

Rebecca Ann Howard

Curriculum vitae

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EDUCATION

Ph.D. Ocean, Earth, and Atmospheric Sciences June 2024

Oregon State University, College of Earth, Ocean & Atmospheric Sciences

Dissertation: “Predicting life-history specific species distributions in the North Pacific”

Minor: Statistics

M.S. Marine Resource Management December 2020

Oregon State University, College of Earth, Ocean & Atmospheric Sciences

Thesis: “Change in Oregon’s nearshore groundfish trawl fishery: Perspectives from science and industry data”

B.S. Aquatic Biology June 2015

University of California, Santa Barbara, College of Letters & Science

Minor: Earth Science

RESEARCH EXPERIENCE

2023 – Present **National Science Foundation Graduate Research Assistant**

2021 – 2022 *Oregon State University, College of Earth, Ocean, and Atmospheric Sciences*

Evaluating the use of size-structured and size-aggregated statistical species distribution models for projecting distributions of California Current System fish and invertebrate species under different climate scenarios using the NEP ROMS.

2022 – 2023 **Cooperative Institute for Marine Ecosystem and Resources Studies Graduate Research Assistant**

Oregon State University, College of Earth, Ocean, and Atmospheric Sciences

Developed updated species distribution models for Alaskan snow crab (*Chionoecetes opilio*) in order to provide short term forecasts. Used machine learning methods to predict distributions of different sexes and sizes.

2020 - 2021 **North Pacific Research Board Graduate Research Assistant**

Oregon State University, College of Earth, Ocean, and Atmospheric Sciences

Hindcasted and forecasted eastern Bering Sea groundfish spawning distributions under future oceanographic conditions using the Bering 10K ROMS-NPZ. Used statistical modeling to hindcast distributions that then informed models used to forecast distributions during different emissions scenarios.

2018 – 2020 **Oregon Sea Grant Graduate Research Assistant**

Oregon State University, College of Earth, Ocean, and Atmospheric Sciences

Used statistical models to investigate the effects of oceanography and climate on groundfish long-term distribution and abundance in the northern California Current. Studied the overlap of fishery-independent (NOAA survey) and -dependent (logbook and landings) data sources on the Oregon continental shelf and their potential utility for assessment of nearshore flatfishes.

- 2014 – 2015 **Undergraduate Research Assistant**
Marine Science Institute, University of California Santa Barbara (Page/Dugan Lab)
 Tested the swimming duration of *Watersipora subtorquata* to determine potential to spread as invasive species. Conducted SCUBA settlement plate surveys for presence of recently settled *W. subtorquata* and eelgrass presence.
- 2014 **Undergraduate Research Assistant**
Earth Research Institute, University of California Santa Barbara (CEIN)
 Development of settlement plate frames and antifouling paint treatments to test effectiveness of zinc and copper on invertebrate fouling communities.
- 2013 – 2014 **Undergraduate Research Assistant**
EEMB Dept., University of California Santa Barbara (Collins Lab)
 Documented cabezon (*Scorpaenichthys marmoratus*) embryonic development with photomicroscopy. Assisted in larval rockfish laboratory hypoxia studies.

PUBLICATIONS

- Vary, L, LA Rogers, MJ Harte, **RA Howard**, L Ciannelli. (2023). Temperature-dependent spawning behavior and larval thermohaline associations of Bering Sea groundfishes. *ICES Journal of Marine Science*, 80(7), 1881-1898.
<https://doi.org/10.1093/icesjms/fsad113>
- RA Howard**, L Ciannelli, WW Wakefield, MA Haltuch. (2023). Comparing fishery-independent and fishery-dependent data for analyzing the distributions of Oregon shelf groundfishes. *Fisheries Research*, 258, 106553. <https://doi.org/10.1016/j.fishres.2022.106553>
- RA Howard**, L Ciannelli, WW Wakefield, and MR Fewings. (2021). The effects of climate, oceanography, and habitat on the distribution and abundance of northern California Current continental shelf groundfishes. *Fisheries Oceanography*, 30(6), 707–725.
<https://doi.org/10.1111/fog.12553>

MANUSCRIPTS IN REVIEW

- RA Howard**, L Ciannelli, ER Ryznar, MA Litzow. Static and climate-linked habitat features explain the collapse of a well-managed fishery. In Review at *Nature Communications*.
- RA Howard**, LA Rogers, KA Kearney, LA Vary, L Ciannelli. Projecting marine fish distributions during early life stages under future climate scenarios. In Review at *Fish and Fisheries*.

INVITED PRESENTATIONS

- RA Howard**, L Ciannelli, LA Rogers, KA Kearney, L Vary. (2024, April 16-18). *Projecting future shifts of Bering Sea groundfish spawning distributions*. Lowell Wakefield Fisheries Symposium, Sitka, AK, USA.
- RA Howard**. (2014, June 1). *Hypoxia: Climate change in the coastal oceans*. Coastal Fund Gala, Santa Barbara, CA, USA.

CONTRIBUTED ORAL PRESENTATIONS

- RA Howard**, LA Rogers, KA Kearney, LL Vary, L Ciannelli. (2024, February 18-23). *Changes in ocean conditions over the next century lead to shifts in spawning distributions of Bering Sea groundfishes*. Ocean Sciences Meeting, New Orleans, LA, USA.
- RA Howard**, MA Litzow, L Ciannelli, ER Ryznar. (2023, October 23-27). *Sex- and maturity-specific distributions of eastern Bering Sea snow crab (*Chionoecetes opilio*)*. PICES-2023 Annual Meeting, Seattle, WA, USA.
- L Ciannelli, **RA Howard**, RG Asch, KE Dale, LA Rogers, LAK Barnett, ME Hunsicker. (2023,

- October 23-27). *Size-explicit species distribution models for marine fishes*. PICES-2023 Annual Meeting, Seattle, WA, USA.
- KE Dale , L Ciannelli , J Fiechter, M Pozo Buil, RE García Gómez, SPA Jiménez-Rosenberg, G Aceves-Medina, AR Thompson, JC Field, TD Auth, RI Perry, LA Rogers, **RA Howard**, RG Asch. (2023, October 23-27). *Tradeoffs between shifts in phenology and geography among early life history stages of fishes in response to environmental changes in the Eastern Pacific*. PICES-2023 Annual Meeting, Seattle, WA, USA.
- RA Howard**, L Ciannelli, JC Field, BK Wells, LAK Barnett, RG Asch. (2023, April 17-21). *The influence of ontogeny and size on the distribution of pelagic young-of-the-year fishes*. 5th International Symposium on Effects of Climate Change on the World's Ocean, Bergen, Norway.
- RA Howard**, L Ciannelli, LA Rogers, KA Kearney, LL Vary. (2022, February 27-March 4). *Effects of future climate variability on Bering Sea groundfish spawning distributions*. Ocean Sciences Meeting, Virtual.
- RA Howard**, L Ciannelli, LA Rogers, KA Kearney, LL Vary. (2022, January 24-27). *Effects of future climate variability on Bering Sea groundfish spawning distributions*. Alaska Marine Science Symposium, Virtual.

CONTRIBUTED POSTER PRESENTATIONS

- RA Howard**, L Ciannelli, JC Field, BK Wells, LAK Barnett, RG Asch. (2022, November 7-11). *The influence of ontogeny and size on the distribution of juvenile forage fishes*. International Symposium on Small Pelagic Fish, Lisbon, Portugal.
- LL Vary, L Ciannelli, LA Rogers, **RA Howard**. (2022, February 27-March 4). *Biogeography and Behavior: Flexibility of Bering Sea groundfishes' spawning behavior and subsequent impacts on biogeography of early life stages*. Ocean Sciences Meeting, Virtual.
- LL Vary, L Ciannelli, LA Rogers, **RA Howard**. (2022, January 24-27). *Biogeography and Behavior: Flexibility of Bering Sea groundfishes' spawning behavior and subsequent impacts on biogeography of early life stages*. Alaska Marine Science Symposium, Virtual.
- RA Howard**, L Ciannelli, and WW Wakefield (2020, December 1-2). *Visualization and overlap of fishery-independent and fishery-dependent data for assessment of the Oregon shelf flatfish fishery*. CalCOFI Conference, Virtual.
https://calcofi.com/downloads/Posters2020/CalCOFI_Poster-Rebecca%20Howard.pdf
- RA Howard**, L Ciannelli, WW Wakefield, and MR Fewings. (2020, March 4-5). *Four decades of change in the Oregon nearshore flatfish fishery through the eyes of science and industry*. Meeting of the Oregon American Fisheries Society, Bend, OR, USA.
- RA Howard**, L Ciannelli, WW Wakefield, and MR Fewings. (2019, November 8-9). *Four decades of change in the Oregon nearshore flatfish fishery through the eyes of science and industry*. State of the Coast Conference, Gleneden Beach, OR, USA.
- RA Howard**, and HM Page. (2015, May 19). *Larval swimming duration of Watersipora subtorquata*. UCSB Undergraduate Research Colloquium, Santa Barbara, CA, USA.
- RA Howard** and PM Collins. (2014, May 20). *Embryonic development of the cabezon (Scorpaenichthys marmoratus)*. UCSB Undergraduate Research Colloquium, Santa Barbara, CA, USA.

EMPLOYMENT

- 2016 – 2017 **AmeriCorps Member**
 Watershed Stewards Program, placed at the NOAA Fisheries SWFSC

Collected data for population assessment and conservation of endangered Central California Coho salmon and threatened steelhead trout by stream surveys, juvenile trapping, and tagging. Created maps using ArcGIS for conference poster and future publications. Archived historical biological samples.

2015 – 2017 **North Pacific Groundfish Observer**

Alaskan Observers, Inc., contracted for the NOAA Fisheries AFSC

Collected biological, safety, and effort data aboard commercial bottom trawlers in the Bering Sea. Biological data recorded included maturity scans, otoliths, and salmon genetic samples. Worked with observers, NOAA Fisheries scientists, fishermen, and processing plants.

2012 – 2015 **Aquarist** (2015), **Intern** (2013 – 2015), **Volunteer** (2012 – 2013)

Research Experience and Education Facility, UCSB

FELLOWSHIPS & AWARDS

- 2023 Graduate Dean's Catalyst Fellowship, Oregon State University
- 2023 Wayne V. & Louise Burt Memorial Fellowship, Oregon State University
- 2023 CEOAS Outreach Accomplishment Award, Oregon State University
- 2022 Ocean Ecology of Nekton Research Scholarship, Oregon State University
- 2021 Kuhnle Regional Scholarship, Mensa Education and Research Foundation
- 2020 Thesis Completion Award, Oregon State University
- 2018 Provost's Distinguished Graduate Fellowship, Oregon State University
- 2017 Segal AmeriCorps Education Award, Corporation for National and Community Service
- 2014 Bradley Paul Nuremberg Memorial Scholarship, UCSB Diving Operations

STUDENT TRAVEL GRANTS

- 2024 Scholarly Presentation Award, Oregon State University
- 2024 Ocean Sciences Meeting Student Travel Grant, AGU
- 2024 NCEAS Environmental Data Science Summit Travel Support, UCSB
- 2023 PICES Annual Meeting Travel Grant, NSF
- 2023 CEOAS Association of Graduate Students Travel Award, Oregon State University
- 2023 Scholarly Presentation Award, Oregon State University
- 2023 Effects of Climate Change on the World's Ocean Travel Grant, PICES
- 2022 NSF Travel Grant, WHOI & UMCES
- 2022 International Symposium on Small Pelagic Fish Travel Grant, PICES & ICES

FIELD EXPERIENCE

May/Jun 2023 **Volunteer Survey Biologist**

Pre-Recruit Survey and NCC Ecosystem Survey (NOAAS Bell M. Shimada)

July 2019 **Volunteer Survey Biologist**

West Coast Groundfish Bottom Trawl Survey (F/V Last Straw)

July 2019 **Mooring and Instrument Deployment Volunteer**

Partnership for the Interdisciplinary Studies of Coastal Oceans (R/V Elakha)

May 2017 **Volunteer Survey Biologist**

Rockfish Recruitment and Ecosystem Assessment Survey (NOAAS Reuben Lasker)

MENTORING & OUTREACH

- 2019 – 2024 **National Ocean Sciences Bowls**, Oregon State University
Salmon Bowl event volunteer and judge.

- 2023 **Guess Who? Fish Edition**, *Oregon State University*
Developed fisheries activity for College of Earth, Ocean & Atmospheric Sciences.
- 2019 – 2020 **Academic Mentoring Program (CEOAS AMP)**, *Oregon State University*
Mentor for four undergraduate students in environmental sciences.
- 2014 – 2015 **Graduate Biology Mentorship Association (BIOME)**, *UCSB*
Mentor for undergraduate students in biology.
- 2014 – 2015 **Hollister Ranch Tidepool Conservancy, Gaviota, CA**
Outdoor education for 3rd through 7th grade students.

TEACHING EXPERIENCE

- Summer 2023 **Biological Oceanography**, *Oregon State University*
Guest Lecturer
- Winter 2021 **Fishery Biology (online)**, *Oregon State University*
Graduate Teaching Assistant

ACADEMIC SERVICE

- 2023 Reviewer for Journals: *FACETS*; *Fish and Fisheries*
- 2022 – 2023 CEOAS Ocean Ecology & Biogeochemistry Graduate Representative, Corvallis, OR
- 2022 CEOAS Promotion and Tenure Student Committee, Corvallis, OR
- 2020 CEOAS Promotion and Tenure Student Committee, Corvallis, OR