Title: Collaborative development of a winter habitat model for Atlantic Mackerel, “version 2.0”, for the identification of “cryptic” habitats and estimation of population availability to assessment surveys and the fishery

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Applicant type: Trade Association 501c6

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MAFMC Research Area Being Addressed:
The proposed research to develop an Atlantic Mackerel habitat model addresses MAFMC research priorities # 1 and # 2 published in the Mid-Atlantic Collaborative Fisheries Research Request for proposals. If funded, we will develop a 2nd generation habitat model that will be used to: 1) develop environmentally informed and time varying estimates of the availability of Atlantic Mackerel to fishery independent surveys used to inform models in upcoming stock assessments, and 2) serve as a quantitative hypothesis we will use to design an efficient, cost effective and state of the art industry based field survey of cryptic habitat and potential mackerel aggregations outside the domain of fishery independent surveys and the current fishery.

Proposed Start Date: May 1, 2016
Proposed End Date: December 15, 2017
Amount requested under this proposal: $125,241.00
Executive Summary

Research priority area being addressed: This proposal for industry, academic and government collaborative research addresses the following MAFMC collaborative research priorities listed in the 2016 Request For Proposals:

1) Investigate net efficiency, availability and catchability of Atlantic mackerel to the NEFSC trawl survey

2) Investigate abundance and/or distribution of Atlantic mackerel beyond the depth range of current NEFSC trawl surveys.

These were also among the same important research priorities identified by the Atlantic Mackerel Working group (AMWG) of industry, academic and government experts assembled for the 1st Atlantic Mackerel Population Ecology and Fishery Workshop: Industry & Science perspectives, December 2-3, 2015 Point Judith, RI which was supported by the MAFMC and NOAA/NEFSC Cooperative research program. We will leverage the expertise and advice of the AMWG to ensure the product we develop is of the highest quality and has the highest possible impact in an ecosystem based assessment of the North West Atlantic Mackerel population scheduled in late 2017.

Brief overview of methods: Our overall objective in the proposed industry-science collaboration is to synthesize existing information to develop and evaluate a quantitative model describing dynamic winter habitat distributions for Atlantic Mackerel that can be used to accurately estimate the availability of the population to fishery independent (FI) surveys and the fishery. To address RFP priority #1 we will apply the model in hindcast mode to estimate availability of the population to fishery independent surveys used in the 2017 Atlantic Mackerel stock assessment. We will do this by applying methods similar to those used in the recent stock assessments of Atlantic Butterfish, Scup and Bluefish (NEFSC 2014, 2015). To address RFP priority area #2 we will use simulations of the model as a quantitative hypothesis of cryptic habitat distributions to design an efficient, cost effective strategy for an industry based exploratory survey of locations and times of potential Mackerel aggregations outside the domain of FI surveys and the fishery.

We will achieve our objectives as follows. We will 1) formally evaluate two existing models of dynamic winter/spring habitat distributions for adult and juvenile Atlantic Mackerel in the Northwest Atlantic. The first model was developed collaboratively by Roffer’s Ocean Forecasting Service, Inc. (ROFFSTM) and the fishing industry in 2007-2009 (CO-PI: Roffer). This model was based on satellite derived sea surface temperature, ocean color, water mass boundary stability and historical catch data. The second model has been co-developed from 2015 through the present by NEFSC Cooperative Research Program (CO-PI: Manderson) and the Study Fleet (CO-PI: Bright and others) using validated data assimilative ocean models, FI survey data, study fleet and observer catch data and the mental models of individual fisher collaborators. Secondly, we will 2) assemble and review scientific and industry based information describing characteristics of deep water mackerel habitats (>200M) in the North East Atlantic that contribute significantly to an annual European harvest of 500,000-1 million tons (CO-PI: Moore & Bright have close relations with the EU Mackerel fishery industry). With input from the AMWG we will 3) synthesize results of the evaluation of the two US models and deep water mackerel habitat information from the Northeast Atlantic to develop a 2nd generation winter habitat model for Atlantic Mackerel (v2.0). We will evaluate the accuracy and precision of model v2.0 during the winter of a 2016-2017 by leveraging field activities of NOAA/NMFS Northeast Fisheries Science Center (NEFSC) cooperative research study fleet, as well as available study fleet, observer,
and fishery independent data. We will review results of the model evaluation and pathways for applying it to develop an index of population availability to fishery independent surveys used the assessment with the AMWG. With guidance from the AMWG we will 4) apply the model to develop population availability estimates with uncertainties, and draft technical working papers in time for Atlantic Mackerel assessment data, modeling, SARC review meetings scheduled for the summer and fall of 2017. Finally, we will 5) design a cost effective and efficient industry based survey of habitats outside the domain of fishery independent surveys and the fishery using the 2nd generation model as a quantitative hypothesis of locations and times of “cryptic” mackerel habitat and potential aggregation.

Measurable outcomes: We will use a collaborative industry-science approach to produce and evaluate a 2nd generation winter habitat model for Atlantic mackerel. This model will be used in hindcast mode to develop a quantitative estimate of the availability of the mackerel population to fishery independent surveys in the North West Atlantic. We will produce availability estimates and working papers describing technical details for presentation at benchmark stock assessment meetings scheduled for the second half of 2017. The 2nd generation habitat model be used as a quantitative hypothesis to design industry based surveys of potential mackerel aggregations in “cryptic” habitats including those in deep water off the edge of the US continental shelf. During well-defined and critical periods in the research we will review preliminary results and approaches with the Atlantic Mackerel Working group (AMWG). We will incorporate advice of the working group to maximize the likelihood that products produced will have impact in the assessment and management of the North West Atlantic Mackerel population.
**Introduction:** Atlantic mackerel (*Scomber scombrus*) is a fast swimming, migratory, cold temperate pelagic fish that occupies continental shelf, slope and oceanic island waters throughout the North Atlantic where it has supported valuable fisheries. During the past 250 years the western Atlantic fishery has experienced periods of high abundance and scarcity of several orders of magnitude (Hoy & Clark 1967). Changes in availability of the fish to a fishery can result from shifting habitat distributions and migration pathways as well as population fluctuations. However contributions of births, deaths and movements to fluctuations in mackerel availability are unknown. Mackerel have recently been scarce in Western North Atlantic (NWA) waters where its stock status is highly uncertain. Cryptic habitat use, including occupation of deep continental slope habitats, is one of several competing mechanisms hypothesized to account for the low abundance of mackerel in fishery independent surveys and the fishery.

In the NWA, mackerel can range from North Carolina to Labrador, but migration and seasonal distributions appear to be primarily controlled by variations in seawater temperature, prey availability and other external factors (Overholtz, et al., 2011, Radlinski et al. 2013, van der Kooij et al. 2015). Mackerel perform extensive fall migrations from Canadian and Gulf of Maine (GOM) waters southward to overwintering grounds in southern New England and the mid-Atlantic Bight (MAB) where they occupy waters between 5-8°C (Karasiov 1975); Manderson, unpub. analysis (Fig 2a); Goodwin G. pers. com.). Mackerel also appear to respond to shifts in prey availability. Recent expansion into western Greenland waters appears to be related to shifts in distributions of copepod prey (ICES 2014, van der Kooij et al. 2015). There is speculation that fish overwinter in continental slope water outside the domains of FI surveys and the fishery. Mackerel occur as by-catch along the shelf break in the winter squid fishery. The fish also overwinter in deep water habitats (~225 M) in the northern North Sea where they support an important European fishery (Petitgas 2010, Slotte et. al. 2005).

Models predicting probabilities of habitat occupancy can be used to identify important cryptic habitats and estimate environmentally dependent changes in population availability to surveys and fisheries (Manderson et al. 2011; Muhling et al. 2015; NEFSC 2014, 2015). Habitat models with broad extents produced time varying estimates of population availability to surveys used in recent assessments of Atlantic Butterfish, Scup and Bluefish (NEFSC 2014, 2015). The model based estimates of proportions of habitat sampled fall within bounds of empirical availability estimates (Richardson et al. 2014). Coarse-grained habitat models can be developed from FI surveys. However, FI surveys alone cannot be used to accurately describe habitat outside survey domains or at scales finer than sampling scales that are seasonal with grains > 10km. Fishers sample daily at scales of ≤1 km and are not constrained to FI survey domains. *Synthesizing formal analyses of FI survey and fisheries data and mental models of expert fishers should produce models that accurately capture fine scale and “cryptic” habitat use patterns.*

We will synthesize existing models developed using different data and approaches including mental modeling with fishers into a 2nd generation habitat model for Atlantic mackerel (v2.0). We will use model v2.0 to hindcast population availability to FI surveys for the next assessment. We will also use model v2.0 as a hypothesis predicting potentially important “cryptic” mackerel habitats to develop a strategy for a cost effective industry based survey, otherwise prohibitively expensive to perform given vessel costs of ~$12k-15k day⁻¹.
Methods: We will meet our objectives by perform the following tasks:
1) Evaluate existing collaborative industry-science efforts to develop winter/early spring habitat forecast models for Atlantic mackerel in the NWA. We focus on winter/spring models because the high volume fishery has traditionally occurred during this season and the spring NEFSC bottom trawl survey is currently used in stock assessments.
2) Gather and review fishery dependent and independent information describing the deep-water habitat associations of Atlantic Mackerel in the North East Atlantic (NEA).
3) Develop mackerel habitat model v2.0 based on evaluation of the 2 NWA habitat models and the review of NEA deep-water habitat characteristics. Evaluate accuracy and precision of habitat model v2.0.
4) Use hindcast ocean habitat characteristics as input to model v2.0 to develop time varying estimates of proportions of available habitat suitability surveyed on fisheries independent surveys informing population models considered in the 2017 benchmark assessment.
5) Use simulations of model v2 as a quantitative hypothesis to develop a cost effective, efficient strategy for an exploratory industry-based survey of potentially important “cryptic” habitat including in the shelf slope sea.

At the critical stages between tasks #2 and #3 and #3 and #4 we will review progress and products and seek the guidance of the Industry, Academic and Government experts in the Atlantic Mackerel Working Group (AMWG). Leveraging the AMWG will maximize the likelihood that we will produce state of the art products that significantly impact the assessment and the ecological and economic sustainability of the fish and fishery.

Task 1) Two existing habitat modeling efforts will be evaluated and synthesized. The first effort led by ROFFS™ (Co-PI Roffer; https://www.roffs.com) was an industry collaboration occurring from 2007-2009 (Fig.1). Preferred winter habitat for Atlantic Mackerel was determined using historical catch data provided by the fishing industry (1981-2006) and satellite derived sea surface temperature (SST), chlorophyll and colorized dissolved organic matter (CDOM). These fields, supplemented with ocean frontal analysis, provided daily forecasts of areas where mackerel were most likely to be caught. Northern Pelagic Group, LLC (NORPEL) and Lund’s Fisheries, Inc. participated in the project. The analyses proved moderately successful when fish occurred within 60 miles from shore. They were not sufficiently tested when mackerel concentrations were most likely to occur beyond 60 miles from the coast where there was little fishing effort. The project was suspended in 2010 because the absence of persistent mackerel concentrations near the coast dramatically depressed fishing effort.

The second effort seeks to “crowd source” the mental models of expert fishers participating in the NEFSC study fleet. It is ongoing and was launched during the winter
of 2014-2015 by the NEFSC NOAA cooperative research program (CO-PI Manderson, lead). A baseline thermal niche model was developed using a parametric approach and NEFSC spring bottom trawl collections of mackerel (Fig. 2). The approach produced a thermal niche model during the winter that matched published studies, but with parameters that can be easily adjusted to reflect the “mental” habitat models of collaborating NEFSC study fleet experts. The data assimilative, validated MARACOOS ESPRESSO ROMS ocean model (www.myroms.org/espresso) that has a 3 day forecast horizon and covers the MAB with a 5 km horizontal resolution is used to project various “flavors” of personalized habitat models. While the current work has focused on water temperature just above the seabed, addition of water column thermal habitat dynamics, as well as other ocean characteristics are being explored. The models are developed and evaluated iteratively with blind and transparent methods and catch and temperatures measured by NEFSC study fleet collaborators during normal fishing operations.

Simulations of thermal habitat for Atlantic mackerel near the seabed during the winter show a persistent band of “preferred” bottom water temperatures offshore of the continental shelf break at depths ranging from 250 to 400 meters (https://dl.dropboxusercontent.com/u/13925942/AtlanticMackerelAnimate.gif). Simulations also show the evolution of water masses on the continental shelf that form ephemeral thermal “shuttles” and corridors connecting the Gulf of Maine to the SNE/MAB. These features appear to be generated by winter storms and associated “cold snaps”.

The ROFFS & NEFSC COOP models will be formally evaluated using fisheries independent survey data, study fleet data and observer data not used in model training. Use of fishery data will allow us to evaluate the accuracy of the models outside space-time domains and at scales finer than is possible using FI survey data alone. A “backward selection” processes will be used to evaluate multivariate models and identify variables that contribute greatest accuracy to predicting winter habitat occupancy for Atlantic Mackerel. We will measure accuracy using the relationship between model based predictions of habitat suitability and probability of occupancy calculated using catches and habitat characteristics in the evaluation data (see methods TOR 3 NEFSC 2014, 2015). The metric of model precision will be standard errors for occupancy probabilities computed using evaluation data for predicted habitat suitability values.

Task 2) We will review fisheries and scientific information describing the deep water habitat ecology of Atlantic Mackerel in Europe. CO-PIs Moore and Bright have
longstanding relationships with participants in the Mackerel fishery in Iceland, Norway and the UK as a result of their direct involvement in the development of Alaska (Moore) and US east coast pelagic fisheries (Moore and Bright) beginning in the 1980s. They have maintained these relationships and have outstanding offers for information transfers with EU partners. Moore and Bright will work to identify leading EU industry participants and information including industry data describing size dependent abundance and environmental characteristics if available. We will also perform a thorough review of the scientific literature. If possible a CO-PIs will arrange to meet with European industry and scientific experts immediately following the ICES Annual Science Conference in Riga, Latvia, September 2016. (This travel will not be funded on this grant)

**Task 3** We will present the results of steps 1 and 2 at the 2nd Atlantic Mackerel Population Ecology and Fishery Workshop: Industry & Science perspectives, which we anticipate will be scheduled in October 2016. We will present to AMWG, which includes the lead stock assessment scientist (K Curti), several alternative approaches to integrate the best features of the models and the deep water habitat information into a model v2.0. This model will serve as a tool for 1) hindcasting population availability to surveys and the fishery for stock assessments and 2) forecasting locations and times of “cryptic” habitats including potentially important deep water habitats in the shelf slope sea. Based on the advice of the AMWG we will develop, evaluate and refine a working model v2.0. To do so we will combine an opportunistic field based approach with industry partners in the NEFSC Study fleet during the winter season of 2016-2017, along with out of sample evaluations using available fishery and fishery independent data not used in the training of model v2.0. We will develop a “straw man” approach to apply the refined model v2.0 to estimates of population availability to assessment surveys used to calculate abundance indices for the 2017 assessment. We anticipate the approach will be similar to the one used in the 2014 Assessment for Atlantic Butterfish (NEFSC 2014) and 2015 assessments of Scup and Bluefish (NEFSC 2015).

**Task 4** We will present habitat model v2.0, its evaluation, and preliminary availability indices developed using the “straw man” approach to the 3rd Atlantic Mackerel Population Ecology and Fishery Workshop: Industry & Science perspectives which we anticipate will be scheduled in late April 2017, several months prior to the formal stock assessment meetings. Based on guidance of the AMWG we will finalize the approach, develop availability indices with uncertainties from the habitat model and draft technical documents to be presented at the data, modeling and SARC assessment review meetings anticipated to occur from mid summer to December, 2017.

**Task 5** We will use simulations from model v2.0 to develop a design and detailed plan, including cost estimates for an exploratory industry based survey of cryptic mackerel habitats on and off the continental shelf.

**Specific results expected:** We expect to develop an accurate model of winter habitat suitability for mackerel both on and off the shelf using our approach that combines statistical and mental modeling with fishers knowledge within a data rich context of assimilative ocean models, ocean observations, and shipboard measurements from participating study fleet and fishery independent surveys. We expect that the model, developed and evaluated using a combination of opportunistic field evaluation with the industry and traditional out of sample statistical techniques, will allow us to provide state of the art time varying estimates of mackerel habitat suitability sampled by FI surveys.
This index that has been shown to provide accurate proxies for population availability to surveys in 2 recent stock assessments. Further we expect to be able to use habitat model v2.0 as a quantitative and environmentally explicit hypothesis for the design of a state of the art, cost effective exploratory industry based survey of cryptic mackerel habitats, including those located in the shelf slope sea. Identifying potential habitat outside the “known” winter/spring distribution will allow commercial fishermen to explore unfished areas cost effectively. We anticipate that real-time habitat forecasts will improve the efficiency of the industry’s operations by reducing search time, which reduces critical expenses and increasing fishing precision and selectivity which reduces undesirable collateral ecosystem effects.

### Time frame/work plan

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### Elements of collaboration with the fishing community, industry, and stakeholders:

The industry-Science collaboration, led by PI Greg DiDomenico of the Garden State Seafood Association (GSSA), leverages and synthesizes features of earlier and ongoing collaborations with the Atlantic Mackerel fishing industry. The first of these modeling efforts undertaken in 2007-2009 by ROFFS™ in collaboration with several companies fishing (e.g. NORPEL, Lund’s Fisheries, Inc.) to develop habitat classification from satellite observations for prediction. The second is a continuing effort by the NOAA/NEFSC Cooperative Research Program (CO-PI John Manderson) and members of the NOAA Study Fleet and the AMWG (Lunds Fisheries, Cape Seafood, Axelson & Sons, Seafreeze Ltd). CO-PI Peter Moore, once a partner in NORPEL and NORPEL’s VP for Science and Intergovernmental Affairs, along with CO-PI William Bright has close connections with experts in the in the European mackerel fishery that we will also leverage in this project to better understand the deep water habitat associations of Atlantic Mackerel. Evaluation and synthesis of the models and deep water habitat information into a final working model will be performed by a team including CO-PI William Bright, an expert in the US mackerel fishery, as well as other industry experts participating in the NEFSC Cooperative research program. Finally, this proposal leverages the expertise and guidance of the collaborative working group of experts in ocean physics, marine ecology, stock assessment, fisheries, and fishery economics from the fishing industry, government and academia to amalgamate the understanding of “all sides” and develop rigorous approach to integrate relevant ecosystem considerations into the accurate assessment and rational management of the Atlantic Mackerel population in the North West Atlantic (i.e. AMWG).
## BUDGET

**GSSA: Collaborative development of a winter habitat model for Atlantic Mackerel**

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5. Statement of Qualifications and Staffing Plan
**Greg DiDomenico Lead PI** (Garden State Seafood Assn.) will administer the grant and provide interface with the MAFMC and outreach with industry stakeholders. Greg has been a leader in bringing industry expertise and involvement to bear on solutions to difficult fishery science and management issues including MidAtlantic Deep Sea Coral delineations and protections and resolving "data poor" stock status of the Butterfish and restoring the directed fishery. He attends all MAFMC and ASMFC meetings to evaluate changes to FMPs. **Bill Bright Co-PI** (F/V Defiance) is Owner-Operator of F/V Defiance, a longline tuna and swordfish vessel, and former Owner-Operator of F/V Retriever, a 140 ft mackerel and herring vessel. Bill has fished for mackerel and herring since the early 80s when foreign fleets and Joint Ventures operated in the NWA. Bill is a Master Mariner and has a wealth of knowledge of the habitat relations of Atlantic Mackerel. Bill will work closely with fishing fleet and team scientists. **Peter Moore Co-PI** (Fishing Industry veteran/MARACOOS) will serve as Project Manager, and liaison to European-US mackerel industry and IOOS. From mid-90s-2011 he was managing mackerel fishing operations in the NWA, leading tech transfers with European, Icelandic, UK fishing industry while representing the industry interface in mackerel assessment and management. He currently serves as Industry Advisor to MAFMC, NEFMC, ASMFC and is a recent MAFAC appointee. He has led industry solutions to science-management problems including River Herring By-catch Avoidance program with industry (SMAST and MA DMF), Formation of American Pelagic Association engaging industry in assessments, and development of a voluntary port sampling for mackerel and herring. Peter has been MARACOOS Stakeholder Liaison since 2012. **John Manderson Co-PI** (NEFSC) is a research fisheries biologist with the NOAA/North East Fisheries Science Centers Cooperative Research Program and Ecosystem Processes Divisions. His research interests include relationships between marine habitat dynamics and dynamics of populations and ecosystems and applications of IOOS in quantitative seascape ecology supporting scientific assessment and management of marine resources. His approach blends the ecological knowledge of academic and fishing industry experts into a holistic science that integrates understanding of “wild” and human ecological systems in strategies of sustainable resource use. He co-formed and led multidisciplinary working groups of government, academic and fishing industry experts to formally integrate ecosystem considerations into population assessments of Atlantic Butterfish, Scup & Bluefish, and Atlantic Mackerel. **Josh Kohut Co-PI** (Rutgers Univ./MARACOOS) is an associate professor of oceanography at Rutgers U. with research interest in coastal ocean physical processes that structure marine ecological systems. He has been involved in the development of ocean observing systems and in applying the technologies to better understand the role of the ocean fluid in coastal marine ecosystems. He works across broad stakeholder groups to ensure collaborative in applied studies that have included habitat models used in the butterfish, scup and bluefish assessments. **Mitchell Roffer Co-PI** (ROFFSTM Ocean Fishing Forecasting Service) is owner of Roffer's Ocean Fishing Forecasting Service, Inc. A biological oceanographer and Adjunct Faculty at Florida Institute of Oceanography, Mitch has served as PI on government and industry contracts including integrating satellite and ocean data products in support of ecosystem studies and fisheries management in the Northwest Atlantic. Mitch will work with the team to incorporate previous work he conducted for the pelagic fishery from 2007-2009.
Work Experience:

January 2004 to Present
Executive Director, Garden State Seafood Association, Cape May, NJ
As Executive Director I attend Mid-Atlantic Fishery Management Council and Atlantic States Marine Fisheries Commission meetings in order to evaluate changes to the Fishery Management Plans under the authority of these regulatory bodies. I am responsible for submitting written comments and giving public testimony on behalf of the Garden State Seafood Association. I represent our association to the New Jersey State Delegation as well as our U.S. Federal Delegations. This requires frequent communication and the development of a sound working relationship with legislative staff. In addition I track state and federal legislation and follow the actions of relevant committees. My experience within the management process, combined with my understanding of the everyday operations of many fisheries, has given me a proper understanding of the Magnuson-Stevens Fishery Management Conservation and Management Act.

1999 to 2004
Executive Director Monroe County Commercial Fishermen, Marathon, FL
As the Executive Director of this association it was my responsibility to communicate to fishing dependent communities all relevant issues and policies of the National Marine Fisheries Service and the National Marine Sanctuary. I attended the Gulf of Mexico Fishery Management Council, South Atlantic Fisheries Management Council and the Florida Fish and Wildlife Conservation Commission meetings. I served on the Florida Keys National Marine Sanctuary Council representing the local commercial fishing industry. I was successful at pursuing and obtaining a $4.8 million Disaster Relief Appropriation for the local community as a result of a hurricane Georges that devastated the fishing industry.

Congressional Testimony:
Oversight Field Hearing before the House Committee on Water, Power, and Oceans, New York December 7, 2015; titled “Restoring Atlantic Fisheries and Protecting the Regional Seafood Economy.”

Legislative Hearing before the Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs United States House of Representatives, July 19, 2012; titled the “Atlantic Fisheries Statutes Reauthorization Act of 2012.”

Oversight Hearing before the Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs United States House of Representatives July 26, 2011; titled “NOAA Fishery Science: Is the Lack of Basic Science Costing Jobs?”
Oversight Hearing before the Committee on Natural Resource Subcommittee on Insular Affairs, Oceans & Wildlife United States House of Representatives, October 27, 2009; titled the “Implementation of the Magnuson-Stevens Fishery Conservation and Management Act of 2006.”

**Published Abstracts and Proceedings:**


Effect of Lobster Traps on Seagrass Beds of the Florida Keys National Marine Sanctuary (FKNMS) 2002: Damage Assessment and Evaluation of Recovery, Junior Author.

**Research Grants:**
2011: National Oceanic and Atmospheric Administration, Experimental Approaches to Butterfish Bycatch Reduction.

**Current Committee Appointments:**
- MAFMC Ecosystem Based Management, Bluefish and Spiny Dogfish Advisory Panels
- MAFMC Squid Mackerel Butterfish and River Herring and Shad Advisory Panels
- NMFS Large Whale and Small Cetacean Take Reduction Team
- NMFS Bottlenose Dolphin and Harbor Porpoise Take Reduction Team
- ASMFC Herring Advisory Panel

**Education:**
B.A., Marine Affairs, University of Rhode Island, Kingston, RI, 1992
William E. Bright  
615 Goshen Road  
Cape May Court House, NJ 08210  
609-338-3497

Commercial Fishing Professional Summary

F/V Defiance  
Owner/Operator 1985 – Present  
55-foot fiberglass longline fishing vessel homeport, Wildwood, NJ  
Fishing summer months in Gulf Stream and canyons from New York to North Carolina  
Permits held: Swordfish, Atlantic Tuna, Mahi, Shark

F/V Retriever  
Owner, Operator 1997 – Present  
140 foot fishing vessel homeport, Cape May, NJ  
Trawling the coastal waters of Maine to Virginia  
Permits Held: Mackeral, Herring, and Squid

F/V WhiteDove  
Captain, First mate, 1991-1996  
120 foot trawler participating in mackerel joint venture and landing in Cape May, NJ

F/V Atlantic Prince  
First Mate, 1987 1990  
Joint venture for coordinator responsible for search efforts between U.S., East Germany, Poland and Netherlands for mackerel and herring

F/V Nightwatch  
First Mate, Deckhand 1983-1986  
83 foot Trawler participating in mackerel joint venture

Professional Accreditation  
Master Captain’s License

Organizations  
Blue Water Fisherman’s Association  
Garden State Seafood Association
Peter Jessup Moore  
University of Delaware  
Mid-Atlantic Regional Association Coastal Ocean Observing System (MARACOOS)  
318 S. College Avenue, Newark, DE 19711  
moore@maracoos.org  
302-528-9773

Education  
Bowdoin College, Brunswick, Maine AB  
University of Rhode Island, Kingston, RI MMA (Master of Marine Affairs – Fisheries and Marine Science concentration)

Employment  
Current—University of Delaware, Mid-Atlantic Regional Association Coastal Ocean Observing System (MARACOOS)  
Stakeholder Liaison  
Interface between the diverse user community, the fishing industry and the technical capabilities of the MARACOOS Ocean Observatory consisting of satellite, HF radar and in water ROVs and stationary buoys.

2011-2012—Maine Lobster Industry Business Planning Consultant  
(http://www.taaforfarmers.org/commodity/)

2002-2011—Northern Pelagic Group LLC, New Bedford, MA (Atlantic Mackerel and Sea herring fishing company)  
Partner and Director of Governmental and Scientific Affairs (www.norpel.com)


Vice President, Pelagic Division  
Foreign fishery joint ventures targeting NW Atlantic mackerel and herring utilizing Russian and other flag vessels

1974-1995 Alaska Commercial Fisheries - Fisherman, Processor, Business Consultant  
Project Manager for Alaska Fisheries Development Foundation – International technology transfer to “Americanize” the Alaska fisheries

Relevant Appointments (all current)  
• 2015 – present (first term) NOAA Marine Fisheries Advisory Committee (MAFAC)  
• Mid-Atlantic Fisheries Management Council Advisory Panels:  
  1. Atlantic Mackerel, Squid and Butterfish AP  
  2. Ecosystems and Ocean Planning AP  
  3. Spiny Dogfish AP  
• New England Fisheries Management Council Atlantic Herring Advisory Panel
Relevant Appointments (con’t)

- Atlantic States Marine Fisheries Commission Atlantic Sea Herring Advisor
- Mid-Atlantic Telemetry Observing System (MATOS) Outreach Team Coordinator
- NOAA NMFS Protected Resources River Herring/Shad Technical Advisory Group
- NOAA IOOS Animal Telemetry Network (ATN) Steering Committee

Research Grants
2015: National Oceanic and Atmospheric Administration: *Indicators of habitat change affecting three key commercial species of the U.S. Northeast Shelf: A design to facilitate proactive management in the face of climate change*
2015: ASMFC: *Outreach and Website Design-Operational Feedback for the Mid-Atlantic Acoustic Telemetry Observation System (MATOS)*
2009-2012: National Fish and Wildlife Foundation (NFWF): *River Herring and Shad Bycatch Avoidance Project (Initiated proposal and managed project with SMAST and MA DMF)*
John Pilling Manderson PhD  
NOAA/NEFSC Cooperative Research  
1382 Lafayette Street, 2nd Floor  
Cape May, New Jersey 08204  
Email: john.manderson@noaa.gov

**Professional Preparation:**  
Connecticut College, New London Connecticut, Major: Field Biology, Economics. MS 1983

University of Massachusetts, Amherst. Hadley, Massachusetts. Wildlife and Fisheries Conservation Biology. PhD. 2005

**Appointments:**  
Research Fisheries Biologist, NOAA National Marine Fisheries Service, Northeast Fisheries Science Center. GS 11-14 1999-Present

**Products: 5 products closely related to the proposed project**
Manderson J.P. (in press) Seascapes are not landscapes: A systems analysis performed using Bernhard Riemann’s rules. ICES Journal of Marine Science


5 other significant products  


**Synergistic Activities:**
Lead formation of collaborative working groups of fishing industry, academic, and government experts to develop approaches for integrating ecosystem and climate considerations into operational population assessments for Atlantic Butterfish in 2015 and Atlantic Mackerel in 2017.

Session Co-Chair: Science-industry partnerships. The value of cooperative research in fisheries and marine management at the ICES ANNUAL SCIENCE CONFERENCE 2015. Copenhagen, Denmark

Co-conceived, planned and lead 2012 Workshop developing a framework for a quantitative seascape ecology supporting ecosystem assessment and management. Rutgers University.

US lead for marine habitat science section of the ICES working group tasked with developing an integrated ecosystem assessment for the North West Atlantic Regional Sea 2010-2013 [http://www.ices.dk/community/groups/Pages/WGNARS.aspx](http://www.ices.dk/community/groups/Pages/WGNARS.aspx)

Science Advisor for Development of a National Ocean Science Curriculum for grades, 3-5, and 5-8 lead by Curriculum Development Team Laurence Hall of Science Berkeley, California 2008-2012
Education and Training:
1997 B.S. with honors in Physics, College of Charleston, Charleston, South Carolina, USA (Cum Laude)
1997 Minor in Mathematics, College of Charleston, Charleston, South Carolina, USA
2002 Ph.D. Physical Oceanography, Rutgers University, New Brunswick, New Jersey, USA

Professional Experience:
2014-Pres: Associate Professor, Rutgers University, New Brunswick, New Jersey.
2008-2014: Assistant Professor, Rutgers University, New Brunswick, New Jersey.
2002-2007: Director: COOL Operational Center, Rutgers University, New Brunswick, New Jersey.
1997-2002: Graduate Assistant, Rutgers University, New Brunswick, New Jersey

Selected Products:


Other Significant Products:


Synergistic Activities:
Member: National Federation of Regional Association Ocean Observing Build Out Plan Steering Team - National effort to develop a 10 year vision plan for ocean observatory based products and services.

Member: New Jersey Department of Environmental Protection Science Advisory Board - Provide scientific advice to the department related to marine water quality and quantity.

Chair: Radiowave Operators Working Group - ROWG is an international group charged with promoting the reliable, continuous, and quality controlled operation of HF radar surface current mapping networks

Member: New Jersey Governor’s Oil Spill Task Force - Served as an advisor to the governor and his cabinet during the Deep Horizon spill in the Gulf of Mexico.

Collaborators (55, Last 48 Months)
Larry Atkinson (ODU), Don Barrick (CODAR Ocean Sensors), Carlos Barrera (PLOCAN), Bill Biocourt (U.Maryland), Alan Blumberg (Stevens), Michael Bruno (Stevens), Robert Chant (Rutgers), Jorge Corredor (U. Puerto Rico), Rich Dunk (Rutgers), Brian Emery (UCSB), Enrique Fanjul (Puertos del Estados), William Fraser (PORG), Becky Gast (WHOI), Scott Glenn (Rutgers), Hans Graber (U. Miami), Brian Haus (Miami), Tom Herrington (Stevens), Karen Heywood (U. East Anglia), Bruce Huber (Lamont), Olaf Jensen (Rutgers), Clayton Jones (Teledyne Webb Research), Rebeca Jordan (Rutgers), Anton Kjellas (CodarNor), Lee Kerkhof (Rutgers), Gary Kirkpatrick (Mote Marine Lab), Adam Kustka (Rutgers), Phoebe Lam (WHOI), Peter Lilleboe (CODAR Ocean Sensors), Belinda Lipa (CODAR Ocean Sensors), Bruce Lipphardt (U.Delaware), John Manderson (NOAA), Doug Martinson (Lamont), Janice McDonnell (Rutgers), Chris Measures (U. Hawaii), Alan Milligan (OSU), Mark Moline (CalPoly), Mike Muglia (CSI), Jim O’Donnell (UCconn), Matt Oliver (U. Delaware), Jeff Paduan (Naval PG School), John Quinlan (Rutgers), Antonio Ramos (UGCLP), Hugh Roarty (Rutgers), Bob Sanders (Temple), Oscar Schofield (Rutgers), Harvey Seim (UNC-CH), Rob Sherrell (Rutgers), Walker Smith (VIMS), Eric Terrill (Scripps), Joaquin Tintore (IMEDEA), Jay Titlow (Weatherflow), Dave Ullman (URI), Libe Washburn (UCSB), Doug Webb (Teledyne Webb Research), and John Wilkin (Rutgers).
Curriculum Vitae: Mitchell A. Roffer

Education & Professional Experience:

Ph.D. Biological Oceanography, University of Miami, Rosenstiel School of Marine and Atmospheric Science, Division of Biology and Living Resources, Miami, Florida.

President - Roffer's Ocean Fishing Forecasting Service™, Inc. (ROFFS™) West Melbourne, FL. 12/86 - present.

Adjunct Faculty – Florida Institute of Technology, Department of Marine and Environmental Systems. Melbourne, FL. 06/06 - present.

Principal Investigator – 09/11 – 09/15. National Aeronautics and Space Administration four year funded ($1.7M) project, Management and Conservation of Atlantic Bluefin Tuna (Thunnus Thynnus) and Other Highly Migratory Fish in the Gulf of Mexico Under IPCC Climate Change Scenarios: A Study Using Regional Climate and Habitat Models” (10-BIOCLIM10-14).

Principal Investigator – 09/11 – 09/15. NOAA IOOS Southeast U.S. Coastal Ocean Observing Regional Association three year project, “Providing Oceanographic Data in Support of Ecosystem Based Fisheries Management.

Principal Investigator – 06/11 – 12/11. NOAA – Cooperative Institute for Marine and Atmospheric Studies funded project, “Ocean conditions in the Gulf of Mexico.”


Principal Investigator – 06/10 – 9/11. NOAA – Cooperative Institute for Marine and Atmospheric Studies funded project, “Integrated satellite and ocean data products in support of ecosystem studies in the Gulf of Mexico and Straits of Florida.”

Principal Investigator – 05/08 – 05/11. National Aeronautics and Space Administration three year funded project, “Improving The NOAA NMFS and ICCAT Atlantic Bluefin Tuna Fisheries Management Decision Support System.”

Principal Investigator – 01/08-06/08. Florida Department of Environmental Protection – Florida Oceans and Coastal Council funded project “Florida COOS Consortium Task 8: Florida Specific Remote Sensing.”

Principal Investigator – 02/04 – 02/08. National Aeronautics and Space Administration three year funded project, “Study Of Ocean Environmental Parameters To Forecast The Effects Of Climate Variability On Pelagic Fish Resources.”

Selected Publications and Presentations:


7. APPENDICES

7-I. References


http://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/crr306/CRR%20306-Web.pdf

Richardson, D., R. Bell, J. Manderson & J. Hare (2014) MINIMUM BOUNDS ON GEORGES BANK YELLOWTAIL FLOUNDER SPAWNING STOCK BIOMASS WITH A METAANALYSIS OF CATCHABILITY ACROSS NORTHEAST STOCK ASSESSMENTS.


7-2 Budget Justifications

Appendices

Budget Justifications

GSSA: Collaborative development of a winter habitat model for Atlantic Mackerel

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<th>Year 1 (12 mo)</th>
<th>Year 2 (8 mo)</th>
<th>Total</th>
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<td>Greg DiDomenico (1 week/yr)</td>
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<td>Total Indirect Costs (25%)</td>
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<td>$4,527</td>
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Budget Justification:

**Personnel:** Greg DiDomenico is the lead PI and will administer the grant on behalf of GSSA and the Project Team. Assumed salary rate of 3% at $75,000/year.

**Travel:** Funds are requested for two two-day trips from Cape May to Pt Judith, RI, to participate in the Mackerel Working Group (MWG) meetings, and for two two-day trips to Woods Hole, MA, for mackerel stock assessment meetings. Perdiem and travel is at the federal rate of $363/day. Total estimated travel costs are $2,904.

**Indirect Costs:** 25% as per the sponsor requirement as stated in the Clarifications for Mid-Atlantic Collaborative Fisheries Research document dated January 20, 2016.

<table>
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<th>Year 1 (12mo)</th>
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<td>Bill Bright (1.68 mo/yr)</td>
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<td>Fringe</td>
<td>$4,624</td>
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<td>Total Salaries and Fringe</td>
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<td>Total Indirect Costs (25%)</td>
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<td>$7,862</td>
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<td>Total</td>
<td>$22,799</td>
<td>$16,509</td>
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Budget Justification:

**Personnel:** Bill Bright is Co-PI and industry liaison. Assumed salary rate of 15% at $75,000/year.

**Travel:** Funds are requested for three two-day trips from Cape May, NJ to Pt Judith, RI, to participate in the Mackerel Working Group (MWG) meetings, and for three two-day trips to Woods Hole, MA, NEFSC for mackerel stock assessment meetings. Perdiem and travel is at the federal rate of $363/day. Total estimated travel costs are $4,356.

**Indirect Costs:** 25% as per the sponsor requirement as stated in the Clarifications for Mid-Atlantic Collaborative Fisheries Research document dated January 20, 2016.
Personnel | Year 1 (12mo) | Year 2 (8 mo) | Total  
--- | --- | --- | ---  
Peter Moore (1.2 mo/yr) | $8,625 | $5,806 | $14,290  
Fringe | $3,487 | $2,347 | $5,777  
*Rate is 40.43%  
Total Salaries and Fringe | $12,119 | $8,153 | $20,274  
Travel | $2,178 | $2,178 | $4,356  
Total Direct Costs | $14,290 | $10,331 | $24,623  
Total Indirect Costs (25%) | $3,573 | $2,583 | $6,166  
Total | $17,863 | $12,914 | $30,776  

Budget Justification:
Personnel: Peter Moore is Co-PI, Project Manager and industry liaison. Assumed salary rate of 11% at $75,000/year. Note: Moore is part-time (75%) salary at MARACOOS.
Travel: Funds are requested for three two-day trips from Cape May, NJ to Pt Judith, RI, to participate in the Mackerel Working Group (MWG) meetings, and for three two-day trips to Woods Hole, MA, NEFSC for mackerel stock assessment meetings. Per diem and travel is at the federal rate of $363/day. Total estimated travel costs are $4,356.
Indirect Costs: 25% as per the sponsor requirement as stated in the Clarifications for Mid-Atlantic Collaborative Fisheries Research document dated January 20, 2016.

Personnel | Year 1 (12 mo) | Year 2 (8 mo) | Total  
--- | --- | --- | ---  
Josh Kohut (1 summer week) | $2,445 | $0 | $2,445  
Software Technician (1 mon/yr) | $5,200 | $5,460 | $10,660  
Fringe | $2,289 | $2,207 | $4,497  
*Rate is 40.43% for technician and 7.65% for faculty summer  
Total Salaries and Fringe | $9,934 | $7,667 | $17,602  
Travel | $2,000 | $2,000 | $4,000  
Supplies (laptop, software, media) | $2,540 | $2,540 | $5,080  
Total Direct Costs | $14,475 | $9,667 | $24,142  
Total Indirect Costs (25%) | $3,619 | $2,417 | $6,036  
Total | $18,094 | $12,084 | $30,178  

Budget Justification:
Personnel: Josh Kohut (1 week summer salary) will oversee the Rutgers modeling and physical oceanographic analysis. He will be assisted by a software technician (2 months) who will develop software and assemble the datasets for inclusion in the habitat niche model.
Travel: Funds are requested for 2 two-day trips to project and regional meetings for two people each trip. Estimated costs include train ($200 ea.), hotel ($300 ea.), per diem ($300 ea.) and other costs ($200 ea.). Total estimated costs are $4,000.
Supplies: Funds ($2,540) are requested for anticipated project supplies including laptop computer, software and backup media.
**Indirect Costs:** 25% as per the sponsor requirement as stated in the Clarifications for Mid-Atlantic Collaborative Fisheries Research document dated January 20, 2016.

<table>
<thead>
<tr>
<th></th>
<th>Year 1 (12mo)</th>
<th>Year 2 (8 mo)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitch Roffer (1.2 mo/yr)</td>
<td>$4,500</td>
<td>$2,833</td>
<td>$7,333</td>
</tr>
<tr>
<td>Fringe</td>
<td>$1,819</td>
<td>$1,145</td>
<td>$2,964</td>
</tr>
<tr>
<td>*Rate is 40.43%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Salaries and Fringe</strong></td>
<td>$6,319</td>
<td>$3,978</td>
<td>$10,297</td>
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<tr>
<td><strong>Travel</strong></td>
<td>$726</td>
<td>$726</td>
<td>$1,452</td>
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<tr>
<td><strong>Total Direct Costs</strong></td>
<td>$7,045</td>
<td>$4,704</td>
<td>$11,749</td>
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<tr>
<td><strong>Total Indirect Costs (25%)</strong></td>
<td>$1,761</td>
<td>$1,176</td>
<td>$2,937</td>
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<tr>
<td><strong>Total</strong></td>
<td>$8,806</td>
<td>$5,880</td>
<td>$14,686</td>
</tr>
</tbody>
</table>

**Budget Justification:**

**Personnel:** Mitch Roffer is Co-PI. Assumed salary rate of 5% at $75,000/year.

**Travel:** Funds are requested for two two-day trips from Cape May, NJ to Pt Judith, RI, to participate in the Mackerel Working Group (MWG) meetings. Perdiem and travel is at the federal rate of $363/day. Total estimated travel costs are $1,452.

**Indirect Costs:** 25% as per the sponsor requirement as stated in the Clarifications for Mid-Atlantic Collaborative Fisheries Research document dated January 20, 2016.
7-3. Letters of Support
1. John Hoey, PhD., NEFSC Cooperative Research Program and Study Fleet
2. Dave Secor, PhD, U Maryland and MAFMC SSC Mackerel lead
4. Cape Seafoods, Gloucester, MA
5. Lunds Fisheries, Cape May, NJ
6. Western Sea Fishing Co., Gloucester, MA
Thursday, February 11, 2016

Mr. Gregory DiDomenico  
Garden State Seafood Association  
212 West State Street  
Trenton, NJ 08608

Dear Mr. DiDomenico

The NOAA/NEFSC Cooperative Research Program (NCRP) strongly endorses your proposal entitled “Collaborative development of a winter habitat model for Atlantic Mackerel, version 2.0”, for the identification of ‘cryptic’ habitats and the estimation of population availability to assessment surveys and the fishery”. Your proposal which leverages work done by our program and the NEFSC study fleet is fully consistent with the goal of the NCRP which is actively engaging fishing industry experts in the science used to improve the accuracy of population assessments that determine levels of sustainable harvest. Specifically the proposed research leverages two linked NCRP initiatives. These include 1) a working group of industry, academic and government experts formed to identify products to improve the accuracy and reduce uncertainty of the next Atlantic Mackerel population assessment now scheduled for Fall 2017. The first meeting of the group, The Atlantic Mackerel Population Ecology and Fishery Workshop: Industry & science perspectives, also supported by the mid-Atlantic Council, was held in Narragansett Rhode Island December 2 and 3, 2015. At the meeting development of time varying estimates of the availability of the Mackerel population to the NEFSC bottom trawl survey to inform survey catchability estimates” was identified as potentially important product. 2) Members of the NCRP began engaging NOAA study fleet collaborators during the winter of 2014-15 in an effort to develop an operational habitat model for Atlantic mackerel. This effort has continued this winter (2015-16) and is also being leveraged by your proposed research project. We are fully supportive of your efforts and will provide as much assistance as we find possible to ensure that your project is a success.

Sincerely,

John Hoyt, PhD  
Cooperative Research Director  
NOAA/NEFSC Cooperative Research Program & Study Fleet  
28 Tarzwell Drive  
Narragansett, RI 02882
10 January, 2016

Mr. Gregerey DiDomenico  
Garden State Seafood Association  
212 West State Street  
Trenton, NJ 08608

Dear Mr. DiDomenico:

I wish to strongly endorse the research plan and intended outcomes of your team’s MAFMC proposal, **Collaborative development of an Atlantic Mackerel winter habitat model for estimating population availability to assessment surveys and the fishery.** As you know, as a member of the MAFMC SSC, I help lead efforts to understand the stock dynamics of this “data-poor” species and review and develop OFL and ABC reference points for domestic fisheries. I also was privileged to attend the Atlantic Mackerel Population Ecology and Fishery Workshop held in Port Judith last December. At that workshop it became abundantly clear that I remain very much a student of Atlantic mackerel and the fisheries that target this species. There is much to gain by combining the intimate understanding of species ecology and behavior that emerges from actively pursuing mackerel in fisheries and the broader perspectives that surveys, observing systems, and modeling can supply. Your team’s proposal realizes this type of new understanding by wedding “seascape” capabilities (coupled observing system data, multivariate habitat models, and telecommunications) to fisheries ground-truthing. Involvement by the group of fishers and scientists within the Atlantic Mackerel Working Group will also benefit the project - in informing the habitat model, evaluating its predictions, and insuring that research products are amenable to stock assessment frameworks. Research products should also allow for improved interpretation of the NEFSC bottom trawl abundances for Atlantic mackerel, which as you know has been problematic. A particular strength of the proposed work is its alignment with the bench mark assessment for Atlantic mackerel.

In endorsing this proposal, I recognize that there could be a perception of conflict of interest should it receive funding and project findings receive review by the MAFMC SSC. Should such an instance arise, I will be careful to inform the SSC that I initially supported the scope of work outlined in this proposal.

Sincerely Yours,

David H. Secor, Ph.D.  
Professor
To Whom it Concerns:

Seafreeze, Ltd, of Davisville and Point Judith, RI, is a vertically-integrated family owned fishing company with origins in the 1950s, established for over 30 years, and currently run by second generation fishermen. We are a fishing company operated and run by fishermen: http://seafreezeltd.com/fishing-company/.

Our business is based on small pelagic species, including Atlantic mackerel. Seafreeze Ltd, is fully in support of your proposal to the Mid-Atlantic Fishery Management Council 2016-2017 Collaborative Fisheries Research Program.

Our company is a US-owned, vessel and shore-based processor/dealer located in Rhode Island. We are 100% dependent on access to US stocks of small pelagics, including Atlantic mackerel. We employ over 100 people when in production and create food grade products for both the domestic market and for export.

We have been active in the Atlantic mackerel fishing for decades - before, during and after the directed foreign fishery of the 1970s-1990s. Mackerel fishing was robust through 2006, and an important part of our annual production from late November into April. Starting in 2007, availability of mackerel became less and less and, coupled with high fuel prices, our vessels redirected our efforts to other species as the mackerel fishery proved uneconomic.

I am a member of the Mackerel Working Group, and our company is fully supportive of this proposal as it is driven by a meaningful collaboration of industry and science. The proposal is well focused on taking the first step towards understanding the dynamics of the mackerel stock and so informing the next stock assessment scheduled for 2017.

We are pleased to be included in this proposal as Collaborators and will be fully engaged in this effort.

Please call on me any time and we will cooperate fully within our capacities.

Sincerely,

Glenn Goodwin
Owner
Seafreeze Ltd., North Kingstown, and Seafreeze Shoreside, Pt. Judith, RI
February 12, 2016

Greg DiDomenico, Executive Director
Garden State Seafood Association

Dear Greg:

Lund's Fisheries, of Cape May, NJ, is a vertically-integrated family owned fishing company founded in the 1950s and currently run by third generation fishermen. We are a fishing company operated and run by fishermen: http://www.lundsfish.com/

Our business is based on a variety of MidAtlantic species, including small pelagic species, including Atlantic mackerel. Lund's Fisheries is fully in support of your proposal to the Mid-Atlantic Fishery Management Council 2016-2017 Collaborative Fisheries Research Program.

Our company is a US-owned, shore-based processor based in Cape May, NJ. We are 100% dependent on access to MidAtlantic fisheries, including Atlantic mackerel. We employ over 100 people when in production and create food grade products for both the domestic market and for export.

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Lund's is a member of the Mackerel Working Group, and our company is fully supportive of this proposal as it is driven by a meaningful collaboration of industry and science. The proposal is well focused on taking the first step towards understanding the dynamics of the mackerel stock and so informing the next stock assessment scheduled for 2017.

We are pleased to be included in this proposal as Collaborators and will be fully engaged in this effort.

Please call on me any time and we will cooperate fully within our capacities.

Sincerely,

Wayne Reisde
Vice President
Lund's Fisheries, Inc.
Cape May, NJ
Mr. Greg DiDomenico  
GSSA  
212 West State Street  
Trenton, NJ 08608  
Email gregdidomenico@gmail.com  
Phone 609-675-0202

Re: Letter of Support for your proposal: A Working Atlantic Mackerel Habitat Model for Estimating Population Availability To Assessment Surveys and The Fishery: a First Step to Defining Stock Size On and Off the Shelf

To Whom it Concerns:

Cape Seafoods and Western Sea Fishing Company are fully in support of your proposal to the Mid-Atlantic Fishery Management Council 2016-2017 Collaborative Fisheries Research Program.

Our companies are US-owned, fishing and processing operation based in Gloucester, MA. We are 100% dependent on access to US stocks of Atlantic herring and Atlantic mackerel. We employ over 70 people when in production and create food grade products for export. We are also a leading supplier of bait herring to the local lobster fishery.

When we decided to invest in Gloucester, in the late 1990's-early 2000's, the federal government was encouraging development of the fisheries, based on federal stock assessments for both species that indicated robust stocks with a combined Total Allowable Catch (TAC) of over 600,000 MT. We invested millions of dollars in the plant, and partnered with three state-of-the art mid-water trawl vessels to supply the plant.

Mackerel fishing was robust through 2006, and an important part of our annual production from late November into April. Starting in 2007, availability of mackerel became less and less and, coupled with high fuel prices, our vessels were increasingly tied to the dock as the mackerel fishery proved uneconomic. This put more and more pressure on the herring fishery, which is rife with user conflict, and increasingly subject to stringent by-catch limits on haddock that are unworkable in the face of an exploding haddock biomass in prime offshore herring fishing grounds. Simply put, the situation is approaching a train wreck for our industry.
I am a member of the Mackerel Working Group, and our company is fully supportive of this proposal as it is driven by a meaningful collaboration of industry and science. The proposal is well focused on taking the first step towards understanding the dynamics of the mackerel stock and so informing the next stock assessment scheduled for 2017.

We are pleased to be included in this proposal as Collaborators and will be fully engaged in this effort.

Please call on me any time and we will cooperate fully within our capacities.

Sincerely,

Gerry O'Neill
General Manager
Western Sea Fishing Company, Inc.  
F/V Endeavour & F/V Challenger  
3 State Pier, Unit B  
Gloucester, MA 01930 USA  
Telephone 978-283-7996  
Facsimile 978-283-3133

Mr. Greg DiDomenico  
GSSA  
212 West State Street  
Trenton, NJ 08608  
Email gregdidomenico@gmail.com  
Phone 609-675-0202

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Gerry O'Neill
General Manager