

TOPSAIL ISLAND PROJECT PORTFOLIO

A. Final Topsail Island Project Portfolio

LEGEND (for each project below):

Symbol	Estimated Cost Range
\$	< \$250,000
\$\$	\$250,000 - \$500,000
\$\$\$	\$500,000 - \$1,000,000
\$\$\$\$	> \$1,000,000

Project Next Steps (color by type)

More analysis / detailed planning needed to identify and/or prioritize specific location(s), suitability, or feasibility

Design- or implementation-ready (project location and type of design already identified)

Other implementation (policy, non-structural, monitoring)

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Project #1 –Stormwater Infiltration System Along Roadways

Green infrastructure can be installed along roadways to receive stormwater runoff directly from the road surface. Green infrastructure such as swales, bioswales and rain gardens can provide locations for stormwater retention and enhanced mechanisms of infiltration to allow roads to drain faster and avoid ponding. *Potential island wide project.*

Hazard(s) addressed by the project	Flooding – rainfall, sea level rise, water quality
Type of Solution	Infrastructure
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$\$\$
Potential Implementation Funding Sources	ARPA/NC Stormwater funding; other state grants; GoldenLEAF Flood Mitigation Program, Clean Water State Revolving Fund, EPA 319 grants
Projected Estimated Timeline	3 years
Priority Rating	High
Project location(s)	Some locations already identified by Topsail Beach and Surf City; can be applied on roadway shoulders Island-wide. In Topsail Beach, the Rocky Mount area (among others) has been identified as top priority for nuisance flooding/stormwater improvements. Surf City has been looking into an area north of Surf Condos to implement a chamber infiltration project

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Project #2 – Collaborative (Island-Wide) Stormwater Management Ordinance

Compose an island wide stormwater management ordinance as current stormwater management policies vary across the three communities. Allow for flexibility within existing ordinances to “improve land area to hold and retain water to offset water table height increases and reducing runoff.” *Potential island wide project.*

Hazard(s) addressed by the project	Flooding – rainfall, tidal, sea level rise, water quality
Type of Solution	Policy/programming
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	N/A
Potential Implementation Funding Sources	Local municipal funds, RCCP Phase III
Projected Estimated Timeline	1 year
Priority Rating	High
Project location(s)	Island-wide

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Project #3 – Beach Nourishment and Dune Restoration

Continue on-going projects to maintain both a healthy dune system and beach for protection from hurricanes, nor'easters, etc. A nature-based strategy to restore dune vegetation and berms for flood protection. *Potential island wide project.*

Hazard(s) addressed by the project	Storm surge
Type of Solution	Nature-based
Project Design (Phase 3) Estimated Cost*	\$-\$\$
Project Construction (Phase 4) Estimated Cost*	\$\$\$\$
Potential Implementation Funding Sources	USACE; FEMA/federal
Projected Estimated Timeline	1-5 years
Priority Rating	High
Project location(s)	Island-wide

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Project #4 – Stormwater Infiltration within Existing Dunes

An infiltration system can be installed within the dune systems to receive stormwater runoff from roadways. The system will provide additional storage for runoff and improved conditions for faster infiltration, which will in turn allow roads to drain faster. Pumps and/or catch basins can be installed to move stormwater runoff from roadways into the dune infiltration system. *Potential island wide project.*

Hazard(s) addressed by the project	Flooding – rainfall
Type of Solution	Hybrid Infrastructure-Nature-based
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$\$\$-\$\$\$\$
Potential Implementation Funding Sources	ARPA/NC stormwater funding, RCCP Phase III, GoldenLEAF Flood Mitigation Program, Clean Water State Revolving Fund, EPA 219 grants
Projected Estimated Timeline	2-4 Years
Priority Rating	High
Project location(s)	Multiple locations identified; some prioritization needed for specific “hot spots.”

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Project #5 – Consultant Study to Obtain Credit Points for FEMA’s Community Rating System (CRS)

Act with consultant to obtain credit points to increase rating class to reduce flood insurance premiums for property owners by determining what credits are in place and further credits that are needed to improve CRS rating. Note: NTB is currently a class 5 community which provides a 25% discount for Special Flood Hazard Area (SFHA) and a 10% discount for non-SFHA. *Project identified by the towns of Topsail Beach and North Topsail Beach.*

Hazard(s) addressed by the project	Flooding
Type of Solution	Programming/Policy
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$-\$\$
Potential Implementation Funding Sources	ARPA/NC stormwater funding; FEMA/federal
Projected Estimated Timeline	1+ year
Priority Rating	High
Project location(s)	Topsail Beach and North Topsail Beach

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Project #6 – South Shore Drive Drainage Project

The Town of Surf City conducted feasibility analysis to divert stormwater from high frequency rain events to areas of underground infiltration. Project could be several forms of engineering approaches such as a system to include pumps, piping, or other mechanisms that would connect to infiltration basins. *Project locations on S. Shore Drive in Surf City.*

Hazard(s) addressed by the project	Flooding – rainfall, sea level rise
Type of Solution	Infrastructure
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$\$\$
Potential Implementation Funding Sources	ARPA/NC stormwater funding, GoldenLEAF Flood Mitigation Program, Clean Water State Revolving Fund, EPA 319 Grants, NCEM Transportation Infrastructure Resiliency Fund Grants, NCDOT
Projected Estimated Timeline	Need to verify scope from existing study/analysis
Priority Rating	High
Project location(s)	Nine (9) locations identified through from an analysis done along South Shore Dr. in Surf City, including some that place infiltration basins on adjacent properties that the Town owns. Consultant WK Dickson has completed a study that is in final review with NCDOT.

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Project #7 – Analysis to Evaluate Vulnerable and Critical Infrastructure for Elevation

Evaluate vulnerable/critical infrastructure locations such as lift stations, fire stations, and emergency facilities and determine if electrical or mechanical components need to be elevated. *Potential island wide project.*

Hazard(s) addressed by the project	Flooding – rainfall, tidal, sea level rise
Type of Solution	Infrastructure
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$\$
Potential Implementation Funding Sources	ARPA/NC stormwater funding; FEMA/federal grants
Projected Estimated Timeline	2+ years
Priority Rating	Medium
Project location(s)	Critical facilities (fire, police, utilities)

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Project #8 – Manhole Retrofits

Retrofitting manhole covers that take on inflow and infiltration (I & I). Combination of elevating manholes that do not impede traffic and sealing manholes that are within the roadway with sensible access for maintenance and cleanout. *Project location within towns of Surf City and NTB.*

Hazard(s) addressed by the project	Flooding
Type of Solution	Maintenance
Project Design (Phase 3) Estimated Cost*	\$-\$\$
Project Construction (Phase 4) Estimated Cost*	\$\$
Potential Implementation Funding Sources	Local municipal funds; ARPA/NC stormwater grants
Projected Estimated Timeline	1 year+
Priority Rating	Medium
Project location(s)	Surf City and North Topsail Beach

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Project #9 – Land Conservation and Targeted Acquisitions

A nature-based solution/strategy to preserve interconnected systems of natural areas and open space. Land conservation projects begin by prioritizing areas of land for acquisition. Secure lots through either acquisition, grant-funded purchase, or donation. These lots may be secured as open space easements in perpetuity. Special attention will be given to acquire properties that have been deemed unbuildable due to either state or local development regulations. *Potential island wide project.*

Hazard(s) addressed by the project	Flooding – rainfall, tidal, sea level rise
Type of Solution	Nature-based
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$\$-\$\$\$\$
Potential Implementation Funding Sources	Local municipality funds, NC Land and Water Fund, Wildlife Conservation Society Climate Adaptation Fund, NOAA Coastal and Estuarine Land Conservation Program
Projected Estimated Timeline	2+ years
Priority Rating	Medium
Project location(s)	Island-wide

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Project #10 – Develop Policy for Roadway Elevations (lift and crown) with Stormwater BMPs

Create a policy manual to dictate roadway elevation standards and other drainage solutions that convey roadway flooding such as stormwater infiltration systems and other best management practices coupled with elements of streetscaping/landscaping improvements to also enhance the public rights-of-way. In addition, policy would prioritize local and State roads to receive lift and crown improvements. *Potential island wide project.*

Hazard(s) addressed by the project	Flooding - rainfall
Type of Solution	Policy/programming
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	N/A
Potential Implementation Funding Sources	Local municipal funds
Projected Estimated Timeline	2+ years
Priority Rating	Low
Project location(s)	Island-wide

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Project #11 – Conduct Engineering Studies for Hydrology and Stormwater Management

The Town of North Topsail Beach will review its stormwater control policies and include regulatory updates for water detention and/or retention facilities in new developments as per new state and federal policy requirements. This will include analysis of reducing the Town’s current maximum lot coverage requirements and other land use/development mechanisms which relate to stormwater management. *Project identified by North Topsail Beach but has potential for implementation of an island wide project.*

Hazard(s) addressed by the project	Water quality, flooding
Type of Solution	Policy/programming
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$-\$\$
Potential Implementation Funding Sources	ARPA/NC Stormwater funding; NC Coastal Federation
Projected Estimated Timeline	2-3 years
Priority Rating	Low
Project location(s)	North Topsail Beach

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Project #12 – Drainage Maintenance Program & Infrastructure Upgrades

Conduct analysis for drainage infrastructure maintenance and upgrades by implementing programs coupled with data collection/monitoring to identify locations for drainage infrastructure upgrades. *Potential island wide project.*

Hazard(s) addressed by the project	Flooding
Type of Solution	Policy/programming/research
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$\$
Potential Implementation Funding Sources	ARPA/NC stormwater funding; state grants; university research partnership
Projected Estimated Timeline	2+ years
Priority Rating	Low
Project location(s)	Island-wide

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Project #13 – Locate/Design/Construct a Living Shoreline Demonstration Project

The community would determine the location of the living shoreline project. Once location is determined, engineering and design would be performed, and project would be further implemented by permitting and construction. *Project identified by North Topsail Beach.*

Hazard(s) addressed by the project	Flooding – tidal, sea level rise
Type of Solution	Nature-based
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$-\$\$
Potential Implementation Funding Sources	NC Coastal Federation and other state appropriated funding, NCDEQ grants, National Fish and Wildlife Federation (NFWF) and NOAA Coastal Resilience grants, Wildlife Conservation Society Climate Adaptation Fund
Projected Estimated Timeline	2 years
Priority Rating	Low
Project location(s)	3 locations on Topsail Beach, other locations to be determined and prioritized based on suitability and other factors

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Project #14 – Soundside Park Environmental Enhancement Project

Implement a suite of best management practices (BMP) such as a rain garden or other nature-based solutions to control stormwater runoff and water quality and to improve drainage conditions. An additional educational component will describe the project and encourage similar projects to be implemented potentially elsewhere across Topsail Island. *Project location Soundside Park in Surf City.*

Hazard(s) addressed by the project	Flooding – rainfall, tidal, sea level rise
Type of Solution	Nature-based
Project Design (Phase 3) Estimated Cost*	\$-\$\$
Project Construction (Phase 4) Estimated Cost*	\$\$\$-\$\$\$\$
Potential Implementation Funding Sources	NC Coastal Federation, other state grants, NFWF Coastal Resilience, NC Land and Water Fund
Projected Estimated Timeline	6 months
Priority Rating	Low
Project location(s)	Surf City - Soundside Park

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Project #15 – Stream/Creek Cleanout and Maintenance

Remove debris from and perform maintenance on various streams/creeks that feed into the tidal area and intracoastal waterway on the mainland portion of Surf City. Priority emphasis on stream/creek cleanout on portions that cross major travel ways (i.e., NC 210 and NC 50). *Project location mainland Surf City.*

Hazard(s) addressed by the project	Flooding – rainfall
Type of Solution	Maintenance
Project Design (Phase 3) Estimated Cost*	\$
Project Construction (Phase 4) Estimated Cost*	\$\$-\$\$\$
Potential Implementation Funding Sources	Local municipality funds; ARPA/NC Stormwater funding
Projected Estimated Timeline	Routinely every 2 years
Priority Rating	Low
Project location(s)	Mainland Surf City

ADDITIONAL PROJECTS IDENTIFIED – NORTH TOPSAIL BEACH

Project Description
The Town supports implementation of the Cape Fear and White Oak River Basin Water Quality Management Plans. New River watershed (03030001020040) projects that improve estuarine water quality, shellfish habitat and fish nursery habitat are priorities for this Hydrologic Units (HU). (Ref: White Oak River Basin Restoration Priorities 2010, link here).
The Town supports implementation of the Cape Fear and White Oak River Basin Water Quality Management Plans. Turkey Creek watershed priorities for the HU include buffer projects, stormwater BMPs, and agricultural BMPs (ref: White Oak River Basin Restoration Priorities 2010).
The Town supports implementation of the Cape Fear and White Oak River Basin Water Quality Management Plans. Topsail Beach watershed (est. 2010) stormwater management projects that reduce impacts from runoff are highest priority here. (Ref: White Oak River Basin Restoration Priorities 2010). <i>Potential island wide project also listed above.</i>
Implement stream, wetland and riparian buffer restoration projects within watersheds that drain directly into class SA waters (e.g., tidal creeks). <i>Potential for island wide project.</i>
Support local public education/outreach efforts to increase public awareness of the sources and controls of pathogens in local streams, rivers, bays, and sounds. <i>Potential for island wide project</i>
Existing pervious pavement parking lot in front of Town Hall, Fire Stations, Public Works.
Electric vehicle charging stations. <i>Potential for island wide project.</i>
Critical facilities flood protection.
Flooding of tidal pond.
Stormwater erosion and ponding.
Hazard mitigation through elevation and acquisition. Pursue the acquisition of properties in flood prone areas when they are substantially damaged and meet the benefit-cost analysis (BCA) requirements for acquisition. A re-use plan will be identified during the scoping process. Deed restrictions should be placed on properties that are acquired to prevent development.

ADDITIONAL PROJECTS IDENTIFIED – NORTH TOPSAIL BEACH

Project Description
Retrofit critical facilities and town owned facilities for improved resilience to all hazards with the use new technology. This could include but is not limited to wind retrofits, low water consumption fixtures, leak detectors, backup generators, ignition-resistant materials, 320 or 361 compliant safe rooms, lightning protection, hail resistant roofing, anchoring fixed building equipment.
Support activities in the development of Army Corps of Engineers Federal Shoreline Protection Project.
The Town supports ongoing planning and capital improvement efforts to address the drainage problems associated with flooding. Perform assessment town wide of ditches to ensure proper grading. Coordinate with NCDOT for repairs to ensure proper drainage.
Work with Onslow County to ensure implementation of a viable public education and outreach program for mitigation, preparedness, response, and recovery.
Install backup generators with automatic transfer switches for mobile generators on all critical facilities and critical utilities.
Reduce <i>plastic marine</i> debris. The Town supports commercial and recreational fishing in its waters and will cooperate with other local governments and state and federal agencies to control pollution of these waters to improve conditions so that commercial and recreational fisheries will not be depleted. It also supports the preservation of primary nursery and habitat areas.
Salt marsh and wetland preservation. Consider opportunities for planting <i>Spartina alterniflora</i> (smooth cordgrass), <i>Spartina patens</i> (salt meadow hay) and <i>Juncus roemerianus</i> (black needle rush) to restore marshes and provide shoreline protection.
Protect shellfish harvesting waters.
Conduct a build out analysis to assist with policy development related to resilience.
Habitat protection.
Construct LEEDs certified fire station(s) (critical facility).
The Town will secure land through property acquisition. The Town may aim to secure lots through either acquisition, grant-funded purchase, or donation, in an effort to protect the eco-friendly environment that they have established. These lots may be secured as open space easements in perpetuity. Special attention will be given to acquire properties that have been deemed unbuildable due to either state or local development regulations.

ADDITIONAL PROJECTS IDENTIFIED – NORTH TOPSAIL BEACH

Project Description
<p>The Town will establish a land trust that will serve to secure undeveloped land through either acquisition or donation as open space easements in perpetuity. This effort will help realize the Town’s vision to maintain an eco-friendly environment. The Town will work with the Conservation Trust of North Carolina throughout this effort to ensure that all land secured is properly protected.</p>
<p>Shoreline Protection. The Town supports the US Army Corps of Engineers policy on dredging the New River Inlet; however, the Town would like to work with the Corps to establish a dredging process that will provide sand to the Town. This will help the Town in their efforts to establish a long-term solution to beach nourishment.</p>
<p>High Water Mark Initiative. Provide information on past floods by posting high water markers in public places, along with maps and photographs of past floods on the Town’s website.</p>
<p>Build oyster reefs to protect the emergency service buildings from sound side flooding. The State of North Carolina owns all land below the mean high-water line, except provided for by NCGS 113-205 and -206. Lines extending beyond the MHW will require proof from chain of title to a recorded declaration of submerged land, pursuant to NCGS 113-205 and -206.</p>
<p>Reduce impacts from runoff. Review recommendations found in the Cape Fear and White Oak River Basin Water Quality Management Plans. The Topsail Beach watershed (est. 2010) stormwater management projects that reduce impacts from runoff are highest priority. (Ref: White Oak River Basin Restoration Priorities, 2010, link here). Potential for island wide project, proposed by NTB.</p>