Compendium of Current Monitoring Programs
in Tampa Bay and its Watershed

Prepared for:

Tampa Bay National Estuary Program
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FOREWORD

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I. INTRODUCTION

Tampa Bay is the subject of research and monitoring programs conducted by several federal, state, regional, and local agencies and institutions. In order to provide information on existing monitoring programs, we conducted an investigation to identify a set of ongoing, recently suspended, and proposed monitoring programs for Tampa Bay and its watershed. A summary of each program investigated was classified as either a water quality, habitat, or living resource study and listed alphabetically by agency within each class.

During the course of the investigation contacts were made with federal, state, regional, and local agencies to identify a set of research programs that were involved with monitoring the living resources or physical systems of Tampa Bay. Discussions with the principal staff of the agency responsible for each identified program provided the information necessary for critical reviews. Preliminary data compiled by the Tampa Bay Regional Planning Council for the Southwest Florida Water Management District SWIM Program, and published literature provided additional information.

The information collected was reviewed and summarized with respect to the status, objective, approach, sample selection method, and level of sampling effort for each monitoring program. The status and objectives of each program were characterized by the principal staff contacted and the status was reported as either an ongoing effort, a proposed future effort, or a recently suspended effort. The approach of each monitoring program was reported as a summary of the sampling design, methods used, and parameters analyzed. Sample selection criteria were presented in terms of sample selection methods and geographic sample coverage. The sampling effort was presented in terms of temporal sample coverage, sampling event frequency, and number of samples taken per sampling event.
II. TAMPA BAY MONITORING PROGRAMS

WATER QUALITY
City of Clearwater
Recently Suspended, Surface Water Monitoring
Geographic Coverage Schematic

= Area Included in General Sample Coverage
City of Clearwater
Surface Ambient Water Monitoring Program

AGENCY:  City of Clearwater
Department of Public Works
Environmental Management Group

CONTACT:  Tom Miller
Assistant Director of Public Works/Environmental
City of Clearwater - Pollution Control
1605 Harbor Drive
Clearwater, FL 34615

STATUS:  Presently reevaluating existing program

OBJECTIVE:  To monitor run off and its impacts on receiving water to help determine
watershed management decisions

APPROACH:  The City of Clearwater initiated a surface water quality ambient monitoring
program in January of 1982, for all of the drainage basins within the City
jurisdiction. Water samples were monitored for temperature, pH, conductivity,
dissolved oxygen, biological oxygen demand, fecal coliform bacteria, fecal strep.
bacteria, oil and grease, ammonia, organic nitrogen, nitrate, nitrite, orthophosphate, and chlorophyll-a.

SAMPLE SELECTION:  There are nine drainage basins within City jurisdiction. In the past, 6 lakes and
6 creeks systems were sampled.

SAMPLING EFFORT:  A total of 29 stations were sampled. Stations were sampled discreetly.

REVALUATION EFFORT:  The program is currently suspended pending reevaluation of the watershed land
use and drainage pattern study. The monitoring program will begin in the
summer of 1992, and all lake and creek system bodies within City jurisdiction
will be sampled. Primary sample stations will be sampled monthly and
monitored for all of the previously sampled parameters. Chloride, total
phosphorus, and TKN will be added to the monitoring efforts if needed.
Secondary sample stations will be sampled monthly and monitored for
temperature, pH, salinity, TSS, DO, and conductivity. Sampling station
locations will be selected after the reevaluation effort.
City of Clearwater
Water Pollution Assessment Support Program

AGENCY:
City of Clearwater
Department of Public Works
Environmental Management Group

CONTACT:
Tom Miller
Assistant Director of Public Works/Environmental
City of Clearwater, Dept. of Environ. Mgmt.
P.O. Box 4748
Clearwater, FL 34618

STATUS:
Ongoing

OBJECTIVE:
To address the need for site specific water quality monitoring efforts when public health, safety, or other water related issues require sampling

APPROACH:
The City of Clearwater is presently conducting various monitoring projects regarding: permit compliance support, aeration system feasibility studies, and a water quality monitoring project in Spring Lake.

SAMPLE SELECTION:
Stations are selected discreetly regarding type, location, and time of the specific project.

SAMPLING EFFORT:
Depending on the objectives of the project, samples are monitored accordingly.
City of Gulfport
Surface Water Monitoring

AGENCY: City of Gulfport

CONTACT: Summary Data Provided by TBRPC
Mr. Peter Clark
TBRPC-ABM
9455 Koger Blvd., Suite 219
St. Petersburg, FL 33702

STATUS: Ongoing monitoring program

OBJECTIVE: To verify that conditions are safe for swimming in local areas of public access

APPROACH: Samples are collected from surface and near surface waters from the Gulfport Public Pier and the Gulfport Beach west end. Samples are analyzed by Pinellas County for bacteria concentrations.

SAMPLE SELECTION: Samples were taken as grab samples from public access areas.

SAMPLING EFFORT: Samples were collected on a monthly basis.
City of Largo
Sparkling Water Program
Geographic Coverage Schematic

= Area Included in General Sample Coverage
City of Largo
Monitoring Component of the Sparkling Water Program

AGENCY:  City of Largo

CONTACT:  Jack Salagar  
City of Largo  
225 1st. Avenue Southwest  
Largo, FL  34640

STATUS:  Ongoing and expanding monitoring program

OBJECTIVE:  To characterize the effluent from a wastewater treatment plant

APPROACH:  The City of Largo performs routine monitoring of treated wastewater effluents from its wastewater treatment plant. Effluent from the city's 10 MGD waste water treatment facility is reused to water local golf courses. Water reuse is planned for three golf courses on the shore of Tampa Bay. These courses are the Airco golf course, the Cove Cay Country Club, and Feather Sound. Effluent will be sampled from test wells from each reuse project. Feather Sound is the only reuse program in operation to date, and hence approximately 7 to 8 MGD effluent that is not able to be used in the reuse program is discharged daily to the Bay through the Feather Sound Lake system. Parameters measured from samples include conductivity, TOC, temperature, fecal coliform bacteria, turbidity, TDS, NO₃, Na, Cl, SO₄, and pH.

SAMPLE SELECTION:  The existing sample wells at Feather Sound were selected based on a study of the flow of groundwater through the system, and were submitted to the Florida DER for approval. Some of the wells were found to be tidally-influenced by Tampa Bay as evidenced by Cl levels.

SAMPLING EFFORT:  The six existing wells at the Feather Sound site have been monitored quarterly since 1985. Plans have been submitted to Florida DER to monitor wells at the two planned reuse facilities, and these plans will bring total sampling effort to 14 wells.
City of Palmetto
Wastewater Treatment Plant Discharge Monitoring

AGENCY: City of Palmetto
Public Works Department

CONTACT: Allen R. Tusing
City of Palmetto - Public Works Dept.
600 17th St. West
Palmetto, FL 34221

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor effluent of wastewater treatment plant in coordination with NPDES permit.

APPROACH: Samples are collected from the effluent of the City of Palmetto's 1.4 MGD discharge waste water treatment plant. Grab samples and flow measurements are collected daily with some parameters analyzed weekly. Parameters measured in the outfall included total phosphate, orthophosphate, fecal coliform bacteria, BOD$_5$, total Kjeldahl nitrogen, NO$_3$, NH$_3$, and total suspended solids.

SAMPLE SELECTION: Samples are taken as grab samples from the outfall prior to discharge.

SAMPLING EFFORT: Samples have been collected on a daily basis, with some parameters measured weekly.
City of St. Petersburg
Surface Water Monitoring

AGENCY: City of St. Petersburg Public Utilities
         Water Quality Assessment Division

CONTACT: Fred Crafa
         Manager, Water Quality Assessment Division
         City of St. Petersburg Public Utilities & Wastewater Treatment
         1635 3rd. Avenue N

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor bacteria levels in water at public beaches

APPROACH: The City of St. Petersburg previously monitored surface water quality, but
the program was halted in 1982 when the Environmental Affairs department was
disbanded. The City became a zero discharge area with regard to surface
waters when it began using residential reclamation, so there is no discharge
monitoring to surface waters. The City currently monitors total coliform
bacteria and fecal coliform bacteria at public beaches.

SAMPLE SELECTION: Two fixed sites were selected for monitoring. The sites were Maxima Beach
and North Shore Beach. Samples were selected from "knee-deep" water.

SAMPLING EFFORT: A single sample is collected at each beach in each month. Additional samples
are collected after rain events in summer.
City of Tampa
Bay Study Group Monitoring Programs

AGENCY: City of Tampa
         Sanitary Sewer - Bay Study Group

CONTACT: Roger Johansson, Chief Biologist
         Tampa Sanitary Sewers Dept.
         2700 Maritime Blvd
         Tampa, FL 33605

STATUS: Ongoing monitoring program

OBJECTIVE: The objectives are to monitor the responses of water quality and biological communities, particularly in Hillsborough Bay, to changes in nutrient loading. An additional objective was to monitor compliance with discharge regulations.

APPROACH: The Bay Study Group commenced five ongoing monitoring programs in Tampa Bay. These programs were developed to monitor phytoplankton, drift macroalgae, seagrasses, benthic macroinvertebrates, and compliance with discharge regulations. Parameters measured for the phytoplankton monitoring included taxonomy, enumeration, C¹⁴ uptake, chlorophyll content, temperature, conductivity, DO, pH, and nutrient concentrations in the water column. The macroalgae (e.g. Ulva, Gracilaria) monitoring program was designed to monitor spatio-temporal variation in biomass and species composition. The seagrass program was planned to perform photographic remote sensing and ground inspection of seagrass distribution. Parameters monitored weekly in the effluent compliance program were designed to characterize effluents in accordance with FDER regulations and to monitor chlorophyll.

SAMPLE SELECTION: Fixed sample stations and transects were selected systematically in Hillsborough Bay, and an additional station was sampled in the middle Bay adjacent to the channel between Ruskin and St. Petersburg.

SAMPLING EFFORT: Three stations have been sampled monthly by the phytoplankton and water quality monitoring programs since 1978. Four transects have been sampled monthly by the macroalgae program since 1983. In addition to an annual assessment of the distribution of seagrasses in Hillsborough Bay, seven discrete stations have been sampled seasonally by the seagrass program since 1986. Three stations have been sampled in Hillsborough Bay by the benthic macroinvertebrate program monthly or bimonthly since 1987. The compliance monitoring program began in 1990 and currently monitors effluents at one station south of Davis Island, one in East Bay, one between Davis Island and Hookers Point, and one off Ballast Point.
Environmental Protection Commission of Hillsborough County
Surface Water Quality Monitoring Program

AGENCY: Environmental Protection Commission of Hillsborough County
        Water Management Division

CONTACT: Tom Cardinale
         Asst. Director, Environmental Monitoring and Analysis
         E.P.C. of Hillsborough Co.
         1900 9th. Avenue
         Tampa, FL  33605

STATUS: Ongoing monitoring program

OBJECTIVE: A continuous program for monitoring ambient water pollution and an evaluation
           of trends of pollution in Tampa Bay and its tributaries in Hillsborough County

APPROACH: Ambient water monitoring has been routinely conducted since 1972. Parameters
           measured in ambient surface water samples included: dissolved oxygen, temperature,
           conductivity, pH, total solids, ammonia, nitrite, nitrate, ortho phosphate, total phosphate,
           suspended solids, BOD, chlorophyll, color, sulfates, turbidity, fluorides, chloride,
           total and fecal coliform bacteria, fecal strep, calcium, cadmium, chromium, copper,
           iron, potassium, magnesium, manganese, sodium, nickel, lead, and zinc. Phytoplankton
           samples were routinely collected and analyzed qualitatively and quantitatively.

SAMPLE SELECTION: Fifty-four water quality stations were fixed in a county-wide network covering
Old Tampa Bay, Hillsborough Bay, Middle Tampa Bay, and Lower Tampa Bay. In Hillsborough
County, 38 stations were fixed in the tributaries.

SAMPLING EFFORT: In 1991, 92 stations were sampled monthly as part of the surface water
monitoring network. Ambient water monitoring has been routinely conducted since 1972.
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Environmental Protection Commission of Hillsborough County
Permitted Facilities Compliance Monitoring Program

AGENCY: Environmental Protection Commission of Hillsborough County
Water Management Division

CONTACT: Christopher A. Dunn, P.E.
Director, Water Management Division
E.P.C. of Hillsborough County
1900 9th Avenue
Tampa, FL 33605

STATUS: Ongoing monitoring program

OBJECTIVE: A continuous program for monitoring compliance of permitted facilities

APPROACH: Compliance monitoring has been routinely conducted since 1972. A county-wide surveillance network and a continuous point source waste water monitoring/sampling program is conducted. Parameters measured are facility specific.

SAMPLE SELECTION: At a minimum, sampling is conducted within the effluent of each permitted discharging facility.

SAMPLE EFFORT: Each permitted discharging facility is monitored as part of the permitted facilities compliance monitoring program. In 1991, there were 188 permitted facilities actively discharging. The E.P.C. of Hillsborough County attempted to sample each facility twice per year, and compliance monitoring has been routinely conducted since 1972. Sampling focuses on surface dischargers and those discharging in areas of public access. Dischargers are required to perform self-monitoring on a quarterly basis.
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Florida Department of Environmental Regulation  
Proposed Ambient Water Quality Monitoring

AGENCY: Florida Department of Environmental Regulation  
Southwest District

CONTACT: Douglas Farrell  
Surface Water Management Technical Assistance  
Southwest District, Florida Department of Environmental Regulation  
4520 Oak Fair Blvd.  
Tampa, FL 33610-7347

STATUS: Proposed monitoring programs, status not determined due to funding limitations

OBJECTIVE: The objective of the proposed water quality monitoring component was to provide information which in conjunction with other monitoring programs could determine if waters of the Southwest District were meeting their designated use criteria. The proposed biological monitoring component had the cojoint goals of augmenting establishment of freshwater reference stations for use with Rapid Bioassessment Protocols and to provide a pilot survey for future efforts.

APPROACH: Parameters proposed to be measured by the water quality monitoring component included nutrients, sulfate, fluoride, and chloride concentrations, temperature, conductivity, DO, and pH. On a one year basis, sediment and water column samples were proposed to be analyzed for metals, pesticides and volatile organics. Parameters proposed to be monitored by the biological monitoring component included artificial substrate samples and parameters required for Rapid Bioassessment Protocols.

SAMPLE SELECTION: Fixed stations were selected systematically based on previous data. An attempt was made to locate reference sites. Biological samples were chosen within the Peace River, Manatee River, Hillsborough River, and several coastal streams near the mouth of Tampa Bay. Chemistry stations were chosen at several marine sites including John's Pass, Bunces Pass, and near Green Key in Pasco County.

SAMPLING EFFORT: Two man-years of effort were proposed for the sampling programs. Biological sampling was proposed to be conducted on a seasonal (hot/cold) basis at 18 stations, and chemical sampling was proposed to be conducted on a quarterly basis at 30 stations. A similar level of effort was proposed for future years, and the status of the program was recently characterized as undetermined due to limited funding.
Manatee County Environmental Action Commission
Ambient Water Program
Geographic Coverage Schematic

- = Area Included In General Sample Coverage
- = Additional Sampling Station

CHOASTAL
ENVIRONMENTAL RESOURCES BUREAU
Manatee County Environmental Action Commission
Ambient Water Quality Program

AGENCY: Manatee County
Environmental Action Commission

CONTACT: Robert C. Brown, Water Quality Manager
Environmental Action Commission
P.O. Box 1000
Bradenton, FL 34206

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor ambient water quality in Tampa and Sarasota Bays

APPROACH: The Manatee County Environmental Action Commission has maintained an
ambient water quality monitoring network in the southern portion of Tampa Bay
and the northern portion of Sarasota Bay. There was some overlap with the
northernmost stations of the Sarasota Bay National Estuary Program water
quality monitoring stations. Monitoring has been ongoing since the 1960's, and
data have been submitted to the STORET system for the years up to and
including 1988. The Ambient Water Program parameters measured in the field
include temperature, time, sample depth, pH, wind direction and velocity, tide
condition and direction of flow, dissolved oxygen, conductivity, salinity, and
Secchi depth. The parameters measured in the laboratory included TKN, BOD,
chlorophyll a, chlorophyll b, chlorophyll c, phaeophytin, nitrite, nitrate, total
suspended solids, fixed solids, volatile solids, turbidity, ammonia, chloride,
color, fluoride, and total P. The Sarasota Bay National Estuary Program samples
include only chlorophyll a for pigments, and include the additional
measurements of percent cloud cover, wave conditions, ortho phosphate, cell
count, total organic carbon, and total inorganic carbon.

SAMPLE SELECTION: A network of fixed sample stations are located in the southern portions of
Tampa Bay, Terra Ceia Bay, Palma Sola Bay, Manatee River, Myakka River, and
the northern portion of Sarasota Bay.

SAMPLING EFFORT: Monitoring has been conducted annually from the 1960's to the present. The
Ambient Water Program network include a total of 23 stations, and each station
is sampled monthly. Approximately 9 stations of the Sarasota Bay National
Estuary Program overlapped geographically with the Ambient Water Program
stations, and these stations were sampled quarterly. A similar level of effort is
planned for future years.
Manatee Port Authority
Surface Water Monitoring

AGENCY:  Manatee Port Authority

CONTACT: Summary Data Provided by TBRPC
Mr. Peter Clark
TBRPC-ABM
9455 Koger Blvd., Suite 219
St. Petersburg, FL 33702

STATUS:  Ongoing monitoring program

OBJECTIVE: To monitor water conditions in the Manatee Port region

APPROACH: Samples are collected from surface waters by electronic instruments. Parameters measured include turbidity, visibility (secchi disk), pH, temperature, conductivity, and dissolved oxygen.

SAMPLE SELECTION: Samples are taken from 10 fixed stations within the port area.

SAMPLING EFFORT: Samples are collected on a monthly basis since 1989.
Manatee Public Works
Surface Water Monitoring (Suspended 1991)
Geographic Coverage Schematic

- = Area Included In General Sample Coverage
Manatee Public Works
Surface Water Monitoring

AGENCY: Manatee Public Works

CONTACT: T. Scott Linkenhoker
Manatee Public Works
Manatee County Government
P.O. Box 1000
Bradenton, FL 34206-1000

STATUS: Monitoring program suspended in 1991

OBJECTIVE: To monitor surface water effluent

APPROACH: The Manatee Public Works Department began monitoring sampling stations associated with stormwater runoff and septic tank runoff in June of 1990. Samples were collected until the program was halted in May of 1991. Parameters measured included rainfall, TKN, suspended solids, nitrite, nitrate, ammonia, and fecal coliform bacteria.

SAMPLE SELECTION: Samples were collected from a stormwater lake outfall, a stormwater ditch outfall, at the midpoint of a canal, and on a point of land adjacent to a canal. All locations were at a point of land on the Terra Ceia Bay known as Palmetto Point.

SAMPLING EFFORT: Samples were collected weekly from June, 1990 to May, 1991 and the sampling program was then suspended.
Pinellas County Department of Environmental Management
Surface Water Ambient Monitoring Program

AGENCY: Pinellas County
Department of Environmental Management (DEM)

CONTACT: Don Moores
Program Manager
Water Resources Management Section
Pinellas County
2208 Riverside Dr. N
Clearwater, FL 34624

STATUS: Ongoing and expanding monitoring program

OBJECTIVE: To monitor runoff and its impacts on receiving water

APPROACH: Pinellas County DEM initiated an ambient water quality monitoring network to monitor quality of discharge from each of its defined drainage basins and adjacent coastal waters. Monitoring began at the commencement of 1991 for temperature, conductivity, and DO. The program expanded from this point to include measurements of total coliform bacteria, fecal coliform bacteria, fecal strep. bacteria, nitrite, nitrate, orthophosphate, total suspended solids, chlorophyll-a, chlorophyll-b, chlorophyll-c, phaeophytin, and 5-day-BOD. Total phosphorus, ammonia, and TKN will be measured when the laboratory develops the capability to perform the analyses.

SAMPLE SELECTION: A total of 72 primary (monthly) fixed sample stations were systematically selected. At least one primary sample was selected for each of the 52 drainage basins defined in the County. Adjacent coastal waters were also sampled, and an additional 39 secondary (bimonthly) fixed sample stations were systematically selected in critical areas of the same waters. An effort was made not to sample areas on the Tampa Bay side of Pinellas County which were already being sampled by Hillsborough County. Six of the fixed sample stations were located in Boca Ciega Bay, and one was located in Old Tampa Bay.

SAMPLING EFFORT: In 1991, 141 stations were sampled monthly or bimonthly. A similar effort is planned for each future year.
Pinellas County Sewer System, Water Quality Management Division
Boca Ciega Bay Surface Water Environmental Monitoring Program
Geographic Coverage Schematic

Lake Tarpon

Hillsborough R.

Palm River

Alafla R.

Little Manatee R.

Manatee R.

St. Petersburg

Tampa

N

= Area Included In General Sample Coverage

31
Pinellas County Sewer System, Water Quality Management Division  
Boca Ciega Bay Surface Water Environmental Monitoring Program

AGENCY: Pinellas County Sewer System (PCSS)  
Water Quality Management Division (WOMD)

CONTACT: Sheri A. Lovely  
Program Supervisor  
Environmental Monitoring Section  
Pinellas Co. Sewer System  
14850 118th Avenue North  
Largo, FL 34644

STATUS: Ongoing and expanding monitoring program

OBJECTIVE: To monitor ambient water quality conditions in Boca Ciega Bay

APPROACH: PCSS monitors water quality in Boca Ciega Bay in order to build a historical database of various water quality parameters. These baseline data would be used for comparisons with data collected following an emergency discharge. Monitoring began in May 1991 with measurements of fecal coliform and fecal streptococcus levels, and was expanded to bimonthly monitoring in July of 1991. The parameter list was expanded at this time to include temperature, pH, conductivity, salinity, and dissolved oxygen. The program also included sampling for analyses of 5-day biochemical oxygen demand, 5-day carbonaceous biochemical oxygen demand, total suspended solids, turbidity, chloride, total Kjeldahl nitrogen, ammonia, nitrate and nitrite, total phosphorus, orthophosphate, fecal coliform, and fecal streptococcus.

SAMPLE SELECTION: Ten fixed sample stations were selected from both sides of the Bay between John’s Pass and Conch Key. One of the sites, near Veteran’s Memorial Park, overlaps with the outfalls monitoring project.

SAMPLING EFFORT: The ten sites have been sampled bimonthly since May 1991, and this level of effort is planned for future years.
Pinellas County Sewer System, Water Quality Management Division
Outfalls Surface Water Environmental Monitoring Program
Geographic Coverage Schematic

[Map of geographic coverage with various locations and rivers indicated]

- Lake Tarpon
- Hillsborough R.
- Tampa
- Palm River
- Alafia R.
- St. Petersburg
- Little Manatee R.
- Manatee R.

= Area Included in General Sample Coverage

COASTAL ENVIRONMENTAL SERVICES INC.

33
Pinellas County Sewer System, Water Quality Management Division
Outfalls Surface Water Environmental Monitoring Program

AGENCY: Pinellas County Sewer System (PCSS)
        Water Quality Management Division (WQMD)

CONTACT: Sheri A. Lovely, Program Supervisor
         Environmental Monitoring Section
         Pinellas Co. Sewer System
         14850 118th Avenue North
         Largo, FL 34644

STATUS: Ongoing monitoring program

OBJECTIVE: Prior to initiation of the effluent injection disposal program (i.e. cessation of effluent discharge), the objectives were to monitor the responses of receiving waters to additional nutrients and to monitor compliance with discharge regulations. The present objective is to monitor ambient water quality conditions in Cross Bayou, Boca Ciega Bay, and portions of the Intracoastal Waterway.

APPROACH: PCSS monitors the bay waters of southwest Pinellas County in order to build a historical database of various water quality parameters. These data would be used to compare with data collected following discharges due to emergencies or due to mechanical integrity testing of injection wells. Monthly monitoring began in 1974. Presently the program measures parameters, such as temperature, pH, conductivity, salinity, and dissolved oxygen. The program also includes sampling for analyses of 5-day biochemical oxygen demand, 5-day carbonaceous biochemical oxygen demand, total suspended solids, turbidity, chloride, ammonia, nitrate and nitrite, total phosphorus, orthophosphate, fecal coliform, and fecal streptococcus.

SAMPLE SELECTION: In 1974, fixed sample stations were selected in relation to surface water discharges from wastewater treatment facilities. Two sites were selected on either side of a sewer outfall to a tributary of South Cross Bayou (Joe’s Creek). Four sites were selected between Cross Bayou and Veteran’s Memorial Park. Two sites were selected on either side of a sewer outfall along the Intracoastal Waterway at the Narrows.

SAMPLING EFFORT: Following the discontinuation of effluent discharges to surface waters in 1988. The present eight fixed sample stations are monitored monthly, and this level of effort is planned for future years.
Pinellas County Sewer System, Water Quality Management Division
Lake Tarpon Surface Water Environmental Monitoring Program

AGENCY: Pinellas County Sewer System (PCSS)
        Water Quality Management Division (WQMD)

CONTACT: Sheri A. Lovely
         Program Supervisor
         Environmental Monitoring Section
         Pinellas Co. Sewer System
         14850 118th Avenue North
         Largo, FL 34644

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor water quality conditions in Lake Tarpon in order to detect potential non-point source discharge associated with reclaimed water spray fields

APPROACH: Pinellas County Sewer System began monitoring water quality in Lake Tarpon in 1990 to detect effects of potential non-point discharges from reclaimed water spray fields. The quarterly monitoring program included measurement of physical parameters, such as temperature, pH, conductivity, and salinity. The program also included measurement of 5-day biochemical oxygen demand, total organic carbon, alkalinity, total solids, volatile solids, fixed solids, total suspended solids, volatile suspended solids, fixed suspended solids, turbidity, chlorides, total Kjeldahl nitrogen, ammonia, nitrate and nitrite, total phosphorus, orthophosphate, fecal coliform, and fecal streptococcus.

SAMPLE SELECTION: Seven fixed sample stations were selected near drainage areas from housing developments which use reclaimed water for irrigation. The housing developments were Highland Lakes, Cobb’s Landing, Wentworth, Lansbrook, President’s Landing, and a site near Anderson Park.

SAMPLING EFFORT: Pinellas County Sewer System monitored sites monthly throughout Lake Tarpon from 1984 to 1987. In 1987, the Pinellas County Department of Environmental Management began a Lake Tarpon Monitoring Program. In July of 1990, PCSS resumed monitoring of the lake to fulfill the objective stated above. This monitoring included seven sites which are sampled quarterly, and a similar level of effort has been planned for future years.
Pinellas County Sewer System, Water Quality Management Division
Brooker Creek Surface Water Environmental Monitoring Program

AGENCY: Pinellas County Sewer System (PCSS)
Water Quality Management Division (WQMD)

CONTACT: Sheri A. Lovely
Program Supervisor
Environmental Monitoring Section
Pinellas Co. Sewer System
14850 118th Avenue North
Largo, FL 34644

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor water quality conditions in Brooker Creek, a tributary of Lake Tarpon, in order to detect potential non-point source discharge associated with reclaimed water spray fields.

APPROACH: PCSS has monitored water quality in Brooker Creek since 1990 in order to detect effects of possible non-point discharges from reclaimed water spray fields. Monthly monitoring included measurements of physical parameters, such as temperature, pH, conductivity, and dissolved oxygen and measurements of water quality parameters, such as chloride, nitrate and nitrite, total Kjeldahl nitrogen, ammonia, total phosphorous, and orthophosphate. In addition, the following parameters were measured quarterly: 5-cay biochemical oxygen demand, total organic carbon, alkalinity, total solids, volatile solids, fixed solids, total suspended solids, volatile suspended solids, fixed suspended solids, turbidity, fecal coliform and fecal streptococcus.

SAMPLE SELECTION: In order to monitor compliance with reuse permits, ten fixed sample stations were selected along Brooker Creek. The developments associated with these sites were Pine Ridge, Tarpon Woods, and East Lake Woodlands.

SAMPLING EFFORT: Ten sites have been sampled monthly since 1990, and a similar level of effort is planned for future years.
Pinellas County Sewer System, Water Quality Management Division
Investigation of Receiving Water Conditions at Ft. DeSoto Park

AGENCY: Pinellas County Sewer System (PCSS)
Water Quality Management Division (WQMD)

CONTACT: Sheri A. Lovely
Program Supervisor
Environmental Monitoring Section
Pinellas Co. Sewer System
14850 118th Avenue North
Largo, FL 34644

STATUS: Concluded Investigative Study Monitoring

OBJECTIVE: The objective of the one year study was to resolve wastewater treatment plant
discharge issues at Ft. DeSoto Park. Site specific information on receiving
water conditions was collected for an analysis of management alternatives.

APPROACH: PCSS monitored the waters surrounding Ft. DeSoto Park from June, 1984 to
June, 1985. The program monitored for water quality, diel oxygen changes,
benthic invertebrates, sediment, circulation, and tide levels on a quarterly basis.
Physical parameters measured included temperature, pH, transparency,
conductivity, salinity, wind velocity and direction, air temperature, depth, and
dissolved oxygen. The measured parameters also included 5-day biochemical
oxygen demand, carbonaceous biochemical oxygen demand, chlorophyll a, total
suspended solids, turbidity, total organic carbon, total Kjeldahl nitrogen,
ammonia, nitrate, nitrite, total phosphorus, orthophosphate, fecal coliform, and
total coliform.

SAMPLE SELECTION: In 1984, four fixed sample stations were selected in relation to surface water
discharges from waste water treatment facilities, and three stations were
selected as control sites. Three sample sites were intermediate between
discharge location sites and three control sites.

SAMPLING EFFORT: Ten sites were sampled for a one year period in 1984. If sufficient funding
existed, a survey of the sites to determine the effect of discharge cessation
would be desired.
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Southwest Florida Water Management District
Stormwater Contaminant Removal Efficiency Studies

AGENCY: SWFWMD

CONTACT: Betty Rushton, Ph.D.
Southwest Florida Water Management District, SWIM Dept.
2739 Broad Street
Brooksville, FL 34609-6899

STATUS: Recent and ongoing monitoring program

OBJECTIVE: To determine stormwater contaminant removal efficiency of wetland and detention pond stormwater treatment methods.

APPROACH: Three types of water quality studies are currently being conducted by the program: grab sample surveys of wetlands and detention ponds, in-depth studies of contaminant removal efficiencies, and experimental studies of detention ponds. Parameters measured include $\text{NO}_2 + \text{NO}_3$, $\text{NH}_3$, $\text{NH}_3 + \text{Org N}$, ortho-$\text{P}$, total-$\text{P}$, total metals (Zn, Cd, Cr, Mn, Ni, Cu, Fe, Pb), temperature, conductivity, DO, and pH.

SAMPLE SELECTION: Samples have been selected for the grab sample surveys from wetlands and detention ponds throughout SWFWMD's jurisdiction. In-depth studies of contaminant removal efficiencies are being conducted at two detention ponds at the Tampa office of SWFWMD, a wetland at Hidden River, and a detention system at Horizon Park.

SAMPLING EFFORT: Grab samples have been collected after nearly every rain event in 24 wetlands for the past year, and sampling is ongoing. Grab samples were collected after nearly every rain event in 24 detention ponds from 1990 to 1991. Sampling of the four ongoing in-depth studies began with sampling of one of the detention ponds at the SWFWMD Tampa office in 1989. Samples are also being collected after nearly every rain event at a pair of experimental ponds.
West Coast Regional Water Supply Authority
Tampa Bypass Canal and Hillsborough R. Bio. Monitoring and Assess. Program
Geographic Coverage Schematic
Tampa Bypass Canal and Hillsborough River Biological Monitoring and Assessment Program

AGENCY: West Coast Regional Water Supply Authority

CONTACT: Richard Chinn
Environmental Specialist
West Coast Regional Water Supply Authority
2535 Landmark Drive
Clearwater, FL 34621

STATUS: Ongoing monitoring program

OBJECTIVE: To determine how discharge (flow) conditions affect water quality and biologic communities in the vicinity of the lower Hillsborough River

APPROACH: The program was planned to sample the water quality, phytoplankton, macroinvertebrates, juvenile fishes, and ichthyoplankton of the lower Hillsborough River and Palm River systems. Parameters measured include: temperature, salinity, DO, color, turbidity, TSS, BOC, TOC, ammonia, nitrite, nitrate, TKN, orthophosphate, total phosphate, total dissolved solids, chloride, sulfate, phytoplankton, ichthyoplankton, macroinvertebrates, and juvenile fishes.

SAMPLE SELECTION: Sample locations were selected in the lower Tampa Bypass Canal and Hillsborough River System from a list specified in the Water Use Permits. Site selection criteria included the following: (1) optimization of coverage for the study area, (2) representativeness of area, (3) consideration of possible contamination (e.g. stormwater inputs) and (4) physical suitability for sampling method.

SAMPLING EFFORT: The monitoring program is planned to run from the Fall of 1991 to the Fall of 1994. In the first study year, temperature, salinity, and DO were planned to be sampled monthly at 19 stations. Water quality was sampled monthly at 11 stations. Two replicate phytoplankton samples were planned for each month at each of 9 stations. Three replicate macroinvertebrate samples were planned for each quarter at each of 9 stations. Two replicate ichthyoplankton samples were planned for each month at each of 7 stations, and seine samples were planned for monthly collection of juvenile fishes at each of 10 stations.
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U.S. Geological Survey
Measurement of Non-Point-Source Nutrient Loading to Estuaries
with Emphasis on Tidally Dominated Rivers: A Case Study of Hillsborough Bay

AGENCY: USGS; Cooperating Agency: Southwest Florida Water Management District

CONTACT: William M. Woodham
U.S. Geological Survey
4710 Eisenhower Blvd B-5
Tampa, FL 33634

STATUS: Ongoing program

OBJECTIVE: The objective is to provide realistic estimates of non-point-source loading of nutrients to Hillsborough Bay in order to satisfy the need to develop a nutrient budget and provide reliable data for input to a eutrophication model. The eutrophication model will be developed at some future time. A second objective is to develop and operate a cost-effective technique for measuring nutrient loads in a tidally-dominated river at its most downstream point in order to eliminate unmeasured loads from parts of the drainage basin.

APPROACH: The overall approach for developing reliable non-point-source nutrient loading estimates for Hillsborough Bay is based on an extensive program of field measurements and sampling. An innovative application of state-of-the-art velocity measuring equipment will be tested and evaluated for continual measurement of tidal discharge and appropriate nutrient concentrations at the mouth of the Alafia River for determining nutrient loading rates from the entire basin. If successful, such techniques could later be applied to other major tributaries to Tampa Bay. Results will be used to design a data collection program which will provide yearly constituent loading and seasonal variability from the Alafia River basin.

SAMPLE SELECTION: Alafia River at State Highway 640 and at U.S. Highway 41; Lithia Springs; Tampa Bypass Canal (Palm River) at S-160; Hillsborough River Tampa Dam and at Platt Street; and Sulphur Springs.

SAMPLING EFFORT: Monthly sample collection at Alafia, Palm, and Hillsborough Rivers. Sampled constituents include dissolved and total ammonia, nitrate plus nitrite, organic nitrogen, carbon, orthophosphate, phosphorous; dissolved silica; chlorophyll a and b; total suspended solids; conductance; chloride; and 5-day biochemical oxygen demand.
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U.S. Geological Survey
Evaluation of Stormwater Detention Basins in West-Central Florida

AGENCY: USGS; Cooperating Agency: Pinellas County

CONTACT: William M. Woodham
         U.S. Geological Survey
         4710 Eisenhower Blvd B-5
         Tampa, FL 33634

STATUS: Data collection completed; report in preparation

OBJECTIVE: To determine the effectiveness of runoff detention ponds in reducing suspended solids, nutrients, metals, coliform, and biochemical oxygen demand (BOD) loading entering receiving waters from urban areas in Pinellas County.

APPROACH: Runoff quantity and quality of an urban watershed will be monitored for a year before the construction of a stormwater detention pond just upstream from the monitoring station. This will provide background data to compare with data collected after completion of the pond in the second year. After completion of the pond, an additional sampling station will be established at the inflow. Loads entering and leaving the pond will be compared. Detention Basin #3 on St. Joe Creek at Pinellas Park.

SAMPLE SELECTION: Detention Basin #3 on St. Joe Creek at Pinellas Park.

SAMPLING EFFORT: Daily discharge and rainfall are recorded at the inflow and outflow of the pond. Quarterly baseflow and storm runoff water quality samples for four storms are collected and analyzed at both inflow and outflow stations. Constituent loads of Cl, Cu, Cr, Pb, Zn, N, P, BOD, and total solids are computed for each storm. This project began in October 1980.
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U.S. Geological Survey
Fine Sediment Resuspension Processes and Light Attenuation
in Shallow Estuarine Environments

AGENCY: USGS; Cooperating Agencies: City of St. Petersburg, Hillsborough
Environmental Protection Commission, Pinellas County, Southwest Florida
Water Management District, Tampa Port Authority

CONTACT: David H. Schoellhamer,
U.S. Geological Survey
4710 Eisenhower Blvd B-5
Tampa, FL 33634

STATUS: Sampling completed, report to be completed

OBJECTIVE: The objectives were to determine the mechanisms that cause resuspension of
fine sediments from the bottom of Tampa Bay and to determine the effect of
these resuspended materials on light attenuation. Reports on bottom sediment
distribution and on sedimentation in the port of St. Petersburg are also
expected.

APPROACH: Instrumentation was deployed at several sites to measure vertical profiles of
velocity and suspended solids and to detect resuspension caused by tidal
currents, cold fronts, tropical storms, thunderstorms, and ship wakes. Light
attenuation and water quality were measured during instrument deployments
and during monthly sampling trips.

SAMPLE SELECTION: A deep-water and a shallow-water sampling site was selected in Hillsborough
Bay and in Old Tampa Bay. Each of site is representative of a large part of the
bay bottom.

SAMPLING EFFORT: To relate the resuspension information to light attenuation and to detect
possible interferences from nonresuspension processes (such as phytoplankton
blooms, river discharges, and stormwater runoff), light and water quality data
were collected at least every month at the sampling sites and at two nearby
companion sites with sandy bottoms. Resuspension monitoring instrumentation
was deployed during events which were anticipated to be able to cause
resuspension, including spring tides, cold fronts, and thunderstorms. Data were
collected from 1987 to 1991.

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U.S. Geological Survey
Light attenuation in the estuarine and coastal waters of southwestern Florida
-- causes and implications.

AGENCY: USGS; Southwest Florida Water Management District

CONTACT: Ben McPherson
U.S. Geological Survey
4710 Eisenhower Blvd B-5
Tampa, FL 33634

STATUS: Sampling completed; reports in preparation.

OBJECTIVE: The objectives are: (1) to evaluate how light (photosynthetically active radiation, PAR) attenuation varies spatially and over time in Tampa Bay and Charlotte Harbor; (2) to evaluate causes of light attenuation in these estuarine waters; (3) to evaluate availability of light (PAR) with special emphasis on seagrass needs.

APPROACH: Irradiance was measured using a spherical quantum sensor that detected radiation in the 400-700 nm range (PAR). The "in-water" sensor was lowered through the water column to a series of depths, and measurements of scalar irradiance were made at each depth. Each irradiance value in the water was adjusted for changes in incoming solar PAR based on an in air sensor reading and was recorded in $\mu$(m$^2$s)$^{-1}$. Water-quality data were collected and sky conditions were recorded with each irradiance profile.

In addition to the primary method of measuring PAR, 5 minute averages of attenuation were made continuously on a number of days in 1990-1991 at a station in Tampa Bay. Two spherical quantum sensors were positioned in the water, separated by a fixed interval of 1 or 2 meters, and irradiance was recorded simultaneously every 5 minutes and used to compute attenuation coefficients. In-air solar irradiance was also measured. Water-quality samples were collected by automatic sampler every few hours for several days during the June 1991 sampling.

SAMPLE SELECTION: Six sampling sites that represent different estuarine environments in Tampa Bay were established.

SAMPLING EFFORT: Stations were established in Tampa Bay and Charlotte Harbor and sampled every 1 to 2 months from October 1989 to October 1991. A total of 16 sampling trips were made to each station, and four replicate vertical profiles were made at each station. A number of additional trips were made for special studies.
U.S. Geological Survey
Water Quality Sampling Station Locations

EXPLANATION
△ 02300500 STREAM GAGING STATION
▼ 02307000 GW SAMPLING SITE

USGS Monitoring Sites

SITE: Manatee River 02299950
27°28'24" 82°12'41"

FLOW DATA: Collected from 1966 to the present.

WATER QUALITY DATA: Collected from 1966 to the present.

CURRENT DATA COLLECTION:

Bimonthly
Temperature, conductivity, DO, pH

Annually
BOD, NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP,
Ortho P, TOC

SITE: Little Manatee River 02300100
27°42'16" 82°11'53"

FLOW DATA: Collected from 1963 to the present.

WATER QUALITY DATA: Collected from 1966 to the present.

CURRENT DATA COLLECTION:

Bimonthly
Temperature, conductivity, DO, pH
BOD, NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP,
Ortho P

Twice yearly
Ca, Mg, K, SO₄, Cl, F, Si, Sr, TOC
USGS Monitoring Sites (continued)

SITE: Little Manatee River 02300500
27°40′15″ 82°21′10″

FLOW DATA: Collected from 1939 to the present.

WATER QUALITY DATA: 1956 to 1984; 1991

CURRENT DATA COLLECTION: NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP, Ortho P

SITE: Little Manatee River 02300546
27°41′18″ 82°26′19″

FLOW DATA: None.

WATER QUALITY DATA: Collected from 1983 to the present.

CURRENT DATA COLLECTION: Daily maximum conductivity and temperature.
USGS Monitoring Sites (continued)

SITE: Alafia River 02301000
27°52'59" 82°06'03"

FLOW DATA: Collected from 1950 to the present.

WATER QUALITY DATA: Collected from 1965 to the present.

CURRENT DATA COLLECTION:

Weekly
Temperature, F, Ortho P, conductivity

Bimonthly
DO, pH, BOD, NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP

Twice yearly
Ca, Mg, K, SO₄, Cl, Si, Sr, TOC,
As, Cd, Cu, Fe (total and dissolved),
Pb (total and dissolved), Mn, Hg, Ni, Zn

SITE: Alafia River 02301300
27°47'47" 82°07'04"

FLOW DATA: Collected from 1962 to the present.

WATER QUALITY DATA: Collected from 1965 to the present.

CURRENT DATA COLLECTION:

Weekly
Temperature, F, Ortho P, conductivity

Bimonthly
DO, pH, BOD, NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP

Yearly
Ca, Mg, K, SO₄, Cl, F, Si, Sr, TOC, Al
As, Cd, Cu, Fe (total and dissolved)
USGS Monitoring Sites (continued)

SITE: Alafia River 02301500
27°52'19" 82°12'41"
(NASQUAN site)

FLOW DATA: Collected from 1932 to the present.

WATER QUALITY DATA: Collected from 1956 to the present.

CURRENT DATA COLLECTION:

Bimonthly
Temperature, conductivity, DO, pH
BOD, NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP
total coliform, fecal coliform, Ca, Mg, K, SO₄, Cl, F, Si, Sr, TOC,
As (total and dissolved), Fe (total and dissolved),
Al, Mo, Ag, V, Se, suspended sediment,
Pb (total and dissolved), Li, Be, Cu, Ba, Co, Cr
Hg (total and dissolved), Cd (total and dissolved)

SITE: Lithia Springs 02301600
27°52'00" 82°13'50"

FLOW DATA: Nonrecording gage.

WATER QUALITY DATA: Collected from 1967 to the present.

CURRENT DATA COLLECTION:

Weekly
Temperature, F, Ortho P, conductivity

Twice yearly
DO, pH, NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP, TCC
USGS Monitoring Sites (continued)

SITE: Buckhorn Creek 02301695
27°53'36" 82°17'55"


WATER QUALITY DATA: None.

CURRENT DATA COLLECTION: None.

---

SITE: Alafia River 02301706
27°52'57" 82°18'36"

FLOW DATA: None.

WATER QUALITY DATA: Collected from 1983 to the present.

CURRENT DATA COLLECTION: Daily maximum conductance and temperature.
USGS Monitoring Sites (continued)

SITE: Delaney Creek 02301750
27°55'32" 82°21'52"

FLOW DATA: Collected from 1984 to the present.

WATER QUALITY DATA: None.

CURRENT DATA COLLECTION: None.

---

SITE: Tampa Bypass Canal 02301764
28°02'32" 82°20'42"

FLOW DATA: Collected from 1982 to 1990, incomplete and discontinued.
Stage only.

WATER QUALITY DATA: None.

CURRENT DATA COLLECTION: None.
USGS Monitoring Sites (continued)

SITE: Tampa Bypass Canal 02301778
     27°59'00" 82°21'07"

FLOW DATA: Collected from 1977 to 1990, incomplete and discontinued.
            Stage only.


CURRENT DATA COLLECTION: None.

SITE: Tampa Bypass Canal 02301802
     27°57'21" 82°22'15"

FLOW DATA: Collected from 1974 to 1990, incomplete and discontinued.

WATER QUALITY DATA: Collected from 1974 to 1990.

CURRENT DATA COLLECTION:

Bimonthly
   DO, pH, BOD, NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP

Yearly
   Ca, Mg, K, SO₄, Cl, F, Si, Sr, TOC,
   As, Cd, Cu, Fe, Pb, Hg
USGS Monitoring Sites (continued)

SITE: Hillsborough River 02301870
28°15'32" 82°06'20"

FLOW DATA: Collected from 1965 to 1991 (thrice weekly gage heights).


CURRENT DATA COLLECTION: None.

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SITE: Hillsborough River 02301990
28°11'07" 82°11'03"

FLOW DATA: Collected from 1983 to the present; fragmentary records before 1983.

WATER QUALITY DATA: Collected 1960; 1966 to the present.

CURRENT DATA COLLECTION:

Quarterly
DO, pH, NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP, TOC
USGS Monitoring Sites (continued)

SITE: Blackwater Creek 02302500
     28°08'25" 82°09'00"

FLOW DATA: Collected from 1951 to the present.

WATER QUALITY DATA: Collected from 1964 to the present.

CURRENT DATA COLLECTION:

Bimonthly
  Temperature, conductivity, DO, pH,
  NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP

Yearly
  Ca, Mg, K, SO₄, Cl, F, Si, As, TOC,
  Al, Fe (total and dissolved), Zn,
  Pb (total and dissolved), Ni, Hg,
  Mn (total and dissolved), Sr

SITE: Hillsborough River 02303000
     28°08'59" 82°13'57"

FLOW DATA: Collected from 1939 to the present.

WATER QUALITY DATA: Collected from 1957 to the present.

CURRENT DATA COLLECTION:

  Twice annually
  Temperature, conductivity, DO, pH
  NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP,
  Ca, Mg, K, SO₄, Cl, F, Si, As, TOC,
  Al, Fe (total and dissolved), Zn,
  Pb (total and dissolved), Ni, Hg
  Mn (total and dissolved), Sr, Cu

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USGS Monitoring Sites (continued)

SITE: Flint Creek 02303300
28°04'04" 82°16'03"

FLOW DATA: Collected 1956-58; 1970 to the present.


CURRENT DATA COLLECTION: None.

SITE: Hillsborough River 02303330
28°05'50" 82°18'45"

FLOW DATA: Collected from 1972 to the present.

WATER QUALITY DATA: Collected from 1932 to 1983.

CURRENT DATA COLLECTION: NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP, Ortho P
USGS Monitoring Sites (continued)

SITE: Hillsborough River 02303354
28°05'16" 82°21'05"

FLOW DATA: Collected from 1982 to 1990 (discontinued).
Stage only.

WATER QUALITY DATA: Collected from 1974 to the present.

CURRENT DATA COLLECTION:

Annually
Temperature, conductivity, DO, pH
color, BOD, NO₂, NO₂+NO₃, NH₃, NH₃+Org N, TP,
Ca, Mg, K, SO₄, Cl, F, Si, As, TOC, Cu
Al, Fe, Zn, Pb, Ni, Hg, Mn, Sr

SITE: Cypress Creek 02303400
28°19'25" 82°23'03"

FLOW DATA: Collected from 1964 to the present.

WATER QUALITY DATA: Collected from 1964 to the present.

CURRENT DATA COLLECTION:

Annually
Temperature, conductivity, DO, pH
NO₂, NO₂+NO₃, NH₃, NH₃+Org N, TP
USGS Monitoring Sites (continued)

SITE: Cypress Creek 02303420
28°11'08" 82°24'03"

FLOW DATA: Collected from 1974 to the present.

WATER QUALITY DATA: Collected from 1966 to the present.

CURRENT DATA COLLECTION:

Bimonthly
Temperature, conductivity, DO, pH
NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP

SITE: Cypress Creek 02303800
28°05'20" 82°24'33"

FLOW DATA: Collected from 1964 to the present.

WATER QUALITY DATA: Collected 1964, 1966 to the present.

CURRENT DATA COLLECTION:

Bimonthly
Temperature, conductivity, DO, pH
NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP,
Ca, Mg, K, SO₄, Cl, F, Si, As, TOC,
Al, Fe (total and dissolved), Zn,
Pb (total and dissolved), Ni, Hg, Cu,
Mn (total and dissolved), Sr, color,
USGS Monitoring Sites (continued)

SITE: Hillsborough River 02304000
28°03'15" 82°21'50"

FLOW DATA: Collected from 1961 to the present (incomplete).
Stage only.

WATER QUALITY DATA: Collected 1961; 1966 to the present.

CURRENT DATA COLLECTION:

Bimonthly
Temperature, conductivity, DO, pH
NO₂, NO₂+NO₃, NH₃, NH₃+Org N, TP

Twice annually
Ca, Mg, K, SO₄, Cl, F, Si, As, TOC,
Al, Fe (total and dissolved), Zn,
Pb (total and dissolved), Ni, Hg, Cu,
Mn (total and dissolved), Sr, color

SITE: Hillsborough River 02304500
28°01'25" 82°25'40"

FLOW DATA: Collected from 1938 to the present.


CURRENT DATA COLLECTION: None.
USGS Monitoring Sites (continued)

SITE: Sweetwater Creek 02306500
     28°02'35"  82°30'42"

FLOW DATA: Collected from 1951 to the present.


---

SITE: Sweetwater Creek 02306647
     28°00'49"  82°32'43"

FLOW DATA: Collected from 1985 to the present.


CURRENT DATA COLLECTION:
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<thead>
<tr>
<th>Site</th>
<th>Location Details</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henry Street Canal</td>
<td>27°59'59&quot; 82°33'05&quot;</td>
<td>02306654</td>
</tr>
<tr>
<td>Rocky Creek</td>
<td>28°03'55&quot; 82°34'00&quot;</td>
<td>02306774</td>
</tr>
</tbody>
</table>

**Flow Data:**
- Rocky Creek: Collected from 1985 to the present.

**Water Quality Data:**
- Henry Street Canal: None.

**Current Data Collection:**
- Henry Street Canal: None.
- Rocky Creek: None.
USGS Monitoring Sites (continued)

SITE: Brushy Creek 02306910
28°04'10" 82°31'51"

FLOW DATA: Collected 1981-1987 to the present.
Stage only.

WATER QUALITY DATA: 1970.

CURRENT DATA COLLECTION: None.

SITE: Rocky Creek 02307000
28°02'12" 82°34'34"

FLOW DATA: Collected from 1953 to the present.

WATER QUALITY DATA: Collected 1957-58; 1964 to the present.

CURRENT DATA COLLECTION:

Bimonthly
Temperature, conductivity, DO, pH
NO₂, NO₃, NH₃, NH₃ + Org N, TP, Sr,
Ca, Mg, K, SO₄, Cl, F, Si, TOC,
BOD, total coliform, fecal coliform
USGS Monitoring Sites (continued)

SITE: Brooker Creek 02307200
28°07'34" 82°34'14"

FLOW DATA: Collected from 1981 to the present.


CURRENT DATA COLLECTION: None.

SITE: Brooker Creek 02307323
28°08'26" 82°38'24"

FLOW DATA: Collected from 1970 to the present.

WATER QUALITY DATA: Collected from 1972 to the present.

CURRENT DATA COLLECTION:

Twice yearly
Temperature, DO, pH, conductivity
USGS Monitoring Sites (continued)

SITE: 
Brooker Creek
28°05'45" 82°41'15"

02307359

FLOW DATA: 
Collected from 1950 to the present.

WATER QUALITY DATA: 
Collected from 1964 to the present.

CURRENT DATA COLLECTION:

Approximately monthly
Temperature, DO, pH, conductivity, color,
Ca, Mg, Na, K, SO₄, Cl, F, Si, TOC,
NO₂, NO₂ + NO₃, NH₃, NH₃ + Org N, TP, Sr
II. TAMPA BAY MONITORING PROGRAMS

HABITAT
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AGENCY: FDNR / NOAA Cooperative Program

CONTACT: Ken Haddad
Florida Department of Natural Resources
Marine Research Institute
100 8th Ave. SE
St. Petersburg, FL 33701

STATUS: New and ongoing monitoring program


APPROACH: Using spectral comparisons from digital satellite images, the program was designed to monitor changes in land cover over several years at a time. Progress has begun on the development of methods for initial analysis, and plans for a continuous future monitoring program were proposed.

SAMPLE SELECTION: The digital satellite images were ordered for complete geographic coverage of areas of Tampa Bay emergent vegetation. Coverage was not planned for submerged seagrass beds.

SAMPLING EFFORT: Satellite data was ordered for the years of 1991 and 1992, and data will be required from 1993 in order to commence with the first set of analyses. An ongoing monitoring program is proposed for future years.
Location of Artificial Reefs in Tampa Bay
Source: Hillsborough Co. EPC Artificial Reef Program

- = Artificial Reef (Hillsborough Co., Pinellas Co., and City of Tampa)
FDNR Office of Fisheries Management and Assistance Services
Artificial Reef Programs

AGENCY: Florida Department of Natural Resources
Division of Marine Resources - Environmental Division
Office of Fisheries Management and Assistance Services

CONTACT: Dr. Virginia Vail
Environmental Administrator
Florida Dept. of Natural Resources
3900 Commonwealth Blvd., MS 240
Tallahassee, FL 32399

STATUS: Proposed and ongoing monitoring programs

OBJECTIVE: To provide guidance for local monitoring of existing artificial reefs and perform contract compliance monitoring for new artificial reefs

APPROACH: Development of a statewide monitoring plan was begun to provide assistance for local reef managers in planning physical, biological, and economic monitoring programs for artificial reefs. An example of a local reef program in Tampa Bay is the E.P.C. of Hillsborough County Artificial Reef Program which is directed by Mr. Tom Ash. It was planned that use of the monitoring program guidelines will be encouraged for local reef programs and required for those programs requesting state grant financing of reef monitoring. A program was also recently begun to monitor contract compliance for reefs under construction. Parameters proposed to be examined by the compliance program include the effectiveness of the reef material, compliance with contract terms, faunal sightings, colonization characteristics, and physical stability of the reef structure.

SAMPLE SELECTION: These programs were established to monitor all applicable artificial reefs statewide.

SAMPLING EFFORT: Development of the these programs was recently begun, and the programs were planned for continued operation by the Florida Department of Natural Resources.
NOAA/National Ocean Service
Physical Oceanographic Real Time System (PORTS)
Geographic Coverage Schematic
NOAA/National Ocean Service
Physical Oceanographic Real Time System (PORTS)

AGENCY: NOAA/NOS
Physical Oceanography Division

CONTACT: Dr. Henry R. Frey
Chief, Estuarine and Ocean Physics Branch
Physical Oceanography Division
National Oceanic and Atmospheric Administration
U.S. Dept. of Commerce
Washington, D.C.

STATUS: New monitoring program with ongoing component planned

OBJECTIVE: To provide real-time information on oceanographic conditions where these data are critical for safe and cost-effective navigation

APPROACH: The ongoing PORTS monitoring program was established as part of the 1990 to 1992 Tampa Bay Oceanographic Project (TOP). TOP was initiated to complete three tasks: (1) a 15-month circulation survey to measure currents, water level, temperature, salinity, winds and meteorological conditions, (2) a bay-wide circulation model and (3) the PORTS system. At the completion of TOP, the PORTS system was intended to remain in place as an ongoing monitoring program. The NOS is currently in the process of transferring the PORTS system management to an as of yet unidentified state agency.

SAMPLE SELECTION: Sample stations for the initial 15-month survey were fixed in stations throughout Tampa Bay where they would best characterize data relevant to navigation without interfering with navigation or trawling. Plans for the ongoing PORTS monitoring system located current meter stations at the New Sunshine Skyway Bridge and in the navigation channels leading to Port Manatee and Port Tampa. Plans were also made to install a meteorological station near the Bay mouth and to deploy three water level gages at major ports.

SAMPLING EFFORT: Sampling effort for the initial 15-month (1990-1992) survey included 6 current meters installed for approximately 1 year (13-15 months), 31 current meters installed for 2 months each, 19 water level stations (new and existing), 5 meteorological stations, 37 bottom conductivity/temperature instruments, 3 water column conductivity/temperature instruments arrays, and conductivity/temperature/depth transects sampled 10 times each.
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NOAA/Office of Ocean Resources Conservation and Assessment
Survey of Sediment Toxicity in Tampa Bay

AGENCY: NOAA/ORCA

CONTACT: Ed Long
Program Manager
Office of Oceanography and Marine Assessment
National Ocean Service
National Oceanic and Atmospheric Administration
U.S. Dept. of Commerce
Seattle, Washington

STATUS: New survey with possible future sampling/monitoring

OBJECTIVE: Determine the spatial extent and magnitude of toxicity in sediments in Tampa Bay.

APPROACH: The first sampling of this program was conducted in August of 1991. Grab samples of sediment were collected from the upper 2 cm of substrate and each was sent in part to the University of Georgia for chemical analysis and the remainder to a set of three toxicity tests. Parameters measured from the sediments directly included grain size, trace metals, PNAHs, PCBs, and pesticides. The three sediment toxicity sets were:

1) A solid phase 10-day mortality test with the amphipod *Ampelisca abdita*.
2) A pore water 48-hour sea urchin embryo fertilization test. Response was % successful fertilization of *Arbacia punctata*.
3) Organic extract phase test with bioluminescent bacteria ("microtox" test).

SAMPLE SELECTION: A 1991 NOAA Status and Trends report summarized the existing data from sediment and tissue toxicity tests reported for Tampa Bay (e.g. SWIM, USF, USGS, ACOE). A stratified random sampling program was designed based on existing data. The sampling grid covered throughout the estuary from the General Hospital to Boca Ciega Bay. The densest sampling effort was in Hillsborough Bay.

SAMPLING EFFORT: One sampling period was sampled in August 1991. Three replicate samples were collected at each of 30 stations. 13 of the stations were located in Hillsborough Bay. A future sampling effort is under consideration.
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Pinellas County Department of Environmental Management
Watershed Characterization Studies

AGENCY: Pinellas County D.E.M.
Water Resources Department

CONTACT: Don Moores, Program Manager
Water Resources Management Section
Pinellas County
2208 Riverside Dr. N
Clearwater, FL 34624

STATUS: New monitoring program, Exhaustive sampling of each watershed for one-time only

OBJECTIVE: The long range objective was to characterize ambient conditions of each watershed in the County.

APPROACH: The long range plan was to sample each watershed in Pinellas County intensively on a one-time basis. Allen's Creek Study was first sampled (1986-1989), and studies of Lake Tarpon and Lake Seminole are currently being conducted. Parameters measured included: Temperature, conductivity, pH, DO, clarity, water level, nitrogen series, phosphorous series, bacteria, pigmentation, DOC, BOD, TSS, color, benthic invertebrates, fish, sediment characterization, metals, pesticides, oil and grease, faunal sightings, emergent plant communities, phytoplankton, and algal growth rates (in lakes). Several other ancillary studies were performed at the lakes, including rate and effect of groundwater inflow, sedimentation rate and chronology, turbulent resuspension impacts on water quality, and storm event sampling at selected outfalls.

SAMPLE SELECTION: A network of fixed stations grouped by parameter category was selected for the Allen’s Creek, Lake Tarpon, and Lake Seminole Studies.

SAMPLING EFFORT: A long range goal was made to sample extensively in each watershed on a one time basis. To date, Allen's Creek, Lake Tarpon, and Lake Seminole were the only watersheds sampled. In the Allen's Creek study physical parameters were measured for 30 hours every 6 weeks at 24 sample sites. Benthic invertebrates were sampled quarterly at 5 sites. Fish and sediment pesticides and priority pollutants were measured quarterly at 24 sites. Water column sediments and priority pollutants were sampled once. In Lake Tarpon, physical parameters were measured weekly at 40 stations, and water chemistry was sampled monthly at 9 of these. In Lake Seminole, physical parameters were measured weekly, and water chemistry monthly, at each of 10 stations.
Southwest Florida Water Management District
Seagrass Monitoring
Geographic Coverage Schematic

[Map showing geographic coverage with symbols and labels]

- Hillsborough R.
- Tampa
- Alafia R.
- Little Manatee R.
- Manatee R.
- St. Petersburg

= Area included in general sample coverage
Southwest Florida Water Management District
Seagrass Monitoring

AGENCY: SWFWMD
SWIM Program

CONTACT: Thomas Ries
Southwest Florida Water Management District, SWIM Dept.
7601 Hwy. 301 North
Tampa, FL 33637

STATUS: Recent and ongoing monitoring program

OBJECTIVE: To monitor status of seagrass distribution and coverage in Tampa Bay.

APPROACH: Surveys of seagrass coverage were begun in 1988 and are planned for ongoing monitoring. Coverages were determined by analysis of 1:24,000 scale, true color aerial photographs. In 1990, ground transects were added to the sampling effort in order to ground-truth the photo-derived data. Species could not be distinguished from photos, but areas of seagrass coverage were classified as either continuous or patchy. Photo quality continued to improve as the program progressed.

SAMPLE SELECTION: Aerial photos were made for complete coverage of Tampa Bay at a scale of 1:24,000. Locations for ground-truthing were randomly selected in areas where photos were equivocal. An attempt was made to distribute ground-truthing transects over entire Tampa Bay area.

SAMPLING EFFORT: Aerial photos were made for complete coverage of Tampa Bay. Surveys were conducted in 1988 and 1990, and additional surveys were planned for two-year intervals commencing in 1992. Transects were chosen on the ground-truthing component for 1000 meters in length, and 70 transects were sampled in 1990. Transect data include: species present, blade length, water depth, bottom substrate, and other unique observations noted. A similar level of sample effort has been planned for 1992 and for each future two-year interval.
III. TAMPA BAY MONITORING PROGRAMS

HARVESTABLE AND NON-HARVESTABLE LIVING RESOURCES
Florida Department of Natural Resources
Aerial Surveys of Sea Mammals

AGENCY: Florida Department of Natural Resources

CONTACT: Brad Weigle
Florida Department of Natural Resources
Marine Research Institute
100 8th Ave. SE
St. Petersburg, FL 33701

STATUS: Ongoing monitoring program

OBJECTIVE: To assess the abundance and distribution of manatees and bottlenose dolphins in Tampa Bay

APPROACH: Aerial surveys of manatees (*Trichechus manatus*) and bottlenose dolphins (*Tursiops truncatus*) have been conducted by the Florida Department of Marine Resources since November 1987. During each survey two aircraft simultaneously covered each side of the Bay at an altitude of 150 meters. Parameters measured for each species included total number of animals, number of calves, animals' behavior (e.g., feeding, resting, direction of travel), and precise location. Other data collected included verification photographs, time of day, air temperature, water clarity, and surface water conditions.

SAMPLE SELECTION: Flight paths covered the complete perimeter of the Bay at each sampling event, and in order to maximize manatee counts, flight paths concentrated on areas of the Bay from the shoreline to 1 kilometer offshore. Until 1989, counts were made annually in two seasons (December through February and March through November).

SAMPLING EFFORT: Annual aerial surveys were conducted from November of 1987 to the present. In 1989, the biseasonal sampling was reduced to one sampling event per year, and a similar level of effort has been planned for at least the next two years. To date a total of 51 survey flights have been completed.
Florida Department of Natural Resources
Biostatistical Sampling of Catches Monitoring Program

AGENCY: Florida DNR

CONTACT: Stu Kennedy
Florida Department of Natural Resources
Marine Research Institute
100 8th Ave. SE
St. Petersburg, FL 33701

STATUS: Ongoing and expanding monitoring program

OBJECTIVE: To assess the species composition and age structure of that portion of the stocks being caught by recreational and commercial fishermen in Florida

APPROACH: The program has been funded by a contract from the National Marine Fisheries Service since 1985. The program has been planned as an ongoing monitoring program and has been expanding. Sampling of fish landed was performed, and parameters measured included lengths and otolith-based age. Hard body parts were discarded, but DNR has been willing to cooperate with other programs requiring body part samples from fishes in Tampa Bay. A recent example of the cooperation was the submission of tissues to the Florida Dept. of Health and Rehabilitative Services for mercury analysis.

SAMPLE SELECTION: Samples were collected from fish collected in Charlotte Harbor, Indian River, and Fort Walton Beach, in addition to Tampa Bay.

SAMPLING EFFORT: Samples have been collected since 1985, and future efforts have been planned.
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Florida Department of Natural Resources
Florida Sea Turtle Nesting Activity Monitoring

AGENCY: Florida Department of Natural Resources

CONTACT: Alan Huff
Florida Department of Natural Resources
Marine Research Institute
100 8th Ave. SE
St. Petersburg, FL 33701

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor the beach nesting activities of Florida sea turtles

APPROACH: Beaches are monitored by volunteers assigned to specific lengths of beaches. Parameters measured included number of nests, number of aborted nesting attempts, and number of hatchlings.

SAMPLE SELECTION: Beaches are monitored within the Tampa Bay area in Pinellas County by three permit holders who sampled beaches adjacent to Fort DeSoto Park.

SAMPLING EFFORT: Annual surveys have been ongoing since 1979, and the total length of beach monitored has increased with time. Beaches are monitored on a daily basis during the breeding season if possible. However, beaches with limited access may be visited only a few times during the nesting season. A similar level of effort has been planned for future years.
Florida Department of Natural Resources
Marine Fisheries Independent Monitoring Program (MarFIM)

AGENCY: Florida Department of Natural Resources

CONTACT: Robert H. McMichael, Jr.
Florida Marine Research Institute
100 8th Ave. SE
St. Petersburg, FL 33701-5095

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor abundance and distribution of bony fishes, sharks and rays, and macroinvertebrates of Tampa Bay

APPROACH: The MarFIM program was initiated by the Florida Marine Research Institute, and with state and federal assistance the program began sampling Tampa Bay in 1989. Adult and juvenile fish and macroinvertebrates are collected with a variety of actively and passively fished gears which included gill nets, drop nets, purse nets, dip nets, trawls, and trammel nets. Counts and a set of length measurements are recorded for each species collected. Water quality and other biological data collected include temperature, conductivity, pH, DO, tide condition, wind condition, percent cloud cover, current condition, lunar phase, general habitat attributes, gear deployment data, seagrass coverage, seagrass vegetative attributes, and drift macroalgae attributes.

SAMPLE SELECTION: Sample stations covered the complete geographic area of Tampa Bay and included stratified randomly selected stations and fixed stations.

SAMPLING EFFORT: The program sampled the period from 1989 to 1991, and a similar effort was planned for future years. Stratified random stations were sampled for six zones of Tampa Bay in each spring and fall, and each zone was sampled twice within each season with a variety of gears. Total random samples collected were as follows: 1989 - 1409, 1990 - 1492, 1991 - 926. Twenty-two fixed stations were sampled with either trawl, seine or blocknet on a monthly basis.
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Florida Department of Natural Resources  
Marine Fisheries Information System/Commercial Landings

AGENCY: Florida Department of Natural Resources  
Division of Marine Resources

CONTACT: Stu Kennedy  
Florida Department of Natural Resources  
Marine Research Institute  
100 8th Ave. SE  
St. Petersburg, FL 33701

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor the status of Florida's marine fisheries

APPROACH: The state began this ongoing program in 1984, and each year the state completes a census (i.e. an attempt is made to measure all landings for each year) of all commercial landings and effort. Reporting is accomplished by the use of a trip ticket system. The data collected are time fished, county that catch was landed in, gear used, and pounds of each species landed for each trip.

SAMPLE SELECTION: Census of all landings sold to seafood dealers.

SAMPLING EFFORT: Census of all landings sold to seafood dealers.
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National and Local Audubon Societies
Bird Population Monitoring Programs

AGENCY: National and Local Audubon Societies
(Also Florida Game and Freshwater Fish Commission)

CONTACT: Richard T. Paul
National Audubon Society / Tampa Bay Sanctuaries
410 Ware Blvd, Suite 500
Tampa, FL 33619

STATUS: Ongoing monitoring programs

OBJECTIVE: To monitor mid-winter and breeding bird populations in Tampa Bay.

APPROACH: Bird population monitoring programs conducted in Tampa Bay include the National Audubon Society Christmas Bird Counts (CBC’s), the Florida Audubon Society Breeding Bird Atlas data collection, and the winter waterfowl surveys conducted by the Florida Game and Freshwater Fish Commission (GFFC). The CBC’s have been conducted nationwide since the beginning of this century, and have recently employed approximately 40,000 persons to participate in approximately 1600 counts. Each CBC is conducted in a 15 mile diameter circle surrounding a fixed station, and noted vocalizations, calls and faunal sightings (counts). The data collection for the state Audubon Society’s Breeding Bird Atlas is recently completed and includes statewide distribution (presence) data for breeding birds by taxa. Additional surveys are conducted of waterfowl by the Florida GFFC, and unpublished monitoring has been conducted by the National Audubon Society of annual breeding populations of colonial waterbirds (particularly within the Tampa Bay Sanctuaries).

SAMPLE SELECTION: Fixed sample stations for the Christmas Bird Counts were chosen systematically based on the preference of the count’s founding participants. Counts were conducted over a single 24 hour period within a 2 week/3 weekend period during the midwinter of each year.

SAMPLING EFFORT: Five Christmas Bird Counts were established for the Tampa Bay Area, and because of the 15 mile diameter area in which the counts were made, only a portion of each count covered the Bay and Shorelines. Annual Counts were conducted in Tampa and St. Petersburg since at least 1972, in north Pinellas County since at least 1985, and in Bradenton and Gulf City since at least 1986. A similar level of effort was planned for future years.
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NOAA / National Marine Fisheries Service  
Marine Recreational Fisheries Statistics Survey

AGENCY: NOAA  
National Marine Fisheries Service

CONTACT: Ron Schmied  
National Marine Fisheries Service  
9450 Koger Blvd  
St. Petersburg, FL  33731

STATUS: Ongoing and expanding monitoring program

OBJECTIVE: To monitor recreational catch and effort data on a regional level

APPROACH: The National Marine Fisheries Service initiated the recreational monitoring program in 1979, and has sampled each year to the present. The sampling is conducted in two stages. A field intercept stage collects catch and effort data per trip, and a telephone survey collects trips per season data. Sample sizes are of a magnitude to allow only regional estimates of catch and effort (e.g. Florida and Gulf inshore waters as a whole). Recent increases in funding have allowed the service to define a Tampa Bay boundary that parallels the NEP definition. It is projected that intercept samples will be increased 2.5 times the base level in 1992 and that the bi-monthly call back period will be increased to monthly.

SAMPLE SELECTION: Households for the telephone survey are selected at random from throughout the coastal regions of Florida. Intercept sites are compiled into a list frame, and sites to be sampled are selected randomly. The probability of sampling an intercept site is a function of its perceived public usage, and each intercept site was sampled a minimum of 1 to 2 times per year.

SAMPLING EFFORT: Current level of sampling effort allows only Gulf Coast regional estimates to be computed with reasonable confidence intervals. It is expected that 1992 and future surveys will have enough sampling effort to make some Tampa Bay regional estimates.
NOAA/National Status and Trends Program
Mussel Watch Project
Geographic Coverage Schematic

- = Area Included in General Sample Coverage
NOAA/National Status and Trends Program  
Mussel Watch Project

AGENCY: NOAA/National Status and Trends Program

CONTACT: Ed Long  
Office of Oceanography and Marine Assessment  
National Ocean Service  
National Oceanic and Atmospheric Administration  
U.S. Dept. of Commerce  
Seattle, Washington

STATUS: Ongoing monitoring program

OBJECTIVE: To monitor spatial and temporal trends in contaminant concentrations in shellfish

APPROACH: The NOAA National Status and Trends Program has annually collected and analyzed mussel and oyster tissues. Samples were collected nationwide, and included stations in Tampa Bay from which oysters were collected. Parameters analyzed included DDT and its metabolites, other chlorinated pesticides, polyaromatic hydrocarbons, trace elements, aluminum, iron, manganese, and silicon.

SAMPLE SELECTION: The sampling sites were selected with the intention that the samples would be representative of the surrounding area. Small-scale patches of contamination and known points of waste discharge were avoided. Since the urban centers along the Gulf were located far inland, an attempt was made to sample as close to them as possible without entering waters too low in salinity to support oyster populations.

SAMPLING EFFORT: Sampling has been conducted in Tampa Bay during each year from 1986 to 1991, and a similar effort was planned for future years commencing with 1992. The 1989 data report listed 5 sample locations for Tampa Bay.
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NOAA-ORCA/USEPA at Gulf Breeze Cooperative Program
Survey of Health of Oysters in Tampa Bay

AGENCY: NOAA-ORCA/USEPA

CONTACT: Ed Long
Program Manager
Office of Oceanography and Marine Assessment
National Ocean Service
National Oceanic and Atmospheric Administration
U.S. Dept. of Commerce
Seattle, Washington

STATUS: Started program as a survey, becoming a monitoring program, may sample 8-10 times over next 2 years

OBJECTIVE: To determine the presence, spatial extent, and magnitude of toxic effects in oysters in Tampa Bay

APPROACH: Samples were collected in July and August of 1991. Parameters measured were biochemical assays, assays of reproductive health/condition, assays of histopathological disorders (e.g. tumors), assays of animals immune-competence, assays of chromosome abnormalities, and tissue toxicant analyses. Toxicants measured in tissues will include trace metals, PNAHs, PCBs, and pesticides.

SAMPLE SELECTION: A stratified random sample was collected. Strata were based on a suspected pollution gradient, sites were located at Hillsborough River mouth, East Bay, Ybor Channel, Delaney Creek, off Macdill AFB, Mullet Key, and the southern tip of Hookers Point. The samples for the second year of the survey were planned for the same stations with the possible addition of more stations.

SAMPLING EFFORT: The first year sampling effort (1991) collected samples from each site once. The program was planned to collect additional samples, and it has been planned to sample a total of 10 to 15 sites 8 times each.