

Virginia Ocean Plan
FY16 Task 94.01
Final Report, Grant Period October 1, 2016 to June 30, 2018
Grant# NA16NOS4190171
Compiled by Todd Janeski, VCU, Department of Life Sciences

This project was funded by the Virginia Coastal Program at the Department of Environmental Quality through Grant FY16: NA16NOS4190171 of the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Management, under the Coastal Zone Management Act of 1972, as amended.



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Overview

The VCU Environmental Scientist/Analyst, as retained by the Virginia Department of Environmental Quality, Coastal Zone Management Program, served as the Ocean Planning Stakeholder Engagement Coordinator (OPSE) for the grant reporting period under the VACZM Section 309 Ocean Resources Strategy. During this period, a several tasks were undertaken: ocean stakeholder engagement for the Healthy Oceans Ecosystem's Goal of the Mid-A Ocean Action Plan, engagement of ocean users needs under the Sustainable Ocean Uses Goal of the AOP, and a synthesis of scientific literature on electromagnetic field (EMF) impacts on fisheries and threatened and endangered species.

Ocean planning in the Commonwealth includes a partnership, the Mid-Atlantic Regional Council on the Ocean (MARCO), which includes representatives from the States of New York, New Jersey, Delaware, Maryland and Virginia. The broader MARCO effort is being supported through several contractors such as Monmouth University, University of Delaware, Rutgers University, Nature Conservancy, and NatureServe. Primarily, ocean planning brings together the sectors of Ports and Navigation, Military, Commercial Fisheries, Recreational Users, Alternative and Traditional Energy, Conservation, Tourism, and Local Government. These sectors have been brought together both in the Commonwealth as well as in the region to share information regarding ocean uses for the purpose of understanding the complexity of overlapping and abutting uses.

During the reporting period, the OPSE Coordinator worked to support the VZCM Director and directly engaged with the commercial and recreational fishing sectors to convey information and obtain feedback to continue the forward progress on ocean planning. The OPSE Coordinator sought to assist in the development in data development and synthesis of information to support informed decision making. The OPSE Coordinator worked with the Marine Life Data Analysis Team (MDAT) to synthesize, analyze and document changes in species geographic range for black sea bass (*Centropristis striata*) and summer flounder (*Paralichthys dentatus*). Through extensive communications with the VA Marine Resources Commission, the OPSE Coordinator sought to obtain Virginia-based, fisheries data relevant to the catch, based on communications with staff at VMRC indicating those catch data would inform conclusions about changes in catch location. The intent was to display species shifts to determine if there was a visible relationship to changes in temperature and/or climate. Close coordination with Duke University and Nature Conservancy was implemented to develop the data format and delivery mechanisms. Close coordination with the VA Marine Resources Commission was required to ensure those data could be made available for such conclusions provided the analysis ensured the Rule of 3 is not broken, maintaining data protection standards. The VA Marine Resources Commission indicated those catch and landings data would be available to the mid-1990s and agreed would be helpful in understanding changes in geography. After extensive communication and coordination with the VMRC, data delivered did not meet the request only providing, year, species and harvest

gear. VMRC indicated that the specific geographic description of latitude and longitude could not be supplied and only Water Area could be provided. Further request for data were refined and submitted to MRC including year, species, gear and water area but was met with limits in availability of those data due to confidentiality issues and not meeting the Rule of 3. Therefore, despite VMRC staff indicating those data were available to make conclusions about the changes in catch location of certain species, those data as they relate to the Waters Areas identified (*Ocean, Seaside Eastern Shore and Misc Seaside* (VMRC Systems 1 - 3)) were not made available. This lack of available data, due to confidentiality, resulted in the inability to make conclusions about species shift due to changes in climate or other factors. This frustrating conclusion could have been avoided had those VMRC staff been more familiar with those data and data management requirements before offering their availability.

From previous coordination and conversations with the offshore commercial fishing fleet, the concept of fixed gear loss due to ship strike was raised. The OPSE Coordinator communicated with the commercial fishing industry, specifically the potters and gillnetters, to further understand this gear loss issue. Anecdotally, it had been reported that certain gill netters and potters had lost significant gear that amounted to a high impact to the annual income due to an increase in cargo ships striking their gear. Those locations were anecdotally identified outside the shipping lanes and in open waters. The OPSE Coordinator sought to specifically identify those locations but found limited success due to changes in the points of contact representing the various gear types and the corresponding difficulties establishing a dialogue with these new points of contact. The goal of such interaction is to record and formally document gear loss with the outcome of minimizing economic impacts to each industry with the potential to maximize their activities. Further work could be explored and options to identify additional areas of navigation that seasonally might have a higher incidence of potential ship-strike and impacts on the commercial fishing industry. The US Maritime Administration (MARAD) has demonstrated interest in understanding this issue further.

Based on the FY14 reprogramming of 309 funding, the partnership between the VCU Center for Environmental Studies and the VCU Department of Electrical and Computer Engineering for the purpose of conducting research relevant to the collection of data demonstrating any electromagnetic field impacts on migratory, Federally-listed, endangered Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*). Through this partnership, the VCU Engineering modeled, designed, and built a high-precision Magnetic and Electromagnetic (M/EM) Field Generator as well as an array of magnetometers (sensors) that allow researchers to track and record M/EM values continuously during each experiment. In the laboratory, sturgeon biologists from the VCU Center for Environmental Studies utilized visual tracking software and data gathered by high-speed cameras to quantify and evaluate a range of fish behaviors in response to magnitude and orientation of M/EM fields. The VCU research team focused on the collection of data to continue to inform a response to the hypothesis that EMF should affect behavior of Atlantic Sturgeon. Results of that study suggested that, under laboratory conditions, the types and ranges of M/EM fields to which Atlantic Sturgeon were exposed in the laboratory did not result in biologically relevant changes to simple behaviors in sub-adult individuals. Hence, these results are not consistent with the hypothesis that localized M/EM fields from anthropogenic sources—specifically benthic HV cables—in coastal ocean habitats may negatively impact behavior of migrating or foraging wild Atlantic Sturgeon.

Because of the relevance of those FY14 Section 309 supported data, research, and from feedback from the commercial fishing industry which concluded changes in catch of boney fishes was due to an increase in submarine cables, the concept of developing a synthesis of research related to research electromagnetic field impacts on commercial fisheries would be beneficial. The original intent was to focus on those VCU-based research on threatened and endangered fishes such as Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) for the purpose of developing a communication piece for the industry was developed. Upon further discussions, the focus was to create a Frequently Asked Questions (FAQ) document translating the conclusions from the research conducted at VCU on EMF impacts on sturgeon and to expand to include black sea bass (*Centropristis striata*), summer flounder (*Paralichthys dentatus*), tautog (*Tautoga onitis*), and channeled whelk (*Busycotypus canaliculatus*). The OPSE Coordinator added capacity by bringing a VCU Research Assistant Intern to collect and synthesize relevant published, peer-reviewed papers to further understand the breadth of research associated with the topic. That research was expanded to include black sea bass, summer flounder, tautog, channeled whelk, and knobbed whelk (*Busycon carica*), American lobster (*Homarus americanus*), pelagic species, broader boney fishes and elasmobranchs (sharks and rays). Chesapeake Environmental Communications (rebranded: Greenfin Communications) was hired to develop the layout and design while the VCU intern continued to conduct detailed research and policy brief documents. During the research and synthesis process, intermediary conclusions indicated that limited research was available to make informed conclusions regarding the impacts of either electro or magnetic impacts on boney fishes. Majority of available research has been conducted on those species that either utilize magnetic navigation for migration or electric field detection for feeding behavior such as sharks and rays. Some research has been conducted on shellfish but with a focus on conch or lobster. Challenges continue to be these lack of conclusion to inform anecdotal evidence of boney fishes impacts.

The FAQ document was developed beyond a single, one-page document as originally intended and expanded to a four-page FAQ with detailed information. Once the scope was broadened beyond the focus of threatened and endangered fish and a short list of commercially sought benthic, boney fishes, the document was expanded to include a background on design of wind farms and electromagnetic fields, submarine cables design and installation, broader marine species affected and not affected by EMF, how life stage and age class of species plays a role in habitat utilization, mitigating impacts and the research gaps. Included in the FAQ document is a literature cited and was reviewed by VMRC, BOEM, NOAA, Dominion Energy, Orsted and commercial fishing representatives. The complete document can be found in Appendix 1.

The OPSE Coordinator was nominated by the Governor McAuliffe Administration to the BOEM Offshore Renewable Energy Task Force in 2016. The Coordinator attended the Task Force meeting in Virginia Beach on December 7, 2017. Orsted, previously known as Dong Energy, was present as Dominion Energy's developer of the VOWTAP area and reported on progress made toward a 2020 deployment of the two test turbines in the leading edge of the VA Wind Energy Area (WEA). Orsted and Dominion shared design changes in the proposed deployment of those test turbines from a twisted-jack design to a monopole. Additionally, two historic test turbine locations were discussed immediately north of the VA WEA that are positioned in an area identified by the commercial fishing industry as being highly productive for benthic

species and by the recreational sector as being a site most commonly fished. That site was identified and used “as an example” of other potential sites for turbine deployment or offshore research. The OPSE Coordinator raised the issues from both the commercial and recreational sector that they identified those locations as valuable to their industry and would likely be vocal opponents of changes in use or otherwise impacts to the landings. Recommendations were shared with Dominion and Orsted to follow the process outlined in the Collaborative Fisheries Management Project and Best Management Practices, funded by BOEM and the VA DMME. VA had offered to Dominion to assist in the development of communication materials that would inform the commercial and recreational sectors of timing and potential impacts.

Further work with the offshore wind industry began to define the opportunities for the OPSE Coordinator to begin to serve as an interim Fisheries Representative. Work detailing the implementation of that role will be reported on under FY 17. However, the OPSE Coordinator met with Dominion Energy and Orsted to expand on the information and timing of deployment shared at the Virginia Beach Offshore Wind Renewable Energy Task Force meeting. The opportunity to grow a relationship that would assist in the deployment of renewables was in the best interest of the Commonwealth.

In March, 2017, the OPSE Coordinator was requested to assist the MARCO Executive Director by sharing contacts to market the upcoming Healthy Ocean Ecosystem Indicators workshop planned for Delaware. The OPSE Coordinator attended the April 2017 meeting at Rutgers University *Changing Ocean Conditions Related to Fisheries* in New Brunswick NJ, the MARCO ERA Workshop in Dover, DE in May where they assisted in the facilitation of breakout groups and the whole working group to identify those areas and means to protect ERAs. The OPSE Coordinator joined the ERA workgroup webinars, and the Silver Spring RPB meeting in June as an observer and to coordinate with federal, state and local partners on issues related to Virginia’s commercial fishing interests. The RPB meeting provided the opportunity to interact directly with the sectors with specific focus on the commercial fishing interests. These opportunities included communicating with representatives from Garden State Seafood Association, representatives of the scallop industry and Center for Sustainable Fisheries. Social capital building provided for continued relationship development with the industry and solidifying the Commonwealth’s position with the industries. The OPSE Coordinator joined various calls including the ERA Workgroup, and MARCO MB calls. The OPSE Coordinator engaged with the Long Island Commercial Fishing Association, SeaFreeze, Town Dock, Garden State Seafood Association, FMC Representatives, and commercial and recreational contacts from VA, NY and NC.

Appendix 1: Electromagnetic Field Effects on Marine Fishes in the Mid-Atlantic

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