

# Joseph A. Langan

jalangan@alaska.edu

## Education

**University of Rhode Island Graduate School of Oceanography (URIGSO)** 2015-2021  
Narragansett, Rhode Island

**I. PhD in Biological Oceanography** 2021  
◇ Dissertation Title: The Role of Climate Change in the Decline of Narragansett Bay Winter Flounder

**II. MS in Statistics** 2021  
◇ Thesis Title: A Bayesian State-Space Approach to Improve Projections of Stock Biomass for Managing New England Groundfish

**University of New England** 2011-2015  
Biddeford, Maine

### **BS with Honors in:**

**I. Marine Sciences, Concentration in Marine Biology**  
◇ Thesis Title: Evaluating the Management Implications of Discard Mortality in the Gulf of Maine Recreational Atlantic Cod Fishery

**II. Mathematics**

## Professional Experience

**American Fisheries Society** 2021 - Present  
*Representative*

◇ Serve as Northeast Division representative to the Marine Fisheries Section

**University of Alaska Fairbanks** 2021 - Present  
*Postdoctoral Fellow*

◇ Research objective: Use machine learning methods to develop dynamic distribution models of three salmon species in the North Pacific high seas for use by law enforcement agencies seeking to prevent illegal harvest

**URIGSO** 2016 - 2021  
*Graduate Research Assistant*

◇ Conducted research on a variety of topics and projects, including investigating the decline of winter flounder in RI waters, assessing patterns of lobster and jonah crab abundance in wind energy lease areas south of RI, and constructing Bayesian state-space models to improve forecasting of New England groundfish biomass

**Southern New England Ventless Trap Survey** 2018 - 2019  
*Assistant Sea Sampler and Data Analyst*

◇ Participated in bimonthly sampling in wind energy lease areas south of RI in collaboration with commercial lobstermen and the Commercial Fisheries Research Foundation  
◇ Assisted in analyzing the survey data to evaluate and interpret findings and prepare reports

**URIGSO-RIDMF Ichthyoplankton Survey** 2016 - 2017  
*Field Coordinator*

◇ Coordinated and conducted survey with colleagues from URIGSO and the RI Division of Marine Fisheries (RIDMF) twice per week between February and April of 2016 and 2017  
◇ Trained, oversaw, and assisted undergraduates in sample processing and larval fish identification  
◇ Mentored undergraduates in forming and investigating research questions using the data

*Trawl Researcher*

- ◇ Coordinated and conducted the fish trawl survey each week, maintained the database, and fulfilled approved data requests
- ◇ Brought classes out on the survey to teach them about the Narragansett Bay, RI ecosystem

**Sulikowski Laboratory, University of New England**

2011 - 2015

*Undergraduate Research Assistant*

- ◇ Participated in a variety of research projects investigating the ecology of fish and sharks in coastal Maine waters
- ◇ Conducted research on the post-release mortality of Atlantic cod captured by recreational anglers
- ◇ Coordinated and conducted a pilot study characterizing patterns of Atlantic cod capture in commercial lobster gear in southern Maine waters in collaboration with Captain Edward Hutchins

**Peer-Reviewed Publications**

- Langan, JA**, JS Collie, & C Minto. In press. Detecting Population Regulation of Winter Flounder from Noisy Data. *Canadian Journal of Fisheries and Aquatic Sciences*.
- Verkamp, HJ, N Hammerschlag, J Quinlan, **JA Langan**, & JS Sulikowski. In press. Reproductive hormone profiles of the blacktip shark (*Carcharhinus limbatus*) in southern Florida suggest an annual cycle of circulating hormone concentrations in a biennially-reproducing species. *Marine & Freshwater Research*.
- McManus, MC, **JA Langan**, RJ Bell, & JS Collie. 2021. Spatiotemporal patterns in early life stage winter flounder (*Pseudopleuronectes americanus*) highlight phenology changes and habitat dependencies. *Marine Ecology Progress Series* 677: 161–175.
- Staudinger, MD, AJ Lynch, SK Gaichas, MG Fox, D Gibson-Reinemer, **JA Langan**, AK Teffer, SJ Thackeray, & IJ Winfield. 2021. How does climate change affect emergent properties of aquatic ecosystems? *Fisheries*. doi: 10.1002/fsh.10606
- Gonçalves Neto, A, **JA Langan**, & JB Palter. 2021. Changes in the Gulf Stream precede rapid warming of the Northwest Atlantic Shelf. *Nature Communications Earth & Environment* 2, 74. doi: 10.1038/s43247-021-00143-5
- Langan, JA**, G Puggioni, CA Oviatt, ME Henderson, & JS Collie. 2021. Climate Alters the Migration Phenology of Coastal Marine Species. *Marine Ecology Progress Series* 660: 1–18. (Feature Article)
- Slesinger, E, **JA Langan**, BK Sullivan, DG Borkman, & TJ Smayda. 2020. Multi-decadal (1972-2019) *Mnemiopsis leidyi* (Ctenophora) abundance patterns in Narragansett Bay, Rhode Island USA. *Journal of Plankton Research* 42(5): 539–552.
- Swezey, BB, CW Capizzano, **JA Langan**, HP Benoît, EW Hutchins II, JW Mandelman, WY Koh, MJ Dean, BN Anderson, & JA Sulikowski. 2020. Estimating the discard mortality of Atlantic cod *Gadus morhua* in the southern Gulf of Maine commercial lobster fishery. *North American Journal of Fisheries Management* 40(5): 1252–1262.
- Langan, JA**, MC McManus, DR Zemeckis, & JS Collie. 2020. Abundance and distribution of Atlantic cod (*Gadus morhua*) in a warming southern New England. *Fishery Bulletin* 118: 145–156.
- Friedland, KF, **JA Langan**, SI Large, RL Selden, JS Link, RA Watson, & JS Collie. 2020. Changes in higher trophic level productivity, diversity and niche space in a rapidly warming continental shelf ecosystem. *Science of the Total Environment* 704: doi: 10.1016/j.scitotenv.2019.135270
- Langan, JA**, MC McManus, AJ Schonfeld, CL Truesdale, & JS Collie. 2019. Evaluating Summer Flounder Spatial Sex-Segregation in a Southern New England Estuary. *Marine and Coastal Fisheries* 11:76–85.

- Capizzano, CW, JW Mandelman, WS Hoffman, MJ Dean, DR Zemeckis, HP Benoît, MJ Stettner, J Kneebone, NJ Buchan, **JA Langan**, & JA Sulikowski. 2016. Estimating and mitigating post-release mortality of Atlantic cod (*Gadus morhua*) in the Gulf of Maine recreational rod-and-reel fishery. *ICES Journal of Marine Science* 73(9): 2342–2355.
- Sulikowski, JA, CR Wheeler, AJ Gallagher, BK Prohaska, **JA Langan**, & N Hammerschlag. 2016. Variation in the reproductive ecology of a marine apex predator, the tiger shark (*Galeocerdo cuvier*), at a protected female aggregation site. *Aquatic Biology* 24: 175–184.

### Publications In Preparation

- McMahon, KW, **JA Langan**, J Pi, SR Thorrold, & ML Berumen. Food web compartmentalization leads to niche partitioning in a multispecies school of coral reef snapper.
- Langan, JA**, RJ Bell, & JS Collie. Taking stock: is recovery possible for a depleted population challenged by climate change?
- Langan, JA**, G Puggioni, MC McManus, RJ Bell, & JS Collie. Ontogenetic patterns of spatiotemporal habitat use in Narragansett Bay winter flounder.
- Legault, CM, RJ Bell, E Brooks, J Cournane, JJ Deroba, G Fay, A Jones, **JA Langan**, T Miller, B Muffley, & J Wiedenmann. Data Rich but Model Resistant: Use of Data-Limited Methods to Manage Fisheries When Stock Assessment Models Fail.
- Langan, JA**, CM Legault, JS Collie, JE McNamee, & G Puggioni. A Bayesian State-space Approach To Improve Biomass Projections For Managing New England Groundfish.

### Other Publications

- Langan, JA**. 2018. Spatial Sex-Segregation in Rhode Island Fluke. Rhode Island Recreational Saltwater Fishing Magazine. Available from: <http://www.eregulations.com/rhodeisland/fishing/19risw/fluke-research/>
- Langan, JA**, G Puggioni, CA Oviatt, ME Henderson, & JS Collie. 2018. Characterizing Changing Summer Flounder Phenology in Response to Climate in a Large Temperate Estuary. Working paper submitted and presented to the Summer Flounder SAW/SARC66 Working Group.
- Langan, JA**, MC McManus, AJ Schonfeld, CL Truesdale, & JS Collie. 2018. Evaluating Summer Flounder (*Paralichthys dentatus*) Spatial Sex-Segregation in a Southern New England Estuary. Working paper submitted and presented to the Summer Flounder SAW/SARC66 Working Group.

### Recent Conference Presentations

- \*Presentations I personally presented.
- †Best student paper award received.
- <sup>u</sup>Undergraduate mentee.
- Santos, N, C Mayer, **JA Langan**, & K McMahon. 2021. Trophic niche overlap of Atlantic cod and Black Sea bass in relation to warming southern New England waters. American Fisheries Society 2021 Annual Meeting. (virtual oral)
- \***Langan, JA**, G Puggioni, MC McManus, RJ Bell, & JS Collie. 2021. Spatial Patterns of Habitat Use and Mortality in a Declining Winter Flounder Population. American Fisheries Society- Southern New England Chapter Winter Science Meeting. (virtual oral)
- <sup>u</sup>Reyes-Delgado, A, N Santos, **JA Langan**, M Heinichen, & KW McMahon. 2021. Cod morphometric analysis reveals physical differences among sub-populations in the Georges Bank fisheries stock, Northwest Atlantic. American Fisheries Society- Southern New England Chapter Winter Science Meeting. (virtual poster)

- <sup>u</sup>Reyes-Delgado, A, N Santos, **JA Langan**, M Heinichen, & KW McMahon. 2020. Cod morphometric analysis reveals physical differences among sub-populations in the Georges Bank fisheries stock, Northwest Atlantic. American Geophysical Union Fall Meeting. (virtual poster)
- \***Langan, JA**, MC McManus, NR Santos, DR Zemeckis, & JS Collie. 2020. Are they climate deniers? Insights into climate resilience from the world's southernmost group of Atlantic cod. The Regional Association for Research on the Gulf of Maine Annual Science Meeting. (virtual oral).
- Neto, AG, **JA Langan**, & JB Palter. 2020. The Consequences for the North American Shelf of a Shift Toward a Heightened Gulf Stream Presence at the Tail of the Grand Banks. Ocean Sciences Meeting. San Diego, CA. (poster).
- Santos, NR, C Mayer, **JA Langan**, & KW McMahon. 2020. Competition between Atlantic cod and black sea bass due to warming southern New England waters. Ocean Sciences Meeting. San Diego, CA. (poster).
- \***Langan, JA**, CM Legault, G Puggioni, JE McNamee, & JS Collie. 2020. A Bayesian State-Space Approach to Improve Projections of Stock Biomass for Managing New England Groundfish. American Fisheries Society- Southern New England Chapter Winter Science Meeting. Cambridge, MA. (oral).
- Collie, JS, **JA Langan**, & A Humphries. 2019. The URI-GSO Fish Trawl Survey: Documenting 60 Years of Ecosystem Change in Narragansett Bay. American Fisheries Society- Southern New England Chapter Winter Science Meeting. Cambridge, MA. (oral).
- Santos, NR, C Mayer, **JA Langan**, & KW McMahon. 2020. Competition between Atlantic cod and black sea bass due to warming southern New England waters. American Fisheries Society- Southern New England Chapter Winter Science Meeting. Cambridge, MA. (poster).
- Heinichen, M., JS Collie, **JA Langan**, A Innes-Gold, A Humphries, & T Richman. 2020. Diet of Striped Searobin in Narragansett Bay, RI. American Fisheries Society- Southern New England Chapter Winter Science Meeting. Cambridge, MA. (poster).
- McManus, MC, **JA Langan**, <sup>u</sup>A Frey, RJ Bell, & JS Collie. 2019. Inferring climate's influence on winter flounder spawning dynamics from larval abundance in Narragansett Bay. Rhode Island Natural History Survey Science Conference. North Kingstown, RI. (oral).
- \***Langan, JA** & JS Collie. 2019. The Role of Climate Change in the Decline of Narragansett Bay Winter Flounder. Rhode Island Natural History Survey Science Conference. North Kingstown, RI. (oral).
- Collie, JS, **JA Langan**, & A Humphries. 2019. The URI-GSO Fish Trawl Survey: Documenting 60 Years of Ecosystem Change in Narragansett Bay. Rhode Island Natural History Survey Science Conference. North Kingstown, RI. (oral).
- \***Langan, JA**, CM Legault, G Puggioni, JE McNamee, & JS Collie. 2019. A Bayesian State-Space Approach to Improve Projections of Stock Biomass for Managing New England Groundfish. New England Statistics Symposium. Hartford, CT. (poster).
- \***Langan, JA**, CM Legault, G Puggioni, JE McNamee, & JS Collie. 2019. A Bayesian State-Space Approach to Improve Projections of Stock Biomass for Managing New England Groundfish. NMFS-Sea Grant Joint Fellowship Program Symposium. Honolulu, HI. (poster).
- \*<sup>†</sup>**Langan, JA**, MC McManus, DR Zemeckis, & JS Collie. 2019. Atlantic cod in southern New England: are the climate deniers? American Fisheries Society- Southern New England Chapter Winter Science Meeting. Storrs, CT. (oral).
- \***Langan, JA** & JS Collie. 2018. Effects of Climate Change on Winter Flounder and its Impacts on Fisheries in Narragansett Bay. Flatfish Biology Conference. Westport, CT. (oral).
- \***Langan, JA**, G Puggioni, CA Oviatt, ME Henderson, & JS Collie. 2018. Characterizing Changing Ecosystem Phenology in Response to Climate in a Large Temperate Estuary. The Regional Association for Research on the Gulf of Maine Annual Science Meeting. Portland, ME. (oral).

- <sup>u</sup>Frey, A, **JA Langan**, MC McManus, & JS Collie. 2018. Characterizing the response of the winter-spring ichthyoplankton community to environmental change. Annual Larval Fish Conference. Victoria, BC. (poster).
- \*Langan, JA**, MC McManus, <sup>u</sup>AJ Schonfeld, CL Truesdale, & JS Collie. 2018. Evaluating Summer Flounder Sexual Dimorphism in Spatial Distribution in a Southern New England Estuary. Annual Meeting of the American Fisheries Society. Atlantic City, New Jersey. (oral).
- \*<sup>†</sup>Langan, JA**, G Puggioni, CA Oviatt, ME Henderson, & JS Collie. 2018. Characterizing Changing Ecosystem Phenology in Response to Climate in a Large Temperate Estuary. Annual Meeting of the American Fisheries Society. Atlantic City, New Jersey. (oral).
- \*Langan, JA** & JS Collie. 2018. Effects of climate change on winter flounder and its impacts on fisheries in Narragansett Bay. American Fisheries Society- Southern New England Chapter Summer Science Meeting. Narragansett, RI. (oral).
- \*<sup>†</sup>Langan, JA**, G Puggioni, CA Oviatt, ME Henderson, & JS Collie. 2018. Characterizing Changing Ecosystem Phenology in Response to Climate in a Large Temperate Estuary. American Fisheries Society- Southern New England Chapter Winter Science Meeting. New Bedford, MA. (oral).
- <sup>u</sup>Frey, A, **JA Langan**, MC McManus, & JS Collie. 2018. Characterizing the response of the winter-spring ichthyoplankton community to environmental change. American Fisheries Society- Southern New England Chapter Winter Science Meeting. New Bedford, MA. (poster).
- \*Langan, JA**, & JS Collie. 2017. Effects of climate change on winter flounder and its impacts on fisheries in Narragansett Bay. 24th Biennial Coastal and Estuarine Research Federation Conference. Providence, RI. (oral).
- \*Langan, JA**, & JS Collie. 2017. Evidence of spatiotemporal skew in the observed sex ratio of winter flounder in Narragansett Bay, Rhode Island. American Fisheries Society- Southern New England Chapter/Northeast Division Joint Meeting. Mystic, CT. (oral).

## Grants & Fellowships

- NOAA Climate Variability & Predictability Program (\$568,182)** 2020  
*Collaborator*
- ◇ Title: Understanding dramatic warming and altered fisheries on the US Continental Shelf through observations and multi-scale models
  - ◇ Helped to conceive of and write the proposal, involved in ongoing research activities
- URI Enhancement of Graduate Research Award (\$749)** 2019
- ◇ Title: A Bayesian State-Space Approach to Improve Projections of Stock Biomass for Managing New England Groundfish
  - ◇ Award funded travel to present at the 2020 American Fisheries Society- Southern New England Chapter Winter Science Meeting in Cambridge, MA
- New England Fishery Management Council Contract For Service (\$19,530)** 2018  
*Workshop Presenter, Researcher*
- ◇ Title: Fish Population Dynamics Workshops (NEFMC Contract Number 18-24)
  - ◇ Presented work on the development of a Bayesian state-space approach for projecting groundfish stock biomass to the staff and committees of the NEFMC and led discussions to solicit feedback to improve the utility of the model framework for fishery managers

- AFS Fish Habitat Section Student Travel Award (\$250)** 2018
- ◇ Title: Characterizing Changing Ecosystem Phenology in Response to Climate in a Large Temperate Estuary
  - ◇ Award funded travel to present at the 148th Annual Meeting of the American Fisheries Society in Atlantic City, NJ

- NMFS-Sea Grant Population & Ecosystem Dynamics Fellowship (\$92,000)** 2018
- Fellow*
- ◇ Title: A Bayesian State-Space Approach to Improve Projections of Stock Biomass for Managing New England Groundfish

- URI Council for Research: Proposal Development Grant (\$13,558)** 2018
- Co-PI*
- ◇ Title: Is Narragansett Bay production sustaining climate-challenged cod of Southern New England?
  - ◇ Conceived of and wrote the proposal, assisted in oversight of the graduate student performing sampling and analysis
  - ◇ Coordinated collection of Atlantic cod samples with Captain Rick Bellavance

## Awards & Honors

AFS Southern New England Chapter Saul Saila Best Student Paper Award . . . . . 2018, 2019  
 Davis Family Endowed Scholarship for Fisheries Oceanography . . . . . 2017, 2018  
 AFS Fish Habitat Section Best Student Paper Award . . . . . 2018  
 Henry S. Farmer Award in Biological Oceanography . . . . . 2017

## Science Communication & Teaching

- OCG 673 Fisheries Oceanography, URIGSO** 2021, 2019
- Guest Lecturer*

- ◇ Presented a lecture on the role of climate and ocean circulation in shifting the migration phenology of coastal marine species in Rhode Island waters

- OCG 561 Biological Oceanography, URIGSO** Fall 2020
- Teaching Assistant*

- ◇ Assisted in lecturing, leading lab exercises, and evaluating student performance

- URIGSO** Fall 2020
- Student Mentor*

- ◇ Mentored two incoming graduate students to aid in their transition to graduate studies by providing guidance regarding housing, classes, beginning research, and other topics as needed

- The Fisheries Podcast** 2020
- Guest*

- ◇ Served as a guest on the 86<sup>th</sup> episode of The Fisheries Podcast (release date: 9/13/20)

- Bay Informed Discussion Series, URIGSO** 2017 - 2021
- Founder and Coordinator*

- ◇ Led a team of graduate students in hosting a monthly public lecture series highlighting graduate research in all aspects of marine science
- ◇ Helped students to develop science communication skills while building appreciation for marine research in their community
- ◇ Presented four lectures as part of the series
- ◇ Currently developing a podcast about oceanographic research

- Ocean Classroom (Live!), URIGSO** 2020  
*Invited Guest*  
 ◇ Served as a guest in a livestream interview regarding the effects of climate change on the Rhode Island marine ecosystem
- Narragansett Bay Classroom, URIGSO** 2017 - Present  
*Outreach Scientist*  
 ◇ Developed and led lessons about marine science for Rhode Island K-12 students in the field and in the classroom
- SURFO Program (NSF REU), URIGSO** 2016, 2020  
*Mentor*  
 ◇ Served as the primary mentor (2016) and co-mentor (2020) to students conducting research projects in the URIGSO Summer Undergraduate Research Fellowship in Oceanography (SURFO) program  
 ◇ Student from 2016 presented work at a conference and participated in writing a published manuscript (Langan et al. 2019). Student from 2020 submitted an abstract to present their research at the 2020 American Geophysical Union Fall Meeting
- NOAA New England Recreational Fishing Workshop** 2019  
*Invited Presenter*  
 ◇ Presented results of research on the abundance, distribution, and potential responses to climate change of southern New England Atlantic cod to researchers, recreational fishermen, and other stakeholders
- NEFMC Habitat Plan Development Team** 2019  
*Invited Presenter*  
 ◇ Presented results of research on the abundance, distribution, and potential responses to climate change of southern New England Atlantic cod to the Habitat Plan Development Team of the New England Fishery Management Council to inform regional gear restriction decisions
- Rhode Island Marine Fisheries Institute** 2016 - 2019  
*Presenter*  
 ◇ Gave multiple presentations to researchers, fishermen, and other stakeholders on topics including the decline of Rhode Island winter flounder, the abundance and distribution of Atlantic cod in southern New England, and spatial sex-segregation patterns in summer flounder
- RI Sea Grant Coastal State Discussion Series** 2018  
*Invited Presenter*  
 ◇ Presented research on the causes of the decline of Rhode Island winter flounder to a public audience
- BIO 412/512 Evolution and Diversity of Fishes, URI** 2018  
*Guest Lecturer*  
 ◇ Presented a lecture on ichthyoplankton research in Rhode Island waters and helped lead an activity where students tried to identify preserved larval fish
- Undergraduate Independent Study, URIGSO** 2016 - 2018  
*Mentor*  
 ◇ Trained two students in processing ichthyoplankton samples and identifying larval fish  
 ◇ Oversaw independent research conducted by the students using the collected data, resulting in three conference presentations

## Professional Activities & Competencies

- ◇ **Statistical topics:** regression methods and maximum likelihood estimation, time series analysis, spatial data analysis, Bayesian statistics, categorical data analysis, survival/time-to-event analysis, multivariate analysis, analysis with missing data
- ◇ **Programming languages:** R (Advanced), MATLAB (Beginner), L<sup>A</sup>T<sub>E</sub>X(moderate)
- ◇ URI Diversity & Inclusion Badge Certification
- ◇ **Fish/invertebrate sampling gears:** trawl, lobster/crab trap, rod and reel, plankton net, small gillnet, drumline, beach seine
- ◇ **Journal referee:** Marine Ecology Progress Series, Marine and Freshwater Research, PLOS One
- ◇ **Professional organizations:** American Fisheries Society, American Institute of Fishery Research Biologists

Current as of November, 2021