Assessing vulnerability of the Atlantic Sea Scallop social-ecological system in the northeast waters of the US

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1.0 EXECUTIVE SUMMARY

Title: Assessing vulnerability of the Atlantic Sea Scallop social-ecological system in the northeast waters of the US

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The vulnerability and resilience of fishing communities to the effects of warming and acidification is dependent on their ability to adapt to changes to their fisheries. Communities that harvest a diversity of species may adapt more easily to these changes than communities that specialize in one or a few species. However, the regional contribution of sea scallops to total regional landed value has steadily increased over recent decades as has fishing community dependence on it as a source of revenue.

To understand the impact of changes in water temperature and ocean acidification to the scallop fishery, this project looks at how vulnerable sea scallops and the fishing communities that rely on the fishery are to these changes and develops recommendations on how to build resiliency to these changes. Our hypothesis is that a spatially- explicit regional projection of changes relative to sea scallop fishing zones can inform fishery management and allow communities that rely on Atlantic sea scallops to plan and become more resilient to future change. This work proposes to develop a recommendation to management to assist scallop industry stakeholders and managers with changes in the fishery that result from projected ocean acidification and temperature changes. The results of this project will include a projection of changes to fishing zones used as spatial rotational management areas that considers both ocean acidification and warming and relies on critical scallop growth, reproductive, and recruitment modeling. The results will be presented in a series of workshops designed with a focus group approach that includes members of the scallop fishery and coastal communities that depend on this marine resource. The workshop participants ideas will be incorporated into the final recommendation. The recommendation will include identification of regions that are candidates for future fishing zones and those to consider closing or protecting through the rotational closures, potential inclusion in the currently uses spatial area management model, the likelihood that harvest size or time to reach harvest size will remain like current conditions all under two different RCP scenarios, and knowledge as to the role of acidification in past change. Two industry collected data sets from the Commercial Fisheries Research Foundation, will be used to evaluate historical simulations.

2.0 PRELIMINARY RESULTS AND DISCUSSION

A focus of the first year was a set of workshops in New Bedford, MA, Point Judith, RI, and Barnegat Light, NJ to establish interest in the project and create positive partnerships with sea scallop fishermen. We wrapped up our last fishing community workshop for year one of the project in November, 2021. The workshops included over 30 participates at all three locations where the content generated lively and constructive discussions which continued on site after the end of their designated times. Although each workshop had some regional differences in comments from the participants (e.g. warming impacts was more present in the conversation in NJ than in MA), the workshops also revealed some common perceptions and misconceptions on the impact of ocean warming and acidification on the scallop fishery that we will continue to address in year two. One activity where shells raised in the lab under OA stress were passed around to feel the impacts to the shells resonated with the fisherman and some connected with seeing these kind of shell impacts in the field. Other feedback focused on improving the workshops including increasing the length of the workshops to allow more time for question and answers. Initially we assumed that a shorter workshop would provide a more positive experience for the participants. Further, we will modify the presentations for each workshop to include more local and regional results from the project. Based on feedback from a pilot workshop, we moved the timing of the workshops this year to late summer early fall and we plan to hold the workshops next year in the late fall period. Finally, a flyer was produced on the impacts of shell condition from OA exposure that is planned to be distributed through channels identified within the workshops. We will showcase the flyer during our presentation as well.

3.0 SPECIAL COMMENTS

None