

# EMILY MARKOWITZ

I believe there is a need and new opportunity across all science fields to make workflows more efficient, improve data management, and make our results accessible and digestible to general audiences.

## EDUCATION

2015  
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2018

### **Accelerated Master's of Science in Marine Science**

Dr. Janet Nye, Quantitative Fisheries Ecology Laboratory

 Stony Brook University, NY

- Thesis: "Distribution Shifts Associated with Changing Environmental Parameters in Two Demersal Species: Summer Flounder (*Paralichthys dentatus*) & Black Sea Bass (*Centropristes striata*) on the NE US shelf."
- Developed environmental preference and habitat suitability models from the NOAA NEFSC survey dataset and Regional Oceanographic Modeling System (ROMS) output in MATLAB and R.



2011  
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2015

### **Bachelor of Science in Marine Science, Cum Laude**

Minors in Geospatial Information Sciences, Coastal Environmental Studies, and Theater Arts

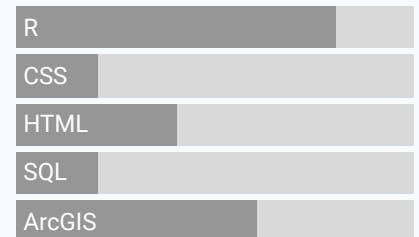
 Stony Brook University, NY

- Dr. Joseph Warren, Acoustic Laboratory for Ecological Studies
- Dr. Bradley Peterson, Marine Community Ecology Laboratory, School of Marine and Atmospheric Sciences, Stony Brook, NY
- Dr. Steve Wing, University of Otago, Portobello Marine Laboratory, New Zealand
- Dr. Nathan Brennan, Mote Marine Laboratory Marine Aquaculture Park, Sarasota, FL
- Dr. Janet Nye, Quantitative Fisheries Ecology Laboratory, School of Marine and Atmospheric Sciences, Stony Brook, NY

## CONTACT

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## LANGUAGE SKILLS



## WORK EXPERIENCE

2020  
|  
Present

### **Research Fisheries Biologist**

NOAA Fisheries' Alaska Fisheries Science Center, Resource Assessment and Conservation Engineering Division, Groundfish Assessment Program

 Seattle, WA

- Assist in planning of and participate aboard the Eastern Bering Sea Shelf Bottom Trawl Survey, Eastern Bering Sea Slope, and Arctic Bottom Trawl Surveys.
- Assist in data collection and pre- and post-cruise data management for surveys and field research activities.
- Advance species distribution modeling research using model-based estimates of abundance and biomass using VAST, Generalized Additive Mixed Models (GAMMs), and other techniques.
- Aid in the development of R products that advance GAP surveys, modeling activities, and automation of reports and data products.
- Assist with the production of educational and informational outreach materials for engaging Alaska native communities about the Bering Sea surveys.

Links: [Post](#), [More info](#)

2019  
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2020

### **Environmental Policy Analyst**

NOAA Fisheries' Office of Science and Technology, Division of Economics and Social Analysis, Contractor through ECS Federal

 Silver Spring, MD

- Manage the production and publishing of the annual Fisheries Economics of the US Report (FEUS).
- Redefine a commercial, recreation, and aquaculture national I/O model impact calculator model as an RShiny application to assist fisheries scientists and managers assess the impacts of changing fisheries.
- Develop the national fisheries economic productivity Tornqvist index output and organizing two fisheries economic productivity workshops for NOAA scientists.

Links: [Fisheries Economics of the US Report](#), [GitHub of {FishEconProdOutput} R Package](#)

2018  
|  
2019

### 2018 Knauss Marine Policy Fellow

NOAA Fisheries' Office of Science and Technology, Assessment and Monitoring Division, Protected Species Science Branch, Fellow through New York Sea Grant

📍 Silver Spring, MD

- Lead Coordinator, Protected Species Assessment Workshop II (PSAW II/#PSAW2019). 150+ person event, La Jolla, CA February 2019.
- Lead Coordinator, National Protected Species Toolbox Initiative (NPST). Managing 7 individual projects from fisheries science centers around the country.
- Co-Lead Coordinator, 2018 Protected Species Toolbox Mini-Symposium II. Program Manager, Sea Turtle Assessment Internal Funding Allocation.
- Lead Coordinator, Sea Turtle Research Standard Methods. Technical Support, Sea Turtle & Marine Mammal Protected Species Climate Vulnerability Assessment.
- Prepared sensitivity attributes guidelines, webinar presentations, and population literature reviews.
- Editor, Science Connect Newsletter (via Constant Contact and GovDelivery)
- RShiny App Developer, NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. App provides a calculator function and report for permit applications. Prepared working group/program terms of references, webpages, internal proposals, and final reports.

Links: [PSAW II Planning Website](#), [Science Connect Newsletter](#)

## 🐟 RESEARCH

2021  
|  
on

### Model-Based Abundance and Distribution Estimates using VAST

Help provide model-based estimates of abundance, distribution, or age composition from AFSC Groundfish Assessment Program (GAP) bottom trawl survey data to stock assessment authors.

Links: [GitHub of Private Repository](#), [ModSquad](#)

2021

### Alaska Fisheries Science Center Survey Data Reports

Reproductively automate groundfish data reports for all surveys conducted by the AFSC in R Markdown.

Links: [GitHub of Repository](#)

2021

### 2021 Northern Bering Sea Groundfish and Crab Trawl Survey Highlights

Reproductively automate outreach reports for the Bering strait communities with results from the northern Bering sea survey conducted by the AFSC in R Markdown.

Links: [GitHub of Private Repository](#)

2021

### **Fisheries Economics of the US Report**

Manage the redevelopment and production of the Fisheries Economics of the US report. This is a national-level report that provides ten years of economic information, impacts, and analyses related to U.S. commercial and recreational fishing activities and fishing-related industries. I am working to contemporize this iconic report by writing reproducible code using R and RMarkdown, which produces several report outputs and JavaScript files for the interactive FEUS online tool. All of this work has gone into improving this nationally regarded report for the many who reference it and making the process of producing it more streamlined, reproducible, and efficient.

Links: [Website](#)

2021

### **GAP Survey Temperature Maps**

These scripts create the daily temperature and anomaly plots as NOAA Fisheries' Alaska Fisheries Science Center conducts fisheries independent surveys in Alaska. The script pull temperature content from google drive and then push the maps to google drive for the communications team.

Links: [GitHub of R Package](#), [Website where graphics are used!](#)

2020

### **{NMFSReports}: Easily write NOAA reports and Tech Memos in R Markdown**

The NMFSReports Package has all of the basic architecture you need to create reproducible and repeatable NOAA Tech Memos in R Markdown! This approach is perfect for efficiently rolling out annual (or other regular) reports or reports with formulaic sections (the same chapter structure but for a different area or species). Scripts integrate table, figure, data, and bibliography management and design automation.

Links: [Pkgdown Site for R Package](#)

2020

### **{FishEconProdOutput}: Measuring Output for U.S. Commercial Fisheries From Theory to Practice**

This package provides guidelines on fishery productivity measurement at the individual fishery and aggregate sector levels. Attention is given to the constructions of output and total factor productivity based on available data and a bottom-up approach. Given that there is no nation-wide standard cost survey, we recommend starting with measuring TFP at the fishery level based on a translog gross output production possibility frontier using index number techniques. Special attention is given to measuring quality-adjusted physical capital inputs in the bottom-up approach.

Links: [Pkgdown Site for R Package](#)

2020

### **{GAPsurvey}: At-sea data management tools for RACE GAP surveys**

Catch, Length, and Specimen Data Import Program Instructions for at sea survey data for AFSC's Gulf of Alaska and Bering Sea groundfish surveys.

Links: [Pkgdown Site for R Package](#)

2019

### **NOAA Fisheries Commercial, Recreational, and Aquaculture**

#### **Fisheries Economic Impact R Shiny Model**

I/O models are used to assess economic activity such as jobs, income, and sales generated by a given industry sector. This is currently used in industry statistics (such as in FEUS) and management applications (to determine how a change would effect the economy, such as in planning team meetings).

Links: [GitHub to R Package](#), [GitHub to RShiny App](#)

2018

### **Modeling Environmentally Driven Distribution Shifts for Two Demersal, Migratory Species**

Habitat suitability models (HSMs) of summer flounder (*Paralichthys dentatus*) and black sea bass (*Centropristes striata*) were created using the fishery-independent Northeast Fisheries Science Center (NEFSC) bottom trawl survey data in generalized additive models and cumulative distribution functions. These analyses were used to probabilistically link where different length classes of these fish would likely be across different environmental variables in spring and fall. These different environmental variables (surface and bottom temperature and salinity, depth, and bottom type) have similar influences on life history of these two demersal, migratory, and commercially important species. Then, the HSMs were used to illustrate how the population's distribution changed over time by hindcasting over regional ocean modeling systems (ROMS). The ROMS used in this analysis was a 1 Day Averaged ROMS for the Northeast US Coastline from 1958-2020.

Links: <https://github.com/orgs/afsc-gap-products/teams/modsquad>

2018

### **NOAA Fisheries Marine Mammal Acoustic Thresholds**

NMFS has provided this Web Calculator as an optional tool to provide estimated effect distances (i.e., isopleths) where PTS onset thresholds may be exceeded. Results provided by this calculator do not represent the entirety of the comprehensive effects analysis, but rather serve as one tool to help evaluate the effects of a proposed action on marine mammal hearing and make findings required by NOAA's various statutes. Input values are the responsibility of the individual user.

Links: [GitHub Repository](#), [Shiny App](#)

## TEACHING EXPERIENCE

2021  
I  
Present

### **Co-organizer and co-host for the AFSC Openscapes Workshop**

NOAA Fisheries Alaska Fisheries Science Center

 Seattle, WA

- Co-wrote a proposal to bring Openscapes training workshops to AFSC. Training coming to AFSC January 2022!

We can take it upon ourselves to build an inclusive community for teams to collaborate with and learn from. Internally-driven investment in professional development extends the impact of a team member and takes the weight off the organization's experts as new users are able to take on more tasks.

2021   Present	<b>Co-organizer of the NMFS-wide R Users Group and GitHub Organization</b> NOAA Fisheries Alaska Fisheries Science Center <ul style="list-style-type: none"><li>Organize meetings and speakers and foster the open science-R community across NMFS.</li></ul> Links: <a href="#">NMFS-Openscapes GitHub Organization</a>	📍 Seattle, WA
2021	<b>Co-teacher and Co-organizer</b> NOAA Fisheries Alaska Fisheries Science Center <ul style="list-style-type: none"><li>Co-host and organize a 5-week entry-level R-Users workshop for 15 coworkers in the AFSC RACE groundfish assessment program. Developed a curriculum, lesson plans, and assignments.</li></ul> Links: <a href="#">Lesson Website</a>	📍 Seattle, WA
2020	<b>Co-teacher and Co-organizer</b> NOAA Fisheries Office of Science and Technology Division of Economics and Social Analysis <ul style="list-style-type: none"><li>Co-hosted a Workshop for Social Scientists for over 60 participants from across the country and across centers</li></ul> Links: <a href="#">Lesson Website</a>	📍 Silver Spring, MD
2015	<b>ArcGIS Teaching Assistant</b> Sustainability Studies Program, Stony Brook University <ul style="list-style-type: none"><li>Introduction to ArcGIS, taught by Professor Maria Brown.</li><li>Worked with students to develop multi-map projects aimed at answering questions in hydrology, weather, climate change, and marine science for unique final projects in ArcGIS.</li><li>Provided comments and assessments of presentations, quizzes, and homework assignments.</li><li>Held office hours and provided computer assistance.</li></ul>	📍 Stony Brook, NY

## 👤+ MENTORSHIP

2020   2021	<b>Capstone Co-mentor</b> University of Washington School on the Environment Undergraduate Capstone Program <ul style="list-style-type: none"><li>Mentoring student investigating the purple-orange sea star and bivalve climate change-driven distribution changes in Alaska's eastern Bering Sea.</li></ul>	📍 Seattle, WA
2019   2020	<b>High School STEM Competition Mentor and Volunteer</b> Blacks in Government <ul style="list-style-type: none"><li>Mentor to student participant and assisted with marketing for the NOAA Chapter High School STEM Competition.</li></ul>	📍 Silver Spring, MD

2017

### **Graduate Peer Mentor**

School of Marine and Atmospheric Sciences, Stony Brook University  
📍 Stony Brook, NY

- Helped troubleshoot seabird telemetry home range metrics and marine mammal bycatch modeling

2016

### **High School Student Mentor**

Dr. Janet Nye, Quantitative Fisheries Ecology Laboratory, Stony Brook University  
📍 Stony Brook, NY

- Mentored high school student assisting on assessment of Black Sea Bass (*Centropristes striata*) winter survival on the NE US shelf using MATLAB

## OUTREACH

2021

### **Counting Fish in Alaska!**

Diversity in STEM - Let's Talk Science Symposium  
📍 McGill University, Montreal, Quebec, Canada/Remote

- Presented to students in grades 3-8 from across Montreal, Quebec, Canada about NOAA Fisheries groundfish surveys in Alaska.

2018  
I  
Present

### **Skype and Scientist Visiting Scientist**

Remote  
📍 Skype a Scientist Program

- 30+ schools across the country K-12

2018

### **Science Festival Booth Presenter**

USA Science and Engineering Festival  
📍 Washington, D.C.

- Used the Science on Sphere (SOS) to share relationships between temperature, climate change, and changes in fish distributions.

2018

### **Presenter**

Smithsonian National Museum of Natural History's Expert is in Program  
📍 Washington, D.C.

- Hosted a table in the Smithsonian Natural History Museum Ocean Hall and engage with patrons about fisheries management.

2016  
I  
2017

### **WISE Program Assisting Researcher**

School of Marine and Atmospheric Sciences, Stony Brook University  
📍 Stony Brook, NY

- Stony Brook WISE (Women in Science and Engineering) working up some of the day's data from our mini-study on blue crab temperature-dependent aerobic and anaerobic metabolism.

2014

### **Plastic Pollution Outreach Program Organizer**

Coastal Steward Long Island

📍 Across Long Island, NY

- Wrote, designed, and ran an outreach initiative teaching local elementary and middle school students about the global marine plastic pollution problem with Coastal Steward

## PUBLICATIONS

In review

### **Advancing bioenergetics-based modeling will improve climate change projections for marine ecosystems**

Rose, K., KK Holsman, JA Nye, EH Markowitz, et al.

- Marine Ecology Progress Series.

In prep

### **SocioEconomic Aspects in Stock Assessments Workshop (SEASAW) Report**

NMFS

- DOC NOAA Tech. Memo. U.S. DOC, NOAA Tech. Memo.

In prep

### **Influence of environmental parameters on ontogenetic habitat selection for summer flounder and black sea bass on the Northeast (US) shelf large marine ecosystem**

Markowitz, EH and JA Nye

In prep

### **Results of the 2021 Eastern and Northern Bering Sea Continental Shelf Bottom Trawl Survey of Groundfish and Invertebrate Fauna**

Stevenson, D, EH Markowitz, L Dawson, N Charriere, B Prohaska, and S Rohan

- DOC NOAA Tech. Memo. NMFS-F/SPO.

In prep

### **Results of the 2019 Eastern and Northern Bering Sea Continental Shelf Bottom Trawl Survey of Groundfish and Invertebrate Fauna**

Stevenson, D, EH Markowitz, L Dawson, N Charriere, B Prohaska, and S Rohan

- DOC NOAA Tech. Memo. NMFS-F/SPO.

In prep

### **Results of the 2018 Eastern Bering Sea Continental Shelf Bottom Trawl Survey of Groundfish and Invertebrate Fauna**

Stevenson, D, EH Markowitz, L Dawson, N Charriere, B Prohaska, and S Rohan

- DOC NOAA Tech. Memo. NMFS-F/SPO.

In prep

### **Fisheries Economics of the United States, 2020**

NMFS. Eds. A Richardson and EH Markowitz

- DOC NOAA Tech. Memo. NMFS-F/SPO

In prep

### **Fisheries Economics of the United States, 2021**

NMFS. Eds. A Richardson and EH Markowitz

- DOC NOAA Tech. Memo. NMFS-F/SPO

2022

**Fisheries Economics of the United States, 2019**

NMFS. Eds. A Richardson and EH Markowitz

- DOC NOAA Tech. Memo. NMFS-F/SPO-229, 236 p.

Links: [Link](#)

2021

**Measuring Output, Inputs, and Total Factor Productivity for the U.S. Fishery: A Proposal**

Wang, SL., Walden J., EH Markowitz

- NOAA Tech. Memo. NMFS-F/SPO-217, 14 p.

Links: [Link](#)

2021

**Fisheries Economics of the United States, 2017**

NMFS. Eds. EH Markowitz and A Richardson

- DOC NOAA Tech. Memo. NMFS-F/SPO-219, 259 p.

Links: [Link](#)

2021

**2021 Northern Bering Sea Groundfish and Crab Trawl Survey Highlights**

Britt, L, EH Markowitz, L Dawson, N Charriere, J Richar, S Rohan, B Prohaska, R Haehn, and D Stevenson

- Outreach material

Links: [Presentation at the University of Alaska Fairbanks Strait Science Seminar.](#)

2021

**Fisheries Economics of the United States, 2018**

NMFS. Eds. A Richardson and EH Markowitz

- DOC NOAA Tech. Memo. NMFS-F/SPO-225, 246 p.

Links: [Link](#)

2019

**Fisheries Economics of the United States, 2016 Addendum**

NMFS. Ed. EH Markowitz

- DOC NOAA Tech. Memo. NMFS-F/SPO-187a, 243 p.

Links: [Link](#)

2019

**Proceedings of the 2nd National Protected Species Assessment Workshop**

M. Srinivasan, SK Brown, EH Markowitz, M Soldevilla, E Patterson, K Forney, K Murray, E Ward, JM Ver Hoef, J Redfern, and T Eguchi (eds.)

- NOAA Tech. Memo. NMFS-F/SPO-198, 46 p. Memo.

Links: [Link](#)

2018

### **Fisheries Economics of the United States, 2016**

NMFS. Ed. EH Markowitz

- U.S. DOC, NOAA Tech. Memo. NMFS-F/SPO-187a, 243 p.

Links: [Link](#)

## SELECTED PRESENTATIONS

2022

### **What does a Fisheries Researcher Do?**

Markowitz, EH

- NOAA Live! Alaska Seminar Series

Links: [Recording](#), [NOAA Live! Alaska](#)

2021

### **2021 Northern Bering Sea Groundfish and Crab Trawl Survey Highlights**

Britt, L, EH Markowitz, L Dawson, N Charriere, J Richar, S Rohan, B Prohaska, R Haehn, and D Stevenson

- University of Alaska Fairbanks Strait Science Seminar.

Links: [Presentation](#)

2021

### **Data to Product Workflows**

Markowitz, EH

- NOAA NMFS NWFSC Openscapes Fall 2021

Links: [Recording](#), [Slides](#)

2021

### **Reproducible Reports in R Markdown - Perspectives and {NMFSReports}**

Markowitz, EH

- R Cascadia Conf., June 2021. Remote.

Links: [Recording](#), [Slides](#)

2021

### **Different Strategies for Teaching Your Colleagues R: Lessons Learned and Recommendations**

Davis, C, EH Markowitz, and D Dishman

- R Cascadia Conf., June 2021. Remote.

Links: [Recording](#)

2020

**Reproducible National-level Reports: Using Rmarkdown to Recode the Fisheries Economics of the United States Report**

Markowitz, EH

- Women in Statistics and Data Science Conf., September 2020. Remote.
- American Fisheries Society, September 2020. Remote. (5 minute speed talk)
- SatRDay Conference, March 2020. Washington, D.C.

Links: [Recording](#)

2020

**Commercial and Recreational Fisheries Economic Impact Input/Output Model: Tool Update and Increasing Accessibility for Managers and Scientists**

Markowitz, EH and S Steinback

- American Fisheries Society, September 2020. Remote.
- Socioeconomic Aspects in Stock Assessments Workshop (SEASAW), February 2020. New Orleans, LA.

2020

**Measuring Output for U.S. Commercial Fisheries - From Theory to Practice**

Markowitz, EH and SL Wang

- Fishery Productivity Workshop 2020: Measurement, Data Sources, and the Pattern of Growth, April 2020. Silver Spring, MD/Remote.

2019

**Science News Fatigue Battlefront. How do we do better? An observation-based discussion piece**

Markowitz, EH

- NOAA DataComm Group, November 2019. Silver Spring, MD (60 minutes with demo and discussion).

2018

**Assessing the Impact of Underwater Sound on Marine Mammal Hearing in R Shiny: Increasing Accessibility of Tools for Managers and Stakeholders**

Markowitz, EH, AR Scholik-Schlomer, M Srinivasan, J Gedamke

- NOAA DataComm Group, May 2019. Silver Spring, MD (60 minutes with demo and discussion)
- NOAA NMFS OST Brown Bag series, October 2018. Silver Spring, MD (45 minutes with demo)
- International Marine Conservation Congress, June 2018. Kuching, Malaysia (15 minutes)

2018

**Modeling Environmentally Driven Distribution Shifts in Regional Ocean Model Systems for the Demersal, Migratory, Commercially Important Summer Flounder**

Markowitz, EH, M Frisk, S Sagarese, and JA Nye

- ICES ASC, September 2018. Hamburg, Germany.
- American Fisheries Society's National Meeting, August 2018. Atlantic City, NJ.
- International Marine Conservation Congress, June 2018. Kuching, Malaysia.



## AWARDS AND SCHOLARSHIPS

- **NOAA Fisheries Science and Technology Assessment and Monitoring Branch, Employee of the Quarter, 2019**
- **CPAESS/UCAR Conference Travel Award, 2017**
- **Southern New England Conference Student Travel Award, 2017**
- **Maze-Landeau Conference Travel Award, 2017**
- **SoMAS Travel Award, 2017**
- **Undergraduate Student Leadership Award, 2017**
- **Evan R. Liblit Memorial Fund Scholarship for Waste Management, 2015**



## FELLOWSHIPS

- **American Fisheries Society Climate Ambassador Program, 2021 - 2023**
- **American Meteorological Society Early Career Leadership Academy, 2019**
- **New York Sea Grant - John A. Knauss Marine Policy Fellowship, 2018**
- **Waterfront Alliance Conference Scholar, 2017**
- **Stony Brook University's Mote Marine Lab Fellowship, 2015**



## PROFESSIONAL AFFILIATIONS

- **500 Women Scientists, Silver Spring Pod, 2020 - 2021**
- **American Institute of Fishery Research Biologists, 2018 - Present**
- **NOAA DataComm, 2018 - Present**
- **American Fisheries Society (AFS), 2016 - Present**