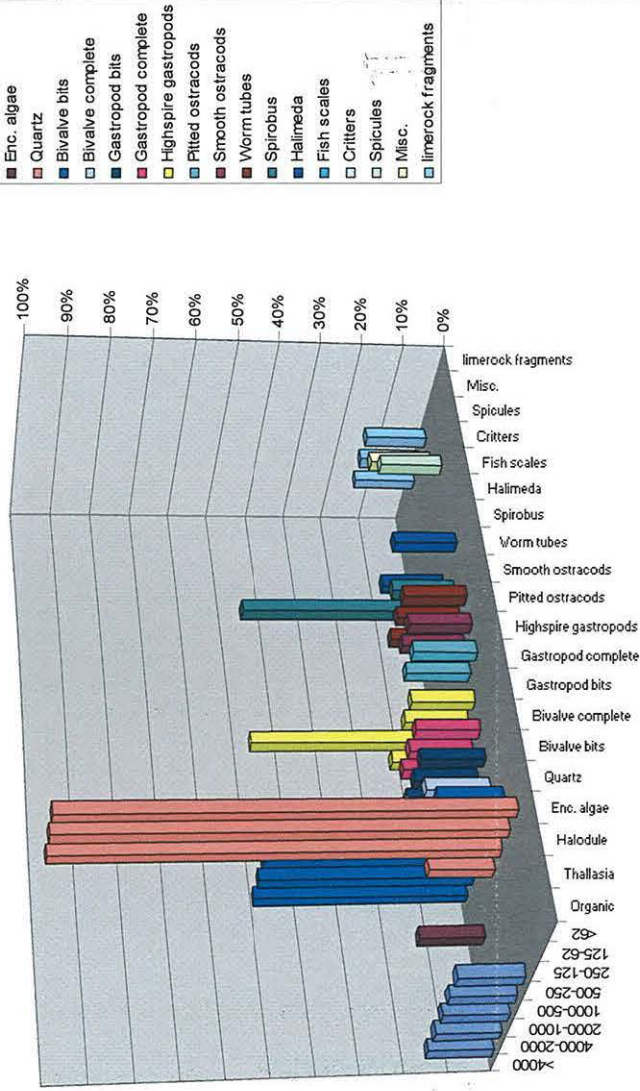


### BBS22-D 040807 Forams

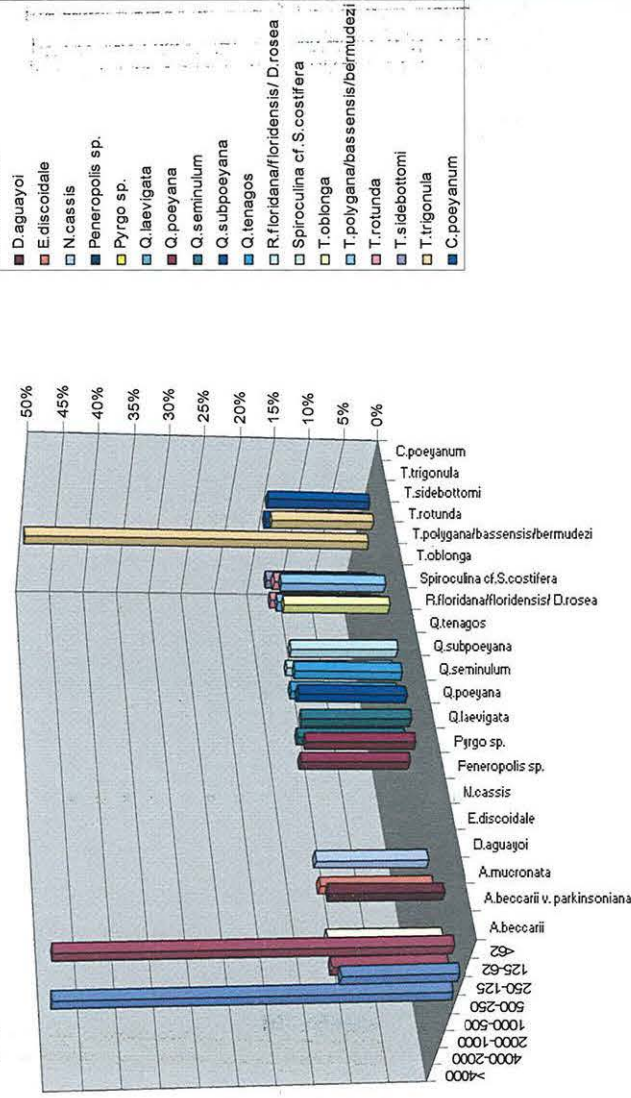


[illegible]

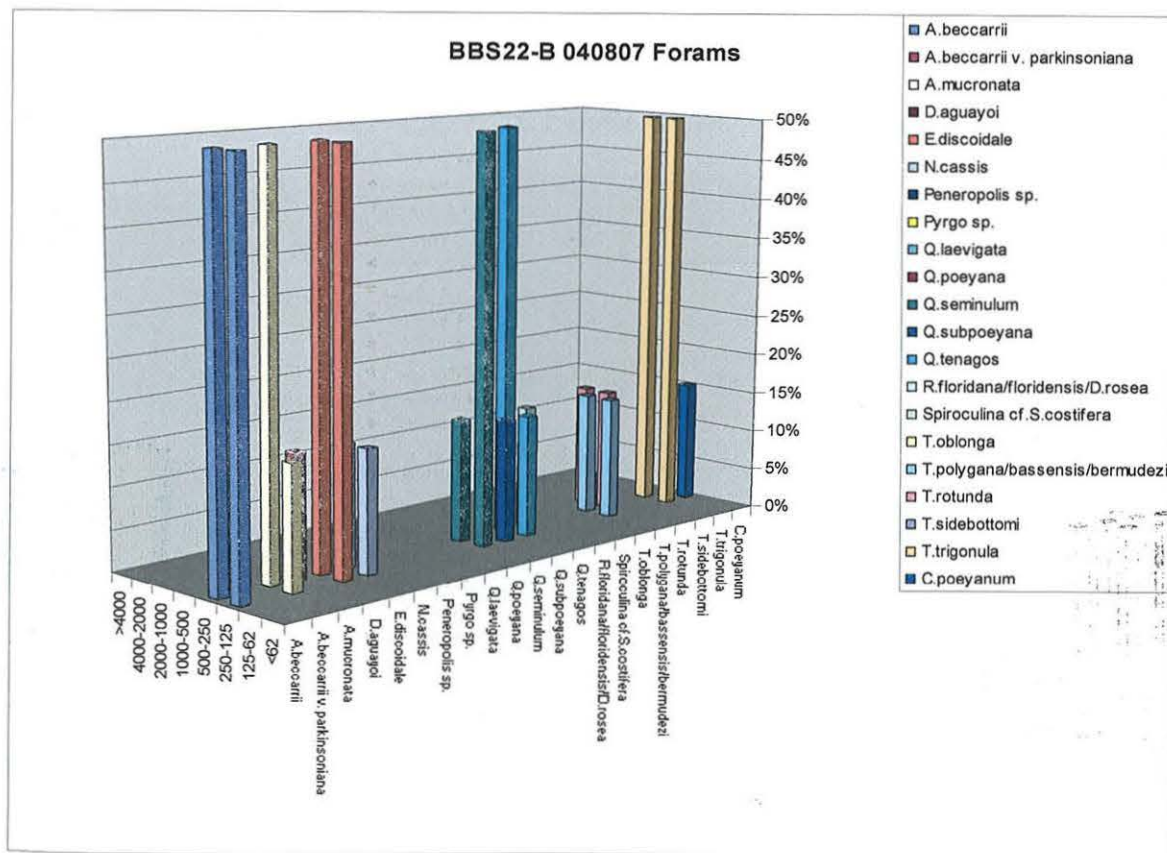
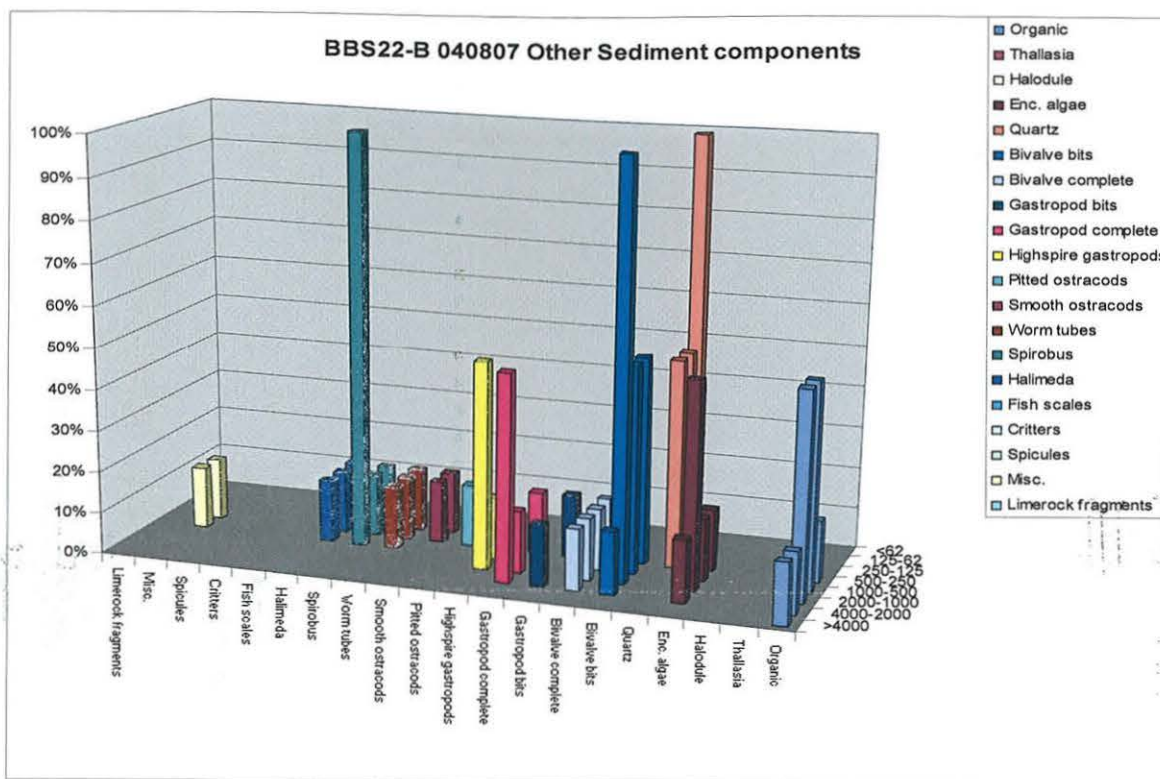
# BBS22-J 040807 Other Sediment components



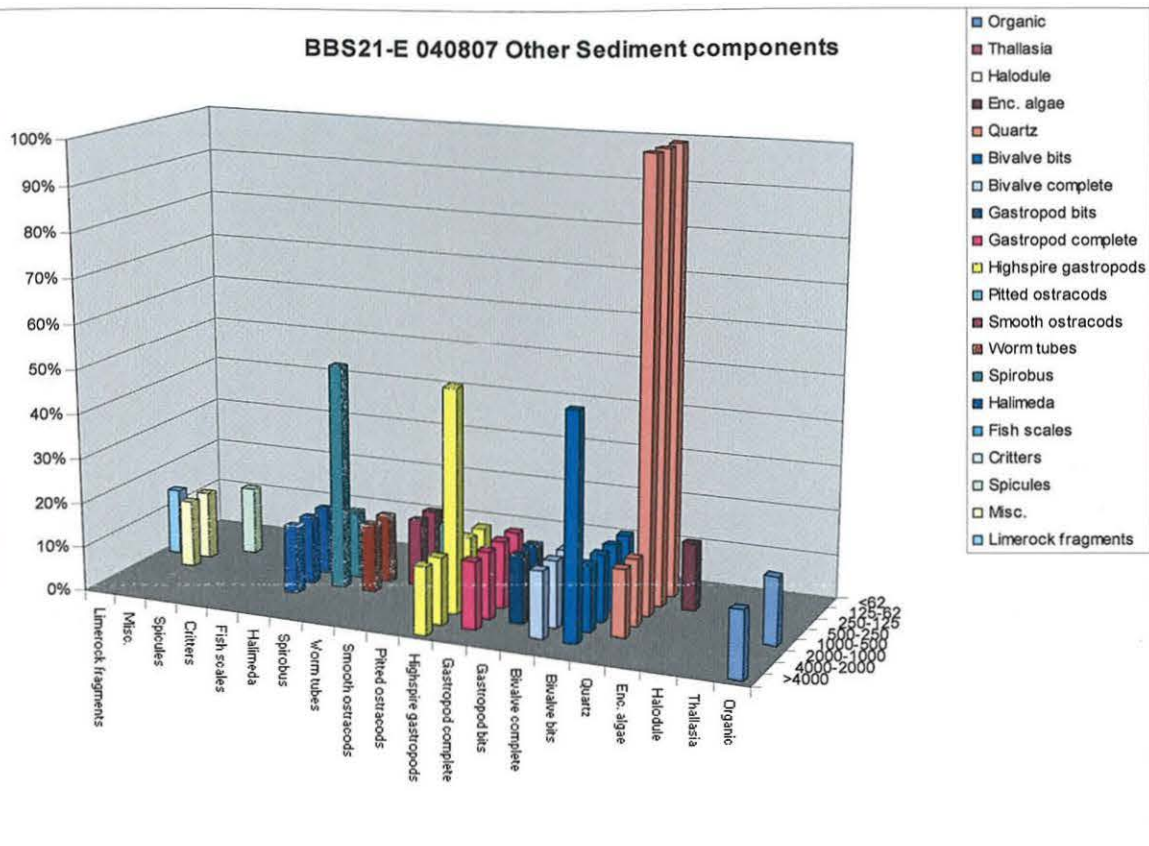
# BBS22-J 040807 Forams



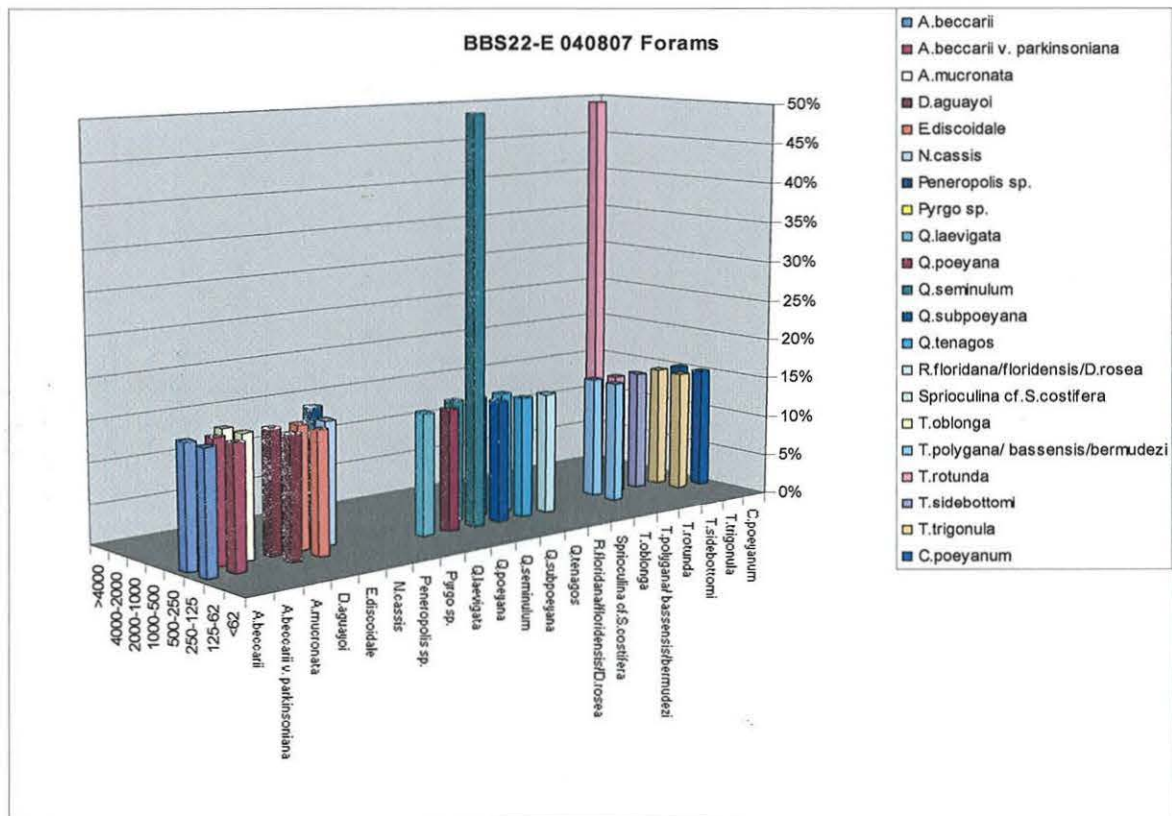
**BBS 22. Sediment sample component analyses and foraminifera species assemblages of different size fractions for sediment samples taken from 1 m distance of spring (samples B, E, H, and K)**



BBS21-E 040807 Other Sediment components

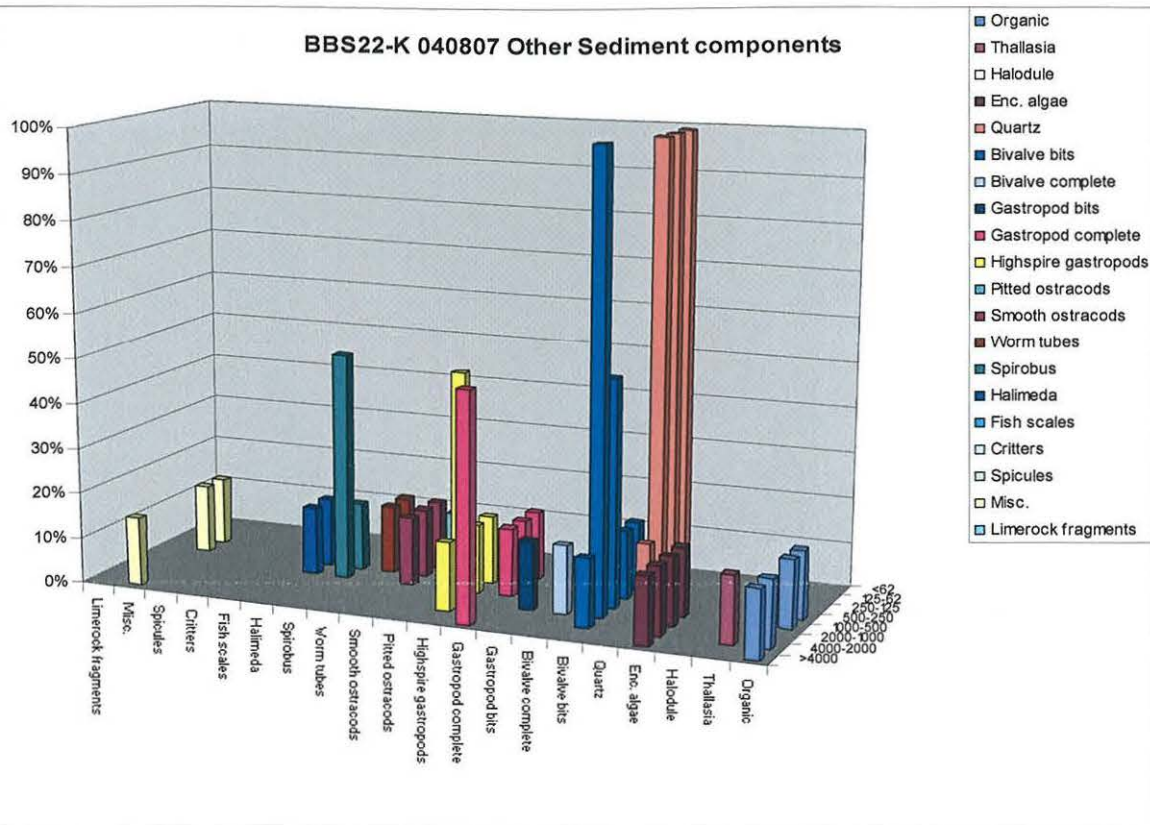


BBS22-E 040807 Forams

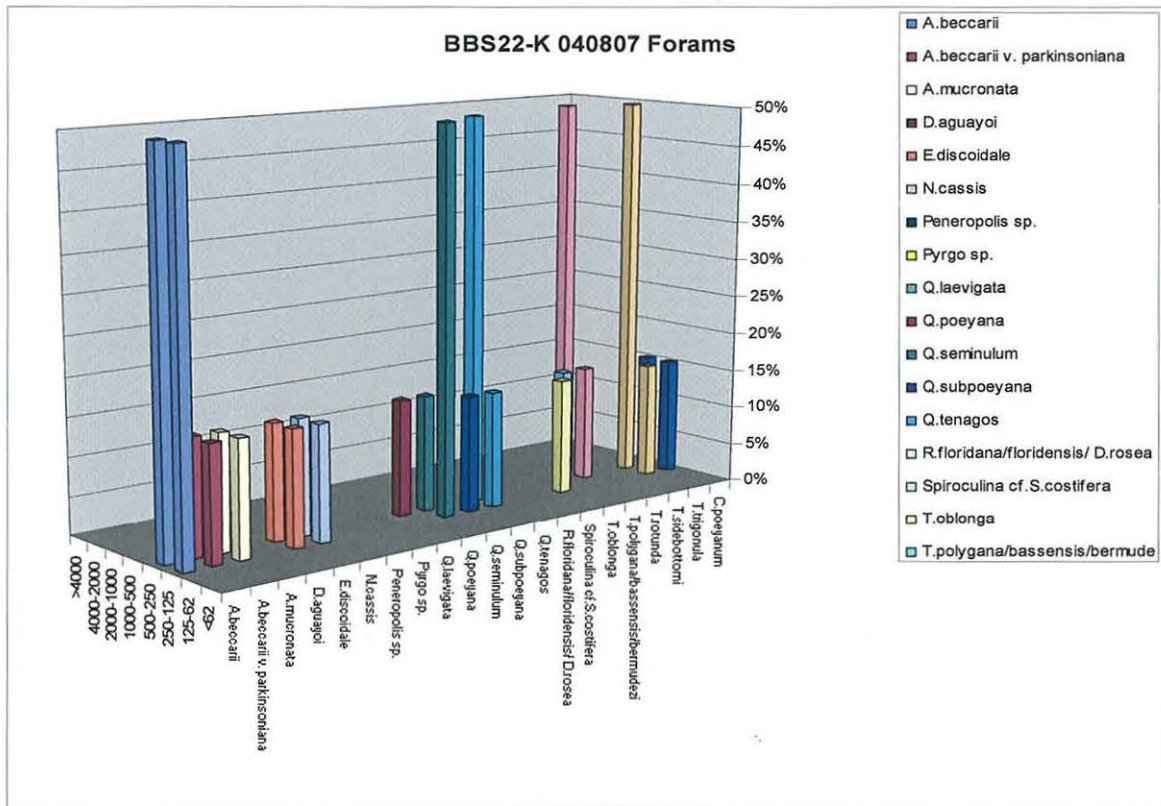




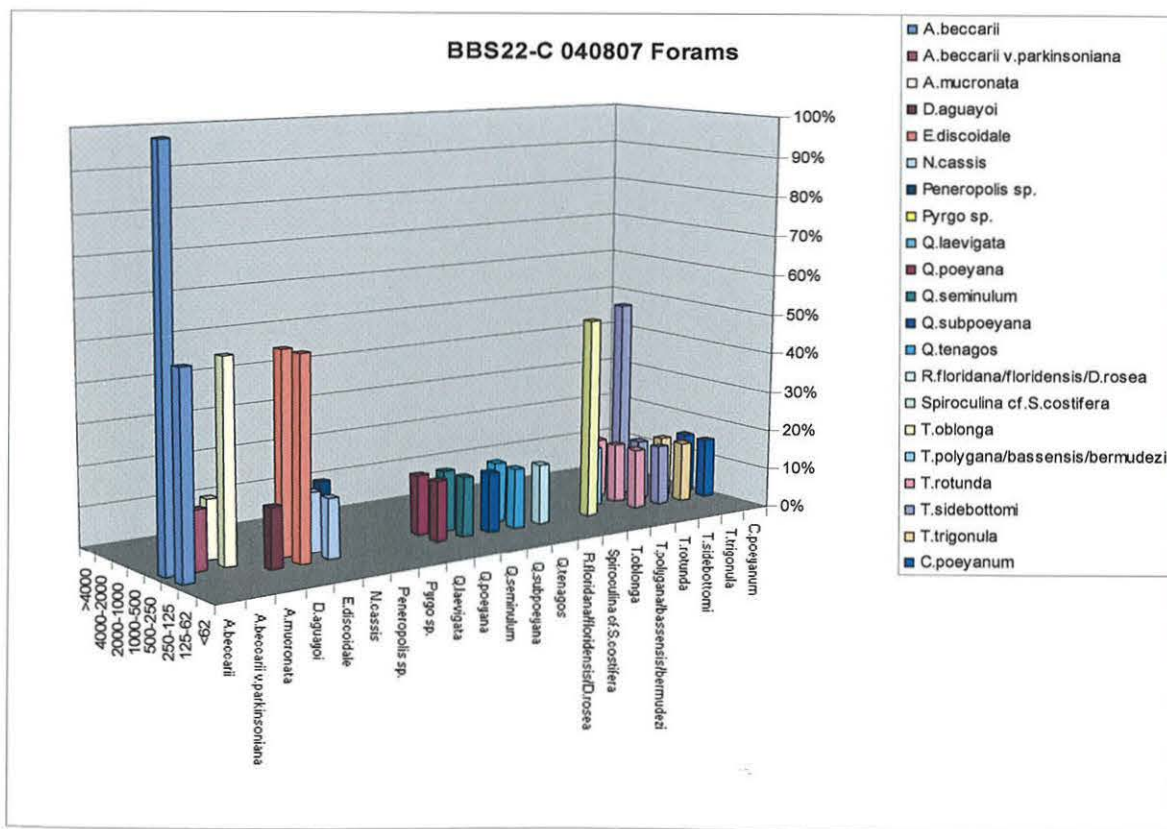
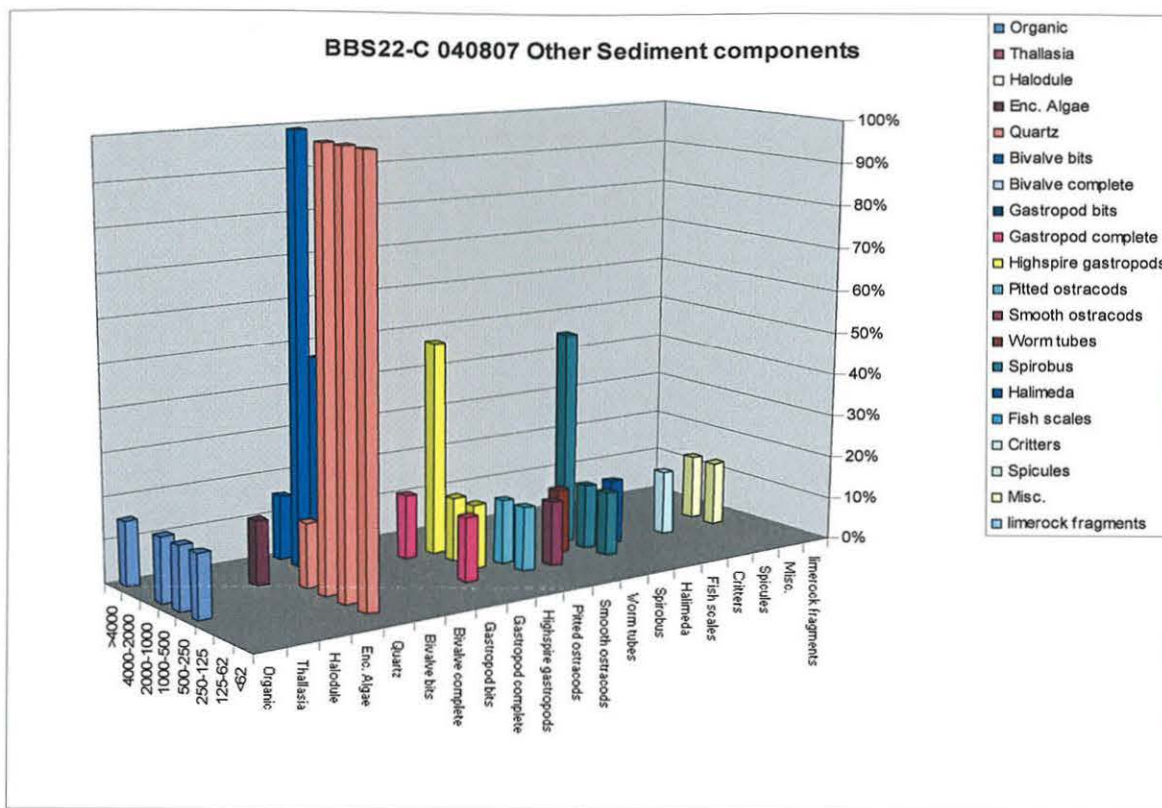
# BBS22-K 040807 Other Sediment components



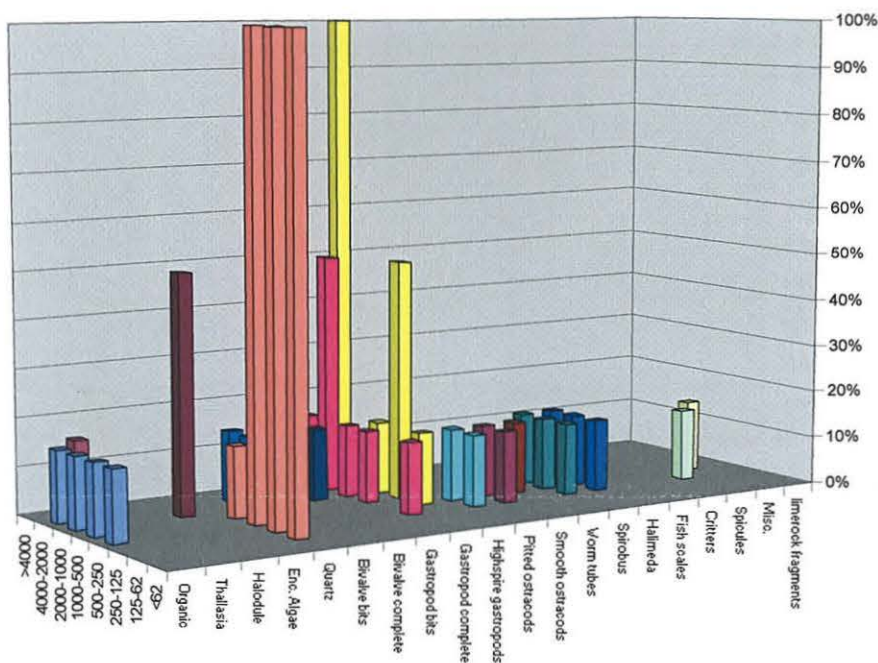
# BBS22-K 040807 Forams



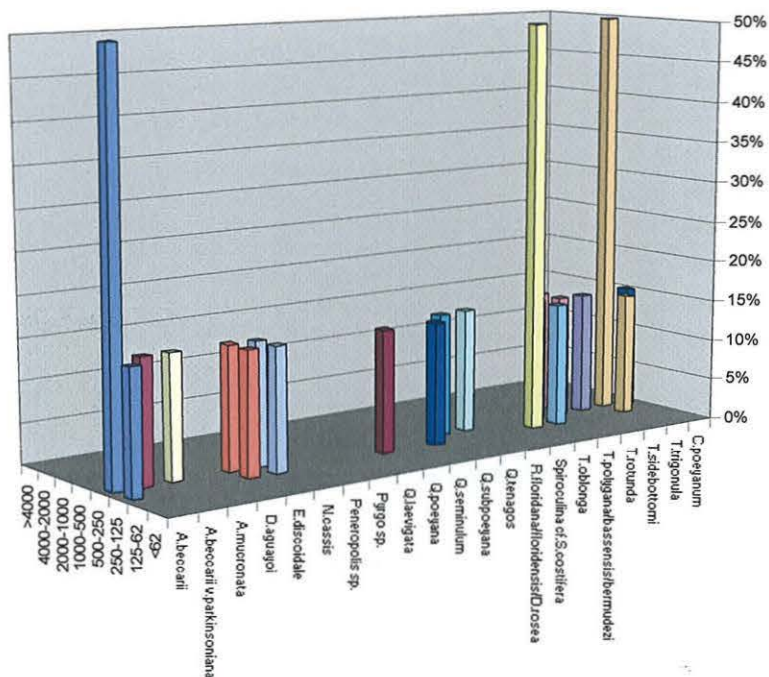
**BBS 22. Sediment sample component analyses and foraminifera species assemblages of different size fractions for sediment samples taken from 4 m distance of spring (samples C, F, I, and L)**



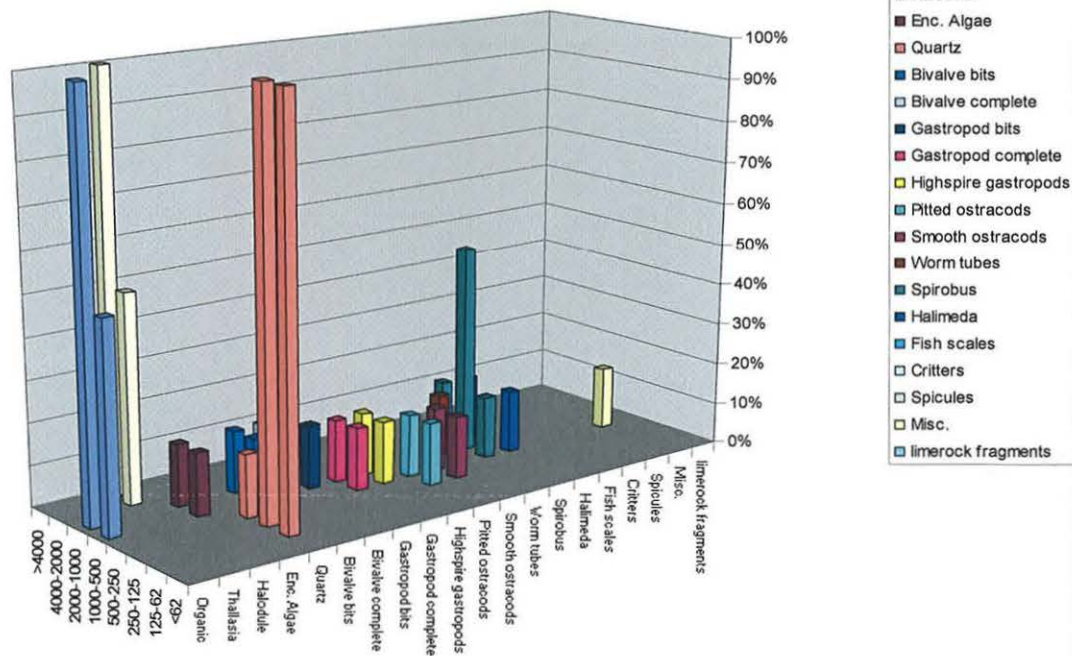
- ☒ Organic
- ☒ Thallasia
- ☐ Halodule
- ☒ Enc. Algae
- ☒ Quartz
- ☒ Bivalve bits
- ☐ Bivalve complete
- ☒ Gastropod bits
- ☒ Gastropod complete
- ☒ Highspire gastropods
- ☒ Pitted ostracods
- ☒ Smooth ostracods
- ☒ Worm tubes
- ☒ Spirobus
- ☒ Halimeda
- ☒ Fish scales
- ☐ Critters
- ☐ Spicules
- ☐ Misc.
- ☒ Limerock fragments



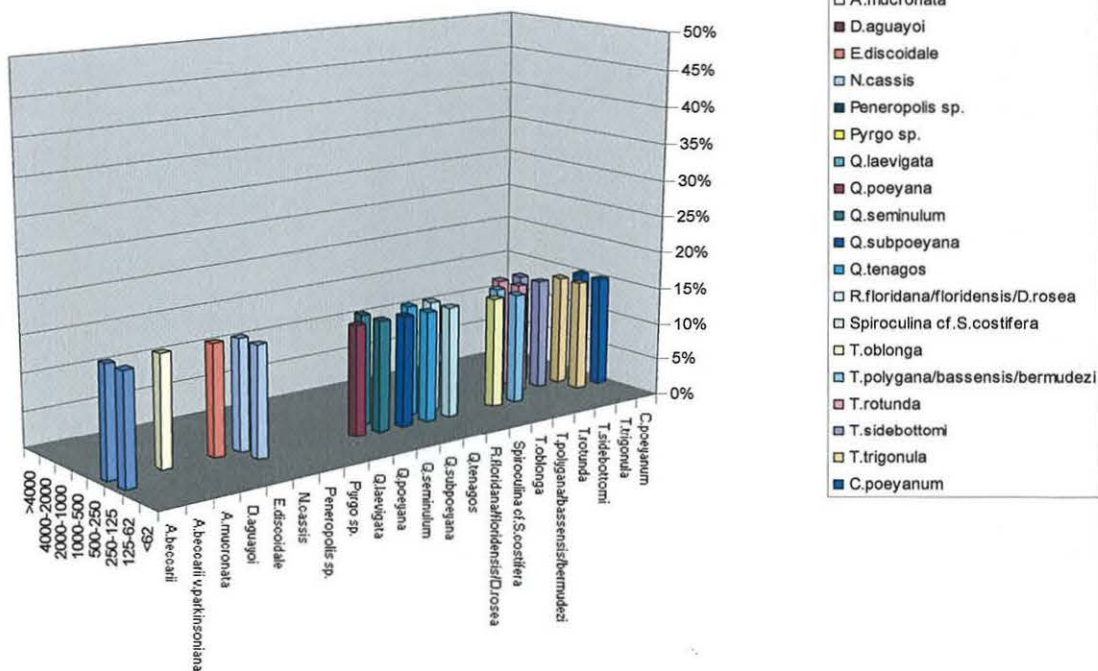
- ☒ A. beccarii
- ☒ A. beccarii v. parkinsoniana
- ☐ A. mucronata
- ☒ D. aguayoi
- ☐ E. discoidale
- ☒ N. cassis
- ☒ Peneropolis sp.
- ☒ Pyrgo sp.
- ☒ Q. laevigata
- ☒ Q. poeyana
- ☒ Q. seminulum
- ☒ Q. subpoeyana
- ☒ Q. tenagos
- ☐ R. floridana/floridensis/D. rosea
- ☐ Spiroculina cf. S. costifera
- ☒ T. oblonga
- ☒ T. polygana/bassensis/bermudezi
- ☒ T. rotunda
- ☒ T. sidebottomi
- ☒ T. trigonula
- ☒ C. poeyanum



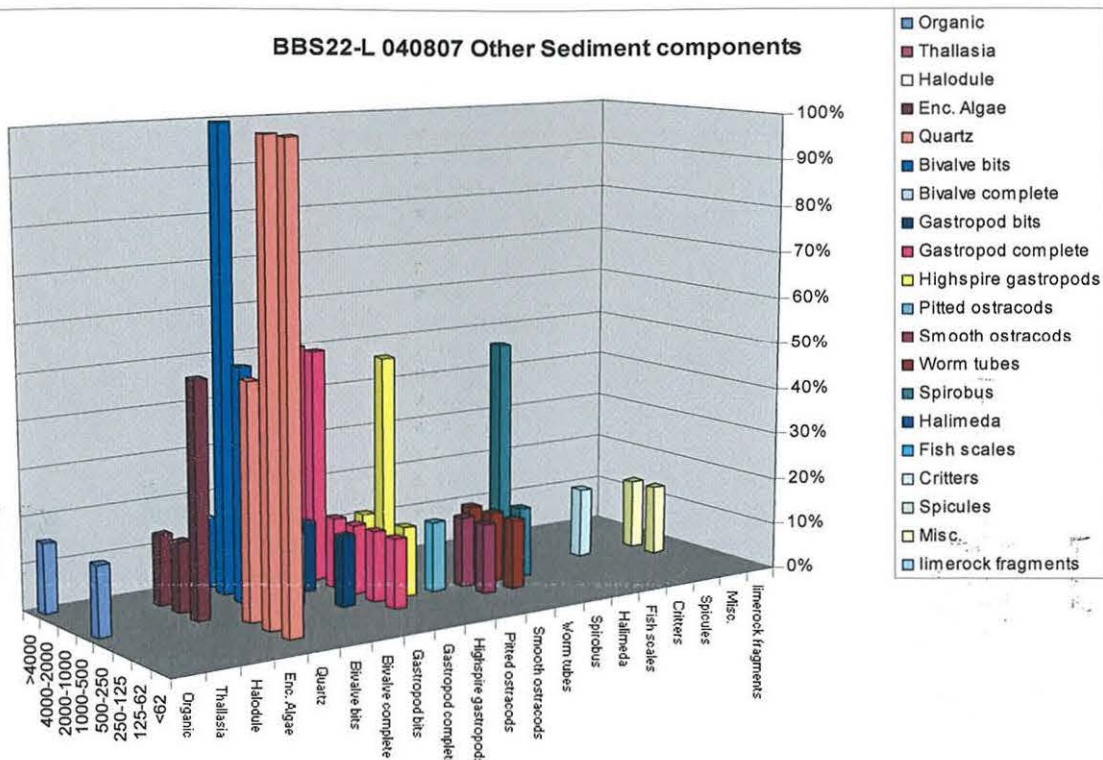
### BBS22-I 040807 Other Sediment components



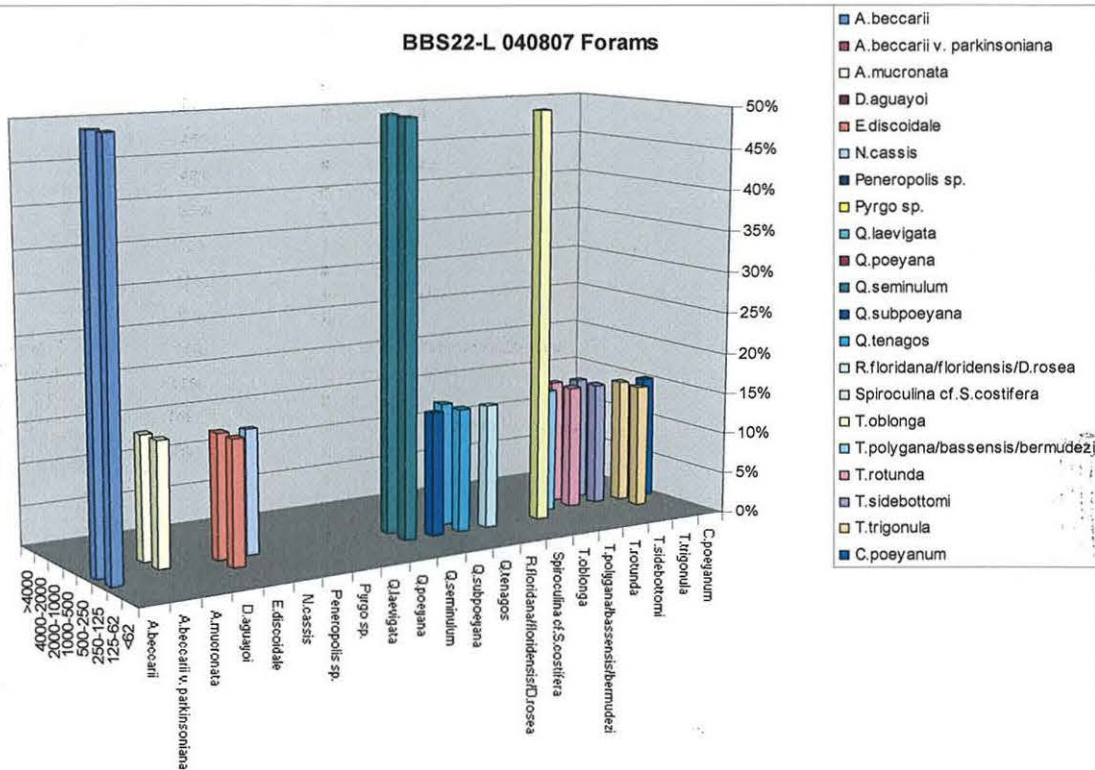
### BBS22-I 040807 Forams



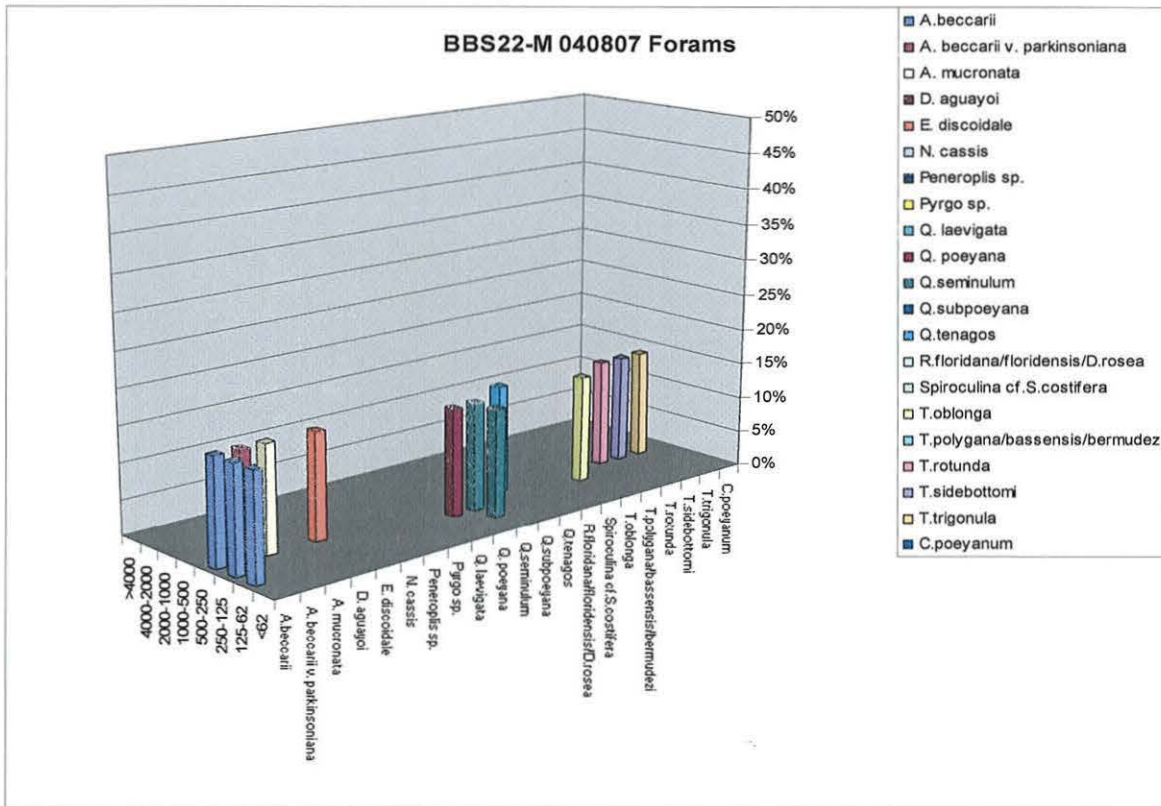
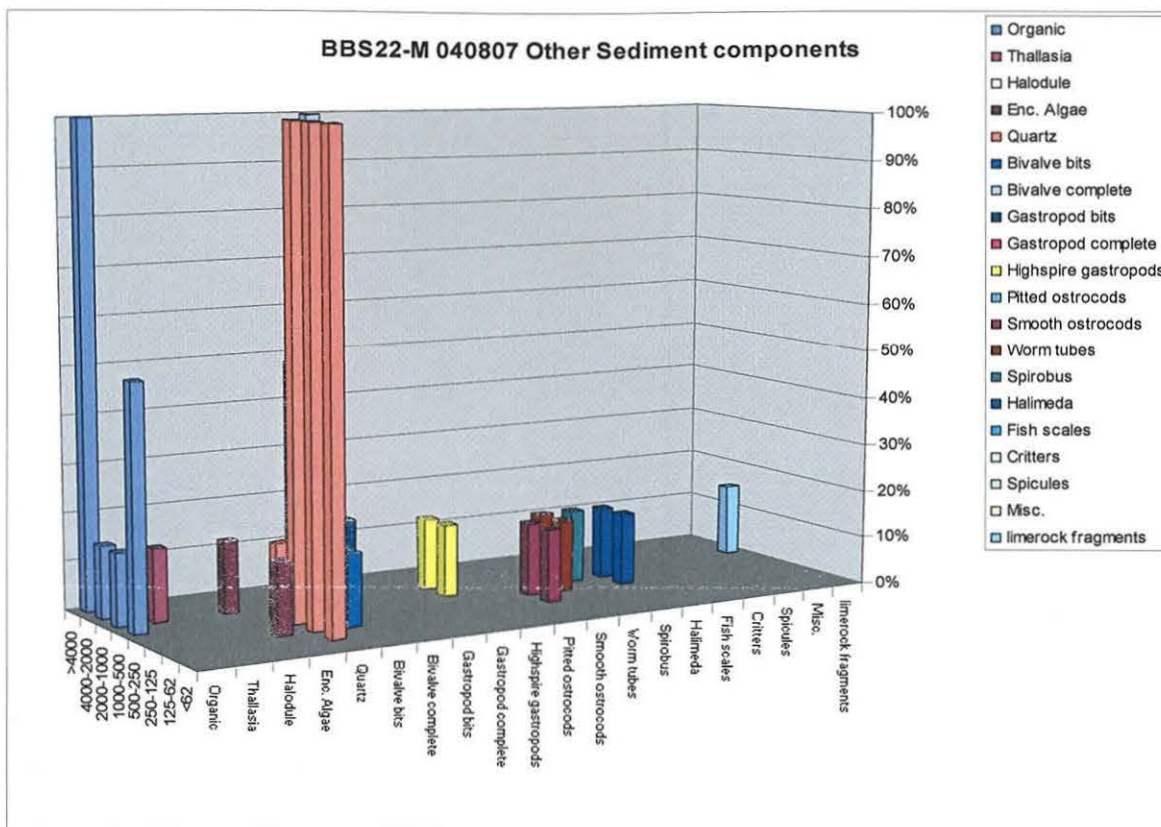
# BBS22-L 040807 Other Sediment components



# BBS22-L 040807 Forams



**BBS 22. Sediment sample component analyses and foraminifera species assemblages of different size fractions for sediment samples taken from the center of the spring (sample M)**



### **APPENDIX 3: YSI Data Tables and Graphs**

# YSI Data for 10/28/2004

NOTE: pH sensor was off on instrument

| Time  | Temp (C°) | SpCond (mS/cm) | Cond (mS/cm) | Sal (ppt) | Press (psi) | Depth (m) | Turbidity (NTU) | Chl (ug/L) |
|-------|-----------|----------------|--------------|-----------|-------------|-----------|-----------------|------------|
| 10:00 | 24.45     | 39.280         | 38.870       | 25.02     | 17.39       | 1.86      | 3.0             | 6.80       |
| 10:10 | 24.47     | 39.300         | 38.910       | 25.04     | 17.41       | 1.87      | 1.4             | 6.20       |
| 10:20 | 24.51     | 39.280         | 38.920       | 25.03     | 17.42       | 1.88      | 1.0             | 6.80       |
| 10:30 | 24.54     | 39.260         | 38.920       | 25.01     | 17.42       | 1.88      | 1.3             | 6.50       |
| 10:40 | 24.61     | 39.240         | 38.950       | 24.99     | 17.42       | 1.88      | 2.1             | 6.60       |
| 10:50 | 24.76     | 39.050         | 38.870       | 24.86     | 17.42       | 1.88      | 1.7             | 6.70       |
| 11:00 | 24.80     | 39.130         | 38.990       | 24.91     | 17.40       | 1.86      | 1.1             | 6.80       |
| 11:10 | 24.85     | 39.140         | 39.030       | 24.92     | 17.38       | 1.85      | 1.1             | 7.10       |
| 11:20 | 24.91     | 39.090         | 39.030       | 24.88     | 17.36       | 1.84      | 1.2             | 6.90       |
| 11:30 | 24.95     | 39.100         | 39.070       | 24.89     | 17.33       | 1.82      | 1.4             | 6.10       |
| 11:40 | 25.01     | 39.160         | 39.170       | 24.93     | 17.30       | 1.80      | 1.0             | 6.90       |
| 11:50 | 25.05     | 39.250         | 39.290       | 24.99     | 17.27       | 1.78      | 1.2             | 6.60       |
| 12:00 | 25.10     | 39.270         | 39.340       | 25.00     | 17.23       | 1.75      | 1.4             | 7.10       |
| 12:10 | 25.18     | 39.300         | 39.430       | 25.02     | 17.19       | 1.72      | 1.1             | 7.00       |
| 12:20 | 25.24     | 39.370         | 39.550       | 25.07     | 17.16       | 1.70      | 1.2             | 6.70       |
| 12:30 | 25.30     | 39.400         | 39.630       | 25.09     | 17.13       | 1.68      | 1.0             | 7.10       |
| 12:40 | 25.36     | 39.430         | 39.700       | 25.11     | 17.10       | 1.66      | 1.5             | 6.50       |
| 12:50 | 25.43     | 39.430         | 39.750       | 25.11     | 17.07       | 1.64      | 1.0             | 6.80       |
| 13:00 | 25.65     | 35.570         | 36.010       | 22.39     | 17.03       | 1.61      | 1.1             | 6.80       |
| 13:10 | 25.76     | 30.760         | 31.210       | 19.08     | 17.00       | 1.60      | 0.9             | 5.80       |
| 13:20 | 25.82     | 31.860         | 32.350       | 19.83     | 16.97       | 1.57      | 1.0             | 6.40       |
| 13:30 | 25.92     | 33.530         | 34.110       | 20.97     | 16.93       | 1.54      | 1.1             | 6.70       |
| 13:40 | 26.03     | 31.520         | 32.140       | 19.59     | 16.89       | 1.52      | 1.2             | 6.20       |
| 13:50 | 26.09     | 31.770         | 32.430       | 19.76     | 16.85       | 1.49      | 1.2             | 6.20       |
| 14:00 | 26.18     | 32.700         | 33.430       | 20.40     | 16.82       | 1.47      | 1.3             | 6.50       |
| 14:10 | 26.22     | 33.080         | 33.850       | 20.66     | 16.79       | 1.45      | 1.2             | 6.00       |
| 14:20 | 26.24     | 37.110         | 37.990       | 23.46     | 16.76       | 1.42      | 1.2             | 6.80       |
| 14:30 | 26.34     | 33.840         | 34.710       | 21.18     | 16.72       | 1.40      | 1.0             | 6.20       |
| 14:40 | 26.41     | 37.080         | 38.080       | 23.44     | 16.70       | 1.38      | 1.2             | 6.40       |
| 14:50 | 26.49     | 37.540         | 38.600       | 23.75     | 16.67       | 1.36      | 1.0             | 5.80       |
| 15:00 | 26.56     | 37.220         | 38.330       | 23.53     | 16.65       | 1.34      | 0.9             | 5.90       |
| 15:10 | 26.62     | 35.820         | 36.930       | 22.55     | 16.61       | 1.32      | 1.0             | 6.10       |
| 15:20 | 26.66     | 33.070         | 34.120       | 20.65     | 16.58       | 1.30      | 1.3             | 5.80       |
| 15:30 | 26.74     | 36.260         | 37.470       | 22.86     | 16.56       | 1.29      | 0.9             | 6.30       |
| 15:40 | 26.79     | 36.490         | 37.740       | 23.01     | 16.53       | 1.27      | 1.0             | 6.50       |
| 15:50 | 26.81     | 35.160         | 36.380       | 22.09     | 16.52       | 1.26      | 0.8             | 6.40       |

# YSI Data for 11/02/2004 to 11/04/2004

NOTE: Pressure, chlorophyll and the voltage of the instrument were acquired, but not included on this report.

| DateTime      | Temp( C°) | SpCond (mS/cm) | Cond (mS/cm) | Sal (ppt) | Depth (m) | Turbidity (NTU) |
|---------------|-----------|----------------|--------------|-----------|-----------|-----------------|
| 11/2/04 10:00 | 25.62     | 31.500         | 31.870       | 19.58     | 1.39      | 2.9             |
| 11/2/04 10:10 | 25.70     | 30.500         | 30.910       | 18.90     | 1.39      | 0.2             |
| 11/2/04 10:20 | 25.90     | 29.030         | 29.530       | 17.89     | 1.41      | 0.3             |
| 11/2/04 10:30 | 25.96     | 27.670         | 28.170       | 16.98     | 1.42      | 0.1             |
| 11/2/04 10:40 | 26.18     | 25.780         | 26.360       | 15.71     | 1.44      | 0.1             |
| 11/2/04 10:50 | 26.20     | 24.710         | 25.280       | 14.99     | 1.46      | 0.0             |
| 11/2/04 11:00 | 26.21     | 24.860         | 25.430       | 15.09     | 1.48      | 0.0             |
| 11/2/04 11:10 | 26.29     | 26.000         | 26.630       | 15.85     | 1.49      | 0.0             |
| 11/2/04 11:20 | 26.33     | 29.440         | 30.190       | 18.17     | 1.51      | 0.3             |
| 11/2/04 11:30 | 26.31     | 36.370         | 37.280       | 22.94     | 1.52      | 0.6             |
| 11/2/04 11:40 | 26.38     | 36.400         | 37.350       | 22.96     | 1.53      | 0.7             |
| 11/2/04 11:50 | 26.46     | 36.450         | 37.460       | 22.99     | 1.54      | 0.6             |
| 11/2/04 12:00 | 26.54     | 36.500         | 37.580       | 23.03     | 1.55      | 0.5             |
| 11/2/04 12:10 | 26.62     | 36.540         | 37.670       | 23.05     | 1.55      | 0.5             |
| 11/2/04 12:20 | 26.71     | 36.580         | 37.780       | 23.08     | 1.56      | 0.6             |
| 11/2/04 12:30 | 26.78     | 36.620         | 37.860       | 23.11     | 1.57      | 0.5             |
| 11/2/04 12:40 | 26.85     | 36.640         | 37.940       | 23.12     | 1.57      | 0.6             |
| 11/2/04 12:50 | 26.92     | 36.640         | 37.990       | 23.12     | 1.57      | 0.6             |
| 11/2/04 13:00 | 27.00     | 36.670         | 38.060       | 23.13     | 1.57      | 0.4             |
| 11/2/04 13:10 | 27.07     | 36.680         | 38.130       | 23.14     | 1.56      | 0.5             |
| 11/2/04 13:20 | 27.16     | 36.700         | 38.220       | 23.16     | 1.55      | 0.7             |
| 11/2/04 13:30 | 27.23     | 36.710         | 38.270       | 23.16     | 1.55      | 0.7             |
| 11/2/04 13:40 | 27.29     | 36.690         | 38.300       | 23.15     | 1.53      | 0.7             |
| 11/2/04 13:50 | 27.36     | 36.680         | 38.340       | 23.14     | 1.52      | 0.6             |
| 11/2/04 14:00 | 27.40     | 36.660         | 38.340       | 23.12     | 1.51      | 0.9             |
| 11/2/04 14:10 | 27.47     | 36.660         | 38.380       | 23.12     | 1.49      | 0.4             |
| 11/2/04 14:20 | 27.28     | 32.860         | 34.290       | 20.49     | 1.47      | 1.0             |
| 11/2/04 14:30 | 27.33     | 30.130         | 31.470       | 18.62     | 1.46      | 0.4             |
| 11/2/04 14:40 | 27.51     | 30.170         | 31.620       | 18.64     | 1.44      | 0.5             |
| 11/2/04 14:50 | 27.60     | 29.510         | 30.970       | 18.19     | 1.43      | 0.4             |
| 11/2/04 15:00 | 27.63     | 31.140         | 32.700       | 19.30     | 1.42      | 0.2             |
| 11/2/04 15:10 | 27.70     | 28.950         | 30.440       | 17.81     | 1.40      | 0.4             |
| 11/2/04 15:20 | 27.69     | 32.770         | 34.450       | 20.41     | 1.38      | 0.5             |
| 11/2/04 15:30 | 27.71     | 27.800         | 29.230       | 17.03     | 1.37      | 0.2             |
| 11/2/04 15:40 | 27.72     | 26.720         | 28.100       | 16.31     | 1.36      | 0.5             |
| 11/2/04 15:50 | 27.69     | 26.590         | 27.950       | 16.22     | 1.34      | 0.3             |
| 11/2/04 16:00 | 27.17     | 19.720         | 20.540       | 11.71     | 1.33      | 4.1             |
| 11/2/04 16:10 | 27.74     | 26.520         | 27.910       | 16.18     | 1.31      | 0.1             |
| 11/2/04 16:20 | 27.81     | 27.230         | 28.690       | 16.65     | 1.29      | 0.1             |
| 11/2/04 16:30 | 27.65     | 24.870         | 26.130       | 15.08     | 1.28      | 0.3             |
| 11/2/04 16:40 | 27.58     | 24.040         | 25.220       | 14.53     | 1.26      | 0.1             |
| 11/2/04 16:50 | 27.57     | 23.730         | 24.890       | 14.32     | 1.25      | 0.3             |
| 11/2/04 17:00 | 27.50     | 24.040         | 25.190       | 14.53     | 1.24      | 0.3             |
| 11/2/04 17:10 | 27.76     | 26.930         | 28.350       | 16.45     | 1.22      | 0.4             |
| 11/2/04 17:20 | 27.73     | 26.060         | 27.420       | 15.87     | 1.21      | 0.2             |
| 11/2/04 17:30 | 27.57     | 25.130         | 26.360       | 15.25     | 1.20      | 0.4             |
| 11/2/04 17:40 | 27.40     | 24.230         | 25.350       | 14.66     | 1.19      | 0.2             |

|               |       |        |        |       |      |      |
|---------------|-------|--------|--------|-------|------|------|
| 11/2/04 17:50 | 27.34 | 22.900 | 23.920 | 13.78 | 1.18 | 0.1  |
| 11/2/04 18:00 | 27.35 | 24.360 | 25.450 | 14.74 | 1.17 | 0.3  |
| 11/2/04 18:10 | 27.31 | 26.120 | 27.270 | 15.91 | 1.15 | 0.1  |
| 11/2/04 18:20 | 27.22 | 23.470 | 24.460 | 14.15 | 1.15 | 0.3  |
| 11/2/04 18:30 | 27.24 | 25.200 | 26.280 | 15.30 | 1.15 | 0.2  |
| 11/2/04 18:40 | 27.19 | 23.940 | 24.940 | 14.47 | 1.14 | 0.4  |
| 11/2/04 18:50 | 27.10 | 23.420 | 24.360 | 14.13 | 1.14 | 0.6  |
| 11/2/04 19:00 | 27.09 | 24.240 | 25.210 | 14.67 | 1.14 | 1.4  |
| 11/2/04 19:10 | 27.09 | 23.530 | 24.460 | 14.20 | 1.14 | 0.9  |
| 11/2/04 19:20 | 27.03 | 23.000 | 23.900 | 13.85 | 1.14 | 0.1  |
| 11/2/04 19:30 | 27.02 | 19.850 | 20.610 | 11.79 | 1.14 | 0.1  |
| 11/2/04 19:40 | 26.98 | 20.160 | 20.920 | 11.99 | 1.14 | 0.3  |
| 11/2/04 19:50 | 26.97 | 23.800 | 24.690 | 14.38 | 1.15 | 0.3  |
| 11/2/04 20:00 | 26.96 | 20.430 | 21.200 | 12.17 | 1.16 | 0.1  |
| 11/2/04 20:10 | 26.95 | 23.020 | 23.880 | 13.86 | 1.18 | 0.1  |
| 11/2/04 20:20 | 26.91 | 22.460 | 23.270 | 13.49 | 1.19 | 0.2  |
| 11/2/04 20:30 | 26.87 | 24.070 | 24.930 | 14.56 | 1.20 | 0.2  |
| 11/2/04 20:40 | 26.80 | 27.190 | 28.130 | 16.64 | 1.22 | 0.2  |
| 11/2/04 20:50 | 26.76 | 26.780 | 27.680 | 16.37 | 1.24 | 0.2  |
| 11/2/04 21:00 | 26.70 | 28.070 | 28.980 | 17.24 | 1.26 | 0.3  |
| 11/2/04 21:10 | 26.65 | 25.650 | 26.450 | 15.61 | 1.27 | 1.8  |
| 11/2/04 21:20 | 26.61 | 25.870 | 26.660 | 15.76 | 1.29 | 0.3  |
| 11/2/04 21:30 | 26.59 | 25.880 | 26.670 | 15.77 | 1.30 | 1.4  |
| 11/2/04 21:40 | 26.57 | 25.940 | 26.720 | 15.81 | 1.32 | 4.9  |
| 11/2/04 21:50 | 26.55 | 29.930 | 30.820 | 18.50 | 1.33 | 1.1  |
| 11/2/04 22:00 | 26.54 | 27.740 | 28.550 | 17.01 | 1.35 | 4.2  |
| 11/2/04 22:10 | 26.53 | 32.010 | 32.940 | 19.92 | 1.36 | 0.4  |
| 11/2/04 22:20 | 26.52 | 28.830 | 29.670 | 17.75 | 1.37 | 0.3  |
| 11/2/04 22:30 | 26.52 | 30.930 | 31.830 | 19.18 | 1.39 | 0.4  |
| 11/2/04 22:40 | 26.51 | 30.240 | 31.110 | 18.71 | 1.40 | 6.4  |
| 11/2/04 22:50 | 26.51 | 26.030 | 26.780 | 15.87 | 1.42 | 29.5 |
| 11/2/04 23:00 | 26.50 | 28.450 | 29.260 | 17.49 | 1.43 | 24.1 |
| 11/2/04 23:10 | 26.46 | 27.380 | 28.140 | 16.77 | 1.45 | 38.3 |
| 11/2/04 23:20 | 26.45 | 24.390 | 25.060 | 14.78 | 1.46 | 32.4 |
| 11/2/04 23:30 | 26.41 | 24.100 | 24.750 | 14.58 | 1.47 | 18.9 |
| 11/2/04 23:40 | 26.38 | 25.150 | 25.810 | 15.28 | 1.48 | 19.9 |
| 11/2/04 23:50 | 26.32 | 25.850 | 26.510 | 15.75 | 1.48 | 10.5 |
| 11/3/04 0:00  | 26.32 | 25.990 | 26.650 | 15.85 | 1.49 | 11.9 |
| 11/3/04 0:10  | 26.31 | 30.650 | 31.420 | 18.99 | 1.50 | 1.1  |
| 11/3/04 0:20  | 26.25 | 30.100 | 30.820 | 18.62 | 1.50 | 0.3  |
| 11/3/04 0:30  | 26.15 | 35.910 | 36.700 | 22.62 | 1.51 | 0.4  |
| 11/3/04 0:40  | 26.15 | 36.670 | 37.480 | 23.16 | 1.51 | 0.6  |
| 11/3/04 0:50  | 26.16 | 36.730 | 37.540 | 23.19 | 1.51 | 0.7  |
| 11/3/04 1:00  | 26.16 | 36.720 | 37.540 | 23.19 | 1.51 | 0.9  |
| 11/3/04 1:10  | 26.16 | 36.670 | 37.480 | 23.16 | 1.50 | 1.3  |
| 11/3/04 1:20  | 26.15 | 36.620 | 37.430 | 23.12 | 1.50 | 1.2  |
| 11/3/04 1:30  | 26.12 | 36.580 | 37.370 | 23.09 | 1.49 | 1.2  |
| 11/3/04 1:40  | 26.13 | 36.600 | 37.390 | 23.11 | 1.48 | 1.2  |
| 11/3/04 1:50  | 26.19 | 31.240 | 31.950 | 19.39 | 1.48 | 1.0  |
| 11/3/04 2:00  | 26.20 | 25.210 | 25.790 | 15.33 | 1.47 | 0.1  |
| 11/3/04 2:10  | 26.17 | 28.770 | 29.410 | 17.72 | 1.45 | 0.3  |
| 11/3/04 2:20  | 26.17 | 30.970 | 31.660 | 19.21 | 1.43 | 0.3  |
| 11/3/04 2:30  | 26.13 | 27.780 | 28.380 | 17.05 | 1.41 | 0.5  |
| 11/3/04 2:40  | 26.08 | 30.200 | 30.820 | 18.69 | 1.40 | 0.6  |
| 11/3/04 2:50  | 26.04 | 31.610 | 32.240 | 19.65 | 1.39 | 1.0  |
| 11/3/04 3:00  | 26.05 | 31.330 | 31.960 | 19.46 | 1.38 | 0.6  |

|               |       |        |        |       |      |      |
|---------------|-------|--------|--------|-------|------|------|
| 11/3/04 3:10  | 26.06 | 30.980 | 31.610 | 19.22 | 1.36 | 0.4  |
| 11/3/04 3:20  | 26.07 | 28.330 | 28.910 | 17.42 | 1.35 | 0.6  |
| 11/3/04 3:30  | 26.07 | 27.420 | 27.980 | 16.81 | 1.33 | 0.3  |
| 11/3/04 3:40  | 26.03 | 27.240 | 27.780 | 16.69 | 1.32 | 0.3  |
| 11/3/04 3:50  | 26.03 | 26.680 | 27.210 | 16.31 | 1.30 | 0.3  |
| 11/3/04 4:00  | 26.01 | 25.500 | 25.990 | 15.52 | 1.28 | 0.1  |
| 11/3/04 4:10  | 26.21 | 17.630 | 18.030 | 10.37 | 1.28 | 1.0  |
| 11/3/04 4:20  | 26.02 | 24.860 | 25.340 | 15.09 | 1.25 | 1.8  |
| 11/3/04 4:30  | 26.02 | 23.160 | 23.600 | 13.97 | 1.24 | 0.4  |
| 11/3/04 4:40  | 25.97 | 25.110 | 25.570 | 15.26 | 1.23 | 0.1  |
| 11/3/04 4:50  | 25.99 | 24.570 | 25.040 | 14.91 | 1.21 | 0.0  |
| 11/3/04 5:00  | 25.97 | 21.150 | 21.540 | 12.65 | 1.20 | 0.2  |
| 11/3/04 5:10  | 25.96 | 23.820 | 24.250 | 14.40 | 1.18 | 0.2  |
| 11/3/04 5:20  | 25.93 | 24.410 | 24.840 | 14.80 | 1.16 | 0.3  |
| 11/3/04 5:30  | 25.87 | 24.510 | 24.920 | 14.87 | 1.15 | 0.3  |
| 11/3/04 5:40  | 25.95 | 24.820 | 25.270 | 15.07 | 1.14 | 0.2  |
| 11/3/04 5:50  | 26.00 | 24.990 | 25.470 | 15.18 | 1.13 | 0.9  |
| 11/3/04 6:00  | 26.08 | 21.030 | 21.460 | 12.57 | 1.12 | 0.2  |
| 11/3/04 6:10  | 26.06 | 21.500 | 21.940 | 12.88 | 1.11 | 0.4  |
| 11/3/04 6:20  | 26.06 | 22.110 | 22.560 | 13.28 | 1.10 | 0.3  |
| 11/3/04 6:30  | 26.10 | 19.100 | 19.510 | 11.32 | 1.09 | 0.4  |
| 11/3/04 6:40  | 26.36 | 14.510 | 14.880 | 8.40  | 1.09 | 0.4  |
| 11/3/04 6:50  | 26.16 | 19.310 | 19.740 | 11.46 | 1.08 | 0.4  |
| 11/3/04 7:00  | 26.27 | 17.040 | 17.450 | 9.99  | 1.07 | 0.4  |
| 11/3/04 7:10  | 26.12 | 19.000 | 19.410 | 11.26 | 1.06 | 0.4  |
| 11/3/04 7:20  | 26.20 | 18.700 | 19.130 | 11.06 | 1.06 | 0.3  |
| 11/3/04 7:30  | 26.22 | 19.750 | 20.210 | 11.74 | 1.06 | 0.6  |
| 11/3/04 7:40  | 26.21 | 19.260 | 19.710 | 11.43 | 1.06 | 0.1  |
| 11/3/04 7:50  | 26.33 | 17.130 | 17.570 | 10.06 | 1.07 | 0.0  |
| 11/3/04 8:00  | 26.27 | 17.730 | 18.160 | 10.44 | 1.08 | 0.1  |
| 11/3/04 8:10  | 26.04 | 20.630 | 21.040 | 12.31 | 1.09 | 0.2  |
| 11/3/04 8:20  | 26.31 | 18.790 | 19.260 | 11.12 | 1.10 | 0.3  |
| 11/3/04 8:30  | 26.06 | 19.010 | 19.390 | 11.26 | 1.12 | 0.3  |
| 11/3/04 8:40  | 26.22 | 18.690 | 19.130 | 11.06 | 1.14 | 0.1  |
| 11/3/04 8:50  | 26.23 | 21.300 | 21.810 | 12.75 | 1.15 | 1.0  |
| 11/3/04 9:00  | 26.42 | 21.190 | 21.770 | 12.67 | 1.17 | 0.6  |
| 11/3/04 9:10  | 26.40 | 20.110 | 20.640 | 11.97 | 1.19 | 0.3  |
| 11/3/04 9:20  | 26.50 | 17.430 | 17.930 | 10.25 | 1.20 | 1.3  |
| 11/3/04 9:30  | 26.30 | 20.880 | 21.400 | 12.47 | 1.22 | 1.0  |
| 11/3/04 9:40  | 26.47 | 21.760 | 22.370 | 13.04 | 1.23 | 1.1  |
| 11/3/04 9:50  | 26.47 | 19.910 | 20.470 | 11.84 | 1.25 | 0.5  |
| 11/3/04 10:00 | 26.51 | 20.640 | 21.240 | 12.32 | 1.27 | 1.2  |
| 11/3/04 10:10 | 26.61 | 19.100 | 19.680 | 11.31 | 1.29 | 1.7  |
| 11/3/04 10:20 | 26.65 | 18.560 | 19.140 | 10.96 | 1.31 | 1.7  |
| 11/3/04 10:30 | 26.63 | 23.140 | 23.860 | 13.95 | 1.32 | 0.6  |
| 11/3/04 10:40 | 26.69 | 29.940 | 30.910 | 18.50 | 1.34 | 0.7  |
| 11/3/04 10:50 | 26.77 | 23.440 | 24.230 | 14.15 | 1.36 | 12.3 |
| 11/3/04 11:00 | 26.83 | 30.020 | 31.070 | 18.55 | 1.38 | 6.7  |
| 11/3/04 11:10 | 26.90 | 29.920 | 31.010 | 18.49 | 1.39 | 2.0  |
| 11/3/04 11:20 | 26.97 | 27.560 | 28.600 | 16.89 | 1.41 | 1.8  |
| 11/3/04 11:30 | 27.03 | 25.530 | 26.520 | 15.52 | 1.43 | 0.4  |
| 11/3/04 11:40 | 27.11 | 26.700 | 27.780 | 16.31 | 1.44 | 11.7 |
| 11/3/04 11:50 | 27.15 | 28.210 | 29.370 | 17.32 | 1.45 | 10.0 |
| 11/3/04 12:00 | 27.27 | 24.460 | 25.520 | 14.81 | 1.47 | 0.4  |
| 11/3/04 12:10 | 27.36 | 32.450 | 33.920 | 20.21 | 1.48 | 6.8  |
| 11/3/04 12:20 | 27.53 | 35.100 | 36.790 | 22.03 | 1.49 | 2.3  |

|               |       |        |        |       |      |     |
|---------------|-------|--------|--------|-------|------|-----|
| 11/3/04 12:30 | 27.58 | 35.110 | 36.840 | 22.04 | 1.50 | 2.0 |
| 11/3/04 12:40 | 27.64 | 35.140 | 36.920 | 22.06 | 1.50 | 1.5 |
| 11/3/04 12:50 | 27.71 | 35.180 | 37.000 | 22.08 | 1.51 | 0.7 |
| 11/3/04 13:00 | 27.79 | 35.220 | 37.100 | 22.11 | 1.51 | 1.0 |
| 11/3/04 13:10 | 27.87 | 35.240 | 37.170 | 22.12 | 1.51 | 0.6 |
| 11/3/04 13:20 | 27.93 | 35.250 | 37.230 | 22.13 | 1.52 | 0.7 |
| 11/3/04 13:30 | 27.99 | 35.270 | 37.290 | 22.14 | 1.52 | 0.6 |
| 11/3/04 13:40 | 28.06 | 35.290 | 37.350 | 22.15 | 1.52 | 0.7 |
| 11/3/04 13:50 | 28.10 | 35.310 | 37.400 | 22.16 | 1.52 | 0.9 |
| 11/3/04 14:00 | 28.16 | 35.280 | 37.420 | 22.14 | 1.51 | 1.0 |
| 11/3/04 14:10 | 28.21 | 35.280 | 37.440 | 22.14 | 1.50 | 0.8 |
| 11/3/04 14:20 | 28.25 | 35.270 | 37.460 | 22.13 | 1.49 | 1.1 |
| 11/3/04 14:30 | 28.33 | 35.250 | 37.500 | 22.12 | 1.48 | 0.7 |
| 11/3/04 14:40 | 28.31 | 35.240 | 37.470 | 22.11 | 1.47 | 0.9 |
| 11/3/04 14:50 | 28.14 | 33.820 | 35.850 | 21.13 | 1.45 | 1.8 |
| 11/3/04 15:00 | 27.69 | 26.670 | 28.040 | 16.27 | 1.44 | 1.5 |
| 11/3/04 15:10 | 27.83 | 24.370 | 25.690 | 14.74 | 1.42 | 0.9 |
| 11/3/04 15:20 | 27.63 | 20.790 | 21.830 | 12.39 | 1.41 | 1.8 |
| 11/3/04 15:30 | 28.51 | 27.060 | 28.880 | 16.52 | 1.39 | 1.0 |
| 11/3/04 15:40 | 28.63 | 26.830 | 28.690 | 16.36 | 1.38 | 0.7 |
| 11/3/04 15:50 | 27.51 | 18.510 | 19.400 | 10.92 | 1.38 | 9.1 |
| 11/3/04 16:00 | 27.43 | 18.090 | 18.930 | 10.65 | 1.37 | 5.1 |
| 11/3/04 16:10 | 27.31 | 17.450 | 18.220 | 10.24 | 1.36 | 2.5 |
| 11/3/04 16:20 | 27.66 | 19.990 | 21.010 | 11.88 | 1.34 | 2.2 |
| 11/3/04 16:30 | 27.32 | 17.760 | 18.550 | 10.44 | 1.32 | 7.1 |
| 11/3/04 16:40 | 27.43 | 17.750 | 18.570 | 10.44 | 1.31 | 5.1 |
| 11/3/04 16:50 | 27.96 | 19.990 | 21.120 | 11.87 | 1.29 | 1.2 |
| 11/3/04 17:00 | 27.78 | 18.770 | 19.770 | 11.09 | 1.28 | 1.3 |
| 11/3/04 17:10 | 27.82 | 19.920 | 20.990 | 11.82 | 1.26 | 2.6 |
| 11/3/04 17:20 | 28.20 | 20.090 | 21.320 | 11.93 | 1.25 | 0.7 |
| 11/3/04 17:30 | 28.05 | 21.610 | 22.870 | 12.92 | 1.24 | 1.5 |
| 11/3/04 17:40 | 28.21 | 21.670 | 23.000 | 12.96 | 1.22 | 0.8 |
| 11/3/04 17:50 | 28.13 | 20.580 | 21.810 | 12.25 | 1.21 | 0.7 |
| 11/3/04 18:00 | 28.09 | 23.510 | 24.900 | 14.17 | 1.20 | 0.4 |
| 11/3/04 18:10 | 28.06 | 21.950 | 23.240 | 13.15 | 1.19 | 1.5 |
| 11/3/04 18:20 | 27.59 | 19.450 | 20.410 | 11.52 | 1.18 | 0.4 |
| 11/3/04 18:30 | 27.99 | 21.360 | 22.580 | 12.76 | 1.17 | 0.3 |
| 11/3/04 18:40 | 28.02 | 23.370 | 24.720 | 14.08 | 1.16 | 0.4 |
| 11/3/04 18:50 | 28.14 | 22.720 | 24.080 | 13.65 | 1.15 | 0.6 |
| 11/3/04 19:00 | 28.01 | 21.670 | 22.920 | 12.96 | 1.14 | 0.4 |
| 11/3/04 19:10 | 27.96 | 21.120 | 22.320 | 12.61 | 1.14 | 0.1 |
| 11/3/04 19:20 | 27.73 | 21.290 | 22.400 | 12.72 | 1.13 | 0.1 |
| 11/3/04 19:30 | 27.75 | 21.330 | 22.450 | 12.74 | 1.13 | 0.2 |
| 11/3/04 19:40 | 27.53 | 20.190 | 21.160 | 12.00 | 1.13 | 0.1 |
| 11/3/04 19:50 | 27.66 | 21.540 | 22.640 | 12.89 | 1.12 | 0.0 |
| 11/3/04 20:00 | 27.38 | 18.890 | 19.750 | 11.17 | 1.12 | 2.3 |
| 11/3/04 20:10 | 27.36 | 18.710 | 19.550 | 11.05 | 1.12 | 0.4 |
| 11/3/04 20:20 | 27.40 | 17.420 | 18.220 | 10.23 | 1.13 | 0.6 |
| 11/3/04 20:30 | 27.16 | 15.600 | 16.240 | 9.07  | 1.14 | 1.3 |
| 11/3/04 20:40 | 27.21 | 17.420 | 18.150 | 10.23 | 1.14 | 0.6 |
| 11/3/04 20:50 | 27.19 | 16.910 | 17.610 | 9.90  | 1.15 | 0.5 |
| 11/3/04 21:00 | 27.16 | 15.610 | 16.250 | 9.08  | 1.17 | 0.5 |
| 11/3/04 21:10 | 27.19 | 18.620 | 19.400 | 11.00 | 1.18 | 0.5 |
| 11/3/04 21:20 | 27.14 | 19.140 | 19.920 | 11.33 | 1.19 | 0.6 |
| 11/3/04 21:30 | 27.09 | 20.280 | 21.090 | 12.07 | 1.20 | 0.2 |
| 11/3/04 21:40 | 27.19 | 24.070 | 25.070 | 14.55 | 1.21 | 0.1 |

|               |       |        |        |       |      |     |
|---------------|-------|--------|--------|-------|------|-----|
| 11/3/04 21:50 | 27.05 | 19.070 | 19.810 | 11.29 | 1.23 | 0.1 |
| 11/3/04 22:00 | 27.02 | 18.810 | 19.530 | 11.12 | 1.24 | 0.1 |
| 11/3/04 22:10 | 27.01 | 19.070 | 19.810 | 11.29 | 1.25 | 0.5 |
| 11/3/04 22:20 | 26.95 | 18.300 | 18.980 | 10.80 | 1.27 | 0.3 |
| 11/3/04 22:30 | 26.93 | 19.920 | 20.650 | 11.84 | 1.28 | 0.2 |
| 11/3/04 22:40 | 26.92 | 19.490 | 20.210 | 11.56 | 1.29 | 0.3 |
| 11/3/04 22:50 | 26.90 | 18.920 | 19.610 | 11.19 | 1.31 | 0.4 |
| 11/3/04 23:00 | 26.85 | 19.510 | 20.200 | 11.57 | 1.33 | 0.1 |
| 11/3/04 23:10 | 26.83 | 20.320 | 21.030 | 12.10 | 1.35 | 0.3 |
| 11/3/04 23:20 | 26.81 | 18.990 | 19.650 | 11.24 | 1.36 | 0.1 |
| 11/3/04 23:30 | 26.80 | 21.400 | 22.130 | 12.80 | 1.38 | 0.1 |
| 11/3/04 23:40 | 26.77 | 23.450 | 24.250 | 14.15 | 1.38 | 0.1 |
| 11/3/04 23:50 | 26.76 | 24.390 | 25.210 | 14.77 | 1.39 | 0.2 |
| 11/4/04 0:00  | 26.74 | 25.840 | 26.700 | 15.74 | 1.40 | 0.6 |
| 11/4/04 0:10  | 26.72 | 23.750 | 24.530 | 14.35 | 1.42 | 0.1 |
| 11/4/04 0:20  | 26.70 | 23.480 | 24.240 | 14.17 | 1.44 | 0.2 |
| 11/4/04 0:30  | 26.68 | 21.810 | 22.510 | 13.07 | 1.45 | 0.1 |
| 11/4/04 0:40  | 26.65 | 25.060 | 25.860 | 15.22 | 1.47 | 0.9 |
| 11/4/04 0:50  | 26.62 | 28.300 | 29.180 | 17.39 | 1.47 | 0.5 |
| 11/4/04 1:00  | 26.59 | 35.300 | 36.370 | 22.19 | 1.48 | 1.0 |
| 11/4/04 1:10  | 26.55 | 35.420 | 36.470 | 22.27 | 1.49 | 1.2 |
| 11/4/04 1:20  | 26.52 | 35.500 | 36.540 | 22.33 | 1.50 | 1.2 |
| 11/4/04 1:30  | 26.51 | 35.510 | 36.530 | 22.34 | 1.50 | 1.2 |
| 11/4/04 1:40  | 26.49 | 35.560 | 36.570 | 22.37 | 1.50 | 1.2 |
| 11/4/04 1:50  | 26.47 | 35.550 | 36.550 | 22.37 | 1.50 | 1.0 |
| 11/4/04 2:00  | 26.47 | 35.510 | 36.500 | 22.34 | 1.50 | 1.0 |
| 11/4/04 2:10  | 26.41 | 35.500 | 36.450 | 22.33 | 1.51 | 1.0 |
| 11/4/04 2:20  | 26.38 | 35.520 | 36.450 | 22.35 | 1.50 | 1.0 |
| 11/4/04 2:30  | 26.38 | 35.460 | 36.400 | 22.31 | 1.50 | 1.2 |
| 11/4/04 2:40  | 26.41 | 35.420 | 36.370 | 22.27 | 1.49 | 1.0 |
| 11/4/04 2:50  | 26.39 | 35.370 | 36.310 | 22.24 | 1.48 | 1.0 |
| 11/4/04 3:00  | 26.39 | 35.300 | 36.240 | 22.19 | 1.47 | 1.3 |
| 11/4/04 3:10  | 26.40 | 35.270 | 36.210 | 22.17 | 1.46 | 1.4 |
| 11/4/04 3:20  | 26.43 | 35.250 | 36.210 | 22.16 | 1.44 | 0.7 |
| 11/4/04 3:30  | 26.46 | 30.070 | 30.910 | 18.60 | 1.43 | 0.9 |
| 11/4/04 3:40  | 26.15 | 29.800 | 30.450 | 18.41 | 1.41 | 1.1 |
| 11/4/04 3:50  | 26.12 | 28.750 | 29.370 | 17.71 | 1.40 | 0.8 |
| 11/4/04 4:00  | 26.10 | 28.520 | 29.120 | 17.55 | 1.39 | 0.8 |
| 11/4/04 4:10  | 26.23 | 23.240 | 23.780 | 14.02 | 1.37 | 0.6 |
| 11/4/04 4:20  | 26.12 | 27.010 | 27.590 | 16.53 | 1.36 | 0.8 |
| 11/4/04 4:30  | 26.06 | 24.890 | 25.390 | 15.11 | 1.35 | 1.0 |
| 11/4/04 4:40  | 26.03 | 23.080 | 23.530 | 13.92 | 1.33 | 0.5 |
| 11/4/04 4:50  | 25.97 | 26.140 | 26.630 | 15.95 | 1.32 | 0.6 |
| 11/4/04 5:00  | 26.06 | 23.590 | 24.060 | 14.25 | 1.31 | 0.4 |
| 11/4/04 5:10  | 26.03 | 24.190 | 24.660 | 14.65 | 1.29 | 1.7 |
| 11/4/04 5:20  | 26.09 | 21.310 | 21.750 | 12.76 | 1.28 | 0.5 |
| 11/4/04 5:30  | 26.06 | 20.130 | 20.540 | 11.99 | 1.26 | 0.4 |
| 11/4/04 5:40  | 26.14 | 24.180 | 24.710 | 14.64 | 1.25 | 0.5 |
| 11/4/04 5:50  | 26.07 | 22.870 | 23.330 | 13.78 | 1.23 | 0.4 |
| 11/4/04 6:00  | 26.20 | 20.070 | 20.520 | 11.94 | 1.22 | 0.4 |
| 11/4/04 6:10  | 26.01 | 23.130 | 23.570 | 13.95 | 1.20 | 0.4 |
| 11/4/04 6:20  | 26.00 | 21.400 | 21.800 | 12.81 | 1.19 | 0.7 |
| 11/4/04 6:30  | 26.13 | 20.280 | 20.720 | 12.09 | 1.18 | 0.8 |
| 11/4/04 6:40  | 26.03 | 20.640 | 21.050 | 12.32 | 1.17 | 0.7 |
| 11/4/04 6:50  | 26.21 | 19.060 | 19.510 | 11.30 | 1.16 | 0.5 |
| 11/4/04 7:00  | 25.96 | 22.300 | 22.700 | 13.40 | 1.15 | 0.4 |

|               |       |        |        |       |      |     |
|---------------|-------|--------|--------|-------|------|-----|
| 11/4/04 7:10  | 26.21 | 18.490 | 18.920 | 10.93 | 1.15 | 0.3 |
| 11/4/04 7:20  | 26.30 | 17.470 | 17.900 | 10.27 | 1.14 | 0.4 |
| 11/4/04 7:30  | 26.34 | 16.230 | 16.640 | 9.48  | 1.13 | 0.6 |
| 11/4/04 7:40  | 26.41 | 16.000 | 16.430 | 9.34  | 1.13 | 0.5 |
| 11/4/04 7:50  | 26.32 | 15.470 | 15.860 | 9.00  | 1.12 | 0.4 |
| 11/4/04 8:00  | 26.31 | 15.610 | 16.000 | 9.09  | 1.12 | 0.4 |
| 11/4/04 8:10  | 25.98 | 18.450 | 18.790 | 10.90 | 1.11 | 0.4 |
| 11/4/04 8:20  | 26.28 | 18.620 | 19.080 | 11.01 | 1.12 | 0.4 |
| 11/4/04 8:30  | 26.29 | 16.520 | 16.930 | 9.67  | 1.13 | 0.4 |
| 11/4/04 8:40  | 26.28 | 17.170 | 17.590 | 10.08 | 1.12 | 0.2 |
| 11/4/04 8:50  | 26.16 | 19.840 | 20.280 | 11.80 | 1.12 | 0.3 |
| 11/4/04 9:00  | 26.14 | 18.110 | 18.500 | 10.68 | 1.13 | 0.4 |
| 11/4/04 9:10  | 26.25 | 17.750 | 18.170 | 10.45 | 1.14 | 0.3 |
| 11/4/04 9:20  | 26.32 | 17.880 | 18.330 | 10.53 | 1.16 | 0.3 |
| 11/4/04 9:30  | 26.28 | 18.770 | 19.230 | 11.11 | 1.17 | 0.3 |
| 11/4/04 9:40  | 26.32 | 19.200 | 19.690 | 11.38 | 1.18 | 0.3 |
| 11/4/04 9:50  | 26.42 | 17.890 | 18.380 | 10.54 | 1.20 | 0.5 |
| 11/4/04 10:00 | 26.43 | 19.030 | 19.550 | 11.27 | 1.22 | 0.7 |

# YSI Data for 11/05/2204 to 11/10/2004

NOTE: Pressure, chlorophyll and the voltage of the instrument were acquired, but not included on this report.

| DateTime      | Temp (C°) | SpCond(mS/cm) | Cond (mS/cm) | Sal (ppt) | Depth (m) | Turbidity (NTU) |
|---------------|-----------|---------------|--------------|-----------|-----------|-----------------|
| 11/5/04 10:45 | 26.90     | 14.490        | 15.020       | 8.38      | 1.22      | 0.2             |
| 11/5/04 10:55 | 26.94     | 17.050        | 17.680       | 10.00     | 1.24      | 3.1             |
| 11/5/04 11:05 | 27.01     | 17.550        | 18.230       | 10.32     | 1.25      | 0.0             |
| 11/5/04 11:15 | 27.00     | 15.980        | 16.600       | 9.32      | 1.26      | 4.5             |
| 11/5/04 11:25 | 27.16     | 17.300        | 18.010       | 10.15     | 1.28      | 0.0             |
| 11/5/04 11:35 | 27.23     | 19.700        | 20.540       | 11.69     | 1.30      | 0.0             |
| 11/5/04 11:45 | 27.25     | 19.100        | 19.920       | 11.31     | 1.32      | 0.1             |
| 11/5/04 11:55 | 27.18     | 15.570        | 16.220       | 9.06      | 1.33      | 3.9             |
| 11/5/04 12:05 | 27.32     | 17.150        | 17.910       | 10.05     | 1.35      | 0.2             |
| 11/5/04 12:15 | 27.41     | 15.870        | 16.600       | 9.24      | 1.37      | 0.4             |
| 11/5/04 12:25 | 27.72     | 17.490        | 18.400       | 10.27     | 1.38      | 0.4             |
| 11/5/04 12:35 | 27.79     | 20.480        | 21.570       | 12.19     | 1.40      | 0.6             |
| 11/5/04 12:45 | 27.90     | 18.510        | 19.530       | 10.91     | 1.41      | 0.3             |
| 11/5/04 12:55 | 28.05     | 22.380        | 23.690       | 13.43     | 1.42      | 0.3             |
| 11/5/04 13:05 | 28.06     | 34.220        | 36.230       | 21.41     | 1.43      | 0.9             |
| 11/5/04 13:15 | 28.24     | 37.890        | 40.230       | 23.96     | 1.45      | 1.2             |
| 11/5/04 13:25 | 28.19     | 37.890        | 40.200       | 23.96     | 1.46      | 1.0             |
| 11/5/04 13:35 | 28.17     | 37.890        | 40.180       | 23.96     | 1.48      | 0.9             |
| 11/5/04 13:45 | 28.13     | 37.880        | 40.150       | 23.96     | 1.49      | 1.2             |
| 11/5/04 13:55 | 28.08     | 37.890        | 40.110       | 23.96     | 1.50      | 0.9             |
| 11/5/04 14:05 | 28.03     | 37.900        | 40.090       | 23.97     | 1.52      | 1.4             |
| 11/5/04 14:15 | 27.97     | 37.900        | 40.050       | 23.98     | 1.52      | 0.8             |
| 11/5/04 14:25 | 27.95     | 37.900        | 40.040       | 23.98     | 1.53      | 1.0             |
| 11/5/04 14:35 | 27.95     | 37.900        | 40.040       | 23.97     | 1.54      | 1.5             |
| 11/5/04 14:45 | 27.98     | 37.890        | 40.040       | 23.97     | 1.56      | 0.7             |
| 11/5/04 14:55 | 28.02     | 37.840        | 40.020       | 23.93     | 1.56      | 0.7             |
| 11/5/04 15:05 | 28.00     | 37.860        | 40.030       | 23.95     | 1.56      | 0.7             |
| 11/5/04 15:15 | 27.99     | 37.850        | 40.010       | 23.94     | 1.56      | 0.7             |
| 11/5/04 15:25 | 27.94     | 37.870        | 40.000       | 23.96     | 1.56      | 0.7             |
| 11/5/04 15:35 | 27.89     | 37.890        | 39.980       | 23.97     | 1.57      | 0.9             |
| 11/5/04 15:45 | 27.86     | 37.900        | 39.970       | 23.98     | 1.57      | 1.0             |
| 11/5/04 15:55 | 27.84     | 37.900        | 39.960       | 23.98     | 1.57      | 0.6             |
| 11/5/04 16:05 | 27.81     | 37.910        | 39.940       | 23.98     | 1.56      | 1.2             |
| 11/5/04 16:15 | 27.83     | 37.900        | 39.950       | 23.98     | 1.54      | 1.8             |
| 11/5/04 16:25 | 27.83     | 37.880        | 39.930       | 23.96     | 1.52      | 0.9             |
| 11/5/04 16:35 | 27.83     | 37.880        | 39.920       | 23.96     | 1.51      | 1.0             |
| 11/5/04 16:45 | 27.81     | 37.870        | 39.910       | 23.96     | 1.50      | 0.7             |
| 11/5/04 16:55 | 27.81     | 37.870        | 39.900       | 23.96     | 1.49      | 0.7             |
| 11/5/04 17:05 | 27.81     | 37.870        | 39.890       | 23.95     | 1.48      | 0.7             |
| 11/5/04 17:15 | 27.80     | 37.860        | 39.880       | 23.95     | 1.47      | 0.7             |
| 11/5/04 17:25 | 27.80     | 37.860        | 39.880       | 23.95     | 1.45      | 0.6             |

|               |       |        |        |       |      |      |
|---------------|-------|--------|--------|-------|------|------|
| 11/5/04 17:35 | 27.70 | 28.630 | 30.100 | 17.59 | 1.44 | 1.6  |
| 11/5/04 17:45 | 27.67 | 26.130 | 27.460 | 15.91 | 1.43 | 0.6  |
| 11/5/04 17:55 | 27.74 | 28.690 | 30.190 | 17.63 | 1.41 | 0.6  |
| 11/5/04 18:05 | 27.73 | 28.900 | 30.410 | 17.78 | 1.40 | 2.0  |
| 11/5/04 18:15 | 27.70 | 28.200 | 29.660 | 17.30 | 1.39 | 0.9  |
| 11/5/04 18:25 | 27.68 | 27.920 | 29.350 | 17.11 | 1.39 | 0.4  |
| 11/5/04 18:35 | 27.66 | 27.680 | 29.080 | 16.95 | 1.37 | 0.6  |
| 11/5/04 18:45 | 27.67 | 27.480 | 28.880 | 16.82 | 1.35 | 0.7  |
| 11/5/04 18:55 | 27.65 | 27.810 | 29.220 | 17.04 | 1.33 | 0.4  |
| 11/5/04 19:05 | 27.66 | 27.550 | 28.950 | 16.87 | 1.32 | 0.3  |
| 11/5/04 19:15 | 27.64 | 29.390 | 30.870 | 18.11 | 1.31 | 0.2  |
| 11/5/04 19:25 | 27.63 | 29.630 | 31.120 | 18.27 | 1.30 | 0.4  |
| 11/5/04 19:35 | 27.59 | 26.180 | 27.470 | 15.95 | 1.29 | 0.3  |
| 11/5/04 19:45 | 27.64 | 27.820 | 29.230 | 17.05 | 1.28 | 0.2  |
| 11/5/04 19:55 | 27.61 | 27.020 | 28.370 | 16.51 | 1.26 | 0.4  |
| 11/5/04 20:06 | 27.64 | 29.450 | 30.930 | 18.15 | 1.25 | 0.1  |
| 11/5/04 20:15 | 27.62 | 27.720 | 29.110 | 16.98 | 1.24 | 0.3  |
| 11/5/04 20:25 | 27.61 | 25.250 | 26.510 | 15.33 | 1.22 | 0.4  |
| 11/5/04 20:35 | 27.59 | 24.830 | 26.060 | 15.05 | 1.21 | 0.2  |
| 11/5/04 20:45 | 27.54 | 24.220 | 25.400 | 14.65 | 1.20 | 0.1  |
| 11/5/04 20:55 | 27.52 | 26.220 | 27.480 | 15.98 | 1.19 | 0.1  |
| 11/5/04 21:05 | 27.44 | 24.470 | 25.610 | 14.82 | 1.19 | 0.6  |
| 11/5/04 21:15 | 27.50 | 23.210 | 24.320 | 13.98 | 1.19 | 0.6  |
| 11/5/04 21:25 | 27.24 | 19.920 | 20.770 | 11.83 | 1.18 | 2.0  |
| 11/5/04 21:35 | 27.30 | 20.590 | 21.500 | 12.27 | 1.18 | 0.6  |
| 11/5/04 21:45 | 27.25 | 19.720 | 20.570 | 11.71 | 1.18 | 1.7  |
| 11/5/04 21:55 | 27.22 | 18.870 | 19.670 | 11.16 | 1.18 | 2.0  |
| 11/5/04 22:05 | 27.26 | 19.540 | 20.380 | 11.59 | 1.18 | 0.4  |
| 11/5/04 22:15 | 27.18 | 20.460 | 21.310 | 12.19 | 1.19 | 0.7  |
| 11/5/04 22:25 | 27.17 | 21.760 | 22.660 | 13.03 | 1.20 | 0.1  |
| 11/5/04 22:35 | 27.15 | 21.130 | 22.000 | 12.63 | 1.21 | 0.3  |
| 11/5/04 22:45 | 27.03 | 22.330 | 23.190 | 13.41 | 1.22 | 0.4  |
| 11/5/04 22:55 | 27.06 | 20.750 | 21.570 | 12.38 | 1.23 | 0.3  |
| 11/5/04 23:05 | 27.02 | 19.280 | 20.030 | 11.43 | 1.25 | 1.4  |
| 11/5/04 23:15 | 26.96 | 21.020 | 21.810 | 12.55 | 1.25 | 0.2  |
| 11/5/04 23:25 | 26.97 | 17.540 | 18.200 | 10.31 | 1.27 | 0.6  |
| 11/5/04 23:35 | 27.04 | 20.710 | 21.510 | 12.35 | 1.28 | 0.0  |
| 11/5/04 23:45 | 26.92 | 19.130 | 19.830 | 11.33 | 1.29 | -0.1 |
| 11/5/04 23:55 | 26.94 | 19.100 | 19.810 | 11.31 | 1.30 | 1.0  |
| 11/6/04 0:05  | 26.88 | 18.260 | 18.910 | 10.77 | 1.31 | 0.2  |
| 11/6/04 0:15  | 26.85 | 17.140 | 17.740 | 10.05 | 1.34 | 0.6  |
| 11/6/04 0:25  | 26.91 | 20.770 | 21.520 | 12.39 | 1.36 | 0.4  |
| 11/6/04 0:35  | 26.96 | 28.860 | 29.940 | 17.76 | 1.37 | 0.4  |
| 11/6/04 0:45  | 26.95 | 26.490 | 27.480 | 16.17 | 1.38 | 0.4  |
| 11/6/04 0:55  | 26.86 | 24.250 | 25.110 | 14.68 | 1.40 | 0.3  |
| 11/6/04 1:05  | 26.84 | 20.510 | 21.230 | 12.22 | 1.41 | 0.3  |
| 11/6/04 1:15  | 26.82 | 18.010 | 18.640 | 10.61 | 1.43 | 0.3  |

|              |       |        |        |       |      |       |
|--------------|-------|--------|--------|-------|------|-------|
| 11/6/04 1:25 | 26.82 | 18.890 | 19.540 | 11.17 | 1.45 | 0.0   |
| 11/6/04 1:35 | 26.75 | 28.720 | 29.680 | 17.67 | 1.46 | 0.1   |
| 11/6/04 1:45 | 26.67 | 37.780 | 38.980 | 23.92 | 1.47 | 0.4   |
| 11/6/04 1:55 | 26.61 | 37.920 | 39.090 | 24.02 | 1.48 | 0.5   |
| 11/6/04 2:05 | 26.61 | 37.960 | 39.120 | 24.05 | 1.49 | 0.4   |
| 11/6/04 2:15 | 26.63 | 38.010 | 39.190 | 24.08 | 1.51 | 0.6   |
| 11/6/04 2:25 | 26.59 | 38.030 | 39.180 | 24.10 | 1.51 | 0.8   |
| 11/6/04 2:35 | 26.76 | 38.300 | 39.590 | 24.29 | 1.52 | 0.4   |
| 11/6/04 2:45 | 27.14 | 39.790 | 41.410 | 25.33 | 1.53 | 0.6   |
| 11/6/04 2:55 | 27.19 | 40.250 | 41.940 | 25.65 | 1.54 | 0.3   |
| 11/6/04 3:05 | 27.21 | 40.540 | 42.260 | 25.86 | 1.55 | 0.3   |
| 11/6/04 3:15 | 27.23 | 40.760 | 42.500 | 26.01 | 1.56 | 0.3   |
| 11/6/04 3:25 | 27.23 | 40.930 | 42.670 | 26.13 | 1.56 | 0.5   |
| 11/6/04 3:35 | 27.22 | 41.040 | 42.780 | 26.21 | 1.56 | 0.3   |
| 11/6/04 3:45 | 27.21 | 41.150 | 42.890 | 26.29 | 1.56 | 0.4   |
| 11/6/04 3:55 | 27.19 | 41.240 | 42.970 | 26.36 | 1.56 | 0.3   |
| 11/6/04 4:05 | 27.16 | 41.280 | 42.980 | 26.38 | 1.56 | 0.3   |
| 11/6/04 4:15 | 27.12 | 41.290 | 42.970 | 26.39 | 1.55 | 0.4   |
| 11/6/04 4:25 | 27.06 | 41.310 | 42.940 | 26.41 | 1.54 | 0.3   |
| 11/6/04 4:35 | 27.03 | 41.350 | 42.950 | 26.43 | 1.53 | 0.3   |
| 11/6/04 4:45 | 27.01 | 41.370 | 42.960 | 26.45 | 1.52 | 0.6   |
| 11/6/04 4:55 | 27.00 | 41.370 | 42.950 | 26.45 | 1.50 | 0.3   |
| 11/6/04 5:05 | 26.98 | 41.370 | 42.940 | 26.45 | 1.49 | 0.4   |
| 11/6/04 5:15 | 26.96 | 41.440 | 42.990 | 26.50 | 1.48 | 0.3   |
| 11/6/04 5:25 | 26.98 | 41.970 | 43.560 | 26.88 | 1.45 | 0.3   |
| 11/6/04 5:35 | 26.97 | 28.180 | 29.250 | 17.31 | 1.43 | 0.3   |
| 11/6/04 5:45 | 26.96 | 26.500 | 27.490 | 16.17 | 1.43 | 0.3   |
| 11/6/04 5:55 | 26.97 | 26.610 | 27.620 | 16.25 | 1.43 | 0.5   |
| 11/6/04 6:05 | 26.99 | 26.760 | 27.770 | 16.35 | 1.42 | 0.2   |
| 11/6/04 6:15 | 26.98 | 29.200 | 30.300 | 17.99 | 1.41 | 0.2   |
| 11/6/04 6:25 | 26.98 | 29.040 | 30.140 | 17.89 | 1.40 | 0.2   |
| 11/6/04 6:35 | 26.98 | 31.480 | 32.680 | 19.55 | 1.37 | 0.2   |
| 11/6/04 6:45 | 26.95 | 29.280 | 30.370 | 18.05 | 1.36 | 0.4   |
| 11/6/04 6:55 | 26.91 | 20.900 | 21.670 | 12.48 | 1.35 | 1.1   |
| 11/6/04 7:05 | 26.88 | 19.380 | 20.080 | 11.49 | 1.33 | 1.2   |
| 11/6/04 7:15 | 26.89 | 21.550 | 22.330 | 12.90 | 1.32 | 1.4   |
| 11/6/04 7:25 | 26.89 | 22.590 | 23.410 | 13.58 | 1.30 | 2.4   |
| 11/6/04 7:35 | 26.89 | 23.820 | 24.680 | 14.39 | 1.29 | 1.2   |
| 11/6/04 7:45 | 26.90 | 22.220 | 23.020 | 13.34 | 1.28 | 1.2   |
| 11/6/04 7:55 | 26.91 | 22.400 | 23.220 | 13.46 | 1.27 | 1.6   |
| 11/6/04 8:05 | 26.91 | 20.620 | 21.370 | 12.29 | 1.26 | 1.4   |
| 11/6/04 8:15 | 26.93 | 22.010 | 22.820 | 13.20 | 1.24 | 0.3   |
| 11/6/04 8:25 | 27.02 | 23.930 | 24.850 | 14.46 | 1.22 | 1.0   |
| 11/6/04 8:35 | 27.00 | 24.410 | 25.340 | 14.78 | 1.21 | 0.6   |
| 11/6/04 8:45 | 27.01 | 23.300 | 24.200 | 14.05 | 1.20 | 18.7  |
| 11/6/04 8:55 | 27.00 | 21.360 | 22.170 | 12.77 | 1.19 | 29.9  |
| 11/6/04 9:05 | 27.06 | 26.500 | 27.540 | 16.17 | 1.18 | 112.7 |

|               |       |        |        |       |      |      |
|---------------|-------|--------|--------|-------|------|------|
| 11/6/04 9:15  | 27.10 | 22.270 | 23.160 | 13.37 | 1.18 | 38.1 |
| 11/6/04 9:25  | 27.00 | 22.910 | 23.780 | 13.79 | 1.18 | 2.8  |
| 11/6/04 9:35  | 27.11 | 23.610 | 24.560 | 14.25 | 1.17 | 1.2  |
| 11/6/04 9:45  | 27.18 | 26.140 | 27.230 | 15.93 | 1.16 | 11.4 |
| 11/6/04 9:55  | 27.20 | 24.710 | 25.750 | 14.98 | 1.15 | 34.9 |
| 11/6/04 10:05 | 27.31 | 23.320 | 24.350 | 14.06 | 1.15 | 4.4  |
| 11/6/04 10:15 | 27.27 | 22.800 | 23.790 | 13.71 | 1.15 | 0.2  |
| 11/6/04 10:25 | 27.15 | 18.150 | 18.890 | 10.70 | 1.16 | 1.0  |
| 11/6/04 10:35 | 27.14 | 23.030 | 23.980 | 13.87 | 1.16 | 0.9  |
| 11/6/04 10:45 | 27.39 | 24.070 | 25.170 | 14.55 | 1.17 | 0.3  |
| 11/6/04 10:55 | 27.28 | 20.520 | 21.410 | 12.22 | 1.18 | -0.1 |
| 11/6/04 11:05 | 27.42 | 21.190 | 22.170 | 12.66 | 1.20 | 1.4  |
| 11/6/04 11:15 | 27.46 | 20.630 | 21.600 | 12.29 | 1.22 | 0.1  |
| 11/6/04 11:25 | 27.31 | 19.400 | 20.260 | 11.50 | 1.23 | 0.1  |
| 11/6/04 11:35 | 27.30 | 21.440 | 22.380 | 12.82 | 1.25 | 1.5  |
| 11/6/04 11:45 | 27.25 | 18.820 | 19.620 | 11.12 | 1.27 | 1.2  |
| 11/6/04 11:55 | 27.48 | 22.760 | 23.840 | 13.69 | 1.28 | 1.6  |
| 11/6/04 12:05 | 27.28 | 17.240 | 17.990 | 10.12 | 1.30 | 1.5  |
| 11/6/04 12:15 | 27.22 | 16.480 | 17.170 | 9.63  | 1.32 | 3.7  |
| 11/6/04 12:25 | 27.57 | 22.500 | 23.600 | 13.51 | 1.33 | 1.5  |
| 11/6/04 12:35 | 27.86 | 21.580 | 22.760 | 12.91 | 1.35 | 1.5  |
| 11/6/04 12:45 | 28.06 | 22.740 | 24.070 | 13.66 | 1.38 | 1.2  |
| 11/6/04 12:55 | 28.01 | 22.140 | 23.410 | 13.27 | 1.38 | 1.4  |
| 11/6/04 13:05 | 28.02 | 25.760 | 27.250 | 15.67 | 1.39 | 1.2  |
| 11/6/04 13:15 | 27.98 | 21.370 | 22.590 | 12.77 | 1.41 | 1.2  |
| 11/6/04 13:25 | 28.08 | 23.190 | 24.550 | 13.96 | 1.43 | 1.2  |
| 11/6/04 13:35 | 28.20 | 28.980 | 30.750 | 17.82 | 1.44 | 2.8  |
| 11/6/04 13:45 | 28.41 | 39.630 | 42.210 | 25.18 | 1.45 | 3.1  |
| 11/6/04 13:55 | 28.59 | 42.050 | 44.930 | 26.89 | 1.47 | 3.5  |
| 11/6/04 14:05 | 28.65 | 42.150 | 45.090 | 26.96 | 1.48 | 3.5  |
| 11/6/04 14:15 | 28.64 | 42.240 | 45.170 | 27.03 | 1.49 | 4.0  |
| 11/6/04 14:25 | 28.62 | 42.280 | 45.200 | 27.06 | 1.50 | 3.9  |
| 11/6/04 14:35 | 28.57 | 42.310 | 45.190 | 27.08 | 1.51 | 3.9  |
| 11/6/04 14:45 | 28.53 | 42.400 | 45.250 | 27.14 | 1.52 | 4.2  |
| 11/6/04 14:55 | 28.49 | 42.580 | 45.420 | 27.27 | 1.54 | 4.0  |
| 11/6/04 15:05 | 28.53 | 42.440 | 45.300 | 27.17 | 1.56 | 4.3  |
| 11/6/04 15:15 | 28.54 | 42.470 | 45.340 | 27.20 | 1.58 | 4.7  |
| 11/6/04 15:25 | 28.53 | 42.590 | 45.460 | 27.28 | 1.59 | 4.3  |
| 11/6/04 15:35 | 28.47 | 42.890 | 45.730 | 27.49 | 1.61 | 4.5  |
| 11/6/04 15:45 | 28.43 | 43.140 | 45.970 | 27.68 | 1.61 | 4.3  |
| 11/6/04 15:55 | 28.35 | 43.770 | 46.570 | 28.13 | 1.61 | 4.2  |
| 11/6/04 16:05 | 28.30 | 44.140 | 46.920 | 28.40 | 1.60 | 4.2  |
| 11/6/04 16:15 | 28.21 | 44.350 | 47.070 | 28.55 | 1.61 | 4.3  |
| 11/6/04 16:25 | 28.05 | 44.640 | 47.240 | 28.77 | 1.62 | 4.9  |
| 11/6/04 16:35 | 28.00 | 44.790 | 47.360 | 28.87 | 1.63 | 4.6  |
| 11/6/04 16:45 | 27.92 | 44.730 | 47.220 | 28.83 | 1.62 | 4.2  |
| 11/6/04 16:55 | 27.90 | 44.740 | 47.210 | 28.84 | 1.61 | 4.4  |

|               |       |        |        |       |      |     |
|---------------|-------|--------|--------|-------|------|-----|
| 11/6/04 17:05 | 27.91 | 44.580 | 47.050 | 28.72 | 1.61 | 4.8 |
| 11/6/04 17:15 | 27.92 | 44.540 | 47.030 | 28.70 | 1.60 | 4.2 |
| 11/6/04 17:25 | 27.93 | 44.490 | 46.980 | 28.66 | 1.60 | 4.0 |
| 11/6/04 17:35 | 27.94 | 44.510 | 47.020 | 28.68 | 1.59 | 3.9 |
| 11/6/04 17:45 | 27.94 | 44.490 | 46.980 | 28.66 | 1.56 | 3.9 |
| 11/6/04 17:55 | 27.92 | 44.750 | 47.250 | 28.85 | 1.54 | 4.0 |
| 11/6/04 18:05 | 27.90 | 44.820 | 47.300 | 28.90 | 1.51 | 4.1 |
| 11/6/04 18:15 | 27.87 | 44.980 | 47.450 | 29.02 | 1.49 | 3.9 |
| 11/6/04 18:25 | 27.81 | 45.250 | 47.680 | 29.21 | 1.48 | 4.0 |
| 11/6/04 18:35 | 27.78 | 45.300 | 47.710 | 29.25 | 1.47 | 4.0 |
| 11/6/04 18:45 | 27.76 | 45.350 | 47.750 | 29.29 | 1.47 | 4.0 |
| 11/6/04 18:55 | 27.74 | 39.990 | 42.080 | 25.46 | 1.44 | 3.6 |
| 11/6/04 19:05 | 27.59 | 23.720 | 24.900 | 14.32 | 1.42 | 3.1 |
| 11/6/04 19:15 | 27.61 | 27.640 | 29.020 | 16.93 | 1.39 | 2.8 |
| 11/6/04 19:25 | 27.60 | 29.090 | 30.540 | 17.91 | 1.38 | 2.6 |
| 11/6/04 19:35 | 27.52 | 29.970 | 31.420 | 18.51 | 1.36 | 2.3 |
| 11/6/04 19:45 | 27.52 | 27.810 | 29.150 | 17.05 | 1.38 | 2.4 |
| 11/6/04 19:55 | 27.44 | 22.210 | 23.250 | 13.33 | 1.43 | 2.8 |
| 11/6/04 20:05 | 27.56 | 22.740 | 23.850 | 13.67 | 1.43 | 2.3 |
| 11/6/04 20:15 | 27.50 | 21.990 | 23.040 | 13.18 | 1.42 | 2.3 |
| 11/6/04 20:25 | 27.59 | 29.060 | 30.500 | 17.89 | 1.38 | 2.5 |
| 11/6/04 20:35 | 27.35 | 31.310 | 32.710 | 19.42 | 1.33 | 2.3 |
| 11/6/04 20:45 | 27.17 | 32.120 | 33.450 | 19.98 | 1.34 | 2.8 |
| 11/6/04 20:55 | 27.09 | 29.340 | 30.510 | 18.08 | 1.32 | 2.3 |
| 11/6/04 21:05 | 27.09 | 29.980 | 31.180 | 18.52 | 1.33 | 2.3 |
| 11/6/04 21:15 | 26.99 | 29.530 | 30.660 | 18.22 | 1.30 | 3.1 |
| 11/6/04 21:25 | 26.95 | 32.220 | 33.420 | 20.05 | 1.28 | 2.4 |
| 11/6/04 21:35 | 26.91 | 31.520 | 32.670 | 19.58 | 1.29 | 2.2 |
| 11/6/04 21:45 | 26.93 | 29.730 | 30.820 | 18.35 | 1.28 | 2.1 |
| 11/6/04 21:55 | 26.88 | 31.730 | 32.870 | 19.72 | 1.25 | 2.3 |
| 11/6/04 22:05 | 26.85 | 31.790 | 32.920 | 19.76 | 1.22 | 2.2 |
| 11/6/04 22:15 | 26.91 | 30.200 | 31.300 | 18.67 | 1.21 | 2.5 |
| 11/6/04 22:25 | 26.90 | 30.570 | 31.680 | 18.92 | 1.21 | 2.3 |
| 11/6/04 22:35 | 26.90 | 30.980 | 32.100 | 19.21 | 1.20 | 2.3 |
| 11/6/04 22:45 | 26.90 | 30.970 | 32.090 | 19.20 | 1.20 | 3.0 |
| 11/6/04 22:55 | 26.86 | 32.780 | 33.940 | 20.44 | 1.19 | 2.2 |
| 11/6/04 23:05 | 26.86 | 31.420 | 32.540 | 19.51 | 1.19 | 1.7 |
| 11/6/04 23:15 | 26.85 | 30.950 | 32.040 | 19.19 | 1.19 | 1.5 |
| 11/6/04 23:25 | 26.86 | 29.260 | 30.300 | 18.04 | 1.18 | 1.5 |
| 11/6/04 23:35 | 26.82 | 31.390 | 32.480 | 19.49 | 1.18 | 1.7 |
| 11/6/04 23:45 | 26.83 | 31.580 | 32.690 | 19.62 | 1.17 | 1.5 |
| 11/6/04 23:55 | 26.75 | 32.310 | 33.390 | 20.12 | 1.20 | 1.7 |
| 11/7/04 0:05  | 26.69 | 30.140 | 31.110 | 18.64 | 1.22 | 1.7 |
| 11/7/04 0:15  | 26.66 | 29.620 | 30.550 | 18.28 | 1.24 | 1.6 |
| 11/7/04 0:25  | 26.60 | 30.950 | 31.900 | 19.19 | 1.26 | 1.6 |
| 11/7/04 0:35  | 26.58 | 32.310 | 33.280 | 20.12 | 1.28 | 1.7 |
| 11/7/04 0:45  | 26.64 | 27.710 | 28.580 | 16.99 | 1.30 | 1.6 |

|              |       |        |        |       |      |     |
|--------------|-------|--------|--------|-------|------|-----|
| 11/7/04 0:55 | 26.46 | 26.780 | 27.530 | 16.37 | 1.33 | 1.9 |
| 11/7/04 1:05 | 26.34 | 26.360 | 27.030 | 16.09 | 1.34 | 1.8 |
| 11/7/04 1:15 | 26.35 | 29.890 | 30.670 | 18.48 | 1.34 | 1.7 |
| 11/7/04 1:25 | 26.34 | 30.290 | 31.060 | 18.75 | 1.35 | 1.7 |
| 11/7/04 1:35 | 26.30 | 27.570 | 28.260 | 16.91 | 1.37 | 2.0 |
| 11/7/04 1:45 | 26.27 | 27.090 | 27.750 | 16.58 | 1.39 | 1.7 |
| 11/7/04 1:55 | 26.30 | 19.580 | 20.060 | 11.63 | 1.42 | 1.3 |
| 11/7/04 2:05 | 26.33 | 18.160 | 18.620 | 10.71 | 1.44 | 1.2 |
| 11/7/04 2:15 | 26.23 | 21.660 | 22.170 | 12.98 | 1.45 | 1.0 |
| 11/7/04 2:25 | 26.17 | 24.140 | 24.680 | 14.62 | 1.46 | 1.1 |
| 11/7/04 2:35 | 26.10 | 30.450 | 31.090 | 18.86 | 1.46 | 1.2 |
| 11/7/04 2:45 | 26.05 | 41.830 | 42.670 | 26.80 | 1.47 | 2.5 |
| 11/7/04 2:55 | 26.01 | 44.490 | 45.350 | 28.71 | 1.48 | 1.7 |
| 11/7/04 3:05 | 26.00 | 44.640 | 45.500 | 28.82 | 1.49 | 1.7 |
| 11/7/04 3:15 | 26.02 | 44.780 | 45.660 | 28.92 | 1.51 | 1.7 |
| 11/7/04 3:25 | 26.04 | 44.890 | 45.790 | 29.00 | 1.54 | 1.7 |
| 11/7/04 3:35 | 26.04 | 44.980 | 45.870 | 29.06 | 1.54 | 1.6 |
| 11/7/04 3:45 | 26.03 | 45.040 | 45.930 | 29.10 | 1.55 | 1.7 |
| 11/7/04 3:55 | 25.99 | 45.090 | 45.940 | 29.14 | 1.56 | 1.8 |
| 11/7/04 4:05 | 25.93 | 45.120 | 45.920 | 29.16 | 1.57 | 1.7 |
| 11/7/04 4:15 | 25.85 | 45.110 | 45.850 | 29.16 | 1.58 | 1.7 |
| 11/7/04 4:25 | 25.77 | 45.140 | 45.800 | 29.18 | 1.59 | 1.8 |
| 11/7/04 4:35 | 25.72 | 45.180 | 45.800 | 29.21 | 1.60 | 1.7 |
| 11/7/04 4:45 | 25.67 | 45.240 | 45.820 | 29.25 | 1.60 | 1.8 |
| 11/7/04 4:55 | 25.63 | 45.300 | 45.850 | 29.30 | 1.60 | 1.7 |
| 11/7/04 5:05 | 25.62 | 45.320 | 45.860 | 29.32 | 1.60 | 1.7 |
| 11/7/04 5:15 | 25.61 | 45.340 | 45.870 | 29.33 | 1.59 | 1.8 |
| 11/7/04 5:25 | 25.61 | 45.350 | 45.880 | 29.34 | 1.57 | 1.7 |
| 11/7/04 5:35 | 25.61 | 45.370 | 45.900 | 29.35 | 1.57 | 1.7 |
| 11/7/04 5:45 | 25.60 | 45.400 | 45.920 | 29.37 | 1.56 | 1.7 |
| 11/7/04 5:55 | 25.58 | 45.380 | 45.890 | 29.36 | 1.54 | 1.8 |
| 11/7/04 6:05 | 25.57 | 45.390 | 45.890 | 29.37 | 1.53 | 2.0 |
| 11/7/04 6:15 | 25.56 | 45.380 | 45.870 | 29.36 | 1.52 | 1.8 |
| 11/7/04 6:25 | 25.56 | 45.370 | 45.860 | 29.35 | 1.51 | 1.8 |
| 11/7/04 6:35 | 25.55 | 45.380 | 45.860 | 29.36 | 1.49 | 2.0 |
| 11/7/04 6:45 | 25.54 | 45.390 | 45.860 | 29.37 | 1.48 | 1.8 |
| 11/7/04 6:55 | 25.54 | 45.400 | 45.860 | 29.37 | 1.47 | 1.9 |
| 11/7/04 7:05 | 25.68 | 27.760 | 28.120 | 17.04 | 1.46 | 2.1 |
| 11/7/04 7:15 | 25.67 | 24.530 | 24.850 | 14.88 | 1.46 | 1.5 |
| 11/7/04 7:25 | 25.69 | 25.140 | 25.480 | 15.29 | 1.45 | 1.7 |
| 11/7/04 7:35 | 25.67 | 27.320 | 27.670 | 16.75 | 1.43 | 1.7 |
| 11/7/04 7:45 | 25.66 | 26.850 | 27.190 | 16.43 | 1.41 | 2.0 |
| 11/7/04 7:55 | 25.61 | 27.200 | 27.520 | 16.67 | 1.38 | 1.8 |
| 11/7/04 8:05 | 25.64 | 27.790 | 28.130 | 17.06 | 1.37 | 1.6 |
| 11/7/04 8:15 | 25.62 | 28.360 | 28.690 | 17.45 | 1.35 | 1.7 |
| 11/7/04 8:25 | 25.64 | 30.950 | 31.320 | 19.21 | 1.34 | 2.0 |
| 11/7/04 8:35 | 25.70 | 28.400 | 28.780 | 17.48 | 1.33 | 1.8 |

|               |       |        |        |       |      |     |
|---------------|-------|--------|--------|-------|------|-----|
| 11/7/04 8:45  | 25.64 | 29.660 | 30.020 | 18.33 | 1.33 | 2.1 |
| 11/7/04 8:55  | 25.71 | 31.110 | 31.530 | 19.32 | 1.31 | 2.0 |
| 11/7/04 9:05  | 25.76 | 29.030 | 29.450 | 17.90 | 1.29 | 1.7 |
| 11/7/04 9:15  | 25.79 | 28.510 | 28.940 | 17.55 | 1.28 | 4.1 |
| 11/7/04 9:25  | 25.85 | 31.270 | 31.780 | 19.42 | 1.26 | 2.1 |
| 11/7/04 9:35  | 25.91 | 31.680 | 32.230 | 19.71 | 1.25 | 2.5 |
| 11/7/04 9:45  | 26.05 | 32.740 | 33.400 | 20.43 | 1.24 | 1.8 |
| 11/7/04 9:55  | 26.12 | 29.060 | 29.680 | 17.92 | 1.23 | 2.0 |
| 11/7/04 10:05 | 26.21 | 30.890 | 31.600 | 19.16 | 1.22 | 1.5 |
| 11/7/04 10:15 | 26.26 | 29.370 | 30.080 | 18.12 | 1.22 | 1.8 |
| 11/7/04 10:25 | 26.38 | 29.020 | 29.790 | 17.88 | 1.22 | 2.0 |
| 11/7/04 10:35 | 26.43 | 32.260 | 33.140 | 20.09 | 1.21 | 1.9 |
| 11/7/04 10:45 | 26.51 | 28.580 | 29.400 | 17.58 | 1.21 | 1.8 |
| 11/7/04 10:55 | 26.63 | 31.690 | 32.670 | 19.70 | 1.21 | 2.0 |
| 11/7/04 11:05 | 26.69 | 29.380 | 30.330 | 18.12 | 1.21 | 2.0 |
| 11/7/04 11:15 | 26.72 | 32.590 | 33.660 | 20.31 | 1.21 | 1.7 |
| 11/7/04 11:25 | 26.80 | 30.210 | 31.240 | 18.68 | 1.22 | 2.0 |
| 11/7/04 11:35 | 26.89 | 31.370 | 32.500 | 19.47 | 1.22 | 1.8 |
| 11/7/04 11:45 | 27.00 | 29.750 | 30.880 | 18.36 | 1.23 | 1.6 |
| 11/7/04 11:55 | 27.11 | 30.250 | 31.470 | 18.71 | 1.24 | 1.7 |
| 11/7/04 12:05 | 27.24 | 27.860 | 29.050 | 17.09 | 1.25 | 1.7 |
| 11/7/04 12:15 | 27.35 | 27.470 | 28.700 | 16.82 | 1.27 | 2.3 |
| 11/7/04 12:25 | 27.40 | 29.110 | 30.440 | 17.92 | 1.29 | 2.6 |
| 11/7/04 12:35 | 27.36 | 25.830 | 26.990 | 15.72 | 1.31 | 2.3 |
| 11/7/04 12:45 | 27.46 | 28.450 | 29.790 | 17.48 | 1.32 | 2.5 |
| 11/7/04 12:55 | 27.44 | 25.450 | 26.640 | 15.47 | 1.33 | 2.5 |
| 11/7/04 13:05 | 27.36 | 23.790 | 24.870 | 14.37 | 1.34 | 2.1 |
| 11/7/04 13:15 | 27.33 | 23.280 | 24.320 | 14.03 | 1.36 | 2.1 |
| 11/7/04 13:25 | 27.39 | 23.780 | 24.870 | 14.36 | 1.37 | 2.2 |
| 11/7/04 13:35 | 27.44 | 23.770 | 24.870 | 14.35 | 1.39 | 2.3 |
| 11/7/04 13:45 | 27.47 | 20.260 | 21.210 | 12.05 | 1.41 | 2.2 |
| 11/7/04 13:55 | 27.41 | 17.230 | 18.020 | 10.10 | 1.43 | 1.8 |
| 11/7/04 14:05 | 27.60 | 17.400 | 18.260 | 10.21 | 1.45 | 1.7 |
| 11/7/04 14:15 | 27.72 | 30.530 | 32.120 | 18.88 | 1.46 | 2.3 |
| 11/7/04 14:25 | 27.85 | 43.750 | 46.130 | 28.13 | 1.46 | 2.6 |
| 11/7/04 14:35 | 27.85 | 44.880 | 47.320 | 28.94 | 1.48 | 2.7 |
| 11/7/04 14:45 | 27.87 | 44.870 | 47.340 | 28.94 | 1.50 | 2.6 |
| 11/7/04 14:55 | 27.89 | 44.880 | 47.360 | 28.94 | 1.51 | 2.7 |
| 11/7/04 15:05 | 27.89 | 44.920 | 47.400 | 28.97 | 1.53 | 2.0 |
| 11/7/04 15:15 | 27.87 | 45.010 | 47.480 | 29.03 | 1.55 | 2.1 |
| 11/7/04 15:25 | 27.84 | 45.190 | 47.640 | 29.16 | 1.57 | 2.5 |
| 11/7/04 15:35 | 27.78 | 45.470 | 47.890 | 29.37 | 1.59 | 2.0 |
| 11/7/04 15:45 | 27.71 | 45.730 | 48.100 | 29.56 | 1.61 | 1.9 |
| 11/7/04 15:55 | 27.63 | 45.930 | 48.230 | 29.70 | 1.62 | 1.9 |
| 11/7/04 16:05 | 27.58 | 46.030 | 48.290 | 29.78 | 1.63 | 2.4 |
| 11/7/04 16:15 | 27.53 | 46.080 | 48.310 | 29.82 | 1.64 | 2.0 |
| 11/7/04 16:25 | 27.48 | 46.140 | 48.320 | 29.86 | 1.65 | 2.1 |

|               |       |        |        |       |      |     |
|---------------|-------|--------|--------|-------|------|-----|
| 11/7/04 16:35 | 27.44 | 46.160 | 48.320 | 29.88 | 1.67 | 1.8 |
| 11/7/04 16:45 | 27.41 | 46.190 | 48.320 | 29.90 | 1.67 | 1.9 |
| 11/7/04 16:55 | 27.36 | 46.240 | 48.330 | 29.94 | 1.68 | 1.8 |
| 11/7/04 17:05 | 27.30 | 46.080 | 48.100 | 29.82 | 1.69 | 2.0 |
| 11/7/04 17:15 | 27.24 | 45.910 | 47.880 | 29.70 | 1.69 | 2.4 |
| 11/7/04 17:25 | 27.20 | 45.790 | 47.720 | 29.62 | 1.69 | 2.3 |
| 11/7/04 17:35 | 27.17 | 45.700 | 47.600 | 29.55 | 1.69 | 2.3 |
| 11/7/04 17:45 | 27.12 | 45.720 | 47.570 | 29.57 | 1.69 | 2.6 |
| 11/7/04 17:55 | 27.12 | 45.860 | 47.720 | 29.67 | 1.69 | 2.6 |
| 11/7/04 18:05 | 27.12 | 45.980 | 47.850 | 29.76 | 1.67 | 2.9 |
| 11/7/04 18:15 | 27.12 | 46.060 | 47.930 | 29.81 | 1.66 | 2.9 |
| 11/7/04 18:25 | 27.11 | 46.110 | 47.960 | 29.85 | 1.65 | 3.0 |
| 11/7/04 18:35 | 27.09 | 46.110 | 47.960 | 29.85 | 1.63 | 3.1 |
| 11/7/04 18:45 | 27.08 | 46.120 | 47.960 | 29.86 | 1.62 | 3.1 |
| 11/7/04 18:55 | 27.08 | 46.140 | 47.970 | 29.87 | 1.60 | 2.9 |
| 11/7/04 19:05 | 27.07 | 46.130 | 47.960 | 29.87 | 1.58 | 2.9 |
| 11/7/04 19:15 | 27.07 | 46.170 | 48.000 | 29.90 | 1.57 | 3.1 |
| 11/7/04 19:25 | 27.06 | 46.170 | 47.980 | 29.89 | 1.55 | 3.0 |
| 11/7/04 19:35 | 27.05 | 46.200 | 48.010 | 29.92 | 1.54 | 3.2 |
| 11/7/04 19:45 | 27.05 | 46.220 | 48.030 | 29.93 | 1.52 | 3.1 |
| 11/7/04 19:55 | 27.04 | 46.220 | 48.020 | 29.93 | 1.51 | 2.9 |
| 11/7/04 20:05 | 27.04 | 46.210 | 48.010 | 29.92 | 1.49 | 2.4 |
| 11/7/04 20:15 | 27.03 | 46.210 | 48.010 | 29.93 | 1.48 | 2.7 |
| 11/7/04 20:25 | 26.96 | 27.380 | 28.400 | 16.76 | 1.47 | 1.4 |
| 11/7/04 20:35 | 26.97 | 31.120 | 32.290 | 19.30 | 1.45 | 1.7 |
| 11/7/04 20:45 | 26.97 | 30.450 | 31.590 | 18.84 | 1.43 | 1.4 |
| 11/7/04 20:55 | 26.94 | 27.240 | 28.250 | 16.67 | 1.42 | 1.5 |
| 11/7/04 21:05 | 26.93 | 29.100 | 30.170 | 17.93 | 1.40 | 1.5 |
| 11/7/04 21:15 | 26.91 | 30.320 | 31.420 | 18.75 | 1.38 | 1.5 |
| 11/7/04 21:25 | 26.91 | 31.780 | 32.930 | 19.75 | 1.36 | 1.5 |
| 11/7/04 21:35 | 26.89 | 30.440 | 31.540 | 18.84 | 1.35 | 1.7 |
| 11/7/04 21:45 | 26.89 | 32.510 | 33.680 | 20.26 | 1.33 | 1.7 |
| 11/7/04 21:55 | 26.87 | 39.010 | 40.400 | 24.78 | 1.31 | 1.7 |
| 11/7/04 22:05 | 26.86 | 37.930 | 39.270 | 24.02 | 1.29 | 2.1 |
| 11/7/04 22:15 | 26.84 | 41.060 | 42.500 | 26.23 | 1.27 | 1.7 |
| 11/7/04 22:25 | 26.82 | 36.960 | 38.250 | 23.34 | 1.25 | 1.7 |
| 11/7/04 22:35 | 26.82 | 40.060 | 41.440 | 25.52 | 1.24 | 1.5 |
| 11/7/04 22:45 | 26.80 | 43.620 | 45.120 | 28.06 | 1.22 | 2.2 |
| 11/7/04 22:55 | 26.78 | 35.020 | 36.210 | 21.99 | 1.22 | 1.5 |
| 11/7/04 23:05 | 26.77 | 42.920 | 44.370 | 27.56 | 1.20 | 2.2 |
| 11/7/04 23:15 | 26.77 | 42.300 | 43.730 | 27.12 | 1.20 | 3.1 |
| 11/7/04 23:25 | 26.74 | 39.970 | 41.290 | 25.46 | 1.19 | 1.7 |
| 11/7/04 23:35 | 26.76 | 37.290 | 38.550 | 23.58 | 1.18 | 1.8 |
| 11/7/04 23:45 | 26.71 | 42.520 | 43.910 | 27.28 | 1.18 | 1.8 |
| 11/7/04 23:55 | 26.67 | 39.800 | 41.070 | 25.35 | 1.18 | 2.1 |
| 11/8/04 0:05  | 26.67 | 42.070 | 43.410 | 26.95 | 1.17 | 2.0 |
| 11/8/04 0:15  | 26.63 | 39.820 | 41.060 | 25.36 | 1.18 | 1.7 |

|              |       |        |        |       |      |     |
|--------------|-------|--------|--------|-------|------|-----|
| 11/8/04 0:25 | 26.54 | 41.710 | 42.940 | 26.71 | 1.19 | 2.1 |
| 11/8/04 0:35 | 26.47 | 39.190 | 40.300 | 24.92 | 1.20 | 2.1 |
| 11/8/04 0:45 | 26.41 | 39.290 | 40.340 | 24.99 | 1.21 | 2.3 |
| 11/8/04 0:55 | 26.30 | 34.870 | 35.730 | 21.90 | 1.23 | 1.7 |
| 11/8/04 1:05 | 26.06 | 32.060 | 32.710 | 19.96 | 1.26 | 2.1 |
| 11/8/04 1:15 | 25.96 | 33.010 | 33.620 | 20.62 | 1.28 | 2.4 |
| 11/8/04 1:25 | 25.89 | 34.000 | 34.570 | 21.30 | 1.30 | 1.8 |
| 11/8/04 1:35 | 25.90 | 29.670 | 30.180 | 18.33 | 1.32 | 2.3 |
| 11/8/04 1:45 | 25.94 | 31.010 | 31.560 | 19.24 | 1.34 | 2.4 |
| 11/8/04 1:55 | 25.85 | 31.970 | 32.490 | 19.90 | 1.35 | 2.1 |
| 11/8/04 2:05 | 25.85 | 28.420 | 28.880 | 17.49 | 1.36 | 2.1 |
| 11/8/04 2:15 | 25.86 | 28.690 | 29.160 | 17.67 | 1.37 | 2.5 |
| 11/8/04 2:25 | 25.89 | 28.740 | 29.230 | 17.70 | 1.39 | 1.8 |
| 11/8/04 2:35 | 25.90 | 25.020 | 25.450 | 15.20 | 1.42 | 1.7 |
| 11/8/04 2:45 | 25.91 | 19.860 | 20.210 | 11.82 | 1.44 | 1.4 |
| 11/8/04 2:55 | 25.94 | 19.520 | 19.870 | 11.59 | 1.45 | 1.4 |
| 11/8/04 3:05 | 26.02 | 20.590 | 20.990 | 12.28 | 1.47 | 1.2 |
| 11/8/04 3:15 | 25.86 | 37.060 | 37.670 | 23.43 | 1.47 | 1.7 |
| 11/8/04 3:25 | 25.78 | 45.840 | 46.520 | 29.68 | 1.48 | 2.2 |
| 11/8/04 3:35 | 25.75 | 45.970 | 46.620 | 29.78 | 1.50 | 2.0 |
| 11/8/04 3:45 | 25.76 | 46.020 | 46.690 | 29.82 | 1.51 | 2.0 |
| 11/8/04 3:55 | 25.71 | 46.000 | 46.630 | 29.81 | 1.53 | 2.0 |
| 11/8/04 4:05 | 25.67 | 45.980 | 46.570 | 29.79 | 1.55 | 2.0 |
| 11/8/04 4:15 | 25.32 | 45.610 | 45.880 | 29.53 | 1.57 | 2.0 |
| 11/8/04 4:25 | 25.33 | 45.600 | 45.890 | 29.53 | 1.58 | 2.0 |
| 11/8/04 4:35 | 25.37 | 45.680 | 46.000 | 29.58 | 1.60 | 2.0 |
| 11/8/04 4:45 | 25.43 | 45.800 | 46.170 | 29.66 | 1.60 | 2.0 |
| 11/8/04 4:55 | 25.48 | 45.820 | 46.240 | 29.68 | 1.61 | 2.0 |
| 11/8/04 5:05 | 25.47 | 45.830 | 46.240 | 29.68 | 1.62 | 2.1 |
| 11/8/04 5:15 | 25.45 | 45.830 | 46.230 | 29.69 | 1.63 | 2.1 |
| 11/8/04 5:25 | 25.45 | 45.820 | 46.210 | 29.68 | 1.64 | 2.0 |
| 11/8/04 5:35 | 25.42 | 45.800 | 46.170 | 29.67 | 1.65 | 2.0 |
| 11/8/04 5:45 | 25.41 | 45.760 | 46.120 | 29.63 | 1.64 | 2.1 |
| 11/8/04 5:55 | 25.41 | 45.830 | 46.190 | 29.69 | 1.64 | 2.1 |
| 11/8/04 6:05 | 25.39 | 45.710 | 46.060 | 29.60 | 1.64 | 2.1 |
| 11/8/04 6:15 | 25.40 | 45.790 | 46.140 | 29.66 | 1.64 | 2.0 |
| 11/8/04 6:25 | 25.35 | 45.760 | 46.060 | 29.64 | 1.63 | 2.1 |
| 11/8/04 6:35 | 25.35 | 45.760 | 46.070 | 29.64 | 1.62 | 2.3 |
| 11/8/04 6:45 | 25.33 | 45.750 | 46.040 | 29.63 | 1.61 | 2.3 |
| 11/8/04 6:55 | 25.34 | 45.740 | 46.030 | 29.62 | 1.59 | 2.4 |
| 11/8/04 7:05 | 25.32 | 45.720 | 46.000 | 29.61 | 1.58 | 2.0 |
| 11/8/04 7:15 | 25.31 | 45.700 | 45.970 | 29.60 | 1.56 | 2.1 |
| 11/8/04 7:25 | 25.27 | 45.650 | 45.880 | 29.56 | 1.55 | 2.3 |
| 11/8/04 7:35 | 25.11 | 45.480 | 45.580 | 29.44 | 1.54 | 2.2 |
| 11/8/04 7:45 | 24.91 | 45.360 | 45.280 | 29.36 | 1.51 | 2.3 |
| 11/8/04 7:55 | 25.06 | 45.410 | 45.460 | 29.39 | 1.49 | 2.3 |
| 11/8/04 8:05 | 25.21 | 43.590 | 43.770 | 28.08 | 1.47 | 2.2 |

|               |       |        |        |       |      |     |
|---------------|-------|--------|--------|-------|------|-----|
| 11/8/04 8:15  | 25.38 | 22.980 | 23.140 | 13.86 | 1.47 | 2.1 |
| 11/8/04 8:25  | 25.33 | 24.310 | 24.470 | 14.74 | 1.46 | 2.8 |
| 11/8/04 8:35  | 25.39 | 22.930 | 23.100 | 13.83 | 1.44 | 4.6 |
| 11/8/04 8:45  | 25.37 | 23.630 | 23.790 | 14.29 | 1.42 | 6.0 |
| 11/8/04 8:55  | 25.41 | 23.570 | 23.760 | 14.25 | 1.41 | 7.4 |
| 11/8/04 9:05  | 25.36 | 23.740 | 23.900 | 14.36 | 1.40 | 3.2 |
| 11/8/04 9:15  | 25.50 | 22.420 | 22.630 | 13.49 | 1.38 | 2.5 |
| 11/8/04 9:25  | 25.28 | 24.720 | 24.850 | 15.02 | 1.36 | 2.8 |
| 11/8/04 9:35  | 25.37 | 23.640 | 23.810 | 14.30 | 1.34 | 8.3 |
| 11/8/04 9:45  | 25.35 | 27.480 | 27.670 | 16.86 | 1.32 | 4.4 |
| 11/8/04 9:55  | 25.45 | 25.350 | 25.570 | 15.43 | 1.31 | 2.1 |
| 11/8/04 10:05 | 25.43 | 24.930 | 25.130 | 15.15 | 1.29 | 3.3 |
| 11/8/04 10:15 | 25.39 | 30.280 | 30.510 | 18.76 | 1.27 | 2.5 |
| 11/8/04 10:25 | 25.46 | 27.510 | 27.750 | 16.88 | 1.26 | 3.2 |
| 11/8/04 10:35 | 25.56 | 26.860 | 27.150 | 16.44 | 1.24 | 2.4 |
| 11/8/04 10:45 | 25.70 | 27.380 | 27.750 | 16.79 | 1.24 | 2.0 |
| 11/8/04 10:55 | 25.84 | 26.860 | 27.290 | 16.43 | 1.23 | 5.7 |
| 11/8/04 11:05 | 25.74 | 27.460 | 27.850 | 16.84 | 1.22 | 3.9 |
| 11/8/04 11:15 | 25.88 | 27.930 | 28.400 | 17.16 | 1.21 | 2.2 |
| 11/8/04 11:25 | 25.94 | 28.290 | 28.790 | 17.40 | 1.20 | 4.2 |
| 11/8/04 11:35 | 26.07 | 27.400 | 27.960 | 16.79 | 1.20 | 3.7 |
| 11/8/04 11:45 | 26.21 | 25.770 | 26.370 | 15.70 | 1.19 | 2.5 |
| 11/8/04 11:55 | 26.26 | 26.220 | 26.850 | 16.00 | 1.18 | 2.9 |
| 11/8/04 12:05 | 26.39 | 26.210 | 26.910 | 15.99 | 1.18 | 3.2 |
| 11/8/04 12:15 | 26.42 | 25.380 | 26.070 | 15.43 | 1.17 | 3.4 |
| 11/8/04 12:25 | 26.59 | 25.760 | 26.540 | 15.68 | 1.17 | 3.1 |
| 11/8/04 12:35 | 26.67 | 25.870 | 26.690 | 15.76 | 1.18 | 2.5 |
| 11/8/04 12:45 | 26.75 | 26.960 | 27.860 | 16.49 | 1.18 | 4.5 |
| 11/8/04 12:55 | 26.83 | 26.360 | 27.280 | 16.09 | 1.19 | 3.0 |
| 11/8/04 13:05 | 26.95 | 25.600 | 26.550 | 15.57 | 1.20 | 4.4 |
| 11/8/04 13:15 | 27.05 | 25.550 | 26.560 | 15.54 | 1.22 | 2.7 |
| 11/8/04 13:25 | 27.08 | 24.980 | 25.970 | 15.16 | 1.24 | 2.2 |
| 11/8/04 13:35 | 27.19 | 24.450 | 25.470 | 14.80 | 1.26 | 3.6 |
| 11/8/04 13:45 | 27.15 | 23.500 | 24.460 | 14.17 | 1.28 | 5.1 |
| 11/8/04 13:55 | 27.27 | 20.660 | 21.560 | 12.32 | 1.31 | 3.2 |
| 11/8/04 14:05 | 27.48 | 25.550 | 26.760 | 15.53 | 1.33 | 6.4 |
| 11/8/04 14:15 | 27.51 | 22.840 | 23.930 | 13.74 | 1.34 | 5.3 |
| 11/8/04 14:25 | 27.59 | 22.470 | 23.580 | 13.49 | 1.36 | 4.6 |
| 11/8/04 14:35 | 27.62 | 23.620 | 24.800 | 14.25 | 1.37 | 3.9 |
| 11/8/04 14:45 | 27.63 | 24.180 | 25.390 | 14.62 | 1.39 | 4.0 |
| 11/8/04 14:55 | 27.64 | 17.850 | 18.750 | 10.50 | 1.41 | 2.3 |
| 11/8/04 15:05 | 27.56 | 16.670 | 17.490 | 9.75  | 1.43 | 2.0 |
| 11/8/04 15:15 | 27.60 | 15.950 | 16.740 | 9.29  | 1.45 | 2.0 |
| 11/8/04 15:25 | 27.66 | 21.590 | 22.690 | 12.91 | 1.46 | 1.9 |
| 11/8/04 15:35 | 27.80 | 42.600 | 44.880 | 27.31 | 1.47 | 2.9 |
| 11/8/04 15:45 | 27.83 | 45.400 | 47.860 | 29.32 | 1.48 | 2.9 |
| 11/8/04 15:55 | 27.76 | 45.460 | 47.860 | 29.36 | 1.50 | 3.9 |

|               |       |        |        |       |      |     |
|---------------|-------|--------|--------|-------|------|-----|
| 11/8/04 16:05 | 27.71 | 45.550 | 47.900 | 29.43 | 1.52 | 3.2 |
| 11/8/04 16:15 | 27.61 | 45.590 | 47.860 | 29.46 | 1.54 | 3.4 |
| 11/8/04 16:25 | 27.55 | 45.590 | 47.810 | 29.46 | 1.55 | 3.2 |
| 11/8/04 16:35 | 27.48 | 45.570 | 47.730 | 29.45 | 1.57 | 3.0 |
| 11/8/04 16:45 | 27.42 | 45.550 | 47.660 | 29.43 | 1.60 | 2.7 |
| 11/8/04 16:55 | 27.37 | 45.480 | 47.530 | 29.38 | 1.62 | 3.2 |
| 11/8/04 17:05 | 27.29 | 45.400 | 47.390 | 29.33 | 1.63 | 3.2 |
| 11/8/04 17:15 | 27.23 | 45.270 | 47.200 | 29.24 | 1.64 | 2.6 |
| 11/8/04 17:25 | 27.21 | 45.250 | 47.160 | 29.23 | 1.65 | 2.1 |
| 11/8/04 17:35 | 27.20 | 45.280 | 47.180 | 29.25 | 1.66 | 3.1 |
| 11/8/04 17:45 | 27.12 | 45.240 | 47.070 | 29.22 | 1.67 | 4.3 |
| 11/8/04 17:55 | 27.16 | 45.300 | 47.170 | 29.26 | 1.68 | 2.5 |
| 11/8/04 18:05 | 27.14 | 45.350 | 47.210 | 29.30 | 1.68 | 2.7 |
| 11/8/04 18:15 | 27.11 | 45.340 | 47.170 | 29.30 | 1.68 | 2.0 |
| 11/8/04 18:25 | 27.09 | 45.350 | 47.160 | 29.30 | 1.67 | 1.9 |
| 11/8/04 18:35 | 27.08 | 45.380 | 47.190 | 29.32 | 1.67 | 2.6 |
| 11/8/04 18:45 | 27.08 | 45.400 | 47.200 | 29.34 | 1.66 | 1.9 |
| 11/8/04 18:55 | 27.08 | 45.440 | 47.250 | 29.37 | 1.65 | 2.8 |
| 11/8/04 19:05 | 27.06 | 45.770 | 47.570 | 29.60 | 1.64 | 2.4 |
| 11/8/04 19:15 | 26.99 | 46.060 | 47.810 | 29.81 | 1.62 | 2.1 |
| 11/8/04 19:25 | 26.93 | 46.200 | 47.900 | 29.92 | 1.60 | 2.8 |
| 11/8/04 19:35 | 26.86 | 46.320 | 47.970 | 30.01 | 1.58 | 2.2 |
| 11/8/04 19:45 | 26.78 | 46.420 | 48.000 | 30.08 | 1.56 | 2.3 |
| 11/8/04 19:55 | 26.75 | 46.470 | 48.020 | 30.12 | 1.54 | 2.3 |
| 11/8/04 20:05 | 26.70 | 46.520 | 48.030 | 30.16 | 1.52 | 2.8 |
| 11/8/04 20:15 | 26.65 | 46.570 | 48.040 | 30.19 | 1.51 | 2.3 |
| 11/8/04 20:25 | 26.62 | 46.590 | 48.030 | 30.21 | 1.49 | 2.3 |
| 11/8/04 20:35 | 26.60 | 29.800 | 30.710 | 18.41 | 1.48 | 5.6 |
| 11/8/04 20:45 | 26.57 | 24.620 | 25.350 | 14.93 | 1.47 | 4.8 |
| 11/8/04 20:55 | 26.53 | 25.960 | 26.720 | 15.82 | 1.45 | 4.9 |
| 11/8/04 21:05 | 26.49 | 25.950 | 26.690 | 15.81 | 1.42 | 3.5 |
| 11/8/04 21:15 | 26.47 | 24.880 | 25.580 | 15.10 | 1.40 | 2.7 |
| 11/8/04 21:25 | 26.43 | 26.150 | 26.870 | 15.95 | 1.38 | 3.0 |
| 11/8/04 21:35 | 26.41 | 26.590 | 27.300 | 16.24 | 1.36 | 2.7 |
| 11/8/04 21:45 | 26.38 | 25.420 | 26.090 | 15.47 | 1.35 | 5.3 |
| 11/8/04 21:55 | 26.37 | 24.340 | 24.980 | 14.75 | 1.33 | 3.9 |
| 11/8/04 22:05 | 26.37 | 26.770 | 27.470 | 16.37 | 1.31 | 2.9 |
| 11/8/04 22:15 | 26.30 | 31.410 | 32.190 | 19.51 | 1.29 | 2.8 |
| 11/8/04 22:25 | 26.30 | 30.270 | 31.030 | 18.74 | 1.28 | 3.6 |
| 11/8/04 22:35 | 26.26 | 30.600 | 31.340 | 18.96 | 1.26 | 4.2 |
| 11/8/04 22:45 | 26.22 | 38.010 | 38.890 | 24.09 | 1.24 | 3.4 |
| 11/8/04 22:55 | 26.17 | 36.370 | 37.180 | 22.94 | 1.22 | 5.7 |
| 11/8/04 23:05 | 26.15 | 37.570 | 38.390 | 23.78 | 1.21 | 6.5 |
| 11/8/04 23:15 | 26.12 | 36.740 | 37.530 | 23.21 | 1.19 | 4.2 |
| 11/8/04 23:25 | 26.10 | 37.280 | 38.070 | 23.58 | 1.18 | 8.2 |
| 11/8/04 23:35 | 26.02 | 40.220 | 41.010 | 25.66 | 1.16 | 4.2 |
| 11/8/04 23:45 | 26.10 | 35.940 | 36.690 | 22.65 | 1.15 | 6.7 |

|               |       |        |        |       |      |      |
|---------------|-------|--------|--------|-------|------|------|
| 11/8/04 23:55 | 25.94 | 35.920 | 36.560 | 22.64 | 1.14 | 5.0  |
| 11/9/04 0:05  | 26.05 | 34.590 | 35.290 | 21.71 | 1.13 | 7.2  |
| 11/9/04 0:15  | 25.95 | 34.930 | 35.570 | 21.95 | 1.12 | 3.2  |
| 11/9/04 0:25  | 26.04 | 31.430 | 32.050 | 19.53 | 1.12 | 3.0  |
| 11/9/04 0:35  | 25.96 | 34.180 | 34.810 | 21.43 | 1.11 | 8.1  |
| 11/9/04 0:45  | 25.99 | 31.350 | 31.940 | 19.48 | 1.11 | 7.0  |
| 11/9/04 0:55  | 25.87 | 33.930 | 34.490 | 21.25 | 1.11 | 7.8  |
| 11/9/04 1:05  | 25.85 | 36.340 | 36.920 | 22.93 | 1.11 | 5.9  |
| 11/9/04 1:15  | 25.73 | 37.740 | 38.270 | 23.91 | 1.13 | 6.0  |
| 11/9/04 1:25  | 25.58 | 40.150 | 40.600 | 25.62 | 1.15 | 5.7  |
| 11/9/04 1:35  | 25.72 | 37.860 | 38.380 | 24.00 | 1.16 | 5.4  |
| 11/9/04 1:45  | 25.44 | 37.630 | 37.950 | 23.84 | 1.19 | 7.2  |
| 11/9/04 1:55  | 25.37 | 36.230 | 36.490 | 22.87 | 1.21 | 10.1 |
| 11/9/04 2:05  | 25.17 | 36.580 | 36.700 | 23.11 | 1.23 | 4.9  |
| 11/9/04 2:15  | 25.06 | 32.500 | 32.540 | 20.28 | 1.25 | 9.3  |
| 11/9/04 2:25  | 24.93 | 34.010 | 33.960 | 21.33 | 1.27 | 7.2  |
| 11/9/04 2:35  | 24.92 | 28.630 | 28.590 | 17.64 | 1.29 | 5.0  |
| 11/9/04 2:45  | 24.89 | 27.580 | 27.530 | 16.94 | 1.30 | 5.1  |
| 11/9/04 2:55  | 24.90 | 26.650 | 26.590 | 16.31 | 1.32 | 7.5  |
| 11/9/04 3:05  | 24.91 | 22.640 | 22.610 | 13.65 | 1.35 | 4.7  |
| 11/9/04 3:15  | 24.84 | 22.880 | 22.810 | 13.81 | 1.37 | 9.8  |
| 11/9/04 3:25  | 24.90 | 20.940 | 20.900 | 12.53 | 1.39 | 6.4  |
| 11/9/04 3:35  | 25.36 | 15.260 | 15.370 | 8.88  | 1.42 | 2.6  |
| 11/9/04 3:45  | 25.09 | 14.570 | 14.590 | 8.45  | 1.45 | 2.7  |
| 11/9/04 3:55  | 24.80 | 23.220 | 23.130 | 14.03 | 1.47 | 1.6  |
| 11/9/04 4:05  | 24.69 | 41.970 | 41.720 | 26.93 | 1.47 | 3.9  |
| 11/9/04 4:15  | 24.56 | 45.590 | 45.210 | 29.53 | 1.49 | 2.5  |
| 11/9/04 4:25  | 24.57 | 45.500 | 45.130 | 29.47 | 1.52 | 2.7  |
| 11/9/04 4:35  | 24.52 | 45.440 | 45.030 | 29.43 | 1.54 | 4.3  |
| 11/9/04 4:45  | 24.41 | 45.390 | 44.880 | 29.39 | 1.57 | 3.0  |
| 11/9/04 4:55  | 24.35 | 45.350 | 44.780 | 29.36 | 1.59 | 3.4  |
| 11/9/04 5:05  | 24.28 | 45.270 | 44.650 | 29.30 | 1.61 | 2.9  |
| 11/9/04 5:15  | 24.18 | 45.160 | 44.450 | 29.23 | 1.63 | 4.8  |
| 11/9/04 5:25  | 24.02 | 44.950 | 44.100 | 29.08 | 1.65 | 2.7  |
| 11/9/04 5:35  | 23.99 | 44.950 | 44.080 | 29.08 | 1.67 | 2.4  |
| 11/9/04 5:45  | 24.02 | 45.010 | 44.170 | 29.12 | 1.68 | 2.4  |
| 11/9/04 5:55  | 24.04 | 44.950 | 44.120 | 29.08 | 1.69 | 2.6  |
| 11/9/04 6:05  | 23.95 | 45.100 | 44.200 | 29.19 | 1.71 | 2.9  |
| 11/9/04 6:15  | 24.00 | 45.030 | 44.170 | 29.14 | 1.72 | 3.2  |
| 11/9/04 6:25  | 24.01 | 45.270 | 44.420 | 29.31 | 1.73 | 2.7  |
| 11/9/04 6:35  | 24.00 | 45.360 | 44.500 | 29.38 | 1.73 | 2.4  |
| 11/9/04 6:45  | 24.00 | 45.420 | 44.550 | 29.42 | 1.73 | 3.2  |
| 11/9/04 6:55  | 24.02 | 45.490 | 44.630 | 29.47 | 1.74 | 3.6  |
| 11/9/04 7:05  | 24.00 | 45.270 | 44.410 | 29.31 | 1.74 | 3.1  |
| 11/9/04 7:15  | 23.97 | 45.650 | 44.750 | 29.59 | 1.73 | 3.5  |
| 11/9/04 7:25  | 23.96 | 45.620 | 44.720 | 29.57 | 1.72 | 3.4  |
| 11/9/04 7:35  | 23.96 | 45.620 | 44.710 | 29.56 | 1.71 | 3.1  |

|               |       |        |        |       |      |        |
|---------------|-------|--------|--------|-------|------|--------|
| 11/9/04 7:45  | 23.98 | 45.710 | 44.810 | 29.63 | 1.68 | 2.9    |
| 11/9/04 7:55  | 23.98 | 46.070 | 45.170 | 29.89 | 1.66 | 2.9    |
| 11/9/04 8:05  | 23.98 | 45.800 | 44.900 | 29.69 | 1.65 | 2.7    |
| 11/9/04 8:15  | 23.98 | 45.750 | 44.860 | 29.66 | 1.63 | 2.7    |
| 11/9/04 8:25  | 23.98 | 45.950 | 45.060 | 29.81 | 1.62 | 3.3    |
| 11/9/04 8:35  | 24.00 | 46.120 | 45.250 | 29.93 | 1.59 | 3.8    |
| 11/9/04 8:45  | 24.03 | 46.090 | 45.240 | 29.90 | 1.57 | 3.2    |
| 11/9/04 8:56  | 24.06 | 45.960 | 45.130 | 29.81 | 1.56 | 3.4    |
| 11/9/04 9:05  | 24.11 | 46.020 | 45.230 | 29.85 | 1.54 | 4.3    |
| 11/9/04 9:15  | 24.15 | 46.290 | 45.530 | 30.04 | 1.53 | 3.2    |
| 11/9/04 9:25  | 24.21 | 46.290 | 45.590 | 30.05 | 1.51 | 3.3    |
| 11/9/04 9:35  | 24.56 | 21.040 | 20.860 | 12.60 | 1.51 | 2.0    |
| 11/9/04 9:45  | 24.47 | 27.340 | 27.070 | 16.78 | 1.49 | 2.9    |
| 11/9/04 9:55  | 24.62 | 25.870 | 25.680 | 15.79 | 1.47 | 4.8    |
| 11/9/04 10:05 | 24.50 | 26.990 | 26.730 | 16.55 | 1.45 | 3.6    |
| 11/9/04 10:15 | 24.70 | 33.130 | 32.930 | 20.72 | 1.42 | 2.5    |
| 11/9/04 10:25 | 24.64 | 26.670 | 26.490 | 16.33 | 1.41 | 4.1    |
| 11/9/04 10:35 | 24.97 | 26.080 | 26.070 | 15.93 | 1.39 | 3.6    |
| 11/9/04 10:45 | 24.79 | 27.180 | 27.070 | 16.67 | 1.38 | 4.2    |
| 11/9/04 10:55 | 24.88 | 29.250 | 29.180 | 18.07 | 1.36 | 2.8    |
| 11/9/04 11:05 | 25.68 | 22.700 | 23.000 | 13.68 | 1.34 | 4.7    |
| 11/9/04 11:15 | 25.86 | 21.150 | 21.490 | 12.65 | 1.32 | 5.1    |
| 11/9/04 11:25 | 25.72 | 22.760 | 23.070 | 13.71 | 1.30 | 4.5    |
| 11/9/04 11:35 | 25.19 | 31.430 | 31.550 | 19.55 | 1.28 | 7.0    |
| 11/9/04 11:45 | 25.10 | 27.760 | 27.810 | 17.05 | 1.27 | 4.7    |
| 11/9/04 11:55 | 26.05 | 22.260 | 22.700 | 13.38 | 1.26 | 6.1    |
| 11/9/04 12:05 | 26.20 | 21.090 | 21.570 | 12.61 | 1.25 | 12.8   |
| 11/9/04 12:15 | 26.21 | 20.330 | 20.790 | 12.11 | 1.24 | 93.9   |
| 11/9/04 12:25 | 25.65 | 26.680 | 27.000 | 16.31 | 1.23 | 6.1    |
| 11/9/04 12:35 | 25.80 | 25.950 | 26.340 | 15.82 | 1.22 | 4.9    |
| 11/9/04 12:45 | 25.89 | 31.170 | 31.700 | 19.36 | 1.21 | 22.2   |
| 11/9/04 12:55 | 26.03 | 28.280 | 28.830 | 17.39 | 1.21 | 5.7    |
| 11/9/04 13:05 | 26.14 | 26.500 | 27.080 | 16.19 | 1.23 | 4.4    |
| 11/9/04 13:15 | 26.19 | 25.480 | 26.060 | 15.50 | 1.24 | 4.0    |
| 11/9/04 13:25 | 26.30 | 26.910 | 27.580 | 16.46 | 1.25 | 10.4   |
| 11/9/04 13:35 | 26.40 | 27.210 | 27.930 | 16.66 | 1.27 | 16.7   |
| 11/9/04 13:45 | 26.51 | 27.140 | 27.920 | 16.61 | 1.29 | 9.7    |
| 11/9/04 13:55 | 26.60 | 24.010 | 24.750 | 14.53 | 1.30 | 3.8    |
| 11/9/04 14:05 | 26.70 | 26.330 | 27.180 | 16.06 | 1.32 | 17.5   |
| 11/9/04 14:15 | 26.73 | 22.880 | 23.640 | 13.78 | 1.34 | 48.5   |
| 11/9/04 14:25 | 26.72 | 24.650 | 25.460 | 14.94 | 1.35 | 3.6    |
| 11/9/04 14:35 | 26.70 | 24.050 | 24.830 | 14.55 | 1.36 | 5.1    |
| 11/9/04 14:45 | 26.68 | 24.360 | 25.140 | 14.75 | 1.38 | 37.4   |
| 11/9/04 14:55 | 26.68 | 24.000 | 24.770 | 14.51 | 1.40 | 66.4   |
| 11/9/04 15:06 | 26.66 | 23.580 | 24.330 | 14.24 | 1.42 | 16.4   |
| 11/9/04 15:15 | 26.61 | 23.400 | 24.110 | 14.12 | 1.44 | 1433.9 |
| 11/9/04 15:25 | 26.54 | 17.820 | 18.340 | 10.49 | 1.47 | 1433.2 |

|               |       |        |        |       |      |        |
|---------------|-------|--------|--------|-------|------|--------|
| 11/9/04 15:35 | 26.50 | 27.970 | 28.770 | 17.17 | 1.49 | 216.6  |
| 11/9/04 15:45 | 26.43 | 42.620 | 43.780 | 27.35 | 1.50 | 50.8   |
| 11/9/04 15:55 | 26.35 | 45.730 | 46.910 | 29.59 | 1.51 | 10.1   |
| 11/9/04 16:05 | 26.32 | 45.730 | 46.880 | 29.59 | 1.53 | 6.7    |
| 11/9/04 16:15 | 26.26 | 45.760 | 46.870 | 29.62 | 1.56 | 8.9    |
| 11/9/04 16:25 | 26.22 | 45.880 | 46.950 | 29.70 | 1.58 | 10.1   |
| 11/9/04 16:35 | 26.19 | 46.100 | 47.150 | 29.87 | 1.61 | 21.1   |
| 11/9/04 16:46 | 26.12 | 46.340 | 47.340 | 30.04 | 1.63 | 14.3   |
| 11/9/04 16:55 | 25.99 | 46.680 | 47.560 | 30.29 | 1.65 | 9.9    |
| 11/9/04 17:05 | 25.90 | 46.800 | 47.610 | 30.38 | 1.67 | 9.3    |
| 11/9/04 17:15 | 25.81 | 46.900 | 47.620 | 30.45 | 1.70 | 1425.4 |
| 11/9/04 17:25 | 25.74 | 46.940 | 47.600 | 30.48 | 1.72 | 103.9  |
| 11/9/04 17:35 | 25.69 | 46.950 | 47.570 | 30.49 | 1.73 | 8.5    |
| 11/9/04 17:45 | 25.65 | 46.950 | 47.530 | 30.49 | 1.74 | 11.9   |
| 11/9/04 17:56 | 25.61 | 46.950 | 47.490 | 30.49 | 1.76 | 5.0    |
| 11/9/04 18:05 | 25.55 | 46.940 | 47.430 | 30.49 | 1.77 | 4.0    |
| 11/9/04 18:15 | 25.50 | 46.930 | 47.370 | 30.48 | 1.78 | 1422.0 |
| 11/9/04 18:25 | 25.45 | 46.920 | 47.320 | 30.48 | 1.80 | 4.7    |
| 11/9/04 18:35 | 25.40 | 46.900 | 47.260 | 30.46 | 1.80 | 6.9    |
| 11/9/04 18:45 | 25.35 | 46.890 | 47.210 | 30.46 | 1.81 | 1420.5 |
| 11/9/04 18:55 | 25.33 | 46.880 | 47.180 | 30.45 | 1.81 | 30.3   |
| 11/9/04 19:06 | 25.28 | 46.890 | 47.140 | 30.46 | 1.82 | 9.1    |
| 11/9/04 19:15 | 25.23 | 46.900 | 47.110 | 30.47 | 1.82 | 7.3    |
| 11/9/04 19:26 | 25.18 | 46.910 | 47.070 | 30.48 | 1.82 | 4.3    |
| 11/9/04 19:36 | 25.14 | 46.900 | 47.030 | 30.47 | 1.82 | 5.3    |
| 11/9/04 19:45 | 25.06 | 46.880 | 46.940 | 30.46 | 1.81 | 5.2    |
| 11/9/04 19:55 | 25.00 | 46.850 | 46.850 | 30.43 | 1.81 | 11.4   |
| 11/9/04 20:05 | 24.93 | 46.750 | 46.690 | 30.37 | 1.78 | 3.7    |
| 11/9/04 20:15 | 24.87 | 46.560 | 46.440 | 30.23 | 1.77 | 5.0    |
| 11/9/04 20:25 | 24.86 | 46.340 | 46.210 | 30.07 | 1.75 | 4.4    |
| 11/9/04 20:35 | 24.85 | 46.100 | 45.960 | 29.89 | 1.74 | 5.3    |
| 11/9/04 20:45 | 24.81 | 45.920 | 45.760 | 29.77 | 1.72 | 6.1    |
| 11/9/04 20:55 | 24.77 | 45.920 | 45.720 | 29.77 | 1.70 | 5.9    |
| 11/9/04 21:05 | 24.74 | 45.910 | 45.680 | 29.76 | 1.67 | 4.4    |
| 11/9/04 21:15 | 24.68 | 45.920 | 45.640 | 29.77 | 1.66 | 5.5    |
| 11/9/04 21:25 | 24.62 | 45.950 | 45.610 | 29.79 | 1.64 | 7.6    |
| 11/9/04 21:35 | 24.59 | 45.880 | 45.520 | 29.74 | 1.63 | 5.3    |
| 11/9/04 21:45 | 24.63 | 45.700 | 45.370 | 29.61 | 1.61 | 7.0    |
| 11/9/04 21:55 | 24.68 | 45.640 | 45.360 | 29.57 | 1.59 | 8.1    |
| 11/9/04 22:05 | 24.65 | 45.510 | 45.210 | 29.48 | 1.56 | 11.0   |
| 11/9/04 22:15 | 24.59 | 45.530 | 45.170 | 29.49 | 1.55 | 8.1    |
| 11/9/04 22:25 | 24.55 | 45.540 | 45.140 | 29.49 | 1.54 | 12.1   |
| 11/9/04 22:35 | 24.90 | 20.440 | 20.400 | 12.21 | 1.58 | 0.8    |
| 11/9/04 22:45 | 24.88 | 17.590 | 17.550 | 10.37 | 1.57 | 1.5    |
| 11/9/04 22:55 | 25.76 | 14.480 | 14.690 | 8.38  | 1.53 | 4.5    |
| 11/9/04 23:05 | 25.46 | 13.180 | 13.290 | 7.57  | 1.54 | 9.9    |
| 11/9/04 23:15 | 25.91 | 15.210 | 15.470 | 8.84  | 1.52 | 8.6    |

|               |       |        |        |       |      |        |
|---------------|-------|--------|--------|-------|------|--------|
| 11/9/04 23:25 | 25.92 | 15.160 | 15.430 | 8.81  | 1.48 | 26.4   |
| 11/9/04 23:36 | 26.33 | 12.070 | 12.380 | 6.88  | 1.47 | 20.8   |
| 11/9/04 23:45 | 25.79 | 17.160 | 17.420 | 10.08 | 1.48 | 1425.1 |
| 11/9/04 23:55 | 25.76 | 14.090 | 14.290 | 8.14  | 1.47 | 74.8   |
| 11/10/04 0:05 | 25.92 | 13.690 | 13.930 | 7.89  | 1.46 | 196.8  |
| 11/10/04 0:15 | 26.03 | 16.110 | 16.430 | 9.41  | 1.43 | 21.5   |
| 11/10/04 0:25 | 24.40 | 25.350 | 25.060 | 15.45 | 1.39 | 1363.5 |
| 11/10/04 0:35 | 25.52 | 22.330 | 22.550 | 13.43 | 1.37 | 1422.3 |
| 11/10/04 0:45 | 24.78 | 30.900 | 30.770 | 19.19 | 1.37 | 1.7    |
| 11/10/04 0:55 | 24.71 | 28.420 | 28.260 | 17.50 | 1.35 | 10.1   |
| 11/10/04 1:05 | 24.25 | 29.310 | 28.900 | 18.12 | 1.37 | 6.2    |
| 11/10/04 1:16 | 24.35 | 28.370 | 28.020 | 17.48 | 1.38 | 62.1   |
| 11/10/04 1:26 | 24.37 | 28.850 | 28.500 | 17.80 | 1.37 | 1.8    |
| 11/10/04 1:35 | 24.00 | 28.350 | 27.810 | 17.47 | 1.36 | 6.9    |
| 11/10/04 1:45 | 24.13 | 24.870 | 24.460 | 15.13 | 1.35 | 5.3    |
| 11/10/04 1:55 | 24.14 | 31.170 | 30.660 | 19.39 | 1.35 | 1407.7 |
| 11/10/04 2:05 | 23.91 | 26.510 | 25.950 | 16.23 | 1.35 | 27.3   |
| 11/10/04 2:15 | 23.70 | 26.280 | 25.620 | 16.08 | 1.40 | 1403.1 |
| 11/10/04 2:25 | 23.86 | 24.440 | 23.910 | 14.85 | 1.41 | 235.3  |
| 11/10/04 2:35 | 23.86 | 23.580 | 23.070 | 14.28 | 1.45 | 1404.8 |
| 11/10/04 2:45 | 23.75 | 22.600 | 22.060 | 13.63 | 1.47 | 1403.6 |
| 11/10/04 2:55 | 23.74 | 20.730 | 20.230 | 12.41 | 1.47 | 30.3   |
| 11/10/04 3:06 | 23.79 | 20.280 | 19.810 | 12.11 | 1.49 | 51.6   |
| 11/10/04 3:15 | 23.74 | 22.140 | 21.610 | 13.33 | 1.51 | 2.0    |
| 11/10/04 3:25 | 23.80 | 25.780 | 25.180 | 15.74 | 1.55 | 15.0   |
| 11/10/04 3:35 | 23.27 | 46.110 | 44.580 | 29.93 | 1.55 | 24.2   |
| 11/10/04 3:46 | 23.25 | 46.300 | 44.760 | 30.07 | 1.59 | 27.6   |
| 11/10/04 3:56 | 23.24 | 46.350 | 44.790 | 30.10 | 1.62 | 18.8   |
| 11/10/04 4:06 | 23.26 | 46.370 | 44.830 | 30.12 | 1.63 | 22.5   |
| 11/10/04 4:15 | 23.27 | 46.390 | 44.860 | 30.14 | 1.65 | 1398.3 |
| 11/10/04 4:25 | 23.30 | 46.400 | 44.900 | 30.14 | 1.68 | 1398.6 |
| 11/10/04 4:35 | 23.32 | 46.380 | 44.890 | 30.13 | 1.69 | 250.4  |
| 11/10/04 4:45 | 23.32 | 46.350 | 44.860 | 30.11 | 1.72 | 1393.6 |
| 11/10/04 4:55 | 23.32 | 46.310 | 44.820 | 30.08 | 1.75 | 1398.8 |
| 11/10/04 5:05 | 23.31 | 46.280 | 44.790 | 30.06 | 1.76 | 46.6   |
| 11/10/04 5:15 | 23.31 | 46.260 | 44.770 | 30.04 | 1.78 | 1398.6 |
| 11/10/04 5:25 | 23.29 | 46.230 | 44.730 | 30.02 | 1.81 | 70.1   |
| 11/10/04 5:35 | 23.28 | 46.190 | 44.670 | 29.99 | 1.83 | 1387.8 |
| 11/10/04 5:45 | 23.26 | 46.130 | 44.600 | 29.95 | 1.85 | 1398.1 |
| 11/10/04 5:55 | 23.23 | 45.960 | 44.410 | 29.83 | 1.88 | 25.6   |
| 11/10/04 6:05 | 23.19 | 45.750 | 44.170 | 29.67 | 1.89 | 1397.4 |
| 11/10/04 6:15 | 23.17 | 45.560 | 43.970 | 29.53 | 1.91 | 51.5   |
| 11/10/04 6:25 | 23.17 | 45.400 | 43.820 | 29.42 | 1.93 | 1397.2 |
| 11/10/04 6:35 | 23.17 | 45.290 | 43.710 | 29.34 | 1.95 | 52.3   |
| 11/10/04 6:45 | 23.18 | 45.210 | 43.630 | 29.28 | 1.97 | 1397.2 |
| 11/10/04 6:55 | 23.18 | 45.120 | 43.550 | 29.22 | 1.97 | 1397.2 |
| 11/10/04 7:05 | 23.18 | 45.050 | 43.480 | 29.17 | 1.99 | 206.7  |

|                |       |        |        |       |      |        |
|----------------|-------|--------|--------|-------|------|--------|
| 11/10/04 7:15  | 23.19 | 44.960 | 43.400 | 29.10 | 1.99 | 1397.4 |
| 11/10/04 7:25  | 23.19 | 44.900 | 43.350 | 29.06 | 1.99 | 13.1   |
| 11/10/04 7:35  | 23.20 | 44.860 | 43.310 | 29.03 | 1.99 | 1394.2 |
| 11/10/04 7:45  | 23.20 | 44.830 | 43.280 | 29.01 | 1.99 | 1397.4 |
| 11/10/04 7:55  | 23.20 | 44.810 | 43.260 | 28.99 | 1.98 | 30.3   |
| 11/10/04 8:05  | 23.19 | 44.810 | 43.260 | 28.99 | 1.98 | 1397.4 |
| 11/10/04 8:15  | 23.18 | 44.840 | 43.280 | 29.02 | 1.97 | 1157.4 |
| 11/10/04 8:25  | 23.16 | 44.870 | 43.300 | 29.04 | 1.96 | 229.9  |
| 11/10/04 8:35  | 23.16 | 44.900 | 43.320 | 29.06 | 1.95 | 1397.0 |
| 11/10/04 8:45  | 23.15 | 44.930 | 43.340 | 29.08 | 1.93 | 241.0  |
| 11/10/04 8:55  | 23.15 | 44.950 | 43.360 | 29.09 | 1.92 | 1397.0 |
| 11/10/04 9:05  | 23.15 | 44.970 | 43.380 | 29.11 | 1.90 | 1396.9 |
| 11/10/04 9:15  | 23.15 | 45.010 | 43.420 | 29.14 | 1.87 | 38.5   |
| 11/10/04 9:25  | 23.15 | 45.050 | 43.460 | 29.17 | 1.84 | 1396.9 |
| 11/10/04 9:35  | 23.15 | 45.100 | 43.500 | 29.20 | 1.83 | 1038.3 |
| 11/10/04 9:45  | 23.15 | 45.150 | 43.560 | 29.24 | 1.81 | 337.2  |
| 11/10/04 9:55  | 23.17 | 45.200 | 43.620 | 29.27 | 1.79 | 1397.2 |
| 11/10/04 10:05 | 23.22 | 45.220 | 43.680 | 29.29 | 1.77 | 47.1   |
| 11/10/04 10:15 | 23.27 | 45.230 | 43.730 | 29.30 | 1.76 | 1396.2 |
| 11/10/04 10:25 | 23.32 | 45.200 | 43.750 | 29.28 | 1.74 | 1398.8 |
| 11/10/04 10:35 | 23.34 | 45.220 | 43.790 | 29.29 | 1.71 | 259.2  |
| 11/10/04 10:46 | 23.38 | 45.250 | 43.850 | 29.31 | 1.69 | 24.3   |
| 11/10/04 10:55 | 23.43 | 45.260 | 43.900 | 29.31 | 1.67 | 1399.9 |
| 11/10/04 11:05 | 23.45 | 45.270 | 43.930 | 29.32 | 1.64 | 656.7  |
| 11/10/04 11:15 | 23.51 | 45.250 | 43.960 | 29.31 | 1.62 | 411.8  |
| 11/10/04 11:25 | 24.28 | 21.100 | 20.810 | 12.64 | 1.61 | 6.4    |
| 11/10/04 11:35 | 24.88 | 16.860 | 16.820 | 9.90  | 1.59 | 3.3    |
| 11/10/04 11:45 | 25.47 | 17.500 | 17.660 | 10.30 | 1.57 | 72.3   |
| 11/10/04 11:55 | 25.91 | 16.140 | 16.420 | 9.43  | 1.55 | 1426.3 |
| 11/10/04 12:05 | 26.34 | 18.640 | 19.120 | 11.02 | 1.53 | 459.7  |
| 11/10/04 12:16 | 24.33 | 30.580 | 30.190 | 18.98 | 1.50 | 70.8   |
| 11/10/04 12:25 | 24.35 | 29.240 | 28.870 | 18.06 | 1.48 | 1409.9 |
| 11/10/04 12:35 | 25.70 | 21.870 | 22.160 | 13.13 | 1.46 | 490.2  |
| 11/10/04 12:45 | 25.72 | 20.310 | 20.590 | 12.11 | 1.45 | 1424.3 |
| 11/10/04 12:55 | 26.06 | 19.050 | 19.430 | 11.29 | 1.43 | 1427.9 |
| 11/10/04 13:05 | 25.99 | 19.420 | 19.790 | 11.53 | 1.42 | 89.0   |
| 11/10/04 13:15 | 24.71 | 33.560 | 33.380 | 21.02 | 1.39 | 1413.7 |
| 11/10/04 13:25 | 24.67 | 25.960 | 25.800 | 15.85 | 1.39 | 8.1    |
| 11/10/04 13:35 | 24.76 | 32.150 | 32.000 | 20.05 | 1.38 | 1414.2 |
| 11/10/04 13:45 | 24.81 | 25.760 | 25.670 | 15.72 | 1.38 | 1414.7 |
| 11/10/04 13:55 | 24.83 | 25.260 | 25.180 | 15.38 | 1.37 | 320.0  |
| 11/10/04 14:05 | 24.93 | 25.310 | 25.270 | 15.41 | 1.37 | 1416.0 |
| 11/10/04 14:15 | 24.89 | 26.070 | 26.010 | 15.92 | 1.36 | 191.7  |
| 11/10/04 14:25 | 25.00 | 26.090 | 26.090 | 15.93 | 1.37 | 1409.3 |
| 11/10/04 14:35 | 24.93 | 25.090 | 25.060 | 15.27 | 1.37 | 1416.0 |
| 11/10/04 14:45 | 25.02 | 26.080 | 26.090 | 15.92 | 1.38 | 171.3  |
| 11/10/04 14:55 | 25.26 | 41.140 | 41.350 | 26.33 | 0.64 | 1419.4 |

# YSI Data for 11/18/2204 to 11/24/2004

NOTE: Pressure and the voltage of the instrument were acquired, but not included on this report.

| Date/Time      | Temp (C°) | SpCond (mS/cm) | Cond (mS/cm) | Sal (ppt) | Depth (meters) | Turbid+ (NTU) | Chl (ug/L) |
|----------------|-----------|----------------|--------------|-----------|----------------|---------------|------------|
| 11/18/04 10:00 | 22.64     | 39.29          | 37.52        | 25.06     | 1.253          | 0.7           | 6.2        |
| 11/18/04 10:10 | 22.73     | 37.94          | 36.29        | 24.11     | 1.277          | 0.3           | 6.4        |
| 11/18/04 10:20 | 22.92     | 34.79          | 33.41        | 21.9      | 1.301          | 1             | 5.5        |
| 11/18/04 10:30 | 22.96     | 39.89          | 38.34        | 25.48     | 1.317          | 0.3           | 6          |
| 11/18/04 10:40 | 23.12     | 40.14          | 38.7         | 25.66     | 1.338          | 0.3           | 6.4        |
| 11/18/04 10:50 | 23        | 38.3           | 36.84        | 24.36     | 1.361          | 0.3           | 6.1        |
| 11/18/04 11:00 | 22.92     | 36.44          | 34.99        | 23.06     | 1.381          | 0.1           | 5.8        |
| 11/18/04 11:10 | 23.06     | 39.32          | 37.86        | 25.07     | 1.4            | 0.4           | 6.5        |
| 11/18/04 11:20 | 24.18     | 25.27          | 24.87        | 15.4      | 1.434          | 0             | 6.3        |
| 11/18/04 11:30 | 24.02     | 23.38          | 22.94        | 14.15     | 1.458          | 0             | 5.2        |
| 11/18/04 11:40 | 23.93     | 37.78          | 37.01        | 23.98     | 1.472          | 0.2           | 5.6        |
| 11/18/04 11:50 | 23.28     | 44.35          | 42.89        | 28.66     | 1.49           | 0.7           | 5.3        |
| 11/18/04 12:00 | 23.02     | 44.36          | 42.68        | 28.67     | 1.514          | 0.7           | 5.7        |
| 11/18/04 12:10 | 23.17     | 44.36          | 42.81        | 28.67     | 1.534          | 0.6           | 5.5        |
| 11/18/04 12:20 | 23.36     | 44.4           | 43.01        | 28.7      | 1.556          | 0.5           | 5.7        |
| 11/18/04 12:30 | 23.38     | 44.38          | 43           | 28.68     | 1.573          | 0.6           | 5.4        |
| 11/18/04 12:40 | 23.36     | 44.31          | 42.92        | 28.63     | 1.594          | 0.8           | 5.5        |
| 11/18/04 12:50 | 23.42     | 44.27          | 42.93        | 28.6      | 1.612          | 0.7           | 5.9        |
| 11/18/04 13:00 | 23.47     | 44.26          | 42.97        | 28.6      | 1.633          | 0.6           | 6.2        |
| 11/18/04 13:10 | 23.74     | 44.32          | 43.25        | 28.63     | 1.65           | 0.6           | 5.8        |
| 11/18/04 13:20 | 23.71     | 44.21          | 43.12        | 28.55     | 1.663          | 0.7           | 6.4        |
| 11/18/04 13:30 | 23.89     | 44.08          | 43.15        | 28.46     | 1.678          | 0.7           | 5.3        |
| 11/18/04 13:40 | 23.93     | 44.04          | 43.14        | 28.42     | 1.688          | 0.6           | 6.2        |
| 11/18/04 13:50 | 23.97     | 43.95          | 43.09        | 28.36     | 1.698          | 0.6           | 5.8        |
| 11/18/04 14:00 | 24.05     | 43.86          | 43.06        | 28.29     | 1.711          | 0.9           | 6.6        |
| 11/18/04 14:10 | 24.09     | 43.82          | 43.06        | 28.27     | 1.732          | 0.8           | 6.1        |
| 11/18/04 14:20 | 24.13     | 43.81          | 43.08        | 28.26     | 1.736          | 0.8           | 6.1        |
| 11/18/04 14:30 | 24.13     | 43.93          | 43.2         | 28.34     | 1.733          | 0.7           | 5.9        |
| 11/18/04 14:40 | 24.15     | 43.93          | 43.22        | 28.35     | 1.727          | 0.7           | 6.3        |
| 11/18/04 14:50 | 24.2      | 43.85          | 43.18        | 28.29     | 1.719          | 0.8           | 6          |
| 11/18/04 15:00 | 24.24     | 43.8           | 43.17        | 28.25     | 1.712          | 0.9           | 6.8        |
| 11/18/04 15:10 | 24.29     | 43.74          | 43.15        | 28.21     | 1.705          | 0.7           | 6.3        |
| 11/18/04 15:20 | 24.31     | 43.75          | 43.17        | 28.21     | 1.707          | 0.7           | 6.1        |
| 11/18/04 15:30 | 24.36     | 43.74          | 43.21        | 28.2      | 1.692          | 0.9           | 5.8        |
| 11/18/04 15:40 | 24.39     | 43.73          | 43.23        | 28.2      | 1.666          | 0.7           | 6.2        |
| 11/18/04 15:50 | 24.41     | 43.69          | 43.19        | 28.16     | 1.638          | 0.7           | 5.8        |
| 11/18/04 16:00 | 24.4      | 43.66          | 43.16        | 28.15     | 1.611          | 0.9           | 7          |
| 11/18/04 16:10 | 24.39     | 43.66          | 43.15        | 28.14     | 1.592          | 0.7           | 6          |
| 11/18/04 16:20 | 24.34     | 43.68          | 43.13        | 28.16     | 1.578          | 0.9           | 5.7        |

|                |       |       |       |       |       |      |     |
|----------------|-------|-------|-------|-------|-------|------|-----|
| 11/18/04 16:30 | 24.29 | 43.66 | 43.07 | 28.14 | 1.567 | 0.7  | 6.3 |
| 11/18/04 16:40 | 24.26 | 43.62 | 43    | 28.12 | 1.553 | 0.7  | 6.6 |
| 11/18/04 16:50 | 24.25 | 43.58 | 42.96 | 28.09 | 1.536 | 0.7  | 6.1 |
| 11/18/04 17:00 | 24.23 | 43.56 | 42.93 | 28.08 | 1.514 | 1    | 5.9 |
| 11/18/04 17:10 | 24.21 | 43.54 | 42.89 | 28.07 | 1.498 | 0.6  | 7   |
| 11/18/04 17:20 | 24.34 | 36.46 | 36    | 23.04 | 1.484 | 0.6  | 6.2 |
| 11/18/04 17:30 | 24.31 | 38.27 | 37.77 | 24.32 | 1.463 | 0.2  | 5.7 |
| 11/18/04 17:40 | 24.34 | 40.83 | 40.31 | 26.13 | 1.442 | 0.4  | 5.5 |
| 11/18/04 17:50 | 24.33 | 39.94 | 39.42 | 25.49 | 1.423 | 0.4  | 5.6 |
| 11/18/04 18:00 | 24.4  | 36.19 | 35.77 | 22.85 | 1.407 | 0.3  | 6.5 |
| 11/18/04 18:10 | 24.48 | 32.12 | 31.8  | 20.03 | 1.392 | 0.2  | 6.1 |
| 11/18/04 18:20 | 24.37 | 32.27 | 31.88 | 20.14 | 1.374 | 0.2  | 6.2 |
| 11/18/04 18:30 | 24.38 | 37.37 | 36.92 | 23.68 | 1.353 | 0.9  | 6.1 |
| 11/18/04 18:40 | 24.56 | 35.57 | 35.27 | 22.42 | 1.341 | 0.3  | 6   |
| 11/18/04 18:50 | 24.6  | 35.92 | 35.65 | 22.66 | 1.325 | 0.2  | 6.1 |
| 11/18/04 19:00 | 24.44 | 38.07 | 37.66 | 24.17 | 1.311 | 0.4  | 6.7 |
| 11/18/04 19:10 | 24.52 | 32.87 | 32.57 | 20.55 | 1.301 | 0.3  | 5.9 |
| 11/18/04 19:20 | 24.35 | 36.14 | 35.69 | 22.82 | 1.282 | 0.2  | 5.8 |
| 11/18/04 19:30 | 24.34 | 35.82 | 35.37 | 22.6  | 1.264 | 0.5  | 6.1 |
| 11/18/04 19:40 | 24.51 | 35.52 | 35.19 | 22.39 | 1.247 | 0.3  | 5.9 |
| 11/18/04 19:50 | 24.36 | 34.94 | 34.51 | 21.98 | 1.234 | 0.4  | 6.3 |
| 11/18/04 20:00 | 24.25 | 37.88 | 37.34 | 24.04 | 1.223 | 0.3  | 5.8 |
| 11/18/04 20:10 | 24.35 | 36.28 | 35.83 | 22.91 | 1.217 | 0.3  | 6.1 |
| 11/18/04 20:20 | 24.34 | 37.52 | 37.04 | 23.78 | 1.205 | 0.3  | 6.3 |
| 11/18/04 20:30 | 24.34 | 39.32 | 38.82 | 25.06 | 1.199 | 0.5  | 5.8 |
| 11/18/04 20:40 | 24.29 | 35.53 | 35.05 | 22.4  | 1.194 | 0.4  | 6   |
| 11/18/04 20:50 | 24.32 | 36.85 | 36.38 | 23.32 | 1.192 | 0.5  | 6   |
| 11/18/04 21:00 | 24.27 | 36.8  | 36.28 | 23.28 | 1.188 | 0.2  | 5.5 |
| 11/18/04 21:10 | 24.48 | 37.66 | 37.29 | 23.88 | 1.185 | 0.4  | 6.2 |
| 11/18/04 21:20 | 24.3  | 35.98 | 35.5  | 22.71 | 1.188 | 0.6  | 5.7 |
| 11/18/04 21:30 | 24.27 | 35.07 | 34.58 | 22.07 | 1.197 | 0.3  | 6.2 |
| 11/18/04 21:40 | 24.2  | 36.23 | 35.68 | 22.88 | 1.207 | 0.3  | 6.4 |
| 11/18/04 21:50 | 24.34 | 33.53 | 33.11 | 21    | 1.225 | 0.2  | 5.9 |
| 11/18/04 22:00 | 23.97 | 35.76 | 35.06 | 22.56 | 1.245 | 0.7  | 6.5 |
| 11/18/04 22:10 | 23.96 | 35.11 | 34.41 | 22.11 | 1.267 | 0.3  | 6.6 |
| 11/18/04 22:20 | 23.9  | 36.66 | 35.89 | 23.19 | 1.287 | 0.3  | 5.6 |
| 11/18/04 22:30 | 23.7  | 38.13 | 37.19 | 24.23 | 1.302 | 0.2  | 6.7 |
| 11/18/04 22:40 | 23.54 | 39.03 | 37.94 | 24.86 | 1.318 | 0.3  | 6   |
| 11/18/04 22:50 | 23.68 | 33.69 | 32.83 | 21.12 | 1.338 | 0.5  | 6.5 |
| 11/18/04 23:00 | 23.69 | 36.18 | 35.28 | 22.86 | 1.354 | 0.5  | 6.3 |
| 11/18/04 23:10 | 23.31 | 40.14 | 38.84 | 25.65 | 1.368 | 0.4  | 6.2 |
| 11/18/04 23:20 | 23.29 | 40.48 | 39.16 | 25.9  | 1.386 | 0.4  | 6.2 |
| 11/18/04 23:30 | 23.22 | 38.21 | 36.91 | 24.29 | 1.404 | 0.2  | 6   |
| 11/18/04 23:40 | 23.5  | 31.1  | 30.21 | 19.35 | 1.43  | 0    | 6   |
| 11/18/04 23:50 | 23.68 | 32.31 | 31.49 | 20.17 | 1.453 | -0.1 | 5.4 |
| 11/19/04 0:00  | 23.37 | 35.46 | 34.36 | 22.36 | 1.468 | 0.1  | 5   |
| 11/19/04 0:10  | 23.13 | 41.84 | 40.34 | 26.86 | 1.485 | 0.4  | 6.7 |

|               |       |       |       |       |       |     |     |
|---------------|-------|-------|-------|-------|-------|-----|-----|
| 11/19/04 0:20 | 22.97 | 43.31 | 41.63 | 27.92 | 1.502 | 0.6 | 7.4 |
| 11/19/04 0:30 | 22.92 | 43.39 | 41.67 | 27.98 | 1.525 | 0.7 | 6.7 |
| 11/19/04 0:40 | 22.88 | 43.44 | 41.68 | 28.01 | 1.544 | 0.6 | 6.8 |
| 11/19/04 0:50 | 22.87 | 43.48 | 41.71 | 28.04 | 1.564 | 0.6 | 6.7 |
| 11/19/04 1:00 | 22.85 | 43.52 | 41.73 | 28.07 | 1.584 | 0.7 | 6.3 |
| 11/19/04 1:10 | 22.83 | 43.54 | 41.73 | 28.08 | 1.602 | 0.7 | 6.3 |
| 11/19/04 1:20 | 22.8  | 43.63 | 41.8  | 28.15 | 1.621 | 0.6 | 6.8 |
| 11/19/04 1:30 | 22.75 | 43.76 | 41.88 | 28.24 | 1.634 | 0.5 | 6.6 |
| 11/19/04 1:40 | 22.69 | 43.92 | 41.98 | 28.36 | 1.65  | 0.6 | 6.6 |
| 11/19/04 1:50 | 22.63 | 44.04 | 42.05 | 28.45 | 1.664 | 0.9 | 6.5 |
| 11/19/04 2:00 | 22.59 | 44.13 | 42.1  | 28.51 | 1.675 | 0.9 | 6.4 |
| 11/19/04 2:10 | 22.56 | 44.16 | 42.1  | 28.54 | 1.688 | 0.7 | 6   |
| 11/19/04 2:20 | 22.43 | 44.21 | 42.03 | 28.57 | 1.695 | 0.7 | 6.4 |
| 11/19/04 2:30 | 22.36 | 44.24 | 42.01 | 28.59 | 1.704 | 0.6 | 6.7 |
| 11/19/04 2:40 | 22.32 | 44.22 | 41.95 | 28.58 | 1.707 | 0.7 | 6.3 |
| 11/19/04 2:50 | 22.32 | 44.2  | 41.94 | 28.57 | 1.708 | 0.6 | 6.5 |
| 11/19/04 3:00 | 22.31 | 44.21 | 41.93 | 28.58 | 1.707 | 0.6 | 6.6 |
| 11/19/04 3:10 | 22.29 | 44.22 | 41.93 | 28.58 | 1.704 | 0.6 | 6.2 |
| 11/19/04 3:20 | 22.31 | 44.19 | 41.92 | 28.56 | 1.7   | 0.5 | 6.3 |
| 11/19/04 3:30 | 22.28 | 43.99 | 41.7  | 28.41 | 1.689 | 0.6 | 6.2 |
| 11/19/04 3:40 | 22.24 | 43.94 | 41.62 | 28.38 | 1.679 | 0.6 | 6.7 |
| 11/19/04 3:50 | 22.23 | 43.92 | 41.59 | 28.37 | 1.664 | 0.5 | 6.3 |
| 11/19/04 4:00 | 22.25 | 43.92 | 41.62 | 28.37 | 1.641 | 0.8 | 6.9 |
| 11/19/04 4:10 | 22.26 | 43.91 | 41.62 | 28.36 | 1.624 | 0.5 | 6.7 |
| 11/19/04 4:20 | 22.28 | 43.91 | 41.63 | 28.36 | 1.6   | 0.7 | 7.2 |
| 11/19/04 4:30 | 22.29 | 43.92 | 41.64 | 28.37 | 1.58  | 0.5 | 6.9 |
| 11/19/04 4:40 | 22.32 | 43.89 | 41.64 | 28.35 | 1.564 | 0.6 | 6.2 |
| 11/19/04 4:50 | 22.34 | 43.91 | 41.68 | 28.36 | 1.547 | 0.6 | 6.4 |
| 11/19/04 5:00 | 22.33 | 43.91 | 41.67 | 28.36 | 1.532 | 0.6 | 6.3 |
| 11/19/04 5:10 | 22.34 | 43.89 | 41.66 | 28.35 | 1.515 | 0.6 | 6.4 |
| 11/19/04 5:20 | 22.34 | 43.89 | 41.65 | 28.34 | 1.5   | 0.6 | 7.5 |
| 11/19/04 5:30 | 22.34 | 43.88 | 41.65 | 28.34 | 1.483 | 0.6 | 6.2 |
| 11/19/04 5:40 | 22.58 | 40.88 | 38.99 | 26.19 | 1.462 | 0.3 | 6.2 |
| 11/19/04 5:50 | 22.58 | 37.89 | 36.13 | 24.07 | 1.446 | 3.6 | 6.9 |
| 11/19/04 6:00 | 22.51 | 40.53 | 38.6  | 25.94 | 1.422 | 0.6 | 6.4 |
| 11/19/04 6:10 | 23.09 | 36.43 | 35.1  | 23.04 | 1.407 | 0.6 | 6.1 |
| 11/19/04 6:20 | 22.92 | 37.94 | 36.44 | 24.11 | 1.39  | 0.4 | 6.5 |
| 11/19/04 6:30 | 22.84 | 31.66 | 30.35 | 19.74 | 1.374 | 0.5 | 6.7 |
| 11/19/04 6:40 | 22.74 | 37.33 | 35.72 | 23.68 | 1.354 | 0.5 | 7.1 |
| 11/19/04 6:50 | 22.73 | 35.01 | 33.5  | 22.06 | 1.34  | 0.7 | 6.4 |
| 11/19/04 7:00 | 23.4  | 34.83 | 33.76 | 21.92 | 1.32  | 0.7 | 6.3 |
| 11/19/04 7:10 | 22.89 | 37.36 | 35.85 | 23.69 | 1.303 | 0.6 | 6.3 |
| 11/19/04 7:20 | 23.11 | 34.3  | 33.06 | 21.56 | 1.289 | 0.4 | 5.8 |
| 11/19/04 7:30 | 23.15 | 34.93 | 33.7  | 22    | 1.271 | 0.4 | 6.1 |
| 11/19/04 7:40 | 23.16 | 37.78 | 36.46 | 23.99 | 1.253 | 0.6 | 6.3 |
| 11/19/04 7:50 | 22.84 | 38.36 | 36.77 | 24.4  | 1.236 | 0.4 | 6.3 |
| 11/19/04 8:00 | 23.17 | 36.33 | 35.06 | 22.97 | 1.222 | 0.5 | 6   |

|                |       |       |       |       |       |      |     |
|----------------|-------|-------|-------|-------|-------|------|-----|
| 11/19/04 8:10  | 23.1  | 36.71 | 35.37 | 23.23 | 1.208 | 0.7  | 6.2 |
| 11/19/04 8:20  | 23.13 | 38.2  | 36.83 | 24.28 | 1.193 | 0.4  | 5.7 |
| 11/19/04 8:30  | 22.98 | 37.05 | 35.62 | 23.48 | 1.183 | 0.5  | 6   |
| 11/19/04 8:40  | 23.19 | 33.77 | 32.6  | 21.19 | 1.172 | 0.5  | 6   |
| 11/19/04 8:50  | 23.25 | 36.09 | 34.89 | 22.8  | 1.16  | 0.5  | 5.8 |
| 11/19/04 9:00  | 23.43 | 34.8  | 33.76 | 21.9  | 1.15  | 0.7  | 6.8 |
| 11/19/04 9:10  | 23.46 | 33.24 | 32.27 | 20.82 | 1.147 | 0.4  | 6.4 |
| 11/19/04 9:20  | 23.6  | 33.84 | 32.93 | 21.23 | 1.142 | 0.6  | 5.9 |
| 11/19/04 9:30  | 23.42 | 33.34 | 32.33 | 20.89 | 1.138 | 0.3  | 5.2 |
| 11/19/04 9:40  | 23.59 | 34.76 | 33.82 | 21.87 | 1.138 | 0.6  | 5.6 |
| 11/19/04 9:50  | 23.69 | 32.42 | 31.6  | 20.25 | 1.14  | 3.6  | 5.8 |
| 11/19/04 10:00 | 23.71 | 35.21 | 34.34 | 22.18 | 1.144 | 0.4  | 6.2 |
| 11/19/04 10:10 | 23.76 | 36.09 | 35.24 | 22.8  | 1.152 | 0.4  | 5.7 |
| 11/19/04 10:20 | 24.07 | 33.26 | 32.68 | 20.83 | 1.169 | 0.3  | 5.2 |
| 11/19/04 10:30 | 23.94 | 35.12 | 34.41 | 22.12 | 1.19  | 0.1  | 5.9 |
| 11/19/04 10:40 | 23.82 | 36.59 | 35.76 | 23.14 | 1.211 | 0.2  | 5.3 |
| 11/19/04 10:50 | 23.96 | 33.93 | 33.25 | 21.29 | 1.238 | 0.1  | 5.8 |
| 11/19/04 11:00 | 23.89 | 35.94 | 35.18 | 22.69 | 1.258 | 0.4  | 6.3 |
| 11/19/04 11:10 | 23.96 | 36.72 | 35.99 | 23.23 | 1.278 | 0.2  | 5.9 |
| 11/19/04 11:20 | 23.95 | 34.85 | 34.15 | 21.93 | 1.296 | 0.1  | 5.7 |
| 11/19/04 11:30 | 24.05 | 36.58 | 35.91 | 23.13 | 1.319 | 0    | 6.1 |
| 11/19/04 11:40 | 24.16 | 35.24 | 34.68 | 22.2  | 1.333 | 0.6  | 6.1 |
| 11/19/04 11:50 | 24.29 | 34.15 | 33.68 | 21.44 | 1.354 | 0.1  | 6   |
| 11/19/04 12:00 | 25.06 | 29.81 | 29.85 | 18.44 | 1.377 | 0.4  | 5.8 |
| 11/19/04 12:10 | 24.42 | 30.58 | 30.24 | 18.97 | 1.396 | 0.6  | 5.8 |
| 11/19/04 12:20 | 24.44 | 35.62 | 35.24 | 22.45 | 1.414 | 0.3  | 5.5 |
| 11/19/04 12:30 | 24.64 | 27.69 | 27.5  | 17.01 | 1.439 | -0.2 | 5.3 |
| 11/19/04 12:40 | 24.78 | 36.5  | 36.34 | 23.06 | 1.451 | 0.1  | 5.9 |
| 11/19/04 12:50 | 24.48 | 41.99 | 41.57 | 26.95 | 1.468 | 0.4  | 5.3 |
| 11/19/04 13:00 | 24.49 | 42.9  | 42.49 | 27.6  | 1.486 | 0.5  | 5.4 |
| 11/19/04 13:10 | 24.54 | 42.97 | 42.59 | 27.65 | 1.506 | 0.4  | 5.6 |
| 11/19/04 13:20 | 24.56 | 43.01 | 42.65 | 27.68 | 1.525 | 0.6  | 5.5 |
| 11/19/04 13:30 | 24.58 | 43.05 | 42.7  | 27.7  | 1.543 | 0.4  | 5.7 |
| 11/19/04 13:40 | 24.61 | 43.07 | 42.75 | 27.72 | 1.562 | 0.5  | 5.6 |
| 11/19/04 13:50 | 24.66 | 43.09 | 42.81 | 27.73 | 1.581 | 0.3  | 6   |
| 11/19/04 14:00 | 24.71 | 43.12 | 42.88 | 27.75 | 1.598 | 0.5  | 5.8 |
| 11/19/04 14:10 | 24.77 | 43.16 | 42.97 | 27.78 | 1.612 | 0.4  | 6   |
| 11/19/04 14:20 | 24.86 | 43.24 | 43.13 | 27.84 | 1.629 | 0.3  | 5.5 |
| 11/19/04 14:30 | 24.9  | 43.23 | 43.15 | 27.83 | 1.641 | 0.4  | 5.9 |
| 11/19/04 14:40 | 24.96 | 43.22 | 43.19 | 27.82 | 1.652 | 0.4  | 5.7 |
| 11/19/04 14:50 | 25.06 | 43.24 | 43.29 | 27.83 | 1.661 | 0.4  | 6.4 |
| 11/19/04 15:00 | 25.1  | 43.23 | 43.32 | 27.82 | 1.666 | 0.4  | 6.3 |
| 11/19/04 15:10 | 25.15 | 43.24 | 43.36 | 27.83 | 1.672 | 0.5  | 6.1 |
| 11/19/04 15:20 | 25.19 | 43.25 | 43.41 | 27.84 | 1.675 | 0.6  | 6.1 |
| 11/19/04 15:30 | 25.21 | 43.24 | 43.42 | 27.83 | 1.676 | 0.4  | 5.5 |
| 11/19/04 15:40 | 25.24 | 43.22 | 43.42 | 27.81 | 1.674 | 0.4  | 6.5 |
| 11/19/04 15:50 | 25.26 | 43.21 | 43.43 | 27.81 | 1.673 | 0.4  | 5.4 |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/19/04 16:00 | 25.28 | 43.21 | 43.45 | 27.81 | 1.665 | 0.4 | 6.3 |
| 11/19/04 16:10 | 25.31 | 43.2  | 43.46 | 27.8  | 1.655 | 0.7 | 7.2 |
| 11/19/04 16:20 | 25.29 | 43.17 | 43.41 | 27.78 | 1.643 | 0.4 | 6.3 |
| 11/19/04 16:30 | 25.3  | 43.17 | 43.42 | 27.78 | 1.631 | 0.4 | 5.9 |
| 11/19/04 16:40 | 25.31 | 43.14 | 43.4  | 27.75 | 1.608 | 5.2 | 6.7 |
| 11/19/04 16:50 | 25.32 | 43.14 | 43.4  | 27.75 | 1.589 | 0.5 | 6.5 |
| 11/19/04 17:00 | 25.31 | 43.12 | 43.37 | 27.74 | 1.571 | 0.6 | 6   |
| 11/19/04 17:10 | 25.31 | 43.11 | 43.36 | 27.73 | 1.554 | 0.4 | 6.6 |
| 11/19/04 17:20 | 25.3  | 43.1  | 43.35 | 27.73 | 1.538 | 0.4 | 6.9 |
| 11/19/04 17:30 | 25.3  | 43.1  | 43.34 | 27.72 | 1.521 | 0.4 | 6.2 |
| 11/19/04 17:40 | 25.3  | 43.09 | 43.34 | 27.72 | 1.504 | 0.3 | 5.9 |
| 11/19/04 17:50 | 25.29 | 43.08 | 43.31 | 27.71 | 1.488 | 0.3 | 6.3 |
| 11/19/04 18:00 | 25.41 | 34.01 | 34.27 | 21.32 | 1.477 | 1.1 | 5.6 |
| 11/19/04 18:10 | 25.33 | 36.89 | 37.13 | 23.33 | 1.454 | 0.3 | 6.5 |
| 11/19/04 18:20 | 25.18 | 36.54 | 36.67 | 23.08 | 1.438 | 0.1 | 5.8 |
| 11/19/04 18:30 | 25.2  | 38.51 | 38.66 | 24.47 | 1.418 | 0.1 | 6.6 |
| 11/19/04 18:40 | 25.28 | 37.44 | 37.64 | 23.71 | 1.403 | 1.1 | 6.1 |
| 11/19/04 18:50 | 25.26 | 39.02 | 39.21 | 24.83 | 1.384 | 0.1 | 5.8 |
| 11/19/04 19:00 | 25.22 | 38.1  | 38.25 | 24.17 | 1.366 | 0.3 | 6.2 |
| 11/19/04 19:10 | 25.23 | 37.54 | 37.71 | 23.78 | 1.353 | 0.3 | 6.2 |
| 11/19/04 19:20 | 25.31 | 36.44 | 36.66 | 23.01 | 1.335 | 0.2 | 5.7 |
| 11/19/04 19:30 | 25.3  | 35.91 | 36.12 | 22.64 | 1.318 | 0.6 | 5.5 |
| 11/19/04 19:40 | 25.31 | 34.31 | 34.51 | 21.53 | 1.302 | 0.6 | 5.9 |
| 11/19/04 19:50 | 25.19 | 37.2  | 37.34 | 23.55 | 1.282 | 0.3 | 6.2 |
| 11/19/04 20:00 | 25.28 | 35.35 | 35.55 | 22.25 | 1.27  | 1.1 | 5.9 |
| 11/19/04 20:10 | 25.08 | 37.18 | 37.24 | 23.53 | 1.254 | 0.9 | 6.5 |
| 11/19/04 20:20 | 25.15 | 35.76 | 35.87 | 22.54 | 1.241 | 0.4 | 6.6 |
| 11/19/04 20:30 | 25.18 | 36.77 | 36.9  | 23.24 | 1.225 | 0.4 | 6.1 |
| 11/19/04 20:40 | 25.15 | 36.66 | 36.76 | 23.17 | 1.212 | 0.5 | 6.1 |
| 11/19/04 20:50 | 25.09 | 36.3  | 36.37 | 22.92 | 1.198 | 0.2 | 6.2 |
| 11/19/04 21:00 | 25.02 | 37.26 | 37.27 | 23.59 | 1.187 | 0.2 | 6.6 |
| 11/19/04 21:10 | 25.02 | 36.33 | 36.34 | 22.94 | 1.178 | 0.3 | 6.3 |
| 11/19/04 21:20 | 25.07 | 35.83 | 35.88 | 22.59 | 1.164 | 0.6 | 6.4 |
| 11/19/04 21:30 | 24.96 | 37.5  | 37.47 | 23.76 | 1.154 | 0.2 | 6.2 |
| 11/19/04 21:40 | 24.94 | 37.53 | 37.49 | 23.78 | 1.148 | 0.3 | 5.1 |
| 11/19/04 21:50 | 24.85 | 35.44 | 35.34 | 22.32 | 1.142 | 1.2 | 6   |
| 11/19/04 22:00 | 24.95 | 34.65 | 34.62 | 21.77 | 1.14  | 0.1 | 6.5 |
| 11/19/04 22:10 | 24.88 | 36.53 | 36.45 | 23.08 | 1.136 | 0.1 | 5.5 |
| 11/19/04 22:20 | 24.85 | 36.66 | 36.55 | 23.17 | 1.137 | 0.3 | 5.8 |
| 11/19/04 22:30 | 24.81 | 34.42 | 34.3  | 21.62 | 1.141 | 0.4 | 6.2 |
| 11/19/04 22:40 | 24.8  | 35.51 | 35.37 | 22.37 | 1.147 | 0.3 | 6.4 |
| 11/19/04 22:50 | 24.66 | 36.94 | 36.7  | 23.37 | 1.157 | 0.4 | 6   |
| 11/19/04 23:00 | 24.57 | 34.73 | 34.45 | 21.83 | 1.179 | 0.1 | 5.8 |
| 11/19/04 23:10 | 24.56 | 35.43 | 35.14 | 22.32 | 1.199 | 0.6 | 6.6 |
| 11/19/04 23:20 | 24.64 | 35.59 | 35.34 | 22.43 | 1.222 | 0.1 | 6.1 |
| 11/19/04 23:30 | 24.45 | 34.97 | 34.6  | 22    | 1.247 | 0.6 | 6.3 |
| 11/19/04 23:40 | 24.25 | 37.41 | 36.87 | 23.71 | 1.268 | 0.3 | 6.2 |

|                |       |       |       |       |       |      |     |
|----------------|-------|-------|-------|-------|-------|------|-----|
| 11/19/04 23:50 | 24.1  | 38.63 | 37.97 | 24.57 | 1.284 | 0.1  | 6.1 |
| 11/20/04 0:00  | 23.99 | 36.77 | 36.06 | 23.27 | 1.303 | 0.2  | 6.2 |
| 11/20/04 0:10  | 24.03 | 38.04 | 37.34 | 24.16 | 1.316 | 0.1  | 5.9 |
| 11/20/04 0:20  | 24.07 | 36.09 | 35.45 | 22.79 | 1.335 | 0.2  | 5.6 |
| 11/20/04 0:30  | 23.93 | 37.84 | 37.07 | 24.01 | 1.352 | 0.1  | 6.3 |
| 11/20/04 0:40  | 23.81 | 38.87 | 37.99 | 24.75 | 1.37  | 0.3  | 6.3 |
| 11/20/04 0:50  | 24.2  | 28.48 | 28.04 | 17.55 | 1.4   | 0.3  | 6.3 |
| 11/20/04 1:00  | 23.83 | 37.8  | 36.95 | 23.99 | 1.412 | 1.4  | 6.3 |
| 11/20/04 1:10  | 23.81 | 31.28 | 30.57 | 19.47 | 1.437 | -0.2 | 5.6 |
| 11/20/04 1:20  | 23.82 | 38.04 | 37.19 | 24.16 | 1.452 | 0.3  | 6.4 |
| 11/20/04 1:30  | 23.42 | 40.49 | 39.27 | 25.9  | 1.469 | 0.4  | 5.8 |
| 11/20/04 1:40  | 23.19 | 42.39 | 40.93 | 27.26 | 1.488 | 0.7  | 6.5 |
| 11/20/04 1:50  | 23.2  | 42.5  | 41.04 | 27.34 | 1.507 | 0.5  | 6.6 |
| 11/20/04 2:00  | 23.24 | 42.6  | 41.16 | 27.4  | 1.528 | 0.7  | 7   |
| 11/20/04 2:10  | 23.27 | 42.66 | 41.25 | 27.45 | 1.547 | 0.6  | 6.5 |
| 11/20/04 2:20  | 23.27 | 42.69 | 41.28 | 27.47 | 1.564 | 0.7  | 6.5 |
| 11/20/04 2:30  | 23.27 | 42.7  | 41.29 | 27.47 | 1.584 | 0.6  | 6.9 |
| 11/20/04 2:40  | 23.27 | 42.72 | 41.31 | 27.49 | 1.602 | 0.6  | 5.9 |
| 11/20/04 2:50  | 23.27 | 42.76 | 41.35 | 27.52 | 1.618 | 0.6  | 6.4 |
| 11/20/04 3:00  | 23.28 | 42.81 | 41.41 | 27.56 | 1.63  | 0.7  | 6.7 |
| 11/20/04 3:10  | 23.27 | 42.86 | 41.45 | 27.59 | 1.64  | 0.7  | 6.5 |
| 11/20/04 3:20  | 23.27 | 42.92 | 41.5  | 27.64 | 1.652 | 1    | 7   |
| 11/20/04 3:30  | 23.27 | 43    | 41.58 | 27.69 | 1.663 | 0.8  | 6.7 |
| 11/20/04 3:40  | 23.27 | 43.04 | 41.62 | 27.72 | 1.671 | 0.9  | 6.5 |
| 11/20/04 3:50  | 23.27 | 43.08 | 41.65 | 27.75 | 1.679 | 0.7  | 7.3 |
| 11/20/04 4:00  | 23.27 | 43.09 | 41.66 | 27.76 | 1.681 | 0.9  | 6.1 |
| 11/20/04 4:10  | 23.26 | 43.12 | 41.69 | 27.78 | 1.683 | 0.9  | 7   |
| 11/20/04 4:20  | 23.26 | 43.14 | 41.71 | 27.79 | 1.682 | 0.7  | 6.9 |
| 11/20/04 4:30  | 23.26 | 43.14 | 41.71 | 27.79 | 1.678 | 0.9  | 6.7 |
| 11/20/04 4:40  | 23.26 | 43.14 | 41.71 | 27.79 | 1.669 | 0.8  | 6.5 |
| 11/20/04 4:50  | 23.26 | 43.15 | 41.71 | 27.8  | 1.657 | 0.7  | 6.4 |
| 11/20/04 5:00  | 23.27 | 43.14 | 41.72 | 27.8  | 1.642 | 0.7  | 6.4 |
| 11/20/04 5:10  | 23.27 | 43.13 | 41.7  | 27.78 | 1.627 | 0.7  | 6.8 |
| 11/20/04 5:20  | 23.28 | 43.11 | 41.69 | 27.77 | 1.611 | 0.8  | 6.9 |
| 11/20/04 5:30  | 23.29 | 43.1  | 41.69 | 27.76 | 1.59  | 0.7  | 6.6 |
| 11/20/04 5:40  | 23.29 | 43.04 | 41.63 | 27.72 | 1.574 | 0.7  | 6.7 |
| 11/20/04 5:50  | 23.3  | 43.04 | 41.64 | 27.72 | 1.55  | 0.7  | 7.1 |
| 11/20/04 6:00  | 23.3  | 43.05 | 41.65 | 27.72 | 1.535 | 0.7  | 6.7 |
| 11/20/04 6:10  | 23.3  | 43.06 | 41.66 | 27.73 | 1.521 | 0.7  | 6.8 |
| 11/20/04 6:20  | 23.3  | 43.05 | 41.66 | 27.73 | 1.51  | 0.7  | 6.3 |
| 11/20/04 6:30  | 23.31 | 43.04 | 41.65 | 27.72 | 1.494 | 1.4  | 7.1 |
| 11/20/04 6:40  | 23.32 | 43.02 | 41.64 | 27.71 | 1.477 | 0.8  | 7   |
| 11/20/04 6:50  | 23.53 | 39.99 | 38.87 | 25.55 | 1.458 | 1.1  | 6   |
| 11/20/04 7:00  | 23.52 | 33.93 | 32.97 | 21.29 | 1.445 | 0.4  | 6.1 |
| 11/20/04 7:10  | 23.35 | 39.85 | 38.59 | 25.45 | 1.426 | 0.6  | 6.4 |
| 11/20/04 7:20  | 23.87 | 26.04 | 25.48 | 15.92 | 1.42  | 0.4  | 6.1 |
| 11/20/04 7:30  | 25.03 | 21.73 | 21.74 | 13.05 | 1.404 | 0.4  | 6.3 |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/20/04 7:40  | 25.44 | 20.28 | 20.45 | 12.1  | 1.386 | 0.3 | 6.1 |
| 11/20/04 7:50  | 23.68 | 26.78 | 26.11 | 16.42 | 1.362 | 0.6 | 6.4 |
| 11/20/04 8:00  | 23.72 | 32.18 | 31.39 | 20.08 | 1.34  | 0.4 | 5.6 |
| 11/20/04 8:10  | 23.98 | 27.78 | 27.24 | 17.08 | 1.327 | 1.1 | 6.5 |
| 11/20/04 8:20  | 23.71 | 37.14 | 36.22 | 23.53 | 1.304 | 0.6 | 5.7 |
| 11/20/04 8:30  | 23.88 | 36    | 35.23 | 22.73 | 1.287 | 1.7 | 6.2 |
| 11/20/04 8:40  | 24.01 | 35.25 | 34.59 | 22.21 | 1.272 | 0.5 | 5.7 |
| 11/20/04 8:50  | 23.78 | 35.65 | 34.82 | 22.49 | 1.254 | 0.7 | 5.8 |
| 11/20/04 9:00  | 24    | 36.48 | 35.78 | 23.06 | 1.24  | 0.4 | 6.4 |
| 11/20/04 9:10  | 24.25 | 33.94 | 33.46 | 21.29 | 1.226 | 0.3 | 5.3 |
| 11/20/04 9:20  | 24.11 | 36.23 | 35.61 | 22.88 | 1.212 | 0.6 | 5.8 |
| 11/20/04 9:30  | 24.17 | 35.32 | 34.75 | 22.25 | 1.203 | 0.4 | 5.9 |
| 11/20/04 9:40  | 24.25 | 37.51 | 36.97 | 23.78 | 1.188 | 0.4 | 5.5 |
| 11/20/04 9:50  | 24.17 | 37.83 | 37.23 | 24    | 1.178 | 0.8 | 6.6 |
| 11/20/04 10:00 | 24.38 | 31.91 | 31.54 | 19.89 | 1.171 | 0.3 | 6   |
| 11/20/04 10:10 | 24.46 | 37.41 | 37.02 | 23.71 | 1.16  | 0.6 | 6.2 |
| 11/20/04 10:20 | 24.52 | 33.55 | 33.25 | 21.02 | 1.157 | 0.6 | 6.5 |
| 11/20/04 10:30 | 24.61 | 36.44 | 36.16 | 23.02 | 1.149 | 0.6 | 6.7 |
| 11/20/04 10:40 | 24.84 | 34.9  | 34.79 | 21.95 | 1.148 | 0.9 | 6   |
| 11/20/04 10:50 | 24.94 | 34.52 | 34.47 | 21.68 | 1.147 | 0.3 | 6.2 |
| 11/20/04 11:00 | 25.07 | 34.4  | 34.45 | 21.6  | 1.152 | 0.4 | 6.1 |
| 11/20/04 11:10 | 25.07 | 33.32 | 33.36 | 20.85 | 1.159 | 0.6 | 5.7 |
| 11/20/04 11:20 | 25.28 | 36.12 | 36.31 | 22.78 | 1.171 | 1   | 6.1 |
| 11/20/04 11:30 | 25.33 | 35.35 | 35.58 | 22.25 | 1.185 | 0.4 | 5.6 |
| 11/20/04 11:40 | 25.38 | 36.49 | 36.76 | 23.05 | 1.209 | 0.4 | 5.9 |
| 11/20/04 11:50 | 25.39 | 36.56 | 36.83 | 23.09 | 1.234 | 0.3 | 5.5 |
| 11/20/04 12:00 | 25.45 | 36.1  | 36.41 | 22.77 | 1.255 | 0.4 | 5.7 |
| 11/20/04 12:10 | 25.41 | 33.79 | 34.05 | 21.17 | 1.28  | 0.3 | 5.3 |
| 11/20/04 12:20 | 25.41 | 36.11 | 36.39 | 22.78 | 1.299 | 0.2 | 5.8 |
| 11/20/04 12:30 | 25.49 | 33.93 | 34.25 | 21.26 | 1.312 | 0.3 | 5.9 |
| 11/20/04 12:40 | 25.58 | 35    | 35.39 | 22    | 1.328 | 0.4 | 5.2 |
| 11/20/04 12:50 | 26.04 | 21.38 | 21.8  | 12.8  | 1.35  | 0.3 | 5.7 |
| 11/20/04 13:00 | 25.76 | 31.54 | 32    | 19.61 | 1.363 | 0.6 | 6   |
| 11/20/04 13:10 | 25.81 | 37.46 | 38.04 | 23.72 | 1.379 | 0.4 | 5.6 |
| 11/20/04 13:20 | 25.91 | 21.86 | 22.24 | 13.12 | 1.411 | 0   | 6   |
| 11/20/04 13:30 | 25.94 | 35.16 | 35.79 | 22.11 | 1.42  | 0   | 5.6 |
| 11/20/04 13:40 | 25.95 | 35.64 | 36.29 | 22.44 | 1.439 | 0   | 5.7 |
| 11/20/04 13:50 | 25.91 | 40.26 | 40.96 | 25.69 | 1.456 | 0.3 | 4.9 |
| 11/20/04 14:00 | 25.83 | 42.33 | 43.01 | 27.17 | 1.477 | 0.7 | 5.4 |
| 11/20/04 14:10 | 25.82 | 42.36 | 43.03 | 27.18 | 1.496 | 0.5 | 5.6 |
| 11/20/04 14:20 | 25.84 | 42.42 | 43.1  | 27.23 | 1.515 | 0.4 | 5.6 |
| 11/20/04 14:30 | 25.87 | 42.53 | 43.24 | 27.3  | 1.536 | 0.5 | 6   |
| 11/20/04 14:40 | 25.91 | 42.58 | 43.32 | 27.34 | 1.556 | 0.3 | 5.7 |
| 11/20/04 14:50 | 25.97 | 42.62 | 43.41 | 27.36 | 1.574 | 0.6 | 6.6 |
| 11/20/04 15:00 | 26.06 | 42.8  | 43.66 | 27.49 | 1.593 | 0.6 | 6.6 |
| 11/20/04 15:10 | 26.17 | 42.88 | 43.84 | 27.55 | 1.611 | 1   | 6.1 |
| 11/20/04 15:20 | 26.25 | 42.96 | 43.99 | 27.61 | 1.623 | 1.2 | 6.3 |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/20/04 15:30 | 26.26 | 42.94 | 43.98 | 27.59 | 1.636 | 0.5 | 6.2 |
| 11/20/04 15:40 | 26.27 | 42.93 | 43.96 | 27.58 | 1.644 | 0.7 | 5.6 |
| 11/20/04 15:50 | 26.28 | 42.9  | 43.95 | 27.56 | 1.653 | 0.7 | 6.6 |
| 11/20/04 16:00 | 26.29 | 42.86 | 43.92 | 27.53 | 1.659 | 0.6 | 6.1 |
| 11/20/04 16:10 | 26.3  | 42.82 | 43.88 | 27.5  | 1.666 | 0.7 | 6.2 |
| 11/20/04 16:20 | 26.32 | 42.79 | 43.87 | 27.48 | 1.673 | 0.6 | 6.5 |
| 11/20/04 16:30 | 26.32 | 42.76 | 43.84 | 27.46 | 1.675 | 0.7 | 5.9 |
| 11/20/04 16:40 | 26.33 | 42.68 | 43.77 | 27.4  | 1.677 | 0.8 | 6.2 |
| 11/20/04 16:50 | 26.33 | 42.67 | 43.76 | 27.4  | 1.67  | 0.4 | 7.1 |
| 11/20/04 17:00 | 26.33 | 42.67 | 43.76 | 27.39 | 1.664 | 0.6 | 6.5 |
| 11/20/04 17:10 | 26.32 | 42.65 | 43.72 | 27.38 | 1.66  | 0.6 | 5.7 |
| 11/20/04 17:20 | 26.33 | 42.98 | 44.06 | 27.61 | 1.651 | 0.8 | 6.5 |
| 11/20/04 17:30 | 26.32 | 43.26 | 44.35 | 27.82 | 1.634 | 0.4 | 5.5 |
| 11/20/04 17:40 | 26.33 | 42.68 | 43.76 | 27.4  | 1.61  | 0.6 | 6.4 |
| 11/20/04 17:50 | 26.32 | 42.43 | 43.49 | 27.22 | 1.588 | 0.5 | 6.2 |
| 11/20/04 18:00 | 26.31 | 42.4  | 43.46 | 27.2  | 1.571 | 0.7 | 7   |
| 11/20/04 18:10 | 26.3  | 42.38 | 43.43 | 27.19 | 1.557 | 0.4 | 6.3 |
| 11/20/04 18:20 | 26.3  | 42.63 | 43.69 | 27.37 | 1.539 | 0.5 | 6.7 |
| 11/20/04 18:30 | 26.27 | 42.56 | 43.59 | 27.32 | 1.521 | 0.4 | 6.3 |
| 11/20/04 18:40 | 26.26 | 42.52 | 43.54 | 27.29 | 1.508 | 0.4 | 6.4 |
| 11/20/04 18:50 | 26.25 | 42.5  | 43.51 | 27.27 | 1.49  | 0.6 | 6.2 |
| 11/20/04 19:00 | 26.23 | 40.44 | 41.39 | 25.81 | 1.474 | 1   | 6.1 |
| 11/20/04 19:10 | 26.19 | 36.26 | 37.09 | 22.87 | 1.457 | 0.2 | 5.9 |
| 11/20/04 19:20 | 26.28 | 23.18 | 23.75 | 13.98 | 1.452 | 0   | 5.6 |
| 11/20/04 19:30 | 26.35 | 21.07 | 21.61 | 12.59 | 1.434 | 1.2 | 6.3 |
| 11/20/04 19:40 | 26.4  | 17.16 | 17.62 | 10.07 | 1.414 | 0.6 | 6.1 |
| 11/20/04 19:50 | 26.17 | 33.22 | 33.96 | 20.76 | 1.386 | 0.7 | 6.1 |
| 11/20/04 20:00 | 26.16 | 22.77 | 23.28 | 13.71 | 1.375 | 0.6 | 6.4 |
| 11/20/04 20:10 | 26.14 | 31.09 | 31.77 | 19.3  | 1.351 | 1   | 5.7 |
| 11/20/04 20:20 | 26.05 | 36.07 | 36.79 | 22.73 | 1.331 | 0.5 | 6.6 |
| 11/20/04 20:30 | 26.1  | 34.32 | 35.04 | 21.52 | 1.313 | 0.3 | 6.8 |
| 11/20/04 20:40 | 26.03 | 35.42 | 36.12 | 22.29 | 1.295 | 0.2 | 5.8 |
| 11/20/04 20:50 | 25.98 | 35.19 | 35.85 | 22.13 | 1.277 | 0.1 | 7.4 |
| 11/20/04 21:00 | 25.98 | 33.52 | 34.15 | 20.97 | 1.26  | 0.2 | 6.2 |
| 11/20/04 21:10 | 26    | 35.53 | 36.21 | 22.36 | 1.243 | 1.1 | 6.3 |
| 11/20/04 21:20 | 25.96 | 32.24 | 32.83 | 20.09 | 1.228 | 0.3 | 5.8 |
| 11/20/04 21:30 | 25.92 | 35.62 | 36.24 | 22.42 | 1.21  | 0.2 | 6.2 |
| 11/20/04 21:40 | 25.91 | 35.39 | 36    | 22.26 | 1.196 | 0.4 | 6.3 |
| 11/20/04 21:50 | 25.92 | 34.92 | 35.53 | 21.94 | 1.183 | 0.4 | 5.9 |
| 11/20/04 22:00 | 25.87 | 35.07 | 35.65 | 22.05 | 1.17  | 0.3 | 5.9 |
| 11/20/04 22:10 | 25.85 | 34.58 | 35.14 | 21.71 | 1.157 | 0.2 | 6.1 |
| 11/20/04 22:20 | 25.79 | 33.62 | 34.13 | 21.04 | 1.146 | 0.3 | 5.6 |
| 11/20/04 22:30 | 25.68 | 33.32 | 33.76 | 20.84 | 1.136 | 0.4 | 7.3 |
| 11/20/04 22:40 | 25.66 | 31.99 | 32.4  | 19.92 | 1.126 | 0.5 | 6.7 |
| 11/20/04 22:50 | 25.57 | 34.2  | 34.56 | 21.44 | 1.118 | 0.4 | 5.8 |
| 11/20/04 23:00 | 25.58 | 34.51 | 34.89 | 21.66 | 1.113 | 0.4 | 6.1 |
| 11/20/04 23:10 | 25.46 | 34.84 | 35.15 | 21.9  | 1.111 | 0.4 | 6.8 |

|                |       |       |       |       |       |      |     |
|----------------|-------|-------|-------|-------|-------|------|-----|
| 11/20/04 23:20 | 25.46 | 32.83 | 33.12 | 20.5  | 1.107 | 0.5  | 6   |
| 11/20/04 23:30 | 25.41 | 33.62 | 33.88 | 21.05 | 1.107 | 0.3  | 6   |
| 11/20/04 23:40 | 25.32 | 31.93 | 32.12 | 19.88 | 1.116 | 0.3  | 6.4 |
| 11/20/04 23:50 | 25.23 | 32.11 | 32.25 | 20.01 | 1.125 | 0.6  | 6.4 |
| 11/21/04 0:00  | 25.16 | 34.73 | 34.84 | 21.83 | 1.135 | 0.3  | 6   |
| 11/21/04 0:10  | 25.26 | 33.68 | 33.84 | 21.09 | 1.154 | 0.2  | 5.9 |
| 11/21/04 0:20  | 25.03 | 32.3  | 32.32 | 20.14 | 1.181 | 0.3  | 5.8 |
| 11/21/04 0:30  | 24.9  | 34.73 | 34.67 | 21.83 | 1.208 | 0.3  | 6.1 |
| 11/21/04 0:40  | 24.95 | 32.93 | 32.9  | 20.58 | 1.232 | 0.4  | 6   |
| 11/21/04 0:50  | 24.88 | 36.49 | 36.4  | 23.05 | 1.248 | 0.3  | 6.3 |
| 11/21/04 1:00  | 24.93 | 34.49 | 34.44 | 21.66 | 1.263 | 0.4  | 6.3 |
| 11/21/04 1:10  | 24.94 | 35.82 | 35.78 | 22.58 | 1.278 | 0.2  | 6.2 |
| 11/21/04 1:20  | 25.05 | 33.64 | 33.67 | 21.07 | 1.296 | 0.4  | 6.1 |
| 11/21/04 1:30  | 24.91 | 32.73 | 32.67 | 20.44 | 1.316 | 0.4  | 6.3 |
| 11/21/04 1:40  | 24.98 | 27.2  | 27.19 | 16.68 | 1.341 | 0.5  | 5.8 |
| 11/21/04 1:50  | 24.7  | 31.78 | 31.6  | 19.79 | 1.358 | 0.1  | 6   |
| 11/21/04 2:00  | 24.6  | 38.58 | 38.28 | 24.52 | 1.373 | 0.5  | 6   |
| 11/21/04 2:10  | 24.85 | 25.9  | 25.82 | 15.81 | 1.403 | 0.1  | 6.2 |
| 11/21/04 2:20  | 24.59 | 35.75 | 35.47 | 22.54 | 1.416 | 0    | 6.2 |
| 11/21/04 2:30  | 24.55 | 34.37 | 34.08 | 21.59 | 1.436 | -0.1 | 6.2 |
| 11/21/04 2:40  | 24.51 | 38.76 | 38.4  | 24.65 | 1.454 | 0.3  | 6.5 |
| 11/21/04 2:50  | 24.28 | 41.8  | 41.23 | 26.82 | 1.475 | 0.8  | 7.1 |
| 11/21/04 3:00  | 24.25 | 41.81 | 41.22 | 26.83 | 1.497 | 0.7  | 6.5 |
| 11/21/04 3:10  | 24.22 | 41.77 | 41.14 | 26.79 | 1.517 | 0.9  | 7   |
| 11/21/04 3:20  | 24.08 | 41.91 | 41.18 | 26.9  | 1.538 | 1.1  | 7.1 |
| 11/21/04 3:30  | 23.98 | 42    | 41.18 | 26.96 | 1.557 | 1    | 6.5 |
| 11/21/04 3:40  | 23.95 | 42.06 | 41.22 | 27.01 | 1.577 | 1    | 7   |
| 11/21/04 3:50  | 23.89 | 42.08 | 41.19 | 27.02 | 1.594 | 1.2  | 6.4 |
| 11/21/04 4:00  | 23.87 | 42.08 | 41.17 | 27.02 | 1.606 | 1.2  | 7.3 |
| 11/21/04 4:10  | 23.88 | 42.09 | 41.19 | 27.03 | 1.617 | 1.2  | 6.4 |
| 11/21/04 4:20  | 23.84 | 42.09 | 41.16 | 27.03 | 1.629 | 1.1  | 6.9 |
| 11/21/04 4:30  | 23.82 | 42.15 | 41.2  | 27.08 | 1.637 | 1.3  | 7.1 |
| 11/21/04 4:40  | 23.82 | 42.18 | 41.23 | 27.1  | 1.645 | 1.2  | 6.6 |
| 11/21/04 4:50  | 23.84 | 42.19 | 41.25 | 27.1  | 1.65  | 1.4  | 6.5 |
| 11/21/04 5:00  | 23.84 | 42.22 | 41.29 | 27.12 | 1.656 | 1.2  | 6.5 |
| 11/21/04 5:10  | 23.85 | 42.26 | 41.33 | 27.15 | 1.658 | 1.4  | 6.2 |
| 11/21/04 5:20  | 23.85 | 42.29 | 41.36 | 27.17 | 1.657 | 1.5  | 6.5 |
| 11/21/04 5:30  | 23.85 | 42.28 | 41.35 | 27.17 | 1.654 | 1.2  | 6.4 |
| 11/21/04 5:40  | 23.86 | 42.33 | 41.41 | 27.2  | 1.64  | 1.2  | 6.7 |
| 11/21/04 5:50  | 23.87 | 42.32 | 41.4  | 27.19 | 1.631 | 1.5  | 6.8 |
| 11/21/04 6:00  | 23.88 | 42.28 | 41.38 | 27.17 | 1.62  | 1.4  | 6.4 |
| 11/21/04 6:10  | 23.88 | 42.25 | 41.35 | 27.15 | 1.604 | 1.1  | 6.3 |
| 11/21/04 6:20  | 23.88 | 42.25 | 41.35 | 27.15 | 1.581 | 1.2  | 7.3 |
| 11/21/04 6:30  | 23.89 | 42.23 | 41.33 | 27.13 | 1.56  | 1.4  | 6.4 |
| 11/21/04 6:40  | 23.89 | 42.22 | 41.33 | 27.12 | 1.542 | 1.2  | 7   |
| 11/21/04 6:50  | 23.9  | 42.19 | 41.3  | 27.1  | 1.527 | 1.3  | 6.9 |
| 11/21/04 7:00  | 23.9  | 42.17 | 41.29 | 27.09 | 1.51  | 1.2  | 6.9 |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/21/04 7:10  | 23.92 | 42.15 | 41.28 | 27.07 | 1.493 | 1.4 | 6.5 |
| 11/21/04 7:20  | 23.93 | 42.13 | 41.26 | 27.05 | 1.475 | 1.7 | 6.7 |
| 11/21/04 7:30  | 24.28 | 35.4  | 34.91 | 22.3  | 1.46  | 0.9 | 6.5 |
| 11/21/04 7:40  | 24.01 | 37.25 | 36.55 | 23.6  | 1.444 | 0.4 | 6.9 |
| 11/21/04 7:50  | 25.11 | 26.12 | 26.17 | 15.95 | 1.432 | 0.9 | 6   |
| 11/21/04 8:00  | 24.64 | 24.25 | 24.08 | 14.71 | 1.415 | 1.1 | 6.2 |
| 11/21/04 8:10  | 24.66 | 34.36 | 34.13 | 21.57 | 1.391 | 0.6 | 7.4 |
| 11/21/04 8:20  | 24.27 | 36.83 | 36.31 | 23.3  | 1.37  | 1   | 6.2 |
| 11/21/04 8:30  | 24.18 | 38.2  | 37.59 | 24.26 | 1.352 | 0.6 | 6.2 |
| 11/21/04 8:40  | 24.42 | 35.55 | 35.16 | 22.41 | 1.336 | 0.5 | 6.3 |
| 11/21/04 8:50  | 24.43 | 36.76 | 36.36 | 23.25 | 1.319 | 0.9 | 6.5 |
| 11/21/04 9:00  | 24.56 | 36.2  | 35.9  | 22.85 | 1.301 | 0.7 | 5.4 |
| 11/21/04 9:10  | 24.62 | 35.4  | 35.14 | 22.3  | 1.283 | 0.4 | 6.4 |
| 11/21/04 9:20  | 24.56 | 37.84 | 37.53 | 24.01 | 1.265 | 0.5 | 5.9 |
| 11/21/04 9:30  | 24.75 | 38.15 | 37.97 | 24.22 | 1.247 | 0.5 | 6.2 |
| 11/21/04 9:40  | 24.63 | 36.11 | 35.85 | 22.79 | 1.233 | 0.9 | 6   |
| 11/21/04 9:50  | 24.94 | 35.39 | 35.35 | 22.28 | 1.217 | 1.1 | 6.4 |
| 11/21/04 10:00 | 24.89 | 37.47 | 37.4  | 23.74 | 1.2   | 0.4 | 6.1 |
| 11/21/04 10:10 | 25.03 | 34.31 | 34.33 | 21.53 | 1.187 | 0.5 | 5.9 |
| 11/21/04 10:20 | 25.21 | 33.52 | 33.65 | 20.98 | 1.173 | 0.4 | 5.7 |
| 11/21/04 10:30 | 25.28 | 32.97 | 33.14 | 20.6  | 1.158 | 0.5 | 6.4 |
| 11/21/04 10:40 | 25.37 | 36.37 | 36.63 | 22.96 | 1.143 | 0.6 | 5.8 |
| 11/21/04 10:50 | 25.46 | 33.43 | 33.72 | 20.92 | 1.132 | 0.3 | 5.8 |
| 11/21/04 11:00 | 25.48 | 33.6  | 33.91 | 21.03 | 1.12  | 0.3 | 5.8 |
| 11/21/04 11:10 | 25.66 | 35.65 | 36.1  | 22.45 | 1.109 | 0.3 | 6.4 |
| 11/21/04 11:20 | 25.74 | 32.46 | 32.92 | 20.25 | 1.102 | 0.8 | 5.5 |
| 11/21/04 11:30 | 25.84 | 36.76 | 37.35 | 23.22 | 1.093 | 0.3 | 5.8 |
| 11/21/04 11:40 | 26.03 | 36.62 | 37.33 | 23.12 | 1.088 | 0.4 | 5.6 |
| 11/21/04 11:50 | 26.16 | 35.17 | 35.95 | 22.11 | 1.086 | 0.3 | 6.2 |
| 11/21/04 12:00 | 26.28 | 31.56 | 32.33 | 19.61 | 1.086 | 0.1 | 5.5 |
| 11/21/04 12:10 | 26.44 | 36.24 | 37.24 | 22.85 | 1.083 | 0.3 | 5.2 |
| 11/21/04 12:20 | 26.51 | 32.83 | 33.78 | 20.49 | 1.092 | 0.2 | 6   |
| 11/21/04 12:30 | 26.69 | 36.08 | 37.25 | 22.73 | 1.097 | 0.4 | 5.6 |
| 11/21/04 12:40 | 26.82 | 33.43 | 34.6  | 20.89 | 1.115 | 0.1 | 5.7 |
| 11/21/04 12:50 | 26.98 | 31.42 | 32.61 | 19.5  | 1.157 | 0.2 | 5.8 |
| 11/21/04 13:00 | 26.98 | 30.67 | 31.82 | 18.99 | 1.186 | 0.3 | 5.8 |
| 11/21/04 13:10 | 26.91 | 29.87 | 30.95 | 18.45 | 1.211 | 0.3 | 5.3 |
| 11/21/04 13:20 | 26.93 | 33.28 | 34.51 | 20.79 | 1.235 | 0.4 | 6.5 |
| 11/21/04 13:30 | 26.99 | 29.38 | 30.5  | 18.12 | 1.254 | 0   | 5.3 |
| 11/21/04 13:40 | 26.97 | 33.95 | 35.22 | 21.24 | 1.272 | 0.1 | 6   |
| 11/21/04 13:50 | 26.91 | 32.85 | 34.06 | 20.49 | 1.296 | 0   | 5.5 |
| 11/21/04 14:00 | 26.66 | 24.7  | 25.48 | 14.98 | 1.321 | 0.1 | 5.8 |
| 11/21/04 14:10 | 26.71 | 33.27 | 34.35 | 20.78 | 1.325 | 0.1 | 5.9 |
| 11/21/04 14:20 | 26.7  | 28.7  | 29.63 | 17.66 | 1.338 | 0.1 | 6   |
| 11/21/04 14:30 | 26.73 | 25.77 | 26.62 | 15.69 | 1.36  | 0   | 5.5 |
| 11/21/04 14:40 | 26.66 | 15.16 | 15.64 | 8.8   | 1.39  | 0.8 | 5.7 |
| 11/21/04 14:50 | 26.73 | 22.1  | 22.83 | 13.26 | 1.408 | 0.1 | 6.4 |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/21/04 15:00 | 26.77 | 21.67 | 22.4  | 12.98 | 1.43  | 0   | 5   |
| 11/21/04 15:10 | 26.86 | 24.21 | 25.07 | 14.65 | 1.446 | 0   | 5.7 |
| 11/21/04 15:20 | 26.93 | 27.55 | 28.57 | 16.88 | 1.46  | 0.1 | 5.8 |
| 11/21/04 15:30 | 27.05 | 37.46 | 38.93 | 23.69 | 1.471 | 0.3 | 4.9 |
| 11/21/04 15:40 | 27.17 | 40.91 | 42.61 | 26.12 | 1.491 | 0.9 | 6.5 |
| 11/21/04 15:50 | 27.19 | 41.02 | 42.74 | 26.2  | 1.506 | 0.6 | 5.7 |
| 11/21/04 16:00 | 27.17 | 41.16 | 42.86 | 26.29 | 1.526 | 0.6 | 6.4 |
| 11/21/04 16:10 | 27.17 | 41.21 | 42.92 | 26.33 | 1.545 | 0.7 | 6.7 |
| 11/21/04 16:20 | 27.15 | 41.31 | 43.01 | 26.4  | 1.555 | 0.8 | 5.8 |
| 11/21/04 16:30 | 27.2  | 41.39 | 43.13 | 26.46 | 1.566 | 0.8 | 5.8 |
| 11/21/04 16:40 | 27.3  | 41.43 | 43.25 | 26.49 | 1.585 | 0.9 | 6.1 |
| 11/21/04 16:50 | 27.28 | 41.43 | 43.24 | 26.49 | 1.6   | 1.2 | 6.4 |
| 11/21/04 17:00 | 27.27 | 41.41 | 43.21 | 26.47 | 1.61  | 0.9 | 6   |
| 11/21/04 17:10 | 27.22 | 41.3  | 43.05 | 26.39 | 1.617 | 0.8 | 6.3 |
| 11/21/04 17:20 | 27.16 | 41.18 | 42.88 | 26.31 | 1.625 | 0.9 | 6.2 |
| 11/21/04 17:30 | 27.05 | 41.02 | 42.62 | 26.2  | 1.629 | 1.6 | 6.3 |
| 11/21/04 17:40 | 26.97 | 40.9  | 42.44 | 26.12 | 1.631 | 0.9 | 6.2 |
| 11/21/04 17:50 | 27.01 | 40.93 | 42.5  | 26.14 | 1.627 | 1   | 6.5 |
| 11/21/04 18:00 | 26.99 | 40.9  | 42.46 | 26.12 | 1.622 | 0.7 | 6.6 |
| 11/21/04 18:10 | 27    | 40.92 | 42.48 | 26.13 | 1.62  | 0.7 | 6.6 |
| 11/21/04 18:20 | 27.01 | 40.95 | 42.52 | 26.15 | 1.61  | 0.7 | 6.1 |
| 11/21/04 18:30 | 26.97 | 40.86 | 42.4  | 26.09 | 1.593 | 0.9 | 6.4 |
| 11/21/04 18:40 | 26.96 | 40.86 | 42.39 | 26.09 | 1.569 | 0.7 | 6.7 |
| 11/21/04 18:50 | 26.96 | 40.93 | 42.46 | 26.14 | 1.543 | 0.6 | 7.6 |
| 11/21/04 19:00 | 26.95 | 40.94 | 42.46 | 26.14 | 1.524 | 0.9 | 7.3 |
| 11/21/04 19:10 | 26.94 | 40.96 | 42.48 | 26.16 | 1.506 | 0.7 | 7.3 |
| 11/21/04 19:20 | 26.92 | 40.94 | 42.44 | 26.15 | 1.491 | 0.7 | 5.8 |
| 11/21/04 19:30 | 26.88 | 33.83 | 35.04 | 21.17 | 1.479 | 1   | 6.3 |
| 11/21/04 19:40 | 26.72 | 26.06 | 26.92 | 15.89 | 1.468 | 0.3 | 5.9 |
| 11/21/04 19:50 | 26.73 | 27.21 | 28.11 | 16.66 | 1.454 | 0.3 | 5.8 |
| 11/21/04 20:00 | 26.68 | 25.33 | 26.14 | 15.4  | 1.438 | 0.7 | 5.9 |
| 11/21/04 20:10 | 26.61 | 14.03 | 14.46 | 8.09  | 1.425 | 1.1 | 6.6 |
| 11/21/04 20:20 | 26.6  | 30.16 | 31.08 | 18.66 | 1.395 | 0.2 | 6.6 |
| 11/21/04 20:30 | 26.53 | 28.43 | 29.26 | 17.48 | 1.376 | 2.1 | 5.7 |
| 11/21/04 20:40 | 26.51 | 30.33 | 31.21 | 18.77 | 1.357 | 0.3 | 6.8 |
| 11/21/04 20:50 | 26.47 | 29.39 | 30.21 | 18.13 | 1.339 | 0.4 | 6.7 |
| 11/21/04 21:00 | 26.44 | 24.04 | 24.7  | 14.55 | 1.326 | 0.4 | 6.5 |
| 11/21/04 21:10 | 26.36 | 27.15 | 27.85 | 16.62 | 1.306 | 0.3 | 6.3 |
| 11/21/04 21:20 | 26.41 | 29.45 | 30.24 | 18.17 | 1.287 | 0.2 | 6   |
| 11/21/04 21:30 | 26.44 | 22.65 | 23.27 | 13.63 | 1.272 | 0.3 | 6.1 |
| 11/21/04 21:40 | 26.38 | 26.59 | 27.29 | 16.24 | 1.252 | 0.3 | 5.5 |
| 11/21/04 21:50 | 26.27 | 25.22 | 25.83 | 15.33 | 1.233 | 0.5 | 6.1 |
| 11/21/04 22:00 | 26.37 | 27.4  | 28.12 | 16.79 | 1.213 | 0.9 | 6   |
| 11/21/04 22:10 | 26.33 | 24.76 | 25.39 | 15.02 | 1.196 | 0.6 | 6.1 |
| 11/21/04 22:20 | 26.3  | 24.72 | 25.34 | 15    | 1.178 | 1.1 | 5.8 |
| 11/21/04 22:30 | 26.23 | 30.36 | 31.08 | 18.8  | 1.158 | 1   | 6.1 |
| 11/21/04 22:40 | 26.29 | 29.02 | 29.74 | 17.89 | 1.142 | 0.9 | 5.8 |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/21/04 22:50 | 26.29 | 26    | 26.64 | 15.85 | 1.13  | 0.8 | 5.8 |
| 11/21/04 23:00 | 26.25 | 24.6  | 25.19 | 14.92 | 1.117 | 0.4 | 6.1 |
| 11/21/04 23:10 | 26.12 | 24.14 | 24.66 | 14.62 | 1.102 | 0.9 | 6.6 |
| 11/21/04 23:20 | 26.1  | 26.27 | 26.82 | 16.03 | 1.088 | 0.6 | 5.9 |
| 11/21/04 23:30 | 25.99 | 26.59 | 27.1  | 16.25 | 1.078 | 0.5 | 6.6 |
| 11/21/04 23:40 | 26.05 | 25.33 | 25.83 | 15.41 | 1.069 | 0.6 | 6.3 |
| 11/21/04 23:50 | 26.02 | 26.73 | 27.25 | 16.34 | 1.06  | 0.6 | 6.1 |
| 11/22/04 0:00  | 26.04 | 23.83 | 24.3  | 14.41 | 1.055 | 0.7 | 5.6 |
| 11/22/04 0:10  | 25.86 | 27.85 | 28.3  | 17.1  | 1.052 | 0.7 | 5.1 |
| 11/22/04 0:20  | 25.92 | 27.13 | 27.61 | 16.62 | 1.05  | 0.7 | 6.5 |
| 11/22/04 0:30  | 25.95 | 27.06 | 27.56 | 16.57 | 1.054 | 0.6 | 6   |
| 11/22/04 0:40  | 26.08 | 26.21 | 26.75 | 15.99 | 1.058 | 0.5 | 5.3 |
| 11/22/04 0:50  | 26.04 | 25.14 | 25.64 | 15.28 | 1.067 | 0.8 | 6.5 |
| 11/22/04 1:00  | 25.98 | 25.67 | 26.15 | 15.63 | 1.087 | 0.4 | 5.4 |
| 11/22/04 1:10  | 25.55 | 28.27 | 28.57 | 17.39 | 1.118 | 0.6 | 6.5 |
| 11/22/04 1:20  | 25.74 | 27.25 | 27.64 | 16.7  | 1.146 | 0.3 | 5.7 |
| 11/22/04 1:30  | 25.59 | 30.25 | 30.59 | 18.73 | 1.169 | 0.6 | 5.7 |
| 11/22/04 1:40  | 25.3  | 31.54 | 31.72 | 19.62 | 1.192 | 0.6 | 5.8 |
| 11/22/04 1:50  | 25.35 | 29.64 | 29.84 | 18.32 | 1.211 | 0.8 | 5.2 |
| 11/22/04 2:00  | 25.39 | 31.69 | 31.92 | 19.72 | 1.228 | 0.6 | 6.5 |
| 11/22/04 2:10  | 25.22 | 31.33 | 31.46 | 19.48 | 1.25  | 0.6 | 6.3 |
| 11/22/04 2:20  | 25.1  | 34.41 | 34.47 | 21.6  | 1.27  | 1   | 6.6 |
| 11/22/04 2:30  | 25.12 | 34.29 | 34.37 | 21.52 | 1.29  | 0.7 | 6.2 |
| 11/22/04 2:40  | 25.18 | 29.28 | 29.38 | 18.08 | 1.313 | 0.7 | 6.5 |
| 11/22/04 2:50  | 25.09 | 24.27 | 24.31 | 14.72 | 1.335 | 0.7 | 6   |
| 11/22/04 3:00  | 24.92 | 25.56 | 25.52 | 15.58 | 1.357 | 0.7 | 5.9 |
| 11/22/04 3:10  | 24.88 | 24.4  | 24.35 | 14.81 | 1.379 | 0.8 | 6.3 |
| 11/22/04 3:20  | 25.01 | 22.18 | 22.18 | 13.34 | 1.406 | 0.5 | 6.2 |
| 11/22/04 3:30  | 24.96 | 27.07 | 27.05 | 16.59 | 1.428 | 0.8 | 6.2 |
| 11/22/04 3:40  | 24.72 | 37.06 | 36.87 | 23.46 | 1.445 | 1.4 | 6.3 |
| 11/22/04 3:50  | 24.55 | 40.13 | 39.79 | 25.62 | 1.467 | 1.1 | 6.9 |
| 11/22/04 4:00  | 24.51 | 40.19 | 39.82 | 25.67 | 1.488 | 1   | 7.8 |
| 11/22/04 4:10  | 24.5  | 40.22 | 39.84 | 25.69 | 1.513 | 1.2 | 6.4 |
| 11/22/04 4:20  | 24.45 | 40.23 | 39.81 | 25.7  | 1.532 | 1.2 | 7.1 |
| 11/22/04 4:30  | 24.4  | 40.24 | 39.78 | 25.7  | 1.552 | 1   | 6.2 |
| 11/22/04 4:40  | 24.38 | 40.25 | 39.78 | 25.71 | 1.574 | 1   | 7.1 |
| 11/22/04 4:50  | 24.36 | 40.28 | 39.79 | 25.73 | 1.594 | 1.1 | 6.6 |
| 11/22/04 5:00  | 24.36 | 40.31 | 39.81 | 25.75 | 1.611 | 0.9 | 7   |
| 11/22/04 5:10  | 24.37 | 40.3  | 39.82 | 25.75 | 1.628 | 1.2 | 6.9 |
| 11/22/04 5:20  | 24.45 | 40.49 | 40.06 | 25.88 | 1.641 | 1.5 | 7.3 |
| 11/22/04 5:30  | 24.5  | 40.64 | 40.25 | 25.99 | 1.653 | 1.4 | 7.5 |
| 11/22/04 5:40  | 24.51 | 40.77 | 40.39 | 26.08 | 1.661 | 1.5 | 7.2 |
| 11/22/04 5:50  | 24.54 | 40.95 | 40.59 | 26.21 | 1.673 | 1.7 | 6.8 |
| 11/22/04 6:00  | 24.53 | 41.07 | 40.71 | 26.29 | 1.681 | 1.7 | 6.7 |
| 11/22/04 6:10  | 24.5  | 41.16 | 40.76 | 26.35 | 1.688 | 1.6 | 7   |
| 11/22/04 6:20  | 24.47 | 41.21 | 40.79 | 26.39 | 1.694 | 1.7 | 6.9 |
| 11/22/04 6:30  | 24.47 | 41.13 | 40.72 | 26.34 | 1.693 | 1.6 | 6.5 |

|                |       |       |       |       |       |     |      |
|----------------|-------|-------|-------|-------|-------|-----|------|
| 11/22/04 6:40  | 24.47 | 41.14 | 40.72 | 26.34 | 1.689 | 1.8 | 7.2  |
| 11/22/04 6:50  | 24.47 | 41.07 | 40.66 | 26.29 | 1.677 | 1.7 | 7.2  |
| 11/22/04 7:00  | 24.48 | 41.1  | 40.68 | 26.31 | 1.664 | 1.7 | 7.1  |
| 11/22/04 7:10  | 24.49 | 41.11 | 40.71 | 26.32 | 1.655 | 1.7 | 6.9  |
| 11/22/04 7:20  | 24.5  | 41.08 | 40.69 | 26.3  | 1.638 | 1.6 | 6.5  |
| 11/22/04 7:30  | 24.51 | 41.06 | 40.68 | 26.29 | 1.62  | 1.8 | 6.7  |
| 11/22/04 7:40  | 24.52 | 41.05 | 40.68 | 26.28 | 1.589 | 1.7 | 6.4  |
| 11/22/04 7:50  | 24.53 | 41.06 | 40.69 | 26.29 | 1.57  | 1.6 | 6.3  |
| 11/22/04 8:00  | 24.53 | 41.09 | 40.73 | 26.31 | 1.557 | 1.8 | 7    |
| 11/22/04 8:10  | 24.55 | 41.1  | 40.75 | 26.31 | 1.545 | 1.8 | 9.4  |
| 11/22/04 8:20  | 24.59 | 41.02 | 40.7  | 26.25 | 1.531 | 1.7 | 15.9 |
| 11/22/04 8:30  | 24.62 | 41    | 40.7  | 26.24 | 1.515 | 1.5 | 10.2 |
| 11/22/04 8:40  | 24.65 | 40.94 | 40.67 | 26.2  | 1.502 | 1.4 | 9.3  |
| 11/22/04 8:50  | 24.68 | 40.94 | 40.69 | 26.2  | 1.485 | 1.3 | 8.9  |
| 11/22/04 9:00  | 25.2  | 27.09 | 27.2  | 16.6  | 1.472 | 1.2 | 6.8  |
| 11/22/04 9:10  | 25.47 | 26.42 | 26.65 | 16.14 | 1.451 | 0.4 | 5.6  |
| 11/22/04 9:20  | 25.7  | 22.61 | 22.92 | 13.62 | 1.436 | 0.4 | 5.9  |
| 11/22/04 9:30  | 25.93 | 16.75 | 17.05 | 9.82  | 1.423 | 0.4 | 5.6  |
| 11/22/04 9:40  | 25.29 | 31.58 | 31.75 | 19.64 | 1.39  | 0.6 | 6    |
| 11/22/04 9:50  | 25.47 | 28.98 | 29.24 | 17.87 | 1.374 | 0.6 | 6    |
| 11/22/04 10:00 | 25.5  | 30.21 | 30.49 | 18.71 | 1.357 | 0.7 | 6    |
| 11/22/04 10:10 | 25.27 | 29.58 | 29.73 | 18.28 | 1.337 | 0.6 | 6    |
| 11/22/04 10:20 | 25.33 | 36.04 | 36.27 | 22.73 | 1.313 | 0.6 | 6.3  |
| 11/22/04 10:30 | 25.34 | 31.96 | 32.17 | 19.91 | 1.296 | 0.7 | 5.9  |
| 11/22/04 10:40 | 25.49 | 33.71 | 34.03 | 21.11 | 1.277 | 0.7 | 6.6  |
| 11/22/04 10:50 | 25.65 | 27.66 | 28    | 16.97 | 1.262 | 0.6 | 6    |
| 11/22/04 11:00 | 25.69 | 31.87 | 32.29 | 19.84 | 1.242 | 0.7 | 6.3  |
| 11/22/04 11:10 | 25.71 | 29.57 | 29.98 | 18.27 | 1.226 | 0.4 | 6.1  |
| 11/22/04 11:20 | 25.78 | 33.32 | 33.82 | 20.84 | 1.213 | 0.6 | 5.9  |
| 11/22/04 11:30 | 25.87 | 27.66 | 28.11 | 16.97 | 1.202 | 0.6 | 6.2  |
| 11/22/04 11:40 | 25.96 | 31.61 | 32.19 | 19.65 | 1.187 | 1.4 | 6.2  |
| 11/22/04 11:50 | 26.08 | 32.45 | 33.12 | 20.23 | 1.174 | 0.5 | 5.5  |
| 11/22/04 12:00 | 26.18 | 29.76 | 30.43 | 18.39 | 1.163 | 0.5 | 6.1  |
| 11/22/04 12:10 | 26.28 | 30.16 | 30.9  | 18.66 | 1.152 | 0.4 | 5.9  |
| 11/22/04 12:20 | 26.42 | 31.82 | 32.69 | 19.79 | 1.143 | 0.4 | 5.1  |
| 11/22/04 12:30 | 26.5  | 28.15 | 28.96 | 17.29 | 1.14  | 0.3 | 6.1  |
| 11/22/04 12:40 | 26.64 | 27.63 | 28.49 | 16.94 | 1.135 | 0.4 | 5.8  |
| 11/22/04 12:50 | 26.66 | 25.34 | 26.15 | 15.41 | 1.137 | 0.4 | 6.4  |
| 11/22/04 13:00 | 26.77 | 29.01 | 29.99 | 17.87 | 1.141 | 0.4 | 6.1  |
| 11/22/04 13:10 | 26.83 | 30.42 | 31.49 | 18.83 | 1.152 | 0.3 | 5.7  |
| 11/22/04 13:20 | 26.86 | 27.77 | 28.76 | 17.03 | 1.161 | 0.4 | 5.2  |
| 11/22/04 13:30 | 26.97 | 32.02 | 33.23 | 19.92 | 1.168 | 0.4 | 5.7  |
| 11/22/04 13:40 | 27.01 | 29.49 | 30.63 | 18.19 | 1.195 | 0.4 | 6.2  |
| 11/22/04 13:50 | 26.88 | 25.77 | 26.69 | 15.69 | 1.227 | 0.3 | 6.5  |
| 11/22/04 14:00 | 26.86 | 30.12 | 31.2  | 18.62 | 1.251 | 0.4 | 6.2  |
| 11/22/04 14:10 | 26.91 | 29.9  | 30.99 | 18.47 | 1.271 | 0.4 | 6    |
| 11/22/04 14:20 | 26.74 | 20.67 | 21.35 | 12.33 | 1.297 | 0.9 | 5.8  |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/22/04 14:30 | 26.7  | 19.44 | 20.07 | 11.53 | 1.313 | 0.8 | 5.7 |
| 11/22/04 14:40 | 27.02 | 32.95 | 34.22 | 20.55 | 1.32  | 0.3 | 5.9 |
| 11/22/04 14:50 | 26.75 | 15.11 | 15.62 | 8.77  | 1.35  | 0.6 | 5.9 |
| 11/22/04 15:00 | 26.89 | 19.77 | 20.48 | 11.74 | 1.367 | 0.7 | 6.3 |
| 11/22/04 15:10 | 27.04 | 23.35 | 24.26 | 14.08 | 1.387 | 0.6 | 6.6 |
| 11/22/04 15:20 | 27.1  | 27.25 | 28.34 | 16.68 | 1.405 | 0.7 | 6   |
| 11/22/04 15:30 | 27.14 | 28.94 | 30.13 | 17.82 | 1.425 | 0.7 | 5.9 |
| 11/22/04 15:40 | 27.22 | 35.93 | 37.45 | 22.62 | 1.439 | 1.3 | 6.3 |
| 11/22/04 15:50 | 27.31 | 40.49 | 42.27 | 25.82 | 1.456 | 1.8 | 6.5 |
| 11/22/04 16:00 | 27.25 | 40.53 | 42.28 | 25.85 | 1.479 | 1.7 | 6.2 |
| 11/22/04 16:10 | 27.19 | 40.62 | 42.31 | 25.91 | 1.501 | 1.3 | 6   |
| 11/22/04 16:20 | 27.13 | 40.67 | 42.32 | 25.95 | 1.523 | 1.3 | 6.2 |
| 11/22/04 16:30 | 27.09 | 40.73 | 42.35 | 25.99 | 1.546 | 2   | 6.3 |
| 11/22/04 16:40 | 27.07 | 40.77 | 42.39 | 26.02 | 1.565 | 1   | 5.8 |
| 11/22/04 16:50 | 27.05 | 40.83 | 42.43 | 26.06 | 1.586 | 1   | 6.3 |
| 11/22/04 17:00 | 27.01 | 40.9  | 42.47 | 26.12 | 1.603 | 0.9 | 6.7 |
| 11/22/04 17:10 | 26.98 | 40.84 | 42.39 | 26.08 | 1.62  | 1   | 5.6 |
| 11/22/04 17:20 | 26.93 | 40.79 | 42.3  | 26.04 | 1.638 | 1   | 6.9 |
| 11/22/04 17:30 | 26.95 | 40.8  | 42.32 | 26.04 | 1.655 | 0.9 | 6.5 |
| 11/22/04 17:40 | 26.95 | 40.76 | 42.28 | 26.02 | 1.666 | 1.7 | 5.9 |
| 11/22/04 17:50 | 26.94 | 40.76 | 42.27 | 26.02 | 1.673 | 0.9 | 6   |
| 11/22/04 18:00 | 26.95 | 40.8  | 42.31 | 26.05 | 1.682 | 0.7 | 5.9 |
| 11/22/04 18:10 | 26.93 | 40.85 | 42.36 | 26.08 | 1.69  | 0.8 | 6.7 |
| 11/22/04 18:20 | 26.95 | 40.87 | 42.39 | 26.1  | 1.696 | 0.8 | 6.4 |
| 11/22/04 18:30 | 26.95 | 40.93 | 42.45 | 26.14 | 1.7   | 0.7 | 6.2 |
| 11/22/04 18:40 | 26.96 | 40.88 | 42.41 | 26.1  | 1.698 | 0.7 | 6.8 |
| 11/22/04 18:50 | 26.95 | 40.79 | 42.3  | 26.04 | 1.687 | 0.7 | 6.9 |
| 11/22/04 19:00 | 26.93 | 40.71 | 42.2  | 25.98 | 1.68  | 0.7 | 6.4 |
| 11/22/04 19:10 | 26.9  | 40.74 | 42.22 | 26.01 | 1.662 | 0.7 | 6.6 |
| 11/22/04 19:20 | 26.88 | 40.84 | 42.3  | 26.08 | 1.639 | 0.9 | 6.5 |
| 11/22/04 19:30 | 26.86 | 40.79 | 42.24 | 26.04 | 1.616 | 0.6 | 6.4 |
| 11/22/04 19:40 | 26.86 | 40.79 | 42.24 | 26.04 | 1.597 | 0.7 | 6.3 |
| 11/22/04 19:50 | 26.85 | 40.78 | 42.22 | 26.04 | 1.577 | 0.6 | 5.7 |
| 11/22/04 20:00 | 26.84 | 40.76 | 42.2  | 26.02 | 1.554 | 0.6 | 6.6 |
| 11/22/04 20:10 | 26.84 | 40.77 | 42.2  | 26.03 | 1.533 | 0.6 | 6.3 |
| 11/22/04 20:20 | 26.83 | 40.83 | 42.26 | 26.07 | 1.514 | 0.9 | 6.7 |
| 11/22/04 20:30 | 26.83 | 40.76 | 42.18 | 26.02 | 1.501 | 1.1 | 6.2 |
| 11/22/04 20:40 | 26.81 | 40.73 | 42.14 | 26    | 1.484 | 0.7 | 6.3 |
| 11/22/04 20:50 | 26.81 | 40.74 | 42.15 | 26.01 | 1.461 | 0.6 | 5.8 |
| 11/22/04 21:00 | 26.72 | 19.23 | 19.86 | 11.4  | 1.455 | 0.8 | 6.2 |
| 11/22/04 21:10 | 26.65 | 22.05 | 22.75 | 13.23 | 1.435 | 0.4 | 6.6 |
| 11/22/04 21:20 | 26.55 | 20.61 | 21.22 | 12.3  | 1.42  | 0.7 | 6.1 |
| 11/22/04 21:30 | 26.52 | 16.37 | 16.84 | 9.57  | 1.405 | 0.7 | 5.9 |
| 11/22/04 21:40 | 26.54 | 13.89 | 14.3  | 8.01  | 1.387 | 2   | 6   |
| 11/22/04 21:50 | 26.31 | 22.95 | 23.53 | 13.83 | 1.357 | 0.6 | 6.2 |
| 11/22/04 22:00 | 26.25 | 31.72 | 32.47 | 19.72 | 1.331 | 0.4 | 6.3 |
| 11/22/04 22:10 | 26.44 | 20.07 | 20.62 | 11.94 | 1.32  | 1.2 | 6   |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/22/04 22:20 | 26.2  | 29.22 | 29.89 | 18.02 | 1.294 | 0.4 | 5.9 |
| 11/22/04 22:30 | 26.16 | 29.73 | 30.39 | 18.37 | 1.274 | 0.4 | 6.4 |
| 11/22/04 22:40 | 26.23 | 25.76 | 26.37 | 15.69 | 1.256 | 0.6 | 6.2 |
| 11/22/04 22:50 | 26.14 | 26.89 | 27.47 | 16.45 | 1.237 | 0.4 | 7.1 |
| 11/22/04 23:00 | 26.05 | 29.35 | 29.94 | 18.11 | 1.216 | 0.5 | 6.3 |
| 11/22/04 23:10 | 25.97 | 27.33 | 27.84 | 16.75 | 1.199 | 0.6 | 6.2 |
| 11/22/04 23:20 | 25.97 | 25.72 | 26.19 | 15.67 | 1.184 | 0.7 | 6.9 |
| 11/22/04 23:30 | 25.95 | 27.6  | 28.1  | 16.93 | 1.166 | 0.5 | 6.4 |
| 11/22/04 23:40 | 25.91 | 27.9  | 28.38 | 17.13 | 1.15  | 1.6 | 6.1 |
| 11/22/04 23:50 | 25.89 | 30.55 | 31.07 | 18.93 | 1.134 | 0.4 | 5.7 |
| 11/23/04 0:00  | 25.85 | 30.92 | 31.42 | 19.19 | 1.12  | 0.7 | 6   |
| 11/23/04 0:10  | 25.95 | 29.04 | 29.57 | 17.9  | 1.109 | 1.5 | 6.1 |
| 11/23/04 0:20  | 25.9  | 28.54 | 29.03 | 17.57 | 1.097 | 0.4 | 5.9 |
| 11/23/04 0:30  | 25.88 | 25.56 | 26    | 15.57 | 1.084 | 0.4 | 6.2 |
| 11/23/04 0:40  | 25.79 | 28.16 | 28.58 | 17.31 | 1.074 | 1   | 6.2 |
| 11/23/04 0:50  | 25.97 | 23.74 | 24.18 | 14.36 | 1.071 | 0.4 | 6.4 |
| 11/23/04 1:00  | 25.91 | 24.05 | 24.47 | 14.56 | 1.065 | 0.4 | 5.6 |
| 11/23/04 1:10  | 25.91 | 26.03 | 26.48 | 15.88 | 1.065 | 1   | 5.9 |
| 11/23/04 1:20  | 25.62 | 25.74 | 26.05 | 15.69 | 1.071 | 2.3 | 6.2 |
| 11/23/04 1:30  | 25.77 | 27.03 | 27.43 | 16.55 | 1.075 | 0.5 | 6.2 |
| 11/23/04 1:40  | 25.63 | 28.1  | 28.44 | 17.27 | 1.088 | 0.4 | 6   |
| 11/23/04 1:50  | 25.66 | 27.33 | 27.68 | 16.75 | 1.107 | 1   | 6.1 |
| 11/23/04 2:00  | 25.46 | 27.96 | 28.2  | 17.18 | 1.134 | 0.4 | 6.3 |
| 11/23/04 2:10  | 25.43 | 31.06 | 31.31 | 19.29 | 1.157 | 0.3 | 6   |
| 11/23/04 2:20  | 25.44 | 31.24 | 31.5  | 19.41 | 1.185 | 0.4 | 6.6 |
| 11/23/04 2:30  | 25.24 | 33.76 | 33.92 | 21.15 | 1.211 | 0.3 | 6.1 |
| 11/23/04 2:40  | 25.15 | 29.77 | 29.85 | 18.41 | 1.23  | 0.6 | 6.5 |
| 11/23/04 2:50  | 25.23 | 28.06 | 28.18 | 17.25 | 1.255 | 0.4 | 6   |
| 11/23/04 3:00  | 25.25 | 25.89 | 26.01 | 15.79 | 1.271 | 0.4 | 6.7 |
| 11/23/04 3:10  | 25.83 | 24.02 | 24.41 | 14.54 | 1.287 | 0.5 | 6.5 |
| 11/23/04 3:20  | 25.4  | 27.76 | 27.97 | 17.05 | 1.308 | 0.4 | 6.4 |
| 11/23/04 3:30  | 25.71 | 19.61 | 19.87 | 11.65 | 1.34  | 0.9 | 6.2 |
| 11/23/04 3:40  | 25.34 | 22.66 | 22.8  | 13.65 | 1.36  | 1.2 | 6.7 |
| 11/23/04 3:50  | 25.29 | 27.25 | 27.4  | 16.71 | 1.378 | 0.9 | 5.9 |
| 11/23/04 4:00  | 25.29 | 21.49 | 21.6  | 12.88 | 1.409 | 1.1 | 6.3 |
| 11/23/04 4:10  | 24.89 | 36.18 | 36.1  | 22.84 | 1.423 | 1.2 | 5.7 |
| 11/23/04 4:20  | 24.82 | 40.32 | 40.18 | 25.76 | 1.447 | 1.5 | 6.8 |
| 11/23/04 4:30  | 24.79 | 40.43 | 40.27 | 25.83 | 1.472 | 1.2 | 6.2 |
| 11/23/04 4:40  | 24.77 | 40.45 | 40.27 | 25.84 | 1.494 | 1.4 | 7   |
| 11/23/04 4:50  | 24.75 | 40.46 | 40.27 | 25.85 | 1.516 | 1   | 6.5 |
| 11/23/04 5:00  | 24.7  | 40.45 | 40.22 | 25.85 | 1.539 | 0.9 | 7.1 |
| 11/23/04 5:10  | 24.67 | 40.5  | 40.24 | 25.88 | 1.562 | 0.9 | 6.9 |
| 11/23/04 5:20  | 24.64 | 40.57 | 40.29 | 25.93 | 1.583 | 1   | 7.1 |
| 11/23/04 5:30  | 24.59 | 40.57 | 40.25 | 25.93 | 1.601 | 1   | 7.2 |
| 11/23/04 5:40  | 24.59 | 40.55 | 40.23 | 25.92 | 1.625 | 0.8 | 6.4 |
| 11/23/04 5:50  | 24.57 | 40.51 | 40.17 | 25.89 | 1.646 | 1   | 6.8 |
| 11/23/04 6:00  | 24.54 | 40.53 | 40.18 | 25.91 | 1.666 | 0.8 | 6.7 |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/23/04 6:10  | 24.54 | 40.55 | 40.19 | 25.92 | 1.684 | 0.8 | 7.1 |
| 11/23/04 6:20  | 24.52 | 40.63 | 40.26 | 25.98 | 1.702 | 0.7 | 6   |
| 11/23/04 6:30  | 24.49 | 40.71 | 40.32 | 26.04 | 1.712 | 0.9 | 6.5 |
| 11/23/04 6:40  | 24.48 | 40.8  | 40.4  | 26.1  | 1.72  | 1   | 6.8 |
| 11/23/04 6:50  | 24.47 | 40.9  | 40.49 | 26.17 | 1.727 | 0.8 | 6.8 |
| 11/23/04 7:00  | 24.47 | 40.96 | 40.54 | 26.22 | 1.733 | 0.8 | 7.5 |
| 11/23/04 7:10  | 24.47 | 41    | 40.58 | 26.24 | 1.733 | 0.9 | 6.8 |
| 11/23/04 7:20  | 24.45 | 41.11 | 40.68 | 26.32 | 1.727 | 0.8 | 6.5 |
| 11/23/04 7:30  | 24.42 | 41.21 | 40.75 | 26.4  | 1.725 | 0.7 | 6.4 |
| 11/23/04 7:40  | 24.41 | 41.26 | 40.79 | 26.43 | 1.717 | 1   | 6.7 |
| 11/23/04 7:50  | 24.41 | 41.42 | 40.95 | 26.54 | 1.704 | 1   | 7.3 |
| 11/23/04 8:00  | 24.4  | 41.33 | 40.86 | 26.48 | 1.681 | 4.2 | 6.3 |
| 11/23/04 8:10  | 24.4  | 41.22 | 40.75 | 26.4  | 1.651 | 0.7 | 6.9 |
| 11/23/04 8:20  | 24.42 | 41.08 | 40.63 | 26.3  | 1.628 | 0.7 | 6.6 |
| 11/23/04 8:30  | 24.45 | 40.81 | 40.38 | 26.11 | 1.603 | 1.5 | 6.5 |
| 11/23/04 8:40  | 24.41 | 40.62 | 40.16 | 25.98 | 1.585 | 0.8 | 6.4 |
| 11/23/04 8:50  | 24.45 | 40.55 | 40.12 | 25.92 | 1.567 | 0.9 | 6.5 |
| 11/23/04 9:00  | 24.51 | 40.53 | 40.16 | 25.91 | 1.553 | 0.9 | 5.9 |
| 11/23/04 9:10  | 24.55 | 40.4  | 40.05 | 25.81 | 1.541 | 1.1 | 6.3 |
| 11/23/04 9:20  | 24.6  | 40.41 | 40.1  | 25.82 | 1.523 | 0.7 | 6.9 |
| 11/23/04 9:30  | 24.65 | 40.39 | 40.12 | 25.8  | 1.504 | 0.6 | 6.1 |
| 11/23/04 9:40  | 24.73 | 40.47 | 40.26 | 25.86 | 1.486 | 0.6 | 6.1 |
| 11/23/04 9:50  | 24.78 | 40.55 | 40.38 | 25.92 | 1.47  | 0.7 | 6.4 |
| 11/23/04 10:00 | 25.05 | 32.58 | 32.61 | 20.34 | 1.459 | 1.4 | 6.1 |
| 11/23/04 10:10 | 25.33 | 23.56 | 23.71 | 14.25 | 1.449 | 0.6 | 5.9 |
| 11/23/04 10:20 | 25.47 | 20.97 | 21.16 | 12.54 | 1.425 | 0.4 | 6   |
| 11/23/04 10:30 | 25.67 | 23.46 | 23.76 | 14.18 | 1.403 | 0.5 | 6.2 |
| 11/23/04 10:40 | 25.74 | 19.48 | 19.75 | 11.57 | 1.385 | 0.6 | 6.2 |
| 11/23/04 10:50 | 25.85 | 18.04 | 18.33 | 10.64 | 1.365 | 2   | 5.8 |
| 11/23/04 11:00 | 25.48 | 32.73 | 33.04 | 20.44 | 1.334 | 0.7 | 6.1 |
| 11/23/04 11:10 | 25.56 | 33.1  | 33.46 | 20.69 | 1.312 | 2.7 | 5.7 |
| 11/23/04 11:20 | 25.63 | 33.04 | 33.43 | 20.64 | 1.292 | 0.6 | 6.1 |
| 11/23/04 11:30 | 25.74 | 33.58 | 34.05 | 21.02 | 1.273 | 0.4 | 6.7 |
| 11/23/04 11:40 | 25.81 | 31.31 | 31.8  | 19.45 | 1.253 | 0.4 | 6.5 |
| 11/23/04 11:50 | 25.92 | 34.57 | 35.17 | 21.69 | 1.234 | 1.2 | 5.7 |
| 11/23/04 12:00 | 26.02 | 33.05 | 33.7  | 20.65 | 1.22  | 0.4 | 5.4 |
| 11/23/04 12:10 | 26.1  | 33.66 | 34.37 | 21.06 | 1.202 | 0.4 | 5.9 |
| 11/23/04 12:20 | 26.21 | 32.73 | 33.48 | 20.42 | 1.189 | 0.9 | 6.5 |
| 11/23/04 12:30 | 26.32 | 32.21 | 33.02 | 20.06 | 1.173 | 0.6 | 6.1 |
| 11/23/04 12:40 | 26.43 | 30.43 | 31.26 | 18.84 | 1.155 | 0.9 | 5.9 |
| 11/23/04 12:50 | 26.51 | 27.91 | 28.71 | 17.13 | 1.143 | 0.6 | 6.3 |
| 11/23/04 13:00 | 26.59 | 28.85 | 29.73 | 17.76 | 1.128 | 0.6 | 6.1 |
| 11/23/04 13:10 | 26.59 | 25.82 | 26.61 | 15.73 | 1.124 | 0.6 | 6   |
| 11/23/04 13:20 | 26.78 | 32.11 | 33.2  | 19.98 | 1.115 | 0.7 | 6.5 |
| 11/23/04 13:30 | 26.84 | 30.24 | 31.31 | 18.71 | 1.108 | 0.7 | 5.6 |
| 11/23/04 13:40 | 26.78 | 24.23 | 25.05 | 14.66 | 1.105 | 0.5 | 6   |
| 11/23/04 13:50 | 26.94 | 30.11 | 31.23 | 18.61 | 1.104 | 0.7 | 6   |

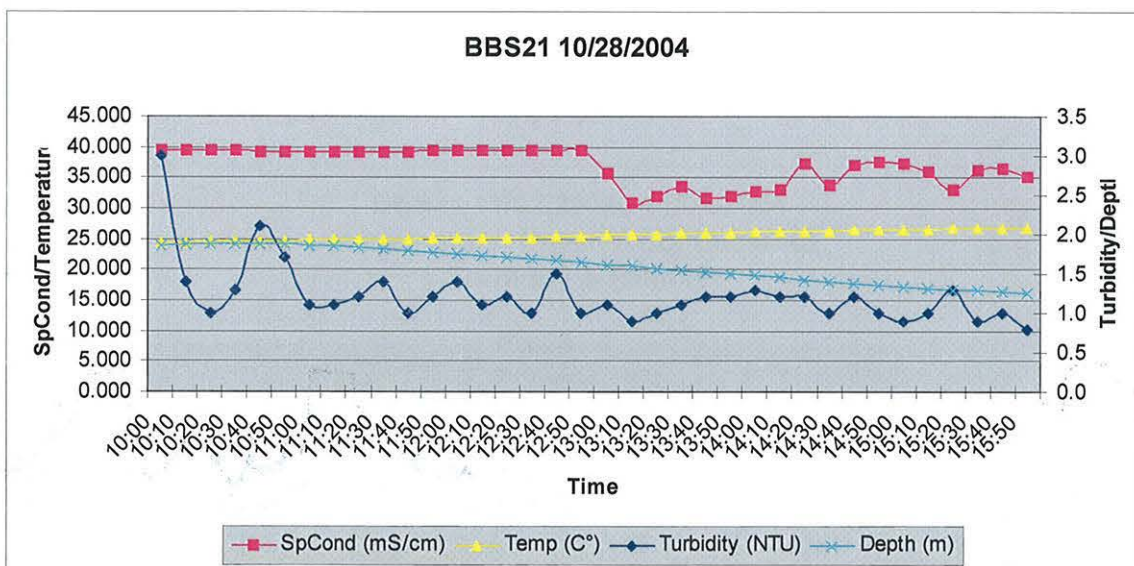
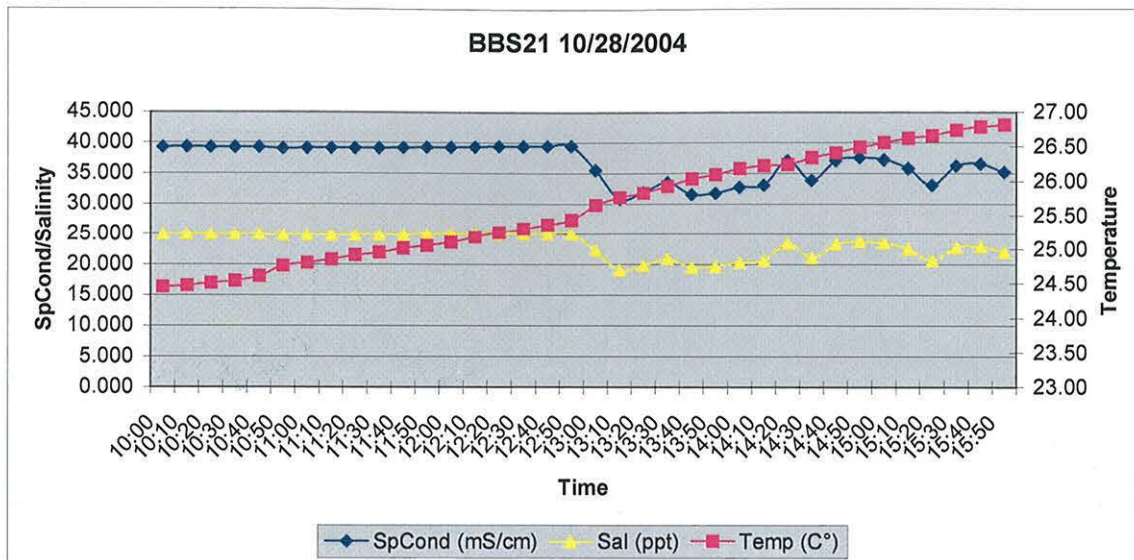
|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/23/04 14:00 | 26.98 | 26.95 | 27.97 | 16.47 | 1.114 | 0.7 | 5.8 |
| 11/23/04 14:10 | 26.86 | 27.01 | 27.97 | 16.52 | 1.12  | 0.6 | 6   |
| 11/23/04 14:20 | 27.02 | 31.91 | 33.14 | 19.84 | 1.133 | 0.6 | 5.8 |
| 11/23/04 14:30 | 27.05 | 33.13 | 34.43 | 20.68 | 1.156 | 0.4 | 6.2 |
| 11/23/04 14:40 | 27.06 | 32.56 | 33.83 | 20.28 | 1.188 | 1   | 6.1 |
| 11/23/04 14:50 | 26.56 | 18.81 | 19.36 | 11.12 | 1.221 | 1.4 | 6.2 |
| 11/23/04 15:00 | 26.76 | 21.53 | 22.25 | 12.89 | 1.24  | 1.2 | 5.9 |
| 11/23/04 15:10 | 27.08 | 32.53 | 33.82 | 20.26 | 1.255 | 0.7 | 6.8 |
| 11/23/04 15:20 | 26.64 | 16.69 | 17.21 | 9.77  | 1.283 | 1.1 | 6.2 |
| 11/23/04 15:30 | 26.76 | 16.41 | 16.96 | 9.59  | 1.302 | 1.2 | 5.2 |
| 11/23/04 15:40 | 26.94 | 19.85 | 20.59 | 11.8  | 1.316 | 0.9 | 6.2 |
| 11/23/04 15:50 | 26.93 | 19.96 | 20.69 | 11.87 | 1.335 | 1   | 6.3 |
| 11/23/04 16:00 | 26.89 | 16.84 | 17.45 | 9.87  | 1.36  | 1.3 | 6.3 |
| 11/23/04 16:10 | 26.91 | 21.78 | 22.57 | 13.05 | 1.379 | 1.4 | 6.4 |
| 11/23/04 16:20 | 26.78 | 23.47 | 24.27 | 14.17 | 1.4   | 1.4 | 5.2 |
| 11/23/04 16:30 | 26.82 | 34.82 | 36.03 | 21.85 | 1.411 | 1.7 | 5.5 |
| 11/23/04 16:40 | 26.85 | 42.56 | 44.07 | 27.31 | 1.425 | 2   | 6.1 |
| 11/23/04 16:50 | 26.82 | 42.69 | 44.17 | 27.4  | 1.444 | 2.6 | 5.7 |
| 11/23/04 17:00 | 26.72 | 42.86 | 44.27 | 27.52 | 1.474 | 2.3 | 6.7 |
| 11/23/04 17:10 | 26.69 | 42.96 | 44.34 | 27.59 | 1.495 | 1.8 | 6.4 |
| 11/23/04 17:20 | 26.64 | 43.01 | 44.36 | 27.63 | 1.512 | 2   | 6.5 |
| 11/23/04 17:30 | 26.59 | 43.11 | 44.42 | 27.7  | 1.529 | 2   | 6.4 |
| 11/23/04 17:40 | 26.55 | 43.18 | 44.45 | 27.75 | 1.549 | 3.6 | 6.5 |
| 11/23/04 17:50 | 26.51 | 43.24 | 44.49 | 27.8  | 1.57  | 1.5 | 6   |
| 11/23/04 18:00 | 26.47 | 43.3  | 44.51 | 27.84 | 1.587 | 1.2 | 6.5 |
| 11/23/04 18:10 | 26.43 | 43.4  | 44.59 | 27.92 | 1.6   | 1.4 | 6.6 |
| 11/23/04 18:20 | 26.42 | 43.45 | 44.63 | 27.95 | 1.608 | 1   | 6   |
| 11/23/04 18:30 | 26.39 | 43.53 | 44.69 | 28.01 | 1.622 | 0.9 | 6.5 |
| 11/23/04 18:40 | 26.37 | 43.6  | 44.74 | 28.06 | 1.631 | 1   | 6.5 |
| 11/23/04 18:50 | 26.36 | 43.65 | 44.78 | 28.09 | 1.64  | 2   | 6.3 |
| 11/23/04 19:00 | 26.35 | 43.68 | 44.8  | 28.12 | 1.644 | 1.4 | 6.4 |
| 11/23/04 19:10 | 26.32 | 43.72 | 44.82 | 28.15 | 1.644 | 0.9 | 7   |
| 11/23/04 19:20 | 26.29 | 43.74 | 44.82 | 28.16 | 1.643 | 1.1 | 6   |
| 11/23/04 19:30 | 26.28 | 43.74 | 44.8  | 28.16 | 1.642 | 0.7 | 6.3 |
| 11/23/04 19:40 | 26.27 | 43.74 | 44.8  | 28.16 | 1.637 | 0.7 | 6   |
| 11/23/04 19:50 | 26.26 | 43.76 | 44.81 | 28.17 | 1.626 | 0.9 | 6.4 |
| 11/23/04 20:00 | 26.27 | 43.81 | 44.87 | 28.21 | 1.616 | 1   | 6.7 |
| 11/23/04 20:10 | 26.27 | 43.78 | 44.84 | 28.19 | 1.593 | 0.8 | 7   |
| 11/23/04 20:20 | 26.2  | 43.66 | 44.66 | 28.11 | 1.571 | 1.2 | 6.3 |
| 11/23/04 20:30 | 26.02 | 43.71 | 44.56 | 28.15 | 1.551 | 1   | 6.7 |
| 11/23/04 20:40 | 25.97 | 43.81 | 44.62 | 28.22 | 1.531 | 0.9 | 6.8 |
| 11/23/04 20:50 | 25.9  | 43.87 | 44.62 | 28.27 | 1.518 | 1.4 | 6.9 |
| 11/23/04 21:00 | 25.8  | 43.89 | 44.56 | 28.28 | 1.498 | 0.6 | 6.2 |
| 11/23/04 21:10 | 25.77 | 43.86 | 44.5  | 28.26 | 1.477 | 0.7 | 6.5 |
| 11/23/04 21:20 | 25.76 | 43.81 | 44.44 | 28.22 | 1.46  | 2.1 | 6.7 |
| 11/23/04 21:30 | 25.73 | 43.78 | 44.39 | 28.2  | 1.445 | 1.1 | 7   |
| 11/23/04 21:40 | 25.74 | 43.7  | 44.32 | 28.15 | 1.423 | 1.2 | 6.5 |

|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/23/04 21:50 | 25.91 | 20.1  | 20.45 | 11.97 | 1.42  | 0.5 | 6   |
| 11/23/04 22:00 | 25.93 | 21.58 | 21.97 | 12.94 | 1.401 | 1   | 5.9 |
| 11/23/04 22:10 | 26    | 19.08 | 19.44 | 11.31 | 1.385 | 0.4 | 5.9 |
| 11/23/04 22:20 | 26.14 | 15.91 | 16.26 | 9.28  | 1.369 | 0.8 | 5.7 |
| 11/23/04 22:30 | 26.14 | 16.5  | 16.86 | 9.65  | 1.352 | 2   | 7.1 |
| 11/23/04 22:40 | 26    | 20.26 | 20.64 | 12.07 | 1.331 | 1.2 | 6.9 |
| 11/23/04 22:50 | 26.09 | 18.41 | 18.79 | 10.88 | 1.307 | 1.5 | 6.6 |
| 11/23/04 23:00 | 26.22 | 15.29 | 15.64 | 8.89  | 1.289 | 2   | 6.2 |
| 11/23/04 23:10 | 26.36 | 14.98 | 15.37 | 8.69  | 1.272 | 1.5 | 6.3 |
| 11/23/04 23:20 | 25.73 | 35.26 | 35.75 | 22.18 | 1.238 | 0.8 | 7   |
| 11/23/04 23:30 | 25.79 | 33.9  | 34.41 | 21.24 | 1.222 | 0.5 | 7.1 |
| 11/23/04 23:40 | 26.26 | 21.8  | 22.33 | 13.08 | 1.215 | 1.4 | 6.5 |
| 11/23/04 23:50 | 25.77 | 30.01 | 30.45 | 18.57 | 1.186 | 0.7 | 6.1 |
| 11/24/04 0:00  | 25.74 | 35.04 | 35.53 | 22.02 | 1.169 | 0.6 | 6   |
| 11/24/04 0:10  | 25.76 | 33.72 | 34.21 | 21.11 | 1.151 | 0.6 | 6   |
| 11/24/04 0:20  | 25.69 | 26.06 | 26.4  | 15.9  | 1.143 | 0.9 | 7.1 |
| 11/24/04 0:30  | 25.7  | 28.86 | 29.24 | 17.79 | 1.126 | 1.7 | 6.7 |
| 11/24/04 0:40  | 25.75 | 28.51 | 28.92 | 17.55 | 1.109 | 1   | 6.8 |
| 11/24/04 0:50  | 25.63 | 27.62 | 27.95 | 16.95 | 1.099 | 0.6 | 6.6 |
| 11/24/04 1:00  | 25.75 | 30.55 | 30.99 | 18.94 | 1.085 | 0.7 | 6.6 |
| 11/24/04 1:10  | 25.58 | 33.04 | 33.41 | 20.65 | 1.075 | 0.6 | 6.1 |
| 11/24/04 1:20  | 25.61 | 32.11 | 32.49 | 20.01 | 1.067 | 0.6 | 6.2 |
| 11/24/04 1:30  | 25.63 | 27.41 | 27.74 | 16.81 | 1.06  | 1   | 6.1 |
| 11/24/04 1:40  | 25.38 | 27.37 | 27.57 | 16.79 | 1.06  | 0.6 | 6.7 |
| 11/24/04 1:50  | 25.44 | 28.28 | 28.52 | 17.4  | 1.052 | 0.6 | 6.8 |
| 11/24/04 2:00  | 25.44 | 28.12 | 28.36 | 17.29 | 1.056 | 1   | 6.7 |
| 11/24/04 2:10  | 25.38 | 30.91 | 31.13 | 19.19 | 1.062 | 0.8 | 6.8 |
| 11/24/04 2:20  | 25.17 | 26.29 | 26.38 | 16.07 | 1.071 | 2   | 6.3 |
| 11/24/04 2:30  | 25.27 | 34.06 | 34.24 | 21.36 | 1.087 | 0.6 | 6.3 |
| 11/24/04 2:40  | 25.16 | 31.34 | 31.44 | 19.48 | 1.103 | 0.9 | 6.7 |
| 11/24/04 2:50  | 25.08 | 35.42 | 35.48 | 22.31 | 1.124 | 0.6 | 6.8 |
| 11/24/04 3:00  | 25.01 | 34.9  | 34.91 | 21.94 | 1.147 | 0.5 | 6.4 |
| 11/24/04 3:10  | 24.87 | 34.66 | 34.57 | 21.78 | 1.185 | 0.4 | 7   |
| 11/24/04 3:20  | 24.8  | 35.85 | 35.72 | 22.61 | 1.208 | 0.6 | 7.5 |
| 11/24/04 3:30  | 24.98 | 28.25 | 28.24 | 17.39 | 1.235 | 0.8 | 7.2 |
| 11/24/04 3:40  | 24.84 | 31.37 | 31.27 | 19.51 | 1.251 | 0.5 | 6.7 |
| 11/24/04 3:50  | 25.87 | 15.39 | 15.65 | 8.95  | 1.285 | 0.7 | 6.2 |
| 11/24/04 4:00  | 25.54 | 16.59 | 16.76 | 9.72  | 1.3   | 1.4 | 6.2 |
| 11/24/04 4:10  | 25.06 | 19.3  | 19.32 | 11.46 | 1.323 | 0.9 | 6.8 |
| 11/24/04 4:20  | 24.95 | 23.67 | 23.65 | 14.32 | 1.344 | 0.6 | 6.6 |
| 11/24/04 4:30  | 24.97 | 20.1  | 20.09 | 11.98 | 1.374 | 0.8 | 6.2 |
| 11/24/04 4:40  | 24.8  | 34.88 | 34.75 | 21.93 | 1.389 | 1.2 | 6.8 |
| 11/24/04 4:50  | 24.43 | 43.49 | 43.01 | 28.02 | 1.408 | 1.8 | 7.2 |
| 11/24/04 5:00  | 24.41 | 43.82 | 43.33 | 28.26 | 1.433 | 1.9 | 7.8 |
| 11/24/04 5:10  | 24.39 | 43.91 | 43.4  | 28.32 | 1.456 | 2   | 7.7 |
| 11/24/04 5:20  | 24.38 | 44.08 | 43.56 | 28.45 | 1.482 | 1.9 | 7.7 |
| 11/24/04 5:30  | 24.37 | 44.32 | 43.79 | 28.62 | 1.51  | 2   | 7.8 |

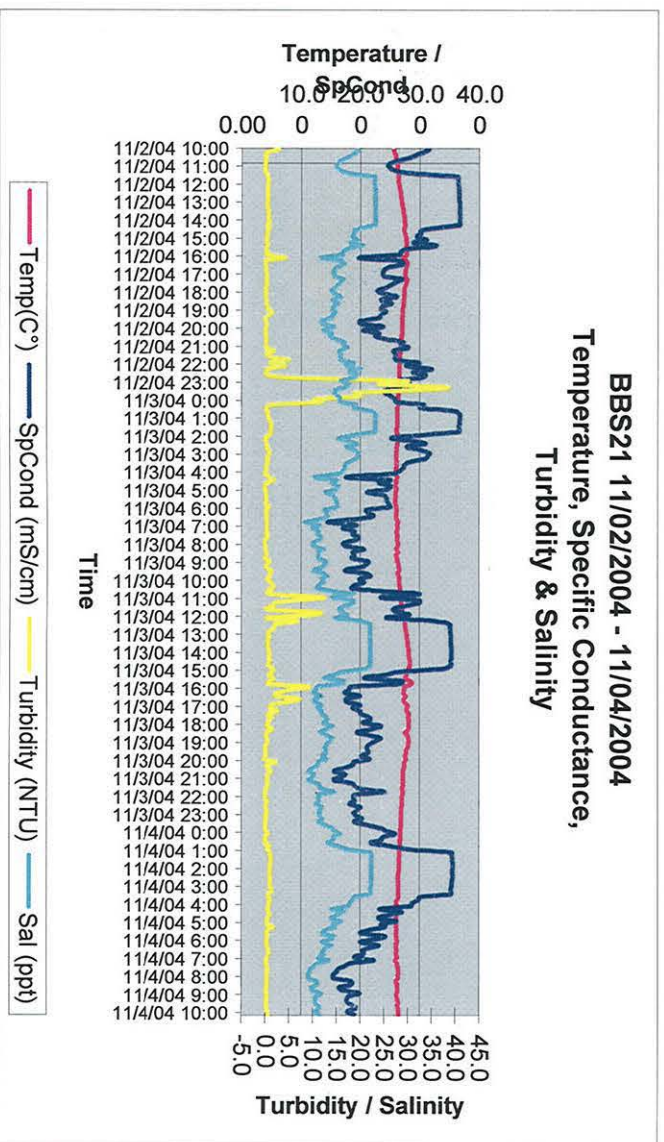
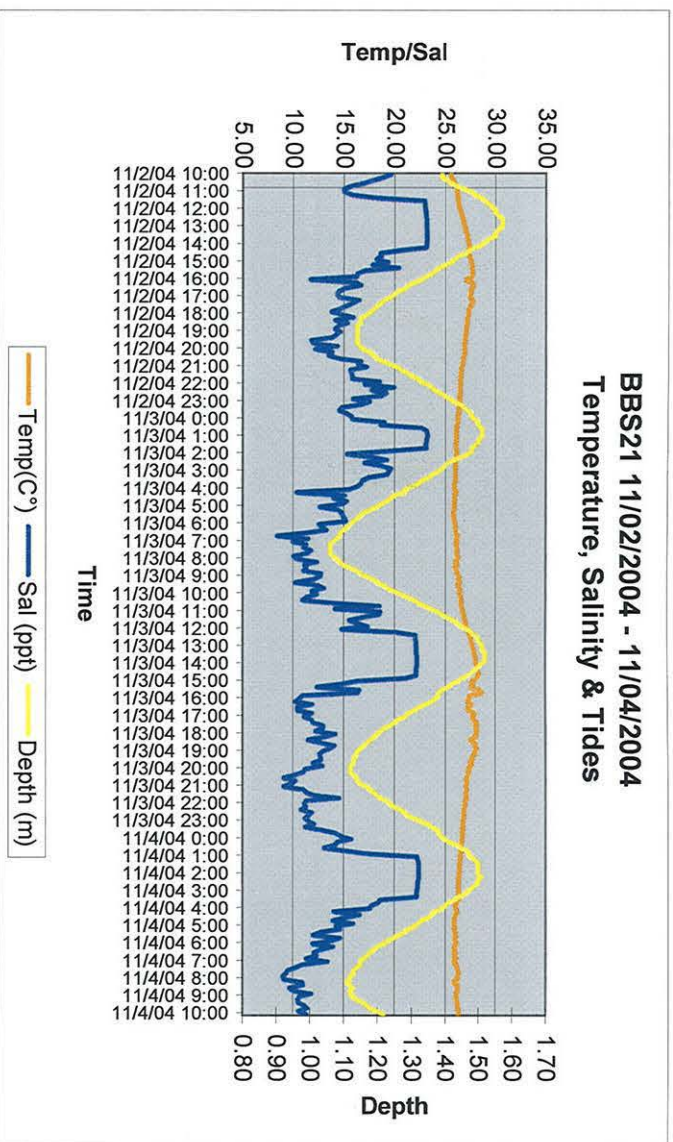
|                |       |       |       |       |       |     |     |
|----------------|-------|-------|-------|-------|-------|-----|-----|
| 11/24/04 5:40  | 24.36 | 44.49 | 43.95 | 28.75 | 1.534 | 2.5 | 7.8 |
| 11/24/04 5:50  | 24.36 | 44.7  | 44.15 | 28.89 | 1.566 | 1.8 | 7.1 |
| 11/24/04 6:00  | 24.36 | 44.79 | 44.23 | 28.96 | 1.59  | 2.5 | 7.5 |
| 11/24/04 6:10  | 24.34 | 44.83 | 44.27 | 28.99 | 1.61  | 1.4 | 7.2 |
| 11/24/04 6:20  | 24.34 | 44.86 | 44.29 | 29.01 | 1.631 | 1.3 | 7.5 |
| 11/24/04 6:30  | 24.32 | 44.95 | 44.37 | 29.07 | 1.655 | 1.7 | 7.6 |
| 11/24/04 6:40  | 24.3  | 44.99 | 44.4  | 29.11 | 1.673 | 1.2 | 6.8 |
| 11/24/04 6:50  | 24.28 | 45.06 | 44.45 | 29.16 | 1.709 | 1.4 | 8.3 |
| 11/24/04 7:00  | 24.26 | 45.12 | 44.48 | 29.2  | 1.727 | 1.7 | 6   |
| 11/24/04 7:10  | 24.25 | 45.13 | 44.49 | 29.21 | 1.745 | 1.7 | 6.6 |
| 11/24/04 7:20  | 24.24 | 45.11 | 44.45 | 29.19 | 1.744 | 1.3 | 7.4 |
| 11/24/04 7:30  | 24.23 | 45.11 | 44.45 | 29.19 | 1.753 | 1.5 | 7.4 |
| 11/24/04 7:40  | 24.23 | 45.16 | 44.49 | 29.23 | 1.766 | 1.5 | 6.6 |
| 11/24/04 7:50  | 24.23 | 45.21 | 44.54 | 29.26 | 1.769 | 1.3 | 6.2 |
| 11/24/04 8:00  | 24.24 | 45.28 | 44.62 | 29.31 | 1.769 | 1.4 | 6.5 |
| 11/24/04 8:10  | 24.25 | 45.3  | 44.64 | 29.33 | 1.754 | 1.4 | 6.1 |
| 11/24/04 8:20  | 24.25 | 45.3  | 44.65 | 29.33 | 1.741 | 1   | 6.8 |
| 11/24/04 8:30  | 24.27 | 45.22 | 44.58 | 29.27 | 1.72  | 1.2 | 6.6 |
| 11/24/04 8:40  | 24.27 | 45.24 | 44.61 | 29.29 | 1.706 | 1.2 | 6.3 |
| 11/24/04 8:50  | 24.27 | 45.22 | 44.58 | 29.27 | 1.689 | 1.7 | 6.8 |
| 11/24/04 9:00  | 24.28 | 45.17 | 44.55 | 29.24 | 1.676 | 3.6 | 6.7 |
| 11/24/04 9:10  | 24.29 | 45.13 | 44.52 | 29.21 | 1.65  | 1.7 | 6.9 |
| 11/24/04 9:20  | 24.3  | 45.15 | 44.55 | 29.22 | 1.638 | 1.7 | 6.7 |
| 11/24/04 9:30  | 24.3  | 45.2  | 44.6  | 29.26 | 1.623 | 1.4 | 6.7 |
| 11/24/04 9:40  | 24.28 | 45.17 | 44.55 | 29.24 | 1.614 | 1.5 | 6.3 |
| 11/24/04 9:50  | 24.26 | 45.09 | 44.45 | 29.18 | 1.606 | 1.4 | 6.9 |
| 11/24/04 10:00 | 24.26 | 45.11 | 44.47 | 29.19 | 1.601 | 1.8 | 7.2 |

NOTE: All of the following graphs were prepared by H. Casanova of NOAA-AOML.

### Graph data for 10/28/2004

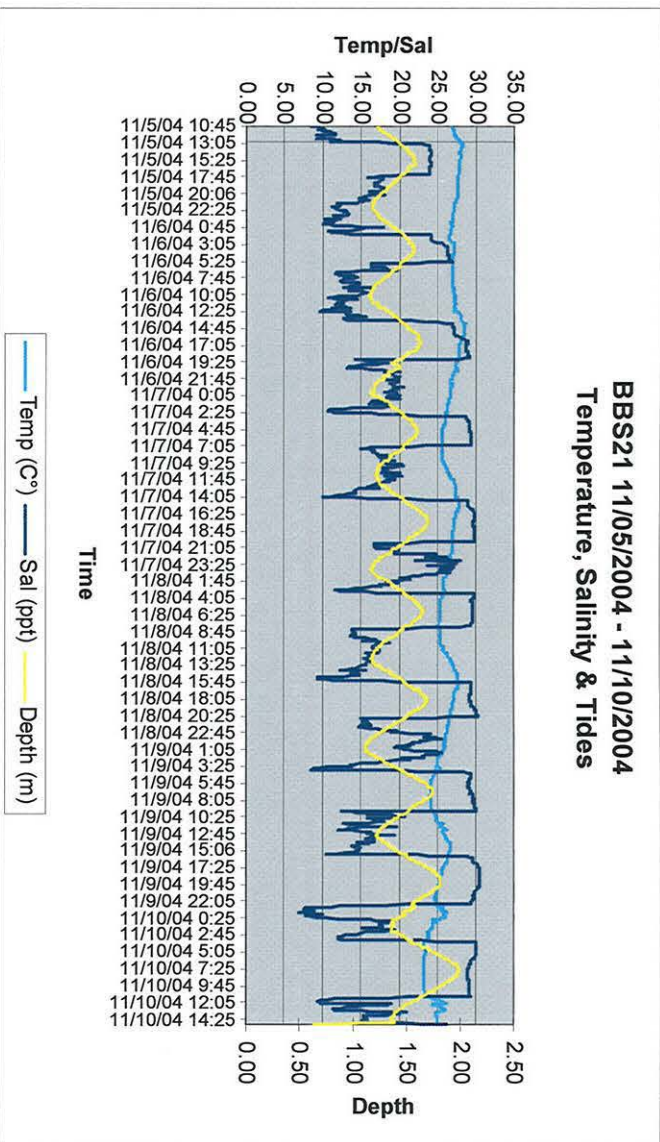


# Graph data for 11/02/2004 to 11/04/2004

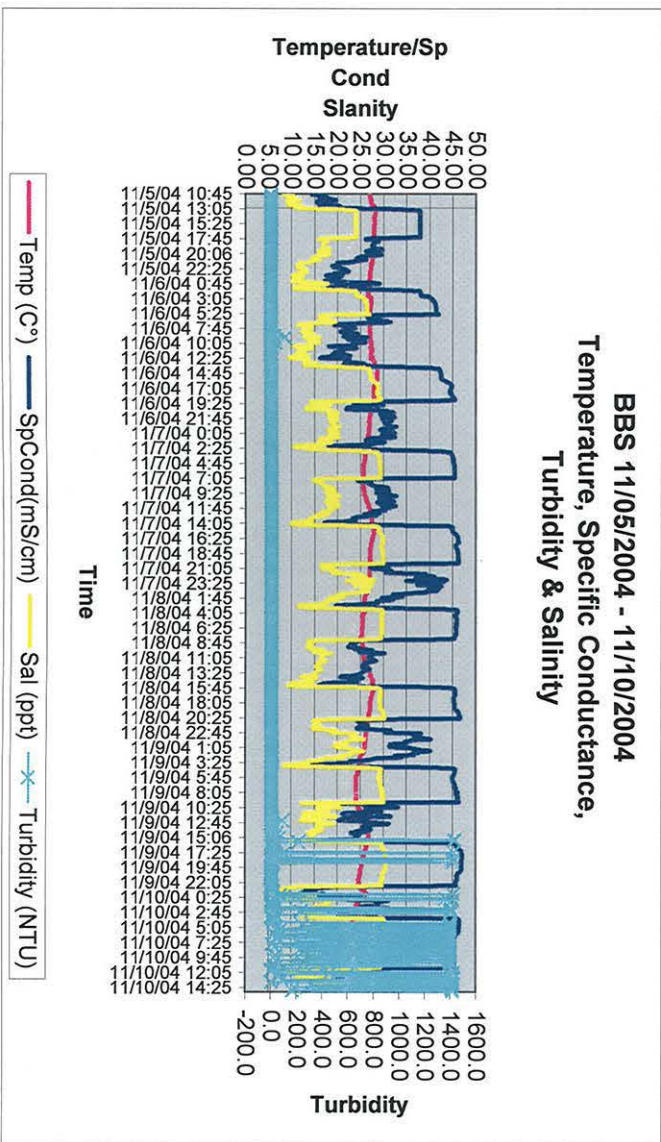


Graph data for 11/05/2004 to 11/10/2004

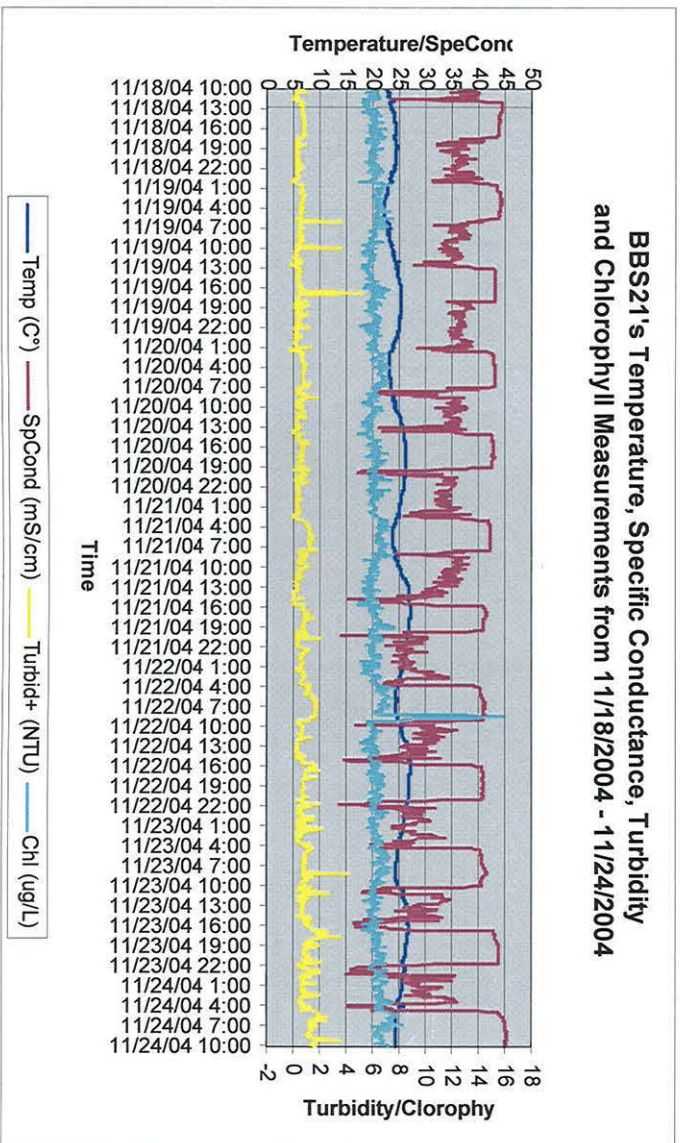
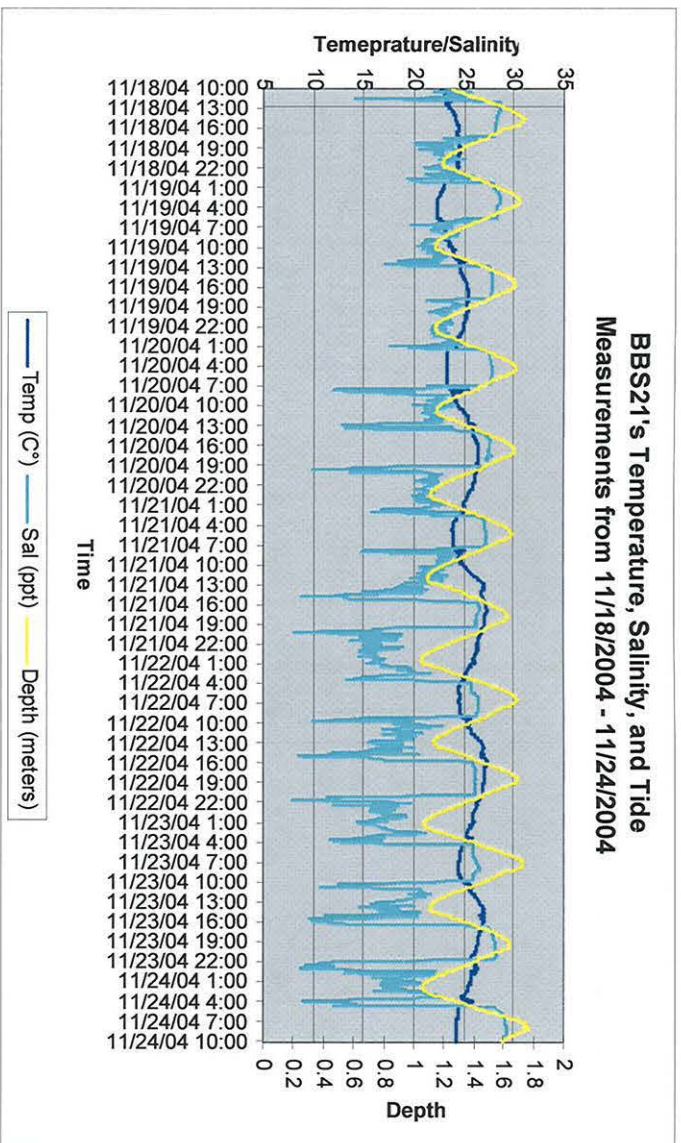
# BBS21 11/05/2004 - 11/10/2004 Temperature, Salinity & Tides



## BBS 11/05/2004 - 11/10/2004 Temperature, Specific Conductance, Turbidity & Salinity



# Graph data for 11/018/2004 to 11/24/2004



**YSI data collected on BBS22 ("Ricisak") after completion of project:**

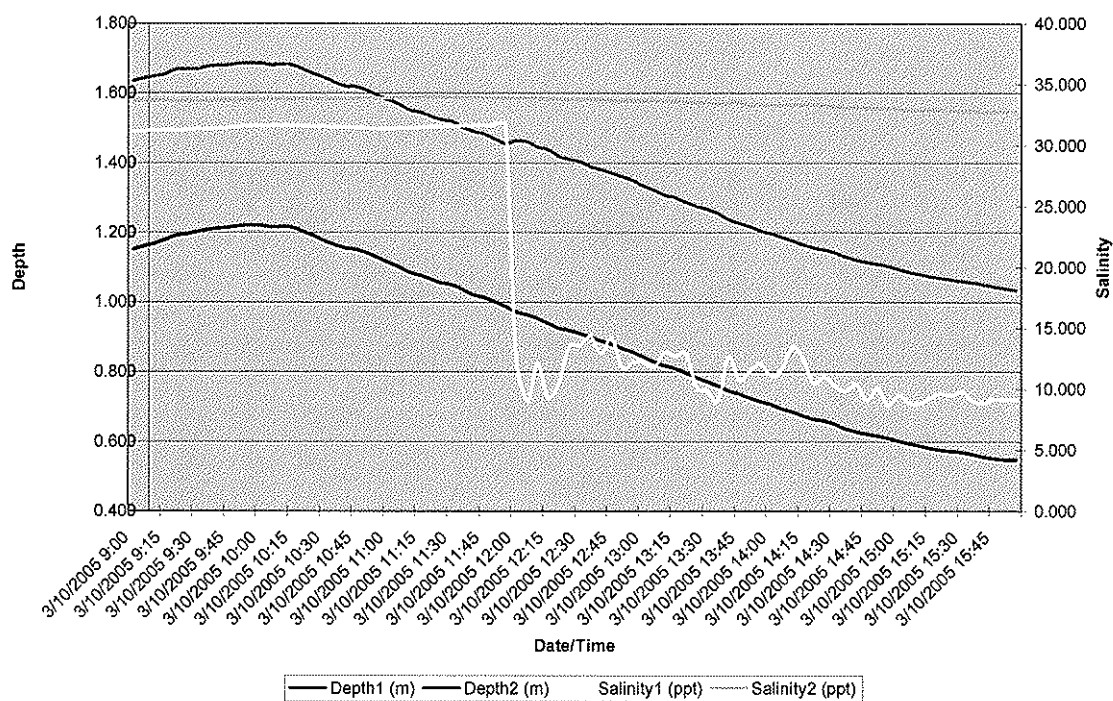
| <b>Date/<br/>Time</b> | <b>Temp<br/>(C°)</b> | <b>SpCond<br/>(mS/cm)</b> | <b>Pressure<br/>(psia)</b> | <b>Depth<br/>(m)</b> | <b>ORP<br/>(mV)</b> | <b>Turbidity<br/>(NTU)</b> | <b>Chlorophyll<br/>(ug/L)</b> | <b>Salinity<br/>(ppt)</b> | <b>TDS<br/>(g/L)</b> |
|-----------------------|----------------------|---------------------------|----------------------------|----------------------|---------------------|----------------------------|-------------------------------|---------------------------|----------------------|
| 3/10/2005<br>9:01     | 15.540               | 0.002                     | 14.780                     | 0.067                | 2000.000            | 7.100                      | 0.100                         | 0.000                     | 0.001                |
| 3/10/2005<br>9:06     | 16.590               | 47.823                    | 15.290                     | 0.418                | 538.000             | 0.200                      | 13.100                        | 31.200                    | 31.085               |
| 3/10/2005<br>9:11     | 16.660               | 47.881                    | 17.070                     | 1.649                | 301.000             | 0.700                      | 2.300                         | 31.250                    | 31.122               |
| 3/10/2005<br>9:16     | 16.730               | 47.918                    | 17.080                     | 1.655                | 250.000             | 1.500                      | 1.100                         | 31.270                    | 31.147               |
| 3/10/2005<br>9:21     | 16.790               | 47.956                    | 17.100                     | 1.668                | 241.000             | 0.400                      | 1.000                         | 31.300                    | 31.171               |
| 3/10/2005<br>9:26     | 16.870               | 47.943                    | 17.100                     | 1.669                | 239.000             | 0.400                      | 1.100                         | 31.290                    | 31.163               |
| 3/10/2005<br>9:31     | 16.940               | 47.962                    | 17.100                     | 1.669                | 239.000             | 0.400                      | 0.500                         | 31.310                    | 31.175               |
| 3/10/2005<br>9:36     | 17.010               | 48.021                    | 17.110                     | 1.677                | 240.000             | 0.400                      | 1.100                         | 31.350                    | 31.213               |
| 3/10/2005<br>9:41     | 17.080               | 48.094                    | 17.120                     | 1.680                | 241.000             | 0.400                      | 1.200                         | 31.410                    | 31.261               |
| 3/10/2005<br>9:46     | 17.130               | 48.175                    | 17.120                     | 1.681                | 243.000             | 0.400                      | 1.200                         | 31.470                    | 31.314               |
| 3/10/2005<br>9:51     | 17.160               | 48.284                    | 17.130                     | 1.686                | 244.000             | 0.400                      | 1.600                         | 31.550                    | 31.385               |
| 3/10/2005<br>9:56     | 17.210               | 48.345                    | 17.130                     | 1.687                | 245.000             | 0.400                      | 1.300                         | 31.590                    | 31.424               |
| 3/10/2005<br>10:01    | 17.270               | 48.411                    | 17.130                     | 1.687                | 246.000             | 0.300                      | 1.600                         | 31.640                    | 31.467               |
| 3/10/2005<br>10:06    | 17.320               | 48.396                    | 17.120                     | 1.681                | 247.000             | 0.400                      | 1.500                         | 31.630                    | 31.458               |
| 3/10/2005<br>10:11    | 17.390               | 48.408                    | 17.120                     | 1.683                | 249.000             | 0.400                      | 1.000                         | 31.640                    | 31.465               |
| 3/10/2005<br>10:16    | 17.460               | 48.403                    | 17.120                     | 1.681                | 251.000             | 0.400                      | 1.000                         | 31.640                    | 31.462               |
| 3/10/2005<br>10:21    | 17.530               | 48.372                    | 17.100                     | 1.669                | 252.000             | 0.400                      | 1.300                         | 31.610                    | 31.442               |
| 3/10/2005<br>10:26    | 17.600               | 48.341                    | 17.080                     | 1.655                | 253.000             | 0.300                      | 1.200                         | 31.590                    | 31.422               |
| 3/10/2005<br>10:31    | 17.650               | 48.339                    | 17.070                     | 1.645                | 255.000             | 0.400                      | 1.500                         | 31.590                    | 31.421               |
| 3/10/2005<br>10:36    | 17.680               | 48.261                    | 17.050                     | 1.631                | 256.000             | 0.500                      | 1.800                         | 31.530                    | 31.370               |
| 3/10/2005<br>10:41    | 17.680               | 48.195                    | 17.030                     | 1.620                | 257.000             | 1.000                      | 0.600                         | 31.480                    | 31.326               |
| 3/10/2005<br>10:46    | 17.690               | 48.151                    | 17.030                     | 1.619                | 258.000             | 0.400                      | 1.200                         | 31.450                    | 31.298               |
| 3/10/2005<br>10:51    | 17.710               | 48.170                    | 17.020                     | 1.609                | 259.000             | 0.300                      | 1.000                         | 31.470                    | 31.311               |
| 3/10/2005             | 17.760               | 48.109                    | 17.000                     | 1.595                | 260.000             | 0.400                      | 1.700                         | 31.420                    | 31.271               |

|                    |        |        |        |       |         |       |       |        |        |
|--------------------|--------|--------|--------|-------|---------|-------|-------|--------|--------|
| 10:56              |        |        |        |       |         |       |       |        |        |
| 3/10/2005<br>11:01 | 17.800 | 48.070 | 16.980 | 1.582 | 261.000 | 0.400 | 1.700 | 31.390 | 31.246 |
| 3/10/2005<br>11:06 | 17.870 | 48.120 | 16.960 | 1.569 | 262.000 | 0.400 | 1.500 | 31.430 | 31.278 |
| 3/10/2005<br>11:11 | 17.940 | 48.168 | 16.930 | 1.553 | 263.000 | 0.800 | 1.900 | 31.470 | 31.309 |
| 3/10/2005<br>11:16 | 18.060 | 48.199 | 16.920 | 1.545 | 265.000 | 0.400 | 1.100 | 31.490 | 31.329 |
| 3/10/2005<br>11:21 | 18.130 | 48.292 | 16.910 | 1.535 | 267.000 | 0.300 | 1.000 | 31.560 | 31.390 |
| 3/10/2005<br>11:26 | 18.170 | 48.311 | 16.890 | 1.524 | 269.000 | 0.400 | 1.200 | 31.570 | 31.402 |
| 3/10/2005<br>11:31 | 18.240 | 48.359 | 16.890 | 1.520 | 271.000 | 0.400 | 1.400 | 31.610 | 31.434 |
| 3/10/2005<br>11:36 | 18.300 | 48.404 | 16.860 | 1.504 | 274.000 | 0.300 | 0.800 | 31.640 | 31.462 |
| 3/10/2005<br>11:41 | 18.370 | 48.390 | 16.840 | 1.491 | 275.000 | 0.400 | 1.000 | 31.630 | 31.453 |
| 3/10/2005<br>11:46 | 18.420 | 48.434 | 16.830 | 1.483 | 278.000 | 0.300 | 1.800 | 31.660 | 31.482 |
| 3/10/2005<br>11:51 | 18.510 | 48.484 | 16.810 | 1.470 | 280.000 | 0.300 | 0.900 | 31.700 | 31.514 |
| 3/10/2005<br>11:56 | 18.570 | 48.493 | 16.790 | 1.456 | 283.000 | 0.200 | 1.000 | 31.710 | 31.521 |
| 3/10/2005<br>12:01 | 23.040 | 21.479 | 16.770 | 1.464 | 284.000 | 0.400 | 1.300 | 12.900 | 13.961 |
| 3/10/2005<br>12:06 | 23.550 | 15.536 | 16.760 | 1.461 | 296.000 | 0.300 | 1.000 | 9.070  | 10.098 |
| 3/10/2005<br>12:11 | 23.700 | 20.320 | 16.750 | 1.446 | 310.000 | 0.200 | 1.200 | 12.140 | 13.208 |
| 3/10/2005<br>12:16 | 23.950 | 15.993 | 16.730 | 1.439 | 323.000 | 0.100 | 1.300 | 9.360  | 10.395 |
| 3/10/2005<br>12:21 | 23.600 | 17.814 | 16.710 | 1.421 | 329.000 | 0.300 | 0.900 | 10.520 | 11.579 |
| 3/10/2005<br>12:26 | 23.450 | 22.493 | 16.700 | 1.411 | 325.000 | 0.400 | 1.300 | 13.560 | 14.620 |
| 3/10/2005<br>12:31 | 22.600 | 22.673 | 16.690 | 1.404 | 321.000 | 0.100 | 1.500 | 13.690 | 14.737 |
| 3/10/2005<br>12:36 | 22.920 | 23.730 | 16.670 | 1.390 | 322.000 | 0.000 | 1.400 | 14.390 | 15.425 |
| 3/10/2005<br>12:41 | 23.480 | 21.661 | 16.660 | 1.382 | 325.000 | 0.100 | 1.500 | 13.020 | 14.080 |
| 3/10/2005<br>12:46 | 23.290 | 23.590 | 16.640 | 1.371 | 327.000 | 0.100 | 1.700 | 14.290 | 15.333 |
| 3/10/2005<br>12:51 | 23.530 | 19.832 | 16.620 | 1.361 | 334.000 | 0.000 | 1.500 | 11.820 | 12.891 |
| 3/10/2005<br>12:56 | 23.730 | 20.510 | 16.610 | 1.350 | 344.000 | 0.000 | 1.600 | 12.260 | 13.332 |
| 3/10/2005<br>13:01 | 23.280 | 20.597 | 16.590 | 1.334 | 351.000 | 0.200 | 2.100 | 12.320 | 13.388 |
| 3/10/2005<br>13:06 | 23.490 | 19.869 | 16.570 | 1.322 | 359.000 | 0.800 | 2.000 | 11.850 | 12.915 |
| 3/10/2005<br>13:11 | 23.650 | 21.717 | 16.550 | 1.309 | 366.000 | 0.000 | 2.500 | 13.050 | 14.116 |

|                    |        |        |        |       |         |       |        |        |        |
|--------------------|--------|--------|--------|-------|---------|-------|--------|--------|--------|
| 3/10/2005<br>13:16 | 23.700 | 21.178 | 16.540 | 1.301 | 372.000 | 0.600 | 2.800  | 12.700 | 13.766 |
| 3/10/2005<br>13:21 | 23.530 | 21.518 | 16.520 | 1.287 | 378.000 | 0.100 | 4.900  | 12.920 | 13.987 |
| 3/10/2005<br>13:26 | 24.040 | 17.265 | 16.500 | 1.276 | 383.000 | 2.100 | 3.500  | 10.160 | 11.222 |
| 3/10/2005<br>13:31 | 24.050 | 16.881 | 16.490 | 1.267 | 387.000 | 0.200 | 4.400  | 9.920  | 10.973 |
| 3/10/2005<br>13:36 | 24.240 | 15.514 | 16.470 | 1.256 | 390.000 | 1.600 | 2.900  | 9.050  | 10.084 |
| 3/10/2005<br>13:41 | 24.180 | 21.182 | 16.450 | 1.238 | 393.000 | 0.400 | 3.800  | 12.700 | 13.768 |
| 3/10/2005<br>13:46 | 23.890 | 18.241 | 16.430 | 1.228 | 394.000 | 4.800 | 4.700  | 10.790 | 11.856 |
| 3/10/2005<br>13:51 | 23.980 | 19.412 | 16.420 | 1.217 | 395.000 | 0.800 | 4.400  | 11.550 | 12.618 |
| 3/10/2005<br>13:56 | 23.870 | 20.360 | 16.400 | 1.206 | 396.000 | 0.600 | 8.000  | 12.160 | 13.234 |
| 3/10/2005<br>14:01 | 24.050 | 18.698 | 16.390 | 1.198 | 398.000 | 0.000 | 8.800  | 11.080 | 12.154 |
| 3/10/2005<br>14:06 | 24.010 | 19.634 | 16.380 | 1.188 | 400.000 | 0.200 | 10.900 | 11.690 | 12.762 |
| 3/10/2005<br>14:11 | 23.790 | 22.431 | 16.360 | 1.176 | 403.000 | 0.600 | 12.300 | 13.520 | 14.580 |
| 3/10/2005<br>14:16 | 24.060 | 20.916 | 16.350 | 1.166 | 405.000 | 0.500 | 5.000  | 12.520 | 13.595 |
| 3/10/2005<br>14:21 | 24.160 | 17.876 | 16.330 | 1.157 | 407.000 | 1.200 | 7.100  | 10.550 | 11.619 |
| 3/10/2005<br>14:26 | 23.970 | 18.623 | 16.320 | 1.151 | 410.000 | 0.300 | 9.000  | 11.040 | 12.105 |
| 3/10/2005<br>14:31 | 24.290 | 17.478 | 16.310 | 1.143 | 412.000 | 1.300 | 19.100 | 10.300 | 11.360 |
| 3/10/2005<br>14:36 | 24.420 | 16.799 | 16.290 | 1.131 | 415.000 | 0.300 | 6.000  | 9.860  | 10.919 |
| 3/10/2005<br>14:41 | 24.320 | 17.760 | 16.280 | 1.122 | 417.000 | 0.000 | 4.900  | 10.480 | 11.544 |
| 3/10/2005<br>14:46 | 24.380 | 15.636 | 16.270 | 1.115 | 420.000 | 0.300 | 6.800  | 9.130  | 10.163 |
| 3/10/2005<br>14:51 | 24.330 | 17.234 | 16.260 | 1.110 | 421.000 | 0.100 | 6.900  | 10.140 | 11.202 |
| 3/10/2005<br>14:56 | 24.480 | 14.921 | 16.250 | 1.104 | 423.000 | 0.400 | 5.000  | 8.670  | 9.699  |
| 3/10/2005<br>15:01 | 24.490 | 16.371 | 16.240 | 1.095 | 425.000 | 0.400 | 4.000  | 9.590  | 10.641 |
| 3/10/2005<br>15:06 | 24.510 | 15.301 | 16.230 | 1.087 | 427.000 | 0.600 | 4.600  | 8.910  | 9.945  |
| 3/10/2005<br>15:11 | 24.390 | 15.156 | 16.220 | 1.081 | 429.000 | 0.400 | 4.900  | 8.820  | 9.851  |
| 3/10/2005<br>15:16 | 24.470 | 15.948 | 16.210 | 1.074 | 431.000 | 0.600 | 6.900  | 9.320  | 10.366 |
| 3/10/2005<br>15:21 | 24.480 | 16.451 | 16.200 | 1.069 | 432.000 | 0.800 | 7.400  | 9.640  | 10.693 |
| 3/10/2005<br>15:26 | 24.440 | 16.278 | 16.200 | 1.064 | 432.000 | 0.400 | 5.600  | 9.530  | 10.581 |
| 3/10/2005          | 24.480 | 16.734 | 16.190 | 1.060 | 435.000 | 0.900 | 4.200  | 9.820  | 10.877 |

|           |        |        |        |       |         |       |       |        |        |
|-----------|--------|--------|--------|-------|---------|-------|-------|--------|--------|
| 15:31     |        |        |        |       |         |       |       |        |        |
| 3/10/2005 |        |        |        |       |         |       |       |        |        |
| 15:36     | 24.510 | 15.507 | 16.190 | 1.056 | 437.000 | 1.500 | 2.800 | 9.040  | 10.079 |
| 3/10/2005 |        |        |        |       |         |       |       |        |        |
| 15:41     | 24.550 | 15.237 | 16.180 | 1.050 | 437.000 | 0.900 | 3.400 | 8.870  | 9.904  |
| 3/10/2005 |        |        |        |       |         |       |       |        |        |
| 15:46     | 24.590 | 15.719 | 16.170 | 1.045 | 439.000 | 2.800 | 4.400 | 9.180  | 10.217 |
| 3/10/2005 |        |        |        |       |         |       |       |        |        |
| 15:51     | 23.240 | 35.355 | 14.750 | 0.050 | 449.000 | 4.000 | 1.400 | 22.290 | 22.981 |
| 3/10/2005 |        |        |        |       |         |       |       |        |        |
| 15:56     | 23.200 | 35.317 | 14.750 | 0.050 | 457.000 | 3.900 | 1.400 | 22.260 | 22.956 |

Salinity vs Calculated Depth



## **Appendix 4: Nutrient Analyses**

**Date Collected: 04/25/04**

**Date Analyzed: 04/30/04**

Units in Micromoles ( $\mu\text{M}$ )

| Station  | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2$ | $\text{NO}_2$ | $\text{PO}_4$ | Si   | $\text{NH}_4$ |
|----------|-------------|-------------|----------|---------------------------|---------------|---------------|------|---------------|
| BBSW-21A | 80°18'25.8" | 25°36'23.2" | 27.5     | 0.13                      | 0.05          | 0.07          | 13.7 | 4.8           |
| BBSW-21B | 80°18'25.8" | 25°36'23.2" | 21       | BDL                       | 0.05          | 0.05          | 27.2 | 7.1           |
| BBSW-21C | 80°18'25.8" | 25°36'23.2" | 25       | BDL                       | 0.06          | 0.06          | 14.6 | 5.2           |
| BBSW-21D | 80°18'25.8" | 25°36'23.2" | 23       | BDL                       | 0.04          | 0.06          | 25   | 7             |
| BBSW-21E | 80°18'25.8" | 25°36'23.2" | 21       | BDL                       | 0.04          | 0.06          | 31.5 | 7.1           |
| BBSW-22A | 80°18'26.7" | 25°36'21.8" | 24.5     | BDL                       | 0.05          | 0.09          | 19.3 | 5.3           |
| BBSW-22B | 80°18'26.7" | 25°36'21.8" | 9        | BDL                       | 0.05          | 1.5           | 69.5 | 75.8          |
| BBSW-22C | 80°18'26.7" | 25°36'21.8" | 6        | BDL                       | 0.03          | 0.46          | 68.4 | 16.8          |

\*BDL = Below Detection Limit

Units in mg-L Nitrogen, Phosphorus & Silica (Atoms)

| Station  | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2\text{-N}$ | $\text{NO}_2\text{-N}$ | $\text{PO}_4\text{-P}$ | Si    | $\text{NH}_4\text{-N}$ |
|----------|-------------|-------------|----------|------------------------------------|------------------------|------------------------|-------|------------------------|
| BBSW-21A | 80°18'25.8" | 25°36'23.2" | 27.5     | 0.004                              | 0.0007                 | 0.002                  | 0.384 | 0.067                  |
| BBSW-21B | 80°18'25.8" | 25°36'23.2" | 21       | BDL                                | 0.0007                 | 0.001                  | 0.762 | 0.99                   |
| BBSW-21C | 80°18'25.8" | 25°36'23.2" | 25       | BDL                                | 0.0008                 | 0.002                  | 0.409 | 0.073                  |
| BBSW-21D | 80°18'25.8" | 25°36'23.2" | 23       | BDL                                | 0.0006                 | 0.002                  | 0.700 | 0.098                  |
| BBSW-21E | 80°18'25.8" | 25°36'23.2" | 21       | BDL                                | 0.0006                 | 0.002                  | 0.882 | 0.099                  |
| BBSW-22A | 80°18'26.7" | 25°36'21.8" | 24.5     | BDL                                | 0.0007                 | 0.003                  | 0.540 | 0.074                  |
| BBSW-22B | 80°18'26.7" | 25°36'21.8" | 9        | BDL                                | 0.0007                 | 0.05                   | 1.946 | 1.061                  |
| BBSW-22C | 80°18'26.7" | 25°36'21.8" | 6        | BDL                                | 0.0004                 | 0.01                   | 1.915 | 0.235                  |

\*BDL = Below Detection Limit

Units in mg-L Nitrate + Nitrite, Nitrite, Phosphate, Silica & Ammonium (Compounds)

| Station  | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2$ | $\text{NO}_2$ | $\text{PO}_4$ | Si    | $\text{NH}_4$ |
|----------|-------------|-------------|----------|---------------------------|---------------|---------------|-------|---------------|
| BBSW-21A | 80°18'25.8" | 25°36'23.2" | 27.5     | 0.014                     | 0.002         | 0.007         | 0.384 | 0.086         |
| BBSW-21B | 80°18'25.8" | 25°36'23.2" | 21       | BDL                       | 0.002         | 0.005         | 0.762 | 0.128         |
| BBSW-21C | 80°18'25.8" | 25°36'23.2" | 25       | BDL                       | 0.003         | 0.006         | 0.409 | 0.094         |
| BBSW-21D | 80°18'25.8" | 25°36'23.2" | 23       | BDL                       | 0.002         | 0.006         | 0.700 | 0.126         |
| BBSW-21E | 80°18'25.8" | 25°36'23.2" | 21       | BDL                       | 0.002         | 0.006         | 0.882 | 0.0128        |
| BBSW-22A | 80°18'26.7" | 25°36'21.8" | 24.5     | BDL                       | 0.002         | 0.008         | 0.540 | 0.095         |
| BBSW-22B | 80°18'26.7" | 25°36'21.8" | 9        | BDL                       | 0.002         | 0.142         | 1.946 | 1.364         |
| BBSW-22C | 80°18'26.7" | 25°36'21.8" | 6        | BDL                       | 0.001         | 0.043         | 1.915 | 0.302         |

\*BDL = Below Detection Limit

**Date Collected: 07/08/04**

**Date Analyzed: 07/28/04**

Units in Micromoles ( $\mu\text{M}$ )

| Station | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2$ | $\text{NO}_2$ | $\text{PO}_4$ | Si   | $\text{NH}_4$ |
|---------|-------------|-------------|----------|---------------------------|---------------|---------------|------|---------------|
| BBSW-21 | 80°18'26.7" | 25°36'21.9" | N/A      | 0.58                      | BDL           | 0.52          | 57.8 | BDL           |
| BBSW-22 | 80°18'27.4" | 25°36'20.5" | N/A      | 0.28                      | 0.01          | 1.3           | 67.7 | 6.9           |
| BBSW-26 | 80°18'28.2" | 25°36'22.0" | N/A      | 0.4                       | 0.19          | 0.53          | 56.1 | 4.4           |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |

\*BDL = Below Detection Limit

Units in mg-L Nitrogen, Phosphorus & Silica (Atoms)

| Station | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2\text{-N}$ | $\text{NO}_2\text{-N}$ | $\text{PO}_4\text{-P}$ | Si    | $\text{NH}_4\text{-N}$ |
|---------|-------------|-------------|----------|------------------------------------|------------------------|------------------------|-------|------------------------|
| BBSW-21 | 80°18'26.7" | 25°36'21.9" | N/A      | 0.016                              | BDL                    | 0.016                  | 1.618 | BDL                    |
| BBSW-22 | 80°18'27.4" | 25°36'20.5" | N/A      | 0.008                              | 0.0001                 | 0.040                  | 1.895 | 0.097                  |
| BBSW-26 | 80°18'28.2" | 25°36'22.0" | N/A      | 0.011                              | 0.003                  | 0.016                  | 1.571 | 0.062                  |
|         |             |             |          |                                    |                        |                        |       |                        |
|         |             |             |          |                                    |                        |                        |       |                        |
|         |             |             |          |                                    |                        |                        |       |                        |
|         |             |             |          |                                    |                        |                        |       |                        |
|         |             |             |          |                                    |                        |                        |       |                        |

\*BDL = Below Detection Limit

Units in mg-L Nitrate + Nitrite, Nitrite, Phosphate, Silica & Ammonium (Compounds)

| Station | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2$ | $\text{NO}_2$ | $\text{PO}_4$ | Si    | $\text{NH}_4$ |
|---------|-------------|-------------|----------|---------------------------|---------------|---------------|-------|---------------|
| BBSW-21 | 80°18'26.7" | 25°36'21.9" | N/A      | 0.063                     | BDL           | 0.049         | 1.618 | BDL           |
| BBSW-22 | 80°18'27.4" | 25°36'20.5" | N/A      | 0.030                     | 0.0005        | 0.123         | 1.895 | 0.124         |
| BBSW-26 | 80°18'28.2" | 25°36'22.0" | N/A      | 0.043                     | 0.009         | 0.050         | 1.571 | 0.079         |
|         |             |             |          |                           |               |               |       |               |
|         |             |             |          |                           |               |               |       |               |
|         |             |             |          |                           |               |               |       |               |
|         |             |             |          |                           |               |               |       |               |
|         |             |             |          |                           |               |               |       |               |

\*BDL = Below Detection Limit

\* $\text{NO}_3+\text{NO}_2$ ,  $\text{PO}_4$  and Si were run on the autoanalyzer

\* $\text{NO}_2$  and  $\text{NH}_4$  were run on the UV-VIS Spec.

**Date Collected: 08/23/04**

**Date Analyzed: 09/13/04**

Units in Micromoles ( $\mu\text{M}$ )

| Station | Long                  | Lat                   | Salinity | $\text{NO}_3+\text{NO}_2$ | $\text{NO}_2$ | $\text{PO}_4$ | Si   | $\text{NH}_4$ |
|---------|-----------------------|-----------------------|----------|---------------------------|---------------|---------------|------|---------------|
| BBSW-37 | $80^{\circ}18'17.6''$ | $25^{\circ}36'55.6''$ | N/A      | 0.72                      | 0.25          | 0.20          | 68.2 | 7.8           |
| BBSW-40 | $80^{\circ}18'19.5''$ | $25^{\circ}36'55.9''$ | N/A      | 0.34                      | 0.17          | 0.58          | 44.7 | 12.8          |
| BBSW-43 | $80^{\circ}18'18.4''$ | $25^{\circ}36'57.1''$ | N/A      | 0.34                      | 0.18          | 0.41          | 39.7 | 4.4           |
|         |                       |                       |          |                           |               |               |      |               |
|         |                       |                       |          |                           |               |               |      |               |
|         |                       |                       |          |                           |               |               |      |               |
|         |                       |                       |          |                           |               |               |      |               |
|         |                       |                       |          |                           |               |               |      |               |

\*BDL = Below Detection Limit

Units in mg-L Nitrogen, Phosphorus & Silica (Atoms)

| Station | Long                  | Lat                   | Salinity | $\text{NO}_3+\text{NO}_2\text{-N}$ | $\text{NO}_2\text{-N}$ | $\text{PO}_4\text{-P}$ | Si   | $\text{NH}_4\text{-N}$ |
|---------|-----------------------|-----------------------|----------|------------------------------------|------------------------|------------------------|------|------------------------|
| BBSW-37 | $80^{\circ}18'17.6''$ | $25^{\circ}36'55.6''$ | N/A      | 0.020                              | 0.003                  | 0.006                  | 1.91 | 0.109                  |
| BBSW-40 | $80^{\circ}18'19.5''$ | $25^{\circ}36'55.9''$ | N/A      | 0.009                              | 0.002                  | 0.018                  | 1.25 | 0.179                  |
| BBSW-43 | $80^{\circ}18'18.4''$ | $25^{\circ}36'57.1''$ | N/A      | 0.009                              | 0.002                  | 0.013                  | 1.11 | 0.062                  |
|         |                       |                       |          |                                    |                        |                        |      |                        |
|         |                       |                       |          |                                    |                        |                        |      |                        |
|         |                       |                       |          |                                    |                        |                        |      |                        |
|         |                       |                       |          |                                    |                        |                        |      |                        |
|         |                       |                       |          |                                    |                        |                        |      |                        |

\*BDL = Below Detection Limit

Units in mg-L Nitrate + Nitrite, Nitrite, Phosphate, Silica & Ammonium (Compounds)

| Station | Long                  | Lat                   | Salinity | $\text{NO}_3+\text{NO}_2$ | $\text{NO}_2$ | $\text{PO}_4$ | Si   | $\text{NH}_4$ |
|---------|-----------------------|-----------------------|----------|---------------------------|---------------|---------------|------|---------------|
| BBSW-37 | $80^{\circ}18'17.6''$ | $25^{\circ}36'55.6''$ | N/A      | 0.078                     | 0.012         | 0.019         | 1.91 | 0.140         |
| BBSW-40 | $80^{\circ}18'19.5''$ | $25^{\circ}36'55.9''$ | N/A      | 0.037                     | 0.008         | 0.055         | 1.25 | 0.225         |
| BBSW-43 | $80^{\circ}18'18.4''$ | $25^{\circ}36'57.1''$ | N/A      | 0.037                     | 0.008         | 0.039         | 1.11 | 0.079         |
|         |                       |                       |          |                           |               |               |      |               |
|         |                       |                       |          |                           |               |               |      |               |
|         |                       |                       |          |                           |               |               |      |               |
|         |                       |                       |          |                           |               |               |      |               |
|         |                       |                       |          |                           |               |               |      |               |

\*BDL = Below Detection Limit

\* $\text{NO}_3+\text{NO}_2$ ,  $\text{PO}_4$  and Si were run on the autoanalyzer

\* $\text{NO}_2$  and  $\text{NH}_4$  were run on the UV-VIS Spec.

**Temperature: BBSW 37 & 40 = 26.70C. BBSW40 = N/A**

**PH: BBSW37 = 6.96, BBSW40 = N/A, BBSW43 = 7.94**

**Date Collected: 11/24/04 (21) and 12/04/04 (55)**

**Date Analyzed: 12/04/04**

Units in Micromoles ( $\mu\text{M}$ )

| Station | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2$ | $\text{NO}_2$ | $\text{PO}_4$ | Si   | $\text{NH}_4$ |
|---------|-------------|-------------|----------|---------------------------|---------------|---------------|------|---------------|
| BBSW-21 | 80°18'26.7" | 25°36'21.9" | 17       | 1.4                       | 1.3           | 0.12          | 53.0 | 10.6          |
| BBSW-55 | N/A         | N/A         | 9.5      | 3.2                       | 1.4           | 0.53          | 80.3 | 5.5           |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |

\*BDL = Below Detection Limit

Units in mg-L Nitrogen, Phosphorus & Silica (Atoms)

| Station | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2\text{-N}$ | $\text{NO}_2\text{-N}$ | $\text{PO}_4\text{-P}$ | Si   | $\text{NH}_4\text{-N}$ |
|---------|-------------|-------------|----------|------------------------------------|------------------------|------------------------|------|------------------------|
| BBSW-21 | 80°18'26.7" | 25°36'21.9" | 17       | 0.04                               | 0.02                   | 0.004                  | 1.48 | 0.15                   |
| BBSW-55 | N/A         | N/A         | 9.5      | 0.09                               | 0.02                   | 0.016                  | 2.25 | 0.08                   |
|         |             |             |          |                                    |                        |                        |      |                        |
|         |             |             |          |                                    |                        |                        |      |                        |
|         |             |             |          |                                    |                        |                        |      |                        |
|         |             |             |          |                                    |                        |                        |      |                        |
|         |             |             |          |                                    |                        |                        |      |                        |
|         |             |             |          |                                    |                        |                        |      |                        |

\*BDL = Below Detection Limit

Units in mg-L Nitrate + Nitrite, Nitrite, Phosphate, Silica & Ammonium (Compounds)

| Station | Long        | Lat         | Salinity | $\text{NO}_3+\text{NO}_2$ | $\text{NO}_2$ | $\text{PO}_4$ | Si   | $\text{NH}_4$ |
|---------|-------------|-------------|----------|---------------------------|---------------|---------------|------|---------------|
| BBSW-21 | 80°18'26.7" | 25°36'21.9" | 17       | 0.15                      | 0.06          | 0.01          | 1.48 | 0.19          |
| BBSW-55 | N/A         | N/A         | 9.5      | 0.34                      | 0.06          | 0.05          | 2.25 | 0.10          |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |
|         |             |             |          |                           |               |               |      |               |

\*BDL = Below Detection Limit

\* $\text{NO}_3+\text{NO}_2$ ,  $\text{PO}_4$  and Si were run on the autoanalyzer

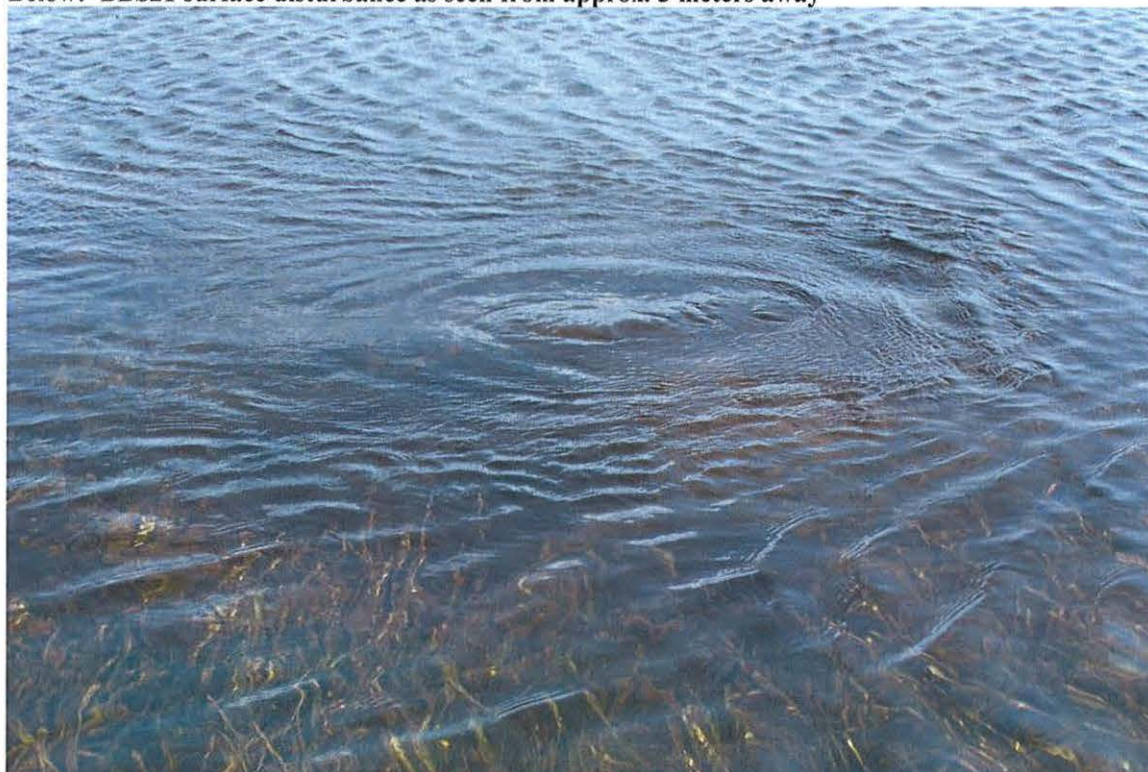
\* $\text{NO}_2$  and  $\text{NH}_4$  were run on the UV-VIS Spec.

## **APPENDIX 5: Photographs of springs**



**Above: BBS 21 ("Ricisak" spring) surface disturbance from flowing spring, looking north**

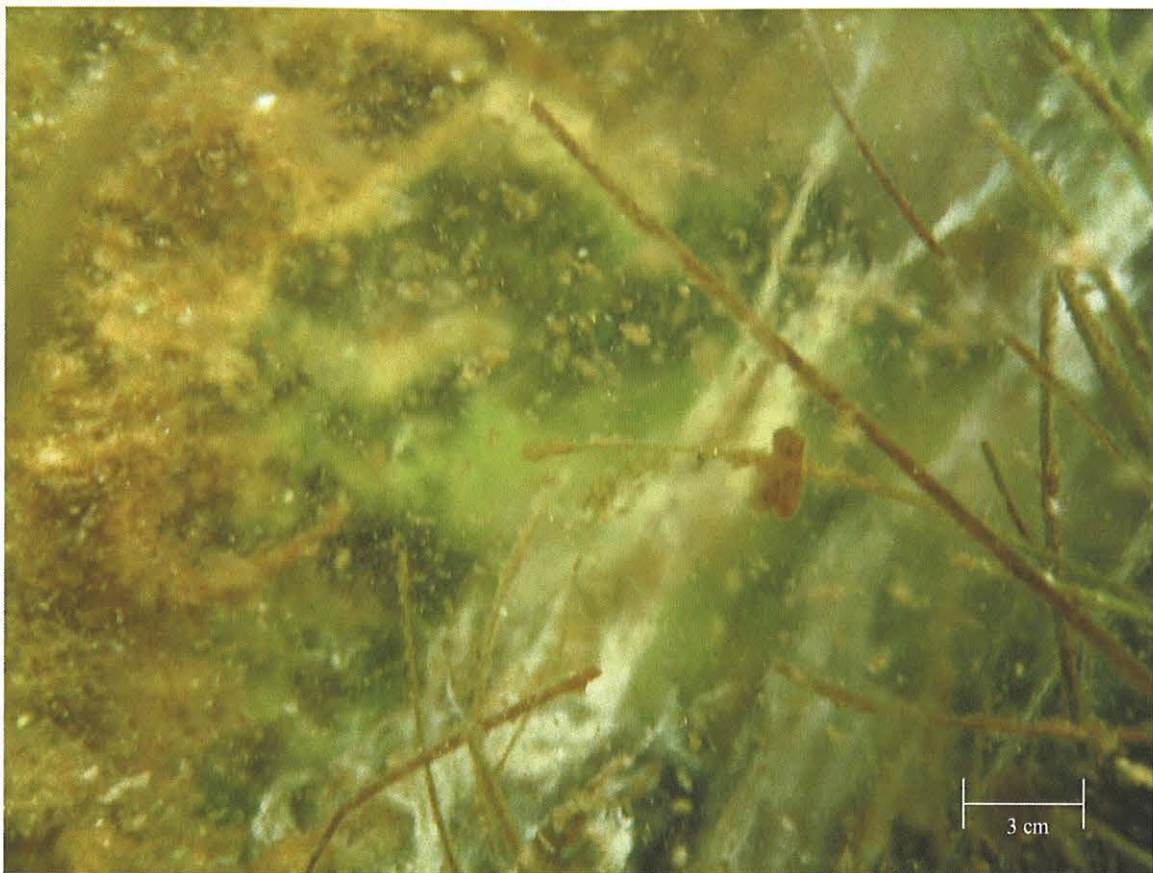
**Below: BBS21 surface disturbance as seen from approx. 3 meters away**





Above: BBS21 surface feature "trail" observed on windless days, looking northwest  
Below: BBS21 observed above the surface, looking north

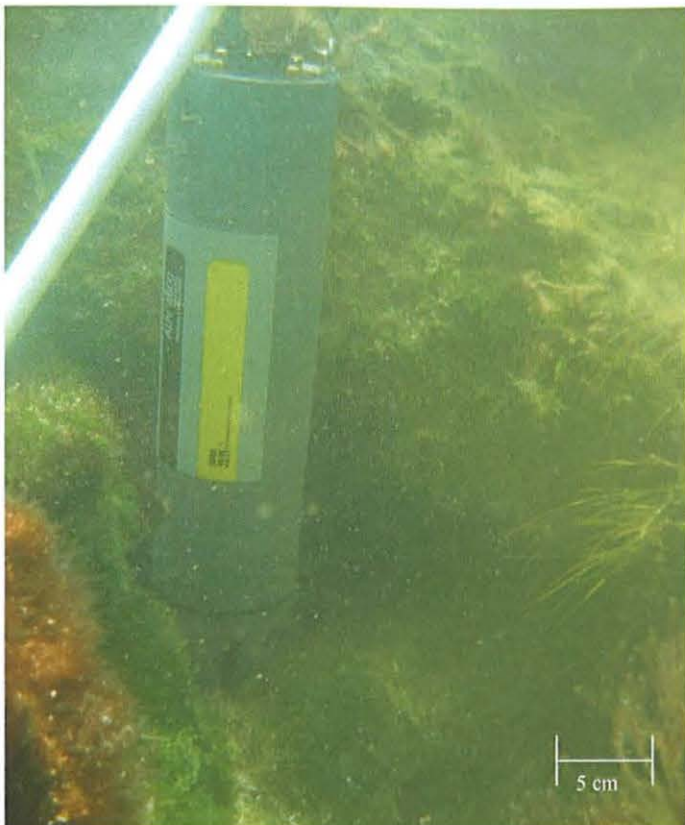




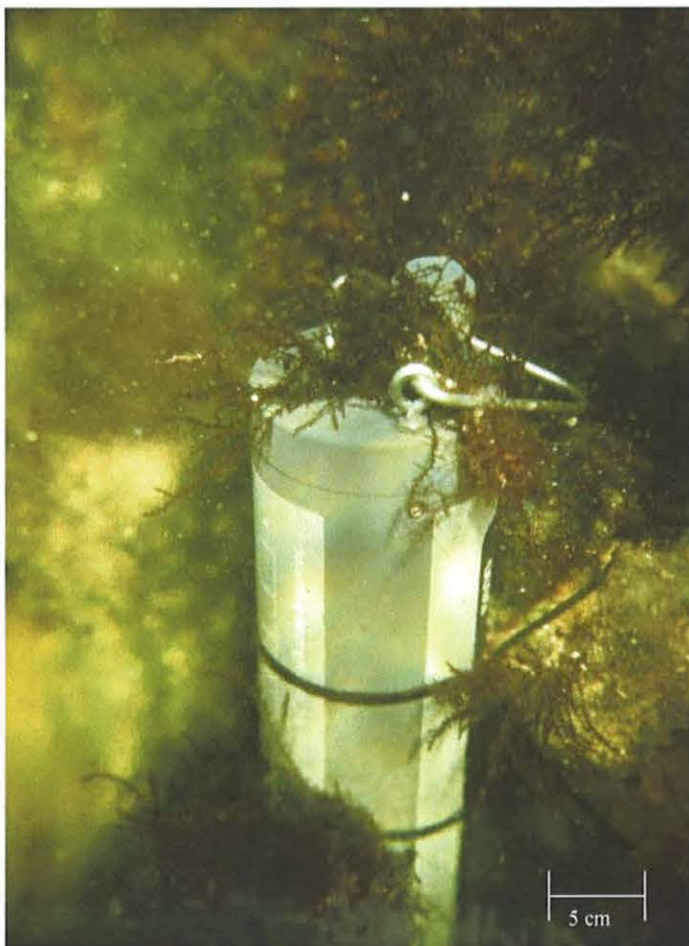
**Above: Blue-green algae seen in and along a few conduits of BBS21**

**Below: BBS21 when covered by massive amounts of red and green algae, late 2004**





**Top photo: YSI instrument hung over larger opening of BBS21**

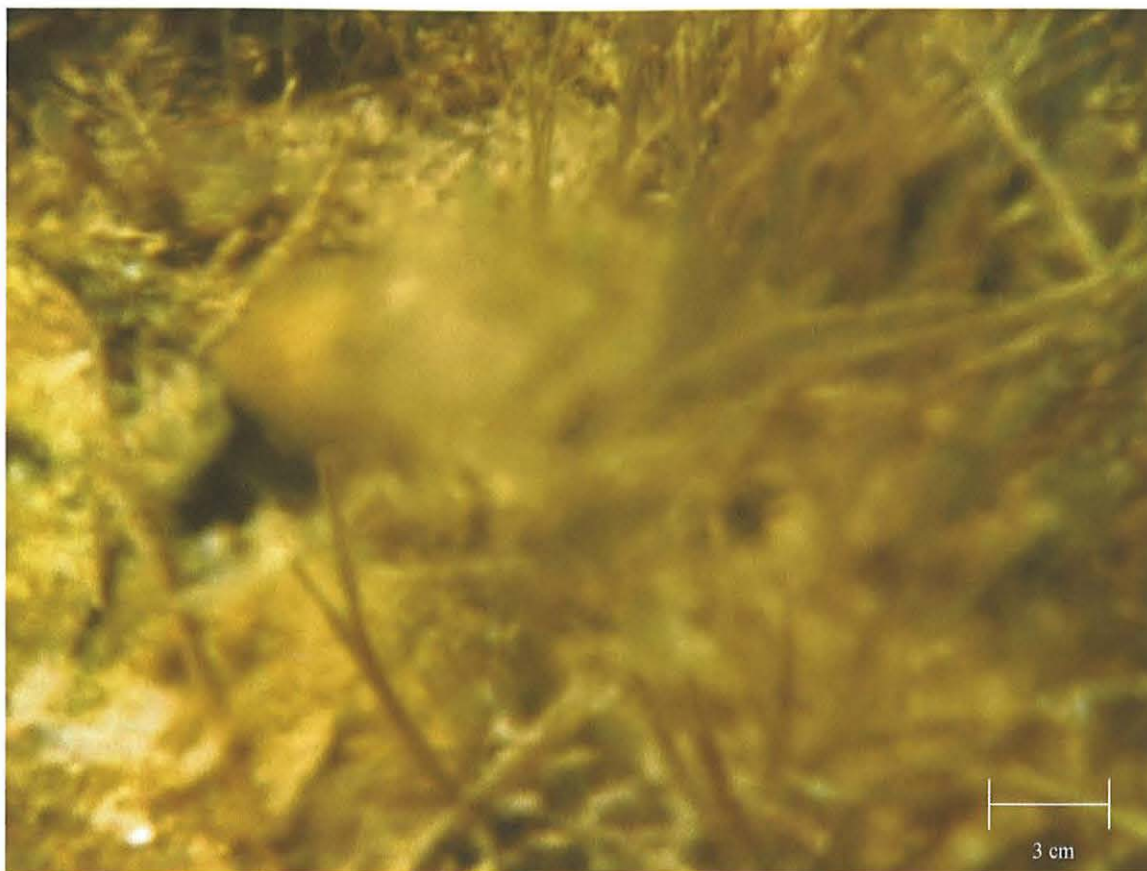


**Bottom photo: YSI instrument suspended and camouflaged within smaller hole of BBS21**



**Above: BBS22 flow column, seen as cone of shleran water through the seagrass**  
**Below: BBS22 shleran water column, different angle**



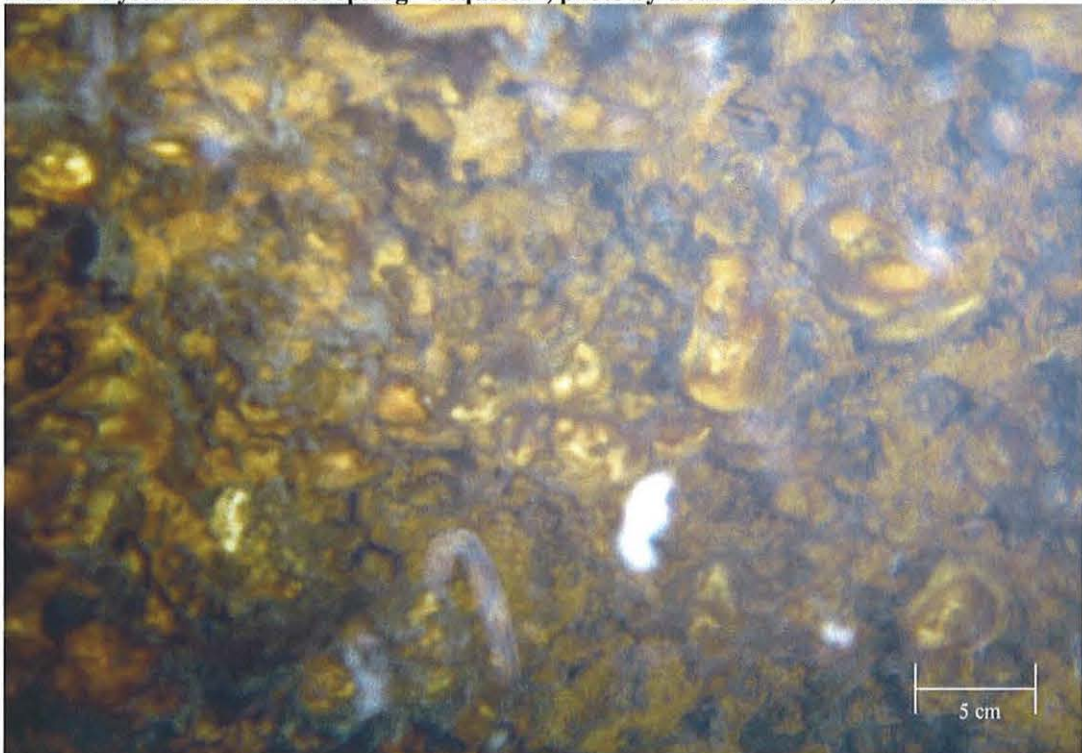


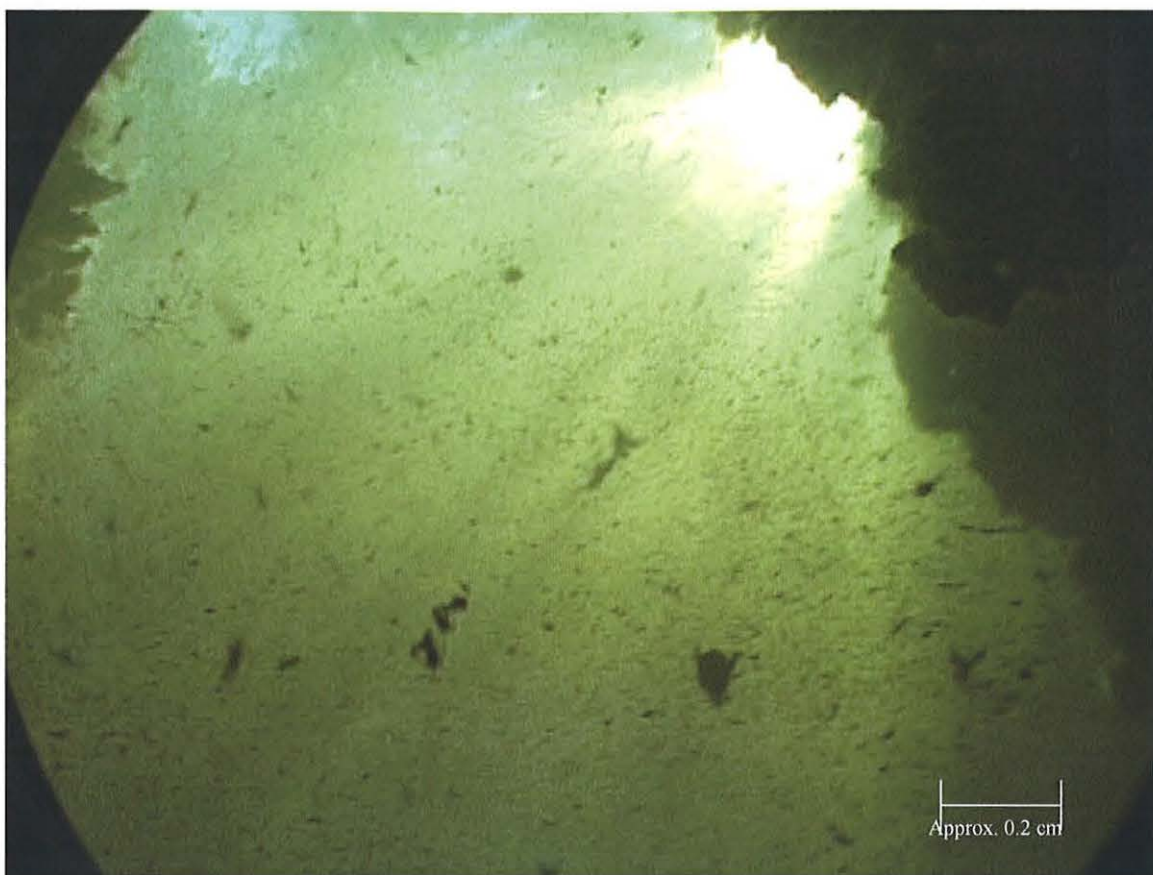
Above: BBS26, 1" diameter spring where "flap" has been created, located south of C-100 canal  
 Below: BBS42, 1" diameter spring located north of the north jetty of the Deering Estate boat basin





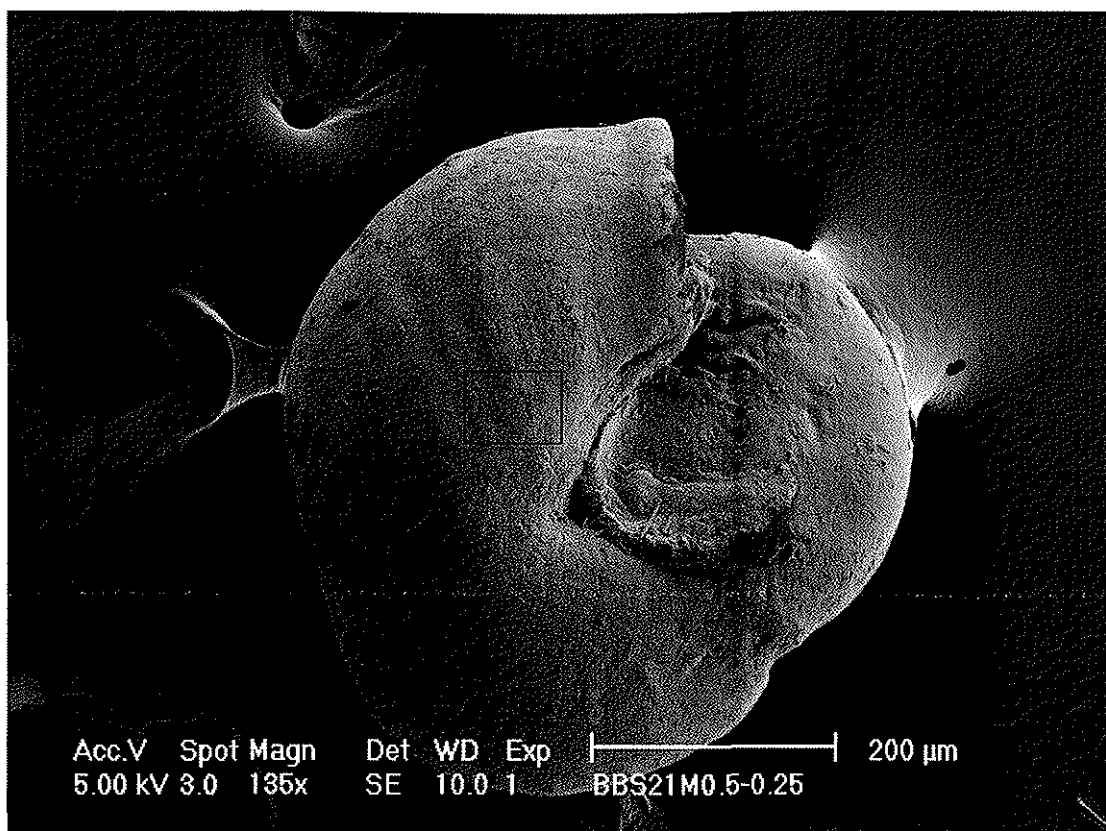
**Above: Spring "Tequesta" located at terminal end of natural water canal on Deering Estate prop.  
Below: Oyster lined walls of spring "Tequesta", photo by Todd Garland, Matrox Films**





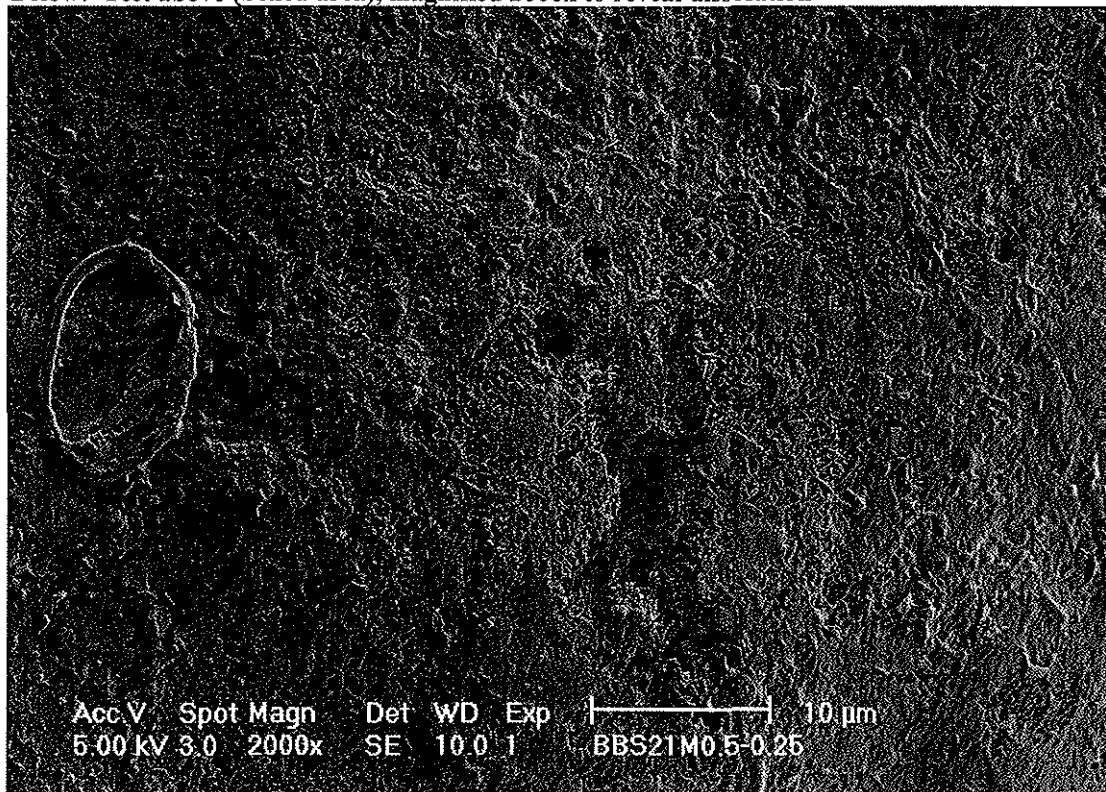
**Above: Inside spring "Tequesta" looking up, high organic and sediment turbidity when spring flows,  
Photo taken by Todd Garland, Matrox Films**

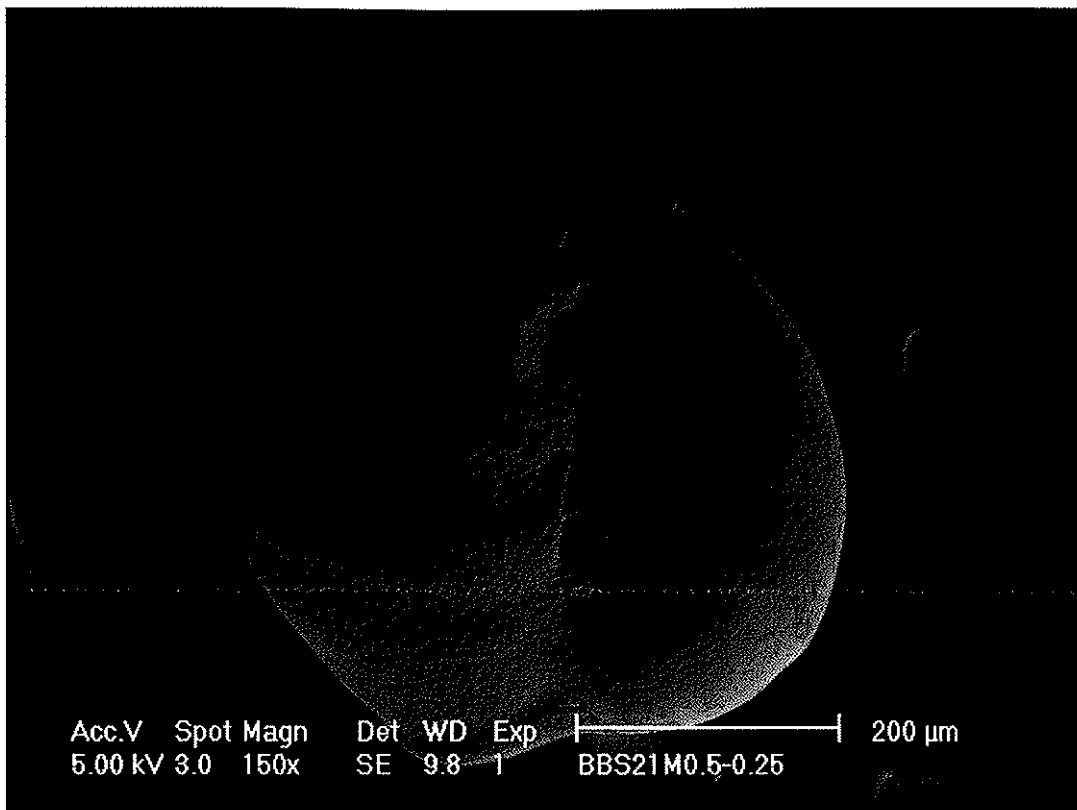
## **APPENDIX 6: SEM photographs**



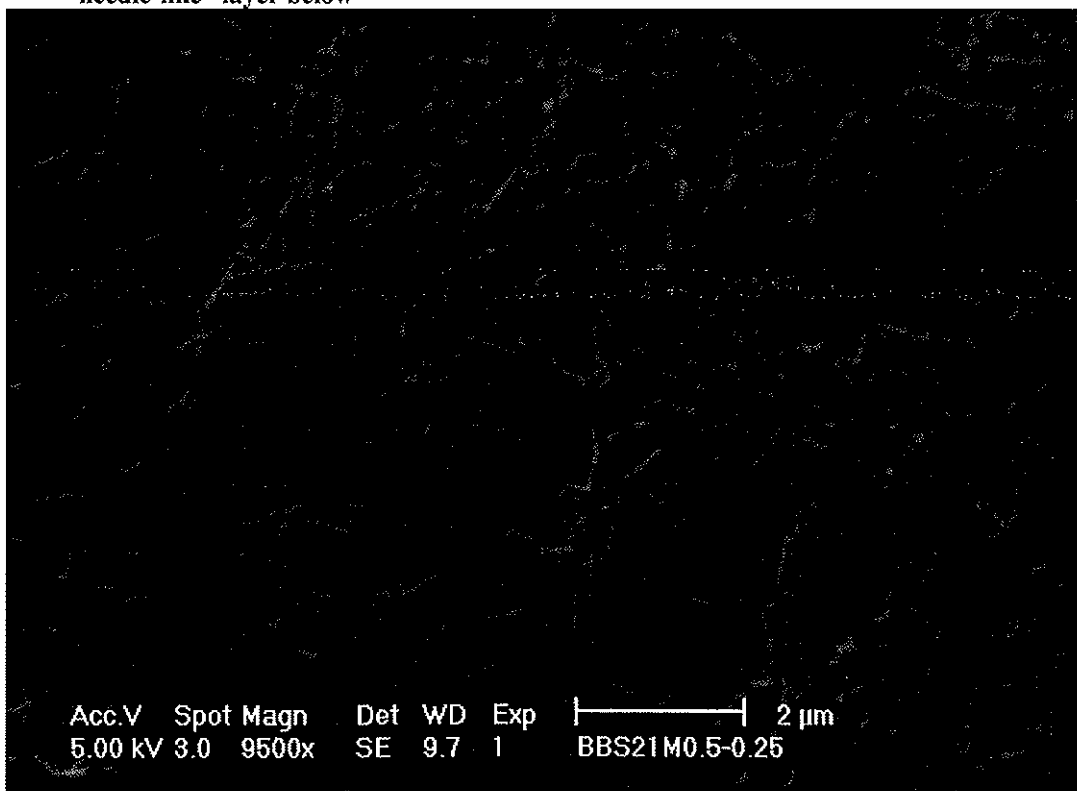
Above: *Triloculina* sp. test (Miliolid member) from BBS21M

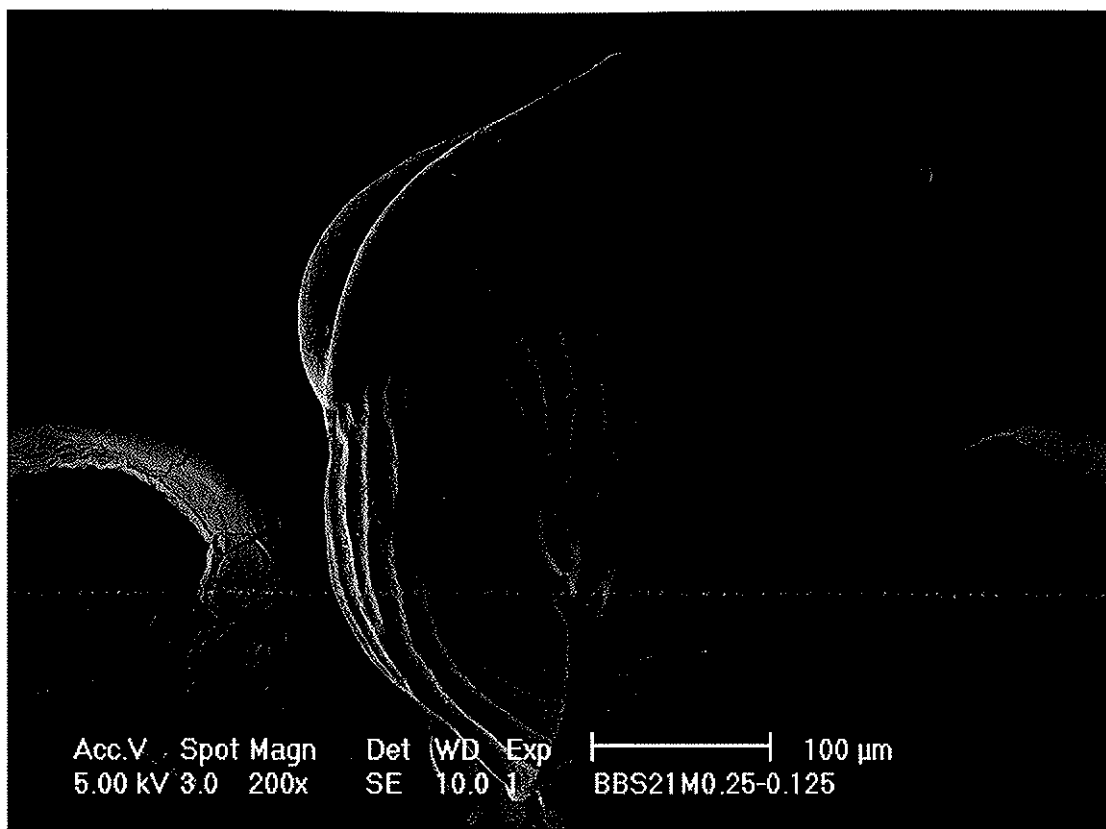
Below: Test above (boxed area), magnified 2000x to reveal dissolution



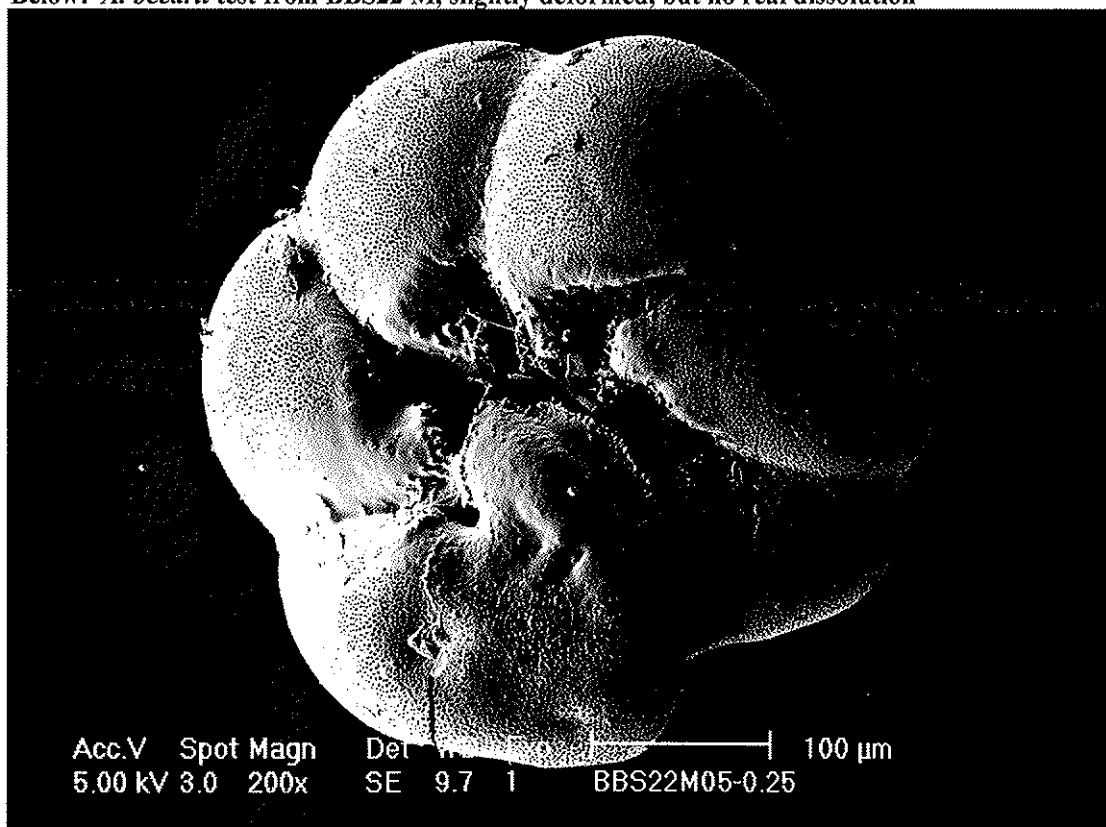


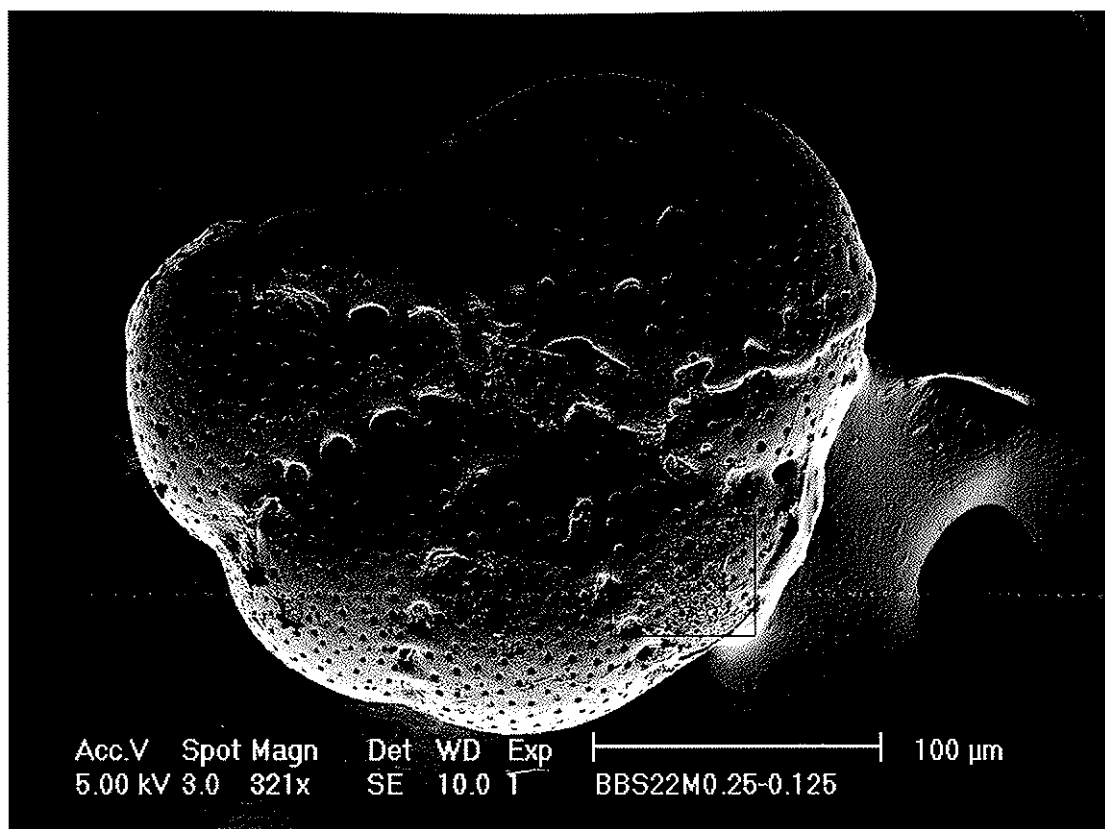
Above: *Triloculina* sp. test from BBS22 M, appears in good condition at 150x magnification  
 Below: Test above (boxed area), magnified 9500x to reveal dissolution of top “blocky” layer and “needle-like” layer below





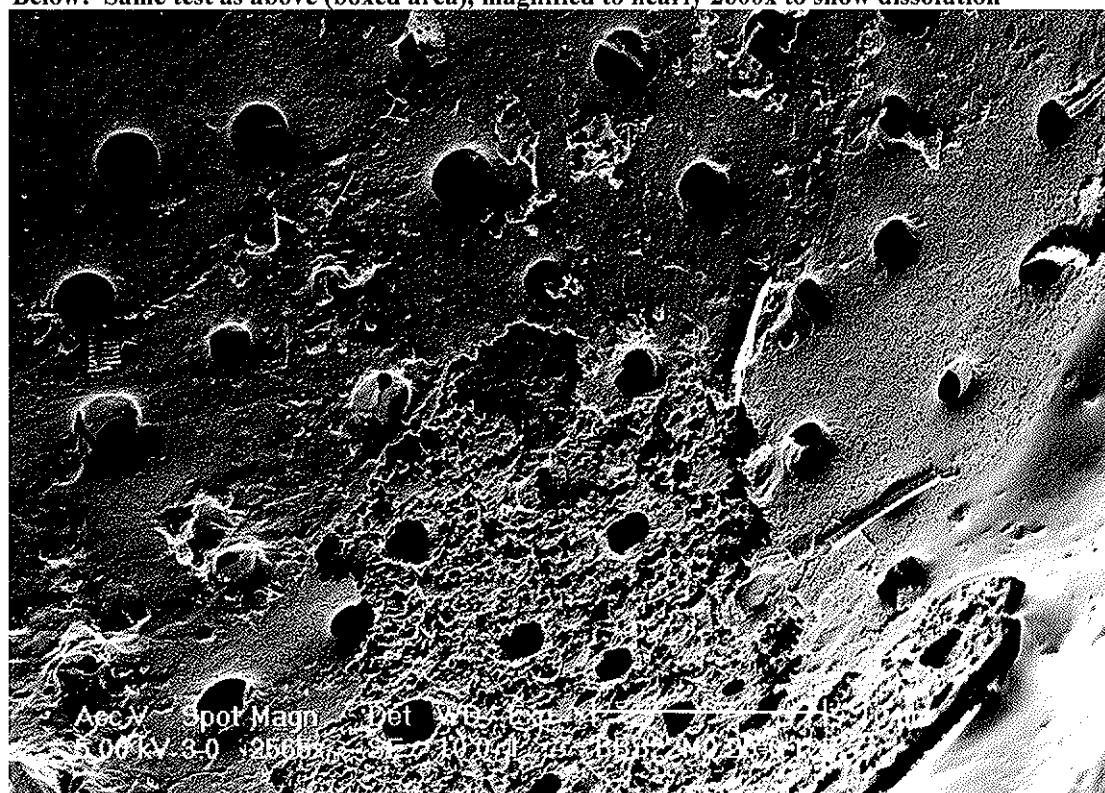
Above: *Articulina species*, taken from small size fraction on BBS21 M, in relatively good shape  
 Below: *A. becarii* test from BBS22 M, slightly deformed, but no real dissolution

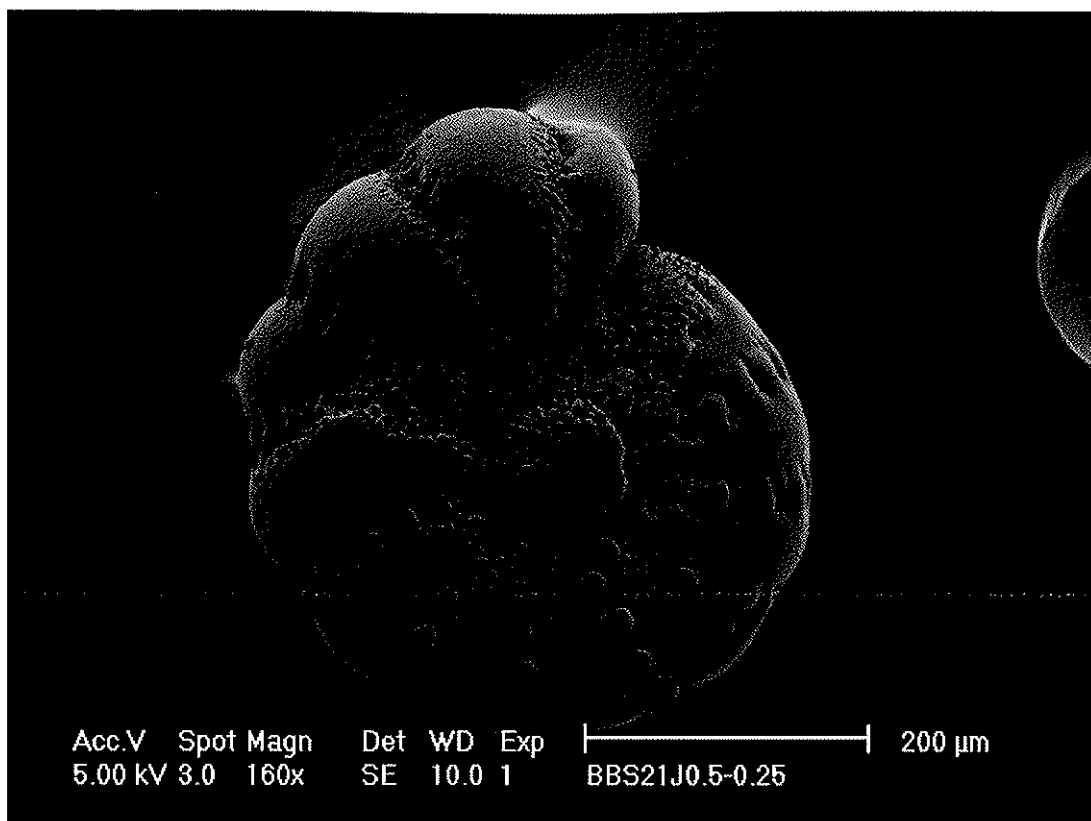




Above: *Elphidium* sp. test from BBS22 M in bad shape

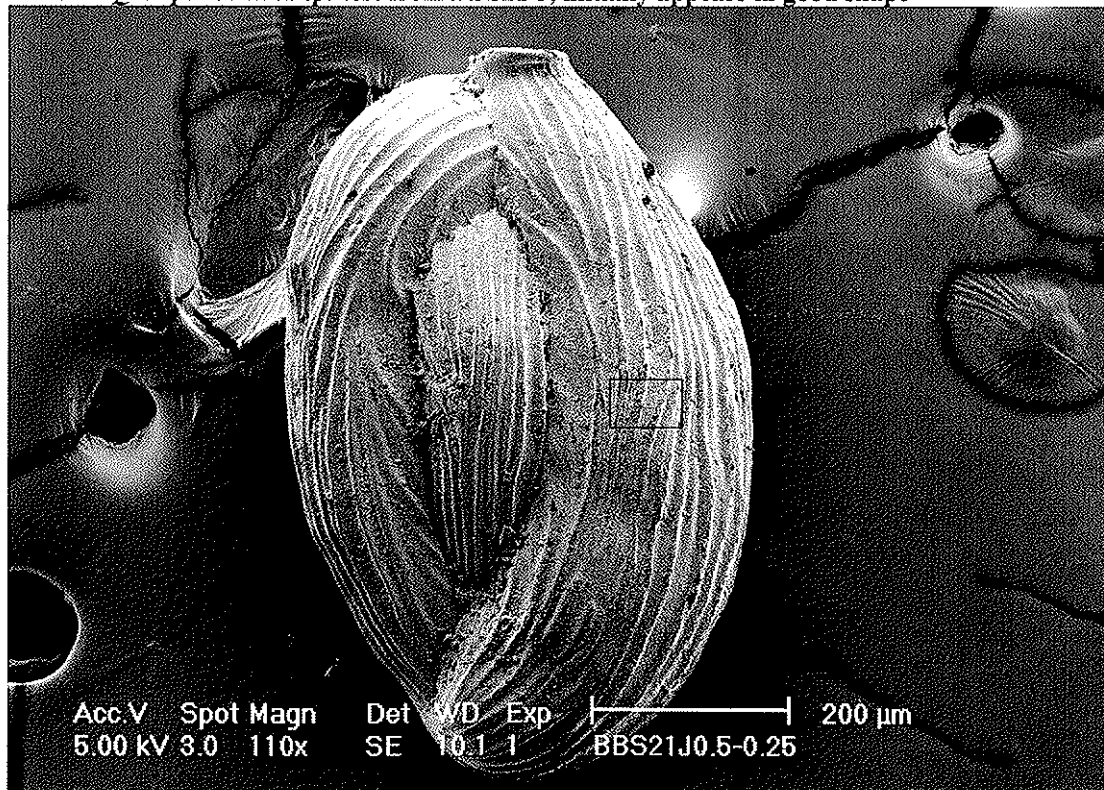
Below: Same test as above (boxed area), magnified to nearly 2600x to show dissolution

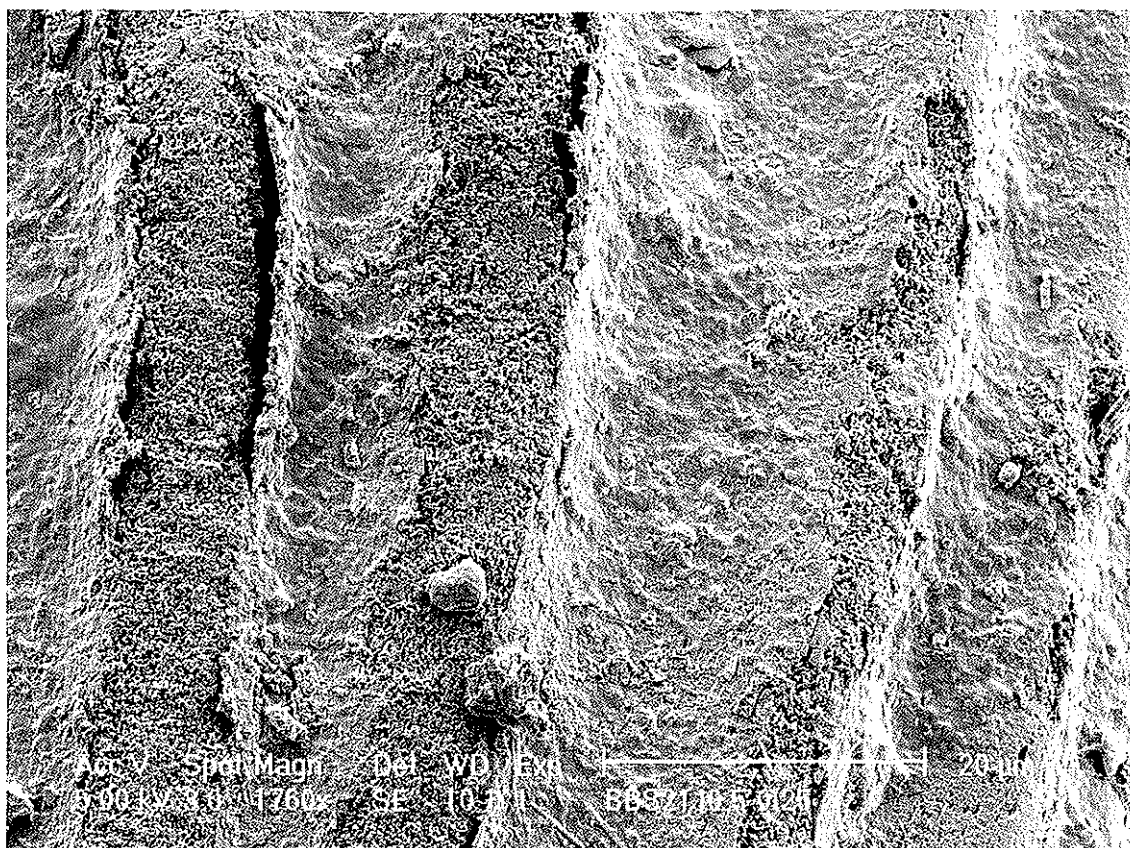




Above: *Elphidium* sp. test from BBS21 J, in good shape

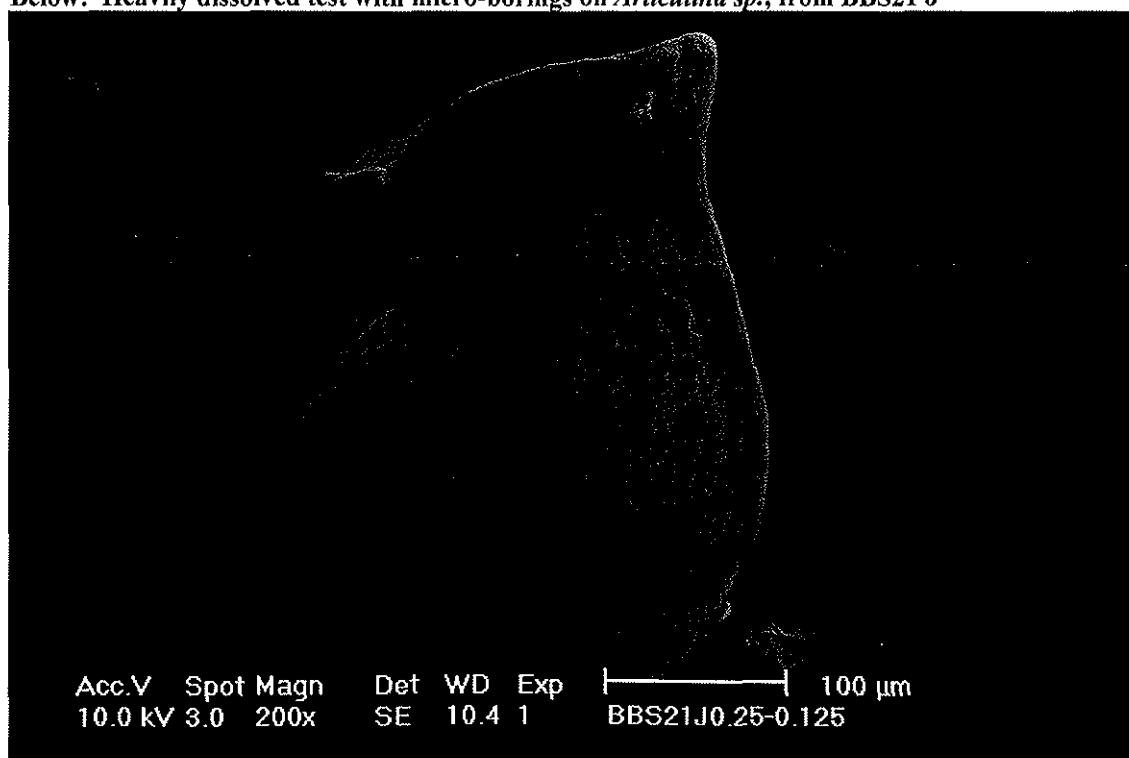
Below: *Quinqueloculina* sp. test from BBS21 J, initially appears in good shape

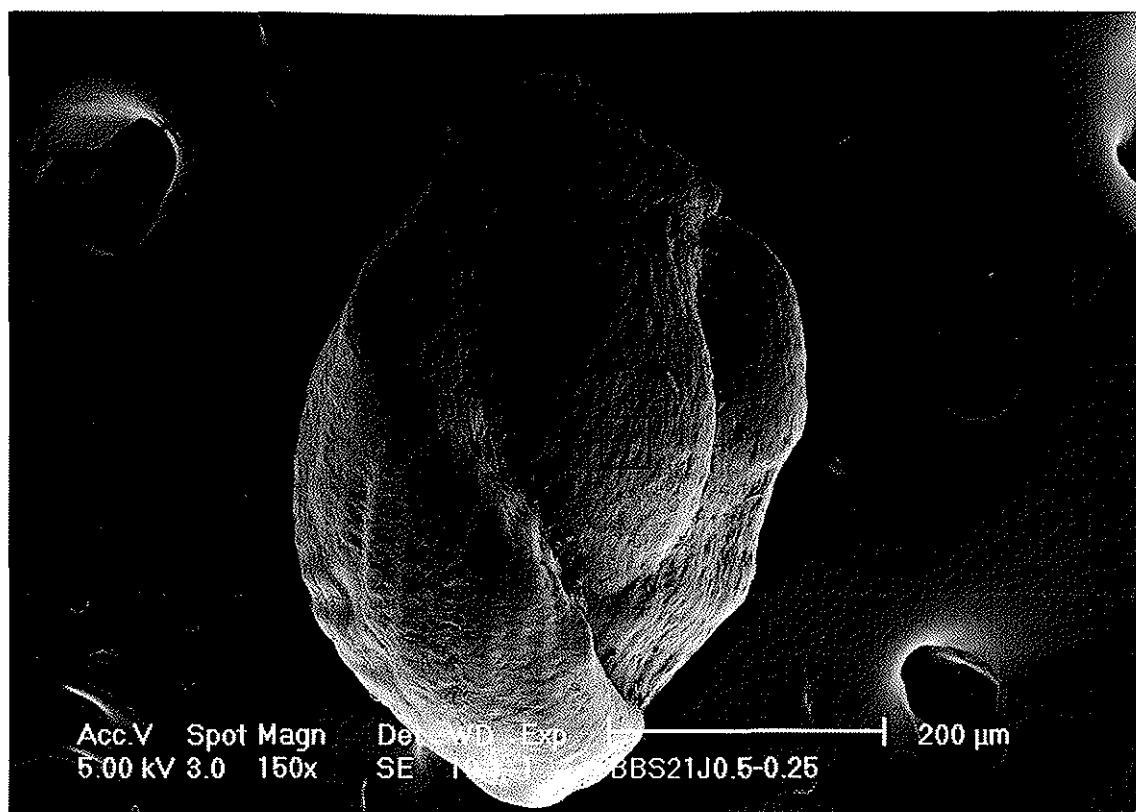




Above: The test in the last photo (boxed area), magnified nearly 1800x to reveal dissolution, particularly on the ridges

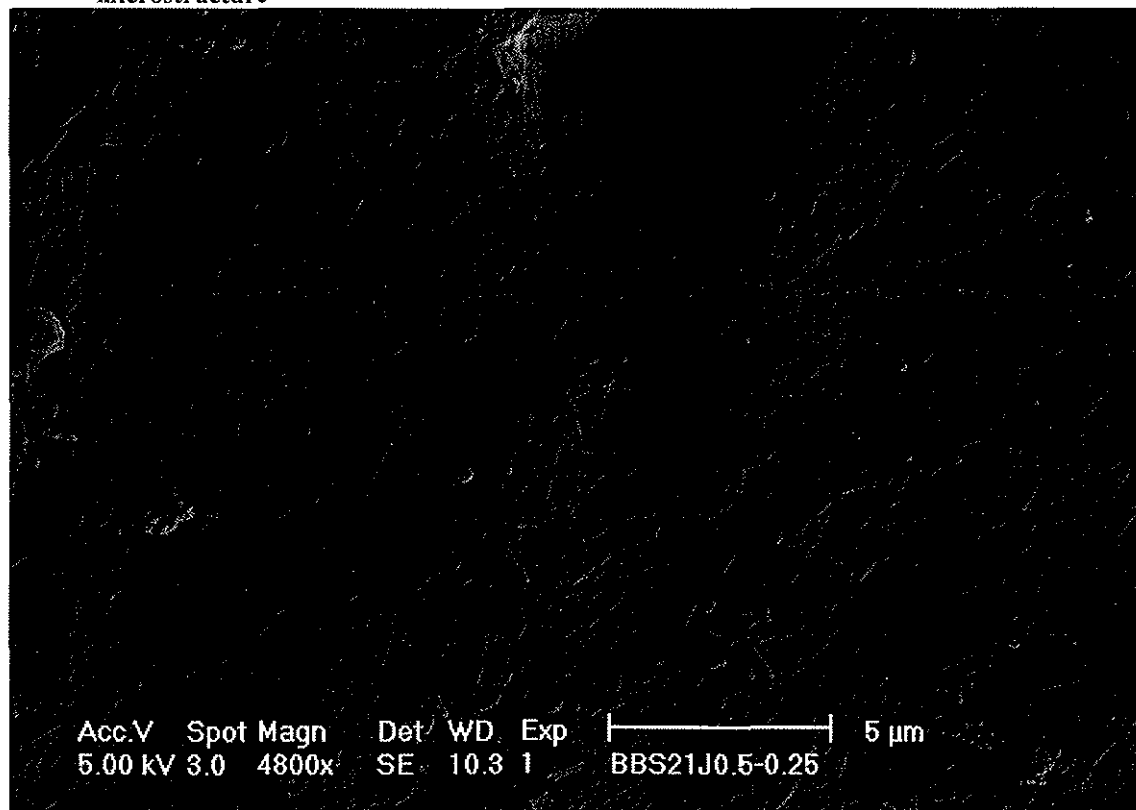
Below: Heavily dissolved test with micro-borings on *Articulina sp.*, from BBS21 J

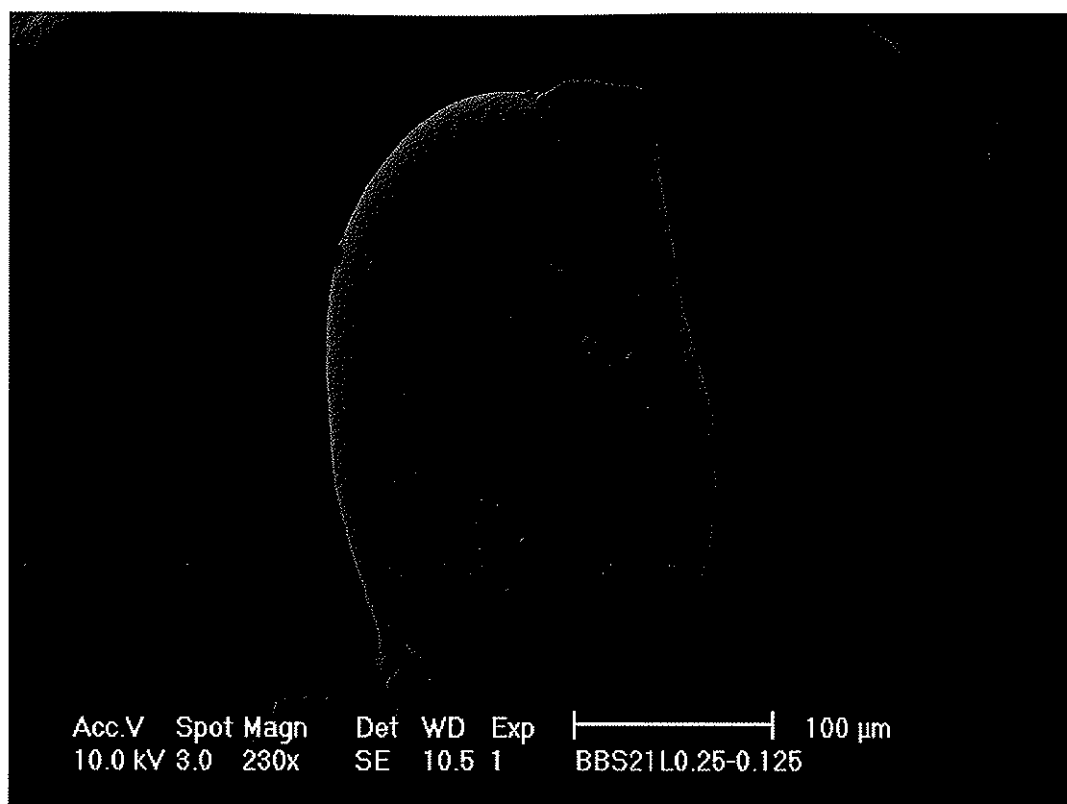




Above: *Triloculina* sp. from BBS21 J, in good shape

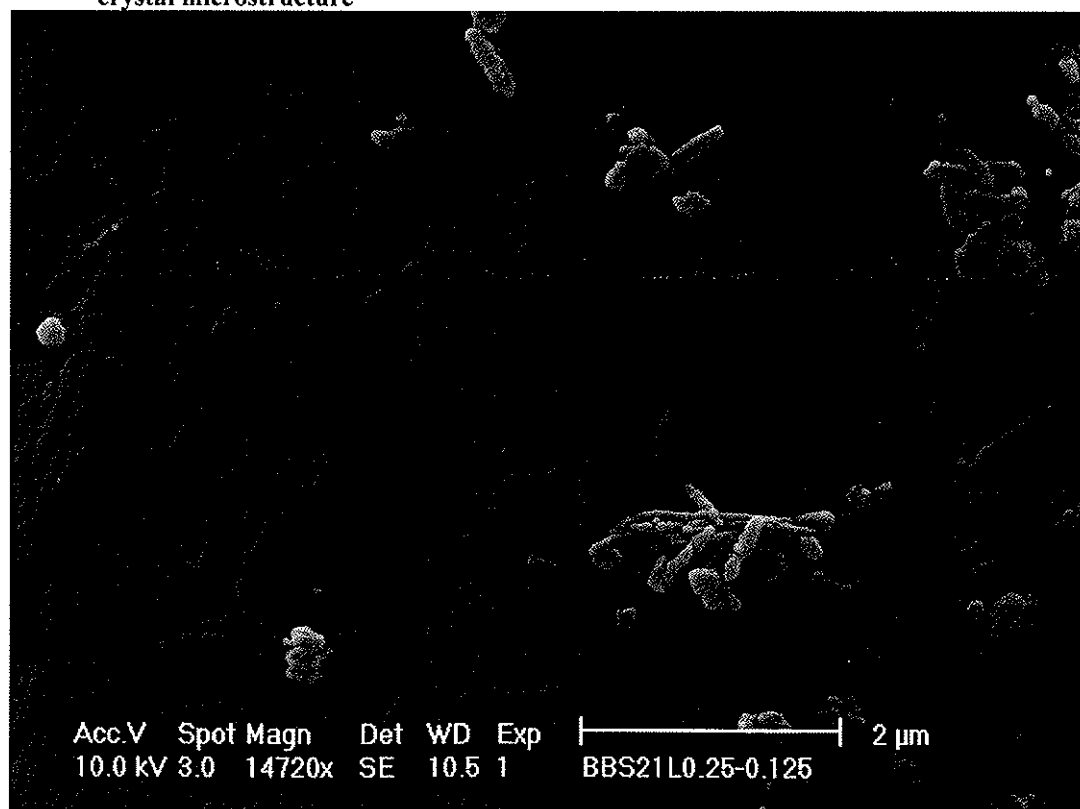
Below: Same test as above (boxed area), magnified 4800x to reveal “brick-like” calcite crystal microstructure

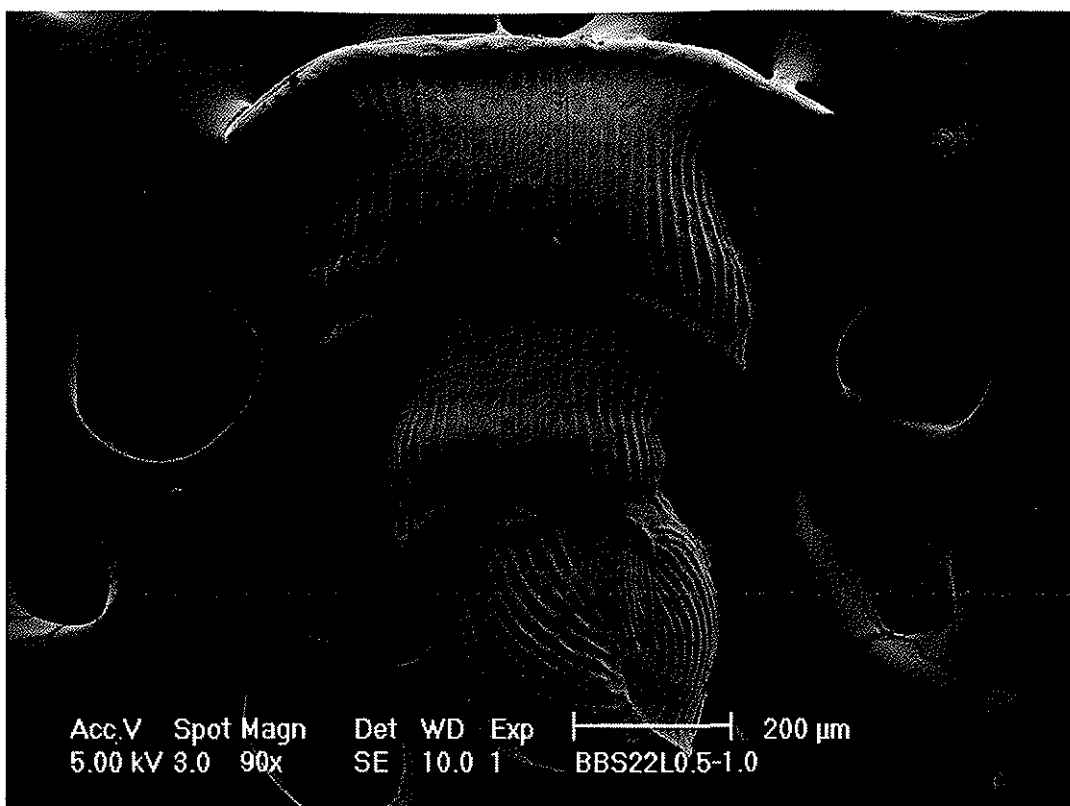




Above: *Triloculina* sp. test from BBS21 L, in good shape

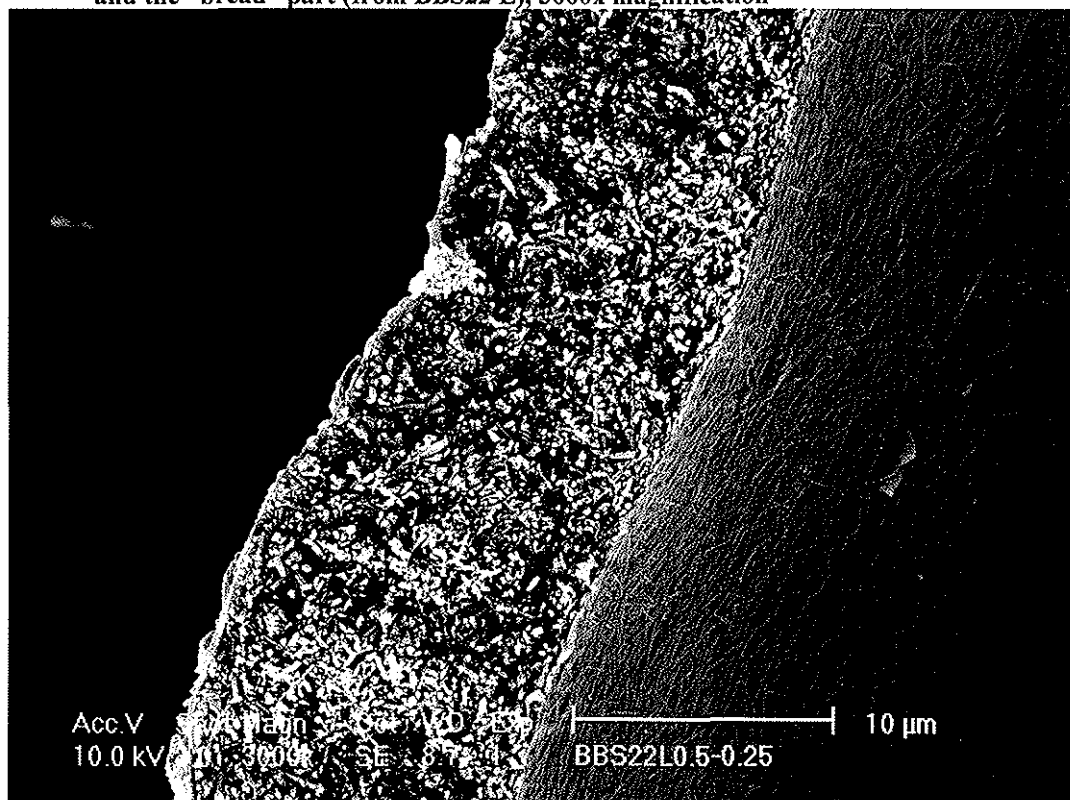
Below: Same test as above (boxed area) , magnified almost 15000x to reveal elongate calcite crystal microstructure

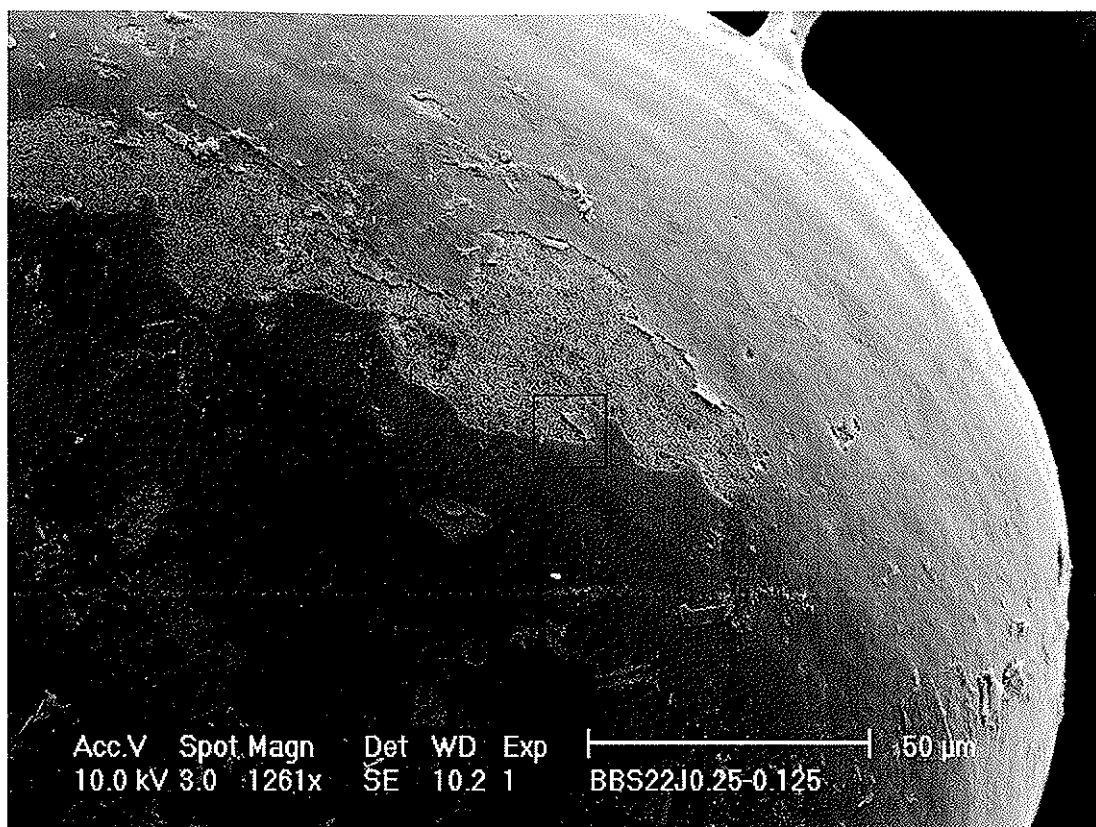




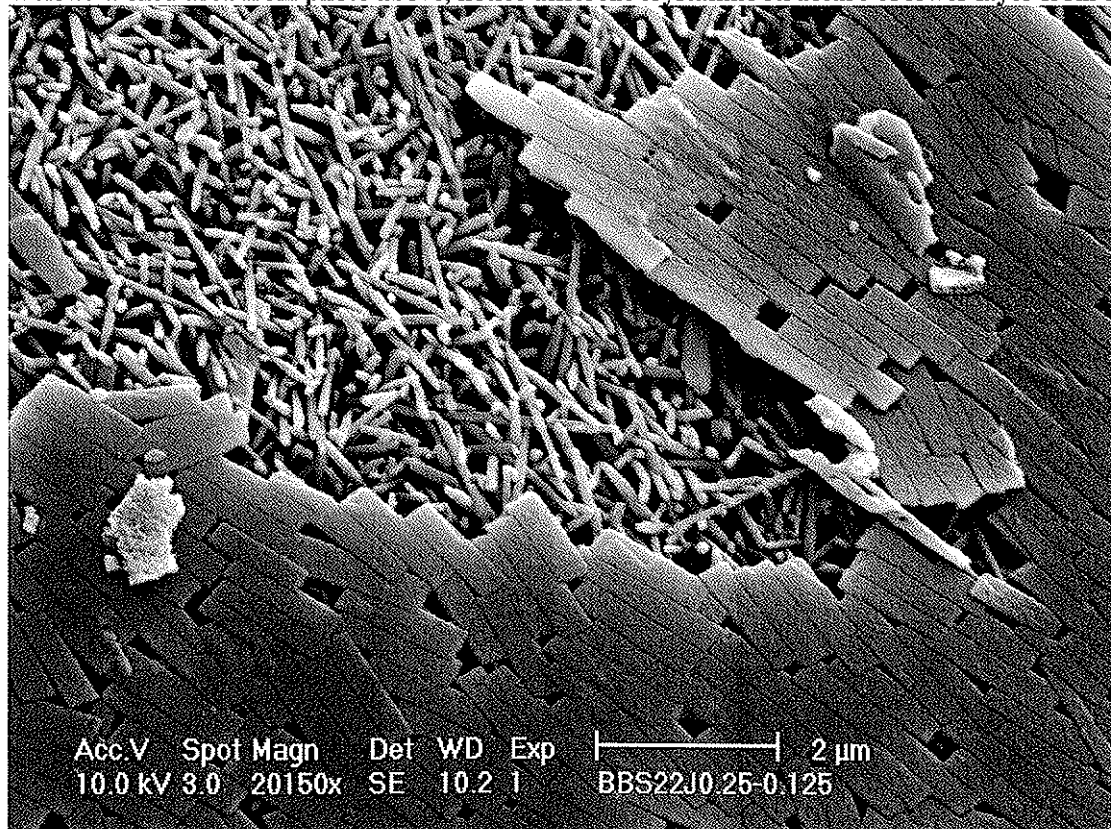
Above: *Articulina* sp. test from BBS22 L, in good shape

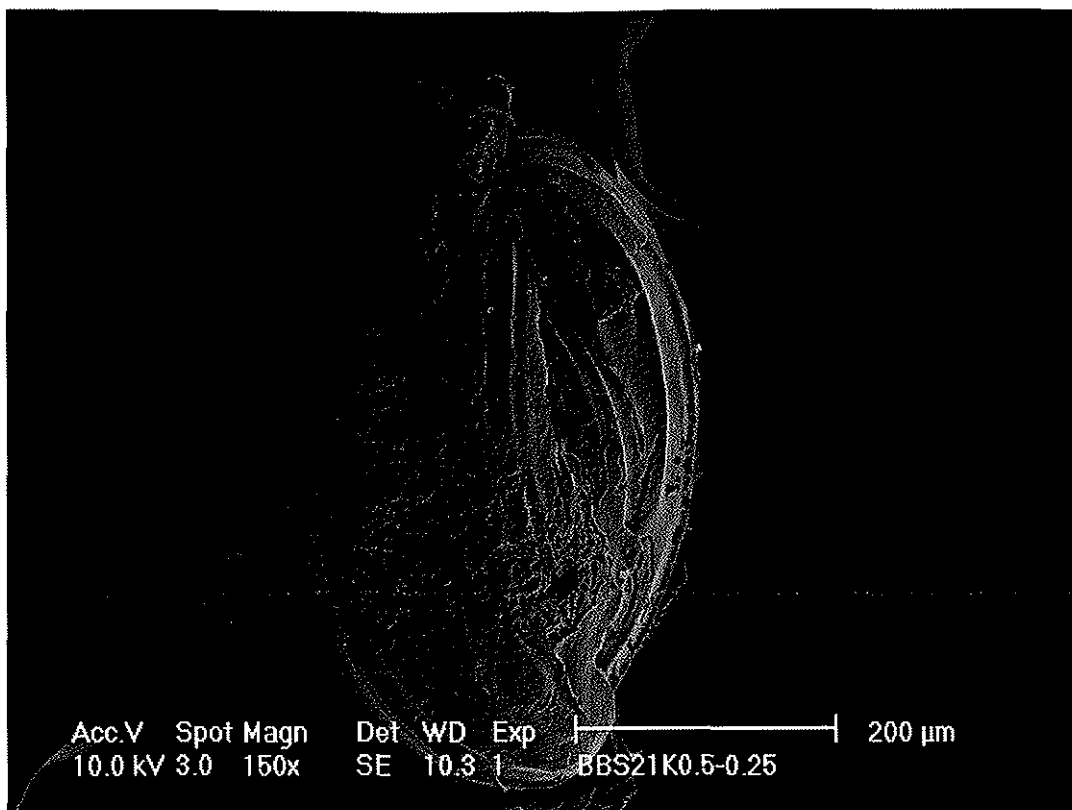
Below: Edge of a Miliolid broken test part showing differing structures within the “jelly” part and the “bread” part (from BBS22 L), 3000x magnification





Above: Milliolid test from Ricisak spring sediment sample at 1 m distance from center of spring  
 Below: Boxed area from photo above, notice different crystalline structure of lower layer from top





Above: *Quinqueloculina* sp. from Ricisak sediment sample from 1 m distance from center of spring. Test is heavily bored.

Below: Boxed area of above photo, notice dissolution fabric

