

EMILY L. NORTON

Joint Institute for the Study of Atmosphere and Ocean | University of Washington
Box 355672 | 3737 Brooklyn Ave NE | Seattle, WA 98195-5672
Office: (206) 685-6341 | emilyln@uw.edu

EDUCATION

- | | | |
|-------------|--|-------------|
| M.S. | University of Hawai'i at Mānoa (UHM)
Oceanography (GPA 3.90) | August 2013 |
| B.A. | Bowdoin College
Biology major, Mathematics minor, <i>Summa cum laude</i> | May 2010 |

PROFESSIONAL EXPERIENCE

Joint Institute for the Study of the Ocean and Atmosphere (JISAO) **University of Washington (UW)**

Research Scientist | Seattle, WA | May 2017 - present

- Forecasting ocean conditions for the Pacific Northwest shelf waters on seasonal timescales to help inform decision-making by managers in Dungeness crab, sardine, and hake fisheries.
- Exploring the effects of environmental exposure history on driving habitat in Dungeness crab megalopae using particle tracking.
- Investigating plankton community structure with genetic metabarcoding.
- Providing technical support for collaborative projects by writing programs in R, Matlab, Python, Fortran, and Bash. (40 hrs/wk)

Brown University

Research Assistant | Providence, RI | June 2016 - May 2017

- Investigated the evolutionary diversity of the reproduction pathways in *Candida spp.* using the CRISPR/Cas9 system.
- Automated the identification of and ranked potential CRISPR/Cas9 engineered constructs through the development of concise and efficient scripts in R. (40 hrs/wk)

Maine Coastal Program (Maine Department of Agriculture, Conservation and Forestry)

Senior Planner | Augusta, ME | July 2015 - May 2016

NOAA Coastal Management Fellow | Augusta, ME | July 2013 - July 2015

- As project manager for the Maine Coastal Mapping Initiative, a hydrographic data collection program for the State of Maine, I oversaw six contractors, assisted with data collection and quality checking, wrote technical reports summarizing the data processing methods and results, conducted outreach including maintaining the project website, acquired external grant funding, and managed the ~\$300,000 annual budget.
- Collaborated with state and federal agencies and private and non-profit partners to improve the sustainable management of marine species and habitats by integrating them into the 2015 State Wildlife Action Plan; served on the Steering Committee as a marine science expert.

- Organized stakeholder engagement meetings and public workshops on ocean acidification, invasive species, and regional ocean planning. (40 hrs/wk)

University of Hawai'i at Mānoa

Graduate Research Assistant | Honolulu, HI | August 2010 - July 2013

- Conducted biophysical numerical modeling in Matlab and genetic population structure analyses to evaluate the relative importance of physical and biological forces driving connectivity in a circumglobal copepod species. (20 hrs/wk)
- Thesis: *Empirical and bio-physical modeling studies of dispersal barriers for marine plankton*

University of Hawai'i at Mānoa

Teaching Assistant | Honolulu, HI | August - December 2011

- Taught two recitations per week and corrected weekly assignments for ~20 undergraduate and graduate students enrolled in an applied mathematics course (Geomathematics, OCN312), which covered topics including basic coding in Matlab, ordinary and partial differential equations, complex analysis, linear algebra, and vector calculus. (20 hrs/wk)

SELECTED PUBLICATIONS AND PRESENTATIONS

- Berger, H., Siedlecki, S.A., Matassa, C., Alin, S.R., Kaplan, I.C., Hodgson, E., Pilcher, D., **Norton, E.L.**, and Newton, J. Assessing the vulnerability of species with complex life cycles to changing ocean conditions in seasonally dynamic habitats: the Dungeness crab (*Metacarcinus magister*) as a case study. Manuscript in preparation.
- Siedlecki, S.A., Pilcher, D., Deutsch, C., Howard, E.M., MacCready, P., **Norton, E.L.**, Frenzel, J., Newton, J., Feely, R.A., Alin, S.R., and Klinger, T. Coastal processes modify projections of some climate-driven stressors in the California Current System. *Manuscript in preparation*.
- Norton, E.L.**, Siedlecki, S., Officer, S., Kaplan, I., Fisher, J., Morgan, C., Hermann, A., Alin, S.A., Feely, R.A., Saenger, C., Newton, J., and Bednarsek, N. 2020. The importance of environmental exposure history in forecasting Dungeness crab megalopae distribution using J-SCOPE, a high-resolution model for the US Pacific Northwest. *Frontiers in Marine Science*, 7, 102.
- Bednarsek, N., Feely, R.A., Beck, M.W., Alin, S.R., Siedlecki, S.A., Calosi, P., **Norton, E.L.**, Saenger, C., Strus, J., Greeley, D., Nezlin, N.P., Roethler, M., and Spicer, J.I. 2020. Exoskeleton dissolution with mechanoreceptor damage in larval Dungeness crab related to severity of present-day ocean acidification vertical gradients. *Science of the Total Environment* 716: 136610.
- Litzow, M.A., Hunsicker, M.E., Bond, N.A., Burke, B.J., Cunningham, C., Gosselin, J.L., **Norton, E.L.**, Ward, E.J., and Zador, S. 2020. The changing physical and ecological meanings of North Pacific Ocean climate indices. *Proceedings of the National Academy of Sciences* 117 (14): 7665-7671.
- Norton, E.L.**, Siedlecki, S., Officer, S., Kaplan, I., Fisher, J., Morgan, C., Hermann, A., Alin, S.A., Feely, R.A., Saenger, C., Newton, J., and Bednarsek, N. The importance of environmental exposure history in forecasting Dungeness crab megalopae occurrence using J-SCOPE, a high-resolution model for the US Pacific Northwest.

- Ocean Sciences Meeting, San Diego, CA. Feb 2020. Poster presentation: PC44A-1850.
- Stepien, C.A., Keister, J.E., Paight, C., Slikas, E., **Norton, E.L.** Species composition and diversity patterns across the Salish Sea: Multiple targeted metabarcoding analyses of zooplankton and eDNA in relation to chemical conditions. Manuscript in preparation.
- Norton, E.L.**, Siedlecki, S., Officer, S., Kaplan, I., Fisher, J., Morgan, C., Hermann, A., Alin, S.A., Feely, R.A., Saenger, C., Newton, J., and Bednarsek, N. The importance of environmental exposure history in forecasting Dungeness crab megalopae occurrence using J-SCOPE, a high-resolution model for the US Pacific Northwest. PICES Annual Meeting, Victoria, Canada. Oct 2019. Oral presentation: 14301.
- Norton, E.L.**, Officer, S., Kaplan, I., Fisher, J., Morgan, C., Hermann, A., Alin, S.A., Feely, R.A., Bednarsek, N., and S. Siedlecki. The importance of exposure history in forecasting larval Dungeness crab distribution using J-SCOPE, a high-resolution model for the US Pacific Northwest. Ocean Sciences Meeting, Portland, OR. Feb 2018. Poster presentation: Abstract OC14A-0404.
- Norton, E.L.**, Sherwood, R.K., and R.J. Bennett. 2017. Development of a CRISPR-Cas9 system for efficient genome editing of *Candida lusitanae*. *mSphere* 2:e00217-17.
- Norton, E.L.**, Powell, B.S., Neuheimer, A., and E. Goetze. Biophysical modeling to identify oceanic dispersal barriers for holoplankton in the equatorial Atlantic Ocean. Manuscript in preparation.
- Dobbs, K., Ozmon, I., **Norton, E.L.**, and M. Nixon. Maine Coastal Mapping Initiative progress update: Applications and utilization of high resolution multibeam echosounder data. Maine Geological Survey Annual Meeting. Augusta, ME. November 11, 2015. Oral presentation.
- Nixon, M., and **E.L. Norton**. Mapping Maine's seafloor: Maine Coastal Mapping Initiative. Port Safety Forum. Portland, ME. December 16, 2015. Oral presentation.
- Norton, E.L.**, Dobbs, K., Ozmon, I., and M. Nixon. Under the sea: Exploring submerged geologic features using multibeam sonar. Maine Geological Society Annual Meeting. Augusta, ME. November 11, 2015. Poster presentation.
- Norton, E.L.**, and M. Nixon. Mapping Maine's seafloor: Maine Coastal Mapping Initiative. The Nature Conservancy Brown Bag Webinar. Brunswick, ME. April 15, 2015. Oral presentation.
- Norton, E.L.**, and I. Ozmon. Aggregate exploration and habitat classification: Tools for building resiliency in Maine. Geological Society of America Northeastern Section Meeting. Bretton Woods, NH. March 24, 2015. Oral presentation.
- Goetze, E., Andrews, K.R., Peijnenburg, K.T.C.A., Portner, E., and **E.L. Norton**. 2015. Temporal stability of genetic structure in a mesopelagic copepod. *PLoS ONE* 10(8): e0136087. doi: 10.1371/journal.pone.0136087
- Norton, E.L.**, and Ozmon, I. Aggregate exploration and habitat classification: Tools for building resiliency in Maine. Geological Society of America Northeastern Section Meeting. March 24, 2015. Oral presentation.
- Norton, E.L.**, Ozmon, I., and M. Nixon. Maine bathymetric update: Maine Coastal Mapping Initiative. Maine GIS Users Group Annual Conference. Portland, ME. February 2, 2015. Oral presentation.

- Andrews, K. R., **Norton, E. L.**, Fernandez-Silva, I., Portner, E., and Goetze, E. 2014. Multilocus evidence for globally distributed cryptic species and distinct populations across ocean gyres in a mesopelagic copepod. *Molecular Ecology* 23: 5462-5479.
- Norton, E. L.**, Andrews, K., Powell, B., and Goetze, E. Empirical and biophysical modeling studies of dispersal barriers for marine plankton. Ocean Sciences Meeting, Honolulu, HI. Feb 18-23, 2014. Poster presentation.
- Norton, E.L.**, and M. Nixon. Offshore bathymetric and backscatter data for ocean spatial planning in Maine. Ocean Sciences Meeting, Honolulu, HI. Feb 18-23, 2014. Poster presentation.
- Norton, E. L.**, and Goetze, E. 2013. Equatorial dispersal barriers and limited connectivity among oceans in a planktonic copepod. *Limnology and Oceanography* 58: 1581-1596.
- Norton, E. L.**, Andrews, K., Powell, B., and Goetze, E. What mechanisms underlie dispersal barriers for marine plankton? Association for the Sciences of Limnology and Oceanography (ASLO) Aquatic Sciences Meeting, New Orleans, LA. Feb 17-22, 2013. Oral presentation.
- Norton, E. L.**, Ellers, O., and Johnson, A. Testing an inverted pendulum model for underwater walking in the crab *Carcinus maenas*. Society for Integrative and Comparative Biology (SICB) annual meeting, Seattle, Washington, Jan 2010. Poster presentation.

SELECTED AWARDS AND HONORS

Science Communication Fellow | Pacific Science Center | Spring 2019

NOAA Project of Special Merit Grant | MCP | Oct 2015

- Benthic exploration and habitat classification: Tools for building resiliency in Maine (\$198,722)

Maine Outdoor Heritage Fund Grant | MCP | May 2015

- Benthic habitat characterization of Maine's coastal waters (\$14,403)

NOAA Coastal Management Fellowship | MCP | July 2013

Travel Award | UHM Graduate Student Organization | Oct 2012

Charles Carroll Everett Scholarship | Bowdoin College | May 2010

Donald and Harriet S. Macomber Prize in Biology | Bowdoin College | May 2010

INBRE Academic Year Supply Award | Bowdoin College | Sep 2009

Doherty Coastal Studies Research Fellowship | Bowdoin College | May-Aug 2009

Abraxas Award | Bowdoin College | May 2007

National Merit Scholar | Huntington High School | May 2006

PROFESSIONAL DEVELOPMENT

Writing for the General Public workshop | UW | May 2019

Software Carpentry workshop | eScience Institute, UW | January 2019

Data Carpentry workshop | eScience Institute, UW | September 2018

Science Communication Improv workshop | UW | May 2018

Mapping the Coast: Elevation, Inundation, and Frequency workshop | Coastal GeoTools conference | March 2015

Sustainability Summit | MIT | May 2014

C-MORE Virtual Workshop on Science Writing | UHM | Oct 2012

Mathematical Modeling in Evolutionary Ecology workshop | Evolution conference | July 2012

Larval Ecology graduate course | Friday Harbor Laboratories | Summer 2010

VOLUNTEER SCIENCE OUTREACH

Meet a Scientist | Pacific Science Center | April 2019 - present | ~3 hrs per month

Skype a Scientist | skypeascientist.com | April 2019 - present | 3 hrs

Guest Speaker | Brunswick Junior High | June 2015 | 4 hrs

- “The tale of a traveler: Stories of marine invasive species in Maine”

Guest Speaker | Tech Night for Augusta, ME, high school students | March 2015, 2016 | 3 hrs

- “Developing high resolution bathymetric maps for ocean planning in Maine”

Science Interpreter | Waikiki Aquarium | January 2013 - July 2013 | 2 hrs/wk

Coordinator | Nerd Nite Honolulu | September 2012 - July 2013 | 10-15 hrs/wk

Judge | Hawaii State Science Fair | April 2013 | 4 hrs

Science Judge | Ocean Science Quiz Bowl | February 2011, 2012, 2020 | 34 hrs

OCEANOGRAPHIC CRUISES

Research Vessel (R/V) *Ronald H. Brown* | Cape Town, SA - Norfolk, VA | Mar 21 - Apr 17, 2020

- Modified GO-SHIP A13.5. Assisted Dr. Bonnie Chang with CFC sampling and analysis.

R/V *Amy Gale* | Maine | 2014 and 2015 field seasons

- Assisted with hydrographic data collection and supervised the six member crew (1-2 days/wk)

R/V *Oscar Elton Sette* | American Samoa | March 12-26, 2012

- Collected and preserved plankton for my master’s thesis; identified midwater nekton

R/V *Thomas Thompson* | Station ALOHA (north of Hawaii) | February 22-28, 2012

- Collected, photographed, and preserved plankton for my master’s thesis

R/V *Kilo Moana* | Station ALOHA | August 19-25, 2011

- Collected plankton for my master’s thesis; assisted with deploying and operating the MOCNESS

R/V *Kilo Moana* | Station ALOHA | March 4-10, 2011

- Taught graduate students plankton protocols; assisted with deploying and retrieving the CTD

ADDITIONAL SKILLS/EXPERTISE

- Computer Expertise | Matlab, R, Python, Fortran, Bash, NCO operators, Git/GitHub, ArcGIS, Ocean Data View, Adobe Pro Suite
- Certificates | NOAA marine mammal and sea turtle observer, PADI Open Water Diver