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A Working Group on Climate Change Impacts on Shellfishing in Wellfleet Harbor

The **purpose** of the Working group on Climate Change impacts on shellfishing in Wellfleet Harbor is to identify:

- threats to shellfishing in Wellfleet Harbor from climate change,
- the role of shellfish in mitigating impacts from climate change and other environmental hazards in Wellfleet Harbor, and
- strategies to increase the resilience of Wellfleet and its shellfishery in a time of climate change.

The **outcome** of the working group will be a report summarizing threats and opportunities, including specific actions that the Town and others can consider further to manage threats to the shellfishery in both the short and longterm. Specifically, the Working Group will provide information to inform local planning by addressing these questions:

1. What are anticipated impacts in Wellfleet Harbor and to shellfish from climate change?
2. To what extent do existing plans and proposed actions address impacts in Wellfleet Harbor and to shellfish from a changing climate? (Harbor Plan, Shellfish Management Plan, etc.)
3. What information is needed to understand impacts and how they can be managed (reduce vulnerabilities, adapt, etc.)?
4. What are additional / new actions that can be taken to reduce vulnerabilities and increase resilience of Wellfleet Harbor and its shellfish to a changing climate?

The report will be provided to the Selectboard and relevant Town boards and committees, as well as other interested organizations (e.g., Wellfleet Bay Audubon Sanctuary, Massachusetts Aquaculture Association).

The history of the Town of Wellfleet is closely connected to shellfish in Wellfleet Harbor. Shellfish, including oysters, quahogs, and scallops, are key drivers of the town's economy and identity. Commercial shellfishing, from aquaculture and wild populations, provide jobs, tax revenues, and income to local residents. Recreational shellfishing has many participants, forming an important social activity among residents and tourists. As part of the natural habitat, shellfish also provide important ecological services. They filter large amounts of water, and healthy populations improve water quality in the Harbor which is impacted by stormwater and wastewater runoff. Oyster reefs reduce erosion and the impact of storm surge and wave action.

Climate change may impact shellfish populations and health and the shellfishery in multiple ways. Climate change may impact the health of shellfish populations by increasing water temperatures and reducing pH of Harbor waters. Shellfish pathogens may become more prevalent and food

supplies may become more scarce. Shellfish may be impacted by increasing amounts of stormwater and wastewater runoff from more severe storms, predicted as part of climate change in this region. As for the shellfishery, climate change may also result in a number of impacts. Shellfish health may deteriorate (and mortality increase) from changing pH and water temperatures, thus reducing the income of shelfishers and other associated local businesses. Human pathogens, such as vibrio, may become more prevalent and the requirements on shellfishers to reduce vibrio risks more burdensome.

At the same time, shellfish can promote resilience in the face of climate change. Large, healthy populations of shellfish have more resiliency, provide more buffering from acidic waters, improve water quality, and reduce erosion from storms.

Opportunities to prevent or reduce impacts can be integrated into ongoing and future Town planning efforts, including the Harbor Management Plan, Hazard Mitigation Plan, and Stormwater Management Plan. Other actions can be taken at the state level, for example new regulations for managing vibrio and protection of spawning sanctuaries.

How a typical working group process works

- Funding for this work is provided by the NOAA Climate Program Office in a grant to the Social and Environmental Research Institute. The goals of this project are twofold:
    - *First, the project will improve understandings of how a changing climate will affect fishing communities' abilities to maintain marine fisheries and the local economies historically dependent upon them.*
    - *Second, the project will investigate the role of a structured discussion and participatory modeling process to support decision makers in fishing communities addressing consequences, vulnerabilities, and adaptive strategies in a context of climate stressors.*
- Our typical structured discussion and participatory modeling process involves a series of 6 working meetings (more can be considered if participants like), 3 hours each.
    - Meetings 1+2: Identify vulnerabilities and impacts to climate change and identify preliminary set of actions to make the shellfishery more resilient.
    - Meetings 3+4: Create a model that describes dynamics of key parameters of interest to the participants. Participants and a team of expert scientists will determine what to model so that it can inform planning.
    - Meetings 5+6: Discuss report recommendations and conclusions.
- Meetings are scheduled at a time convenient for participants.
- We bring in experts to give presentations and participate in discussions about subjects of interest to the group
- Our grant allows us to pay $100 honoraria for each participant at the end.

For more information contact:

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