

A vertical decorative band on the left side of the cover features various green silhouettes of food items including a pear, a pumpkin, a corn cob, a chili pepper, and a fly.

Climate Resilience and Food Systems: Interconnections, Best Practices, and Recommendations for Rhode Island

**RI FOOD
POLICY
COUNCIL**



Climate Resilience and Food Systems: Interconnections, Best Practices, and Recommendations for Rhode Island

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Executive Summary

As a coastal state, Rhode Island (RI) faces severe climate risks. The state incurred \$2-5B in climate disaster damages from 1980 to 2024. Currently, RI's \$19B food economy supports 75k jobs. **Yet, RI climate strategies often ignore the food system's potential to enhance resilience.** This report demonstrates how food systems & climate resilience are deeply interconnected to provide recommendations to support RI climate resilience approaches that will enhance both.

Food System and Climate Resilience Interconnections

- **Agriculture:** Upstream soil stewardship and agricultural land preservation enhance food security while acting as natural green infrastructure, absorbing extreme rainfall, and reducing toxic nutrient runoff into downstream coastal ecosystems.
- **Coastal Ecosystems & Blue Foods:** Coastal habitat restoration and restorative aquaculture buffer storm surges, stabilize shorelines, improve water quality, and protect wild fish stocks.
- **Food Supply Chains & Socio-Economic Resilience:** Protecting working waterfronts, localizing processing and distribution infrastructure, and supporting food hubs safeguards local livelihoods, strengthens food economy resilience, and ensures equitable community health.

Best Practices & Utilization

Inclusive, holistic land-to-sea management frameworks, including best practices like agroforestry, composting, and nature-based solutions intentionally bolster food systems and climate resilience simultaneously. Various examples exist of real-world applications, including RI projects like Ocean Hour Farm, Almy Pond Wetland Restoration Project, and Farm Fresh RI, as well as models from the national Sea Grant Network, like Hawai'i's Pili Nā Moku initiative.

Recommendations

To implement these best practices for resilience, state and municipal leaders must

- Streamline fishing, aquaculture, and direct-to-consumer permitting;
- Create a designated conservation restoration permit;
- Reform disaster policies to replace damaged gray infrastructure with green;
- Adapt agricultural programs for coastal landscapes;
- Utilize cross-sector funding streams to finance projects;
- Align resilience with commercial innovation.
- Work collaboratively on climate resilience projects;
- Invest in educational outreach, storytelling, & land-to-sea watershed literacy;
- Further strengthen social cohesion through cross-sector networks;
- Create a unified strategic policy agenda actively advocating for Green Bond funding.

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Introduction

Climate change is adversely affecting humans' ability to live on the earth. Over the last century, sea levels have risen 6 inches¹, and global temperatures have climbed more than 2°F above 20th-century averages.² Meanwhile, the cost associated with extreme weather has soared: 5-year CPI-adjusted averages of damage from extreme weather events has increased from \$18.9 billion in 1984 to \$149.3 billion in 2024.³ This has necessitated many adaptations which are commonly referred to as “climate resilience”. The food system is far from immune to these effects, facing disruptions in the production, storage, and transportation of food. Yet often when state and municipal decision makers discuss climate resilience, they ignore the effects on our food system and the potential benefits the system can provide.

Rhode Island (RI), being a coastal state, faces a high climate risk, which is a huge financial threat for state legislators and municipalities.⁴ RI's food economy is a \$19B industry, supporting over 75,000 jobs across food retail, wholesaling, processing, commercial fisheries, and agriculture.⁵ At the same time, the state has experienced 33 major climate disaster events from 1980 to 2024, incurring between \$2-5B in total damages.⁶ While winter storms have been the most common type of billion-dollar disaster, tropical cyclones/hurricanes are the costliest type of disaster. In the 29 years from 1980 to 2009, Rhode Island experienced 3 hurricanes. In the 13 years between 2010 and 2023, the state has experienced 5 hurricanes.

For RI's municipal decision-makers, the economic ramifications from escalating climate-risks to the food system are severe: upstream land runoff degrades downstream water quality and marine ecosystems, while extreme weather and storm surges directly damage working waterfronts, coastal agriculture, and local food supply chains. Put more simply, integrating food systems best practices into climate and coastal resilience frameworks is essential to protecting local economies and municipal infrastructure from disasters.

In 2018, RI's agencies, municipalities, and partners collaborated to address the impacts of climate change, working together to implement innovative programs, funding mechanisms, and technical assistance through the state's first climate resilience strategy, Resilient Rhody. In response, the Municipal Resilience Program (MRP) was created by the Rhode Island Infrastructure Bank (RIIB) to help municipalities build resilience against climate change.⁷ However, this version of

¹ <https://www.nationalacademies.org/news/human-driven-climate-change-is-causing-sea-levels-to-rise>

² <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>

³ <https://www.ncei.noaa.gov/access/billions/time-series>

⁴ <https://climatechange.ri.gov/resilient-rhody-2025>

⁵ <https://rifoodcouncil.org/data-dashboard/food-system-economy/>

⁶ <https://rifoodcouncil.org/data-dashboard/food-and-climate/>

⁷ <https://www.riib.org/solutions/programs/municipal-resilience-program/>

Resilient Rhody lacked a dedicated section on the role food systems could play in supporting climate resilience. Building on the original strategy and aligned with the goals of the state's 2021 Act on Climate, RIDEM released Resilient Rhody 2025. This updated statewide strategy expanded climate adaptation efforts, incorporating agricultural protection and sustained productivity as 1 of its 79 key resilience actions.⁷ While this is a step forward, in general, little attention, support, and funding has been given to projects concurrently supporting food systems, climate resilience, and/or coastal resilience.

This report demonstrates that food systems actively support climate and coastal resilience (and vice versa), and provides actionable recommendations for policymakers, municipal leadership, and community-based organizations to support and promote opportunities for these types of projects. **Specifically, this report aims to answer the following questions:**

- What are the interconnections between food systems and climate resilience, focusing on coastal resilience?
- What best practices are used in New England, the U.S., and internationally that intentionally address climate resilience and food systems concurrently?
- What projects have been conducted by Sea Grant programs across the country that support food systems and coastal resilience?
- What funding and investment mechanisms in the state (RI), and nationally, are supporting or may support food systems and climate/coastal resilience projects?
- What are existing and potential high-priority RI-based projects that concurrently support climate resilience and food systems?

To address the above research objectives, secondary data in the form of academic and gray literature were collected, analyzed, and combined with interviews with relevant RI stakeholders, Sea Grant staff, and Sea Grant-funded researchers. The findings of this research provide valuable insights for understanding how food systems projects advance climate and coastal resilience (and vice versa), supporting recommendations on viable ways in which municipalities, policymakers, and community-based organizations can support such projects.

Section I: Defining the Interconnections Between Climate Resilience & Food Systems

To review the ways in which climate resilience and the food system connect, or the “interconnections”, Section I is divided into three general categories of interconnections: Agriculture, Coastal Ecosystems & Blue Foods, and Food Supply Chains & Socio-Economic Resilience. Each category is further separated into specific interconnections associated with the general categories.

Agriculture

Soil Health

Soil is essential to life on Earth. However, not all soil is created equally. Climate change and unsustainable land management accelerate soil degradation while increasing greenhouse gas emissions, creating a harmful climate feedback loop.⁸ Restoring soil health is a key strategy for building climate and coastal resilience.⁹ Healthy soil is “teaming with billions of bacteria, fungi, and other microbes that are the foundation of an elegant symbiotic ecosystem”.¹⁰ Investing in soil health practices enhances water storage and filtration, serving as a natural form of stormwater infrastructure. When soils hold and filter water, they slow extreme rainfall, mitigate localized flooding, and reduce nutrient and pollutant runoff into downstream wetlands, estuaries, and coastal waters.^{9,10} Along with this, healthy soils sustain crop production under the pressures of climate variability, drive carbon sequestration through nutrient cycling, and provide a foundation for municipal infrastructure.^{8,10}

“The impact of increasing organic matter in our soils is incredible. There’s a correlation between organic matter and water absorption. If your soil has only 1% organic matter, it may only be able to absorb about an inch of rain in a 24-hour period. In our fields, we have 10–12% organic matter, so even during a major rain event, that water can soak into the soil like a sponge instead of running off. That helps prevent runoff from carrying pollutants into our bays and oceans. At the same time, the soil filters the water as it moves through, helping recharge our aquifers with cleaner water. And because the soil holds more water and nutrients, it creates the conditions for healthier, more robust plants.” - Jayne Merner, Earth Care Farm

Agricultural Watershed Health

Watersheds route rainfall and snowmelt into rivers, streams, and oceans. Healthy watersheds are critical natural buffers against extreme weather.¹¹ In the watershed system, upstream watersheds supply clean irrigation water and build drought

⁸ <https://www.weforum.org/stories/2024/11/soil-climate-change-sustainable-agriculture/>

⁹ <https://www.sciencedirect.com/science/article/pii/S004896972502100X>

¹⁰ <https://www.nrcs.usda.gov/conservation-basics/soil/soil-health>

¹¹ <https://www.epa.gov/hwp/benefits-healthy-watersheds>

resilience for local farms. Downstream, sustainable agricultural practices prevent nutrient runoff from contaminating municipal drinking supplies and marine ecosystems, and prevent toxins from cycling into locally consumed seafood.¹² Managing these land-to-sea hydrological flows through green infrastructure and sustainable land management protects vital coastal habitats like salt marshes and wetlands.¹³ By absorbing storm surges and filtering pollutants, healthy watersheds reduce municipal infrastructure damage, and protect both public health and vulnerable coastal communities.^{11,13}



Figure 1: Diagram of a watershed, displaying the flow of water from the top of the watershed to the bottom ([USA EPA New England](https://www.epa.gov/newengland/watersheds), 2025).

Agricultural Land Preservation

Agriculture is highly dependent on climate stability, making local food security highly vulnerable to accelerating droughts, intense floods, and sea level rise.¹⁴ Across coastal regions, climate-driven stressors, such as accelerated soil erosion, saltwater intrusion, and soil salinization, are driving losses in productive agricultural land.^{14,15}

Concurrently, municipal leaders face complex land-use trade-offs as pressure grows to develop land for a wide variety of purposes including renewable energy facilities, like solar farms.¹⁶ The decisions these leaders make can further exacerbate loss of

¹² https://www.chesapeake.org/stac/wp-content/uploads/2021/07/FINAL_STAC-Soil-Health.pdf

¹³ https://files.ipbes.net/ipbes-web-prod-public-files/2021-06/20210609_workshop_report.pdf

¹⁴ <https://9january2017snapshot.epa.gov/climate-impacts/climate-impacts-agriculture-and-food-supply>

¹⁵ <https://www.climatehubs.usda.gov/taxonomy/term/391>

¹⁶ <https://farmland.org/smart-solar-policy-recommendations>

agricultural lands. When facing these choices they must be fully aware of the tradeoffs they are making such as allowing development that increases impervious surfaces will increase runoff/flooding, as well as understand that conserving and adapting existing agricultural land is key to local climate resilience.¹⁷ Protecting these lands will safeguard local economic stability, preserve natural buffers, and secure local food production against supply chain disruptions.^{14,17}

Coastal Ecosystems & Blue Foods

Coastal Ecosystem Restoration

Climate-driven stressors, upstream land-use decisions, and fishing/harvesting practices in the seafood industry are accelerating the degradation of crucial coastal habitats, including wetlands, salt marshes, shellfish reefs, coastal forests, and seagrass meadows.^{18,19} These coastal ecosystems serve as natural infrastructure, actively absorbing carbon, stabilizing shorelines, and reducing wave heights during severe storms.^{19,20} When these natural defenses erode, heightened storm surges and saltwater intrusion push farther inland, inundating coastal transportation routes, contaminating agricultural irrigation sources, and threatening regional food infrastructure (processing facilities, cold storage, and distribution routes).^{20,21,22} Conversely, restoring these coastal buffers (through oyster restoration, wetlands restoration, etc.) is a high-yield investment for local governments, shielding public infrastructure, preserving economic stability, and protecting frontline communities from climate hazards.^{18,22}

“When I think of climate resilience, I think of...shellfish restoration...it’s literally...rebuilding this 3D structure that provides habitat for fish, that buffers the shores from storms...then the seafood industry, like, fishermen benefit, because all that oyster reef creates habitat for little juvenile black sea bass, and little juvenile tautog, and cunner...and I literally see it. I’m like, oh my gosh, those are gonna recruit into the fishery.” - Azure Cygler, RI Sea Grant & Rhody Wild Sea Gardens.

¹⁷ <https://extension.psu.edu/harnessing-renewable-energy-a-sustainable-future-for-farming>

¹⁸ <https://www.unep.org/topics/ocean-seas-and-coastland-to-sea-baseds/ecosystem-degradation>

¹⁹ <https://www.wri.org/insights/what-is-blue-carbon-benefits-for-people-planet>

²⁰ <https://www.sciencedirect.com/science/article/pii/S0301479726006146>

²¹ <https://www.fao.org/ecosystem-restoration-monitoring/stories-detail/four-ways-ecosystem-restoration>

²² <https://toolkit.climate.gov/food-distribution>

Water Quality

Freshwater, coastal, and marine ecosystems face growing pressure from habitat destruction, agricultural nutrient runoff, pollution, and stormwater, all of which are exacerbated by extreme weather events.¹⁸ These pressures trigger eutrophication (excess nutrients in a body of water) and harmful algal blooms (HABs), causing widespread fish kills, marine and coastal habitat loss, and food safety concerns with seafood.^{21,22} In addition, warming water temperatures and ocean acidification reduce the nutritional quality of wild and farmed seafood.²¹ Together, these environmental stressors heighten risks for vulnerable coastal communities, disrupting local seafood economies and impacting public health.²² Mitigating water quality risks requires prioritizing land-to-sea management strategies such as green stormwater controls and holistic land management practices to strengthen municipal climate resilience.¹⁸

Sustainable Offshore Renewable Energy

The rapid development of offshore wind energy as a climate resilience strategy presents complex trade-offs for coastal communities.²³ The construction and operation of wind turbines can displace commercial, recreational, and tribal fishermen and aquaculturists. Additionally, offshore wind can alter the distribution and abundance of local fish species.^{24,25} Furthermore, offshore wind logistics compete for the same waterfront infrastructure, ports, and shoreline access that local seafood producers, port workers, and coastal neighborhoods depend on.²⁶ This disproportionately impacts low-income and Black, Indigenous, and People of Color (BIPOC) communities, which historically border industrial port zones and face increased industrial traffic, diesel emissions, and gentrification that prices out traditional waterfront jobs.²⁵ At the same time, offshore renewable energy is a fast-growing industry that plays a vital role in addressing the climate crisis by transitioning away from fossil fuels.²⁴ It also offers a viable alternative to siting renewable projects on agricultural or arable land. By pursuing proactive strategies that integrate coastal community and stakeholder needs into energy projects, Rhode Island can build a clean energy economy, while protecting marine ecosystems, safeguarding local seafood supply chains, and preserving fishers' livelihoods.²⁷

²³ https://www.selc.org/news/powering-the-south-with-offshore-wind/?gad_source=1&gad_campaign

²⁴ <https://www.fisheries.noaa.gov/topic/offshore-wind-energy/evaluating-impacts-to-fisheries>

²⁵ <https://www.sciencedirect.com/science/article/abs/pii/S2214629624005103>

²⁶ <https://www.newenergycoalition.org/en/offshore-wind-farms/>

²⁷ <https://www.boem.gov/renewable-energy/reducing-or-avoiding-impacts-offshore-wind-energy>

Food Supply Chains & Socio-Economic Resilience

Resilient Working Waterfronts

Climate-driven extreme weather not only accelerates the loss of arable land, but also threatens the physical stability of working waterfronts. Key infrastructure, like commercial fishing docks, seafood processing plants, aquaculture facilities, and distribution terminals, faces escalating flood risks from storm surges and sea level rise.²⁸ These climate-driven stressors can create processing bottlenecks, product loss, and broader market disruptions across the seafood supply chain²⁸ resulting in significant lost economic opportunities. Concurrently, spatial competition from expanding offshore renewable energy logistics increases competition for the working waterfront.^{26,27} Implementing targeted municipal resilience strategies is therefore essential to preserving working waterfronts, sustaining coastal communities, and maintaining regional seafood supply chains.²⁹

Food Supply Chains & Socio-Economic Security

Climate resilience directly strengthens localized food systems and socio-economic security. As sea level rise and extreme weather events degrade important coastal and inland transportation routes, working lands, and port assets, supply chain bottlenecks cause immediate economic losses.³⁰ Transportation delays, power outages, and cold-storage disruptions cause widespread food spoilage and financial strain across the supply chain. Producers are left vulnerable to long-term instability from damaged equipment and shifting resource availability, while consumers experiencing price volatility and escalated food insecurity.^{30,31} Simultaneously, changing climate patterns are shifting agricultural landscapes and driving marine species northward into new regional waters.³² While farmers and fishers are highly adaptable, they face persistent barriers with regulatory alignment, market access (such as permits to catch/sell new species and buyer demand for new/unfamiliar species), and regional processing capacity.²¹ Therefore, local leaders must pair resilient infrastructure with targeted policy support to strengthen localized food supply chains, protect economies, and guarantee long-term food security.^{18,22}

²⁸ <https://www.sciencedirect.com/science/article/abs/pii/S0308597X23003305>

²⁹ <https://pingree.house.gov/legislation/protecting-working-waterfronts.htm>

³⁰ <https://www.usda.gov/sites/default/files/documents/FullAssessment.pdf>

³¹ <https://pmc.ncbi.nlm.nih.gov/articles/PMC11325766/>

³² <https://www.climate.gov/news-features/featured-images/search-cooler-waters-marine-species-are>

Food Justice, Equity, & Public Health

Climate hazards disproportionately affect low-income communities, frontline food systems workers, and BIPOC communities.³³ Historical discriminatory land-use policies, like redlining, have left these neighborhoods systematically exposed to heightened flood risks, urban heat islands, and environmental hazards.^{33,34} At the same time, pre-existing economic and health disparities limit access to safety nets, healthcare, and resources required to adapt and recover.^{33,35} Climate-related hazards further compound these inequities by triggering food supply shocks, escalating rates of foodborne illness, and threatening traditional harvesting rights and cultural foodways.^{35,36,37} Building meaningful climate resilience requires, and will be most successful when, local governments to integrate food justice into coastal, agricultural, and environmental planning, ensuring that frontline communities directly help to shape resilience strategies.^{34,35}

³³ <https://cig.uw.edu/learn/inequities-in-climate-impacts/>

³⁴ <https://eri.iu.edu/erit/implications/equity-justice-food.html>

³⁵ <https://www.climatesolutions.org/article/2025-10/food-security-food-justice-and-climate-solution>

³⁶ <https://www.oregonfoodbank.org/posts/hunger-and-humanity-connecting-food-justice>

³⁷ <https://pmc.ncbi.nlm.nih.gov/articles/PMC9729008/>

Section II: Best Practices

The following section outlines effective **best practices** that intentionally bolster food systems and climate resilience simultaneously. Because these interconnections span both environmental and economic systems, many of the best practices yield co-benefits. Each practice identifies its associated interconnections prior to its description. The benefits of supporting these practices for municipalities are listed after the description. The information in this section draws from secondary research and conversations with relevant RI stakeholders.

Climate-Smart Agricultural Practices (CSA)

Associated Interconnections: Implementing CSA will help address the following interconnections discussed in Section I: *Soil Health; Agricultural Watershed Health; Agricultural Land Preservation; Coastal Ecosystems Restoration; Water Quality; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

CSA is a holistic, integrated approach focused on managing landscapes such as cropland, livestock, forests, and fisheries to address the interlinked challenges of food security and climate change while increasing productivity, resilience, and carbon sequestration.³⁸ Key CSA practices include:

- **Permaculture:** Whole-farm design systems that mimic natural ecosystem balance. Core practices like no-till farming, organic ground cover, polycultures, and rainwater harvesting build soil microbial diversity and capture carbon, reducing soil erosion during municipal flood events.^{39,40}
- **Agroforestry:** The intentional integration of trees and shrubs with crops or livestock (e.g., alley cropping, silvopasture, riparian buffers, windbreaks, and forest farming).⁴¹ Perennial root systems anchor soil in place, reducing erosion, and build soil structure that filters agricultural runoff before it flows downstream.^{42,43}
- **Regenerative Agriculture:** Farming practices that improve soil health by minimizing tillage and keeping carbon in the soil. Core practices include composting (diverting waste from landfills and cutting emissions of methane), cover cropping, managed rotational grazing, and salt-tolerant crop planting.⁴⁴
- **Conservation Agriculture:** Sustainable farming methods built on crop diversification, minimal soil disturbance, and permanent ground cover.

³⁸ <https://www.worldbank.org/en/topic/climate-smart-agriculture>

³⁹ <https://oceanhourfarm.org/2024/06/28/what-is-permaculture-whole-systems-design/>

⁴⁰ <https://open.oregonstate.edu/permaculturedesign/chapter/sea-level-rise-and-flooding/>

⁴¹ <https://www.fs.usda.gov/nac/practices/>

⁴² <https://www.mdpi.com/2673-4834/7/1/31>

⁴³ <https://www.savannainstitute.org/agroforestry-practices/>

⁴⁴ <https://www.weforum.org/stories/2022/10/what-is-regenerative-agriculture/>

Techniques such as contour buffer strips, cover crops, nutrient management (for example, using seaweed fertilizers), and integrated pest management reduce erosion, enhance water efficiency, and maximize on-farm cost savings.⁴⁵

- **Restorative Marine Aquaculture:** Commercial or subsistence farming of marine life (especially bivalves and seaweed) that actively restore ocean ecosystems. Well-designed systems absorb wave energy during storms, filter water to improve water quality, mitigate ocean acidification, and restore habitat.^{46,47,48} A great example of restorative marine aquaculture is Integrated Multi-Trophic Aquaculture (IMTA), an advanced CSA system that farms species from different trophic levels (species from different food chain levels) together to mimic natural ecosystems. Waste nutrients from one species feed another, enhancing yield while reducing nutrient pollution and reducing ocean acidification.⁴⁹

Benefits to Municipalities: *Adopting CSA practices will increase Stormwater buffering and flooding mitigation; enhance carbon sequestration; improve water quality; increase landfill diversion; food supply resilience; agricultural land productivity.*

Coastal and Marine Spatial Planning (CMSP)

Associated Interconnections: Implementing CMSP will help address the following interconnections discussed in Section I: *Coastal Ecosystems Restoration; Water Quality; Sustainable Offshore Renewable Energy; Resilient Working Waterfronts; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

CMSP is a public, multi-sector process that analyzes and allocates the spatial and temporal distribution of human activities in ocean and coastal waters. Essentially, CMSP acts as a comprehensive plan for coastal/marine waters, similar to how cities use zoning to separate industrial sites from parks and recreational spaces. This approach balances socio-economic goals with ecological conservation (e.g., allocating dedicated space for commercial fishing and shipping lanes while protecting areas for coastal habitat restoration) to ensure the sustainable, long-term use of shared marine resources.^{50,51}

⁴⁵ <https://www.fao.org/conservation-agriculture/en/>

⁴⁶ <https://www.climatehubs.usda.gov/hubs/northwest/topic/northwest>

⁴⁷ <https://library.edf.org/AssetLink/gnm10f35t0fbqil5s26rl4i55ptxt415.pdf?>

⁴⁸ <https://www.conservationgateway.org/collections/ocean/restorative-seafood-production>

⁴⁹ https://library.edf.org/AssetLink/gnm10f35t0fbqil5s26rl4i55ptxt415.pdf?_gl=1*5mh7mh

⁵⁰ <https://coastalscience.noaa.gov/science-areas/coastal-and-marine-planning/>

⁵¹ <https://www.ioc.unesco.org/en/marine-spatial-planning>

Benefits to Municipalities: *Strengthens local seafood economy; protects seafood workers careers; provides local planners with dynamic frameworks to safety site restorative aquaculture.*

Consumer Education & Awareness

Associated Interconnections: Consumer education and awareness will help address the following interconnections discussed in Section I: *Soil Health; Agricultural Watershed Health; Agricultural Land Preservation; Coastal Ecosystems Restoration; Water Quality; Resilient Working Waterfronts; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

A key part of addressing climate and food system realities in Rhode Island is awareness and adaptation by Rhode Island residents. Consumer education around local food systems is a key best practice for building socio-economic resilience through local demand for climate-smart foods and shifting seafood species (i.e. learning to eat/prefer what is available).⁵² Expanding community-based education around public health, food justice, and climate risks, through storytelling in particular, will also empower food systems workers, BIPOC communities, and local consumers with actionable knowledge to help bolster local advocacy driving policy change. Core practices for consumer education and awareness include Farm to Institution procurement and curriculum, culinary training for underutilized species and shifting species, community-supported agriculture (CSA), community-supported fisheries, agritourism, and public awareness campaigns.^{52,53,54} Throughout the food system behavior change will be needed to adapt to our climate realities. Even practices such as composting programs, when made available, will need Rhode Islanders to embrace a new behavior to increase adoption.

Benefits to Municipalities: *Strengthen local food economy; protect agricultural workers careers; improve public health.*

Farmland Access & Farmworker Support

Associated Interconnections: Farmland access and farmworker support will help address the following interconnections discussed in Section I: *Soil Health; Agricultural Watershed Health; Agricultural Land Preservation; Water Quality; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

⁵² <https://mecklenburg.ces.ncsu.edu/news/the-consumers-role-in-the-local-food-system/>

⁵³ <https://civileats.com/2016/08/29/forget-farm-to-table-its-farm-to-institution-sourcing>

⁵⁴ <https://www.cfcni.org/sea-to-schools.html>

Farmland access and worker support programs preserve working agricultural land during generational transitions, help new farmers prosper, and provide the long-term tenure security needed to invest in CSA practices.

- **Succession Planning:** Structured business and legal transfer frameworks that help transitioning farmers pass land and operations to the next generation. This prevents farms from being sold for non-agricultural development during generational changes - often because there simply was no plan in place.⁵⁵
- **Farmland Conservation Easements:** Legal agreements that permanently restrict non-farm development on agricultural land. This keeps farmland affordable for future generations and protects long-term land-tenure security for farmers to feel more confident investing in multi-year CSA practices.⁵⁶
- **Farmland Access Support:** Programs, land matching platforms, and policy tools that connect new, beginning, and historically underserved farmers with affordable land, lease agreements, and capital to build viable agricultural businesses.⁵⁷
- **Agri-solar:** Co-locating solar energy infrastructure directly with active crop cultivation or livestock grazing, allowing municipalities to generate renewable energy without converting arable farmland away from active food production.⁵⁸

Benefits to Municipalities: *Preservation of working agricultural land; encourage long-term climate resilience investments; strengthen local food economies; balancing clean energy with local agriculture.*

Localized Food Systems Networks

Associated Interconnections: Localized food systems networks will help address the following interconnections discussed in Section I: *Soil Health; Agricultural Watershed Health; Agricultural Land Preservation; Resilient Working Waterfronts; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

Localized food systems networks are webs of people, farms, and organizations that grow, distribute, and consume food within a specific and local region.⁵⁹ Local food systems networks build community resilience, shorten supply chains and reduce greenhouse gas emissions, and keep economic value within the state by connecting local farmers, fishermen, aquaculturists, distributors, and consumers together.⁶⁰ Key practices include:

⁵⁵ <https://farmlandinfo.org/publications/farm-succession-planning/>

⁵⁶ <https://farmlandinfo.org/publications/agricultural-conservation-easements/>

⁵⁷ <https://farmland.org/blog/ushering-new-and-beginning-farmers-onto-agriculture>

⁵⁸ <https://theconservationfoundation.org/agrivoltaics/#:~:text=>

⁵⁹ <https://www.ncat.org/blog/the-full-circle-of-local-food-systems/>

⁶⁰ <https://www.ams.usda.gov/sites/default/files/media/Why%20Local%20Food%20Matters.pdf>

- **Community-Supported Agriculture & Gardens:** Community-supported Agriculture and community gardens are direct-to-consumer, community-driven models where members share the risks, labor, and harvests of farm and garden production.^{61,62} They shorten supply chains, boost local food economies, and expand fresh food access, building resilient food systems.^{60,61}
- **Food Hubs & Local Value Chains:** Food hubs act as value-chain facilitators, aggregating, distributing, and marketing products from local producers to meet commercial and institutional demand. Operating on values-based chains, hubs handle complex logistics (e.g., light processing, order volumes, delivery) and ensure fair pricing, helping small-to-midsize farmers economically while ensuring equitable food access.^{63,64}
- **Culturally Relevant Food Access:** Culturally relevant food access is an important component of food justice, as it guarantees that food assistance aligns with a community's cultural traditions, dignity, and consumption habits. Integrating culturally relevant food access programs into local food procurement strengthens localized supply chains and can build social cohesion vital for community disaster recovery.^{65,66}

Benefits to Municipalities: *Mitigate urban heat; local stormwater management; enhance food security; enhance public health; strengthen the local food economy; ensure local food supply chain resilience, build social cohesion.*

"Having a stronger food system that can bring nutritious, healthy food to people is important all the time, but it's even more important to people when there are strains because of a pandemic or sustained heat waves or a nor'easter." -Janet Coit, Farm Fresh RI

Nature-Based Solutions (NBS)

Associated Interconnections: Implementing NBS will help address the following interconnections discussed in Section I: *Soil Health; Agricultural Watershed Health; Agricultural Land Preservation; Coastal Ecosystems Restoration; Water Quality; Resilient Working Waterfronts; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

NBS are strategies that use or restore natural systems to reduce climate and hazard risks. NBS treats natural systems as critical civic infrastructure, strengthening

⁶¹ <https://www.nal.usda.gov/farms-and-agricultural-production-systems/community-supported>

⁶² <https://lod.nal.usda.gov/nalt/en/page/68415>

⁶³ <https://www.usda.gov/about-usda/news/blog/food-hubs-building-businesses-and-sustaining>

⁶⁴ <https://healthyfoodaccess.org/business-models/food-hubs/>

⁶⁵ <https://caes.ucdavis.edu/news/supporting-community-nutrition-and-diverse-cultures>

⁶⁶ <https://foodtank.com/news/2026/08/food-tank-explains-food-justice/>

municipal resilience against flooding, urban heat, and storm surges. Key types include:⁶⁷

- **Green Stormwater Infrastructure (GSI):** Natural or semi-natural systems, like rain gardens, bioswales, and vegetated retention basins, designed to manage stormwater by capturing, infiltrating, evaporating, or reusing rainfall when it lands instead of being sent directly into conventional pipe-and-drain systems.⁶⁶
- **Coastal Stabilization and Wetland Restoration:** Projects like living shorelines, marsh and dune restoration, and oyster reef restoration that repair or recreate coastal ecosystems. These natural buffers attenuate wave energy, absorb surge waters, anchor shorelines against erosion, and rebuild fish habitats that support the local seafood economy.⁶⁶
- **Polycultures & Indigenous Cropping Systems:** Planting multiple crops together rather than one (monoculture) with high-biodiversity planting methods like intercropping and traditional multi-crop systems. Diversified canopy structures retain soil moisture, reduce herbicide dependency, improve natural pest management, and increase crop survival rates during extreme climate events.^{67,68}
- **Regenerative Soil Stewardship:**^{67,68} Practices like cover cropping and no-till farming that minimize soil disturbance and maintain permanent ground cover year-round. Rebuilding soil structure enhances water infiltration and holding capacity, functioning like a sponge to absorb waters that would otherwise cause flooding and preserving soil moisture during extended droughts.^{8,9,10}
- **Urban Forestry:** Planning, planting, and taking care of trees and forests in municipalities, treating them as part of a city's critical infrastructure to improve water quality, moderate temperatures, manage stormwater, support biodiversity, and community resilience.⁶⁶
- **Dam Removal/Adaptation:** Selectively removing outdated or harmful dams in rivers and streams to restore natural flow regimes, reconnect habitat, and reinstate river-floodplain dynamics. Doing so helps native fish reach spawning grounds, supporting aquatic biodiversity and improving water quality.⁶⁶
- **Infrastructure Elevation / Floodproofing / Voluntary Acquisitions:** Raising existing buildings above locally defined flood elevation, modifying structures to reduce or prevent flooding, and purchasing flood-prone properties to preserve land to its natural floodplain function to reduce long-term flood risk.⁶⁶

Benefits to Municipalities: *Stormwater buffering and flood mitigation; enhance coastal protection; upstream nutrient and pollutant filtering; municipal infrastructure risk reduction; preservation of working waterfronts; local food security; strengthen local food economy.*

⁶⁷ <https://storymaps.arcgis.com/stories/d2954d7efb804d36a306e7622077ef0f>

Nature-Inclusive Design (NID)

Associated Interconnections: Implementing NID will help address the following interconnections discussed in Section I: *Coastal Ecosystems Restoration; Water Quality; Sustainable Offshore Renewable Energy; Resilient Working Waterfronts; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

Nature-Inclusive Design (NID) is the intentional integration of eco-friendly, biodiversity-enhancing features directly into the design, construction, and operation of man-made structures. NID engineers artificial structures so they actively support, rather than disrupt, natural ecosystems.^{68,69} Types include:

- **Artificial Reefs:** Designing the submerged foundations of offshore wind turbines, breakwaters, and piers using eco-friendly materials, micro-habitats, or textured rock armor. These features provide shelter, nursery grounds, and hard substrate for juvenile fish, lobsters, kelp, and bivalves.⁷⁰
- **Optimized Scour Protection:** Purposefully varying the materials, rock types, grain sizes, and surface textures of the stone used where pipelines or subsea cables intersect to create structural micro-cavities that function as an artificial reef for seabed organisms.⁷¹
- **Biohuts:** Cage-like subsea frame attachments packed with organic and natural materials to promote seaweed and native oyster growth, serving as natural bio-filters to improve water quality and sustain ecosystem habitats.⁷²

Benefits to Municipalities: *Minimize ecological trade-offs of major infrastructure projects; protect food supply chains; strengthen local food economy.*

Statewide Working Waterfront Policy

Associated Interconnections: Statewide working waterfront policy will help address the following interconnections discussed in Section I: *Coastal Ecosystems Restoration; Water Quality; Sustainable Offshore Renewable Energy; Resilient Working Waterfronts; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

Statewide working waterfront policy provides a legal and financial framework that protects access for water-dependent commercial industries like commercial fishing, aquaculture, and seafood processing from real estate development, coastal gentrification, and climate impacts.⁷² In states with important maritime and seafood

⁶⁸ <https://vivarapro.com/about-us/nature-inclusive-design/>

⁶⁹ <https://www.vo-a.com/en/tools-and-knowledge/natuurinclusief-ontwerp-voor-d>

⁷⁰ <https://www.naturalpower.com/uk/insight/from-compliance-to-contribution-how-nature-inclusive>

⁷¹ <https://jscholarship.library.jhu.edu/server/api/core/bitstreams/a6bacdd4-4558-4f4f-b74a-7c70>

⁷² <https://nationalworkingwaterfronts.com/toolkit/>

industries, like Maine and Florida, statewide policy ensures that local land-use planning, coastal resilience efforts, and regional food system security are all addressed.^{73,74} Effective policy should include specific zones for water-dependent industrial and commercial use and resilience grants for public and private green/gray infrastructure upgrades.^{74,75,76}

Benefits to Municipalities: *Protect local seafood economies; protect working waterfronts; unlock state-matching resilience grants; standardize water-dependent zoning.*

Supporting Local Seafood Industry Workers

Associated Interconnections: Supporting local seafood industry workers will help address the following interconnections discussed in Section I: *Resilient Working Waterfronts; Food Supply Chains and Socio-Economic Security; Food Justice, Equity, and Public Health.*

Investing in local seafood worker support directly reinforces municipal climate resilience efforts. Such support helps coastal communities adapt to changing climates, becoming more resistant.^{75,76} Flexible permitting and localized processing help build short food supply chains (reducing greenhouse gas emissions as products are not being transported long distances for processing) that strengthen food transportation and security in the face of climate disasters.⁷⁷ Supporting fishing fleets with working waterfront protection/adaptation (including inclusive offshore wind energy development planning) and workforce training ensures the seafood industry in RI stays strong, while allowing coastal communities to adapt to changing marine/coastal ecosystems without experiencing economic instability.^{76,77} Core seafood worker support mechanisms include:

- **Inclusive Offshore Energy Policy:** Establishing compensation funds to seafood workers, stakeholder advisory committees during offshore renewables planning, and co-existence agreements between offshore wind developers and commercial harvesters.²⁹ This also can include funding for gear adaptation, loss-of-access compensation, and ecological restoration funding.⁷⁸
- **Workforce Development:** Investing in specialized workforce development training, safety certifications, business management, and technical education for young and transitioning fishermen/aquaculturists.^{80,79} These programs can

⁷³ <https://www.maine.gov/dacf/lmf/funds/wwapp.shtml>

⁷⁴ <https://law.justia.com/codes/florida/title-xxvi/chapter-342/section-342-07/>

⁷⁵ <https://link.springer.com/article/10.1007/s40152-025-00426-z>

⁷⁶ <https://oceanstrat.com/2024/12/18/what-were-tracking-for-2025-fisheries-policy-report/>

⁷⁷ <https://mifseafood.com/blogs/lifestyle-and-community/supporting-local-fishermen-and-com>

⁷⁸ <https://rodafisheries.org/us-seafood-organizations-recommend-steps-to-reduce-impacts/>

⁷⁹ <https://www.sciencedirect.com/science/article/pii/S2590332220302487>

train workers to adopt climate-adaptive gear, shift target species toward underutilized stocks, or diversity into restorative marine aquaculture.⁸⁰

- **Regulatory Adaptation & Direct-to-Consumer Market Access:**⁸⁰ Updating state and municipal permitting frameworks to allow dockside sales, flexible fishing permits, landing regulations, and small-scale processing. Simplifying and regularly updating these regulations is beneficial with climate-driven change and adaptation, and can allow for harvesters to sustain a living.
- **Localized Processing Infrastructure:**⁸¹ Funding the development and maintenance of municipal or co-op seafood processing facilities, cold-storage, and value-added equipment on the waterfront. Local, accessible processing keeps jobs local, reduces post-harvest loss, and allows workers to process underutilized/shifting species.
- **Preserving Working Waterfront Access:** Protecting physical access to landing docks, gear storage, ice plants, and waterfront processing facilities to support local seafood workers and the seafood economy. See the above statewide working waterfront policy best practice.^{74,75,76}

Benefits to Municipalities: *Sustain local maritime employment; strengthen the local seafood economy; enhance community-level disaster recovery; mitigate socio-economic conflict surrounding offshore wind transitions; preserve local food security.*

⁸⁰ <https://www.cfrfoundation.org/bait-skate-utilization>

⁸¹ <https://www.cfrfoundation.org/scup-mince-processing>

Section III: Utilization

This section examines how these climate resilience and food systems best practices are actively applied in real-world settings and how they could be expanded to address our increasing climate resilience challenge. The content within this section explores examples from existing or potential high-priority RI-based projects (Within Rhode Island), as well as regional, national, and international initiatives (Outside of Rhode Island). To view the locations of these RI-based projects, please refer to this link, which will direct readers to the [RI-based projects map](#).

Within Rhode Island

In RI, there are a plethora of existing high-priority projects that concurrently support climate resilience and food systems. Quantifying the climate benefit of these projects is not within the scope of this project. However, we can clearly state that across them there is a significant and measurable amount of carbon sequestration occurring, alongside ecosystem restoration and strengthened local food security, that supports the achievement of RI's Act on Climate goals.

Agriculture

1. [**Regenerative Agriculture Demonstration Farm: Ocean Hour Farm, Newport, RI**](#)
 - **Project Overview:** Ocean Hour Farm is a 42-acre living laboratory studying the link between farming and ocean health. Using sustainable land stewardship, their practices connect plants, animals, and people to restore soil, clean stormwater, and sequester carbon. The farm design includes wetlands, ledge woodlands, habitat buffers, perennial pasture, alley cropping, food forests, compost centers, a pollinator meadow, and more.
 - **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions; Farmworker Support.
2. [**Composting Facility & Soil Health Hub: Earth Care Farm, Charlestown, RI**](#)
 - **Project Overview:** Earth Care Farm has been producing high quality farm-made compost for gardeners and landscapes to enrich their soil naturally for over 45 years – including their own farm. The organic waste used to make compost at the farm comes from fish scraps, seaweed, woodchips, food waste and more, diverting thousands of tons of local organic waste annually.
 - **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions; Consumer Education & Awareness.

3. **Community Gardens & Urban Farms: Southside Community Land Trust (SCLT), Providence, Pawtucket, Central Falls, RI**
 - **Project Overview:** SCLT supports roughly 60 community gardens and urban farms, with many, if not all, supporting practices like composting and chemical-free farming. SCLT addresses heavy metal contamination common in post-industrial urban soils through composting, raised beds, and cover cropping, transforming degraded urban land into safe spaces for BIPOC and immigrant community farmers.
 - **Best Practices Utilized:** Localized Food Systems Networks; Climate-Smart Agriculture; Nature-Based Solutions; Consumer Education & Awareness; Farmland Access & Farmworker Support.
4. **Harvest Cycle Compost, West End Compost Hub, & Ring Street Community Garden: Groundwork Rhode Island, Providence, RI**
 - **Project Overview:** Groundwork RI has three main composting projects of interest. Harvest Cycle Compost is a hyper-local social enterprise diverting organic waste from residents and small businesses for high-quality soil amendments. By processing food scraps in Providence communities, like the Ring Street Community Garden and, eventually, the West Elm Compost Hub, they keep organic matter out of the landfill and restore degraded urban soils.
 - **Best Practices Utilized:** Localized Food Systems Networks; Climate-Smart Agriculture; Nature-Based Solutions; Consumer Education & Awareness; Farmland Access & Farmworker Support.
5. **Silvopasture Project: University of Rhode Island (URI) Agricultural Experiment Station (AES), Kingston, RI**
 - **Project Overview:** The URI AES silvopasture project on Peckham Farm started in 2024, with URI researcher, faculty, and students working to transform 52 acres of severely compacted, eroded land left from a former commercial sod lease. Supported by a public-private partnership with Tree Pro, URI is planting trees and integrating them with cattle grazing to rebuild topsoil, enhance carbon sequestration, and manage water runoff.
 - **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions.
6. **Healthy Farms, Healthy Watershed Project: Northern Rhode Island Conservation District (NRICD), Scituate Reservoir Watershed**
 - **Project Overview:** This project is a farmer-driven education and outreach effort for small scale livestock farmers to improve water quality through their manure practices. By providing free technical support, manure management planning, and soil health education, NRICD helps

small farmers convert livestock manure from a potential runoff hazard into a soil amendment.

- **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions; Farmworker Support.

7. **FarmLink Aquidneck: Aquidneck Land Trust (ALT), Middletown, RI**

- **Project Overview:** ALT protects open space, coastal watersheds, and agricultural soils across Middletown, Portsmouth, and Newport. Understanding that high land costs and development pressures make land access a barrier for farmers, ALT runs FarmLink Aquidneck, connecting local landowners willing to lease or sell farmland with prospective agricultural producers. ALT also actively acquires properties and secures conservation easements on critical working farmlands.
- **Best Practices Utilized:** Farmland Access & Farmworker Support; Climate-Smart Agriculture; Nature-Based Solutions.

8. **Farm, Forest, and Open Space Program: Southern Rhode Island Conservation District (SRICD), Washington and Kent County**

- **Project Overview:** All of RI's conservation districts are participating in this program. SRICD works with landowners in Washington and Kent Counties specifically to develop conservation plans to assist landowners (in this case farmers) to conserve their soils and water resources.
- **Best Practices Utilized:** Farmland Access & Farmworker Support; Climate-Smart Agriculture; Nature-Based Solutions.

Coastal Ecosystems & Blue Foods

1. **Rhody Wild Sea Gardens: Rhody Wild Sea Gardens, Narragansett, RI**

- **Project Overview:** Rhody Wild Sea Gardens, a family-run sugar kelp farm in Rhode Island, advances marine conservation through community education and climate programs. Their Dockside Kelp Program guides marina and dock owners in cultivating kelp for environmental health, while their educational initiatives engage local students through classroom visits, in-person farm and dock labs, and hands-on youth summer camps.
- **Best Practices Utilized:** Localized Food Systems Networks; Climate-Smart Agriculture; Nature-Based Solutions; Consumer Education & Awareness.

2. **India Point Park Shoreline Improvements Project: TNC, RIIB, RIDEM, Providence, RI**

- **Project Overview:** Originally funded by an MRP action grant, and currently also being supported by the Ocean State Climate Adaptation

and Resilience (OSCAR) fund, this project focuses on stabilizing urban shorelines, upgrading waterfront infrastructure, and reducing erosion along the Providence river to improve climate resilience, restore intertidal habitats, and enhance community access to the water.

- **Best Practices Utilized:** Nature-Based Solutions; Nature-Inclusive Design.

3. [Scaling Living Shoreline Solutions for Aquidneck Island](#): **Aquidneck Land Trust, Aquidneck Resilience, Newport, RI**

- **Project Overview:** This project, part of the Northeast Regional Ocean Council (NROC) and TNC's living shoreline planning series, provides free training, technical assistance, and guidance to identify and develop a design for a living shoreline. The potential living shoreline projects designed will reduce erosion and coastal flooding to increase resilience, while improving habitats.
- **Best Practices Utilized:** Nature-Based Solutions; Supporting Local Seafood Industry Workers.

4. [Ninigret Barrier Beach Restoration Project](#): **RIDEM, Save The Bay, Charlestown, RI**

- **Project Overview:** RIDEM and Save the Bay are conducting coastal habitat restoration at East Beach. The project will restore natural barrier beach dynamics and salt marsh hydrology by clearing invasive species and digging shallow marsh runnels, which will protect habitat while enhancing storm buffers along the coast.
- **Best Practices Utilized:** Nature-Based Solutions; Supporting Local Seafood Industry Workers.

5. [Almy Pond Wetland Restoration Project](#): **The Nature Conservancy (TNC), Aquidneck Resilience, Newport, RI**

- **Project Overview:** The Almy Pond Wetlands Restoration project demonstrates downstream watershed health management by using green infrastructure, an engineered gravel vegetated treatment system, to capture and filter nutrient-polluted stormwater runoff. The project demonstrates how reducing fertilizer runoff and building soil infiltration upstream directly protects downstream fisheries and water quality.
- **Best Practices Utilized:** Nature-Based Solutions; Nature-Inclusive Design; Supporting Local Seafood Industry Workers.

6. [Rhode Island EQIP Oyster Reef Restoration Initiative](#): **RIDEM, Coastal Resources Management Council (CRMC), USDA NRCS**

- **Project Overview:** This conservation initiative is a collaborative conservation program that pays local aquaculture growers to construct

and seed long-term oyster reefs in state-protected marine sanctuaries. The program uses the filtering power and physical structure of oysters to clear coastal waters, restore vital fish habitat, and build climate-resilient marine ecosystems.

- **Best Practices Utilized:** Nature-Based Design; Supporting Local Seafood Industry Workers; Coastal and Marine Spatial Planning.

7. **Ecosystem Monitoring & NID Integration: RI Commerce**

- **Project Overview:** As a potential project, the initiative could connect RI Commerce's offshore wind supply chain strategy with marine ecosystem monitoring to evaluate the impacts of energy development on coastal communities, local fisheries, and marine ecosystems. Simultaneously, it can use such data to explore and create NID lower-impact survey methodologies, or potential NID additions to infrastructure if they are non-intrusive.
- **Best Practices Utilized:** Nature-Inclusive Design; Nature-Based Solutions; Supporting Local Seafood Industry Workers; Statewide Working Waterfront Policy.

Food Supply Chains & Socio-Economic Security

1. **Commercial Fishing Fleet Advocacy: Commercial Fisheries Center of Rhode Island (CFCRI), RI**

- **Project Overview:** CFCRI serves as the headquarters for RI's commercial fishing associations. They advocate for protected dock access, spatial policy alongside offshore wind development, and economic sustainability for wild harvesters.
- **Best Practices Utilized:** Supporting Local Seafood Industry Workers; Statewide Working Waterfront Policy; Localized Food Systems Networks; Consumer Education & Awareness.

2. **Advancing Scup Mince Processing to Expand Markets for a Sustainable U.S Fishery: Commercial Fisheries Research Foundation (CFRF), RI**

- **Project Overview:** The Scup Mince Processing Project combines processing innovation with culinary market development to expand consumer and institutional demand for abundant, locally harvested scup. By utilizing mechanical deboning and cold-storage infrastructure to transform underutilized scup into a minced product, the initiative creates new value-added culinary uses (such as for local restaurants and schools) while reducing harvest waste, stabilizing dockside prices, and maintaining processing jobs in RI.
- **Best Practices Utilized:** Supporting Local Seafood Industry Workers; Localized Food Systems Networks.

3. [Local Seafood Supply Chain Protection & Market Resilience](#): Eating with the Ecosystem, RI

- **Project Overview:** This non-profit organization advocates for a place-based, ecosystem-balanced local seafood system. As offshore wind developments and other climate-related impacts shift fishing grounds and alter target species availability, they work to build market demand for wild-caught local seafood. They help strengthen relationships between fishermen, processors, chefs, and consumers to protect fisher's livelihoods and ensure that local seafood supply chains remain resilient.
- **Best Practices Utilized:** Consumer Education & Awareness; Localized Food Systems Networks; Supporting Local Seafood Industry Workers.

"We live in a very globalized society, and seafood in particular is a very global commodity product...we export a lot of the seafood we catch here and import a lot from all over the world ..if you are talking about climate resilience, the cost of shipping and all of that all over the world is kind of crazy...we could easily feed our community with the seafood we actually are catching here." - Kate Masury, Eating with the Ecosystem

4. [Ready, Set, Rhody](#): RI Commerce, RI

- **Project Overview:** This initiative focuses on protecting vulnerable main street districts by providing small businesses with actionable flood mitigation and disaster resilience recovery tools. In doing so, the initiative protects local food retail, distribution, and jobs against climate change, securing the food supply chain.
- **Best Practices Utilized:** Supporting Local Seafood Industry Workers; Localized Food Systems Networks.

5. [Farm Fresh Rhode Island \(FFRI\)](#): Providence, RI

- **Project Overview:** FFRI is a key food systems organization growing the food system to be more sustainable for farmers and eaters in the region. As a food hub, FFRI offers markets and transparent enterprise systems to help farmers, fishers, and food purchases reach more customers and reduce waste. Every one of FFRI's projects, in one way or another, benefit the socio-economic resilience of food systems stakeholders and food supply chains in ways that safeguard against climate change.
- **Best Practices Utilized:** Consumer Education & Awareness; Localized Food Systems Networks; Supporting Local Seafood Industry Workers.

6. [Succession Planning and Mediation Services](#): Land & Sea Together, RI

- **Project Overview:** Land & Sea Together is a statewide initiative focused on addressing the systemic stressors facing RI's agricultural, fishing, and forestry communities. They do land succession and land access planning with local farmers to try and keep them in farming jobs further supporting regenerative agriculture and protecting land from development. In addition, they do work through a USDA Resilient Food Systems Infrastructure (RFSI) grant, providing farmers with technical support, business coaching, and more to help them have viable businesses.
- **Best Practices Utilized:** Climate-Smart Agriculture; Farmland Access & Farmworker Support; Localized Food Systems Networks; Nature-Based Solutions; Supporting Local Seafood Industry Workers.

7. [African Alliance of Rhode Island \(AARI\)](#): Providence, Johnston, RI

- **Project Overview:** AARI advances food justice through its many programs, one being Bami Farm, where local African immigrants and community members gain land access to cultivate culturally traditional produce for their families and local markets. In addition, AARI has education programs, cooking demonstrations, and farmers markets to build economic self-sufficiency and improve healthy food access for underrepresented populations.
- **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions; Consumer Education & Awareness; Farmland Access & Farmworker Support; Localized Food Systems Networks.

8. [Ashawaug Farm](#): Hopkinton, RI

- **Project Overview:** Rooted in Narragansett soil, this Indigenous-owned and operated farm serves as a sanctuary for food sovereignty, cultural revitalization, and community healing. Beyond growing culturally significant crops, the owners run an educational initiative sharing Narragansett foodways through workshops, seasonal harvest celebrations, and community learning events.
- **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions; Consumer Education & Awareness; Localized Food Systems Networks.

9. **Narragansett Tribe at Winnapaug Pond: Charlestown, RI**

- **Project Overview:** Jason Jarvis, one of the individuals we talked to for this project, highlighted a local initiative taking place in the summer of 2026. Although the project lacks an official website, it holds direct relevance to this study: Jarvis is collaborating with the Narragansett Indian Tribe at Winnapaug Pond to facilitate educational programming

aimed at teaching and reclaiming tribal history and traditional harvesting practices.

- **Best Practices Utilized:** Consumer Education & Awareness; Localized Food Systems Networks.

Outside of Rhode Island

Examining initiatives outside of RI demonstrates how climate-smart food system practices are applied across state, national, and international scales. This subsection includes out-of-state models that offer inspiration for RI, insightful international frameworks and programs, and national programs that RI can leverage to reinforce projects concurrently supporting food systems and climate resilience.

Agriculture

10. [USDA Forest Service National Agroforestry Center](#): **United States**

- **Utilization Overview:** The U.S. Department of Agriculture (USDA) National Agroforestry Center provides resources, conducts outreach, and provides technical assistance to landowners, producers, agencies, and organizations on agroforestry practices.
- **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions.

11. [Global Soil Health & Erosion Prevention Frameworks](#): **World Resources Institute (WRI), International**

- **Utilization Overview:** WRI's global *Creating a Sustainable Food Future* report analyzes and scales climate-smart agricultural strategies internationally. The report emphasises that regenerative soil management is essential to halting degradation, improving water retention, and building resilient global food production systems.
- **Best Practices Utilized:** Climate-Smart Agriculture Practices.

12. [Solar Massachusetts Renewable Target \(SMART\) Program](#): **Massachusetts, United States**

- **Utilization Overview:** The Solar Massachusetts Renewable Target (SMART) program incentivizes agrivoltaics so farmland remains operational alongside solar generation. By co-locating renewable energy structures with active crop production or grazing, the program resolves land-use conflicts and provides farmers with diversified revenue while preserving working farmland.
- **Best Practices Utilized:** Farmland Access & Farmworker Support.

13. [The American Farmland Trust](#): **United States**

- **Utilization Overview:** The American Farmland Trust (AFT) is a national nonprofit that protects working farmland using agricultural conservation easements preventing the permanent loss of arable land to suburban development and industrial land conversion. AFT also provides technical support and national advocacy for legacy succession planning, helping new and historically underserved farmers access land while advancing soil health and climate-smart management across protected acres.
- **Best Practices Utilized:** Farmland Access & Farmworker Support; Climate-Smart Agriculture.

14. Chesapeake Watershed Initiative: Mid-Atlantic, United States

- **Utilization Overview:** One of the largest coastal estuary restoration projects in the U.S., the Chesapeake Bay Watershed Initiative (CBWI), helps producers enhance land and water resources through CSA practices, and nature-based solutions. By complementing USDA NRCS programs like EQIP, the initiative targets non-point source nutrient pollution to restore downstream water quality in Chesapeake Bay.
- **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions.

15. Tamil Nadu Climate Resilient Village: Tamil Nadu, India

- **Utilization Overview:** Internationally, many efforts to combat saltwater intrusion and soil salinization are underway. Tamil Nadu, India, for example, has embedded best practices for climate responsibility across every government sector. Supported by the World Research Institute (WRI), this strategy combines coastal/wetland restoration, stormwater management, and irrigation management to protect farmland from being lost to flooding, erosion, and salinization.⁸²
- **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions.

Coastal Ecosystems & Blue Foods

1. Oyster Aquaculture and Restoration: Massachusetts, United States

- **Utilization Overview:** TNC partnered with the Massachusetts Division of Marine Fisheries (DMF), the USDA NRCS, and the Cape Cod Conservation District to develop a program to construct living shorelines via oyster reef restoration.⁸³ The initiative builds native oyster reefs to filter water, attenuate storm surge, and restore wild marine

⁸² <https://www.wri.org/insights/tamil-nadu-india-takes-innovative-approach-climate-adaptation>

⁸³ <https://newbedfordlight.org/new-england-reefs-their-world-is-the-oyster/>

habitat while purchasing surplus adult stock from local shellfish growers to support aquaculture viability.

- **Best Practices Utilized:** Nature-Based Solutions; Supporting Local Seafood Industry Workers; Localized Food Systems Networks.

2. [Agrifood Systems in Nationally Determined Contributions: Global Analysis Report](#): International

- **Utilization Overview:** A comprehensive global analysis by the FAO assessing how nations integrate agrifood systems into their Nationally Determined Contributions (NDCs) under the Paris Agreement. The report highlights that protecting, managing, and restoring aquatic ecosystems ranks among the top climate strategies prioritized by countries worldwide. Utilizing land-to-sea watershed management strategies, the framework provides information on integrating sustainable fisheries, aquaculture, and agriculture into national climate resilience.
- **Best Practices Utilized:** Climate-Smart Agriculture; Nature-Based Solutions.

3. [Massachusetts Oyster Project](#): Massachusetts, United States

- **Utilization Overview:** The Massachusetts Oyster Project is a regional non-profit initiative dedicated to restoring native oyster populations across estuaries in Greater Boston and coastal Massachusetts. The organization deploys shell recycling programs and community-driven reef restoration projects to restore oysters as a natural buffer against coastal erosion while improving marine water quality, enhancing biodiversity, and educating the public on land-to-sea water protection.
- **Best Practices Utilized:** Nature-Based Solutions; Consumer Education & Awareness.

4. [Galway Bay Oyster Restoration Project](#): Galway Bay, Ireland

- **Utilization Overview:** The Galway Bay Oyster Restoration project, part of the Native Oyster Restoration Alliance, is a community, state, and scientific institution led initiative aiming to restore native oyster habitats and improve coastal water quality in Galway Bay by fostering a community understanding that land based activities have an immediate impact on coastal water quality.
- **Best Practices Utilized:** Nature-Based Solutions; Consumer Education & Awareness.

5. [Cartagena Convention Land-Based Sources of Pollution \(LBS\) Protocol](#): International

- **Utilization Overview:** Internationally, a major legal framework addressing land-to-sea connections is the United Nations Environment Programme (UNEP) Cartagena Convention Land-Based Sources of Pollution (LBS) Protocol. Entering into force in 2010, the agreement mandates that participating nations establish management plans to control agricultural non-point source pollution to protect downstream water quality and has directly supported various ongoing projects.⁸⁴
- **Best Practices Utilized:** Nature-Based Solutions; Climate-Smart Agriculture

6. Statewide Strategy for the Coexistence of California Fishing Communities and Offshore Wind: California, United States

- **Utilization Overview:** While federal support for offshore wind development has been halted by the current administration's presidential memorandum, states like California have continued to invest in offshore wind, as well as implement strategies that monitor and safeguard the ecosystems and communities surrounding projects. The California Coastal Commission (CCC), through the State enforces coastal site consistency reviews, requiring developer mitigation funds, tribal consultation, and dock space protection for offshore wind planning in the Pacific.
- **Best Practices Utilized:** Coastal and Marine Spatial Planning; Statewide Working Waterfront Policy; Supporting Local Seafood Industry Workers.

7. Dutch Marine Spatial Plan: North Sea, Netherlands

- **Utilization Overview:** In the Netherlands, the Dutch Marine Spatial Plan, based on consultation with the countries of the North Sea with which the Netherlands shares EEZ borders, promotes sustainable offshore energy development, as well as sea transport, fisheries, and aquaculture. The Plan outlines that, in doing this, it must contribute to the protection and recovery of the marine environment.
- **Best Practices Utilized:** Coastal and Marine Spatial Planning; Nature-Inclusive Design

8. Working Waterfront Access Protection Program (WWAPP): Maine, United States

- **Utilization Overview:** Coastal resilience strategies to protect local working waterfronts are being adopted in coastal states across the country, like in Maine, where a combination of state funding and legal easements has funded the Working Waterfront Access Protection Program (WWAPP). This program assists commercial fisheries businesses, co-ops, and municipalities in securing critical waterfront

⁸⁴ <https://gefcrew.org/regional-initiatives/lbs-protocol>

properties, protecting vital resources such as commercial piers, landings, gear storage, and shore-side processing infrastructure.

- **Best Practices Utilized:** Statewide Working Waterfront Policy; Supporting Local Seafood Industry Workers.

9. **New South Wales Oyster Reef Restoration: New South Wales, Australia**

- **Utilization Overview:** In Australia, the New South Wales (NSW) government has been supporting an oyster reef restoration and research project since 2020. The NSW government has worked with partners to deliver landmark oyster reef restoration projects across essential ports and bays directly offshore from working waterfronts, protecting them from storm surges and reducing coastal infrastructure risks.
- **Best Practices Utilized:** Nature-Based Solutions; Statewide Working Waterfront Policy.

Food Supply Chains & Socio-Economic Security

1. **Resilient Food Systems Infrastructure Program: United States**

- **Utilization Overview:** The USDA's Resilient Food Systems Infrastructure (RFSI) program, established as a one-time federal funding program, targets the middle of the food supply chain by providing non-recurring grant funds for regional cold-storage facilities, aggregation hubs, processing equipment, and local distribution systems to protect food producers against climate shocks and market disruptions.
- **Best Practices Utilized:** Localized Food Systems Networks.

2. **Sustainable Cold Chains Initiative: International**

- **Utilization Overview:** The joint UNEP-FAO Sustainable Food Cold Chains initiative was designed to address post-harvest food waste caused by climate shocks and energy disruptions. The initiative promotes sustainable, end-to-end cooling infrastructure like solar-powered packhouses, off-grid cold storage, and refrigerated transport, to maintain temperature control from harvest to market and prevent rapid spoilage.
- **Best Practices Utilized:** Localized Food Systems Networks; Climate-Smart Agriculture; Supporting Local Seafood Industry Workers.

3. **Waipā Foundation: Hawai'i, United States**

- **Utilization Overview:** The nonprofit Waipā Foundation restores the 1,600-acre Waipā watershed (*ahupua'a*) through a long-term lease with Kamehameha Schools. By applying Native Hawaiian socio-ecological knowledge across the entire watershed, this community project

advances food justice and demonstrates how Indigenous land management drives climate resilience.^{85,86}

- **Best Practices Utilized:** Localized Food Systems Networks; Climate-Smart Agriculture; Nature-Based Solutions; Consumer Education & Awareness.

4. Via Campesina: International

- **Utilization Overview:** La Vía Campesina is a global movement representing over 200 million small-scale producers advocating for food sovereignty. Through practitioner-led agroecology schools, La Vía Campesina trains farmers in CSA, preserves seed varieties, and supports land tenure to build resilient, community-based food systems.
- **Best Practices Utilized:** Farmland Access & Farmworker Support; Climate-Smart Agriculture; Nature-Based Solutions; Agricultural Land Preservation.

⁸⁵ <https://www.nationofhawaii.org/ahupuaa/>

⁸⁶ <https://drive.google.com/file/d/1e53b1qJtoyotBhJRKen5vib7HsMo64Zq/view>

Funding & Investment Mechanisms

Numerous funding and investment opportunities exist for projects that simultaneously advance climate resilience and sustainable food systems, with many focusing on land-to-sea watershed management and equitable, resilient food supply chains. This section highlights key state-level and national mechanisms available to RI nonprofits, municipalities, state agencies, and community partners. For a more detailed and complete list of these resources please refer to the [Funding & Investment Mechanisms Database](#).

Fully leveraging these resources will require the state of RI, RI municipalities, policymakers and funders to better understand how upstream land management practices impact downstream coastal systems and food security. In addition, grant seekers must clearly describe the reciprocal benefits between food systems and climate resilience in project proposals, emphasizing key socio-economic benefits alongside environmental. Adopting the best practices in this report, through the funding opportunities below, provides a pathway to strengthen municipal resilience statewide.

State

State-level support includes RI government agency grants (many of which are capitalized by state Green Bonds and federal funding), financing, and local philanthropic foundation funding.

Grants & Bond Capitalized Programs

- Local Agriculture and Seafood Act Grants Program, *RIDEM*⁸⁷
- Municipal Resilience Program Action Grants, *RIIB*⁸⁸
- Narragansett Bay and Water Restoration Fund, *RIDEM*⁸⁹
- Farmland Preservation Program, *RIDEM*⁹⁰
- Local Open Space Grant Program, *RIDEM*⁹¹
- Climate Resilience Fund, *RIDEM*, *RIIB*⁹²
- Ocean State Climate Adaptation and Resilience Fund Grants, *RIDEM*, *CRMC*, *RIIB*⁹³
- RI Agricultural Energy Program, *RIDEM*⁹⁴

⁸⁷ <https://dem.ri.gov/agriculture/grants/lasa>

⁸⁸ <https://www.riib.org/solutions/programs/municipal-resilience-program/>

⁸⁹ <https://dem.ri.gov/environmental-protection-bureau/water-resources/financial-assistance>

⁹⁰ <https://dem.ri.gov/natural-resources-bureau/agriculture-and-forest-environment/agriculture>

⁹¹ <https://dem.ri.gov/natural-resources-bureau/planning-development/grant-opportunities>

⁹² <https://dem.ri.gov/environmental-protection/initiatives/acting-climate-change/financial-assistance/>

⁹³ <https://dem.ri.gov/environmental-protection-bureau/water-resources/financial-assistance/>

⁹⁴ <https://dem.ri.gov/agriculture/financial-assistance/farm-energy-program>

- Coastal and Estuary Habitat Restoration Program and Trust Fund, *CRMC*⁹⁵
- Nonpoint Source Implementation Grants, *RIDEM, EPA CWA Section 319*⁹⁶

Financing

- Commercial Property Assessed Clean Energy, *RIIB*⁹⁷
- Stormwater Project Accelerator, *RIIB*⁹⁸
- Clean Water State Revolving Fund, *RIIB*⁹⁹
- Healthy Food/Community Resilience Financing, *LISC RI*¹⁰⁰

Philanthropic Foundations

- *Van Beuren Charitable Foundation, Aquidneck Island and Newport County*¹⁰¹
- *The Rhode Island Foundation*¹⁰²
- *11th Hour Racing*¹⁰³

National

Federal agencies and national philanthropic organizations offer broader investment opportunities for regional resilience, such as:

National Grant Programs

- Federal State Marketing Improvement Program, *USDA AMS*¹⁰⁴
- Local Agriculture Market Program, *USDA AMS*¹⁰⁵
- Conservation Reserve Program, *USDA Farm Service Agency (FSA)*¹⁰⁶
- Conservation Stewardship Program, *USDA NRCS*¹⁰⁷
- Regional Conservation Partnership Program, *USDA NRCS*¹⁰⁸
- Agricultural Conservation Easement Program, *USDA NRCS*¹⁰⁹
- Environmental Quality Incentives Program, *USDA NRCS*¹¹⁰
- National Water Quality Initiative, *USDA NRCS*¹¹¹

⁹⁵ <https://www.crmc.ri.gov/habitatrestoration/index.html>

⁹⁶ <https://dem.ri.gov/environmental-protection-bureau/water-resources/financial-assistance/nonpoint>

⁹⁷ <https://www.riib.org/solutions/programs/commercial-property-assessed-clean-energy/>

⁹⁸ <https://www.riib.org/solutions/programs/stormwater-project-accelerator/>

⁹⁹ <https://www.riib.org/solutions/programs/clean-water-state-revolving-fund/>

¹⁰⁰ <https://www.lisc.org/rhode-island/>

¹⁰¹ <https://www.vbcfoundation.org/grants#grants-new>

¹⁰² <https://rifoundation.org/>

¹⁰³ <https://11thhourracing.org/>

¹⁰⁴ <https://www.ams.usda.gov/services/grants/fsmip>

¹⁰⁵ <https://www.ams.usda.gov/services/grants/lamp>

¹⁰⁶ <https://www.fsa.usda.gov/resources/conservation/conservation-reserve-program>

¹⁰⁷ <https://www.nrcs.usda.gov/programs-initiatives/conservation-stewardship-program>

¹⁰⁸ <https://www.nrcs.usda.gov/programs-initiatives/regional-conservation-partnership-program>

¹⁰⁹ <https://www.nrcs.usda.gov/programs-initiatives/agricultural-conservation-easement-program>

¹¹⁰ <https://www.nrcs.usda.gov/programs-initiatives/environmental-quality-incentives-program>

¹¹¹ <https://www.nrcs.usda.gov/programs-initiatives/national-water-quality-initiative>

- National Coastal Resilience Fund, *National Fish and Wildlife Foundation (NFWF)*, NOAA¹¹²
- Catalyzing Agroforestry Grants Program, *Edwards Mother Earth Foundation*¹¹³

Financing & Impact Investing

- Farm Loan Programs, *USDA Farm Service Agency (FSA)*^{114,115}
- Regenerative Farmland Fund, *Lucerne Capital Management*¹¹⁶
- *Dirt Capital Partners*¹¹⁷
- Kelp Climate Fund, *Greenwave*¹¹⁸

Philanthropic Foundations

- *Henry P. Kendall Foundation*¹¹⁹
- *W.K. Kellogg Foundation*¹²⁰
- *Allen Family Philanthropies*¹²¹

¹¹² <https://www.nfwf.org/programs/national-coastal-resilience-fund>

¹¹³ <https://www.catalyzingagroforestry.org/cagp>

¹¹⁴ <https://www.fsa.usda.gov/resources/loans/guaranteed-farm-loans>

¹¹⁵ <https://sustainableagriculture.net/publications/grassrootsguide/credit-crop-insurance/direct>

¹¹⁶ <https://www.lucernecap.com/post/lucerne-capital-management-launches-regenerative>

¹¹⁷ <https://www.dirtpartners.com/>

¹¹⁸ <https://www.greenwave.org/kelp-climate-fund>

¹¹⁹ <https://www.kendall.org/>

¹²⁰ <https://www.wkkf.org/i/usa-food-systems-work/>

¹²¹ <https://www.allenphilanthropies.org/grant-search>

The Role of Sea Grant

The National Sea Grant is a Federal-University partnership program bringing together science with communities, and works to create and maintain a healthy coastal environment and economy. The network consists of 3,000+ scientists, engineers, public outreach experts, educators, and students, whose expertise helps citizens better understand, conserve, and utilize coastal resources.¹²² As such, the work that the Sea Grant supports is an important component of this research.

Risks, Impacts, and Strategies for Coastal Communities (RISCC)

Rhode Island, Delaware, and South Carolina Sea Grants

Overview

The 2024-2028 RISCC project is a multi-state initiative funded through the National Science Foundation (NSF) EPSCoR Research Infrastructure Improvement Program. The project addresses the threats of saltwater intrusion, sea-level rise, and coastal flooding across low-lying working landscapes in Delaware, RI, and South Carolina. Part of Delaware's research is directed towards agricultural landscapes, and in Delaware and the Delmarva Peninsula, Delaware's RISCC researchers are utilizing a combination of satellite remote sensing, economic modeling, and community engagement to quantify salt patch formation on agricultural lands and evaluate the land-use options for local growers.^{123,124,125} The Delaware Sea Grant acts as a supportive institutional collaborator for the project, facilitating research outreach and engaging state agencies.¹²⁶

Coastal Resilience and Food Systems Connections

The RISCC project directly intersects with food systems by addressing threats to the Delmarva Peninsula's agricultural economy, which is heavily reliant on low-lying corn and soy production for poultry feed. As storm surges, high tides, and saline groundwater increase salt patches in fields, agricultural operations face severe annual crop losses. Delaware's researchers are actively supporting resilience in the food supply chain by evaluating salt-tolerant alternative crops to determine their agronomic feasibility (evaluating whether specific crops can successfully grow and produce a viable yield) and market viability. This project is helping to maintain working farmland where feasible, protecting farmers' livelihoods, enhancing regional food security, and strengthening coastal resilience.¹²⁶

¹²² <https://seagrants.noaa.gov/our-story/about-sea-grant/>

¹²³ <https://www.nature.com/articles/s41893-023-01186-6>

¹²⁴ <https://www.easel-lab-mondal.com/research.html>

¹²⁵ <https://www.udel.edu/udaily/2024/september/coastal-communities-sea-level-rise-national-science>

¹²⁶ <https://risccproject.org/about-riscc/>

Cultural Storytelling in Coastal Resilience

Alaska Sea Grant

Overview

Alaska Sea Grant's coastal resilience programming in Southwest Alaska, led by coastal resilience specialist Katie Basile, focuses on the intersection of rapid environmental change, youth engagement, and indigenous food sovereignty. Operating along the Bering Sea coast in predominantly Alaska Native (mainly Yup'ik) communities, her work addresses threats such as severe erosion, flooding, permafrost thaw, and extreme typhoon events that force community relocations. The program utilizes community-based digital storytelling and youth journalism to include indigenous knowledge within regional adaptation planning.^{127,128}

Coastal Resilience and Food Systems Connections

The coastal resilience programming Katie has created connects to food systems in various ways, specifically that of food justice. Climate-related events and ecosystem shifts are creating socio-economic risks within local communities in Southwest Alaska, where extreme grocery costs make traditional hunting, fishing, and gathering an economic necessity. Extreme weather has driven villages to relocate away from historical harvesting grounds and depend on immediate relief through traditional food drives. Cultural storytelling serves as a tool for education, awareness, and resilience by allowing youth to document traditional ecological knowledge from elders. This preserves Alaska Native subsistence traditions, expands support for coastal restoration projects, and ensures Native perspectives guide solutions.^{127,128}

Pili Nā Moku (PNM)

Hawai'i Sea Grant

Overview

Hawai'i Sea Grant leads critical programming that concurrently supports food systems and coastal resilience. With the Ulana 'Ike Center of Excellence serving as a collaborative hub, Hawai'i Sea Grant's faculty and partners coordinate on projects that engage multiple knowledge systems, integrating traditional Indigenous knowledge with Western science.¹²⁹ In 2024, Hawai'i Sea Grant received funding from NOAA's Climate Resilience Regional Challenge to launch PNM, a five-year, multi-island climate resilience initiative bringing together community-based organizations, Native Hawaiian practitioners, government agencies, and academic

¹²⁷ <https://alaskaseagrant.org/2026/06/lessons-from-newtok/>

¹²⁸ <https://arcticpolaris.org/films>

¹²⁹ <https://seagrant.soest.hawaii.edu/ulana-ike/>

partners to strengthen stewardship and climate adaptations across the state.^{130,131} As of July 2026, Hawai'i Sea Grant and PNM are launching a \$7 million community funding program through the initial NOAA award, aiming to further support projects that care for the land, promote cultural and ecological stewardship, and foster resilient communities.¹³²

Coastal Resilience and Food Systems Connections

The PNM initiative connects coastal resilience and food systems by revitalizing the moku system, which is a traditional Native Hawaiian framework for land and ocean management that links ecosystems and communities across the watershed.¹³²

Grounded in this understanding, PNM is doing work to conserve and restore watersheds, enhance community-based coastal stewardship, restore marine abundance, share knowledge to strengthen community-based networks, improve disaster resilience, and advance community governance.¹³² Through this approach, PNM is strengthening food sovereignty and disaster resilience through land-to-sea strategies anchored in place-based knowledge.^{131,132}

¹³⁰ <https://seagrant.soest.hawaii.edu/pili-na-moku-about-us/>

¹³¹ <https://coast.noaa.gov/states/stories/hawaii.html>

¹³² <https://www.hawaiipublicradio.org/local-news/2026-07-06/hawaii-sea-grant-and-pili-na-moku-launch>

Section IV: Recommendations

This research, and conversations with RI stakeholders, Sea Grant program staff, and Sea Grant-funded researchers have led to the identification of **two categories of recommendations** to support initiatives to strengthen climate resilience: (1) functional recommendations focused on policy, regulation, and administration and (2) practical recommendations focused on actionable strategies, community engagement, and educational outreach.

Functional Recommendations

Streamline and Modernize State Fishing Regulations and Permitting

Who needs to take action: RIDEM, CRMC, Municipal Port/Harbor Authorities

It is recommended that RIDEM and CRMC update state regulations to flexibly accommodate climate-migrating species moving into Rhode Island waters and allow for commercial harvesters to legally land (bring on shore/to port) and commercialize new, abundant catches. At the same time, RIDEM should reduce regulatory burdens on small-scale fishermen and aquaculturists in conjunction with establishing direct-to-consumer sales pathways. Furthermore, CRMC should establish a dedicated conservation restoration permit separate from commercial aquaculture leases for nature-based oyster restoration projects.

Reform Disaster Recovery Permitting and Maintenance

Who needs to take action: Federal Emergency Management Agency (FEMA), RI Emergency Management Agency (RIEMA), RIIB, RIDEM, and Municipal Departments

State agencies (RIDEM and RIEMA) key funding partners (RIIB), and municipal departments are recommended to collaborate with FEMA to reform emergency post-disaster policies to allow for damaged gray infrastructure to be replaced with green infrastructure using nature-based solutions and include ecological features. The maintenance of green infrastructure should be included in emergency post-disaster policy updates.

Adapt Agricultural Programs for Coastal Landscapes

Who needs to take action: USDA NRCS RI State Office, RIDEM Division of Agriculture, and RI Conservation Districts

The USDA NRCS RI Office and RIDEM should adapt state-level implementation of conservation frameworks like EQIP and CSP to better serve RI's coastal producers. State leaders should establish local practice guidelines and dedicate funding to assist farmers facing saltwater intrusion, sea-level rise, and coastal marsh migration.

Leverage Cross-Sector Funding Streams

Who needs to take action: *RIFPC & local nonprofits, Municipalities, State Agencies (RIDEM, RIIB, CRMC)*

RIFPC, local non-profits, municipalities, and state agencies should coordinate joint grant applications to work together on food systems and climate resilience projects while simultaneously pursuing independent cross-sector grant opportunities for land-to-sea projects. Grant seekers should pair federal/state infrastructure and resilience grants (e.g., NOAA, NFWF, RIIB MRP, State Green Bonds) with philanthropic capital. In the case of working farmland preservation, this strategy will be very beneficial.

Align Resilience with Commercial Innovation

Who needs to take action: *RI Commerce, Private Investors, Higher Education*

RI Commerce and state economic development entities should expand business innovation grants and seed (early capital for startups) funding. These incentives should target private enterprises, technology startups, and local businesses to help translate academic climate resilience research into viable commercial products and services to bolster resilience efforts.

Practical Recommendations

Work with Municipalities on Climate Resilience Projects

Who needs to take action: *RIFPC & local nonprofits, RIIB, RI Sea Grant/URI, Municipal Planners, State Climate/Coastal/Food Systems Resilience Experts*

RIFPC, Sea Grant/URI, local nonprofits, and climate/coastal/food systems experts should directly engage with municipal leadership to review Municipal Resilience Program (MRP) findings reports. Experts should assist towns in establishing local resilience advisory committees to integrate land-to-sea food system strategies into local hazard mitigation and comprehensive plans. These partnerships should explicitly articulate the local economic return on investment to demonstrate how land-to-sea nature-based projects reduce costly storm-damage repairs to coastal infrastructure and both support and protect the state's food economy.

Invest in Educational Outreach and Digital Storytelling

Who needs to take action: *RIFPC & local nonprofits, RI Sea Grant, Philanthropic Organizations, Community-Based Organizations, Media Networks.*

Private funders and state grantmakers (including Sea Grant) are advised to fund digital storytelling, youth journalism, and public outreach initiatives led by community-based organizations, RIFPC, and relevant local nonprofits. Campaigns should target both decision-makers and consumers to build literacy around food-climate connections, celebrate traditional ecological knowledge, and shift consumer demand toward climate-resilient local food and shifting seafood species.

Advance Land-to-Sea Watershed Literacy

Who needs to take action: *RIFPC & local nonprofits, Conservation Districts, RI Sea Grant/URI Extension, Municipalities, Private Landowner Associations*

It is recommended that RIFPC & local nonprofits, conservation districts, and RI Sea Grant/URI Extension run unified, targeted outreach campaigns for private landowners, farmers, and municipal board members. Educational programming should focus on land-to-sea watershed connections, demonstrating how upstream soil health, composting, and conservation agriculture protect downstream municipal water quality and coastal fisheries.

Strengthen Social Cohesion Through Cross-Sector Networks

Who needs to take action: *RIFPC & local nonprofits, RI Sea Grant/URI Extension, State Agencies, Indigenous Leaders/Tribal Nations, Local Supply Chain Workers, State Climate/Coastal/Food Systems Resilience Experts*

RIFPC and its network partners are encouraged to convene cross-sector working groups connecting researchers/extension, state agency staff, agricultural and seafood producers/supply chain workers, Indigenous leaders, and community organizations. This network should collectively monitor climate impacts, foster social cohesion for disaster recovery and collaborative project partnership, and draft a unified strategic policy agenda that actively advocates for future state Green Bond funding allocations.

Conclusion

Food systems and climate resilience are deeply interconnected, serving as complementary forces to be integrated into RI's climate resilience frameworks. From upstream soil health management improving water holding capacity and drainage, to downstream ecosystem restoration projects like living shorelines and oyster reefs buffering the impacts of storm surges inland, land-to-sea management is key to strengthening climate resilience efforts. In addition, the preservation and stewardship of working agricultural lands, protection of waterfronts, and support for localized food systems help to enhance economic stability and food security for RI communities. Treating climate, coastal, and food resilience strategies as separate ignores their joint potential to strengthen and reinforce one another.

To translate these interconnections and their best practices into long-term resilience, RI must connect decision-makers, multi-sector practitioners, and local communities. The recommendations in this report support an integrated resilience approach where the modernization of permitting structures, adaptation of land-to-sea conservation programs, and use of cross-sector funding mechanisms are combined with education, partnership, and the facilitation of equitable resilience networks. By intentionally cultivating sustainable food systems alongside climate and coastal resilience action, RI can successfully advance climate resilience to further enhance the state's food economy, disaster preparedness, and food security.