

Non-Structural Projects

NC 12 Side Street Stormwater Diversion Program

Project Description

The Town of Southern Shores will conduct a focused study to evaluate opportunities for diverting stormwater from selected NC 12 side streets and neighborhood drainage systems to reduce localized flooding and improve the overall performance of the NC 12 drainage network. The study will evaluate existing drainage patterns, roadway grades, conveyance capacity, culverts, swales, outfalls, and downstream receiving systems within priority areas, including East Dogwood Trail, Sea Oats Trail, and Fourth Avenue. Hydrologic and hydraulic analysis will be used, as appropriate, to identify existing deficiencies and evaluate potential diversion strategies. Alternatives may include new or upgraded swales, storm drains, culverts, storage areas, infiltration practices, and other nature-based stormwater controls. The study will develop conceptual improvement alternatives, planning-level cost estimates, implementation priorities, and recommendations addressing constructability, property constraints, permitting, maintenance, and environmental considerations. The results will provide the Town with a prioritized program for advancing feasible drainage diversion projects into preliminary engineering, permitting, funding, and implementation.



Hazard(s) Addressed	Stormwater Flooding
Type of Solution	Planning Document
Estimated Cost	\$200,000
Estimated Timeline	1 year
Potential Funding Sources	Town, National Coastal Resilience Fund, NC Department of Environmental Quality, NCDOT
Map/Location	Multiple neighborhoods along NC 12
Prioritization Measures	
Cost-Benefit	High
Social Equity	Medium
Internal Capacity	Medium
Co-Benefits	Educated/informed public and staff, and will serve as a resource for other Towns along NC 12 or alternate evacuation routes.
Sources for Project	2012 CAMA Land Use Plan update & RCCP survey
Prioritization Ranking	

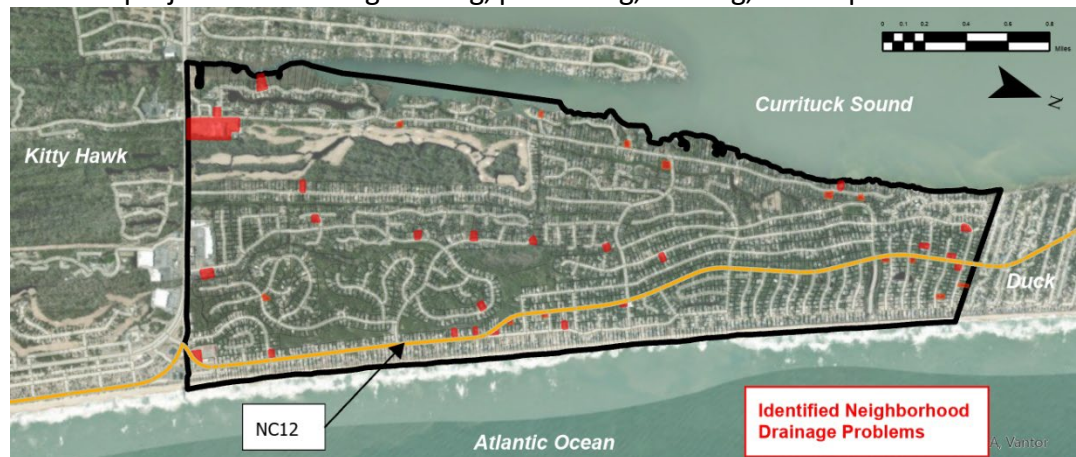
Non-Structural Projects

Neighborhood Stormwater Management Study

Project Description

The Town of Southern Shores will conduct a neighborhood-scale stormwater management study to identify, evaluate, and prioritize solutions for recurring drainage and flooding problems in vulnerable residential areas. The study will build upon existing drainage information, previous studies, resident observations, available topographic and GIS data, and RCCP vulnerability findings. Field investigations and targeted survey will document existing drainage infrastructure, conveyance routes, outfalls, elevations, and site conditions. Hydrologic and hydraulic analysis will be used, as appropriate, to identify system deficiencies and evaluate potential improvements.

The study will develop conceptual alternatives including drainage conveyance upgrades, roadway drainage modifications, swales, stormwater storage, infiltration practices, outfall improvements, and nature-based solutions. Alternatives will be evaluated based on flood-risk reduction, constructability, property constraints, permitting, maintenance requirements, planning-level costs, and potential funding opportunities. The final study will provide Southern Shores with a prioritized neighborhood stormwater improvement program and a roadmap for advancing selected projects toward engineering, permitting, funding, and implementation.



Hazard(s) Addressed	Stormwater Flooding
Type of Solution	Planning Document
Estimated Cost	\$250,000
Estimated Timeline	1 Year
Potential Funding Sources	Town, Dare County, and NC DEQ
Map/Location	Townwide

Prioritization Measures

Cost-Benefit	High
Social Equity	Medium
Internal Capacity	Medium
Co-Benefits	Storm Protection and educated/informed public.
Sources for Project	2012 CAMA Land Use Plan update & RCCP survey
Prioritization Ranking	

Non-Structural Projects

Update NC 12 Stormwater Study

Project Description

The Town of Southern Shores will coordinate an update of the 2006 NCDOT NC 12 Stormwater Study to provide a current, comprehensive assessment of drainage conditions and stormwater management needs along the NC 12 corridor and connected drainage systems. The study will incorporate updated topographic and survey data, current land use and development conditions, existing drainage infrastructure, recent storm events, observed flooding locations, and updated rainfall, sea-level rise, and coastal hazard information. Hydraulic and hydrologic modeling will be used, as appropriate, to evaluate existing system capacity, identify drainage deficiencies and bottlenecks, and assess the effectiveness of potential improvements under current and future conditions.

The updated study will identify and prioritize practical improvements such as drainage conveyance upgrades, outfall improvements, roadway drainage modifications, stormwater storage, infiltration and nature-based solutions, and opportunities to improve connections between existing drainage systems. Recommendations will consider flood-risk reduction, constructability, permitting, maintenance, property constraints, environmental impacts, planning-level costs, and potential funding opportunities. The study will provide the Town with updated mapping, modeling, prioritized projects, and conceptual improvement recommendations that can support capital planning, grant applications, detailed engineering, and future implementation. The updated analysis will also provide a technical basis for evaluating how drainage improvements along NC 12 can reduce flooding impacts to adjacent neighborhoods and maintain transportation and emergency access during major rainfall and coastal storm events.

Hazard(s) Addressed	Stormwater flooding
Type of Solution	Planning Document
Estimated Cost	\$300,000
Estimated Timeline	2 Years
Potential Funding Sources	Town and NC DOT
Map/Location	Along NC 12

Prioritization Measures

Cost-Benefit	High
Social Equity	Medium
Internal Capacity	Low
Co-Benefits	Improves emergency access during flooding events
Sources for Project	2012 CAMA Land Use Plan update & RCCP survey
Prioritization Ranking	

Non-Structural Projects

Oceanside Beach\Dune Nourishment Program

Project Description

The Town of Southern Shores will continue its oceanfront beach and dune nourishment program to strengthen protection from erosion, storm surge, wave attack, and sea-level rise. It will evaluate nourishment performance, shoreline change, storm impacts, sediment losses, dune conditions, and monitoring data to improve design, placement, frequency, and effectiveness. Activities may include beach and dune monitoring, nourishment criteria, sediment management, dune restoration, and nature-based measures. It will assess permitting, environmental considerations, maintenance needs, costs, and funding opportunities. An adaptive management approach will adjust nourishment activities based on shoreline response and changing conditions. Monitoring will evaluate impacts, including sand accumulation around beach crossovers, maintenance requirements for public access structures, and effects on dune vegetation. The program will support oceanfront properties, infrastructure, access, resources, and coastal community resilience.



Hazard(s) Addressed	Oceanfront erosion, Storm surge flooding, and Sea level rise flooding
Type of Solution	Nature-Based/Green Infrastructure
Estimated Cost	\$6.8 Million
Estimated Timeline	Every 5-7 years
Potential Funding Sources	Town, NC Division of Water Resources, Dare County, FEMA
Map/Location	Entire Town oceanfront shoreline as shown on Project Map.

Prioritization Measures

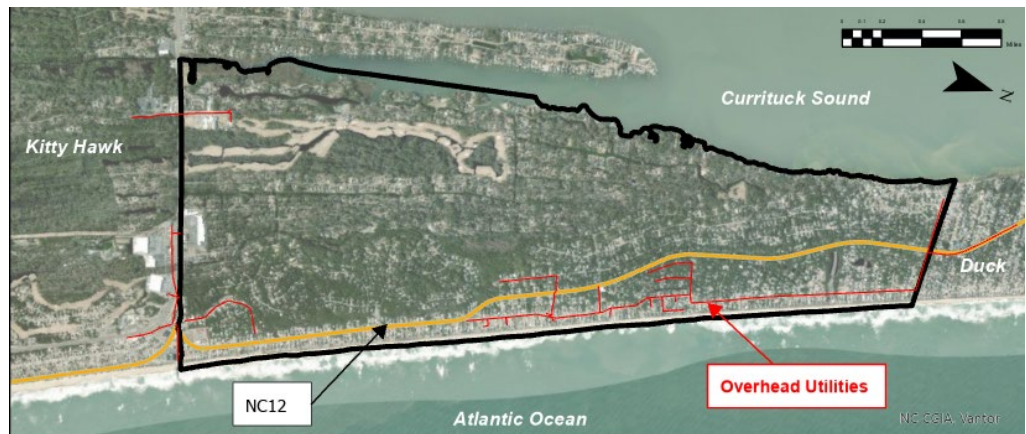
Cost-Benefit	High
Social Equity	Medium
Internal Capacity	High
Co-Benefits	Protection of key economic assets
Sources for Project	2012 CAMA Land Use Plan update & RCCP survey
Prioritization Ranking	

Non-Structural Projects

Evaluate Burying Overhead Utilities along Coast

Project Description

The Town of Southern Shores will evaluate the feasibility of undergrounding overhead electrical and communications utilities within vulnerable coastal areas. The assessment will identify priority utility corridors susceptible to hurricane-force winds, storm surge, flooding, saltwater exposure, and storm debris, with emphasis on infrastructure serving critical facilities, evacuation routes, and densely developed areas. The project will evaluate potential resilience benefits, constructability, right-of-way and easement constraints, utility coordination, permitting requirements, maintenance considerations, and planning-level costs. Potential undergrounding corridors will be prioritized based on vulnerability, criticality, community benefit, and implementation feasibility. The assessment will identify potential phasing and funding opportunities and provide recommendations for coordinating with utility providers and advancing priority underground utility improvements to improve service reliability and community resilience following major coastal storms.



Hazard(s) Addressed	Coastal storm flooding, power and communication disruptions
Type of Solution	Study
Estimated Cost	\$100,000
Estimated Timeline	1 Year
Potential Funding Sources	Town and County
Map/Location	Townwide

Prioritization Measures

Cost-Benefit	Medium
Social Equity	Medium
Internal Capacity	Medium
Co-Benefits	Protection of critical communication and power services
Sources for Project	CAMA Land Use Plan & RCCP CAT
Prioritization Ranking	

Non-Structural Projects

Update Development Policies & Regulations

Project Description	The Town of Southern Shores will review and update its development policies, ordinances, and regulations to improve the community's long-term coastal resilience and ensure that future development and redevelopment appropriately account for existing and projected coastal hazards. The project will evaluate current land use, zoning, stormwater, floodplain, subdivision, landscaping, building, and site development requirements in relation to the Town's identified vulnerabilities, including coastal and stormwater flooding, storm surge, sea-level rise, extreme precipitation, erosion, and impacts to critical infrastructure. The review will identify regulatory gaps, inconsistencies, and opportunities to incorporate current resilience practices while maintaining compatibility with the Town's Comprehensive Land Use Plan, CAMA requirements, and other applicable state and federal regulations. The project will develop recommended policy and regulatory amendments that encourage or require risk-informed development practices, including improved stormwater management, protection of natural drainage features, preservation and enhancement of dunes and natural areas, appropriate setbacks and site design, flood-resistant construction, and consideration of future coastal hazards. Recommendations will consider technical feasibility, property rights, economic impacts, permitting requirements, and consistency with existing Town policies. The project will include stakeholder and public engagement to identify community concerns and build support for proposed changes. The resulting Development Policy and Regulatory Update will provide the Town with specific, implementable recommendations and draft ordinance or policy language that can be considered for adoption. The updated framework will help reduce future vulnerability, improve redevelopment resilience, and ensure that new development does not exacerbate existing flooding and coastal hazard risks.
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Hazard(s) Addressed	Coastal Flooding, Water Quality
Type of Solution	Regulatory changes
Estimated Cost	<\$100,000
Estimated Timeline	2 year
Potential Funding Sources	Town, Division of Water Resources, NC Department of Environmental Quality, Coastal Studies Institute
Map/Location	Townwide

Prioritization Measures

Cost-Benefit	Medium
Social Equity	Medium
Internal Capacity	Medium
Co-Benefits	Health, water quality
Sources for Project	CAMA Land Use Plan & RCCP CAT
Prioritization Ranking	

Non-Structural Projects

Coastal Resiliency Community Engagement, Education, and Outreach

Project Description	The Town of Southern Shores will develop and implement a focused programmatic effort to engage, educate, and reach out to the community to increase public understanding of the coastal hazards affecting the town and provide residents, property owners, businesses, and other stakeholders with practical information and resources to reduce vulnerability and improve resilience. The program will translate the technical findings of the Town's RCCP risk and vulnerability assessments into accessible educational materials focused on the hazards most relevant to Southern Shores, including coastal flooding, stormwater flooding, storm surge, sea-level rise, shoreline and dune erosion, extreme precipitation, and impacts to critical infrastructure and transportation. The program will provide residents and property owners with information regarding individual and neighborhood-scale resilience measures, including floodproofing and elevation considerations, drainage maintenance, stormwater management practices, dune and vegetation protection, living shoreline and nature-based approaches where appropriate, septic system considerations, emergency preparedness, and protection of homes and other critical assets. Educational materials will also explain how individual properties and neighborhoods contribute to the Town's overall drainage and coastal resilience and identify actions that residents can undertake to reduce risk.
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Hazard(s) Addressed	Coastal Flooding, Coastal Erosion, Water Quality, Sea-Level Rise, Stormwater
Type of Solution	Educational engagement and outreach
Estimated Cost	\$50,000 initial startup and \$20,000 continued annual effort
Estimated Timeline	Ongoing
Potential Funding Sources	Town, NC DEQ
Map/Location	Townwide

Prioritization Measures

Cost-Benefit	Medium
Social Equity	Medium
Internal Capacity	High
Co-Benefits	Provides internal accountability
Sources for Project	CAMA Land Use Plan & RCCP CAT
Prioritization Ranking	

Non-Structural Projects

Evaluate Adaptability of Critical Facilities

Project Description	The Town of Southern Shores will conduct a site-specific evaluation of the adaptability and long-term resilience of priority critical infrastructure and essential municipal assets identified through the Town's RCCP risk and vulnerability assessment. The project will evaluate individual infrastructure sites in greater technical detail to identify site-specific vulnerabilities, potential failure mechanisms, and opportunities to maintain essential services under existing and future coastal hazard conditions. Selected sites will be evaluated for exposure to stormwater and coastal flooding, storm surge, sea-level rise, extreme precipitation, erosion, and other applicable hazards. Existing site conditions, elevations, drainage patterns, access, utility connections, critical equipment, structural characteristics, and operational requirements will be considered to determine how hazards could affect facility functionality and service continuity. The assessment will identify and evaluate feasible site-specific adaptation strategies, including drainage improvements, floodproofing, elevation or relocation of vulnerable equipment, flood barriers, backup power, utility protection, improved emergency access, redundancy, nature-based measures, or facility relocation/replacement. Alternatives will be evaluated based on anticipated risk reduction, engineering feasibility, permitting and environmental considerations, property constraints, maintenance requirements, estimated costs, and anticipated useful life. The project will culminate in a Site-Specific Critical Infrastructure Adaptability Assessment for each priority asset, documenting existing conditions, hazard exposure, vulnerabilities, recommended adaptation measures, planning-level costs, and implementation priorities. Results will provide the Town with a practical roadmap for advancing priority infrastructure improvements toward engineering, permitting, capital planning, and future funding opportunities.
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Hazard(s) Addressed	Coastal Storm Flooding, Stormwater, Sea-Level Rise
Type of Solution	Evaluation
Estimated Cost	\$30,000
Estimated Timeline	6 Months
Potential Funding Sources	Town, FEMA, Dare County
Map/Location	Townwide

Prioritization Measures

Cost-Benefit	High
Social Equity	Medium
Internal Capacity	High
Co-Benefits	Provides internal accountability
Sources for Project	RCCP survey & RCCP CAT
Prioritization Ranking	

Non-Structural Projects

Oceanside Beach Monitoring Program

Project Description

The Town of Southern Shores proposes an annual beach monitoring program to evaluate conditions along its 3.8-mile oceanfront shoreline. The project will analyze beach-profile data documenting changes in shoreline position, dune configuration, beach width, and sand volume. Results will be compared with prior surveys and nourishment baseline data to identify erosion hotspots, assess storm impacts, and evaluate nourishment performance. Monitoring will identify increasing risks to public infrastructure, private property, recreational resources, and shorebird and sea turtle habitat. The analysis will consider long-term erosion trends, sea-level rise, storm vulnerability, and sand availability for future nourishment. Findings will inform recommendations for nourishment timing, design adjustments, dune management, and resilience measures.

The project advances RCCP resilience objectives and implements Policy PA 6 of the Town's 2024 Comprehensive CAMA Land Use Plan by supporting data-informed beach nourishment and dune management.



Hazard(s) Addressed	Oceanfront erosion, Storm surge flooding, and Sea level rise flooding
Type of Solution	Nature-Based/Green Infrastructure
Estimated Cost	\$100,000
Estimated Timeline	Annually
Potential Funding Sources	Town, NC Division of Water Resources, Dare County, FEMA
Map/Location	Entire Town oceanfront shoreline as shown on Project Map.
Prioritization Measures	
Cost-Benefit	High
Social Equity	Medium
Internal Capacity	Low
Co-Benefits	Protection of key economic assets
Sources for Project	CAMA Land Use Plan & RCCP survey
Prioritization Ranking	