Economic Impacts of Offshore Wind Energy Development on the Commercial Sea Scallop Fishery

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1.0 EXECUTIVE SUMMARY

Project Title: Economic Impacts of Offshore Wind Energy Development on the Commercial Sea Scallop Fishery

Year Awarded: 2020

RSA Priorities Addressed By This Research: Priority 3. Research to assess the impact of offshore wind energy development on the Atlantic sea scallop resource, including …. economic analyses to fishery and ports.

Industry Partners: Viking Village, Atlantic Capes Fisheries, Stratus Fisheries, Santos Fishing Corp, B&C Fisheries, Trawler Cap Fisheries

Understanding the scale of potential economic impacts of wind farms to this important fishery is critical to management of the fishery; however, previous estimates of impact have been based on generalizations across a suite of commercial and recreational fisheries and have not allowed for route changes or shifts in fishing locations due to wind farms, and thereby may underestimate economic consequences to the fisheries. The complex interactions among wind farm arrays, stock biology, fishers' decision-making, transit routes and costs must be holistically considered to fully address potential impacts. Comprehensive fishery models, also called integrated ecological–economic fisheries models, are valuable tools that can be used to investigate complex interactions among biology, ecology, management, and socio-economics to develop sustainable and cogent marine spatial planning decision.

The objective of this project is to improve understanding of how offshore wind energy infrastructure may directly affect the economics of the Atlantic sea scallop fishery through changes in fishing behavior of vessel operators, the direct costs of transit and fishing, and possible shifts in landings and shoreside infrastructure. This objective will be addressed by adapting an existing modeling framework that integrates spatial dynamics in stock biology, fishery captain and fleet behavior, federal management decisions, and fishery economics. The model structure will be modified to include dynamics appropriate for sea scallop fishing vessels, fleet, and port structure, and the latest stock distribution, biology, and ecology. The resulting sea scallop model will be used to implement simulations that consider proposed wind array configurations, combined with anticipated vessel responses to array and turbine locations and stock abundance dynamics. All simulation details will be informed via stock assessment data, and detailed input from industry and management advisory teams. Development of the model structure itself is of long-term benefit to the scallop fishery because it can be used subsequently to evaluate a variety of fishery dynamics including consequences of stock range shifts, rotational closures, management changes, and other spatial use conflicts.

Understanding and identifying the costs of displacement or changes in sea scallop fishing activity due to wind energy will enable the industry and fishery managers to have a quantitative basis for managing future expectations relative to the interaction between the scallop fishery and the growing offshore wind industry.

2.0 PRELIMINARY RESULTS AND DISCUSSION

- Team meetings have continued on a regular basis and relevant datasets are assembled
    - Multiple federal survey datasets are available to inform model biology
    - Dr. Mann (VIMS) has provided age datasets available to inform growth and mortality
    - Permit data have been gathered to inform fleet parameterization
- PIs travelled to docks in Cape May, Point Pleasant, and New Bedford to talk with scallop captains about their fishing behaviors, decision making, vessel capacities and wind energy
- Model development and validation is underway
    - A novel spatial domain is created that has nested spatial resolution and encompasses the shelf habitat from the mouth of the Chesapeake north to the southern Gulf of Maine, and eastward to the shelf break.
    - Scallop biological model or calculating scallop population dynamics have been developed and are under evaluation.
    - A fishing model is being developed that assigns vessels in the fleet to a homeport and allows them to fish days-at-sea trips in the domain. The performance of the fishing model is being evaluated against data collected.
    - Seasonal spatial dynamics in the fleet, and fishery exploitation of management area quotas are being built into model capacity.
- Results will not be able to be generated until the model reconfiguration is complete and simulations are run.

3.0 SPECIAL COMMENTS

Engagement with fishing collaborators has been critical to model development. Information provided to the modeling team about how fishing decision are made in this fishery, and where, when and what they fish has been highly informative to the changes made to the model structure. We anticipate that this generous information sharing will allow the model to generate realistic stock, fishery, and management dynamics. Any details specific to companies or individuals will be masked in the final model product and any results derived from the model to protect those who have contributed information.