UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Alaska Fisheries Science Center
7600 Sand Point Way NE, Bldg. 4
Seattle, Washington 98115-0070
(206) 526-4000

Angel Drobnica, Chair
North Pacific Fishery Management Council 1007 W. 3rd Avenue
Anchorage, AK 99501

Dear Ms. Drobnica,

I am pleased to recommend the appointment of Dr. Jonathan Reum as a member of the Bering Sea and Aleutian Islands (BSAI) Crab Plan Team. Dr. Reum is a Research Fishery Biologist at NOAA's Alaska Fisheries Science Center within the Resource Ecology and Ecosystem Modeling Program.

Throughout Dr. Reum's career, he has cultivated strong expertise that is directly applicable to crab stock management. In the context of the Alaska Climate Integrated Modeling Project, Dr. Reum developed size-based food web models that included snow, Tanner, and red king crab fisheries. Using the model, they evaluated catch responses under different climate scenarios and alternative harvest control rules. In addition, Dr. Reum has led collaborative research efforts to model and better understand the potential efficacy of different management actions intended to promote PI blue king crab recovery.

Currently, Dr. Reum is employing various statistical methods to utilize predator stomach content data to estimate abundances of small size classes of crab and improve indices of predator consumption rates of commercial crab species. These research products are intended to have applications with respect to the prediction of crab predation mortality and recruitment.

Dr. Reum's familiarity with AFSC crab assessments and pressing issues related to monitoring and management of AK crab stocks make him a well-qualified candidate for contributing to the BSAI Crab Plan Team.

Sincerely,

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Date: 2026.10.23 09:49:55 -07'00'

Ronald Felthoven
Director, REFM Division, Alaska Fisheries Science Center

JONTAHAN C.P. REUM
Alaska Fisheries Science Center, NOAA
7600 Sand Point Way N.E.
Seattle, WA, USA 98115
Phone: 206-526-4057 | Email: Jonathan.Reum@noaa.gov
Research Fish Biologist (ZP3-III)

EDUCATIONAL HISTORY

University of Washington, *Ph.D. Aquatic and Fishery Sciences* — Seattle, WA *2007—2011*
(Prof. Tim Essington)
University of Washington, *M.S. Aquatic and Fishery Sciences* — Seattle, WA *2004—2006*
(Prof. Tim Essington)
University of California Santa Cruz, *B.S. Marine Biology* — Santa Cruz, CA *1999—2004*

PROFESSIONAL HISTORY

Trophic ecology and ecosystem modeling, Alaska Fishery Science Center — Seattle, WA *2019—present*
Research Fish Biologist, ZP-3, Supervisor: Kerim Aydin

Responsibilities

- Lead research on diet-based indicators of ecosystem status, forage species abundances, and trophic conditions in AK ecosystems
- Lead and disseminate research on food web models with management applications
- Coordinate ongoing predator stomach sampling surveys, field and laboratory logistics, data management, and research partnerships

Accomplishments

- Adapted statistical methods for generation of diet-based indicators of forage species abundances for use in Ecosystem Status Reports and stock assessment research
- Led research on the application of size-structured food web model for evaluating fishing and climate scenarios on the Eastern Bering Sea; coordinated food web ensemble modeling efforts
- Lead PI on an international, comparative food web modeling project; Co-PI on three climate-related fisheries management projects; active collaborator on three additional ecosystem research projects
- Since 2019, published 23 scientific papers (11 as first author); presented 25 times at conferences, symposia, workshops, and seminars
- Supervised one postdoc, one Lapenta Fellow, and mentored graduate students and other early career scientists

Alaska Climate Integrated Modeling Project (ACLIM) and the University of Washington
Research Scientist — Seattle, WA 2015–2019

Responsibilities

- Performed research on climate impacts on NE Pacific food webs and fisheries using quantitative and qualitative food web models
- Disseminate methods and findings to the scientific community

Accomplishments

- Led development of the multispecies size spectrum model for the Eastern Bering Sea size (mizer-EBS) for projections of food webs and fisheries under climate and management scenarios
- Led NOAA-IEA workshop lessons (25 participants) on the application of network methods for use in ecosystem approaches to management

NOAA Washington Sea Grant and the University of Washington — Seattle, WA
Project Manager & Research Scientist — *2013–2015*

Responsibilities

- Led management and coordination of a multidisciplinary research team focused on the ecology and economics of Washington State bivalve aquaculture
- Organize and lead stakeholder workshops for scenario planning and conceptual model development

- Perform research on effects of environmental change and aquaculture practices on WA ecosystems
- Ensure project adherence to budget and timelines

Accomplishments
- Successfully led 2 stakeholder workshops to develop conceptual models of bivalve aquaculture effects on the environment
- Developed expertise on network modeling methods
- Edited project reports, authored three journal publications (two first author, one second author), and organized public symposium of research findings

Northwest Fisheries Science Center Seattle, WA *2011–2014*
Postdoctoral Research Scientist

Responsibilities
- Led research on ocean acidification (OA) impacts on NE Pacific species and environmental variability of seawater carbonate chemistry
- Disseminate findings in reports and scientific journal publications
- Mentor undergraduate research assistance

Accomplishments
- Published review of OA effects on the US west coast and recommendations for OA experimental design and interpretation
- Presented findings at national and international conferences

PUBLICATIONS (41; first author 28)

Summary: 1958 citations | h-index 23 | Google Scholar

Published Peer-reviewed (45)

1. Vivitskaia T, Murray, C, …, **Reum, JCP**, et al. (In press) Applications of Marine Ecosystem Models for Pacific Salmon Conservation and Management in the Northeast Pacific. FACETS
2. **Reum JCP**, JT Thorson, Erin Fedewa (2025). Joint spatiotemporal models for the estimation of prey consumption and predator-prey overlap: Dynamics of Pacific Cod predation on Snow and Tanner Crab in the Eastern Bering Sea. Fisheries Oceanography, doi: 10.1111/fog.70023
3. Goodman, M.C., **Reum, JCP**, Barnes, C, Punt, AE, Ianelli, JN, McHuro, EA, De Leo, GA, Holsman, KK (2025) Spatial responses to pH, oxygen, and an oceanographic index increase the extent of projected range shifts in the Bering Sea. Fish and Fisheries 26 (2), 219-239
4. **Reum JCP**, JT Thorson, C Yeung, K Aydin (2025). Assessing benthos through predator stomach contents: spatiotemporal modeling of abundance and habitat use. Ecography, doi: 10.1002/ecog.07723
5. Eddy, TD,…, **JCP Reum,** …(40 coauthors) (2025) Global and regional marine ecosystem models reveal key uncertainties in climate change projections. Earth's Future 13 (3), e2024EF005537
6. Ortega-Cisneros, K, …, **JCP Reum,** … (23 coauthors) (2025) An integrated global‐to‐regional scale workflow for simulating climate change impacts on marine ecosystems. Earth's Future 13 (2), e2024EF004826
7. Blanchard, JL,…, **JCP Reum,** … (45 coauthors) (2024) Detecting, attributing, and projecting global marine ecosystem and fisheries change: FishMIP 2.0. Earth's Future 12 (12), e2023EF004402
8. **Reum, JCP**, P Woodworth-Jefcoats, C Novaglio, R Forestier, A Audzijonyte, A Gårdmark, M Lindmark, J Blanchard (2024) Temperature-dependence assumptions drive projected responses of diverse size-based food webs to warming. Earth's Future, doi: 10.1029/2023EF003852
9. Hollowed, A, KK Holsman, SP Wise, AC Haynie, W Cheng, DCK Evans, AJ Hermann, JN Ianelli, KA Kearney, AE Punt, **JCP Reum**, DL Stram, CS Szuwalski (2024) Development of climate informed management scenarios for fisheries in the eastern Bering Sea. ICES Journal of Marine Science, doi: 10.1093/icesjms/fsae034
10. Ferriss, BE, **JCP Reum**, BL Sanderson, PS McDonald (2022) Social-ecological approaches to shellfish aquaculture using qualitative network models. ICES Journal of Marine Science 79 (4), 1289-1301
11. **Reum**, JCP, CR Kelble, CJ Harvey, RP Wildermuth, N Trifonova, et al. (2021) Network approaches for formalizing conceptual models in ecosystem-based management. ICES Journal of Marine Science 78 (10), 3674-3686

12. Grüss, A, JT Thorson, CC Stawitz, **JCP Reum**, SK Rohan, CL Barnes (2021) Synthesis of interannual variability in spatial demographic processes supports the strong influence of cold-pool extent on eastern Bering Sea walleye pollock (*Gadus chalcogrammus*). Progress in Oceanography 194, 102569
13. **Reum, JCP**, H Townsend, S Gaichas, S Sagarese, IC Kaplan, A Grüss (2021) It's not the destination, it's the journey: multispecies model ensembles for ecosystem approaches to fisheries management. Frontiers in Marine Science 8, 631839
14. Holsman, KK , AC Haynie, AB Hollowed, **JCP Reum**, K Aydin, et al. (2020). Ecosystem-based fisheries management forestalls climate-driven collapse. Nature Communications 11 (1), 4579
15. **Reum, JCP**, Blanchard J, Holsman K, Aydin K, Hollowed A, Faig A, Haynie A, Punt AE (2020). Ensemble projections of the Eastern Bering Sea food web under climate change using a multispecies size spectrum model. Frontiers in Marine Science 7, doi: 10.3389/fmars.2020.00124
16. **Reum, JCP** , GD Williams, CJ Harvey, KS Andrews, PS Levin (2020) Trophic ecology of a large-bodied marine predator, bluntnose sixgill shark *Hexanchus griseus*, inferred using stable isotope analysis. Environmental Biology of Fishes 103, 147-162
17. Hollowed, AB, Holsman KK, Haynie AC, Hermann AJ, Punt AE, Aydin K, Ianelli JN, Kasperski S, Cheng W, Faig A, Kearney KA, **Reum JCP**, Spencer, Spies I, Stockhausen W, Szuwalski CS, Whitehouse GA, Wilderbuer TK (2020) Integrated modeling to evaluate climate change impacts on coupled social-ecological systems in Alaska. Frontiers in Marine Science 6, doi: 10.3389/fmars.2019.00775
18. **Reum, JCP**, PS McDonald, KK Holsman, C Long (2019) Rapid evaluation of management options for promoting species recovery under climate change. Conservation Biology doi: 10.1111/cobi.13427
19. **Reum, JCP**, J Blanchard, K Holsman, K Aydin, A Punt (2019) Species-specific ontogenetic diet shifts attenuate trophic cascades and lengthen food chains in exploited ecosystems. Oikos, doi: 10.1111/oik.05630
20. **Reum, JCP**, J Blanchard, K Holsman, K Aydin, S Jennings (2018) Energetically relevant predator-prey body mass ratios and their relationship with predator body size. Ecology & Evolution, doi: 10.1002/ece3.4715
21. Bird, CS, A Veríssimo, S Magozzi, KG Abrantes, …, **Reum JCP**, et al. (73 co-authors) 2018. A global perspective on the trophic geography of sharks. Nature Ecology & Evolution 2 (2), 299-305
22. **Reum JCP**, GD Williams, CJ Harvey (2017) Stable isotope applications for understanding shark ecology in the northeast Pacific Ocean. Advances in Marine Biology 77, 149-178
23. Harvey CJ, **Reum JCP**, Poe MR, Williams GD, Kim SJ. 2016. Using conceptual models and qualitative network models to advance integrative assessments of marine ecosystems. Coastal Management 44:486–503.
24. Ferriss, BE, **JCP Reum**, PS McDonald, DM Farrell, CJ Harvey (2016) Evaluating trophic and non-trophic effects of shellfish aquaculture in a coastal estuarine foodweb. ICES Journal of Marine Science 73 (2), 429-440
25. **Reum, JCP**, BE Ferriss, PS McDonald, CJ Harvey, D Farrell, P Levin (2015) Evaluating community impacts of ocean acidification using qualitative network model. Marine Ecology Progress Series, 536:11-24.
26. **Reum**, **JCP**, PS McDonald, BE Ferriss, DM Farrell, CJ Harvey, PS Levin (2015) Qualitative network models in support of ecosystem approaches to bivalve aquaculture. ICES Journal of Marine Science 72 (8), 2278-2288
27. **Reum, JCP**, S Alan, C Harvey, W Evans, B Hales, N Bednaršek, R Feely, N Lucey, JT Mathis, P McElhany, J Newton, CL Sabine (2015) Interpretation and design of ocean acidification experiments in upwelling systems in the context of carbonate chemistry co-variation with temperature and oxygen. ICES Journal of Marine Sciences, 73: 582-595.
28. **Reum**, **JCP ,**S Jennings, ME Hunsicker (2015) Implications of scaled δ15N fractionation for community predator–prey body mass ratio estimates in size‐structured food webs. Journal of Animal Ecology 84 (6), 1618-1627
29. Bednaršek, N, RA Feely RA, **JCP Reum**, B Peterson, J Menkel, SR Alin, B Hales (2014) *Limacina helicina* shell dissolution as an indicator of declining habitat suitability owing to ocean acidification in the California Current Ecosystem. Proceedings of the Royal Society B 281: 20140123.
30. **Reum, JCP,** S Alan, RA Feely, J Newton, M Warner, P McElhany (2014) Seasonal covariation of carbonate chemistry with temperature, oxygen, and salinity in a fjord estuary: implications for ocean acidification experimental design. PLoS ONE 9(2): e89619.
31. **Reum, JCP**, RA Hovel, CM Greene (2014) Estimating continuous body size-based shifts in $\delta^{15}N$–$\delta^{13}C$ space using multivariate hierarchical models. Marine biology 162, 469-478
32. **Reum, JCP**, TE Essington (2013) Spatial and seasonal variation in $\delta^{15}N$ and $\delta^{13}C$ values in a mesopredator shark, *Squalus suckleyi*, revealed through multitissue analyses. Marine Biology 160, 399-411
33. **Reum, JCP**, KN Marshall (2013) Evaluating $\delta^{15}N$–body size relationships across taxonomic levels using hierarchical models. Oecologia, 173, 1159-1168
34. **Reum, JCP**, TE Essington, CM Greene, CA Rice, KL Fresh (2013) Biotic and abiotic controls on body size during critical life history stages of a pelagic fish. Fisheries Oceanography, 22(4):324-336.
35. **Reum, JCP**, ME Hunsicker (2012) Season and prey type influence size dependency of predator− prey body mass ratios in a marine fish assemblage. Marine Ecology Progress Series 466, 167-175

36. **Reum**, JCP (2011) Lipid correction model of carbon stable isotopes for a cosmopolitan predator, spiny dogfish *Squalus acanthias*. Journal of fish biology 79 (7), 2060-2066
37. **Reum, JCP**, TE Esstington (2011) Season- and depth-dependent variability of a demersal fish assemblage in a large fjord estuary (Puget Sound, Washington). Fishery Bulletin 109(2): 1986-197
38. **Reum, JCP**, TE Essington, CM Greene, CA Rice, KL Fresh (2011) Multiscale influence of climate on estuarine populations of forage fish: the role of coastal upwelling, freshwater flow and temperature. Marine Ecology Progress Series, 425:203-215.
39. **Reum, JCP**, ME Hunsicker, CE Paulsen (2010) Species composition and relative abundance of large medusae in Puget Sound, Washington. Northwest Science 84 (1), 131-140
40. **Reum, JCP**, CE Paulsen, TW Pietsch, SL Parker-Stetter (2010) First record of an albino chimaeriform fish, *Hydrolagus colliei.* Northwestern Naturalist, 60-62
41. **Reum, JCP**, TE Essington (2008) Seasonal variation in guild structure of the Puget Sound demersal fish community. Estuaries and Coasts 31, 790-801

Publications In Review / In preparation

- **Reum, JCP**, Thorson J, K Aydin (*In prep*) Influence of large-scale climate modes on spatiotemporal covariation in Northeast Pacific pollock diets. Intended for PLoS Climate
- **Reum, JCP**, Thorson J, Reissler P, Levin M (*In Review*) Eastern Bering Sea krill abundance trends and climate response inferred from predator stomach contents and joint spatiotemporal models. Intended for Progress in Oceanography. [Available upon request]
- Diaz, RR, **Reum JCP**, Eddy T (*In review*) Trophic reorganization and energy deficit: a multispecies size-spectrum model of the Grand Banks. Marine Ecology Progress Series

Reports and Non-peer reviewed publications (6)

1. Blanchard, JL, C Novaglio, EA Fulton, CM Petrik, M Coll, CS Harrison, RF Heneghan, **JCP Reum**, et al. (2024) Uncertainties and limitations of projections. *In*: Blanchard, JL & Novaglio, C (eds.) Climate change risks to marine ecosystems and fisheries – Projections to 2100 from the Fisheries and Marine Ecosystem Model Intercomparison Project. FAO Fisheries and Aquaculture Technical Paper, No. 707. Rome, FAO. https://doi.org/10.4060/cd1379en
2. Townsend, K. Aydin, S. Brodie, G. DePiper, Y. deReynier, C. Harvey, A. Haynie, E. Hazen, I. Kaplan, S. Kasperski, K. Kearney, S. Large, S. Lucey, M. Masi, I. Ortiz, **J Reum** (Editors) C. Stawitz, D. Tommasi, M. Weijerman, A. Whitehouse, P. Woodworth-Jefcoats, P. Lynch, K. Osgood, and J. Link. Report of the 5th National Ecosystem Modeling Workshop (NEMoW 5): Progress in Ecosystem Modeling For Living Marine Resource Management. NOAA Technical Memorandum NMFS-F/SPO-205, September 2023
3. Rankin, TL, K Frens, WE Morrison, SK Gaichas, SG Zador, C Greene, K Aydin, **JCP Reum**, KK Holsman (2023) Applications of Ecosystem Risk Assessment in Federal Fisheries to Advance Ecosystem-Based Fisheries Management. NOAA Technical Memorandum NMFS-OHC-11, March 2023
4. **Reum, JCP**, S Alin (2016) Carbonate chemistry co-variation with temperature and oxygen in coastal environments and the design of ecologically relevant ocean acidification experiments. Ocean Carbon and Biogeochemistry Newsletter 8(1): 3-7
5. Harvey,CJ, KK Bartz, J Davies, TB Francis, TP Good, AD Guerry, B Hanson, KK Holsman, J Miller, ML Plummer, **JCP Reum**, LD Rhodes, CA Rice, JF, Samhouri, GD Williams, N Yoder, PS Levin, and MH Ruckelshaus (2010) A mass-balance model for evaluating food web structure and community-scale indicators in the central basin of Puget Sound. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-106, 180 p.
6. Loeb, V, K Dietrich, M Force, N Gong, A Jenkins, **J Reum**, R Rowley, C Ware and S Wilson (2003). Net Sampling. *In* AMLR 2002/2003 Field Season Report: Objectives, Accomplishments and Tentative Conclusions. Editor: J Lipsky. NOAA Technical Memorandum, NMFS-SWFSC-355, November 2003

PRESENTATIONS (First author; last 10 yrs)

Talks presented at professional meetings

2024 PICES Annual Science Meeting, Honolulu, HI. Temperature-dependence assumptions regarding fish growth drive projected responses of diverse size-based food webs to warming

2023 Effects of Climate Change on the World's Ocean (ECCWO5), Bergen, Norway. Quantification and communication of uncertainty in climate-forced regional food web projections

2019 ICES Annual Science Meeting, Gothenburg, Sweden. Scaling climate impacts from individual-level processes to populations and food webs using multispecies size spectrum models

National Shellfisheries Association Conference, New Orleans, LA. A qualitative modeling approach to assess the potential effects of management actions and environmental changes on Pribilof Island blue king crab (*Paralithodes platypus*)

2018 Effects of Climate Change on the World's Ocean (ECCWO4), Washington D.C. Scaling climate impacts from individual-level processes to populations and food webs using multispecies size spectrum models

Alaska Marine Science Symposium, Anchorage, AK. A Qualitative Modeling Approach to Assess the Potential Effects of Management Actions and Environmental Changes on Pribilof Islands Blue King Crab (*Paralithodes platypus*)

2016 PICES Annual Science Meeting, San Diego, CA. Identifying potential ecosystem effects of ocean acidification using size structured food web models

Other seminars / presentations

2026 Shellfish Program Winter Seminar, Kodiak, AK. Use of predator diets to monitor benthos and estimate crab consumption in AK ecosystems.

2025 PEEC, Seattle, WA. Timeseries of benthic forage derived from predator stomach content data for the Eastern Bering Sea

Longline Freezer Association Annual Meeting, Seattle, WA. How does consumption of crab by Pacific crab change over time and space?

AFSC Pollock Symposium, Seattle, WA. What do pollock eat? Seasonal and interannual variation in pollock diets across Alaska large marine ecosystems in Alaska

2024 PICES Annual Science Meeting, Honolulu, HI. Temperature-dependence assumptions regarding fish growth drive projected responses of diverse size-based food webs to warming

NOAA /AFSC Board of Directors, Seattle, WA. Monitoring benthos and undersampled species using predator stomach samples

NOAA/AFSC/REFM All hands meeting, Seattle, WA. I know what you ate last summer: predator stomach contents inform prey population trends.

2023 ACLIM+GOACLIM Joint Annual Meeting, Seattle, WA. Setting the stage: Multispecies size spectrum models

Forage Congress, AFSC, Seattle, WA. Fish predator food-habits research.

NOAA National Ecosystem Modeling Workshop (NEMoW5) and Fisheries and Marine Ecosystem Model Intercomparison Project (FishMIP) Joint Meeting, Honolulu, HI. Regional comparison of food web responses to warming: effects of assumptions regarding size-dependency of temperature effects on biological rates

2022 CSIRO, Hobart, Australia. Improved representation of climate processes in multispecies size spectrum food web models: Examples from the Eastern Bering Sea and Central North Pacific

[Guest lecture] Fish 528 Ecosystem Based Fisheries Management. University of Washington, Seattle. An introduction to size-based food web models

2021 NOAA Western Regional Action Plan -- Species interaction Workshop, Seattle, WA. Network models for days: Fuzzy Cognitive Maps Bayesian belief networks, and QNMs

2020 [*Invitational travel] Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Australia. Methods for parameterizing species interactions using diet data in multispecies size spectrum models: progress and updates.

2019 NOAA National Ecosystem Modeling Workshop (NEMoW5), St. Petersburg, FL. Development of multimodal ecosystem ensembles with applications for management

ICES Annual Science Meeting, Gothenburg, Sweden. Scaling climate impacts from individual-level processes to populations and food webs using multispecies size spectrum models

Multispecies Size Spectrum Model in R (MIZER) Symposium, Gothenburg, Sweden. An Eastern Bering Sea size spectrum model for the projection of climate effects on food webs and fisheries

2018 Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Australia. Development of a size spectrum model for the Eastern Bering Sea food web

NOAA Integrated Ecosystem Assessment Workshop, Baton Rouge, LA. Qualitative network models for synthesizing system knowledge and evaluating management actions.

2017 NOAA Integrated Ecosystem Assessment National Meeting, Boulder, CO. Use of Qualitative Network Models to synthesize ecosystem understanding and inform management decision making.

Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Australia. Development of a multispecies size spectrum for the Eastern Bering Sea.

PROFESSIONAL ACTIVITIES AND SERVICE

Affiliations

2020—2023 Affiliate Researcher. Institute for Marine and Antarctic Sciences, University of Tasmania,

2022 Visiting Researcher. Center for Marine Socioecology, University of Tasmania

Workshops organized and sessions chaired

2023 [Session chair] Advances in coupling regional climate and social-ecological models to improve climate-ready ecosystem management. Effects of Climate Change on the World's Ocean (ECCWO5), Bergen, Norway.

[Steering Committee Member] Joint meeting: NOAA National Ecosystem Modeling Workshop and Fisheries and Marine Ecosystem Model Intercomparison Program (NEMoW-FishMIP), Honolulu HI, 62 Participants from 11 countries. *Lead PI on funded NOAA S&T International Science proposal*

2019 [Steering Committee Member] NOAA National Ecosystem Modeling Workshop 4. St. Petersburg, FL.

2015 Ecology and Economics of bivalve aquaculture in Washington State Research Symposium. Washington Sea Grant. Lacey, WA. *Lead organizer*

2014 [Lead organizer] Workshop: Development of environment-aquaculture conceptual models Workshop in Washington State Research Symposium. St. Mary University, Lacey, WA. Project Lead.

Advisory services

2019 [Presentation] Application of Qualitative Network Models for exploring effects of management actions on Blue King Crab recovery options. Crab Plan Team Meeting, Anchorage, AK

Courses taught

2022 [Guest lecture] Fish 528: Ecosystem Based Fisheries Management (Prof. Ray Hilborn). Introduction to multispecies size spectrum models

2021 [Guest lecture] Fish 528: Ecosystem Based Fisheries Management (Prof. Ray Hilborn). Qualitative Network Models for fisheries management

2018 NOAA Integrated Ecosystem Assessment: Networks Working Group. Qualitative Network Models and applications to ecosystem approaches to management. Baton Rouge, LA

2010 [Teaching assistant] Fish 522: Climate and Marine Ecosystems (Prof. Nate Mantua). University of Washington, Seattle

2009 [Teaching assistant] Fish 520: Multivariate Statistic for Ecologists (Prof. Julian Olden). University of Washington, Seattle

FUNDED PROPOSALS (10 yrs)

2025-Present	CLRUP North - *Chionoecetes* Left-to-Right and Under Pressure in a changing NBS. North Pacific Research Board., Bering Sea Crab Disaster Funds. 110K (Collaborator)
2025-Present	Pollock Conservation Cooperative Research Center. Using a spatial consumption index to investigate the collapse of snow crab in the Bering Sea. Pollock Conservation Cooperative Research Center. 60k (Collaborator)
2023–2026	Alaska Climate Integrated Modeling Project 3.0. NOAA Climate and Fisheries Initiative. 1,200k (Collaborator)
2023	Linking NOAA's regional ecosystem models with international climate impact modeling efforts. NOAA S&T International Science. 33K (Lead PI)
2022–2025	Evaluating OA vulnerability and interactions among traditional and emerging coastal Alaska industries. NOAA Ocean Acidification Program. 150K (co-PI)
2020–2024	Alaska Climate Integrated Modeling Project 2.0. NOAA Climate and Fisheries Initiative. 1,300k (co-PI)
2020	Resolving climate impacts in size-structured food webs from regional to global scales. NOAA S&T International Science. 20K (Lead PI)
2016-2018.	Evaluating management options for promoting Pribilof Island Blue King Crab recovery. North Pacific Research Board. 100K (co-PI)