Suffolk County Vector Control & Wetlands Management Long Term Plan & Environmental Impact Statement

ESTUARINE AND GROUNDWATER DATA SETS
TASK 5 – DATA COMPILATION

Submitted to:

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Suffolk County Department of Health Services
Suffolk County Department of Public Works
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SUFFOLK COUNTY VECTOR CONTROL AND WETLANDS MANAGEMENT LONG - TERM PLAN AND ENVIRONMENTAL IMPACT STATEMENT

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1. Introduction

A summary of water quality and sediment data is provided, along with watershed delineations for Suffolk County coastal areas. The data was acquired from various estuary programs, the New York State Department of Environmental Conservation (NYSDEC), the Suffolk County Department of Health Services (SCDHS), and the United States Geological Survey (USGS). The data was reviewed by Bowne Management Systems for incorporation into Geographic Information System (GIS) maps for the Suffolk County Vector Control and Wetlands Management Long-Term Plan.

2. Data Sources

2.1. Peconic Estuary Program

The Peconic Estuary Program (PEP) worked with Suffolk County Department of Health Services (SCDHS) to collect water quality data. The PEP provided georeferenced water quality data and GIS coverage of stormwater contribution areas, nitrogen sub-watersheds, and groundwater contribution areas (Table 1).

Table 1. Peconic Estuary Program data summary

Type of Data Collected	Data Format	Information Provided
Water quality and watershed maps	Excel, DBASE	Latitude/longitude & descriptions of testing stations
Watershed maps	GIS	Groundwater contribution areas, stormwater contribution areas & natural critical resource areas

2.2. South Shore Estuary Reserve

The South Shore Estuary Reserve (SSER) provided GIS maps delineating the watersheds of over 20 creeks and rivers along the south shore of Suffolk County, from Amityville Creek to Sam's Creek (Table 2). Water quality samples from south shore areas were collected by the County (see SCDHS section 2-6).

Table 2. South Shore Estuary Reserve data summary

Type of Data Collected	Data Format	Information Provided
Watershed maps	GIS	Latitude/longitude of over 20 creeks and rivers on the south shore of Long Island, from Amityville Creek to Sam's Creek

2.3. National Coastal Assessment Program

Water quality data were collected from 2000 to 2003 at stations located on northern Long Island (Port Jefferson Harbor and Northport Bay), southern Long Island (Great South Bay, Moriches Bay, and Shinnecock Bay), eastern Long Island (Shelter Sound, Threemile Harbor, and Napeague Bay), and Block Island Sound. Several freshwater stations were also sampled. The stations listed in Table 3 were sampled from July to October 2000 at least twice each month. Similarly, the stations listed in Table 4 were sampled from August to November 2001

at least twice each month. Water quality parameters and the presence of metals and organic compounds were measured for the samples collected during 2000 and 2001. In addition, toxicity testing was conducted, and the benthic infauna community was sampled. Data collected during 2002 and 2003 is not yet available, as it is in the process of being reviewed (Larry Swanson, SUNY Stony Brook, pers. communication, 2005). Data sets are available in Excel spreadsheets.

Table 3. National Coastal Assessment Program sampling stations for 2000.

Location	Name
NYC	East River
	Hudson River
Northern coast	Hempstead Harbor
	Little Neck Bay
	Manhasset Bay
	Northport Bay
	Oyster Bay Harbor
	Port Jefferson Harbor
Southern coast	Gardiners Bay
	Great Peconic Bay
	Great South Bay
	Hempstead Bay
	Lake Montauk
	Little Peconic Bay
	Moriches Bay
	Shinnecock Bay

Table 4. National Coastal Assessment Program sampling stations for 2001.

Location	Name
NYC	Hudson River
Northern coast	Hempstead Harbor
	Little Neck Bay
	Manhasset Bay
	Northport Bay
	Oyster Bay Harbor
	Port Jefferson Harbor
	Stony Brook Harbor
Southern coast	Gardiners Bay
	Great Peconic Bay
	Great South Bay
	Hempstead Bay
	Little Peconic Bay
	Moriches Bay
	Napeague Bay
	Shelter Sound
	Shinnecock Bay

2.4. Town of Huntington

The Cornell Cooperative Extension Marine Program initiated a volunteer water quality monitoring project in the summer of 2003. Senior citizen volunteers living in the Town of Huntington, New York carried out the sampling at 18 stations throughout the Huntington-Northport Bay complex for this project. Volunteers worked alongside environmental scientists when recording water quality measurements and nutrient concentrations. The samples collected were not analyzed in an EPA certified laboratory. As such, the resulting data should be used with discretion. The data, which is available in Microsoft Excel, was collected at least twice per month from August to November in 2003 and from May to November in 2004 at thirteen different stations. The latitude and longitude of each station were recorded along with information on the type of wildlife present and current weather conditions.

2.5. New York State Department of Environmental Conservation

2.5.1. Freshwater

Water quality data from eight freshwater streams were collected by the NYSDEC two to five times per month from April to November of 1999. The latitude and longitude of each station were included. The collected data is available in DBASE format, which can be read using Microsoft Access and Excel (Table 5).

Table 5. NYSDEC Freshwater data summary

Type of Data Collected	Data Format	Information Provided
Water quality	DBASE	Latitude/longitude of 8 stations sampled in streams from 4/99 to 11/99, from 2-5 times/month

2.5.2. Shellfish Growing Area Data

Water quality data (total and fecal coliform data, tide stage, and recent rainfall information) for the 67 shellfish growing areas in Suffolk County are collected by the NYSDEC. Data were collected one to eight times per month, for two to ten months each year, from February 1988 to December 2004. Fecal coliform data was reported as the most probable number (MPN) per 100 milliliters of water. Data were formatted into Microsoft Access and Excel (Table 6).

A staff vacancy resulted in an information gap from July 1998 to the start of 2001. In March 2003, the NYSDEC switched to a different method of testing that only yielded fecal coliform data (William Hastback, NYSDEC, pers. communication, 2005).

Table 6. NYSDEC saltwater data summary

Type of Data Collected	Data Format	Information Provided
Water quality	Access, Excel	67 shellfish growing areas were sampled for fecal coliform (MPN/100ml), tidal stage and rainfall amounts from 2/88 to 12/04, for two to ten months/year, from 1-7x/month

MPN = most probable number

2.5.3. Statewide Waters Monitoring

The Statewide Waters Monitoring Section of the NYSDEC monitors all the waters of the state. They do this through Rotating Integrated Basin Studies (RIBS), the ambient chemical and biological monitoring program for the state's rivers and streams. They also maintain and manage the collected data and provide analysis for use in assessing the quality of the monitored waters.

2.5.4. Inland Lakes and Freshwaters

This section of the NYSDEC oversees and conducts basin-specific activities of the State's freshwater bodies.

2.6. Suffolk County Department of Health Services

Water quality data, available in Microsoft Access format, were collected from 1976 to 2003 at 17 stations on the north shore, 1 to 39 stations on the south shore, 17 stations in the Peconics and 12 stations representing specific Peconic point sources on Long Island. Data was collected at various times of the year, from one to eight times per month (Table 7).

Table 7. Suffolk County Department of Health Services data summary

Type of data collected	Data format	Location	Years	Sampling frequency/month	Parameters sampled	Units used
Water quality	Access	North shore	76-03	1-7	Ammonia	mg/L
					BOD	mg/L
					Chlorophyll a	µg/L
					Depth	mg/L
					Dissolved oxygen	mg/L
					Dissolved phosphate	mg/L
					Fecal coliform	mg/L
					Nitrite/trate	mg/L
					Salinity	mg/L
					Total nitrogen	mg/L
					Total phosphate	mg/L
					Transparency	Standard units
					Water temperature	celcius
Water quality	Access	Peconic	76-03	1-8	Same as north shore areas, plus flow and suspended solids Chlorophyll a, depth, and salinity missing for some stations	mgd mg/L
Water quality	Access	Peconics Pt Sources	76-03	1-5	Same as north shore areas, plus streamflow	cfs
Water quality	Access	SSER	76-03	1-7	Same as north shore areas minus flow, dissolved oxygen, and Chlorophyll a	Same as north shore areas

2.7. United States Geological Survey

Water quality data and nutrient concentrations have been collected by the USGS for the 168 ponds and streams in Suffolk County. The data can be accessed via http://ny.water.usgs.gov, from the headings "Scientific data, water quality" (not "real time" water quality), "Suffolk", "county" and "surface" (but the process of downloading data is complex, and may be difficult the first few times the site is accessed). The parameter grouping that is easiest to read is "table". Selecting "inventory water quality data" provides sample parameter units. The latitude and longitude of each stream location are provided. For example, the Nissequogue River, near Smithtown, was repeatedly sampled at the same station from 1988 to 1991. Each of the eight parameters tested were sampled at different frequencies throughout the year (Table 8).

Table 8. Example of data available on USGS website

Type of Data Collected	Data Format	Stream Sampled	Stream Location	Years	Parameters Sampled	Samples/yr	Station number
Water quality	Excel	Carman's River	Yaphank	85-93	alkalinity	4-12	1305000
					biological (fecal coliform and phytoplankton)	4-12	
					streamflow	365	
					dissolved ions	4-12	
					dissolved/trace elements	3 or 4	
					nutrients,suspended sediment, organic carbon	4-12	
					physical (temp.,pH, etc.)	4-12	
					radiochemical	1 or 2	
Water quality	Excel	Nissequogue River	Near Smithtown	88-91	Same as above	Same as above	1304000
Water quality	Excel	Peconic River	Riverhead	73-93	Same as above	Same as above	1304500

2.8. Suffolk County North Shore Watershed Management Program

The Suffolk County North Shore Watershed Management Program prepared a watershed management study for the Suffolk County portion of the Long Island Sound Study drainage area, focusing in detail on the specific subwatersheds of the Huntington Bay-Northport Harbor complex, the Nissequogue River, and Stony Brook, Port Jefferson, and Mount Sinai Harbors. The objectives of the land use inventory were to establish an accurate GIS existing land use database for the north shore embayment watershed within Suffolk County. The information was collected by EEA, Inc. along with the Suffolk County Soil and Water Service. Additional watershed mapping refinements were completed by Nelson and Pope.

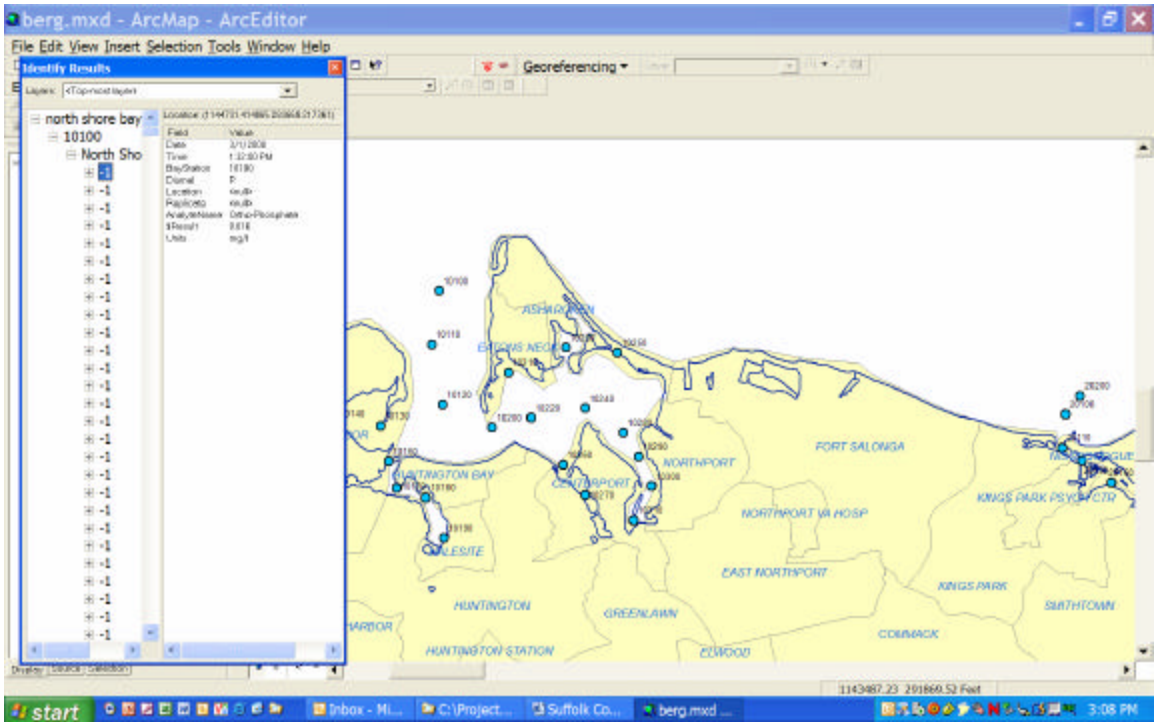
3. Incorporating Data into GIS

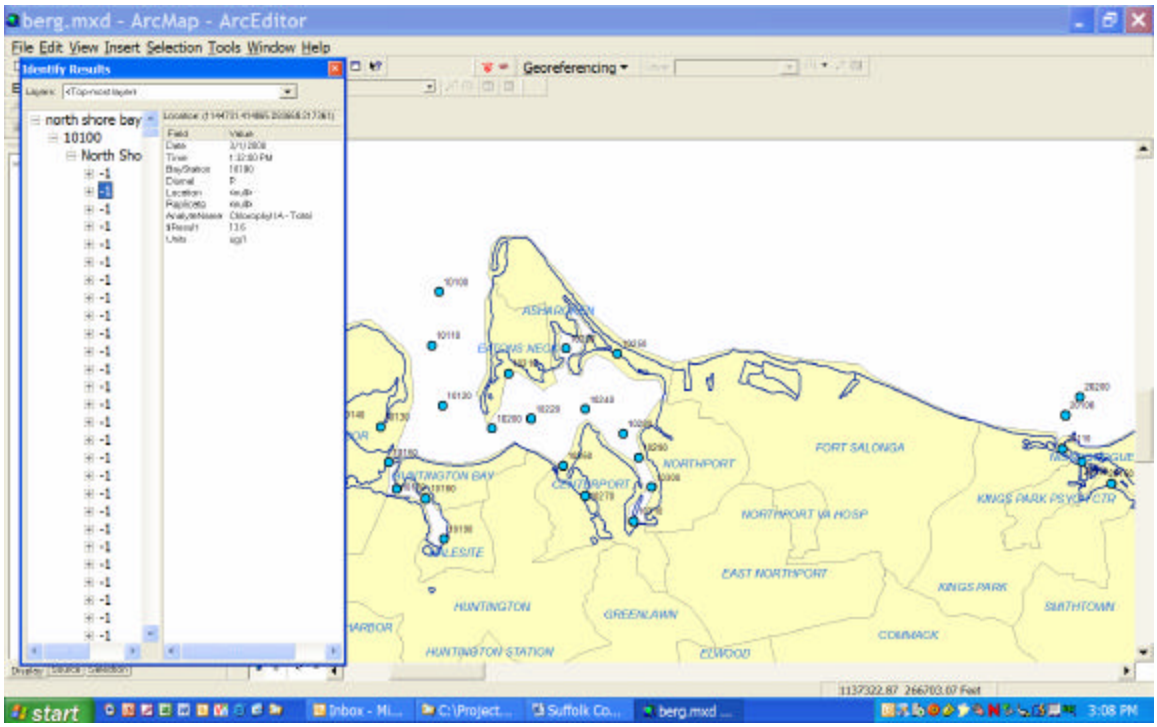
3.1. North Shore Stations

No shape file of the point locations is provided. The location of the points is given as a latitude/longitude in Degrees Decimal Minutes format in an Excel file. This format for the latitude/longitude is not natively understood by ArcGIS. A third party program such as Corpscon6 is needed to convert the latitude/longitude to a useable format such as Decimal Degrees. Then a shape file can be created, locating the points on a map. The station number in this shape file can be related to the station number in the table "North Shore Bays 76-03" in the access database "Suffolk WQ Data.mdb".

In order to show the data on a map, a "relate" must be used in ArcGIS. This represents a one to many relationship between the station point and the "North Shore Bays 76-03" table which has the results of testing. The problem with this approach is that table contains multiple records by date and time for each station with a record for each analysis result for that date and time. However, with this approach you cannot symbolize the results on a map. By default, ArcGIS can only symbolize results when there is a one to one relationship (i.e. only one sample result per station). Here is an example of what I mean:

Create a relate between the North Shore Stations to the "North Shore Bays 76-03" table using the station field in the North Shore Stations and the Baystation field in the table. When north shore station "10100" is identified multiple results appear. Here are just two:





In order to make the information in the table useful, an analysis of the data and an assessment of the users' needs must be undertaken. Once this is understood, summary tables or queries can be

created to symbolize on a map the most relevant information (e.g. search for a specific date or range of dates and symbolize on the map the values for a specific analyte, or show the maximum value per year per analyte, etc.).

3.2. Peconic Point Sources

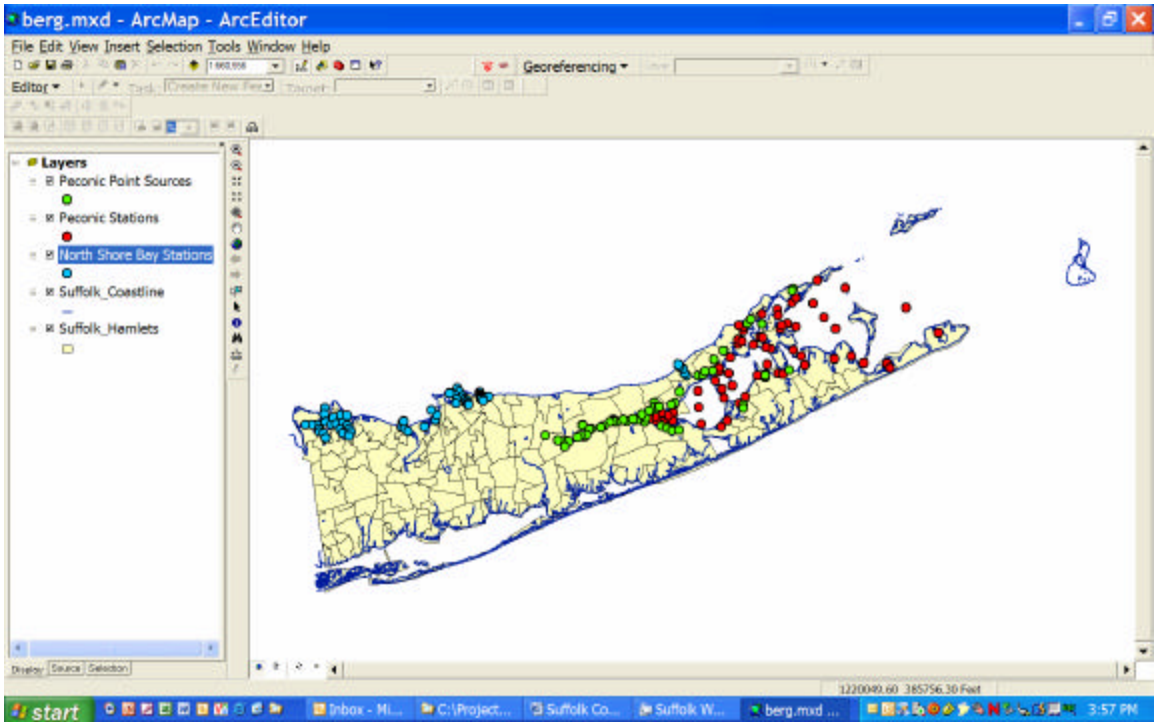
Locations were provided as a shape file. The fields Area_code and Station_nu need to be concatenated together. Then this new field can be related to the field "BayStation" in the table "Peconic Point Sources and Streams 76-03" in the access database "Suffolk WQ Data.mdb".

The same issue regarding symbolizing the results occurs with this data as with north shore stations. There is a one to many relationship between the Peconic Point Sources and the analysis results. In order to make the information in the table useful, an analysis of the data and an assessment of the users' needs must be undertaken.

3.3. Peconic Stations

Locations provided as a shape file. The user needs to concatenate its field's Area_code and Station_nu together. This new field can then be related to the field "BayStation" in the table "Peconics 76-03" in the access database "Suffolk WQ Data.mdb".

Again, the same issue regarding symbolizing the results occurs with this data as with north shore stations. There is a one to many relationship between the Peconic Stations and the analysis results. In order to make the information in the table useful, an analysis of the data and an assessment of the users' needs must be undertaken.



3.4. South Shore Estuary Reserve

No shape file of the point locations is provided. The location of the points is given as a latitude/longitude in Degrees Decimal Minutes format in an Excel file "Stations.sser.xls". This format for the latitude/longitude is not natively understood by ArcGIS. A third party program such as Corpscon6 must be used to convert the latitude/longitude to a useable format such as Decimal Degrees. Then a shape file can be created locating the points on a map. The station number in this shape file can be related to the field BayStation in the table "SSER 76-03" in the access database "Suffolk WQ Data.mdb".

Again, the same issue regarding symbolizing the results occurs with this data as with north shore stations. There is a one to many relationship between the SSER Stations and the analysis results. In order to make the information in the table useful, an analysis of the data and an assessment of the users' needs must be undertaken.