

**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**

**FY20: Use of Geographic Data and SAFIS Data Sources to Evaluate an Aggregate
Landings Commercial Fishing Management Program**

Submitted By:
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Applicant Name: Rhode Island Department of Environmental Management,
Division of Marine Fisheries

Project Title: **FY20: Use of Geographic Data and SAFIS Data Sources to Evaluate
an Aggregate Landings Commercial Fishing Management Program**

Project Type: New Proposal

Requested Award Amount: **\$35,414**

Requested Award Period: For one year, beginning after the receipt of funds.

Primary Program Priority: Commercial and Recreational Catch and Effort Module

Date Submitted:

Project Supervisor: John Lake, Supervising Biologist

Principal Investigator: Nichole Ares, Principal Biologist

Project Staff: Richard Balouskus, Principal Biologist

Objectives:

- Use data collected by SAFIS eTRIPS-Mobile (eTRIPS-M) to evaluate metrics of an aggregate commercial fishing pilot program.
- Evaluate low cost vessel monitoring system (VMS) technology as an enforcement tool for compliance to aggregate landing limits.
- Create standard methodology for using SAFIS fisherman and dealer data sources combined with geographic data to pilot programs to evaluate effects on quota consumption rate, number of trips taken, and changes in fishing methods.

Background:

For years, discussions on an aggregate program have circled around the summer flounder, or fluke (*Paralichthys dentatus*) and black sea bass (*Centropristis striata*) commercial fisheries in Rhode Island (RI). These two species' commercial quotas 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. Given the high demand of the species and level of participation (especially in the summer), and the low state quota allocations, the daily possession limits of these species are low (50 pounds per day in the summer). With the species' increased prevalence in recent years, commercial fishermen have reported that the low fluke and black sea bass daily limits result in greater discards. Additionally, the low possession limits are resulting in fishermen operating in poor conditions to ensure the fish are caught so the operation can be profitable.

With the variability of fish stocks, low quotas, and subsequently, low possession limits combined with raising fuel and vessel maintenance costs, fisheries managers are being asked to provide more flexible fishing operation practices to the fishing industry. One of the common programs suggested are aggregate programs. These programs would allow fishermen more flexibility in fishing practices through the utilization of a weekly possession limit instead of a daily limit. Such programs could potentially decrease costs to the fishermen by decreases days at sea (fuel and vessel maintenance costs decrease) while also increasing safety as fishermen could pick which days are the best weather wise. Aggregate programs could also decrease discards, and thus, discard mortality in some fisheries, especially at times when possession limits are low.

Despite these benefits, there are concerns that need to be considered in aggregate programs. Such programs may favor a given sector or individual businesses depending on how they operate. Further, such programs could increase catch rates, which can lead to quicker quota consumption and result in shorter fishing seasons due to early closures. There are also economic concerns that an increase in fish landed will oversaturate the market and drive prices down. Additionally, the enforcement of a program and accountability of the participants is difficult; possession limits differ from vessel to vessel given the flexible system. This results in a possession limit that is impossible to enforce without a record of the prior day/weeks landings values. To ensure proper operation of this type of program, more stringent reporting is required, as well as access to the reports. Additionally, a program that is difficult to enforce has the potential to increase illegal fishing activity due to the potential difficulties in accountability. 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, have been debated, they are largely untested.

A series of public meetings were held between 2017 and 2018 to discuss potential new management programs, including gear specific quotas, sector programs, expanded aggregate

programs, removing seasons and possession limit changes, and others. There was a large amount of public comments over the validity of some of the programs, with an aggregate program being the preferred option by the fishing industry. Therefore, in the fall of 2018, the Rhode Island Marine Fisheries Council (RIMFC) voted to adopt a Pilot Aggregate Program for the 2019 calendar year that can 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, with the option to run the program again in 2020 as either a pilot or a larger more open program. In December 2018, new regulations were established (Rhode Island Marine Fisheries Regulations (RIMFR), Part 12- Research Pilot Aggregate Program, 2018). The program requires participants have at a minimum 4 years of 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. Both fisheries will continue to be managed separately (separate quotas, seasons, and possession limits) and participants are eligible to utilize both aggregates within the regulations set forth. All participants are also required to have a Vessel Monitoring System (VMS) device on their vessel and allow RIDEM Office of Law Enforcement (RIDEM OLE) and RIDMF staff have access to the data collected. The cost of the VMS device is the responsibility of the fishermen. The VMS device is meant to address concerns over compliance issues and will be used to confirm trip counts reported by the fishermen. Additionally, all participants must report their catch and effort information prior to offloading their catch into eTRIPS-M. This is to assist in the enforceability of the program (possession limit compliance) and to improve data quality through limiting recall bias.

An application for the program was made available for all RI commercial fishermen licensed to participate in the fluke and black sea bass fisheries in late 2018. All applications from individuals who met the requirements (fishing history, willingness to install a VMS device, agreeable to electronic reporting) were considered for inclusion in the program. The goal of the application process was to ensure as many fisheries as possible were represented (otter trawl, pot, gillnet, and rod and reel fisheries) as well as variability in the scale of the fisheries (small day boats and larger offshore vessels). Twelve participants were chosen to represent multiple gear types; 3 otter trawl fishermen, 1 lobster pot fisherman, 3 gillnet fishermen, 1 rod and reel fisherman, 3 multi-gear fishermen, and a fish pot fisherman. This participant pool represents both state-only and federally permitted vessels. The program is currently underway, with all participants officially having started their fishing year.

Need:

State partners are being asked to create more flexible management programs to address efficiency, safety at sea, and reduce bycatch rates. This pilot aggregate program allows fishery managers an opportunity to collect data to model what potential impacts are on the commercial fishery if the program is expanded to the entire fishery. In order to complete this analysis, RI is requesting funding to allow for a complete analysis and resulting report to be developed. The report will be made available to all partners who request it. Funds being made available in September 2020 will allow all 2019 data to be collected prior to analysis; if the program is expanded to include more vessels in 2020 as anticipated it would also allow for the inclusion of the additional data in the analysis.

Aggregate landing programs are just one approach to managing fisheries more efficiently. Other potential initiatives include allowing multiple licensed fishermen to harvest from one vessel, allowance of vessel to harvest multiple state possession limits in one trip, and allowance

for certain gear types to access closed areas. There is a need to create standard methodology to assess the impacts of flexible management on the related fisheries, **which this initial analysis will help support**. Standard methodology will allow for comparison of various management measures in both a quantitatively and qualitatively manner. To provide the necessary accountability to potential flexible management practices multiple data sources must be evaluated and compared to ensure data accuracy and reporting compliance.

Currently the ACCSP does not have geographic data standards. This project as well as the FY2018 joint RIDMF and MADMF project which is creating an API for VMS data sources “Integration of Vessel Monitoring Systems and Electronic Reporting in SAFIS and SAFIS Applications through API Development and Field Testing of Multiple Hardware Options” are both necessary first steps to start using VMS data sources to manage inshore fisheries. This proposal will complement the 2019 proposal by creating standard methodologies for use with VMS data sources. The work represented here will help to identify data standards for geographic data sources. It is essential that ACCSP remain at the forefront of emerging fisheries technologies such as VMS. Failure to do so is detrimental to the continued success of the program **as increased data needs are required to support fisheries management. The enhanced data needs to be collected, stored, and available for use; inability to collect and disseminate this data will be detrimental to fisheries management in the future.**

Approach:

This project will use SAFIS Dealer Reports (eDR) and eTRIPS-M to collect landings catch and effort data from participants **(currently 12 in 2019 with a potential increase in participation in 2020)** in the RIDMF Summer Flounder and Black Sea Bass pilot aggregate landing program. VMS data will also be collected from the Faria Beede Sentry Boat Tracking and Monitoring system for comparison to the SAFIS sourced data. Details about the VMS device can be found here: (https://fariabeede.com/site_manuals/Faria_Beede-fm-002-0049_A_WD300_FB-Sentry.pdf). **Geodata from the VMS devices will stay with RI until an ACCSP standard is developed. Once developed, geodata can be included in the ACCSP database. Location data (latitude and longitude) from the eTRIPS-M reporting will be included in the transmission to ACCP and available for access.**

Data will be analyzed and standard methodologies for comparing the two data sources will be evaluated. The analysis will include but not be limited to trip counts, catch rates, areas fished, and gear types used. **VMS data will be primarily used by enforcement officers to ensure participants are adhering to the regulations of the program but will be used in the analysis to track trip counts to help model fishermen behavior and track compliance with the reporting requirements.** Other areas where data standardization is needed will be identified. **Comparison of past fishing behavior (4 years of history) to new behavior will be evaluated. The potential impacts on expanding the aggregate program will be examined and modeled. Observed changes in behavior relative to the pilot program will be modeled for expansion to the entire fishery. Methodologies for evaluation of the pilot program will be documented and shared with interested parties. The geofencing capability built into the Faria Beede VMS software will assist in both the data analysis of trip counts, area fished, and distance traveled. RIDEM OLE will have full access to the VMS data for purposes of regulatory compliance.**

Results and Benefits:

The overall goal is to provide the ability to manage programs that meet the demands of the industry, without compromising the fishing seasons by harvesting quota at an increased rate and maintaining healthy fish stocks. The resulting analysis will help fisheries managers determine the ability of low cost VMS to provide accountability for fisheries management, where geographic data standards need to be established, create standard methods for using landings, catch and effort, and VMS data to evaluate flexible management programs. While the analysis being done is RI specific, all partners will benefit from the creation of VMS data standards, as this proposal and others currently ongoing highlight the need for the development of these standards through proper ACCSP protocols. Additionally, other partners might utilize the results of the RI program to consider the impacts of implementing the program within their state, petition for conservation equivalency, development of regulations for similar programs, and addressing the technological needs to support and manage the program. If additional states want to establish the management program, it should be fairly simple. The VMS devices utilized are cost effective, the data reporting software used is free, so the largest hurdles would be implementing regulations.

This project also increases the quality and timeliness of catch and effort data collected by requiring data submitted to SAFIS via eTRIPS-M, a tablet and smartphone-based reporting system. eTRIPS-M is a relatively new product this project will father its use as a standard data collection tool. Already using eTRIPS -M for the pilot has aided in addressing bugs in the application, which is valuable to all partners. Requiring on board data recording via eTRIPS-M increases data quality by reducing recall bias. Data quality is paramount in regional stock assessments and management of fisheries both in RI and coastwide.

With low possession limits come larger discards of fish in some fisheries. By allowing the fishermen to aggregate limits, the number of trips executed should be reduced resulting in the decreased discard rates of both regulatory and non-regulatory discards.

Data generated from analyses, including days in which quota is achieved before and during an aggregate program, and changes in days fished with an aggregate program, will provide critical data that is required to understand the social and economic responses of such a program.

Data Delivery Plan:

All landings data and catch and effort data collected by RI is entered in SAFIS. All catch and effort data will be collected through eTRIPS-M and stored in SAFIS. All dealer reports (landings) are entered electronically into SAFIS eDR twice a week by the dealers. Once entered, all data is immediately available to ACCSP and other program partners who utilize SAFIS and the SAFIS tables within the warehouse. This data is also incorporated into the warehouse tables during the yearly uploads and available for warehouse users annually. All proposed geographic data standards and analysis methodologies developed by the program will be made available to all partners, including the results on catch rates by gear and information from RIDEM OLE on their ability to enforce the program. If possible, VMS data will be submitted to ACCSP via the API under development.

Geographic Location:

The project will be administered out of the Rhode Island Division 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:

Goal	Metric
Data entered into eTRIPS Mobile by pilot program participants.	Number of trips submitted.
Successful monitoring of participants.	Enforcement can successfully access VMS and reports from participating vessels without issue.
Data QA/QC from participants and ensuring format and fields successfully aid in addressing analytical needs.	Tabular data with aggregated information across the participants.
Data collected is utilized to measure the impacts of expanding the program.	Report containing descriptive statistics, modeled catch rates, and simulations to assess uncertainty in data.
Methodology for verifying trips entered in SAFIS Dealer and eTRIP-M with VMS data established.	VMS track lines or geofence triggers are used to verify SAFIS trip counts.

Table 1. Milestone Schedule

Activity	Month														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Data collection	X	X	X	X	X	X	X	X	X	X	X	X			
Data QA/QC	X	X	X	X	X	X	X	X	X	X	X	X			
Monitoring Participants Catch Rates	X	X	X	X	X	X	X	X	X	X	X	X			
Analyses Geographic Data, Catch Rate of Participants, Compare their Rates and Quota Benchmarks to Previous Years							X	X	X	X	X	X			
Model the impacts of expanding the aggregate program							X	X	X	X	X	X			
Semi and Annual Report Writing							X					X	X	X	X

Requested Budget FY 2019 (August 1, 2019 to July 31, 2020)

Item	ACCSP Share	Direct State Share	Total
Supervising Biologist (FTE 4%)		\$3,942	\$3,942
Principal Biologist (FTE 27%)	\$30,204		\$30,204
Indirect Charges (RIDEM FTE 17.25%)	\$5,210	\$678	\$5,890
Total Personnel	\$35,414	\$4,622	\$40,035

TOTAL:

Item	ACCSP Share	Direct State Share	Total
Total Direct Charges	\$35,414	\$5,890	\$40,035
Percentage	88%	12%	100%

COST DETAILS:

Description of Budget categories and expenses for this project.

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:

- i. **Principal Biologist:** 27% ACCSP funded position (salary and fringe) to act as support to the ACCSP Coordinator; 27% of salary for one year = \$30,204.

From RIDEM as match:

- i. **Supervising Biologist:**
Approximately 4% of annual salary and fringe equals \$3,942.

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 Mercer - \$165/year
Assessed Fringe 4.25%
Retiree Health 6.75%

c. Equipment

No equipment will be purchased on this grant.

d. Supplies

No supplies will be purchased on this grant

e. Construction

There will be no construction as part of this grant.

f. Other

There is nothing in this category

g. 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 2019 is 17.25%.

Summary of Proposal for Ranking

Proposal Type: New Proposal

Primary Program Priority: Catch and Effort (100%)

Project Quality Factors:

Partners

- **Multi-Partner/Regional impact including broad applications** – This proposal is specific to RI catch and effort fishing data collection and management of fluke and black sea bass fisheries. However, both fluke and black sea bass are jointly managed species and the data collected are used in coastwide stock assessments. Additionally, the program analysis could be utilized in other states experiencing similar demand in flexibility of fishing practices through aggregate fishing programs to examine the impacts to their commercial industry or model their own pilot program. The VMS data collection and potential inclusion into ACCSP in the future could be both utilized by other partners if it becomes available, and the methodologies surrounding the data in management use will be made available to all partners.

Funding

- **Contains funding transition plan** – The project is to complete a data analysis on the pilot project. Once the analysis is complete no additional funding would be required unless the project is expanded to additional years and additional participation and further analyses need to be completed.
- **In-kind contribution-** 12% of the budget is contributed by RIDMF in kind.

Data

- **Improvement in data quality/quantity/timeliness** – Data collected by the fishermen (catch and effort) is required to be documented within SAFIS eTRIPS Mobile prior to offloading their catch. This improves the quality of the data by reducing recall bias. The timeliness of the data is also increased as the data is immediately viewable by law enforcement and uploaded to SAFIS once an internet connection is available.
- **Potential secondary module as a by-product** – Social and economic data can be derived from the raw data source and can be shared with social and economic scientists to develop models to investigate what potential benefits aggregate programs have on the fishing industry. The raw data source also provides insight into human social behavior and how fishermen react to changes in management. Additionally, the integration of VMS data can be used to assist in ocean planning projects as it provides a more robust source of fishermen use of fishing grounds. The program can also be expanded in the future to include the collection of bycatch data, although at this time that data is not required to be reported.
- **Impact on stock assessment** - This project is specific to fluke and black sea bass fisheries, both species are regionally managed, and the data can be used in and to support stock assessments of both species.

Appendix B: Curriculum Vitae for Principal Investigator

Nichole L. Ausfresser Ares

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(978) 833- 4017

Education

Roger Williams University
Bachelor of Science in Marine Biology
Minor in Mathematics

Bristol, RI
Dec. 2010

Atlantic States Marine Fisheries Commission
Introduction to Stock Assessment
Intermediate Stock Assessment Training

October 2015
December 2017

Work Experience

Rhode Island Department of Environmental Management
Principal Biologist

February 2016-Present

- Coordinate and improve the Atlantic Coastal Cooperative Statistics Program (ACCSP) in Rhode Island.
- Monitor commercial fishing quotas, lead quota management meetings and determination of seasonal closures and possession limit changes.
- Reporting compliance for ~1500 RI commercially licensed fishermen. Including tracking compliance, training and support to fishermen on report submissions and utilization of the electronic reporting system. Supervise and train staff on data entry of collected catch and effort data. Audit data quality of submitted reports.
- Data accuracy and quality of dealer reported landings data for the ~140 RI commercial licensed seafood dealers. Correction of inaccuracies in data, training new seafood dealers, and retraining dealers with data entry issues.
- Serve on ACCSP committees, including Commercial Technical Committee, Information Systems Committee and Standard Codes Committee.
- Assist in field work as necessary including but not limited to otter trawl, ventless lobster pot, beach seine, fyke net, and ventless fish pot surveys.
- Write and submit project plans, compliance reports, and grant proposals.

Atlantic States Marine Fisheries Commission
Fisheries Specialist 1- ACCSP Coordinator

May 2014- February 2016

- Coordinate and improve the Atlantic Coastal Cooperative Statistics Program (ACCSP) in Rhode Island under the supervision of Rhode Island Division of Fish and Wildlife Marine Fisheries Section.
- Monitor commercial fishing quotas, lead quota management meetings and determination of seasonal closures and possession limit changes.
- Track reporting compliance for ~1500 RI commercially licensed fishermen. Train fishermen and seasonal staff on report submissions. Audit data quality of submitted reports.
- Audit and correct data of dealer reported landings data for the ~140 RI commercial licensed seafood dealers. Train new seafood dealers and retraining dealers with data entry issues.
- Write and submit project plans, compliance reports, and grant proposals.
- Member of various ACCSP committees, including Commercial Technical Committee and Information Systems Committee.

- Assist in field work as needed, including beach seine, lobster ventless pot, and otter trawl surveys.

East West Technical Services LLC

Feb. 2012- May 2014

At-Sea Monitor and Scallop Observer

- Organize fishing trips with federal commercial fishermen of the North Eastern United States.
- Collect catch and discard data on groundfish (trawl, gillnet, and longline) and scallop dredge fishing vessels. Identify all species brought on board and take biological measurements and samples including; length, weight, scales, vertebrae, and otoliths.

Rhode Island Department of Environmental Management

June. 2011-Dec. 2011

Division of Fish and Wildlife- Marine Fisheries Student Researcher

April 2013-Oct. 2013

- Data and logbook entry using Microsoft Access, Microsoft Excel, SAFIS, and Telnet.
- Contact fishermen when questions arise with logbook submissions.
- Assist in field work sampling in beach seine, otter trawl, clam suction, clam dredge, lobster pots, fish pots, and finfish port sampling.
- Fish aging structure removal (operculum, scales, and otoliths) and preparation.

Research Experience

Roger Williams University

June 2009- June 2011

- Project goals are to examine mercury bioaccumulation in fish tissues, examine selenium concentrations in tissues, and examine selenium mercury relationships.
- Includes sampling methods of rod & reel and otter trawl surveys, the extraction of muscle, liver, brain tissues, and otoliths. Preparing tissues samples for atomic absorption spectroscopy and inductively coupled plasma mass spectroscopy. Use of Microsoft Excel and SAS to analyze the data, PowerPoint to present data at conferences. Organize the laboratory and help keep scientific equipment running correctly.
- Mentor: Dr. David L. Taylor, Assistant Professor

Technology, Skills, and Certifications

- Proficient in Microsoft Word, PowerPoint, Excel, Access, and Picture Manager, SAFIS info systems, Telnet, HTML, Adobe DreamWeaver, Oracle Databases (SAFIS Interface and Business Objects), and R.
- Familiar with SQL.
- Large dataset management
- Certified PADI Open Water Scuba Diver
- RIDEM Certificate of Boating Safety Education
- U.S Coastguard Auxiliary Boating Safety Course
- Fisheries sampling techniques including fish and invertebrate identification, trawl, beach seine, lobster and fish pots, gillnets, and dissections.