Nueces River Basin Volunteer Water Quality Monitoring Data Summary Report compiled by Texas Watch

This data summary report includes general basin volunteer monitoring activity, general water quality descriptive statistics, tables and graphs. Data from sites sampled more than 10 times between 2000 and 2004 were queried from the Texas Watch Environmental Monitoring Database and are included in this document. Since 1992, Texas Watch volunteer water quality monitors have collected environmental data at 34 sites in the Nueces River basin.

In alignment with Texas Watch's core mission, monitors attempt to collect data that can be used in decision-making processes, to promote a healthier and safer environment for people and aquatic inhabitants. While many assume it is the responsibility of Texas Watch to serve as the main advocate for volunteer monitor data use, it has become increasingly important for monitors to be accountable for their monitoring information and how it can be infused into the decision-making process, from "backyard" concerns to state or regional issues. To assist with this effort, Texas Watch is coordinating with monitoring groups and government agencies to propagate numerous data use options.

Among these options, volunteer monitors can directly participate by communicating their data to various stakeholders. Some options include: participating in the Clean Rivers Program (CRP) Steering Committee Process (see box insert on this page); providing information during "public comment" periods; attending city council and advisory panel meetings; developing relations with local Texas Commission on Environmental Quality (TCEQ) and river authority water specialists; if necessary, filing complaints with environmental agencies; contacting elected representatives and media; or start organizing local efforts to address areas of concern.

The Texas Clean Rivers Act established a way for the citizens of Texas to participate in building the foundation for effective statewide watershed planning activities. Each CRP partner agency has established a steering committee to set priorities within its basin. These committees bring together the diverse interests in each basin and watershed. Steering committee participants include representatives from the public, government, industry, business, agriculture, and environmental groups. The steering committee is designed to allow local concerns to be addressed and regional solutions are recommended. For more information about participating in these steering committee meetings and to contribute your views about water quality, contact the appropriate CRP partner agency for your river basin at: http://www.tnrcc.state.tx.us/water/quality/data/wmt/contract.html.

Currently, Texas Watch is working with various public and private organizations to facilitate data and information sharing. One component of this process includes interacting with watershed stakeholders at CRP steering committee meetings. A major function of these meetings is to discuss water quality issues and to obtain input from the general public. While participation in this process may not bring about instantaneous results, it is a great place to begin making institutional connections and to learn how to "work" the assessment and protection system Texas agencies use to keep water resources healthy and sustainable.

In general, Texas Watch efforts to use volunteer data may include the following:

1. Assist monitors with data analysis and interpretation
2. Analyze watershed-level or site-by-site data for monitors and partners
3. Screen all data annually for values outside expected ranges
4. Network with monitors and pertinent agencies to communicate data
5. Attend meetings and conferences to communicate data
6. Participate in CRP stakeholder meetings
7. Provide a data viewing forum via the Texas Watch Data Viewer
8. Participate in professional coordinated monitoring processes to raise awareness of areas of concern

Information collected by Texas Watch volunteers utilizes a TCEQ and EPA approved quality assurance project plan (QAPP) to ensure data are correct and accurately reflects the environmental conditions being monitored. All data are screened for completeness, precision and accuracy where applicable, and scrutinized with data quality objective and data validation screening techniques. Sample results are intended to be used for education and research, baseline, local decision making, problem identification, and others uses deemed appropriate by the data user. Graphs are compiled and situated to assist the data user in obtaining information from the collected data. Where applicable, "time" is located on the "x" or horizontal axis and is chronologically listed from oldest to most recent sampling (left to right respectively). The "y1" or "y2" axes contain the constituent(s) of interest and these scales may be different. Data collected by Texas Watch monitors include: pH, specific conductivity, water and air temperature, dissolved oxygen, flow severity, days since last precipitation, total depth, sample depth, Secchi depth, field observations, and others.   Note: pH values were not transformed for graphing purposes or for developing mean statistics; data collection events may not be evenly distributed over time (through seasons and years); sampling events may occur at different times of the day; sample collection and results documentation may have been completed by different monitors over time at each site; data collected by school groups should undergo additional scrutiny before use; data summary information is subject to change.

TCEQ Nueces River Basin Narrative Summary

The Texas Commission on Environmental Quality has provided the following summary information. The Nueces River originates in Edwards County and flows approximately 315 miles to Nueces Bay in the Gulf of Mexico near Corpus Christi. The total basin drainage area is 16,950 square miles. Principal tributaries to the Nueces include the Atascosa River, the Frio River, and its tributaries (San Miguel Creek, Hondo Creek, Sabinal River and Leona River). The Atascosa and Frio Rivers join the Nueces River above Lake Corpus Christi. The economy of the basin is based on agricultural and mineral production. The Nueces River Basin contains the extensively irrigated agriculture area near Crystal City known as the Winter Garden.

For monitoring purposes, the Nueces River Basin has been divided into 17 classified segments, consisting of 1,088 stream miles, and two major reservoirs covering 47,900 surface acres for the 2002 assessment. No unclassified water bodies were assessed in the basin.

Water quality in the upper portion of the basin in the less inhabited reaches is relatively good. There are three water bodies which are included on the 2002 list of impaired waters. The Lower Sabinal River (segment 2110) is listed for non-support of the drinking water criteria for nitrate-nitrite nitrogen. Choke Canyon Reservoir is non meeting the general use criteria for total dissolved solids (TDS). This is due in part to increasingly dry conditions in the basin resulting in a lowering of the reservoir through evaporation, thereby causing an increase in TDS. Elevated fecal coliform densities are also causing the Frio River above Choke Canyon Reservoir to not meet its contact recreation use.

A substantial part of the flow of the Nueces River and its tributaries enters the fractured and cavernous limestone formation of the Edwards Aquifer Balcones Fault Zone. As a result, stream flows in the Nueces River Basin downstream from the recharge zone consist almost entirely of stormwater. During low-flow conditions, chloride, sulfate, and total dissolved solid levels increase due to natural and man-made activities.

The Little Bay Sentinels Texas Watch monitoring group began collecting water quality data in 1999. In response to growing concerns about local marinas and houseboat waste disposal practices, a group of concerned citizens coordinates to conduct monthly monitoring at four sites in Little Bay at Rockport, Texas. Little Bay is used for swimming, boating, skiing, community events, fishing, nature tourism and birding, waste water assimilation, and others. Little Bay connects to the surrounding bays through the Blevin and Legget Channels on the north and south sides respectively. There are two main tributaries that flow into Little Bay. Tule Creek flows into Little Bay at the "Effluent Site". This creek has low flows and occasionally contains effluent from the upstream treatment plat. This creek also runs through several subdivisions, a golf course, and several major roads and highways. The other tributary is mainly a wet weather creek that drains many developed areas including the new Walmart, several gas stations, and other businesses.

This group was subsumed by the City of Rockport into their City Council Water Quality Committee in 2002 and is now fully supported by the city. Rockport now sponsors the group by paying for local lab analysis, buying reagents and calibration buffer, and purchasing a Hydrolab to collect routine water chemistry.

Little Bay at Effluent site

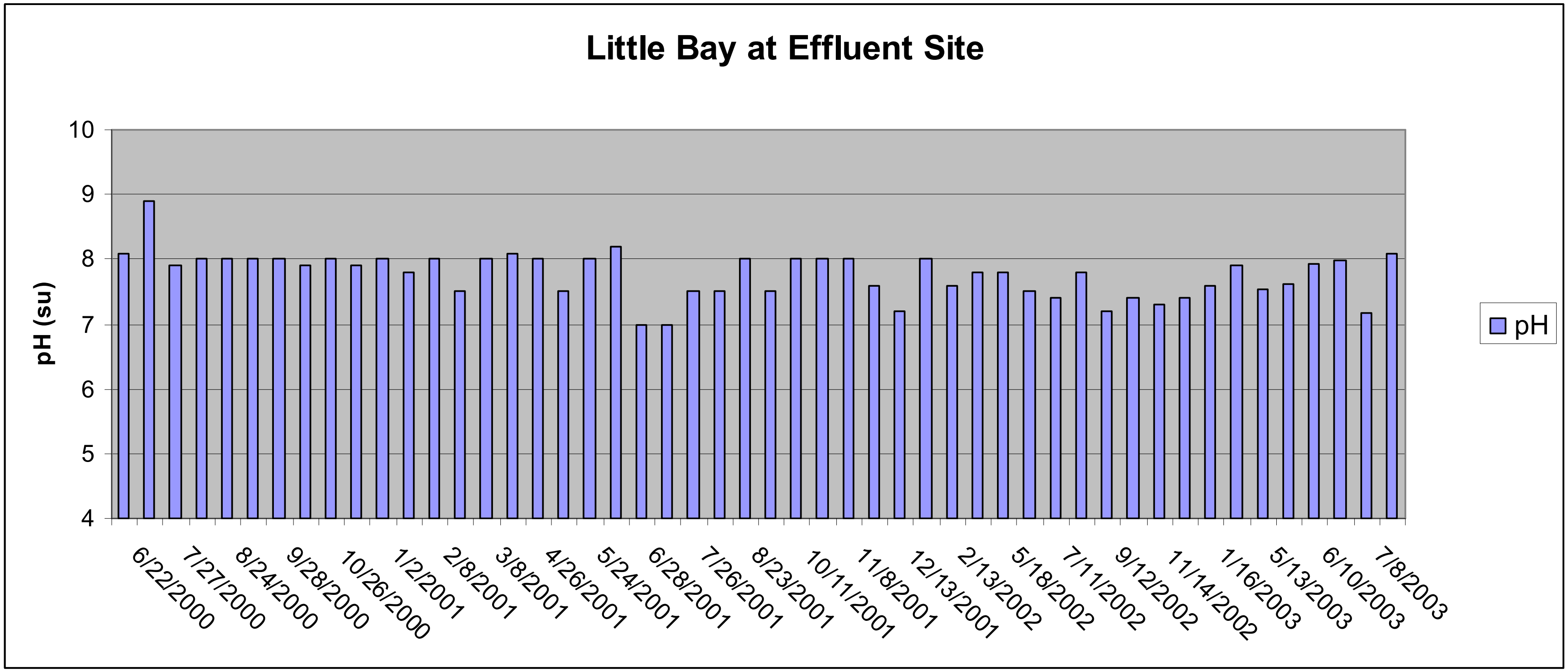
Data collected at the Little Bay at Effluent site were gathered by the Rockport Sentinels monitoring group, specifically by Tom Tooker.

pH values are within an expected range as the values fluctuated between 7.0 su and 8.9 su. Generally speaking, pH average values are slightly basic with an average of 7.76 su. No specific conductivity values were recorded due to lack of available conductivity meter calibration data. Dissolved oxygen readings range from a low of 1.5 mg/L to levels at 6.15 mg/L. While temperature does influence water oxygen levels, this only accounts for a small amount of the variance. Ninety-four percent of the dissolved oxygen samples are below the "exceptional" dissolved oxygen numeric criteria of 6.0 mg/L. Total depth readings at this site vary from 0.3 meters to 5.0 meters while Secchi depth readings range from .2 meters to 2.5 meters. This indicates high levels of suspended solids and turbidity at times.

TABLE 1: Descriptive Statistics

PARAMETER (SAMPLE ID# 80135) Little Bay at Effluent Site	**N**	**% Complete**	**MIN**	**MEAN**	**MAX**
Sample TIME	50	100	6:30	8:13	13:10
Total Depth (m)	45	90	0.3	0.69	5
SC (µS/cm)	0	0	0	0.00	0
Air T (C)	50	100	6.1	23.54	32.3
Water T (C)	50	100	12	23.39	32.58
DO (C)	31	62	1.5	3.99	6.15
pH (su)	50	100	7	7.76	8.9
Secchi Depth (m)	45	90	0.2	0.55	2.5
DO exceedence [< 6.0 mg/L]		29 of 31	94%		

GRAPH 1: pH



Little Bay at Effluent Site
pH (su)
10
9
8
7
6
5
4
6/22/2000
7/27/2000
8/24/2000
9/28/2000
10/26/2000
1/2/2001
2/8/2001
3/8/2001
4/26/2001
5/24/2001
6/28/2001
7/26/2001
8/23/2001
10/11/2001
11/8/2001
12/13/2001
2/13/2002
5/18/2002
7/11/2002
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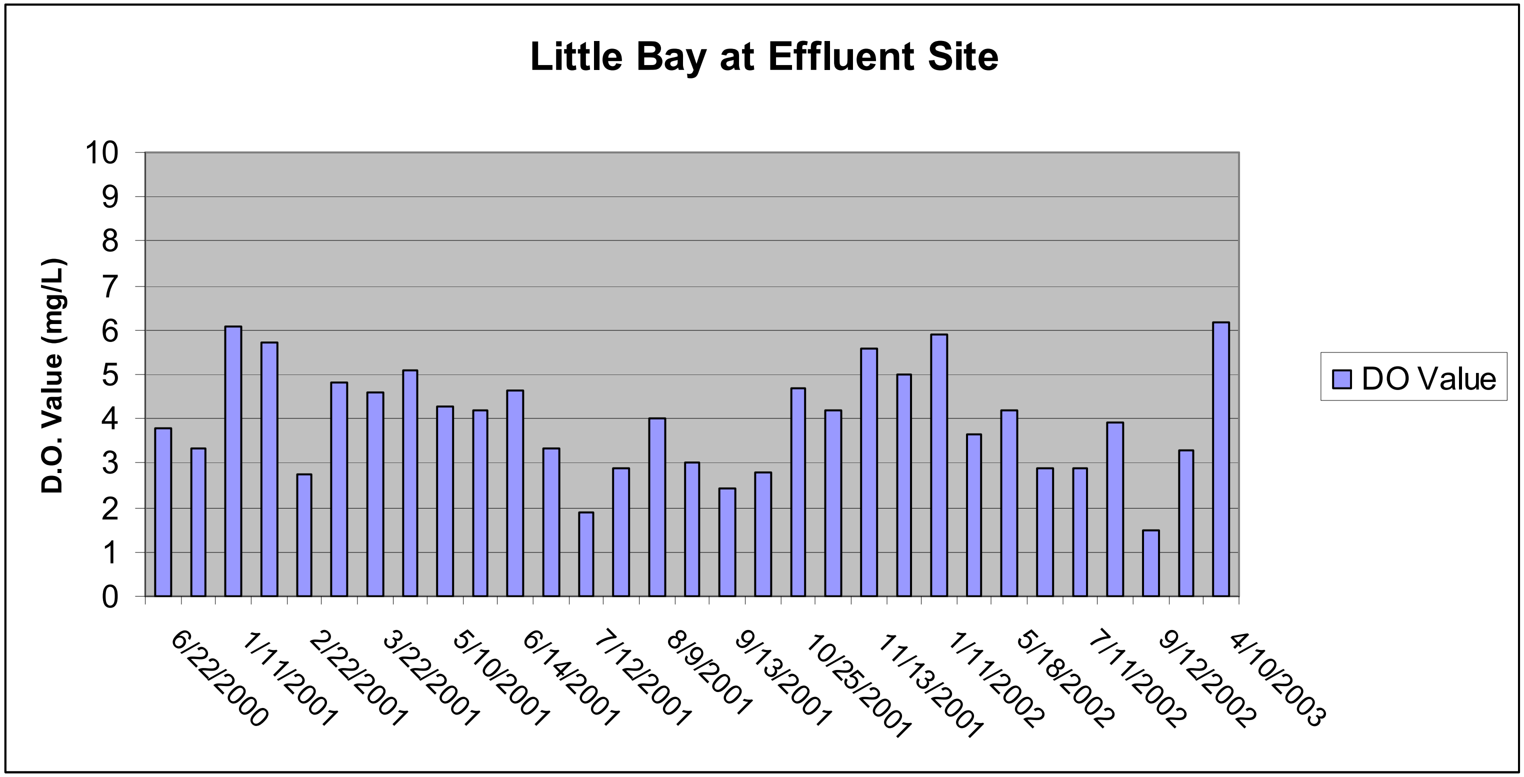
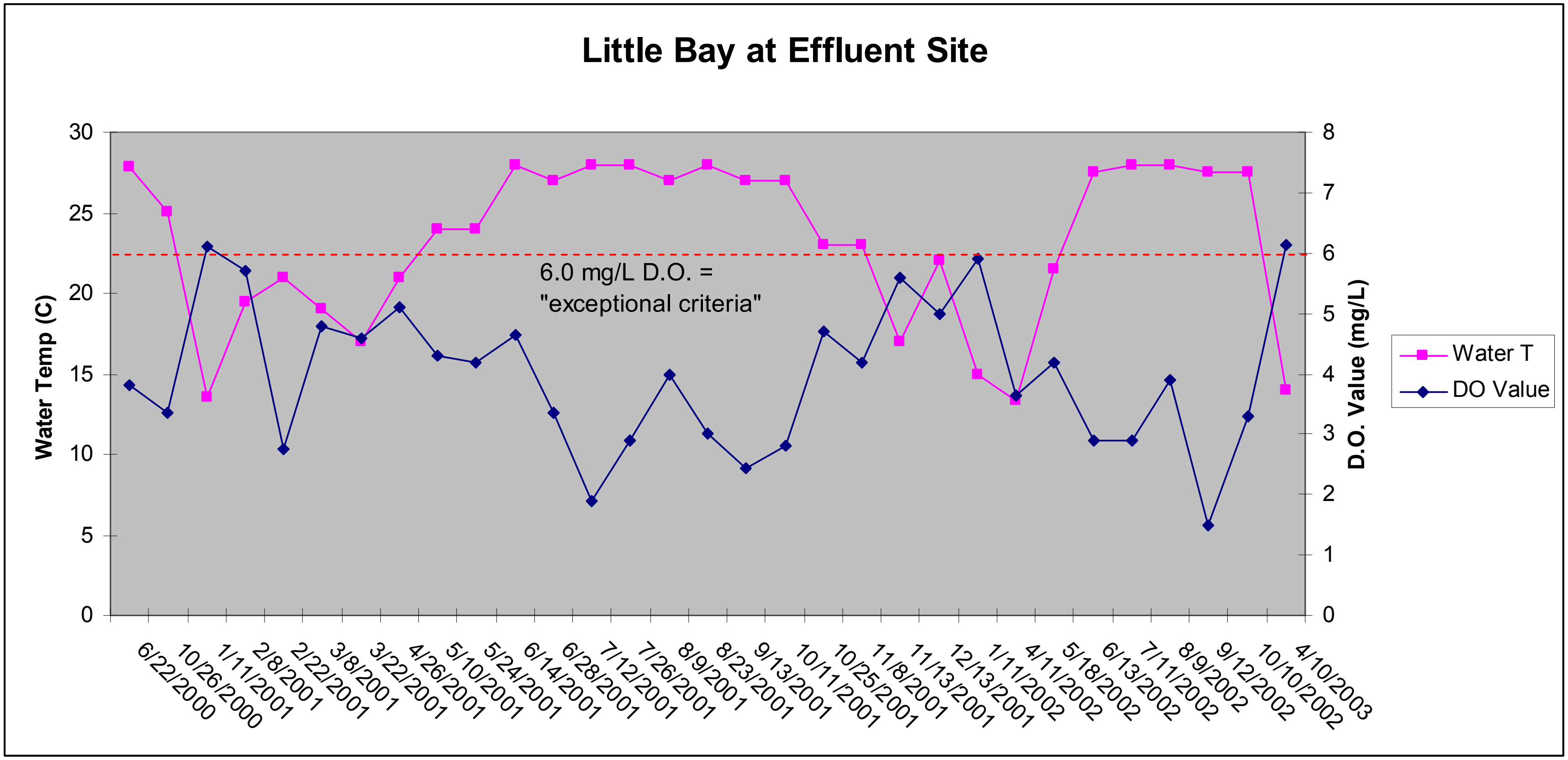
5/13/2003
6/10/2003
7/8/2003
pH

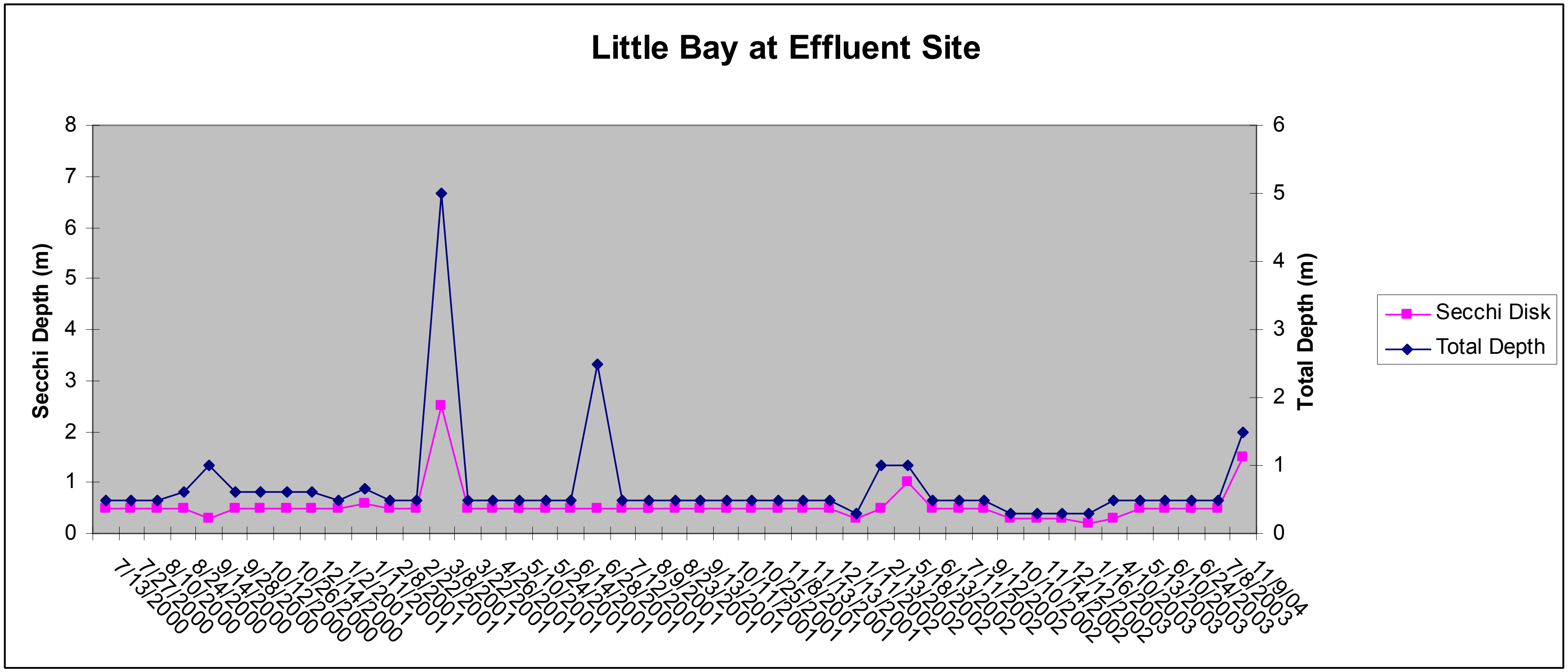
GRAPH 2: Dissolved Oxygen



GRAPH 3: Dissolved Oxygen and Temperature



GRAPH 4: Secchi Depth and Total Depth



Little Bay at Pace Dock

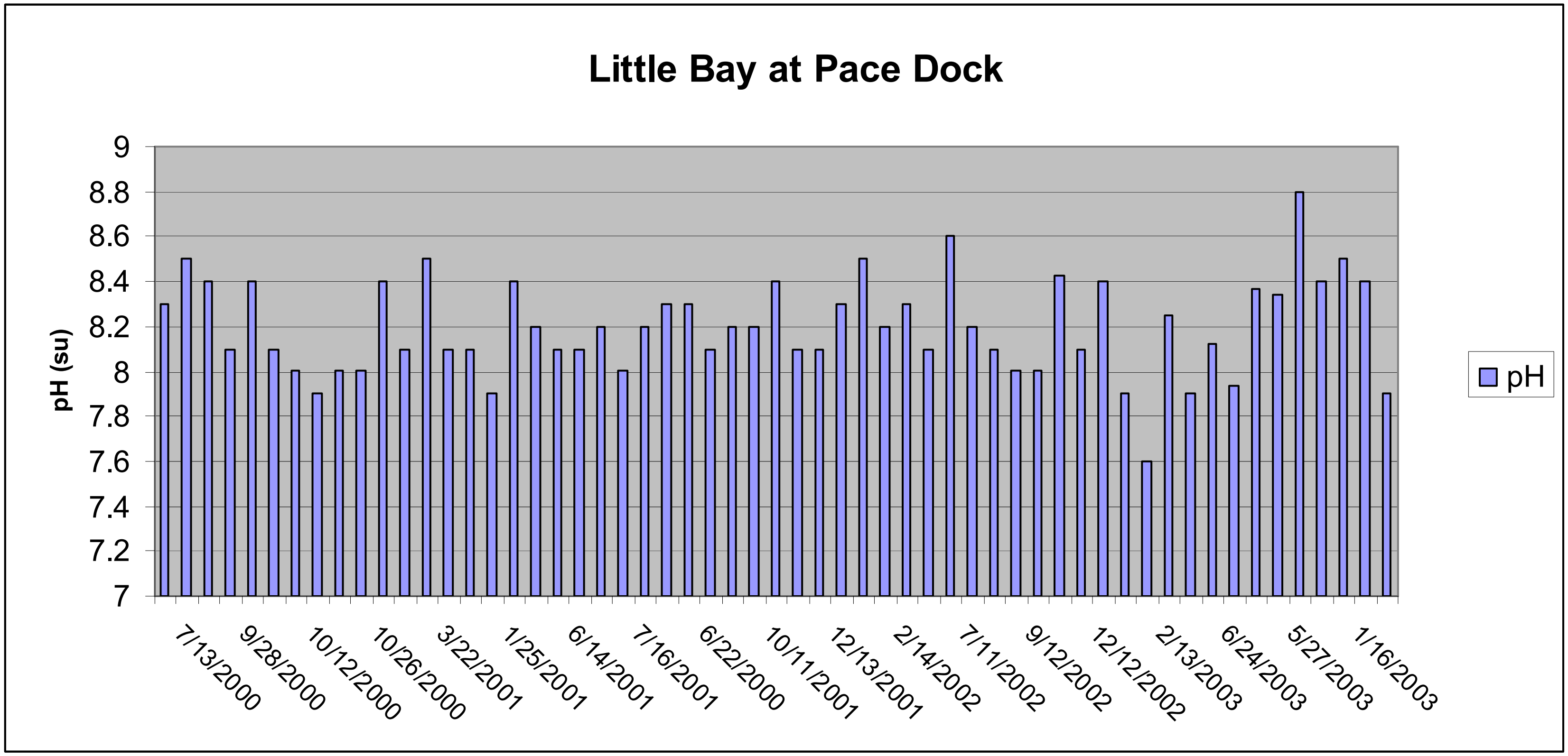
Data collected at the Little Bay at Pace Dock site were gathered by the Rockport Sentinels monitoring group, specifically by Don Butler.

pH values are within an expected range as the values fluctuated between 7.6 su and 8.8 su. Generally speaking, pH average values are slightly basic with an average of 8.2 su. No specific conductivity values were recorded due to lack of available conductivity meter calibration data. Dissolved oxygen readings range from a low of 3.7 mg/L to levels at 10.2 mg/L. While temperature does influence water oxygen levels, this only accounts for a small amount of the variance. Thirty-seven percent of the dissolved oxygen samples are below the "exceptional" dissolved oxygen numeric criteria of 6.0 mg/L. Total depth readings at this site vary from 0.1 meters to 2.4 meters while Secchi depth readings range from .1 meters to 2.4 meters. This indicates high levels of suspended solids and turbidity at times.

TABLE 1: Descriptive Statistics

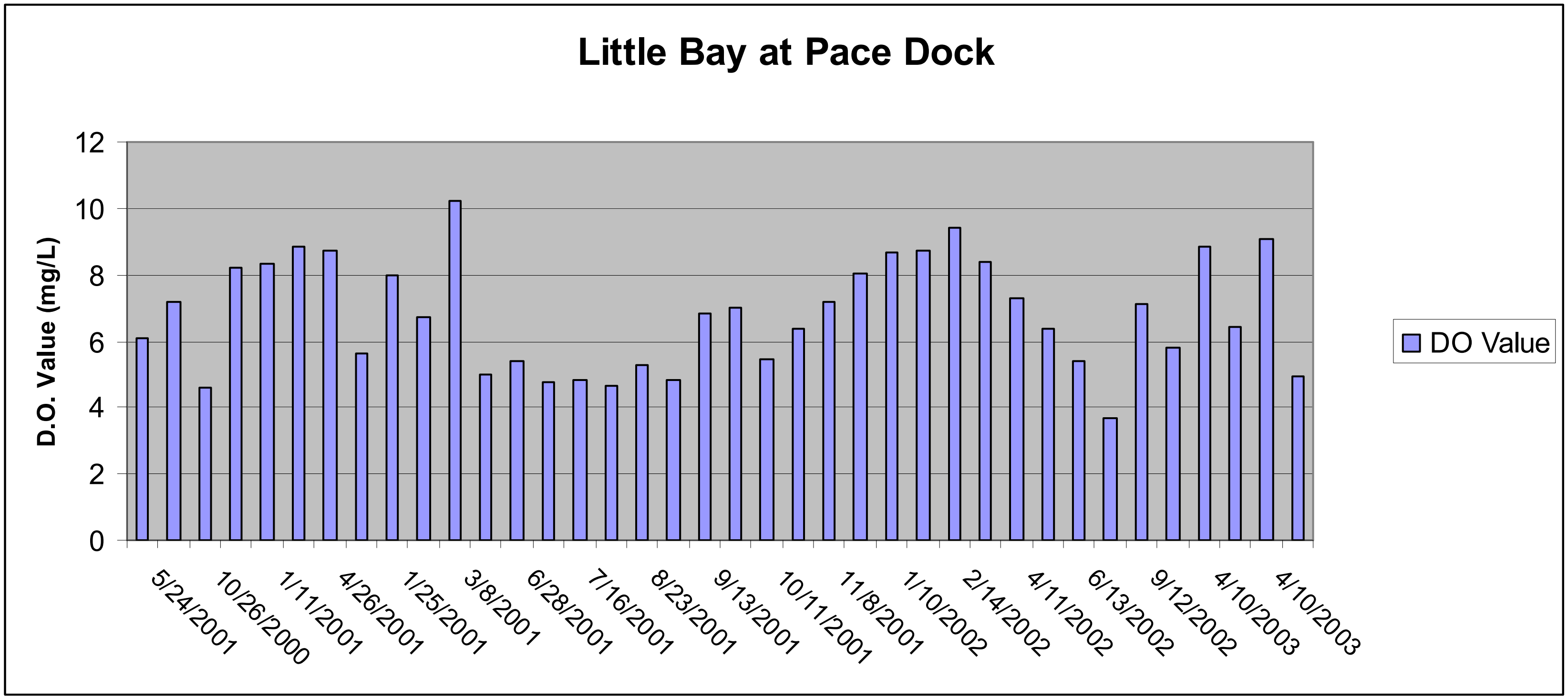
PARAMETER (SAMPLE ID# 80137) Little Bay at Pace Dock	**N**	**% Complete**	**MIN**	**MEAN**	**MAX**
Sample TIME	55	96	7:30	9:24	13:00
Total Depth (m)	57	100	0.1	0.85	2.4
SC (µS/cm)	0	0	0	0.00	0
Air T (C)	57	100	6	23.68	32.7
Water T (C)	38	66	10	23.09	30
DO (C)	38	62	3.7	6.80	10.2
pH (su)	57	100	7.6	8.20	8.8
Secchi Depth (m)	57	100	0.1	0.85	2.4
DO exceedence [< 6.0 mg/L]		14 of 38	37%		

GRAPH 1: pH

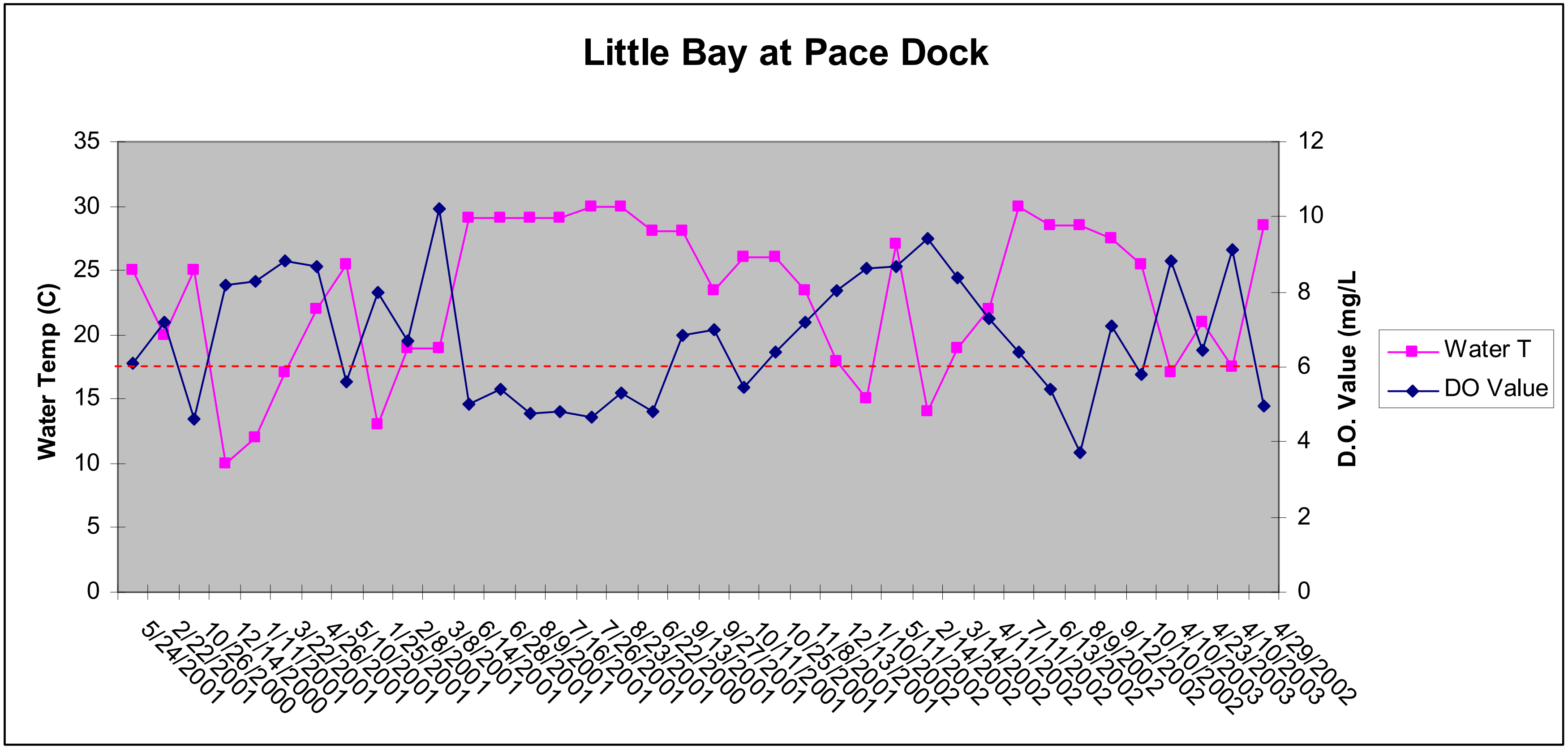


Little Bay at Pace Dock
pH (su)
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
7/13/2000
9/28/2000
10/12/2000
10/26/2000
3/22/2001
1/25/2001
6/14/2001
7/16/2001
6/22/2000
10/11/2001
12/13/2001
2/14/2002
7/11/2002
9/12/2002
12/12/2002
2/13/2003
6/24/2003
5/27/2003
1/16/2003
pH

GRAPH 2: Dissolved Oxygen



GRAPH 3: Dissolved Oxygen and Temperature



GRAPH 4: Secchi Depth and Total Depth