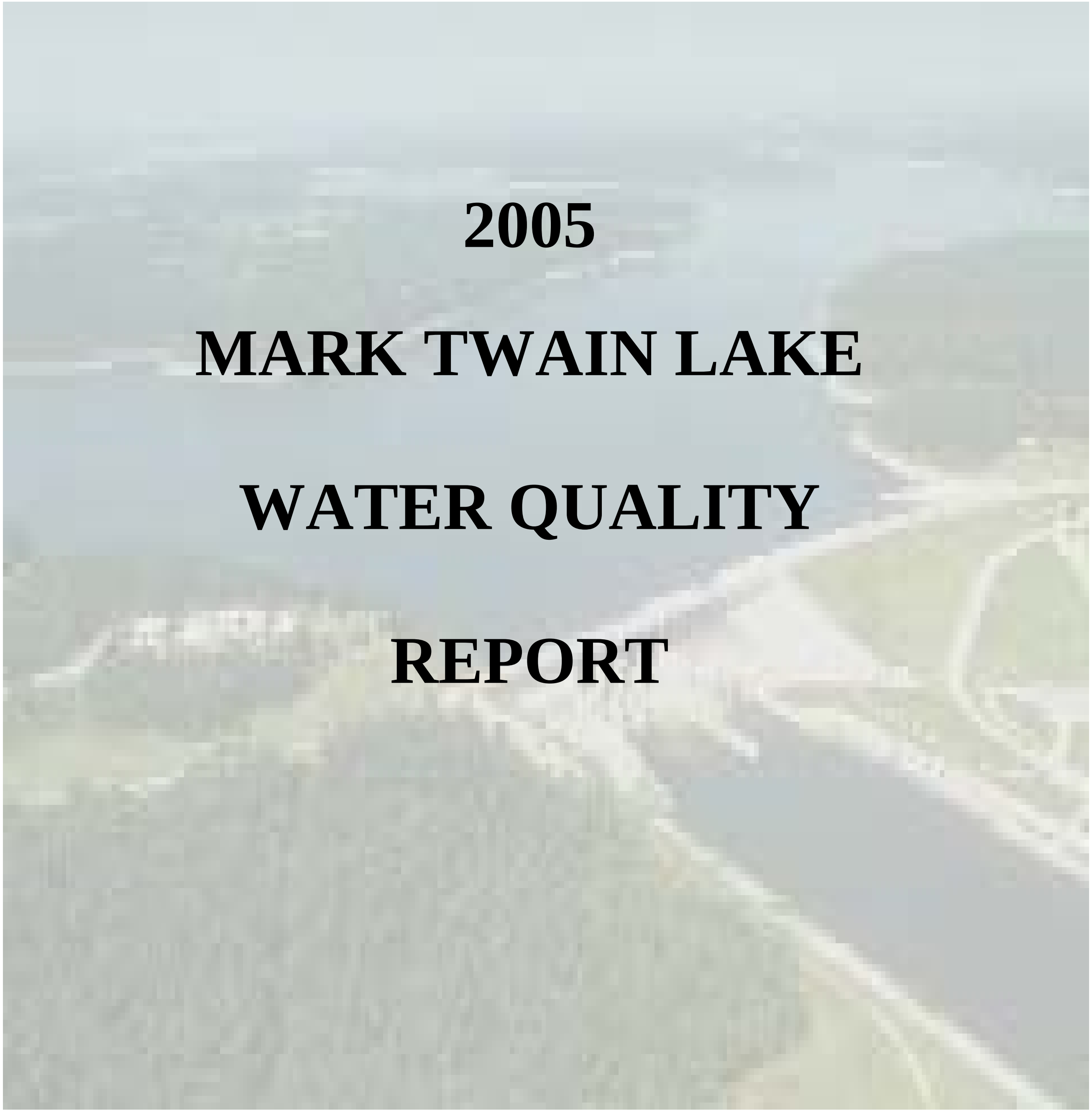

2005

MARK TWAIN LAKE

WATER QUALITY

REPORT

U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT
ENVIRONMENTAL QUALITY SECTION – WATER QUALITY

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WATER QUALITY MONITORING PROGRAM

1.0 GENERAL OVERVIEW

This report summarizes water quality activities of the St. Louis District for Fiscal Year 2005 in accordance with ER 1110-2-8154 Water Quality & Environmental management for Corps Civil Works Projects and ETL 1110-2-362 Environmental Engineering Initiatives for Water Management.

Water quality monitoring remains one of the Sections major responsibilities. The objective is to maintain a reasonable environmental monitoring program for the Mississippi River and the 5 lakes under the St. Louis District's control. The District's reservoirs consist of Mark Twain and Wappapello Lakes in Missouri, and Shelbyville, Carlyle and Rend Lakes in Illinois. Water quality sampling is conducted within the lakes and their tributaries to establish trend analysis and maintain water quality at or above state and federal regulations.

The main objective is to provide technical expertise of an environmental nature to all Corps elements requesting assistance in accordance with ER 1110-2-8154. This would include updating the water quality management priorities for the district's projects to ensure water quality meets the state and federal regulations, for protection of human health and the environment, and for the safety and economic welfare of those at Corps projects. Ongoing goals include ensuring that downstream water quality meets all state and federal regulations, is suitable for aquatic and human life, and continue to evaluate trend analysis in relation to baseline conditions at all projects.

1.1 INTRODUCTION

Mark Twain Lake is located in northeast Missouri. The land surrounding the lake is used predominately for agriculture. The main agricultural contaminants into the watershed include pesticides and fertilizers. Also a concern is the high sediment loading into the lake and the colloidal characteristic of the sediments as well as low dissolved oxygen levels related to turbine generation. The lake is also susceptible to fish kills due to algal decay in the lake arms.

The operating purposes for Mark Twain Lake are fish/wildlife, hydroelectric power, flood control, recreation, navigation and water supply. The water quality management program for the lake includes monitoring of baseline parameters, ecological trends and investigation of problem areas to keep the lake within state and federal standards.

Water quality monitoring was conducted during 2005 to assure safe conditions for human recreation, wildlife and aquatic life as maintained and managed within the lake system. The 2005 water quality monitoring program began in February and continued through September. Four sampling events were conducted. During each sampling period one site was selected for quality control duplication and denoted as MTL-15. The locations of the ten sampling sites are depicted on the lake map in Figure 1.

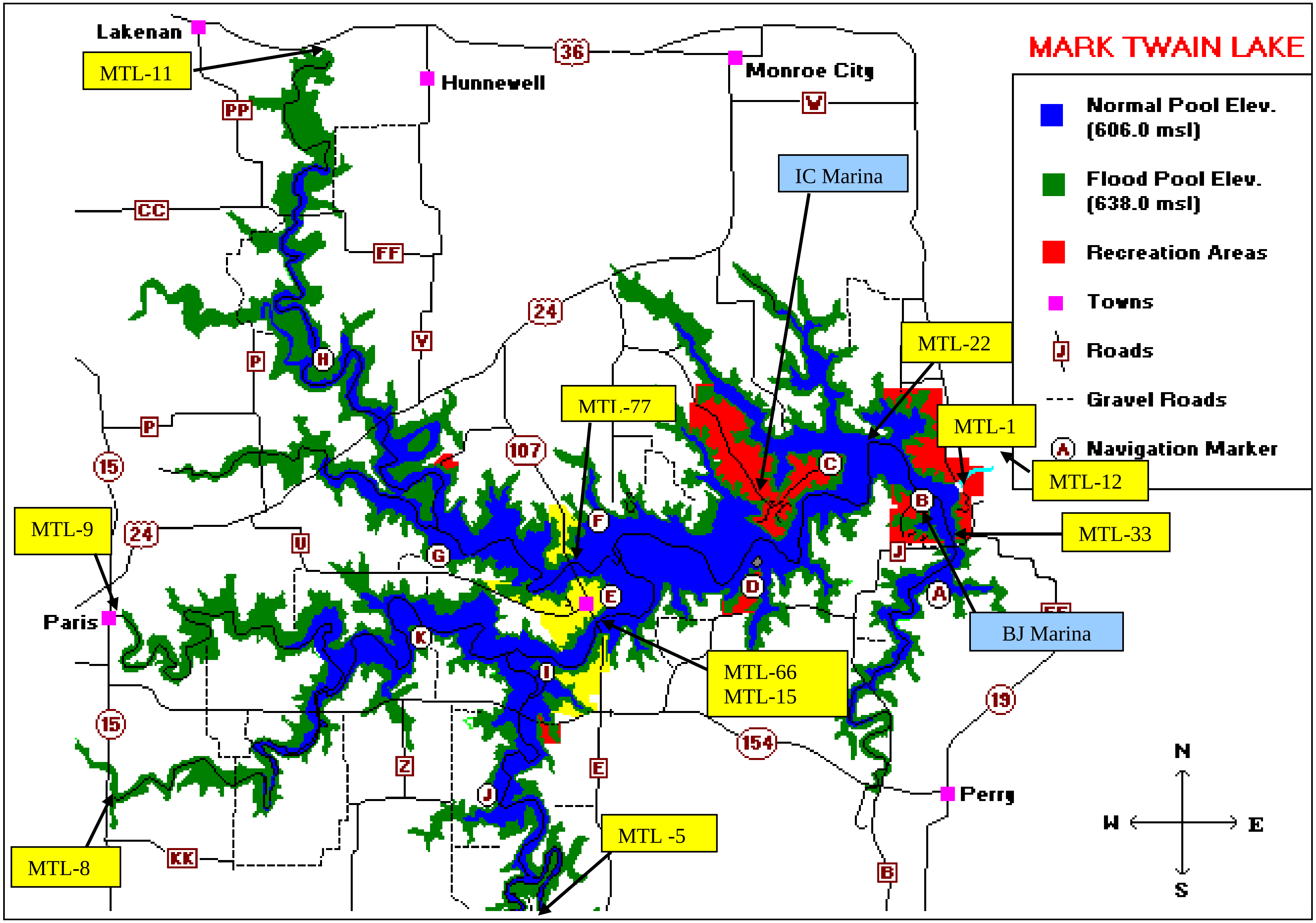


Figure 1
Location of sample sites

2.0 WATER QUALITY ASSESSMENT CRITERIA

The water quality assessment criteria were based upon the State of Missouri regulatory limits for certain contaminants, which has been generally accepted criteria for sustaining adequate aquatic plant and animal growth. The samplings and analysis which were conducted at the Mark Twain Lake sites reflect the minimal set of parameters needed to analyze the current status of water quality for the Mark Twain Lake system.

The following parameters were analyzed in the Fiscal Year 2005 samplings at Mark Twain Lake: Total Organic Carbon (TOC), iron, manganese, ammonia-nitrogen, nitrate-nitrogen, orthophosphate, total phosphate, Total Suspended Solids (TSS), Total Volatile Suspended Solids (TVSS), fecal coliform, pH, temperature, dissolved oxygen, specific conductance, oxidation-reduction potential (ORP), chlorophyll, pheophytin-a, atrazine and alachlor,

The Missouri Department of Natural Resources, Code of State Regulations, Division 20, Chapter 7 classifies water quality criteria based on designated usage. These standards are used to determine the aquatic water quality of the lake. Table 2.1 provides a listing of the regulatory limits for the parameters analyzed where a limit has been established.

TABLE 2.1

State of Missouri
Water Quality Standards

PARAMETER	LIMIT
Temperature	20.5^oC - 33^oC (68^oF - 90^oF)
Ammonia Nitrogen	< 15 mg/L
Nitrate Nitrogen	10 mg/L
Iron	1.0 mg/L (Aquatic Life)
Manganese	0.05 mg/L (Drinking Water & GW)
Phosphorous as Phosphate	0.05 mg/L
Fecal Coliform	< 200 colonies/100 ml
pH	Range: 6.5 to 9.0
DO	> 5.0 mg/L
Atrazine	0.003 mg/L (Drinking Water Standard)
Alachlor	0.002 mg/L (Drinking Water Standard)

Nitrogen is an essential component of proteins, genetic material, chlorophyll, and other key organic molecules. All organisms require nitrogen in order to survive. Nitrogen exists in several forms. These forms include gaseous nitrogen (N_2), nitrites (NO_2), nitrate (NO_3), ammonia nitrogen (NH_3-N), and ammonium (NH_4). Ammonia can be toxic to fish and other aquatic organisms at certain levels. Unlike ammonia, ammonium (NH4) is not toxic to aquatic organisms and is readily available for uptake by plankton and macrophytes. Nitrogen levels have increased as human activities have accelerated the rate of fixed nitrogen being put into circulation. High nitrogen levels can cause eutrophication. Eutrophication increases biomass of phytoplankton, decrease water transparency, and causes oxygen depletion. Ammonia nitrogen is monitored so that the effects on fish spawning, hatching, growth rate and pathologic changes in gills, liver and kidney tissue can be related to the detected levels of ammonia nitrogen. Nitrate-nitrogen degrades to nitrite or produces ammonia which has a detrimental effect on aquatic life and, therefore, has been monitored to assure levels are below the regulatory "safe" limit.

Phosphate has been analyzed as phosphorus and has been monitored due to the potential for uptake by nuisance algae. Levels of phosphate can indicate the potential for rapid growth of algae (algae bloom) which can cause serious oxygen depletion during the algae decay process. Phosphorous is typically the limiting nutrient in a water body. Therefore, addition of phosphorous to the ecosystem stimulates the growth of plants and algae. Phosphorous is delivered to lakes and streams by way of storm water runoff from agricultural fields, residential property, and construction sites. Other sources of phosphorous are anaerobic decomposition of organic matter, leaking sewer systems, waterfowl, and point source pollution. The general standard for phosphorous in lake water is 0.05mg/L. Dissolved phosphorous also called ortho-phosphorous is generally found in much smaller concentrations than total phosphorous and is readily available for uptake. For this reason dissolved phosphorous concentrations are variable and difficult to use as an indicator of nutrient availability.

The metals manganese and iron are nutrients for both plants and animals. Living organisms require trace amounts of metals. However, excessive amounts can be harmful to the organism. Heavy metals exist in surface waters in three forms, colloidal, particulate, and dissolved. Water chemistry determines the rate of adsorption and desorption of metals to and from sediment. Metals are desorbed from the sediment if the water experiences increases in salinity, decreases in redox potential, or decreases in pH. Metals in surface waters can be from natural or human sources. Currently human sources contribute more metals than natural sources. Metals levels in surface water may pose a health risk to humans and the environment.

Photosynthetic activity can be hindered by the levels of total suspended solids. Total suspended solids concentrations, which cause the photosynthetic activity to be reduced by more than 10% from the seasonably established norm, can have a detrimental effect on aquatic life. Soil particles, organic material, and other debris comprise suspended solids in the water column. Secchi disk measurements are inverse to suspended solid measurements. As the total suspended solids (TSS) increase, the secchi disk depth or water transparency decreases. Total suspended solids can be an important indicator of the type and degree of turbidity. TSS measurements represent a combination of organic (volatile) and inorganic (non-volatile) particles in the water. In order to more accurately determine the types and amounts of suspended solids, volatile suspended solids (VSS) are analyzed. VSS concentration represents the organic portion of the total suspended solids. Organic material often includes plankton and additional plant and animal debris that is present in water. Total volatile solids indicate the presence of organics in suspension and, therefore, show additional demand levels of oxygen.

Chlorophyll and pheophytin-a are monitored to provide indicators of algae growth and, therefore, potential oxygen depletion activity. Chlorophyll is measured in lakes to estimate the type and amount of algal productivity in the water column. Chlorophyll a is present in green algae, blue-green algae, and in diatoms. Chlorophyll a is often used to indicate the degree of eutrophication. Chlorophyll b and c are used to estimate the extent of algal diversity and productivity. Chlorophyll b is common in green algae and is used as an auxiliary pigment for photosynthesis. Chlorophyll c is most common in diatom species and serves as an auxiliary pigment. Algal productivity and diversity can be determined by the concentrations of the individual pigments. For example high concentrations of chlorophyll a and b would indicate that green algae is abundant. High concentrations of chlorophyll a would indicate abundance of blue-green algae and concentrations of chlorophyll a and c would indicate diatoms are the dominant species. Chlorophyll production is currently being connected with hypoxia.

Fecal coliform bacteria is monitored for the protection of human health as it relates to full body contact of recreational waters. People can be exposed to disease-causing organisms, such as bacteria, viruses and protozoa in beach and recreational waters mainly through accidental ingestion of contaminated water or through skin contact. These organisms, called pathogens, usually come from the feces of humans and other warm-blooded animals. If taken into the body, pathogens can cause various illnesses and on rare occasions, even death. Waterborne illnesses include diseases resulting from bacteria infection such as cholera, salmonellosis, and gastroenteritis, viral infections such as hepatitis, gastroenteritis, and intestinal diseases, and protozoan infections such as ameobic dysentery and giardiasis. The most commonly monitored recreational water indicator organisms are fecal coliform, Escherichia coli, (E. coli) and enterococci. Fecal coliform are bacteria that live in the intestinal tracts of warm-blooded animals. The standard for fecal coliform is less than 200 colonies per 100ml of sample water. Fecal coliform was originally recommended in 1968 by the Federal Water Pollution Control Administration (predecessor to EPA) as an effective water quality indicator organism for recreational waters. Recent studies indicate that fecal coliform show less correlation to illness than other indicator organisms such as E. coli and enterococci. The Environmental Protection Agency (EPA) currently recommends E. coli or enterococci as an indicator organism for fresh waters. Although E. coli and enterococci are more costly they may become the standard in the near furure.

Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer and, therefore, were monitored for the protection of human and aquatic health. Organic compounds include many pesticides. A pesticide can be any substance that is intended to prevent, destroy, repel, or mitigate any pest. This includes insecticides, herbicides, fungicides, fumigants, algaecides and other substances. Herbicides which are pesticides used to kill vegetation are the most widely used and sampled. Ten of the most frequently used herbicides and detected in water are Atrazine, Metolachlor, Alachlor, 2,4-D, Trifluralin, Glyphosate, Dicamba, Cyanazine, Simazine, and 2,4,5-T. Two of the most widely used pesticides are Atrazine and Alachlor. Atrazine is a preemergence or postemergence herbicide use to control broadleaf weeds and annual grasses. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water. Alachlor is a Restricted Use Pesticide (RUP) due to the potential to contaminate groundwater. The drinking water standard for Atrazine is 0.003mg/L and 0.002 mg/L for Alachlor.

Temperature, dissolved oxygen and pH are monitored for the protection of aquatic life. Temperature is important because it controls several aspects of water quality. Colder water hold more dissolved oxygen which is required by aquatic organisms. Plants grow more rapidly and use more oxygen in warmer water. Decomposition of organic matter which uses oxygen is accelerated in warmer water. Temperature can also determine the availability of toxic compounds such as ammonia. Since aquatic organisms are cold blooded, water temperature regulates their metabolism and ability to survive. The number and kinds of organisms that are found in streams or lakes is directly related to temperature. Certain organisms require a specific temperature range, such as trout, which require water temperatures below 20^{o}C. Most aquatic organisms require a minimum concentration of dissolved oxygen to survive. In spring, surface waters of the lake mix with the water below through wind and thermal action. This mixing diminishes as the upper layer of water becomes warmer and less dense. Solar insulation during the summer months stratifies the lake into three zones. The upper warmer water zone is called the epilimnion and the lower cooler water zone is called the hypolimnion. The epilimnion and the hypolimnion zones are divided by a transition zone known as the metalimnion. The thermocline located within the metalimnion exhibits a rapid change in water temperature. During the summer months the hypolimnion may become anaerobic. In this anaerobic zone, chemical reduction of iron and manganese, or the production of methane and sulfides can occur. Iron rapidly oxidizes in aerobic environments, but manganese oxidizes slowly and can remain in the reduced state for long distances down stream even in aerobic environments. The degree of acidity of water is measured by a logarithmetic scale ranging from 0 to 14 and is known as the pH scale. A reading of 7 indicates neutrality and readings below seven are acidic and above are alkaline. Most Illinois lakes range from 6 to 9 on the pH scale. The buffering capacity of water is the ability to neutralize acid better known as alkalinity. A high alkalinity concentration indicates an increased ability to neutralize pH and resist changes, whereas a low alkalinity concentration indicates that a water body is vulnerable to changes in pH.

Conductivity is a measure of a water's ability to conduct an electrical current. The ability to carry a current is often driven by the dissolved materials present in a water column. These materials can include dissolved ions and other materials in the water and thus are directly proportional to the concentration of total dissolved solids (TDS) present in the water column. Typically TDS concentrations represent 50-60% of the conductivity measurements.

Redox or Oxidation-Reduction Potential (ORP) is a measurement to oxidize materials. Oxidation involves an exchange of electrons between 2 atoms. The atom that loses an electron is oxidized and the one that gains an electron is reduced. ORP sensors measure the electrochemical potential between the solution and a reference electrode. Readings are expressed in millivolts with positive readings indicating increased oxidizing potential and negative readings being increased reduction. The ORP probe is essentially a millivolt meter, measuring the voltage across 2 electrodes with the water in between.

Water clarity is intuitively used by the public to judge water quality. Secchi depth has been used for many years as a limnological characterization tool for characterizing water clarity. Secchi depth is a measure of light penetration into a waterbody and is a function of the absorption and scattering of light in the water. There are three characteristics of water which affect the penetration of light. The three factors are the color of water, amount of phytoplankton in the water column, and amount of inorganic material in the water column. Secchi depth integrates the combined impacts of all the factors which influence water clarity. Water transparency was measured using a Secchi disk. Secchi disk readings were taken at all lake sites.

3.0 SUMMARY OF MONITORING RESULTS

The seasonal change brought on gradual lake stratification during the summer months. Fecal coli are sampled at the marinas to ensure that the marina areas are not being contaminated by boats with restroom facilities. Bacteria levels for all the marinas were below the Missouri standard of 200 colonies/100ml of sample water for the entire sampling period, February through September. The June sample at Indian Creek Marina was the only sample that approached the standard. The increase at this site may be attributed to the warm summer temperatures and the high usage of the facility.

Total iron and total manganese are sampled above the dam near the bottom of the channel (MTL-22-15), below the re-regulation dam (MTL-12), and in the spillway area (MTL-1). As was previously stated living organisms require trace amounts of metals, however excessive amounts can be harmful to the organism. Iron exceeded the Missouri Water Quality Standard at all three sites for the February, March and June sampling events. Iron cycling is a function of oxidation-reduction processes. This elevated level of iron near the bottom of the lake is not detrimental to the overall lake system at this time. Iron oxidizes relatively rapidly (minutes to hours); therefore any iron released through the spillway will normally be oxidized in a short period of time. Missouri's standard for manganese is for drinking water and groundwater. Missouri does not have a manganese standard for aquatic life.

Nitrogen and phosphates are sampled at all sites. The 2005 phosphate results at all sites are above the 0.05 mg/L standard. Because phosphorous in water is not considered directly toxic to humans and animals no drinking water standards have been established for phosphorous. However, phosphorous can cause health threats through the stimulation of toxic algal blooms and the resulting oxygen depletion. However, nitrates can pose a threat to human and animal health. Nitrate in water is toxic at high levels and has been linked to toxic effects of livestock and to blue baby disease (methemoglobinemia) in infants. The Maximum Contaminant Level (MCL) for nitrate-N in drinking water is 10mg/L to protect babies 3 to 6 months of age. The Missouri Water Quality Standard for ammonia nitrogen (NH_3-N) is 15mg/L. The increased levels of phosphate in combination with nitrogen and other lake conditions, such as temperature, pH and stagnant lake conditions, can lead to increased algae growth. Eutrophication is currently the most widespread water quality problem in the U.S. and many other countries. Restoration of eutrophic waters requires the reduction of nonpoint inputs of phosphorous and nitrogen. The resulting detrimental effects of algae toxins and oxygen depletion could result in health problems for fish and other aquatic species as well as land animals utilizing the water supply. There were no signs of any of these effects throughout 2005.

Chlorophyll *a* was sampled at 4 sites, MTL-22, MTL-33, MTL-66 and MTL-77. MTL-15 is a duplicate sample of MTL-66. Chlorophyll a is a green pigment found in plants. Chlorophyll *a* concentrations are an indicator of phytoplankton abundance and biomass. They can be an effective measure of trophic status, and used as a measure of water quality. High levels often indicate poor water quality and low levels suggest good conditions. However, elevated levels are not necessarily bad. It is the long term persistence of elevated levels that is the problem. It is natural for chlorophyll *a* levels to fluctuate over time. Chlorophyll *a* tends to be higher after storm events and during the summer months when water temperatures and light levels are elevated. Chlorophyll can reduce the clarity of the water and the amount of oxygen available to other organisms. Missouri does not currently have a standard for chlorophyll. The data indicates a normal increase in chlorophyll levels during the warmer summer months, which is not a concern.

Seventy percent of the Mark Twain Lake watershed is used for agriculture and 50% of this is used for cropland. Atrazine and Alachlor are pesticides that were sampled at all sites. These chemicals are herbicides used to control weed growth. Atrazine exceeded the 3.0ug/L standard at 3 of the 6 stream sites MTL-5 (South Fork), MTL-8 (Elk Fork) and MTL-9 (middle Fork) on April 26 and June 2. All lakes sites were below the Missouri atrazine standard. These substances can enter water bodies as a result of drift during spraying, surface runoff, and leaching through soil. In order to eliminate pesticide contamination of waters it is important for the public to be educated and institute best manage practices when using these chemicals.

Total Suspended Solids (TSS) and Total Volatile Suspended Solids (TVSS) samples are collected at all sites. Solids can affect water quality by increasing temperature through the absorption of sunlight by the particles in the water, which also effects the clarity of the water. This can then effect the amount of oxygen in the water. Missouri does not currently have a standard for TSS or TVSS.

Total Organic Carbon (TOC) is collected at all sites. TOC is an indicator of the organic character of water. The larger the carbon or organic content, the more oxygen is consumed. TOC tends to be higher in the summer months which may be a result of plant material, which had grown all summer and begins to decay. Missouri does not currently have a standard for TOC.

Temperature and dissolved oxygen levels were taken at all sites. Measurements were taken at 1 meter intervals at the lake sites. During the summer months the lake stratifies and a boundary is formed between the upper warmer water and the lower cooler water. This transition area is known as the thermocline, the area where the temperature drops significantly. Oxygen levels can also change drastically as a function of depth. This area where the oxygen level significantly drops is called the oxycline. The depth of the thermocline and oxycline can have an effect on the aquatic organisms. Occasionally the thermocline and oxycline are at or near the same depth.

pH is taken at all sites and at 1 meter intervals at lake sites. All sites except the lakes sites on 3/29/05 were within the 6 to 9 pH range. This abnormality appears to be caused by a faulty probe. Variances in pH can be caused by a rainfall event.

Conductivity and redox are taken at all sites and at 1 meter intervals at lake sites. Illinois does not currently have a standard for conductivity or redox.

The monitoring program for Mark Twain Lake during Fiscal Year 2005 revealed good water quality when compared to limits established by the Missouri Department of Natural Resources for general use, secondary contact, and indigenous aquatic life. Agricultural nutrient runoffs were primary concerns for the lake's water quality. Better land management practices, erosion control and buffering zones are methods used to reduce such contaminants from entering the lake. The St. Louis District personnel have been working continuously with lake personnel, area communities and other agencies in the implementation of educational programs and implementation planning to bring about the use of better management techniques to improve the lake's water quality.

4.0 PLANNED 2006 STUDIES

The Mark Twain Lake water quality monitoring will continue in Fiscal Year 2006. A total of five sampling events will be conducted between February and September in 2006. Mark Twain Lake provides water supplies to many communities and is a high usage recreational lake, The monitoring of water quality is imperative to assure the water quality is within acceptable limits for the designated usage.

The sampling plan will involve an intensive trend analysis of the contaminants entering Mark Twain Lake. The sampling sites include the following: Site 1 MTL-1 Spillway, Site 5 MTL-5 South Fork at Hwy D, Site 8 Elk Fork at Hwy 15, Site 9 Middle Fork at Hwy 15, Site 11 North Fork at Hwy 36, Site 12 below re-regulation dam, Site 22 MTL-22 old river channel 1mile up lake from dam, Site 33 Lick Creek at Hwy J, Site 66 South Fork at Hwy 107 bridge, and Site 77 North Fork at Hwy 107 bridge. This combination of sites effectively represents the incoming contaminants and their effects on the lake.

A remote sensor was installed in the spillway to allow the project as well as water quality personnel to monitor temperature and oxygen readings to avoid fish kills. During low flow, water is discharged through the afterbay. This water is low in oxygen and can create a low oxygen area below the dam. The sensor will allow the project to track oxygen levels below the dam and make appropriate adjustments to avoid a possible fish kill. Normally allowing water to spill through the tainter gates will alleviate low oxygen levels below the dam.

APPENDIX A

DATA

LAB DATA

SITE	DEPTH (m)	DATE	TIME	TOC (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	NH_3N (mg/L)	NO_{3-} NO_2 (mg/L)	Ortho Phosphate (mg/L)	Total Phosphoruus (mg/L)	Total Suspended Solids (mg/L)	Total Volatile Suspended Solids (mg/L)
MTL-1	0	2/22/2005	1134	8.0	2.40	0.06	0.03	0.96	0.16	0.29	2	1
MTL-1	0	4/26/2005	1004	6.8	2.10	0.03	0.04	1.20	0.12	0.23	8	1
MTL-1	0	6/2/2005	1117	8.4	1.30	0.02	0.07	1.20	0.06	0.13	3	1
MTL-1	0	9/14/2005	1045	6.2	0.80	0.19	0.03	0.06	0.03	0.08	19	4
MTL-5	0	2/22/2005	1409	5.8			0.03	0.97	0.04	0.26	29	5
MTL-5	0	4/26/2005	1310	8.7			0.23	2.10	0.13	0.42	66	7
MTL-5	0	6/2/2005	1430	7.6			0.04	1.20	0.02	0.31	41	9
MTL-5	0	9/14/2005	1336	8.2			0.04	0.05	0.15	0.33	37	6
MTL-8	0	2/22/2005	1342	5.0			0.03	0.57	0.02	0.17	8	3
MTL-8	0	4/26/2005	1238	8.8			0.18	1.90	0.08	0.30	36	4
MTL-8	0	6/2/2005	1337	9.9			0.03	0.70	0.01	0.11	20	3
MTL-8	0	9/14/2005	1254	7.6			0.05	0.06	0.07	0.11	7	1
MTL-9	0	2/22/2005	1319	9.8			0.03	0.50	0.01	0.16	12	3
MTL-9	0	4/26/2005	1210	8.5			0.05	1.20	0.04	0.22	31	4
MTL-9	0	6/2/2005	1313	10.5			0.03	0.71	0.01	0.15	24	5
MTL-9	0	9/14/2005	1223	7.5			0.03	0.07	0.04	0.13	15	3
MTL-11	0	2/22/2005	1247	7.7			0.42	0.72	0.06	0.27	30	3
MTL-11	0	4/26/2005	1116	9.7			0.03	1.30	0.10	0.58	126	13
MTL-11	0	6/2/2005	1237	8.2			0.03	0.04	0.02	0.22	35	9
MTL-11	0	9/14/2005	1147	6.5			0.04	0.12	0.05	0.19	24	5
MTL-12	0	2/22/2005	1205	9.9	2.40	0.06	0.03	0.96	0.17	0.29	3	2
MTL-12	0	4/26/2005	1040	6.8	2.10	0.05	0.03	1.20	0.11	0.21	10	2
MTL-12	0	6/2/2005	1157	9.6	1.30	0.02	0.03	0.67	0.02	0.15	21	5
MTL-12	0	9/14/2005	1116	6.1	0.50	0.17	0.08	0.08	0.02	0.10	10	2

LAB DATA

SITE	DEPTH (m)	DATE	TIME	TOC (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	NH_3N (mg/L)	NO_{3-} NO_2 (mg/L)	Ortho Phosphate (mg/L)	Total Phosphoruus (mg/L)	Total Suspended Solids (mg/L)	Total Volatile Suspended Solids (mg/L)
MTL-15-0	0	2/22/2005	1453	9.9			0.03	0.88	0.19	0.32	3	3
MTL-15-0	0	4/26/2005	1104	6.7			0.03	1.00	0.06	0.18	20	3
MTL-15-0	0	6/2/2005	1120	8.9			0.03	0.56	0.01	0.08	8	3
MTL-15-0	0	9/14/2005	1233	7.5			0.03	0.06	0.01	0.03	3	2
MTL-22-0	0	2/22/2005	1353	7.5			0.03	0.99	0.16	0.29	2	1
MTL-22-0	0	4/26/2005	1040	6.5			0.03	1.30	0.11	0.20	4	1
MTL-22-0	0	6/2/2005	1300	6.8			0.03	0.77	0.01	0.08	7	2
MTL-22-0	0	9/14/2005	1354	6.4			0.03	0.03	0.01	0.03	3	2
MTL-22-15	15	2/22/2005	1357	7.0	2.50	0.07	0.06	0.96	0.17	0.31	3	3
MTL-22-15	15	4/26/2005	1047	7.4	2.10	0.03	0.03	1.10	0.10	0.15	9	2
MTL-22-15	15	6/2/2005	1300	8.3	2.00	0.03	0.03	1.10	0.08	0.19	6	1
MTL-22-15	15	9/14/2005	1358	6.2	0.07	0.04	0.05	0.05	0.01	0.03	3	2
MTL-33-0	0	2/22/2005	1446	8.3			0.03	0.90	0.17	0.31	3	3
MTL-33-0	0	4/26/2005	1320	6.5			0.03	1.00	0.11	0.16	7	1
MTL-33-0	0	6/2/2005	1335	6.7			0.03	0.52	0.01	0.08	9	4
MTL-33-0	0	9/14/2005	1228	6.2			0.03	0.05	0.01	0.03	3	2
MTL-66-0	0	2/22/2005	1208	7.7			0.12	0.89	0.10	0.32	11	4
MTL-66-0	0	4/26/2005	1100	7.1			0.03	1.50	0.08	0.22	15	2
MTL-66-0	0	6/2/2005	1220	8.6			0.03	0.95	0.01	0.10	6	2
MTL-66-0	0	9/14/2005	1108	6.2			0.03	0.05	0.01	0.05	4	2
MTL-77-0	0	2/22/2005	1308	9.5			0.12	1.20	0.14	0.36	6	4
MTL-77-0	0	4/26/2005	1130	6.0			0.03	1.00	0.06	0.18	17	2
MTL-77-0	0	6/2/2005	1100	8.6			0.05	1.00	0.02	0.10	7	2
MTL-77-0	0	9/14/2005	1038	6.7			0.03	0.05	0.01	0.04	4	2

LAB DATA

SITE	DEPTH (m)	DATE	TIME	Chlorophyll (mg/m^3)	Pheophytin (mg/m^3)	Atrazine (ug/L)	Alachlor (ug/L)
MTL-1	0	2/22/2005	1134			1.0	1.0
MTL-1	0	4/26/2005	1004			1.1	1.1
MTL-1	0	6/2/2005	1117			1.0	1.0
MTL-1	0	9/14/2005	1045			1.1	1.1
MTL-5	0	2/22/2005	1409			1.1	1.1
MTL-5	0	4/26/2005	1310			14.9	1.1
MTL-5	0	6/2/2005	1430			6.4	1.0
MTL-5	0	9/14/2005	1336			1.1	1.1
MTL-8	0	2/22/2005	1342			1.1	1.1
MTL-8	0	4/26/2005	1238			8.1	1.1
MTL-8	0	6/2/2005	1337			4.9	1.0
MTL-8	0	9/14/2005	1254			1.1	1.1
MTL-9	0	2/22/2005	1319			1.1	1.1
MTL-9	0	4/26/2005	1210			3.9	1.1
MTL-9	0	6/2/2005	1313			6.1	1.0
MTL-9	0	9/14/2005	1223			1.1	1.1
MTL-11	0	2/22/2005	1247			1.1	1.1
MTL-11	0	4/26/2005	1116			2.2	1.3
MTL-11	0	6/2/2005	1237			2.4	1.0
MTL-11	0	9/14/2005	1147			1.1	1.1
MTL-12	0	2/22/2005	1205			1.1	1.1
MTL-12	0	4/26/2005	1040			1.0	1.0
MTL-12	0	6/2/2005	1157			1.0	1.0
MTL-12	0	9/14/2005	1116			1.1	1.1

LAB DATA

SITE	DEPTH (m)	DATE	TIME	Chlorophyll (mg/m^3)	Pheophytin (mg/m^3)	Atrazine (ug/L)	Alachlor (ug/L)
MTL-15-0	0	2/22/2005	1453	5.0	5.0	1.0	1.0
MTL-15-0	0	4/26/2005	1104	5.0	5.0	1.1	1.1
MTL-15-0	0	6/2/2005	1120	7.3	5.0	1.1	1.1
MTL-15-0	0	9/14/2005	1233	5.4	5.0	1.1	1.1
MTL-22-0	0	2/22/2005	1353	5.0	5.0	1.1	1.1
MTL-22-0	0	4/26/2005	1040	5.0	5.0	1.0	1.0
MTL-22-0	0	6/2/2005	1300	10.7	5.0	1.0	1.0
MTL-22-0	0	9/14/2005	1354	5.0	5.0	1.1	1.1
MTL-22-15	15	2/22/2005	1357				
MTL-22-15	15	4/26/2005	1047				
MTL-22-15	15	6/2/2005	1300				
MTL-22-15	15	9/14/2005	1358				
MTL-33-0	0	2/22/2005	1446	5.0	5.0	1.0	1.0
MTL-33-0	0	4/26/2005	1320	5.0	5.0	1.0	1.0
MTL-33-0	0	6/2/2005	1335	13.9	5.0	1.0	1.0
MTL-33-0	0	9/14/2005	1228	5.2	5.0	1.1	1.1
MTL-66-0	0	2/22/2005	1208	5.0	5.0	1.1	1.1
MTL-66-0	0	4/26/2005	1100	5.0	5.0	0.6	1.0
MTL-66-0	0	6/2/2005	1220	7.0	5.0	0.9	1.0
MTL-66-0	0	9/14/2005	1108	5.0	5.0	1.1	1.1
MTL-77-0	0	2/22/2005	1308	5.0	5.0	1.1	1.1
MTL-77-0	0	4/26/2005	1130	5.0	5.0	1.0	1.0
MTL-77-0	0	6/2/2005	1100	9.0	5.0	0.9	1.0
MTL-77-0	0	9/14/2005	1038	5.0	5.0	1.1	1.1

LAB DATA

SITE	DEPTH (m)	DATE	TIME	FECALCOL (colonies/100ml)
BJ MARINA	0	2/22/2005		
BJ MARINA	0	4/26/2005	1005	2
BJ MARINA	0	6/2/2005	1300	2
BJ MARINA	0	9/14/2005	1030	2

FIELD DATA

Site	Date	Depth (m)	H2OTemp (^oC)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
Mtl-1	2/22/2005	0.398	3.40	101.0	199	7.98	39.3	5.21	1134			Cold	
1	3/29/2005	0.53	8.2	240	218	8.2	82	9.8	1137		76	PC	15
1	4/26/2005	0.354	14.07	NA	207	7.56	120	12.96	1004	15	58 F	Pt. Cloudy	windy
1	6/2/2005	1.69	18.10	264.9	257	8.13	121.2	11.6	1117		80	Sunny	5 to 10
1	7/6/2005	0.78	24.75	68.8	305	8.25	99.7	8.17	1018		82 F		
1	9/16/2005	SONDE BROKE IN FIELD											
Site													
Mtl-12	2/22/2005	1.000	3.41	125.9	199	7.92	64.6	8.43	1205				
12	3/29/2005	0.4	9.5	271	233	8.1	79	9.0	925		65	Sunny	15
12	4/26/2005	0.26	14.56	NA	208	7.50	125	12.76	1040				
12	6/2/2005	0.33	23.07	257.1	266	8.68	176.6	15.22	1157		80	Sunny	11 to 15
12	7/6/2005	0.73	27.10	74.7	301	8.0	99.3	7.9	1040		82 F		
12	9/15/2005	SONDE BROKE											
Site													
MTL-11	2/22/2005	0.479	5.49	118.0	356	7.90	64.9	8.15	1247				
11	3/29/2005	0.15	9.6	264	390	8.1	91	10.3	958		71	PC	15
11	4/26/2005	0.102	12.68	NA	261	7.20	121.9	12.094	1116				
11	6/2/2005	1.05	23.52	273.9	420	7.97	146.4	12.35	1237		80	Sunny	4 ?
11	7/6/2005	0.4	25.85	80	525	7.81	115.4	9.29	1214		82 F		
11	9/16/2005	SONDE BROKE											
Site													
MTL-9	2/22/2005	0.474	5.75	119.8	380	7.90	66.3	8.29	1319				
9	3/29/2005	0.25	9.1	290	419	8.1	90	10.5	1032		73	PC	20
9	4/26/2005	0.153	12.87	NA	330	7.40	121	12.78	1210				
9	6/2/2005	0.385	23.14	279.0	394	8.3	152,8	13.27	1313				
9	7/6/2005	0.14	24.46	78	480	7.86	90.7	7.48	1239		82 F		
9	9/15/2005	SONDE BROKE											

NA – Not Available

FIELD DATA

Site	Date	Depth (m)	H2OTemp (^{o}C)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
MTL-8	2/22/2005	0.490	6.45	118.2	391	7.93	58.5	7.26	1342				
8	3/29/2005	0.29	10.2	277	443	8.2	100	11.2	1043		74	PC	15
8	4/26/2005	0.05	13.99	NA	362	7.50	124.4	12.8	1238				
8	6/2/2005	0.522	24.7	283.3	466	8.1	141.4	11.97	1337				
8	7/6/2005	0.23	26.41	75.7	441	8.02	116.9	9.39	1300				
8	9/15/2005	SONDE BROKE											
Site MTL-5	2/22/2005	0.370	7.37	38.0	357	7.86	86.0	10.22	1409				
5	3/29/2005	0.16	11.3	274	446	8.4	103	11.5	1109		75	PC	15
5	4/26/2005	0.158	14.60	NA	311	7.40	120.7	12.27	1310				
5	6/2/2005	0.23	26.87	261.0	645	8.58	171.9	13.9	1410				
5	7/6/2005	0.22	28.18	74.6	464	8.14	8.14	9.63	1323				
5	9/15/2005	SONDE BROKE											
Site MTL-22-0	2/22/2005	0.911	3.37	161.0	169	8.04	83.8	11.17	1353	12			
22	2/22/2005	2.274	3.32	163.0	169	8.00	82.1	10.96	1355				
22	2/22/2005	3.102	3.33	163.0	169	7.99	81.5	10.86	1355				
22	2/22/2005	4.216	3.32	163.0	168	7.99	80.4	10.73	1356				
22	2/22/2005	5.423	3.33	165.0	167	7.96	77.2	10.30	1358				
22	2/22/2005	6.165	3.28	166.0	167	7.93	75.1	10.03	1400				
22	2/22/2005	7.116	3.33	168.0	166	7.90	72.7	9.70	1403				
22	2/22/2005	9.096	3.30	168.0	166	7.90	72.9	9.73	1404				
22	2/22/2005	9.126	3.35	169.0	166	7.87	72.1	9.61	1405				
22	2/22/2005	9.807	3.29	170.0	166	7.87	71.9	9.61	1407				
22	3/29/2005	0.5	6.9	-216	177	9.6	109	13.3		15			
22	3/29/2005	1.5	6.9	-173	166	9.6	109	13.5					
22	3/29/2005	2.5	6.9	-201	166	9.6	110	13.6					
22	3/29/2005	3.5	6.8	-209	166	9.5	110	13.7					
22	3/29/2005	4.5	6.8	-149	164	9.5	107	13.3					
22	3/29/2005	5.5	6.8	-240	164	9.5	106	13.2					

NA – Not Available

FIELD DATA

Site	Date	Depth (m)	H2OTemp (oC)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
22	3/29/2005	6.5	6.7	-248	160	9.5	105	13.2					
22	4/26/2005	1	13.60	132.2	211	7.49	84.5	8.75	1040				
22	4/26/2005	2	13.60	136.6	211	7.43	81.8	8.5					
22	4/26/2005	3	13.57	138.2	210	7.42	81.3	8.45					
22	4/26/2005	4	13.57	139.6	209	7.41	61.0	8.42					
22	4/26/2005	5	13.56	141.1	209	7.40	80.8	8.4					
22	4/26/2005	6	13.57	142.5	209	7.41	80.4	9.36					
22	4/26/2005	7	13.54	142.8	209	7.40	80.2	8.75					
22	4/26/2005	8	13.54	143.2	209	7.39	80.1	8.34					
22	4/26/2005	9	13.52	144.2	209	7.39	80.2	8.35					
22	4/26/2005	10	13.43	146.0	207	7.38	80.0	8.33					
22	4/26/2005	11	12.05	146.0	201	7.24	75.1	8.01					
22	6/2/2005	1.2	22.07	82.8	228	8.67	123.4	10.74	1330	36			
22	6/2/2005	2.2	21.87	84.6	228	8.62	117.2	10.27					
22	6/2/2005	3.16	21.11	88.9	229	8.11	105.3	9.46					
22	6/2/2005	4.15	19.18	97.8	238	7.72	79.4	7.37					
22	6/2/2005	5.26	18.70	107.4	240	7.60	75.7	7.06					
22	6/2/2005	6.36	16.80	113.1	235	7.48	66.7	6.45					
22	6/2/2005	7.1	15.59	116.3	232	7.40	61.6	6.17					
22	6/2/2005	8.35	13.67	120.9	223	7.34	59.7	6.20					
22	6/2/2005	9.1	12.94	122.3	123.1	7.30	58.8	6.20					
22	6/2/2005	10.1	12.35	123.7	216	7.28	58.2	5.25					
22	6/2/2005	11.1	11.56	126.3	214	7.27	57.2	6.23					
22	6/2/2005	12.1	11.17	127.3	212	7.26	55.9	6.19					
22	6/2/2005	13	10.43	129.4	209	7.23	51.6	5.76					
MTL-33	2/22/2005	0.468	3.75	150.0	165	8.13	87.5	11.54	1446	11			
33	2/22/2005	1.167	3.73	150.0	164	8.13	82.4	10.88	1446				
33	2/22/2005	2.080	3.69	151.0	163	8.11	79.1	10.45	1447				
33	2/22/2005	3.178	3.70	152.0	163	8.09	76.9	10.15	1447				
33	2/22/2005	4.260	3.70	153.0	163	8.07	75.0	9.91	1448				
33	2/22/2005	5.339	3.70	153.0	163	8.06	73.5	9.71	1448				
33	2/22/2005	6.368	3.71	155.0	162	8.04	71.8	9.49	1450				

FIELD DATA

Site	Date	Depth (m)	H2OTemp (oC)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
33	2/22/2005	7.258	3.71	156.0	162	8.02	70.8	9.35	1451				
33	2/22/2005	8.368	3.70	157.0	162	8.00	69.5	9.17	1451				
33	2/22/2005	9.294	3.72	158.0	162	7.99	69.1	9.12	1452				
33	2/22/2005	10.316	3.74	158.0	162	7.99	67.9	8.96	1453				
33	3/29/2005	1.074	7.03	-120	160	9.5	90.0	10.92	23:20	14			
33	3/29/2005	2.295	6.92	-137	159	9.5	85.6	10.4	23:21				
33	3/29/2005	3.268	6.72	-137	160	9.49	84.1	10.28	23:22				
33	3/29/2005	4.257	6.63	-139	159	9.49	83.6	10.24	23:22				
33	3/29/2005	5.272	6.32	-144	160	9.48	83.1	10.25	23:23				
33	3/29/2005	6.225	6.2	-155	159	9.47	82.2	10.18	23:24				
33	3/29/2005	7.257	6.17	-174	159	9.47	81.5	10.1	23:25				
33	3/29/2005	8.324	5.71	-173	159	9.46	81.0	10.16	23:26				
33	3/29/2005	9.362	5.68	-185	159	9.46	80.0	10.03	23:27				
33	3/29/2005	10.358	5.66	-176	159	9.46	78.4	9.84	23:27				
33	3/29/2005	11.263	5.61	-173	159	9.45	77.7	9.77	23:28				
33	4/26/2005	1	14.5	125.4	207	7.55	86.0	8.72					
33	4/26/2005	2	14.4	139.5	207	7.45	83.9	9.55					
33	4/26/2005	3	14.4	132.3	207	7.44	83.7	8.53					
33	4/26/2005	4	14.3	134.0	206	7.42	83.1	8.50					
33	4/26/2005	5	14.3	135.7	206	7.40	87.7	8.46					
33	4/26/2005	6	14.2	137.4	206	7.39	82.3	8.19					
33	4/26/2005	7	14.15	139.2	206	7.36	81.8	8.40					
33	4/26/2005	8	14.06	141.1	205	7.35	81.5	8.37					
33	4/26/2005	9	14.01	141.8	205	7.34	81.3	8.36					
33	4/26/2005	10	13.71	143.8	204	7.32	80.6	8.35					
33	6/2/2005	0.2	23.70	55.2	224	9.04	154.1	13.04	1335	30			
33	6/2/2005	1.2	22.37	58.6	224	9.00	147.8	12.73					
33	6/2/2005	2.2	21.08	74.3	231	8.05	104	9.11					
33	6/2/2005	3.03	20.50	83.9	233	7.91	93.4	8.34					
33	6/2/2005	4.1	19.82	87.4	232	7.80	84.9	7.79					

FIELD DATA

Site	Date	Depth (m)	H2OTemp (oC)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
33	6/2/2005	5.2	18.75	93.2	229	7.66	77.0	7.21					
33	6/2/2005	6.0	16.83	98.4	224	7.56	68.6	6.84					
33	6/2/2005	7.3	15.67	101	221	7.43	60.9	5.99					
33	6/2/2005	8.1	14.14	101.5	217	7.43	58.7	6.03					
33	6/2/2005	9.2	12.88	106	214	7.40	57.8	6.10					
33	6/2/2005	10.2	12.55	107	214	7.35	56.8	6.04					
33	6/2/2005	11.4	11.76	112.9	210	7.31	58.0	6.28					
33	9/15/2005	0.003	25.22	29	218	7.64	56.2	4.62	1228	60			
33	9/15/2005	1.109	25.38	28	218	7.76	47.7	3.92	1229				
33	9/15/2005	2.051	25.41	28	219	7.85	44.7	3.66	1230				
33	9/15/2005	3.185	25.41	28	219	7.9	43.3	3.55	1230				
33	9/15/2005	4.082	25.4	29	219	7.94	40.9	3.35	1231				
33	9/15/2005	5.216	25.23	30	218	7.93	38.9	3.2	1232				
33	9/15/2005	6.125	22.43	-143	218	7.75	19.1	1.65	1233				
33	9/15/2005	7.391	15.61	-131	196	7.73	10.1	1	1233				
33	9/15/2005	8.125	14.29	-107	194	7.63	7.9	0.81	1233				
33	9/15/2005	9.195	13.15	-92	192	7.54	5.3	0.56	1234				
33	9/15/2005	10.313	12.22	-84	189	7.49	4.6	0.5	1234				
33	9/15/2005	11.059	11.5	-73	188	7.42	4	0.44	1235				
MTL-66	2/22/2005	0.288	4.87	138.0	201	8.36	102.4	13.11	1208	8.0			
66	2/22/2005	1.273	4.75	143.0	193	8.17	95.8	12.30	1211				
66	2/22/2005	2.083	4.79	144.0	195	8.15	94.9	12.18	1212				
66	2/22/2005	3.010	4.96	146.0	198	8.10	93.6	11.96	1214				
66	2/22/2005	4.265	5.04	147.0	201	8.07	94.1	12.00	1215				
66	2/22/2005	5.080	5.04	149.0	199	8.02	89.6	11.43	1217				
66	2/22/2005	7.081	5.06	151.0	199	7.98	87.5	11.14	1219				
66	2/22/2005	8.132	5.05	151.0	201	7.97	88.8	11.33	1219				
66	2/22/2005	8.990	5.05	152.0	201	7.95	87.3	11.12	1220				
66	3/29/2005	0.467	6.88	-149	179	9.61	108.0	13.14	22:01	9			
66	3/29/2005	1.697	6.82	-178	179	9.58	108.2	13.18	22:02				
66	3/29/2005	2.548	6.87	-226	179	9.56	108.3	13.18	22:03				
66	3/29/2005	3.518	6.77	-212	178	9.54	108.2	13.21	22:04				

FIELD DATA

Site	Date	Depth (m)	H2OTemp (oC)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
66	3/29/2005	4.514	6.66	-211	178	9.53	107.2	13.11	22:04				
66	3/29/2005	5.588	6.62	-205	178	9.52	107.5	13.16	22:05				
66	3/29/2005	6.522	6.63	-215	178	9.51	108.7	13.31	22:06				
66	3/29/2005	7.572	6.5	-199	178	9.49	108.8	13.36	22:08				
66	3/29/2005	8.504	6.47	-197	177	9.48	108.1	13.29	22:09				
66	3/29/2005	9.511	6.42	-201	178	9.47	108.4	13.34	22:09				
66	3/29/2005	10.500	6.16	-233	177	9.47	106.3	13.17	22:10				
66	3/29/2005	11.644	6.13	-214	177	9.47	106.2	13.17	22:11				
66	4/26/2005	1	12.67	113.2	239	7.37	78.7	8.32	1100	12			
66	4/26/2005	2	12.85	117.8	238	7.27	75.7	8.03					
66	4/26/2005	3	12.80	121.5	238	7.25	75.1	7.98					
66	4/26/2005	4	12.58	123.9	238	7.21	74.6	7.93					
66	4/26/2005	5	12.56	12?.0	238	7.21	74.2	7.29					
66	4/26/2005	6	12.52	127.7	237	7.20	73.8	7.85					
66	4/26/2005	7	12.33	128.7	229	7.19	73.4	7.89					
66	4/26/2005	8	11.32	130.5	219	7.13	71.2	7.78					
66	4/26/2005	9	10.8	132.9	214	7.07	69.1	7.65					
66	4/26/2005	10	9.45	135	206	7.02	65.3	7.46					
66	6/2/2005	0.33	24.15	69.6	249	8.58	138.7	11.65	1220	25			
66	6/2/2005	1.3	22.97	69.0	248	8.65	138.1	11.87					
66	6/2/2005	2.2	22.30	74.1	250	8.36	121.5	10.48					
66	6/2/2005	4.3	21.36	84	257	8.05	108.4	9.50					
66	6/2/2005	5.1	20.38	88.9	262	7.77	92.1	8.30					
66	6/2/2005	6.4	16.73	95.6	258	7.56	65.2	6.06					
66	6/2/2005	7.0	15.15	100.8	252	7.42	41.2	4.14					
66	6/2/2005	8.03	14.89	104.3	248	7.34	39.3	3.96					
66	6/2/2005	9.4	13.70	105.4	245	7.25	29.8	3.01					
66	6/2/2005	10	13.14	109	242	7.18	24.2	2.55					
66	9/15/2005	0.072	24.86	6	218	7.57	98.9	8.19	1108	48			
66	9/15/2005	1.168	24.89	8	217	7.64	84	6.95	1109				
66	9/15/2005	2.152	24.88	8	217	7.68	81.3	6.73	1109				
66	9/15/2005	3.269	24.89	9	217	7.7	80.4	6.65	1109				

FIELD DATA

Site	Date	Depth (m)	H2OTemp (^oC)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
66	9/15/2005	4.038	24.89	9	217	7.72	79.8	6.61	1110				
66	9/15/2005	5.258	24.87	10	217	7.74	77	6.37	1110				
66	9/15/2005	6.052	24.87	10	217	7.74	77	6.38	1111				
66	9/15/2005	7.074	24.85	10	217	7.75	74.6	6.18	1111				
66	9/15/2005	8.088	24.72	12	217	7.74	73.4	6.09	1111				
66	9/15/2005	9.274	15.36	-179	243	7.34	40.7	4.07	1112				
66	9/15/2005	10.594	13.86	-203	240	6.96	13.2	1.36	1113				
66	9/15/2005	11.13	13.12	-209	239	6.86	8	0.84	1113				
66	9/15/2005	12.153	12.41	-213	234	6.82	6.4	0.69	1114				
MTL-77	2/22/2005	0.505	4.35	159.0	190	8.09	101.2	13.14	1308	8.5			
77	2/22/2005	1.205	4.36	159.0	189	8.07	98.1	12.73	1309				
77	2/22/2005	2.181	4.29	160.0	189	8.05	97.9	12.73	1309				
77	2/22/2005	3.120	4.28	161.0	190	8.02	95.7	12.45	1310				
77	2/22/2005	4.024	4.30	161.0	191	8.01	93.2	12.11	1311				
77	2/22/2005	5.264	4.30	162.0	192	7.98	93.0	12.08	1312				
77	2/22/2005	6.033	4.42	163.0	196	7.96	92.0	11.92	1312				
77	2/22/2005	7.114	4.44	164.0	195	7.94	89.9	11.65	1313				
77	2/22/2005	8.008	4.41	163.0	196	7.94	90.0	11.67	1314				
77	2/22/2005	9.099	4.40	165.0	196	7.91	89.5	11.60	1315				
77	2/22/2005	12.183	4.43	166.0	196	7.89	86.6	11.22	1318				
77	3/29/2005	0.281	7.5	-111	180	9.61	115.8	13.88	22:34	9			
77	3/29/2005	1.551	7.42	-134	180	9.58	113.1	13.58	22:35				
77	3/29/2005	2.588	7.37	-147	180	9.57	111.8	13.44	22:36				
77	3/29/2005	3.573	7.42	-155	180	9.55	111.8	13.42	22:37				
77	3/29/2005	4.525	6.92	-153	179	9.55	111.4	13.55	22:38				
77	3/29/2005	5.556	6.71	-153	178	9.54	110.8	13.54	22:39				
77	3/29/2005	6.584	6.58	-158	177	9.52	109.6	13.44	22:40				
77	3/29/2005	7.524	6.42	-199	177	9.52	109.3	13.46	22:41				
77	3/29/2005	8.615	6.26	-176	176	9.52	107.8	13.33	22:42				
77	3/29/2005	9.568	6.05	-172	174	9.51	107.6	13.37	22:42				
77	3/29/2005	10.632	6.06	-169	176	9.50	106.8	13.27	22:44				
77	3/29/2005	11.515	6.07	-244	177	9.49	105.6	13.12	22:44				

FIELD DATA

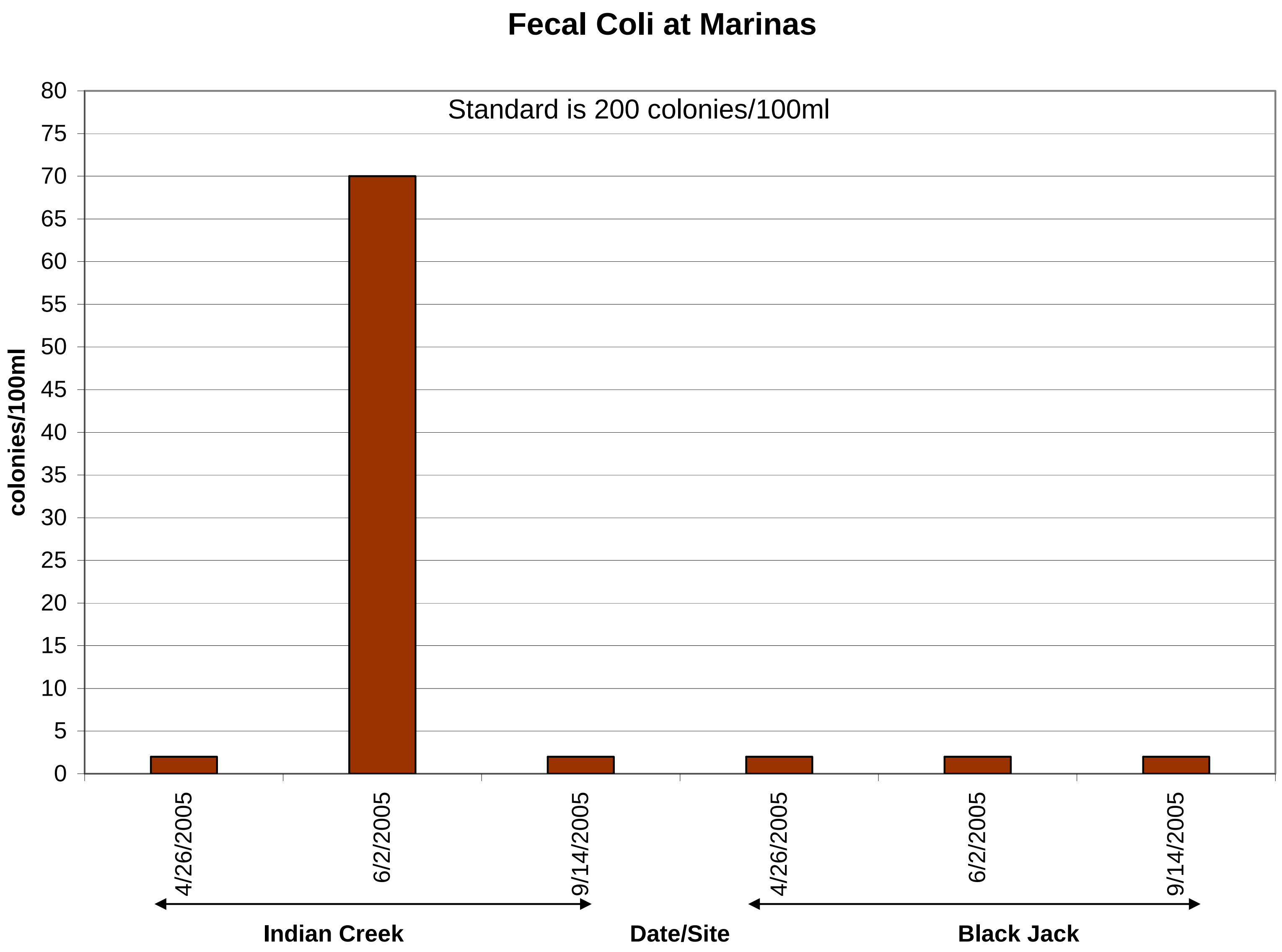
Site	Date	Depth (m)	H2OTemp (°C)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
77	4/26/2005	1	13.50	127.7	236	8.12	78.1	8.12	1130				
77	4/26/2005	2	13.50	130	237	7.96	76.1	7.96					
77	4/26/2005	3	13.50	131.9	237	7.83	75.2	7.83					
77	4/26/2005	4	13.40	133.9	235	7.88	74.9	7.80					
77	4/26/2005	5	13.08	135.5	240	7.83	74.4	7.83					
77	4/26/2005	6	13.03	136.5	240	7.78	73.9	7.78					
77	4/26/2005	7	12.75	138.1	235	7.76	73.3	7.76					
77	4/26/2005	8	12.25	141.4	228	7.72	72.1	7.72					
77	4/26/2005	9	11.68	142.1	226	7.46	68.9	7.46					
77	4/26/2005	10	10.73	142.6	218	7.10	64.0	7.10					
77	6/2/2005	0.15	23.15	41	253	8.34	117.8	10.12	1100	25			
77	6/2/2005	1.0	22.56	53.3	255	8.26	113	9.92					
77	6/2/2005	2.0	21.44	62	258	8.00	100.4	8.87					
77	6/2/2005	3.2	21.24	67.4	260	7.89	97.8	8.62					
77	6/2/2005	4.4	20.92	72	260	7.86	94.5	8.45					
77	6/2/2005	5.3	20.45	81.3	273	7.59	67.5	6.32					
77	6/2/2005	6.2	10.41	84.5	282	7.48	57.4	5.32					
77	6/2/2005	7.2	16.19	93.0	267	7.21	29.2	2.85					
77	6/2/2005	8.2	14.69	94.3	258	7.18	20.2	2.06					
77	6/2/2005	9.1	14.25	96.4	257	7.13	11.1	1.11					
77	6/2/2005	10.2	13.18	97.4	255	7.07	3.7	0.37					
77	6/2/2005	11	12.71	99.3	249	7.04	3.6	0.38					
77	9/15/2005	1.16	24.85	87	219	7.68	22	1.83	1040	48			
77	9/15/2005	2.112	24.84	-116	219	7.2	27.1	2.24	1049				
77	9/15/2005	3.137	24.85	81	219	7.74	21.7	1.8	1042				
77	9/15/2005	4.107	24.84	80	219	7.75	21.6	1.79	1042				
77	9/15/2005	5.288	24.85	78	219	7.77	21.6	1.79	1044				
77	9/15/2005	5.291	24.84	77	219	7.77	21.7	1.79	1044				
77	9/15/2005	6.226	24.84	77	219	7.77	21.7	1.8	1045				
77	9/15/2005	7.307	24.6	77	220	7.77	21.2	1.77	1045				
77	9/15/2005	8.196	17.8	-182	245	7.48	11.6	1.1	1046				
77	9/15/2005	9.054	16.49	-223	241	7.15	13.5	1.31	1047				
77	9/15/2005	10.421	14.3	-232	245	6.93	4.3	0.44	1047				

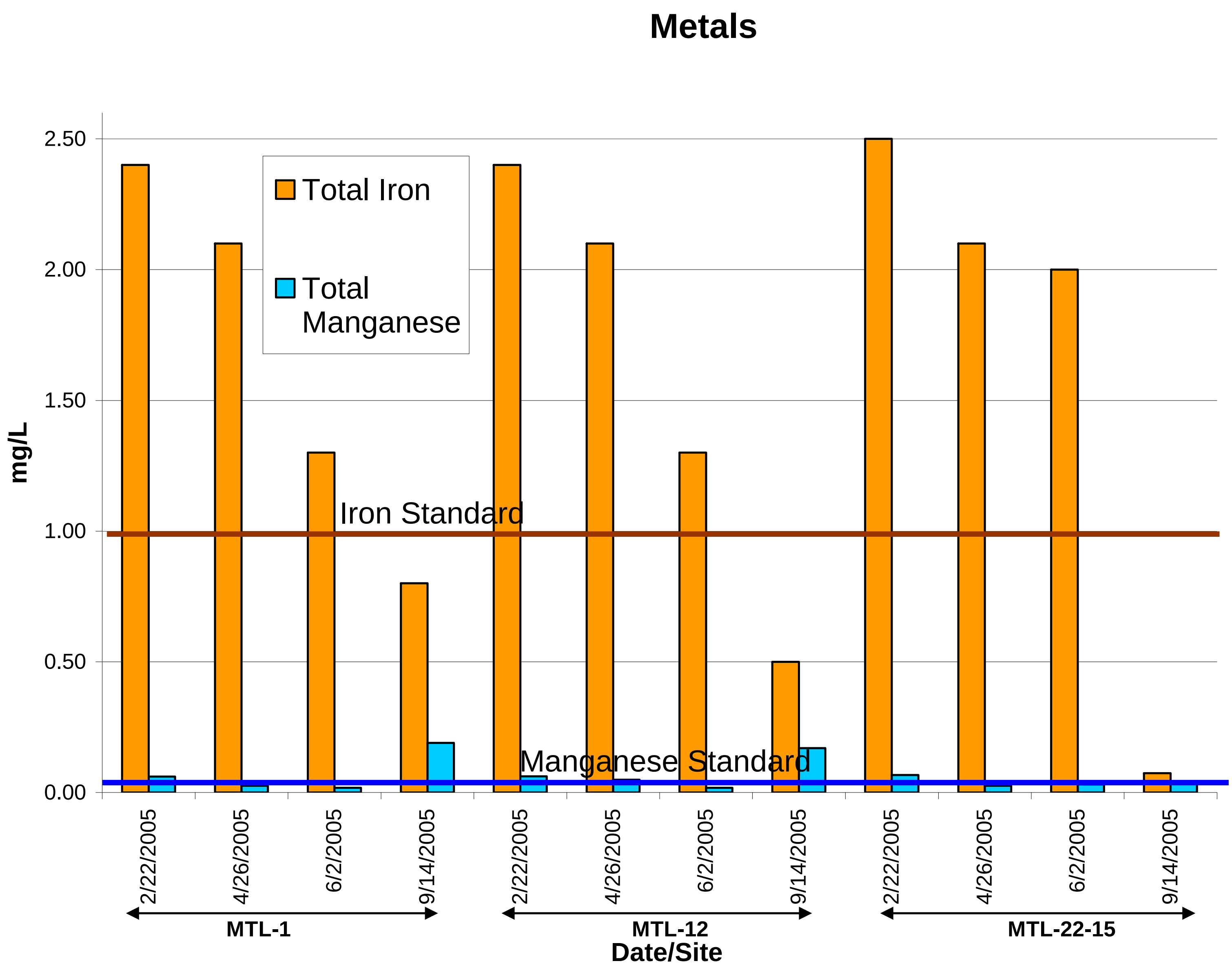
FIELD DATA

Site	Date	Depth (m)	H2OTemp (^{o}C)	Redox (mV)	Cond (uS/cm)	pH	D.0.%	D.O.(mg/L)	Time	Seechi (in.)	Air Temp	Weather	Wind
77	9/15/2005	11.151	13.44	-237	244	6.84	5.9	0.62	1048				

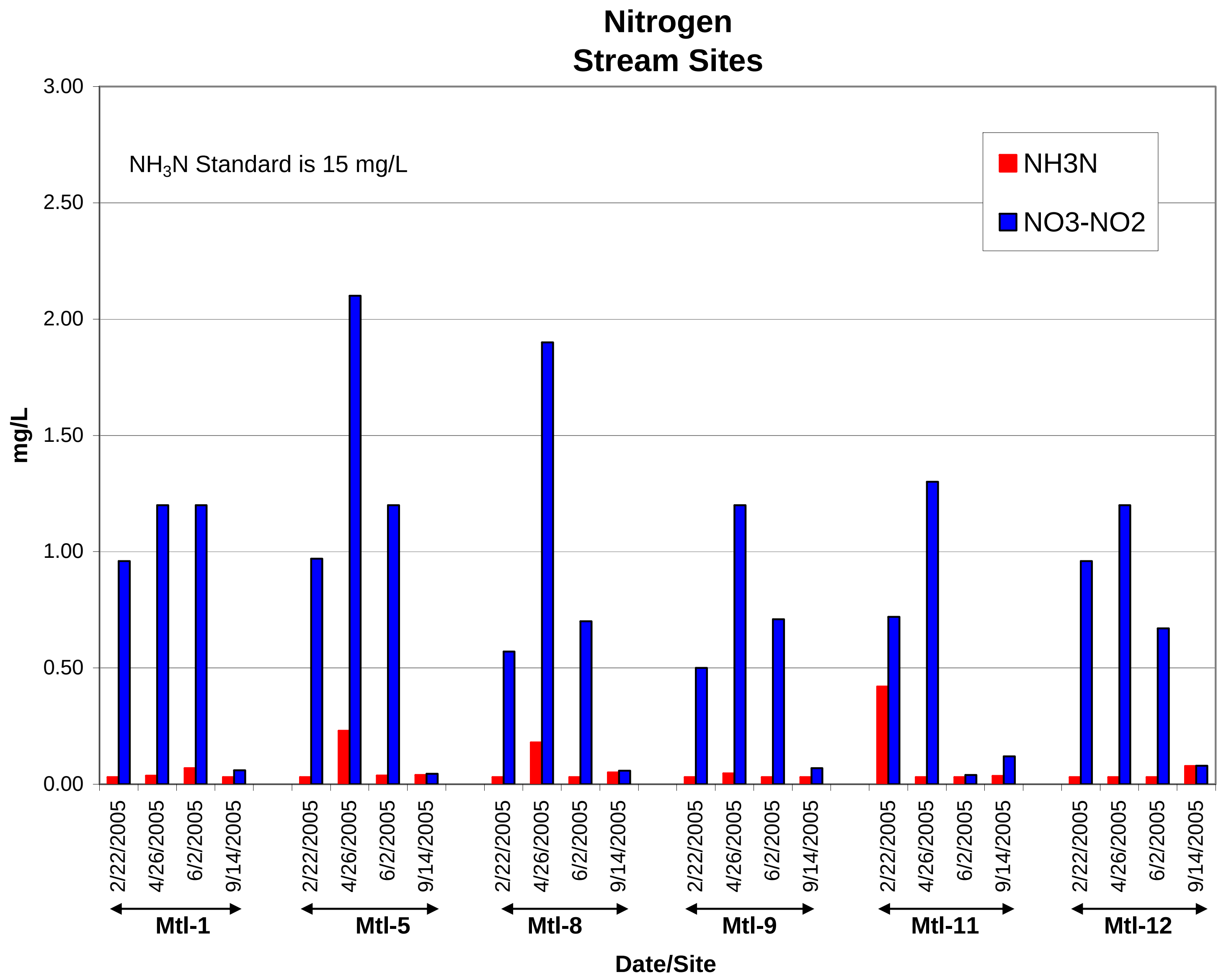
APPENDIX B

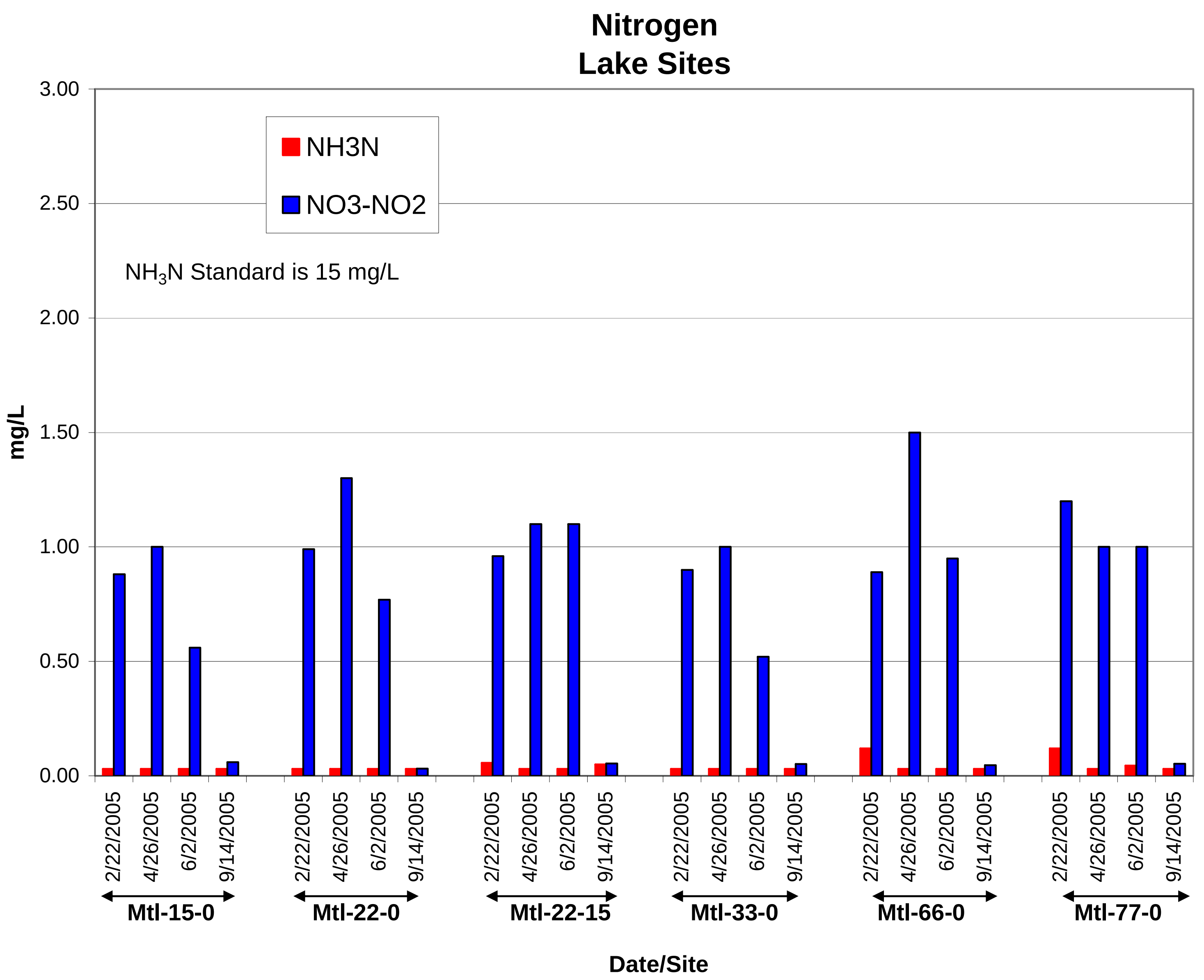
LAB DATA
GRAPHS


Fecal Coli at Marinas
Standard is 200 colonies/100ml
colonies/100ml
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
4/26/2005
6/2/2005
9/14/2005
4/26/2005
6/2/2005
9/14/2005
Indian Creek
Date/Site
Black Jack

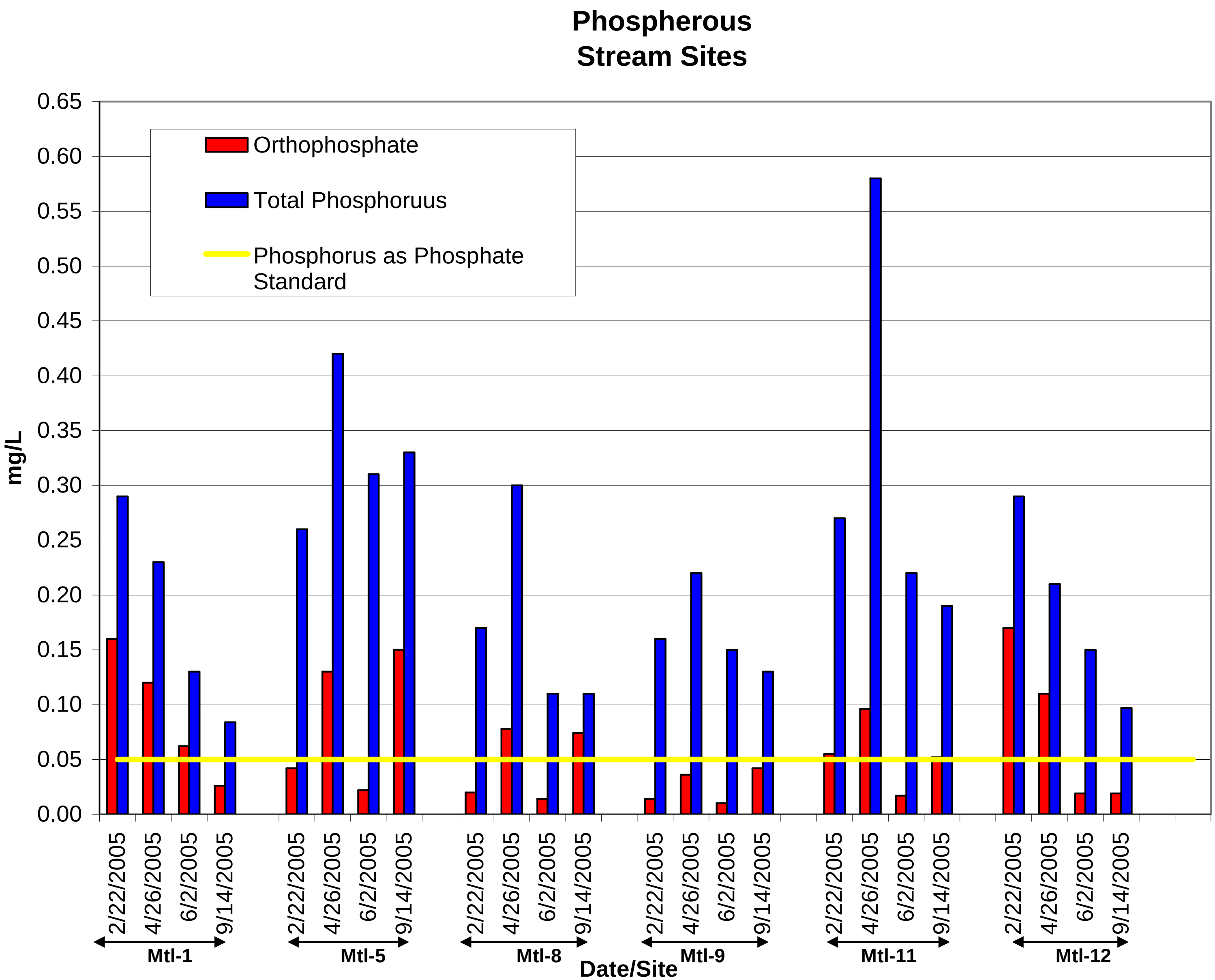


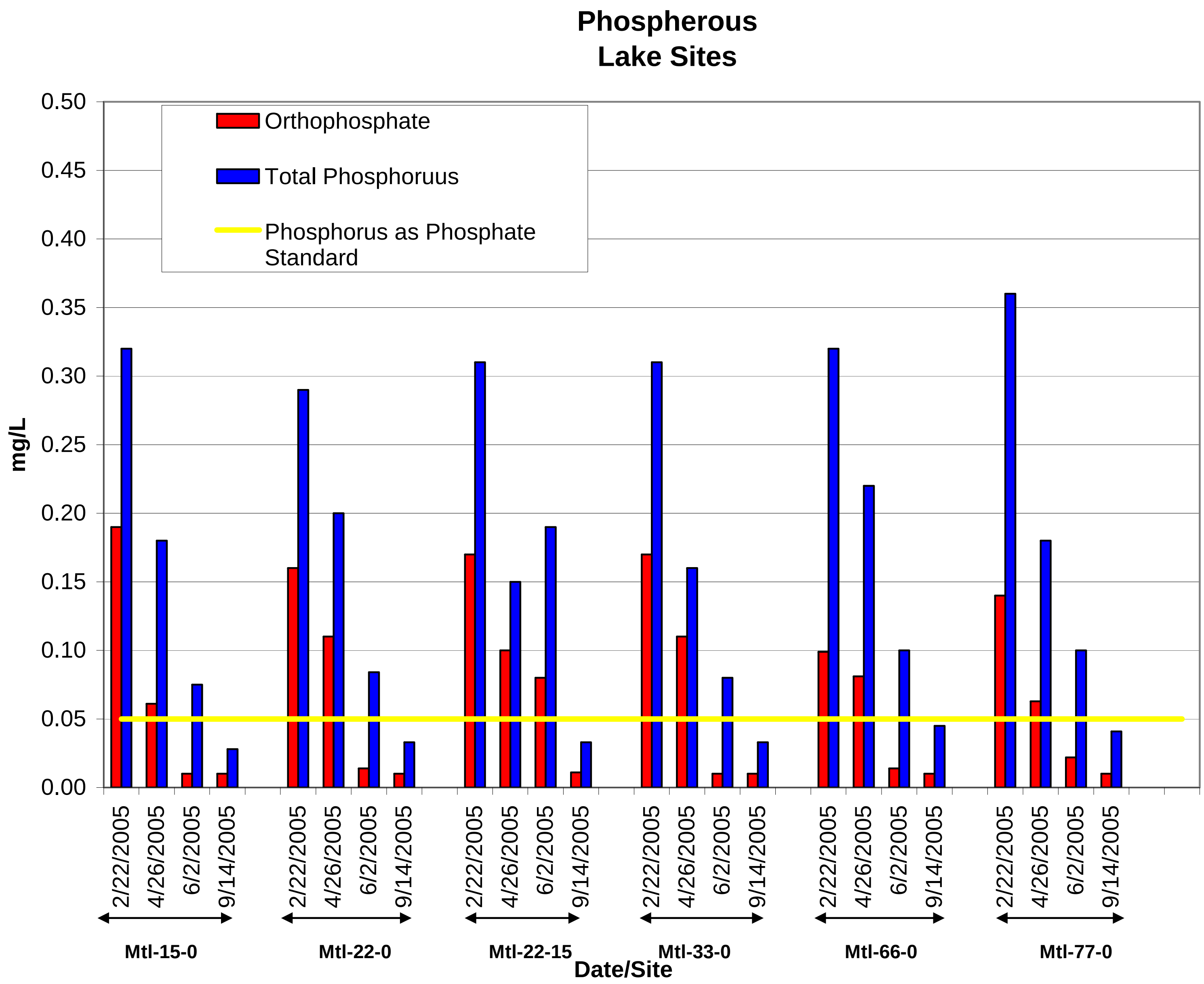
Metals
mg/L
2.50
2.00
1.50
1.00
0.50
0.00
Total Iron
Total Manganese
Iron Standard
Manganese Standard
2/22/2005
4/26/2005
6/2/2005
9/14/2005
2/22/2005
4/26/2005
6/2/2005
9/14/2005
2/22/2005
4/26/2005
6/2/2005
9/14/2005
MTL-1
MTL-12
MTL-22-15
Date/Site

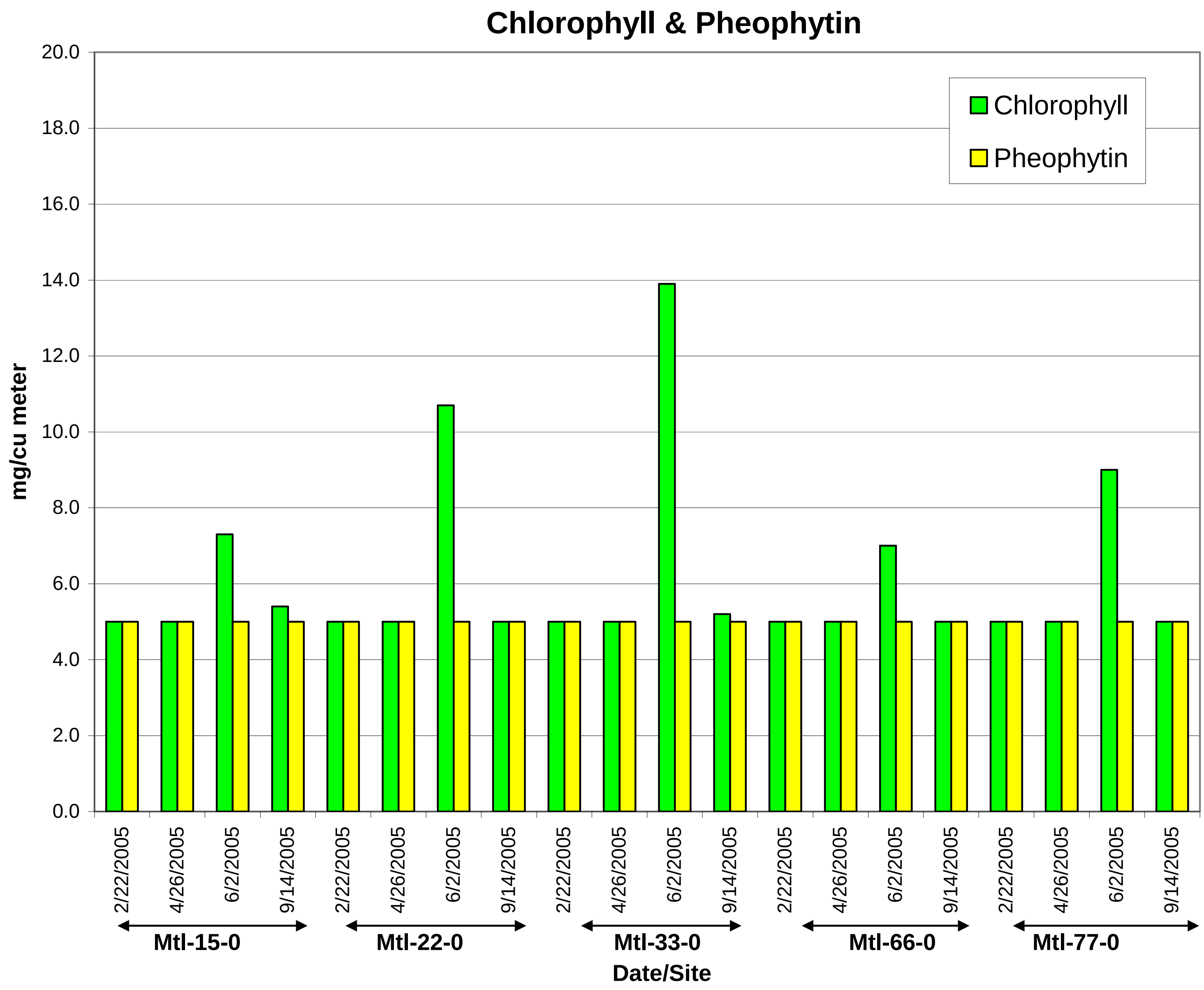

Nitrogen
Stream Sites
3.00
2.50
2.00
1.50
1.00
0.50
0.00
mg/L
NH3N Standard is 15 mg/L
NH3N
NO3-NO2
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-1
Mtl-5
Mtl-8
Mtl-9
Mtl-11
Mtl-12
Date/Site



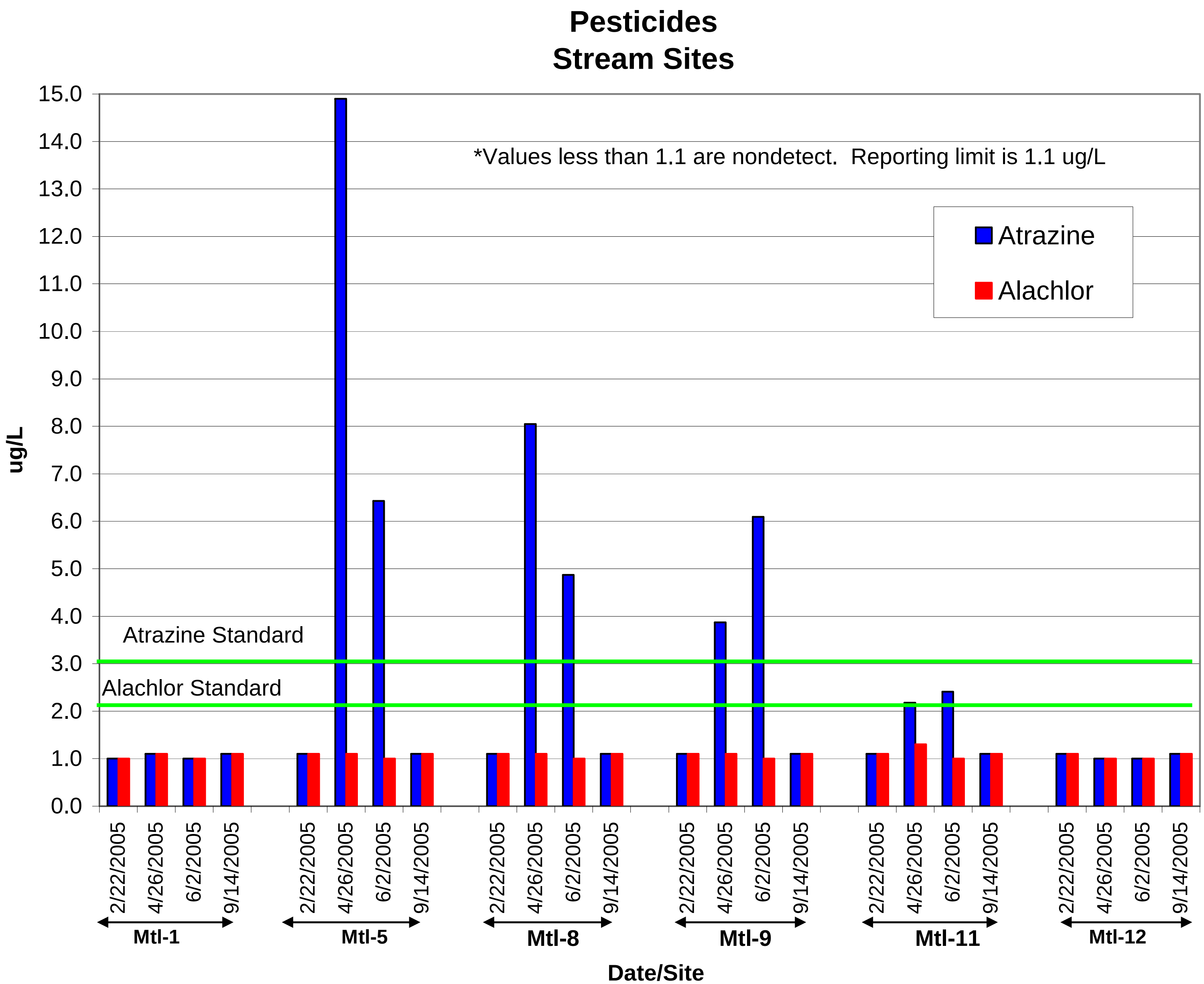
Nitrogen
Lake Sites
3.00
2.50
2.00
1.50
1.00
0.50
0.00
mg/L
NH3N
NO3-NO2
NH$_3$N Standard is 15 mg/L
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-15-0
Mtl-22-0
Mtl-22-15
Mtl-33-0
Mtl-66-0
Mtl-77-0
Date/Site


Phospherous
Stream Sites
mg/L
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Orthophosphate
Total Phosphoruus
Phosphorus as Phosphate Standard
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-1
Mtl-5
Mtl-8
Mtl-9
Mtl-11
Mtl-12
Date/Site

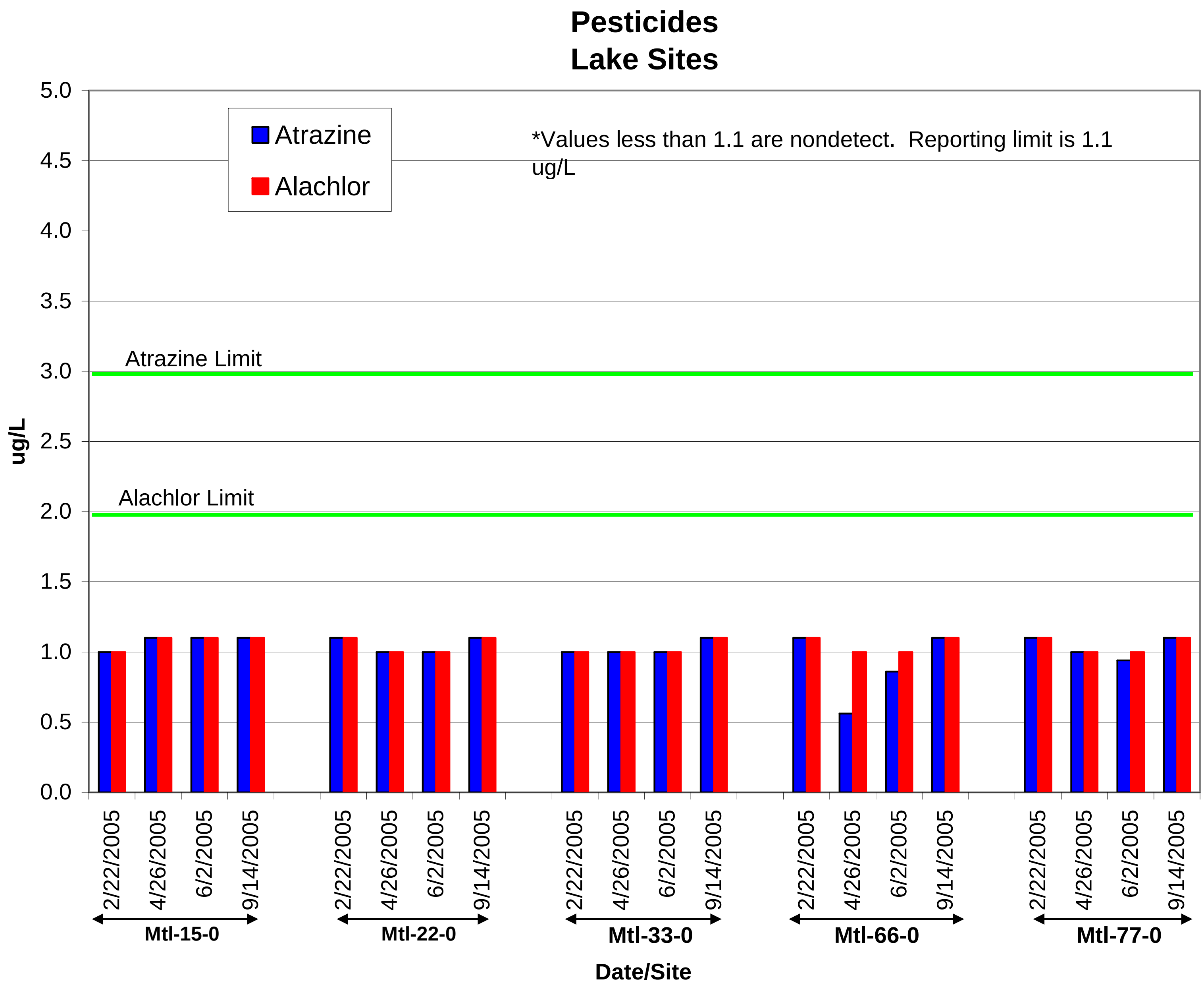

Phospherous
Lake Sites
Orthophosphate
Total Phosphoruus
Phosphorus as Phosphate Standard
mg/L
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-15-0
Mtl-22-0
Mtl-22-15
Mtl-33-0
Mtl-66-0
Mtl-77-0
Date/Site

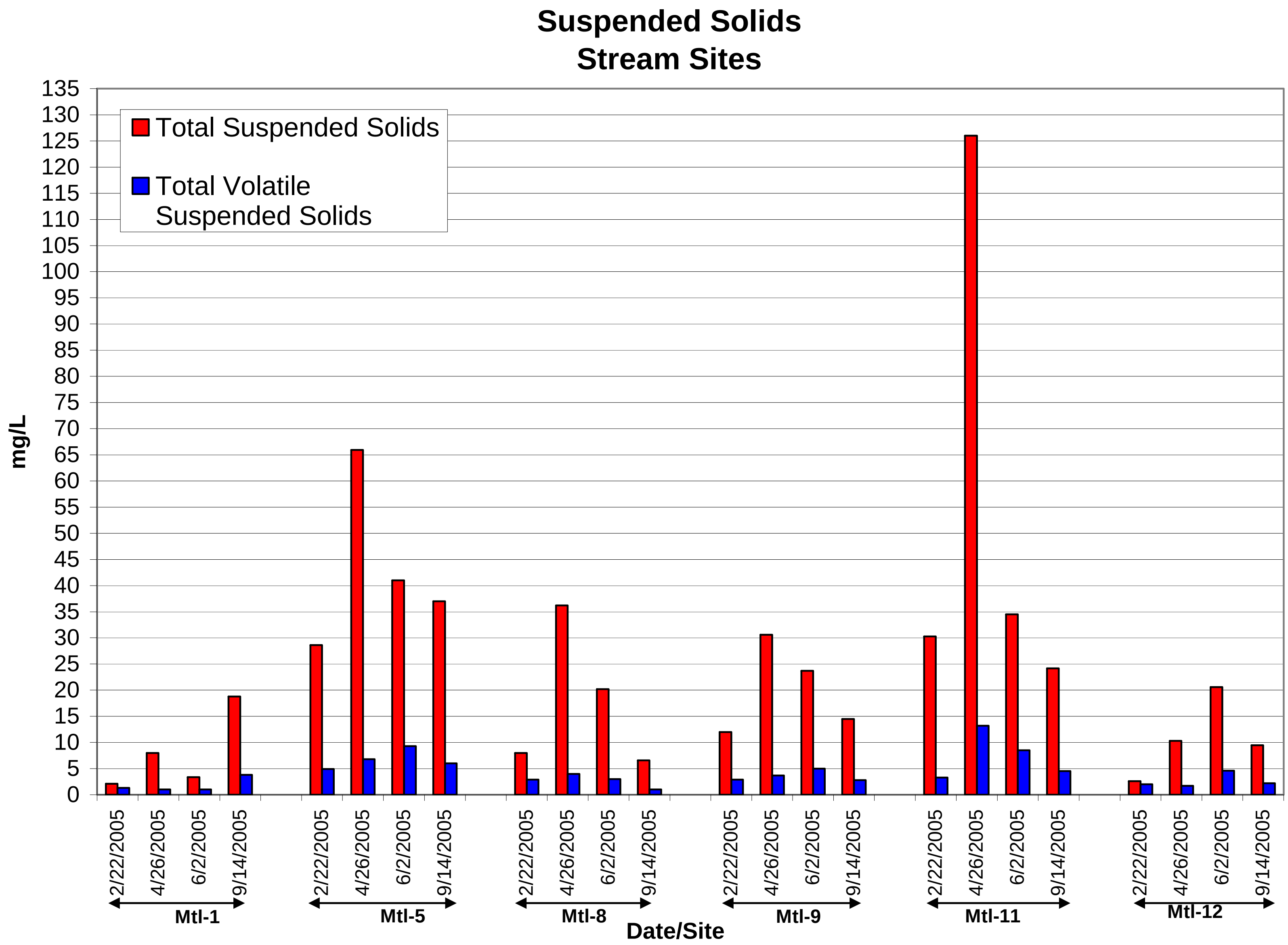


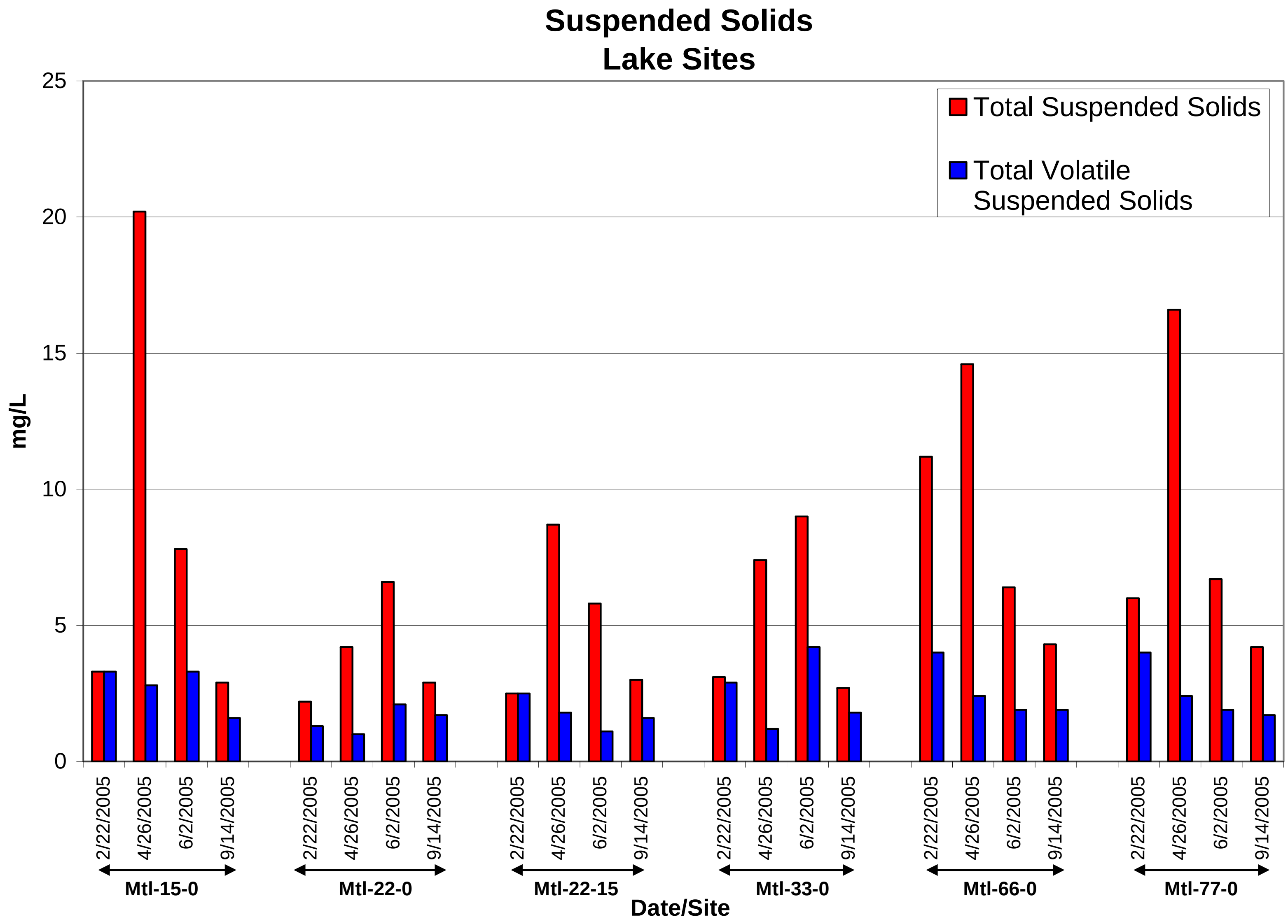
Chlorophyll & Pheophytin
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
mg/cu meter
Chlorophyll
Pheophytin
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-15-0
Mtl-22-0
Mtl-33-0
Mtl-66-0
Mtl-77-0
Date/Site

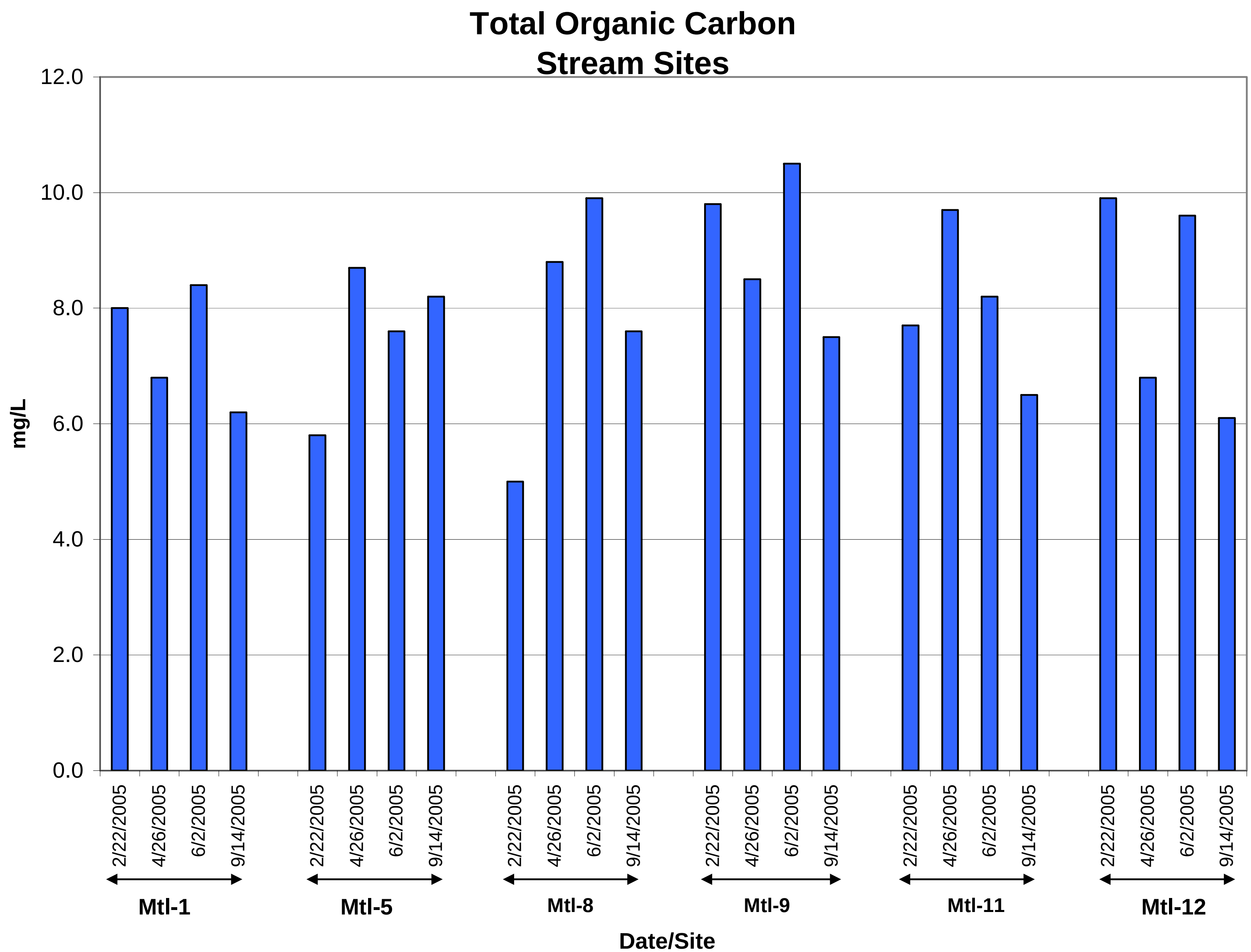


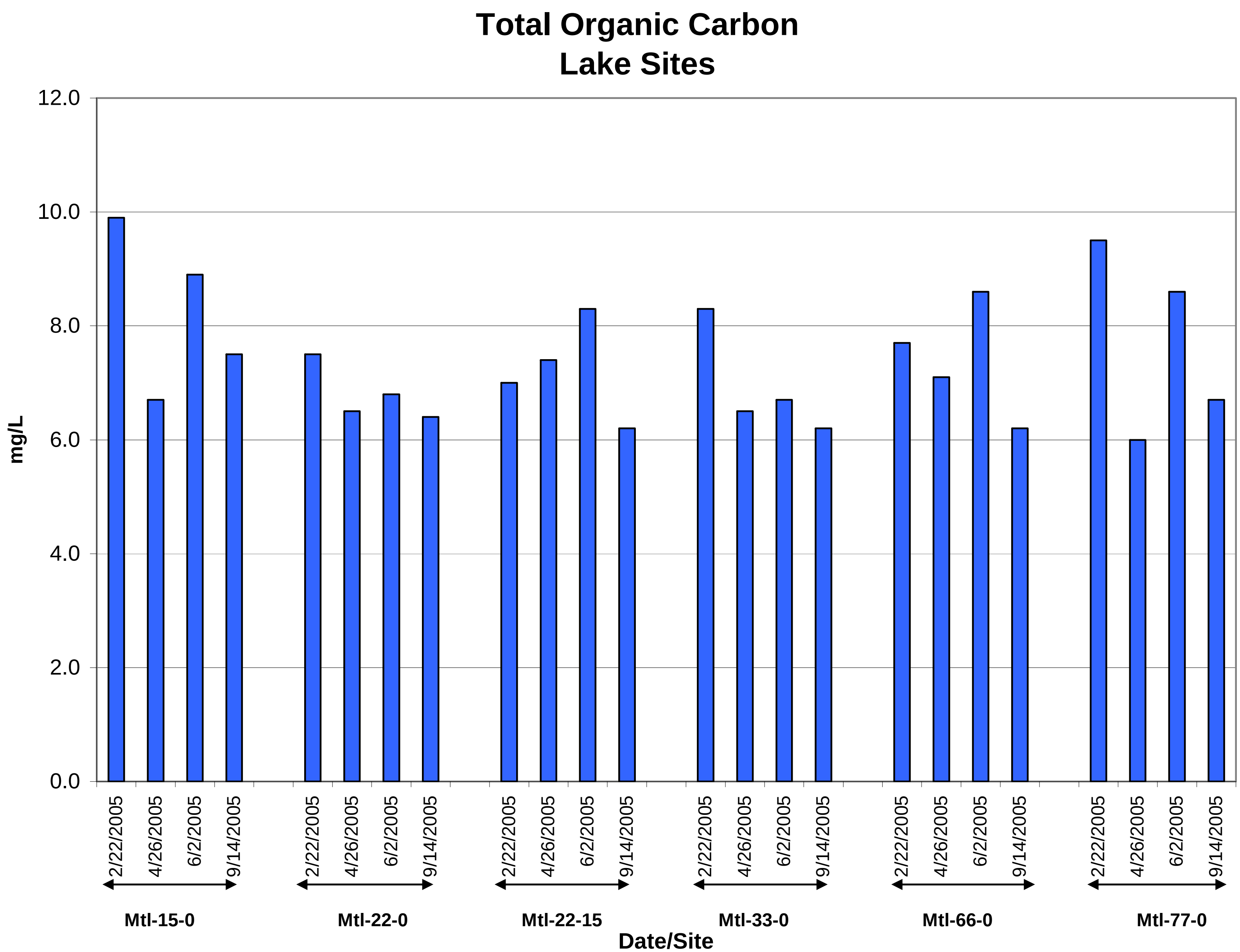
Pesticides
Stream Sites
*Values less than 1.1 are nondetect. Reporting limit is 1.1 ug/L
Atrazine
Alachlor
Atrazine Standard
Alachlor Standard
ug/L
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-1
Mtl-5
Mtl-8
Mtl-9
Mtl-11
Mtl-12
Date/Site


Pesticides
Lake Sites
Atrazine
Alachlor
*Values less than 1.1 are nondetect. Reporting limit is 1.1 ug/L
Atrazine Limit
Alachlor Limit
ug/L
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-15-0
Mtl-22-0
Mtl-33-0
Mtl-66-0
Mtl-77-0
Date/Site


Suspended Solids
Stream Sites
mg/L
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120
125
130
135
Total Suspended Solids
Total Volatile Suspended Solids
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-1
Mtl-5
Mtl-8
Mtl-9
Mtl-11
Mtl-12
Date/Site


Suspended Solids
Lake Sites
mg/L
25
20
15
10
5
0
Total Suspended Solids
Total Volatile Suspended Solids
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-15-0
Mtl-22-0
Mtl-22-15
Mtl-33-0
Mtl-66-0
Mtl-77-0
Date/Site


Total Organic Carbon
Stream Sites
mg/L
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-1
Mtl-5
Mtl-8
Mtl-9
Mtl-11
Mtl-12
Date/Site



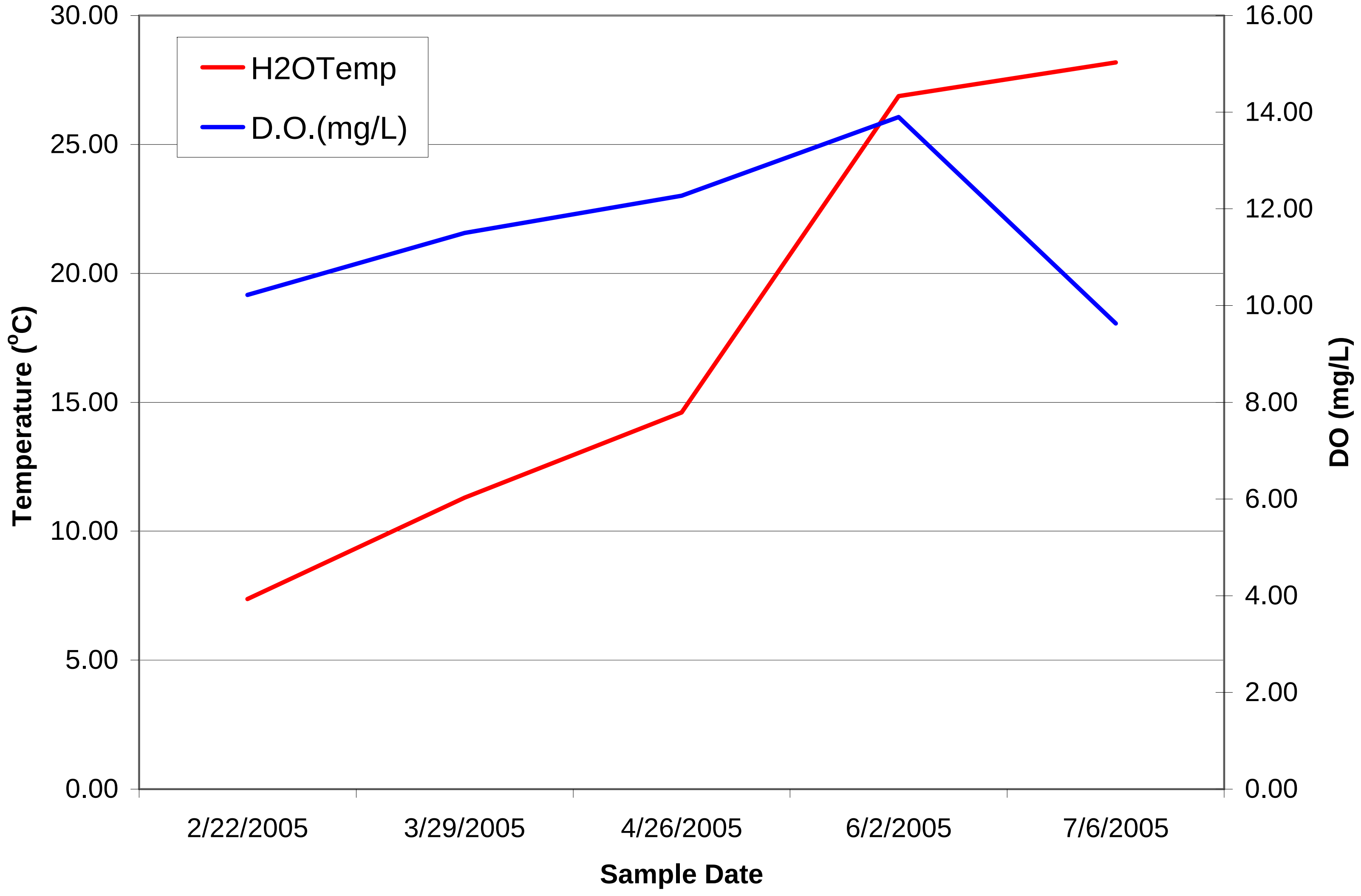
Total Organic Carbon
Lake Sites
mg/L
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2/22/2005
4/26/2005
6/2/2005
9/14/2005
Mtl-15-0
Mtl-22-0
Mtl-22-15
Mtl-33-0
Mtl-66-0
Mtl-77-0
Date/Site

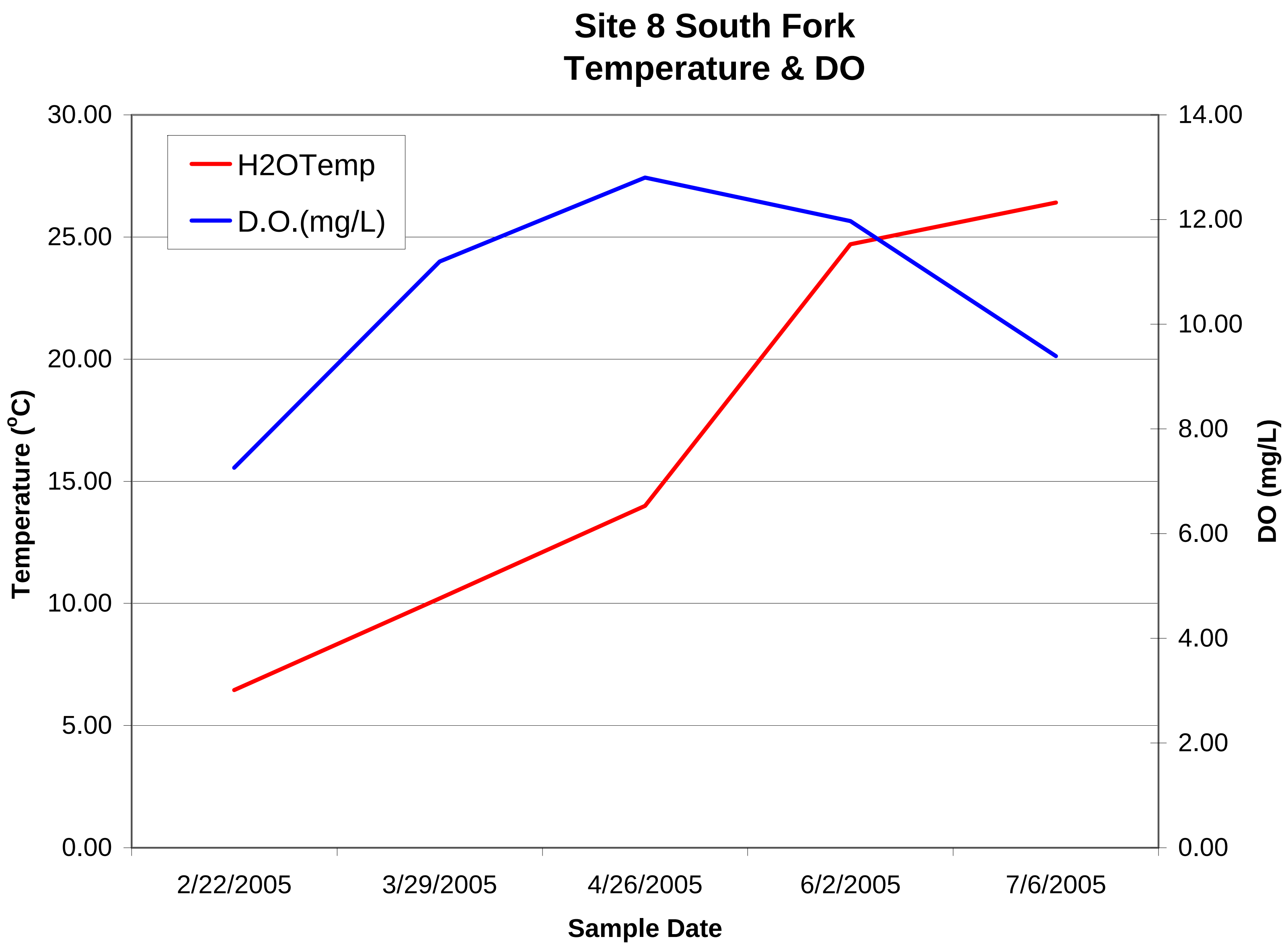
APPENDIX C

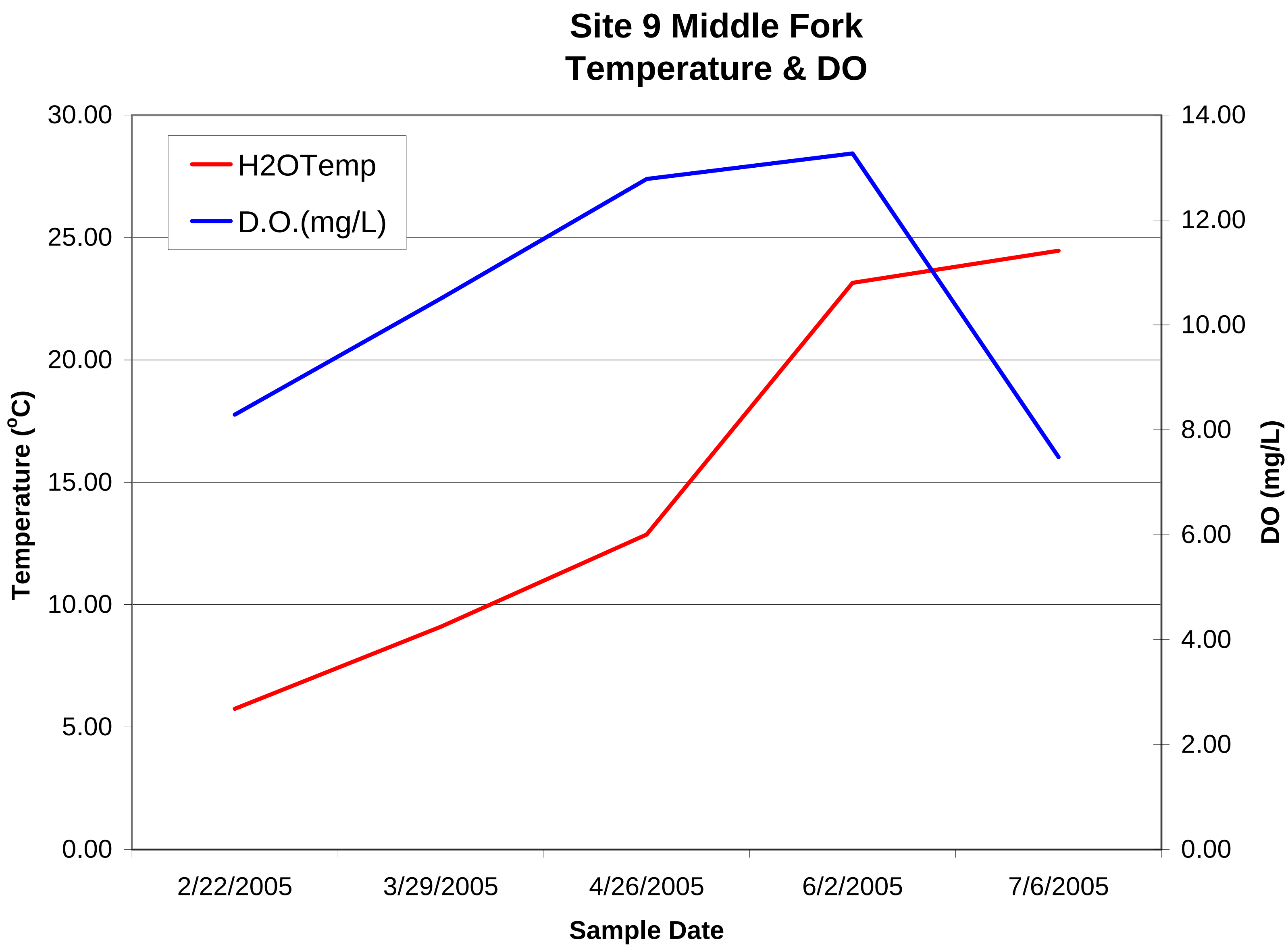
FIELD DATA
GRAPHS

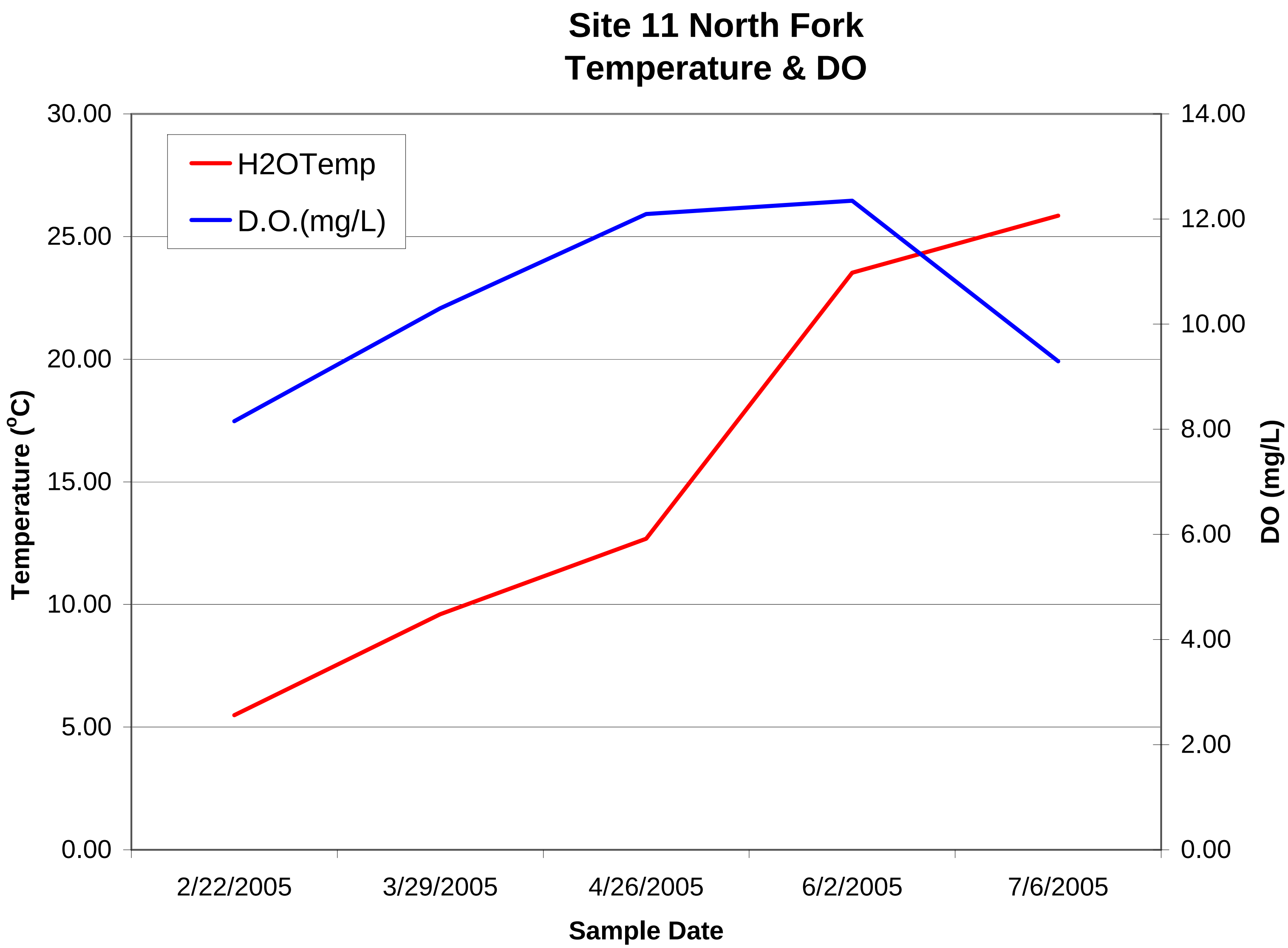

Site 1 Spillway
Temperature & DO
H2OTemp
D.O.(mg/L)
Temperature (°C)
DO (mg/L)
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

Site 5 South Fork Temperature & DO

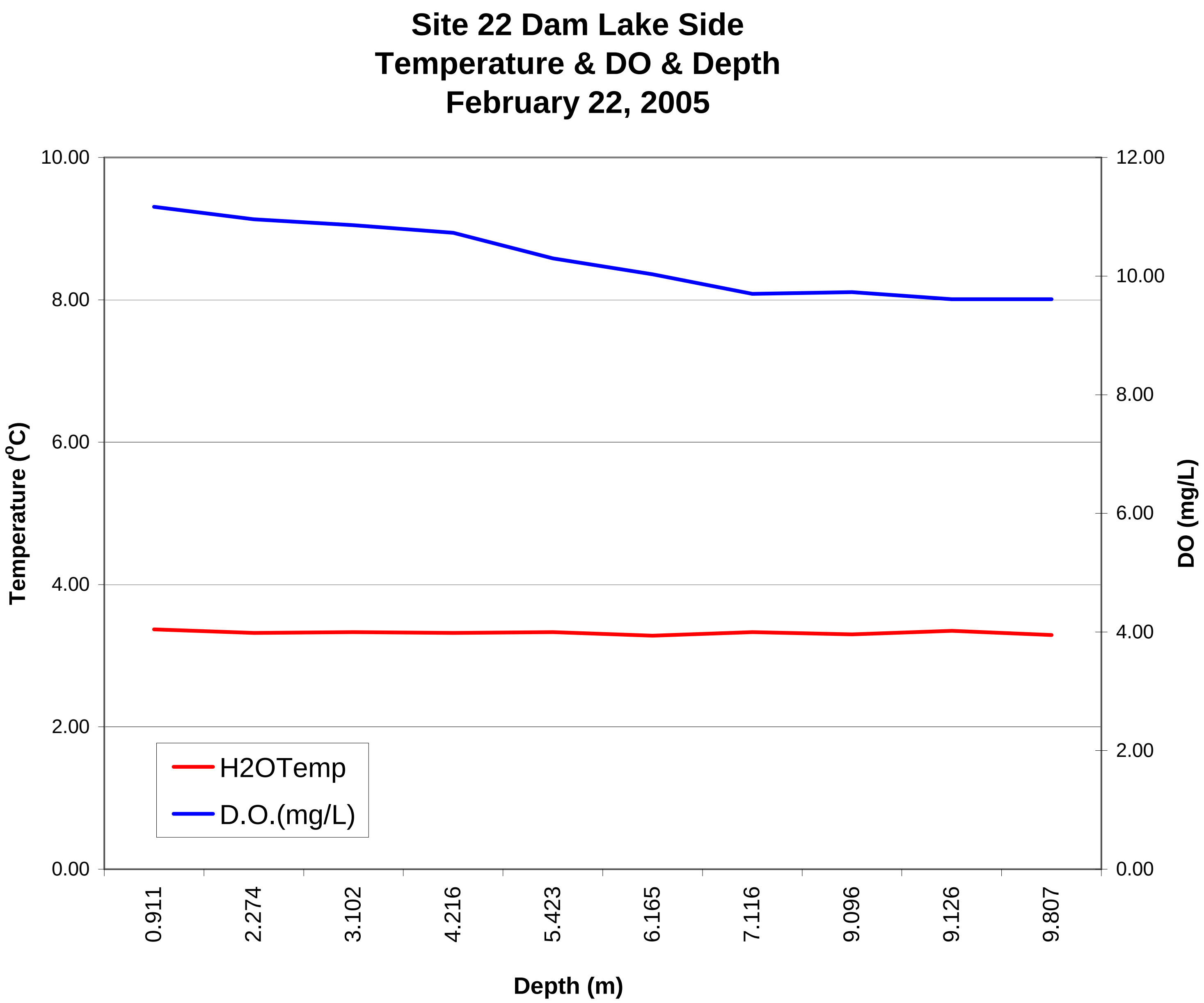


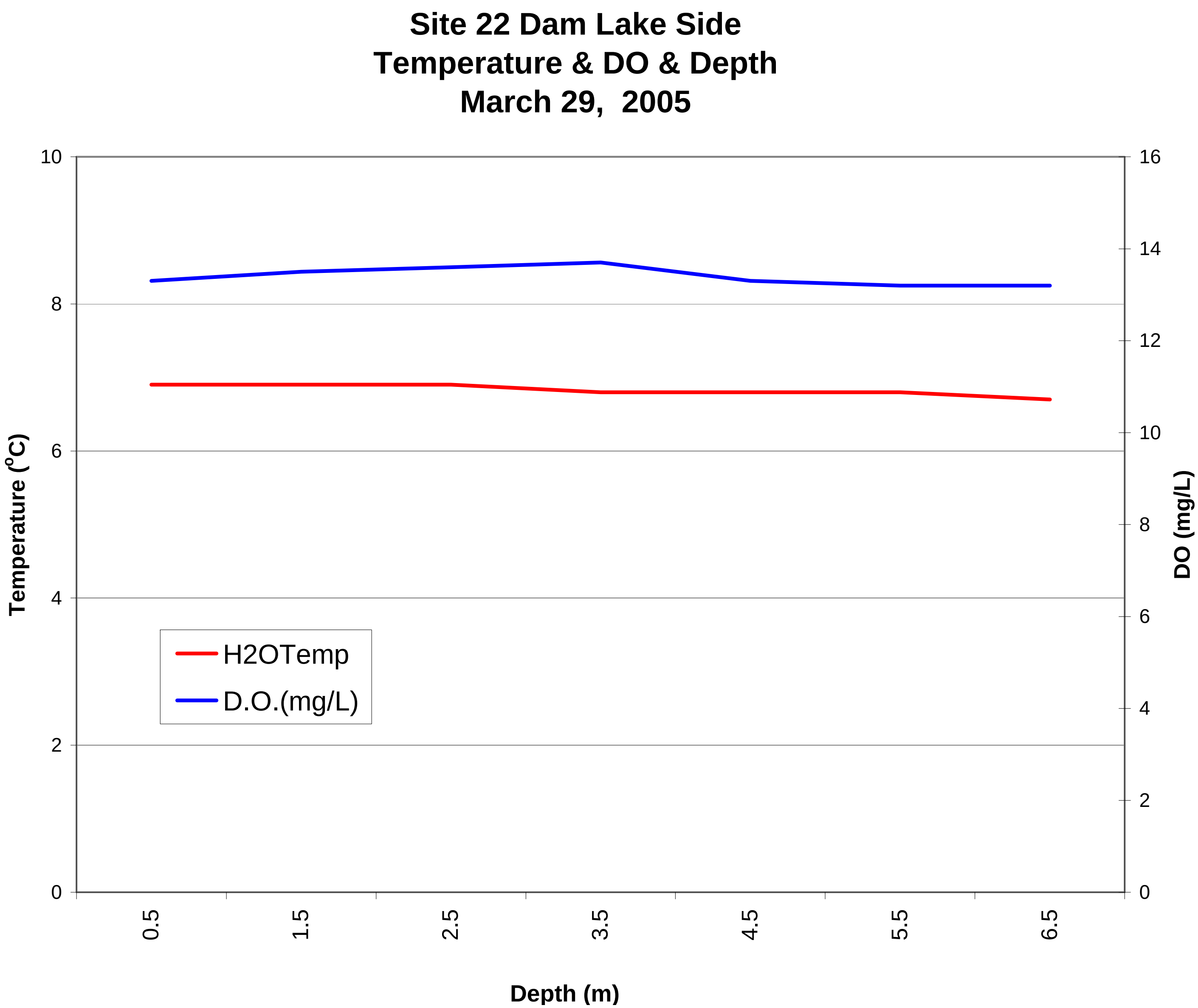

Site 8 South Fork
Temperature & DO
H2OTemp
D.O.(mg/L)
Temperature (°C)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
DO (mg/L)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date


Site 9 Middle Fork
Temperature & DO
H2OTemp
D.O.(mg/L)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Temperature (oC)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
DO (mg/L)
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

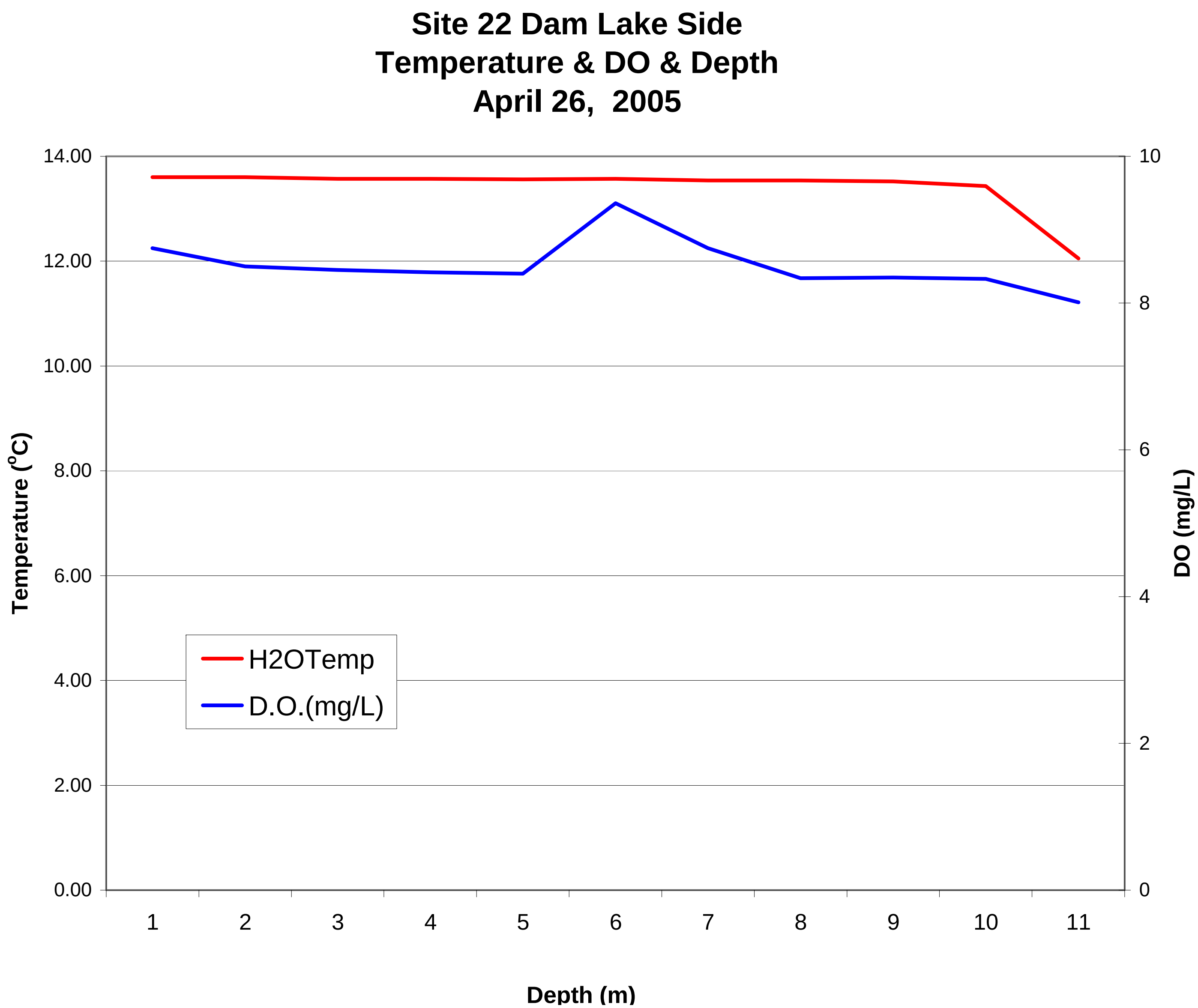


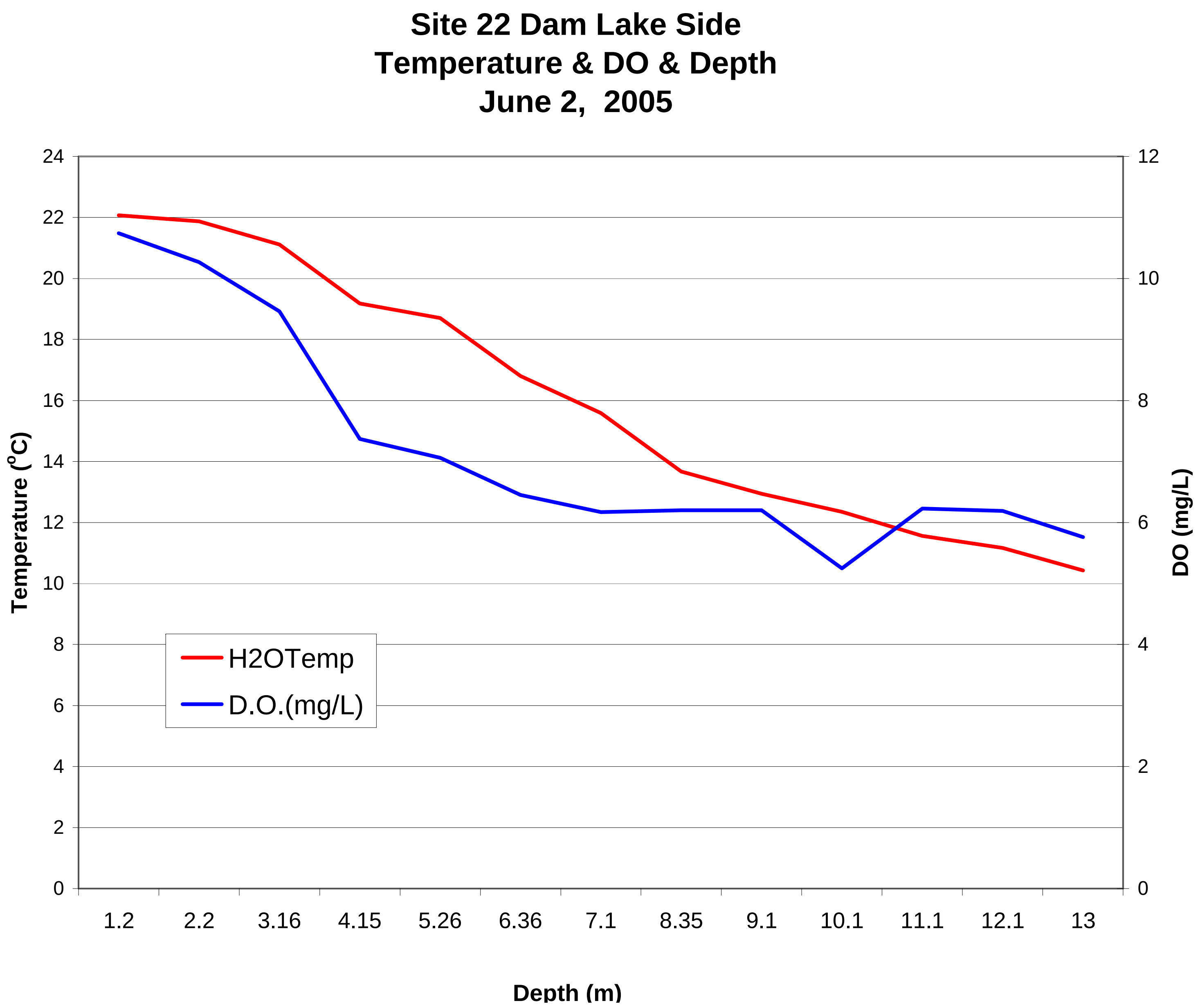
Site 11 North Fork
Temperature & DO
H2OTemp
D.O.(mg/L)
Temperature (°C)
DO (mg/L)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date


Site 22 Dam Lake Side
Temperature & DO & Depth
February 22, 2005
Temperature (°C)
DO (mg/L)
Depth (m)
10.00
8.00
6.00
4.00
2.00
0.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.911
2.274
3.102
4.216
5.423
6.165
7.116
9.096
9.126
9.807
H2OTemp
D.O.(mg/L)

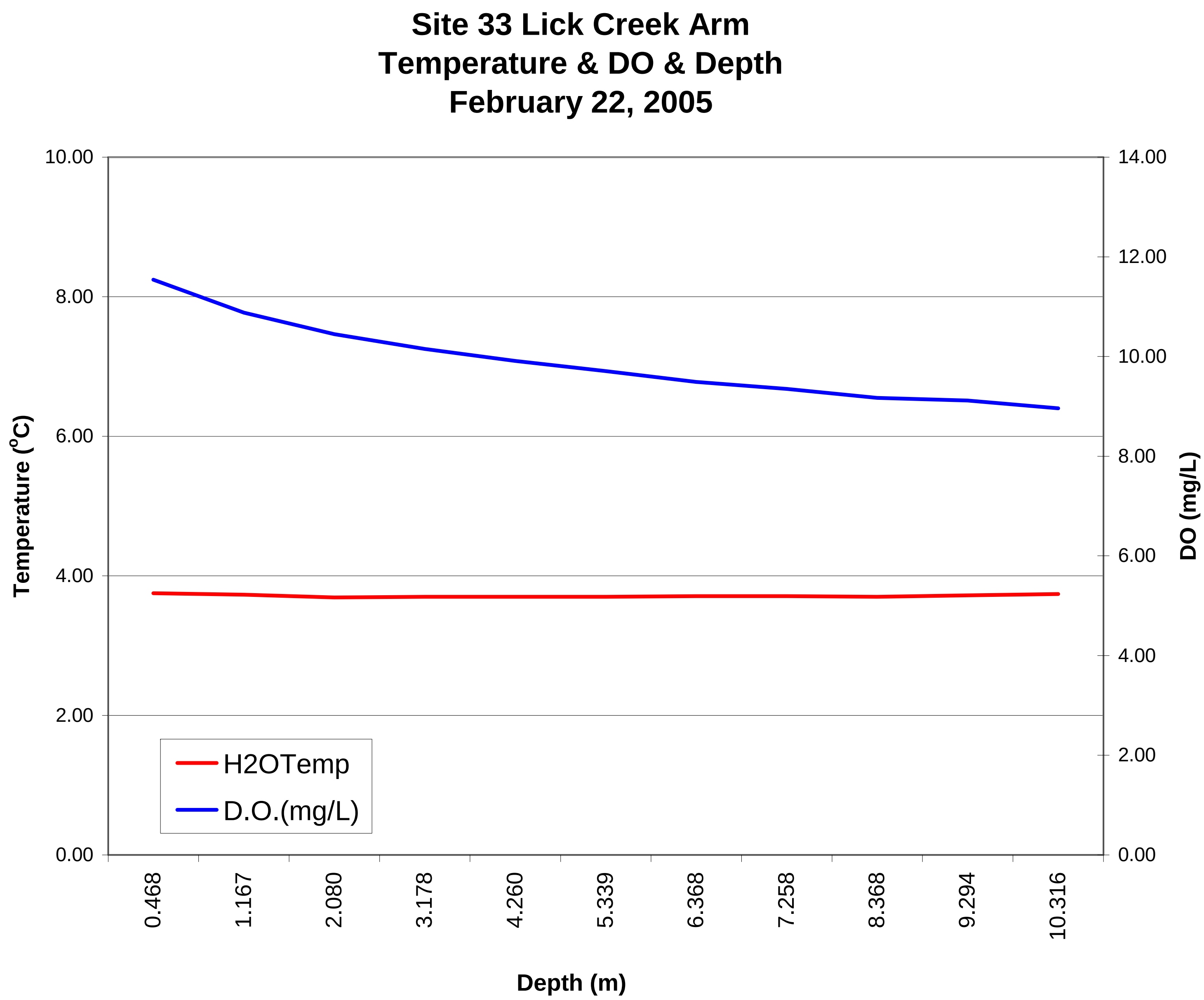


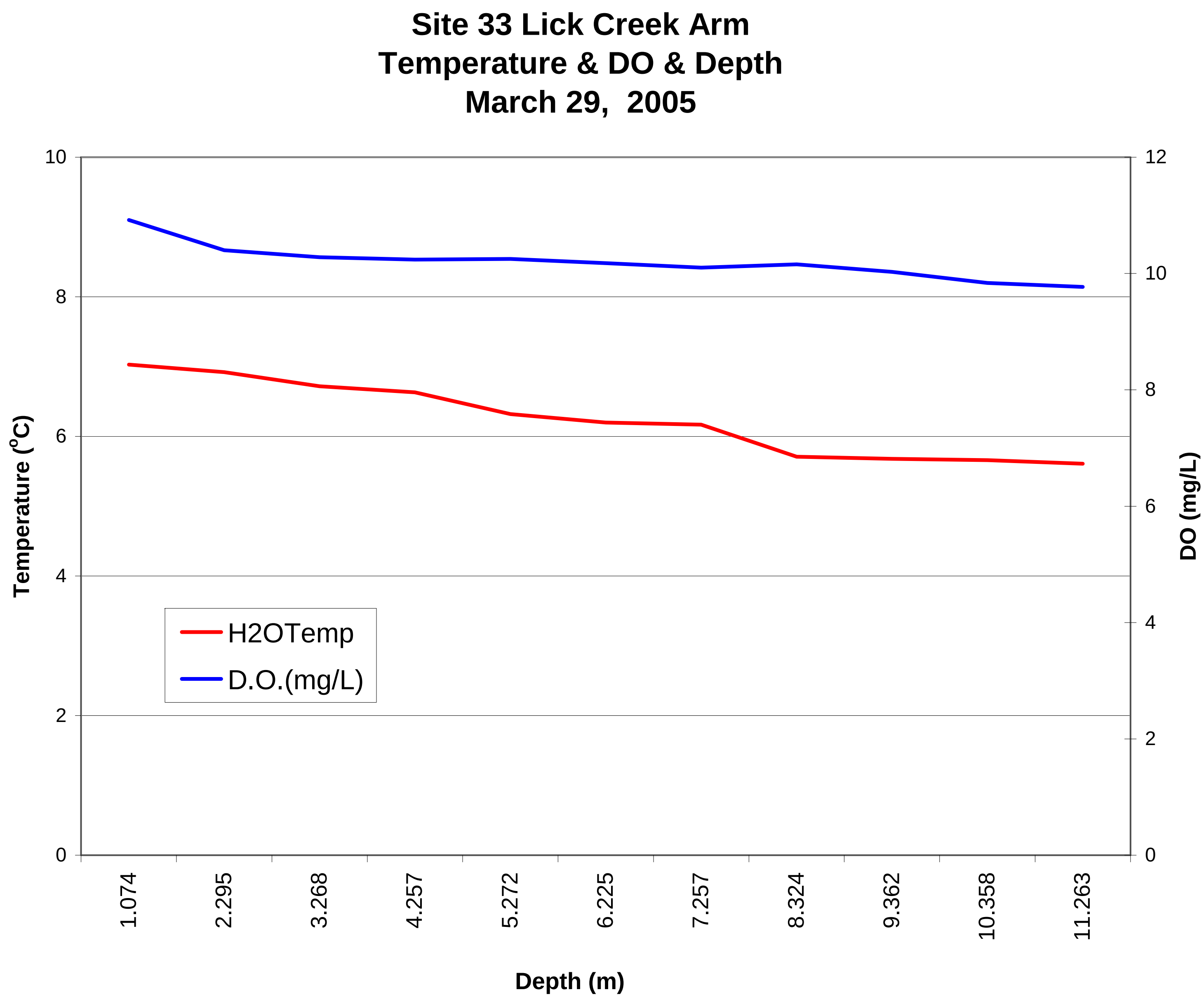
Site 22 Dam Lake Side
Temperature & DO & Depth
March 29, 2005
10
8
6
4
2
0
16
14
12
10
8
6
4
2
0
Temperature (oC)
DO (mg/L)
H2OTemp
D.O.(mg/L)
0.5
1.5
2.5
3.5
4.5
5.5
6.5
Depth (m)

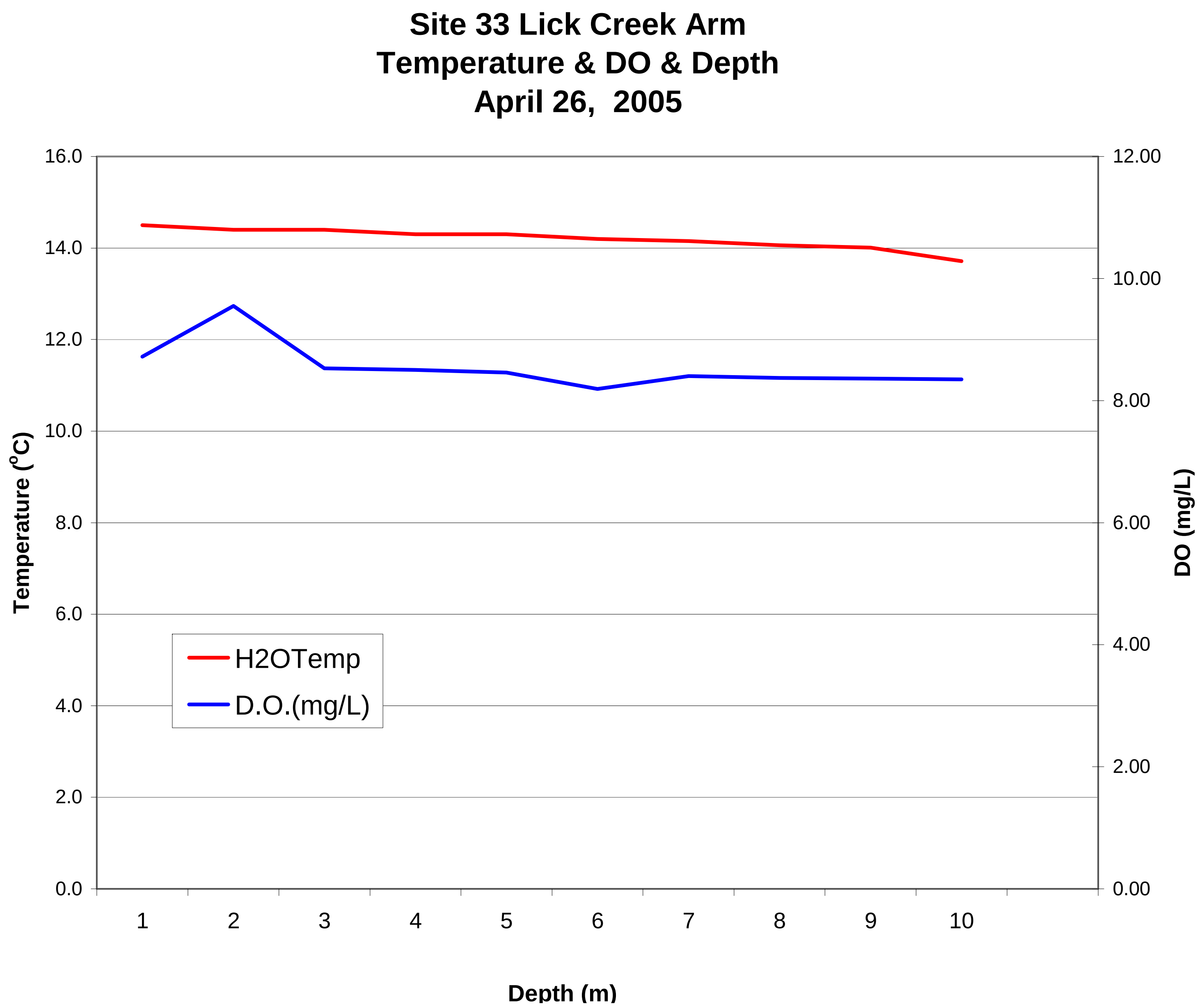

Site 22 Dam Lake Side
Temperature & DO & Depth
April 26, 2005
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Temperature (oC)
10
8
6
4
2
0
DO (mg/L)
1
2
3
4
5
6
7
8
9
10
11
Depth (m)
H2OTemp
D.O.(mg/L)

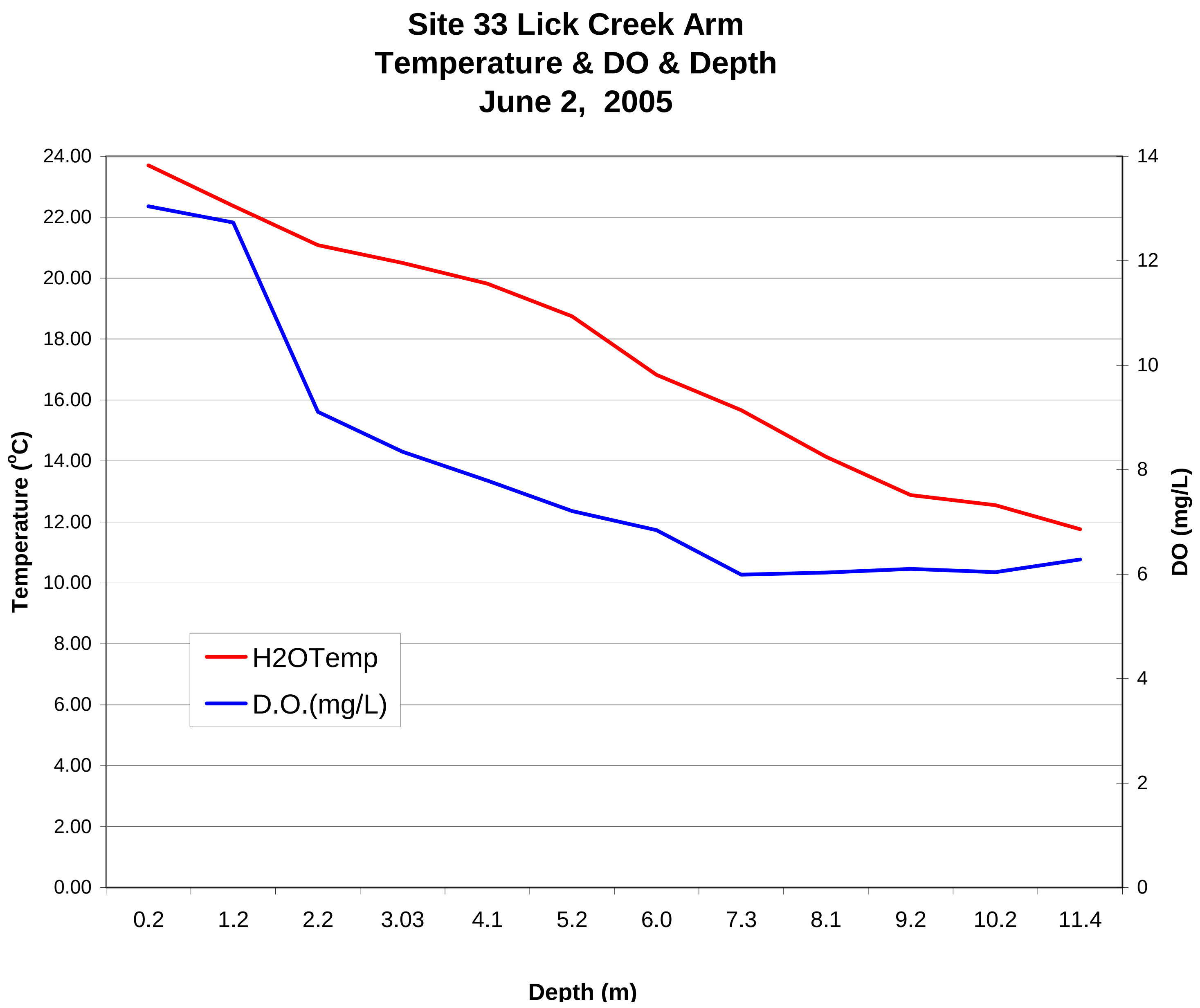


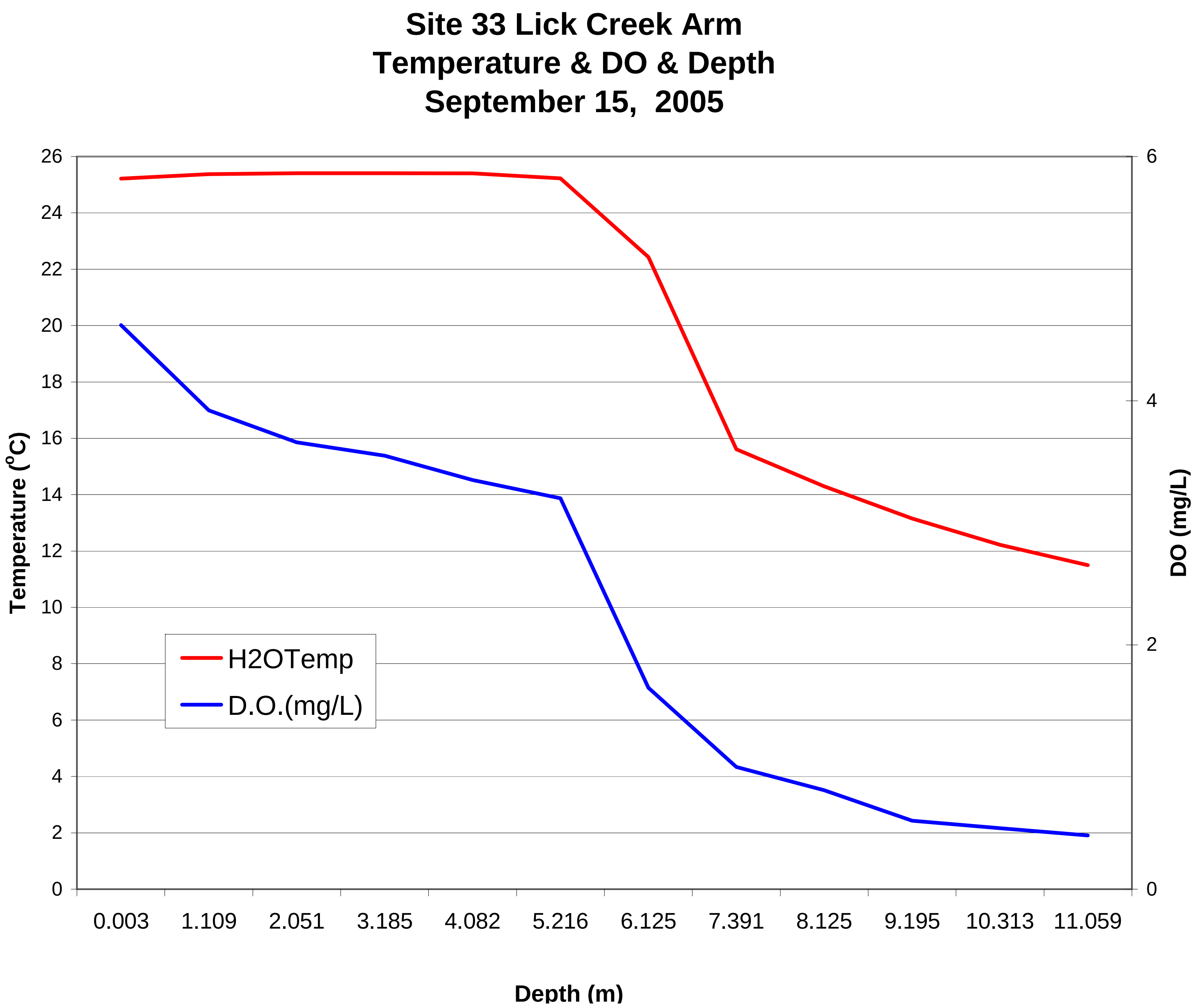
Site 22 Dam Lake Side
Temperature & DO & Depth
June 2, 2005
Temperature (oC)
DO (mg/L)
Depth (m)
H2OTemp
D.O.(mg/L)
0
2
4
6
8
10
12
14
16
18
20
22
24
0
2
4
6
8
10
12
1.2
2.2
3.16
4.15
5.26
6.36
7.1
8.35
9.1
10.1
11.1
12.1
13


Site 33 Lick Creek Arm
Temperature & DO & Depth
February 22, 2005
Temperature (oC)
DO (mg/L)
Depth (m)
10.00
8.00
6.00
4.00
2.00
0.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.468
1.167
2.080
3.178
4.260
5.339
6.368
7.258
8.368
9.294
10.316
H2OTemp
D.O.(mg/L)

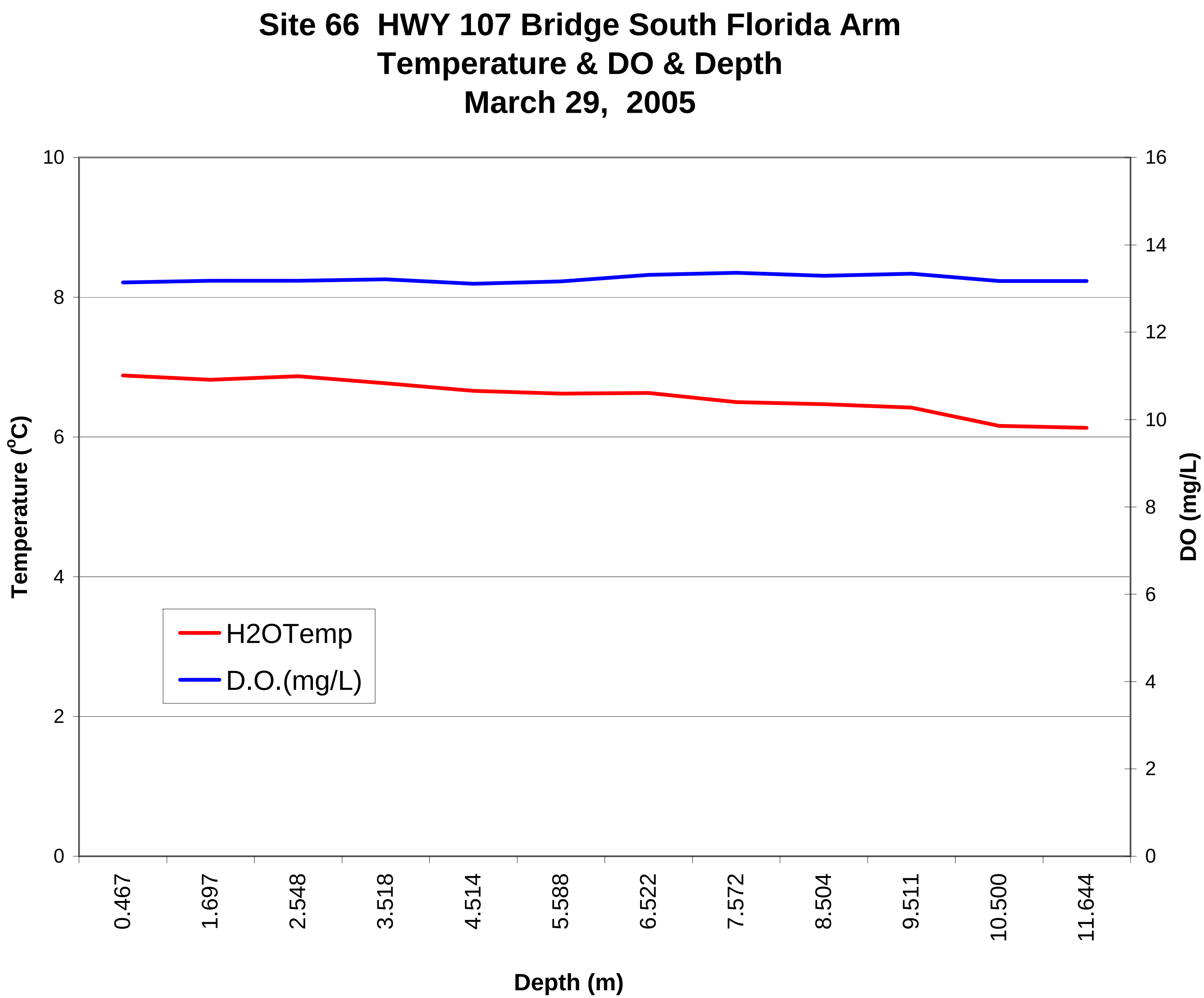

Site 33 Lick Creek Arm
Temperature & DO & Depth
March 29, 2005
Temperature (°C)
DO (mg/L)
Depth (m)
H2OTemp
D.O.(mg/L)
0
2
4
6
8
10
12
1.074
2.295
3.268
4.257
5.272
6.225
7.257
8.324
9.362
10.358
11.263

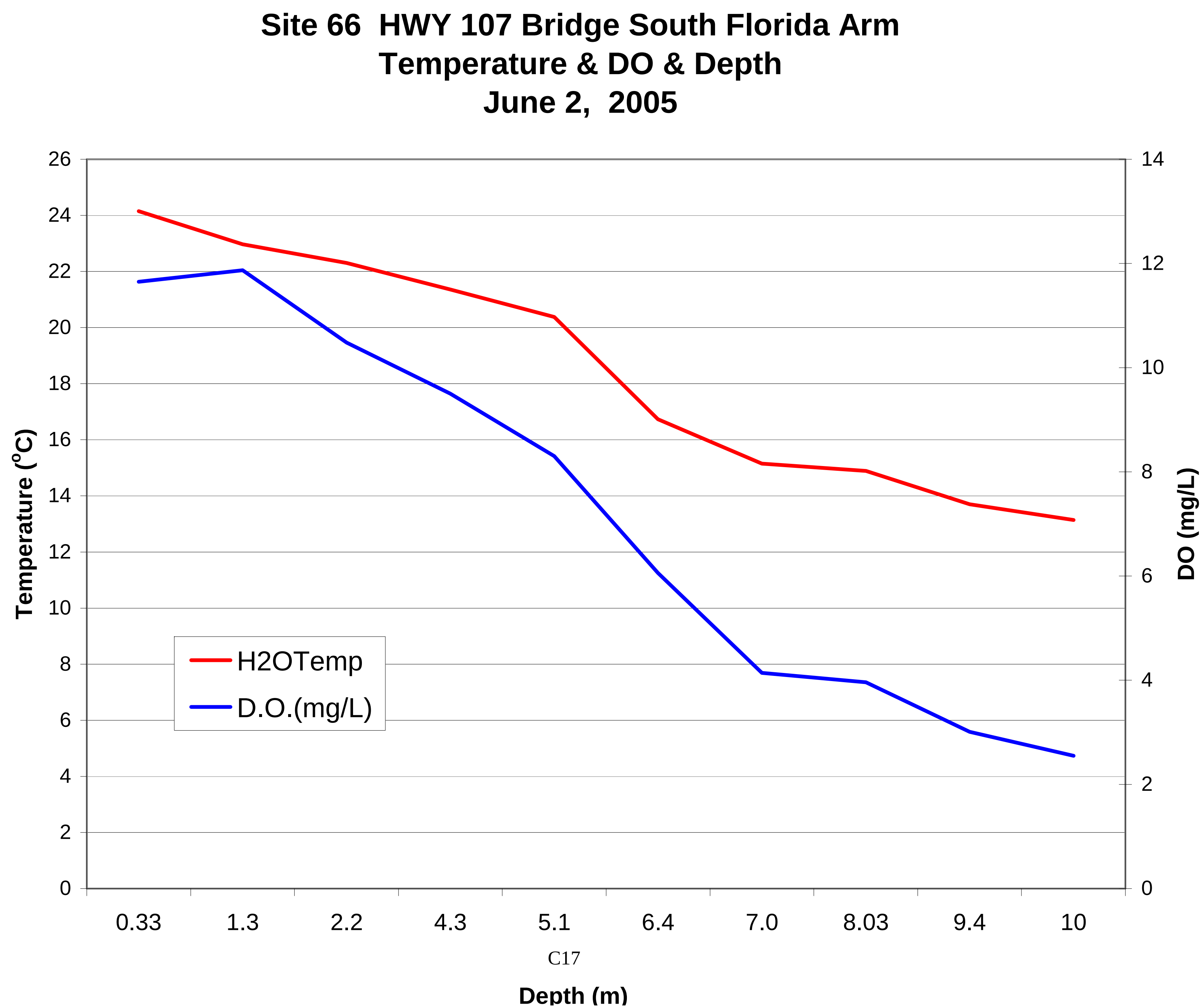

Site 33 Lick Creek Arm
Temperature & DO & Depth
April 26, 2005
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Temperature (°C)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
DO (mg/L)
H2OTemp
D.O.(mg/L)
1
2
3
4
5
6
7
8
9
10
Depth (m)

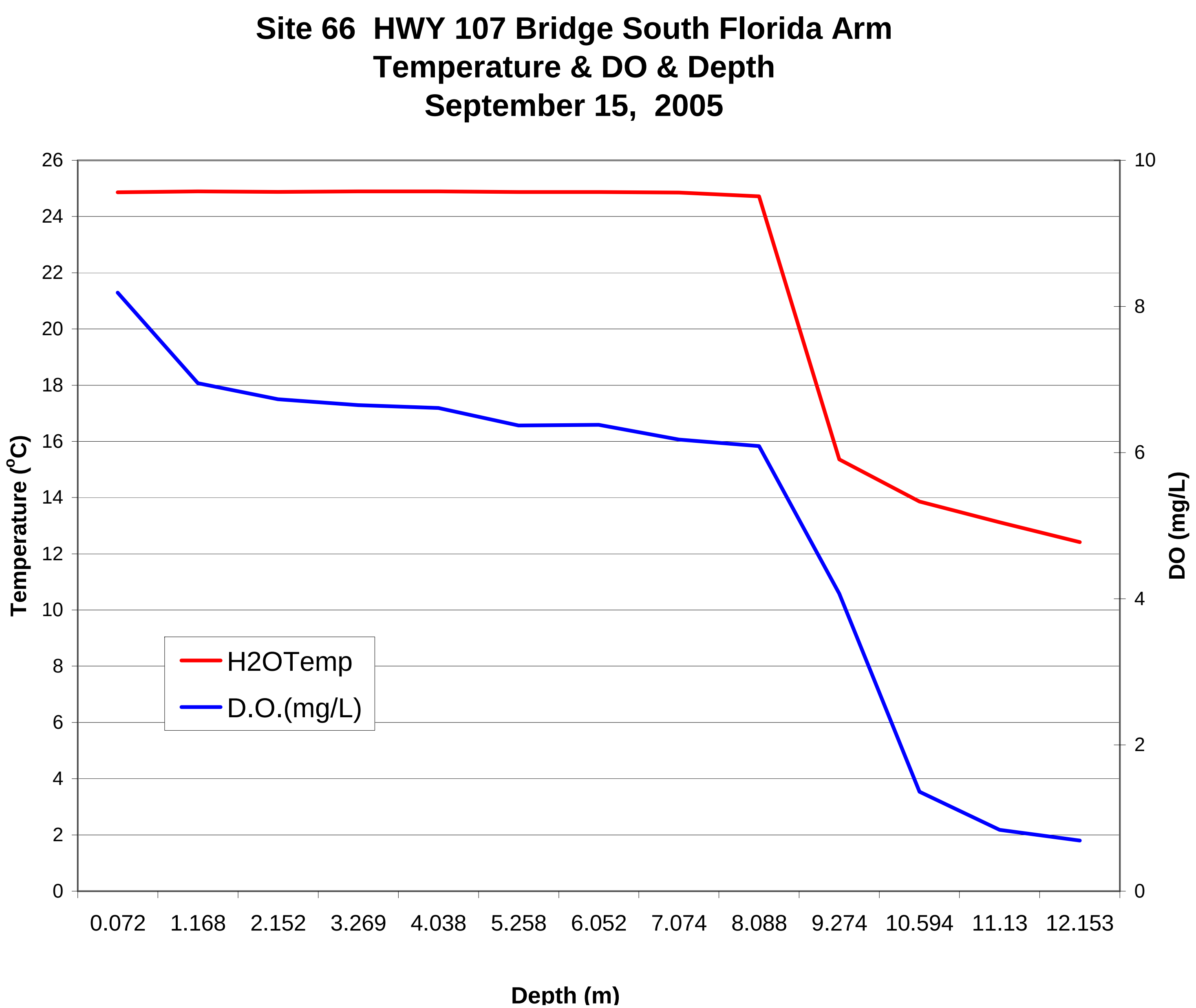

Site 33 Lick Creek Arm
Temperature & DO & Depth
June 2, 2005
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Temperature (oC)
14
12
10
8
6
4
2
0
DO (mg/L)
H2OTemp
D.O.(mg/L)
0.2
1.2
2.2
3.03
4.1
5.2
6.0
7.3
8.1
9.2
10.2
11.4
Depth (m)

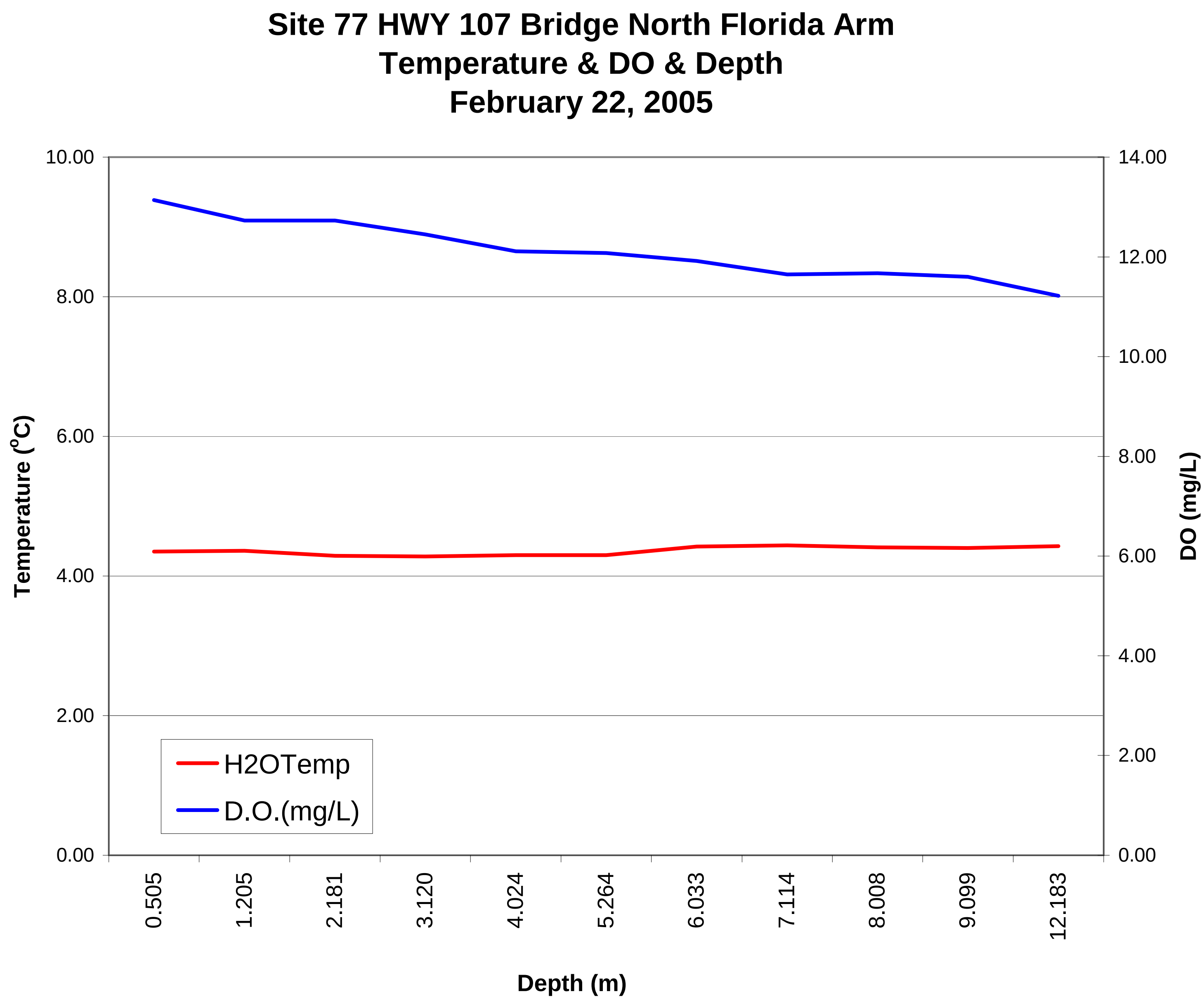

Site 33 Lick Creek Arm
Temperature & DO & Depth
September 15, 2005
Temperature (oC)
DO (mg/L)
Depth (m)
H2OTemp
D.O.(mg/L)
26
24
22
20
18
16
14
12
10
8
6
4
2
0
6
4
2
0
0.003
1.109
2.051
3.185
4.082
5.216
6.125
7.391
8.125
9.195
10.313
11.059

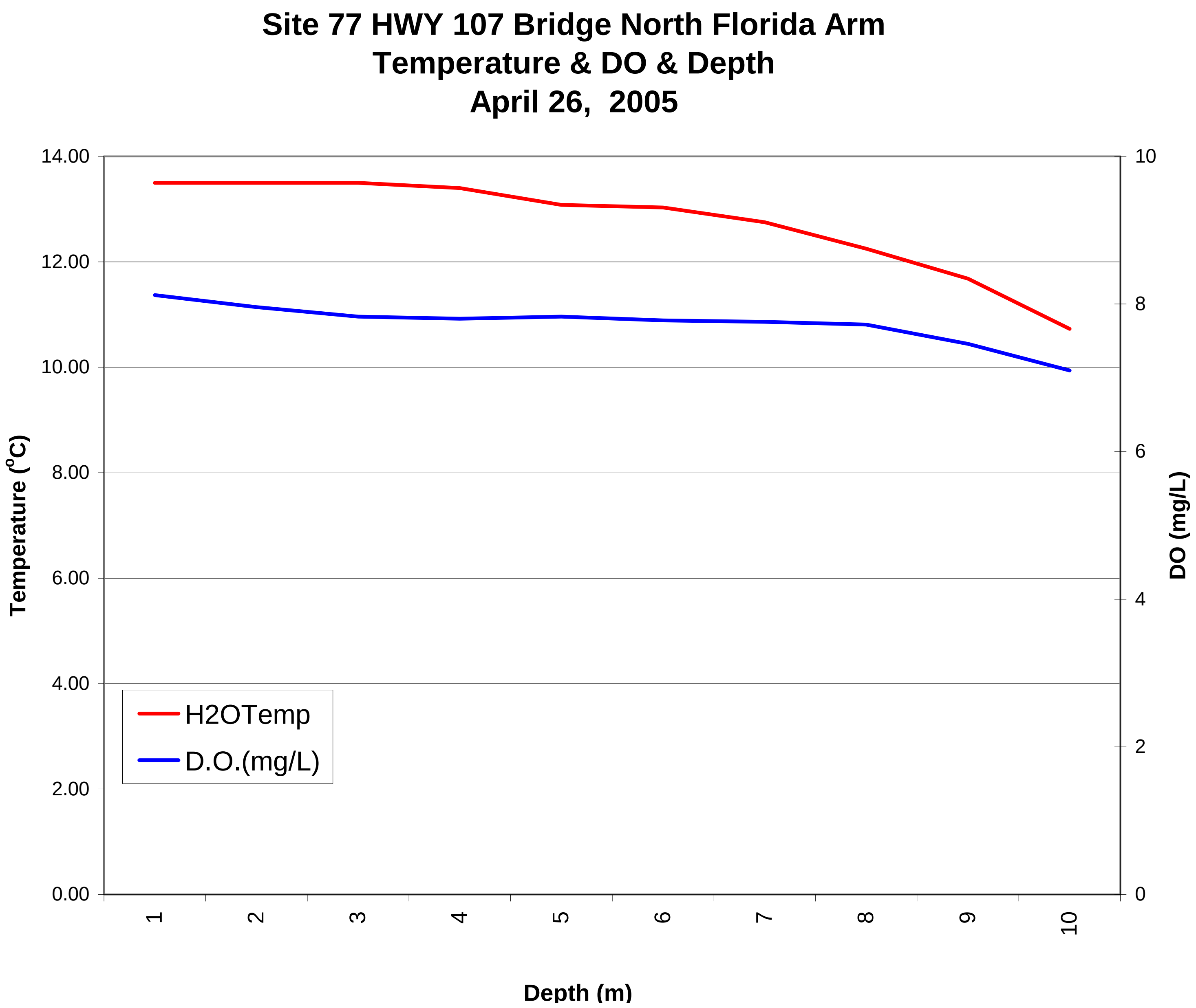

Site 66 HWY 107 Bridge South Florida Arm
Temperature & DO & Depth
February 22, 2005
Temperature (°C)
DO (mg/L)
Depth (m)
H2OTemp
D.O.(mg/L)
10.00
8.00
6.00
4.00
2.00
0.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.288
1.273
2.083
3.010
4.265
5.080
7.081
8.132
8.990


Site 66 HWY 107 Bridge South Florida Arm
Temperature & DO & Depth
March 29, 2005
Temperature (°C)
DO (mg/L)
Depth (m)
H2OTemp
D.O.(mg/L)
0
2
4
6
8
10
12
14
16
0.467
1.697
2.548
3.518
4.514
5.588
6.522
7.572
8.504
9.511
10.500
11.644


Site 66 HWY 107 Bridge South Florida Arm
Temperature & DO & Depth
June 2, 2005
Temperature (°C)
DO (mg/L)
Depth (m)
H2OTemp
D.O.(mg/L)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
0
2
4
6
8
10
12
14
0.33
1.3
2.2
4.3
5.1
6.4
7.0
8.03
9.4
10

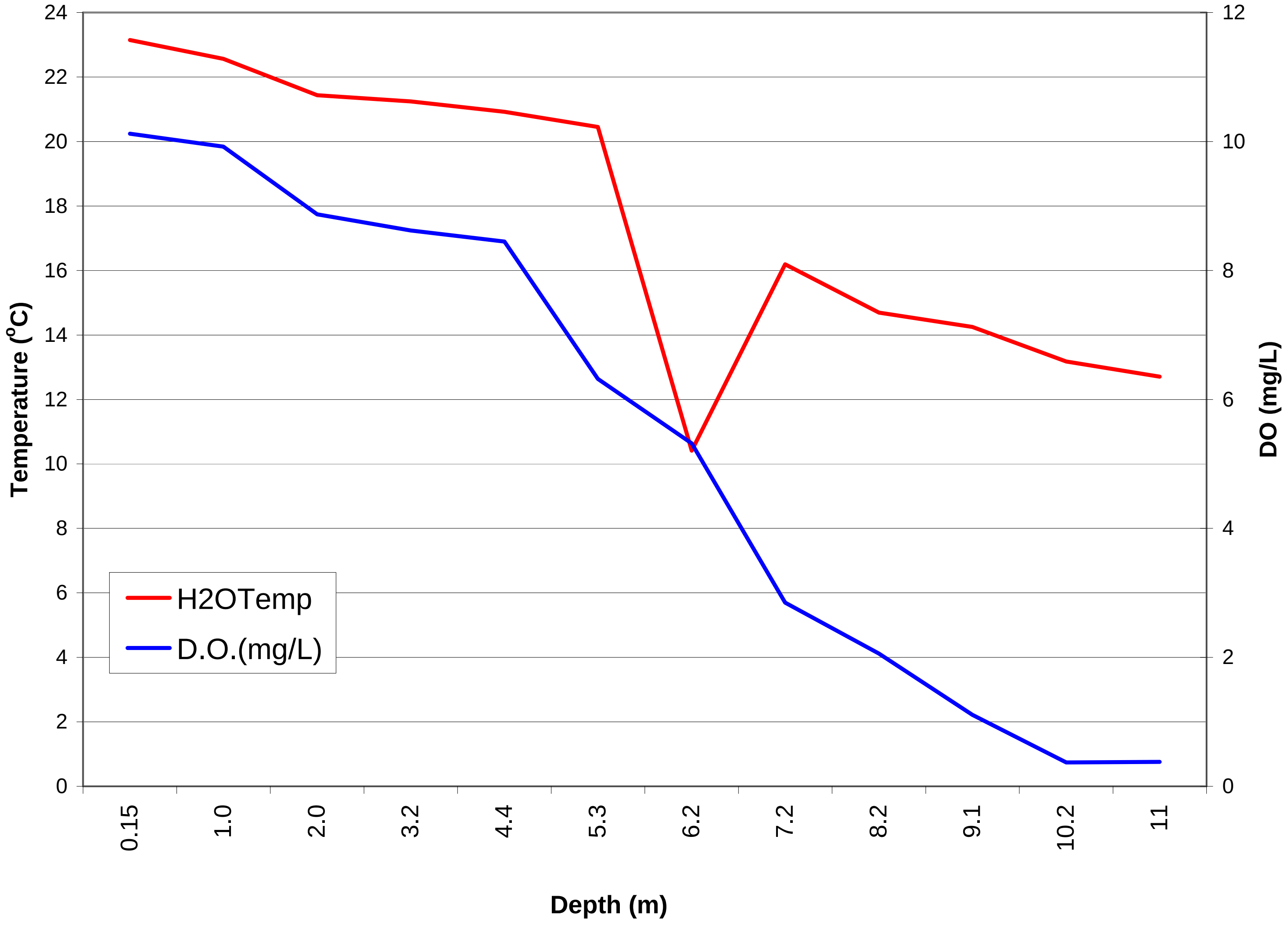

Site 66 HWY 107 Bridge South Florida Arm
Temperature & DO & Depth
September 15, 2005
Temperature (°C)
DO (mg/L)
Depth (m)
H2OTemp
D.O.(mg/L)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
0
2
4
6
8
10
0.072
1.168
2.152
3.269
4.038
5.258
6.052
7.074
8.088
9.274
10.594
11.13
12.153

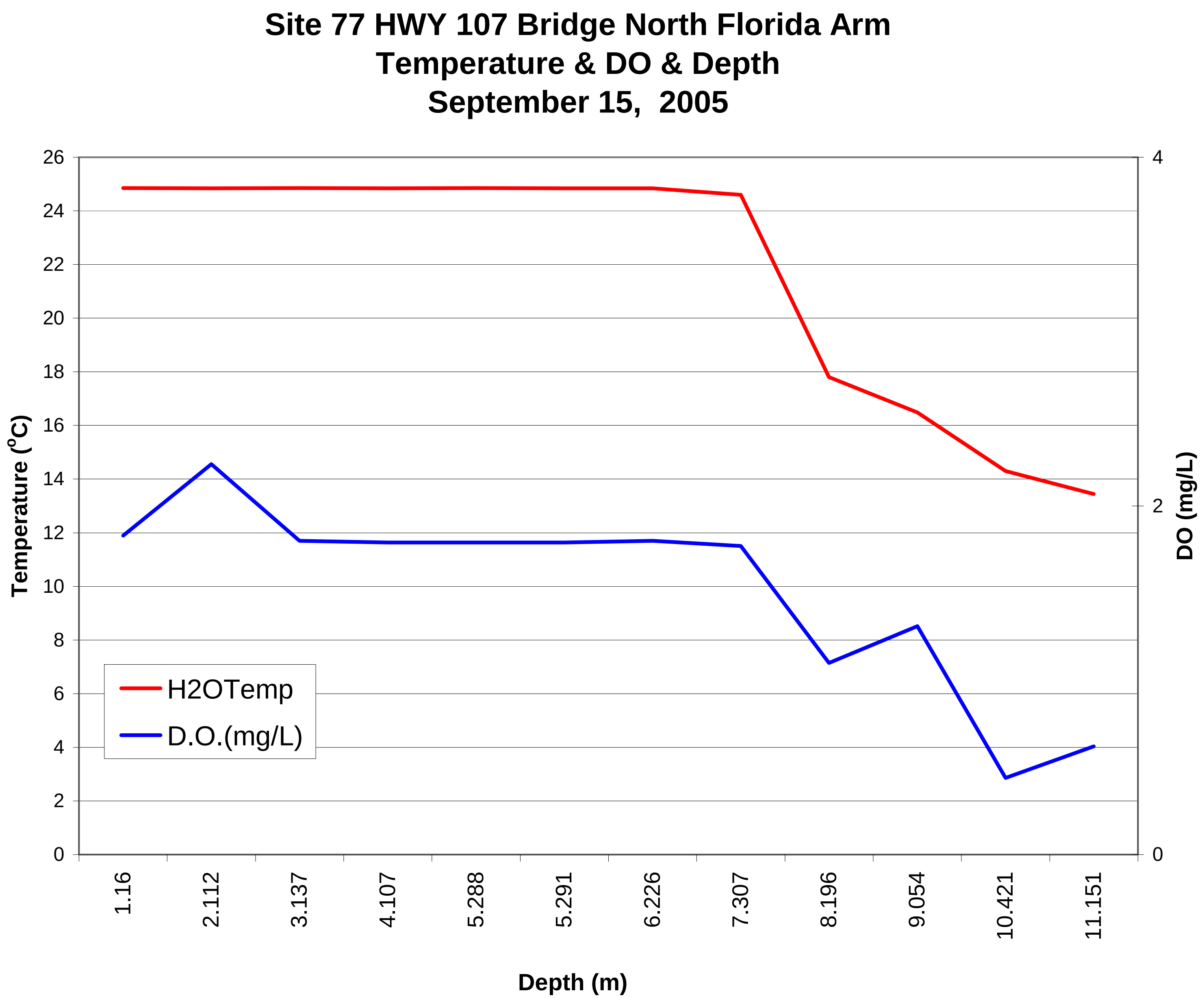

Site 77 HWY 107 Bridge North Florida Arm
Temperature & DO & Depth
February 22, 2005
Temperature (°C)
DO (mg/L)
Depth (m)
10.00
8.00
6.00
4.00
2.00
0.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.505
1.205
2.181
3.120
4.024
5.264
6.033
7.114
8.008
9.099
12.183
H2OTemp
D.O.(mg/L)



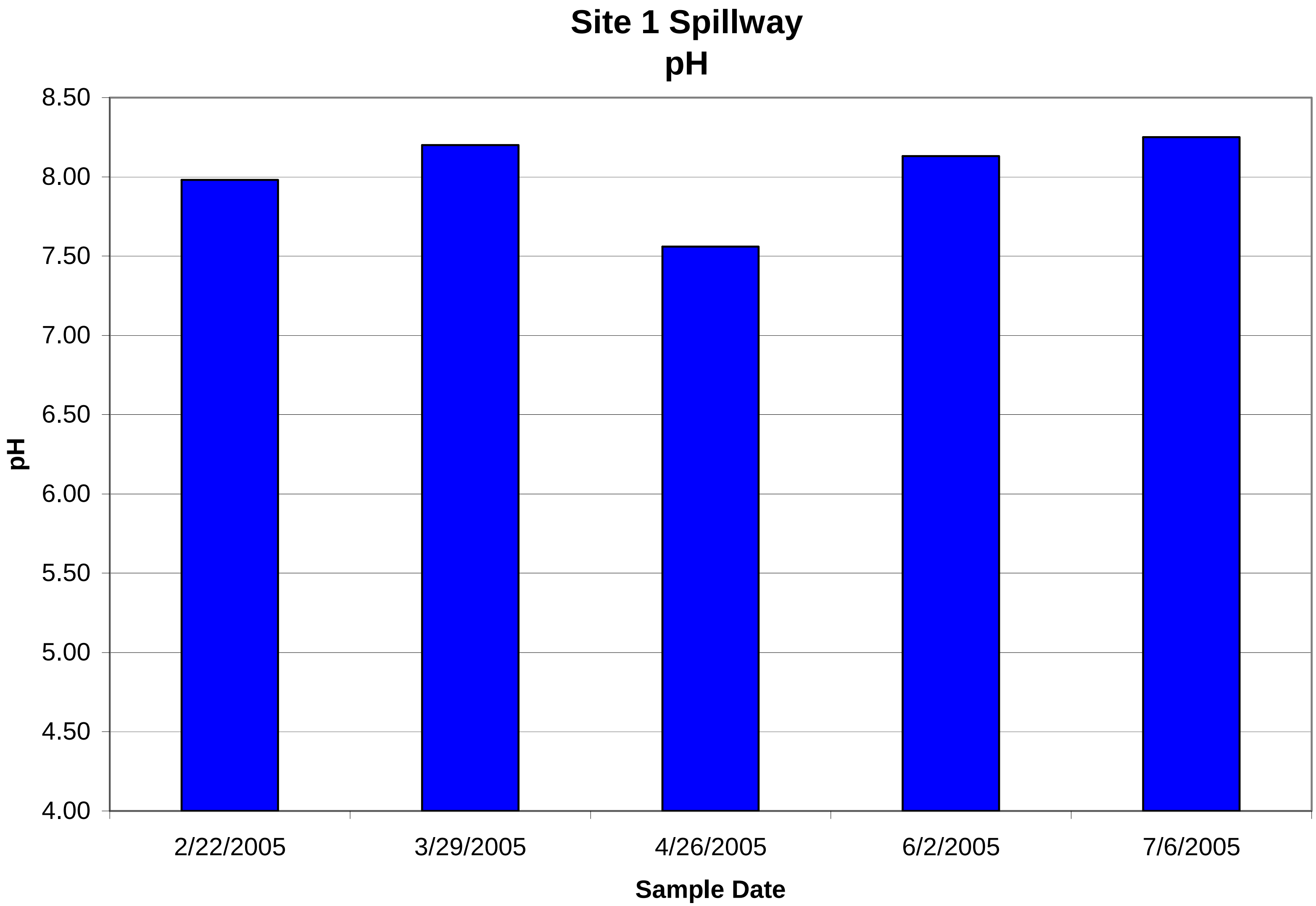
Site 77 HWY 107 Bridge North Florida Arm
Temperature & DO & Depth
April 26, 2005
Temperature (°C)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
DO (mg/L)
10
8
6
4
2
0
1
2
3
4
5
6
7
8
9
10
Depth (m)
H2OTemp
D.O.(mg/L)

Site 77 HWY 107 Bridge North Florida Arm
Temperature & DO & Depth
June 2, 2005

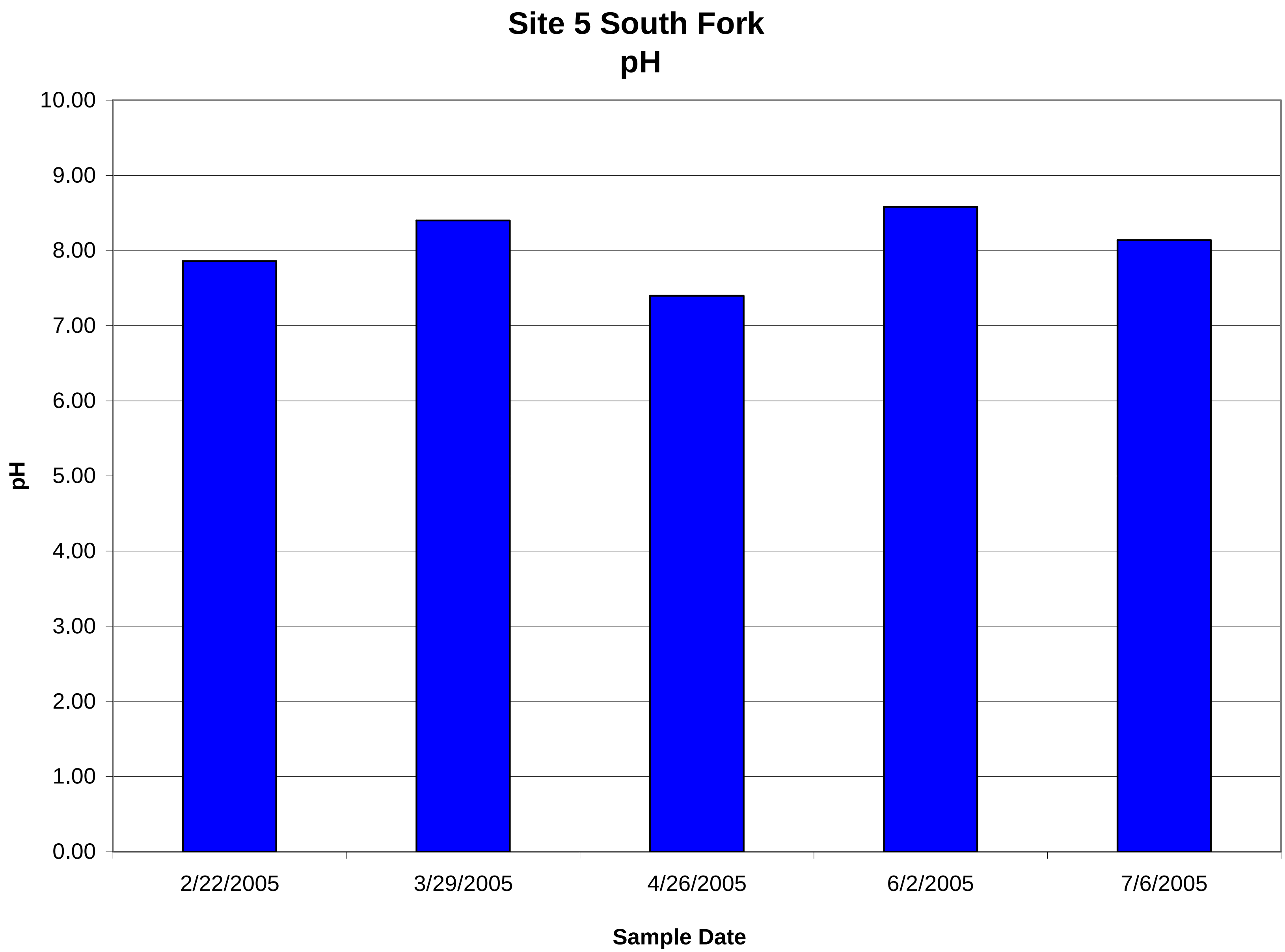


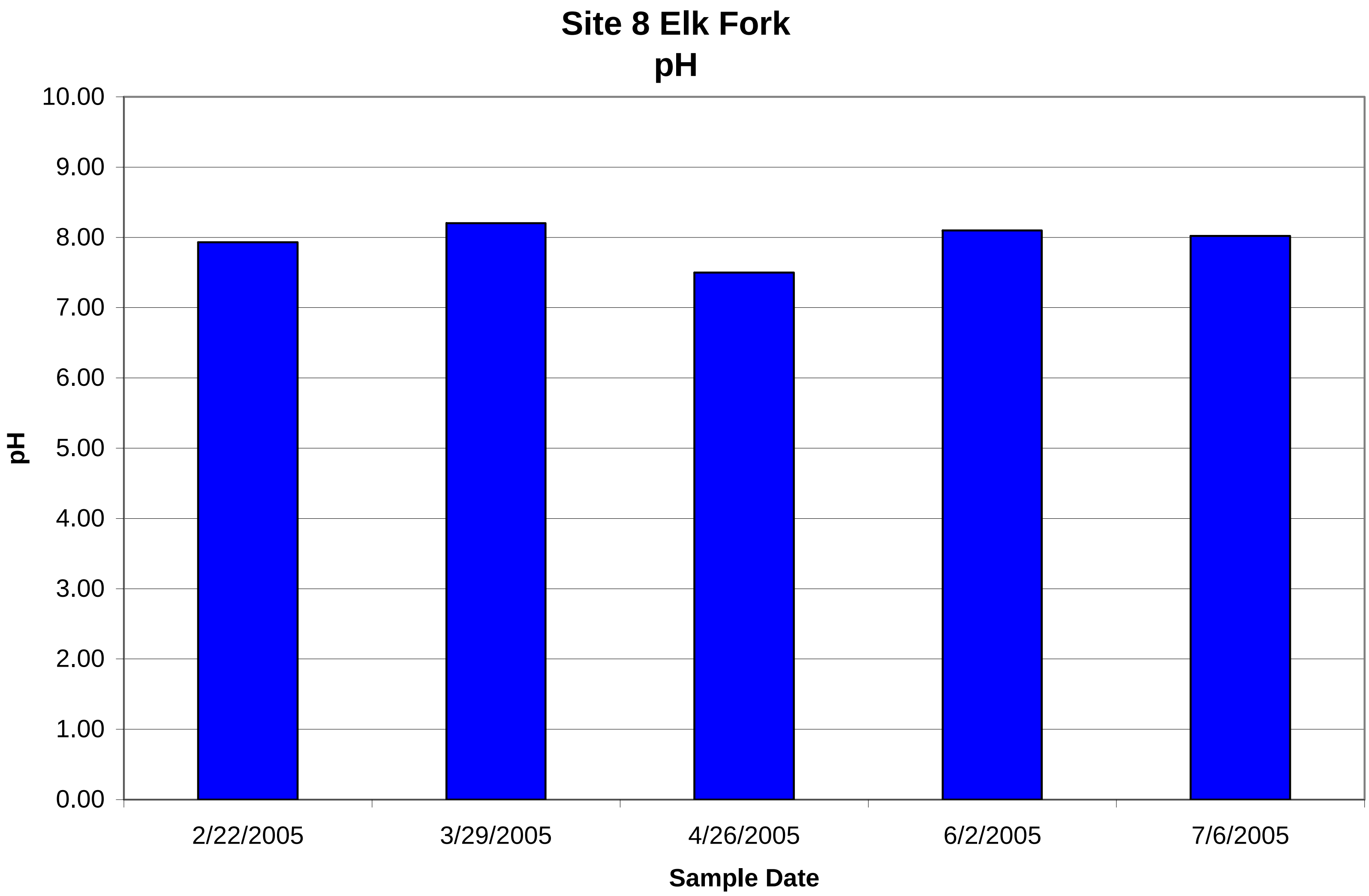


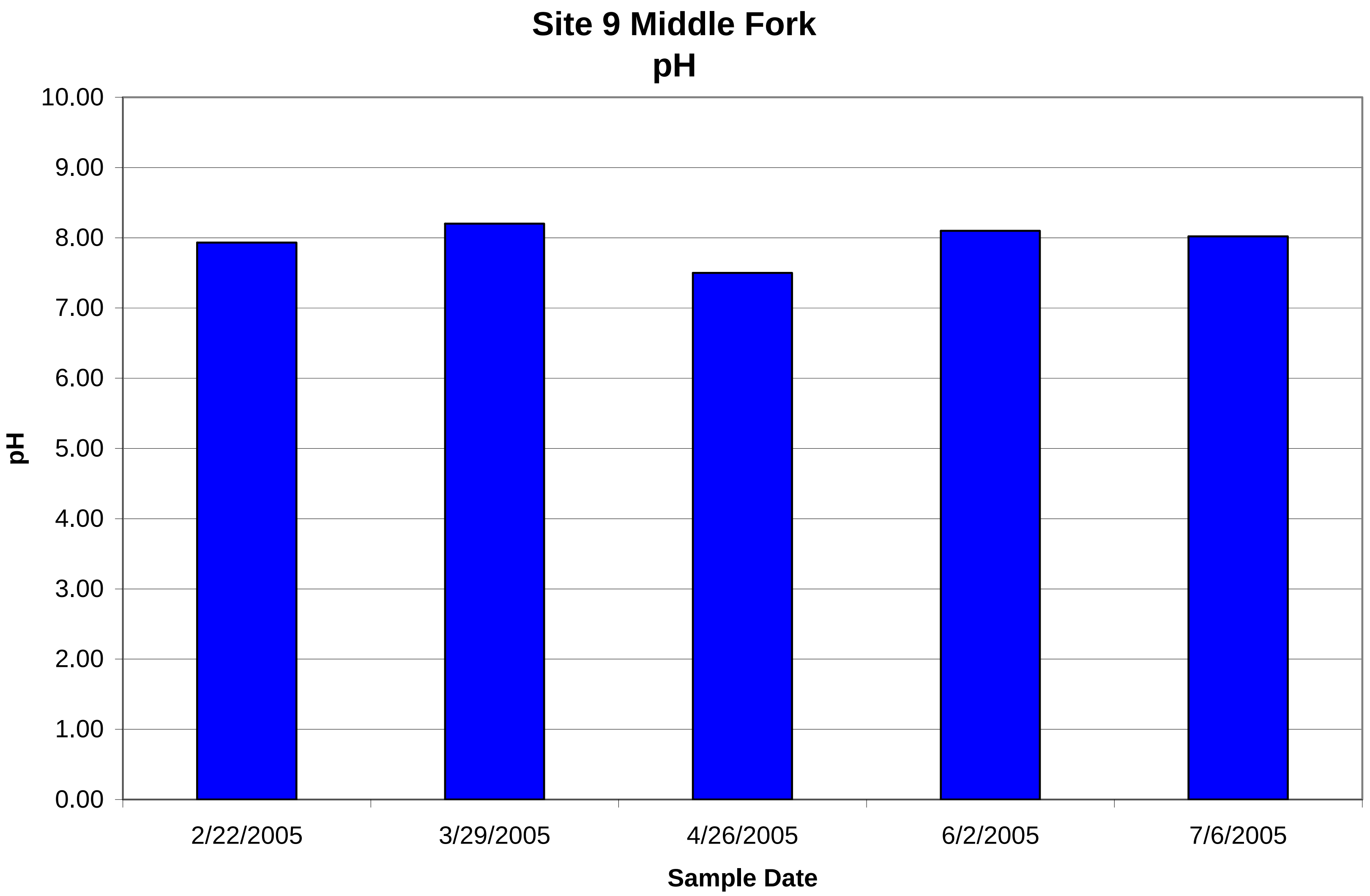
Site 77 HWY 107 Bridge North Florida Arm
Temperature & DO & Depth
September 15, 2005
Temperature (°C)
DO (mg/L)
Depth (m)
H2OTemp
D.O.(mg/L)
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1.16
2.112
3.137
4.107
5.288
5.291
6.226
7.307
8.196
9.054
10.421
11.151

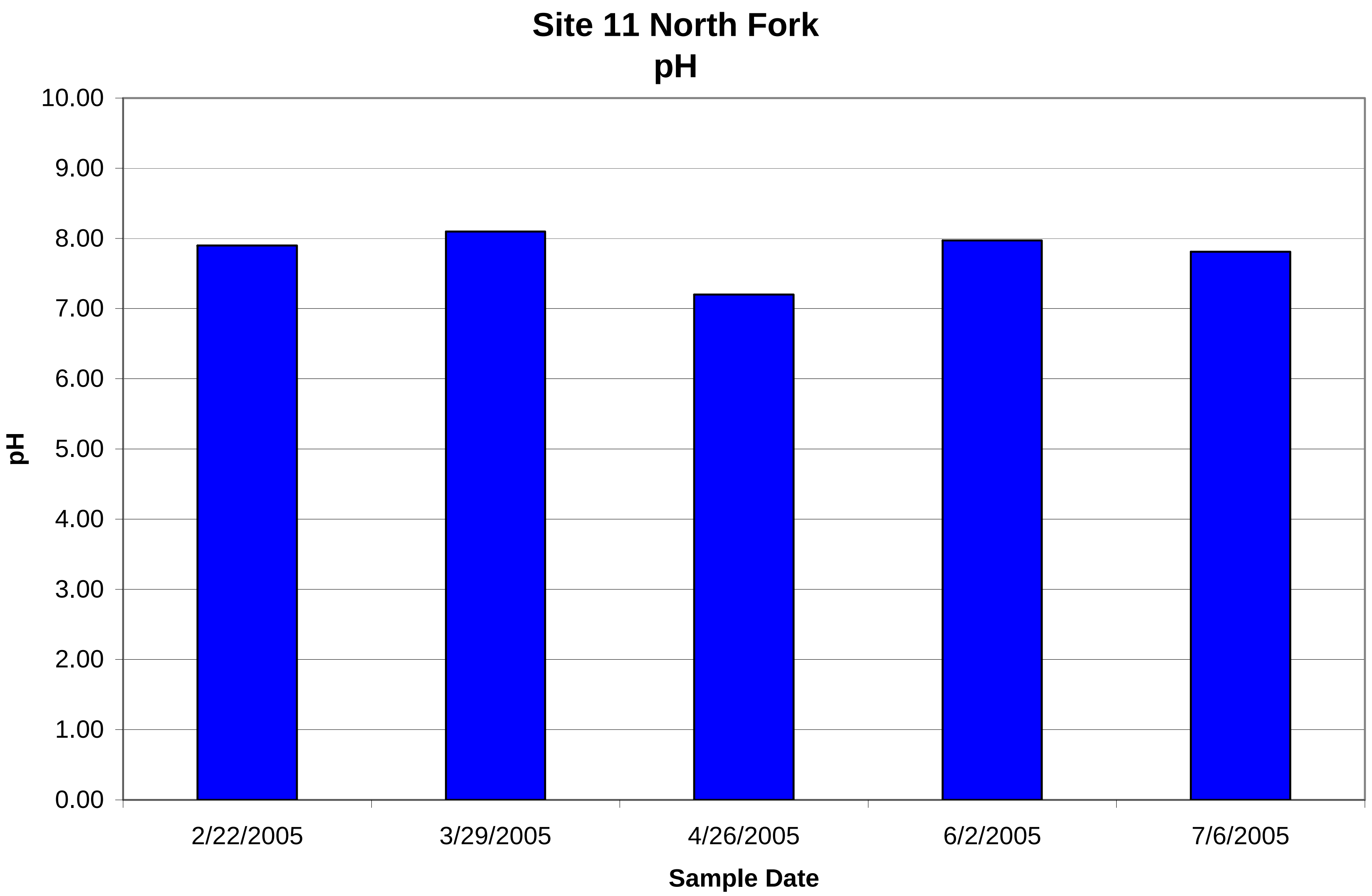


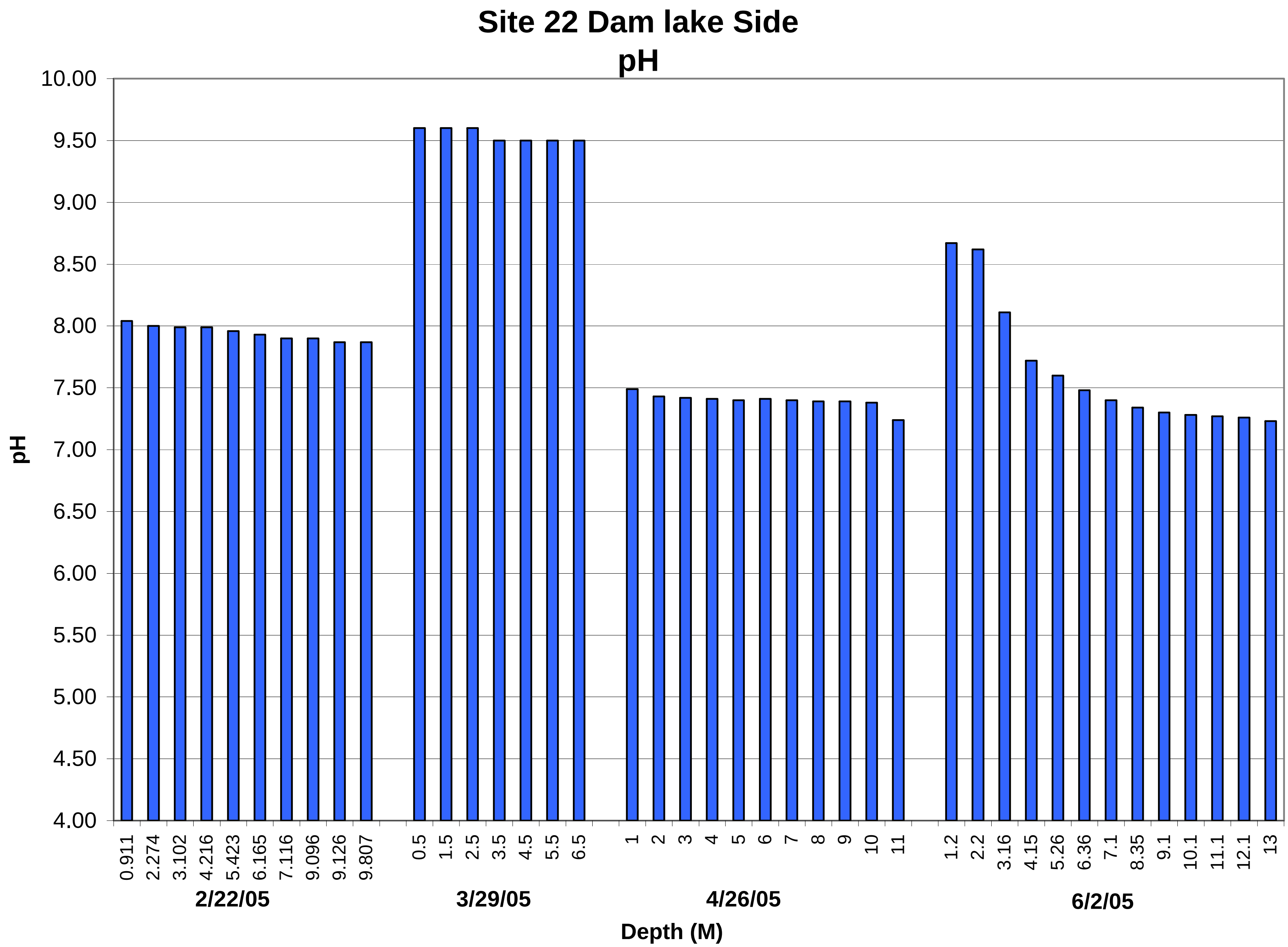
Site 1 Spillway
pH
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
pH
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

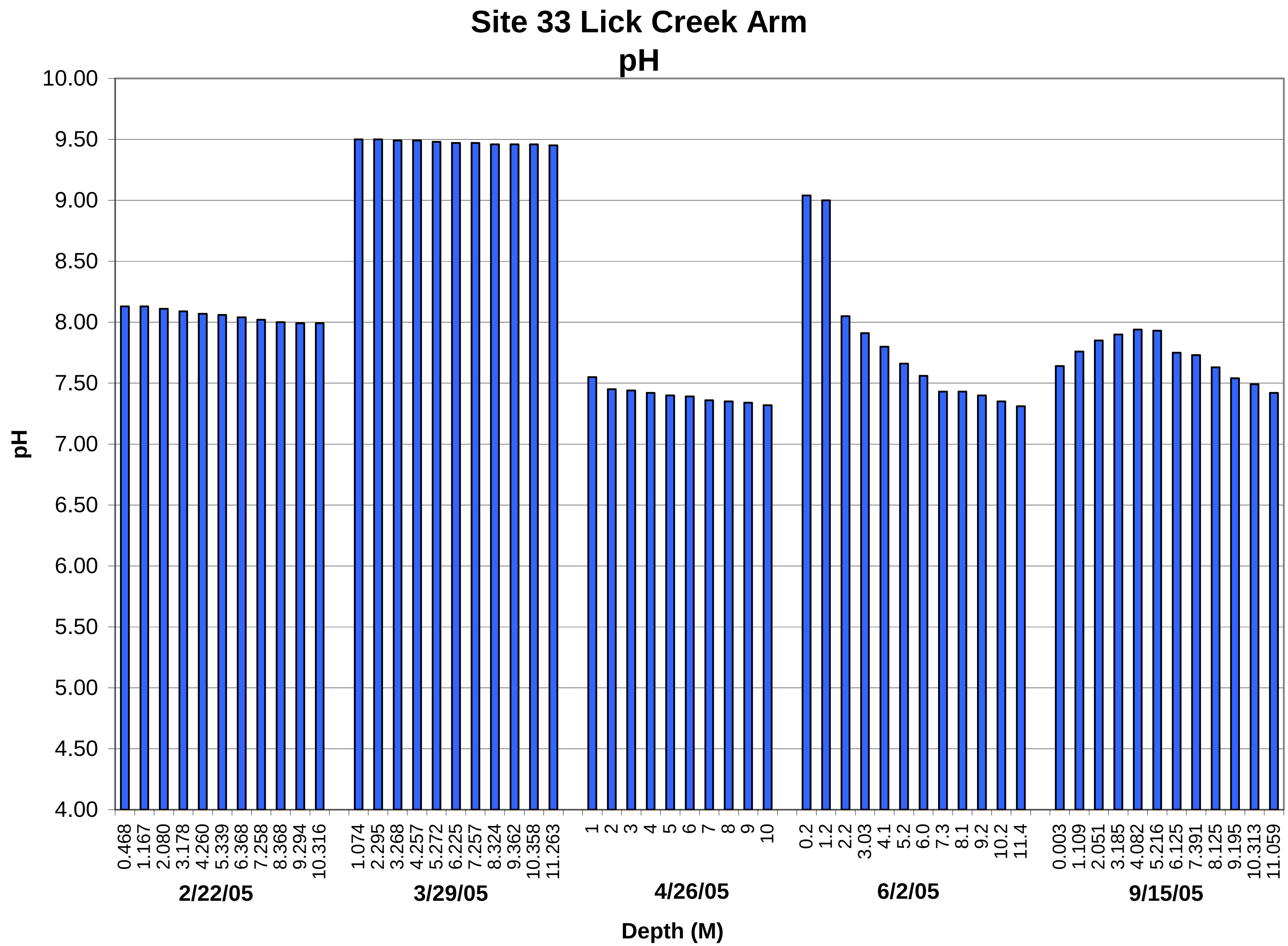

Site 5 South Fork
pH
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
pH
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

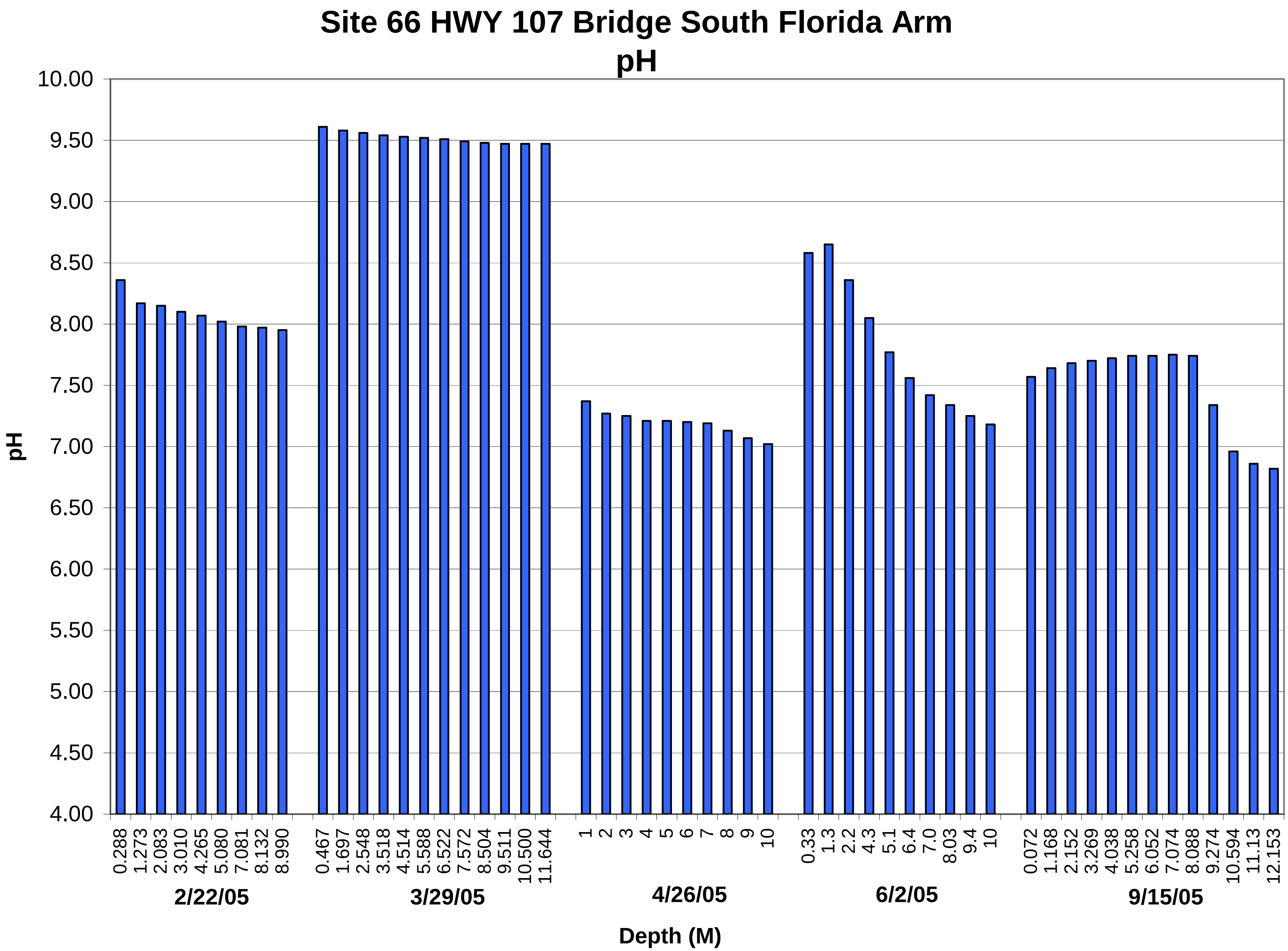

Site 8 Elk Fork
pH
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
pH
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date


Site 9 Middle Fork
pH
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
pH
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

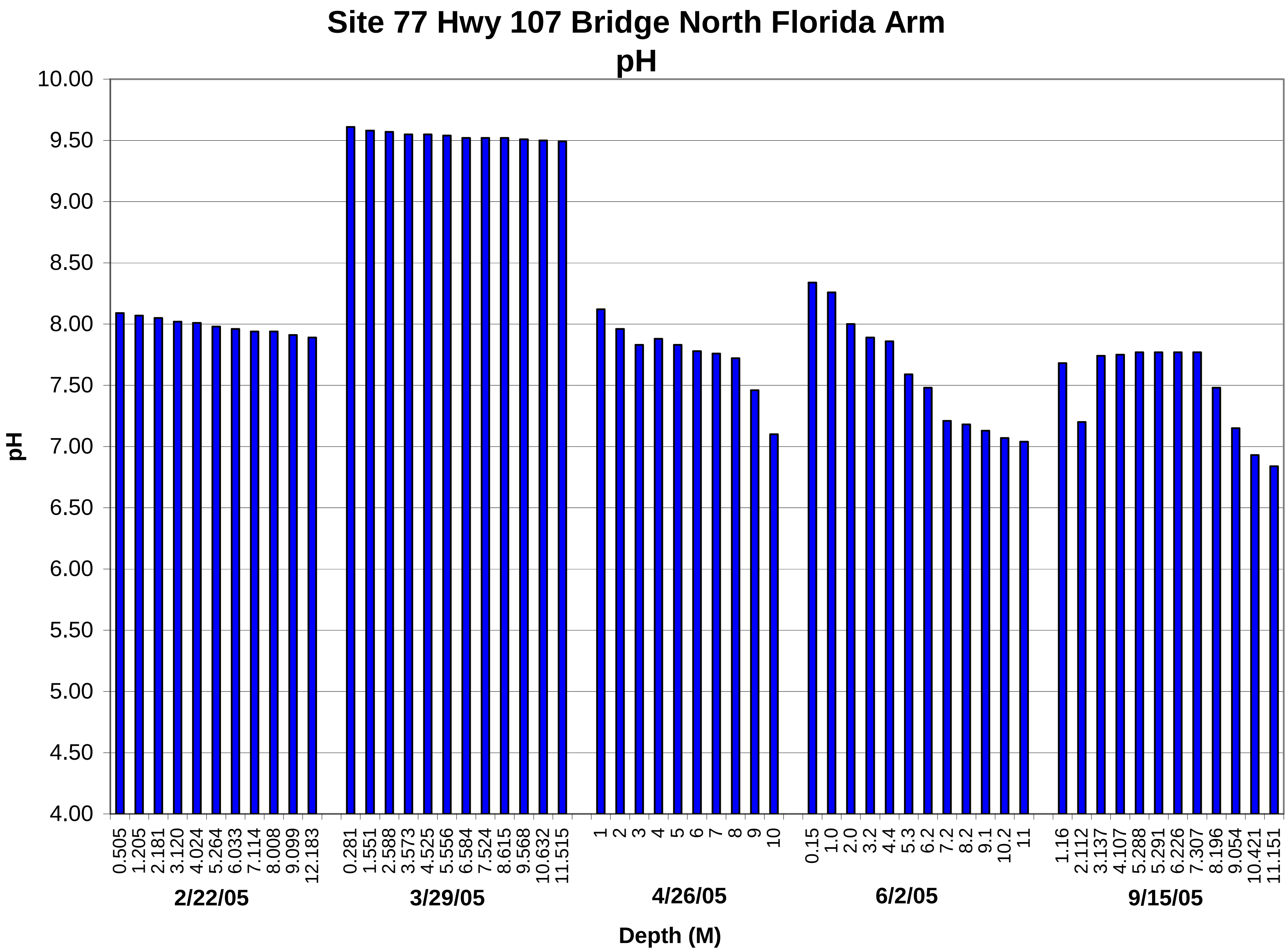

Site 11 North Fork
pH
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
pH
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

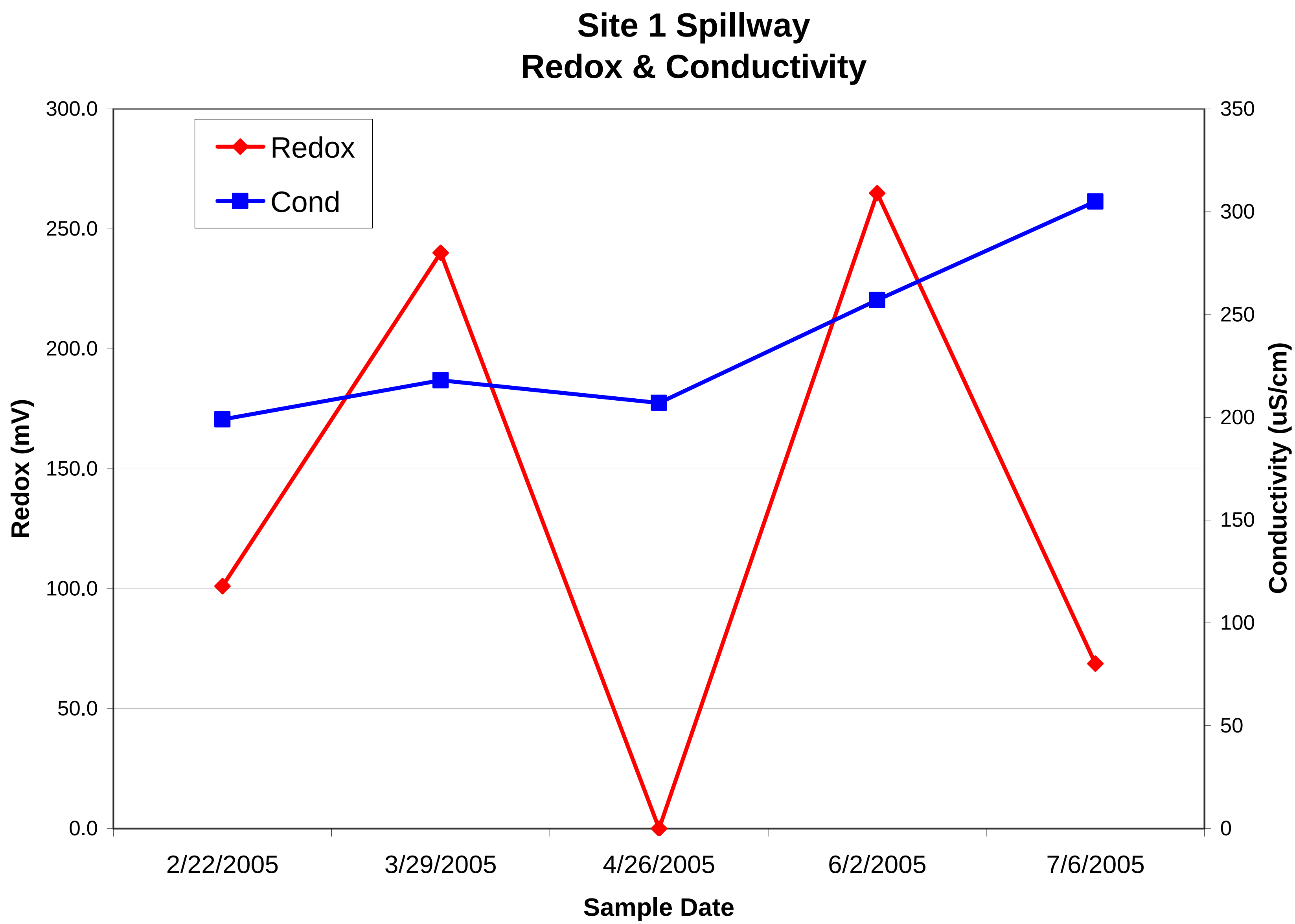

Site 22 Dam lake Side
pH
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
pH
0.911
2.274
3.102
4.216
5.423
6.165
7.116
9.096
9.126
9.807
0.5
1.5
2.5
3.5
4.5
5.5
6.5
1
2
3
4
5
6
7
8
9
10
11
1.2
2.2
3.16
4.15
5.26
6.36
7.1
8.35
9.1
10.1
11.1
12.1
13
2/22/05
3/29/05
4/26/05
6/2/05
Depth (M)

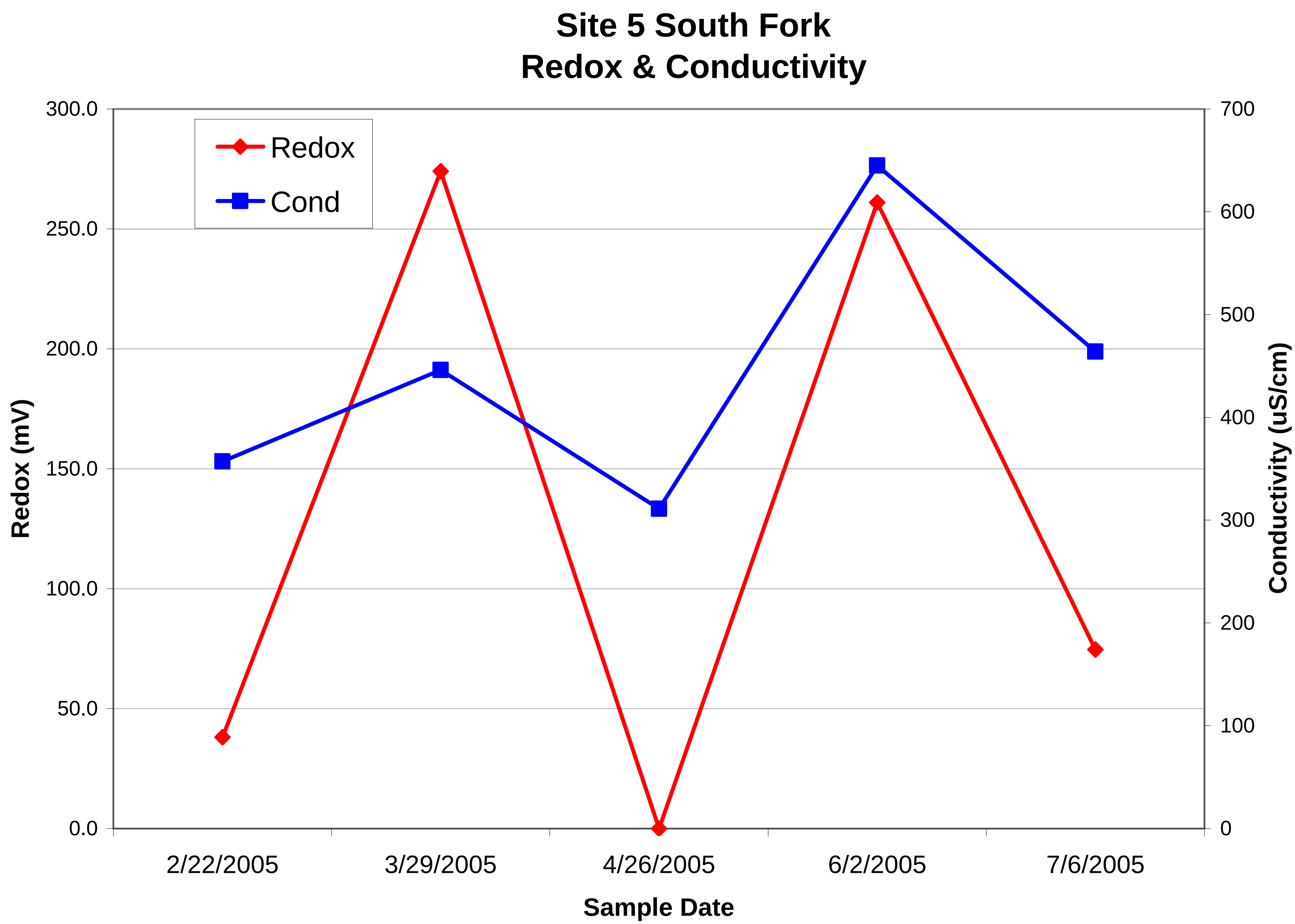

Site 33 Lick Creek Arm
pH
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
pH
0.468 1.167 2.080 3.178 4.260 5.339 6.368 7.258 8.368 9.294 10.316
1.074 2.295 3.268 4.257 5.272 6.225 7.257 8.324 9.362 10.358 11.263
1 2 3 4 5 6 7 8 9 10
0.2 1.2 2.2 3.03 4.1 5.2 6.0 7.3 8.1 9.2 10.2 11.4
0.003 1.109 2.051 3.185 4.082 5.216 6.125 7.391 8.125 9.195 10.313 11.059
2/22/05
3/29/05
4/26/05
6/2/05
9/15/05
Depth (M)

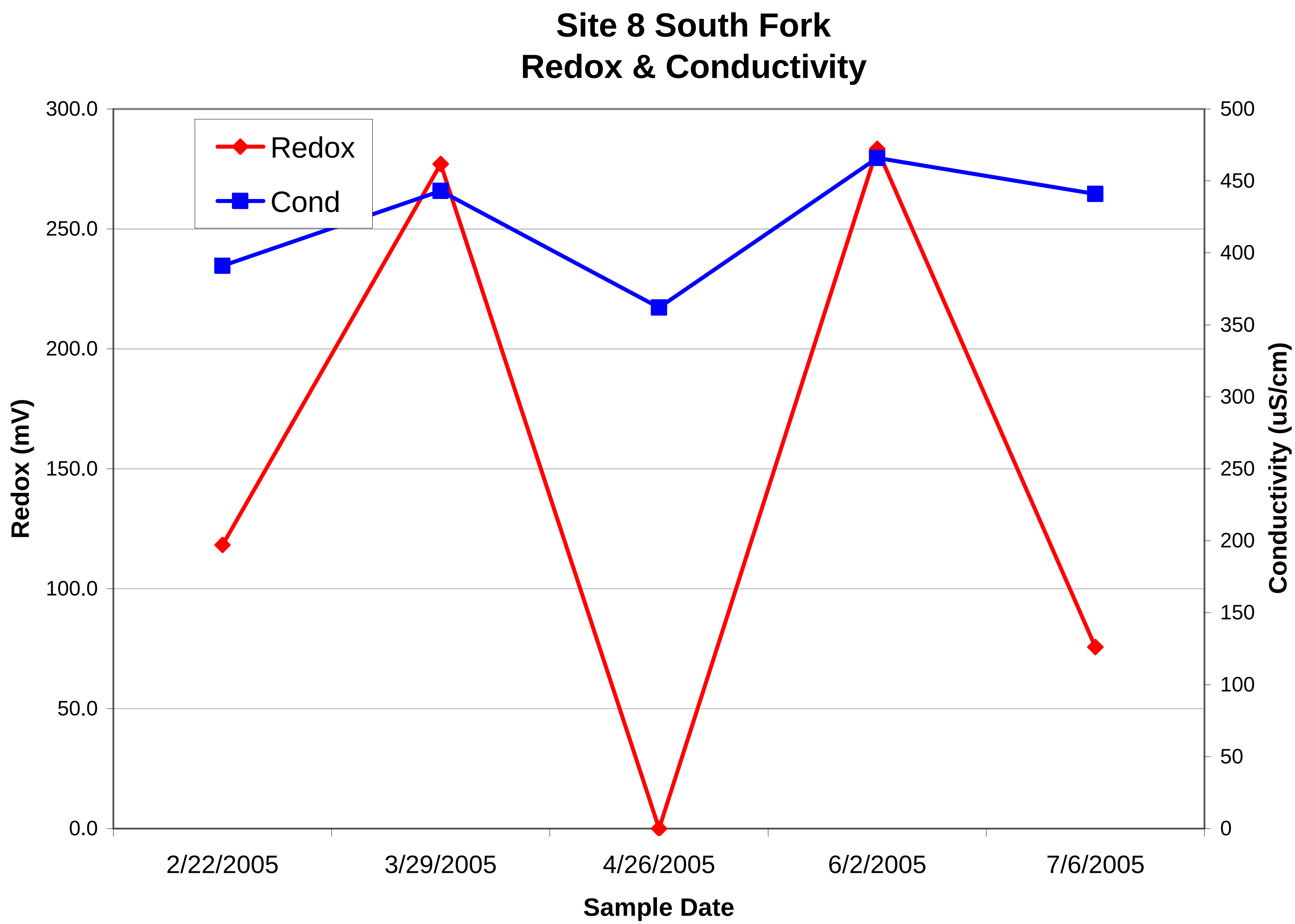


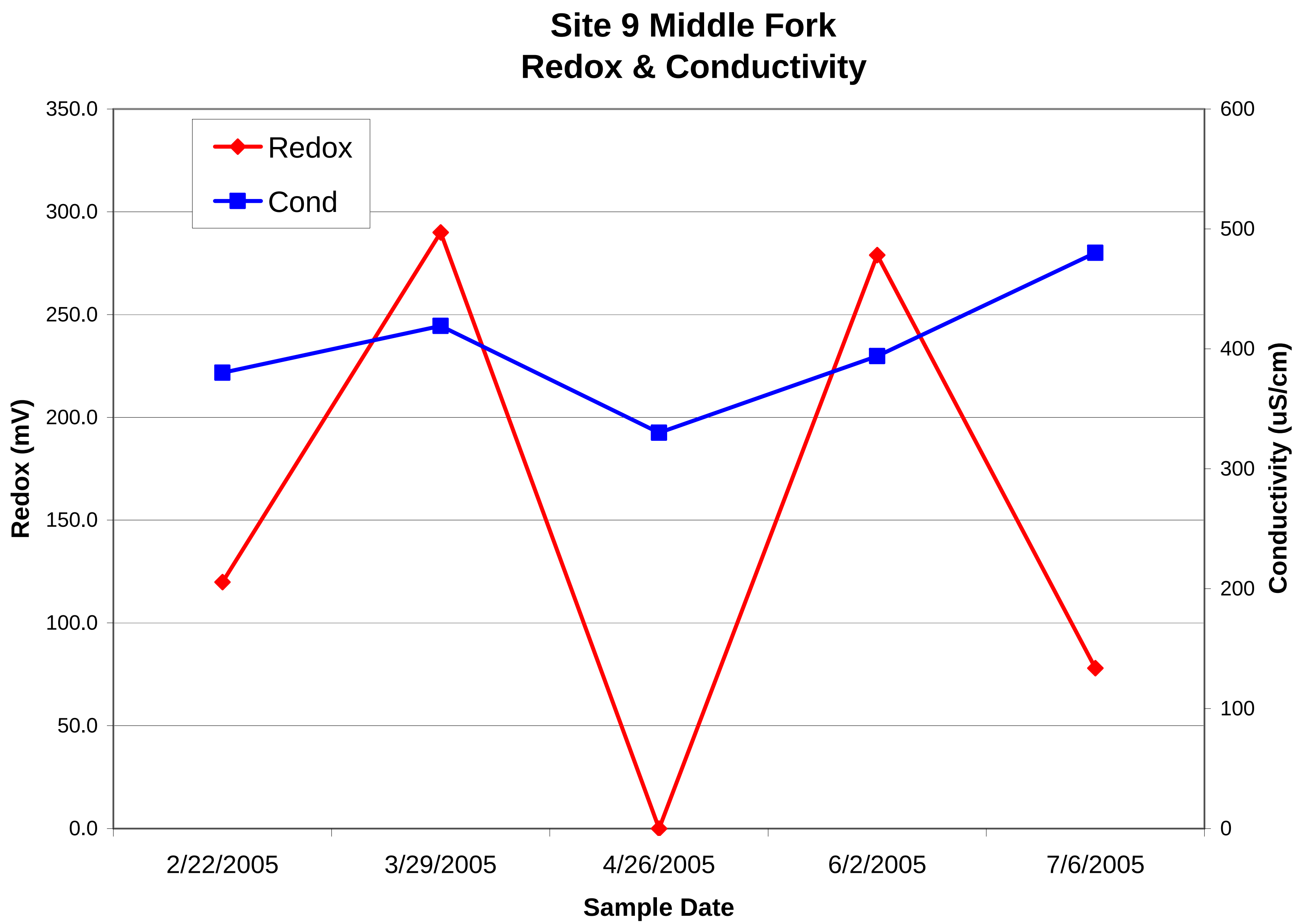
Site 66 HWY 107 Bridge South Florida Arm
pH
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
pH
0.288
1.273
2.083
3.010
4.265
5.080
7.081
8.132
8.990
0.467
1.697
2.548
3.518
4.514
5.588
6.522
7.572
8.504
9.511
10.500
11.644
1
2
3
4
5
6
7
8
9
10
0.33
1.3
2.2
4.3
5.1
6.4
7.0
8.03
9.4
10
0.072
1.168
2.152
3.269
4.038
5.258
6.052
7.074
8.088
9.274
10.594
11.13
12.153
2/22/05
3/29/05
4/26/05
6/2/05
9/15/05
Depth (M)

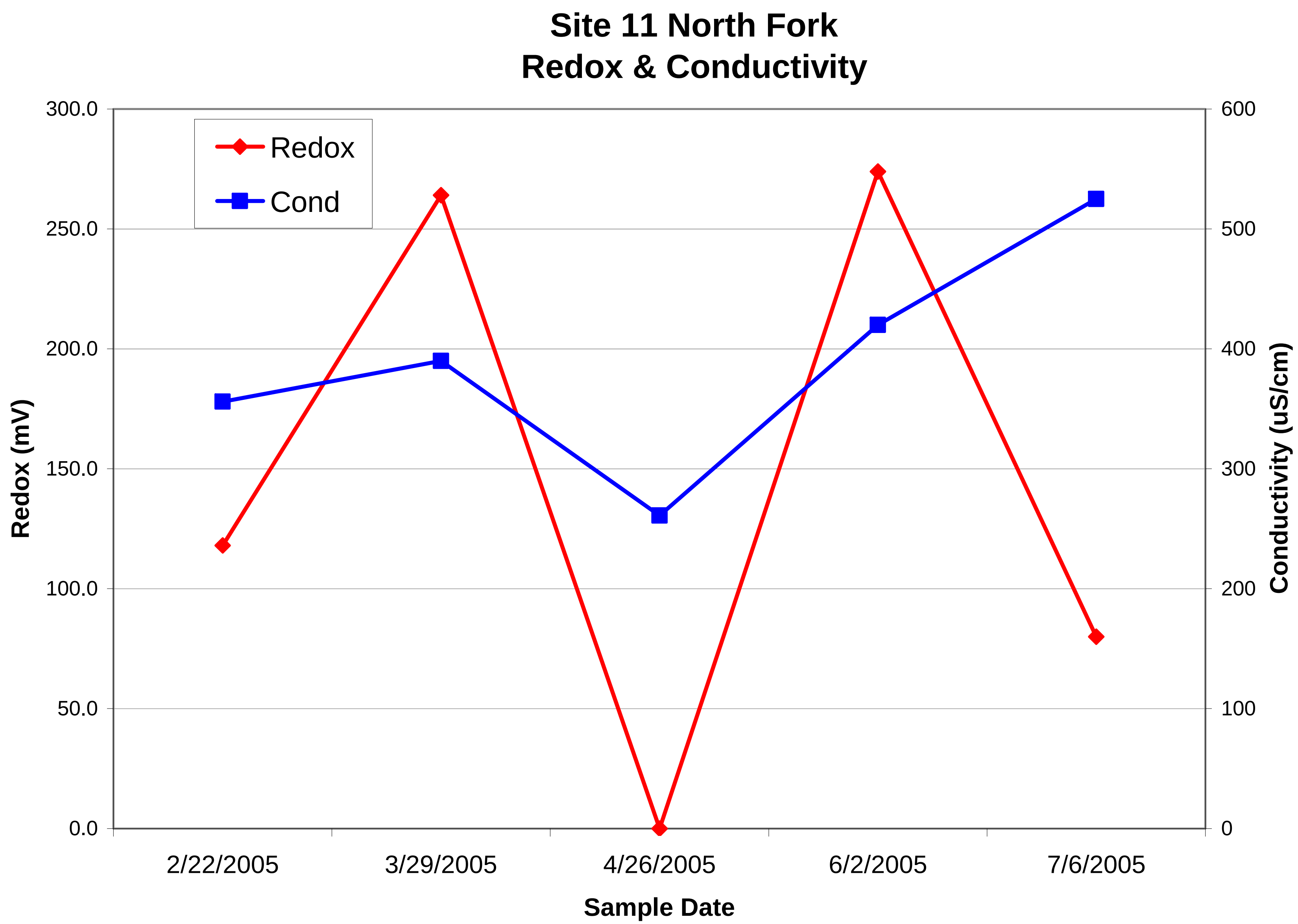

Site 77 Hwy 107 Bridge North Florida Arm
pH
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
pH
0.505
1.205
2.181
3.120
4.024
5.264
6.033
7.114
8.008
9.099
12.183
0.281
1.551
2.588
3.573
4.525
5.556
6.584
7.524
8.615
9.568
10.632
11.515
1
2
3
4
5
6
7
8
9
10
0.15
1.0
2.0
3.2
4.4
5.3
6.2
7.2
8.2
9.1
10.2
11
1.16
2.112
3.137
4.107
5.288
5.291
6.226
7.307
8.196
9.054
10.421
11.151
2/22/05
3/29/05
4/26/05
6/2/05
9/15/05
Depth (M)

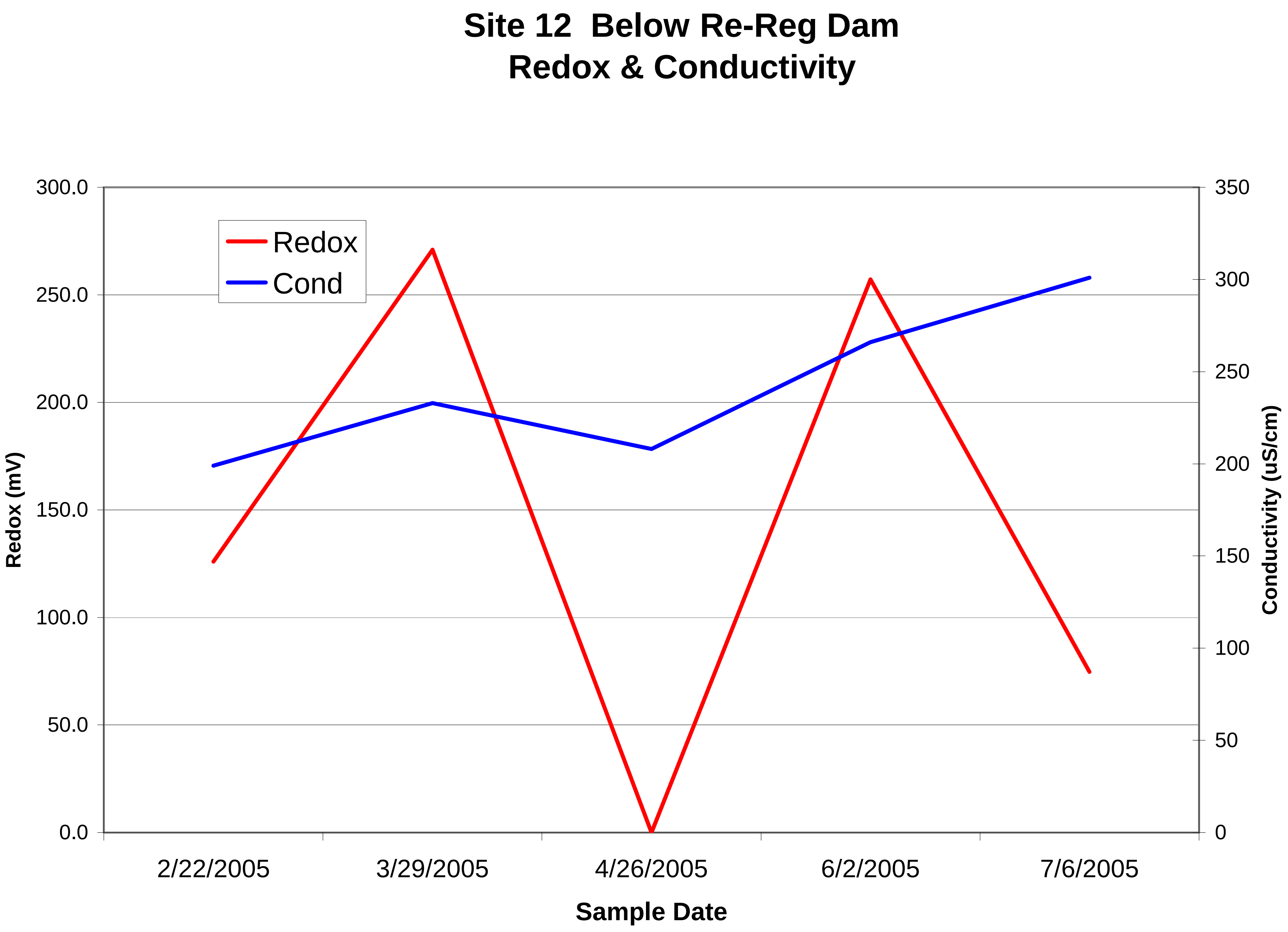

Site 1 Spillway
Redox & Conductivity
Redox
Cond
Redox (mV)
Conductivity (uS/cm)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
350
300
250
200
150
100
50
0
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

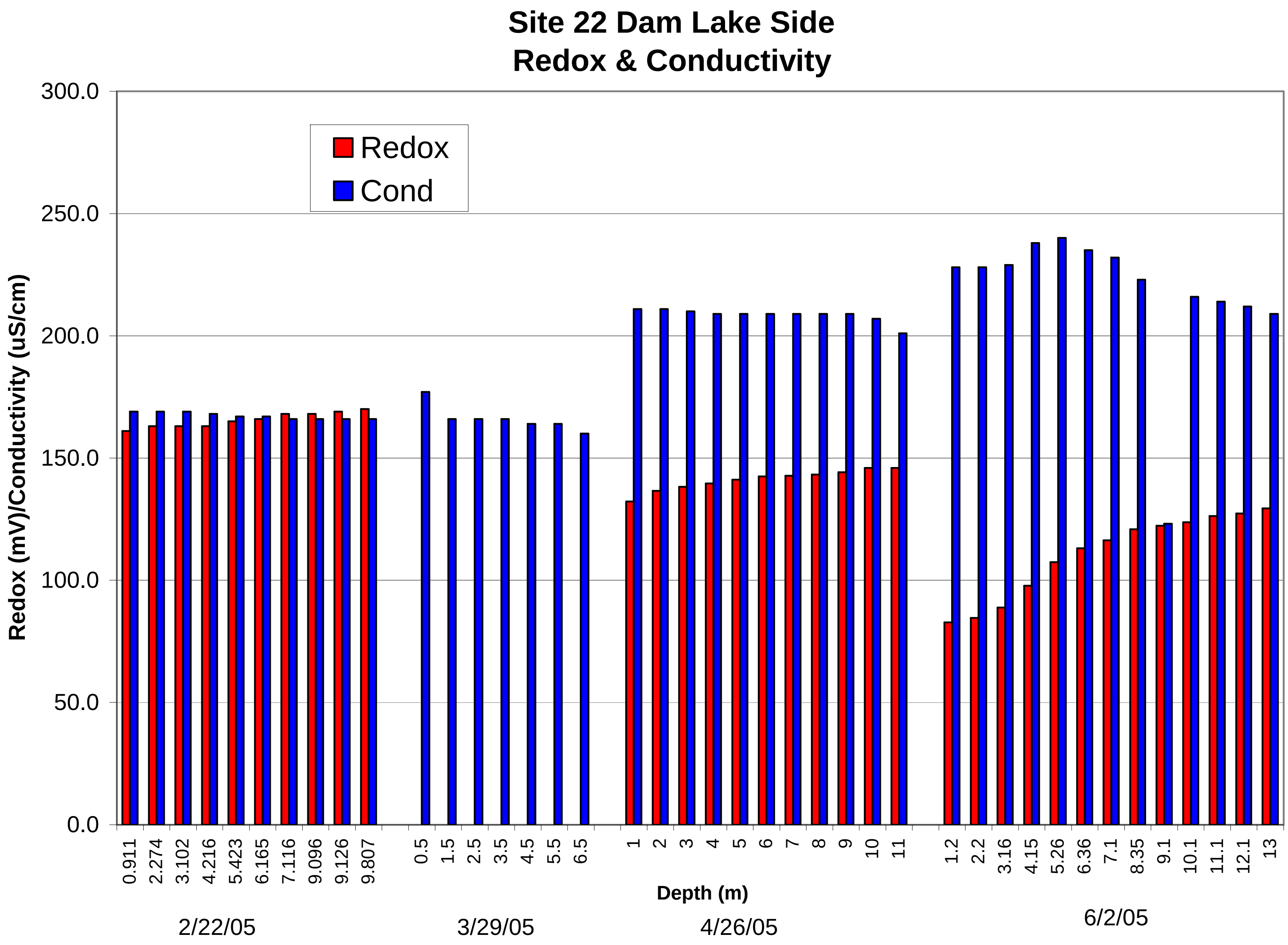

Site 5 South Fork
Redox & Conductivity
Redox
Cond
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Redox (mV)
700
600
500
400
300
200
100
0
Conductivity (uS/cm)
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

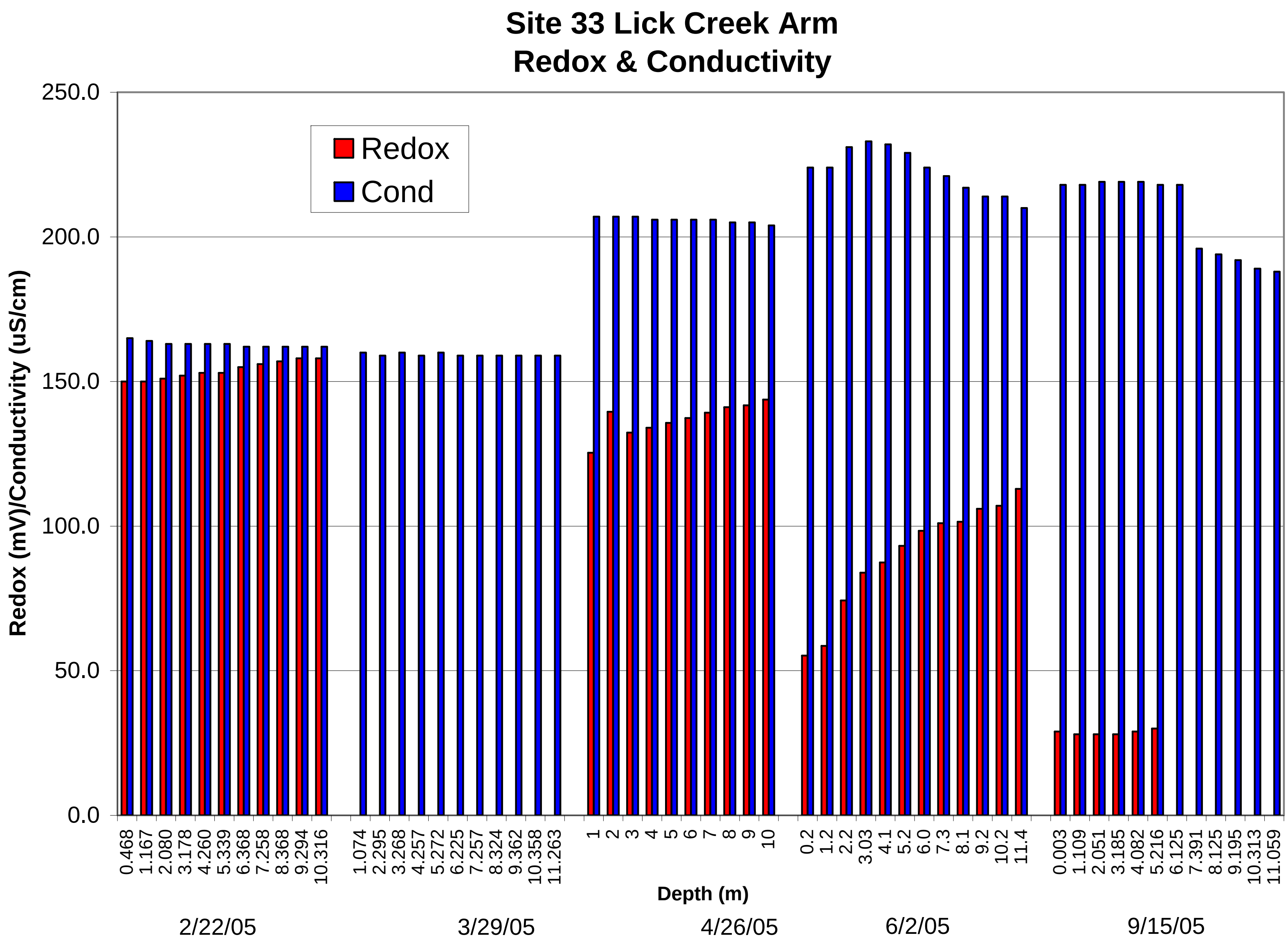

Site 8 South Fork
Redox & Conductivity
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Redox (mV)
500
450
400
350
300
250
200
150
100
50
0
Conductivity (uS/cm)
Redox
Cond
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

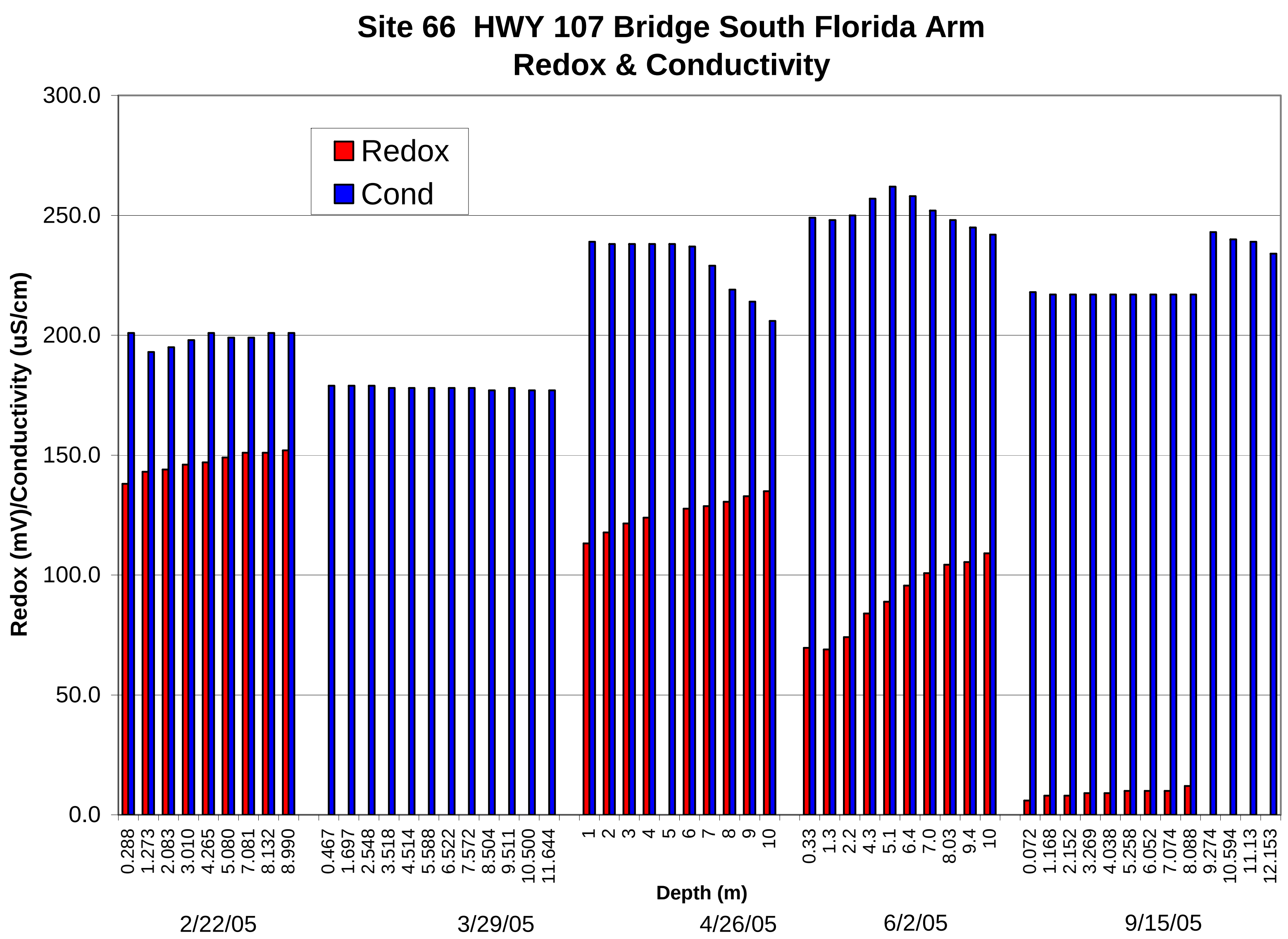

Site 9 Middle Fork
Redox & Conductivity
Redox
Cond
Redox (mV)
Conductivity (uS/cm)
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
600
500
400
300
200
100
0
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

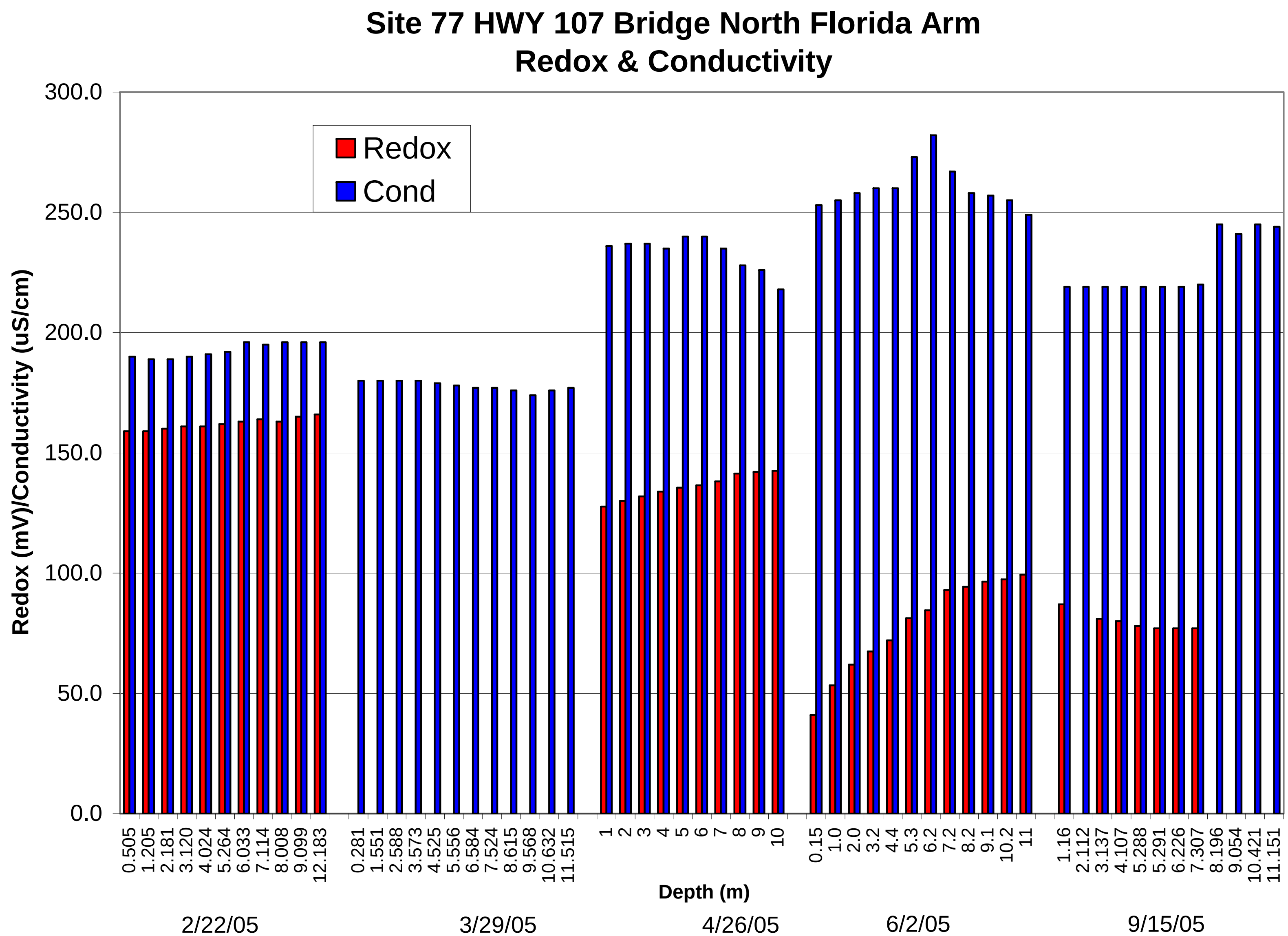

Site 11 North Fork
Redox & Conductivity
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Redox (mV)
600
500
400
300
200
100
0
Conductivity (uS/cm)
Redox
Cond
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date

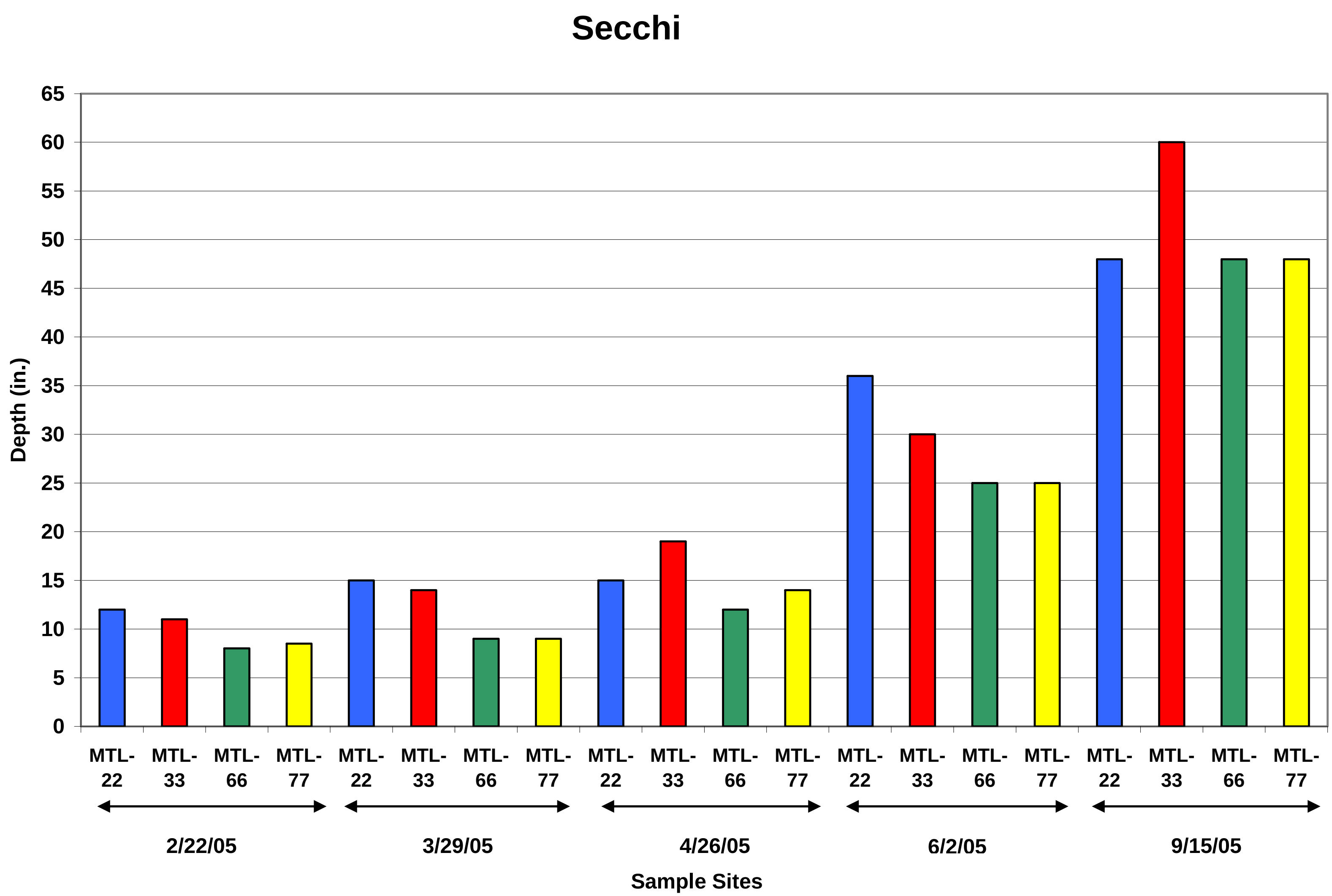

Site 12 Below Re-Reg Dam
Redox & Conductivity
Redox
Cond
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Redox (mV)
350
300
250
200
150
100
50
0
Conductivity (uS/cm)
2/22/2005
3/29/2005
4/26/2005
6/2/2005
7/6/2005
Sample Date


Site 22 Dam Lake Side
Redox & Conductivity
Redox
Cond
Redox (mV)/Conductivity (uS/cm)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.911
2.274
3.102
4.216
5.423
6.165
7.116
9.096
9.126
9.807
0.5
1.5
2.5
3.5
4.5
5.5
6.5
1
2
3
4
5
6
7
8
9
10
11
1.2
2.2
3.16
4.15
5.26
6.36
7.1
8.35
9.1
10.1
11.1
12.1
13
Depth (m)
2/22/05
3/29/05
4/26/05
6/2/05


Site 33 Lick Creek Arm
Redox & Conductivity
Redox
Cond
Redox (mV)/Conductivity (uS/cm)
250.0
200.0
150.0
100.0
50.0
0.0
0.468
1.167
2.080
3.178
4.260
5.339
6.368
7.258
8.368
9.294
10.316
1.074
2.295
3.268
4.257
5.272
6.225
7.257
8.324
9.362
10.358
11.263
1
2
3
4
5
6
7
8
9
10
0.2
1.2
2.2
3.03
4.1
5.2
6.0
7.3
8.1
9.2
10.2
11.4
0.003
1.109
2.051
3.185
4.082
5.216
6.125
7.391
8.125
9.195
10.313
11.059
Depth (m)
2/22/05
3/29/05
4/26/05
6/2/05
9/15/05


Site 66 HWY 107 Bridge South Florida Arm
Redox & Conductivity
Redox
Cond
Redox (mV)/Conductivity (uS/cm)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.288
1.273
2.083
3.010
4.265
5.080
7.081
8.132
8.990
0.467
1.697
2.548
3.518
4.514
5.588
6.522
7.572
8.504
9.511
10.500
11.644
1
2
3
4
5
6
7
8
9
10
0.33
1.3
2.2
4.3
5.1
6.4
7.0
8.03
9.4
10
0.072
1.168
2.152
3.269
4.038
5.258
6.052
7.074
8.088
9.274
10.594
11.13
12.153
Depth (m)
2/22/05
3/29/05
4/26/05
6/2/05
9/15/05


Site 77 HWY 107 Bridge North Florida Arm
Redox & Conductivity
Redox
Cond
Redox (mV)/Conductivity (uS/cm)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.505 1.205 2.181 3.120 4.024 5.264 6.033 7.114 8.008 9.099 12.183
0.281 1.551 2.588 3.573 4.525 5.556 6.584 7.524 8.615 9.568 10.632 11.515
1 2 3 4 5 6 7 8 9 10
0.15 1.0 2.0 3.2 4.4 5.3 6.2 7.2 8.2 9.1 10.2 11
1.16 2.112 3.137 4.107 5.288 5.291 6.226 7.307 8.196 9.054 10.421 11.151
Depth (m)
2/22/05
3/29/05
4/26/05
6/2/05
9/15/05



Secchi
Depth (in.)
65
60
55
50
45
40
35
30
25
20
15
10
5
0
MTL-22
MTL-33
MTL-66
MTL-77
2/22/05
3/29/05
4/26/05
6/2/05
9/15/05
Sample Sites