

**Proposal for funding made to the  
Coordinating Council and the Operations Committee  
Atlantic Coastal Cooperative Statistics Program  
1050 N. Highland St., Ste. 200A-N  
Arlington, VA 22201**

**FY21: Economic Efficiency Assessment of the Rhode Island Fluke and Black Sea Bass  
Aggregate Management Programs**

Submitted By:  
Julia Livermore  
Rhode Island Department of Environmental Management  
Division of Marine Fisheries  
3 Fort Wetherill Rd,  
Jamestown, RI 02835  
[julia.livermore@dem.ri.gov](mailto:julia.livermore@dem.ri.gov)

**Applicant Name:** Rhode Island Department of Environmental Management,  
Division of Marine Fisheries (RIDEM)

**Project Title:** **FY21: Economic Efficiency Assessment of the Rhode Island  
Fluke and Black Sea Bass Aggregate Management Programs**

**Project Type:** New Project

**Requested Award Amount:** \$61,383.77

**Requested Award Period:** FY 2021 (one year from the receipt of funds)

**Primary Program Priority:** Economic and Sociological Data

**Date Submitted:** August 13, 2020

**Project Supervisor:** Dr. Conor McManus, Deputy Chief, [conor.mcmanus@dem.ri.gov](mailto:conor.mcmanus@dem.ri.gov)

**Principal Investigator:** Julia Livermore, Supervising Biologist, [julia.livermore@dem.ri.gov](mailto:julia.livermore@dem.ri.gov)

**Project Staff:** Nichole Ares, Principal Biologist, [nichole.ares@dem.ri.gov](mailto:nichole.ares@dem.ri.gov)  
Dr. Tracey Dalton, URI Professor of Marine Affairs, [dalton@uri.edu](mailto:dalton@uri.edu)

**Atlantic Coastal Cooperative Statistics Program (ACCSP) Proposal**  
**for the State of Rhode Island 2021**

**Objectives:**

- Collect socioeconomic data directly from commercial Rhode Island (RI) fluke and black sea bass fishers that is not currently recorded or available.
- Evaluate the economic efficiency, safety improvements, overall efficacy, and perceptions and attitudes associated with the RI Research Pilot Aggregate Program.
- Create a model for socioeconomic data collection in the context of fishery management program evaluation and develop a platform for soliciting and storing of fisheries management information of this type, **consistent with the SE standards.**
- Address research and management needs that leverage electronic catch and effort reporting through supporting the RI Research Pilot Aggregate Program. Depending on the findings, the resulting economic analysis may be used in support for continuing the program.

**Need:**

For years, discussions on an aggregate program have garnered interest from the summer flounder, or fluke (*Paralichthys dentatus*), and black sea bass (*Centropristis striata*) commercial fisheries in Rhode Island. The commercial quotas for fluke and black sea bass have traditionally been managed through specific season quotas, changes in possession limits throughout the year, and in some cases closures during certain days of the week. Due to the high demand of the species and level of participation (especially in the summer), and the suboptimal state quota allocation, the daily possession limit of both species is generally low. Given the variability of fish stocks, low quotas, and subsequently low possession limits, combined with rising fuel and vessel maintenance costs, fisheries managers are being asked to provide more flexible fishing operation practices to the fishing industry.

Consequently, the Rhode Island Department of Environmental Management Division of Marine Fisheries (DMF) implemented a pilot fluke aggregate program starting in 2019 after the Rhode Island Marine Fisheries Council (RIMFC) voted in fall of 2018 to adopt a fluke Pilot Aggregate Program. The goal of the 2019 pilot program was to collect data to assess the efficacy of an aggregate program, where participants would be held to a weekly aggregate limit (daily limit, x days open) in lieu of a daily limit. Based on the support of the 2019 fishing participants, the pilot program was extended through the 2021 fishing year in hopes of better understanding interannual variability associated with the program that is imperative to understand before any form of the program can be formally adopted.

It is hypothesized that an aggregate program would allow fishermen more flexibility in fishing practices through the utilization of a weekly possession limit instead of a daily limit. Such a program could potentially decrease costs to the fishermen by decreasing days at sea (fuel and vessel maintenance costs decrease) while also increasing safety as fishermen could pick which days are the best in terms of weather. Aggregate programs could also decrease discards, and thus, discard mortality in some fisheries, especially at times when possession limits are low.

However, there have been stated concerns from the commercial industry in RI that aggregate programs may: 1) favor a given sector or individual businesses depending on how they operate; 2) increase catch rates, which can lead to quicker quota consumption and result in shorter fishing seasons due to early closures; 3) cause an increase in fish landed that will oversaturate the market and drive prices down; and 4) lead to an increase in illegal fishing activity due to the potential difficulties in accountability and enforceability. While ideas on how such an aggregate program would impact the prosecution of these fisheries and what the potential mechanisms should be to manage and enforce the program, they are largely untested.

Data collection on harvest and effort have occurred, yet there has been no data collection on the economic and safety components of the program and therefore no ability to assess program performance in terms of socioeconomic impact. Collection of these data is necessary to determine whether the aggregate programs result in improved economic efficiency and safety, as hypothesized. **This proposal aims to address this data gap by offering a strategy to collect business information (fuel, bait, ice, grocery, and labor costs, number of days fished, etc.) directly from fishermen participating in the program. This data collection will not only provide the raw data that does not currently exist, but also allow for assessment of social components of the aggregate programs.**

#### **Results and Benefits:**

- **Data improvement: This proposal will provide a substantial improvement to data quality because data of this form are not currently being collected.** Specific data types will be targeted (e.g., trip-level business information), but the open-ended nature of the data collection process may also reveal other pieces of information that may be useful in management program evaluation and in leveraging existing datasets collected by ACCSP. The fishery-dependent data collected through this program will inform fishery managers, the fishing industry, and stakeholders on the economic and social benefits of an aggregate program. This information is vital to the fishing industry when commenting on intentions of management practices and it also assists fishery managers in ensuring proper management.
- **Improvements to reporting:** This work may help to improve the catch and effort data reporting that aggregate program participants are required to report accurately to remain in the program. If this study demonstrates the effectiveness of the aggregate program and it is continued or expanded, SAFIS data reporting quality and frequency are expected to improve. For instance, participants of the aggregate program are required to report within 48 hours of their trips via eTrips Mobile, which improves quality by limiting “recall bias”.
- **Stock assessment impact: The project further encourages the use of eTrips mobile, which results in enhanced catch and effort data. Improved data quality may result in more accurate stock assessments.** This is especially important for high priority species like fluke and black sea bass. The program being evaluated through this data collection may also decrease discards by reducing the number of days of fishing. If this occurs, stock health may improve. If unaccounted discards are reduced and the program

prevents overages on quota, this improves data quality and sustainable stocks, respectively.

- **Partnerships and/or regional impact: While this initial effort is specific to the RI fishing industry, other states could adopt similar flexible management opportunities, depending on our findings.** Data collection will be designed to collect information that will allow for comparison or application to other states' or federal fisheries (e.g., questions will address different gear types and areas fished). **Understanding how fishing businesses respond to aggregate programs may provide justification for other states or regional fisheries to take aggregate program approaches to management for species with small quotas.** Fluke and black sea bass are both highly sought-after species, with complicated management structures; aggregate program evaluation may help to improve fishing flexibility, while maintaining healthy fish populations.
- **Innovative: This work will introduce a new methodology of data collection for future entry into ACCSP channels (following the ACCSP social and economic standards) and may serve as a model for future efforts or a launchpad for further development of methods. This is an entirely unique form of fishery-dependent data.** No past projects have involved direct qualitative data collection for socioeconomic information. The data collection involved will serve to evaluate an innovative management program for RI that could lead to improved efficiencies in commercial fishing and business practices (reduced trip costs, reduced bycatch, improved safety, etc.). The proposed mixed methods approach (qualitative and quantitative components) allows for richer insights into the social and economic impacts of the aggregate program. Fishery managers often talk about changes in harvest or stock status that result from management programs, but efforts rarely quantify how such programs change how fisheries operate. This project presents an innovative step towards understanding how fishing practices may change in response new management measures.

#### **Data Delivery Plan:**

All data collected from fishermen collected by RI will be transcribed into NVivo software and digitally entered into a Microsoft Access database. There is no existing data feed for entry directly into ACCSP channels. **As such, if ACCSP has time and interest, RI will work with ACCSP staff early on in the project to determine preferred data format and method of entry or sharing. Whether or not ACCSP has capabilities at the time to develop a data storage system, all applicable data will be named and formatted according to the Social and Economic (SE) standard data elements so that future entry is possible and streamlined. Experience with additional forms of data collection may also result in recommendations regarding formatting of data elements not currently addressed by the SE standards. This data collection effort will complement the data collected through the voluntary annual fixed cost, trip cost, and owner/captain/crew surveys conducted as part of the SE standards.** Given that this is a new effort that requires substantial staff time to extract data from fishery participants, only one year of data collection is planned at present. If the process is successful, further data collection may be considered at a later date.

## Approach:

To collect participant business information (90% social and economic module, 10% catch and effort), we propose to conduct semi-structured, in-person interviews (or virtual interviews if circumstances prevent in-person; Table 1). Sampling efforts will attempt to reach most aggregate program participants. This is an example of purposive sampling, which is a common practice for studying individuals of a particular demographic (Bernard and Ryan 2010). Data collection will be focused exclusively on participants of the aggregate programs to allow for assessment of changes to their businesses since joining the program. Starting in 2019, twelve participants were chosen by lottery to represent multiple gear types within the aggregate programs; 3 otter trawl fishermen, 1 lobster pot fisherman, 3 gillnet fishermen, 1 rod and reel fisherman, 3 multi-gear fishermen, and 1 fish pot fisherman. 3 participants per gear type were sought out in year one, but limited applications for lobster pot, fish pot, and rod and reel participants were received (1 apiece). This pool was expanded in 2020 to an additional 18 participants. Three new participants for each gear type were sought out in 2020, but not all types met this goal; participants were selected by lottery when more than three applications were received within a gear type. New participants brought the totals by gear type to:

- 6 otter trawl fishermen
- 6 gillnet fishermen
- 2 lobster pot fishermen
- 5 fish pot fishermen
- 5 rod and reel fishermen
- 6 multi-gear fishermen

This participant pool represents both state-only and federally permitted vessels. The program is currently underway, with all participants officially having started their 2020 fishing year. Given limited numbers of participants for certain gear types (e.g., lobster pot), data may not be able to be discussed for that specific gear due to confidentiality constraints (Rule of Three). However, that gear type may be aggregated with other gears to discuss overall program impacts or breakdowns by broader gear groupings (e.g., fixed vs. mobile gear). Moreover, when the Rule of Three is not met, the research team can reach out to harvesters to see if they are willing to sign a waiver that would allow release of confidential data. Program participants have already waived landings data confidentiality by entering the program (250-RICR-90-00-12 §12.7.2.F), so they may also be willing to share related socioeconomic information.

Initiation of sampling in 2021 would allow for any of the 30 current aggregate participants to be included. Even without complete participation of all current aggregate participants, a reasonable sample size for interview data collection will be achieved. It is important to understand that qualitative data is more useful for providing insights into how people think about a particular issue, rather than identifying the proportions of the population that feel a certain way; the latter is better approached through quantitative methods. The proposed sampling strategy is expected to result in a sample size of 12 or more participants, as

recommended by Guest et al. (2006). While this is a relatively small sample size, this is an acceptable number in qualitative data collection. In fact, Crouch and McKenzie (2006) recommend that studies not exceed 20 participants in order to build and maintain a close relationship built on trust, that allows for the open exchange of information. Guest et al. (2006) suggest that data “saturation” (when additional participants do not provide additional insights) occurs around 12 participants in homogeneous groups. Nevertheless, one goal of sampling in qualitative analysis is to ensure that sampling has included a broad set of interests. Given the use of purposive sampling of aggregate program participants only, it is reasonable to assume that this study will reach saturation if between 12 and 30 aggregate participants are interviewed; a 40% positive interview response rate will achieve an acceptable sample size to determine overall program efficiency for all gear types combined. For discussion on program effectiveness for individual gears, public data products will only be produced when three or more aggregate participants provide data. While larger numbers of interviewees within gear types would improve data quality, research is limited to the participants in the pilot aggregate program, which only includes a small number of individuals at this time.

If 15 (or 12 at minimum) interviews are not achieved, fewer generalizations can be made about the data and overall program performance. However, within specific gear groupings abstractions could yet be made and the data will still provide insight into how fishing businesses responded by participating in the aggregate program. Furthermore, recommendations about potential improvements to the SE standards may also still be made following limited data collection given this is the first effort to collect socioeconomic information in an interview format. Nevertheless, in order to avoid a small number of respondents, DMF will offer embroidered baseball caps to interviewees. Monetary incentives would be inappropriate, as non-aggregate program participants may feel that those in the program are being treated with favoritism by DMF staff. Baseball caps present a non-monetary incentive; DMF has used caps and t-shirts as incentives in the past for other programs administered by RIDEM.

Interview respondents will be contacted directly by phone or email. Interviews are expected to last between 30 and 60 minutes each and will be recorded. Participants will be asked to sign consent forms prior to initiating the interview and will be notified that participation is voluntary and that all data will remain confidential; the Rule of Three will be used to aggregate any information to ensure confidentiality.

Given the sensitive nature of the questions being asked, informal discussions/pilot interviews with a small group of participants will be used to collect information about how best to approach potentially sensitive or contentious topics. For instance, each question may have multiple forms to allow for some data collection in the event the interviewee is not comfortable providing full information. Furthermore, sensitive questions may be addressed approximately two thirds of the way through the interview to allow the researcher to draw the respondent into the interview process and build a base level of trust before sensitive topics are raised (Miller 2019). Project researchers may also utilize hard copy surveys at the end of the interview as a technique to collect more sensitive info like costs and expenditures. Different interview question structures and hard copy surveys soliciting sensitive information will be tested in pilot interviews to determine the most effective approach.

A draft interview protocol is not available at this time, as initial interview input will be used to develop the interview protocol that addresses these challenging topics in a variety of ways. Therefore, the first step of data collection will be comprised of pilot interviews with aggregate program participants. While focus groups are often used for this purpose, the sensitive nature of the data that the researchers are requesting to collect may make group discussions ineffective. Academic training and expertise in collecting empirical data in the field from Dr. Tracey Dalton at the University of Rhode Island's Department of Marine Affairs will guide the development of the initial interview instrument. This process will involve using the pilot interviews as an opportunity to pre-test the formal interview questions.

The interview protocol will also include a preface that explains the purpose of the data collection and the intent to evaluate whether the aggregate program should be expanded to include the full RI industry and will undergo University of Rhode Island Institutional Review Board (IRB) review to ensure that ethical standards are upheld: first, that subjects are not placed at undue risk; second, that they give uncoerced, informed consent to their participation. Due to the variety of gear types within the fluke and black sea bass fisheries, specific questions will be included to address differences in fishing approaches in order to derive a more comprehensive understanding of fleet activity and allow for comparisons and extrapolations to be made to other fisheries (e.g., other species or in other states/regions). **The interview protocol will likely include a mixture of open- and closed-ended questions that will address the following topics:**

- **Closed-ended** questions will collect information consistent with ACCSP SE standard data elements to evaluate variable costs associated with commercial fishing trips. These questions will be asked for individual years prior to entering the aggregate program and for years while participating in the program to assess differences.
  - **Trip level information for current and past fishing years (labor costs, fuel, bait, ice, grocery, and other miscellaneous costs)**
  - **Breakdown of labor costs by crew/captain/owner**
  - **Insurance costs**
  - **Days at sea by year or season**
  - **Gear/equipment or vessel maintenance costs**
  - **Fishing activity (primary species, gears used, years in fishery, use of permits, etc.)**
- **Open-ended** questions will focus on attitudes and perceptions of stakeholders to assess satisfaction with the fishery and its operations (which the Committee on Economics and Social Sciences has identified as an area requiring additional research). Questions will address fishery performance prior to pilot program implementation, as well as after.
  - **Perceptions and attitudes associated with the aggregate program in general**
  - **Perceived social impacts (e.g., safety, quality of life) of the aggregate program**

- **Perceived changes to the fishery (i.e., harvest rates) as a result of the program**
- **Perceived or documented changes in trip-level and annual costs due to the program**
- **Noted changes in value of fluke and black sea bass**
- **Changes in the number of bad weather fishing days**

Following completion of each interview, the audio will be transcribed and analyzed using NVivo, Microsoft Excel, and R (R Core Team 2020). NVivo is a software program that is designed to organize and analyze mixed methods and qualitative data by coding transcribed information by theme; it enables users to make evidence-based conclusions through qualitative and quantitative analysis of the data. Closed-ended questions may be analyzed using summary statistics, while open-ended questions will be structurally coded or descriptively coded by theme, or category, and then analyzed (see Saldaña 2015).

In addition to the data to be collected through the proposed work, the aggregate program also requires that participants have history participating in the fisheries in RI (confirmed through SAFIS dealer reports and catch and effort reports), so the impacts of the aggregate program could be compared to prior fishing practices. All participants are also required to have a Vessel Monitoring System (VMS) device on their vessel and allow RIDEM Office of Law Enforcement and DMF staff to have access to the data collected. Additionally, all participants must report their catch and effort information prior to offloading their catch into eTrips Mobile. This is to assist in the enforceability of the program (possession limit compliance) and to improve data quality by limiting recall bias. If any participants fail to adhere to any of the reporting requirements, their permit will be revoked for the remainder of the pilot program (250-RICR-90-00-12).

The socioeconomic data will complement the existing data collected and allow for paired analysis. For example, perceived economic changes with respect to ex-vessel value of target species can be compared directly to pricing data and volume of landings provided through dealer reports in SAFIS. Changes to the number of days at sea can be evaluated by comparing to state logbooks or Vessel Trip Reports (VTRs) and wind/buoy data could be incorporated to evaluate whether a reduction of fishing in bad weather occurred. Reduction in discards could also be assessed by comparing qualitative data with VTR and/or observer data. There may also be opportunities to analyze the fishery-dependent information collected through this effort in the context of different sectors (e.g., by gear types or port). This form of analysis may or may not be possible, as it would depend on achieving sample sizes that meet the Rule of Three within each sector (or for participants to agree to sharing of confidential data via legal data release forms).

Furthermore, this work will leverage another ACCSP-funded effort to model what potential impacts could be on commercial harvest if the program is expanded to the entirety of the RI fishery. Ongoing analyses include trip counts, catch rates, areas fished, and gear types used and observed changes in fishing behavior for aggregate program participants are being modeled for the full fleet. The data collected through this effort could be used in conjunction with the modeled outputs to determine potential socioeconomic impacts for fishery participants if the program were open to all RI fluke and black sea bass harvesters. This will complement

ongoing analytical efforts that simulate what expansion of the aggregate program would mean for the state’s fishery.

This program (socioeconomic data collection coupled with catch and effort analysis) could provide essential information on the efficacy of aggregate programs to manage high-value commercial species, or species with relatively small quotas. While this is of great importance to the RI fishery, this information is also useful to other states or federal fisheries when considering potential management options for other species or other regions. Discerning the human response in terms of changes to fishing activity and business operations is pivotal to understanding the changes in harvest. This information is necessary to make informed recommendations about management options that will achieve a desired effect on harvest rate.

**Geographic Location:**

The project will be administered out of the Rhode Island Department of Environmental Management’s Division of Marine Fisheries office in Jamestown, RI. The scope of the project covers all of RI and adjacent state and federal waters fished by RI license holders.

**Program Accomplishment Measurement Metrics:**

The success of the project will be measured by the following metrics (Table 1):

- Achieving successful stakeholder buy-in by finding program participants agreeable to socioeconomic interviews.
- Successful completion of in-person interviews of a reasonable sample size.
- Quality controlled data transcription and entry into data format consistent with the SE standards.
- Data formatting that allows for integration with existing data sources (e.g., linking by trip ID, Commercial Fishing license number, vessel ID).
- Evaluation of fluke and black sea bass aggregate program performance in the context of socioeconomic effects.

<b>Goal</b>	<b>Metric</b>
15 participants (50%) agreeing to be interviewed/share data	Number of participants
15 interviews conducted	Number of interviews
Data accurately transcribed into Microsoft Access database (or other format preferred by ACCSP)	Completion of database
Data integrated with existing data sources	Ability to link information across databases
Formal aggregate program evaluation	Presentation of findings to RIMFC for consideration of program expansion and a technical report or peer-reviewed paper

**Table 1.** Milestone Schedule

Activity	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Initial phone interviews	X	X										
Survey development		X	X	X								
In-person participant interviews			X	X	X	X	X	X				
Data transcription					X	X	X	X	X			
Data analysis									X	X	X	X
Preparation of results (report writing and public workshop)											X	X
Annual reporting						X						X

**References:**

- Bernard, R., and G. Ryan. 2010. *Analyzing qualitative data: systematic approaches*. SAGE Publications: Thousand Oaks, California.
- Crouch, M., & McKenzie, H. (2006). The logic of small samples in interview-based qualitative research. *Social Science Information*, 45(4), 18. doi: 10.1177/0539018406069584
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 24. doi: 10.1177/1525822X05279903
- Miller, P.R. (2019). Sensitive Questions: Duke Initiative on Survey Methodology at the Social Science Research Institute. <https://dism.ssri.duke.edu/survey-help/tipsheets/tipsheet-sensitive-questions>
- R Core Team (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.
- Saldaña, J. (2015). *The coding manual for qualitative researchers*. SAGE Publications: Thousand Oaks, California.

**REQUESTED BUDGET FY 2021**

**PERSONNEL COSTS:**

Item (position and percent of staff time covered through this grant)	ACCSP Share (dollars and % of grant time covered by ACCSP)	Direct State Share (dollars and % of grant time covered by RIDEM)	Total
Deputy Chief (FTE 5%)	\$0.00 (0%)	\$7,664.65 (100%)	\$7,664.65
Supervising Biologist (FTE 40%)	\$36,553.80 (75%)	\$12,184.60 (25%)	\$48,738.40
Principal Biologist (FTE 10%)	\$9,088.43 (75%)	\$3,029.65 (25%)	\$12,117.90
Student Researchers (Intern 50%)	\$2,673.00 (50%)	\$2,673.00 (50%)	\$5,346.00
Professor of Marine Affairs (0%)	\$0.00 (% NA)	\$0.00 (% NA)	\$0.00
Indirect Charges (RIDEM FTE 19.25%)	\$9,300.68	\$4,918.71	\$14,219.39
<b>Total Personnel</b>	<b>\$57,615.91</b>	<b>\$30,470.43</b>	<b>\$88,086.34</b>

**EQUIPMENT & SUPPLY:**

Item	ACCSP Share (dollars and % of grant fees covered by ACCSP)	Direct State Share (dollars and % of grant fees covered by RIDEM)	Total
Fuel (travel)	\$750.00 (50%)	\$750.00 (50%)	\$1,500.00
NVivo software	\$2,672.86 (100%)	\$0.00 (0%)	\$2,672.86
Recorder	\$45.00 (100%)	\$0.00 (0%)	\$45.00
Baseball caps (interview incentive)	\$300.00 (100%)	\$0.00 (0%)	\$300.00
<b>Total Supply</b>	<b>\$3,767.86</b>	<b>\$750</b>	<b>\$4,517.86</b>

**TOTAL:**

Item	ACCSP Share	Direct State Share	Total
Total Direct Charges	\$61,383.77	\$31,220.43	\$92,604.20
Percentage	66%	34%	100%

**COST DETAILS:**

**Description of budget categories and expenses for this project**

**Overall match: RIDEM is providing 34% of services as in-kind contribution (equivalent to a 51% match:  $\$31,220.43/\$61,083.77=0.508$ )**

**a. Salary**

Each person spends a fraction of their time working on this grant in a team effort. The annual salaries for personnel and the percentage of their time spent on this project are as follows:

**From ACCSP:**

- a. **Supervising Biologist:** 30% funded position to act as the principal investigator and conduct the interviews; 30% of salary (\$78,270) and fringe benefits (\$43,576) for one year = \$36,553.80.
- b. **Principal Biologist:** 7.5% funded position to act as support to the principal investigator and provide assistance in ensuring high data quality and proper entry; 7.5% of salary (\$69,394) and fringe benefits (\$51,785) for one year = \$9,088.43.
- c. **Seasonal Interns:** support for 1 seasonal intern to assist with data transcription (audio to digital files). Approximately 25% of annual salary (\$10,692) = \$2,673.00.

**From RIDEM as match:**

- a. **Supervising Biologist:** 10% funded position to act as the principal investigator and primary interviewer; 10% of salary (\$78,270) and fringe benefits (\$43,576) for one year = \$12,184.60.
- b. **Principal Biologist:** 2.5% funded position to act as support to the principal investigator and provide assistance in ensuring data quality and entry; 2.5% of salary (\$69,394) and fringe benefits (\$51,785) for one year = \$3,029.65.
- d. **Seasonal Interns:** support for 1 seasonal intern to assist with data transcription (audio to digital files). Approximately 25% of annual salary (\$10,692) = \$2,673.00.
- c. **Deputy Chief:** 5% funded to provide project oversight and staff management; 5% salary (\$91,301) and fringe benefits (\$61,992) for one year = \$7,664.65.
- d. **Professor of Marine Affairs:** The guidance provided by the URI professor (Dr. Tracey Dalton) will be provided as in-kind services. No formal monetary match will be provided; however, no associated costs will be incurred by ACCSP.

**b. Fringe benefits**

Annual fringe benefits rates for all employees include the following:

Retirement 24%  
Deferred Compensation 0.4%  
FICA 6.2%  
Medicare 1.45%  
Health care \$21,937/year  
Dental \$1,132/year  
Vision \$165/year  
Assessed Fringe 4.25%  
Retiree Health 6.75%

- Total annual fringe benefits for the Deputy Chief are \$61,992. Fringe benefits for 5% of his time are \$3,099.60.

- Total annual fringe benefits for Supervising Biologist are \$43,576. Fringe benefits for 40% of her time are \$17,430.40.
  - Total annual fringe benefits for Principal Biologist are \$51,785. Fringe benefits for 10% of her time are \$5,178.50.
- c. Travel**  
 \$1,500 used for mileage and tolls for interviews with fishers and meetings with URI counterparts by RIDEM DMF staff. RIDEM will assume half of the costs; these costs are based on historical use under past RIDEM awards. This funding amount proposed will cover trips for pilot interviews (N=5), formal interviews (12<N≤30), and regular trips to URI by the principal investigator using RIDEM state vehicles.  
**From ACCSP:** \$750  
**From RIDEM:** \$750
- d. Equipment**  
 No equipment will be purchased on this grant.
- e. Supplies**  
**From ACCSP:**
- i. NVivo software (2 licenses at \$1,336.43 each) = \$2,672.86
  - ii. Audio recorder = \$45.00
  - iii. Embroidered hats (30 hats at ~\$10 each, including tax and shipping) = \$300.00
- f. Contractual**  
 There are no contractual costs associated with this project.
- g. Construction**  
 There will be no construction as part of this grant.
- h. Other**  
 There is nothing in this category.
- i. Total Direct Charges**  
 This is the sum of all direct charges to the grant, listed above.
- j. Indirect Charges**  
 Indirect charges are only calculated using RIDEM personnel charges. The negotiated Indirect Rate for fiscal year 2021 is 19.25%.

## Summary of Proposal for Ranking

**Proposal Type:** New Project

**Primary Program Priority:** Economic and Sociological Data

**Project Quality Factors:**

Multi-Partner/Regional Impact - This project is specific to RI socioeconomic data collection of fluke and black sea bass fisheries. However, both species are jointly managed and socioeconomic data collected could be applied across the entire regional fishery for use in potential new management programs by interested partners. Data collection will be designed to collect information that will allow for comparison or application to other states' or federal fisheries. **Questions will address different gear types and areas fished which may allow for theoretical application to other fisheries utilizing the same gear types or operating in overlapping areas.** Interested partners could utilize the analysis to examine potential impacts on their commercial fisheries if considering or enacting a similar pilot program.

In-kind Contribution - Funding Transition Plan: One-year project. **In-kind contribution: 34%**

Data Improvement - **This proposal will provide a substantial improvement to data quality because data of this form are not currently being collected.** Specific data types will be targeted (e.g., trip-level business information; **90% social and economic, 10% catch and effort**), but the open-ended nature of the data collection process may also reveal other pieces of information that may be useful in management program evaluation and in leveraging existing datasets collected by ACCSP. **Data collected through this program will inform fishery managers, the fishing industry, and stakeholders on the economic and social benefits of an aggregate program.** This information is vital to the fishing industry when commenting on goals of management practices and assists fishery managers in ensuring effective management. **This work will also create a model for socioeconomic data collection in the context of fishery management program evaluation and develop an innovative platform for soliciting and storing of fisheries management information of this type.** Support garnered for the aggregate programs being evaluated will help to continue the trend towards electronic catch and effort reporting through supporting the RI Research Pilot Aggregate Program. **This work may help to improve catch and effort reporting, as aggregate program participants are required to report accurately via eTrips mobile to remain in the program and the resulting economic analysis may be used to support continuing the program.**

Stock Assessment Impact - **The project further encourages the use of eTrips mobile, which results in enhanced catch and effort data. Improved data quality may result in more accurate stock assessments.** This is especially important for high priority species like fluke and black sea bass. The program being evaluated through this data collection may also decrease discards by reducing the number of days of fishing. If this occurs, stock health may improve.

Secondary Module – As mentioned above, this research and data collection effort will serve to evaluate aggregate program efficiency. Depending on the results of this study, there may be additional support for flexible management programs like the pilot aggregate programs in RI, which require improved catch and effort data reporting. **Catch and effort data improvements may occur as a result of this program because aggregate program participants are required to report via eTrips mobile in a more timely manner to reduce recall bias. They are also required to use VMS aboard their fishing vessels to participate.**

**Bold comments indicate sections that help with the ranking process**

## Appendix B. Curriculum Vitae of Principal Investigator

### JULIA C. LIVERMORE SHEEHAN, MEM

3 Fort Wetherill Road  
Jamestown, RI 02835  
Work Phone: 401.423.1937  
[julia.livermore@dem.ri.gov](mailto:julia.livermore@dem.ri.gov)

#### EDUCATION

---

Sept. 2020 - Present **University of Rhode Island**, Kingston, RI  
PhD Student: Marine Affairs

May 2015 **Duke University Nicholas School of the Environment**, Durham, NC  
Master of Environmental Management (Coastal Resource Management)

May 2015 **Duke University Nicholas School of the Environment**, Durham, NC  
Professional Certificate in Geospatial Analysis

May 2013 **Bowdoin College**, Brunswick, ME  
Bachelor of Arts; Majors: Biology and Environmental Studies; Honors: Biology

#### RESEARCH EXPERIENCE

---

2018 – Present **Supervising Marine Biologist** - Rhode Island Department of Environmental Management, Division of Marine Fisheries (Jamestown, RI)

2016 – 2018 **Principal Marine Biologist** - Rhode Island Department of Environmental Management, Division of Fish and Wildlife, Marine Fisheries (Jamestown, RI)

2015 – 2016 **Marine Resource Impact Assessment Fisheries Specialist** - Rhode Island Department of Environmental Management, Division of Fish and Wildlife, Marine Fisheries Section (Jamestown, RI)

2015 **Anadromous Fisheries Technician** - Massachusetts Division of Marine Fisheries (New Bedford, MA)

2014 – 2015 **Graduate Teaching Assistant in Geospatial Analysis for Coastal and Marine Management** - Duke University (Durham, NC)

2014 **Climate-Fisheries Research Intern and Database Developer** - Gulf of Maine Research Institute (Portland, ME)

2013 – 2014 **Forage Fish Policy Analyst/Graduate Research Assistant** - Fisheries Leadership and Sustainability Forum (Beaufort and Durham, NC)

2013 **River Herring Fisheries Technician** - Maine Department of Marine Resources (Hallowell and Woolich, ME)

2012 **Doherty Coastal Studies Research Fellow** - Bowdoin College Coastal Studies Center (Brunswick and Orr's Island, ME)

#### HONORS / AWARDS

---

2019 **Rhode Island Department of Environmental Management Director's Award**

2014 **North Carolina Wildlife Federation Scholarship Grant**

2013 – 2015 **Duke Nicholas School Merit-Based Scholarship**

2013 – 2014 **Grua/O'Connell Research Award**

2012 **Doherty Coastal Studies Research Fellowship**

#### PUBLICATIONS

---

2020 ten Brink, T., Dalton, T., **Livermore, J.** In press. Integrating social and ecological research on the impacts of offshore wind farms in North America. In

- J. Phillipson (Ed.), *Researching people and the sea: methodologies and traditions*. London, UK: Palgrave Macmillan (Springer Nature Limited)
- 2018 **Livermore, J.,** T. Perreault, T. Rivers. 2018. Luminescent defensive behaviors of polynoid polychaete worms to natural predators. *Marine Biology*. 165:149  
<https://doi.org/10.1007/s00227-018-3403-2>
- 2018 **Livermore, J.** 2018. Spatiotemporal and Economic Analysis of Vessel Monitoring System Data Within the New York Bight Call Areas. Rhode Island Department of Environmental Management, Division of Marine Fisheries Technical Report:  
[http://www.dem.ri.gov/programs/bnatres/fishwild/pdf/RIDEM\\_VMS\\_Report\\_2018.pdf](http://www.dem.ri.gov/programs/bnatres/fishwild/pdf/RIDEM_VMS_Report_2018.pdf)
- 2017 **Livermore, J.,** M. Trainor, M.S. Bednarski. 2017. Response of anadromous *Petromyzon marinus* L. (sea lamprey) following dam removal and channel reconstruction in the Mill River, Massachusetts. *Northeastern Naturalist*. 24(3):380-390.
- 2017 **Livermore, J.** 2017. [Spatiotemporal and Economic Analysis of Vessel Monitoring System Data Within Wind Energy Area in the Greater North Atlantic](http://www.dem.ri.gov/programs/bnatres/fishwild/pdf/RIDEM_VMS_Report_2017.pdf). Rhode Island Department of Environmental Management, Division of Marine Fisheries Technical Report:  
[http://www.dem.ri.gov/programs/bnatres/fishwild/pdf/RIDEM\\_VMS\\_Report\\_2017.pdf](http://www.dem.ri.gov/programs/bnatres/fishwild/pdf/RIDEM_VMS_Report_2017.pdf)

## RESEARCH PROJECTS

---

- 2020 – 2022 **Fishing Status of Vessels Using the AIS: A Big Data and Machine Learning Approach**  
MassCEC Offshore Wind Regional Pilot Fisheries Studies (Collaborator, July 2020 – December 2022 \$249,696)
- 2018 – 2020 **Assessing Impacts of the Block Island Wind Farm on Recreational Saltwater Fishing**  
Rhode Island Sea Grant (co-Principal Investigator; February 2018 - January 2020; \$200,000)
- 2016 – 2018 **Understanding marine resource user response to ecological impacts of offshore wind energy: a case study of the Block Island Wind Farm**  
Rhode Island Sea Grant (Principal Investigator; May 2016 – January 2018; \$56,437)
- An investigation of users’ preferences for and values of recreational boating activities associated with the Block Island Wind Farm**  
Rhode Island Sea Grant (Investigator; May 2016 – January 2018; \$79,927)

## RELEVANT SKILLS

---

- Software Aptitude** Proficient with R, Python, MATLAB, Microsoft Access, ArcGIS 10.x, ArcPy, NVivo
- Field Skills** AAUS Certified Research Diver and PADI Rescue Diver (over 150 logged dives), fish and invertebrate identification, field sampling (trawl, beach seine, fish pots, hydraulic dredge), otolith extraction, small vessel operation and trailering
- Safety/Medical** Wisconsin Certified Nursing Assistant (Lakeshore Technical College, Technical Diploma), RIDEM Certificate of Boating Safety Education, U.S Coastguard Auxiliary Boating Safety Course