

# **BAY FLOODING AND EROSION IN THE LONG ISLAND SOUTH SHORE ESTUARY RESERVE: FINDINGS AND RECOMMENDATIONS**

## *Executive Summary*

### **Introduction:**

The Long Island South Shore Estuary Reserve (SSER) Office and the New York State Department of State, Division of Coastal Resources prepared a report titled: *Bay Flooding and Erosion in the Long Island South Shore Estuary Reserve: Findings and Recommendations*. Based on a survey conducted by the SSER Office of local governments and park agencies with jurisdiction of bay shorelines, the report investigates and documents current understanding and mitigation strategies for addressing the hazards posed by bay flooding and erosion in SSER communities.

The survey and report were prepared in response to implementation actions called for in the SSER *Comprehensive Management Plan* (CMP). The report summarizes existing conditions and provides a context for comprehensive planning and management actions Reserve communities may choose to undertake to reduce the future impact of these hazards. The report also provides contact information to government agencies and non-government organizations with programs that can assist communities with coastal hazard mitigation.

### **Methodology:**

Survey questions were developed based on a review of existing flooding and erosion literature, and were crafted to seek descriptions of the nature and extent of flood and erosion conditions and related mitigation activities in each community. Survey distribution between October 2003 and January 2005 included the two counties, six towns, one city, twenty three villages, and state and federal parks in the Reserve. Respondents were generally community representatives involved in planning or emergency service.

Two sets of survey questions were distributed. The initial survey included questions about existing programs, preparedness and response, planning provisions, and mapping efforts related to coastal hazards. Recipients were also requested to indicate the location of any bay flooding or erosion sites on maps provided with the survey. Upon reviewing responses from the initial survey, a supplementary survey was distributed in an effort to clarify results by better defining the nature and extent of hazards. The combination of results from the initial survey and supplemental survey questions provided improved documentation of Reserve community flooding and erosion hazards and locations.

## Survey Results:

- A variety of bay flooding and erosion impacts are experienced by communities in the Reserve, affecting approximately two thirds of all survey respondents. Survey respondents associated three principal conditions with bay flooding and erosion: storms, high tides, and wind.
- The three most commonly reported causes of damage were storm surge, storm water runoff, and flooding.
- Responses regarding the frequency of bay flooding or erosion events were varied throughout the Reserve. The early 1990's and the period of survey distribution (2003 - 2004) were cited as time periods of most recent severe damage experience.
- Bay related flooding on roads, buildings, boardwalks and landscapes accounted for forty percent of all reported damages.
- About half of all respondents identified erosion areas. In general, erosion impacts were limited and communities did not emphasize a need for mitigation assistance. Almost half the respondents did not determine the specific number of properties at risk to coastal hazards.
- Survey results indicated a wide variety of existing flood and erosion mitigation efforts. The two most frequently cited mitigation actions were road raising and tidal check valve installation.
- Nearly half of the respondents reported current disaster planning has provisions to address uncompensated costs such as business interruption, natural resource damages and services for vulnerable populations.
- Twenty percent of respondents reported having a post-disaster plan that includes hazard mitigation.
- Nearly all survey respondents participate in the National Flood Insurance Program.
- A variety of education and outreach measures are employed by respondents to educate their communities. The majority have conducted flood and erosion area mapping, and have emergency evacuation plans and/or flood early warning systems.
- Forty-three percent of respondents reported a need for additional disaster preparedness education, and one quarter of reporting communities indicated a need for additional volunteer recruitment for emergency response.

## **Preliminary Findings and Recommendations:**

### **Most Recent Severe Damage Experience**

Severe coastal hazard damages affect multiple communities with varying frequency. The dates of severe damage citations generally correspond with years of severe weather (early 1990s and 2003-2004). Site specific investigations are necessary to identify the causes and potential management options for locations that experience frequent severe damage. FEMA programs, such as the Community Vulnerability Assessment Tool, should be considered as a means to assess high-risk sites and prepare management plans. Communities that experience severe impacts need adequate descriptive information to prepare plans and mitigation actions, and to support future requests for assistance. Those that experience damages on an infrequent basis may still need long-term management measures.

### **Number of Properties Affected by Bay Flooding or Erosion**

There was limited response regarding the number of properties at risk, and reported answers ranged from as many as 625 properties to as few as 2. Local governments should be aware of how knowledge on coastal hazards and impacts is stored so it can be applied to planning and mitigation. A record of impacts over time would help communities determine whether existing plans and programs are adequate. Communities could create standardized record keeping on areas at risk and types and amounts of damages experienced. These records would help support or improve management measures. Standardized reporting of hazard information would help fulfill information requirements of assisting agencies. Communities should compare properties actually affected by flooding or erosion with existing plans and programs and evaluate whether management measures are appropriate based on experience.

### **Coastal Hazard Damages and Mitigation Planning**

Damages are widely experienced in the Reserve but most communities feel they are adequately addressed by existing measures. Survey results indicate management plans and mitigation actions exist for some, but not all SSER sites vulnerable to coastal hazards. Coastal hazard planning, management and mitigation should be encouraged for at-risk sites where such provisions do not currently exist. Provisions for coastal hazards should be added to existing Local Waterfront Revitalization Programs (LWRP), or should be included in new LWRPs for communities that do not already have them. Post-disaster planning should be encouraged as a means to use the recovery process to develop disaster resilient communities.

### **Mitigation Actions**

The wide range of reported mitigation actions demonstrates the variety of options available and could indicate Reserve communities select measures to meet specific local needs. Management measures tailored to meet specific local needs should be supported if they are cost-effective. SSER communities can share information about effective mitigation tools. Preparation of comprehensive management plans should be considered to address coastal hazards if costs for site specific mitigation become excessive or efficiencies of scale offer more effective management.

### **Post-Disaster Plans**

Post-storm mitigation plans are under-utilized among SSER communities. Reconstruction following a disaster can be an opportune time to rebuild communities in a more disaster resistant form. However, few resources are available for planning when a disaster occurs, so post-disaster plans must be in place before they are needed in order to be effective. Local governments should consider post-disaster recovery planning as a means to create disaster resistant communities.

By reducing future damages while recovering from a disaster, local governments could address both public and private storm damages and respond to changing conditions over the course of time.

### **Education and Outreach**

Survey responses suggest that opportunities are available to improve community preparedness and support for mitigation and planning through expanded outreach. Adapting outreach tools used by other communities or sharing outreach resources could offer opportunities to reach wider audiences. Local governments should consider expanding education and outreach related to coastal hazards as a means to increase awareness and build support for management actions. Websites should be considered for providing information to support planning and mitigation actions for coastal hazards in SSER communities. Joint outreach programs might be possible where issues shared in common can be addressed. Communities should review the list of education and outreach, and mitigation options already in use for possible opportunities.

### **Disaster Education and Volunteer Recruitment Needs**

There are needs for disaster preparedness education and volunteer recruitment. The basis for requesting further disaster preparedness education needs further investigation. Local governments may identify needs by checking with emergency response staff or coastal hazard managers. Volunteer opportunities in Emergency Response are also included in one section of the report.

### **Erosion**

Slightly more than half of the respondents mentioned erosion problems of some form. Some significant localized erosion was reported, in particular on the barrier island bay shores, which may be related to unique local conditions. Bay erosion issues are widely distributed among Reserve communities and in some instances have a substantial impact. Although erosion management may be needed in a few locations it does not appear to be a priority for most communities in the SSER based on their survey responses. Communities that share erosion prone sites could consider a mutually supported monitoring program or scientific study if common needs are identified. Creation of a generic erosion monitoring program would be premature at this time due to the variety of local conditions and potential causes in the SSER.

### **Standardization of Damage/Scope Definitions and Monitoring Methodology**

Survey results show a wide variety in significant flood and erosion impacts. Impacts that are currently below the significant level may become more serious during severe storm conditions or over the course of time with changing local conditions and sea level rise. If not already documented, communities should consider recording coastal hazard impacts for sites where damages currently fall

below the level of significance. It may be appropriate to prepare management plans for sites where impacts are not presently significant but are likely to rise to the significant level in the future.

### **Flood and Erosion Record Keeping**

Respondents frequently consulted a number of local sources with various responsibilities to gather bay flooding and erosion information. Standardized reports on risk exposures, management expenses and damage experience could benefit local planning as well as providing support for assistance. Improved communication links within and among communities could support decision making, preparation of joint management measures and sharing of lessons learned.

### **Flood Preparedness**

Evacuation plans should be prepared for areas vulnerable to inundation. "Worst case" scenarios can be determined using FEMA storm surge maps. The National Weather Service will issues bulletins in case of an emergency, but community based communications may be necessary in the event of an emergency. If flood early warning systems are needed, consider cooperative efforts with nearby communities where they are already in place.

### **Future Actions**

Several trends emerged from survey responses. Coastal hazard impacts are experienced by a variety of communities distributed throughout the SSER. Differences in weather conditions, topography, hydrography or development exposure may explain the differing level of impacts over time among respondents. Severe flood and erosion events occur periodically, with storms and high tides the dominant sources of damage. A number of mitigation and outreach measures are already in place and the opportunity exists for sharing successful education, outreach, and mitigation options.

- Continued use of the NFIP by residents is encouraged. The high response rate for repetitive flood insurance claims is an indication that sites with repeat damages exist. Use of the Community Rating System helps reduce insurance premiums.
- Local governments should support coastal hazard planning. Opportunities exist to create or improve coastal hazard management plans, such as improvements to existing LWRPs and flood hazard mitigation plans. Plans should be updated with new or revised information as it is developed, such as projections for sea level rise. Planning and management can be improved using better map inventory tools. Local governments should consider incorporating coastal hazard conditions into existing community mapping as upgrades occur over time. Plans can be flexible to allow communities to adapt to changing conditions over time as the need or opportunity rises.

**Sources of Assistance/Contact Information:**

**Federal Emergency Management Agency (FEMA)**

[FEMAWebmaster@DHS.gov](mailto:FEMAWebmaster@DHS.gov)

National Flood Insurance Program

<http://www.fema.gov/business/nfip/index.shtm>

Hazard Mitigation Grant Program (HMGP)

<http://www.fema.gov/government/grant/hmgp/index.shtm>

Flood Mitigation Assistance (FMA)

<http://www.fema.gov/government/grant/fma/Index.shtm>

Pre-Disaster Mitigation Program (PDM)

<http://www.fema.gov/government/grant/pdm/>

Increased Cost of Compliance (ICC)

<http://www.fema.gov/business/nfip/icc.shtm>

Federal Emergency Management Agency Emergency Management Institute

<http://www.training.fema.gov/emiweb/>

**United State Department of Agriculture, Natural Resources Conservation Service**

<http://www.nrcs.usda.gov/contact/>

Watershed Protection and Flood Prevention Act

[http://www.nrcs.usda.gov/programs/watershed/ws\\_main/law.html](http://www.nrcs.usda.gov/programs/watershed/ws_main/law.html)

Watershed Surveys and Planning

[http://www.nrcs.usda.gov/programs/watershed/Surveys\\_Plng.html](http://www.nrcs.usda.gov/programs/watershed/Surveys_Plng.html)

Emergency Watershed Protection

<http://www.nrcs.usda.gov/programs/ewp/>

**National Oceanic and Atmospheric Administration - National Weather Service**

[ohd.webmaster@noaa.gov](mailto:ohd.webmaster@noaa.gov)

Local Flood Warning Systems - <http://www.nws.noaa.gov/oh/docs/alfws-handbook/>

**National Oceanic and Atmospheric Administration - National Ocean Service Office of Coastal Resource Management**

[ocrm.webmaster@noaa.gov](mailto:ocrm.webmaster@noaa.gov)

Coastal Zone Management Program (CZMP)

<http://www.ocrm.nos.noaa.gov/czm/>

**U.S. Department of the Interior - U.S. Geological Survey (USGS)**

[www.usgs.gov](http://www.usgs.gov)

<http://ny.usgs.gov>

Southeastern New York Tide-Telemetry and Coastal-Flood-Warning System

<http://ny.cf.er.usgs.gov/nyprojectsearch/projects/2457-A5P-2.html>

**U.S. Department of the Interior - National Park Service**

<http://www.nps.gov/>

[http://www.nps.gov/pub\\_aff/e-mail/nps\\_contact.htm](http://www.nps.gov/pub_aff/e-mail/nps_contact.htm)

**U.S. Department of the Interior - Fish and Wildlife Service**

<http://www.fws.gov/>

<http://www.fws.gov/duspit/contactus.htm>

**U.S. Environmental Protection Agency**

[npdesbox-request@epa.gov](mailto:npdesbox-request@epa.gov)

[http://www.epa.gov/npdes/pubs/sw\\_resource\\_list.pdf](http://www.epa.gov/npdes/pubs/sw_resource_list.pdf)

**Department of Defense - U.S. Army Corps of Engineers**

<http://www.usace.army.mil/>

[webmaster@usace.army.mil](mailto:webmaster@usace.army.mil)

New York District

<http://www.nan.usace.army.mil/>

[thanh.g.nguyen@nan.usace.army.mil](mailto:thanh.g.nguyen@nan.usace.army.mil)

**The Center for Stormwater Technology Evaluation and Verification**

[robert.roseen@unh.edu](mailto:robert.roseen@unh.edu)

<http://www.unh.edu/erg/cstev/>

**New York Sea Grant**

[Paul.Focazio@stonybrook.edu](mailto:Paul.Focazio@stonybrook.edu)

<http://www.seagrant.sunysb.edu/>

**New York State Department of State - Coastal Resources Division**

Barry Prendergass

<http://www.nyswaterfronts.com/>

**The New York State Emergency Management Office**

[postmaster@semo.state.ny.us](mailto:postmaster@semo.state.ny.us)

<http://www.nysemo.state.ny.us/>

**New York State Department of Environmental Conservation (NYS-DEC), Bureau of  
Program Resources and Flood Protection**

<http://www.dec.state.ny.us/website/dow/bprfp/index.html>

[dowinfo@gw.dec.state.ny.us](mailto:dowinfo@gw.dec.state.ny.us)

**Sources for Disaster Response Education:**

**Adelphi University: Emergency Management**

Phone: 516-877-4110

E-mail: [vetter@adelphi.edu](mailto:vetter@adelphi.edu)

Website: <http://academics.adelphi.edu/artsci/emgmt/>

**FEMA: Community Hazards Emergency Response Capability Assurance Process**

Website: [http://www.fema.gov/plan/prepare/cher\\_cap.shtm](http://www.fema.gov/plan/prepare/cher_cap.shtm)

**FEMA: Emergency Education Network (EENET)**

National Emergency Training Center, 16825 South Avenue, Emmitsburg, MD 21727

Phone: 800-500-5164 or 301-447-1068

Website: <http://www.usfa.fema.gov/training/prepnet/>

**FEMA: Emergency Management Institute**

16825 South Seton Avenue, Emmitsburg, MD 21727

Phone: 301-447-1000

Website: <http://training.fema.gov/EMIWeb/>

**FEMA: National Emergency Training Center (Virtual Campus)**

Website: <http://training.fema.gov/VCNew/firstVC.asp>

**FEMA: Noble Training Center**

PO Box 5237, Ft. McClellan, AL 36205

Phone: 256-741-3600

Website: <http://training.fema.gov/emiweb/ntc/>

**International Critical Incident Stress Foundation, Inc.**

E-mail: [ahowell@icisf.org](mailto:ahowell@icisf.org)

Website: <http://www.icisf.org/>

**Nassau County Community Emergency Response Team Training**

Email: <http://www.nassaucountyny.gov/agencies/OEM/contact.html>

Website: <http://www.nassaucountyny.gov/agencies/OEM/CC/CERT/>

**Nassau County Red Cross**

195 Willis Avenue, Mineola, NY 11501

Phone: 516-747-3500

E-mail: [nassau@usa.redcross.org](mailto:nassau@usa.redcross.org)

Website: <http://www.nassauredcross.org/>

**National Organization for Victim Assistance (NOVA) Training**

170 Park Road NW, Washington, DC 20010

<http://www.trynova.org/contactus>

Phone: 202-232-6682

Website: <http://www.trynova.org/jobpostings/>

**National Weather Service: StormReady**

Phone: 631-924-0037

E-mail [Gary.Conte@noaa.gov](mailto:Gary.Conte@noaa.gov)

Website: <http://www.stormready.noaa.gov/>

**New York State Emergency Management Office (SEMO): Emergency and Public Education**

1220 Washington Avenue, Suite 101, Building 22, Albany, NY 12226

Phone: 518-485-5666

E-mail: [postmaster@semo.ny.us](mailto:postmaster@semo.ny.us)

Website: <http://www.nysemo.state.ny.us/PIO/safety.asp>

**New York State Emergency Management Office (SEMO): Training and Exercises**

1220 Washington Avenue, Suite 101, Building 22, Albany, NY 12226

Phone: 518-457-9986

E-mail: [postmaster@semo.ny.us](mailto:postmaster@semo.ny.us)

Website: <http://www.nysemo.state.ny.us/TRAINING/semotraining.asp>

**Suffolk County Red Cross**

95 Horseblock Road, PO Box 745, Yaphank, NY 11980

Phone: 631-924-6700

Email: [suffolk@crossnet.org](mailto:suffolk@crossnet.org)

Website: <http://suffolkcounty.redcross.org/Classes/disasterClasses.html>

**Volunteer Opportunities in Emergency Response:**

**Americorps**

Phone: 1-800-942-2677

E-mail: [Questions@AmeriCorps.org](mailto:Questions@AmeriCorps.org)

Website: <http://www.americorps.org>

**Americorps: National Civilian Community Corps**

Phone: 1-800-731-0002

E-mail: [anccc@cns.gov](mailto:anccc@cns.gov)

Website: <http://www.americorps.org/nccc/index.html>

**Americorps: VISTA\***

E-mail: [vista@americorps.org](mailto:vista@americorps.org)

Website: <http://www.americorps.org/vista/index.html>

**Long Beach Auxiliary Police**

LB Auxiliary Police

P.O. Box 28

Long Beach, NY 11561

Phone: 516-431-6868

E-mail: [recruiting@lbapd.com](mailto:recruiting@lbapd.com)

Website: <http://www.lbapd.com/>

**Nassau County Department of Health: Medical Reserve Corps:**

240 Old Country Road, Mineola, NY 11501

Contact: Elizabeth Scanlon

Phone: 516-571-2672

E-mail: [escanlon@health.co.nassau.ny.us](mailto:escanlon@health.co.nassau.ny.us)

**Nassau County Auxiliary Police**

1490 Franklin Avenue, Mineola, NY 11501

Community Safety Unit - Auxiliary Police Section

Phone: 516-573-7521

E-mail: [nassau@auxiliary-police.org](mailto:nassau@auxiliary-police.org)

Website: [www.auxiliary-police.org/nassau](http://www.auxiliary-police.org/nassau)

**Nassau County CERT**

Office of Emergency Management

E-mail: [NCOEM@mail.co.nassau.ny.us](mailto:NCOEM@mail.co.nassau.ny.us)

Please enter "CERT INQUIRY" in the subject line and include your first name, last name, address, village, zip code, phone number, email and a brief comment

Website: <http://www.co.nassau.ny.us/oem/cert.html>

**Nassau County Citizen Corps**

1194 Prospect Avenue, Westbury, NY 11590

Contact: Jennifer Mincin

Title: Deputy Commissioner

Phone: (516) 571-9636

E-mail: [jmincin@nassaucountyny.gov](mailto:jmincin@nassaucountyny.gov)

**Nassau County Red Cross**

195 Willis Avenue, Mineola, NY 11501

Phone: 516-747-3500

E-mail: [nassau@usa.redcross.org](mailto:nassau@usa.redcross.org)

Website: <http://www.nassauredcross.org>

**New York State Citizen Corps**

250 Veteran's Memorial Highway, Hauppauge, NY 11788

Phone: 631-952-3361

E-mail: [nyscitizencorps@semo.state.ny.us](mailto:nyscitizencorps@semo.state.ny.us)

Website: <http://www.nysemo.state.ny.us/nyscitizencorps.htm>

**Rockville Centre Auxiliary Police**

34 Maple Avenue, Rockville Centre, NY 11570

Phone: 516-657-0705

E-mail: [RVCAUXPD@OPTONLINE.NET](mailto:RVCAUXPD@OPTONLINE.NET)

**The Salvation Army of Greater New York**

120 W. 14th Street, New York, NY 10011

Phone: 212-337-7200

Website: <http://www.salvationarmy-newyork.org>

**Senior Corps**

Phone: 1-800-424-8867

Website: <http://www.seniorcorps.org>

**Senior Corps: RSVP**

Phone: 1-800-424-8867

Website: <http://www.seniorcorps.org/joining/rsvp/index.html>

**Suffolk County Fire and Emergency Medical Services**

Phone: 1-877-932-9268

Website: <http://www.co.suffolk.ny.us/wewantu>

**Suffolk County Medical Reserve Corps**

PO Box 127, Yaphank, NY 11717

Phone: 631-852-4908 E-mail: [thomas.o'hara@co.suffolk.ny.us](mailto:thomas.o'hara@co.suffolk.ny.us)

**Suffolk County Red Cross**

95 Horseblock Road, PO Box 745, Yaphank, NY 11980

Phone: 631-924-6700

Website: <http://suffolkcounty.redcross.org>

**Suffolk County Auxiliary Police**

PO Box 127 Yaphank, NY 11980

Phone: 631-924- 4343

Website: <http://www.co.suffolk.ny.us/webtemp3.cfm?dept=12&id=1044>

**Suffolk County Citizen Corps Council/Suffolk County CERT**

P.O. Box 127, Yaphank Avenue, Yaphank, NY 11980

Phone: 1-877-932-9268

E-mail: [thomas.ohara@co.suffolk.ny.us](mailto:thomas.ohara@co.suffolk.ny.us)

Website: <http://www.co.suffolk.ny.us/citizencorps>

**Suffolk County, Town of Islip: Community Emergency Response Team**

Sponsoring Agency: East Brentwood Fire Department

Phone: 631-273-4560

E-mail: [fdchief31@aol.com](mailto:fdchief31@aol.com)