CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK

NORTHERN CHARLOTTE HARBOR GROUP

1ST ANNUAL REPORT

SPRING 1998

CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK

Northern Charlotte Harbor Group Volunteers

Sid Berger	Paul Crowley	Carol Cutrone
Fran Dwyer	Joan Fischer	Vicky Fleming
Joe Fleming	Pat Jaquish	Jack Jaquish
Kathy Kelle	Annette Nielsen	Lenny Renda
Brian Sieloff	Rick Storsberg	Fay Vidulich
Ian Vincent	Mary Whiteside	

Intern Florida Gulf Coast University & Report Author

Betty Gilpin

Project Coordinators

Judy Ott - Florida Department of Environmental Protection/ Charlotte Harbor Aquatic & Buffer Preserves

Bobbi Rodgers - Charlotte Harbor Environmental Center

Table of Contents

INTRODUCTION

Charlotte Harbor Estuaries
Volunteer Water Quality Monitoring Network

What is the "Volunteer Water Quality Monitoring Network"?

The Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network is a program designed to establish a coordinated system of volunteer water quality monitoring groups for the aquatic preserves within the Charlotte Harbor National Estuary Program (CHNEP) area. The Monitoring Network includes the Northern Charlotte Group, Three Creek Watch of Lemon Bay, Pine Island Group, Estero Bay Group and Barrier Island Group. The project is a cooperative effort of the Florida Department of Environmental Protection (FDEP) Charlotte Harbor & Estero Bay Aquatic & Buffer Preserves Offices & South Florida District Branch Laboratory, the Charlotte Harbor Environmental Center (CHEC), the Southwest Florida Water Management District's Surface Water Improvement Management Program (SWFWMD/SWIM), and the CHNEP, with assistance from a Florida Gulf Coast University (FGCU) student intern and laboratory assistant.

The program is unique because it 1) includes monitoring sites in all 6 of the aquatic preserves in the Charlotte Harbor estuaries, 2) builds on & expands existing volunteer monitoring programs, 3) provides both scientific & educational functions, and 4) includes critical quality assurance, data management and training components necessary for providing credible data and long term volunteer support.

Volunteers are THE critical component to the success of the monitoring program. It is hoped that educating the volunteers and the general public about the values of estuaries through monitoring will lead to active, self-supporting Citizens Support Organizations for each of the Aquatic Preserves and the Charlotte Harbor NEP.

This report presents the first year's data from the Northern Charlotte Harbor Group of the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network.

How long has the Northern Charlotte Harbor Group been running?

Initial training for the Northern Charlotte Harbor Group of the Volunteer Water Quality Monitoring Network took place in October of 1996, and the first day of sampling was November 4, 1996. Once a month volunteers sample 14 parameters which include dissolved oxygen (D.O.), pH, salinity, water color, water temperature, air temperature, turbidity, water depth, tide stage, wind speed & direction, precipitation, weather and water surface conditions.

As of Spring 1998, 10 sampling sites are established on the estuaries and tributaries that flow into the Gasparilla Sound/Charlotte Harbor Aquatic Preserve. The sites are being monitored on a continuous monthly basis, with this report covering the initial 14 month period, from November 1996 to December 1997 for these 10 stations. All total, we have received 123 data reports for the sampling sites out of the 140 reports possible. 50% of our stations were monitored all 14 months. 40% of the stations were monitored more than 11 months. And, 1 station was only monitored for 5 months due to disruption of the site because of road construction. That's an 88% success rate, which is great, especially for the first year of any major technical project such as this.

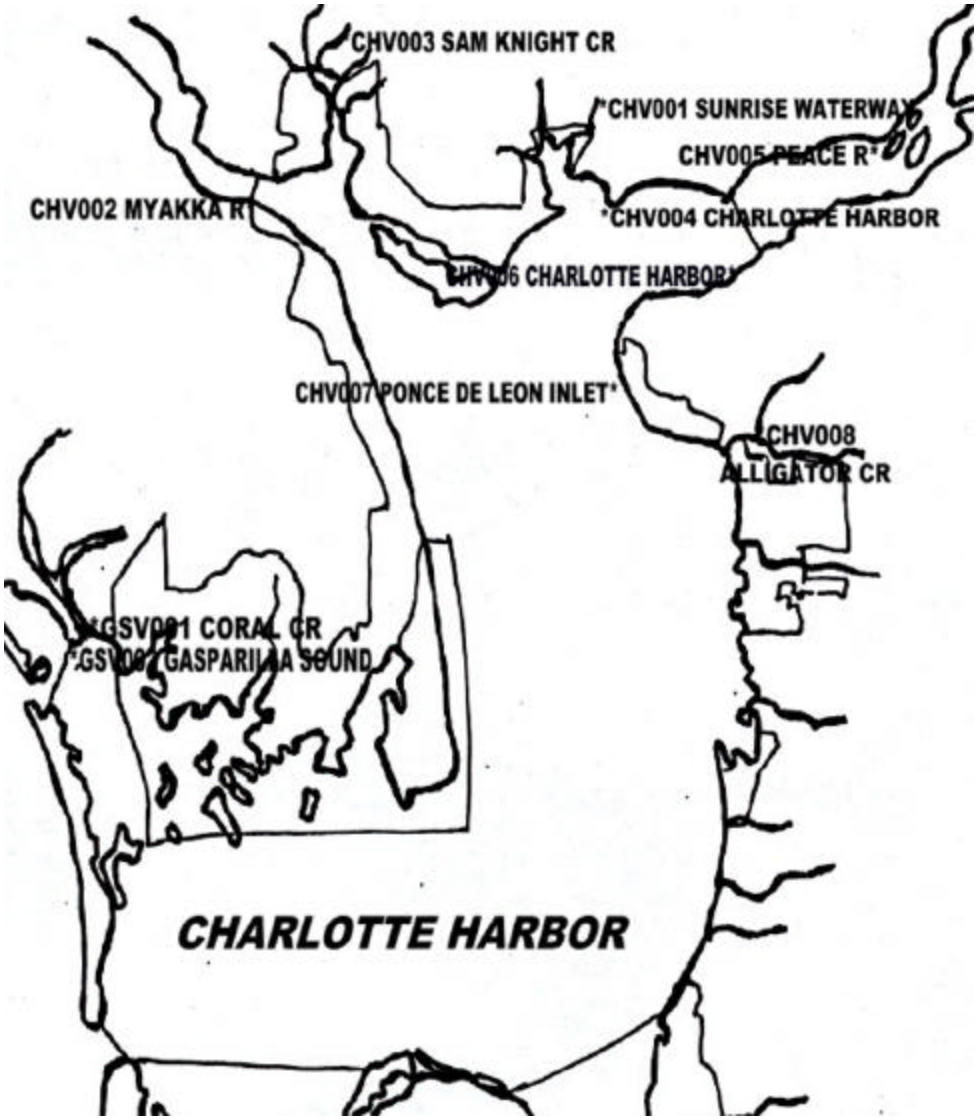
On each of the 123 data reports, 14 parameters were monitored. We received a total of 1,708 pieces of information for the 14 parameters out of a total of 1,722 pieces possible, for a 99% success rate!

How are the volunteers trained?

Volunteers receive initial classroom training on the importance of estuarine environments and the need for their monitoring results. They learn how the estuaries change according to location and throughout the year. They also receive classroom training on the tested parameters and the techniques used.

After the initial classroom training, volunteers are trained in the field by a qualified instructor. All volunteers receive a field manual that they use each month which is also included in the Project Management and Quality Assurance (QA) plans. To assure quality data all trained volunteers attend quality assurance practice sessions as a group twice a year.

SAMPLING SITE LOCATIONS



VOLUNTEERS


CHV005
JOE & VICKY


CHV006
PAT & JACK


CHV007
FRAN & KATHY


CHV008
ANNETTE


GSV001
RICK


GSV002
BRIAN


FGCU INTERN
BETTY


PROJECT COORDINATORS
BOBBI & JUDY

PARAMETERS

What does the data really tell us?

Described below are the results of the water quality sampling conducted by the Northern Charlotte Group of the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network for 10 stations from November 1996 through December 1997. Graphs of the data are shown in Appendix A of this report, and tables of the data are given in Appendix B.

Surface Water Sample Grab

Volunteers collect water to be sampled using a clean bucket lowered to the surface and filled slowly to avoid adding oxygen. Water within an estuary will stratify into layers if there are large differences in salinity or temperature within the water column. Rainfall, tide stage, and season affect the layering of the water. It is therefore important to remember that the sampling methods and data from the Charlotte Harbor Estuaries Volunteer Monitoring Network measure the conditions of the water surface only. This data for surface water quality conditions supplements additional data collected within the water column by other agencies and institutions less frequently and at fewer sites then the volunteer program.

Tide

The tide mixes waters and breaks down stratification (layering). Because estuaries are transitional zones that encompass a wide range of tide levels and environments, they are constantly changing and very complex. In estuaries, tide changes are important to biological communities, because plants and animals must adapt to the wide salt range.

Volunteers measure whether the tide is coming in, going out, or at high or low slack, by using tide tables and observing changes in water levels during each sampling period using on a stationary structure such as a piling or dock. In northern Charlotte Harbor, the range of tide between high and low tide is approximately .5 meters.

From November 1996 through December 1997, the monthly sampling occurred at all tide stages throughout the locations and months, with the majority of the samples being collected at mid-tide levels.

Salinity

Salinity is a measure of dissolved salts in water, measured in parts per thousand (ppt.). Salinity effects distribution of plants and animals based on levels they can tolerate. The normal range of salinity is 0 - 35 ppt., with true freshwater at 0 ppt., and 35 ppt. being true seawater. Salinity is effected by the proximity to passes and tributaries, tides, rain, and wind, and can fluctuate greatly in any area of the estuary over time.

Volunteers measure the salinity with a hydrometer. The hydrometer measures the relative density (specific gravity) of the sampled water compared to pure water. Saltwater is more dense than freshwater; this increased density correlates to an increase in specific gravity. The salinity of the water is determined by using a conversion table based on the specific gravity and temperature of the sample.

The highest salinity readings for the November 1996 -January 1997 period were found at the two Gasparilla Sound locations. GSV001 in Coral Creek at the SR 771 fishing pier in Placida recorded an average salinity of 33.8 ppt., and GSV002 in Gasparilla Sound at the Boca Grande Bridge fishing pier, averaged a salinity of 31.2 ppt. The lowest salinity readings were found at CHV005 in the Peace River at Navigation marker 33 near Harbor Heights which averaged 2.8 ppt. All other sites averaged between 17.8 and 25.6 ppt.

Water Color

Changes in water color result from decomposed organic matter. Color is an indication of water source and content. Locally there is a large variance in water color between the Peace and Myakka Rivers and the Gulf of Mexico. This is mainly because of the tannins produced by the mangrove trees which stain the waters of the Peace and Myakka Rivers a reddish brown. Waters closer to the Gulf passes are greener and bluer than the waters closer to the major tributary rivers.

Volunteers describe the apparent color of the water by lowering a black and white secchi disc into the water and observing the water color above the white sections of the secchi. For the Charlotte Harbor and it's major tributaries, the apparent water color throughout the year was found to be generally browns - red, yellow and green browns, reflecting the influence of the tannins. For the Gasparilla Sound sites, GSV001 at Placida and GSV002 at Coral Creek, the color was observed to be greener.

Beginning in June 1997, volunteers began also measuring total color in the water by using the Platinum Colbalt method, which is a universal standard test for color comparisons. This method determines color by making visual comparisons of a sample with known concentrations of colored solutions. The normal range of color is between 1 and 500 Platinum Colbalt Units (PCUs).

Initial training of this method was in the low range only (1-100 PCUs) of the sampling kits; however, because several of the sights were receiving measurements out of this range, in February volunteer were instructed on use of the high range (1-500 PCUs) of the kits as well.

Based on preliminary results, higher color values were associated with fresher water in the tributaries and during the rainy season.

Turbidity

Turbidity is a measure of cloudiness caused by suspended matter in the water column. Causes of cloudiness include sediments, plankton, and organisms.

Turbidity is measured with a black and white secchi disc, which is a universal measurement of turbidity. The secchi disc is also used by volunteers to measure water depth.

Secchi readings during the monitored period showed the most variance in the deeper water areas. The greatest secchi range was found at CHV007 at Ponce De Leon Inlet in Punta Gorda with a range of 0.5 - >2.6 meters. The lowest secchi readings were recorded during the summer months and after excessively large amounts of rain closer to the tributaries. At several of the shallower sites the secchi read greater than bottom at times throughout the 14 month period.

Dissolved Oxygen (D.O.)

Oxygen enters the water from the atmosphere through photosynthesis by aquatic plants and phytoplankton. Oxygen levels within an estuary change throughout the day, being highest around mid-day and lowest before sunrise. These daily fluctuations in D.O. correspond to times of highest and lowest photosynthetic activity by seagrasses and algae as they respond to the amount of sunlight available.

Dissolved oxygen reflects a water body's ability to support healthy and diverse biological communities. Generally, a healthy level of D.O. is 5+ mg/L. When levels are below 3mg/L for extended periods, living organisms become extremely stressed and will either relocate or if immobile, may die. 5mg/L daily average is also used for state standards for recreational and Outstanding Florida Waters. The sites sampled by the Northern Charlotte Harbor Group are Outstanding Florida Waters or directly adjacent to them.

Volunteers measure dissolved oxygen using the Standard Winkler Titration method with a LaMotte titration kit. Using this method, the D.O. in the water sample is "fixed" (stabilized) through chemical reactions. The equivalent oxygen is then measured by titrating with Sodium Thiosulfate. The sunrise sampling time reflects the lowest daily D.O. values.

For the samples from these 10 stations and 14 months, the dissolved oxygen levels were found to be: 46% > 5mg/L, 41% = 3-5mg/L, and 13% > 3mg/L.

D.O. levels over the November 1996 - December 1997 period tended to be highest in the winter months due to colder temperatures and less fresh water inflow, and lowest in the summer months when the water is warmer and fresher due to more rain runoff. CHV008 in Alligator Creek in Punta Gorda recorded the highest variation in D.O. readings, with a range of 1.6 - 6.6 mg/L. CHV004 in Charlotte Harbor at Port Charlotte Beach, recorded the lowest variation of D.O. readings, with a range of 2.0 - 5.2 mg/L. The highest D.O. reading of 7.4 mg/L was found at CHV005 in the Peace River at Navigation marker 33 near Harbor Heights in December 1997, and the lowest D.O. reading of 1.6 mg/L was found at CHV008 at Alligator Creek in Punta Gorda in September 1997.

pH

pH is a measure of acidity in the water. pH is measured on a scale from 0 - 14.0, with 0 being highly acidic, 7.0 being neutral, and 14.0 being extremely basic. Each increase or decrease of 1.0 along the scale is a change to the power of 10.

The estuary regions closer to the Gulf of Mexico are normally above 8.0 because seawater is buffered by carbonate. Further into the tributaries (Peace and Myakka Rivers), pH tends to be more acidic due to the freshwater inflow.

An optimal pH measurement within the estuary fall between 6.5 and 8.2. When pH levels fall below 5.0 or rise above 9.0, many living organisms find it difficult to survive.

Volunteers measure pH with a LaMotte Cresol Red pH test kit. This kit uses an indicator that changes color according to the pH of the sample. The color is then compared to color standards of known pH values.

GSV002 which is located in Gasparilla Sound at the Boca Grande Bridge fishing pier, recorded the highest pH values for the November 1996 - December 1997 period, with a range of 8.2 - 8.6, which reflects the influence of saltier water from the Gulf. The lowest pH readings were found up the Peace River at CHV005 which is monitored from navigation marker 33 near Harbor Heights. The pH here ranged between 7.2 and 7.8; this is consistent with fresher river water.

Water Temperature

The temperature of water within an estuary affects water quality and productivity. Water temperature is a function of depth, season, weather (mixing), and human activities.

Volunteers measure water temperature with a thermometer in degrees Centigrade and then convert to degrees Fahrenheit.

The warmest temperature readings for the November 1996 - December 1997 period were found during the months July - September. The warmest reading of 30.5°C (87°F) was found in August at GSV002 located in Gasparilla Sound at the Boca Grande Bridge. The coldest month for the period was February with the coldest reading of 17°C (63°F) measured at CHV008 located at Alligator Creek in Punta Gorda.

Yearly temperature averages for all 10 sites were similar ranging from 23.2°C to 25.8°C. Gasparilla Sound and Coral Creek yearly averages were warmer. Lower values were found in tributaries including: Ponce de Leon Inlet, Alligator Creek, and Myakka River.

Rain

Rain effects the rate of run-off, pH, temperature, and the amount of particles and dissolved nutrients in the water. In southwest Florida, rain patterns vary locally. How far up stream rain occurs determines how long before runoff reaches tributaries and estuaries. Volunteers measure the amount of rainfall for the 24 hour period just prior to sampling by using a rain gauge near their site.

The most rain for the 14 month period was recorded in May 1997 at CHV005 located near the Peace River, near Harbor Heights with a reading of 2.80 inches over the 24 hour period. CHV004 near Charlotte Harbor at Port Charlotte Beach, and CHV006 at Gilchrist Park in Punta Gorda, averaged the most rain of .4 inches each over the 14 month period.

The least amount of rain during the monitored period was found at CHV002 near the Myakka River at the SR 776 fishing pier in El Jobean, and GSV002 near Gasparilla Sound at the Boca Grande Bridge, which both averaged .1 inches over the 14 month period.

General Conditions

General conditions help to define the health of the estuary at the sites being sampled. General conditions that volunteers have noted include: odors, birds, fish and other wildlife, debris, vegetation, construction, shoreline conditions, oily appearances, and alga blooms.

Observations were consistent with healthy estuary conditions for most sampling dates and sites. The major exception was losing the site at Sam Knight Creek to lengthy road construction starting in August 1997.

Quality Assurance (Q.A.)

To assure that the data collected by the volunteers is reliable, the volunteers meet several times a year to practice their water quality monitoring techniques, supplies and equipment. The volunteers all measure the same water at the same location at the same time. The goal is to get good precision among the volunteers as well as good accuracy relative to the "true" values for each of the parameters. A calibrated Hydrolab is used to measure the "true" values.

Both classroom and field training sessions were held with the volunteers in October 1996. The values that the volunteers measured in the field were within acceptable goals of each other. In June 1997, another quality assurance session was held at Gilchrist Park in Punta Gorda. The values for all parameters, except dissolved oxygen, showed adequate consistency between the volunteers and with the Hydrolab. Because the dissolved oxygen values showed significant variability, more detailed dissolved oxygen instructions were added to the Field Procedures Manual. The volunteers began using the new instructions in July 1997. A second quality assurance practice session was held in July where the volunteers met to practice just the dissolved oxygen test. The test results came in closer together than the June quality assurance session, but not within the goal. The dissolved oxygen kits were collected from the volunteers, tested by the project coordinator and found to show variability. Some of the chemicals in the kit were determined to be old, were replaced and the kits tested again, showing adequate consistency.

The results of the Quality Assurance sessions are shown in the tables in Appendix C.

DATA NEEDS

What happens to the data?

Every month the water monitors record the water quality data for their site onto data sheets. The data sheets are sent to the Project Coordinators and the data is then entered into a database on a personal computer. The data base is designed using the software "Access". This data is then transformed into graphs and tables using the software "Excel". The graphs and tables are used to give a understandable picture of the water quality of the sites over time. The graphs and tables for the Northern Charlotte Harbor Groups for November 1996 to December 1997 are given in Appendices A and B, respectively, of this report. Annual reports such as this one will help interpret the data results also. All of the data is then made available to scientists, state and local government agencies, policy makers, and citizen's organizations.

Data from this project can be used in a variety of ways. First, it is used to determine **base level** conditions throughout the Charlotte Harbor Estuaries where little widely distributed data previously existed. Base line conditions are critical, because they characterize the current estuarine environment, providing a foundation for future studies. This base level data will be used to determine changes in water quality throughout the year and throughout the estuaries. It will also identify current and potential monitoring needs and will identify freshwater inflows. In addition, more detailed statistical analysis of the data will be meaningful after approximately 2 ½ years of monthly sampling.

Once the base level conditions have been established, the data is then available for future uses in **resource management**, which includes activities such as permitting, recreational decisions, land use and infrastructure decisions, and determining permit compliance.

Data from this project will also be used in other **future** efforts made to protect, restore and enhance the Charlotte Harbor estuary. For instance, data can be used to supplement other water monitoring efforts, and it can be used to develop Aquatic Preserve Management Plans and supplement the Charlotte Harbor National Estuary Program data and reports. It will also contribute to scientific information on ecosystem functioning and provide scientific evidence for county and state management decisions.

This data will also be used to **educate** the public/community regarding water quality issues. Volunteers contribute knowledge, information, and visibility. Their active effort and commitment will help increase public understanding and respect for the Charlotte Harbor estuaries.

Concerned, well trained volunteers have proven that they can collect high quality, credible data. And, because volunteers have easier access to remote sites, they are able to serve as the eyes and ears of scientists, who are not able to witness the changes occurring in the estuary on a daily basis.

Future Happenings

Who else is monitoring the Charlotte Harbor estuary?

The Charlotte Harbor Volunteer Water Quality Monitoring Network has recently begun monitoring in all 6 of the Charlotte Harbor Aquatic Preserves. In January, the Pine Island Sound and Matlacha Pass volunteers were trained and began sampling on February 2, 1998. And, in February the Estero Bay volunteers were trained, and they took their first samples on March 2, 1998.

As of spring 1998, there are now 36 volunteers sampling 22 different sites within the Charlotte Harbor estuaries on the regular monthly basis. An additional 18 sites will be established by summer 1998. 1998 should prove to be a big year for our program. Many thanks to all of our volunteers for their continued support. This program would not be the success that it is without you.

What's happening in the future?

1) Quality Assurance (QA) field sessions in Spring & Fall 1998.
2) Classroom and field training for collection of chlorophyll, coliform bacteria, and nutrients in Summer 1998.
3) Begin collecting chlorophyll, coliform bacteria and nutrient samples to be transported to the FDEP South District Laboratory in Punta Gorda for analysis in Summer 1998.

Beginning this summer, volunteers will be trained and begin collecting samples for an additional five parameters that will be analyzed by the FDEP South District Laboratory in Punta Gorda. These parameters include chlorophyll, as a measure of algae growth, fecal coliform bacteria, an indicator of waste water contamination, and three nitrogen and phosphorus parameters. These nutrients are necessary for plants to grow and reproduce.

Volunteers will collect samples in pre-cleaned preserved sample bottles provided by the laboratory. Samples will then be transported to the laboratory by volunteer drivers for analysis by FDEP chemists. Volunteers will be receiving information about the training soon...

Needed Actions

How can the Project Coordinators help?

The continued success of the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Program depends on the happiness of the volunteers. That is why we are asking for feedback from you on how we can make this program even better. Please give us any suggestions that you have for improvements. Let us know if you are having problems with tests, need information, or if you are having difficulty getting your questions answered. Also, let us know what you like most or least about the program ~ we would like to know so we can make any needed changes.

What else can volunteers do to help the Aquatic Preserves?

1) Join citizens support organizations for Aquatic Preserves, Charlotte Harbor Environmental Center and Charlotte Harbor National Estuary Program.
2) Volunteer to help conduct other water quality sampling and/or exotic plant removal
3) Participate in "Florida Yards and Neighborhoods".
4) Protect biological resources by not prop dredging seagrasses or cutting mangroves
5) Report resource protection problems &/or violations to FDEP or County offices.
6) Work with local governments to reduce stormwater runoff to Aquatic Preserves & their tributaries.

Who do we contact for more information?

Either of the project coordinators will be happy to answer any questions you have and welcome new volunteers. The Coordinator for the Northern Charlotte Harbor Group of the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network is Bobbi Rodgers at the Charlotte Harbor Environmental Center office in Punta Gorda. Bobbi's telephone number is (941) 505-8243.

The Project Coordinator for the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network is Judy Ott at the FDEP Charlotte Harbor Aquatic & Buffer Preserves office in Bokeelia. Judy's telephone number is (941) 283-2424.

REFERENCES

Campbell, Gayla, and Steve Wildberger. 1992. *The Monitor's Handbook.* LaMotte Company. Chestertown, MD.

Comprehensive Quality Assurance Plan for the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network. 1997. Florida Department of Environmental Protection, Charlotte Harbor Aquatic & Buffer Preserves. Bokeelia, FL.

Ellett, Kathleen, and Alice Mayio. 1990. *Volunteer Water Monitoring: A Guide For State Managers.* United States Environmental Protection Agency, Office of Water. Washington, D.C.

Fisher, Nina A. 1993. *Volunteer Water Monitoring: A Methods Manual.* United States Environmental Protection Agency, Office of Water. Washington, D.C.

Franson, Mary Ann H. ed. 1985. *Standard Methods for the Examination of Water and Wastewater.* 16th ed. American Public Health Association. Washington, D.C.

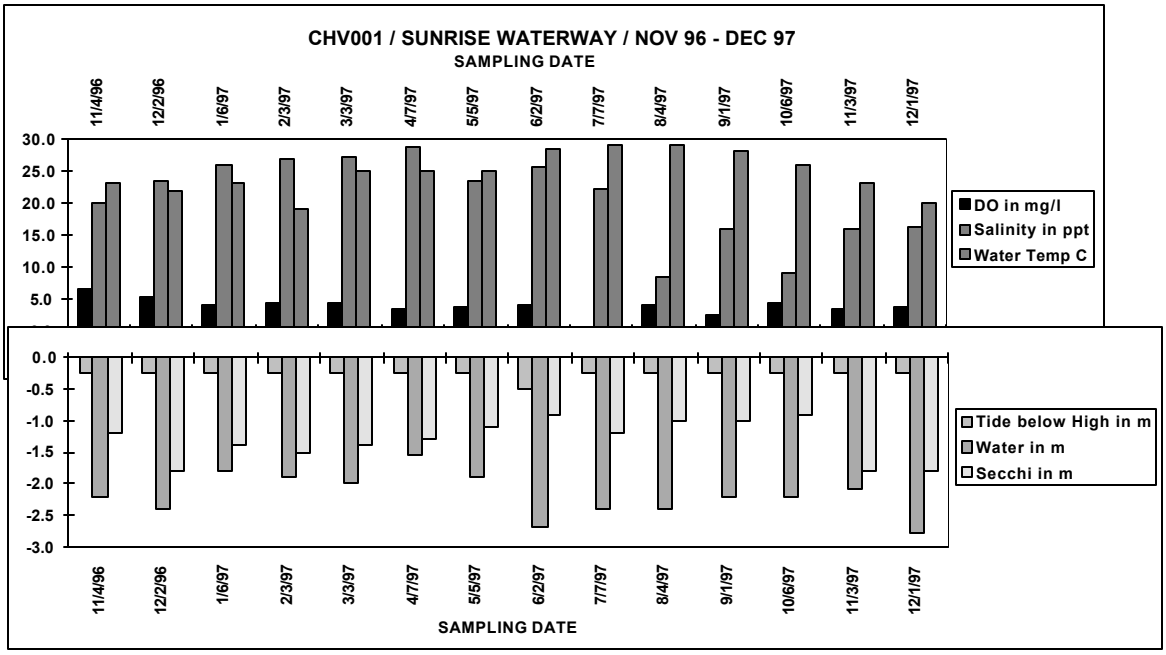
Hunt, Margo, et al. 1996. *The Volunteer Monitor's Guide to Quality Assurance Project Plans.* United States Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds. Washington, D.C.

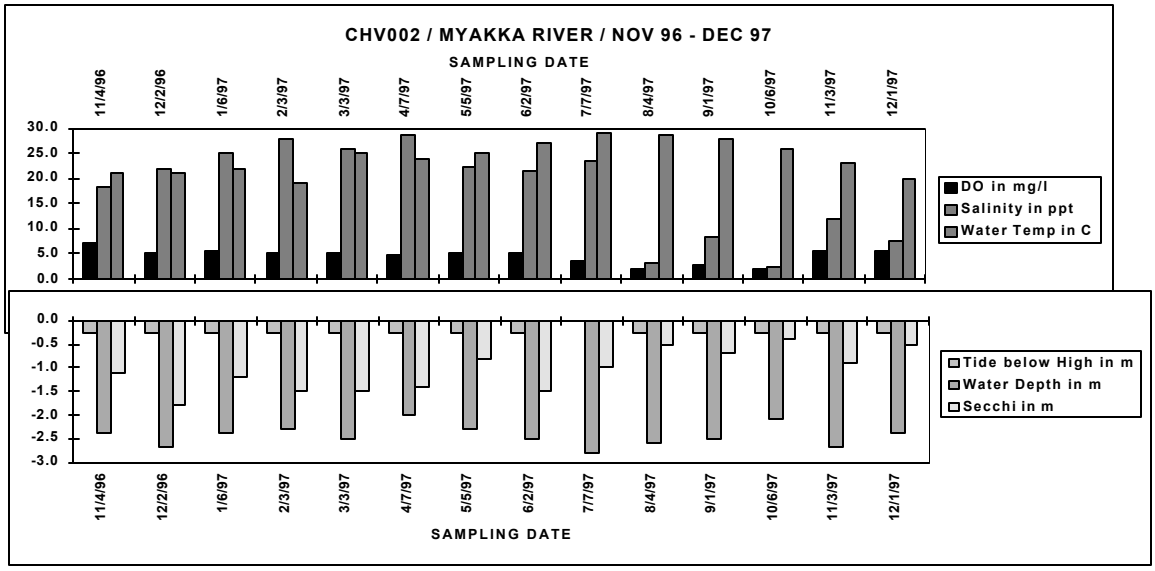
Indian River Lagoon Citizens Water Quality Monitoring Network: Annual Report Summer 1996.

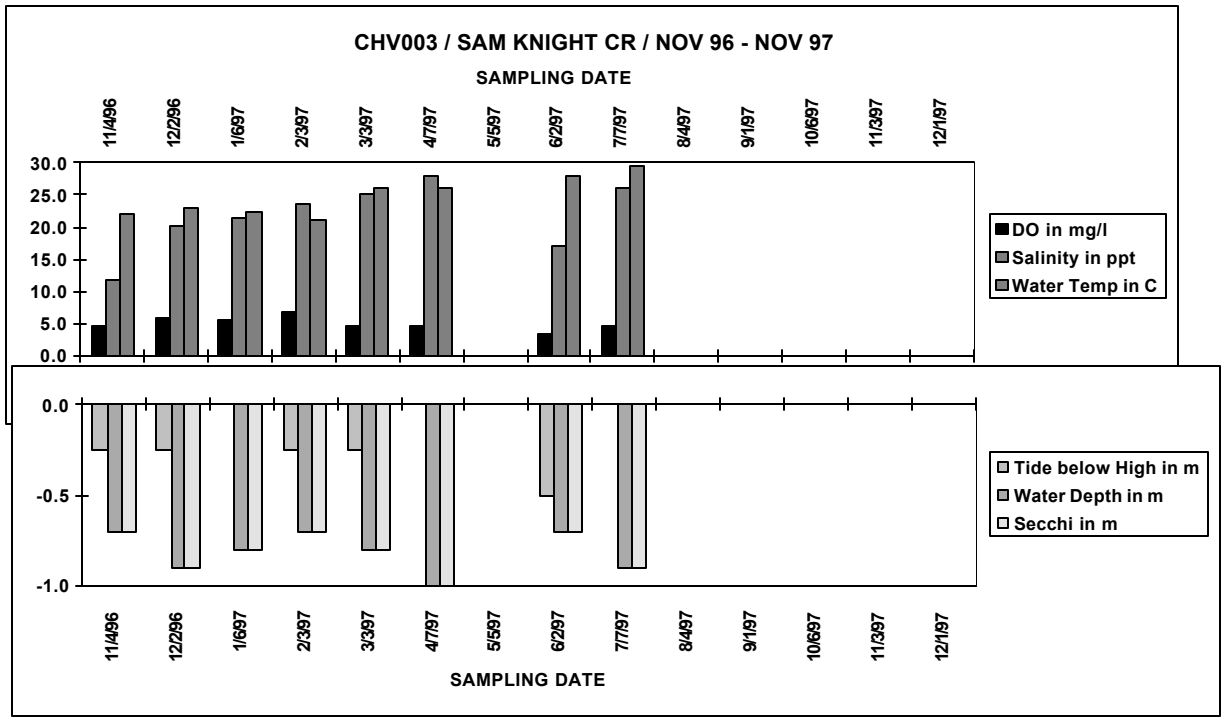
Project Management Guidelines for the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network. 1997. Florida Department of Environmental Protection, Charlotte Harbor Aquatic & Buffer Preserves. Bokeelia, FL.

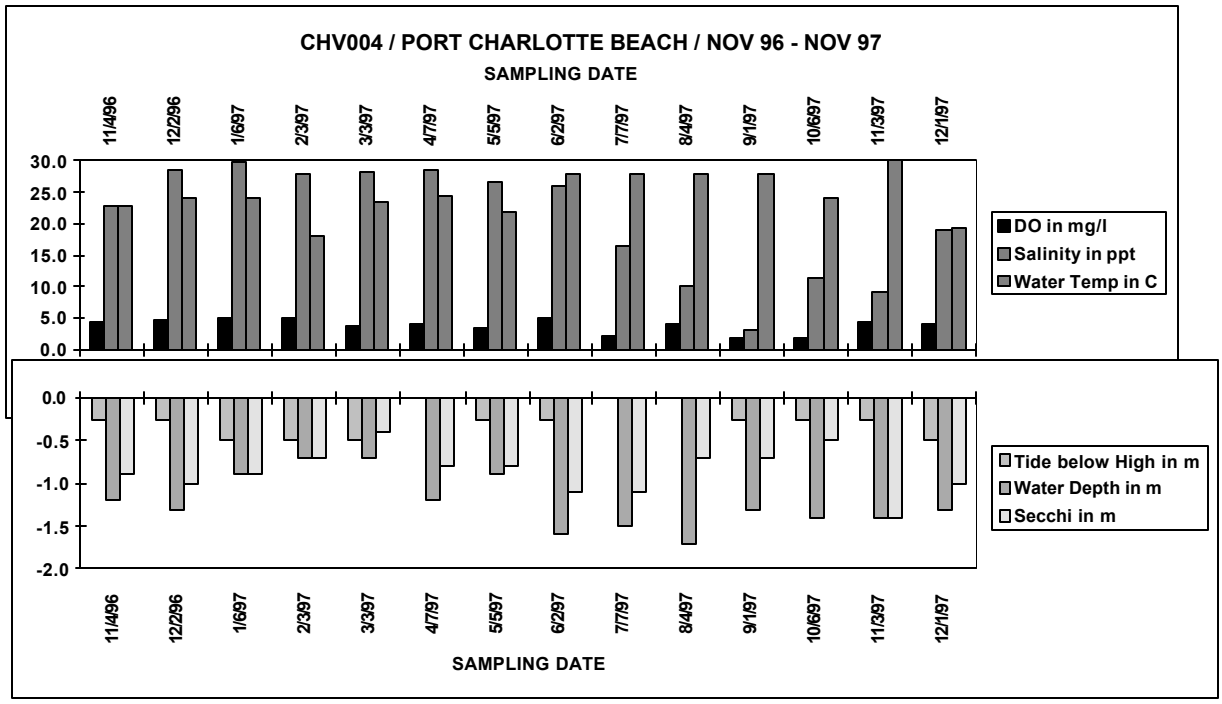
Standard Field Procedures for Water Quality Monitoring for the Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network. 1997. Florida Department of Environmental Protection, Charlotte Harbor Aquatic & Buffer Preserves. Bokeelia, FL.

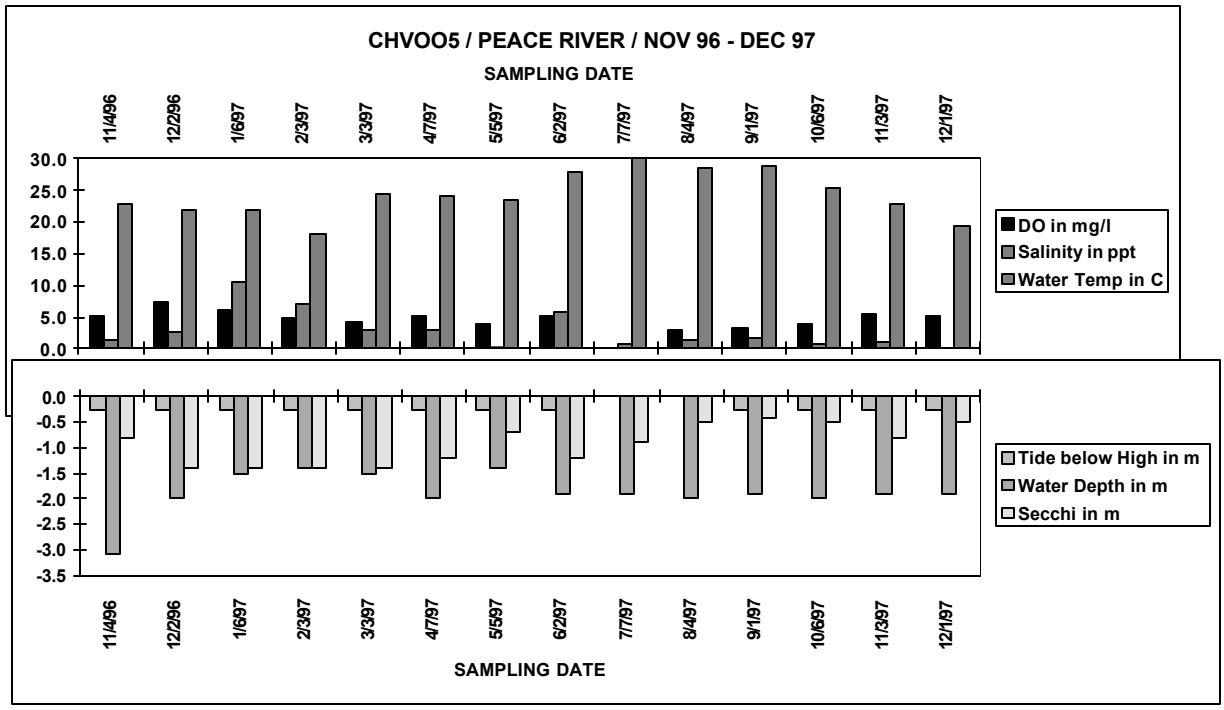
APPENDIX A - DATA GRAPHS

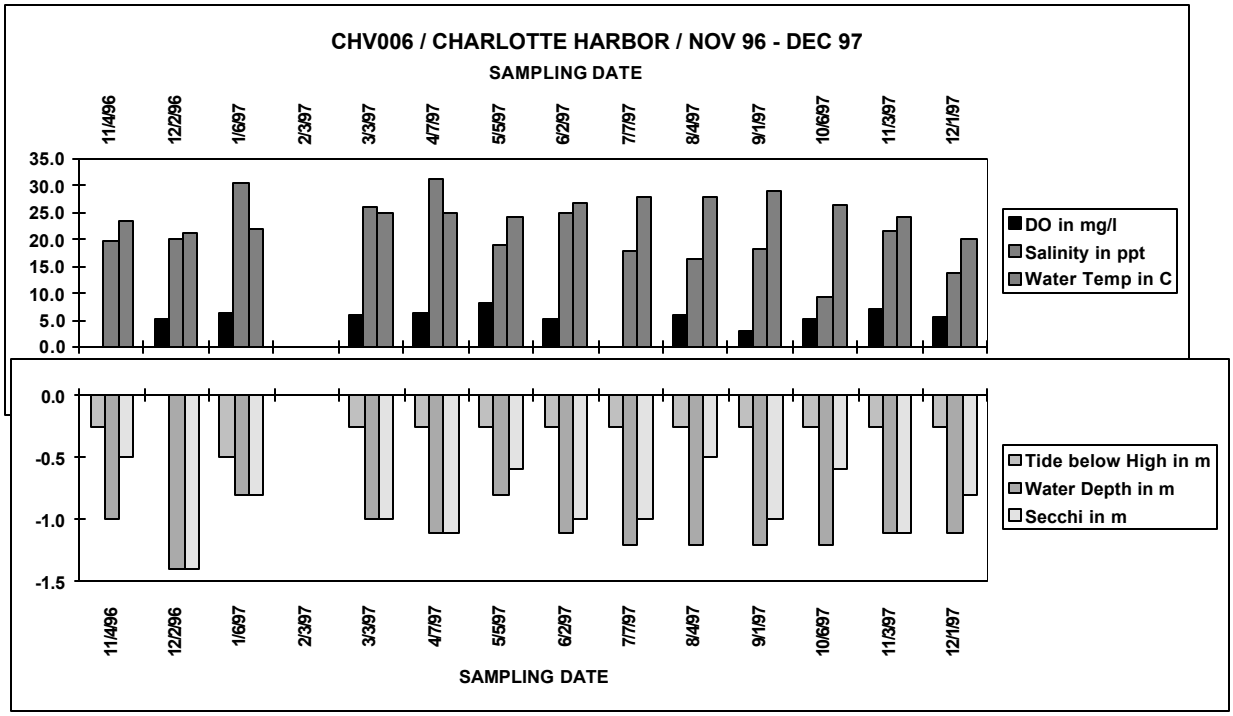


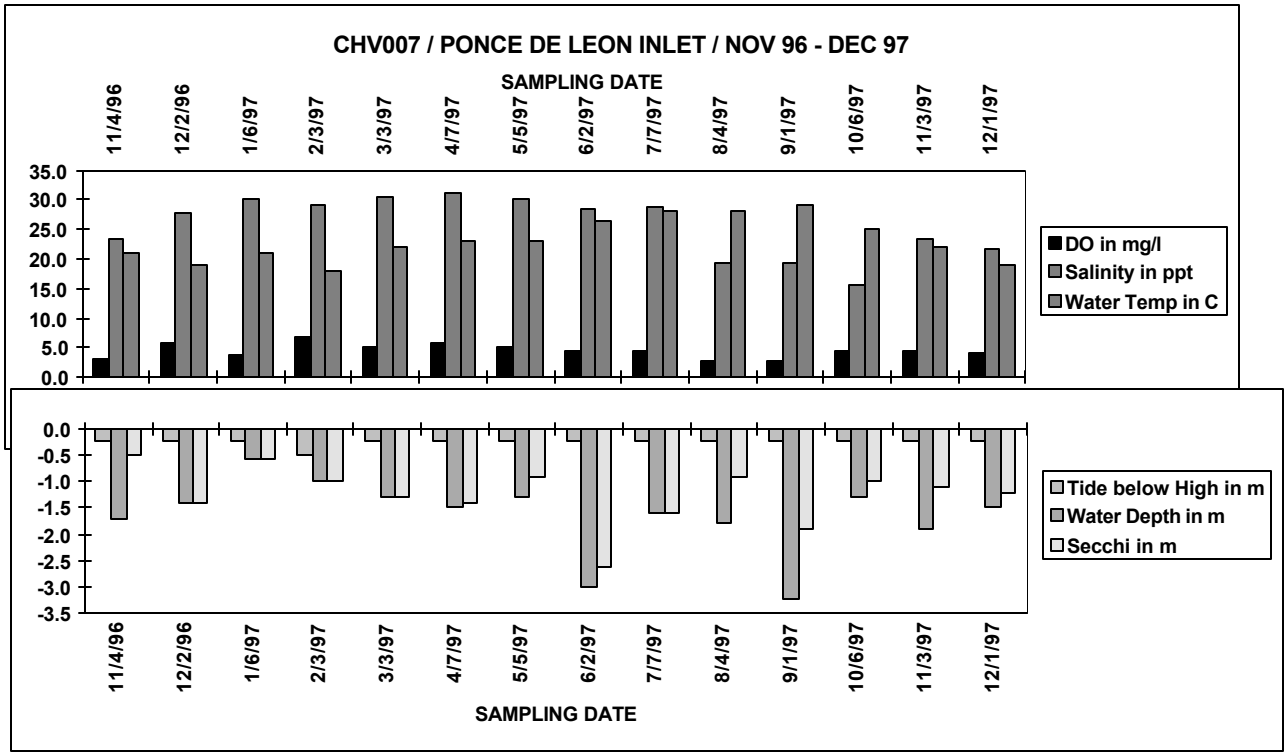


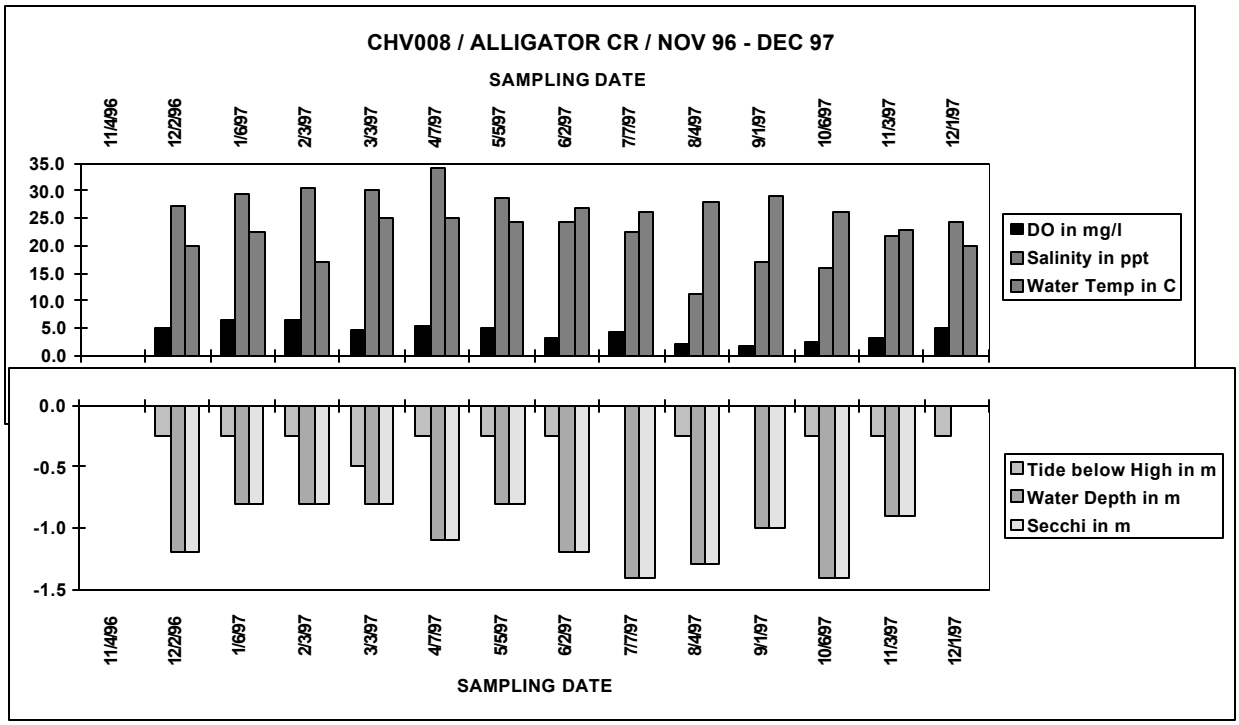

CHV003 / SAM KNIGHT CR / NOV 96 - NOV 97
SAMPLING DATE
11/496
12/296
1/697
2/397
3/397
4/797
5/597
6/297
7/797
8/497
9/197
10/697
11/397
12/197
30.0
25.0
20.0
15.0
10.0
5.0
0.0
DO in mg/l
Salinity in ppt
Water Temp in C
0.0
-0.5
-1.0
Tide below High in m
Water Depth in m
Secchi in m
SAMPLING DATE

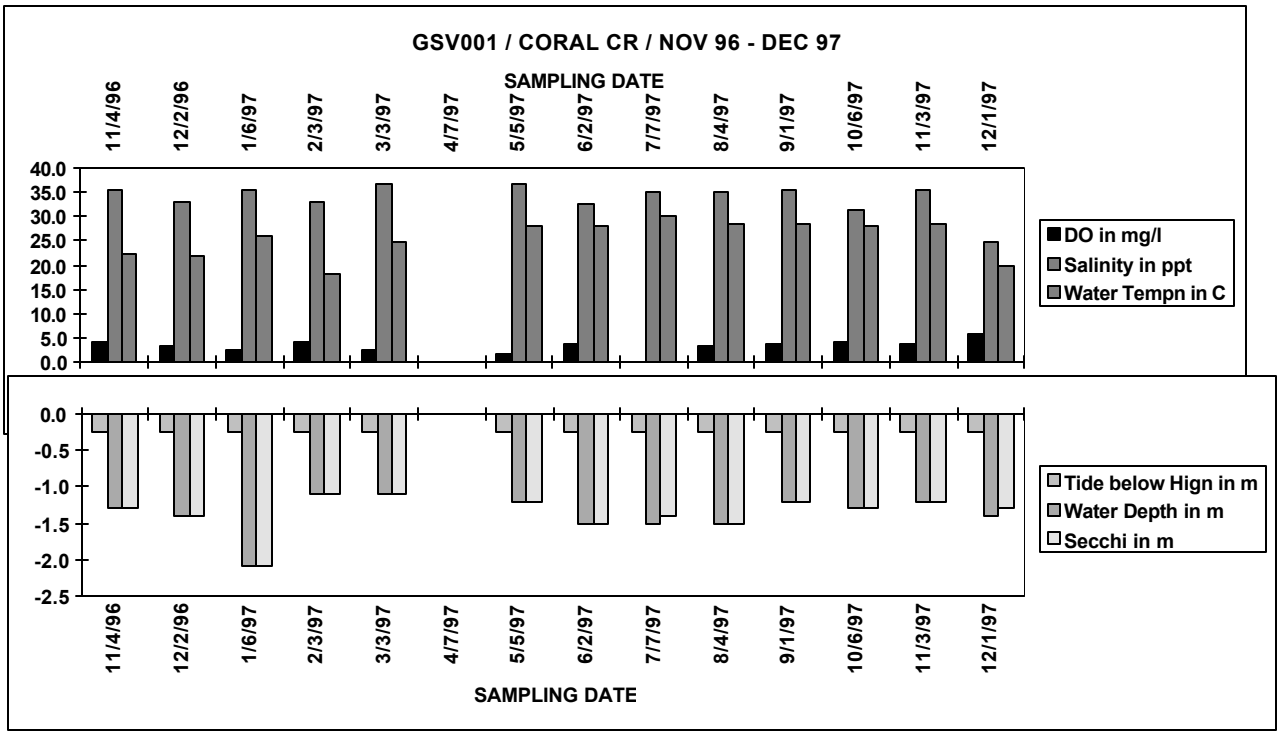

CHV004 / PORT CHARLOTTE BEACH / NOV 96 - NOV 97
SAMPLING DATE
11/496
12/296
1/697
2/397
3/397
4/797
5/597
6/297
7/797
8/497
9/197
10/697
11/397
12/197
30.0
25.0
20.0
15.0
10.0
5.0
0.0
DO in mg/l
Salinity in ppt
Water Temp in C
0.0
-0.5
-1.0
-1.5
-2.0
Tide below High in m
Water Depth in m
Secchi in m
SAMPLING DATE

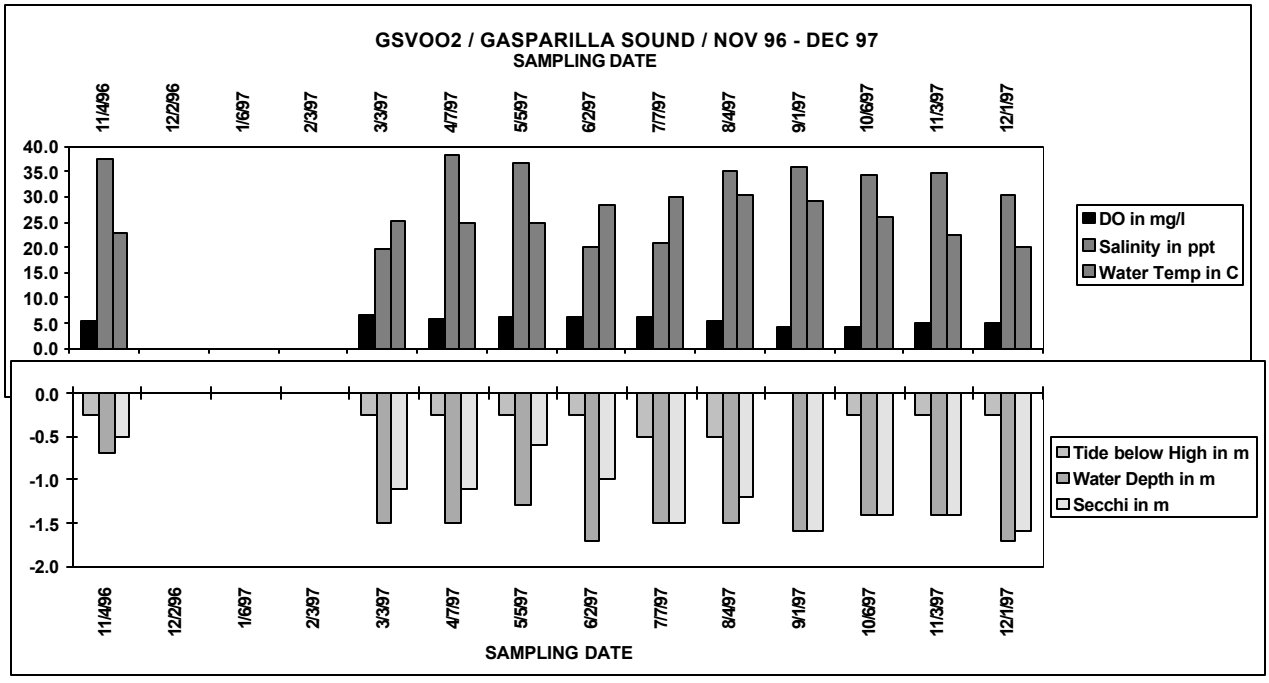

CHVOO5 / PEACE RIVER / NOV 96 - DEC 97
SAMPLING DATE
11/4/96
12/2/96
1/6/97
2/3/97
3/3/97
4/7/97
5/5/97
6/2/97
7/7/97
8/4/97
9/1/97
10/6/97
11/3/97
12/1/97
30.0
25.0
20.0
15.0
10.0
5.0
0.0
DO in mg/l
Salinity in ppt
Water Temp in C
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
Tide below High in m
Water Depth in m
Secchi in m
SAMPLING DATE


CHV006 / CHARLOTTE HARBOR / NOV 96 - DEC 97
SAMPLING DATE
11/4/96
12/2/96
1/6/97
2/3/97
3/3/97
4/7/97
5/5/97
6/2/97
7/7/97
8/4/97
9/1/97
10/6/97
11/3/97
12/1/97
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
DO in mg/l
Salinity in ppt
Water Temp in C
0.0
-0.5
-1.0
-1.5
Tide below High in m
Water Depth in m
Secchi in m
SAMPLING DATE


CHV007 / PONCE DE LEON INLET / NOV 96 - DEC 97
SAMPLING DATE
11/4/96
12/2/96
1/6/97
2/3/97
3/3/97
4/7/97
5/5/97
6/2/97
7/7/97
8/4/97
9/1/97
10/6/97
11/3/97
12/1/97
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
DO in mg/l
Salinity in ppt
Water Temp in C
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
Tide below High in m
Water Depth in m
Secchi in m
SAMPLING DATE


CHV008 / ALLIGATOR CR / NOV 96 - DEC 97
SAMPLING DATE
11/496
12/2/96
1/697
2/397
3/397
4/7/97
5/597
6/2/97
7/7/97
8/4/97
9/1/97
10/697
11/397
12/1/97
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
DO in mg/l
Salinity in ppt
Water Temp in C
0.0
-0.5
-1.0
-1.5
Tide below High in m
Water Depth in m
Secchi in m
SAMPLING DATE


GSV001 / CORAL CR / NOV 96 - DEC 97
SAMPLING DATE
11/4/96
12/2/96
1/6/97
2/3/97
3/3/97
4/7/97
5/5/97
6/2/97
7/7/97
8/4/97
9/1/97
10/6/97
11/3/97
12/1/97
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
DO in mg/l
Salinity in ppt
Water Tempn in C
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Tide below Hign in m
Water Depth in m
Secchi in m
SAMPLING DATE


GSVOO2 / GASPARILLA SOUND / NOV 96 - DEC 97
SAMPLING DATE
11/496
12/296
1/697
2/397
3/397
4/7/97
5/597
6/297
7/7/97
8/497
9/1/97
10/697
11/397
12/1/97
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
DO in mg/l
Salinity in ppt
Water Temp in C
0.0
-0.5
-1.0
-1.5
-2.0
Tide below High in m
Water Depth in m
Secchi in m
SAMPLING DATE

APPENDIX B – DATA TABLES

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: CHARLOTTE HARBOR
SITE: CHV001
WATER BODY: SUNRISE WATERWAY
LOCATION: EDGEWATER DR. IN PORT CHARLOTTE
MONITOR: CROWLEY & WHITESIDE
DATES: NOV 96 - DEC 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr in	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	16.0	61.0	8 - 12	NE	0.00	calm	incoming	19.9	Dark brown		2.2	1.2	23.0	73.0	6.6	7.8
	02-Dec-96	overcast	18.0	64.0	8 - 12	N	0.30	ripples	outgoing	23.5	Med Brown		2.4	1.8	22.0	72.0	5.2	7.8
	06-Jan-97	Fog/haze	19.0	66.0	2 - 3	NE	0.00	calm	outgoing	25.9	Med Brown		1.8	1.4	23.0	73.0	4.0	7.6
	03-Feb-97	sunny	13.0	55.0	2 - 3	NE	0.00	calm	outgoing	26.8	Med Brown		1.9	1.5	19.0	66.0	4.4	7.8
	03-Mar-97	sunny	21.0	70.0	8 - 12	SE	0.00	ripples	incoming	27.3	Med Brown		2.0	1.4	25.0	77.0	4.3	7.8
	07-Apr-97	partly cloudy	22.0	72.0	4 - 7	E	0.00	calm	outgoing	28.9	Med Brown		2.2	1.3	25.0	77.0	3.3	7.7
	05-May-97	sunny	16.0	60.0	8 - 12	N	0.00	ripples	outgoing	23.3	Med Brown		1.9	1.1	25.0	77.0	3.8	7.6
	02-Jun-97	partly cloudy	24.0	77.0	0 - 1	N		calm	low slack	25.5	Green Brown		2.7	0.9	28.5	83.0	4.0	7.8
	07-Jul-97	clear	24.0	75.0	0 - 1		0.00	calm	outgoing	22.3		40	2.4	1.2	29.0	84.0		8.0
	04-Aug-97	partly cloudy	20.0	69.0	0 - 1		0.40	calm	outgoing	8.5		70	2.4	1.0	29.0	84.0	4.1	7.6
	01-Sep-97	partly cloudy	24.0	76.0	4 - 7	N	0.00	ripples	outgoing	15.9		80	2.2	1.0	28.0	82.0	2.6	7.4
	06-Oct-97	clear	20.0	68.0	4 - 7	N	0.00	ripples	outgoing	9.2		60	2.2	0.9	26.0	79.0	4.5	7.4
	03-Nov-97	partly cloudy	15.0	59.0	2 - 3	N	1.00	calm	outgoing	16.0		40	2.1	1.8	23.0	73.0	3.5	7.4
	01-Dec-97	clear	14.0	58.0	2 - 3		0.50	calm	incoming	16.3		45	2.8	1.8	20.0	68.0	3.8	7.4
Max			**24.0**	**77.0**			**1.00**			**28.9**		**80**	**2.8**	**1.8**	**29.0**	**0.0**	**6.6**	**8.0**
Min			**13.0**	**55.0**			**0.00**			**8.5**		**40**	**1.8**	**0.9**	**19.0**	**66.0**	**2.6**	**7.4**
Ave			**19.0**	**66.4**			**0.17**			**20.7**		**56**	**2.2**	**1.3**	**24.7**	**76.3**	**4.2**	**7.7**
Std Dev			**3.78**	**7.14**			**0.31**			**6.57**		**16.86**	**0.29**	**0.32**	**3.22**	**5.76**	**0.96**	**0.20**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: CHARLOTTE HARBOR
SITE: CHV002
WATER BODY: MYAKKA RIVER
LOCATION: SR 776 FISHING PIER IN EL JOBEAN
MONITOR: RENDA
DATES: NOV 96 - DEC 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr in	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	21.0	70.0	8 - 12	NE	0.00	ripples	incoming	18.3	Med Brown		2.4	1.1	21.0	70.0	7.1	8.0
	02-Dec-96	overcast	21.0	70.0	8 - 12	N	0.30	ripples	outgoing	22.0	Green Brown		2.7	1.8	21.0	70.0	5.1	8.0
	06-Jan-97	Fog/haze	20.0	68.0	0 - 1	E	0.00	calm	outgoing	25.2	Green Brown		2.4	1.2	22.0	72.0	5.5	8.0
	03-Feb-97	sunny	15.0	59.0	2 - 3	NE	0.00	calm	outgoing	27.9	Green		2.3	1.5	19.0	66.0	5.2	8.0
	03-Mar-97	sunny	22.0	72.0	2 - 3	SE	0.00	calm	incoming	25.9	Green Brown		2.5	1.5	25.0	78.0	5.2	8.0
	07-Apr-97	partly cloudy	23.0	73.0	4 - 7	E	0.00	ripples	outgoing	28.5	green brown		2.0	1.4	24.0	75.0	4.9	8.2
	05-May-97	sunny	18.0	64.0	8 - 12	N	0.40	waves	outgoing	22.2	Med Brown		2.3	0.8	25.0	77.0	5.2	8.2
	02-Jun-97	partly cloudy	25.0	77.0	2-3	W	0.00	calm	outgoing	21.6	green brown		2.5	1.5	27.0	81.0	5.0	8.0
	07-Jul-97	clear	25.0	77.0	4-7	E	0.00	ripples	high slack	23.6		30.0	2.8	1.0	29.0	84.0	3.7	8.2
	04-Aug-97	clear	26.0	80.0	2-3	E	0.00	ripples	outgoing	3.2	Dark brown		2.6	0.5	28.5	83.0	2.0	7.4
	01-Sep-97	partly cloudy	25.0	77.0	2-3	NE	0.00	ripples	outgoing	8.5	dark brown		2.5	0.7	28.0	82.0	3.0	7.6
	06-Oct-97	clear	22.0	72.0	4-7	NE	0.00	waves	outgoing	2.5	dark brown		2.1	0.4	26.0	79.0	2.0	7.4
	03-Nov-97	clear	18.0	64.0	2-3	E	0.70	ripples	outgoing	11.9		70.0	2.7	0.9	23.0	73.0	5.4	7.8
	01-Dec-97	clear	19.0	66.0	13-18	NW	0.40	waves	outgoing	7.4		95.0	2.4	0.5	20.0	68.0	5.5	7.4
Max			**26.0**	**80.0**			**0.7**			**28.5**		**95.0**	**2.8**	**1.8**	**29.0**	**84.0**	**7.1**	**8.2**
Min			**15.0**	**59.0**			**0.0**			**2.5**		**30.0**	**2.0**	**0.4**	**19.0**	**66.0**	**2.0**	**7.4**
Ave			**21.4**	**70.6**			**0.1**			**17.8**		**65.0**	**2.4**	**1.1**	**24.2**	**75.6**	**4.6**	**7.9**
Std Dev			**3.23**	**6.02**			**0.23**			**9.19**		**32.79**	**0.22**	**0.44**	**3.28**	**5.87**	**1.44**	**0.30**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: CHARLOTTE HARBOR
SITE: CHV003
WATER BODY: SAM KNIGHT CR.
LOCATION: SR 776 BRIDGE WEST OF PORT CHARLOTTE
MONITOR: VINCENT
DATES: NOV 96 - NOV 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr in	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	16.0	61.0	4 - 7	SE	0.00	ripples	incoming	11.9	Dark Brown		0.7	> 0.7	22.0	72.0	4.7	7.6
	02-Dec-96	overcast	21.0	70.0	4 - 7	N	0.30	ripples	outgoing	20.1	Med Brown		0.9	> 0.9	23.0	73.0	5.9	7.8
	06-Jan-97	fog/haze	20.0	68.0	0 - 1		0.00	calm	high slack	21.3	Med Brown		0.8	> 0.8	22.5	72.5	5.4	7.8
	03-Feb-97	sunny	16.0	61.0	0 - 1		0.00	calm	outgoing	23.5	Med Brown		0.7	> 0.7	21.0	70.0	6.7	8.0
	03-Mar-97	sunny	22.0	72.0	2 - 3		0.00	calm	outgoing	25.2	Med Brown		0.8	> 0.8	26.0	79.0	4.7	7.6
	07-Apr-97	partly cloudy	23.0	73.0	2 - 3	W	0.00	calm	high slack	27.8	Med Brown		1.0	> 1.0	26.0	79.0	4.7	7.8
	05-May-97																	
	02-Jun-97	clear		73.0	4-7	S	1.20	calm	Low Slack	17.0	Med Brown		0.7	> 0.7	28.0	82.0	3.4	7.5
	07-Jul-97	clear	26.0	78.0	2-3	W	0.50	calm	high Slack	25.9	Med Brown	55.0	0.9	> 0.9	29.5	85.0	4.7	7.8
	04-Aug-97																	
	01-Sep-97																	
	06-Oct-97																	
	03-Nov-97																	
	01-Dec-97																	
Max			**26.0**	**78.0**			**1.2**			**27.8**		**55.0**	**1.0**	**> 1.0**	**29.5**	**85.0**	**6.7**	**8.0**
Min			**16.0**	**61.0**			**0.0**			**11.9**		**55.0**	**0.7**	**0.7**	**21.0**	**70.0**	**3.4**	**7.5**
Ave			**20.6**	**69.5**			**0.3**			**21.6**		**55.0**	**0.8**	**> 0.8**	**24.8**	**76.6**	**5.0**	**7.7**
Std Dev			**3.64**	**5.98**			**0.43**			**5.22**			**0.11**	**0.11**	**3.07**	**5.42**	**0.98**	**0.16**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: CHARLOTTE HARBOR
SITE: CHV004
WATER BODY: CHARLOTTE HARBOR
LOCATION: PORT CHARLOTTE BEACH PARK FISHING PIER IN PORT CHARLOTTE
MONITORS: CUTRONE & FISCHER
DATES: NOV 96 - DEC 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Direction	Rain last 24 hr in	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	19.0	66.0	8 - 12	NE	0.00	ripples	incoming	22.9	Med Brown		1.2	0.9	23.0	73.0	4.5	7.8
	02-Dec-96	overcast	16.0	61.0	4 - 7	NW	0.50	ripples	outgoing	28.5	Light Brown		1.3	1.0	24.0	75.0	4.8	8.0
	06-Jan-97	fog/haze	22.0	72.0	4 - 7		0.00	ripples	low slack	29.8	Light Brown		0.9	> 0.9	24.0	75.0	5.0	7.8
	03-Feb-97	sunny	13.0	55.0	2 - 3		0.00	calm	low slack	27.9	Light Brown		0.7	> 0.7	18.0	64.0	5.2	8.0
	03-Mar-97	partly cloudy	23.0	73.0	19 - 24		0.00	waves	low slack	28.3	Light Brown		0.7	0.4	23.5	74.0	3.7	8.5
	07-Apr-97	partly cloudy	23.0	73.0	8 - 12		0.00	ripples	high slack	28.6	other		1.2	0.8	24.5	76.0	4.1	7.9
	05-May-97	sunny	18.0	64.0	4 - 7		0.25	ripples	outgoing	26.5	Light Brown		0.9	0.8	22.0	72.0	3.5	8.0
	02-Jun-97	drizzle	25.0	77.0	8-12	SE	0.12	waves	outgoing	26.0	green brown		1.6	1.1	28.0	82.0	5.0	8.0
	07-Jul-97	clear	25.0	77.0	2-3	NE	0.00	ripples	high Slack	16.6		40.0	1.5	1.1	28.0	82.0	2.2	8.2
	04-Aug-97	clear	28.0	82.0	2-3	NE	1.50	ripples	high Slack	10.0	light brown	30.0	1.7	0.7	28.0	82.0	4.0	7.8
	01-Sep-97	clear	25.0	77.0	2-3	NE	0.00	ripples	outgoing	3.2		60.0	1.3	0.7	28.0	82.0	2.0	7.8
	06-Oct-97	clear	23.0	73.0	2-3	NE	0.00	calm	outgoing	11.3	Light Brown	70.0	1.4	0.5	24.0	75.0	2.0	7.6
	03-Nov-97	clear	28.0	82.0	0-1	NE	2.50	ripples	outgoing	9.3		10.0	1.4	> 1.4	30.0	86.0	4.4	7.6
	01-Dec-97	partly cloudy	16.0	62.0	8-12	NW	1.40	ripples	low Slack	19.1		15.0	1.3	1.0	19.5	66.8	4.2	7.6
Max			**28.0**	**82.0**			**2.5**			**29.8**		**70.0**	**1.7**	**> 1.4**	**30.0**	**86.0**	**5.2**	**8.5**
Min			**13.0**	**55.0**			**0.0**			**3.2**		**10.0**	**0.7**	**0.4**	**18.0**	**64.0**	**2.0**	**7.6**
Ave			**21.7**	**71.0**			**0.4**			**20.6**		**37.5**	**1.2**	**> 0.9**	**24.6**	**76.1**	**3.9**	**7.9**
Std Dev			**3.87**	**7.23**			**0.25**			**3.02**			**0.28**	**0.13**	**2.87**	**5.25**	**0.30**	**0.12**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: CHARLOTTE HARBOR
SITE: CHV005
WATER BODY: PEACE RIVER
LOCATION: NAVIGATION MARKER 33 NEAR HARBOR HEIGHTS
MONITORS: FLEMING & FLEMING
DATES: NOV 96 - DEC 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr in	Water Surface	Tidal Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	17.0	63.0	4 - 7	NE	0.00	ripples	incoming	1.4	Yellow Green		3.1	0.8	23.0	73.0	5.2	7.4
	02-Dec-96	overcast	13.0	56.0	13 - 18	N	0.30	ripples	incoming	2.5	Light Brown		2.0	1.4	22.0	72.0	7.4	7.8
	06-Jan-97	fog/haze	17.0	63.0	2 - 3	E	0.00	calm	outgoing	10.5	Yellow Brown		1.5	1.4	22.0	72.0	6.2	7.4
	03-Feb-97	sunny	12.0	54.0	2 - 3	NE	0.00	ripples	outgoing	7.0	Yellow Brown		1.4	> 1.4	18.0	64.0	5.0	7.6
	03-Mar-97	sunny	20.0	68.0	0 - 1		0.00	calm	incoming	2.9	Yellow Brown		1.5	1.4	24.5	76.0	4.2	7.4
	07-Apr-97	partly cloudy	20.0	69.0	0 - 1		0.00	calm	outgoing	2.9	Yellow		2.0	1.2	24.0	75.0	5.3	7.8
	05-May-97	sunny	17.0	63.0	4 - 7	NE	2.80	ripples	outgoing	0.2	Yellow Brown		1.4	0.7	23.5	74.0	4.0	7.4
	02-Jun-97	partly cloudy	23.0	73.0	0-1	S	0.20	ripples	outgoing	5.7	yellow bown		1.9	1.2	28.0	82.0	5.3	7.6
	07-Jul-97	clear	24.0	75.0	2-3	NE	0.00	calm	high Slack	0.8	yellow brown	68.0	1.9	0.9	30.0	86.0		7.2
	04-Aug-97	clear	24.0	74.0	0-1		0.00	calm	high Slack	1.5	Red brown		2.0	0.5	28.5	83.0	2.8	7.2
	01-Sep-97	partly cloudy	24.0	76.0	4-7	NE	0.00	ripples	outgoing	1.8	Red brown		1.9	0.4	29.0	84.0	3.2	7.2
	06-Oct-97	clear	21.0	70.0	4-7	NE	0.00	ripples	outgoing	0.7	red brown		2.0	0.5	25.5	78.0	3.9	7.2
	03-Nov-97	clear	16.0	60.0	0-1		1.00	calm	outgoing	1.0	yellow brown	66.0	1.9	0.8	23.0	73.0	5.4	7.2
	01-Dec-97	clear	16.0	61.0	0-1		0.40	calm	outgoing	0.0	yellow brown		1.9	0.5	19.5	67.0	5.1	7.2
Max			**24.0**	**76.0**			**2.8**			**10.5**		**68.0**	**3.1**	**> 1.4**	**30.0**	**86.0**	**7.4**	**7.8**
Min			**12.0**	**54.0**			**0.0**			**0.0**		**66.0**	**1.4**	**0.4**	**18.0**	**64.0**	**2.8**	**7.2**
Ave			**18.9**	**66.1**			**0.3**			**2.8**		**67.0**	**1.9**	**> 0.9**	**24.3**	**75.6**	**4.8**	**7.4**
Std Dev			**4.04**	**7.10**			**0.76**			**2.99**		**1.41**	**0.42**	**0.39**	**3.56**	**6.39**	**1.23**	**0.22**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: CHARLOTTE HARBOR
SITE: CHV006
WATER BODY: CHARLOTTE HARBOR
LOCATION: GILCHRIST PARK FISHING PIER IN PUNTA GORDA
MONITORS: JAQUISH & JAQUISH
DATES: NOV 96 - NOV 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr ib	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	13.0	55.0	13 - 18	N	0.00	waves	incoming	19.8	Dark brown		1.0	0.5	23.5	74.0		7.8
	02-Dec-96	overcast	21.0	70.0	13 - 18	N	0.50	waves	high slack	20.0	Med Brown		1.4	> 1.4	21.0	70.0	5.2	8.2
	06-Jan-97	fog/haze	17.0	63.0	2 - 3	SW	0.00	calm	low slack	30.4	Med Brown		0.8	0.8	22.0	72.0	6.5	8.0
	03-Feb-97																	
	03-Mar-97	sunny	20.0	68.0	2 - 3	SW	0.00	calm	incoming	25.9	Dark Brown		1.0	> 1.0	25.0	77.0	6.2	8.2
	07-Apr-97	partly cloudy	22.0	72.0	0 - 1	SW	0.00	calm	outgoing	31.2	Dark Brown		1.1	> 1.1	25.0	77.0	6.4	8.4
	05-May-97	sunny	18.0	64.0	4 - 7	E	1.00	ripples	outgoing	19.2	Med Brown		0.8	0.6	24.0	75.0	8.4	8.0
	02-Jun-97	drizzle	24.0	76.0	0-1	NE		ripples	outgoing	24.9	medium brown		1.1	1.0	27.0	81.0	5.1	8.0
	07-Jul-97	clear	24.0	74.0	2-3	NE	0.00	ripples	outgoing	17.9		10.0	1.2	1.0	28.0	82.0		8.2
	04-Aug-97	clear	24.0	75.0	0-1		1.30	calm	outgoing	16.6	medium brown	30.0	1.2	0.5	28.0	82.0	6.0	7.2
	01-Sep-97	partly cloudy	25.0	77.0	4-7	NE	0.00	ripples	outgoing	18.3		5.0	1.2	1.0	29.0	84.0	3.0	7.8
	06-Oct-97	clear	22.0	70.0	4-7	E	0.00	ripples	outgoing	9.3		25.0	1.2	0.6	26.5	80.0	5.1	7.2
	03-Nov-97	partly cloudy	12.0	59.0	0-1		0.90	calm	outgoing	21.8		30.0	1.1	> 1.1	24.0	75.0	7.2	7.8
	01-Dec-97	clear	17.0	63.0	8-12	NW	2.00	waves	outgoing	14.0		30.0	1.1	0.8	20.0	68.0	5.8	7.6
Max			**25.0**	**77.0**			**2.0**			**31.2**		**30.0**	**1.4**	**> 1.4**	**29.0**	**84.0**	**8.4**	**8.4**
Min			**12.0**	**55.0**			**0.0**			**9.3**		**5.0**	**0.8**	**0.5**	**20.0**	**68.0**	**3.0**	**7.2**
Ave			**19.9**	**68.2**			**0.5**			**20.7**		**21.7**	**1.1**	**> 0.9**	**24.8**	**76.7**	**5.9**	**7.9**
Std Dev			**4.25**	**6.89**			**0.68**			**6.18**		**11.25**	**0.17**	**0.27**	**2.80**	**4.96**	**1.37**	**0.37**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: CHARLOTTE HARBOR
SITE: CHV007
WATER BODY: PONCE DE LEON INLET
LOCATION: PONCE DE LEON PARK DOCK IN PUNTA GORDA
MONITORS: KELLE & BERGER & DWYER
DATES: NOV 96 - DEC 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr in	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	17.0	63.0	13 - 18	E	0.00	ripples	incoming	23.5	Green Brown		1.7	0.5	21.0	70.0	3.1	8.0
	02-Dec-96	partly cloudy	14.0	57.0	8 - 12	E	0.00	calm	incoming	27.7	Med Brown		1.4	> 1.4	19.0	66.0	5.9	8.2
	06-Jan-97	fog/haze	20.0	68.0	0 - 1	E	0.00	calm	outgoing	30.2	Med Brown		0.6	> 0.6	21.0	70.0	3.8	7.8
	03-Feb-97	sunny	12.0	54.0	4 - 7	E	0.00	calm	low slack	29.2	Green Brown		1.0	> 1.0	18.0	64.0	6.8	8.0
	03-Mar-97	sunny	19.0	66.0	2 - 3	E	0.00	calm	incoming	30.4	Green Brown		1.3	> 1.3	22.0	72.0	5.3	8.0
	07-Apr-97	partly cloudy	21.0	70.0	2 - 3	E	0.00	calm	outgoing	31.2	Green Brown		1.5	1.4	23.0	73.0	5.9	8.2
	05-May-97	sunny	16.0	60.0	8 - 12	N	2.00	calm	outgoing	30.2	Green Brown		1.3	0.9	23.0	73.0	5.0	8.0
	02-Jun-97	partly cloudy	24.0	74.0	4-7	E	0.20	calm	outgoing	28.5	green brown		3.0	2.6	26.5	80.0	4.6	8.2
	07-Jul-97	clear	26.0	79.0	0-1	E	0.00	calm	outgoing	28.6		10.0	1.6	> 1.6	28.0	82.0	4.3	8.2
	04-Aug-97	partly cloudy	24.0	75.0	0-1		0.00	calm	outgoing	19.3	medium brown		1.8	0.9	28.0	82.0	2.8	7.8
	01-Sep-97	partly cloudy	24.0	75.0	2-3	E	0.00	calm	outgoing	19.3	medium brown		3.2	1.9	29.0	84.0	2.6	7.6
	06-Oct-97	clear	23.0	73.0	8-12	E	0.00	calm	outgoing	15.6	medium brown		1.3	1.0	25.0	77.0	4.4	7.8
	03-Nov-97	clear	14.0	57.0	2-3	E	0.90	calm	outgoing	23.3		40.0	1.9	1.1	22.0	72.0	4.4	7.6
	01-Dec-97	clear	16.0	62.0	8-12	NW	0.43	ripples	outgoing	21.7		50.0	1.5	1.2	19.0	66.0	4.0	7.2
Max			**26.0**	**79.0**			**2.0**			**31.2**		**50.0**	**3.2**	**> 2.6**	**29.0**	**84.0**	**6.8**	**8.2**
Min			**12.0**	**54.0**			**0.0**			**15.6**		**10.0**	**0.6**	**0.5**	**18.0**	**64.0**	**2.6**	**7.2**
Ave			**19.3**	**66.6**			**0.3**			**25.6**		**33.3**	**1.7**	**> 1.2**	**23.2**	**73.6**	**4.5**	**7.9**
Std Dev			**4.51**	**7.97**			**0.56**			**5.08**		**20.82**	**0.70**	**0.54**	**3.60**	**6.45**	**1.23**	**0.29**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: CHARLOTTE HARBOR
SITE: CHVOO8
WATER BODY: ALLIGATOR CR
LOCATION: RIVIERA OYSTER BAR RESTAURANT DOCK IN PUNTA GORDA
MONITOR: NIELSEN
DATES: NOV 96 - DEC 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr in	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	02-Nov-96																	
	02-Dec-96	overcast	21.0	70.0	13 - 18	NW	0.50	calm	outgoing	27.2	Med Brown		1.2	> 1.2	20.0	68.0	5.0	8.0
	06-Jan-97	fog/haze	20.0	68.0	0 - 1		0.00	calm	outgoing	29.5	Med Brown		0.8	> 0.8	22.6	73.0	6.5	8.2
	03-Feb-97	sunny	16.0	61.0	2 - 3	E	0.00	calm	outgoing	30.3	Med Brown		0.8	> 0.8	17.0	63.0	6.6	8.2
	03-Mar-97	sunny	20.0	68.0	0 - 1	E	0.00	calm	low slack	30.0	Light Brown		0.8	> 0.8	25.0	77.0	4.6	8.0
	07-Apr-97	partly cloudy	23.0	73.0	0 - 1		0.00	ripples	outgoing	34.2	Med Brown		1.1	> 1.1	25.0	77.0	5.3	8.2
	05-May-97	sunny	18.0	64.0	8 - 12	NE	0.00	ripples	outgoing	28.6	Med Brown		0.8	> 0.8	24.5	76.0	5.0	8.0
	02-Jun-97	partly cloudy	24.0	75.0	0-1			calm	outgoing	24.3	medium brown		1.2	> 1.2	27.0	81.0	3.2	8.0
	07-Jul-97	clear	26.0	79.0	0-1		0.00	ripples	high slack	22.5	medium brown	65.0	1.4	> 1.4	26.0	80.0	4.2	7.4
	04-Aug-97	clear	25.0	77.0	0-1		0.00	calm	outgoing	11.3	medium brown	65.0	1.3	> 1.3	28.0	82.0	2.0	7.6
	01-Sep-97	partly cloudy	25.0	77.0	4-7	NE		ripples		17.0	medium brown	38.0	1.0	> 1.0	29.0	84.0	1.6	7.6
	06-Oct-97	clear	22.0	72.0	0-1		0.00	calm	outgoing	15.8	medium brown	60.0	1.4	> 1.4	26.0	79.0	2.6	7.6
	03-Nov-97	clear	17.0	63.0	0-1		2.00	calm	outgoing	21.6	medium brown	65.0	0.9	> 0.9	23.0	73.0	3.4	7.6
	01-Dec-97	clear	17.0	63.0	2-3	NW	0.60	ripples	outgoing	24.2	medium brown	10.0			20.0	68.0	5.2	7.8
Max			**26.0**	**79.0**			**2.00**			**34.2**		**65.0**	**1.4**	**> 1.4**	**29.0**	**84.0**	**6.6**	**8.2**
Min			**16.0**	**61.0**			**0.00**			**11.3**		**10.0**	**0.8**	**0.8**	**17.0**	**63.0**	**1.6**	**7.4**
Ave			**21.1**	**70.0**			**0.28**			**24.3**		**50.5**	**1.1**	**> 1.1**	**24.1**	**75.5**	**4.2**	**7.9**
Std Dev			**3.40**	**6.06**			**0.61**			**6.62**		**22.44**	**0.24**	**0.24**	**3.47**	**6.21**	**1.59**	**0.28**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: GASPARILLA SOUND
SITE: GSV001
WATER BODY: CORAL CR
LOCATION: SR 771 FISHING PIER IN PLACIDA
MONITORS: QUIGGLE & STORSBERG
DATES: NOV 96 - DEC 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	17.0	63.0	4 - 7	NE	0.00	ripples	incoming	35.6	Green		1.3	> 1.3	22.5	72.5	4.1	8.2
	02-Dec-96	overcast	20.0	68.0	4 - 7	N	0.30	calm	outgoing	32.9	Yellow Green		1.4	> 1.4	22.0	72.0	3.5	8.0
	06-Jan-97	sunny	20.0	68.0	2 - 3	SE	0.00	calm	outgoing	35.6	Yellow Green		2.1	> 2.1	26.0	79.0	2.6	8.0
	03-Feb-97	sunny	15.0	59.0	2 - 3	NE	0.00	calm	incoming	32.9	Yellow Green		1.1	> 1.1	18.0	64.0	4.1	8.2
	03-Mar-97	sunny	22.0	72.0	8 - 12	SE	0.00	ripples	incoming	36.7	Yellow Green		1.1	> 1.1	24.5	76.0	2.5	8.2
	07-Apr-97																	
	05-May-97	sunny	10.0	50.0	8 - 12	NE	0.23	ripples	outgoing	36.7	Med Brown		1.2	> 1.2	28.0	82.0	1.7	8.2
	02-Jun-97	overcast	24.0	74.0	8-12		0.71	ripples	incoming	32.6	yellow green		1.5	> 1.5	28.0	82.0	3.9	8.0
	07-Jul-97	partly cloudy	25.0	77.0	4-7	E	0.25	ripples	outgoing	34.8	green blue	0.0	1.5	1.4	30.0	86.0		7.8
	04-Aug-97	partly cloudy	27.0	81.0	4-7	sw	0.00	ripples	outgoing	35.0	yellow green		1.5	> 1.5	28.5	83.0	3.4	8.2
	01-Sep-97	partly cloudy	28.0	83.0	2-3	s	0.20	ripples	outgoing	35.5	yellow green	0.0	1.2	> 1.2	28.5	83.0	3.8	8.2
	06-Oct-97	clear	21.0	70.0	8-12	E	0.00	ripples	outgoing	31.3	medium brown	15.0	1.3	> 1.3	28.0	82.0	4.3	7.8
	03-Nov-97	partly cloudy	28.0	83.0	2-3	SE	0.20	ripples	outgoing	35.5	yellow green	0.0	1.2	> 1.2	28.5	83.0	3.8	8.2
	01-Dec-97	partly cloudy	14.0	58.0	2-3	NE	0.25	ripples	outgoing	24.6	red brown	10.0	1.4	1.3	20.0	68.0	5.9	7.6
Max			**28.0**	**83.0**			**0.7**			**36.7**		**15.0**	**2.1**	**2.1**	**30.0**	**86.0**	**5.9**	**8.2**
Min			**10.0**	**50.0**			**0.0**			**24.6**		**0.0**	**1.1**	**1.1**	**18.0**	**64.0**	**1.7**	**7.6**
Ave			**20.8**	**69.7**			**0.2**			**33.8**		**5.0**	**1.4**	**1.4**	**25.6**	**77.9**	**3.6**	**8.0**
Std Dev			**5.65**	**10.20**			**0.20**			**3.23**		**7.07**	**0.26**	**0.26**	**3.82**	**6.80**	**1.06**	**0.20**

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY MONITORING NETWORK
ESTUARY: GASPARILLA SOUND
SITE: GSV002
WATER BODY: GASPARILLA SOUND
LOCATION: BOCA GRANDE BRIDGE FISHING PIER IN PLACIDA
MONITORS: VIDULICH & SIELOFF
DATES: NOV 96 - DEC 97

Stats	Sampling Date	Weather	Air Temp C	Air Temp F	Wind Speed mph	Wind Directn	Rain last 24 hr in	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Color PCUs	Water Depth m	Secchi Depth m	Water Temp C	Water Temp F	DO Ave mg/l	pH
	04-Nov-96	sunny	23.0	73.0	13 - 18	NE	0.00	ripples	outgoing	37.5	Green		0.7	0.5	23.0	73.0	5.3	8.4
	02-Dec-96																	
	06-Jan-97																	
	03-Feb-97																	
	03-Mar-97	partly cloudy		74.0	4-7	SE	0.00	ripples	incoming	19.6			1.5	1.1	25.2	77.5	6.6	8.4
	07-Apr-97	overcast	24.0	74.0	2 - 3	SE	0.00	ripples	incoming	38.1	Green		1.5	1.1	24.7	76.5	5.7	8.6
	05-May-97	partly cloudy	18.0	64.0	8-12	NE	0.48	ripples	incoming	36.8		4.0	1.3	0.6	24.6	76.3	6.1	8.3
	02-Jun-97	partly cloudy	27.0	80.0	4-7	SW	0.31	ripples	incoming	20.0	green brown		1.7	1.0	28.3	82.9	6.4	8.5
	07-Jul-97	clear	26.0	79.5	2-3	NE	0.00	ripples	low Slack	20.8	green		1.5	> 1.5	30.0	86.0	6.3	8.4
	04-Aug-97	partly cloudy	28.0	83.0	2-3		0.00	calm	low slack	35.0	green		1.5	1.2	30.5	87.0	5.4	8.3
	01-Sep-97	partly cloudy	27.0	81.3	4-7	NE	0.00	ripples	high Slack	35.8	green		1.6	> 1.6	29.0	84.0	4.1	8.5
	06-Oct-97	clear	23.0	73.0	8-12	NE		ripples	outgoing	34.5	Green brown		1.4	> 1.4	26.0	79.0	4.3	8.4
	03-Nov-97	partly cloudy	18.0	64.0	2-3	NE	0.20	ripples	incoming	34.6	green brown	12.0	1.4	1.3	22.5	72.0	5.0	8.4
	01-Dec-97	partly cloudy	18.0	65.0	19-24	NW	0.45	ripples	outgoing	30.4	green brown	6.0	1.7	1.6	20.0	68.0	5.2	8.2
Max			**28.0**	**83.0**			**0.5**			**38.1**		**12.0**	**1.7**	**> 1.6**	**30.5**	**87.0**	**6.6**	**8.6**
Min			**18.0**	**64.0**			**0.0**			**19.6**		**4.0**	**0.7**	**0.5**	**20.0**	**68.0**	**4.1**	**8.2**
Ave			**23.2**	**73.7**			**0.1**			**31.2**		**7.3**	**1.4**	**> 1.2**	**25.8**	**78.4**	**5.5**	**8.4**
Std Dev			**3.97**	**6.95**			**0.20**			**7.39**		**4.16**	**0.27**	**0.37**	**3.34**	**6.09**	**0.83**	**0.11**

APPENDIX C – QUALITY ASSURANCE TABLES

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY NETWORK
ESTUARY: CHARLOTTE HARBOR
QUALITY ASSURANCE SESSION
WATER BODY: CHARLOTTE HARBOR
LOCATION: GILCHRIST PARK IN PUNTA GORDA
MONITORS: ALL
DATE: JUNE 18, 1997 AFTER 7 MONTHS OF SAMPLING

Stats	Volunteer Names (& sites)	Weather	Air Temp C	Wind Speed mph	Wind Directn	Water Surface	Tide Stage	Salinity ppt	Water Color Observed	Water Depth m	Secchi Depth m	Water Temp C	DO Avg mg/L	pH
	Crowley & Whiteside (CHV001)	sun	34.0	10	SW	waves	out	25.3	med brown	1.1	0.8	33.0	3.7	8.2
	Renda (CHV002)	sun	34.0	10	W	ripples	out	24.9	gr brown	1.2	0.8	32.0	5.4	8.2
	Vincent (CHV003)	sun	29.0	15	SW	waves	in	24.9	other	1.0	0.8	32.0	5.3	8.2
	Fischer & Cutrone (CHV004)	part cloud	33.0	10	WSW	ripples	out	24.9	other	1.2	0.9	32.0	4.7	8.4
	Fleming & Fleming (CHV005)	part cloud	33.0	5	SW	ripples	out	24.9	other	1.1	0.9	32.0	4.4	8.4
	Jaquish & Jaquish (CHV006)	sun	34.5	10	WSW	ripples	out	22.2	dk brown	1.1	1.0	32.0	2.6	8.6
	Kelle & Berger (CHV007)	part cloud	33.5	10	W	ripples	out	25.3	other	1.1	0.8	32.0	6.2	8.4
	Nielsen (CHV008)	sun	32.0	10	W	ripples	out	25.2	med brown	1.0	0.8	31.5	6.0	8.4
	Storsberg (GSV001)	sun	34.0	5	WSW	waves	out	23.6	gr brown	1.1	0.8	32.0	2.7	8.2
	Vidulich (GSV002)													
	Hamlin (CHEC)	sun	29.0	5	WSW	ripples	out	24.9	med brown	1.0	0.7	32.5	6.6	8.4
	Ott (FDEP)	sun	32.0	15	SE	ripples	in	25.2	red brown	1.0	0.8	33.0	5.9	8.2
Max			**34.5**					**25.3**		**1.2**	**1.0**	**33.0**	**6.6**	**8.6**
Min			**29.0**					**22.2**		**1.0**	**0.7**	**31.5**	**2.6**	**8.2**
Avg			**32.5**					**24.7**		**1.1**	**0.8**	**32.2**	**4.9**	**8.3**
Std Dev			**1.93**					**0.94**		**0.08**	**0.08**	**0.46**	**1.38**	**0.13**
Most Common		**sun (8 of 11)**	**34.0 (3 of 11)**	**10 (6 of 11)**	**WSW (4 of 11)**	**ripples (7 of 11)**	**out (9 of 11)**	**24.9 (5 of 11)**	**other (4 of 11)**	**1.1 (5 of 11)**	**0.8 (6 of 11)**	**32.0 (7 of 11)**	**none (0 of 11)**	**8.2 & 8.4 (5 of 11)**
Hydrolab								**23.3**				**32.7**	**6.5**	**7.9**
QA Goal								**±0.5**		**±0.1**	**±0.1**	**±1.0**	**±0.6**	**±0.2**

AS A RESULT OF THE JUNE 18, 1997 QUALITY ASSURANCE SESSION, MORE DETAILED METHODS FOR DISSOLVED OXYGEN WERE DEVELOPED & IMPLEMENTED IN JULY 1997.

PROGRAM: CHARLOTTE HARBOR ESTUARIES VOLUNTEER WATER QUALITY NETWORK
ESTUARY: CHARLOTTE HARBOR
QUALITY ASSURANCE SESSION
WATER BODY: CHARLOTTE HARBOR
LOCATION: GILCHRIST PARK IN PUNTA GORDA
MONITORS: ALL
DATE: JULY 23, 1997, AFTER IMPLEMENTING MORE DETAILED METHODS

Stats	Volunteer Names (& sites)	DO Avg mg/L
	Crowley & Whiteside (CHV001)	4.7
	Renda (CHV002)	5.0
	Vincent (CHV003)	
	Fischer & Cutrone (CHV004)	5.8
	Fleming & Fleming (CHV005)	6.1
	Jaquish & Jaquish (CHV006)	8.0
	Kelle & Berger (CHV007)	7.6
	Nielsen (CHV008)	
	Storsberg (GSV001)	5.1

29-Jul Stats	Sites	DO Avg mg/L	DO Avg mg/L
	CHV001	2.8	2.8
	CHV002	2.8	2.7
	CHV003		
	CHV004	2.2	2.3
	CHV005	3.0	2.3
	CHV006	2.9	2.9
	CHV007	2.4	2.5
	CHV008		
	GSV001	2.1	2.6

AS A RESULT OF THE JULY 23, 1997 QUALITY ASSURANCE SESSION, SAMPLING KITS WERE COLLECTED AND TESTED BY PROJECT COORDINATORS ON JULY 29, 1997 TO RULE OUT HUMAN ERROR. TEST RESULTS CONTINUED TO SHOW SOME VARIABILITY. CHEMICALS (SODIUM THIOSULFATE) WERE REPLACED, SAMPLING KITS TESTED AGAIN, THIS TIME SHOWING ADEQUATE CONSISTENCY OF RESULTS.