

EEA Municipal Vulnerability Preparedness (MVP) Action Grant – Monthly Report
Feasibility Study for an Essex Bay Living Shoreline
Town of Essex – April 2019

Significant activities that have occurred to show progress toward deliverables:

We have completed all components of our research and are currently working on the final report. Project PIs recently met in April to assign writing tasks for the final report, and we have begun assembling it.

As noted previously, we have reviewed the temperature requirements of each life stage of the Eastern oyster (*Crassostrea virginica*) and the blue mussel (*Mytilus edulis*). Our review has identified that mussels are more vulnerable to stress from warm seawater temperatures, and that the early life states prefer temperatures between 10 and 20 C (Beaumont et al. 2004). Meanwhile, we have found that the early life stages of oysters prefer warmer temperatures, with the optimal range falling between 20 and 30 (Barnes et al. 2017, Lowe et al. 2017). This finding is not surprising given that oysters are more common than mussels at lower latitudes and thus are adapted to warmer environments, whereas blue mussels are more common in colder waters.

We have assembled available water temperature data in Essex and more broadly in the western Gulf of Maine. We have found several offshore and nearshore temperature buoys in the Gulf of Maine, and some nearshore water temperature data along the north shore and in Boston and near Essex. Of the temperature data that we currently have identified, data from the NOAA-NERRS reserve in Wells Maine is likely the most representative.

In addition, we have researched climate scenario projections for the northern coast of Massachusetts so that we can assess the long-term viability of using Eastern oysters and blue mussels. We have found multiple coarse projections that suggest different levels of bottom water warming over the next 30 to 80 years depending on the climate scenario, and are using those to examine the long-term viability of oysters and mussels in Essex.

Finally, we have reviewed existing studies on living shorelines, and will summarize this information in the final report.

Is there a need for a change in schedule or scope?

None anticipated at this time.

Will costs be on target (versus a projected overrun or underrun)?

Yes, based on understanding of project at this time.

Have invoices been paid during the reporting period for work completed to date?

No.

Is additional assistance needed from EEA or its partners?

None at this time.