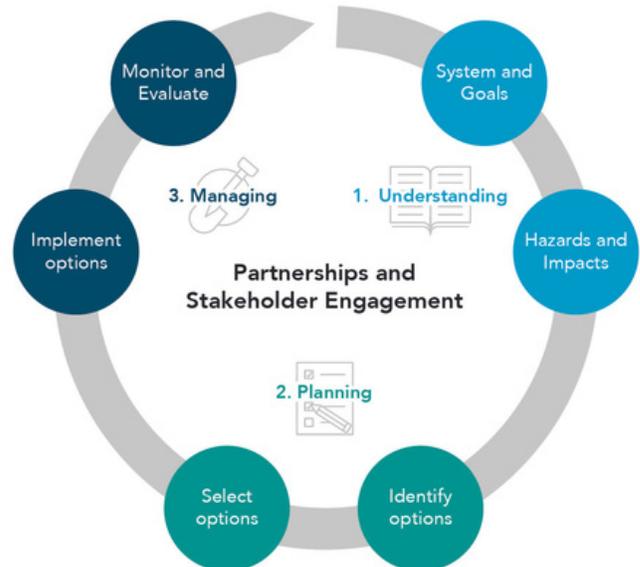


INTRODUCTION

Fisheries in the Northeast US are facing a range of climate change impacts, such as shifting species distributions, changing catch portfolios, and sea level rise effects on shoreside infrastructure. Proactively planning for these current and future impacts can reduce risk and prepare communities for further changes. This document outlines potential adaptation options for fishery stakeholders based on information gathered from stakeholder conversations, workshops, and literature reviews associated with recent research projects.



Exploring adaptation options forms an important part of the 'Planning' stage of the adaptation cycle.

WHY ADAPT TO CLIMATE IMPACTS?

While fisheries climate impacts may be complex and uncertain in their extent, magnitude and timing, undertaking adaptation actions can help moderate harm or capitalize on beneficial opportunities. Actions can be undertaken at the individual, industry, community and institutional levels, from local to regional and national scales, and over time spans of days to years. Adaptation responses are needed throughout all levels of the fishery system and cannot fall on individuals alone. Coordinated planning and action that involves fishery participants, related industries, fishery managers, community partners, and municipal agencies will most effectively build climate resilience for fishing communities. Differences in the nature and magnitude of impacts, as well as in capacities and capabilities to respond, means that climate effects are experienced differently in different places and by different groups. This means that adaptation actions that work for one group, place or system may not work for another.

SELECTING & PRIORITIZING ADAPTATION ACTIONS

A number of considerations influence which adaptation options can be selected and prioritized, including:



Their effectiveness in meeting pre-defined goals and their ability to reduce impacts of concern



Whether appropriate resources—financial, knowledge, skills, and capacity—are available to implement specific options



Costs, benefits, and trade-offs that may arise or exist in selecting particular strategies over others; trade-offs can be ecological, social, economic, political and institutional in nature

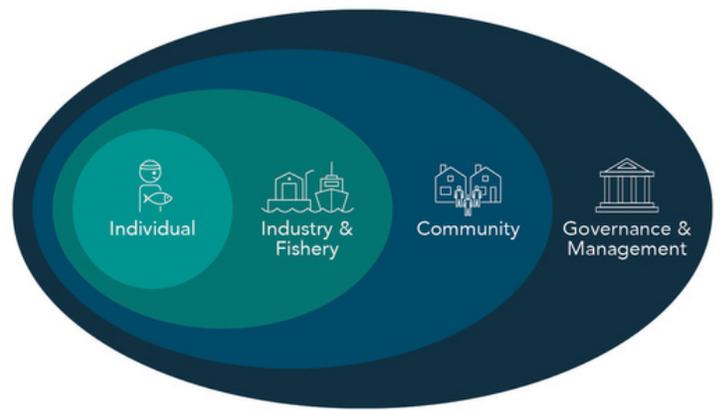


Equity implications of different adaptation actions, particularly minimizing harms and avoiding (further) marginalization or disenfranchisement of particular groups of people, including Indigenous communities

Participatory and collaborative decision-making processes are valuable when selecting and implementing adaptation strategies as these approaches help to center particular communities and fisheries needs, knowledge and interests. Further, transparency in how options are selected and prioritized is crucial to help promote buy-in and reduce conflict among different stakeholders.

ADAPTATION ACTIONS & OPTIONS

We outline adaptation options below according to different scales of the fishery system. These examples are not exhaustive and instead illustrate potential options that exist. Importantly, adaptation has no end point. As the climate continues to change, new impacts will occur, requiring adaptation goals and actions to be re-evaluated and revised to enable effective responses.



Adaptation actions can occur at multiple scales

Individual Harvester Actions

Shifting fishing locations

- Moving to new fishing grounds to continue catching traditional target species that have shifted to more thermally-suitable habitats.

Shifting harvested species

- Diversifying fishing portfolios to take advantage of more abundant or newly emerging species, as existing permits/allocations allow, or through seeking new permits.

Livelihood diversification (alternative fisheries, aquaculture, non-fishing jobs)

- Switching to other jobs, either shore- or marine-based, to buffer seasonal and interannual variations in fishing, or as exit strategies for those wanting to leave the industry.

Management Measures

Quota allocations

- Reassessing quota allocations to incorporate current and future catch changes based on climate-driven effects (as opposed to rooted in historical stability).

Permit access

- Altering permit availability and access to enable diversification into alternative fisheries.

Adaptive reference points

- Modifying reference points within stock assessments and management to account for climate-induced changes in stock productivity.

Dynamic and ecosystem-based management

- Increasing flexibility and using holistic approaches to account for environmental variability and climate-driven ecosystem and fishery changes.

ABOUT THIS WORK

This report was developed through projects led by the Gulf of Maine Research Institute with funding from the National Oceanic and Atmospheric Administration's Climate Program Office under awards NA15OAR4310120 and NA19OAR4310384. For information about climate hazards, fisheries climate impacts, and additional resources please visit our website: www.gmri.org/adaptationhub You can also contact Kathy Mills (kmills@gmri.org) for any questions.

Industry Actions

Product handling

- Improving or altering post-harvest practices, storage and processes to maximize efficiency and add value.

Supply chain capacity

- Improving transportation, logistics, and infrastructure to support changing volumes of landed species.

Marketing

- Facilitating diversification of markets for emerging species, improving value-added products, shaping consumer preferences for locally-available species.

Community Initiatives

Shoreside infrastructure and access

- Maintaining existing infrastructure and improving capacity and resilience.
- Securing future infrastructure and access to working waterfronts.

Transportation networks

- Reducing vulnerabilities of key transportation infrastructure (e.g., roads, bridges).
- Improving transportation connections (e.g., in rural areas) between towns, businesses and key markets.

Local seafood

- Developing local seafood initiatives to enhance consumer demand, create new markets, and add value to local products.

Vulnerability and resilience assessments

- Identifying at-risk people, places and parts of the fishery or community to inform resilience planning.

Early warning monitoring

- Community science initiatives to monitor changes and impacts.

Adaptation and resilience planning through community engagement

- Developing adaptation pathways relevant to community values, needs and contexts.