

**ANNUAL ADMINISTRATIVE REPORT (FY2008) AND
WORK PLAN (FY 2009) FOR INVENTORIES AND VITAL SIGNS
MONITORING
FY2008-FY2009
NORTHEAST COASTAL AND BARRIER NETWORK (NCBN)**

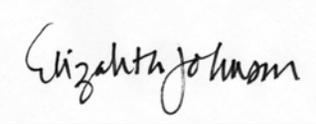
Assateague Island National Seashore (ASIS), Cape Cod National Seashore (CACO), Colonial National Historical Park (COLO), Fire Island National Seashore (FIIS), Gateway National Recreation Area (GATE), George Washington Birthplace National Monument (GEWA), Sagamore Hill National Historic Site (SAHI), and Thomas Stone National Historic Site (THST)

Northeast Coastal and Barrier Network Approval Signatures



George E. Price, Jr. Superintendent, Cape Cod National Seashore (BOD Representative)

Date: Jan. 23, 2009



Elizabeth Johnson, Northeast Region Inventory and Monitoring Coordinator

Date: Jan. 23, 2009



Sara Stevens, Northeast Coastal and Barrier Network Coordinator

Date: Jan. 23, 2009

	Budget program (MS Access, aarwp_budget.mdb)
v	The income amounts entered for Biological Inventories, Vital Signs Monitoring, Prototype \$\$ - Annual Transfer, Water Quality Monitoring and other sources matches the dollar amounts from the memos sent to the regions/networks by WASO (have you used the correct income amounts?).
v	In the Add/Edit Budget Records form, the amount shown for Total Expenses matches that for Total Income. (If it doesn't, enter a record under Expenses in the 7_Other category to make it balance; use an entry such as 'Unexpended funds' or 'Overspent Funds' in the Description column to explain the amount.)
v	For all Expense records, the Description field includes the name of the university, agency, company, or other vendor to help us document our outsourcing efforts. (If this expense involved a contract, cooperative agreement, interagency agreement, or other partnership, is it clear where the money went?)
v	For all Expense records, the correct item from the picklist for 'Where \$\$ Went' has been entered. [Think about who the check was written to; e.g., enter 'Other Non-Federal' for funding that went directly to the private sector, such as for purchases (computers, supplies, etc.), travel (airlines, rental cars, hotels).]
v	On the Status of Biological Inventories form, there is one record for each inventory that is described in the text section of the AARWP or in the budget program. Be sure to list each park that was involved in the particular inventory.
v	Each year's budget has been exported as an .rtf file (one for FY 2008 and one for FY 2009), and both files have been inserted into MS Word at the end of the AARWP document.
v	The file aarwp_budget.mdb has been renamed to include the 4-character network alpha code and the years, as shown in this example: NCCN_FY0809_aarwp.mdb
	Annual Report and Work Plan (MS Word)
v	I have carefully read the guidance for the AARWP and followed it.
v	A header or footer with the date that the aarwp was last revised has been included.
v	I gave special attention to the 'Summary of Major Accomplishments' and 'Public Interest Highlights' sections of the report, following this years' guidance and example. (We need good examples of the successes, applications, and highlights of the program to help us obtain funding for all 32 networks! Your 'Summary of Major Accomplishments' section at the beginning of your annual report is what we'll use for the I&M Program's annual Report to Congress to justify the funding spent by your network.)
v	In the 'Status of Park Vital Signs Monitoring' table, all entries are equal to or greater than the entries in last year's report.
v	Photographs that might be included in one of the reports to Congress, brochures, websites, or other materials that help the program have been submitted by the network. (See the photo database and guidelines for submitting photographs.)
v	The aarwp file has been renamed using the network's 4-character alpha code and the years (FY0809) as in the example NCCN_FY0809_aarwp.doc
v	The annual report has been approved by the appropriate individuals, per my region's procedures. (If you cannot get electronic signatures, it is okay to submit a hard copy with signatures after November 4.)
v	I have followed my region's procedures for submitting the two files (e.g., NCBN_FY0809_aarwp.doc and NCBN_FY0708_aarwp.mdb). (Most regions require you to submit the files through the regional office. The files may be zipped into a zip file if desired, and then submitted to Steven Fancy via either email or ftp).
	Review of FY 2009 Work Plan by WASO
Yes	[Enter Yes or No]: Has the FY 2009 workplan been approved by the network Board of Directors, and therefore ready for the full WASO review? (If you enter No, the WASO I&M and WRD offices will only briefly review the work plan for 'red flags'.

Executive Summary

Northeast Coastal and Barrier Network (NCBN) FY 2008 Annual Administrative Report

The Northeast Coastal and Barrier Network (NCBN) includes eight parks located along the Atlantic coast from Massachusetts to Virginia. These parks represent some of the most ecologically similar collections of lands within the National Park Service. They consist of critical coastal habitat for many rare and endangered species, as well as migratory corridors for birds, sea turtles and marine mammals. They also protect vital coastal wetlands, essential to water quality, fisheries, and the biological diversity of coastal, near shore, and terrestrial environments. These parks represent islands of protected lands within the urban sprawl of the Northeast. Census estimates indicate that populations residing within this zone are growing three times the rate of the total U.S. population. Pressures such as urban encroachment, pollution, and sea level rise, and other effects of global warming, make these coastal parks vulnerable to extreme ecosystem degradation, creating a unique management challenge. Scientifically based data and information on the condition of these park natural resources is key to developing effect management to both maintain and restore coastal park ecosystems. The Northeast Coastal and Barrier Network Inventory and Monitoring Program has been developed to assist and provide parks with credible, defensible scientific information that can be used in a management context to predict both natural and human induced changes to condition in park natural resources. The following summary provides an update for FY08, on specific inventory and monitoring projects being developed by the NCBN program.

Program overview

This year the Network received a total of \$773,640. Vital Signs Monitoring funding to continue implementing monitoring in coastal parks, as well as, \$86,500 from the NPS Water Resources Division to assist with the Network's estuarine water quality monitoring program.

In 2007, the Network initiated a cooperative agreement with the USGS and the University of Rhode Island to develop a plan for inventorying and mapping marine resources in the Northeast Coastal and Barrier Network parks as well as in Acadia National Park and Boston Harbor Islands. In 2008, the University of Rhode Island cooperators completed an inventory and catalog of existing marine and estuarine mapping data. These data and information were

compiled, and a web accessible data catalog and Google spreadsheet were created in order to share results and exchange information with the parks (<http://www.edc.uri.edu/ftsc/submerged/data/Catalog.html>). Data categories include areas such as bathymetry, hydrography, surface sediments and subaqueous soils. This initial data mining exercise is the basis for the detailed five-year strategic inventory and mapping plan, currently being developed in cooperation with the USGS. The complete plan is expected to be available in late fall 2008. Once the plan is completed, the Network and Northeast Region will work to identify potential funding sources for its implementation.

Many of the products from the Network's vertebrate and vascular plant inventory projects have been published in the NPS Northeast Region Technical Report Series over the last 2 years. In addition to inventorying vertebrate species, the Network funded a few priority invertebrate inventories. Odonates (dragonflies and damselflies), considered by scientist to be excellent indicators of wetland ecosystem health and condition, and a taxonomic group of high public interest along the coast, were inventoried in 7 of the Network parks. An inventory on Assateague Island National Seashore resulted in documentation of species range extensions and the identification of a number of new threatened and endangered species for the island. Finally, as part of the inventory program, compilation and cataloging of existing data into the national I&M databases, NPSpecies and NatureBib continues. Verification, review and certification by taxa experts of park NPSpecies databases continues. Local taxonomic experts for Assateague Island NS and the three NCBN NY parks (Gateway, Fire Island and Sagamore Hill) continue their work to review and enter existing data on birds and plants. These databases will be made available to the public in FY09. Vegetation maps will be completed for all Network parks in 2008-2009.

The NCBN Vital Signs Monitoring Plan continued to be implemented in 2008, with additional cooperative agreements being established with scientists from the University of Rhode Island, Virginia Institute of Marine Science and the Seagrass Ecology Lab at SUNY Stony Brook in New York. In 2008, estuarine nutrient enrichment monitoring continued at Gateway NRA, Sagamore Hill NHS, Colonial NHP, and Assateague Island NS. A second pilot year was completed for seagrass monitoring at Fire Island NS with the assistance of Dr. Brad Peterson from SUNY. Data collected as part of the piloting of the estuarine nutrient enrichment protocol collected in 2005-2006 at Gateway National Recreation Area and Assateague Island National Seashore, were analyzed and reviewed to assure data meet the objectives of assessing resource condition in these parks, a draft report on the findings was completed in September 2008.

In addition to water quality monitoring, the Network's coastal geomorphologic monitoring program progressed. With the first phase of protocol development complete, shoreline position monitoring continued to be implemented in four of the Network's parks. A new initiative began in 2008 in collaboration with scientists from Rutgers University, to develop the second phase of protocols for monitoring shoreline, beach and dune topography. Included in this initiative the Network is developing the first annual trend report for shoreline monitoring at Fire Island NS. Collaboration has also continued with the URI Geosciences Department and the USGS to develop baseline historical topography that can be utilized in long-term topographic change analyses in four Network parks, Cape Cod National Seashore, Fire Island National Seashore, Gateway National Recreation Area (Sandy Hook Unit) and Assateague Island National Seashore. These data will be exceptionally useful to the Network and parks for enhanced understanding of how the elevation and volume of the beach and dune system has changed over a long (half-century) time period. The data will be used to help predict and manage for the effects of global warming, such as sea-level rise and increased storm intensity by comparing these historic data sets to those currently being collected by the Network. Finally, the NCBN and staff from the USGS Florida Integrated Science Center collaborated on collecting and processing EAARL LIDAR for both Assateague Island NS and George Washington Birthplace NM.

In May 2008, the Network organized and held the first program review. This 3-year "start-up review" focused on the operational and administrative aspects of the network's monitoring program and asked the basic question "Is the network set up to succeed?" The review was an opportunity for Network and park staff to step back and evaluate initial progress against the objectives and schedule set forth in the Network's monitoring plan, to develop a "road map" for completing and implementing the first set of protocols, and to make adjustments if needed. The review was intended to help the network get off to a good start in developing a practical, sustainable monitoring program that provides parks with timely, relevant information. There were 4 panel members selected to attend and provide constructive comment to the Network. These panel members were, Steve Fancy, National Monitoring Program Leader, NPS I&M Program, Martha Segura, Network Coordinator, Gulf Coast I&M Network, Beth Johnson, Regional I&M Coordinator, Northeast Region, and John Fry, Natural Resource Chief, Cumberland Island National Seashore. Approximately 50 people including Park superintendents, natural resource managers, and collaborators attended the 3 day review held at the University of Rhode Island. Overall there was a general consensus among the four panel members and among the park superintendents and Natural Resource Chiefs who

attended the review that the network is off to a good start. “The accomplishments and productivity of the small network staff to date has been impressive considering the size of the network budget and core staff and the logistical challenges involved.”

Program Accomplishments

Inventories

Field inventories

- Bat survey report completed, Assateague Island National Seashore
- Breeding Marsh bird Survey report completed, Gateway National Recreation Area
- Insect Inventory Report completed, Assateague Island National Seashore, 625 arthropod species identified in the park.
- Submerged marine resources mapping pilot completed and initial reports submitted, Fire Island National Seashore
- Bathymetry and sediment data collection for the Virginia Coastal Bays data collection complete, data analysis to be completed in the fall 2008. Assateague Island National Seashore, partnered with the Maryland Geological Survey (MGS)

Inventory products:

- FIIS-Fire Island Biotic Synthesis Draft report.
- GATE-Draft report and database: Breeding Bird Survey. Cooperators, NJ Audubon Society.
- FIIS-Final report: Avian Data Compilation for Fire Island National Seashore, NJ Audubon Society
- ASIS-Final Report: Bat Inventory of Assateague Island National Seashore. Cooperator: Dr. Ed Gates and Josh Johnson, Appalachian Laboratory University of Maryland Center for Environmental Science (UMCES)
- ASIS-Final Report : Baseline Survey of Selected Insect Groups of Assateague Island National Seashore
- GATE-Edinger, G. J., A L. Feldmann, T. G. Howard, J. J. Schmid, E. Eastman, E. Largay, and L. A. Sneddon. 2008. Vegetation Classification and Mapping of Vegetation at Gateway National Recreation Area. Final Technical Report
- COLO-Karen Patterson. 2008. Vegetation Classification and Mapping at Colonial

National Historical Park. Final Technical Report

- GEWA-Karen Patterson. 2008. Vegetation Classification and Mapping at George Washington Birthplace National Monument. Final Technical Report.
- SAHI- Edinger, G. J., A L. Feldmann, T. G. Howard, J. J. Schmid, E. Eastman, E. Largay, and L. A. Sneddon. Nov 2007. Vegetation Classification and Mapping of Vegetation at Sagamore Hill National Historic Site. Draft Technical Report
- THST- Chris Lea, E. Eastman, L. A. Sneddon. Dec 2007. Vegetation Classification and Mapping of Vegetation at Thomas Stone National Historic Site. Draft Technical Report

Vital Signs Monitoring

Protocol Implementation and Development:

- Forest Health Monitoring was implemented at GEWA, THST and SAHI this year in collaboration with the Northeast Temperate Network and the Mid-Atlantic Network. The three Networks shared seasonal technicians to collect data and will continue to do so annually in these three Network parks.
- Shoreline position continues to be monitored both fall and spring FY08 at FIIS, GATE, ASIS and CACO, following the Network's *NCBN Geomorphological Monitoring Protocol-Phase I Shoreline Position*. This protocol is almost complete pending peer review.
- Estuarine nutrient enrichment monitoring was implemented at GATE and SAHI under cooperative agreement with Dr. Brad Peterson, Seagrass Ecology Lab, SUNY Stony Brook. Dr. Peterson collected the second year's pilot data for seagrass condition monitoring at FIIS.
- Estuarine nutrient enrichment monitoring was implemented at ASIS and COLO under cooperative agreement with Dr. Ken Moore, Virginia Institute of Marine Science (VIMS).
- The NCBN Salt Marsh Vegetation and nekton monitoring protocols were implemented at ASIS, GEWA and COLO this year following the newly developed sampling design. Nine marshes were sampled at ASIS, Dancing marsh at GEWA, and 4 marshes at COLO. A research associate from the University of Rhode Island assisting on the project, along with two NCBN seasonal technicians, were stationed at ASIS and completed the sampling.
- Salt marsh elevation monitoring continued at GATE and FIIS. Dr. Don Cahoon,

USGS cooperator collected data at all sites 2 times during the year. A new task agreement was established with PI Cahoon to begin installation and sampling of SETs at ASIS this year.

- USGS/NASA EAARL LiDAR was collected for both ASIS and GEWA. Data products continued to be delivered to the Network by John Brock, USGS, for the 2004-2005 surveys conducted park-wide at all Network parks. FIIS and GATE-Sandy Hook will be surveyed again in the spring of 2009.
- Baseline historic topographic model development continued through the cooperative agreement with the University of Rhode Island Geosciences department and USGS for FIIS, GATE, ASIS and CACO. These models will allow the Network to analyze topographic change within these parks over decades and assist in assessing the effects of global warming on these coastal systems. This project is due to be completed in 2009.

Monitoring products:

- FIIS-A draft annual report for the Shoreline Position monitoring conducted by the Network in 2007-2008 has been completed.
- Water Quality Monitoring-Draft Report-Estuarine water quality within parks of the Northeast Coastal and Barrier Network: Data report on the development and early implementation phases of Vital Signs estuarine nutrient enrichment monitoring, 2003-2006
- GATE - Sandy Hook (2007) bare earth and first surface topography data in GeoTIFF and ASCII x,y,z format.
- GEWA (2008) bare earth and first surface topography data in GeoTIFF and ASCII x,y,z format.
- ASIS (2008) bare earth and first surface topography data in GeoTIFF and ASCII x,y,z format to be delivered on October 31, 2008.
- Brock, J.C., Wright, C.W., Nayegandhi, A., and Travers, L.J., USGS-NPS-NASA EAARL Topography - Colonial National Historic Site. OFR-2008 Director's Approval.
- Nayegandhi, A., Brock, J.C., Wright, C.W., Stevens, S., Yates, X., and Bonisteel, J.M. EAARL Coastal Topography-Fire Island National Seashore 2007. DS-2008 Director's Approval.
- Nayegandhi, A., Brock, J.C., Wright, C.W., Stevens, S., and Yates, X., EAARL Coastal Topography-Sandy Hook 2007. DS-2008 Director's Approval.
- Nayegandhi, A., Brock, J.C., Wright, C.W., Stevens, S., and Yates, X. EAARL

Topography–George Washington Birthplace National Monument 2008. DS-2008 Director’s Approval.

- Nayegandhi, A., Brock, J.C., Sallenger, A.H., Wright, C.W., Yates, X., and Bonisteel, J.M. EAARL Coastal Topography–Northeast Barrier Islands 2007: Bare Earth. DS-2008 Director’s Approval.
- Nayegandhi, A., Brock, J.C., Sallenger, A.H., Wright, C.W., Yates, X., and Bonisteel, J.M. EAARL Coastal Topography–Northeast Barrier Islands 2007: First Surface. DS-2008 Director’s Approval.

Data management and Information transfer and support to park management and the public:

- In cooperation with the Environmental Data Center at the University of Rhode Island, the NCBN completed the development of two monitoring databases for our Estuarine Nutrient Enrichment and Seagrass monitoring.
- In cooperation with the Environmental Data Center at the University of Rhode Island, updated and revised the NCBN internet and intranet websites. Reports, newsletters, resource briefs, monitoring protocols and other documents can now be found on the website along with information on all of the Network’s Vital Signs. (The website can be viewed at: <http://science.nature.nps.gov/im/units/ncbn/>)
- In cooperation with USGS, the Network provided an opportunity for park and FTSC staff to take part in a week-long training by USGS on processing EAARL LIDAR data collected in NCBN parks. The training was in follow up to a two day workshop held by the Network at URI in 2007. The workshop focused on collecting, processing and the use of LiDAR data. Park and regional GIS staff attended the workshop at the University of Rhode Island in March 2007, along with staff from the regional technical support centers, NC State University and the University of Rhode Island. It was decided at this meeting that it was important that park GIS coordinators, the NCBN data manager and FTSC staff working with LIDAR attend training. USGS developed the ALPS software training, and the NCBN provided travel funds to park and regional staff to attend in St. Petersburg, Florida in 2008.
- NPSpecies certifications and data uploads continued for all NCBN Parks. A number of park staff training sessions on how to use the NPSpecies databases took place for GATE, ASIS, GEWA and COLO staff this year. Species lists have been generated from the database and provided to cooperators working on Water Resources Park

Condition Assessment reports for GEWA, THST and FIIS. Provided data for GMP planning at FIIS, as well as species lists and analyses to park staff addressing GPRA goals.

- Two taxonomic experts continue to enter, verify and certify NPSpecies data for 4 NCBN parks. Mark Hoffman from MD DNR has collected data on birds on ASIS for the last 20 or more years and is cooperating with the NCBN to assure all of his data for the park are entered into the NPSpecies database and archived. Dr. Eric Lamont, an alumni of the NY Botanical Garden, continues to work on entering plant data for FIIS, SAHI and GATE. Dr. Lamont has successfully located and identified a great deal of additional data for these parks providing a very valuable current and historical plant database for each.
- Resource Briefs were developed for Network monitoring initiatives, salt marsh vegetation monitoring, nekton monitoring, estuarine nutrient enrichment and shoreline change. These briefs are very general and intended for interpretative staff to provide to the public on monitoring initiatives in their parks. In the future, these briefs will be more technically oriented and provide data results to park superintendents and resource staff. (NCBN Resource Briefs can be found at: <http://science.nature.nps.gov/im/units/ncbn/execbrief.aspx>)
- A draft of the Northeast Coastal and Barrier Network FIIS Biotic Resource Synthesis Report was completed in 2008 and is being reviewed by the Network and park staff.
- Network staff continue to participate in park-sponsored public science conferences, and park meetings, presenting information on the NCBN's latest inventory and monitoring projects, as well as, how the collected data are organized, stored, and made publicly available through national NPS data repositories.

Water Quality Monitoring

- Estuarine Nutrient Enrichment Protocol-Through a cooperative agreement with the Seagrass Ecology Lab at SUNY Stony Brook, the Network's estuarine nutrient monitoring protocol was implemented at GATE and SAHI this year. The Networks seagrass monitoring component of this protocol was also piloted for the second year at Fire Island.

- Estuarine Nutrient Enrichment Protocol- Through a cooperative agreement with the Virginia Institute of Marine Science (VIMS), the Network's estuarine nutrient monitoring protocol was implemented at COLO and ASIS this year. Seagrass will be monitored at ASIS in 2009 and water quality data will be collected at GEWA under this same agreement with VIMS.
- First draft Estuarine Nutrient Enrichment monitoring Report: Estuarine water quality within parks of the Northeast Coastal and Barrier Network. Data report on the development and early implementation phases of Vital Signs estuarine nutrient enrichment monitoring, 2003-2006
- Through an Interagency agreement with USGS, the Network completed Seagrass monitoring at CACO.

Public Interest Highlights

Northeast Coastal and Barrier Network Adopts Standards to Partner with Global Effort to Monitor and Preserve Seagrass

The Northeast Coastal and Barrier Network has adopted data standards developed by SeagrassNet, a global seagrass monitoring effort that has developed standardized data collection and reporting techniques to leverage data obtained by research and community-based programs throughout the world. In support of its Estuarine Nutrient Enrichment monitoring program, the NCBN monitors seagrass bed extent and condition at a number of coastal parks from Virginia to Massachusetts. In collaboration with cooperators from the USGS Patuxent Wildlife Research Center and University of Rhode Island Environmental Data Center, the NCBN is configuring its seagrass monitoring program database to allow for the seamless transfer of its monitoring data to the SeagrassNet web-based data reporting system. Researchers will then be able to integrate the information obtained by the NCBN on seagrass resources in northeastern coastal parks with data from such ecosystems throughout the world. In this way, the development of the database will serve its initial purpose of aiding coastal park managers in better protecting their estuarine resources, as well contribute to a better understanding of the distribution and status of vital seagrass ecosystems

worldwide.

Using the Web to Develop and Serve a Comprehensive Inventory of Submerged Marine Resources Data in Ten Northeastern Coastal Parks

The National Park Service Field Technical Support Center (FTSC) at the University of Rhode Island, in collaboration with the NPS Northeast Coastal and Barrier Network and USGS Patuxent Wildlife Research Center, has undertaken a project to inventory existing data related to the bathymetry, water chemistry, sediment contaminants, and other aspects of submerged resources in ten Northeastern Coastal Parks, including seven within the NCBN. The work included the development of innovative web services to facilitate communication between collaborators and park managers in the development of map products, and culminated in the production of a publicly available, web-based catalog of all data sources that were identified (<http://www.edc.uri.edu/ftsc/submerged/data/Catalog.html>). Datasets, reports, and web resources were organized by theme to facilitate searching, and links were created to provide users with access to all available data files and documents. The datasets served in this web-based catalog were identified by the NPS Northeast Region Ocean Stewardship Task Force as high priority for acquisition. These datasets will contribute to the Northeast Region marine resources inventory and mapping study plan and will ultimately be used to guide conservation and management of submerged marine and estuarine resources throughout the Northeastern coastal parks. In addition, the catalog will provide researchers studying submerged ecosystems in the Northeast with an invaluable resource for identifying existing sources of data.

Survey of Dragonflies, Butterflies, and other Arthropods of Assateague Island National Seashore documents 600 species

Richard Orr of the Mid-Atlantic Invertebrate Field Studies, in collaboration with the NPS Northeast Coastal and Barrier Network, and Assateague Island National Seashore has completed a three year survey of the dragonflies, beetles, bees and other arthropods of Assateague Island National Seashore. The survey, conducted between 2005 and 2007, documented over 600 species and included the first recorded sightings in Maryland of two species of paper wasps, four species of leaf beetles, and two species of bees. In addition, the

survey noted the first record of over wintering in Maryland by the migratory common green darner dragonfly, as well as the most northern record to date of over wintering by the Carolina saddlebag dragonfly. Data and photographic voucher specimens taken for the survey will be used to produce two publications that can be used by the general public: a photographic field guide to the larger species found on the island, as well as a Checklist of the Dragonflies, Damselflies, Butterflies and Skippers of Assateague Island National Seashore. Information resulting from the survey's report will be used by park staff in making decisions concerning mosquito control measures, wildlife management, and the protection of salt marshes and other habitats impacted by climate change and rising sea levels.

Accomplishments (FY08) and Work Plan (FY09)

I. Objectives

Objectives for Biological Inventories

1. Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available.
2. Conduct inventories targeted at vertebrate and vascular plant species in the network parks and conduct quality assurance and review of all inventory products.
3. Conduct investigations on species and species assemblages that are of special concern to network parks and conduct quality assurance and review of all inventory products.
4. Conduct other baseline inventories identified as important to network parks and the Network Vital Signs program and conduct quality assurance and review of all inventory products.

Objectives for Vital Signs Monitoring

5. Develop and maintain working and decision-making processes that engage the network board of directors, technical staff, cooperators and managers of network

- parks.
6. Develop, implement, and maintain a network data management program. (Note: this objective is placed under Vital Signs monitoring, however, it is equally important and integrated with the Biological Inventories portion of the program.).
 7. Implement Vital Signs monitoring in network parks, develop protocols, implement sampling, and report results.
 8. Integrate water quality monitoring into the Network Vital Signs monitoring plan.
 9. Develop and maintain strategies to share information with network parks, scientists, and others interested in the network's I&M program.
 10. Hire and retain professional staff and provide a safe, healthy, and productive work environment.

II. Accomplishments (FY2008) and Scheduled Activities (FY2009)

A. Biological Inventories

Objective 1: Locate, catalog and archive park natural resource documents, data sets, and spatial information and ensure such information is accurate, in useable formats and readily available. (all parks).

Task 1.1. The NPSpecies Database

- FY2008 Accomplishments: (1) (All parks) A modification to the existing cooperative agreement with the University of Rhode Island was completed for the ongoing maintenance, update and verification of the NPSpecies database. The following tasks were completed as part of this agreement: Coordinated the certification of the following datasets for taxa expert certification: SAHI and FIIS (Vascular Plants) and ASIS (Birds); Trained NPS personnel and cooperators regarding the use of NPSpecies as needed. Provided training to park staff at the following parks: GATE, COLO, GEWA and THST. Began certification (reviewing data and taxonomy) of CACO fish data; participated for 2 months with the NRPC in Fort Collins, Colorado assisting the WASO with the redesign of the NPSpecies database. Met with NCBN

contractors, Mark Hoffman and Dr. Eric Lamont to train them on the NPSpecies database and assist them with the initiation of each of their projects.

- Scheduled FY2009 activities and products: (1) (all parks) The cooperator will continue to maintain, update and verify the NPSpecies database for the Northeast Coastal and Barrier Network as needed; ensure that changes to the database are noted and entered into the database tracking system; (2) The cooperator will continue to coordinate the certification of the following datasets for taxa expert certification: GATE (Vascular Plants) and ASIS (Birds); ensure NPS personnel and Cooperators are trained regarding the use of NPSpecies as needed; work with WASO staff as requested regarding the NPSpecies database redesign; work with NCBN statistician to produce technical documents regarding species diversity and occurrence at the NCBN parks using NPSpecies data.

Task 1.2. The NatureBib Database

- FY2008 Accomplishments: (1) NatureBib database data requests will continue to be fulfilled as they are received. Completed NatureBib database assessment and editing for ASIS, CACO, COLO, FIIS, GATE, GEWA, SAHI, and THST databases will be summarized in a NCBN NatureBib Certification Report. A NatureBib Data Management and Data Entry Manual for the NCBN will be completed. Scanning and digitizing of NCBN NatureBib documents will continue for the duration of this project. Quarterly e-mail progress reports will be sent to detail task progress for the Network. A web page will be created for digital document storage as needed.
- Scheduled FY 2009 Activities and Products: (1) NCBN will review and assess the status and usage of the NatureBib database by the Network's parks. A protocol will be developed for the Network/park relationship in maintaining this important database.

Task 1.3 Natural Resource Inventory Database and Spatial Data Review (All NCBN Parks)

- FY2008 Accomplishments: An amendment to the existing cooperative agreement with NCSU Field Technical Support Center (FTSC) was funded by all 4 networks in

- Scheduled FY 2009 Activities and Products: (1) Trained students will continue to directly assist Northeast Region I&M cooperators with the development of FGDC compliant metadata for all projects. (2) As data becomes available from other NCBN cooperators, NCSU will continue to provide technical support to review biological inventory data and create biological metadata for reviewed projects.

Objective 2: Conduct inventories targeted at vertebrate and vascular plants in the Network parks and conduct quality assurance and review of all inventory products.

Task 2.1. Avian inventories (COLO, THST, GEWA, ASIS, SAHI, FIIS, GATE)

- FY2008 Accomplishments: (1) (GATE) NCBN cooperators, New Jersey Audubon Society conducted and completed avian inventory surveys at Jamaica Bay/Breezy Point unit of Gateway National Recreation Area (GATE) in spring/summer 2007. Surveys used point count methodology for breeding passerines and call/playback methodology for secretive waterbirds (e.g., rails, bitterns) to improve detection. This effort was undertaken to complete surveys originally begun for GATE in 2005 and completed at the Staten Island and Sandy Hook units. A draft final report for this project was submitted in August 2008 (2) (COLO, THST, GEWA) Cooperator's from the College of William and Mary are delayed in completing the Network's three

avian inventory reports for Colonial, Thomas Stone and George Washington Birthplace. A draft report for GEWA was submitted to the Network in July 2007, it was reviewed and comments sent to the cooperator. A final report was completed and submitted in August. No other reports were submitted and the network continues to seek completion of this project. (3) (ASIS) A contract was developed between the Network and private contractor, Mark Hoffman, an ornithologist with many years of experience and knowledge of the birds of Assateague. Mr. Hoffman was hired to assist the Network in developing and completing an avian species database for the park. Mr. Hoffman is a uniquely qualified expert on the birds of Assateague Island National Seashore (ASIS). In 2008 he began to identify, compile, and evaluate existing data pertaining to avian species found on ASIS and synthesize findings into a report with recommendations for further study and management action for birds. The contractor has also started performing quality assurance certification of the NPSpecies avian database for ASIS. Mark Hoffman has provided a database of avian records for ASIS which has been converted to NPSpecies.

- Scheduled FY2009 Activities and Products: (1) (GATE) New Jersey Audubon will make corrections and address comments to the draft GATE breeding bird survey report and deliver a final product. (2) (ASIS) The contract will be completed with Mark Hoffman to compile and review the existing avian species records for ASIS, and submit a final database and report.

Objective 3: Conduct investigations on species and species assemblages that are of special concern to network parks.

Task 3.1. Conduct Odonate and Lepidoptera Inventories in Network parks.

- FY2008 Accomplishments: (1) (ASIS) The field work for the multi-year insect inventory project at ASIS was summarized and submitted in the sixty page document Report on the 2005-2007 Survey of Selected Arthropods from Assateague Island National Seashore on March 12, 2008. Also submitted on the same date, was the complete database Arthropod Database 2005-2007 of the arthropods identified during the study and details of the 625 arthropod species found in the park. A presentation

was given to the ASIS park staff on the findings of the project in April, 2008. All products in the contract have been completed and accepted by the NPS.

- Scheduled FY 2009 Activities and Products: (1) Funds remaining for this project will be used to produce an Assataegue Island Arthropod Photo-guide in FY2009. The purpose of this guide is to provide the ASIS staff and the Park's visitors with a tool to identify the more conspicuous arthropods found on the island. This product is due at the end of FY2009. The majority of the photos needed for the guide were taken during the life of the project; however, one or maybe two returns to the Park in FY2009 will take place to fill in photographic gaps in the guide when identified.

Objective 4: Conduct other baseline biological inventories identified as important to Network parks and the Network Vital Signs program.

Task 4.1. Assemble all final classification, map products, and metadata. Work with NPS staff to integrate new information and revise NVC units and maps as appropriate; produce a single set of classification, map deliverables and metadata that meet all VMP standards.

- FY 2008 Accomplishments: (1) Through a cooperative agreement with NCSU, the Network continues to refine and implement QA/QC standards for vegetation classification and mapping data products. Activities include reviewing and, if necessary, correcting spatial data products and metadata for each project. This review was conducted in 2008 for the following NCBN parks: COLO, GATE, GEWA, SAHI, THST.
- FY2009 Accomplishments: (1) In FY2009, NCSU will implement NPS and USGS guidelines for online presentation and retrieval of vegetation classification and mapping products. For each completed vegetation mapping project, NC State staff prepares the data and documents for posting to the USGS-NPS Vegetation Mapping Program web site, <http://biology.usgs.gov/npsveg> . GATE is expected to be completed by October 2008 and GEWA is expected to be completed in November 2008

Task 4.2. Inventory of Contaminant Sources in Network Parks (All parks)

- FY2008 Accomplishments: (1) (GEWA, THST, FIIS, ASIS, COLO, GATE, SAHI) Cooperators from Rutgers University completed final reports for each of the parks. These park specific reports include a baseline inventory of current xenobiotics in the environment based on historical data and current information gathered by the cooperators. A complete contaminants risk assessment was included in each report.
- Scheduled FY2009 Activities and Products: (1) (GEWA, THST, FIIS, ASIS, GATE, SAHI, COLO) All reports will be formatted and published in the Northeast Region Technical Report Series.

Task 4.3. Inventory of Marine Resources in Network Coastal Parks

- FY2008 Accomplishments: (1) (NCBN and NETN coastal parks) Efforts to inventory marine resources was initiated in FY06 in the Northeast Region coastal parks by the Northeast Coastal and Barrier Network and the North Atlantic Coast Cooperative Ecosystems Study Unit (CESU). The purpose of this initiative was to develop a detailed strategy for the inventory and mapping of submerged natural resources associated with coastal parks within the Northeast Coastal and Barrier Network and two parks in the Northeast Temperate Network. A cooperative agreement was established in FY07 with the USGS and the University of Rhode Island (URI) to: prepare an inventory and catalog of existing mapping data on these priority marine and estuarine natural resources; identify information gaps in the inventory; and develop a detailed five-year strategic plan, including technical and logistical guidance, that NPS can use as a guide to addressing data deficiencies. For reporting purposes within this annual report, this project is divided into three distinct progress summaries. **Marine data inventory and catalog**--In FY08, this project was completed. A catalog of relevant geographically explicit marine resource data was developed and is available at: <http://www.edc.uri.edu/ftsc/submerged/data/Catalog.html> . Data were identified by communicating with GIS personnel at each of the parks, by searching the NPS Data Store application, and by adding other datasets known to, or discovered by, the project investigators. In addition, in order to facilitate park review, the cooperators have organized the catalog into units relevant to each park

and uploaded each file as a Google Spreadsheet document. By using Google Spreadsheets, collaborators were able to review and make real time edits within a shared work environment. The catalog was distributed to NCBN park resource managers for feed back. **Adoption of a uniform marine habitat classification system--** The bulk of investigator effort for this part of the project during FY08 was spent considering how the priority data needs articulated by the NER Ocean Stewardship Task Force might be fit together within the context of a cohesive mapping initiative. The USGS cooperator is in the process of conducting a review of existing marine habitat classification systems and has started to write up this review along with specific recommendations on classification systems for the NPS/Northeast Region initiative. **Evaluation of mapping technologies, scales and resolution--**The third major component of effort during FY 2008 by the USGS cooperators focused on reviewing mapping technologies. The expectation was that specific technologies could be adopted for each of the inventory components and prescribed for use across the NER. Consequently, the cooperators have arrived at the conclusion that a range of technologies are appropriate for populating the NCBN/NETN marine data inventory, and that map quality and consistency should be addressed through adoption of uniform map scales, resolutions, and minimum mapping units (rather than prescribed technologies). These recommendations will be made available through the inventory and mapping study plan being developed by the USGS cooperators to be completed in the fall of 2008. The NPS I&M program also held a workshop in February 2008 to discuss mapping schemes and standards. The NCBN cooperators participated in this workshop. (2) (ASIS) Assateague Island National Seashore has partnered with the Maryland Geological Survey (MGS) to collect bathymetry and sediment data for the Virginia Coastal Bays. Funding for the project was provided to the Network from the National I&M Program to begin piloting marine resource inventories. This project will enable ASIS to manage and protect all of its estuarine waters equally as one holistic system by providing the missing information on the National Seashore's estuarine resources in Virginia. All field work has been completed. Analysis of the physical properties of the sediment samples (water content, bulk density, grain size) is complete. Metals analysis (P, S, Cd, Co, Cu, Fe, Mn, Ni, Pb, and Zn) is also

complete. The final type of analysis, nutrient content (C and N), is underway with approximately 70% of the sample analyses already completed. MGS has also completed a draft of the metadata text, which ASIS will use to create ArcGIS shapefiles with FGDC-compliant metadata. Bathymetric data processing and QA/QC were completed in June 2008, resulting in 740,000 sounding points. MGS also created a new VA coastal bays shoreline to use as a boundary file, because existing shorelines for the western shore of the bay were unreliable, inconsistent, or outdated. Using the new shoreline and bathymetry data, ASIS staff developed land and island polygons and created multiple types of interpolated bathymetry grids, and used statistical methods to assess their accuracies, to enable easier use and display of the large dataset within ArcGIS. ASIS staff also completed FGDC-compliant metadata for the bathymetry points shapefile and the interpolated grids. Results and applications of this project were presented at the NPS Water Resources Professionals Conference poster session in February 2008. (3) (FIIS) Using Fire Island NS as a study area, a brief pilot effort was conducted to test various acoustic techniques available for characterizing submerged resources (e.g., sediments, biological habitats, cultural features). Funding for the project was provided to the Network from the Geologic Resources Division and National I&M Program to begin piloting marine resource inventories. Fire Island was selected as a study area because sub tidal habitats within the Bay portion of the park boundary are shallow and the waters are highly turbid, features that are typical of parks in the northeast and elsewhere along the Atlantic and Gulf coasts. This project was a collaboration between the NCBN, North Atlantic CESU, URI-GSO, NPS Submerged Resources Center, NPS GPS Program, and Fire Island NS. Data were collected over a 5-day period with the objective to use the data to assist with the design of more comprehensive submerged resource inventories and mapping efforts at Fire Island, and other NPS units with shallow waters. Report drafts from each of the cooperators have been submitted to the Network, except for the URI GSO group. Once their report is complete, all reports will be combined into one draft.

- Scheduled FY2009 Activities and Products: (NCBN and NETN coastal parks) (1)
Final Inventory and Mapping Study Plan-- Based on the data-mining effort and

recommended mapping standards, USGS cooperators will develop a strategy for NPS to acquire the marine and estuarine natural resource data identified as “priority data” by the NER. This mapping strategy will include: a description of existing data sets that will make a relevant contribution to enhancing the fundamental inventory of park submerged natural resources; a detailed description of the data required to fill gaps in the marine resource inventory; and methodologies necessary for collection of fundamental data, including literature citations to support use of specific field, laboratory, and data processing procedures, and details on the required products of each inventory (e.g., maps, scale, resolution). The draft plan is due to be completed in the fall of 2008 (2) (ASIS) The bathymetric data processing is currently underway. The bathymetric data will be referenced to the North American Vertical Datum (NAVD88) to provide a digital surface model of the bay bottom and bathymetric maps. Already, ASIS is receiving a steady stream of requests for these data from various government agencies and academic institutions who want to incorporate the data into research on SAV habitat, hydrodynamic circulation models, and water quality trends. Deliverables will include a final report and maps in addition to valuable geospatial datasets, which will be used in multiple ongoing research and management efforts by both the Seashore and park partners, including other Federal agencies, State and local groups. A poster to present additional aspects of this work will be presented at the George Wright Society 2009 Conference. (3) (FIIS) A final report on the pilot to map and text equipment in shallow estuarine habitats will be completed.

B. Vital Signs Monitoring

Objective 5: Hire and retain professional staff and provide a safe, healthy, and productive work environment.

- FY2008 Accomplishments: (1) Two seasonal biotechs were hired by the Network and were stationed at ASIS. These were a GS07 and GS05 position. These biotechs were hired to implement the salt marsh vegetation and nekton monitoring protocols at

ASIS, GEWA and COLO. (2) A position description and crediting plan were developed for a new Network position, Quantitative Ecologist, also to be stationed at the University of Rhode Island. (3) The Network applied to the Geocorp program through the Geological Society of America. This program places interns working in parks or networks on geology-based projects. The Network proposed that the GeoCorp participant be involved in the ongoing development of the Northeast Coastal and Barrier Network (NCBN) geomorphological monitoring protocol development and testing. In 2008, the Network began developing a protocol to monitor coastal dune and beach topography in a number of parks. Part of this internship involved testing and piloting methods at Gateway National Recreation Area in the summer of 2008. Peter Dennehy, the Geologist in the Park participant assisted with field data collection as well as processing and importing new data into ArcMAP, to produce maps/ shapefiles. Peter also worked extensively on establishing and documenting new benchmarks at GATE.

- Scheduled FY2009 Activities and Products: (1) The Network plans to fill the Ecologist position this fiscal year. (2) A position description and crediting plan will be developed for a GS09 Biologist position that will potentially be stationed at URI. (3) Four biotechs (1-GS07 and 3-GS05) will be hired for the 2009 field season (4 months) to conduct salt marsh vegetation monitoring at GATE, FIIS and SAHI. Duty station for these technicians has yet to be determined.

Objective 6: Develop and maintain working and decision-making processes that engage the network board of directors, technical staff and managers of network parks.

Task 6.1. Informational meetings, technical meetings and training

- FY2008 Accomplishments: (1) A board of director's meeting was held via conference call in January 2008, in which the FY07 administrative report and FY08 work plan was reviewed and accepted by the board. (2) No Technical Steering Committee meetings were held this fiscal year. (3) Network staff traveled to ASIS and GEWA and met with park staff to discuss Network monitoring, including the establishment of

SET monitoring at ASIS. Network staff took part in the start-up meeting for the WRD condition assessment for GEWA and THST at the same time. Network staff also traveled to FIIS to take part in 2 Park Condition Assessment meetings to discuss goals and progressive with the project cooperators.

- Scheduled FY2009 Activities and Products: (1) A board of directors meeting will be held again by the end of January 2009 to review the FY 08 report and FY09 work plan. (2) Network staff will travel to GEWA in November 2008 to update park staff on park specific monitoring and projects. The Network staff will also participate in a follow-up meeting for the GEWA Watershed Condition Assessment project/Shoreline Change project. (3) Network staff will travel to FIIS, SAHI and GATE to update park staff and superintendents about the program. (4) 6 NCBN monitoring projects will be presented as posters at the 2009 George Wright Society meeting.

Task 6.2 –Information dissemination

- FY2008 Accomplishments: (1) A cooperative agreement was developed between the Network and the Environmental Data Center (EDC) at URI to assist the Network in enhancing the NCBN website as well as meet the new content standards and recommendations put forth by the WASO for both the Network intranet and internet sites. Through this cooperative agreement, the URI EDC continued the task of updating and enhancing the Network's internet site. The Network's websites are the primary means of sharing data, reports, and general program information with the public, park resource managers, and other I&M staff. This year, the NCBN internet website (<http://www.nature.nps.gov/im/units/ncbn/>) and intranet website (<http://www1.nrintra.nps.gov/im/units/ncbn/index.aspx>) were both updated to include NCBN data products and reports. A web application was developed for the NCBN website that allows parks and others to query a modified NPSpecies database providing species lists and information (http://science.nature.nps.gov/im/units/ncbn/Species_Search.aspx). An additional application that summarizes and provides links to NCBN and other natural resource monitoring programs was also developed. Users may query the data based on park and/or vital sign of interest

(http://science.nature.nps.gov/im/units/ncbn/mon_ProgSelect.aspx) (2) The URI EDC lab also developed an ESRI ArcGIS Server (9.2) web application to aid park natural resource staff access to NCBN's GIS base data layers. Sagamore Hill National Historic Site was used to demo this application and will serve as a template for the development of other NCBN GIS web applications in the future. (3) The Network completed their first NCBN newsletter and distributed it to park staff. Single page resource briefs were also completed for Salt Marsh, Estuarine Nutrient Enrichment, Shoreline, and Nekton monitoring.

- Scheduled FY2009 Activities and Products: (1) Improvements will continue to be made to the Network's website by the NCBN data manager. (2) Additional newsletters and resource briefs will be developed and provided to the parks and made available to the public on the NCBN website.

Task 6.3 - Contribute to General Management Planning

- FY2008 Accomplishments: (1) The Network established a cooperative agreement with the University of Rhode Island in FY06 to assist the Network in combining inventory products into park specific vertebrate and vascular plant synthesis reports that can assist parks with species and habitat protection and planning. These reports will not only combine inventory results, but include park specific guidance and suggestions for the management and conservation of species and habitats by taxonomic experts familiar with each park. URI cooperator and PI, Carol Trocki, continued on a Biotic Resource Synthesis Report for Fire Island National Seashore. The purpose of this project is to provide an accessible, synthetic description of existing biotic resource information and management issues at FIIS so that this information can be incorporated into the general management planning process to ensure appropriate stewardship into the future. All readily accessible information gathered from NCBN staff, park resource staff, technical experts and cooperators, park and regional websites, NatureBIB references and NPSpecies was compiled, reviewed, and synthesized into a single document describing the biotic resources at Fire Island National Seashore. For each biotic resource identified, the following was provided: 1) description of current status and significance at a variety of spatial

- Scheduled FY2009 Activities and Products: (1) In FY2009, the Biotic Resource Synthesis Report for Fire Island National Seashore will be revised and finalized based on feedback received during the review process. Concept diagrams and other useful visual aids will be developed to support the Biotic Resource Synthesis Report for Fire Island National Seashore. These communication tools will be useful for park natural resource managers, planners, and interpretive staff. In addition, work will begin on a Biotic Resource Synthesis Report for another park in the Northeast Coastal and Barrier Network.

Objective 7: Develop, implement, and maintain a Network data management program.

Task 7.1. Develop an NCBN Database Template based on the NPS Natural Resource Database Template and develop individual monitoring databases for all network protocols.

- FY2008 Accomplishments: (1) The URI EDC Lab, working closely with USGS cooperators, created two NRDT compliant, MS Access databases for the NCBN's Estuarine Nutrient Enrichment Monitoring program. Databases were developed for both the Seagrass and Water Quality components of the program, and deliverables included detailed user's guides for each application.

- Scheduled FY2009 Activities and Products: (1) Maintain existing NCBN monitoring databases (2) Through a cooperative agreement with the URI EDC lab, the NCBN will evaluate systems for cataloging metadata associated with the NCBN's geospatial base data, as well as spatial datasets created in conjunction with inventory and monitoring efforts. The cooperator will assist with the implementation of the selected cataloging system, as well as the production of training materials for its use and maintenance. (3) EDC staff will also assist the NCBN in evaluating publicly and commercially available photo management solutions for the Network's imagery library. The ultimate goal of these efforts will be implementation of a photo management solution that facilitates the storage, cataloging, and exploration of all imagery associated with NCBN inventory and monitoring projects. Final deliverables will include training materials for the software's use and maintenance. (3) EDC staff will also continue to aid in the production of formal documentation of server specifications and configuration, LAN configuration, and data storage and backup procedures.

Objective 8: Identify and prioritize Network Vital Signs, develop protocols and implement programs to monitor these Vital Signs in Network parks.

Task 8.1. Test existing protocols for assessing and monitoring salt marsh ecosystems in Network parks. (CACO, FIIS, GATE, ASIS, COLO, GEWA, and two Northeast Temperate Network (NETN) Parks, ACAD and BOHA)

- FY2008 Accomplishments: (1) Revisions to the Vital Signs Monitoring Protocols for salt marsh vegetation and salt marsh nekton continued in close consultation with cooperators and assistance from cooperator/statistician, Penelope Pooler. (2) Protocol implementation at Assateague Island National Seashore (ASIS) – In late June 2008, nine permanent salt marsh monitoring sites were established at ASIS. Both nekton and vegetation monitoring were conducted at these nine sites. In early July, the first round of nekton data collection was conducted, followed by vegetation monitoring which was completed by late July. The second round of nekton at ASIS was completed in early September. (b) Protocol implementation at George

Washington Birthplace National Monument (GEWA) – nekton and vegetation data collection were conducted at Dancing Marsh in early August. (c) Protocol implementation at Colonial National Heritage Park (COLO) – In late August, four permanent salt marsh monitoring sites were established at COLO and vegetation monitoring was completed. Two additional monitoring sites will be added when COLO is re-visited. (2) All data for the 2008 field season have been entered and are currently undergoing quality control procedures.

- Scheduled FY2009 Activities and Products: (1) Revisions to both the NCBN salt marsh vegetation and salt marsh nekton protocols will be prepared and sent out for external review. Following the review the authors will address comments and make changes to the protocol as needed. (2) All data collected during the 2008 field season will be subjected to quality control procedures. (2) The permanent locations for salt marsh nekton and salt marsh vegetation monitoring at Fire Island National Seashore (FIIS), and Gateway National Recreation Area (GATE) will be selected. (3) Protocol implementation – sometime in late spring / early summer 2009, the first round of salt marsh nekton data will be collected. All nekton and vegetation collection at FIIS, SAHI and GATE should be completed by late September 2009. COLO will be revisited if time permits.

Task 8.2. Test variables and develop protocols for assessing and monitoring geomorphologic change in Network parks. (CACO, FIIS, GATE, ASIS, COLO, GEWA, THST, SAHI)

- FY2008 Accomplishments: (1) (ASIS, CACO, GATE, FIIS) A draft prototype Annual Report on shoreline monitoring following the NCBN Shoreline Change monitoring protocol, was developed by NCBN cooperators from Rutgers University, FIIS was used as the model. A major element of the report was the generation of a graphics program to depict the temporal and spatial variations of shoreline position. A draft version of the Annual Report prototype has been submitted to the Network for review. (2) Implementation of the NCBN shoreline monitoring protocol was conducted at all four Network parks, FIIS, GATE, CACO and ASIS in the spring and fall (3) As part of the Network's cooperative agreement with Rutgers scientists, survey monuments were installed and geo-referenced in the following units of

Gateway NRA: Sandy Hook, Great Kills, Plumb Beach, and Breezy Point. The first series of profiles run from these monuments was initiated as part of a piloted 2-D monitoring program. (3) The URI Geosciences Department, USGS and the NCBN project to develop a baseline of historical topography that can be utilized in long-term topographic change analyses in four Network ocean parks, CACO, FIIS, GATE (Sandy Hook Unit) and ASIS continues. These data will be exceptionally useful to the parks for enhanced understanding of how the elevation and volume of the beach and dune system has changed over a long (half-century) time period. The data can be used to help predict and manage for climatic changes such as sea-level rise and increased storm intensity by assessing how these factors have affected the parks over the past half-century. Additionally, accurately quantifying volumetric changes provides an understanding of the sediment budget of the islands and how this budget has responded not only to changing conditions (climatic, increased development, etc.) but to changes in land use and resource management of the parks. (4) Network staff reviewed and formatted the NCBN Geomorphological Monitoring Protocol-Part I Shoreline Position following the National Natural Resource Reporting Series guidelines. This draft version of the protocol was submitted to the National Monitoring Coordinator, Steve Fancy for inclusion in the NPS protocol monitoring database.

- FY2009 Scheduled activities and products: (1) The NCBN Shoreline Position protocol will be peer reviewed and Rutgers cooperator, Norb Psuty, will address reviewers comments and make changes to the protocol as needed. Following this review process the protocol will be submitted for final printing and incorporation in the NPS Protocol database. (2) An Annual Report will be produced for the Sandy Hook Unit of Gateway following the format described in the NCBN Shoreline Position Monitoring Protocol. A second phase of coastal modeling will be initiated to develop a second protocol that will apply to data collection of 2-D and 3-D changes in the beach-dune system. Trend reports for shoreline change for the Sandy Hook Unit of Gateway and for Fire Island National Seashore will be initiated (3) Work will continue throughout the year on development of the coastal park historic digital terrain models by USGS and URI cooperators. (4) Shoreline position data collection will continue at FIIS, GATE, ASIS and CACO.

Task 8.3. Collect NASA EAARL System LiDAR data in coastal parks and assess ways to use these data to enhance monitoring of shoreline and topographic change in the parks,

along with other variables such as vegetation and habitat change. (CACO, FIIS, GATE, ASIS, COLO, GEWA, THST, SAHI)

- FY2008 Accomplishments: (1) The USGS Coastal and Marine Geology (CMG) Program Florida Integrated Science Center (FISC) in collaboration with NCBN conducted an airborne lidar survey in March/April 2008 at ASIS and GEWA. The survey, which was co-funded by USGS and NPS, took 3 survey days to complete and resulted in the acquisition of 52 Gigabytes of raw laser and digital photography (RGB and CIR) data. These data were processed to create Digital Elevation Models of canopy and bare Earth topography in FY08. (2) USGS CMG hosted an Airborne Lidar Processing System (ALPS) hands-on training workshop in February 2008 that was attended by 2 representatives from NPS-NCBN. The primary objective of this workshop was to educate attendees on the ALPS software and its applications to explore and process lidar data and imagery acquired by the Experimental Advanced Airborne Research Lidar (EAARL). (3) An important monitoring goal of NCBN is to improve the understanding of and provide information to park managers on the dynamic nature of coastlines and the temporal variability in dune / beach topography. In the last decade, NPS-NCBN has collaborated with USGS and NASA to acquire dense lidar topographic data along the beach face of the 4 ocean parks (FIIS, CACO, ASIS, GATE). Recently, these surveys were extended to map the aerial topographic features within the entire park boundary. Accordingly, data acquired at FIIS and GATE (Sandy Hook) from 2003, 2005, and 2007 surveys were analyzed for volumetric change and an appropriate temporal lidar survey schedule was suggested for ocean parks based on the analysis conducted. The report for the above analysis was submitted to NPS-NCBN in FY08.
- Scheduled FY2009 activities and products: (1) Recently acquired (2008) digital color infrared (CIR) imagery data will be processed and image world files created for ASIS and GEWA by USGS. (2) EAARL acquisition flights will be conducted at FIIS and GATE (Sandy Hook) in Spring FY09, these products will be processed to create DEMs, xyz ascii data, and image world files as described above. (3) The following NCBN lidar data products will be published as USGS Data Series in FY09:
 - USGS-NASA ATM Coastal Topography – Assateague Island National

Seashore, 2001. USGS Data Series 2008-XXXX (On DVD).

- USGS-NASA ATM Coastal Topography – Northeast Atlantic Coast Survey, 2000. USGS Data Series 2008-XXXX (On DVD).
- EAARL Coastal Topography – Assateague Island National Seashore, 2008.

Task 8.4. Test variables and develop protocol for assessing and monitoring visitor impacts in Network parks. (CACO, FIIS, GATE, ASIS, COLO, GEWA, THST, SAHI)

- FY2008 Accomplishments: (1) No additional work was completed for this vital sign in FY08.
- Scheduled FY2009 activities and products: (1) Based on available funding, the Network may develop a scope of work for the development of a visitor use protocol.

Task 8.5. Test variables and develop protocols for the use of high spatial resolution satellite remote sensing data for estuarine and terrestrial vegetation habitat mapping in NCBN parks.

- FY2008 Accomplishments: (1) (FIIS) Terrestrial vegetation mapping by digital classification of Quickbird-2 satellite image was completed by URI cooperators (Dr. Y.Q.Wang). They developed a simple protocol that used a stratified classification to extract vegetation types under the control of GIS map layers developed by the previous NPS Vegetation Mapping project for FIIS. A manuscript based on the outcome of this project was submitted and accepted to the journal, *Marine Geodesy* 30:77-95, 2007), 5th Special Issue on Marine and Coastal Geographic Information Systems. This project is complete. All data products will be submitted to NCSU for archiving and review.
- Scheduled FY2009 Activities and Products: Follow up on this project will include putting together a small technical team to review these projects and consider expanding this work into a long-term monitoring program for all of the Network parks.

Task 8.6. Salt Marsh Elevation Monitoring (GATE, FIIS, ASIS, CACO)

- FY2008 Accomplishments: (1) (FIIS, GATE, ASIS) Surface elevation table – marker horizon (SET – MH) stations at Fire Island NS, Jamaica Bay Refuge (JoCo, Big Egg Restoration Project, and Black Bank) and GATE, Sandy Hook unit continued to be monitored. Cooperators Dr. Don Cahoon and James Lynch met NCBN staff for a meeting at ASIS in November 2007 to discuss establishment of 6 SETs on ASIS marshes.
- Scheduled FY2009 activities and products: (1) (GATE, FIIS, ASIS) Salt marsh elevation data collection will be continued at FIIS and GATE. Following the revised salt marsh monitoring sampling design, the Network will fund additional SET installations at FIIS and GATE in order to co-locate protocol data collection as necessary. SETs will be installed at ASIS within 6 marshes collocated in relation to the new salt marsh monitoring protocol design for ASIS. Sampling will begin in the spring 2009 at ASIS.

Task 8.7. Integration of the NCBN parks into bird conservation region 30 tidal marsh bird monitoring. (COLO, ASIS, GATE, FIIS, GEWA, THST, SAHI)

- FY2008 Accomplishments: (1) (1) Monitoring objectives for each NCBN Park and groups of tidal marsh bird species was determined. The necessary sample intensity to meet monitoring objectives will be identified and a spatially balanced, hierarchical sampling frame using the Generalized Random Tessellated Sample developed. A draft final report, including power analyses, GIS data layers, and a salt marsh bird sampling frame was submitted for review to the Network.
- FY2009 activities and products: Additional work on this project to be determined.

Task 8.8. Develop an overall statistical sampling design for the NCBN monitoring program, review, revise sampling design sections of existing protocols, and make recommendations for the sampling design sections of planned protocols (all Parks).

- FY2008 Accomplishments: (1) A cooperative agreement was continued between the NCBN, and Virginia Polytechnic Institute and State University to work with Dr. Penelope Pooler, a biostatistician. In FY08, Penelope continued to review and revise the sampling design and standard operating procedures (SOP) for the following

monitoring protocols: salt marsh sediment elevation, salt marsh vegetation, and nekton. Based on preliminary field sampling, Dr. Pooler worked with the network's GIS specialists, as well as the NCBN coordinator, to assure that the intended sampling design was feasible to implement in the field. Dr. Pooler also provided statistical guidance on how sampling design changes could be made to make field sampling more efficient while not compromising statistical inference or analysis options. (2) In conjunction with her work in developing sampling plans and analyzing data for all NCBN protocols, Penelope Pooler participated in a USGS workshop focused on sharing methods for detecting ecological thresholds. This workshop took place in April in Duluth, MN and was attended by both USGS and NPS researchers from across the country whose research involves detecting thresholds. (3) Seagrass modeling- Dr. Penelope Pooler also collaborated with NCBN and USGS on the development of the Seagrass monitoring protocol. Her collaboration involved: a. Reviewing the previous work plan and providing statistical feedback on how it might be revised. b. Reviewing analyses of data from previous years and providing insight into how they could be improved and expanded upon. c. Analyzing data and summarizing statistical model results for technical reports and presentations.

- Scheduled FY2009 activities and products: Penelope Pooler will continue to provide recommendations on how to develop or revise sampling designs and statistical analyses in all NETN monitoring protocols as needed. Additionally, she will provide general text on a wide range of statistical modeling techniques that can be adapted to statistical analyses protocols as needed. As field work progresses and data are collected, Dr. Pooler will begin developing statistical models to analyze data to address questions in individual protocols.

Task 8.9. Development of ecological thresholds for vital signs monitoring protocols

- FY2008 Accomplishments: (1) In FY07, USGS and University of Rhode Island scientists received funding through the USGS Status and Trends program to identify limits of acceptable variation and develop ecological threshold values for the vital signs of vegetation and nekton community structure associated with National Park Service's salt marsh vegetation and salt marsh nekton monitoring protocols. In addition to National Park Service monitoring data sets collected in conjunction with the NPS Northeast Coastal and Barrier Network, datasets from numerous other

agencies that used comparable field methods are included in this study. These cooperating agencies include the US Fish and Wildlife Service Region 5, National Estuarine Research Reserve, and Save the Bay (RI). Progress on this project in FY08 include: new nekton and vegetation databases being created from the master files using SQL procedures in SAS to obtain average nekton densities and vegetation percent cover to characterize each site for each year data were collected. Each of the sites was then characterized based on impacts to tidal flow or marsh alteration. A separate database of primary land use was created for the surrounding watersheds of each marsh. Exploratory analysis was conducted on the nekton database using a combination of clustering, principal component analyses, and multidimensional scaling to flush out any functional patterns in species densities at each reference site (that is, those that were not hydrologically altered during the time of the study or tidally restricted) and the land use in their surrounding watersheds. Analysis was done using SAS and PRIMER (Plymouth Routines in Multivariate Ecological Research).

- FY2009 Scheduled Activities and Products: (1) The project is to be finalized and a final report submitted.

Objective 9: Integrate water quality monitoring in the Network Vital Signs monitoring plan.

Task 9.1. Test variables and develop a protocol for assessing and monitoring nitrogen inputs to estuarine ecosystems in Network parks. (CACO, FIIS, GATE, ASIS, COLO and ACAD (Northeast Temperate Network NETN Park)

- FY2008 Accomplishments: (1) Through a cooperative agreement with investigator Scott Nixon from the University of Rhode Island, an extension of the Nitrogen Loading Model (NLM-E) was completed using the most accurate and recent land use data (1992) for Network parks. This model was run for each park, including a 30-year historical analysis for ASIS with data ranging from 1980-2000. The cooperators submitted a draft final report to NCBN staff for review in FY05. Comments were provided to the cooperators by Network staff and potential peer reviewers contacted,

but URI cooperator, Scott Nixon and staff have yet to complete the final report incorporating comments.

- FY2009 Scheduled Activities and Products: Continue to request final report from cooperators, and when received, send out for peer review. Identify new cooperator to expand this project into a monitoring program for the Network and develop a monitoring protocol following NPS I&M Program standards.

Task 9.2. Test variables and develop protocol for assessing and monitoring estuarine nutrient enrichment in Network parks. (CACO, FIIS, GATE, ASIS, COLO and ACAD (a Northeast Temperate Network NETN Park)

- FY2008 Accomplishments: (1) (FIIS) In FY08, a new task agreement was developed between NCBN and Dr. Brad Peterson at the Seagrass Ecology Lab at Stony Brook University's Marine Sciences Research Center to implement the NCBN ENE protocol at SAHI and GATE, and conduct another pilot year of seagrass monitoring at FIIS. The following describes the specific implementation of the protocol (a) In April, results of the 2007 FIIS water quality monitoring project were presented at the 2008 Benthic Ecology Meetings in Providence, RI. In June of 2008, three members of the Seagrass Ecology Lab at Stony Brook University's Marine Sciences Research Center participated in and successfully completed the MOCC boating course at Fire Island National Seashore (FIIS). Protocol implementation – In late June the permanent seagrass monitoring site in FIIS was visited to locate and replace buoys marking the permanent transect markers. In July, the continuous sonde site was selected and the sonde was placed in the field at Gateway National Recreation Area . The water quality monitoring was conducted and completed over the next four weeks at Gateway. Weather and boat use conflicts resulted in a doubling of sampling effort in one of the sampling weeks. After the water quality monitoring was completed at Gateway NRA, the continuous sonde was reconditioned and recalibrated in preparation for deployment at the Sagamore Hill NHS site. However, the lack of proper permitting from the Fish and Wildlife Service prevented the sonde to be deployed within the established index period. The process of acquiring proper permits is continuing. In early August, the vital signs survey at the permanent

seagrass transects at FIIS was conducted. Digital copies of all data were created. No data reduction has occurred yet. (2) In FY07 a cooperative agreement was developed between NCBN and the USGS Maine Water Science Center, Martha Nielsen, PI. The purpose of this agreement is to synthesize water quality data collected during development and early implementation phases of the ENE protocol. This effort included creating a relational database using MS Access, organizing data, performing quality assurance and quality control checks, performing data reduction steps, and generating interpretive products as specified by the ENE monitoring protocol. For two NCBN parks with pre-existing water quality monitoring programs (ASIS and GATE), NCBN data were compared to those of the parks in order to evaluate the relative strengths of existing park versus network protocols, to evaluate whether the park and network monitoring programs arrive at mutually consistent assessments of condition, and to attempt to identify conditions under which inconsistent assessments of condition might emerge systematically. An initial draft report has been submitted to the Network to review progress on the project. A final draft report will be submitted in FY09 (3) In FY08, USGS researchers, Blaine Kopp and Hilary Neckles, performed the last pilot year of ENE seagrass condition monitoring at CACO, and advanced their efforts to develop rapid assessment techniques for unbiased evaluation of seagrass condition throughout NCBN parks. (4) In FY08 a new cooperative agreement was signed with the Virginia Institute of Marine Science (VIMS), PI Ken Moore, to implement the ENE protocol at ASIS, COLO and GEWA. Assateague Island National Seashore (ASIS)--In early July, preparation began to initiate the water quality spatial survey at ASIS by VIMS. The monitoring index period occurred during the four week period of July 14 through August 8, 2008. A continuous water quality monitoring station was also deployed and maintained by the ASIS staff during this index period. In order to adhere to protocols and due to the vast spatial area to cover, monitoring of ASIS occurred over a two day period. As a result of extremely low tidal conditions, one trend station (ASIS 6) was missed during the third week of the index period. All other stations were successfully sampled. Chlorophyll samples were sent to Cape Cod National Seashore North Atlantic Coast Laboratory for analyses. Results have been returned to VIMS. Digital copies of all data were

created. No data reduction has yet occurred. (5) Colonial National Historical Park (COLO)---A NPS-owned YSI 6600 Multi-Parameter Water Quality Logger upgraded with two wiped LiCor PAR sensors was received in early July, 2008 to be used by VIMS for continuous monitoring in COLO. The monitoring index period occurred during the four week period of August 4 through August 29, 2008. A continuous water quality monitoring station was deployed and maintained by VIMS staff during this index period. Due to high fouling rates, this instrument was retrieved, cleaned, calibrated and re-deployed approximately every 10 days during the index period. During these cleaning and re-deployment procedures the continuous monitoring station was without an instrument for less than 24 hours. These absences were primarily during the late afternoons, nights and early mornings so as to lessen the impact of the crucial time-frame of sampling between the hours of 10:00 a.m. and 4:00 p.m. In order to adhere to protocols, monitoring of COLO occurred over a two day period due to the measurements in two different strata: the estuarine stratum and the tidal creek stratum. All stations were successfully sampled. Chlorophyll samples were sent to Cape Cod National Seashore North Atlantic Coast Laboratory for analyses. Results have been returned to VIMS. Digital copies of all data were created. No data reduction has yet occurred. (6) Cooperators from the URI EDC lab completed an ENE MS Access database to pair with the protocol. FY09 will be the first year this database is used for the program. In the fall of 2007, URI cooperators also completed a Seagrass.net compatible database for the NCBN seagrass monitoring program.

- Scheduled FY2009 Activities and Products: (1) (GATE, SAHI, FIIS) All data collected during the 2008 index period by the SUNY Stony Brook cooperators for GATE will be subjected to quality control and data reduction analysis. Final data sets will be delivered to NPS. The results of the estuarine protocol will be compared between FIIS and other regional sites by USGS. Water quality data (after data quality control and reduction analysis) will be input into the database provided to us by USGS. The SeagrassNet site (vital signs permanent transects) within FIIS will be sampled in October 2008 and March, May and July 2009. The Seagrass Ecology Lab at Stony Brook intends to secure the appropriate permits and deploy the

continuous sonde at the Sagamore Hill NP site in August 2009. In addition, Stony Brook is preparing to conduct the 2009 water quality monitoring and the Rapid Assessment Seagrass survey at FIIS. The Rapid Assessment Seagrass Survey will be initiated in June and continue through July. The FIIS water quality monitoring index period will be July. (2) (ASIS, COLO, GEWA) All data collected during the 2008 index periods for ASIS and COLO will be subjected to quality control and data reduction analysis. NPS staff will travel to ASIS in the early spring to train VIMS staff on SeagrassNet protocols. Seagrass condition indicators at ASIS will be measured in July and October of 2008 and in January and April of 2010. Preparations to monitor GEWA will commence in May. VIMS will initiate the water quality index period in early June at which time a continuous water quality monitoring station will be deployed.

III. Staffing

Inventory and Monitoring Staff (NCBN)

NCBN Program Manager, Sara Stevens

NCBN Data Manager, Dennis Skidds

NCBN Quantitative Ecologist, to be hired FY09

NCBN Biologist, to be hired FY09

NCBN Technical Steering Committee

Sara Stevens, NPS-University of Rhode Island

Elizabeth Johnson, NPS-University of Rhode Island

Carl Zimmerman, NPS-ASIS

Michael Bilecki, NPS-FIIS

Allan O'Connell, USGS-Patuxent

John Sauer, USGS-Patuxent

Charles Roman, NPS-University of Rhode Island

Hilary Neckles, USGS-Augusta, ME

Howard Ginsberg, USGS-University of Rhode Island

John Karish, NPS-Penn State University

Mary Foley, NPS-BOSO

Nancy Finley, NPS-CACO (now relocated from CACO)

NCBN Board of Directors

Carl Zimmerman, (Acting) ASIS

George Price, CACO

P. Daniel Smith, COLO

Chris Soller, FIIS

Barry Sullivan, GATE

Lucy Lawliss, GEWA/THST

Tom Ross, SAHI

Sara Stevens, NCBN Program Manager

Elizabeth Johnson, I&M Regional Coordinator

Mary Foley, Chief Scientist Northeast Region

John Karish, Chief Scientist Northeast Region

NCBN Contractors and Cooperators

RI Natural History Survey, Richard Orr

NatureServe, Lesley Sneddon

New Jersey Audubon Society, David Mizrahi

North Carolina State University, Hugh Devine

NY Natural Heritage Program, Greg Edinger and Aissa Feldman

Rutgers University, Keith Cooper

Rutgers University, Norbert Psuty

USGS, Hilary Neckles, Blaine Kopp

USGS, John Brock and Amar Nayagandhi

NASA, Wayne Wright

University of Maryland, Dr. Edward Gates, Josh Johnson

University of Rhode Island, Natural Resources Science Department (NRS), Peter Paton,

Research Associate Carol Trocki, Erika Patenaude, Graduate Student Assistant, Elizabeth

Donelan

University of Rhode Island, Mary-Jane James-Pirri

University of Rhode Island, URI Environmental Data Center, Dr. Peter August (NRS faculty), Research Associates Charles LaBash, Roland Duhaime, Linda Fabre, Eric Endrulat, Rebecca Bannon and Greg Bonyng. Graduate students, Marisa Thompson
VA DNR-Natural Heritage Program, Karen Patterson

Virginia Polytechnic Institute and State University, Dr. Penelope Pooler

State University of New York, Stony Brook, Dr. Brad Peterson

USGS, Maine Water Resources Division, Martha Nielsen

Virginia Institute of Marine Science-Dr. Ken Moore

Mark Hoffman, Private Contractor

Eric Lamont, Private Contractor

IV. Reports, Publications and Presentations (FY 2008)

Presentations and Posters

Adams, M., Duhaime, R., and R. Bannon. 2008. Visualizing Marindin's Profiles at Cape Cod National Seashore. Presentation.

Christiano, M., Duhaime, R., Bannon, R. 2008. Assessing the Condition of Natural Resources in Coastal National Parks: The Role of GIS. Poster.

Christiano, M., Duhaime, R., Bannon, R. 2008. Web based distribution of natural resource condition assessment GIS products between collaborators. Poster.

Fabre, L. and S. Stevens. 2008. Developing a NCBN Communication Plan. Poster.

Peterson, B.J. 2008. "New York Critical Marine Habitat at Risk: Seagrass resources within the boundaries of Fire Island National Seashore". Presentation.

Rodgers, B., S. Brisbin, J. Myers, H. Neckles, B. S. Kopp and B. J. Peterson. 2008. Assessing estuarine condition through water quality and seagrass monitoring at Fire Island National Seashore, NY 37th Annual Benthic Ecology Meetings. Providence, RI.

Skidds, D.E. 2008. Using GIS for Long Term Monitoring of Coastal Resources in the National Park Service. Panel discussion: Challenges and Considerations of Mapping Dynamic Natural Resources. Annual Northeast Arc Users Group Conference, Hyannis, MA.

Skidds, D.E., 2008. Converting Network Websites from ColdFusion to ASP.NET 2.0: Some Challenges and Lessons Learned. Annual NPS GIS and Data Management Conference, Ft. Collins, CO.

Skidds, D.E., S. Stevens, N. P Psuty, M. Duffy, and J. Pace. 2008. Northeast Coastal & Barrier Network: Using GPS to Monitor Shoreline Change in Four Northeastern Coastal Parks. Annual NPS GIS and Data Management Conference, Ft. Collins, CO.

Reports and Publications

Brock, J.C., Wright, C.W., Nayegandhi, A., and Travers, L.J., USGS-NPS-NASA EAARL Topography - Colonial National Historic Site. OFR-2008 Director's Approval.

Kopp, B. S., M. Nielsen, H. A. Neckles, D. Glisic. 2008. DRAFT Estuarine water quality within parks of the Northeast Coastal and Barrier Network: data report for the development and early implementation phases of Vital Signs estuarine nutrient enrichment monitoring, 2003-2006. Natural Resource Technical Report NPS/xxxx/NRTR—2008/xxx. National Park Service, Fort Collins, Colorado.

Nayegandhi, A., Brock, J.C., Wright, C.W., Stevens, S., Yates, X., and Bonisteel, J.M. EAARL Coastal Topography–Fire Island National Seashore 2007. DS-2008 Director's Approval.

Nayegandhi, A., Brock, J.C., Wright, C.W., Stevens, S., and Yates, X., EAARL Coastal Topography–Sandy Hook 2007. DS-2008 Director's Approval.

Nayegandhi, A., Brock, J.C., Wright, C.W., Stevens, S., and Yates, X. EAARL Topography–George Washington Birthplace National Monument 2008. DS-2008 Director's Approval.

Nayegandhi, A., Brock, J.C., Sallenger, A.H., Wright, C.W., Yates, X., and Bonisteel, J.M. EAARL Coastal Topography–Northeast Barrier Islands 2007: Bare Earth. DS-2008 Director's Approval.

Nayegandhi, A., Brock, J.C., Sallenger, A.H., Wright, C.W., Yates, X., and Bonisteel, J.M. EAARL Coastal Topography–Northeast Barrier Islands 2007: First Surface. DS-2008 Director's Approval.

Orr, R. 2008. Final Report on the 2005-2007 Survey of Selected Arthropods from Assateague Island National Seashore.

Psuty, N. and Silveira, T. 2008. DRAFT annual report for Shoreline Position monitoring at Fire Island National Seashore, conducted by the Network in 2007-2008.

Trocki, C. 2008. DRAFT. Biotic Synthesis Report for Fire Island National Seashore.

V. Connect the Dots – Vital Signs Supporting Table for each Park

The “Connect the Dots” effort is a strategic, long-term framework (over a period of years to decades) for coordinating the efforts of the I&M networks, Watershed Condition Assessment Program, park planning (e.g., Foundation Statement, General Management Plan, Resource Stewardship Strategy), park-funded monitoring and research relevant to assessing natural resource condition, and other research and monitoring efforts. A Natural Resource Summary Table will eventually be developed for each park as part of the park’s Resource Stewardship Strategy document. The Natural Resource Summary Table framework demonstrates the connection of science to management through the planning process. See [Connect the Dots Memo](#) and the [Connect the Dots Intranet Website](#) for more information and example documents.

This year, the 32 I&M networks were required to develop a first draft of a Vital Signs Supporting Table for each park, which will feed into the larger Natural Resource Summary Table. The draft excel spreadsheets listed for each park below summarize the key measures of resource condition that the I&M network will routinely provide data for as part of our ‘Job 1’ duties of measuring the condition of selected park resources.

http://www1.nrintra.nps.gov/im/units/ncbn/monitor/VS_Tables/NCBN_VitalSignTable_ASIS.xls

http://www1.nrintra.nps.gov/im/units/ncbn/monitor/VS_Tables/NCBN_VitalSignTable_COLO.xls

http://www1.nrintra.nps.gov/im/units/ncbn/monitor/VS_Tables/NCBN_VitalSignTable_FIIS.xls

http://www1.nrintra.nps.gov/im/units/ncbn/monitor/VS_Tables/NCBN_VitalSignTable_GATE.xls

http://www1.nrintra.nps.gov/im/units/ncbn/monitor/VS_Tables/NCBN_VitalSignTable_GEWA.xls

http://www1.nrintra.nps.gov/im/units/ncbn/monitor/VS_Tables/NCBN_VitalSignTable_SAH1.xls

http://www1.nrintra.nps.gov/im/units/ncbn/monitor/VS_Tables/NCBN_VitalSignTable_THST.xls

