2022 State of Wellfleet Harbor Conference
Question & Answers

Using environmental DNA (eDNA) to detect presence of spawning winter flounder in Cape Cod embayments

John Logan, MA Division of Marine Fisheries

Q- How does eDNA correlate with the population?

eDNA provides an indication of winter flounder presence in nearby waters within a few days of the time of sampling. We believe that the amount of eDNA detected in a sample may correlate with the amount of flounder in the area, so eDNA provides a record of winter flounder presence and also likely its relative abundance. The information from a single sample is very local; to get population-level information would require extensive sampling throughout their home range.

Q- How much spatial fidelity do you think you have with these eDNA samples?

This likely varies across sites. For example, areas with greater tidal exchange may carry eDNA from further away than areas that are more confined. We do see differences in detections for samples that are collected in the same harbor on the same day, so samples probably reflect the winter flounder collected from a given sub-region of a harbor.

Q- How useful is it for actually finding the flounder populations with the study area?

Our preliminary data suggest eDNA is really effective at detecting winter flounder in the study area, even at presumably low densities. At the moment, eDNA is not as effective as traditional methods like net-based surveys in terms of estimating relative abundance of flounder populations, but it does appear to reflect seasonal patterns in presence and abundance.

Q- Commercial flounder fishing – are the local flounder fished for local markets and restaurants?

There is a small commercial fishery for winter flounder, that can supply local markets/restaurants.

Q- Will the eDNA detections inform quota numbers?

The current goal of the eDNA work is to inform ocean planning and policy decisions regarding coastal construction rather than fisheries management. MA DMF currently has a Spring and Fall bottom trawl survey to assess the abundance of winter flounder in MA coastal waters and a summer beach seine survey to assess the relative abundance of juveniles in MA estuaries to inform fisheries management.

Q- Do the percentages shown relate to how many flounders left the DNA?

In the presentation that I gave at the State of Wellfleet Harbor Conference, I presented eDNA as percentages. For each filter collected from a water sample, Gloucester Marine Genomics Institute performed 6 replicate qPCR analyses for the detection of winter flounder eDNA. The percentages in my figures reflect the percent of these replicates that had positive winter flounder eDNA detections. So, for example, if 3 of the replicates detected winter flounder, that sample would show up as 50% on the map; if all 6 had positive detections, as 100%, etc.

Thin layer sediment deposition to improve salt marsh resilience to climate change

Megan Tyrell, Waquoit Bay National Estuarine Research Reserve

Q- Can one use dredged materials directly on the marsh?

Yes, but in this 8-site experiment, we used land-based quarried sediments of a specified mixture to reduce variability between sites in the responses we observed for vegetation recovery.

Q- If thin layer deposition were tried in Wellfleet, could the 'black custard' be used?

Maybe, it depends on the sediment grain size composition and other chemical factors. One always needs to test sediments thoroughly prior to placement on a marsh surface.

Q- What are the approved sources of sediment for these projects? Are there rules about where it comes from?

As far as I'm aware, there aren't any pre-approved sources for marsh sediment augmentation in Massachusetts. I suspect that if/when there are restoration scale projects permitted, the source of sediments will be dependent on the proximity and physical and chemical properties of the sediment for each project. That is, it is unlikely to have a central repository for all projects due to logistics and other suitability concerns.

I'm providing the link for "Guidance for Thin Layer Placement" product that was produced by project leads with funding from the NERRS Science Collaborative. It's a great resource.
https://nerrssciencecollaborative.org/resource/guidance-thin-layer-sediment-placement