COASTAL RESILIENCE GRANT PROGRAM FY26

RFR ENV 26 CZM 01

Applicants: **The Towns of Salisbury, Newburyport, and Newbury**

Project Lead Address: **5 Beach Road**

Salisbury, MA 01952

Project Manager:

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Type of Resilience Project:

1. **Vulnerability and risk assessments**
2. **Public Outreach**
3. **Proactive Planning**

Project Title: *Upper North Shore Regional Shore Protection Strategy Development and Needs Assessment*

CLIMATE ADAPTATION

The Upper North Shore of Massachusetts, encompasses Salisbury, Newburyport, and Newbury, including the Merrimack River inlet, barrier beach systems, public and private beaches, and the ecologically significant Great Marsh. This region faces increasing risks from climate change, especially sea-level rise, storm surge, and extreme precipitation.

Projections from the UMass Amherst Northeast Climate Adaptation Science Center estimate 2.3–4.2 feet of sea-level rise by 2070. This will intensify tidal flooding, elevate groundwater levels, and increase erosion and infrastructure damage, particularly in low-lying areas like Salisbury and Plum Island, which already experience frequent inundation.

Coastal storms such as 2018's Winter Storm Riley and 2024's Winter Storm Heather have accelerated dune loss, shoreline erosion, and storm surge impacts. Narrow public beaches and exposed infrastructure heighten these risks. Human activities such as jetty

construction, shoreline development, and dredging near the Merrimack River, have further disrupted sediment transport, degrading natural coastal defenses and increasing vulnerability.

These disruptions, combined with rising seas and storm surge, threaten critical ecosystems like the Great Marsh and Parker River National Wildlife Refuge, along with the blue carbon storage and fisheries they support. As sediment sources become more limited, barrier beach retreat will accelerate, compromising habitat resilience and public safety. Extreme precipitation may also drive inland and riverine flooding, compounding these coastal threats.

To address these challenges, this project adopts a long-term, adaptive strategy centered on integrated sediment management, nature-based shoreline restoration, and climate-informed design. The Climate Resilience Design Standards Tool guides scalable, forward-looking interventions.

This work builds on the Upper North Shore Regional Sediment Management Study (Mass DCR, 2020–2021) and other CZM- and EEA-supported efforts, including MVP-funded vulnerability assessments in Salisbury and Newburyport. These efforts establish a foundation for coordinated, data-driven resilience planning.

Over the next 10–20 years, the region will implement targeted strategies to enhance coastal resilience. These include the beneficial reuse of dredged sediment to restore beaches and dunes, with inland sources supplementing where needed. Structural modifications to coastal infrastructure, such as adjustments to the Merrimack River south jetty, are also being evaluated to support natural sediment flow and reduce erosion.

Beach management plans will guide both immediate storm response and long-term planning, aligning recovery with resilience goals. Coordinated governance across federal, state, local, and private partners will be essential for success.

Sustained beach nourishment and sediment management, informed by local modeling and monitoring, will be critical to adapting to future conditions. Adaptation planning will also consider managed retreat in high-risk areas, supported by robust outreach and education.

This project advances strategies outlined in the draft ResilientCoasts plan, including Strategy 1.6, which calls for expanded support for regional sediment management planning, and Strategy 4, which prioritizes high-impact, long-term resilience actions. It will also support near-term adaptation opportunities through CZM's Resilient Grant Program and explore offshore sediment sources and district-scale flood and erosion protection approaches.

NEED FOR ASSISTANCE

The Upper North Shore municipalities, Salisbury, Newburyport, and Newbury, recognize the critical role of sediment dynamics in shaping coastal resilience strategies and the importance of continued technical study and monitoring. The 2021 *Upper North Shore Regional Sediment Management Study*, commissioned by the Massachusetts Department of Conservation and Recreation, a project partner, and prepared by Applied Coastal Research and Engineering, provided foundational guidance on regional sediment transport and coastal processes. This study has directly informed local management actions over the past four years.

Despite these proactive steps, the region's technical capacity is limited, with municipal staff often balancing multiple roles and lacking specialized expertise in coastal geomorphology and modeling. Technical assistance is therefore essential to ensure sound data collection, interpretation, and implementation of adaptive strategies. Financially, the municipalities rely heavily on state grants and in-kind support from regional planning agencies, such as the Merrimack Valley Planning Commission, to advance resilience initiatives.

Recent projects across the Upper North Shore demonstrate the critical need for sustained data collection and analysis to inform coastal resilience strategies. In 2022, the U.S. Army Corps of Engineers dredged the Piscataqua River Turning Basin, strategically placing approximately 75,000 cubic yards of material at nearshore sites to support sediment flow and coastal stability. The following year, in 2023, the Corps completed maintenance dredging at the Merrimack River entrance, removing 226,000 cubic yards of sediment and placing much of it along Plum Island Beach to mitigate severe erosion near the south jetty. Most recently, in 2024 and 2025, the Department of Conservation and Recreation (DCR), in partnership with the Town of Salisbury, implemented a 30,000-ton sand nourishment project to restore dune height and volume following years of degradation. This effort was supported by multiple LiDAR flights conducted by MassDOT Aeronautics to monitor beach conditions and assess the effectiveness of the intervention over time. Evaluating the outcomes of these efforts is critical to inform future resilience strategies, particularly as each intervention has a limited lifespan. Assistance is needed to support long-term monitoring, modeling, and planning that builds on prior investments and leverages regional coordination.

While this project does not directly involve a designated Environmental Justice (EJ) neighborhood, the region’s public coastal resources, especially in Salisbury due to the Salisbury Beach State Reservation, serve a broad, inclusive population**,** including visitors from EJ communities across northeastern Massachusetts. The towns are committed to inclusive public engagement and will continue to explore opportunities to integrate EJ considerations into project planning and implementation.

PROJECT DESCRIPTION

The project proposes to provide a more detailed quantitative assessment of potential shore and flood protection strategies. To address this, the communities are pursuing a long-term planning effort to better understand coastal erosion, sediment transport pathways, and the feasibility of shore protection strategies. The current work expands on the existing foundation by assessing site-specific protection strategies, conducting a needs assessment for beach and dune nourishment, and identifying potential sediment sources from regional dredging and upland areas.

The goal is to improve shoreline resiliency across the three municipalities by developing informed shore protection strategies. The updated coastal processes assessment will guide erosion control, beneficial use of dredged material, beach management, and broader coastal resilience initiatives. Specific objectives include:

Reviewing and synthesizing prior studies and data, and conducting additional fieldwork

Updating coastal process models for the east-facing open coast

Reassessing shoreline changes at the Merrimack River entrance

Analyzing beach and dune nourishment needs, including longevity and maintenance

Considering local policies and community adaptation strategies (e.g., bylaws, managed retreat, retrofits)

Evaluating regional sources of beach-compatible sediment from dredging, offshore, and upland sites the completion of the following tasks.

Task 1: Kick-off Meeting

Stakeholders from Salisbury, Newburyport, Newbury, DCR, MVPC, and SCS will convene with MCZM to confirm project goals and finalize the scope.

Task 2: Review of Existing Data and Data Collection

SCS will gather and evaluate existing data, including shoreline surveys, sediment characteristics, natural resource inventories, sediment transport studies, infrastructure assessments, and wave data. Thirty new grain size samples will be collected from beaches and dunes. Updated "high water" shoreline positions will be recorded using RTK-GPS to inform change analysis.

Task 3: Updated Coastal Processes Modeling and Analyses

Wave climate will be modeled using spectral wave refraction techniques to capture local and offshore influences. Inputs include NOAA buoy data and U.S. Army Corps datasets. Historical shoreline data and new survey results will be used to calibrate and validate the model. The model will support analysis of nourishment design options. Previous hydrodynamic modeling of the Merrimack River entrance will be revisited to evaluate recent nourishment outcomes and estimate future needs.

Task 4: Modeling and Analyses of Shoreline Stabilization Alternatives

Three shoreline nourishment alternatives will be evaluated for two coastal segments. These alternatives will be assessed using sea-level rise projections over 10-, 20-, and 50-year intervals. The project team will develop a rating matrix and narrative based on input from stakeholders and the public. Potential sediment sources—beneficial reuse of dredged material, offshore deposits, and upland sources—will be analyzed. For each alternative, design footprints, sediment volumes, impact assessments, and cost estimates will be prepared.

Task 5: Project Report

SCS will compile a technical report detailing current conditions, wave and sediment processes, littoral cell boundaries, and stabilization alternatives. The report will include environmental impact screening, conceptual cross-sections, cost estimates, and permitting feasibility for each strategy.

Task 6: Meetings and Public Outreach

The project will include monthly coordination meetings with team members and two public forums. Public engagement will include presentations, informational flyers, and stakeholder communications developed by SCS and municipal partners. A regional coastal planning website, managed by the Merrimack River Beach Alliance, will serve as a central hub for project materials and updates.

PUBLIC BENEFIT

The proposed project provides the public benefit by strengthening coastal resilience along the interconnected barrier beach system shared by Salisbury, Newburyport, and Newbury. This region supports essential public infrastructure and transportation corridors, including vital egress routes that are vulnerable to erosion and storm surge impacts. By advancing site-specific nourishment and protection strategies, the project will mitigate coastal flooding and storm damage to these assets, thereby preserving critical services and access routes for the broader region.

The project will focus on stabilizing coastal beach and dune systems, as demonstrated successfully at Reservation Terrace, where nourishment efforts have already reduced

storm damage. Without intervention, continued erosion will degrade coastal dunes and beaches, increasing the vulnerability of homes, roadways, and utilities, and reducing public access and use of shoreline areas. The loss of these natural buffers would shift the burden of emergency response and recovery to individual residents and local agencies, elevating the cost and severity of storm impacts.

The study area encompasses beaches that are publicly accessible and heavily used for recreation, including state-managed resources and local public lands. These areas are open year-round, accessible via public transportation and roadways, and do not require entry or parking fees, ensuring that the benefits of increased resilience extend to a wide public audience.

The project directly engages the Massachusetts Department of Conservation and Recreation (DCR) as a project partner and aligns with its mission to protect natural resources and promote recreational use of coastal areas. The work builds on prior DCR-funded studies and is coordinated with agency staff. Furthermore, the regional partnership approach, led by local governments in collaboration with the Merrimack Valley Planning Commission, the Merrimack River Beach Alliance, and Sustainable Coastal Solutions, ensures consistency with state and regional climate adaptation priorities.

To support community engagement and education, the project will include a series of public outreach workshops. These workshops will feature presentations on the project's goals and strategies, as well as educational sessions on beach best management practices such as responsible dune access, vegetation preservation, and the importance of sediment management. In addition, the workshops will introduce the concept of managed retreat and its relevance in long-term coastal adaptation planning. If we are not planning for managed retreat, we are leaving the individuals affected to manage it themselves. Through interactive working groups, community members will provide input on local priorities and concerns, helping to shape site-specific solutions. This inclusive process is designed to build public awareness, foster local stewardship, and strengthen support for nature-based resilience approaches.

By coordinating shoreline management across three municipalities, the project promotes shared understanding, joint decision-making, and a scalable model for coastal resilience that can be applied elsewhere in the Commonwealth.

TRANSFERABILITY

An integral part of this effort will be public outreach and education, as community buy-in is crucial to the overall prioritization plan for shore protection. The project will include

two public workshops, each featuring presentations, guidance on local resiliency practices (such as beach management best practices), and group discussions to gather input and recommended actions. Topics will include the sustainability of existing coastal infrastructure and the fiscal implications for towns, issues that are often overlooked. These sessions aim to demystify complex concepts like sea level rise and managed retreat, while promoting collaboration rather than conflict.

The project also proposes the development of a dedicated website, which will serve as a centralized and publicly accessible hub for project updates, public meeting notices, educational resources, and final deliverables. The website will be hosted on a municipal or partner platform and maintained beyond the grant period to ensure continued access to outcomes and materials. It will also include transferable tools, methodologies, and decision-making frameworks that can support other communities, organizations, and tribes facing similar coastal resilience challenges. Stakeholder input is critical to the success of this project, especially given the level of potential local funding needed to implement long-term solutions and the significant role of private property owners in storm damage mitigation.

Through public education, the project will enhance awareness of the long-term benefits of beach nourishment and sediment management and illustrate the risks of inaction. It is anticipated this will foster greater collaboration with private owners and build broader regional support for sustainable shoreline management. This outreach and information-sharing approach is intentionally designed to be replicable, offering a model that can be adopted by other coastal communities, particularly those managing developed barrier beaches.

PROJECT TIMELINE

The Towns anticipate that the proposed project will be completed by June 30, 2026, and within the timeframe allotted under the *FY26 Coastal Resilience Grant Program*. Presented below is the anticipated project timeline for the proposed project:

WORK TASK	ESTIMATED COMPLETION DATE
Award to Consultant	**September 15, 2025**
Task 1: Kick-off Meeting	**September 20, 2025**
Task 2: Review of Existing Data and Data Collection	**September 15, 2025 – December 31, 2025**
Task 3: Updated Coastal Processes Modeling and Analyses	**September 15, 2025 – February 15, 2026**
Task 4: Modeling and Analyses of Shoreline Stabilization Alternatives	**January 1, 2026 – May 15, 2026**
Task 5: Project Report	**February 1, 2026 – June 15, 2026**
Task 6: Meetings and Public Outreach	**November 1, 2025 – June 30, 2026**
Completed Project	**June 30, 2026**

PROJECT BUDGET

The project budget has been included as **Exhibit A** and follows the form provided in the RFR. Based upon the total budget required for the project, the Project Team respectfully submits this grant application, herein, requesting a total of $232,830 (90% of the total project cost) in state funding assistance. The Project Team fully understands that if selected to receive state funds under this program that a 10% local match consisting of cash, in-kind services, or a combination of both is required. The Project Team further understands that state funding will be provided on a reimbursement basis. An authorized statement signed by the Municipal Administrators acknowledging the grant program requirements is provided in **Exhibit B**.

PROJECT MANAGEMENT AND PARTNERS

The Towns of Salisbury, Newbury, and the City of Newburyport, and DCR representatives led by Patrice Kish and Darryl Forgione, will be responsible for leading the Team that will be assembled for this project. The municipalities have strategically formulated this team to consist of municipal experts in the fields of engineering, planning, coastal resources, environmental permitting, and coastal construction practices. The team has previously and successfully managed dozens of coastal projects which received funding assistance from the following state and federal agencies: Massachusetts Coastal Zone Management (CZM), Conservation and Recreation (DCR), Environmental Protection Agency (EPA), Federal Emergency Management Agency (FEMA), and Massachusetts Emergency Management Agency (MEMA). The municipalities plan to hire Sustainable Coastal solutions, Inc. (SCS), a group of experienced coastal experts, scientists and engineers that are specifically proficient in performing the quantitative analysis of coastal change and sediment transport processes, assessing and designing shore protection measures, and planning/developing strategic coastal management practices that will result in sustainable, long-term coastal resiliency along the project shoreline. The Project Team will be responsible for the overall management of the project and the consultant, and will also take the lead in public outreach efforts.

Newbury, Newburyport, and Salisbury are committed to partnership with the Mass DCR and each community's residents to unified beach management. All parties are active participants in the MRBA. The group meets regularly and provides a critical forum for community outreach, information exchange, and project prioritization in regards coastal resilience. One of the group's core values is the importance of collaboration and partnership in managing a shared interest.

The project team will work closely with the Merrimack River Beach Alliance, a collaborative group that brings together stakeholders in coastal resiliency within the 3 communities and all levels of government to work on these issues.

Presented below are the key members selected to lead the Project Team. The resumes of key municipal and Engineering Consultant personnel are provided in **Exhibit C**.

LOCAL AND REGIONAL PARTNERSHIPS.

The project exemplifies local and regional partnerships by bringing together three municipalities for a regional project. The project also partners with the Massachusetts Department of Conservation and Recreation and utilizes the skills of the Merrimack Valley Planning Commission to ensure the best reach and complete context of project materials. The project partner team is as follows:

Lisa Pearson, Director of Planning and Development
Adriane Marchand, Conservation Agent, Town of Salisbury

Alison Weaver, Administrative Assistant, Conservation and Grants

Kristen Grubbs, Newbury Planning Director

Mason Ferrick, Newbury Conservation Agent

Andrew Port, Newburyport Director of Planning

Patrice Kish, DCR Chief, Design & Engineering

Darryl Forgione, DCR Project Manager

Hanna Mogensen, Environmental Program Coordinator & MassBays Regional Coordinator, Merrimack Valley Planning Commission

Sean Kelley, P.E., Senior Coastal Engineer (SCS)

John Ramsey, Principal Coastal Engineer (SCS)

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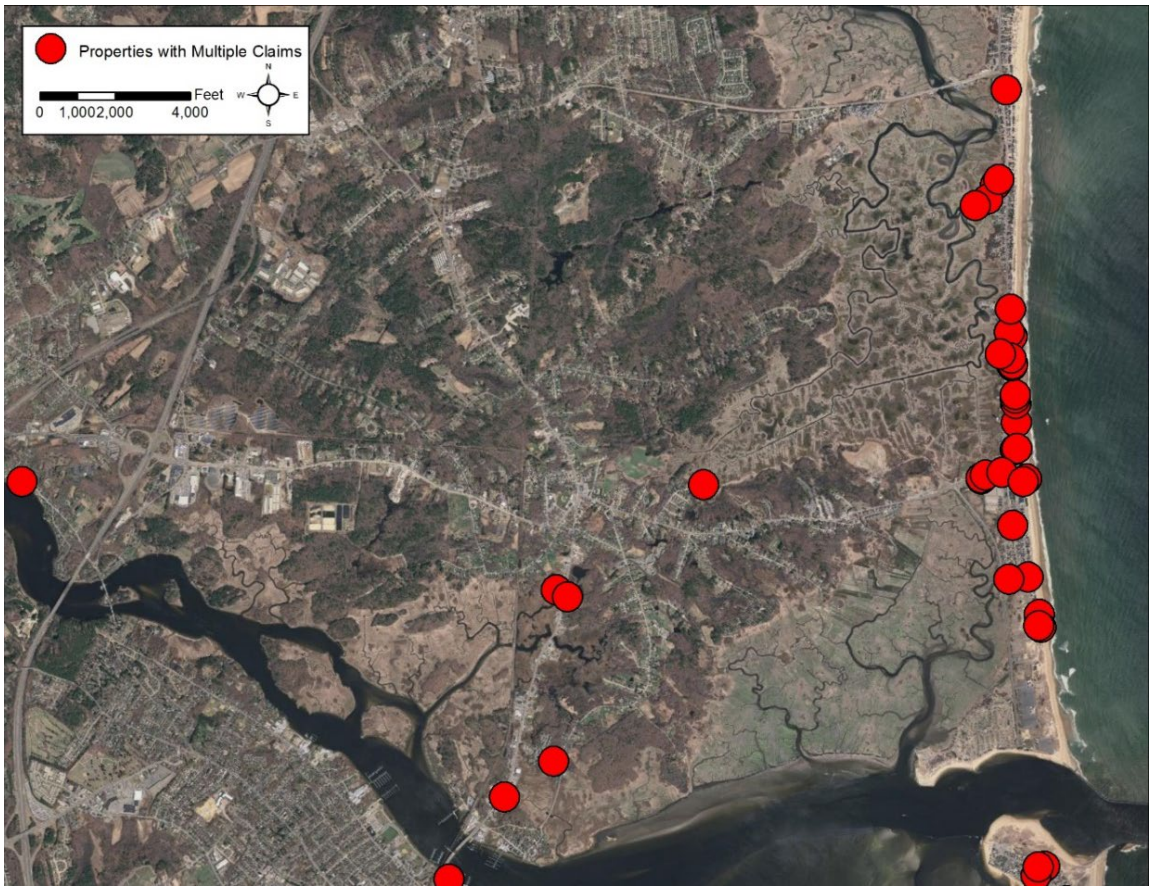

Figure 1 Spatial distribution of FEMA repetitive loss properties along Salisbury Beach.

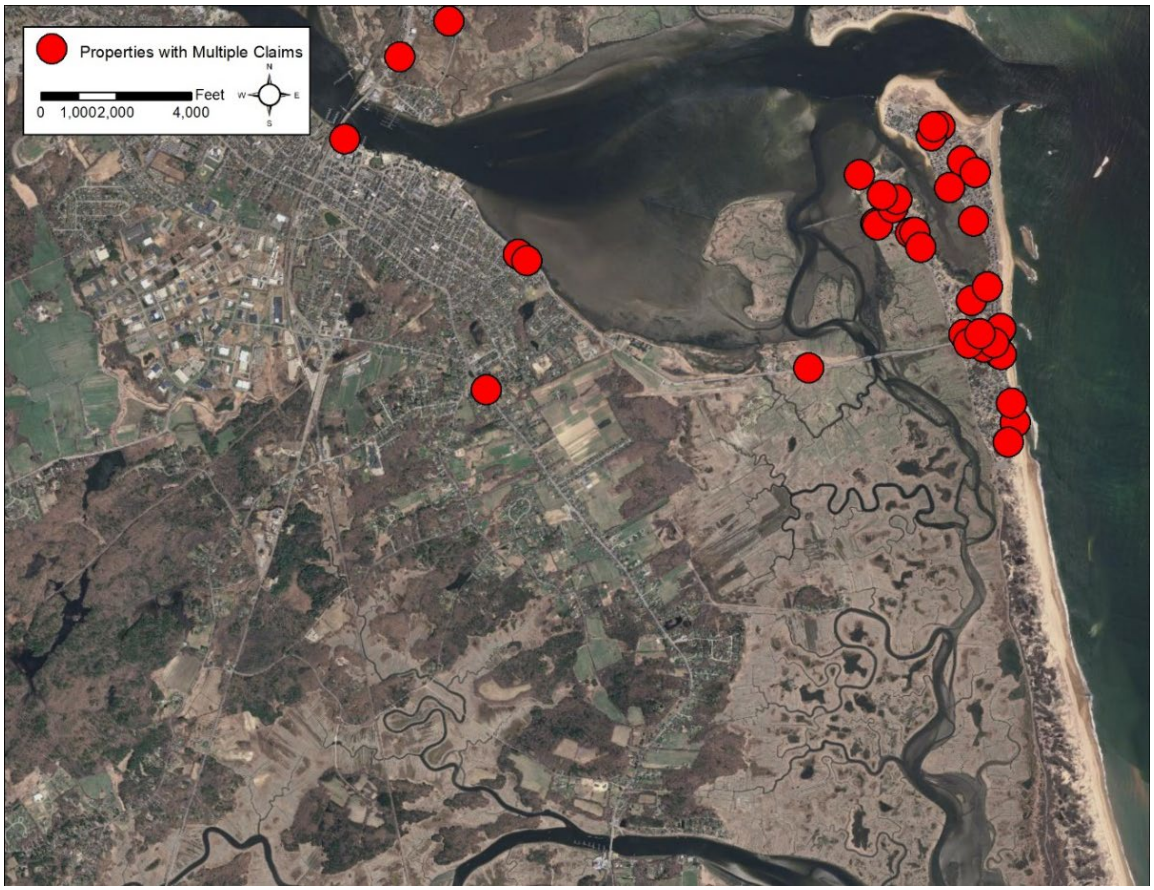

Figure 2 Spatial distribution of FEMA repetitive loss properties for Plum Island.

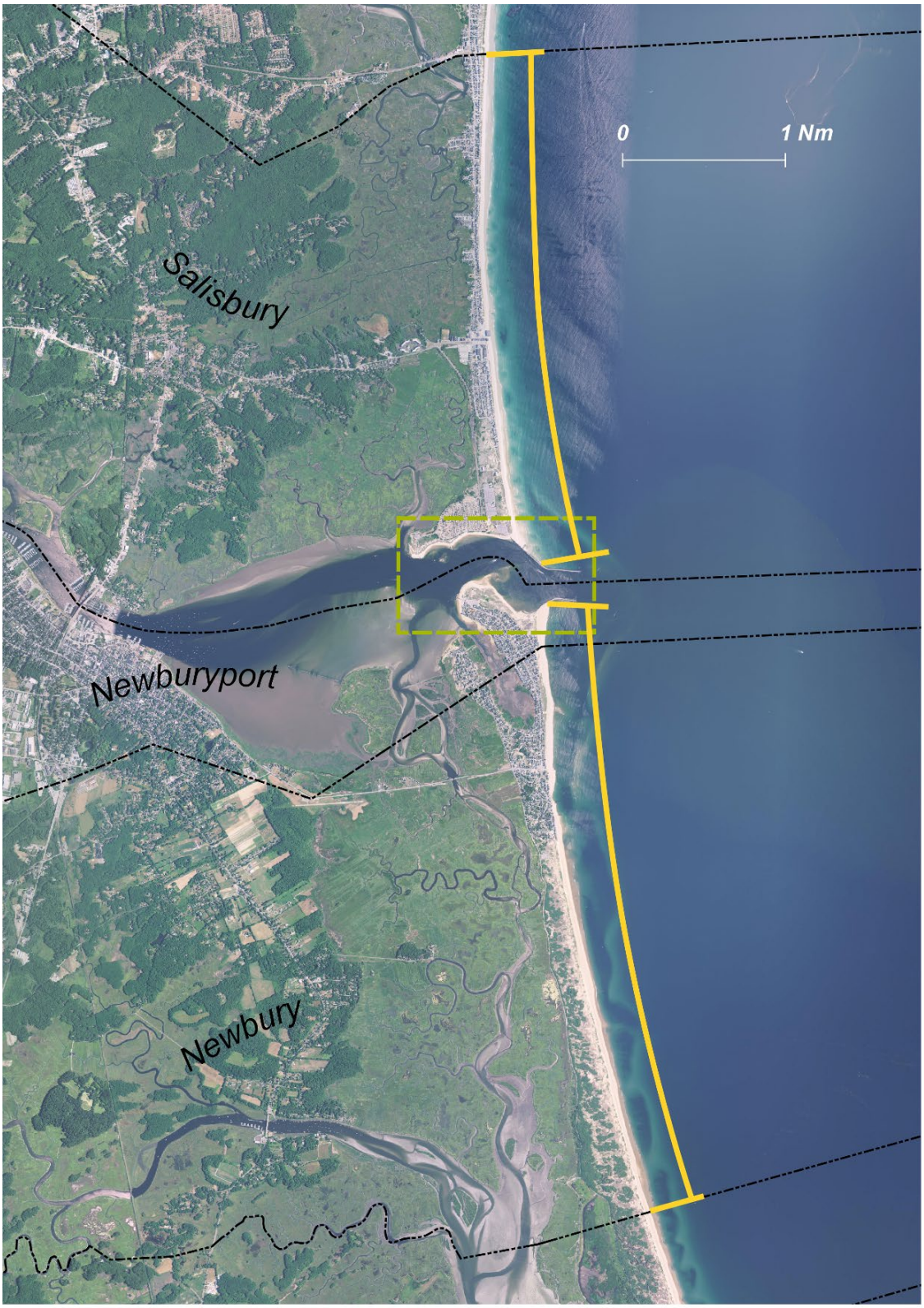

Figure 3 Aerial map of the project area, showing limits of open ocean shoreline modeling (solid yellow line) and the inlet area where analyses will be based on recent shoreline performance (dashed box). Town boundaries are also provided