
Camille H. Ross, Ph.D.

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SUMMARY

Quantitative marine ecologist and postdoctoral researcher specializing in the estimation of ecological fields from sparse, irregular, and effort-limited observations. Seven years of experience separating the observation process from the ecological process — detectability, survey effort, and multi-resolution data fusion — in models that directly inform decision-making around endangered species and environmental management. Skilled in applied statistical learning and spatiotemporal modeling (R, Python, MATLAB), with repeated testing of model transferability across new time periods, climate scenarios, and documented regime shifts. Author of eight peer-reviewed publications and frequent invited speaker on data-driven approaches to environmental conservation.

COMPUTATIONAL & FIELD SKILLS

Observation-process & sampling-design modeling: Detectability modeling from line-transect survey data; density surface modeling with explicit treatment of survey effort; quantifying how survey coverage and design constrain achievable inference; propagation of observation uncertainty into management-facing estimates

Time series & spectral analysis: Multi-decadal oceanographic and biological time series; spectral analysis of time series, including Fourier transforms and periodograms, coherence between series, filtering, and autocorrelation structure, applied to tidal signal analysis (graduate coursework, MATLAB); quantifying the effect of a documented oceanographic regime shift on model-derived density estimates

Programming languages: Expertise in R, Python, git, bash/Unix shell scripting, and Linux; experience with MATLAB, Java, and ArcGIS; limited experience with JavaScript, HTML, CSS, and SQL

Analysis / visualization methods: Species distribution modeling, density surface modeling, generalized additive models, large dataset management; training artificial neural networks from scratch, including CNNs for image classification, video processing algorithms, and natural language processing; R Shiny and Leaflet mapping

Remote sensing & data sources: Satellite-derived oceanographic and climate products, including Copernicus Earth Observation (EO) and NASA EarthData products (e.g., chlorophyll concentration, sea surface temperature); ocean physics model output (e.g., HYCOM, GLORYS, FVCOM, and internal Fisheries and Oceans Canada (DFO) physics models); aerial and vessel survey data; oceanographic sampling cruises

Field / sampling methods: Deploying CTD (conductivity, temperature, depth) and Niskin rosettes; zooplankton sampling using bongo nets; marine mammal spotting

EDUCATION

University of Maine, Orono, ME, USA

Ph.D. in Oceanography, May 2025

Darling Marine Center, School of Marine Sciences

Dissertation: Modeling North Atlantic right whales and their prey

Relevant coursework: Advanced statistics, including spectral analysis of time series (Fourier transforms and periodograms, coherence, filtering, autocorrelation structure) applied to tidal signal analysis in MATLAB

Colby College, Waterville, ME, USA

B.A., May 2020

Major: Environmental Computation

Honors thesis: Projecting regions of North Atlantic right whale, *Eubalaena glacialis*, habitat suitability in the Gulf of Maine in 2050

Awards: Phi Beta Kappa, Magna Cum Laude, Presidential Scholar, Dean's List, Environmental Computation Award, Distinction in Environmental Computation, Honors in Environmental Studies, Buck Prize for Environmental Writing

Sea Education Association, S285: Oceans and Climate, Woods Hole, MA, USA **Spring 2019**

Research project: Examining baroclinic instability and zonal fronts along the Chatham Rise, NZ, and in the Southwestern Pacific Ocean

Bigelow Laboratory for Ocean Sciences, Sea Change Semester Program **Fall 2018**

Research project: Physical factors affecting North Atlantic right whale, *Eubalaena glacialis*, habitat preference in the Gulf of Maine

RESEARCH & PROFESSIONAL EXPERIENCE

Darling Marine Center, University of Maine, Walpole, ME, USA **January 2026 – present**

In partnership with the Maine Department of Marine Resources, Marine Mammal Research Division

Postdoctoral Research Associate (full time) — June 2026 – present

Research Associate (contract) — January 2026 – June 2026

Conducted analysis and integration of both historical and ongoing datasets of large whales, zooplankton prey, and oceanographic variables collected under differing survey designs and sampling frequencies

Anderson Cabot Center for Ocean Life, New England Aquarium, Boston, MA, USA

January 2024 – January 2026

Associate Research Scientist II, Spatial Ecology, Mapping, Assessment, and Photogrammetry (EcoMAP)

Analyzed North Atlantic right whale aerial survey data to build density surface models, modeling detectability and survey effort explicitly alongside the ecological signal

Assisted with other spatial model and data analysis projects

Bigelow Laboratory for Ocean Sciences, East Boothbay, ME, USA **September 2018 – December 2023**

Research Associate, Tandy Center for Ocean Forecasting — January 2023 – December 2023

Tested potential improvements to North Atlantic right whale density surface models

Research Technician, Tandy Center for Ocean Forecasting — June 2020 – January 2023

Modeled North Atlantic right whale prey aggregations in the Gulf of Maine from spatially and temporally patchy ship-based sampling

Research Intern, Computational Ecology Lab — July 2019

Built species distribution models of North Atlantic right whale habitat suitability in the Gulf of Maine presently and under future projected climate scenarios

Sea Change Semester Program Independent Research Project — September 2018 – December 2018

Examined the correlation between Lagrangian coherent structures and North Atlantic right whale sightings in the Gulf of Maine

Anderson Cabot Center for Ocean Life, New England Aquarium, Boston, MA, USA **June 2019**

Computer Programming Intern

Built species distribution models of bowhead whales in the Chukchi Sea and North Atlantic right whales in the Gulf of Maine

Colby College, Waterville, ME, USA

September 2016 – May 2020

Research Assistant, Environmental Studies Department

Georeferenced nautical charts in ArcGIS to determine historical kelp coverage in California

Transcribed data from the International Commission for the Conservation of Atlantic Tunas (ICCAT) to track sustainability of bluefin tuna fishery

Examined the correlation between farm-to-school programs and sustainable fisheries

PUBLICATIONS

Peer-reviewed journal articles

Lurgio, A., Rzeszowski, E., Webb, A., Spillane, T., Jones, S., Ishaq, S., **Ross, C. H.**, Becker, J., Kanwit, K., and Brady, D. C. 2026. Seasonality of *Vibrio parahaemolyticus* in the Eastern oyster, *Crassostrea virginica*, along the coast of Maine, USA. *Applied and Environmental Microbiology*.
<https://doi.org/10.1128/aem.00168-26>

Ross, C. H., Roberts, J. J., Pendleton, D. E., Brady, D. C., Stamieszkin, K., and Record, N. R. 2025. Incorporating prey fields into North Atlantic right whale density surface models. *Endangered Species Research*, 58:67–84. <https://doi.org/10.3354/esr01435>

Johnson, O. H., Plourde, S., Lehoux, C., **Ross, C. H.**, Tupper, B., Orphanides, C. D., Walsh, H. J., and Record, N. R. 2025. Suitability of foraging habitat for *Eubalaena glacialis* under future climate scenarios in the Northwest Atlantic. *Elementa: Science of the Anthropocene*, 13(1).
<https://doi.org/10.1525/elementa.2024.00044>

Evans, T. C., Record, N. R., **Ross, C. H.**, and Thorne, L. H. 2025. Beyond *Calanus*: changes to the copepod community in the northeast USA and implications for North Atlantic right whale foraging energetics. *Endangered Species Research*, 56:1–17. <https://doi.org/10.3354/esr01376>

Record, N. R., Tupper, B., Evanilla, J., Oliveira, K., Ngai, L., **Ross, C. H.**, and Stamieszkin, K. 2023. The surprising oceanography of the Gulf of Maine. *Maine Policy Review*, 32.2:20–28.
<https://digitalcommons.library.umaine.edu/mpr/vol32/iss2/4>

Ross, C. H., Runge, J. A., Roberts, J. J., Brady, D. C., Tupper, B., and Record, N. R. 2023. Estimating North Atlantic right whale prey based on *Calanus finmarchicus* thresholds. *Marine Ecology Progress Series*, 703:1–16. <https://doi.org/10.3354/meps14204>

Ross, C. H., Pendleton, D. E., Tupper, B., Brickman, D., Zani, M. A., Mayo, C. A., and Record, N. R. 2021. Projecting regions of North Atlantic right whale, *Eubalaena glacialis*, habitat suitability in the Gulf of Maine for the year 2050. *Elementa: Science of the Anthropocene*, 9(1), p.00058.
<https://doi.org/10.1525/elementa.2020.20.00058>

Peer-reviewed technical reports

Plourde, S., Lehoux, C., Roberts, J. J., Johnson, C. L., Record, N., Pepin, P., Orphanides, C., Schick, R. S., Walsh, H. J., and **Ross, C. H.** 2024. Describing the seasonal and spatial distribution of *Calanus* prey and North Atlantic right whale potential foraging habitats in Canadian waters using species distribution models. *Canadian Science Advisory Secretariat Research Document*, 2024/039. v + 71 p.

In review

Ross, C. H., Roberts, J. J., Pendleton, D. E., Record, N. R., Ganley, L. C., O'Brien, O., and Brady, D. C. *In review*. Impacts of an oceanographic regime shift on U.S. North Atlantic right whale density estimates.

SOFTWARE

Public, installable R packages authored and maintained by C. H. Ross. Each is documented, general-purpose, and runs on any dataset in the documented shape.

taupatch. Monthly habitat suitability models for high-abundance zooplankton patches, with a Shiny interface. Implements the method in Ross et al. (2023). github.com/chross22/taupatch

dsfit. Fits and compares detection functions for line-transect data, ranked on effective strip half-width and its coefficient of variation rather than the Akaike information criterion alone.
github.com/chross22/dsfit

narwcr. Reads and standardises North Atlantic Right Whale Consortium survey data into a single predictable shape. github.com/chross22/narwcr

distsamp. Segments aerial line-transect survey data into effort segments and detection distances for distance sampling. github.com/chross22/distsamp

datamatch. Fetches Copernicus Marine and other ocean data and joins it to point observations in space and time. github.com/chross22/datamatch

derivoce. Derived oceanographic covariates for species distribution models: gradients, calendar lags, eddy kinetic energy, Lyapunov exponents, distance to fronts. github.com/chross22/derivoce

fancyfx. Publication-ready effect plots pairing every model effect curve with a rug of the underlying raw data. github.com/chross22/fancyfx

PRESENTATIONS, CONFERENCES, & WORKSHOPS

Invited talks

Colby College Environmental Science Department Lecture Series, Waterville, ME, USA, September 2025 — **Invited Lecture.** The right whale to save: how can models aid endangered species management?

Midcoast Stewards Program, Coastal Rivers Conservation Trust, Darling Marine Center, Walpole, ME, USA, April 2025 — **Invited Lecture.** Modeling North Atlantic right whales and their prey.

School of Marine Sciences Seminar Series, University of Maine, Walpole, ME, USA, March 2024 — **Invited Seminar.** The right whale to save: a look at using prey fields in management models.

North Atlantic Right Whale Transboundary Species Distribution Modeling Workshop, Montreal, QC, Canada, December 2022 — **Invited Presentation.** U.S. zooplankton modeling.

Contributed presentations and posters

North Atlantic Right Whale Consortium Annual Meeting, New Bedford, MA, USA, October 2025 — **Contributed Presentation.** The effects of an oceanographic regime shift on U.S. North Atlantic right whale density estimates.

Ocean Sciences Meeting, New Orleans, LA, USA, February 2024 — **Contributed Presentation.** Incorporating prey information into North Atlantic right whale density surface models used in decision support.

North Atlantic Right Whale Consortium Annual Meeting, Halifax, NS, Canada, October 2023 — **Contributed Presentation.** Incorporating prey information into North Atlantic right whale density surface models used in decision support.

Student Conference on Conservation Science (SCCS-NY), American Museum of Natural History, New York, NY, USA, October 2023 — **Contributed Presentation.** Incorporating prey information into North Atlantic right whale management tools.

Bigelow Science Symposium, East Boothbay, ME, USA, February 2023 — **Contributed Presentation.** Incorporating prey information into right whale density surface models.

Regional Association for Research on the Gulf of Maine Annual Science Meeting, December 2022 — **Contributed Presentation.** Incorporating prey information into the Duke right whale density surface model.

North Atlantic Right Whale Consortium Annual Meeting, New Bedford, MA, USA, October 2022 — **Contributed Presentation.** Incorporating prey information into the Duke right whale density surface model.

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- Ocean Sciences Meeting, March 2022 — **Contributed Presentation**. Predicting endangered North Atlantic right whales using prey fields.
- Regional Association for Research on the Gulf of Maine Annual Science Meeting, December 2021 — **Contributed Presentation**. Modeled prey fields improve predicted distributions of endangered North Atlantic right whales.
- North Atlantic Right Whale Consortium Annual Meeting, October 2021 — **Contributed Presentation**. Predicting endangered North Atlantic right whales using prey fields.
- Aquatic Sciences Meeting, June 2021 — **Contributed Presentation**. The dynamics of high-density *Calanus finmarchicus* aggregations on the US continental shelf with respect to North Atlantic right whale feeding.
- North Atlantic Right Whale Consortium Annual Meeting, October 2020 — **Contributed Presentation**. Projecting regions of North Atlantic right whale, *Eubalaena glacialis*, habitat suitability in the Gulf of Maine in 2050.
- Regional Association for Research on the Gulf of Maine Annual Science Meeting, December 2020 — **Contributed Presentation**. Projecting regions of North Atlantic right whale, *Eubalaena glacialis*, habitat suitability in the Gulf of Maine in 2050.
- Ocean Sciences Meeting, San Diego, CA, USA, February 2020 — **Contributed Poster**. Predicting regions of North Atlantic right whale, *Eubalaena glacialis*, habitat suitability in the Gulf of Maine.
- Gulf of Maine 2050 International Symposium, Portland, ME, USA, November 2019 — **Contributed Poster**. Predicting regions of North Atlantic right whale, *Eubalaena glacialis*, habitat suitability in the Gulf of Maine in 2050.

Workshops

- Regional Wildlife Science Collaborative for Offshore Wind (RWSC) Workshop: Oceanographic Modeling and Data Needs to Support Marine Life and Ecosystem Assessment in the Gulf of Maine, Portland, ME, USA, April 2026 — **Invited Workshop**
- MOCEAN Workshop: Nature-Inclusive Design in Offshore Wind, Tufts University, Medford, MA, USA, May 2025 — **Invited Workshop**

Conferences and courses attended

- Southern Right Whale Consortium Meeting, May 2025 — **Attendee**
- North Atlantic Right Whale Consortium Annual Meeting, Providence, RI, USA, October 2024 — **Attendee**
- Near-Term Ecological Forecasting Course, Ecological Forecasting Initiative, Boston University, Boston, MA, USA, June 2022 — **Attendee**
- North Atlantic Right Whale Consortium Annual Meeting, Portland, ME, USA, October 2019 — **Attendee**

TEACHING, MENTORING, & OUTREACH

- Guest lecture, Ocean Forecasting January Term Course, Colby College, Waterville, ME, USA, January 2026
- Guest lecture, Introduction to Marine Biology Course, Unity Environmental University, New Gloucester, ME, USA, December 2025
- Guest lecture, Ocean Forecasting January Term Course, Colby College, Waterville, ME, USA, January 2025
- Conservation lesson, Second Grade Class (~age 7), Roots Academy, Cape Elizabeth, ME, USA, May 2024
- Guest lecture, Intro to Oceanography Course, Sea Change Semester Program, Bigelow Laboratory for Ocean Sciences, September 2023. Lecture Title: Predicting right whales.
- Public outreach talk, Boothbay Harbor Memorial Library, April 2023. Talk Title: North Atlantic right whales and their food.

Guest lecture and lab instruction, Ocean Forecasting January Term Course, Colby College, Waterville, ME, USA, January 2023. Lecture Title: Species distribution modeling.

Mentor to Northeastern University undergraduate co-op (cooperative education) intern, zooplankton species distribution modeling project, Bigelow Laboratory for Ocean Sciences, 2022–2023

Facilitator, Girls Who Code, Boothbay Harbor Memorial Library Chapter, January 2022 – May 2025

Teaching Assistant, Coding office hour, Sea Change Semester Program, Bigelow Laboratory for Ocean Sciences, 2021

Teaching Assistant, Intro to R class, Sea Change Semester Program, Bigelow Laboratory for Ocean Sciences, 2021

Teaching Assistant, Research Experience for Undergraduates coding hour, Bigelow Laboratory for Ocean Sciences, June–July 2020

Species Distribution Modeling in R tutorial, Ocean Hack Week, August 2020

MEDIA ENGAGEMENT

Popular Science, Feature, February 2026, The lobstermen teaming up with scientists to save endangered whales (by Valerie Shively)

UMaine News, Feature, February 2026, Popular Science features UMaine alumna's right whale research

Vineyard Gazette, *Print Interview*, October 2025, *New Tactic Could Be a Big Help in Tracking Right Whales*

The Shift, CBC New Brunswick with Vanessa Vander Valk, *Radio Interview*, September 2025, *New England scientists honing models that predict where right whales will pop up next*

Nantucket Current, *Print Interview*, September 2025, *Follow the Food: Scientists Devise New Strategy to Track Endangered Right Whales*

Oceanographic Magazine feature, *Feature*, September 2025, *Tracking right whales the right way... by thinking small*

NOAA Fisheries feature story, *Feature*, September 2025, *Where the Copepods Are: Prey Data Can Improve Right Whale Models*

The World, PRX with Carolyn Beeler, *Radio Interview*, April 2024, *Oceans heating up fast*

News Center Maine with Don Carrigan, *TV Interview*, March 2022, *Climate change may be drawing right whales out of the Gulf of Maine*

Colby College News, *Print Interview*, March 2022, *In Search of the North Atlantic Right Whale*

COMMITTEES, WORKING GROUPS, & SOCIETY MEMBERSHIPS

Habitat and Ecosystems Subcommittee Member, Regional Wildlife Science Collaborative for Offshore Wind (RWSC): 2024–present

North Atlantic Right Whale Transboundary Species Distribution Modeling Working Group: 2022–present

Organizing Committee Member, Ocean Hack Week: 2024

Member, Society for Marine Mammalogy: 2024–present

Member, Ecological Forecasting Initiative: 2022–present

References available on request.