The Commonwealth of Massachusetts
Division of Marine Fisheries

(617) 626-1520 | www.mass.gov/marinefisheries

MAURA T. HEALEY, Governor | KIMBERLEY DRISCOLL, Lt. Governor | REBECCA L. TEPPER, Secretary | THOMAS K. O'SHEA, Commissioner | DANIEL J. MCKIERNAN, Director

Geoff White, Director
Atlantic Coastal Cooperative Statistics Program
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22204

August 18, 2023

Dear Mr. White,

The Massachusetts Division of Marine Fisheries (MADMF) is pleased to submit the updated proposal titled "*Massachusetts Oracle Forms Redesign and Modernization: Phase 2*" for your review. We believe this proposal is critical to keeping Massachusetts' data streams timely and accurate. The work we completed on Phase 1 has prepared us well for Phase 2, and we are prepared to hit the ground running. We look forward to working with ACCSP to update and optimize our data flows for both the biological and catch and effort modules.

Please note that if FIS proposal announcements are made prior to either the Operations Committee or Coordinating Council meetings to review proposals, additional information will be provided for clarity on objectives and priorities.

MADMF is prepared to begin this work earlier than anticipated if funding is available. The Commonwealth has already secured the contracts for two developers who are being paid through existing resources currently. They begin work on high priority enhancements to FISH2022 in August 2023. MADMF can alter the schedule of the project to prioritize objectives outlined in this proposal and incorporate the ACCSP funds prior to expending our existing resources. Work could begin on the remaining elements of objective 2 by October 2023. Additionally, a decision on the FIS award should be known around the time these funds could be distributed. If FIS is not awarded, the schedule of objective 1 could be re-evaluated, and ACCSP funds would be used for that project as early as January 2024. This would not change the scope of the proposed work and would help us achieve certain objectives sooner.

Please address questions to Anna Webb of the Massachusetts Division of Marine Fisheries.

Sincerely,

Anna R. Webb

Anna R. Webb
Fisheries Statistics Program Leader
Anna.webb@mass.gov
(978) 491-6212

Enclosures:
ACCSP Proposal: "*Massachusetts Oracle Forms Redesign and Modernization: Phase 2*"
Appendix A: Principal Investigator's Curricula Vitae
Appendix B: Supplemental Documents

Proposal for Funding made to:
Atlantic Coastal Cooperative Statistics Program
Operations and Advisory Committees
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22204

Massachusetts Oracle Forms Redesign and Modernization: Phase 2

Submitted by:

Anna Webb
Massachusetts Division of Marine Fisheries
30 Emerson Avenue
Gloucester, MA 01930

Applicant Name:	Massachusetts Division of Marine Fisheries
Project Title:	Massachusetts Oracle forms redesign and modernization: Phase 2
Project Type:	New Project
Principal Investigators:	Anna Webb (MADMF)
Requested Award Amount:	$100,000
Requested Award Period:	For one year, beginning after the receipt of funds
Date Submitted:	June 16, 2023

Sections of the proposal identified to help with the ranking process are highlighted in green with a summary on page 12**.** Changes to the proposal based on feedback from the initial review are highlighted in yellow.

Overview and Terminology:
While this project is titled as Phase 2, Phase 1 was not funded through the Atlantic Coastal Cooperative Statistics Program (ACCSP) and was instead funded by the Massachusetts' Executive Office of Energy and Environmental Affairs Information Technology Department (EEAIT). Phase 1 successfully launched version 1.0 of a new commercial permitting application (hereafter FISH2022) that issues, amends, reviews, and transfers commercial, dealer, and special permits. However, the original scope of the project intended to also include redesigns of other Oracle Forms applications and modernization of an Oracle data warehouse. The scope exceeded the available funds, and remaining portions of the project were pushed to an independently funded Phase 2 project for which multiple grants are being pursued to cover the costs.

The Massachusetts Division of Marine Fisheries (MADMF) acquired approximately half of the required costs through existing resources, which will fund some of the high priority enhancements to FISH2022 and the redesign of the shellfish biotoxin sampling and rainfall data application. MADMF also submitted a full proposal to the FY24 Fisheries Information System (FIS) RFP to cover some of the remaining costs associated with this project. Both the FIS and ACCSP awards are necessary to cover the full remaining costs of this project, and as such it is difficult to predict exactly what elements will be covered by which grant. Assuming FIS is funded, the best prediction is that part of Module 2 and most of Module 3 (defined further in the Approach section) will be funded by this ACCSP award, and this proposal was written with this in mind. An overview of the full project is included for context. If there is a significant change in scope for this specific grant, written notice would be provided.

Objective:

1) Redesign the lobster sea-sampling Oracle Forms applications and associated database in a Form Engine system with a Microsoft SQL Server database that can accommodate all invertebrate fisheries sampling programs including at-sea and port-based sampling protocols. (Module 1; anticipated FIS priority)
2) Develop version 2.0+ of the commercial permitting application launched in 2023. This incorporates several new elements to improve workflows and efficiency. (Module 2; anticipated existing resources, FIS, and ACCSP priorities)
3) Improve data flows from the commercial permitting system, ACCSP, NOAA, and potentially other sources into an MADMF Oracle data warehouse. (Module 3; anticipated FIS and ACCSP priority)
4) Optimize performance within the MADMF Oracle data warehouse. (Module 3; ACCSP priority)
5) Develop an on-demand dynamic report system to aid data management workflows and for external consumption of Massachusetts commercial permitting and fisheries-dependent data. (Module 3; independent funding but support of this module is an ACCSP priority)

The top two objectives of this project are intended to be at least partially funded by FIS. If awarded, those funds will likely be expended partway through objective 2 and the funds from this ACCSP award will contribute towards attaining the remaining objectives. If FIS is not awarded, these funds would contribute to all modules. See Table 1 for prioritization of objectives based on FIS proposal standing.

Sections of the proposal identified to help with the ranking process are highlighted in green with a summary on page 12**.** Changes to the proposal based on feedback from the initial review are highlighted in yellow.

Table 1. Proposed work and the FIS funding dependency.

If FIS Proposal is funded		
Priority for this project	**Objective**	**Explanation**
1	Objective 2: Complete remaining work on version 2.0+ of FISH2022 (Module 2)	Requested funds are expected to fund all priorities. Proposal is written with this expectation. Objective 1 would be funded entirely by FIS.
2	Objectives 3 & 4: Finalize improving flow of data to and optimize Oracle data warehouse (Module 3)	
3	Objective 5: Modernize reporting (support only; includes training itemized in budget)	

If FIS Proposal is not funded		
Priority for this project	**Objective**	**Explanation**
1	Objective 1 (partial): Begin redesigning invertebrate sampling applications (Module 1). Expected to develop back end, data migration plan, and an initial front end for at least one project.	Additional funding from another source will be required to complete the project, particularly objectives 1 & 2. Written notice would be provided for any changes.
2	Objective 2 (partial): Complete remaining high and some medium priority enhancements for FISH2022 (Module 2) but do not fund remaining medium and lower priority enhancements	
3	Objectives 3 & 4: Improve flow of data to and optimize Oracle data warehouse (Module 3)	
4	Objective 5: Modernize reporting (support only); training itemized in the budget would still be included.	

Need:

MADMF has a large amount of technical debt primarily in the form of a legacy, high-security risk Oracle Forms front end system released in 2000 that issued and managed commercial fishing, seafood dealer, and other special permits, managed lobster sea sampling trip data, managed shellfish biotoxin sampling, and tracked rainfall data. The redesign of this legacy system began in collaboration with EEAIT in February 2021 and the first phase culminated in the January 2023 release of version 1.0 of the redesigned permit management module in a SQL Server based form engine application. The scope of this project was much broader than originally realized and several important items were pushed to a second phase of the project including certain permitting elements and the redesign of the sampling modules. As such, the sampling and rainfall Oracle Forms applications are still in use today by MADMF staff and continue to accrue technical debt.

The shellfish sampling application is not proposed to be funded by this award but is a component of the larger Phase 2 project. This application is a large part of the technical debt this overall project intends to eliminate, but it is not included in this scope because it is intended to be funded through already acquired grants and contains a geodatabase component not included elsewhere.

The lobster sampling application is being redesigned as a comprehensive invertebrate sea and port sampling application. If FIS is awarded, this ACCSP grant will not fund this module, but it is included here in case that does not happen. Currently, the invertebrate program uses various

databases and/or excel files to capture all elements of their sampling program. This module will consolidate data collection from all projects conducted by the invertebrate fisheries program into a single repository that will be able to collect data on all types of port and sea sampling trips as well as all target and bycatch species sampled. In addition to reducing the technical debt incurred by the Oracle Forms application, this will streamline much of the data collection for this program.

Enhancements to the version 1.0 of the FISH2022 application are necessary to create a smoother workflow and reduce limitations in the current system. MADMF has been using version 1.0+ since January 2023, and quickly realized there were inefficiencies within many workflows. While this is no longer reducing technical debt, improving the user experience for all staff and external users is critical to successfully managing permits and the associated workflows and reducing the time spent isolating and troubleshooting problems. Some high priority enhancements will be covered by existing funds while the remaining medium and lower priority enhancements are intended to primarily be funded through this proposal.

Additionally, the MADMF fisheries statistics program had built an extensive database integrating permitting data with fisheries-dependent reporting data within the Oracle framework. In lieu of migrating this product to a SQL Server environment, a new schema was added to the existing Oracle database to accept a data stream from the new permitting database and in effect, created a data warehouse from which fisheries statistics analyses could be conducted. Maintaining this product in Oracle resulted in some new problems and highlighted additional modernization and optimization needs to further streamline data flows and analyses. Fisheries statistics staff lack the experience and time necessary to work through some of these issues, and there is not currently any EEAIT staff with the necessary Oracle skills. Thus, the need for a PL/SQL expert and/or API developer and additional help identifying new reporting software options were identified.

Lastly, modernizing MADMF's reporting tools reduces further technical debt. The fisheries statistics program currently manually updates a series of hundreds of static html pages daily to provide some basic auditing and standard query results to both internal and external non-database users. Developing dynamic dashboards in a modern business intelligence solution provides an opportunity to reduce the current workload of refreshing those pages daily, but also provides expanded opportunity for non-database users to review data quality and provide reports on activity more easily. The most likely tool to be used is Power BI which is expected to be a powerful advancement in publicly and internally sharing data.

Results and Benefits:

The results of this project allow MADMF to adapt data collection more easily to ever-changing regulatory requirements, improve fisheries-dependent data management and efficiency, and enhance quality control and assurance methods thus providing more timely and accurate data to support fisheries management both internally and regionally. The intent is to reduce the technical debt incurred by using legacy Oracle Forms applications that have limited support and to modernize towards systems with improved security, seamless maintenance and a dedicated help desk, and increased flexibility to implement future enhancements.

Redesigning these applications addresses several security risks identified as a top priority by EEAIT. The new SQL Server based applications satisfy all the current security guidelines imposed on Commonwealth supported products. Once MADMF is no longer dependent on Oracle Forms

applications, the underlying database can also be moved to a more secure cloud-based RDS environment for preservation and/or access to historical data that is not migrated.

From a data entry perspective, the new web applications are modern and user friendly. They provide an opportunity to expand permit applications from paper to an online platform and provide opportunities for streamlined data entry and retrieval for sampling programs. Additionally, maintaining and supporting the technical aspects of the new applications will be centralized and streamlined through a ticket-based support system and a documented process for larger change management.

Completing the current proposed enhancements to the commercial permitting system will further streamline the existing completed work. Additionally, successful completion of these enhancements will reduce the need for almost constant contact with the EEAIT development team to address problems and to identify temporary workarounds to problems. Lastly, this work will fully transition the application into its maintenance phase with the expectation that most future work will be conducted to accommodate any annual regulatory changes and addressed through a documented change management process. This process is intended to allow developers to respond to regulatory changes quickly and with minimal effort.

MADMF integrates the permitting data with the fisheries-dependent data collected through harvester and seafood dealer reports. MADMF is heavily invested in the commercial data entry tools offered by ACCSP, but this means the data from the SAFIS database must be pulled back to MADMF for various rounds of review with subsequent updates made to the application data before they are considered 'final' and available to data consumers. Each time data must flow to another location, bottlenecks occur and one or the other location is out of sync for some amount of time. Reducing these bottlenecks, automating quality control processes, and/or reducing the time in which the systems are out of sync will improve data quality and timeliness of data availability to fisheries managers.

This flow of data to and from ACCSP is critical to fisheries-dependent data management within MADMF and to support regional fisheries management and stock assessments. Modernizing data flows by incorporating APIs and Oracle scheduled jobs allows MADMF to better streamline data from one system to the other and increases the timeliness and availability of quality assured data to the broader region. Additionally, optimizing the Oracle data warehouse for queryability and reporting creates opportunities for MADMF to be able to fulfill data requests faster and more accurately, provide greater support to harvesters, dealers, and fisheries managers, and perform quality checks on submitted data more regularly and efficiently. Ultimately, achieving the objectives of this module will allow staff to perform QA/QC analyses on reported or entered data more efficiently and ultimately provide more timely data to ACCSP for use in coastwide analyses.

Lastly, if the invertebrate application is included in this funding, this module will provide a path to improve the timeliness of data submissions to ACCSP's biological and bycatch data warehouse tables.

Data Delivery Plan:
All 'final' data will be stored at ACCSP in SAFIS and/or the Data Warehouse.

Approach:

Overview:

EEAIT will contract .NET developers for the back and front-end agile development. A BI expert will configure the reports and provide the ability for MADMF staff to make future modifications. Requirements gathering and wireframes will be completed by existing staff prior to this award. The current Oracle Forms applications will be redesigned as a Form Engine with the generation and tracking of data modeled and stored in a standard normalized structure. The Form Engine is a dynamic configuration based on form templates that allows future modifications of any form without modifying any code. This improves the flexibility of the application to accommodate future projects and/or modifications to existing attributes.

Regular check-ins between MADMF and EEAIT project managers and developers will occur at least once per week and up to once per day. MADMF program staff (e.g., invertebrate program, fisheries statistics program) will meet bi-weekly to discuss each sprint's progress as appropriate, new releases and testing requirements, and to gather feedback from previous testing. The MADMF project manager will coordinate bug reporting and track progress.

Module 1: Invertebrate Sampling Application

While unlikely this award will fund this module, MADMF is including a brief overview in case the FIS funding is not awarded and this ACCSP award will need to cover some of the expenses incurred.

The new invertebrate sampling application will incorporate data collected from seven invertebrate fisheries-dependent or -independent port or sea sampling projects spanning five different invertebrate fisheries and include bycatch data where applicable. Some historical data will be migrated, and others will remain in the original sources. At least one report per project type will be required to export data from the database.

A high-level project map is provided in the supplemental documents that describes the general application data flow. The project type and target species will trigger the various attribute types collected about the fishing trip, effort, and catch on a given trip. Maintenance form(s) will be developed to maintain validations and attribute requirements. A change request process will accommodate larger changes such as new project types.

Two user roles are necessary: an administrator role with full select, insert, delete, update privileges, and a data entry role with full select and insert but limited update privileges. The admin role will include maintenance form administration.

Module 2: FISH2022 Version 2.0

Version 2.0+ builds upon the existing FISH2022 application, within which staff identified and prioritized enhancements as high, medium, and low with the lower priorities addressed by this award. High priority items will be addressed in the fall of 2023 before locking the application for the 2024 renewal season (December 2023 – March 2024). Development will return to the enhancement module in the late spring and summer of 2024 to complete the work. All enhancements were documented within the EEAIT JIRA platform and developer time estimates are available for each story. Most of these lower priority enhancements do not require much additional coding. Some may require an API adjustment and possibly a small change to the front end.

Medium priorities include enhancements to existing features or expansion of existing capabilities. Examples include resolving duplicate profiles and issues selecting vessels, etc. Low priority tasks include improving the end user experience or eliminating redundancies discovered in version 1.0. This includes improving keyboard functionality of the forms, simplifying access to information about a permit or permit holder, etc. These priorities typically are aimed to streamline the internal and external user experience and to discourage the entry of incorrect or duplicate data.

Module 3: Oracle Optimization and Reporting

Phase 2 priorities, and the top priority for this award, include modernizing data sharing with ACCSP and implementing the necessary structures to optimize the MADMF's Oracle data warehouse to improve queryability. API development and/or scheduled Oracle jobs are needed to automate data flows to or from other databases, specifically including improvements to the transfer of permit data from the EEAIT permitting database to MADMF and then to ACCSP, harvester and dealer data from ACCSP, and VTR data from NOAA and/or ACCSP. Furthermore, a review of indices, views, materialized views, triggers, functions, procedures, scheduled jobs, and other bottlenecks for query optimization will be conducted. To address these issues, an Oracle PL/SQL or data warehouse contractor will be hired to review the existing structures, workflows, and data storage and implement improvements where feasible and within budget to maximize efficiency.

This part of the module may include some interactive and iterative work with ACCSP staff to successfully accomplish. MADMF intends to minimize tasks assigned to ACCSP staff and will attempt to fit them into ACCSP's ongoing expected costs and existing resources. It is important to note that this effort begins after the planned registration tracking redesign and during the eDR redesign. The registration tracking work will have direct impacts on the permit data flows to ACCSP, some of which will be addressed prior to this project. The remainder of that work will be included here. The concurrent work on the SAFIS eDR redesign will have limited impact for the first half of the project, but upon release of the new eDR expected in January 2025, data flows will again be disrupted, and changes will be incorporated into MADMF's improved data flow processes. Troubleshooting problems surrounding this data access is an expected piece of the overall redesign project and not expected to be a further additional burden on ACCSP staff.

The final piece of this module is the development of a dynamic, internal, dashboard-driven reporting tool using BI software that will allow the fisheries statistics program to more seamlessly interact with the data required to monitor compliance and perform regular quality assurance and control. With the appropriate confidentiality rules applied, MADMF will also develop both internal dashboards shared with other MADMF programs and public facing dashboards to replace the outdated html display currently used. The Massachusetts Department of Fish and Game, the parent agency of MADMF, is currently hiring a position dedicated to assisting Department projects with business intelligence needs. This new hire will spend at least three months' worth of time with MADMF working to assist the transition from the current static html pages to a dynamic system that streamlines updates and provides comprehensive information for MADMF staff and the public to consume. This award will also fund Power BI training for MADMF staff so they can prepare to support and enhance the dashboards upon the transition of dashboard management to the fisheries statistics program after initial development.

Geographic Location:
All work will be conducted by Commonwealth of Massachusetts staff or contractors and may occur outside of Massachusetts if the contractor is not local.

Milestone Schedule:

	Month												
Task	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Complete ongoing invertebrate application and enhancement work	X	X	X										
Hire Oracle PL/SQL and/or data warehouse DBA			X	X									
Onboarding for Oracle hire				X									
Oracle optimization work					X	X							
BI dashboard work					X	X	X	X	X	X	X	X	
Report Writing						X	X					X	X

Project Accomplishments Measurement:

Project Goal	Measure of Accomplishment
Complete ongoing invertebrate application work	Launch production application, conduct training, and users begin using application.
Complete ongoing FISH2022 enhancement work	Launch production application, conduct training, and users begin using application.
Hire Oracle PL/SQL and/or data warehouse DBA	EEAIT hires a qualified candidate.
Onboarding for Oracle hire	EEAIT successfully onboards candidate and conducts initial training
Oracle optimization work	Data transfer processes are automated and require minimal maintenance.
Oracle optimization work	Queryability and efficiency improve (speeds decrease, database load decreases), database elements are implemented successfully.
BI dashboard work	All current static html pages are replaced with dashboards or other similar dynamic solutions.
BI dashboard work	Internal users have access to an improved QA/QC tracking system. Data are reviewed and available for use in a timelier manner.

Cost Summary:

Description	Calculation	In-Kind	Requested
Personnel (a)		**$6,177.35**	**$0.00**
Anna Webb (Env Analyst, MADMF)	12.5% of time @ 5 hrs/wk for 6 months	$6,177.35	$0.00
Fringe (b)		**$2,829.85**	**$0.00**
43.36% MA Fringe rate	Applied to A. Webb's salary	$2,678.50	$0.00
2.45% MA Payroll rate	Applied to A. Webb's salary	$151.35	$0.00
Supplies (c)		**$0.00**	**$0.00**
none		$0.00	$0.00
Contractual (d)		**$0.00**	**$77,990.00**
EEAIT .NET and Oracle contractors	Development estimated at ~709 hours @ $110/hour	**$0.00**	$77,990.00
Other (e)		**$0.00**	**$2,052.36**
Power BI software fee	$7.95 per license per month for 5 licenses for 12 months	$0.00	$477.00
Power BI training	Online courses for 4-5 program staff, to be sourced	$0.00	$1,200.00
Postage	Mailed outreach materials regarding application changes	$0.00	$375.36
Total Direct Charges		**$9,007.20**	**$80,042.36**
Indirect Charges (f)		**$1,580.78**	**$19,957.64**
25.59% MA Indirect	Applied to A. Webb salary and contractor costs	$1,580.78	$19,957.64
Totals		**$10,587.98**	**$100,000.00**
Total Project Cost		**$110,587.98**	
In-kind versus Direct Percent Contribution		**9.57%**	**90.43%**
Requested Amount		**$100,000.00**	

Cost Details:

a. **Personnel ($0 Requested; $6,177.35 Match)** MADMF will use a portion of PI Anna Webb's salary as match for this application. Her CV is attached, and she is MADMF's project manager for this project. MADMF will be matching 12.5% of her time on this project and an estimated additional 12.5% on the FIS-funded portion of the project (25% match total between this project and FIS).

b. **Fringe ($0 Requested; $2,829.85 Match)** MADMF will provide matching funds to cover fringe and payroll expenses associated with A. Webb's match salary. MADMF's proposed fringe rate of 43.36% includes the costs for Group Insurance, Retirement, and Terminal Leave. MADMF's proposed payroll rate of 2.45% includes the costs of Unemployment Insurance, Universal Health Insurance, Medicare Tax, and the Paid Family Medical Leave Act.

c. **Equipment/Supplies ($0 Requested; $0 Match)**

d. **Contractual ($77,990.00 Requested; $0 Match)** Software development costs for .NET developers and an Oracle expert are $110/hour for approximately 709 hours on this project. The number of hours is rounded and calculated based on the expected remainder of the overall project budget after expending existing and proposed resources prior to using this award.

e. **Other ($2,052.36 Requested; $0 Match)** This request includes a recurring monthly fee for Power BI software ($7.95/license for 12 months x 5 licenses needed) and Power BI training costs for 4-5 program analysts ($1,200). Training costs are required for the analysts to receive the background knowledge necessary to manage the new dashboard reports after transitioning the long-term maintenance back to MADMF. Postage ($375.36) is also requested for various outreach mailings intended to cover ~550+ letters or postcards.

f. **Indirect Charges ($19,957.64 Requested; $1,580.78 Match)** MADMF is requesting $19,957.64 for indirect costs associated with the EEAIT contractors and will provide matching funds ($1,508.78) to cover the indirect costs associated with A. Webb's match salary. MA DMF has a federally negotiated indirect rate of 25.59%.

g. **Total Project Costs ($100,000 Requested; $10,587.98 Match)**

Summary of Proposal for Ranking Purposes

Proposal Type: ***New Project***

Primary Program Priority:

Catch and Effort: This proposal focuses on the modernization of catch and effort and landings data flows already collected through SAFIS applications. If FIS is funded, 100% of the ACCSP funds will be expended under this priority. If FIS is not funded, approximately 60-65% will be for this priority.

Data Delivery Plan: See outline on page 6.

Project Quality Factors:

Multi-Partner/Regional impact including broad applications: Although this plan only covers the activities of MA commercial permit holders, it covers all fisheries that have regional management bodies. Improving the data flows of these data benefit all management strategies coastwide that include these fisheries.

Contains funding transition plan/defined endpoint: This is a one-year project with a defined end goal. The goal is to build or improve existing data collection and review tools and launch these products into production within the one-year time frame.

In-kind contribution: Please see the costs table on page 10.

Improvement in data quality/quantity/timeliness: Improvements in efficiency described here will result in more timely data available for management decisions.

Potential secondary module:

***Biological and Bycatch*:** Module 1 results in a consolidated application for all fisheries-dependent and -independent invertebrate sampling data but does not fund the sampling itself. This work would allow more frequent and comprehensive data submissions to the biological and bycatch ACCSP data warehouse tables. If FIS is not funded, approximately 35-40% of the ACCSP award would be dedicated to this module. The projects proposed to be housed in this database include several projects surrounding American lobster trap-based fisheries, a species and gear in the upper quartiles of the biological and bycatch sampling priority matrices. The model could be expanded for additional sampling projects as well.

Impact on stock assessment: Although this plan only covers the activities of MA commercial permit holders, it covers all fisheries that have regional management bodies. Improving the data flows of these data benefit all management strategies coastwide that include these fisheries. Additionally, the improvements to the invertebrate sampling data flows will make those data more readily available to stock assessments.

Appendix A: Curricula vitae for the principal investigators

Anna R. Webb

30 Emerson Ave · Gloucester, MA 01930
anna.webb@mass.gov · (978) 491-6212

EDUCATION:

Continuing Education:

Intro to Computer Programming, University of Massachusetts, Lowell; Fall 2016
Relational Database Concepts, University of Massachusetts, Lowell; Spring 2015
SQL Programming, Hands-On Technology Transfer, Inc.; Fall 2014

Graduate Education:

Master of Science Degree, Marine and Atmospheric Science, *Focus: Fisheries,* School of Marine and Atmospheric Sciences, Stony Brook University, August 2011
Thesis title: *Understudied Species in Coastal U.S. Waters: Issues, Solutions, and Implications for Ecosystem-Based Fishery Management*

Undergraduate Education:

Bachelor of Science Degree, Marine Vertebrate Biology, Stony Brook University, May, 2007

WORK EXPERIENCE:

Environmental Analyst, Massachusetts Division of Marine Fisheries, Gloucester, MA
November 2015 - Present

Ongoing Responsibilities:

- Program leader for Division's Fisheries Statistics Program. Program is a seven person team responsible for collecting, entering, and managing catch and effort data from commercial fishermen, VMS data from certain commercial fisheries, and landings data from seafood dealers in Massachusetts. Job duties also include managing ongoing federal grants as the principal investigator.
- Provide support and oversight for harvester data collection, entry, quality control, and compliance for Massachusetts and provide outreach and technical support to harvesters submitting reports electronically through SAFIS or via paper.
- Provide support and oversight for dealer data collection, entry, quality control, and compliance, data requests from internal personnel, other partner agencies, and the public, and quota monitoring of various species.
- Lead point of contact for all swipe card technology and Atlantic Coastal Cooperative Statistics Program (ACCSP) related matters.
- Chair of the Commercial Technical Committee, Past Chair of the Information Systems Committee, and Chair of the SAFIS Outreach Committee at the ACCSP.

Program Coordinator, Massachusetts Division of Marine Fisheries, Gloucester, MA
April 2014 – November 2015

- Oversee the harvester data collection, entry, quality control, and compliance for Massachusetts
- Provide outreach and technical support to harvesters and dealers submitting reports electronically through SAFIS or via paper.
- Instituted the online video tutorial series for harvesters using SAFIS and a newsletter focusing on electronic reporting for dealers and harvesters.

Sections of the proposal identified to help with the ranking process are highlighted in green with a summary on page 12**.** Changes to the proposal based on feedback from the initial review are highlighted in yellow.

- Participate in the swipe card dealer application project with ACCSP and Maine Department of Marine Resources.
- Member of the Commercial Technical Committee, Vice Chair of the Information Systems Committee, and Chair of the SAFIS Outreach Committee at ACCSP.

ACCSP Fishery Specialist (Coordinator), Rhode Island Division of Fish and Wildlife-Marine Fisheries Section, Jamestown, RI
April 2012 – April 2014

- Oversee SAFIS data entry and compliance by dealers, harvesters, and staff.
- Provide daily technical support to dealers and fishermen.
- Participate on the quota monitoring team to make decisions regarding seasonal closures and possession limit changes for summer flounder, black sea bass, tautog, bluefish, striped bass, scup, menhaden, and monkfish.
- Manage the research-set-aside program in Rhode Island.
- Write and submit progress and final reports for ACCSP grants.
- Provide data to staff and external users while monitoring confidentiality issues.
- Member of the Commercial Technical Committee, Vice Chair of the Information Systems Committee at ACCSP, Chair of the Data Warehouse Outreach Committee.

Seasonal Field Technician, New York State Department of Environmental Conservation, East Setauket, NY
June 2011 – April 2012

- Conduct seining surveys of juvenile striped bass in Western Long Island bays.
- Assisted with the monitoring of 35 fish pots in a Long Island Sound fishery-independent survey of tautog and a trawl survey of Peconic Bay, NY targeting juvenile finfish species.
- Participated in onboard sampling and measurement of recreational charter boat catch including local species such as summer flounder, black sea bass, and scup.
- Monitor and collect commercial striped bass fishery samples from local fish markets
- Press and age striped bass scales.
- Data entry: Cooperative Angler Program; Vessel trip reports into SAFIS.

Research Technician, Stony Brook University, Stony Brook, NY
March 2007 – September 2008

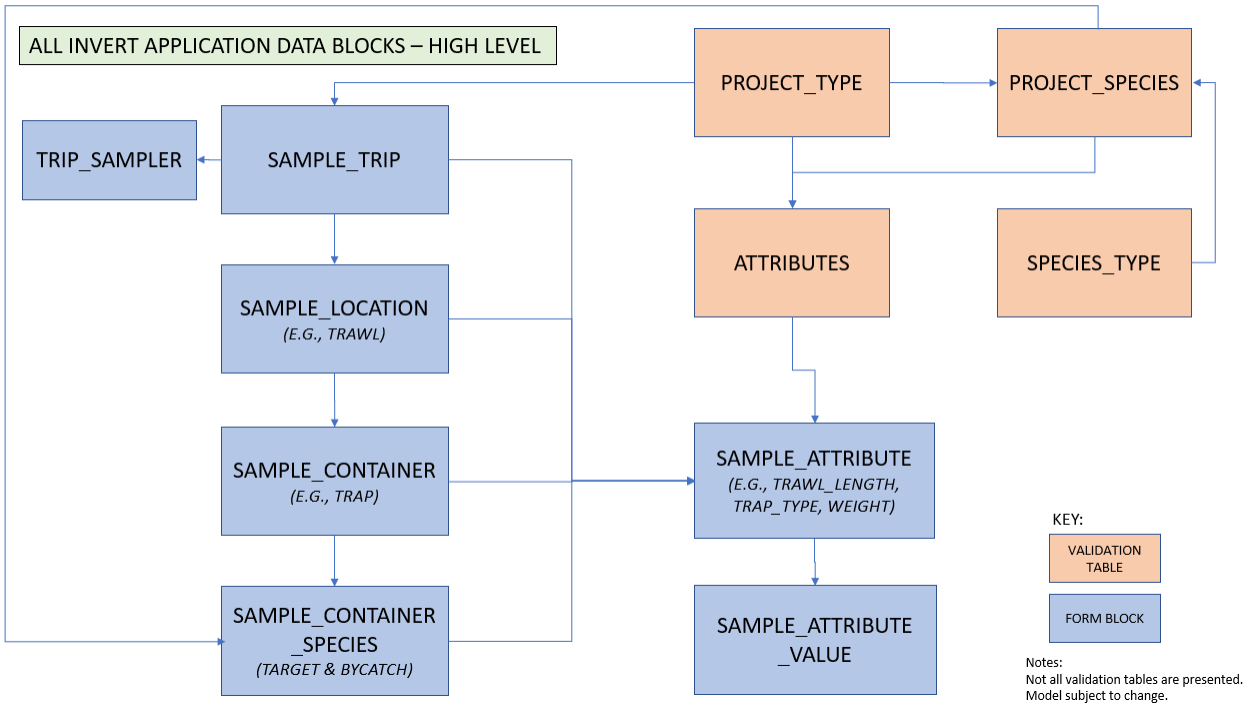
- Participated in hard clam restoration project in conjunction with The Nature Conservancy by analyzing gonad and general body condition of both sanctuary and native clams
- Collected and filtered seawater for chlorophyll and POC/PON content analysis
- Analyzed sediment cores for both POC/PON analysis and enumeration of benthic organisms
- Prepared all materials for both field sampling and laboratory testing

SPECIAL SKILLS:

- Relational database management including MS Access and Oracle based databases
- Data mining large datasets for repeating errors
- Proficient in SQL and Microsoft Office Suite, expert in Microsoft Excel
- Experience with R, GIS, HTML, Visual Basic

Appendix B: Supplemental Documents

B.1 High-level data map for the invertebrate sampling application



Sections of the proposal identified to help with the ranking process are highlighted in green with a summary on page 12**.** Changes to the proposal based on feedback from the initial review are highlighted in yellow.

B.2.A Full Project budget details. Note that this excludes the shellfish biotoxin sampling and rainfall application redesign expected to be completed by March 2024 and approximately half of Module 2 which is expected to be completed by November 2023. Both are funded through existing grants.

Massachusetts Oracle Forms Redesign & Modernization Project: Phase 2 Budget Details							
Module 1: Invertebrate Sampling Application							
Developer Type	**Description**	**Max # Weeks**	**Hours/week**	**Total Hours**	**Cost/hour**	**# Developers**	**Total Cost**
back end	back end/migration	8	37.5	300	110	1	$33,000.00
back end	support for front end	14	25	350	110	1	$38,500.00
front end	admin and data entry screen(s)	14	37.5	525	110	1	$57,750.00
reporting	Business Intelligence software expert	1	37.5	37.5	110	1	$4,125.00
total		22		1212.5		3	$133,375.00
Module 2: FISH2022 Version 2.0							
Developer Type	**Description**	**Max # Weeks**	**Hours/week**	**Total Hours**	**Cost/hour**	**# Developers**	**Total Cost**
back end	back end	4	37.5	150	110	1	$16,500.00
back end	support for front end	12	25	300	110	1	$33,000.00
front end	admin and data entry screen(s)	12	37.5	450	110	1	$49,500.00
total		16		900		3	$99,000.00
Module 3: Oracle Optimization and Reporting							
Developer Type	**Description**	**Max # Weeks**	**Hours/week**	**Total Hours**	**Cost/hour**	**# Developers**	**Total Cost**
Oracle	PL/SQL, DBA	6	37.5	225	110	1	$24,750.00
reporting	Business Intelligence software expert in house	12	37.5	450	0	1	$0.00
total		12		675		2	$24,750.00
Sub Total	.NET Developers, Oracle, BI Expert						$257,125.00
Indirect	Indirect @ 25.59%						$65,798.29
Total							**$322,923.29**

Sections of the proposal identified to help with the ranking process are highlighted in green with a summary on page 12**.** Changes to the proposal based on feedback from the initial review are highlighted in yellow.

B.2.B Summary of Full Project budget by funding sources. Note that this excludes the shellfish biotoxin sampling and rainfall application redesign expected to be completed by March 2024 and approximately half of Module 2 which is expected to be completed by November 2023. Both are funded through existing grants.

Total Project Budget by Funding Source		
Cost Type	**Description**	**Total Cost**
Contract Personnel	.NET Developers, Oracle, BI Expert	$257,125.00
Indirect	Indirect @ 25.59%	$65,798.29
Sub-Total	**Estimated Project Cost**	**$322,923.29**
MADMF funds	Amount already contracted for project	$50,000.00
FIS request	Submitted to FIS	$175,000.00
Total remaining	**Amount yet to be funded**	**$97,923.29**
Remainder split for salary	Rounded to nearest hour (709)	$77,990.00
Remainder split for indirect	applied to the 709 hours	$19,957.64
	ACCSP Contractual Request	**$97,947.64**
	Supplies/software	**$2,052.36**
	ACCSP Total requested amount	**$100,000.00**