



Floodplain Management Plan

Little Egg Harbor Township
Ocean County, New Jersey

Floodplain Management Plan

June 2015

Prepared for:

Township of Little Egg Harbor
Ocean County, New Jersey

Prepared by:



11 Tindall Road
Middletown, NJ 07748

A handwritten signature in black ink, appearing to read 'Stanley C. Slachetka'.

Stanley C. Slachetka, PP, AICP
NJ Professional Planner No.: 33LI00350800

A handwritten signature in black ink, appearing to read 'Jason A. Worth'.

Jason A. Worth, PE, PP, CME
NJ Professional Planner No.: 33LI00622100

*The original of this document was signed
and sealed in accordance with New Jersey Law*

Acknowledgements

Mayor and Committee

Arthur Midgley, Mayor
Eugene Kobryn, Deputy Mayor
Ray Gormley, Committeeman
John Kehm, Jr., Committeeman
Edward Nuttall, Committeeman

Planning Board

Kenneth W. Laney, Jr., Chairman
Ken Miller, Vice Chairman
James Boyle Jr.
George Garbaravage
Eugene Kobryn
Arthur Midgley
George Sauer
Ann McDonald, Alternate #1

Terry Brady, Esq., Planning Board Attorney
Robert Mullin, PE, CME, Planning Board Engineer
Scott D. Taylor, PP, AICP, LLA, LEED-AP, Planning Board Landscape Architect
Robin Schilling, Planning Board Secretary

Garrett K. Loesch, Township Administrator/CFO
Diana McCracken, Township Clerk
Robin La Bue, Township Attorney

T&M Project Team

Jason A. Worth, PP, PE, CME
Martin P. Truscott, PP, AICP, LEED-GA
Christine Bell, PP, AICP, CFM

Executive Summary

This plan is intended to identify and assess flood hazards within Little Egg Harbor Township, establish goals and objectives for floodplain management and resiliency, and to present a series of actions designed to minimize flooding and mitigate the impacts from flooding in the future. This Floodplain Management Plan was funded using Phase II- Post Sandy Planning Assistance Grant Funding from the New Jersey Department of Community Affairs and will be incorporated as an element of the Township's Master Plan.

This plan has been organized according to the guidelines of the 2013 National Flood Insurance Program Community Rating System Coordinator's Manual to maximize the amount of points available for credit in the Community Rating System Program and follows the 10-step planning process outlined in the manual. The planning process was conducted through a committee consisting of Township employees and officials. The committee met frequently throughout the planning process to discuss each step of the plan and provide input on suggested activities and actions.

To assess the problems and flood hazards impacting Little Egg Harbor Township, a review was done of all relevant planning studies, documents, and relevant zoning ordinances. Outside stakeholder agencies were contacted for input on the planning process. Historical flooding events, repetitive loss properties and known flood hazards were reviewed to determine problem areas within the Township.

Possible activities to mitigate the impacts of flooding in the community were discussed. The committee determined a list of goals for the Little Egg Harbor Township Floodplain Management Plan and determined a prioritized list of action items from the list of possible activities, using the goals as guidance. Ocean County's recently updated Hazard Mitigation Plan was also used as a reference when determining proposed activities.

Table of Contents

I. INTRODUCTION	6
PURPOSE AND SCOPE.....	6
FLOODPLAIN MANAGEMENT PLANNING.....	6
COMMUNITY RATING SYSTEM.....	6
ORGANIZATION OF THE PLAN	7
II. TOWNSHIP OF LITTLE EGG HARBOR PROFILE	8
POPULATION TRENDS.....	9
III. PROJECT ORGANIZATION & PUBLIC MEETINGS.....	10
IV. FLOOD HAZARD ASSESSMENT	11
COORDINATION WITH OUTSIDE AGENCIES	16
FLOODING HISTORY	17
DESCRIPTION OF FUTURE EVENTS FOR OTHER HAZARDS	25
SPECIAL FLOOD RELATED HAZARDS	32
V. PROBLEM ASSESSMENT	33
HAZARD IMPACT.....	34
HISTORICAL DAMAGE	37
ECONOMIC IMPACTS.....	38
NATURAL FEATURES.....	39
FUTURE FLOODING IMPACTS.....	41
VI. GOALS	42
VII. POSSIBLE FLOODPLAIN MANAGEMENT ACTIVITIES.....	43
PREVENTATIVE MEASURES.....	43
PROPERTY PROTECTION	45
NATURAL RESOURCE PROTECTION.....	46
EMERGENCY SERVICES	47
STRUCTURAL PROJECTS	49

PUBLIC INFORMATION 50

VIII. ACTION PLAN 52

IX. PLAN IMPLEMENTATION & MAINTENANCE..... 56

List of Tables

Table 1. Floodplain Property Data.....	34
--	----

List of Figures

Figure 1. Township Map	8
Figure 2. Preliminary FIRM.....	17
Figure 3. NOAA National Weather Service Heat Index	28
Figure 4. Category 3 SLOSH Model Map	36
Figure 5. Natural Features	40

List of Appendices

Appendix A: Steering Committee Creation Ordinance	58
Appendix B: Steering Committee Meeting Outlines	59
Appendix C: Public Meetings Information	60
Appendix D: Sample Letter to Outside Agencies	61
Appendix E: Log of Interaction with Stakeholder Groups	62
Appendix F: Effective FIRM Maps	63
Appendix G: Advisory Base Flood Map Superstorm Sandy.....	64
Appendix H: Preliminary FIRM Map	65
Appendix I: Surge Elevation Maps	66
Appendix J: Repetitive Loss Areas Map.....	67
Appendix K: Critical Facilities Map	68
Appendix L: SLOSH Maps	69
Appendix M: Sea Level Rise Maps.....	70
Appendix N: Marsh Retreat Maps	71
Appendix O: NFIP Claim Areas Map	72
Appendix P: Natural Features Map	73

I. INTRODUCTION

PURPOSE AND SCOPE

This plan has been prepared as the Township of Little Egg Harbor's Floodplain Management Plan (FMP) and will be incorporated as an element of the Township's Master Plan. The FMP identifies and assesses flood hazards within the Township, establishes the goals and objectives for floodplain management in Little Egg Harbor, and presents a series of actions designed to minimize flooding and mitigate the impacts from flooding in the future. The FMP also evaluates the need and potential options for wetland restoration and maintenance and/or other engineering control measures to mitigate potential storm surge in those areas of the Township that may be vulnerable. The FMP also includes recommendations for the Township's current Floodplain Development Protection Ordinance.

The Floodplain Management Plan is designed to maximize points available under the Community Rating System Program.

FLOODPLAIN MANAGEMENT PLANNING

Floodplain management is defined by FEMA as the operation of a community program of preventive and corrective measures to reduce the risk of current and future flooding, resulting in a more resilient community. While FEMA has minimum floodplain management standards for communities participating in the National Flood Insurance Program (NFIP), adopting higher standards will lead to safer, stronger, more resilient communities.

COMMUNITY RATING SYSTEM

The Community Rating System (CRS) is a voluntary incentive program of the National Flood Insurance Program (NFIP) that provides participating communities with discounted flood insurance premium rates for undertaking community floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premium rates are discounted in increments of 5%, reflecting the reduced flood risk resulting from community actions in four categories: public information, mapping and

regulations, flood damage reduction, and flood preparedness. The three goals of the Community Rating System Program are:

1. Reduce flood damage to insurable property;
2. Strengthen and support the insurance aspects of the NFIP; and
3. Encourage a comprehensive approach to floodplain management.

ORGANIZATION OF THE PLAN

This plan has been organized according to the guidelines of the 2013 National Flood Insurance Program Community Rating System Coordinator's Manual to maximize the amount of points available for credit in the Community Rating System Program. This Floodplain Management Plan follows the 10- step planning process outlined in the manual:

- Step 1: Organize
- Step 2: Involve the public
- Step 3: Coordinate
- Step 4: Assess the hazard
- Step 5: Assess the problem
- Step 6: Set goals
- Step 7: Review possible activities
- Step 8: Draft an action plan
- Step 9: Adopt the plan
- Step 10: Implement, evaluate, revise



II. TOWNSHIP OF LITTLE EGG HARBOR PROFILE

Little Egg Harbor Township is located in southern Ocean County and encompasses an area of 73.4 square miles. It is bordered by Stafford and Eagleswood Townships to the north, Bass River Township to the west, and shares water boundaries with Long Beach Township, Beach Haven Borough, and Galloway Township. The Borough of Tuckerton is located entirely within Little Egg Harbor Township. The Garden State Parkway, US Route 9, and Green Street (Ocean County Route No. 539) provide regional connections from Little Egg Harbor. Little Egg Harbor contains a number of preserved lands and open spaces including the Bass River State Forest, the Freedom Fields County Park, and the Township Sports Complex.

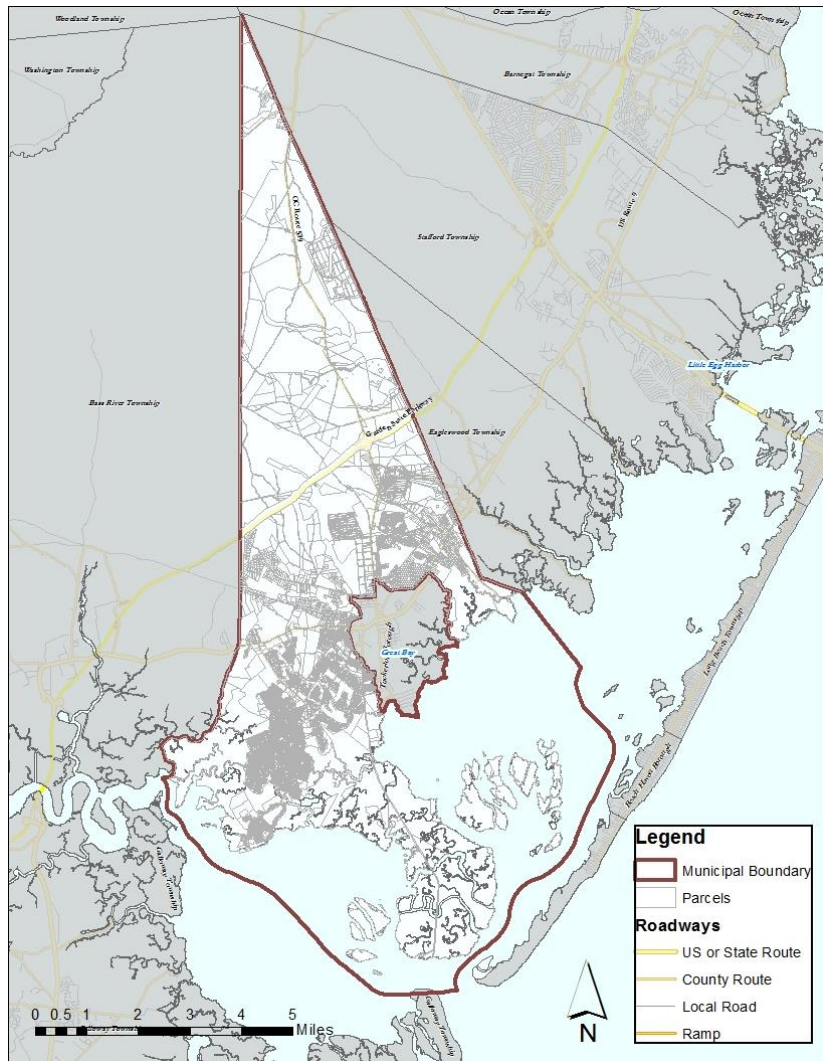


Figure 1. Township Map

Areas of the Township north of the Garden State Parkway lie within the New Jersey Pinelands, with the exception of the portion of Bass River State Forest, which is situated south of the Garden State Parkway. As a result of historical development patterns and the location of the Pinelands, most of the Township's development is located in the southern portion of the Township. All portions of Little Egg Harbor not located within the Pinelands are regulated by New Jersey's Coastal Area Facility Review Act (CAFRA). Certain types of development within the CAFRA Zone are subject to the enhanced review

and permitting requirements, which are administered by the Division of Land Use Regulation of the New Jersey Department of Environmental Protection.

POPULATION TRENDS

The 2015 Master Plan Reexamination Report states that the population of Little Egg Harbor Township has increased by 25.8 percent in the period from 2000 to 2010; with 85.1 percent of the total population growth within the decade attributed to those aged 45 and older. Likewise, during the same time period the median age has increased from 39.9 years to 45.4 years. During the 2000-2010 decade the number of housing units in Little Egg Harbor increased by 30.1 percent. When planning for floodplain management, it will be important to take into consideration the growing senior population and their concerns.

III. PROJECT ORGANIZATION & PUBLIC MEETINGS

T&M Associates assisted the Township of Little Egg Harbor in preparing this Floodplain Management Plan. The planning process was conducted under the supervision of a New Jersey licensed professional planner.

The planning process was conducted through a Floodplain Management Plan Steering Committee consisting of Township staff. The Committee was formed by Township Ordinance 2015-01, which can be found in Appendix A. The committee met on a weekly basis from February 2015 to April 2015 to discuss the existing hazards and problems related to flooding in the Township, review potential goals and hazard mitigation activities, prepare an action plan, and make recommendations to revise existing Township Ordinances. The meeting agendas and minutes can be found in Appendix B. The following are the members of the Committee:

- Committeeman John Kehm
- Garrett Loesch, Township Administrator/CFO
- Michael Fromosky, CFM, Administration/Code Enforcement
- Chief Richard Buzby, LEHT Police Dept./OEM
- Thomas Bonfonti, LEHT Police Dept. /OEM
- Patrick Donnelly, CPWM, Dept. of Public Works
- Mark Ellis, CFM, Zoning Officer
- Oliver Clifford, Acting Construction Official
- Jason Worth, PE, Engineer

In addition to the Steering Committee meetings, a separate public information meeting was held during the initial stages of planning on March 2, 2015. This meeting was publicly advertised in the Asbury Park Press, on the Township website, on the Township Facebook page and open to all members of the public. The public was informed of the proposed Floodplain Management Plan and was given the opportunity to provide input and recommendations.

A second public information meeting was held on April 13, 2015, which presented the elements/details of the Floodplain Management Plan. This meeting was publicly advertised in the Asbury Park Press, on the Township website, on the Township Facebook page and open to all members of the public. The public was given the opportunity to provide input on the Floodplain Management Plan.

An additional public hearing was held during the Township Planning Board Meeting on May 7, 2015. The proposed Floodplain Management Plan was presented to the Board and the public was encouraged to provide input on the recommended plan.

Additional information on these meetings can be found in Appendix C.

IV. FLOOD HAZARD ASSESSMENT

EXISTING DOCUMENTS

It is important to coordinate floodplain management goals with other planning and community development goals in Little Egg Harbor Township. As part of the planning process, the following documents were reviewed:

- 1999 Master Plan
- 2007 Master Plan Reexamination Report
- 2012 Emergency Operating Plan
- 2014 Strategic Recovery Planning Report
- 2014 Ocean County Multi-Jurisdictional Hazard Mitigation Plan
- 2015 Vulnerability and Exposure Analysis
- Township Flood Hazard Ordinance

Information from the following documents was identified as important to the floodplain management planning process:

1999 Master Plan

Little Egg Harbor's master plan was adopted in 1999. The plan outlines a number of goals which promote floodplain management planning. They are as follows:

- Reduce permitted residential densities, where appropriate, consistent with planning efforts aimed at minimizing the fiscal impacts of new residential development
- Concentrate new residential and commercial development in planned centers or other growth corridors where infrastructure is available or comprehensively planned.
- Adopt land use regulations that encourage a better balance among residential, commercial, and industrial land uses, so as to promote improved municipal fiscal planning efforts.
- Promote better coordination and consistency between state and municipal planning efforts.

- Coordinate with the New Jersey Highway Authority and Ocean County in order to continually improve the roadway system of the township, and to plan for anticipated changes brought on by growth and development.

2007 Master Plan Reexamination Report

The 2007 Master Plan Reexamination Report reaffirmed all of the goals that had been outlined in the 1999 Master Plan. The 2007 Reexamination makes the recommendation that the Township amend its zoning ordinance to provide a maximum impervious coverage limit in all residential zones. Such an amendment will help to reduce impervious coverage which will promote resilience to hurricanes and storms by reducing stormwater runoff and promoting its natural infiltration.

2007 Municipal Stormwater Management Plan

The following goals of the 2007 Municipal Stormwater Management Plan are relevant to this Floodplain Management Plan:

- Reduce flood damage, including damage to life and property;
- Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- Reduce soil erosion from any development or construction project;
- Assure the adequacy of existing and proposed culverts and bridges and other in-stream structures;
- Maintain groundwater recharge;
- Prevent to the greatest extent feasible, an increase in nonpoint pollution;
- Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- Minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and science and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water, and
- Protect public safety through the proper design and operation of stormwater basins.

2012 Emergency Operating Plan

The Emergency Operating Plan, updated in 2012, sets forth the general policies and procedure to be carried out by municipal and volunteer entities (such as the Fire Department and EMS) in order to provide the citizens of the Township with an effective integrated emergency response plan designed to minimize the loss of life and property during an emergency. The manual is comprised of the Basic Plan and the following list of annexes providing response plans for such emergency situations as: alerting, warning, and communications; damage assessment; emergency medical; emergency operating centers; emergency public information; evacuation; fire and rescue; hazardous materials; law enforcement; public health; public works; radiological protection; resource management; shelter, reception, and care; social services; terrorism incident; and veterinary services.

The purpose of the Emergency Operating Plan is to protect life and property in emergencies by coordinating response activities of municipal and volunteer entities to ensure their optimum user. It provides for actions to be taken to mitigate, prepare for, respond to, and recover from the effects of an emergency. The plan is an “all-hazards” approach to emergency management and covers natural disasters, technological disasters, and national security crises.

Strategic Recovery Planning Report

As a response to Hurricane Sandy, Little Egg Harbor Township adopted a Strategic Recovery Planning Report in 2014. The purpose of the Strategic Recovery Planning Report is to outline a recommended set of actions to guide the township in promoting recovery from the impacts of Hurricane Sandy and resiliency to future storms. The SRPR identified the community vulnerabilities exacerbated by Sandy and opportunities created by Sandy. Some of the community vulnerabilities identified that relate to floodplain management planning were:

- Homeowners and business owners located in low-lying areas in close proximity to the flooded waterways that border and run through Little Egg Harbor Township were threatened by four to six feet of flood water;
- The damage to the pump stations and wells threatened the effectiveness of sewer service by causing back-ups; and
- The land around and to the south of Route 9 is mostly built out, and the Township faced limited options for relocating debris from the storm; vulnerability to waterfront areas was exacerbated, as Sandy weakened bulkheading and eroded shorelines.

Vulnerability and Exposure Analysis

A Vulnerability and Exposure Analysis was completed for Little Egg Harbor Township in February of 2015 by NJ Future, Rutgers University, and the Jacques Cousteau National Estuarine Research Reserve. The purpose of the vulnerability and exposure analysis was to evaluate vulnerability to likely hazards and to identify and prioritize those actions that most effectively reduce or avoid future losses. The probable impacts of near-term sea level rise for Little Egg Harbor were analyzed to assess the extent to which the Township will be exposed to flood inundation and storm surge.

Zoning Ordinance Amendments

On January 24, 2013, Ordinance #2013-01 amended the maximum building height for the R-100, R-75A, R-70, and R-50 zone districts for lots located in areas of SFH to 40 feet in order to enable residents to rebuild their homes to the new FEMA flood map standards. Additionally this ordinance amended the minimum lot area and depth for the R-50 zone district in the SFHA to be 4,350 square feet and 87 feet, respectively, to facilitate rebuilding without the need for an excessive amount of variance requests.

On August 14, 2014, Ordinance #2014-12 amended the Yard Areas section of the code for those lots within areas of SFH to allow 5 feet of encroachment into the front yard for unroofed stairs and porches for entry into raised dwellings. The ordinance amendment also allow for 5 feet of encroachment into the side yard setback for the same purpose.

2014 Ocean County Multi-Jurisdictional Natural Hazard Mitigation Plan

The 2014 Multi-Jurisdictional All Hazard Mitigation Plan is intended to provide a blueprint for saving lives and reducing property damage from the effects of natural and man-made disasters in Ocean County, as well as to improve community resiliency following disastrous events. The Multi-Jurisdictional All Hazard Mitigation Plan is also intended to fulfill state and federal legislative requirements related to local hazard mitigation planning, and facilitate access to pre- and post-disaster grant funding.

The Multi-Jurisdictional All Hazard Mitigation Plan is comprehensive in scope, and outlines a mitigation strategy that is centered on the following countywide goals and objectives:

- Encourage sustainable development to protect people, property, community resource and the environment from natural and human-made disasters.

- Meet and exceed minimum standards of the National Flood Insurance Program.
 - Manage building code, land use code, ordinance and other planning mechanisms to prevent and mitigate the impact of disasters on people and property.
 - Improve information available for mitigation planning.
 - Coordinate and increase applications for federal and state grant programs.
 - Integrate and leverage other planning mechanisms from: neighboring jurisdictions; local, county and regional organizations; and, state partnerships to implement the plan.
 - Improve shelter management.
- Build and rebuild structures and infrastructure to protect people, and to reduce impacts of future disasters.
 - Increase the number of residential properties protected from hazards.
 - Increase the number of community resources and amount of infrastructure protected from hazards.
 - Improve the ability of critical facilities and infrastructure to safely operate during storms and utility interruptions.
 - Improve evacuation capability.
- Protect and restore the natural environment to support disaster resiliency.
 - Improve the health of natural systems to safely and naturally accommodate flooding and wildfire.
 - Improve the health of natural systems used to protect residential properties and other community resources.
 - Plan for increased open space in the most vulnerable areas.
 - Promote appropriate urban-wild land interface for wildfire mitigation.
- Promote education, awareness and outreach before, during and after disaster.
 - Improve and expand information and opportunities for input available by television, radio, websites, social media, newsletters, and meetings.
 - Increase participation in mitigation programs, including the Community Rating System, StormReady, and FireWise programs.
 - Tailor timely messages for audiences, including children, parents, community groups, universities, seniors and other groups.
 - Improve alert and warning systems.

To support the implementation of the 2014 Multi-Jurisdictional All Hazard Mitigation Plan in Little Egg Harbor Township, the plan recommends that the Township use it (i.e.,

the 2014 Multi-Jurisdictional All Hazard Mitigation Plan) to implement the mitigation strategies and actions as outlined in the Plan.

COORDINATION WITH OUTSIDE AGENCIES

Notices were sent to the following groups, commissions, municipalities, and agencies soliciting data or information related to flooding, as well as any specific actions the agency or organization has undertaken that may affect flooding. Agencies and organizations who were contacted are as follows:

- Eagleswood Township
- Tuckerton Borough
- Bass River Township
- Galloway Township
- Long Beach Township
- Beach Haven Borough
- Stafford Township
- Woodland Township
- Little Egg Harbor Police Department
- Parkertown Volunteer Fire Department, Station 70
- West Tuckerton Volunteer Fire Department, Station 71
- Mystic Island Volunteer Fire Company, Station 72
- Great Bay Regional Volunteer EMS
- Little Egg Harbor Township Environmental Commission
- Little Egg Harbor Township Natural Lands Trust Committee
- Ocean County Sheriff's Office, Office of Emergency Management
- Ocean County Planning Department
- Ocean County Soil Conservation District
- North Jersey Transportation Planning Authority
- Natural Resources Conservation Service
- NJ Coastal Management Program
- U.S. Army Corp of Engineers, Philadelphia District
- American Red Cross, Jersey Coast Chapter
- American Littoral Society, Barnegat Bay Office
- Jacques Cousteau Reserve
- Shore Builders Association of Central Jersey
- Comcast Cable
- New Jersey American Water

- New Jersey Department of Environmental Protection, State Floodplain Manager
- Barnegat Bay Partnership
- Save Barnegat Bay
- Atlantic City Electric
- New Jersey Natural Gas

A sample letter that was sent out can be found in Appendix D. Many agencies responded and discussed information that could be beneficial to the Township's Plan. An example of this work is the various mapping provided by the Jacques Cousteau Reserve and the Rutgers University Center for Remote Sensing and Spatial Analysis (CRSSA). A log of all agencies contacted, along with their responses can be found in Appendix E.

FLOODING HISTORY

Description of Known Flood Hazards

The Flood Insurance Rate Map (FIRM) for Little Egg Harbor Township is currently in the process of being updated. The Effective FIRM maps dated September 25, 2009 can be found in Appendix F. The Advisory Base Flood Maps, which were adopted shortly after Superstorm Sandy, can be found in Appendix G. The new Preliminary FIRM maps issued on January 31, 2014 indicate that the eastern portion of the Township located along Little Egg Harbor and the Great Bay is located within the 100-year floodplain, also known as the Special Flood Hazard Area (SFHA). Most critical township facilities, including the Municipal Complex and Emergency Operations Center, Fire Departments, EMS, and shelters are located outside of the SFHA. The Preliminary FIRM map for the Township is identified in Figure 2 and in Appendix H.

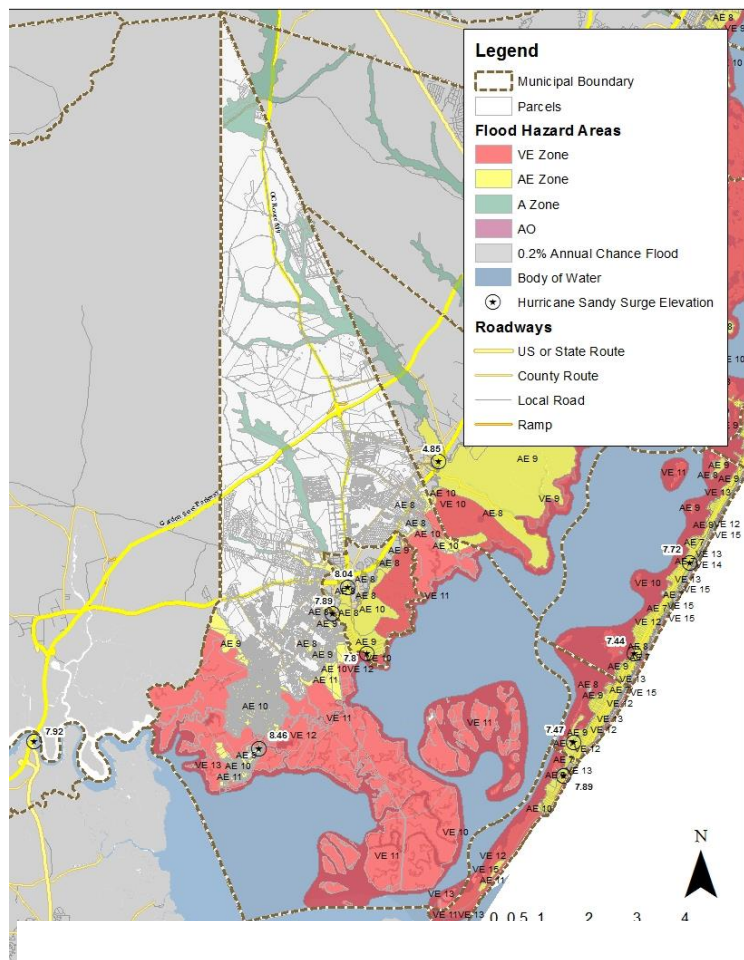


Figure 2. Preliminary FIRM

The areas of Little Egg Harbor Township most likely to flood are Mystic and Osborn Islands, Great Bay Boulevard, areas off of Country Club Blvd. and Atlantis Blvd., as well as the southwestern portion of Mystic Shores; these areas are located within the SFHA. Additionally, the Nation Union Boulevard and Lake Champlain; E. Sail, Dory, and Boat; and the Atlantis and Great Bay Boulevard intersections are known to flood monthly during astrological high tides. A large portion of properties within the Township are located along man-made tidal lagoons; therefore, this area is at risk for flooding during storm events.

Superstorm Sandy made landfall along the coast of New Jersey on October 29, 2012, causing major flooding and destruction. This event has become the storm of record (the highest flood recorded) for much of New Jersey and New York. Sandy surge elevations were recorded by FEMA and where available, were mapped throughout Little Egg Harbor and surrounding communities. These maps can be found in Appendix I.

Historical Flooding Events

Little Egg Harbor is susceptible to flooding along its eastern shore. Some of the major storm events that have affected the Township and the greater Ocean County area are described briefly below:

- September 14 – 15, 1944: A category 2 hurricane passed within 47 miles of the coast of New Jersey in September 1944, producing wind velocities over 100 mph and a maximum tidal elevation of 7.4 feet at the gage in Sandy Hook.
- Hurricane Donna: On September 12, 1960 Hurricane Donna was classified as a Category 2 hurricane when it reached Monmouth County. Wind speeds of up to 110 mph were recorded as was a maximum tidal elevation of 8.6 feet at Sandy Hook.
- The Ash Wednesday Storm: A nor'easter struck the coast of New Jersey lasting 3 days and 5 tidal cycles from March 6- 8, 1962 and causing massive amounts of destruction including 10 deaths in the state of New Jersey.
- Hurricane Belle: On August 9, 1976, Hurricane Belle impacted New Jersey as a Category 1 hurricane with wind speeds of up to 90 mph. In Asbury Park, 2.56 inches of rain was recorded as having fallen in a 24-hour period.
- March 1984: This nor'easter coincided with astronomically high tides and caused flooding, erosion, and damage to roads and boardwalks.
- Hurricane Gloria: On September 27, 1985, Hurricane Gloria came onshore in Long Island, NY as a Category 2 hurricane. The storm caused extensive power outages through New Jersey and forced people to be evacuated from their homes.

However, coastal flooding was minimized as the peak storm surge arrived during low tide.

- The Perfect Storm: The Perfect Storm, also known as the Halloween Storm, was a nor'easter that caused coastal flooding on October 31, 1991.
- The Storm that Stole Christmas: A nor'easter struck the coast of New Jersey on December 11, 1992 and continued to impact the area through eleven (11) tidal cycles, causing extensive beach erosion and 3 to 5 ft. storm surge.
- Tropical Storm Floyd: Tropical Storm Floyd impacted New Jersey on July 16, 1999. Heavy rains coincided with high tide to exacerbate flooding. However, the greatest impacts were felt away from coastal areas in Bergen and Somerset Counties.
- Tropical Storm Irene: Tropical Storm Irene produced heavy rains from August 27-28, 2011, causing tidal flooding and beach erosion, making it the costliest storm in New Jersey after Hurricane Floyd prior to Superstorm Sandy.
- Superstorm Sandy: Superstorm Sandy made landfall in Brigantine on October 29, 2012, becoming the costliest natural disaster in the State of New Jersey and second only to Hurricane Katrina nationwide. The coastal areas of Monmouth and Ocean Counties were among the hardest hit with record breaking high tides and wave action. Many homes throughout the coastal communities, including the SFHA in Little Egg harbor, were destroyed or impacted by severe flooding of up to four (4) feet. All communities within Ocean County faced power outages, some lasting up to two (2) weeks.

Storms with Repetitive Loss

Using repetitive loss data provided by FEMA, areas in Little Egg Harbor Township were identified as being particularly prone to flood events. A repetitive loss property is classified as one which has experienced two or more claims of more than \$1,000 that have been paid by the National Flood Insurance Program (NFIP) within any 10 year period since 1978. To protect the privacy of homeowners, individual repetitive loss properties were not mapped, but rather a 500 foot buffer was created around each repetitive loss property and any parcel falling in that buffer was categorized as in an area generally affected by flooding. The Repetitive Loss Areas map can be found in Appendix J. The general areas are as follows:

- 1) Mystic Island;
- 2) Osborn Island;
- 3) Along the southern border with Tuckerton;

- 4) Northeast of the Ocean County Golf Course;
- 5) The intersection of Route 9 and Parkertown Drive; and
- 6) The intersection of Nugentown Road and Forest Edge Drive.

The highest concentration of repetitive loss properties are located in the Mystic Island section of the Township along Radio Road, which consists mainly of low lying man-made lagoons, which is susceptible to tidal and storm related flooding. This was also the portion of the Township hit hardest by Superstorm Sandy.

The average number of losses per repetitive loss property in Little Egg Harbor Township is three (3). The average pay-out per loss for a repetitive loss property in the Township is \$20,822, with an average total pay-out per property of \$60,468 for all losses. Storm events that have resulted in repetitive losses since 1978 include:

- February 26, 1979: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- August 20, 1979: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- October 26, 1980: Twenty (20) flood insurance claims from repetitive loss properties were made for this event.
- June 15, 1982: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- Nor'easter: A nor'easter on March 29, 1984 caused over \$3 million in damage throughout the state. In Little Egg Harbor, fifty-one (51) repetitive loss properties filed claims for this event.
- Hurricane Gloria: Hurricane Gloria was a Category 2 storm when it made landfall in Long Island, NY. Hurricane Gloria caused extensive power outages throughout New Jersey due to a large amount of downed trees. Although the storm surge averaged about 6.5 feet above predicted tide levels, the peak surge arrived during low tide, minimizing coastal flooding. In Little Egg Harbor Township, seventeen (17) flood insurance claims on repetitive loss properties were made on September 27, 1985 for this event.
- April 4, 1987: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- August 14, 1989: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- October 19, 1989: Two (2) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.

- June 6, 1990: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- July 13, 1991: Two (2) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.
- The Perfect Storm (The Halloween Storm): The Perfect Storm, also known as the Halloween Nor'easter, was a nor'easter that caused extensive damage along the east coast from North Carolina to Maine. It began on October 28th and lasted until November 1, 1991. On October 30, 1991, four (4) flood claims for repetitive loss properties were made in Little Egg Harbor and eleven (11) were made on October 31, 1991; totaling fifteen (15) claims for this event.
- January 1-4, 1992: A total of eleven (11) flood insurance claims from repetitive loss properties were made over the course of four (4) days in Little Egg Harbor Township. One (1) claim was filed on January 1st, one (1) claim on January 3rd, and nine (9) claims were filed on February January 4, 1992.
- September 26, 1992: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- "The Storm that Stole Christmas": The nor'easter of December 1992 caused massive coastal flooding and erosion. Hurricane force winds, a lunar eclipse, a full moon, and four inches of rain in 24 hours all contributed to the flooding. The strongest portion of the storm remained over New Jersey for several days, resulting in elevated surge levels through a number of tidal cycles. In Little Egg Harbor, 96 flood insurance claims were made on repetitive loss properties, the most from any single flood event, including Superstorm Sandy. One (1) claim each was made on December 10 and 12, 1992 and the remaining ninety-four (94) were made on December 11, 1992.
- March 13, 1993: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event due to a blizzard impacting the state of New Jersey from March 13- 17, 1993.
- November 28, 1993: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- December 6, 1993: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.
- March 2- 4, 1994: A total of fifteen (15) flood insurance claims from repetitive loss properties were made over the course of these three (3) days in Little Egg Harbor Township. Two (2) claims were filed on March 2nd, twelve (12) claims on March 3rd, and one (1) claim on March 4, 1994.

- January 7- 8, 1996: A total of three (3) claims from repetitive loss properties were made over two (2) days in Little Egg Harbor Township. One (1) flood insurance claim from a repetitive loss property was made on January 7th, followed by two (2) claims on January 8th.
- March 19, 1996: Two (2) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.
- March 31, 1996: One (1) flood insurance claim from a repetitive loss property was made for this event.
- April 3, 1996: One (1) flood insurance claim from a repetitive loss property was made for this event.
- April 1, 1997: One (1) flood insurance claim from a repetitive loss property was made for this event.
- July 20, 1997: One (1) flood insurance claim from a repetitive loss property was made for this event.
- July 24, 1997: One (1) flood insurance claim from a repetitive loss property was made for this event.
- August 20- 21, 1997: A total of thirty-eight (38) flood insurance claims from repetitive loss properties were made over the course of two (2) days in Little Egg Harbor Township. Nineteen (19) claims were filed on August 20th, followed by another 19 on August 21st.
- September 14, 1997: One (1) flood insurance claim from a repetitive loss property was made for this event.
- November 14, 1997: One (1) flood insurance claim from a repetitive loss property was made for this event.
- January 28, 1998: Four (4) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.
- February 4-8, 1998: A total of eleven (11) flood insurance claims from repetitive loss properties were made over the course of five (5) days in Little Egg Harbor Township. Two (2) claims were filed on February 4th, eight (8) claims on February 5th, and one (1) claim on February 8, 1998.
- February 16, 1998: One (1) flood insurance claim from a repetitive loss property was made for this event.
- August 20, 1999: Five (5) flood insurance claims from repetitive loss properties were made for this event.
- January 25, 2000: Two (2) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.

- August 12, 2000: Seven (7) flood insurance claims from repetitive loss properties were made for this event.
- A single flood insurance claim was made for a repetitive loss property for a flood event on each of the following dates in Little Egg Harbor Township:
 - September 6, 2000
 - June 19, 2001
 - May 12, 2002
 - September 5, 2002
 - December 25, 2002
 - February 15, 2003
 - February 23, 2003
 - June 8, 2003
 - December 5, 2003
 - December 12, 2003
 - July 12, 2004
 - August 6, 2004
 - April 4, 2005
 - October 13, 2005
- October 25- 26, 2005: A total of three (3) flood insurance claims from repetitive loss properties were made over the course of two (2) days in Little Egg Harbor Township. Two (2) claims were filed on October 25th, followed by one (1) additional claim on October 26th.
- January 6, 2006: One (1) flood insurance claim from a repetitive loss property was made for this event.
- September 2, 2006: Two (2) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.
- October 7, 2006: One (1) flood insurance claim from a repetitive loss property was made for this event.
- May 5, 2008: One (1) flood insurance claim from a repetitive loss property was made for this event.
- May 12, 2008: Two (2) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.
- September 6, 2008: One (1) flood insurance claim from a repetitive loss property was made for this event.
- November 6, 2008: One (1) flood insurance claim from a repetitive loss property was made for this event.

- September 11, 2009: Two (2) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.
- October 15- 19, 2009: A total of three (3) flood insurance claims from repetitive loss properties were made over the course of these three (3) days in Little Egg Harbor Township. One (1) claim was filed on October 15th, one (1) claim on October 16th, and one (1) claim on October 19, 2009.
- Nor'easter: A nor'easter in mid- March caused severe storms and flooding in New Jersey. On March 13, 2010, four (4) flood insurance claims for repetitive loss properties were filed in Little Egg Harbor Township, followed by one (1) on March 14th; for a total of five (5) claims over two days in the Township.
- Nor'easter: The remnants from Hurricane Ida combined with a nor'easter, causing damage to the Mid-Atlantic Coast in early November 2009. Over the course of four days, 9 flood insurance claims from repetitive loss properties in Little Egg Harbor were made. One (1) claim was made on November 12, 2009, five (5) on November 13th, two (2) on November 14th, and one (1) claim was made on November 15, 2009.
- December 9, 2009: One (1) flood insurance claim from a repetitive loss property was made for this event.
- March 26, 2010: One (1) flood insurance claim from a repetitive loss property was made for this event.
- Tropical Storm Irene: Tropical Storm Irene caused flooding throughout the state of New Jersey. In Little Egg Harbor Township, a total of nine (9) flood insurance claims were submitted for repetitive loss properties; two (2) of these on August 27, 2011, five (5) on August 28th, and two (2) on August 29, 2011.
- June 30, 2012: One (1) flood insurance claim from a repetitive loss property was made for this event.
- July 20, 2012: Two (2) repetitive loss properties in the Township of Little Egg Harbor filed a claim for this flood event.
- August 5, 2012: One (1) flood insurance claim from a repetitive loss property was made for this event.
- Superstorm Sandy: Superstorm Sandy is the costliest storm to hit the state of New Jersey. It caused extensive damage and severe flooding throughout the state. Coastal Ocean County was one of the areas hardest hit by the storm with power outages in some areas lasting up to two weeks. A total of sixty-three (63) flood insurance claims were filed on repetitive loss properties during Superstorm Sandy. On October 28, 2012 one (1) claim was filed, followed by fifty (50) on October 29th, ten (10) on October 30th, and two (2) on October 31, 2012.

- Nor'easter: One week after Superstorm Sandy a nor'easter hit the area, bringing significant amounts of snow and causing additional power outages. The Weather Channel named the storm Winter Storm Athena, although the National Weather Service does not recognize the naming of winter storms. One (1) repetitive loss property in Little Egg Harbor filed a claim for this flood event on November 5, 2012.
- August 12, 2014: One (1) repetitive loss property in the Township of Little Egg Harbor filed a claim for this flood event.

DESCRIPTION OF FUTURE EVENTS FOR OTHER HAZARDS

In addition to flooding, Little Egg Harbor Township is susceptible to a number of other hazards. While the intent of this plan is to focus on flood hazards, it is important to identify and recognize other hazards that impact the Township. Information on all other hazards was taken from the 2014 Ocean County Multi-Jurisdictional All-Hazards Mitigation Plan.

Coastal Erosion

Coastal erosion occurs when more sediment is lost than is gained at a particular location. Coastal erosion can result from natural or man-made causes, including sea level rise, flooding, strong wave action or large storms, some types of shore protection structures, some land uses, and other alterations to the natural environment. Coastal erosion can occur gradually, as shorelines recede over a period of time or can be caused by a rapid recession of shoreline due to another hazard event. Erosion increases the vulnerability of near-shore structures to damage from storms and flooding events.

Little Egg Harbor Township is susceptible to erosion along the Great Bay and Little Egg Harbor, as well as those areas along the tidal lagoon system which are not stabilized. The impacts of coastal erosion can be lessened by implementing living shoreline techniques and undertaking a variety of shoreline protection measures.

Climate Change

The Township of Little Egg Harbor will be affected by increasing sea levels along the Great Bay and Little Egg Harbor. The effects of sea level rise will be more pronounced in low-lying, marshy areas of the Township and will exacerbate problems with flooding. Additionally, severe storm events are predicted to become more frequent as the climate warms. The impacts of climate change in the future will depend on the rate which sea level rises and human actions and response to the threats caused by climate change.

Dam Failure

There are two dams within Township of Little Egg Harbor that if they fail, would result in flooding. They are located at Great Bay Boulevard adjacent to Holly Lake and Giffordtown Lane adjacent to the Cranberry Bogs. The Township does not expect issues related to dam failures in these locations.

Drought

A drought is a period of low or no precipitation in a given area. The severity of the drought depends on the length of time, geographic reach, regional water supply demands, and the impact of other hazards, such as extreme heat. There is a low probability of severe drought conditions occurring in Little Egg Harbor, due to Township's relatively low elevation and abundant groundwater supply; although short term, less severe droughts may be more likely. If extended drought conditions do occur in Little Egg Harbor, the Township may be subject to restricted water usage and other regulations. Recent periods of drought in New Jersey include:

- October 1997
- 1998- 1999
- October 2001- 2002
- August- September 2008
- August to October 2010

Earthquake

The probability of a significant, damaging earthquake in Little Egg Harbor Township is low. While low magnitude earthquakes do occur throughout New Jersey on a fairly regular basis, most earthquakes impacting Little Egg Harbor will have only minor effects. The greatest probability of an earthquake occurrence in New Jersey exists in the northern portion of the State near the Ramapo Fault.

Extreme Temperature

Little Egg Harbor is highly susceptible to both extreme heat and extreme cold events. The Ocean County Multi-Jurisdictional All-Hazards Mitigation Plan defines extreme heats as occurring when temperatures hover 10 degrees or more above the average high temperature for a region for several weeks. The plan defines extreme cold temperatures

as well below the average level for an area during the winter and often coinciding with winter storm events. Long periods of extreme temperatures can overstress power supply systems, resulting in brown-outs or black outs and leaving residents without heat or air conditioning. Generally, the impact on humans of extreme weather events is minimal, with the exception of the very young and elderly populations, who are more susceptible to the health impacts of extreme temperatures. If the population of Little Egg Harbor continues to age, the vulnerability to extreme temperature events will increase. Improved weather forecasting, community warnings, and community preparedness can help to reduce the risks of extreme weather events to vulnerable populations.

Extreme Cold

Extreme cold events often accompany a winter storm or occur soon after. Prolonged exposure to the cold can cause frostbite or hypothermia. Recent periods of extreme cold in Little Egg Harbor include:

- Jan 14- 29, 2003
- Jan 9-11, 2004
- Jan 16- 18, 2009
- Jan 23, 2014
- Jan 4, 7, & 22, 2014

Extreme Heat

Little Egg Harbor is more likely to experience extreme heat than extreme cold events. Extreme heat events occur during the summertime when the weather in Little Egg Harbor is substantially hotter and/or more humid than the Township average for that time of year. Recent periods of extreme heat include:

- July 4- 11, 1999
- August 1-3, 2006
- June 7-10, 2008
- July 5-7, 2010
- July 21- 24, 2011
- July 17- 18, 2012
- July 18-19, 2013

The extent of extremely hot temperatures are typically measured through the Heat Index, which calculates the temperature that is felt when the effects of relative humidity are added to the base air temperature, highlighting dangerous extreme heat conditions.

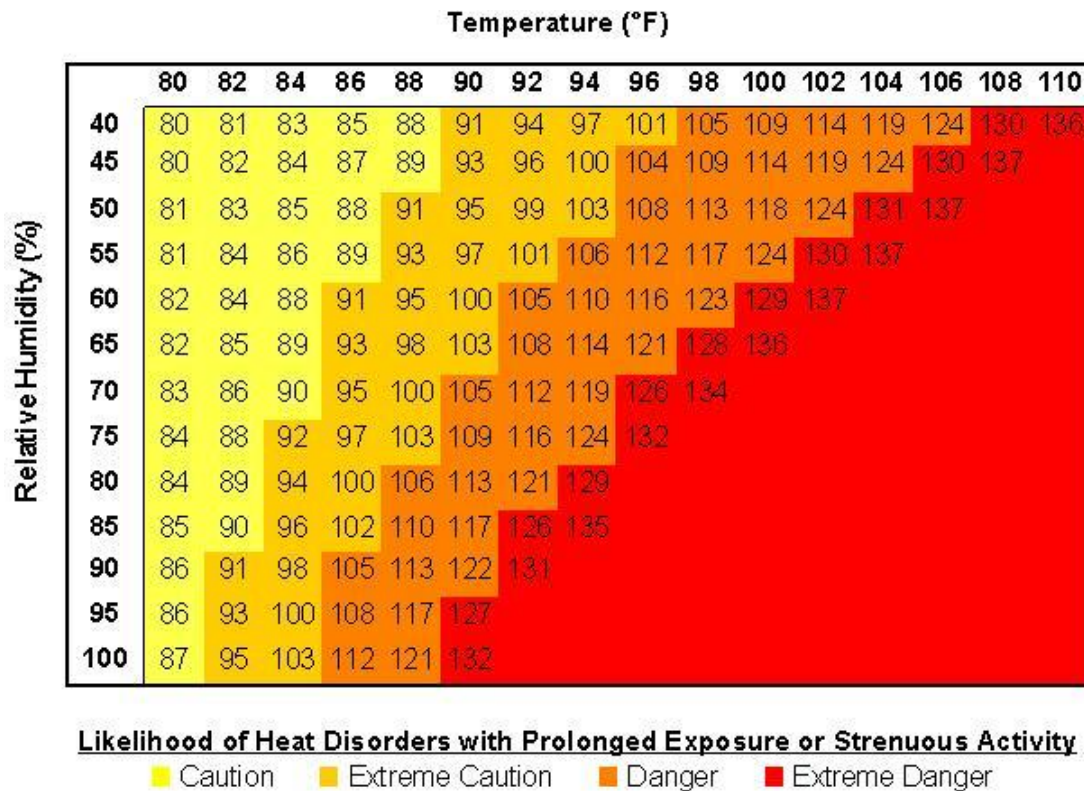


Figure 3. NOAA National Weather Service Heat Index

Extreme Wind

Extreme wind can occur alone or with other natural hazards, often occurring during thunderstorms. The impacts of extreme winds can be critical and can include flying debris and downed trees and power lines. The probability of future extreme wind events is high, with an average of 5- 10 extreme wind events occurring each year in the Central New Jersey region. Recent extreme wind events near Ocean County, New Jersey include:

- Thunderstorm on September 9, 1998
- Thunderstorm on August 7, 2000
- Thunderstorm on August 2, 2002
- Thunderstorm on July 22, 2003
- January 18, 2006
- Thunderstorm on August 17, 2007

- February 13, 2008
- March 5, 2008
- March 13, 2010
- Hurricane Irene, August 27- 28, 2011
- Superstorm Sandy, October 29, 2012

Hurricanes, Tropical Storms, & Nor'easters

Hurricanes, tropical storms, and nor'easters are events consisting of a number of damaging hazards including heavy precipitation, high winds, wave action, storm surge, coastal flooding, and coastal erosion. All of New Jersey, including the Township of Little Egg Harbor, falls within the Hurricane Susceptible Region, and there is a 24- 36% chance of experiencing a tropical storm or hurricane event between June and November of any given year in Ocean County. Ocean County lies within a design Zone II, meaning that shelters and critical facilities should be designed to withstand a 3 second wind gust of up to 160 mph.

Hurricanes and tropical storms that have impacted the Township of Little Egg Harbor include:

- Hurricane- September 14- 15, 1944
- Hurricane Donna- September 12, 1960
- Hurricane Belle- September 9, 1976
- Hurricane Gloria- September 27, 1985
- Tropical Storm Bertha- July 13, 1996
- Tropical Storm Floyd- July 16, 1999
- Tropical Storm Isabel- September 18- 19, 2003
- Tropical Storm Hanna- September 6, 2008
- Tropical Storm Irene- August 27- 28, 2011
- Super Storm Sandy- October 29, 2012

Nor'easters generally occur during the winter months and are named after the wind direction of the storm. They tend to last for more than one tidal cycle, often generating flooding events. Nor'easters that have impacted the Township of Little Egg Harbor occurred on:

- November 25, 1950
- The Ash Wednesday Storm- March 6- 8, 1962
- March 1984,

- The Perfect Storm- October 1991
- January 1992
- December 1992 (harshes NJ storm since 1962),
- February 4, 1998
- February 24, 1998
- October 16, 2002
- December 5- 6, 2003
- March 15- 17, 2007
- April 15- 16, 2007
- October 15- 19, 2009
- November 12- 14, 2009

Lightning

Little Egg Harbor is susceptible to lightning events, but not as much as other areas of the United States, particularly the Southeast. The probability of future lightning events in Little Egg Harbor is certain, however, lightning often occurs with other natural hazards, such as thunderstorms.

Storm Surge

All coastal areas are at high risk for storm surge. The severity of storm surge is generally related to the severity of the storm making landfall, as well as the tidal and lunar cycles. All of Mystic Island and Osborn Island is constructed along man-made tidal lagoons, so storm surge will affect the entirety of these areas.

Tornado

The probability of a tornado in Little Egg Harbor is low as there have not been any recorded tornados in recent history. If a tornado is to occur, it is mostly likely to do so between March and August, forming in the late afternoon or early evening at the trailing edge of a thunderstorm.

Wave Action

All immediate coastal and shoreline areas along the Atlantic Ocean, Little Egg Harbor, and Great Bay are at risk from wave action. Waves are generally caused by wind and storm events, even those which remain offshore, and generally the more severe the storm, the more destructive waves become. Future occurrences of wave action will affect the areas of Little Egg Harbor located along the Great Bay and Little Egg Harbor in the coastal flood hazard zone.

Wildfire

Wildfires typically occur in unoccupied, rural, or forested areas and happen during the fall and spring when it is hot and dry. In New Jersey, 99% of wildfires are caused by human activity. The probability of wildfires occurring in the Pinelands is extremely high, as the Pinelands are categorized as Fuel Model B, which indicates a high hazard fuel. The Township of Little Egg Harbor contains 11,782 acres of land within the Pinelands, or 37.2% of the Township's total land area. Therefore, the probability of wildfires occurring in the western portion of Little Egg Harbor is high. Wildfires have occurred in the Pinelands of Ocean County on the following:

- Sept. 7-10, 1938
- April 15, 1977
- April 30, 2001
- May 1, 2001
- March 10, 2002
- February 19, 2011

Winter Storms

Although the Township of Little Egg Harbor is located south of the typical boundary between freezing and non-freezing precipitation during the wintertime, there is a high probability of occurrence of winter storms in the Township of Little Egg Harbor, with Coastal Ocean County averaging approximately 15 inches of snowfall annually. Winter storms generally occur from November through mid- April, with the peak season being December through March. Winter storms can consist of blizzards, heavy snow, sleet, and/or ice storms.

Winter storms can result in downed trees, damaged vegetation, transportation accidents, road closings, stranded travelers, power outages, and a depletion of heating supplies. They can cause major disruptions to transportation, commerce, and electrical power. Recent winter storm events that have impacted the Township of Little Egg Harbor include:

- January 6-8, 1996
- February 16-17, 2003
- January 22, 2005
- February 17, 2007
- December 26, 2010
- November 7-8, 2012

SPECIAL FLOOD RELATED HAZARDS

There are many special localized situations in which flooding or flood-related problems do not fit the national norm for riverine and coastal floodplain management. These special flood-related hazards include:

Uncertain Flow Paths

Alluvial fans, moveable bed streams, channel migration, and other floodplains where the channel shifts during a flood are classified as uncertain flow paths. This hazard is not an issue in Little Egg Harbor.

Closed Basin Lakes

Lakes that have a small or no outlet that may stay above flood stage for weeks, months, or years are called closed basin lakes. This hazard is not relevant to Little Egg Harbor.

Ice Jams

Ice jams, also known as ice dams, typically occur in late winter or early spring when a frozen river begins to thaw. Blocks of ice break free and can accumulate at bends in the river, mouths of tributaries, or near structures such as bridge piers. The ice can restrict the flow of a river and cause flooding upstream. A flash flood type event can also occur downstream if the ice jam suddenly breaks free. The threat of flooding from ice jams in the Little Egg Harbor Township is low due to the width, depth and tidal nature of the Bay. However, there is a high likelihood of damage to structures such as bulkheads, docks and piles from floating ice.

Land Subsidence

Along the East Coast, land is sinking towards sea-level in a process known as subsidence. This will accelerate the impacts of sea level rise, causing actual water levels to be much higher than some predicted estimates. More locally, Mystic and Osborn Islands are both man-made lands and lagoons that have faced problems due to settling. The Osborn Island HOA issued a report from their professionals indicating that the area is continuing to settle.

Mudflow hazards

Mudflow hazards are identified as a river, flow, or inundation of liquid mud down a hillside, usually as a result of a dual condition of loss of brush over and the subsequent accumulation of water on the ground, preceded by a period of unusually heavy or sustained rain. This is not considered to be a threat in Little Egg Harbor Township.

Coastal Erosion

This hazard was discussed in the previous section. It has a large impact on Little Egg Harbor Township.

Tsunamis

Tsunamis are large ocean waves typically caused by an earthquake, landslide, or underwater volcano. Although Tsunamis are far more likely on the west coast, there are three DART (Deep-ocean Assessment and Reporting of Tsunamis) monitoring stations off the coast of New Jersey, near the Hudson Canyon.

V. PROBLEM ASSESSMENT

FEMA is currently in the process of updating the Flood Insurance Rate Map (FIRM) for Little Egg Harbor Township. The updated Preliminary FIRM indicates that a large portion of the area south of the Garden State Parkway is located within the 100-year floodplain, also known as the Special Flood Hazard Area (SFHA). A total of 4,355 improved residential properties and 56 commercial properties are located within the SFHA. Table 1 below indicates the total properties and land area located within both the 100-year and 500-year floodplains. The table also shows the percentage of each category that is located within the 100-year floodplain to get a better understanding of how much of the Township is vulnerable to flooding.

Table 1. Floodplain Property Data

Item	Township Total	100-Year Floodplain	500-Year ¹ Floodplain	100-Year + 500-Year Floodplain	Percent Located within the 100-Year Floodplain
Properties	13,057	5,170	373	5,543	39.60%
Land Area (acres) ²	29,320.02	12,113.6	165.31	12,278.91	41.32%

1. This does not include the area within the 100-year floodplain.

2. Land area only includes land parcel areas. Waterways and roads are not included in this area.

There is one Community Center located within the 100-year floodplain in Little Egg Harbor Township. The Community Center has been known to get small amounts of flooding from time to time, but during Superstorm Sandy experienced about four feet of water in the building. The Township has a flood insurance policy on this building through JIF. All other critical facilities are located outside of the Special Flood Hazard Area. The map showing the Township's critical facilities and the Special Flood Hazard Areas can be found in Appendix K. The portion of Little Egg Harbor located within the Special Flood Hazard Area is predominately developed and is expected to stay that way.

HAZARD IMPACT

Township residents and first responders are particularly vulnerable to the impacts of flooding in Little Egg Harbor Township. Residents who live within the SFHA should be encouraged to take all necessary precautions to ensure their homes are safe from flood hazards, including but not limited to elevating the structure above the BFE. Additionally, those residents who do not live within the SFHA, but live in areas which are known to flood should take similar precautions as their neighbors living within the SFHA. In addition to the possible damage to buildings and other infrastructure, there is the possibility of injury or even death to residents or responders who could get trapped in a flooded building or swept away in fast moving floodwaters. The Township and its residents must also be aware of the potential impacts to public health from flooding. Mold will quickly develop in many structures and cause respiratory issues for those attempting to rebuild. Debris from damaged and demolished structures could also contain hazardous materials such as mold, lead or asbestos. Early warning and evacuation, as well as making the necessary preparations to protect facilities from flooding, can protect the health and safety of residents and emergency workers and facilitate a rapid response and recovery from future flood events. The Township is in the

process of preparing Debris Management Plans that should address these issues and minimize their impacts to the maximum extent practical.

Many of the hazards to which Little Egg Harbor is vulnerable generally occur concurrently with flooding. Areas that are susceptible to flooding will only increase in their vulnerability as impacts due to sea level rise become greater in the future. Homes which are not raised above the base flood elevation are particularly vulnerable to flood related hazards, as are areas prone to flooding but not located within the SFHA. Little Egg Harbor Township should work with FEMA to ensure that all flood maps illustrate an accurate portrayal of flood risk within the community.

Repetitive Loss Areas were mapped throughout Little Egg Harbor, as illustrated in Appendix J, with repetitive loss properties averaging 3 losses per property. The highest concentration of repetitive loss properties are located on Mystic Island. During Superstorm Sandy, a large percentage of the homes in the Mystic Island census tract were substantially damaged.

Category 1, 2, & 3 SLOSH models for Little Egg Harbor Township were run by the Jacques Cousteau National Estuarine Research Reserve (JCNER) to estimate storm surge heights and wind resulting from historical, hypothetical, or predicted hurricanes. SLOSH is a computer model developed by the National Weather Service (NWS) and stands for Sea, Lake, and Overland Surge from Hurricanes. It is important to note that the SLOSH model does not include rainfall amounts, river flow, or wind-driven waves and accuracy is generally within 20% (NOAA).

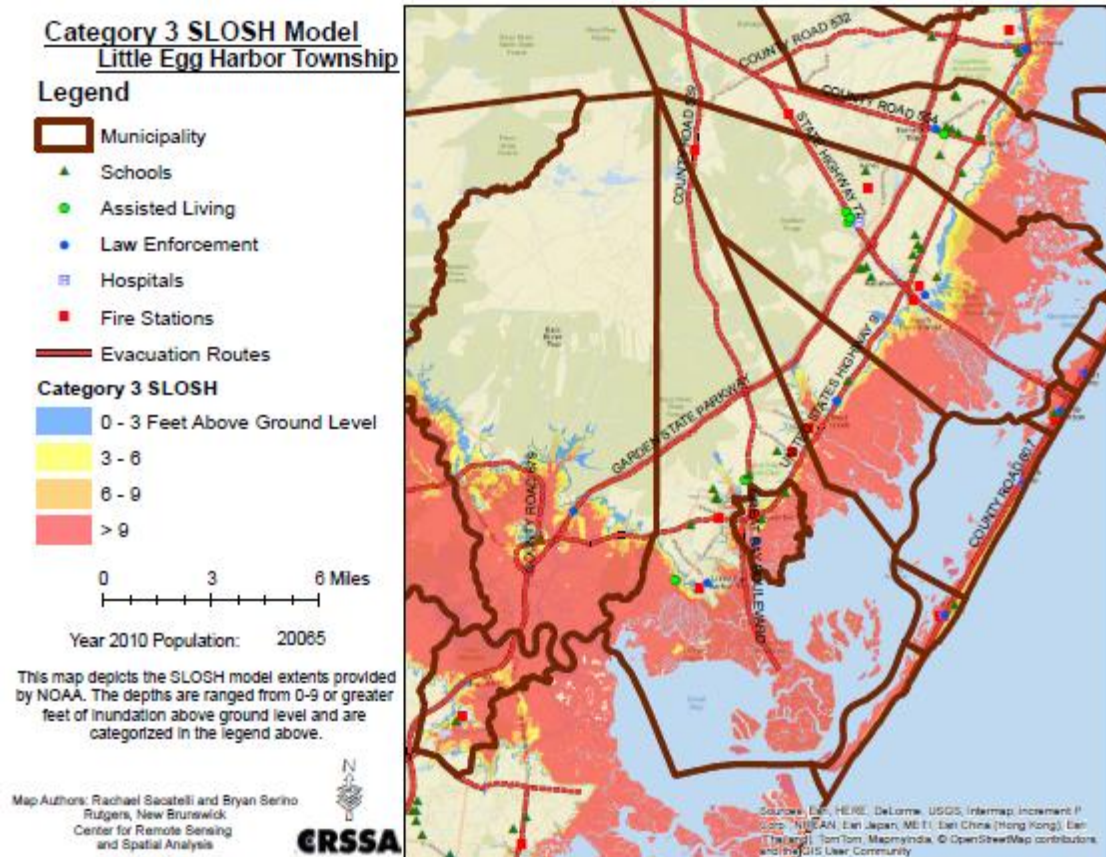


Figure 4. Category 3 SLOSH Model Map

As depicted in the maps found in Appendix L, during a Category 1 storm event storm surge would inundate most of the marsh areas with up to six feet of storm surge. Mystic Island and other neighborhoods in that area would have storm surge up to 3 feet in depth. During a Category 2 storm event, storm surge would further inundate the Township, with surge levels reaching above 9 feet in many of the Bayfront marsh areas. As shown above in Figure 6, a Category 3 storm event would produce storm surge greater than 9 feet along all of the Township's shoreline, within inundation reaching Route 9 in the northern portion of Little Egg Harbor.

The impacts of Sea Level Rise on Little Egg Harbor were also analyzed by JCNERR. With a one foot increase in sea level rise, much of the marshland along the Bayfront would be impacted. Much of the tidal marsh will remain, however a small area in the southern portion of the Township will convert to open water. With two feet of sea level rise, water will further encroach on the land area of Little Egg Harbor along the Bayfront and in the marshes. Much of the tidal marsh will remain, however there will be some areas of unimpeded marsh retreat along Mystic Island and in the very southern portion of the

Township near the border with Bass River Township and Route 9. Three feet of sea level rise will further encroach on all shorelines within the Township and several roadways will have portions underwater. Much of the marsh area in the southern portion of the Township will be impacted by sea level rise. Throughout the Township, much of the tidal marsh will continue to remain; however areas of uninhibited marsh retreat will be present along all boundaries with current tidal marshes. Additionally, portions of the tidal marsh will convert to open water. Sea level rise maps and marsh retreat maps can be found in Appendices M & N respectively.

Little Egg Harbor is a predominately residential community, and as such, much of the areas that will be affected by storm surge and/or sea level rise are residential areas. The Mystic Island and Osborn Island neighborhoods in the southeast corner of the Township contains some of the highest densities of single family homes throughout the community. This is also the area that is and will continue to be most impacted by storm and flooding events.

HISTORICAL DAMAGE

All NFIP claims from 1978 to the present in Little Egg Harbor were examined and a sample was mapped with a 500 foot buffer to protect the privacy of the property owners. Almost all properties on Mystic Island and Osborn Island fell within the claim area, as well as the coastal areas to the northern and southern borders with Tuckerton, as illustrated in Appendix O. A total of 4,127 flood insurance claims have been filed in the Township since 1978.

Superstorm Sandy caused the most damage of any storm in recent history. During Superstorm Sandy, the areas of Little Egg Harbor situated south of the Garden State Parkway were most impacted from the storm. The southern portion of the Township experienced major impacts from wind, storm surge, and flooding, while north of the Parkway, most damage was due to wind.

Approximately 4,000 homes, or 40% of the Township housing stock, sustained damage during Superstorm Sandy, with 800 homes sustaining substantial damage. All of the substantially damaged homes in Little Egg Harbor Township were located in a single census tract, with over 90% of the households in that tract affected with major or severe damage. A structure is considered substantially damaged when the total costs of restoring the structure to it's before damaged condition would equal or exceed 50% of the structure market value. Additionally, many of the residents (29.5%) of the impacted census tract were seniors, aged 62 and older, creating additional hardship for evacuation and rebuilding. Power outages due to Superstorm Sandy lasted for seven to ten days.

Both water and sewer service in the Township were disrupted by the electrical power outages and flooding.

Superstorm Sandy damaged some roadways in Little Egg Harbor, including Great Bay Boulevard, Iowa Court, and Radio Road. Additional damage was incurred during debris removal activities to Maryland Road, North Spinnaker Drive, Columbia Road, and South Portland Drive. Numerous bulkheads throughout Little Egg Harbor were also damaged during the storm and a number of lagoons saw an increase in siltation and debris, reducing overall water depth within the lagoons and the ability of boats to safely navigate through their waters.

The Little Egg Harbor Township Community Center was severely damaged by Superstorm Sandy. Flooding damaged both the interior and exterior of the building, with total damages exceeding \$400,000. At the Parkertown Beach; docks, gangways, decking and stringers were washed away. The pavilion building was undermined and destroyed.

ECONOMIC IMPACTS

Due to the concentration of flood impacts within the lagoon communities of the Township, the majority of flood damage within Little Egg Harbor has been, and will continue to be, to single family homes and small, marine related retail businesses. The cost of flood damage to residential property is generally covered by insurance pay-outs and owner out of pocket expenses. The average flood insurance pay-out for a repetitive loss property within Little Egg Harbor Township is \$20,822 per loss. If property owners can no longer pay their taxes or decide to abandon their property prior to making necessary repairs, there could be a potential impact on the tax base of the Township due to flooding events.

Impacts of flooding on businesses within Little Egg Harbor would be realized mostly in the form of lost profits for times when they are not able to operate and due to displaced residents after a flood event. Most of the businesses within the Township that have the potential to be impacted by flooding events are small retail businesses and marinas in the Mystic Island/ Radio Road area. Those businesses that were impacted during Superstorm Sandy have generally made the necessary repairs and have reopened.

The largest economic impact of flooding to the Township is the cost of debris removal, municipal facility and infrastructure repair, and personnel costs during the event. The impact of costs to the community would depend on the severity and longevity of the event as well as reductions in the tax base due to property loss or migration.

NATURAL FEATURES

Little Egg Harbor is located entirely within the regulatory areas of the Pinelands and CAFRA, with lands to the north of the Parkway located in the Pinelands and lands to the south located in CAFRA. Much of the land to the north of the Parkway in the Pinelands region has been preserved and strict development regulations limit development in areas that have not been officially preserved. Much of the development within Little Egg Harbor is located on the southern side of the Parkway, along Little Egg Harbor and the Great Bay. The Base River State forest is located within Little Egg Harbor Township and extends into Bass River Township. Additionally, the Freedom Fields County Park and the Township Sports Complex provide recreation and open space opportunities within Little Egg Harbor Township. There are significant areas of marshland extending into the bay; and a 3.5 mile portion of the Edwin B. Forsythe National Wildlife Refuge is located across the bay in Holgate at the southern end Long Beach Island. These natural areas along the coast protect Little Egg Harbor from storm surge and can reduce the direct impacts of storm events.

In 2014 the Township of Little Egg Harbor and the Borough of Tuckerton were awarded a \$2.1 million grant for a Marsh Restoration and Replenishment Project. The project consists of several types of waterfront resiliency measures including marsh replenishment, beach replenishment, and thin layer deposition. Erosion control measures such as living shorelines are also proposed in several areas of marsh restoration. The various resiliency measures will be completed utilizing material dredged from nearby lagoons and creeks. The project will greatly benefit the local community by restoring marsh to protect local roads and properties as well as raising marsh elevations.

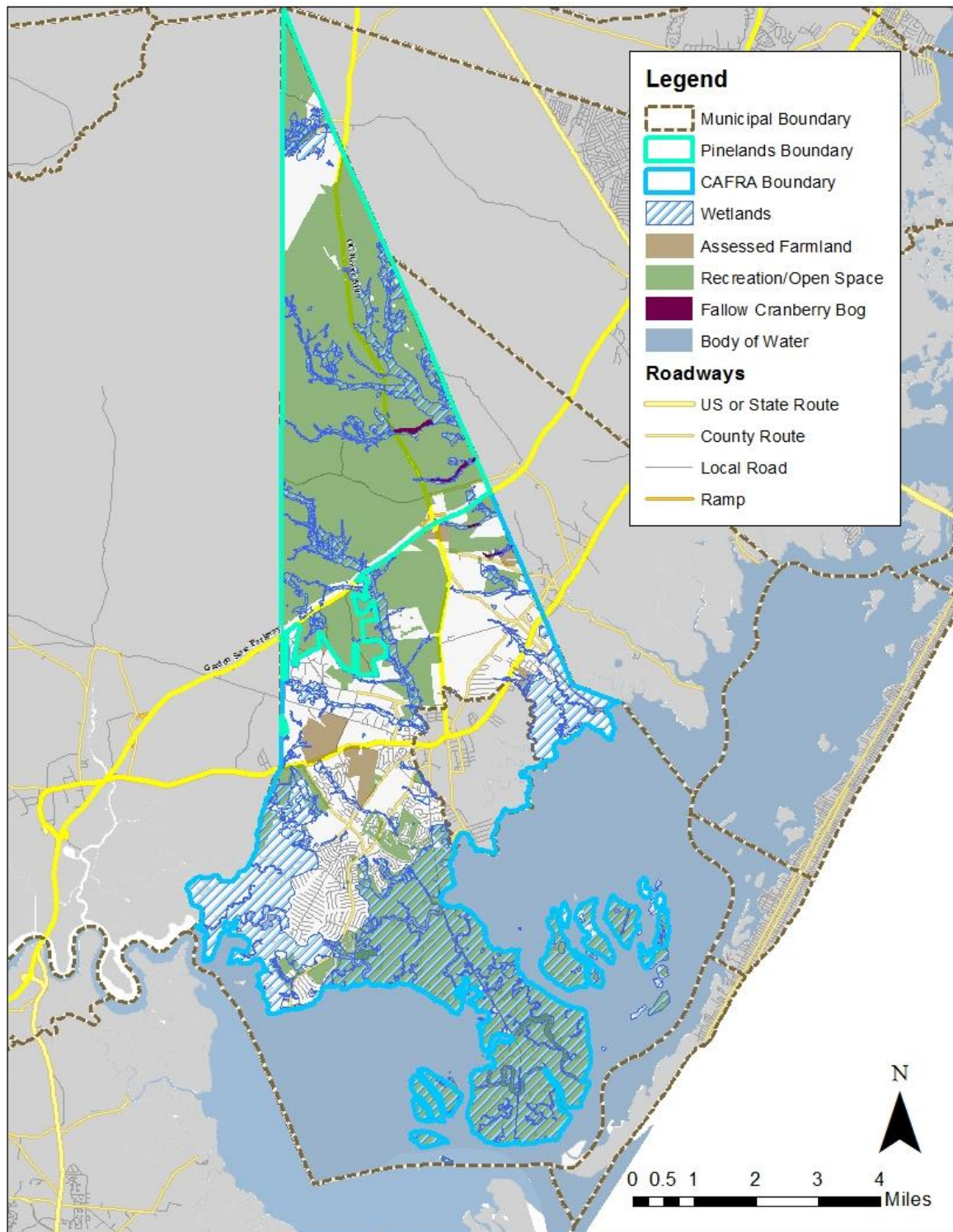


Figure 5. Natural Features

FUTURE FLOODING IMPACTS

As previously indicated, Little Egg Harbor Township has limited future development opportunities within the flood hazard area due to the presence of existing development and CAFRA regulations within its boundaries. The Township should continue to enforce the existing development standards and maintain its open spaces and natural features. This is critical to maintaining permeable surfaces and limiting stormwater runoff.

However, as sea levels rise and marshes retreat, Little Egg Harbor Township could become more vulnerable to impacts from flooding. The 2015 Vulnerability and Exposure Analysis prepared for the Township anticipates sea level rise of 1.48 feet by 2050, which would result in approximately 700 residential lots within the flood hazard area becoming permanently inundated. A 1% annual flood in 2050, coupled with anticipated sea level rise, would result in the inundation of approximately 4,000 residential lots.

The overall impacts of flooding on the community will be contingent on how effectively the Township mitigates current vulnerabilities and plans for future conditions. It is imperative that the Township utilize this Floodplain Management Plan as a valuable tool to plan for the future.

VI. GOALS

Over the course of the various Floodplain Management Plan Steering Committee meetings, the Committee discussed the goals that the Township would like to achieve with the Floodplain Management Plan to increase resiliency and mitigate future storm events. The following is a list of the goals agreed upon by the Committee:

1. Reduce loss from flood damage and other hazards through codes and standards.
2. Educate stakeholders and the public about floodplain management and stormwater management.
3. Protect the natural resources and qualities of the Township, including wetlands, stream corridors, open space, and areas with scenic, cultural, and recreational values.
4. Protect and ensure that Township infrastructure and critical facilities are able to withstand future hazard events and remain operational during and after such events.
5. Provide public information resources to Township residents and business owners so they are informed of the natural hazards within the community and the precautions they can take to protect their properties.

VII. POSSIBLE FLOODPLAIN MANAGEMENT ACTIVITIES

As part of the planning process, all existing and potential floodplain management activities and measures to mitigate property damage and impacts to community infrastructure were reviewed. The benefits, costs and general feasibility of each action were considered prior to making a recommendation to proceed with the action. Many of the proposed activities coincide with actions recommended in the 2014 Draft Monmouth County Multi-Jurisdictional All Hazards Mitigation Plan and 2015 Master Plan Reexamination Report. All activities and measures have been grouped into the following six mitigation strategies: Preventative Measures, Property Protection, Natural Resource Protection, Emergency Services, Structural Projects and Public Information. The findings are as follows.

PREVENTATIVE MEASURES

Planning and Zoning

As part of the Phase 2 Post Sandy Planning Assistance Grants awarded by the New Jersey Department of Community Affairs, the zoning regulations affecting the residential districts within the Special Flood Hazard Area will be analyzed to determine how they can be changed to increase resiliency. Additionally, the Township's Master Plan will be updated as part of the grant projects and will include elements pertaining to resiliency and sustainability.

The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation plan recommends that the Township of Little Egg Harbor continue to participate in the NFIP to support pro-active floodplain management that will protect property from flood related hazards, clearly inform property owners about the risks of being in and near the SFHA, and promote flood insurance and that Little Egg Harbor join the Community Rating System program to complete pro-active floodplain management and assist residents with flood insurance costs.

The Little Egg Harbor Township Floodplain Management Planning Committee discussed increasing the freeboard requirement for properties in the Special Flood Hazard Area from 1 foot to 2 feet and increasing the minimum lot area of zone districts within the floodplain to reduce the amount of potential development. However, due to the built-out nature of these zones, increasing the minimum lot area was deemed not viable.

Open Space Preservation

A large portion of land within the Special Flood Hazard Area of Little Egg Harbor Township is publicly owned for conservation including the Parkertown Dock & Beach,

the former golf course on Osborn Island, Mystic Beach, and the Pretz/ Benco properties. Additional open space purchases should be reviewed, with an emphasis on clustered properties.

Floodplain mapping and data

The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation plan recommends that the Township of Little Egg Harbor improve their mapping capability to increase access to information to inform and plan for mitigation, preparedness, response and recovery as a way to better equip the Township to map hazards and prepare for future events. The Township of Little Egg Harbor will develop Geographic Information Systems (GIS) to increase the community's resiliency and enable them to better prepare for, respond to and recover from disasters. The components of the GIS should support facilities and public works infrastructure, land information, and floodplain management-related data layers and applications. This will be done as part of Round 2 Post-Sandy Planning Assistance Grant program.

Floodplain Regulations

Little Egg Harbor Township will adopt a Floodplain Management Ordinance as an outcome of this plan. Additionally, zoning regulations affecting the residential districts within the Special Flood Hazard Area will be looked at as part of the Phase 2 Post-Sandy Planning Assistance Grant. The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation plan recommends that the Township of Little Egg Harbor accept the FEMA Advisory BFE floodplain maps to support pro-active floodplain management to assist property owners in rebuilding at or above regulatory standards when the new floodplain maps become effective. Little Egg Harbor Township has adopted the Advisory BFEs.

The State regulations are already in place for coastal areas (CAFRA) including freshwater and coastal wetlands, waterfront development and dam safety as well as Flood Hazard permitting.

Erosion Setbacks

The Township of Little Egg Harbor has an ordinance requiring the stabilizing of properties and areas adjacent to lagoons. The FMP committee recommends requiring all lots under construction to install silt fence to control offsite flow of sediment, regardless of whether they are disturbing 5,000 SF or less.

Building Codes

In the aftermath of Superstorm Sandy, Little Egg Harbor adopted a Flood Hazard Areas Ordinance, amended the building height within the SFHAs of the R-100, R-75A, R-70, and R-50 zone districts to 40 feet, and amended the ordinance to allow uncovered stairs to encroach into the require front yard setback, not to exceed 5 feet, as required to elevate the building .to the minimum BFE. The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation plan recommends that the Township of Little Egg Harbor continue to enforce to building codes to require buildings, renovations, and rebuilding meets or exceeds the Uniform Construction Code to protect homes from risks related to hazards including flooding, fire, wind, earthquake, and winter storm. Additionally, the Township requiring grading plans as as-built surveys. Little Egg Harbor Township can gain points under the CRS program by improving their Building Code Effectiveness Grading Schedule classification, and should explore this further.

Stormwater Management

The Township Stormwater Management Plan written in 2007. Little Egg Harbor also has a stormwater management ordinance and stormwater pollution prevention plan. Thee Township currently inspects and cleans inlets, outfalls, and drainage pipes in accordance with their NJDEP Phase 2 Tier A Stormwater Permit. New development could be required to build 'Green' with bio-swales and increased re-charge requirements.

PROPERTY PROTECTION

Acquisition & Relocation

The FMP committee reviewed the pros and cons to property acquisition such as lost revenue and increased maintenance, but less services required. There are a number of programs including Blue Acres and NRCS that residents looking to pursue buyouts could be encouraged to apply to.

Building Elevation

The Township of Little Egg Harbor should require that newly constructed or substantial damaged buildings in SFHAs must comply with the most up-to-date base flood elevations. To ensure this can be done easily, the Township has amended the building height in the SFHA of the R-100, R-75A, R-70, and R-50 zone districts to 40 feet, as well as allowed for uncovered stairs to encroach on the front yard setback.

The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation plan recommends that 826 homes within the Township of Little Egg Harbor be elevated to the new BFE standards to mitigate the impact of flood related hazards and avoid future flood losses while maintaining residents in the community.

Retrofitting

The Township should make information available about different flood proofing techniques in the construction office. The Township should encourage the flood proofing of non-residential buildings within the flood zone that do not meet the BFE. Dry flood proofing is most applicable to commercial structures which already have a substantial structural design. Wet flood proofing is currently recommended where a building is below the base flood elevation. This could involve permanently elevating fixtures and furniture to having materials on hand to elevate costly items in the event of a flood. The installation of flood vents is required for additions and is strongly recommended on the existing portions of housing not undergoing renovation. Flood certifications are required prior to starting construction and after completed the work. The Township should also make sure elevation certificates are accurate and complete for all structures within the SFHA area.

Flood Insurance

Little Egg Harbor participates in the National Flood Insurance Program. Homeowners are encouraged to maintain flood insurance to protect against loss of structure and contents in case of flooding. The Township of Little Egg Harbor can reduce the flood insurance rates for property owners by participating in the Community Rating System program. This plan is intended to gain points towards that program.

NATURAL RESOURCE PROTECTION

Wetlands Protection

There are many areas throughout the Township that contain wetlands. The wetlands are classified as deciduous wetlands, disturbed wetlands, herbaceous wetlands, managed wetlands, phragmites dominant wetlands and salt marshes. These wetlands provide the Township a vital asset during storms and floods. Not only do wetlands provide a natural buffer between buildings and the rivers, but they also slow the speed of surging floodwaters and provide an area for retention and recharge. State regulations through the NJDEP freshwater and coastal wetland permit programs are currently in place to limit development in these areas. The Township should continue to support and enforce these

programs. The Township should also consider further investigation of living shorelines to augment these areas and provide additional shoreline stabilization.

Erosion and Sediment Control

The Standards for Soil Erosion and Sediment Control in New Jersey are regulated by the New Jersey Department of Agriculture and locally enforced through the Ocean County Soil Conservation District. The Township should continue to support and enforce these standards for all applicable development.

Water Quality Improvement

Little Egg Harbor Township currently enforces the NJDEP Best Management Practices for stormwater runoff quality and reduction of total suspended solids. Green infrastructure techniques can be used to promote resiliency in the Township of Little Egg Harbor and improve the water quality entering Little Egg Harbor and Great Bay. Green infrastructure uses permeable surfaces, landscape formations, and plant material to intercept stormwater runoff before it enters storm drains by promoting infiltration. Their use can promote resiliency by mitigating flooding and helping the township to quickly recover from storms. Additionally, green infrastructure captures runoff pollution and prevents it from entering waterways.

Natural Area Preservation

Much of the land in Little Egg Harbor Township along the bay is publically owned for conservation.

Natural Area Restoration

The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation plan recommends that the Township repair and replenish the eroded beach along Dock Road to protect a natural resource that also protects property and is of community and economic value.

The Township could also implement living shoreline or other restoration projects for specific areas within the floodplain as needed.

EMERGENCY SERVICES

Hazards Warning

The Township of Little Egg Harbor alerts its residents to floods, storms, and other hazards through a Nixle system, using the Township website, on local radio and TV stations, and utilizing door to door notifications. The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation plan recommends that Little Egg Harbor Township

develop a reverse 911 system to assist in communication for all hazards. There is currently an Emergency Broadcast System utilized in Ocean County.

Critical Facilities Protection

Little Egg Harbor's municipal building, police department, schools, EMS, and Fire Departments are located outside of the Special Flood Hazard Area. The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation Plan recommends that 3 generators are purchased and maintained to continue critical community services during utility interruptions and storm events at the Little Egg Harbor Township MUA. The plan also recommends upgrading and elevating two pump stations operated by the Township MUA to maintain access to critical community resources during flooding related hazards and installing a grounding system to better protect the Public Works building from future lightning strikes. The FMP committee also recommends that lightning protection be considered for the DPW facilities.

Health and Safety Maintenance

The Police Department is primarily responsible, after the flood, to patrol evacuated areas to prevent looting. Clearing streets and removing debris is performed through the Township Department of Public Works. After a storm the Ocean County Health Department is responsible for ensuring the health needs of residents are met. It was recommended in the 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation Plan to develop a permanent facility, equipment, and staff building that will provide space for a temporary debris management area after a disaster. The Township is currently in the process of writing a debris management plan.

Hazards Response Operations

The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation plan recommends Little Egg Harbor Township undertake the following activities:

- Maintain a local emergency planning committee and hold meetings every month and perform drills to prevent hazard materials accidents.
- Continue "We Care" program to look out for residents with special needs during emergencies. This program assists in getting the right information and assistance to community members who need additional assistance during a disaster and may not receive information effectively from other outlets.
- Continue CERT to improve outreach and community member capability for disaster mitigation, preparedness and response.
- Maintain Nixle notification to assist in communication for all hazards.

- Maintain Emergency Operations Plan to protect community from all hazards.

STRUCTURAL PROJECTS

Bulkheads

Little Egg Harbor Township is responsible for reviewing, repairing, and/or reconstructing Township owned bulkheads to protect property. Township Ordinance requires that private property owners maintain their bulkheads as well. The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation Plan recommends Little Egg Harbor install Bayfront energy dissipation structure to prevent coastal erosion and mitigate flood related hazards and help to reduce undermining of bulkheads, repair and install bulkheads to protect from coastal erosion and flood related hazards, and install riprap along the shoreline to protect from erosion and flood related hazards

Levees/ Floodwalls

The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation Plan recommends Little Egg Harbor repair and improve the Iowa Court seawall to protect from flood related hazards. Levees are not feasible due to the many inlets, lagoons, and back bay areas of the Bayfront.

Channel Modifications

Dredging the inlet and lagoon through the Marsh Restoration and Replenishment project to remove debris and sand, providing space for water to prevent and mitigate flooding in low lying areas is an action item recommended by the 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation Plan.

Capital Improvement Plan

The Township should prepare a 5-year Capital Improvement Plan. An existing inventory of Township property, equipment and infrastructure should be prepared. The recommended improvements and capital investments should focus on community recovery, resiliency and hazard mitigation. This project is currently underway and is being funded by Phase 2 of a Post-Sandy Planning Assistance Grant.

Flood Protection Projects

The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation Plan recommends the Township complete the flood protection project at E. Sailboat & Dorey streets to protect from flood related hazards.

PUBLIC INFORMATION

Map Information

The Township is in the process of developing a GIS program that will contain flood zones, flood elevations, evacuation routes, building footprints, critical facilities, shelters, etc. These portions of the GIS program should be made available to the public through the Township website or by visiting the municipal building where staff members can help explain the various maps and hazards.

Outreach Projects

The Floodplain Management Plan Committee can set up a booth at local events. Additionally, information on flood hazards can be mailed out annually with tax bills. Depending on the information included on the pamphlets, this activity could be eligible for CRS credit. The 2014 Ocean County Multi-Jurisdictional All Hazards Mitigation Plan recommends the following outreach actions for Little Egg Harbor Township:

- Develop awareness level training for the public- Maintain, improve, and expand education and awareness programs to provide effective and relevant information to community members
- Continue “We Care” Program to look out for residents with special needs during emergencies. This program assists in getting the right information and assistance to community members who need additional assistance during a disaster and may not receive information effectively from other outlets.
- Continue Police outreach programs in schools to include children in outreach and improve families capability for disaster mitigation, preparedness, response, and recovery
- Maintain and improve information on website to reach community members effectively before, during, and after disasters
- Start quarterly emergency management town hall meetings- maintain, improve, and expand education and awareness programs to provide effective and relevant information to community members
- Continue CERT to improve outreach and community member capability for disaster mitigation, preparedness and response.

- Support and share information on grant programs that support residential, business and natural resource mitigation projects with appropriate local stakeholders to assist with implementing all actions in hazard mitigation plan.
- Maintain, improve, and expand education and awareness programs to provide effective and relevant information to community members
- Participate in National Night Out to get relevant and effective information on hazard mitigation distributed to community members

Library

FEMA brochures, pamphlets, books, and flooding information should be kept in the Little Egg Harbor Branch of the Ocean County Library.

Technical Assistance

The Municipal Building, Construction Office, and Township website has several pamphlets and booklets concerning flood preparedness and the National Flood Insurance Program, flood venting, etc.

Environmental Education

To increase environmental awareness and knowledge of flood risks, the Township should coordinate local elementary or high school students and coordinate with environmental commission.

Senior Citizen Database

The Township has many senior citizens who may need additional assistance during natural disasters. The Township should maintain a database of all senior citizens so that those in need of assistance can be contacted prior to or during a storm. The Township should create a registration portal on its' website.

VIII. ACTION PLAN

The previous chapter presented a wide range of possible floodplain management activities to address the goals established by the Floodplain Management Plan Steering Committee. This chapter presents an Action Plan that describes which activities should be implemented, who is responsible for implementing the activity, the deadline for completing the activity, the proposed budget and the funding source. The Committee realizes that there are many proposed activities, and that not all activities can be completed immediately based on available funds. The Township should initially focus on those projects that are economically feasible and will aid in the recovery and resiliency of the Township. The following priority levels were therefore established:

- High Priority – Activities in this category are critical to protecting the Township’s critical facilities and creating a more resilient community. The benefits of these activities far outweigh the costs. Funding for these projects is currently in place or there is the high likelihood for grant funds to be secured in the near future. It is recommended that the majority of these projects be completed prior to the next hurricane season.
- Medium Priority – Activities in this category are necessary to increase the Township’s resiliency and provide flood protection. Benefits outweigh the costs; however, funding has not yet been secured for those activities with physical improvements. The Township should continue to seek grants and other funding sources for these activities. It is recommended that these projects be completed in the next three years as funding becomes available.
- Low Priority – Activities in this category will mitigate hazard risks for the Township and are cost-effective. However, it is understood that these projects are not as critical as those identified as high or medium priority and that funding may be difficult to obtain for some of the larger construction projects.
- Ongoing – Activities in this category are required on a continuous or regular basis to be effective. These activities do not require special funds outside of the Township’s standard budget.

The following is the recommended Action Plan for the Township of Little Egg Harbor:

PREVENTATIVE MEASURES

Action Item	Priority	Responsible Party	Deadline	Budget	Funding Source
Prepare a 5-year Capital Improvement Plan	High	Township Staff and T&M Associates	June 2015	\$30,000	NJDCA Grant (secured)
Create an automated and expedited system for zoning and construction permit administration	High	Township Staff and T&M Associates	June 2015	\$25,000	NJDCA Grant (secured)
Develop a Geographic Information System (GIS) Program	High	Township Staff and T&M Associates	June 2015	\$50,000	NJDCA Grant (secured)
Join the Community Rating System (CRS) Program	High	Township Staff	October 2015	Township Staff Time	Township General Funds
Continue to support open space preservation within the Township and FHA.	Low	Federal, State, County, Township, and Non-Profit Partners	Ongoing	Township Staff Time	TBD
Join the Building Code Effectiveness Grading Schedule (BCEGS) Program	Low	Township Staff	June 2016	Township Staff Time	Township General Funds
Maintain, repair, and clean the Township drainage system	Ongoing	Department of Public Works	Ongoing	Township Staff Time	Township General Funds

NATURAL RESOURCE PROTECTION

Action Item	Priority	Responsible Party	Deadline	Budget	Funding Source
Restoration of marsh areas and thin layer to raise marsh elevations; shoreline stabilization	High	Township Staff, NJ Future, T&M Associates, Contractor	March 2017	\$2,100,000.00	NFWF Grant (secured)
Soil Erosion and Sediment Control Ordinance Amendments	Medium	Township Staff	September 2015	Township Staff Time	Township General Funds

PROPERTY PROTECTION

Action Item	Priority	Responsible Party	Deadline	Budget	Funding Source
Elevate 826 homes and build to higher standards	High	Township Staff	Ongoing	Township Staff Time	HMGP

EMERGENCY SERVICES

Action Item	Priority	Responsible Party	Deadline	Budget	Funding Source
Prepare a Debris Management Plan	High	Township Staff and T&M Associates	June 2015	\$20,000.00	NJDCA Grant (secured)
Replacement of emergency backup generators at the Township Municipal Complex	High	Township Staff/Contractor	June 2016	\$250,000.00	General Township Funds/Bonding, other potential funding sources to be reviewed
Install a Reverse 911 system	Medium	Township Staff/Contractor	June 2016	TBD	HMGP
Lightning Protection System at DPW Facility	Medium	Township Staff/Contractor	December 2016	\$50,000.00	HMGP

Continue CERT to improve outreach and community member capability for disaster mitigation, preparedness, response, and recovery	Medium	Township Staff	Ongoing	Township Staff Time	General Township Funds/Grant Opportunities
---	--------	----------------	---------	---------------------	--

STRUCTURAL PROJECTS

Action Item	Priority	Responsible Party	Deadline	Budget	Funding Source
Maintain and Repair Township Bulkheads	Medium	Township Staff/Contractor	Ongoing	\$500,000.00	General Township Funds/Bonding, Grant Opportunities
Storm Drainage Improvements in Mystic Island and Great Bay Blvd.	Ongoing	Township Staff/Contractor	Ongoing	TBD	General Township Funds/Bonding, Grant Opportunities

PUBLIC INFORMATION

Action Item	Priority	Responsible Party	Deadline	Budget	Funding Source
Public Outreach Projects including maintaining flood hazard information on website	Ongoing	Township Staff	December 2015 & Ongoing	Township Staff Time	Township General Funds
Develop We Care Program	Low	Township Staff	December 2016	Township Staff Time	Township General Funds

IX. PLAN IMPLEMENTATION & MAINTENANCE

It is anticipated that this Plan will be introduced to the Township Planning Board on May 7, 2015 and then adopted on May 21, 2015. The Plan will also be adopted by the Township Council by a formal Resolution on May 28, 2015.

This floodplain management plan is intended to be a dynamic document, adapting to changes in flood hazards and the needs of Little Egg Harbor Township. The recommendations and actions identified in this plan should be implemented by the designated lead for each action item as funding and resources become available. Changes in future conditions and funding availability may determine the timeline for when some actions get implemented. As the plan is evaluated each year and updated every five years, the goals and objectives of this plan should also be evaluated and revised as necessary.

The Township's CRS Coordinator will be responsible for monitoring the plan and ensuring that the Floodplain Management Plan Steering Committee will meet at least once per year to aid with the yearly plan evaluation. The original members of the committee will remain, unless they wish to be replaced. Then a like representative will replace them. The committee will review the plan on an annual basis to evaluate changes to hazard conditions, goals and objectives, and progress made towards objectives. The committee will identify any necessary changes or revision to the plan. The annual review will include:

- A review of the original plan;
- Identification of any flood, hurricane, or other disaster that has impacted Little Egg Harbor since the last review;
- Review of action items from the original plan, including what has been accomplished;
- Discussion on why actions have not been completed;
- Where vulnerabilities have increased, identify why and what additional measures can be taken to decrease the vulnerability of that area to flood hazards;
- Recommendations for new projects or revised action items; and
- Survey of available resources to address action items.

This Floodplain Management Plan will be updated every five years and reviewed for CRS credit according to the CRS Coordinator's Manual in effect at the time. The 5-year update must include the following steps to retain CRS credit:

- The update must be conducted by a committee;

- A public meeting must be conducted to review and receive comments on the draft update;
- Review of new studies, reports, and technical information of the community's needs, goals, and plans for the area;
- New floodplain or hazard mapping;
- Identification of additional repetitive loss properties or completed mitigation projects;
- Discussion of any major flood or other disasters that have occurred since the plan was adopted;
- Review of any other changes in flooding conditions or development exposed to flooding or other hazards;
- Goals must be evaluated to determine if they are still appropriate;
- The action plan will be revised to account for projects that have been completed, dropped, or changed, and for changes in the hazard and problem assessments; and
- The update shall be adopted by the Township's governing body.

Appendix A: Steering Committee Creation Ordinance

ORDINANCE NO. 2015 – 01

AN ORDINANCE OF THE TOWNSHIP OF LITTLE EGG HARBOR, COUNTY OF OCEAN, STATE OF NEW JERSEY, CREATING CHAPTER 49 OF THE TOWNSHIP CODE OF THE TOWNSHIP OF LITTLE EGG HARBOR, ENTITLED “FLOODPLAIN MANAGEMENT PLAN COMMITTEE”

BE IT ORDAINED, by the governing body of the Township of Little Egg Harbor, County of Ocean, State of New Jersey, as follows:

SECTION 1. The Township Code of the Township of Little Egg Harbor is hereby amended and supplemented so as to create Chapter 49, which shall be entitled “Floodplain Management Plan Committee,” which shall read as follows:

§49-1. Establishment.

There is hereby established a Floodplain Management Plan Committee, which shall be an advisory body responsible for aiding the Township Engineer in preparing a Floodplain Management Plan, discussing various aspects of the Floodplain Management Plan, including assessing the hazard, assessing the problem, setting goals, reviewing possible activities and strategies to mitigate the hazard and drafting an action plan.

§49-2. Membership, Alternates.

A. The Floodplain Management Committee shall consist of ten members, who shall serve without compensation. The members shall be appointed by the Township Committee from the following Township Departments:

1. Building/ Code Enforcement,
2. Engineering,
3. Land Use, Planning/ Zoning,
4. Public Works,
5. Emergency management Public Safety,
6. Public Information,

7. Environmental Protection/ Public Health,
 8. Parks and Recreation,
 9. Council Member, and
 10. Housing and Community Development
- B. The Mayor and Township Council may appoint by resolution two additional members of the public who currently reside in the Floodplain area.
 - C. The Chair of the Committee will be the Township Engineer.
 - D. A secretary shall be elected annually from among the members of the Committee.
 - E. The Chair shall establish the meeting schedule.
 - F. There shall be two alternate members, who shall be appointed by the Township Committee.

§49-3. Term of office; vacancies.

- A. The term of office for the appointed members of the Committee shall be for two (2) years.
- B. A vacancy on the Committee occurring other than by expiration of term shall be filled for the unexpired term only by the Mayor.
- C. All terms shall run from January 1 of the year in which the appointment is made.

§49-4. Meetings.

- A. There shall be not less than five (5) meetings a year. The Chair shall preside at all meetings of the Committee.
- B. There shall be not less than two (2) public information sessions a year held within the floodplain area

§49-5. Duties of members.

Committee members shall meet and discuss various aspects of the Floodplain Management plan and draft an action plan.

§49-6. Removal of members.

The Mayor or Township Committee may remove any member of the Committee for cause, on written charges served upon the member and after a hearing thereon at which the member shall be entitled to be heard in person or by counsel.

§49-7. Powers and duties.

The Committee shall:

- A. Identify and assess flood hazards within the Township,
- B. Establish goals and objectives,
- C. Review possible activities and strategies designed to minimize flooding and mitigate the impacts from flooding in the future,
- D. Aid in the preparation and drafting of an action plan;
- E. Hold two (2) public information sessions a year in a floodplain area,
- F. Keep records of its meetings and make an annual report to the governing body, and
- G. Perform any other duties as directed by the Mayor and Township Committee.

SECTION 2. All ordinances or parts of ordinances inconsistent herewith are hereby repealed.

SECTION 3. If any section, subsection, sentence, clause, phrase or portion of this ordinance is for any reason held to be invalid or unconstitutional by a court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions hereof.

SECTION 4. This ordinance shall take effect after second reading and publication as required by law.

NOTICE

NOTICE IS HEREBY GIVEN that the foregoing ordinance was introduced and passed by the Township Committee on first reading at a meeting of the Township Committee of the Township of Little Egg Harbor held on the 22nd day of January, 2015, and will be considered for second and final passage at a meeting of the Township Committee to be held on the 12th day of February, 2015, at 7:30 p.m. at the Municipal Building located at 665 Radio Road, Little Egg Harbor, New Jersey, at which time and place any persons desiring to be heard upon the same will be given the opportunity to be so heard.


DIANA K. MCCRACKEN, RMC, Clerk
Township of Little Egg Harbor

Introduction

<u>yes</u> Gormley	<u>yes</u> Kehm	<u>yes</u> Nuttall
<u>yes</u> Kobryn	<u>yes</u> Midgley	

Second Reading & Adoption

<u>yes</u> Gormley	<u>yes</u> Kehm	<u>yes</u> Nuttall
<u>yes</u> Kobryn	<u>Absent</u> Midgley	

RESOLUTION NO. 2015-59

**RESOLUTION OF THE TOWNSHIP OF LITTLE EGG
HARBOR, COUNTY OF OCEAN, STATE OF NEW
JERSEY, AUTHORIZING THE APPOINTMENT OF
MEMBERS TO THE FLOODPLAIN MANAGEMENT PLAN
COMMITTEE**

WHEREAS, Chapter 49 of the Township Code of the Township of Little Egg Harbor authorizes a Floodplain Management Plan Committee to assist the Township in preparing a Floodplain Management Plan within the Township; and

WHEREAS, the Township Committee desires to appoint the following ex officio member to the Floodplain Management Plan Committee:

1. Mark Ellis, representing the Building Department/ Code Enforcement, for a term of two years commencing January 1, 2015 and expiring December 31, 2016,
2. Jason Worth, representing Engineering, for a term of two years commencing January 1, 2015 and expiring December 31, 2016,
3. Michael Fromosky, representing Land Use Planning/Zoning, for a term of two years commencing January 1, 2015 and expiring December 31, 2016,
4. Patrick Donnelly, Superintendent of Public Works, representing Public Works/Parks & Recreation, for a term of two years commencing January 1, 2015 and expiring December 31, 2016,
5. Chief Rich Buzby, for a term of two years commencing January 1, 2015 and expiring December 31, 2016,
6. Garrett Loesch, representing Public Information, for a term of two years commencing January 1, 2015 and expiring December 31, 2016,

7. Thomas Bonfonti, representing Environmental Protection/ Public Health, for a term of two years commencing January 1, 2015 and expiring December 31, 2016,
8. Township Committeeman John Kehm, representing the Township Committee, for a term of two years commencing January 1, 2015 and expiring December 31, 2016,
9. Oliver Clifford, representing Housing and Community Development, for a term of two years commencing January 1, 2015 and expiring December 31, 2016; and

WHEREAS, all members of the Floodplain Management Plan Committee shall serve without compensation.

NOW, THEREFORE, BE IT RESOLVED, by the governing body of the Township of Little Egg Harbor, County of Ocean, State of New Jersey, as follows:

1. That Mark Ellis, Jason Worth, Michael Fromosky, Patrick Donnelly, Rich Buzby, Garrett Loesch, Thomas Bonfonti, John Kehm, and Oliver Clifford are appointed as ex officio members of the Floodplain Management Plan Committee for terms of two years.
2. That a certified copy of this resolution shall be forwarded by the Municipal Clerk to Mark Ellis, Jason Worth, Michael Fromosky, Patrick Donnelly, Rich Buzby, Garrett Loesch, Thomas Bonfonti, John Kehm, and Oliver Clifford.

Motion to Approve: Nuttall Second: Kehm Roll Call:

Gormley	<u>yes</u>
Kehm	<u>yes</u>
Nuttall	<u>yes</u>
Kobryn	<u>yes</u>
Midgley	<u>Absent</u>

CERTIFICATION

I, **DIANA K. MCCRACKEN, RMC**, Municipal Clerk of the Township of Little Egg Harbor, do hereby certify that the foregoing resolution was duly adopted by the Township of Little Egg Harbor Township Committee at a meeting held on the 12th day of February, 2015.

Diana K. McCracken, RMC
DIANA K. MCCRACKEN, RMC, Clerk
 Township of Little Egg Harbor

Appendix B: Steering Committee Meeting Outlines

Agenda - 1st Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, February 23, 2015 (2:00 PM)
Municipal Complex Court Room

Call to Order

Roll Call and Introductions

Discussion Items:

- Flood Plain Management Plan/Community Rating System Overview
- Review of Phase I Items:
 - Step 1: Organize
 - Review Committee Selection
 - Select a Committee Chairperson
 - Step 2: Involve the Public
 - Review Committee Meeting Schedule
 - Schedule 1st Public Meeting in an affected area
 - Schedule 2nd Public Meeting to obtain public input on Plan
 - Step 3: Coordinate
 - Review existing FPMP
 - Review existing Flood Control Ordinance
 - Review existing and preliminary FIRM maps
 - Discuss other sources of information/existing studies/reports
 - Discuss the community's needs, goals and plans for the area
 - Review correspondence/coordination with agencies and organizations outside the community's governmental structure
- Discussion of Phase II Item(s)
 - Step 4: Assess the Hazard
 - Assess the Flood Hazard
 - Review of Special Flood Hazard Area (SFHA) shown on the FIRM
 - Review repetitive loss areas and data
 - Discuss areas not mapped on the FIRM which have flooded in the past
 - Identification of other flood studies
 - Assessment of less-frequent flood hazards
 - Inventory of levees that could result in flooding if they were to fail
 - Inventory of dams that could result in flooding if they were to fail
 - Identify flood hazards in Section 401 of the CRS Coordinators Manual as follows:
 1. Uncertain flow paths: alluvial fans, moveable bed streams, channel migration, and other floodplains where the channel shifts during a flood.

Agenda - 1st Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, February 23, 2015 (2:00 PM)
Municipal Complex Court Room

2. Closed basin lakes: lakes that have a small or no outlet that may stay above flood stage for weeks, months, or years.
 3. Ice jams: flooding caused when warm weather and rain break up a frozen river. The broken ice floats down river until it is blocked by an obstruction, such as a bridge or shallow area, creating a dam.
 4. Land subsidence: lowering of the land surface caused by withdrawal of subsurface water or minerals or by compaction of organic soils.
 5. Mudflow hazards: a river, flow, or inundation of liquid mud down a hillside, usually as a result of a dual condition of loss of brush cover and the subsequent accumulation of water on the ground, preceded by a period of unusually heavy or sustained rain.
 6. Coastal erosion: areas subject to the wearing away of land masses caused primarily by waves on the oceans, Gulf of Mexico, and the Great Lakes.
 7. Tsunamis: large ocean waves typically caused by an earthquake, landslide, or underwater volcano.
- Identify the coastal A zone (wave heights of 1.5 to 3 feet during the 100-year storm)
 - Map the areas affected
 - Summarize the Hazards in lay terms
- Identify areas likely to be flooded and flood problems that are likely to worsen as a result of the following:
 - Changes to the floorplan development and demographics
 - Development in the watershed
 - Climate change or sea level rise
 - Describe the magnitude, severity, history and probability of future events for other natural hazards including the following:
 - Earthquakes
 - Wildfires
 - Tornados

Overview of next committee meetings

- Initial Public Hearing (scheduled for March 2, 2015 at 2:00 PM)
- Phase II – Step 5: Assess the Problem (scheduled for March 9, 2015 at 2:00 PM)

Committee Comments

Adjourn

**Agenda – 2nd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 9, 2015 (2:00 PM)
Municipal Complex Court Room**

Call to Order

Roll Call

Discussion Items:

- Review of Phase I Items:
 - Steps 1 - 3: Organize, Involve the Public, and Coordinate
- Discussion of Phase II Item(s)
 - Step 4: Assess the Hazard – Recap 1st Committee Meeting
 - Review Township's vulnerability to hazards: flood, wildfire, coastal erosion, earthquake, tornado, etc.
 - Step 5: Assess the Problem
 - Impact of Hazards on:
 - Life Safety, Warning/Evacuating Residents
 - Public Health, including health hazards to individuals from flood waters (i.e. mold)
 - Critical facilities and Infrastructure
 - Community's Economy and Major Employers
 - Township Owned Buildings within the SFHA
 - Are the buildings insured?
 - Historical damage to these buildings
 - Review of natural features within the floodplain (i.e. wetlands, sensitive areas)
 - Review of development, redevelopment, population trends for the future within the SFHA.
 - Review of impacts to people and property in areas susceptible to future flooding due to climate change/sea level rise.

Overview of next committee meetings

- Phase II – Steps 6/7: Set Goals/Review Possible Activities
(scheduled for March 16, 2015 at 2:00 PM)

Committee Comments

Adjourn

**Agenda – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room**

Call to Order

Roll Call

Discussion Items:

- Discussion of Phase II Item(s)
 - Step 6: Set Goals
 - Goals should be consistent with other community goals for the affected areas.

Examples:

1. Reduce loss from flood damage and other hazards through codes and standards.
2. Educate stakeholders and the public about floodplain management and stormwater management.
3. Protect the natural resources and qualities of the Township, including wetlands, stream corridors, open space, and areas with scenic, cultural, and recreational values.
4. Protect and ensure that Township infrastructure and critical facilities are able to withstand future hazard events and remain operational during and after such events.
5. Provide public information resources to Township residents and business owners so they are informed of the natural hazards within the community and the precautions they can take to protect their properties.

- Step 7: Review Possible Activities
 - **Preventative Activities**
 - Planning and Zoning
 - Predominantly R-50 within FHA and pre-dominantly developed.
 - Properties required to be developed in accordance preliminary FIRM maps including 1' freeboard.
 - Review/discuss possible zoning amendments.
 - Open Space Preservation
 - Township County currently has several open space properties within the FHA including (Parkertown Dock/Beach, former Golf Course on Osborn Island, Mystic Beach, Pretz/Benco Properties)

Agenda – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room

- Review/discuss possibilities for additional open space purchases.
- Floodplain Regulations
 - State regulations already in place for coastal areas (CAFRA) including freshwater and coastal wetlands, waterfront development and dam safety as well as Flood Hazard permitting.
- Erosion Regulations
 - Township Ordinance requires the stabilizing of properties and areas adjacent to lagoons (i.e. bulkheads).
 - Review/discuss possibilities for additional regulations.
- Building Codes
 - Uniform Construction Code.
 - Grading Plans and As-Built Surveys required (no recharge requirements).
 - Review/discuss possibilities for other code requirements and or activities (i.e. building code effectiveness grading schedule [BCEGS]).
- Stormwater Management/Drainage System Maintenance
 - As required, the Township has a stormwater management ordinance, stormwater management plan, and stormwater pollution prevention plan.
 - Township currently inspects and cleans inlets, outfalls, and drainage pipes in accordance with their NJDEP Phase 2 Tier A Stormwater Permit.
 - Review/discuss possible activities (i.e. continue enforcing/updating ordinances and plans, continue maintaining drainage systems).
- **Property Protection**
 - Acquisition and Relocation
 - Elevating of Buildings (Required of new development)
 - Retrofitting
 - Dry and wet floodproofing
 - Flood Insurance
- **Natural Resource Protection**
 - Wetlands Protection

Agenda – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room

- NJDEP Freshwater and Coastal Wetlands permit programs are currently in place to regulate and limit development in these areas.
- Erosion and Sediment Control
 - NJ Dept. of Agriculture and Counties enforce the Standards for Soil Erosion and Sediment Control in New Jersey.
- Water Quality Improvements
 - NJDEP's Best Management Practices (TSS Removal, Groundwater Recharge, Reduction in offsite flow velocities, etc.) are enforced by the Township through the Planning/Zoning Boards.
- Coastal Barrier Protection
 - LEHT has no coastal barrier islands.
- Natural Area Restoration
 - Marsh restoration/living shorelines, thin layer deposition in marshes, beach replenishment.
- **Emergency Services**
 - Hazards Warning
 - Reverse 911, Nixle, Website, Radio/TV, Door to Door Notifications.
 - Critical Facilities Protection
 - The municipal building/police department, schools, EMS, and Fire Departments are located outside of the FHA.
 - New generators should be considered for Municipal Complex and shelter facilities, as needed.
 - Health and Safety Maintenance
 - DPW – Clearing of debris.
 - Health Services – Hospitals and OC Health Dept.
 - Debris Management Plan
 - Currently being developed through DCA grant,
- **Structural Projects**
 - Levees/floodwalls
 - Not feasible due to the many inlets, lagoons and back bay areas of the bay front.
 - Bulkheads
 - Township owned bulkheads should be reviewed and repaired/reconstructed to protect property.

**Agenda – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room**

- Township ordinance requires private property owners to maintain their bulkheads also.
- Storm Sewers
 - Continue to maintain and clean the existing system. Township has been replacing and adding new drains each year to improve the systems.
- Capital Improvement Plan
 - Currently being developed through DCA grant.
- Public Information
 - Map Information
 - Should be available to all residents at Clerk's and Construction Office, website, etc.
 - Outreach Projects
 - Local events to pass out FEMA and flood related information?
 - Real Estate Disclosure
 - Library
 - Ocean County Library has maps on file as well as FEMA publications.
 - Technical Assistance
 - Township Construction Office (NFIP, building elevations, flood venting, etc.)
 - Environmental Education

Overview of next committee meetings

- Phase II – Steps 8: Draft an Action Plan
(scheduled for March 30, 2015 at 2:00 PM)

Committee Comments

Adjourn

Agenda – 4th Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 30, 2015 (2:00 PM)
Municipal Complex Court Room

Call to Order

Roll Call

Discussion Items:

- Discussion of Phase II Item(s)
 - Recap of activities discussed in prior meeting from Step 7.
 - Step 8: Draft an Action Plan
 - A balanced plan will identify measures from as many activity categories as possible and CRS points are awarded based on that.
 - Preventative Activities
 - Property Protection
 - Natural Resource protection
 - Emergency Services
 - Structural Projects
 - Public Information
 - For each action, the plan must identify the following:
 - Who is responsible for implementing the action;
 - When the action will be done; and
 - How will it be funded.

Preventative Measures:

- 5 Year Capital Improvement Plan – May 2015 – NJDCA Grant
- Construction Office Permit Process Automation – June 2015 – NJDCA Grant
- Develop a GIS Program – June 2015 – NJDCA Grant
- Enter CRS Program – October 2015 – General Township Funds
- Join Building Code Effectiveness Grading Schedule (BCEGS) Program – June 2016 – General Township Funds
- Maintain and Clean Township Drainage Systems – Ongoing – General Township Funds

**Agenda – 4th Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 30, 2015 (2:00 PM)
Municipal Complex Court Room**

Natural Resource Protection:

- Restoration of marsh areas and thin layer to raise marsh elevations– March 2017 – NFWF Grant
- Erosion Control Ordinance Amendments – September 2015 – General Township Funds

Emergency Services:

- Preparation of a Debris Management Plan– June 2015 – NJDCA Grant
- Replacement of generators at Township Municipal Complex
- Lightning Protection System at DPW Facility
- Reverse 911

Structural projects:

- Maintain and Repair Township Bulkheads– Ongoing – General Township Funds, Additional Funding Sources to be Reviewed
- Storm Drainage Improvements in Mystic Island and Great Bay Blvd – Ongoing – General Township Funds, Additional Funding Sources to be Reviewed

Public Information:

- Public outreach projects, maintain flood hazard information on website – December 2015 and ongoing – General Township Funds
- Develop We Care Program – December 2016 – General Township Funds

Overview of next committee meetings

- Distribution of draft FMP to all committee members by April 6, 2015
- 2nd Public Hearing Schedule for April 13, 2015

Committee Comments

Adjourn

Meeting Minutes - 1st Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, February 23, 2015 (2:00 PM)
Municipal Complex Court Room

The first committee meeting was called to order by Jason Worth (JW) and introductions were made.

Roll Call

Present: Jason Worth, Mike Fromosky, Ollie Clifford, Mark Ellis, Rich Buzby, Tom Bonfonti, Mark Kurilla (NJNG), Rick Hauter (NJNG)

Discussion Items:

- Flood Plain Management Plan/Community Rating System Overview
- Review of Phase I Items:
 - Step 1: Organize
 - Review Committee Selection
 - *JW indicated that the committee was created by Township Ordinance 2015-01 and members appointed by resolution of the Township Committee.*
 - Select a Committee Chairperson
 - *The Committee selected Jason Worth as Secretary and Chairperson of the FMP Committee.*
 - Step 2: Involve the Public
 - Review Committee Meeting Schedule
 - *JW outlined the following schedule:*
February 23, 2015 (2:00 PM) – Introduction and Assess the Hazard
March 9, 2015 (2:00 PM) – Problem Assessment
March 16, 2015 (2:00 PM) – Set Goals
March 23, 2015 (2:00 PM) – Review Possible Activities
March 30, 2015 (2:00 PM) – Draft an Action plan
April 20, 2015, (2:00 PM) – Final Review Meeting (if necessary)
 - Schedule 1st Public Meeting in an affected area
 - *JW outlined the following schedule:*
March 2, 2015 (2:00 PM) – Community Center
 - Schedule 2nd Public Meeting to obtain public input on Plan
 - *JW outlined the following schedule:*
April 13, 2015 (2:00 PM) – Community Center
 - Step 3: Coordinate
 - Review existing Flood Control Ordinance
 - Review existing and preliminary FIRM maps
 - *A8.0 to AE10.0*
 - Discuss other sources of information/existing studies/reports
 - Review correspondence/coordination with agencies and organizations outside the community's governmental structure

Meeting Minutes - 1st Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, February 23, 2015 (2:00 PM)
Municipal Complex Court Room

- *NJDEP*
- *NJ Littoral Society*
- *NJNG*

Meeting Minutes - 1st Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, February 23, 2015 (2:00 PM)
Municipal Complex Court Room

Discussion of Phase II Item(s)

- Step 4: Assess the Hazard
 - Assess the Flood Hazard
 - Review of Special Flood Hazard Area (SFHA) shown on the FIRM
 - *JW summarized the area as Mystic Island and Osborn Island, Great Bay Boulevard, areas off of Country Club Blvd and Atlantis Blvd. Also the southwestern portion of Mystic Shores.*
 - Review repetitive loss areas and data
 - *JW indicated that repetitive loss areas include the entire SFHA as there are properties throughout.*
 - Discuss areas not mapped on the FIRM which have flooded in the past
 - *Chief Buzby and Mike Fromosky listed the following areas: Nation Union Blvd & Lake Champlain, E. Sail/Dory/Boat, Atlantis & Great Bay Blvd intersection.*
 - Identification of other flood studies
 - *MF reviewed reports by Rutgers, Jacques Cousteau, and NJ Futures.*
 - Assessment of less-frequent flood hazards
 - Inventory of levees that could result in flooding if they were to fail
 - *None in Township*
 - Inventory of dams that could result in flooding if they were to fail
 - *Great Bay Boulevard adjacent to Holly Lake, Giffordtown Lane adjacent to Cranberry Bogs*
 - Identify flood hazards in Section 401 of the CRS Coordinators Manual as follows:
 1. Uncertain flow paths: alluvial fans, moveable bed streams, channel migration, and other floodplains where the channel shifts during a flood.
 - a. *None*
 2. Closed basin lakes: lakes that have a small or no outlet that may stay above flood stage for weeks, months, or years.
 - a. *None*
 3. Ice jams: flooding caused when warm weather and rain break up a frozen river. The broken ice floats down river until it is blocked by an obstruction, such as a bridge or shallow area, creating a dam.
 - a. *None*
 4. Land subsidence: lowering of the land surface caused by withdrawal of subsurface water or minerals or by compaction of organic soils.

Meeting Minutes - 1st Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, February 23, 2015 (2:00 PM)
Municipal Complex Court Room

- a. *Settling of Mystic and Osborn Island which are man-made lands and lagoons. The Osborn Island HOA has issued a report from their professionals indicating that the area continues to settle.*
- 5. Mudflow hazards: a river, flow, or inundation of liquid mud down a hillside, usually as a result of a dual condition of loss of brush cover and the subsequent accumulation of water on the ground, preceded by a period of unusually heavy or sustained rain.
 - a. None
- 6. Coastal erosion: areas subject to the wearing away of land masses caused primarily by waves on the oceans, Gulf of Mexico, and the Great Lakes.
 - a. *Lagoon ends along Twin Lakes Blvd and West Calabreeze Way; Iowa Ct; Ohio Drive; Marshes surrounding Township*
- 7. Tsunamis: large ocean waves typically caused by an earthquake, landslide, or underwater volcano.
 - a. None
- Identify the coastal A zone (wave heights of 1.5 to 3 feet during the 100-year storm)
 - *Mystic Island and Osborn Island, Great Bay Boulevard, areas off of Country Club Blvd and Atlantis Blvd. Also the southwestern portion of Mystic Shores. JW noted that V Zones stop at bulkheads and roadways.*
- Summarize the Hazards in lay terms
 -
- Identify areas likely to be flooded and flood problems that are likely to worsen as a result of the following:
 - Changes to the floodplain development and demographics
 - *The SFHA is predominantly developed in its existing state.*
 - Development in the watershed
 - *The watershed is predominantly developed in its existing state.*
 - Climate change or sea level rise
 - *All of Mystic and Osborn Island as noted in the Rutgers sea level rise mapping reviewed by the FMP Committee.*
- Describe the magnitude, severity, history and probability of future events for other natural hazards including the following:
 - Earthquakes
 - *One (1) earthquake noted back in 2011, but no damage. Earthquakes are not likely to be an issue.*
 - Wildfires

Meeting Minutes - 1st Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, February 23, 2015 (2:00 PM)
Municipal Complex Court Room

- *Wildfire back in July 2007 caused by a flare from the warren Grove bombing range resulting in the burning of thousands of acres of land west of the GSP. Township emergency services performs annual prescribed burns and fire breaks.*
- **Tornados**
 - *None in LEHT but a few have been noted in neighboring communities. Tornados are not likely to be an issue.*

Overview of next committee meetings

- Initial Public Hearing (scheduled for March 2, 2015 at 2:00 PM)
- Phase II – Step 5: Assess the Problem (scheduled for March 9, 2015 at 2:00 PM)

Committee Comments

- *JW reviewed and discussed the Rutgers mapping for sea level rise and SLOSH models.*
- *NJNG reviewed the NJ Rise Program which is a 5 year program they're implementing to install excess flow valves on services. In the event a structure is removed from its foundation during a storm, there is an auto-shutoff on their gas service.*

Adjourn

Meeting Minutes – 2nd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 9, 2015 (2:00 PM)
Municipal Complex Court Room

JW Called the Meeting to Order

Roll Call

Present: Jason Worth, Mike Fromosky, Ollie Clifford, Mark Ellis, Tom Bonfonti, John Kehm, Mark Kurilla (NJNG), Evan Sherer (NJDEP)

Discussion Items:

- Review of Phase I Items:
 - Steps 1 - 3: Organize, Involve the Public, and Coordinate
- Discussion of Phase II Item(s)
 - Step 4: Assess the Hazard – Recap 1st Committee Meeting
 - Review Township's vulnerability to hazards: flood, wildfire, coastal erosion, earthquake, tornado, etc.
 - Step 5: Assess the Problem
 - Impact of Hazards on:
 - Life Safety, Warning/Evacuating Residents
 - *Currently the Township utilizes Nixle, the Township website, and door to door notifications for issuing warnings.*
 - *The Township would like to have a revise 911 system implemented.*
 - *FMP Committee recommends providing information at public events to get word out about the risks and hazards.*
 - Public Health, including health hazards to individuals from flood waters (i.e. mold)
 - *The SFHA flooded by approximately 4 feet during Superstorm Sandy, so mold is a concern for the area. In particular those houses which are still not being attended to by owners such as banks.*
 - *Flood waters also impede life saving operations as the Township needs 2.5 and 5 ton vehicles to make it through flood waters.*
 - Critical facilities and Infrastructure
 - *Critical Township facilities such as the Municipal Complex and Emergency operations Center, Fire Depts., EMS, and shelters are located outside of the SFHA.*
 - *A new generator is needed at the Municipal Complex to insure that it remains operational during and after a storm*

Meeting Minutes – 2nd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 9, 2015 (2:00 PM)
Municipal Complex Court Room

- event. Currently the Township has a diesel powered generator and it is difficult to keep it running currently.*
 - *Critical Township infrastructure in the SFHA includes stormwater management systems and bulkheads (the bridge over Big Creek for Osborn Island is owned by Ocean County). OC recommended higher bulkheads, but JW noted so many back water areas which will contradict that effect.*
- **Community's Economy and Major Employers**
 - *The committee reviewed the effects on local businesses and while there are a few businesses on Radio Road and local marinas within the SFHA, most businesses are located outside of the SFHA. The largest impact to businesses is lost business due to displaced residents after a storm event such as Superstorm Sandy.*
- **Township Owned Buildings within the SFHA**
 - **Are the buildings insured?**
 - *Community center – yes it is insured through JIF.*
 - **Historical damage to these buildings**
 - *Some small flooding in the Community Center from time to time, but 4 feet during Sandy.*
- **Review of natural features within the floodplain (i.e. wetlands, sensitive areas)**
 - *There are several wetlands and marshes surrounding the Township. JW reviewed a NFWF grant obtained by the Township to dredge lagoons and restore marsh areas.*
- **Review of development, redevelopment, population trends for the future within the SFHA.**
 - *The SFHA is predominantly developed and the FMP Committee expects that to continue. In fact, JK noted many properties where owners are moving in full time.*
 - *All development must build to the preliminary FIRM maps plus 1 foot of freeboard.*
- **Review of impacts to people and property in areas susceptible to future flooding due to climate change/sea level rise.**
 - *With sea level rise, areas north of West Calabreeze Way will be susceptible to flooding.*

Overview of next committee meetings

- **Phase II – Steps 6/7: Set Goals/Review Possible Activities**
(scheduled for March 16, 2015 at 2:00 PM)

**Meeting Minutes – 2nd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 9, 2015 (2:00 PM)
Municipal Complex Court Room**

Committee Comments

Evan Sherer will provide information on his coastal vulnerability index.

Adjourn

**Meeting Minutes – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room**

JW Called the Meeting to Order

Roll Call

Present: Jason Worth, Mark Ellis, Ollie Clifford, Mike Fromosky, Evan Sherer (NJDEP)

Discussion Items:

- Discussion of Phase II Item(s)
 - Step 6: Set Goals
 - Goals should be consistent with other community goals for the affected areas.

JW announced sample goals from the CRS Coordinator's manual and other plans.

Goals identified by FMP Committee:

- 1. Reduce loss from flood damage and other hazards through codes and standards.*
- 2. Educate stakeholders and the public about floodplain management and stormwater management.*
- 3. Protect the natural resources and qualities of the Township, including wetlands, stream corridors, open space, and areas with scenic, cultural, and recreational values.*
- 4. Protect and ensure that Township infrastructure and critical facilities are able to withstand future hazard events and remain operational during and after such events.*
- 5. Provide public information resources to Township residents and business owners so they are informed of the natural hazards within the community and the precautions they can take to protect their properties.*

- Step 7: Review Possible Activities
 - **Preventative Activities**
 - Planning and Zoning
 - *R-50, R-75, and R-100 within FHA and pre-dominantly developed. Zoning changes to require larger lots, thus reducing potential losses, was deemed not viable.*
 - *Properties required to be developed in accordance preliminary FIRM maps including 1' freeboard. FMP Committee discussed requiring 2' of freeboard.*

Meeting Minutes – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room

- **Open Space Preservation**
 - *Township/County currently has several open space properties within the FHA including (Parkertown Dock/Beach, former Golf Course on Osborn Island, Mystic Beach. Pretz/Benco Properties)*
 - *Additional open space purchases should be reviewed, with an emphasis on clustered properties.*
- **Floodplain Regulations**
 - *State regulations already in place for coastal areas (CAFRA) including freshwater and coastal wetlands, waterfront development and dam safety as well as Flood Hazard permitting.*
- **Erosion Regulations**
 - *Township Ordinance requires the stabilizing of properties and areas adjacent to lagoons (i.e. bulkheads).*
 - *FMP Committee recommends requiring all lots under construction to install silt fence to control offsite flow of sediment, regardless of whether they are not disturbing 5,000 SF or less.*
- **Building Codes**
 - *Uniform Construction Code.*
 - *Grading Plans and As-Built Surveys required (no recharge requirements).*
 - *JW recommended that the Township look into the building code effectiveness grading schedule [BCEGS]. CRS credits are available.*
- **Stormwater Management/Drainage System Maintenance**
 - *As required, the Township has a stormwater management ordinance, stormwater management plan, and stormwater pollution prevention plan.*
 - *Township currently inspects and cleans inlets, outfalls, and drainage pipes in accordance with their NJDEP Phase 2 Tier A Stormwater Permit.*
 - *New development could be required to build 'Green' with bio-swales and increased re-charge requirements.*
- **Property Protection**
 - **Acquisition and Relocation**

**Meeting Minutes – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room**

- *FMP Committee reviewed pros and cons to property acquisition such as lost revenue and increased maintenance, but less services required.*
- Elevating of Buildings (Required of new development)
- Retrofitting
 - *Dry and wet floodproofing for commercial buildings.*
 - *Proper flood vents for reconstruction.*
- Flood Insurance
 - *Township participates in NFIP.*
 - *Property owners are encouraged to maintain flood insurance.*

Natural Resource Protection

- Wetlands Protection
 - *NJDEP Freshwater and Coastal Wetlands permit programs are currently in place to regulate and limit development in these areas.*
- Erosion and Sediment Control
 - *NJ Dept. of Agriculture and Counties enforce the Standards for Soil Erosion and Sediment Control in New Jersey.*
- Water Quality Improvements
 - *NJDEP's Best Management Practices (TSS Removal, Groundwater Recharge, Reduction in offsite flow velocities, etc.) are enforced by the Township through the Planning/Zoning Boards.*
- Coastal Barrier Protection
 - *LEHT has no coastal barrier islands.*
- Natural Area Restoration
 - *Marsh restoration/living shorelines, thin layer deposition in marshes, beach replenishment.*
- **Emergency Services**
 - Hazards Warning
 - *Nixle, Website, Radio/TV, Door to Door Notifications.*
 - *Recommend reverse 911.*
 - Critical Facilities Protection
 - *The municipal building/police department, schools, EMS, and Fire Departments are located outside of the FHA.*
 - *New generators should be considered for Municipal Complex and shelter facilities, as needed.*

Meeting Minutes – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room

- *Lightning protection should be considered for the DPW facilities.*
 - Health and Safety Maintenance
 - *DPW – Clearing of debris.*
 - *Health Services – Hospitals and OC Health Dept.*
 - Debris Management Plan
 - *Currently being developed through DCA grant.*
- **Structural Projects**
 - Levees/floodwalls
 - *Not feasible due to the many inlets, lagoons and back bay areas of the bay front.*
 - Bulkheads
 - *Township owned bulkheads should be reviewed and repaired/reconstructed to protect property.*
 - *Township ordinance requires private property owners to maintain their bulkheads also.*
 - Channel Modifications
 - *Lagoon/Creek dredging (Marsh Restoration and Replenishment Project)*
 - Storm Sewers
 - *Continue to maintain and clean the existing system. Township has been replacing and adding new drains each year to improve the systems.*
 - Capital Improvement Plan
 - *Currently being developed through DCA grant.*
- **Public Information**
 - Map Information
 - *Should be available to all residents at Clerk's and Construction Office, website, etc.*
 - Outreach Projects
 - *Local events to pass out FEMA and flood related information.*
 - *"We Care" Program*
 - Real Estate Disclosure
 - Library
 - *Ocean County Library has maps on file as well as FEMA publications.*
 - Technical Assistance

**Meeting Minutes – 3rd Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 16, 2015 (2:00 PM)
Municipal Complex Court Room**

- *Township Construction Office (NFIP, building elevations, flood venting, etc.)*
- Environmental Education

Overview of next committee meetings

- Phase II – Steps 8: Draft an Action Plan
(scheduled for March 30, 2015 at 2:00 PM)

Committee Comments

Adjourn

**Meeting Minutes – 4th Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 30, 2015 (2:00 PM)
Municipal Complex Court Room**

JW Called the Meeting to Order

Roll Call

Present: Jason Worth, Mark Ellis, Ollie Clifford, Tom Bonfonti, Garrett Loesch

Discussion Items:

- Discussion of Phase II Item(s)
 - *JW provided a recap of the prior meeting from Step 7 wherein possible activities were discussed.*
 - Step 8: Draft an Action Plan
 - *JW informed the committee that a balanced plan will identify measures from as many activity categories as possible and CRS points are awarded based on that.*
 - Preventative Activities
 - Property Protection
 - Natural Resource protection
 - Emergency Services
 - Structural Projects
 - Public Information
 - *JW stated that for each action, the plan must identify the following:*
 - Who is responsible for implementing the action;
 - When the action will be done; and
 - How will it be funded.

The committee discussed the possible activities and set the following action plan:

Preventative Measures:

- 5 Year Capital Improvement Plan – May 2015 – NJDCA Grant
- Construction Office Permit Process Automation – June 2015 – NJDCA Grant
- Develop a GIS Program – June 2015 – NJDCA Grant
- Enter CRS Program – October 2015 – General Township Funds
- Join Building Code Effectiveness Grading Schedule (BCEGS) Program – June 2016 – General Township Funds

**Meeting Minutes – 4th Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 30, 2015 (2:00 PM)
Municipal Complex Court Room**

- Maintain and Clean Township Drainage Systems – Ongoing – General Township Funds

Natural Resource Protection:

- Restoration of marsh areas and thin layer to raise marsh elevations– March 2017 – NFWF Grant
- Erosion Control Ordinance Amendments – September 2015 – General Township Funds
(Would require all properties under construction to install silt fence measures, not only those with disturbance greater than 5,000 SF)

Emergency Services:

- Preparation of a Debris Management Plan– June 2015 – NJDCA Grant
(This plan is a vital document following a major storm event. Costs for debris cleanup exceeded \$6 million following Sandy)
- Replacement of Generators at Township Municipal Complex
(Current generator is diesel powered, old, and unreliable. The Municipal Complex houses OEM and the construction office)
- Lightning Protection System at DPW Facility
- Reverse 911 *(To increase pre-storm warnings)*

Structural projects:

- Maintain and Repair Township Bulkheads– Ongoing – General Township Funds, Additional Funding Sources to be Reviewed
- Storm Drainage Improvements in Mystic Island and Great Bay Blvd – Ongoing – General Township Funds, Additional Funding Sources to be Reviewed
(Reconstruction of aging stormwater infrastructure and installation of additional inlets/pipe as needed)

Public Information:

- Public outreach projects, maintain flood hazard information on website – December 2015 and ongoing – General Township Funds
- Develop We Care Program – December 2016 – General Township Funds
(Provides storm related warnings to persons with disabilities)

**Meeting Minutes – 4th Committee Meeting
Township of Little Egg Harbor
Floodplain Management Plan Committee
Monday, March 30, 2015 (2:00 PM)
Municipal Complex Court Room**

Overview of next committee meetings

- 2nd Public Hearing Schedule for April 13, 2015

Appendix C: Public Meetings Information

AFFIDAVIT OF PUBLICATION

Publisher's Fee \$25.50 Affidavit \$35.00

State of New Jersey } SS.
Monmouth/Ocean Counties

Personally appeared

Diana Aguirre

Of the **Asbury Park Press**, a newspaper printed in Freehold, New Jersey and published in Neptune, in said County and State, and of general circulation in said county, who being duly sworn, depose and saith that the advertisement of which the annexed is a true copy, has been published in the said newspaper 1 times, once in each issue as follows:

04/04/15 A.D 2015

Melanie C. Altz

Diana Aguirre

Sworn and subscribed before me, this 4 day of April,
2015

Ad Number: 0000382958

Melanie C. Altz
Notary Public
New Jersey
My Commission Expires 11-19-19

TOWNSHIP OF LITTLE EGG HARBOR

PUBLIC NOTICE

PUBLIC NOTICE IS HEREBY GIVEN, that the Floodplain Management Committee of the Township of Little Egg Harbor will be having a public hearing regarding a Township Floodplain Management Plan on Monday March 2, 2015. The meeting will be held at the Little Egg Harbor Township Community Center, located at 319 West Calabreeze Way, Little Egg Harbor, NJ 08087 at 2:00 pm.

The floodplain management plan will provide an overall strategy of programs, projects, and measures that will reduce the adverse impacts of hazards on the community and promote resiliency within flood hazard areas. Residents are invited to comment on the natural hazards, problems, and possible solutions in flood hazard areas.

BY ORDER OF DIANA MCCracken, RMC, TOWNSHIP CLERK
(\$27.00)

0000318524-01

TOWNSHIP OF LITTLE EGG HARBOR

PUBLIC NOTICE

PUBLIC NOTICE IS HEREBY GIVEN, that the Floodplain Management Committee of the Township of Little Egg Harbor will be having a public hearing regarding a Township Floodplain Management Plan on Monday April 13, 2015. The meeting will be held at the Little Egg Harbor Township Community Center, located at 319 West Calabreeze Way, Little Egg Harbor, NJ 08087 at 2:00 pm.

The floodplain management plan will provide an overall strategy of programs, projects, and measures that will reduce the adverse impacts of hazards on the community and promote resiliency within flood hazard areas. Residents are invited to comment on the draft plan which will be reviewed at the public hearing.
BY ORDER OF DIANA MCCracken, RMC, TOWNSHIP CLERK
(\$25.50)

0000382958-01



Departments

Floodplain Management Committee

Drafting of Action Plan
Administrative Justice Complex (in the courtroom)
February 23, 2015 & March 9, 16, 23 & 30 2015 / 2:00 p.m.

Public Meetings to be held at the
Little Egg Harbor Twp, Community Center
Review of Draft Floodplain Management Plan
March 2, 2015 & April 13, 2015 / 2:00 p.m.

Board of Health - 7:00 p.m.

2015 meeting dates: March 24, June 23, September 22 & December 15
Chairperson: Sandra Johnson.
Meeting is in the Courtroom of the Township Building. Open to the Public.

ADMINISTRATION

BOARDS, COMMISSIONS & COMMITTEES



- CONSTRUCTION
- COURTS
- FINANCE
- HUMAN RESOURCES
- MAYOR AND COMMITTEE
- PLANNING AND ZONING BOARDS
- POLICE
- PUBLIC WORKS
- TAX ASSESSOR
- TAX COLLECTOR
- TOWNSHIP CLERK
- TOWNSHIP & CODE ENFORCEMENT



Email Signup

PHOTOS



VIDEOS



Little Egg Harbor Township



Little Egg Harbor Township adding 3 new photos


Little Egg Harbor Township Floodplain Committee Public Hearing
March 2nd, 2015 2:00PM LEHT Community Center
Community Rating System will be the main topic
For more information Contact Mike Fromosky
295-7241 ext. 225



Station	Station Name	Station Number
1	SEA	100%
2	SEA	100%
3	SEA	100%
4	SEA	100%
5	SEA	100%
6	SEA	100%
7	SEA	100%
8	SEA	100%
9	SEA	100%

**Little Egg Harbor Township
Floodplain Management Plan**

1st Public Hearing - March 2, 2015



T&M Associates
9 Canal Center, Little Egg Harbor, NJ 08043
Phone: (732) 471-3400 Fax: (732) 471-3402 Website: www.tandmassociates.com

**Little Egg Harbor Township
Floodplain Management Plan**

- Little Egg Harbor Township was awarded a grant to prepare a Floodplain Management Plan by the NJ Dept. of Community Affairs.
- Township Ordinance 2015-01 formally created the Floodplain Management Committee to prepare the plan.

Committee Members:

1. Committeeman John Kehm
2. Garrett Loesch, Township Administrator/CFO
3. Michael Fromosky, CFM, Asst. Township Administrator
4. Chief Richard Buzby, LEHT Police Dept./OEM
5. Thomas Bonfonti, LEHT Police Dept.
6. Patrick Donnelly, CPWM, Dept. of Public Works
7. Mark Ellis, CFM, Zoning Officer
8. Oliver Clifford, Acting Construction Official
9. Jason Worth, PE, Engineer

T&M Associates
9 Canal Center, Little Egg Harbor, NJ 08043
Phone: (732) 471-3400 Fax: (732) 471-3402 Website: www.tandmassociates.com

**Little Egg Harbor Township
Floodplain Management Plan**

Purpose of the Plan:

- To provide an overall strategy of programs, projects, and measures that will reduce the impacts of hazards on the community and promote resiliency within flood hazard areas.

T&M Associates
9 Canal Center, Little Egg Harbor, NJ 08043
Phone: (732) 471-3400 Fax: (732) 471-3402 Website: www.tandmassociates.com

**Little Egg Harbor Township
Floodplain Management Plan**

National Flood Insurance Program (NFIP):

- The NFIP provides federally backed flood insurance within participating communities that enact and enforce floodplain regulations.
 - A community adopts and enforces a floodplain management ordinance to regulate development in flood hazard areas in order to minimize the potential for flood damage to future development.
- Through the Community Rating System, communities are rewarded for taking measures and enacting programs which reduce flood damage to existing buildings, manage development outside of flood hazard areas, protect new buildings beyond the minimum standards, etc.

T&M Associates
9 Canal Center, Little Egg Harbor, NJ 08043
Phone: (732) 471-3400 Fax: (732) 471-3402 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Community Rating System (CRS):

Goals -

- Reduce and avoid flood damage to insurable property.
- Strengthen and support the insurance aspects of the NFIP
- Foster comprehensive floodplain management

Benefits of Participation -

- Development of a stronger and more resilient community
- Discounts on flood insurance for residents

T&M Associates
9 Grand Avenue, Toms River, NJ 08723
Phone: (732) 473-3400 Fax: (732) 473-3400 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Table 116-1. CRS classes, credit points, and percentage discounts

CRS Class	Credit Points (0-382)	Percentage Discount	
		As of 9/8/04	Effective 9/8/04
1	4,500+	45%	30%
2	4,000-4,499	40%	25%
3	3,500-3,999	35%	20%
4	3,000-3,499	30%	15%
5	2,500-2,999	25%	10%
6	2,000-2,499	20%	0%
7	1,500-1,999	15%	0%
8	1,000-1,499	10%	0%
9	500-999	5%	0%
10	0-499	0%	0%

T&M Associates
9 Grand Avenue, Toms River, NJ 08723
Phone: (732) 473-3400 Fax: (732) 473-3400 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Community Rating System (cont'd):

- The preparation and adoption of a floodplain management plan can provide up to 382 points in CRS
- Other credit points may include:
 - Public Information Activities
 - Elevation Certificates, Map Information Services, Outreach Projects, etc.
 - Mapping and Regulations
 - Open Space Preservation, Higher Regulatory Standards, Flood Data Maintenance, etc.
 - Flood Damage Reduction Activities such as the FMP
 - Warning and Response Activities
 - Flood warnings, dams, etc.

T&M Associates
9 Grand Avenue, Toms River, NJ 08723
Phone: (732) 473-3400 Fax: (732) 473-3400 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Preparation of Floodplain Management Plan and Process:

Phase 1: Planning Process

- Organize, Involve the Public, and Coordinate (Complete)

Phase 2: Risk Assessment

- Assess the Hazards & Problems
 - Review of Flood Hazard Areas, Repetitive Loss Areas, and Areas susceptible to flooding that are not mapped
 - Review and discuss impacts from prior storm events, including floods, fire, earthquakes, etc.
 - Review of impacts to critical facilities, infrastructure, public health, the local economy, natural habitats, etc.

T&M Associates
9 Grand Avenue, Toms River, NJ 08723
Phone: (732) 473-3400 Fax: (732) 473-3400 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan


Review of Past Storms (Superstorm Sandy):

Sandy Storm Surge

High Water

Low Toss Water

Courtesy of Rutgers Center for Remote Sensing and Global Anal. Inc.



T&M Associates
9 Grand Avenue, Suite 200, Little Egg Harbor, NJ 08043
Phone: (732) 475-3400 Fax: (732) 475-3400 Website: www.tandm.com

Little Egg Harbor Township Floodplain Management Plan


Review of FEMA Preliminary FIRM Maps



T&M Associates
9 Grand Avenue, Suite 200, Little Egg Harbor, NJ 08043
Phone: (732) 475-3400 Fax: (732) 475-3400 Website: www.tandm.com

Little Egg Harbor Township Floodplain Management Plan

Review of FEMA Preliminary FIRM Maps (cont'd)



T&M Associates
9 Grand Avenue, Suite 200, Little Egg Harbor, NJ 08043
Phone: (732) 475-3400 Fax: (732) 475-3400 Website: www.tandm.com

Little Egg Harbor Township Floodplain Management Plan

Preparation of Floodplain Management Plan and Process (cont'd)

Phase 3: Mitigation Strategies

- Set goals and review possible activities that can prevent or reduce the problems identified in Phase 2.

Phase 4: Plan Maintenance

- Adopt/implement the Plan and continue to evaluate/revise

T&M Associates
9 Grand Avenue, Suite 200, Little Egg Harbor, NJ 08043
Phone: (732) 475-3400 Fax: (732) 475-3400 Website: www.tandm.com

**Little Egg Harbor Township
Floodplain Management Plan**

Public Questions or Comments?

T&M Associates
Phone: (732) 472-3400 Fax: (732) 472-3400
E-mail: info@tandmassociates.com
Web: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

2nd Public Hearing – April 13, 2015



Little Egg Harbor Township Floodplain Management Plan

- Little Egg Harbor Township was awarded a grant to prepare a Floodplain Management Plan by the NJ Dept. of Community Affairs
- Township Ordinance 2015-01 formally created the Floodplain Management Committee to prepare the plan

Committee Members

1. Committeeman John Kehm
2. Garrett Loesch, Township Administrator/CFO
3. Michael Fromosky, CFM, Asst. Township Administrator
4. Chief Richard Buzby, LEHT Police Dept./OEM
5. Thomas Bonfonti, LEHT Police Dept.
6. Patrick Donnelly, CPWM, Dept. of Public Works
7. Mark Ellis, CFM, Zoning Officer
8. Oliver Clifford, Acting Construction Official
9. Jason Worth, PE, Engineer

T&M Associates

9 Grand Avenue, Suite 200, Little Egg Harbor, NJ 08023
Phone: (732) 478-3400 Fax: (732) 478-3400 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Purpose of the Plan:

- To provide an overall strategy of programs, projects, and measures that will reduce the impacts of hazards on the community and promote resiliency within flood hazard areas
- Requirement for entry into the Community Rating System

T&M Associates

9 Grand Avenue, Suite 200, Little Egg Harbor, NJ 08023
Phone: (732) 478-3400 Fax: (732) 478-3400 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

National Flood Insurance Program (NFIP)

- The NFIP provides federally backed flood insurance within participating communities that enact and enforce floodplain regulations
 - A community adopts and enforces a floodplain management ordinance to regulate development in flood hazard areas in order to minimize the potential for flood damage to future development.
- Through the Community Rating System, communities are rewarded for taking measures and enacting programs which reduce flood damage to existing buildings, manage development outside of flood hazard areas, protect new buildings beyond the minimum standards, etc.

T&M Associates

9 Grand Avenue, Suite 200, Little Egg Harbor, NJ 08023
Phone: (732) 478-3400 Fax: (732) 478-3400 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Community Rating System (CRS).

Goals -

- Reduce and avoid flood damage to insurable property
- Strengthen and support the insurance aspects of the NFIP.
- Foster comprehensive floodplain management

Benefits of Participation -

- Development of a stronger and more resilient community
- Discounts on flood insurance for residents

The preparation and adoption of a floodplain management plan can provide up to 382 points in CRS

F&M Associates
9 Grand Avenue, Fort Rte. 176753
Phone: (254) 777-7600 Fax: (254) 777-7605 Website: www.fortmyers.com

Little Egg Harbor Township Floodplain Management Plan

Preparation of Floodplain Management Plan and Process.

Phase 1: Planning Process

- **Organize, Involve the Public, and Coordinate**

Phase 2 Risk Assessment

- Assess the Hazards & Problems
 - Review of Flood Hazard Areas, Repetitive Loss Areas, and Areas susceptible to flooding that are not mapped
 - Review and discuss impacts from prior storm events including floods, fire, earthquakes, etc
 - Review of impacts to critical facilities, infrastructure, public health, the local economy, natural habitats, etc.

T&M Associates
 General Insurance, Term Life, & CRIS
 Phone (913) 473-3438 Fax (913) 473-3437 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Preparation of Floodplain Management Plan and Process (cont'd)

Phase 3 Mitigation Strategies

- Set goals and review possible activities that can prevent or reduce the problems identified in Phase 2

Phase 4 Plan Maintenance

- Adopt/implement the Plan and continue to evaluate/revise

T&M Associates,
 6 Grand Avenue, P.O. Box 307, NJ 08755
 Phone: (732) 477-1400 Fax: (732) 477-5400 Website: www.tandm.com

Little Egg Harbor Township Floodplain Management Plan

Hazard Assessment.

Assessment of FEMA Preliminary FIRM Maps -



T&M Associates
 Oneida, New York
 Fax: (315) 471-4400 Tel: (315) 471-4400 Web: www.tandm-ny.com

Little Egg Harbor Township Floodplain Management Plan

Hazard Assessment

Assessment of FEMA Preliminary FIRM Maps (cont'd) -



T&M Associates
1000 Little Egg Harbor Blvd., Suite 200
Little Egg Harbor, NJ 08043
Phone: (732) 447-1110 Fax: (732) 447-1111 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Hazard Assessment

Assessment of Repetitive Loss Properties -

- Properties with 2 or more flood damage claims > \$1,000.00 within any 10 year period after 1978
 - Mystic Island
 - Osborn Island
 - Country Club Boulevard Area
 - Great Bay Boulevard Area
 - Parkertown Area
- Assessment of Other Frequent Flooding Areas -
 - East and West Anchor/Dory/Boat/Bng/Sail
 - Great Bay Boulevard (Various Locations)
 - National Union Blvd and Lake Champlain

T&M Associates
1000 Little Egg Harbor Blvd., Suite 200
Little Egg Harbor, NJ 08043
Phone: (732) 447-1110 Fax: (732) 447-1111 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Hazard Assessment

- Assessment of Past Storms (Superstorm Sandy)



T&M Associates
1000 Little Egg Harbor Blvd., Suite 200
Little Egg Harbor, NJ 08043
Phone: (732) 447-1110 Fax: (732) 447-1111 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Hazard Assessment

Assessment of Less Frequent Flood Hazards -

- Failure of Levees/Dams, Channel Migration, Closed Basin Lakes, Ice Jams, Mudflows, and Tsunamis
 - Low Probability
- Land Subsidence and Coastal Erosion
 - Medium Probability
- Assessment of Other Hazards -
 - Earthquakes, Tornado, and Drought
 - Low Probability
 - Wildfires and Extreme Wind
 - Medium/High Probability

T&M Associates
1000 Little Egg Harbor Blvd., Suite 200
Little Egg Harbor, NJ 08043
Phone: (732) 447-1110 Fax: (732) 447-1111 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Problem Assessment:

Impact of Hazards on –

- Life Safety, Warning/Evacuating Residents
 - Township utilizes Nixle, website notifications, and door to door notifications
- Public Health
 - Flooding (approximately 4 feet during Sandy) impedes life saving operations and creates the risk of mold
- Critical Facilities
 - None located with SFHA including OEM, Municipal Complex, Fire Depts, EMS, and Shelters
- Local Economy
 - Few businesses located within SFHA
 - Loss of revenue due to large quantities of displaced residents

T&M Associates
1000 Highway 202, Suite 100, Little Egg Harbor, NJ 08023
Phone: (732) 413-3410 Fax: (732) 413-3410 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Problem Assessment:

Review of Development/Re-Development –

- SFHA is pre-dominantly developed
 - New development (i.e. Harbor View Estates) is required to build to the BFE and in accordance with NJ stormwater design standards.
- Re-development/reconstruction of homes
 - Required to build to the BFE plus 1 foot of freeboard.

Review of Future Flooding Conditions –

- Sea level rise will result in more frequent flooding

T&M Associates
1000 Highway 202, Suite 100, Little Egg Harbor, NJ 08023
Phone: (732) 413-3410 Fax: (732) 413-3410 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Problem Assessment:

- 1 foot Sea Level Rise



T&M Associates
1000 Highway 202, Suite 100, Little Egg Harbor, NJ 08023
Phone: (732) 413-3410 Fax: (732) 413-3410 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Problem Assessment:

- 2 foot Sea Level Rise



T&M Associates
1000 Highway 202, Suite 100, Little Egg Harbor, NJ 08023
Phone: (732) 413-3410 Fax: (732) 413-3410 Website: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Problem Assessment:

- 3 foot Sea Level Rise



Courtesy of R.A. Lugo, Center for
Coastal Research and Planning, University of
Florida

T&M Associates
50 Canal Avenue, Suite 200, Little Egg Harbor, NJ 08043
Phone: (732) 473-3400 Fax: (732) 473-3400 E-Mail: info@tandmassociates.com Web: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Goals:

1. Reduce loss from flood damage and other hazards through codes and standards
2. Educate stakeholders and the public about floodplain management and stormwater management.
3. Protect the natural resources and qualities of the Township, including wetlands, stream corridors, open space, and areas with scenic, cultural, and recreational values
4. Protect and ensure that Township infrastructure and critical facilities are able to withstand future hazard events and remain operational during and after such events
5. Provide public information resources to Township residents and business owners so they are informed of the natural hazards within the community and the precautions they can take to protect their properties

T&M Associates
50 Canal Avenue, Suite 200, Little Egg Harbor, NJ 08043
Phone: (732) 473-3400 Fax: (732) 473-3400 E-Mail: info@tandmassociates.com Web: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Action Plan:

- A balanced plan will identify measures from as many activity categories as possible and CRS points are awarded based on that
 - Preventative Activities
 - Property Protection
 - Natural Resource protection
 - Emergency Services
 - Structural Projects
 - Public Information

T&M Associates
50 Canal Avenue, Suite 200, Little Egg Harbor, NJ 08043
Phone: (732) 473-3400 Fax: (732) 473-3400 E-Mail: info@tandmassociates.com Web: www.tandmassociates.com

Little Egg Harbor Township Floodplain Management Plan

Action Plan:

Preventative Measures –

- 5 Year Capital Improvement Plan
- Construction Office Permit Process Automation Process
- Develop a GIS Program
- Enter CRS Program
- Join Building Code Effectiveness Grading Schedule (BCEGS) Program
- Maintain and Clean Township Drainage Systems

Natural Resource Protection –

- Restoration of marsh areas and thin layer deposition to raise marsh elevations
- Erosion Control Ordinance Amendments

T&M Associates
50 Canal Avenue, Suite 200, Little Egg Harbor, NJ 08043
Phone: (732) 473-3400 Fax: (732) 473-3400 E-Mail: info@tandmassociates.com Web: www.tandmassociates.com

**Little Egg Harbor Township
Floodplain Management Plan**

Action Plan:

Emergency Services –

- Preparation of a Debris Management Plan
- Replacement of Generators at Township Municipal Complex
- Lightning Protection System at DPW Facility
- Reverse 31st System

Structural Projects –

- Maintain and Repair Township Bulkheads
- Storm Drainage Improvements in Mystic Island and Great Bay Blvd
- Lagoon Dredging

Public Information –

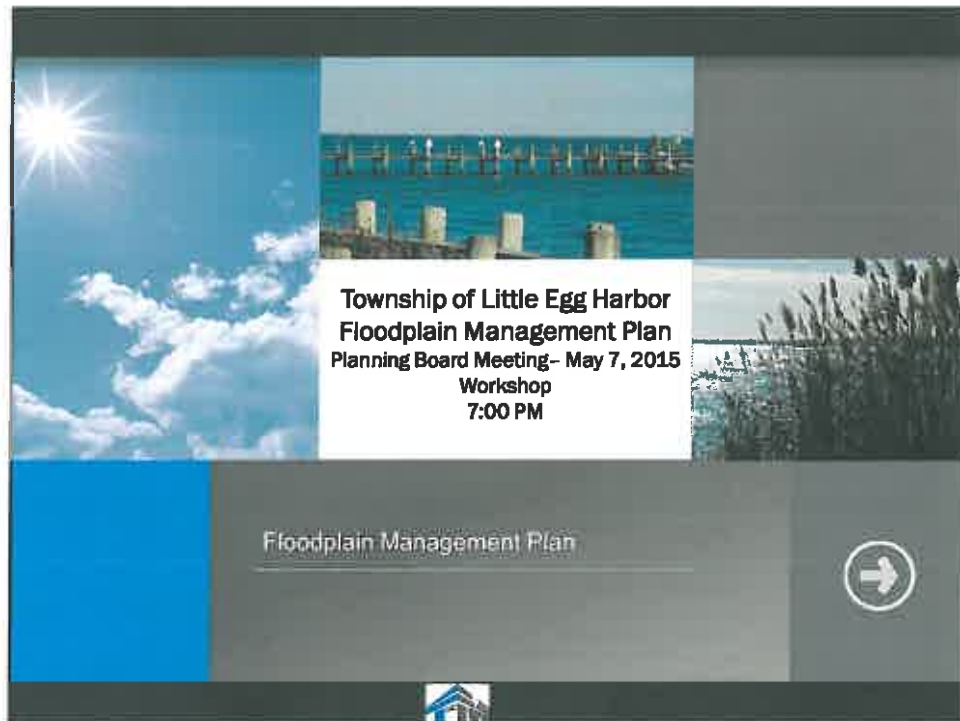
- Public outreach projects, maintain flood hazard information on website
- Develop We Care Program

F&M Associates
P.O. Box 1000, Little Egg Harbor, NJ 08043
Phone: (732) 471-3400 Fax: (732) 471-3400 Website: www.floodcontrol.com

**Little Egg Harbor Township
Floodplain Management Plan**

Public Questions or Comments?

F&M Associates
P.O. Box 1000, Little Egg Harbor, NJ 08043
Phone: (732) 471-3400 Fax: (732) 471-3400 Website: www.floodcontrol.com



Floodplain Management Plan Project Background



- Little Egg Harbor Township was awarded a grant to update their Floodplain Management Plan (FMP) through the NJ Department of Community Affairs (DCA).
- The main objective of the FMP is to provide an overall strategy of programs, projects and measures that will reduce the impacts of hazards on the community and promote resiliency within flood hazard areas.
- The FMP provides the community with credits under the Community Rating System (CRS) which can lower flood insurance premiums within the community.
- One of the main goals of the FMP committee is to increase collaboration during the planning process to obtain input and comment from as many sources as possible.



The slide has a dark background. On the left, there is a photograph of a person wearing a blue long-sleeved shirt, khaki pants, and a yellow hard hat. They are kneeling on the ground, pointing with their right hand at a large white sheet of paper, likely a map or blueprint, that is spread out on the ground. To the right of the photograph is a list of five bullet points. The text is white. At the bottom right of the slide is a logo consisting of a stylized blue and white house shape with the letters 'FMP' inside.

Floodplain Management Plan Executive Summary



The Floodplain Management Plan is intended to:

- Identify and assess flood hazards within Little Egg Harbor Township.
- Establish goals and objectives for floodplain management.
- To present a series of actions designed to minimize flooding and mitigate the impacts from flooding in the future.



Planning Process

Phase 1 – Planning Process

- Organize
- Involve the Public
- Coordinate

Phase 2 – Risk Assessment

- Assess the Hazard
- Assess the Problem

Phase 3 – Mitigation Strategy

- Set Goals
- Review Possible Actions
- Draft an Action Plan

Phase 4 – Plan Maintenance

- Adopt the Plan (scheduled June 2015)
- Implement, evaluate, revise



Phase 1 - Organize

Task 1 - Organize



Little Egg Harbor's Floodplain Management Committee was formed by Township Ordinance 2015-03 and consists of the following members:

1. Committeeman John Kahn
2. Garrett Loesch, Township Administrator/CFO
3. Michael Fromosky, EFM, Administration/Code Enforcement
4. Chief Richard Buzby, LEHT Police Dept./OEM
5. Thomas Bonfanti, LEHT Police Dept.
6. Patrick Donnelly, LPWM, Dept. of Public Works
7. Matt Ellis, EFM, Zoning Officer
8. Oliver O'Hara, Acting Construction Official
9. Jason Worth, PE, Engineer



Phase 1 - Organize

Task 2 - Involve the Public



- Committee contains stakeholders representing a range of interests and perspectives.
- Two public information meetings were held (not including this meeting):
 - March 2, 2015 @ Community Center
 - April 13, 2015 @ Community Center
- Public comments on FMP are encouraged.
- Draft copy of the plan is posted on website. Update draft will be posted this week.
- Numerous outside agencies, groups, commissions and adjacent municipalities were notified of the FMP and requested to provide input.



Phase 1 - Organize Task 3 – Coordinate

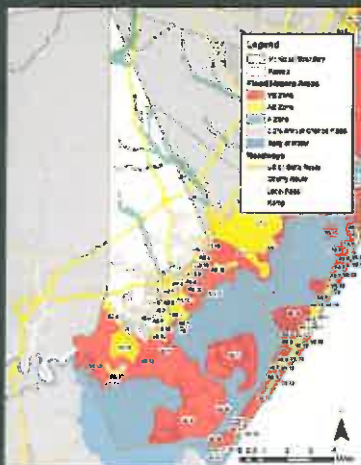


Review of Existing Information

- Current FIRM Map
- Preliminary FIRM Map
- 1993 Master Plan
- 2007 Master Plan for Examination Report
- 2012 Emergency Operating Plan
- 2014 Strategic Recovery Planning Report
- Current Little Egg Harbor Township Flood Hazard Ordinance
- 2014 Ocean County Hazard Mitigation Plan



Phase 2 – Risk Assessment Task 4 – Assess the Hazard



FEMA Preliminary FIRM Maps



Phase 2 – Risk Assessment

Task 5 – Assess the Problem

Problem Assessment

- ~13,000 properties total
- ~4,350 improved residential properties and 66 commercial properties within the SFMA
- Flooding generally occurs as a result of Coastal Flooding
- Localized flooding resulting from non-coastal events is also a consideration, although it has less potential to result in significant damage
- Result of development, loss of natural flood storage, increase in impervious coverage
- Critical facilities are outside of the floodplain

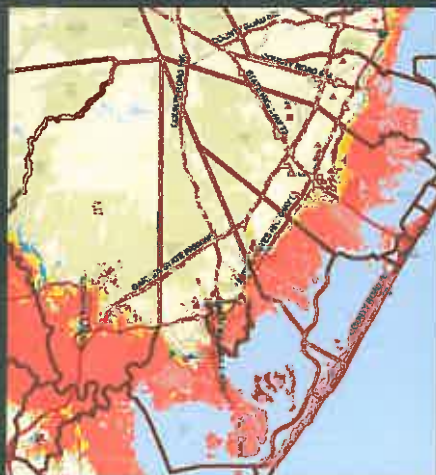
Hazard Impact

- Damage to property
- Damage to infrastructure
- Impact on emergency services
- Health impacts (mold, leak, asbestos, etc.)
- Economic impacts



Phase 2 – Risk Assessment

Task 5 – Assess the Problem



Storm Surge (SLOSH Category 3)

Category 3 SLOSH

- 0 - 3 Feet Above Ground Level
- 3 - 6
- 6 - 9
- > 9



Phase 3 – Mitigation Strategy

Task 6 – Set Goals

Over the course of the various Floodplain Management Plan Steering Committee meetings, the Committee discussed the goals that the Township would like to achieve with the Floodplain Management Plan to increase resiliency and mitigate future storm events. The following is a list of the goals agreed upon by the Committee:

- Reduce loss from flood damage and other hazards through codes and standards;
- Educate stakeholders and the public about floodplain management and stormwater management;
- Protect the natural resources and qualities of the Township, including wetlands, stream corridors, open space, and areas with scenic, cultural, and recreational values;
- Protect and ensure that Township infrastructure and critical facilities are able to withstand future hazard events and remain operational during and after such events;
- Provide public information resources to Township residents and business owners so they are informed of the natural hazards within the community and the precautions they can take to protect their properties;



Phase 3 – Mitigation Strategy

Task 7 – Activities

Preventative Measures

- Develop GIS to increase resiliency and assist in better preparation and planning
- Preserve Open Space
- Review/Update Stormwater Management Ordinance
- Review/Update Flood Hazard Ordinance
- Zoning Amendments/Building Code Updates
- Maintain/Update Stormwater Infrastructure

Property Protection

- Acquisition (Buy Back, NRCS programs)
- Relocation
- Adjusting Building Codes/Elevation Requirements
- Flood Insurance (Encouraging participation)

Natural Resource Protection

- Wetlands Marsh Restoration
- Erosion and Sediment Control

Emergency Services

- Hazard Warnings
- Hazard Response Operations
- Critical Facilities Protection/Relocation
- Health and Safety Maintenance

Structural Projects

- Stormwater Infrastructure Maintenance/Improvements

Public Information

- Mapping
- Outreach



Phase 3 – Mitigation Strategy Task 8 – Action Plan

PREVENTATIVE MEASURES					
Action Item	Priority	Responsible Party	Deadline	Budget	Funding Source
Prepare a 5-year Capital Improvement Plan	High	Township Staff and T&M Associates	June 2015	\$30,000	NJDCA Grant (secured)
Create an automated and expedited system for zoning and construction permit administration	High	Township Staff and T&M Associates	June 2015	\$25,000	NJDCA Grant (secured)
Develop a Geographic Information System (GIS) Program	High	Township Staff and T&M Associates	June 2015	\$50,000	NJDCA Grant (secured)
Join the Community Rating System (CRS) Program	High	Township Staff	October 2015	Township Staff Time	Township General Funds
Continue to support open space preservation within the Township and FPA	Low	Federal, State, County, Township, and Non-Profit Partners	Ongoing	Township Staff Time	T&M
Join the Building Code Effectiveness Timing Schedule (BCEOS) Program	Low	Township Staff	June 2016	Township Staff Time	Township General Funds
Maintain, repair, and clean the Township drainage system	Ongoing	Department of Public Works	Ongoing	Township Staff Time	Township General Funds



Phase 4 – Plan Maintenance

Adopt Plan

- Please submit comments to jworth@landmassassociates by Friday, May 15, 2015.
- Little Egg Harbor Township Planning Board meeting to adopt plan: June 4, 2015
- Update Plan will be posted to Township website prior to final Adoption.



Appendix D: Sample Letter to Outside Agencies



YOUR GOALS. OUR MISSION.

December 29, 2014

John H. Moyle, State Floodplain Manager
New Jersey Department of Environmental Protection
PO Box 420
Trenton, NJ 08625
john.moyle@dep.state.nj.us

Dear Mr. Moyle;

Little Egg Harbor Township is currently in the process of preparing a Floodplain Management Plan to be incorporated as an element of the Township Master Plan. The Floodplain Management Plan will identify and assess flood hazards within the Township, establish the goals and objectives for floodplain management in Little Egg Harbor, and present a series of actions designed to minimize flooding and mitigate the impacts from flooding in the future. The Plan is being funded through a Post- Sandy Planning Assistance Grant issued by the New Jersey Department of Community Affairs (DCA). As we continue to recover from the effects of Superstorm Sandy, the Township has prioritized flood prevention and mitigation as key elements of its post- Sandy planning strategy. The project implements recommendations of the Strategic Recovery Planning Report (SRPR) adopted by the Township Committee in June of 2014.

As part of the Floodplain Management planning process, we are seeking the input of valued stakeholders to develop a foundation for assessing known hazards and flood impacts in Little Egg Harbor. We would appreciate any information from your organization regarding flood hazards in the Little Egg Harbor Township and/ or anything your agency or organization is doing that may affect flooding or properties in flood-prone areas. Additionally, we would like to invite you, or another representative of your agency or organization to become more actively involved in our floodplain management planning process. Your input and involvement in this planning process is important to help identify key floodplain management issues affecting the Little Egg Harbor Township and to establish goals and objectives to make Little Egg Harbor more resilient to flooding events in the future.

Please contact Christine Bell, Staff Planner, T&M Associates at 732-671-6400 or cbell@tandmassociates.com on or before January 15, 2015 if you have any comments, suggestions, input, or would like to set up a meeting to discuss the floodplain management plan in greater detail.

Sincerely,



James M. Oris, P.E., P.P., C.M.E.
Township Engineer

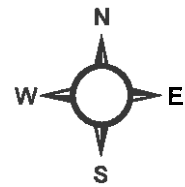
Appendix E: Log of Interaction with Stakeholder Groups

Outside Agency Coordination

<u>Organization</u>	<u>Contact</u>	<u>Sent</u>	<u>Responded</u>	<u>Comments</u>
Eagleswood Township	Lis H. Hand	12/29/2014		
Tuckerton Borough	Honorable George Evans	12/29/2014		
Bass River Township	Amanda Somes	12/29/2014		
Galloway Township	Don Purdy	12/29/2014		
Long Beach Township	Lynda Wells	12/29/2014		
Beach Haven Borough	Robert Keeler	12/29/2014		
Stafford Township	John Spodofora	12/29/2014		
Woodland Township	Matthew Henrich	12/29/2014		
Little Egg Harbor Police Department	Richard J Busby Jr.	12/29/2014		
Parkertown Volunteer Fire Department- Station 70	Frank Runza	12/29/2014	1/13/2015	Phone conversation: 9:45am Their plan is fine from last year- should talk to the other chiefs about their areas
West Tuckerton Volunteer Fire Department- Station 71		12/29/2014		
Mystic Island Volunteer Fire Company- Station 72	Bill Stenger	12/29/2014	1/12/2015	Email and phone convo, would like to be included on input list
Great Bay Regional Volunteer EMS- Squad 85	Jennifer Tompkins	12/29/2014		
Environmental Commission	Rich Lacovara	12/29/2014		
Natural Lands Trust Committee		12/29/2014		
Ocean County Sheriff's Office- OEM	Bob Butkis	12/29/2014	1/7/2015	Phone conversation at 8:40am- said only input are those activities listed in the County HMP
Ocean County Planning Department	David McKeon	12/29/2014	1/15/2015	Sent letter saying to look in County HMP
Ocean County Soil Conservation District	Christine Raabe	12/29/2014		
North Jersey Transportation Planning Authority	Zenobia Fields	12/29/2014		
Natural Resources Conservation Service	David Lamm	12/29/2014		
NJ Coastal Management Program		12/29/2014		
US Army Corps of Engineers- Philadelphia District	Stephen, Rochette	12/29/2014	2/5/2015	Email with information on New Jersey Back Bay Study by USACOE
American Red Cross- Jersey Coast Chapter		12/29/2014		
American Littoral Society	Helen Henderson	12/29/2014	2/12/2015	~30 min phone conversation, followed with email information on stormwater regulations
Jacques Cousteau Reserve	Christopher Huch	12/29/2014	1/7/2015	CH provided additional maps additional maps
Shore Builders Association of Central Jersey	Gina Woolley	12/29/2014		
Comcast Cable	Lawrence Fary	12/29/2014		
New Jersey American Water	Paul Richards	12/29/2014		
New Jersey Department of Environmental Protection	John H. Moyle	12/29/2014		
New Jersey Department of Environmental Protection	Joseph Ruggieri	12/29/2014		
Barneget Bay Partnership	Stan Hales	12/29/2014	2/3/2015	Phone conversation- would like to meeting to discuss floodmapper and getting to resilience
Save Barnegat Bay	Britta Forsberg- Wenzel	12/29/2014		
		12/29/2014	1/12/2015	Spoke to Ryan Sherwood- 8:45am, the Meter Socket Joint Guidance came from interpretations of the FEMA recommendations, should go higher than floodplain, everything considered class 2 construction, didn't have massive damage to system like other utilities did, in LEH town asked not to connect until houses had been inspected, spent Guidance on Electrical Meter Placement in a Designated Flood Zone
Atlantic City Electric	Mark Kurilla	12/29/2014	1/12/2015	Would like to be part of participation process
New Jersey Natural Gas	Evan Sherer	12/29/2014	1/15/2015	Email chain regarding project he is working on in LEH
NIDEP				

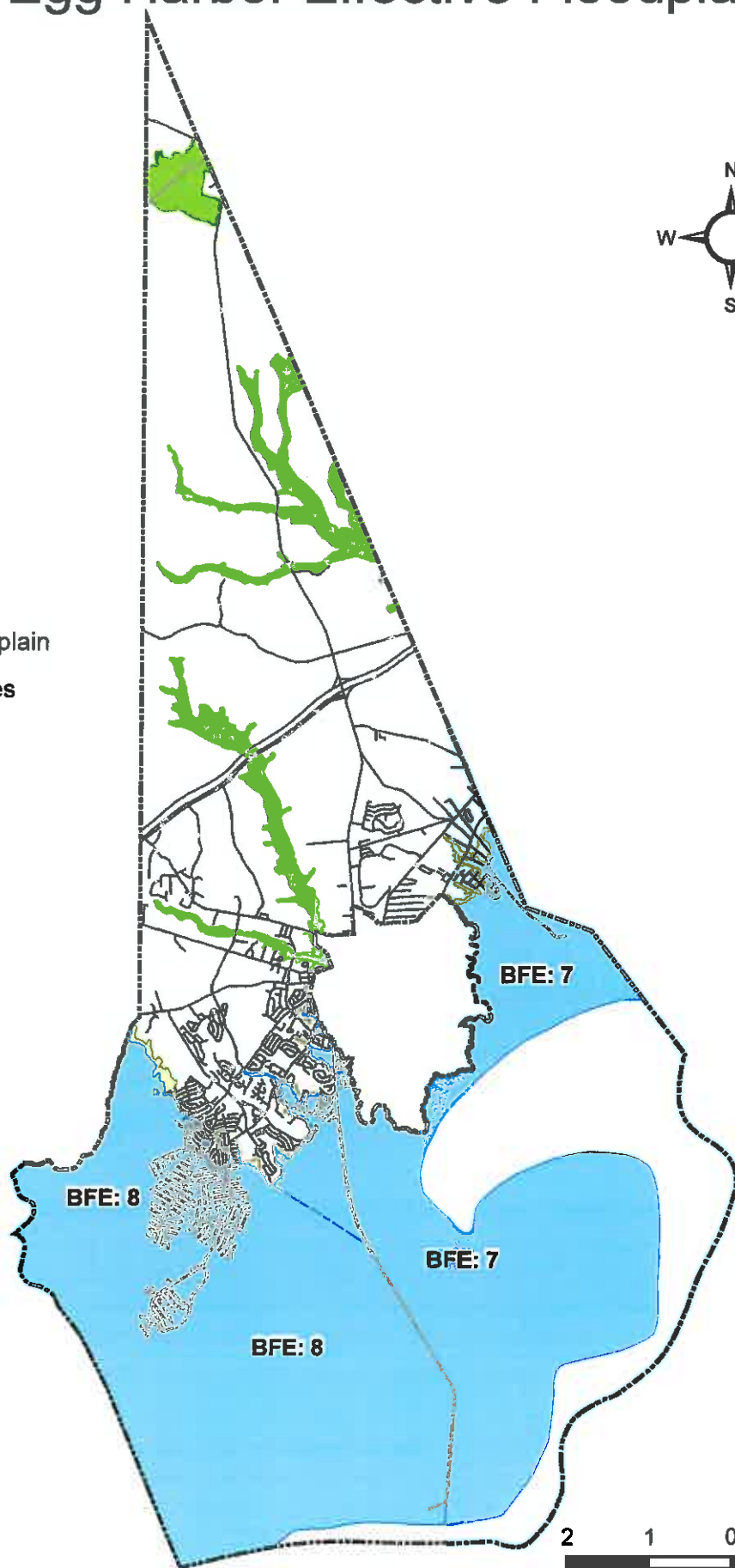
Appendix F: Effective FIRM Maps

Little Egg Harbor Effective Floodplain



Legend

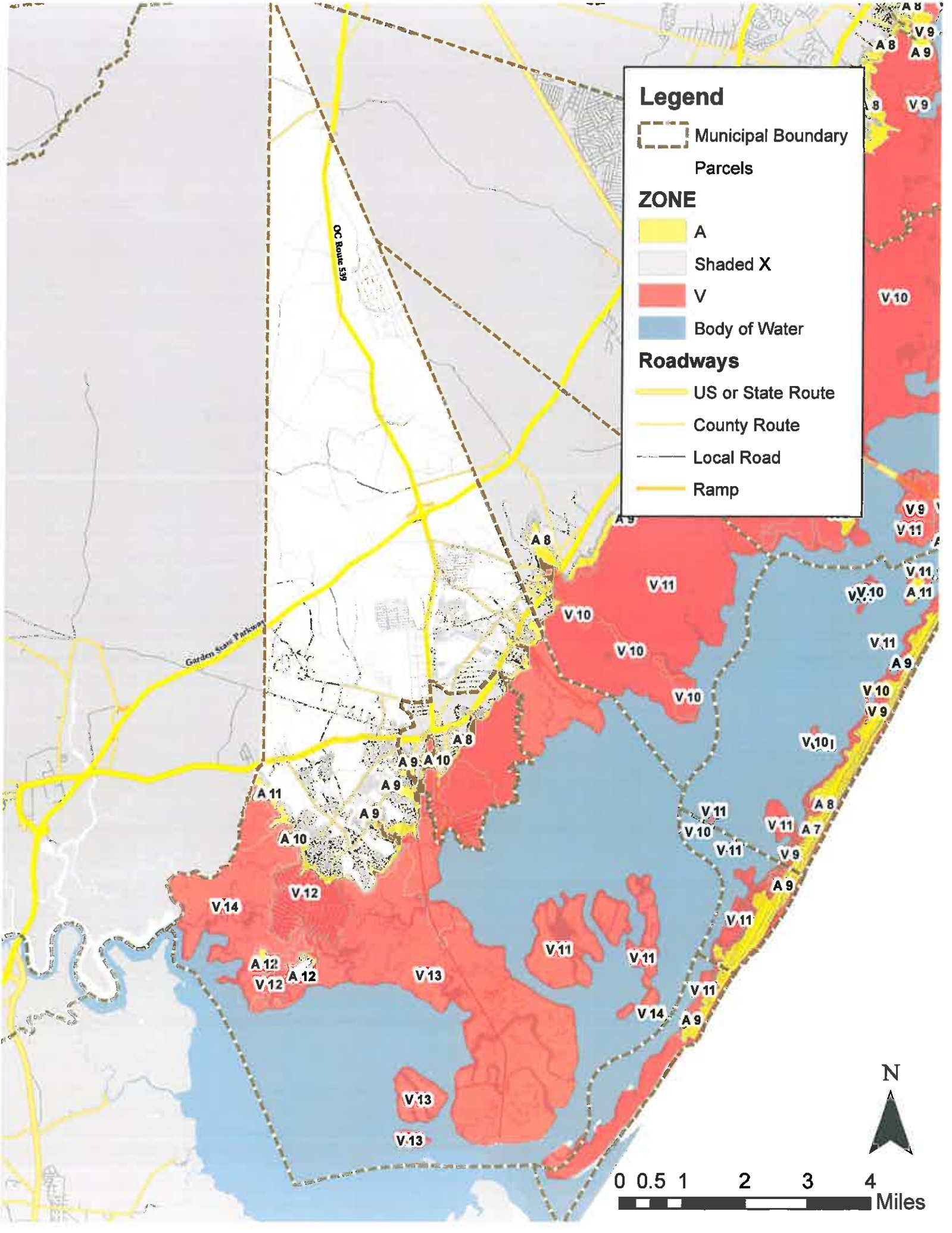
-  A
-  AE
-  500 Year Floodplain
-  RoadCenterlines



2 1 0 2 Miles

1 inch = 2 miles

Appendix G: Advisory Base Flood Map Superstorm Sandy



Legend

 Municipal Boundary
 Parcels

ZONE

 A
 Shaded X
 V
 Body of Water

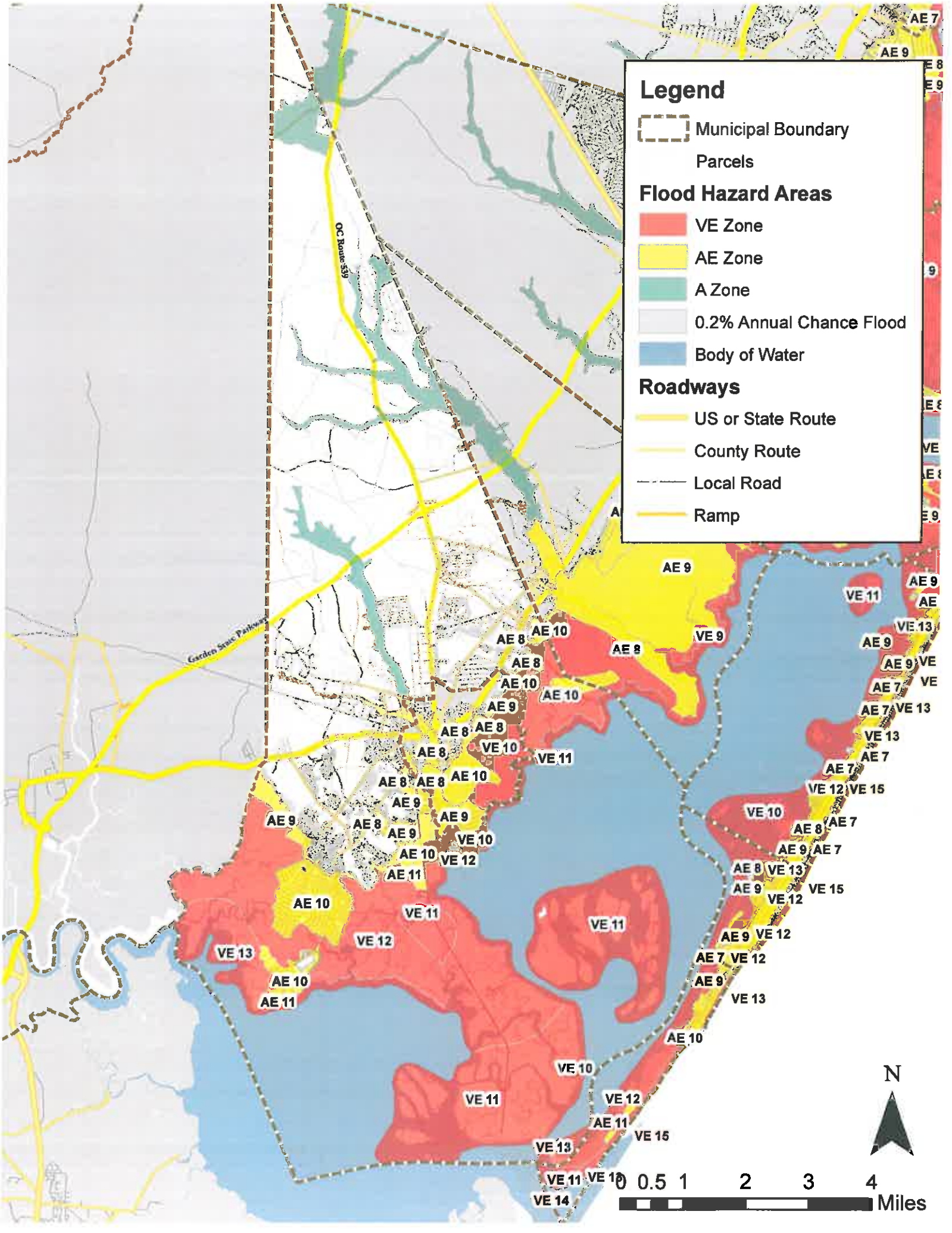
Roadways

 US or State Route
 County Route
 Local Road
 Ramp

N

0 0.5 1 2 3 4 Miles

Appendix H: Preliminary FIRM Map



Legend

 Municipal Boundary

 Parcels

Flood Hazard Areas

 VE Zone

 AE Zone

 A Zone

 0.2% Annual Chance Flood

 Body of Water

Roadways

 US or State Route

 County Route

 Local Road

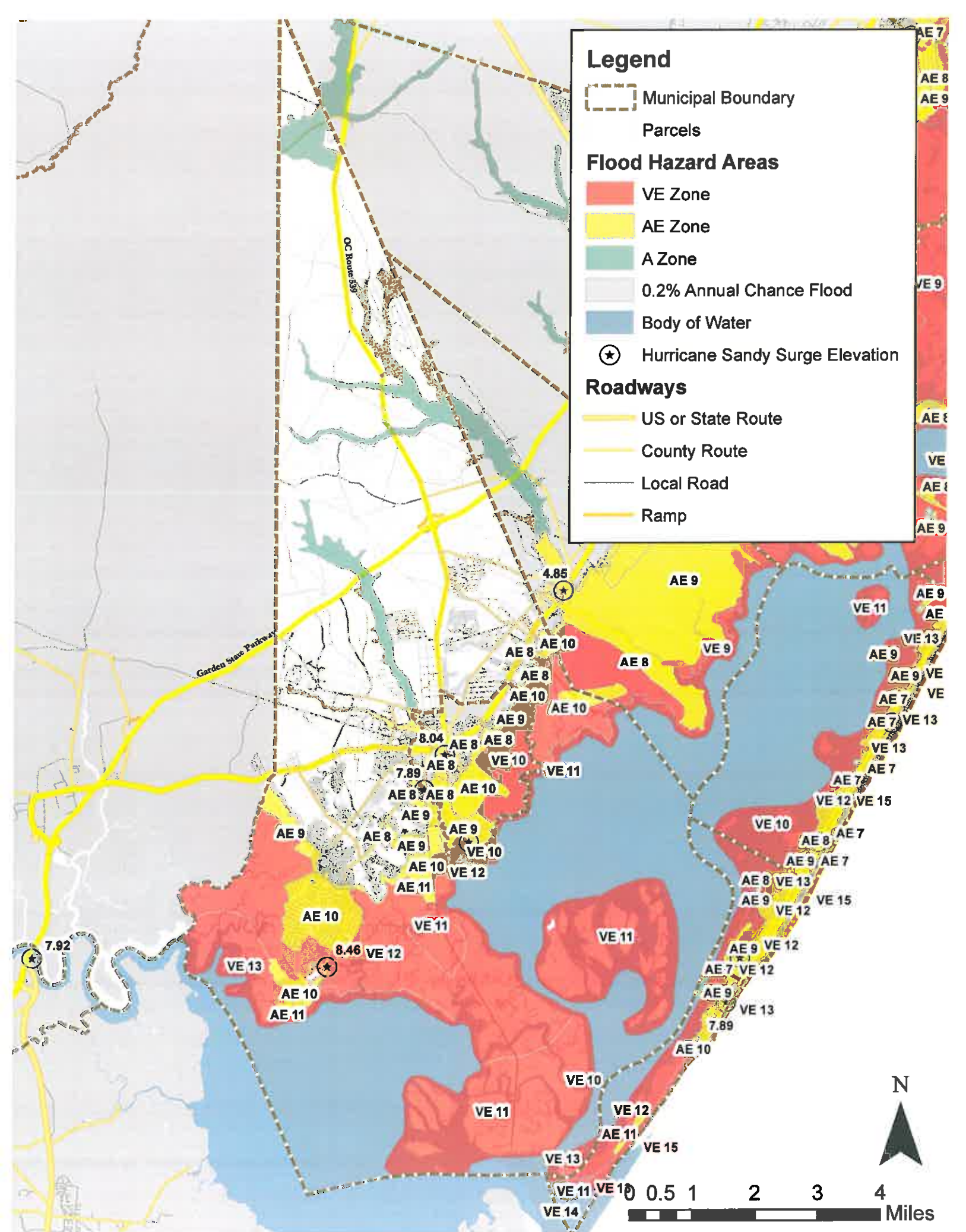
 Ramp

N



0.5 1 2 3 4 Miles

Appendix I: Surge Elevation Maps



Sandy Storm Surge

Little Egg Harbor Township

Legend

 Municipality

 Schools

 Fire Stations

 Law Enforcement

 Assisted Living

 Hospitals

 Evacuation Routes

Sandy Storm Surge

High: More Water

Low: Less Water



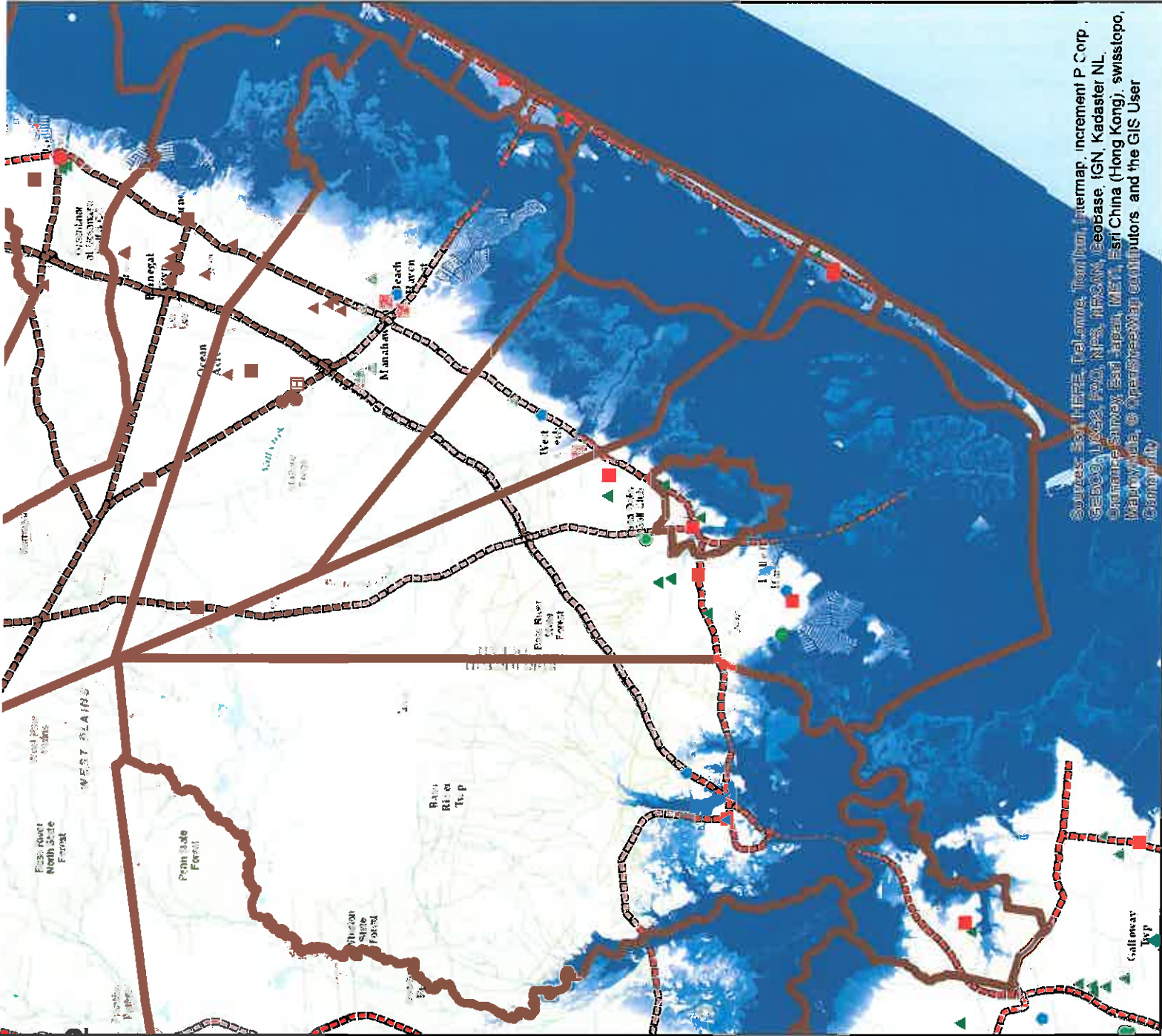
Year 2010 Population: 20065

This map depicts the Sandy Storm Surge extents provided by FEMA. The depths are ranged in meters of inundation above ground level and are categorized in the legend above.



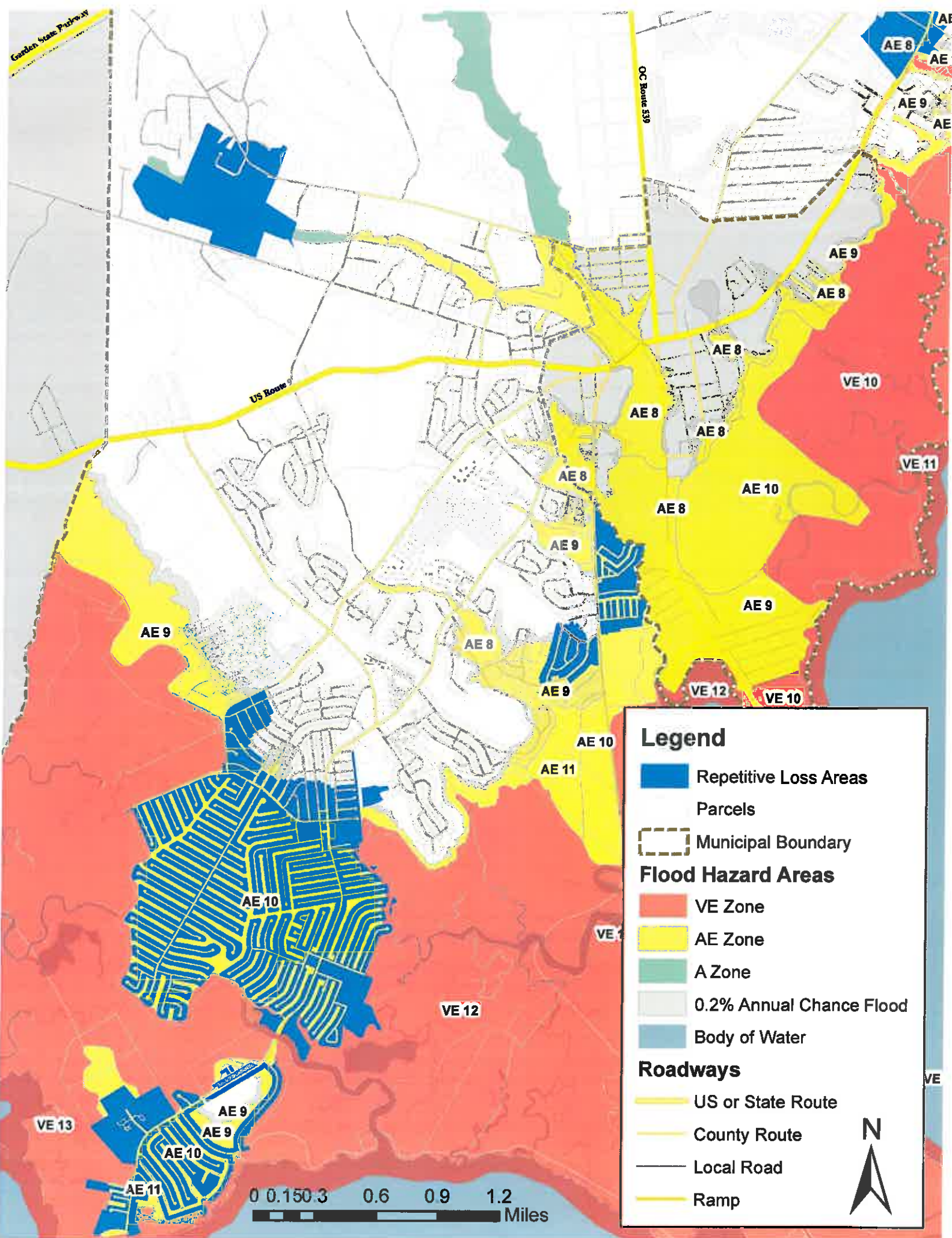
Map Authors: Rachael Sacatelli and Bryan Serino
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis

CRSSA



Sources: ESRI HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FWS, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri - Japan, METI, Esri China (Hong Kong), Swisstopo, Mapbox, OpenStreetMap contributors, and the GIS User Community

Appendix J: Repetitive Loss Areas Map



Garden State Parkway

OC Route 539

US Route 9

AE 9

AE 8

AE 8

AE 8

AE 8

AE 10

AE 8

AE 9

AE 10

AE 11

AE 10

VE 12

VE 13

AE 9

AE 9

AE 10

AE 11

AE 9

AE 8

VE 10

VE 11

VE 12

VE 10

Legend

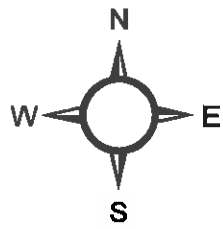
- Repetitive Loss Areas
- Parcels
- Municipal Boundary
- Flood Hazard Areas**
 - VE Zone
 - AE Zone
 - A Zone
 - 0.2% Annual Chance Flood
 - Body of Water
- Roadways**
 - US or State Route
 - County Route
 - Local Road
 - Ramp

0 0.150.3 0.6 0.9 1.2 Miles









Appendix K: Critical Facilities Map

Little Egg Harbor Critical Facilities and Flooded Roads



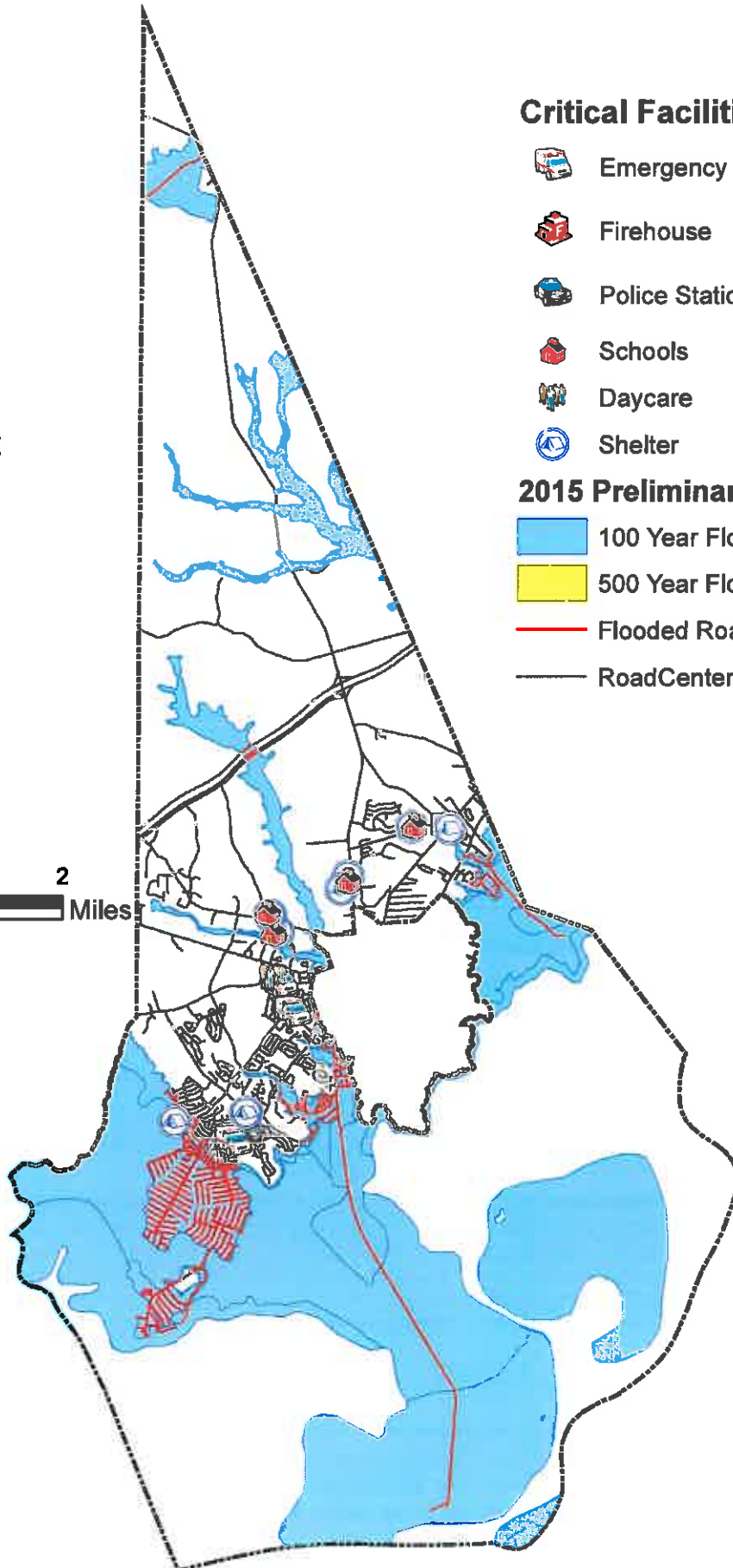
2 1 0 2 Miles
1 inch = 2 miles

Critical Facilities

-  Emergency Medical Center
-  Firehouse
-  Police Station
-  Schools
-  Daycare
-  Shelter

2015 Preliminary Floodplain

-  100 Year Floodplain
-  500 Year Floodplain
-  Flooded Roads
-  Road Centerlines



Appendix L: SLOSH Maps

Category 1 SLOSH Model

Little Egg Harbor Township

Legend

- Municipality
- Schools
- Assisted Living
- Law Enforcement
- Hospitals
- Fire Stations
- Evacuation Routes

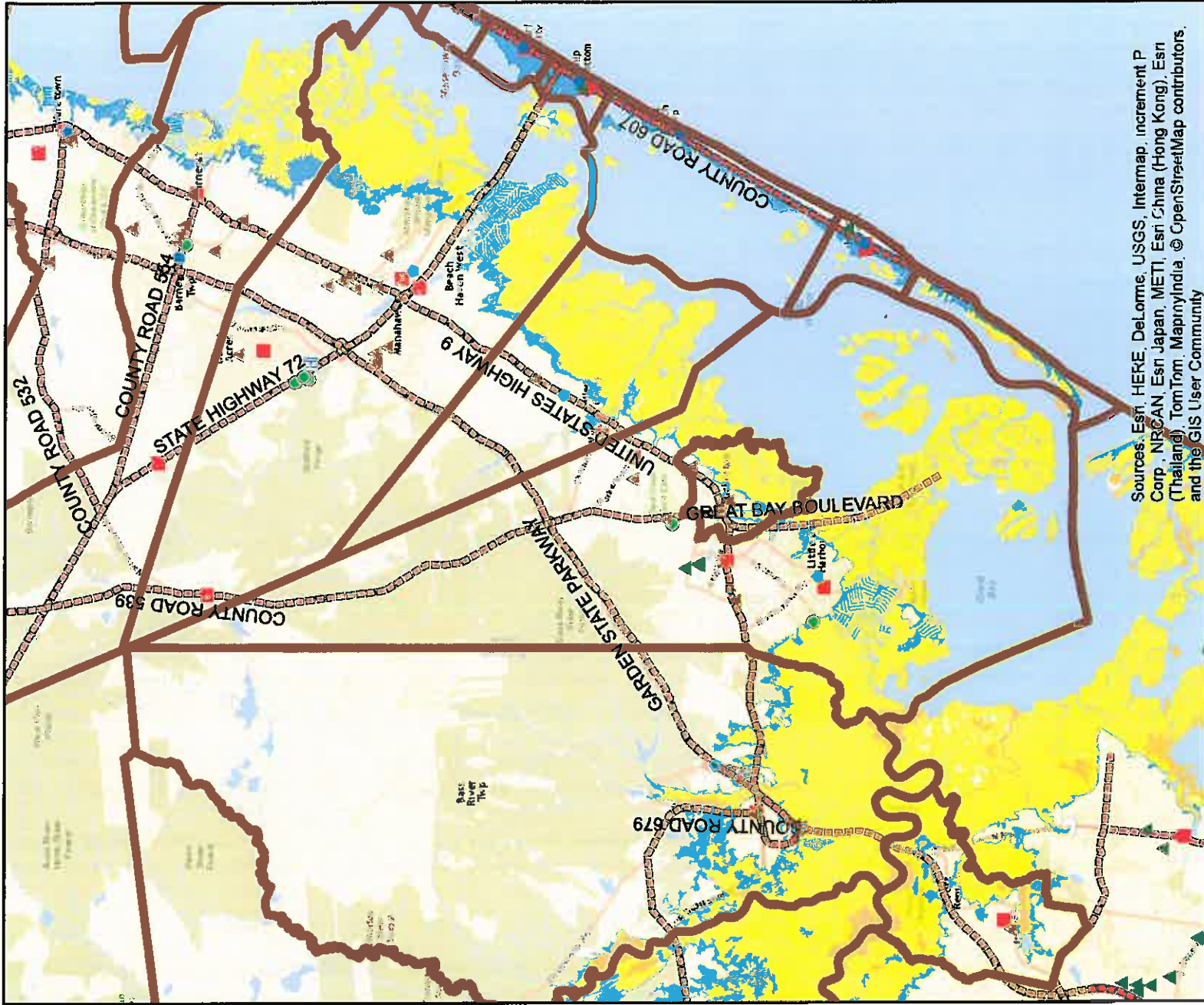
Category 1 SLOSH

- 0 - 3 Feet Above Ground Level
- 3 - 6
- 6 - 9
- > 9



Year 2010 Population: 20065

This map depicts the SLOSH model extents provided by NOAA. The depths are ranged from 0-9 or greater feet of inundation above ground level and are categorized in the legend above.










Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, and the GIS User Community

Category 2 SLOSH Model

Little Egg Harbor Township

Legend

-  Municipality
-  Schools
-  Assisted Living
-  Law Enforcement
-  Hospitals
-  Fire Stations
-  Evacuation Routes

Category 2 SLOSH

-  0 - 3 Feet Above Ground Level
-  3 - 6
-  6 - 9
-  > 9

0 3 6 Miles

Year 2010 Population: 20065

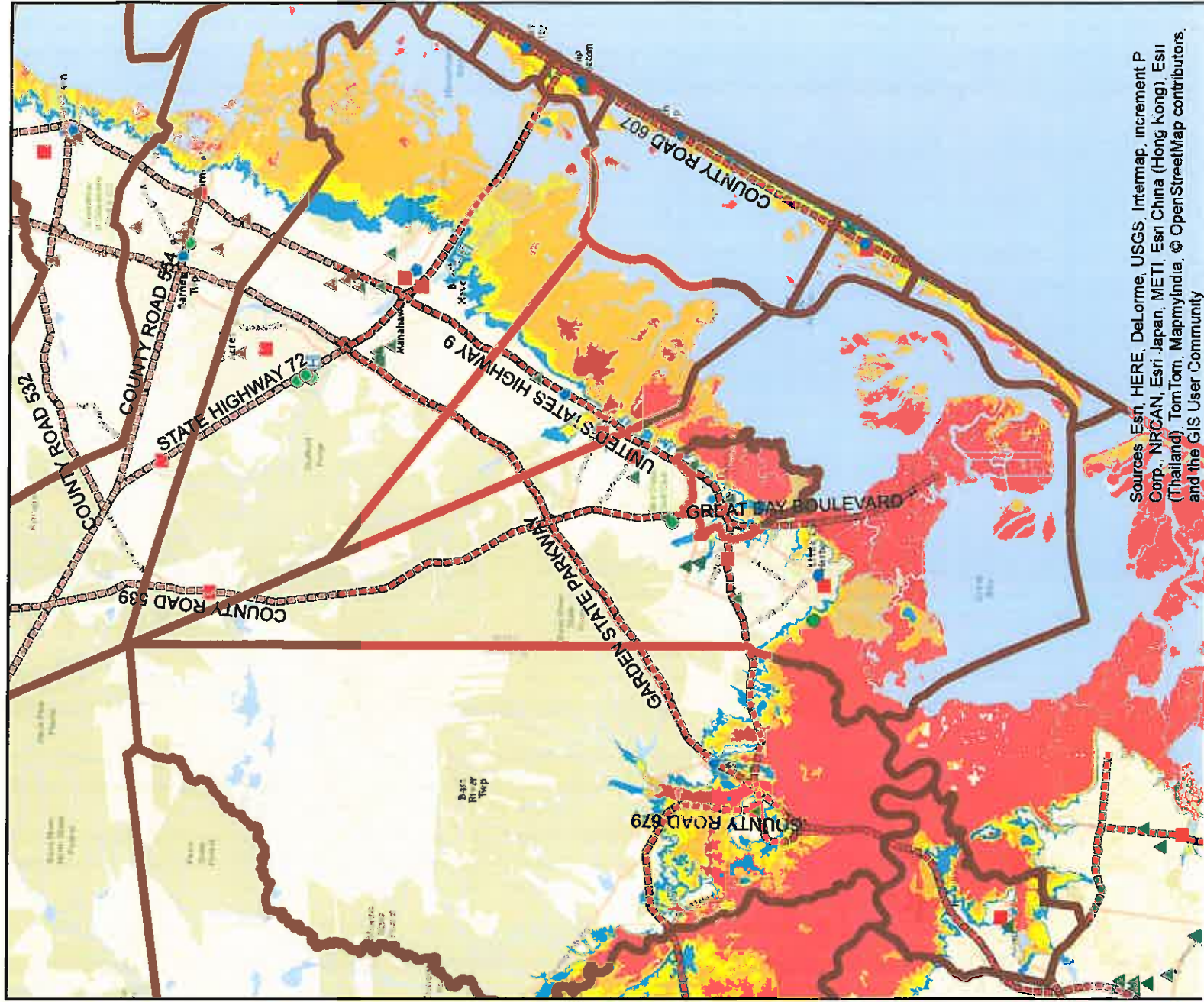
This map depicts the SLOSH model extents provided by NOAA. The depths are ranged from 0-9 or greater feet of inundation above ground level and are categorized in the legend above.



Map Authors: Rachael Sacatelli and Bryan Serino
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



Category 3 SLOSH Model

Little Egg Harbor Township

Legend

-  Municipality
-  Schools
-  Assisted Living
-  Law Enforcement
-  Hospitals
-  Fire Stations
-  Evacuation Routes

Category 3 SLOSH

- | Category 3 SLOSH | 0 - 3 Feet Above Ground Level |
|--|-------------------------------|
|  | 0 - 3 |
|  | 3 - 6 |
|  | 6 - 9 |
|  | > 9 |



Year 2010 Population: 20065

This map depicts the SLOSH model extents provided by NOAA. The depths are ranged from 0-9 or greater feet of inundation above ground level and are categorized in the legend above.



Map Authors: Rachael Sacatelli and Bryan Serino
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis











Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Appendix M: Sea Level Rise Maps

1 Foot of Sea Level Rise Little Egg Harbor Township

Legend

-  Municipality
-  Schools
-  Fire Stations
-  Law Enforcement
-  Assisted Living
-  Hospitals
-  Evacuation Routes
-  1ft SLR

Year 2010 Population: 20065

According to Kenneth G. Miller et al. in the 2013 study "A Geological Perspective on Sea-Level Rise and its Impacts Along the U.S. Mid-Atlantic Coast" a probable threat is the 1ft sea level rise condition that could be expected by 2050. This map depicts that sea level rise as well as the preceding projections thereafter and is centered on target municipalities.

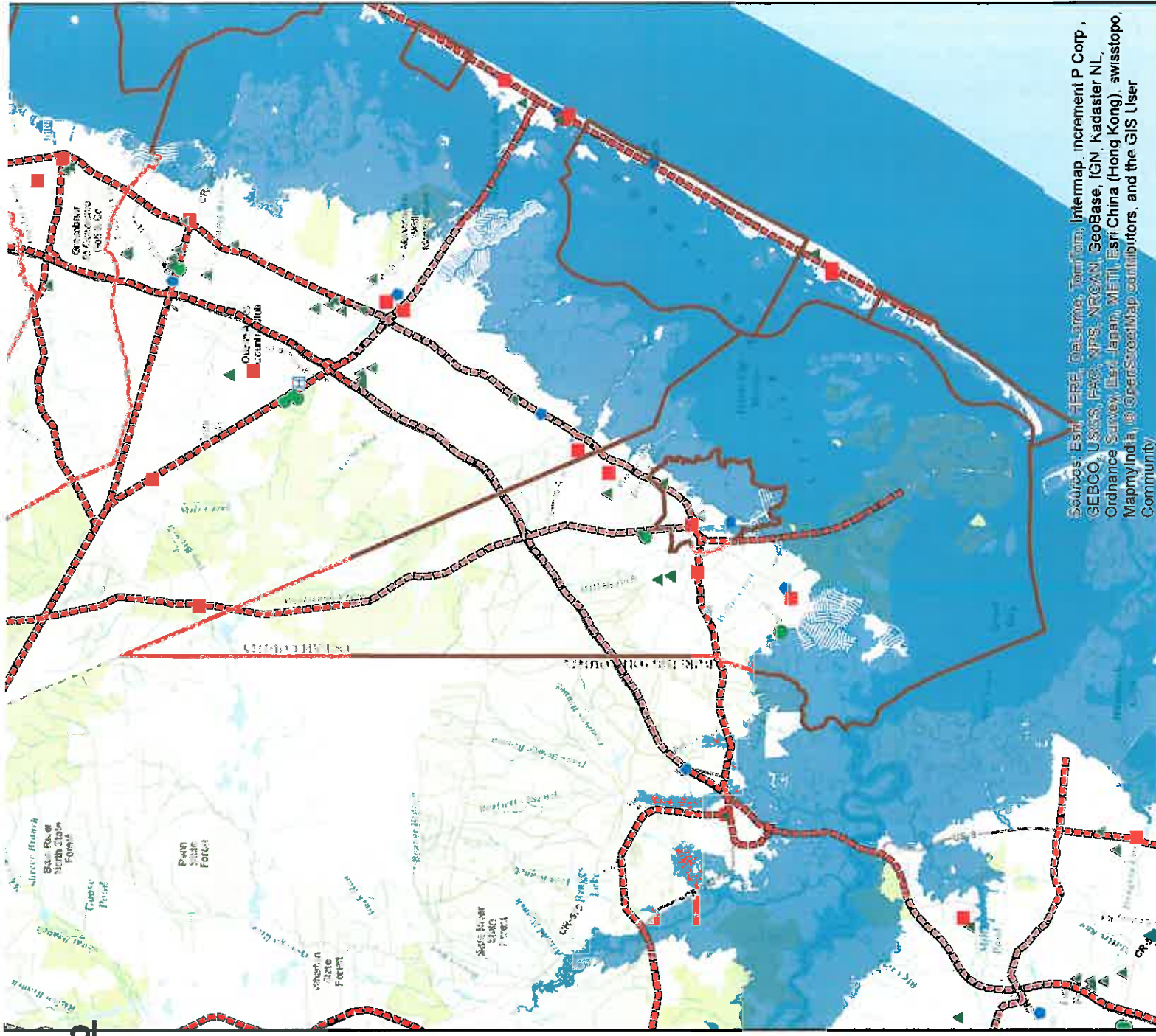
0 1.5 3 6 Miles



Map Author: Rachael Sacatelli and Bryan Serino
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis









CRSSA

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, Mapbox India, OpenStreetMap contributors, and the GIS User Community



2 Feet of Sea Level Rise Little Egg Harbor Township

Legend

-  Municipality
-  Schools
-  Fire Stations
-  Law Enforcement
-  Assisted Living
-  Hospitals
-  Evacuation Routes
-  2ft SLR

Year 2010 Population: 20065

According to Kenneth G. Miller et al. in the 2013 study "A Geological Perspective on Sea-Level Rise and its Impacts Along the U.S. Mid-Atlantic Coast" a probable threat is the 1ft sea level rise condition that could be expected by 2050. This map depicts that sea level rise as well as the proceeding projections thereafter and is centered on target municipalities.

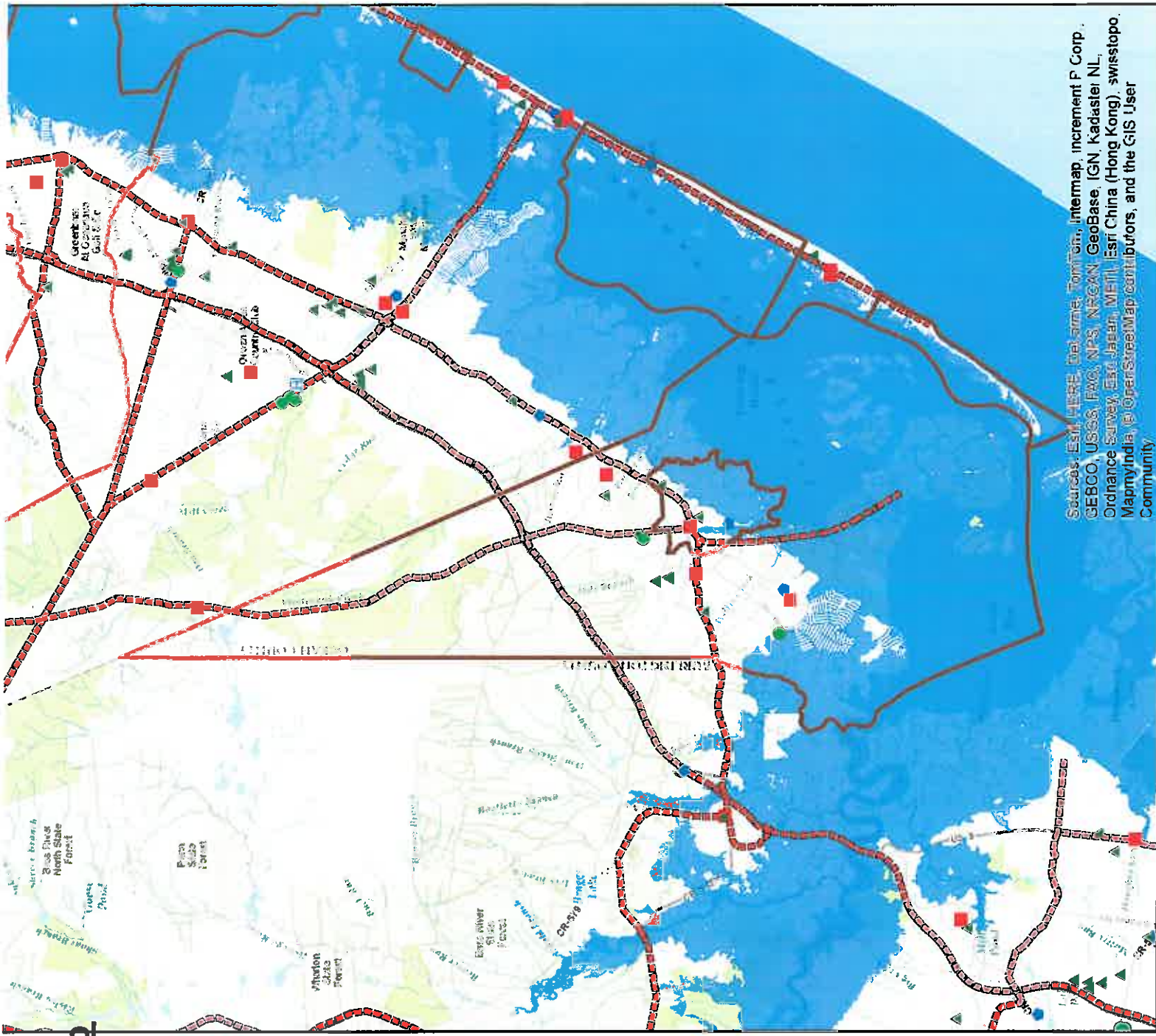
0 1.5 3 6 Miles



Map Author: Rachael Sacatelli and Bryan Serino
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis







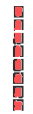

CRSSA

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FWS, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



3 Feet of Sea Level Rise Little Egg Harbor Township

Legend

-  Municipality
-  Schools
-  Fire Stations
-  Law Enforcement
-  Assisted Living
-  Hospitals
-  Evacuation Routes
-  3ft SLR

Year 2010 Population: 20065

According to Kenneth G. Miller et al. in the 2013 study "A Geological Perspective on Sea-Level Rise and its Impacts Along the U.S. Mid-Atlantic Coast" a probable threat is the 1ft sea level rise condition that could be expected by 2050. This map depicts that sea level rise as well as the proceeding projections thereafter and is centered on target municipalities.

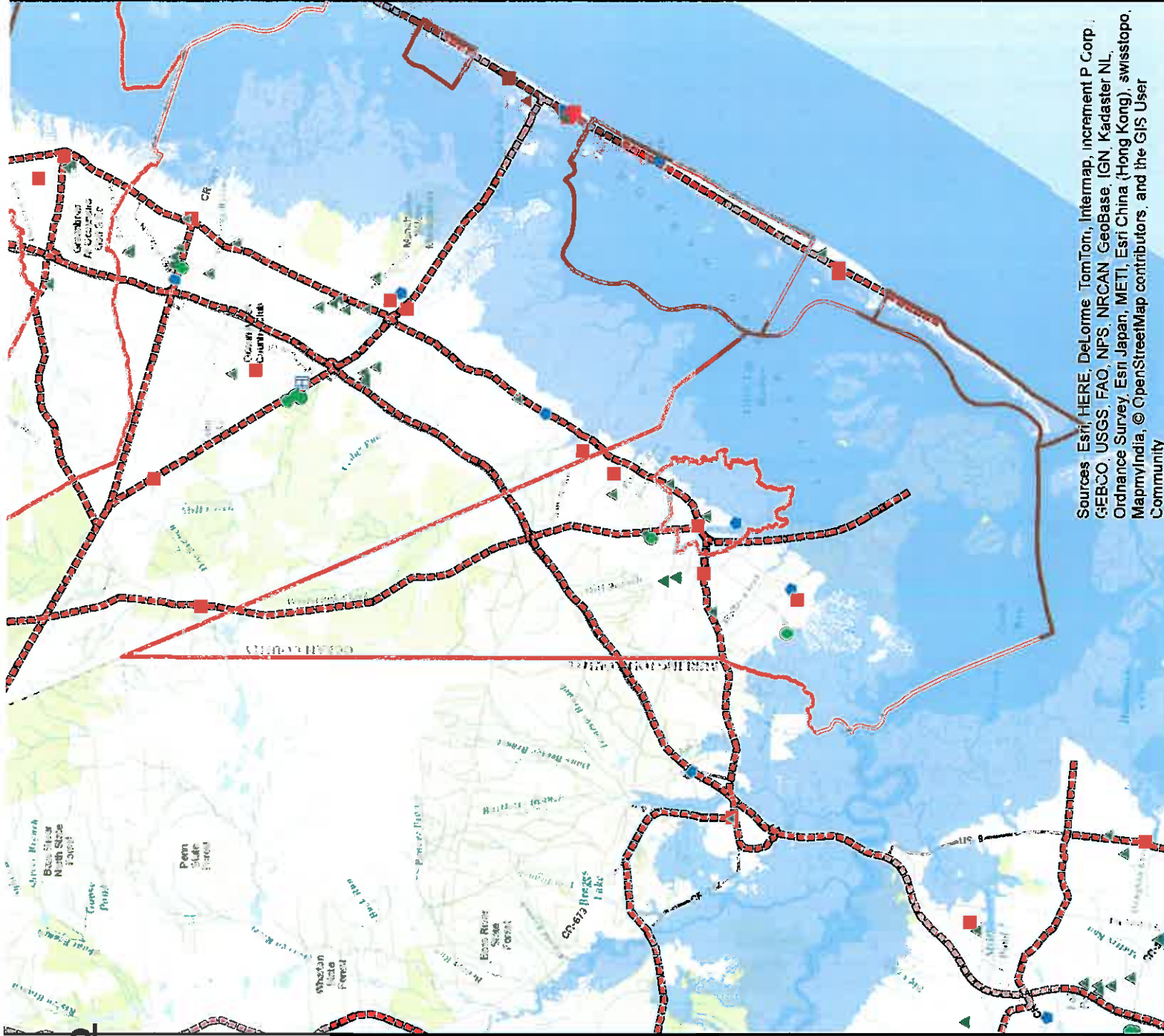
0 1.5 3 6 Miles



Map Author: Rachael Sacatelli and Bryan Serino
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis

CRSSA

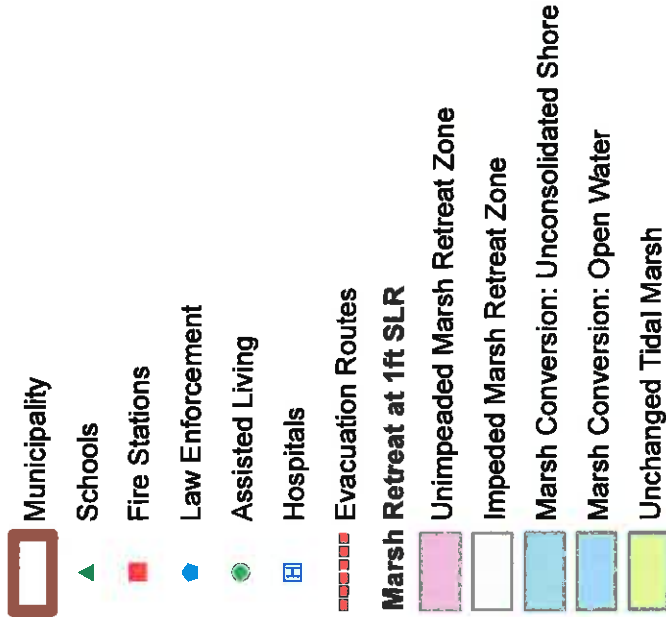
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



Appendix N: Marsh Retreat Maps

Marsh Retreat at 1 foot of Sea Level Rise Little Egg Harbor Township

Legend

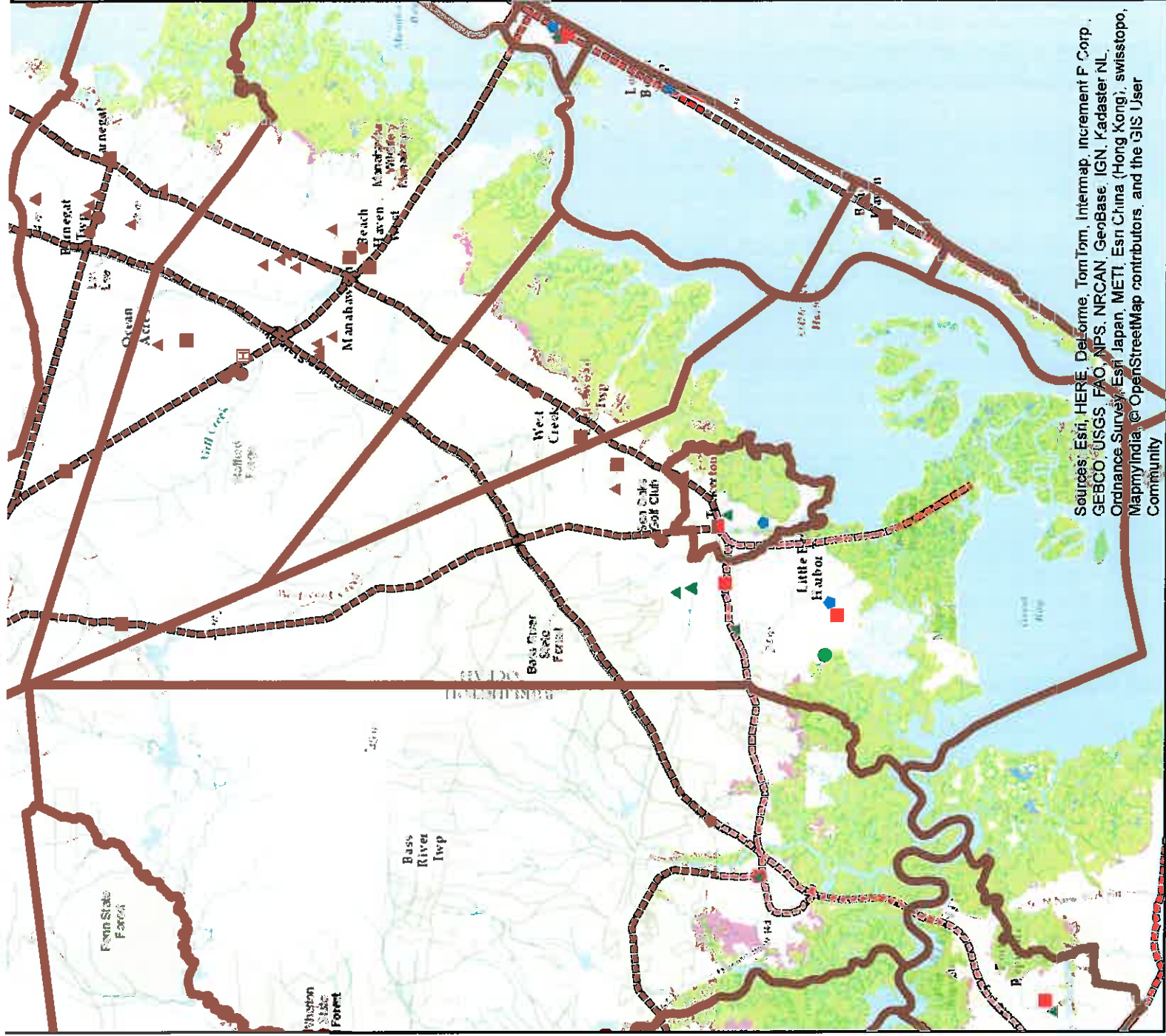


Year 2010 Population: 20065

According to Kenneth G. Miller et al. in the 2013 study "A Geological Perspective on Sea-Level Rise and its Impacts Along the U.S. Mid-Atlantic Coast" a probable threat is the 1ft sea level rise condition that could be expected by 2050. This map depicts the marsh retreat caused by sea level rise centered on target municipalities.



Map Author: Rachael Sacatelli
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Marsh Retreat at 2 feet of Sea Level Rise Little Egg Harbor Township

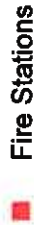
Legend



Municipality



Schools



Fire Stations



Law Enforcement



Assisted Living



Hospitals



Evacuation Routes

Marsh Retreat at 2ft SLR



Unimpeded Marsh Retreat Zone



Impeded Marsh Retreat Zone



Marsh Conversion: Unconsolidated Shore



Marsh Conversion: Open Water



Unchanged Tidal Marsh

0 1.25 2.5 5 Miles



Year 2010 Population: 20065

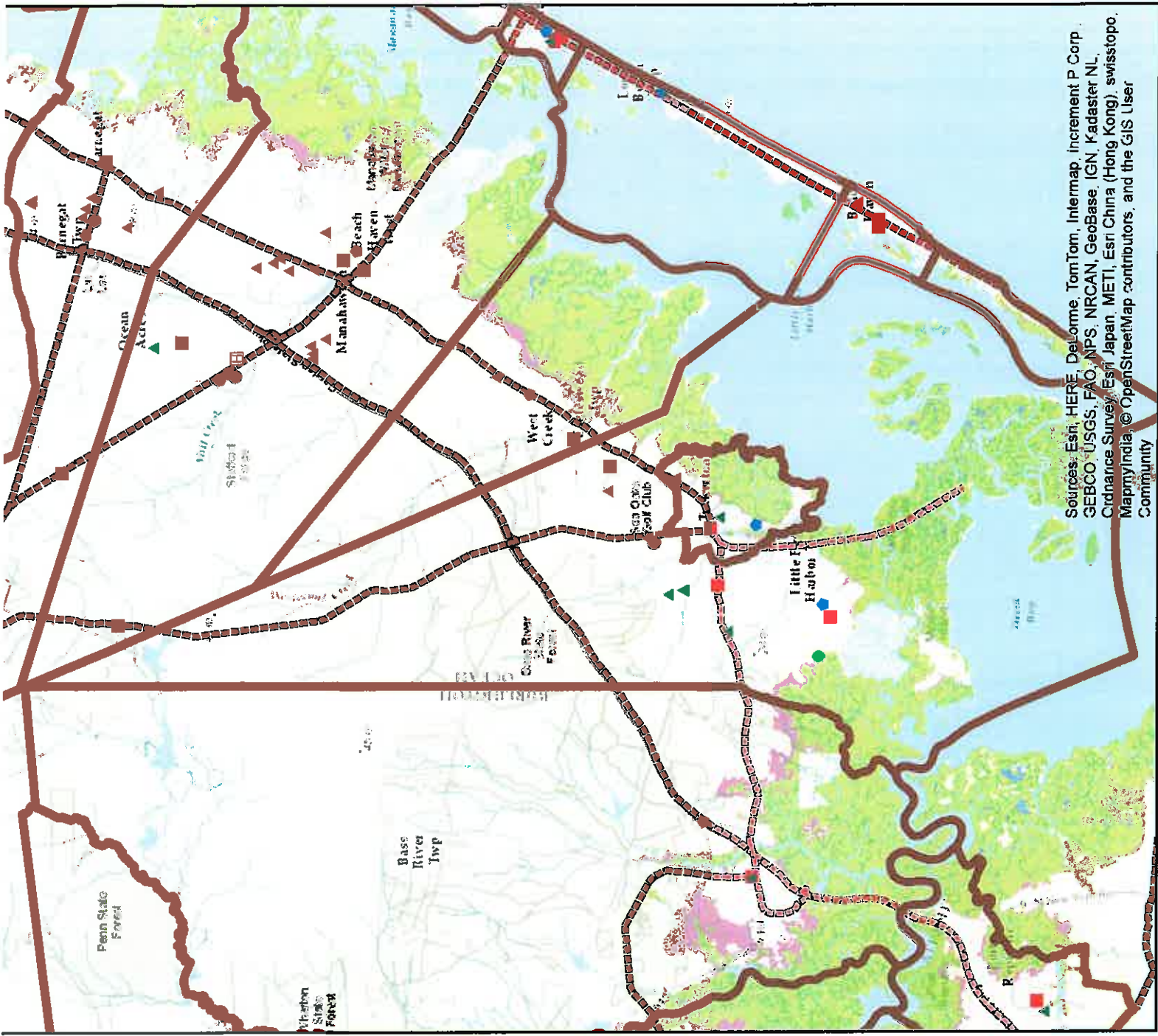
According to Kenneth G. Miller et al. in the 2013 study "A Geological Perspective on Sea-Level Rise and its Impacts Along the U.S. Mid-Atlantic Coast" a probable threat is the 1ft sea level rise condition that could be expected by 2050. This map depicts the marsh retreat caused by sea level rise centered on target municipalities.



Map Author: Rachael Sacatelli
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

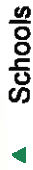


Marsh Retreat at 3 feet of Sea Level Rise Little Egg Harbor Township

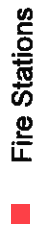
Legend



Municipality



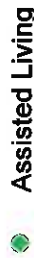
Schools



Fire Stations



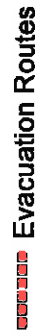
Law Enforcement



Assisted Living

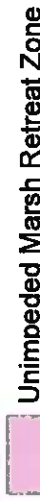


Hospitals



Evacuation Routes

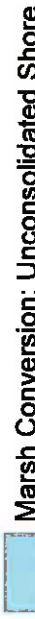
Marsh Retreat at 3ft SLR



Unimpeded Marsh Retreat Zone



Impeded Marsh Retreat Zone



Marsh Conversion: Unconsolidated Shore



Marsh Conversion: Open Water



Unchanged Tidal Marsh



Year 2010 Population: 20065

According to Kenneth G. Miller et al. in the 2013 study "A Geological Perspective on Sea-Level Rise and its Impacts Along the U.S. Mid-Atlantic Coast" a probable threat is the 1ft sea level rise condition that could be expected by 2050. This map depicts the marsh retreat caused by sea level rise centered on target municipalities.

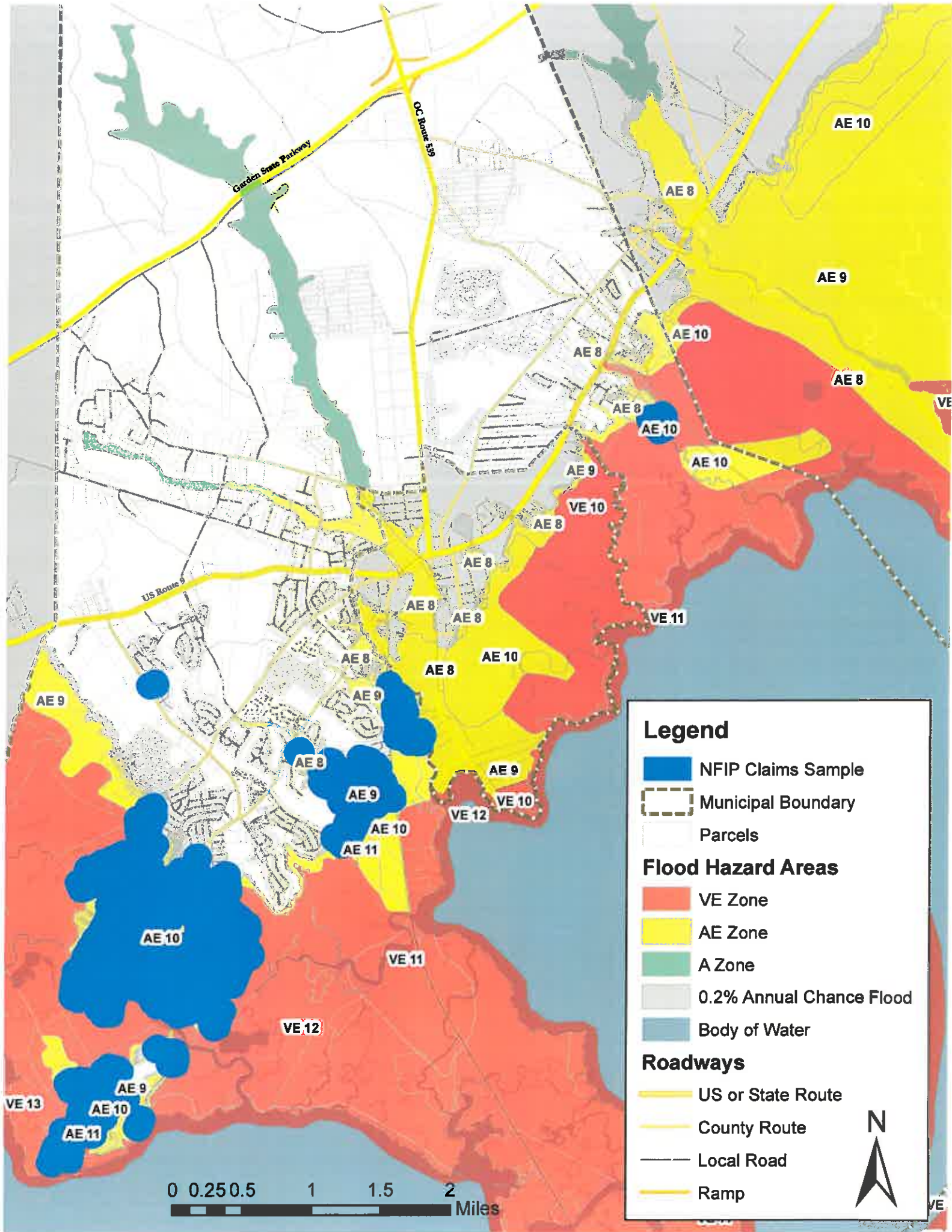


Map Author: Rachael Sacatelli
Rutgers, New Brunswick
Center for Remote Sensing
and Spatial Analysis



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Appendix O: NFIP Claim Areas Map



Legend

 NFIP Claims Sample

 Municipal Boundary

 Parcels

Flood Hazard Areas

 VE Zone

 AE Zone

 A Zone

 0.2% Annual Chance Flood

 Body of Water

Roadways

 US or State Route

 County Route

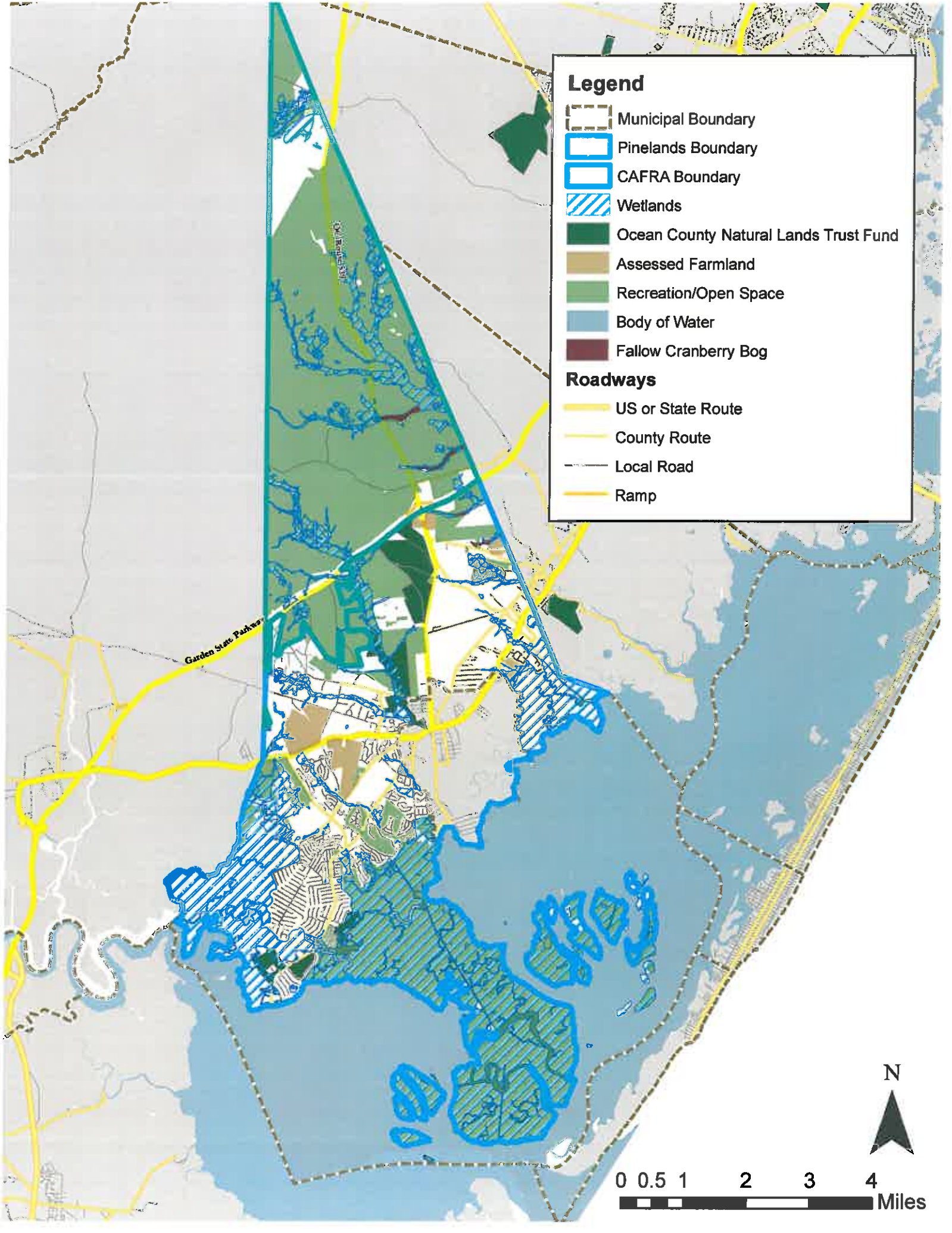
 Local Road

 Ramp

0 0.25 0.5 1 1.5 2 Miles



Appendix P: Natural Features Map



Legend

- Municipal Boundary
- Pinelands Boundary
- CAFRA Boundary
- Wetlands
- Ocean County Natural Lands Trust Fund
- Assessed Farmland
- Recreation/Open Space
- Body of Water
- Fallow Cranberry Bog

Roadways

- US or State Route
- County Route
- Local Road
- Ramp

N

0 0.5 1 2 3 4 Miles