



JOSH STEIN
Governor

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Director

July 23, 2025

Atlantic Coastal Cooperative Statistics Program
Operations and Advisory Committees
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22204

Dear Committee Members,

We respectfully submit this revised maintenance proposal titled **“FY26: North Carolina socioeconomic database construction for the management of existing and future data”**. This request supports an additional year of development on NCDMF’s innovative socioeconomic database and web interface. Continued support aligns directly with ACCSP's goals to improve the collection, management, and dissemination of economic and sociological data.

To date, our development efforts have focused on a prototype using a commercial fishermen survey. In FY26, the scope of the project will not change but the focus will expand to include migrating historic socioeconomic data across all sectors (i.e., recreational, shellfish, for-hire, and dealer surveys) into the database and enhancing the interface to support their unique formats. The extensive variation in survey designs between sectors has made the development of a universal question bank and consistent data model a time-consuming effort but these steps are essential in ensuring broad compatibility and long-term utility of the new application by NCDMF.

Thank you for your consideration.

Sincerely,

Jason Walsh
Fisheries Economics Program Manager
North Carolina Division of Marine Fisheries
jason.walsh@deq.nc.gov

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

FY26: North Carolina socioeconomic database construction for the management of existing and future data

Submitted by:

Jason Walsh
North Carolina Division of Marine Fisheries
3441 Arendell Street; P.O. Box 769
Morehead City, NC 28557
jason.walsh@deq.nc.gov

Applicant Name: North Carolina Division of Marine Fisheries

Project Title: FY26: North Carolina socioeconomic database construction for the management of current and future data

Project Type: Maintenance

Principal Investigator: Jason Walsh
NCDMF Fisheries Economics Program Manager

Requested Award Amount: \$145,020

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

Original Date Submitted: June 13, 2025

Objective

Continue developing a consolidated socioeconomic database to be used by the North Carolina Division of Marine Fisheries (NCDMF) to organize existing data for easier analysis and standardize future data entry and storage. In FY26, focus will be on migrating historical datasets into the new database and expanding the interface to support multiple survey types (e.g., recreational, for-hire, shellfish) beyond the commercial survey design used as the template by building a flexible question bank to accommodate their diverse survey structures. A consolidated database housing standardized data will also facilitate future transmissions of fishery-dependent socioeconomic data to the Atlantic Coastal Cooperative Statistics Program (ACCSP) Data Warehouse.

Background/Need

North Carolina's fisheries are a significant social and economic resource to the state and its communities. The NCDMF works to better understand and predict the impact these fisheries have both on their communities and on the state's economy. The North Carolina Fisheries Economics Program (NCFEP) has a wide range of surveys that they use to monitor economic performance over time including commercial fishermen, recreational fishermen, shellfish/aquaculture, for-hire, and dealer surveys.

NCDMF has been collecting socioeconomic information on commercial and recreational fishing in North Carolina for more than two decades. The NCFEP collects data on all stakeholders in commercial and recreational fisheries to better understand the role fisheries play in the state of North Carolina. Due to the diversity of stakeholder groups in fisheries, the data collected varies between surveys and between years as surveys are continuously updated to summarize contributions. The variables that are often collected include but are not limited to the following: demographic information, gear used, species targeted, expenditure and/or costs associated with business, income, fishing history, and perceptions and awareness of regulations. These data are collected to better understanding coastal communities that rely on the fishing industries, recreational and commercial fishermen, and the impact of all fishing industries on the State's economy through intra and interstate commerce.

The program administers surveys to stakeholders to monitor species-specific and broad fishery performance to achieve the goals of the Division. The data collected through these surveys are considered sensitive and confidential information about fishermen and dealers in North Carolina but are currently stored on a NCDMF network drive that is open to every employee within the License and Statistics Section. These data are collected and stored in Microsoft Excel or Microsoft Access formats in organized folders with corresponding metadata in Microsoft Excel or Microsoft Word documents according to standard operating procedures written by the NCFEP. Given the diversity and structure of datasets there has not been a centralized location for data to be stored. This leads to data being disorganized, difficult to work with and challenging to identify trends which is pertinent to the goal of identifying fishery economic performance and participation over time. Consolidation of these data into a standardized database will allow for faster data entry, validation and analysis as well as facilitate increased protection and organization to ensure data are handled appropriately.

Some surveys are newly created every year, while other surveys are updated about every five years. In the last few years, there has been a delay in data collection due to the COVID-19 pandemic and staff turnover. To better accommodate future variability, consolidating data into a centralized system will reduce delays and improve the organization and structure of resources, enabling more efficient collection, management, and sharing of socioeconomic data across management bodies.

ACCSP funded a new project in FY2023 called “North Carolina socioeconomic database construction for the management of existing and future data” and a developer to build this new database and interface was hired in January 2024. The delay in the start date of the FY2023 grant was due to funds not being available to NCDMF until September 2023 and longer than expected recruitment of a contract developer. An FY2025 maintenance project was also funded through the ACCSP entitled “FY25: North Carolina socioeconomic database construction for the management of current and future data” to continue this work. Those monies are expected in July 2025. Between the end of the FY2023 grant in December 2024 and the upcoming start of the FY2025 grant, NCDMF supported the developer to continue work on this project with in-house monies but those were one-time monies and are unavailable for future use. This maintenance proposal is being submitted to continue funding a contractor for the development of the socioeconomic application for one more year. This project is a large consolidation of past surveys that have a variety of survey question types and variables. The new system will allow for standardized storage and use of past survey data and the development of a novel survey application to meet the needs of fishery managers and the Division. The development of this interface is centered around being flexible and object-oriented by using one past survey as an example to build the infrastructure of the new system but still allow the economist to add all other past surveys and their associated data without having to build additional functionality into the system. The new system will have a modular structure which will vary across fishery sectors and will provide the socioeconomic program with a simple “point and click” format that can adapt to changes in survey needs over time.

The project, initiated in FY2023, created a scalable SQL Server database and began building a dynamic web interface using a commercial fishermen survey as the template. However, to fulfill ACCSP's FY26 priorities and the Division's management goals, integration of additional survey types is essential. Each survey (e.g., commercial, recreational, shellfish, for-hire, dealer) varies substantially in structure, data types, and question logic. As a result, creating a flexible question bank and mapping legacy data into the unified system is a complex and resource-intensive task.

The scope of this project has not changed; however, this year, emphasis will be placed on:

- Migrating historic data into the new relational schema
- Building interface support for non-commercial surveys
- Expanding the survey question repository to accommodate diverse data fields

This proposal covers the socioeconomic module (100%).

Review of Previous Results:

A relational SQL Server database was developed to store existing data that have been historically housed in Microsoft Access and Microsoft Excel documents on the NCDMF servers. One survey was chosen as our prototype for this project which was a survey of commercial fishermen who fish in the Atlantic Ocean. All data for this survey has been migrated into the database and can be accessed by the NCDMF Economist with statistical software like SAS or R. The start of an interactive web-based interface has been developed with screens to view and manage surveys and survey questions, and a commercial survey template can be created by the system. In the future, this modern SQL Server database can be linked to the NCDMF FIN database for commercial license data and the GoOutdoors (formerly known as ALVIN) database which houses the recreational license data to facilitate pulling sample populations more efficiently.

Through the development of the database, it has become clear that the socioeconomic surveys are complex and variable across sectors. There is a wide variety of types of questions unique to sectors that require diverse relational structures in the database. The developer has produced tables in the database

for the commercial sector and has received feedback from NCDIT and the PI. The developer is currently working with NCDIT and the PI to refine the survey templates and to build functionality to view and edit existing survey records within the template.

The FY2023 grant ended in December 2024. The FY2025 maintenance proposal will begin in July 2025 (or whenever the money becomes available). NCDMF has sustained the same developer between the FY2023 and FY2025 projects to ensure continuity of institutional knowledge, maintain development momentum, and reduce onboarding time, significantly enhancing efficiency and consistency across all phases of the system's design and implementation. To support timely project completion, two additional NCDIT staff were provided as in-kind support to assist the ACCSP-funded contractor in developing a uniquely tailored application not currently available at NCDMF.

Approach

NCDMF staff will continue to work with NCDIT staff on a requirements document to detail specific needs and expectations of the new data structure and corresponding input/output (I/O) interface. This document will be fluid and will be updated as decisions are made. The requirements document will be updated to reflect multiple survey types added during this project.

All data will be consolidated into a relational database within SQL Server. This database will be able to interact with the NCDMF FIN database where the commercial license data are stored as well as the Wildlife Resources Commission GoOutdoors (formerly known as ALVIN) database where the recreational license data are stored.

A web-based application will continue to be built to serve as the front-end interface for data entry and editing of socioeconomic surveys for commercial, recreational, for-hire, shellfish, and dealers. A robust question bank supporting all survey formats will be built and the database fields will be expanded to accommodate the diversity of data fields between survey types. NCDMF staff will continue to work with NCDIT staff to complete this project. Several NCDIT staff are housed at the NCDMF Headquarters office in Morehead City, NC and will be overseeing, assisting, and facilitating this project as well as helping with database development. A contractor was hired under the FY2023 grant to complete the interface development, will continue on ACCSP funds for FY2025 and then this grant, if approved.

The new SQL Server database and web-based interface will allow for consolidation of NCFEP data for optimized use by the NCDMF to meet fishery management goals. Once the data are consolidated, a file can be submitted to ACCSP for use by other state partners and in regional fishery management plans such as Black Sea Bass, Bluefin Tuna, American Shad, Cobia, and other commercially and recreationally targeted species in North Carolina.

NCDIT at NCDMF has been using the Agile SCRUM methodology for software development over the last 10 years. Development of the database and interface referenced in this proposal will also be conducted using Agile and 3-week development Sprints. User stories to define "bite-sized" pieces of functionality from the requirements document will be created to guide the development process. During development, components of the system will undergo User Acceptance Testing (UAT) by the NCDMF Economist, who will validate that the functionality meets analytical and programmatic needs. This iterative feedback loop ensures the application remains aligned with user expectations and real-world use cases as new modules are developed and integrated.

Results and Benefits

By the end of FY26, the project will provide:

- Consolidation and standardization of NCDMF’s socioeconomic data including legacy datasets
- Data that can be easily formatted to facilitate use of fishery-dependent socioeconomic data by NCDMF staff and other state partners once data are submitted to ACCSP
- Fully functional data entry and verification modules for North Carolina NCFEP data including multiple fishery sectors within the interface
- Increased timeliness and cleanliness of North Carolina’s socioeconomic data to state and regional fishery managers and stakeholders

Geographic Location

The NCDMF Headquarters are located in Morehead City, North Carolina. This project may be performed remotely and does not require the position to be located in Morehead City. NCDIT staff working on this project are also based in Morehead City. NCDIT contractors working for the Department are located in Charlotte, North Carolina. The current NCFEP manager is located in Kill Devil Hills, NC, which is close to the NCDMF Manteo field office.

Data Delivery Plan

Documentation of the new data entry and editing interface as well as any metadata and the new database schema will be provided to ACCSP as part of the annual report. Documentation on the new database will include data mapping tables that provide a definition of each variable. Any new stored procedures created during this project will include documentation on primary function, data tables being accessed, and corresponding variables within the procedure’s SQL code.

Completed Data Delivery to ACCSP

The FY2023 project finished in December 2024, after a no-cost extension. Throughout the project, performance reports have been submitted as required. The final report for FY2023 will be completed by the due date (due date is 6/28/2025). Reports for the FY2025 project, once started, will also be completed by the respective due dates.

Milestone Schedule (start date depending on time of grant award):

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Update requirements document and user stories	X	X	X	X	X	X	X	X	X	X	X	
Create new database tables for new survey types		X	X	X	X	X	X	X				
Migrate historic survey data			X	X	X	X	X	X	X	X		
Refactor interface for new survey templates, as needed	X	X	X	X	X	X	X	X	X	X	X	

Expand question bank and mapping		X	X	X	X	X	X	X	X			
QA, testing, and documentation						X	X	X	X	X	X	X

The contractor is expected to work 40 hours a week on this project. Report writing will follow the requirements of two semi-annual status reports and a final report due at the end of the grant award.

Project Accomplishments Measurement (Metrics and Achieved Goals)

Projects	Accomplishments
Update requirements document, as needed throughout project	<ul style="list-style-type: none"> Document is completed and describes functionality that needs to be completed in new application
User stories are created for Agile Development	<ul style="list-style-type: none"> User stories are written and document small tasks for developers to complete requirements within Sprints
Multi-survey interface integration	<ul style="list-style-type: none"> At least 3 new surveys active within the interface
Question bank development	<ul style="list-style-type: none"> Minimum of 150 validate reusable survey questions
Data migration	<ul style="list-style-type: none"> 100% of data for surveys active within the system have been migrated to SQL
Documentation	<ul style="list-style-type: none"> Updated schemas and metadata delivered to ACCSP

Project Personnel

Jason Walsh— Fisheries Economics Program Manager, NCDMF License and Statistics Section (NCDEQ)
Stephanie McInerny—Section Chief, NCDMF IT Section (NCDIT)
Brandi Salmon—Section Chief, NCDMF License and Statistics Section (NCDEQ)
Semir Badic – Applications Systems Analyst II, NCDMF IT Section (NCDIT)
Chris Capoccia – Applications Systems Analyst II, NCDMF IT Section (NCDIT)

Funding Transition Plan

This project will hopefully be completed within the proposed 1-year maintenance grant period. After the FY26 grant, a better inventory of survey questions and survey types will exist in the system. Other historic surveys that still need to be migrated can be completed by NCDIT and NCDMF staff.

FY26 Budget Narrative

The cost summary table below shows an explanation for each budget item for a one-year period. NCDIT will not charge an indirect fee for the Contractor. The cost for the developer in the summary below is based on an expert level .NET developer from NCDIT’s convenience contracts.

The hours represent the time dedicated to this project from the developer, NCDIT staff, and L&S staff. The contractor that was hired on the FY23 grant is still working on this project and will start on the FY2025 grant when the money become available. This contractor will continue to work on this project in the proposed maintenance window, if approved. In the case of the departure of the contractor from this project, a new contractor will be hired at the same hourly rate. Additional NCDIT staff were included in this year’s project as in-kind to support the contractor on developing novel approaches to application development to facilitate this project.

FY26 Cost Summary

Category	Expense	Units	Cost	ACCSP Request	State In-Kind	Explanation
Personnel	Contractor	1	\$143,520	\$143,520		One Analyst @ \$69/hr for 2,080 hrs (1 year)
	IT Section Chief	1			\$40,768	\$10,192/month for 4 months
	L&S Section Chief	1			\$13,602	\$6,801/month for 2 months
	IT Applications Systems Analyst II	2			\$45,600	\$7,600/month for 3 months
	Fisheries Economics Program Manager	1			\$34,422	Average salary of \$5,737/month for 6 months
Subtotal				\$143,520	\$134,392	
Fringe	Retirement, Social Security, Health Insurance				\$44,965	Fringe=25.02% of salary (\$33,625) plus \$7,557/year for health insurance (1 month insurance = \$630*18 months combined work=\$11,340)
Indirect						No indirect needed for NCDIT contractors
Subtotal				\$0	\$44,965	
Supplies	Computer	1	\$1,500	\$1,500		Replacement laptop for contractor, if needed
Subtotal				\$1,500	\$0	
	Column Totals			\$145,020	\$179,357	Total project cost = \$324,377
	Total Request					
	Percent			45%	55%	Percentage calculated from total cost

Attachment 1: Budget Narrative and Cost Summary for previously funded projects (FY2023 and FY2025)

FY23 Budget Narrative

The cost summary table below shows an explanation for each budget item for a one-year period. NCDIT will not charge an indirect fee for the Contractor. The cost for the developer in the summary below is based on an expert level .NET developer from NCDIT’s convenience contracts.

FY23 Cost Summary

Category	Expense	Units	Cost	ACCSP Request	State In-Kind	Explanation
Personnel	Contractor	1	\$143,520	\$143,520		One Analyst @ \$69/hr for 2,080 hrs (1 year)
	IT Section Chief	1			\$18,938	\$9,469/month for 2 months
	L&S Section Chief	1			\$11,154	\$5,577/month for 2 months
	Fisheries Economics Program Manager	1			\$28,134	Average salary of \$4,689/month for 6 months
Subtotal				\$143,520	<u>\$58,226</u>	
Fringe	Retirement, Social Security, Health Insurance				\$20,245	Fringe=24.19% of salary (\$14,085) plus \$7,397/year for health insurance (1 month insurance = \$616*10 months combined work=\$6,160)
Indirect						No indirect needed for NCDMF contractors
Subtotal				\$0	<u>\$20,245</u>	
Supplies	Computer	1	\$1,500	\$1,500		Laptop for contractor, if needed
Subtotal				\$1,500	\$0	
	Column Totals			\$145,020	<u>\$78,471</u>	Total project cost = \$223,491
	Total Request					
	Percent			65%	35%	Percentage calculated from total cost

FY25 Budget Narrative

The cost summary table below shows an explanation for each budget item for a one-year period. NCDIT will not charge an indirect fee for the Contractor. The cost for the developer in the summary below is based on an expert level .NET developer from NCDIT’s convenience contracts.

The hours represent the time dedicated to this project from the developer, NCDIT staff, and L&S staff. The contractor that was hired on the FY23 grant is still working on this project and will continue to work on this project in the proposed maintenance window, if approved. In the case of the departure of the

contractor from this project, a new contractor will be hired at the same hourly rate. Additional NCDIT staff were included in this year's project as in-kind to support the contractor on developing novel approaches to application development to facilitate this project.

FY25 Cost Summary

Category	Expense	Units	Cost	ACCSP Request	State In-Kind	Explanation
Personnel	Contractor	1	\$143,520	\$143,520		One Analyst @ \$69/hr for 2,080 hrs (1 year)
	IT Section Chief	1			\$40,768	\$10,192/month for 4 months
	L&S Section Chief	1			\$13,602	\$6,801/month for 2 months
	IT Applications Systems Analyst II	2			\$45,600	\$7,600/month for 3 months
	Fisheries Economics Program Manager	1			\$34,422	Average salary of \$5,737/month for 6 months
Subtotal				\$143,520	<u>\$134,392</u>	
Fringe	Retirement, Social Security, Health Insurance				\$44,965	Fringe=25.02% of salary (\$33,625) plus \$7,557/year for health insurance (1 month insurance = \$630*18 months combined work=\$11,340)
Indirect						No indirect needed for NCDMF contractors
Subtotal				\$0	<u>\$44,965</u>	
Supplies	Computer	1	\$1,500	\$1,500		Replacement laptop for contractor, if needed
Subtotal				\$1,500	\$0	
	Column Totals			\$145,020	<u>\$179,357</u>	Total project cost = \$324,377
	Total Request					
	Percent			45%	55%	Percentage calculated from total cost

Attachment 2: Project History and Total Project Cost by Year

Year	Title	Cost	Results
2023	<i>North Carolina socioeconomic database construction for the management of existing and future data</i>	\$145,020	Project completed in December 2024. Requirements document was created. SQL database has been built and populated with pilot survey data , a web-based interface has been created, new surveys and survey questions can be added and edited within the system. The commercial survey used as the pilot can be viewed in the system as a template.
2025	<i>FY25: North Carolina socioeconomic database construction for the management of existing and future data</i>	\$145,020	Expected to start in July 2025

Condensed Summary for Ranking for Maintenance Proposals

Proposal Type: *Maintenance*

Achieved Goals:

Goals of the FY23 project has been met; however, the full interface turned out to be more work than expected due to diverse survey designs across sectors resulting in maintenance proposals in FY25 and FY26. FY23 project completed in December 2024. Requirement document was created. SQL database has been built and populated with pilot survey data, a web-based interface has been created, new surveys and survey questions can be added and edited within the system. The commercial survey used as the pilot can be viewed in the system as a template. Development is steadily continuing on this project. FY25 project started in July 2025 to continue this work.

Data Delivery Plan:

A detailed plan is in place to deliver documentation, metadata, stored procedures, and database schema to ACCSP. New documentation on the new database will include data mapping tables that provide a definition of each variable. Any new stored procedures created during this project will include documentation on primary function, data tables being accessed, and corresponding variables within the procedure's SQL code. Documentation will be provided as part of the grant completion report. (Page 6)

Level of Funding:

This proposal is requesting the same amount as last year's proposal.

Properly Prepared:

This proposal follows the guidelines provided in the ACCSP Funding Decision Document.

Summary of Proposal for Ranking Purposes

Proposal Type: *Maintenance*

Primary Program Priority

Social and Economic: 100%

The NCFEP strives to assess and follow the economic performance of the State's marine resources. This goal includes, but is not limited to, understanding coastal communities that rely on the fishing industries, recreational and commercial fishermen, and the impact of all fishing industries on the State's economy through intra and interstate commerce. The program administers surveys to recreational fishermen, commercial fishermen, processors, and other stakeholders to achieve the goals of the Division. The project directly fulfills ACCSP's high-priority focus on socioeconomic data by centralizing trip-level and owner/operator socioeconomic information from North Carolina. (Page 3-5)

Data Delivery Plan:

A detailed plan is in place to deliver documentation, metadata, stored procedures, and database schema to ACCSP. New documentation on the new database will include data mapping tables that provide a definition of each variable. Any new stored procedures created during this project will include documentation on primary function, data tables being accessed, and corresponding variables within the procedure's SQL code. Documentation will be provided as part of the grant completion report. (Page 6)

Project Quality Factors

Multi-Partner/Regional impact including broad applications:

Although this project only covers data for North Carolina, many species within North Carolina are managed regionally. Regional management agencies such as the Atlantic States Marine Fisheries Commission (ASMFC) and Mid-Atlantic Fishery Management Council (MAFMC) would benefit from having more access to these fishery-dependent socioeconomic data. (Page 3-5)

Contains funding transition plan and/or justification for continuance:

The goals defined in this project should be completed within the grant cycle. (Page 7)

In-kind contribution:

55% (see cost table on Page 7-8)

Improvement in data quality/quantity/timeliness:

The project identified in this proposal will greatly improve data quality and timeliness by providing a more modernized format for the data with enhanced data entry/verification screens and workflows that will prepare North Carolina for future data reference and analysis. (Page 4)

Potential secondary module as a by-product:

None

Impact on stock assessment:

By organizing and standardizing socioeconomic data, the project enables more efficient access to information used in stock assessment processes. Accurate socioeconomic profiles of fishery

participants, expenditures, and effort provide context for understanding fishery dynamics, evaluating management alternatives, and informing bioeconomic models. With improved data quality and accessibility, assessment scientists and managers can better account for human dimensions in their analyses. (Page 3-5)

Impact on management:

The consolidation of socioeconomic data across multiple fisheries supports informed decision-making by providing a clearer picture of how regulations and fishery dynamics impact coastal communities and stakeholder economics. With improved access to data on income, expenditures, and participant demographics across sectors, managers can better evaluate the economic tradeoffs of management alternatives, ensure equitable outcomes, and increase transparency in the decision-making process. This system also improves the agency's responsiveness to ad-hoc policy questions and public information requests. (Pages 3-5)

Other Factors

Properly Prepared:

This proposal follows the guidelines provided in the ACCSP Funding Decision Document.

Merit:

Modernizing NCDMF's Socioeconomic Database and the front-end interface that allow data entry clerks and analysts to interact with the database is crucial to the success of socioeconomic data collection programs in North Carolina. (Page 5)

Jason Walsh

Cell: (525)269-9299 Email: Jason.Walsh@deq.nc.gov

SUMMARY OF QUALIFICATIONS

EDUCATION

University of Rhode Island	Graduated: 2021
M.S., Environmental and Natural Resource Economics	
University of North Carolina (Wilmington, NC)	Graduated: 2015
B.A., Economics	
B.S., Environmental Science	
Nelson Mandela Metropolitan University (Port Elizabeth, South Africa)	January-May 2014
Moulay Ismail University (Meknes, Morocco)	January-May 2013

WORK EXPERIENCE

North Carolina Division of Marine Fisheries	Morehead City, North Carolina
<ul style="list-style-type: none">• Fisheries economics program manager• Supervisor of social research scientist temporary staff• Support fishery managers in the development of fishery management plans• Complete fiscal notes in the rule development process• Leading PI to ongoing project identifying economic contribution of for-hire industry to North Carolina economy funded by ACFCMA• Leading PI to ongoing project on an update status of economic contribution of shellfish aquaculture industry to North Carolina economy funded by SK grant• Leading PI on ongoing project to create novel economic database for the NC fisheries economics program funded by ACCSP• Member of SAFMC SSC and ASMFC CESS	January 2022-Present
McArthur Environmental Consulting	Framingham, Massachusetts
<ul style="list-style-type: none">• Prepare documents for clients and local municipalities	December 2020-December 2021
Rhode Island Fish and Wildlife	Wakefield, Rhode Island
<ul style="list-style-type: none">• Field interview marine recreational anglers	July 2017-October 2017

RESEARCH

Research Assistant (Dr. Todd Guilfoos, Professor of Natural Resource Economics URI)	May 2017-May 2021
<ul style="list-style-type: none">• 20 Hours/Week• Creating hedonic studies on the economic effect of dam removals in New England using statistical tools Stata and ArcGIS	

Student Trainee (USDA Economic Research Service)**June 2019-August 2019**

- 40 Hours/ Week
- Intern modelling nutrient runoff of farms from the agricultural resource management survey using the environmental policy integrated climate model software.

Research Assistant (Annette Bourbonniere)**September 2018-May 2019**

- 10 Hours/ Week
- A team member developing the model and performing analysis using R for a discrete choice study on the effect of removing earnings from insurance and social security payments for persons with spinal chord injuries

Research Consultant (Chris Brozyna)**December 2018-May 2019**

- 5 Hours/ Week
- A team member providing assistance during analysis and writing stages of an experimental economics study on TURFS (a rights based fishery management strategy)

Directed Independent Study (Dr. Peter Schuhmann, Professor of Economics at UNCW) July 2015-2016

- Used Contingent valuation methods and regression analysis to assess willingness to pay and willingness to return of tourists to Barbados

Directed Independent Study (Dr. Zachary Long, Professor of Ecology at UNCW) July-December 2014

- Studied macro algae at Fort Fisher recreation area to find how stability of benthic marine communities' consumers is influenced by the presence of invasive macro algae

PUBLICATIONS**A Hedonic Study of New England Dam Removals****September 2021**

- An analysis of dam removals heterogeneous effects on housing prices in New England
- <https://www.sciencedirect.com/science/article/abs/pii/S0921800922002853>

TURF Wars: Group Dynamics in Resource Management**October 2019**

- Working paper at the Center for Growth and Opportunity on TURF as a fishery management tool.
- <https://www.thecgo.org/wp-content/uploads/2020/04/working-paper-2019.013.pdf>

PRESENTATIONS**AAEA Conference Presentation****August 2018**

- Present preliminary results from first chapter of dissertation. A hedonic study on dam removals heterogeneous effect on housing prices.

Guest Lecturer**February 2019 & February 2020**

- Present results from first chapter of dissertation in an ecohydrology graduate course. A hedonic study on dam removals heterogeneous effect on housing prices. This also serves as an introduction to environmental economics to the masters of environmental management at URI.