

JESSICA Y. LUO

National Center for Atmospheric Research
Climate and Global Dynamics
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EDUCATION

- Ph.D. **University of Miami**, Miami, FL 2015
Rosenstiel School of Marine & Atmospheric Sciences
Division of Marine Biology and Fisheries
Dissertation: *Gelatinous zooplankton in marine communities and ecosystems: fine-scale horizontal and vertical distribution, trophic drivers, and contributions to global carbon cycling*
Major Professor: Robert K. Cowen
- M.S. **Stanford University**, Stanford, CA 2007
Department of Geological and Environmental Sciences
Thesis: *Dominance of seasonal fluctuations over local variability on zooplankton from the Gulf of Aqaba, Red Sea: Analysis of carbon and nitrogen stable isotopes and trace metal concentrations*
Major Professor: Adina Paytan
- B.A. **Stanford University**, Stanford, CA 2007
Program in Human Biology

HONORS AND AWARDS

- Eco-DAS XII (Ecological Dissertations in the Aquatic Sciences), invited participant
- Best Oral Presentation by an Early Career Scientist
International Council for the Exploration of the Seas (ICES) 2014 Annual Science Meeting
- National Science Foundation (NSF) Graduate Research Fellowship
- University of Miami Robert C. Maytag Fellowship

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher

National Center for Atmospheric Research
Climate and Global Dynamics Division, Oceanography Section 2016 – present

- Developing a prognostic plankton food-web model for the Community Earth System Model (CESM) with specific application in the California Current ecosystem.

Postdoctoral Scholar

Oregon State University, Hatfield Marine Science Center, Plankton Ecology Lab 2016

- Investigating larval fish predator-prey spatiotemporal dynamics in the Straits of Florida using the *In Situ* Ichthyoplankton Imaging System (ISIIS).
- Research cruise participation: N. California Current, *FSV Bell Shimada*, 1 week.

Graduate Research Assistant

University of Miami, Rosenstiel School of Marine and Atmospheric Sciences 2010 – 2015

- Studied the fine-scale distribution and community dynamics of gelatinous zooplankton and their prey using imaging systems in the Southern California Bight and the northern Gulf of Mexico.
- Co-developed Plankton Portal (www.planktonportal.org), for online crowdsourcing of plankton image identification.
- Participated in five oceanographic research cruises (~70 days at sea), utilizing an array of imaging and net-based samplers.
 - Straits of Florida, *R/V Walton Smith*, 6 weeks total, 2014 and 2015
 - Mediterranean Sea, *NO Tethys II*, 2 weeks, 2013
 - Gulf of Mexico, *R/V McArthur II*, 2 weeks, 2011
 - Monterey Bay, *R/V Shana Rae*, 1 week, 2010

Ocean Education and Outreach Coordinator

2008 – 2010

National Park Service, Point Reyes National Seashore

- Developed education and outreach products regarding marine protected areas during the California Marine Life Protection Act (MLPA) Initiative.
- Managed science communication projects for the San Francisco Bay Area National Parks.
- Developed youth internship programs and experiential field courses in the aquatic sciences.

Research Assistant

Stanford University, Department of Geological and Environmental Sciences

2005 – 2007

- Used C and N stable isotopes and trace metals to study zooplankton dynamics in the Red Sea.
- Used stable isotopes to study sources of sedimentary organic matter into the Santa Monica Basin over the Late-Pleistocene to Holocene.

PUBLICATIONS

Manuscripts in preparation or in review

1. **Luo JY**, Condon RH, Stock CA, Duarte CM, Cowen RK. Gelatinous zooplankton facilitate carbon export in the global oceans. *Nature Geoscience*, **in prep.**
2. **Luo JY**, Irisson J-O, Sponaugle S, Cowen RK. Trophic drivers of diel vertical migration in a plankton community. *Limnology and Oceanography*, **in prep.**
3. **Luo JY**, Irisson J-O, Sponaugle S, Cowen RK. Fine-scale vertical migration and distribution of zooplankton in the Northern Gulf of Mexico. *Journal of Plankton Research*, **in prep.**
4. Robinson KL, **Luo JY**, Sponaugle S, Guigand C, Cowen RK. A tale of two crowds. *Frontiers in Marine Science*, **in prep.**
5. **Luo JY**, Irisson J-O, Graham B, Guigand C, Sarafraz A, Mader C, Cowen RK. Automated plankton image analysis using convolutional neural networks. *Marine Ecology Progress Series*, **in review.**

Peer-reviewed publications

1. Faillettaz R, Picheral M, **Luo JY**, Guigand C, Cowen RK, Irisson J-O. (2016) Imperfect automatic image classification successfully describes plankton distribution patterns. *Methods in Oceanography*, 15-16:60-77.
2. **Luo JY**, Grassian B, Tang D, Irisson J-O, Greer AT, Guigand CG, and Cowen RK. (2014) Environmental drivers of fine-scale distributions of the gelatinous zooplankton community across a mesoscale front. *Marine Ecology Progress Series*, 510:129-149. doi: 10.3354/meps10908.
3. McClatchie S, Cowen R, Nieto K, Greer A, **Luo JY**, Guigand C, Demer D, Griffith D, and Rudnick D. (2012) Resolution of fine biological structure including small narcomedusae across a front in the Southern California Bight. *Journal of Geophysical Research*, 117, C04020, doi:10.1029/2011JC007565.

INVITED TALKS

1. Dynamics of zooplankton in marine communities and ecosystems: insights from high-resolution imaging and models. University of Colorado - Boulder, 2016
2. Gelatinous zooplankton: fine-scale distributions, trophic drivers, and contribution to global carbon cycling. Oregon State University, Integrative Biology Fall Seminar Series, 2015
3. Imaging Jellyfish in the Oceans. *Sharing the Coast conference*. Oregon Sea Grant. 2015.

CONTRIBUTED TALKS

1. Irisson, JO, Faillettaz R, **Luo JY**, Guigand CM, Cowen RK. Fine Scale distribution of zooplankton over a mesoscale front. *Aquatic Sciences Meeting*, Granada, Spain. 2015.
2. **Luo, JY**, Grassian B, Tang D, Irisson J-O, Greer AT, Guigand CM, McClatchie S, Cowen RK. Environmental drivers of the fine-scale distribution of a gelatinous zooplankton community across a mesoscale front. *International Council for the Exploration of the Seas (ICES) Annual Science Meeting*. A Coruña, Spain. 2014. **Won Best Oral Presentation by an Early Career Scientist
3. **Luo, JY**, Grassian B, Greer AT, Guigand C, Irisson J-O, McClatchie S, Cowen RK. Fine scale distribution of gelatinous zooplankton across a front in the Southern California Bight. 4th *International Jellyfish Blooms Symposium*. Hiroshima, Japan. 2013.
4. Cowen, RK, Guigand CM, Greer AT, **Luo JY**. *In Situ* Ichthyoplankton Imaging System (ISIIS): Design, capabilities and results from case studies. *Larval Fish Conference*. Miami, FL. 2013.
5. Cowen, RK, Guigand CM, Greer AT, **Luo JY**. *In Situ* Ichthyoplankton Imaging System (ISIIS): Design, capabilities and results from four case studies. *Aquatic Sciences Meeting*. New Orleans, LA. 2013.
6. **Luo JY**, Greer AT, Guigand C, McClatchie S, Cowen, RK. The fine scale distribution of siphonophores and a narcomedusae bloom across a front in the Southern California Bight. *Ocean Sciences Meeting*. Salt Lake City, UT. 2012.

POSTERS

1. **Luo JY**, Condon RH, Cowen RK. Gelatinous animals facilitate carbon export in the global oceans. *Ocean Sciences Meeting*. 2016.
2. Robinson, KL, **Luo JY**, Sponaugle S, Guigand C, Cowen RK. A Tale of Two Crowds. *Ocean Sciences Meeting*. 2016.
3. **Luo, JY**, Grassian B, Tang D, Irisson J-O, Greer AT, Guigand CM, McClatchie S, Cowen RK. Environmental drivers of the fine-scale distribution of a gelatinous zooplankton community across a small-scale front. *Ocean Sciences Meeting*. 2014.
4. Faillettaz R, **Luo JY**, Guigand C, Cowen RK, Irisson J-O. Fine-scale distribution of larval fish and zooplankton over a mesoscale front explored through high frequency imaging. *Ocean Sciences Meeting*. 2014.
5. Cowen RK, Guigand C, **Luo JY**, Greer AT, Grassian B. Plankton Portal: an online citizen science project for plankton classification and education. *Ocean Sciences Meeting*. 2014.
6. McClatchie S, Cowen R, Nieto K, Greer A, **Luo JY**, Guigand C, Demer D, Griffith D, and Rudnick D. Resolution of fine biological structure including small narcomedusae across a front in the Southern California Bight. *Ocean Sciences Meeting*. 2012.

7. **Luo J**, Paytan A, Al-Najjar, T. Using Carbon and Nitrogen Stable Isotopes and Trace Metal Concentrations in Zooplankton to Determine Seasonal and Anthropogenic Influences in the Gulf of Aqaba, Red Sea. *AGU Fall Meeting*. 2007.
8. **Luo J**, Paytan A, Al-Najjar, T. Carbon and Nitrogen Stable Isotopes of Zooplankton Tows from the Gulf of Aqaba, Red Sea: Indicators of Anthropogenic Influence? *AGU Fall Meeting*. 2006.
9. **Luo J**, Erohina T, Paytan A. Carbon and Nitrogen Stable Isotopes of Sedimentary Organic Matter from the Santa Monica Basin, Southern California. *Ocean Sciences Meeting*. 2006.
10. **Luo J**, Erohina T, Paytan A. Carbon Stable Isotopes of Sedimentary Organic Matter from the Santa Monica Basin. *AGU Fall Meeting*. 2005.
11. Wong J, Hwang H, **Luo J**, Nekhendzy M, Finsterbach T, Chen C, Patterson, AJ. Preliminary analysis of cardiac structure and function in mice with disruption in the β_2 -adrenergic reception PDZ domain. *Society of Critical Care Medicine*. 2005.
12. **Luo J**, Feliu M, Hwang H, Romer A, Walsh M, Agrawal R, Patterson AJ. Role of the PDZ motif in β_2 -adrenergic receptor signaling. *Undergraduate Research Symposium, Stanford University*. 2004.

GRANTS AND FELLOWSHIPS

(Total: \$820,402)

1. National Science Foundation (NSF) Graduate Research Fellowship. 2010-2015.
2. Robert E. Maytag Fellowship, University of Miami. 2010-2015.
3. Data Science for Social Good: 1st Annual National Data Science Bowl. Prize sponsorship and competition support. Booz Allen Hamilton. 2014-2015.
4. International Council for the Exploration of the Seas (ICES) Annual Science Meeting, Conference Travel and Best Oral Presentation Award. 2014.
5. Partner University Fund, coursework and research support at the University of Pierre and Marie Curie (UPMC), Villefranche-sur-Mer, France. 2013.
6. **Ten** grants funding aquatic sciences education and outreach at Point Reyes National Seashore, National Park Service, 2008 – 2010. (\$310,000)
7. “Assessing Anthropogenic Influences on Phytoplankton Nutrient Dynamics using Zooplankton Tows in the Gulf of Aqaba, Red Sea.” Stanford University McGee grant. 2006.
8. Department of Geological & Environmental Sciences (GES) Research Fellowship, Stanford University. 2005 and 2006.
9. Conference travel grant, Undergraduate Research Program, Stanford University. 2006.
10. “Carbon and Nitrogen Stable Isotopes of Sedimentary Organic Matter from the Santa Monica Basin, Southern California.” Undergraduate Research Program Grant, Stanford Univ. 2005.
11. Program in Human Biology Summer Fellowship, Stanford University. 2004.

PROFESSIONAL ACTIVITIES

Session Chair, *Big Data in Marine Ecology*, Ocean Sciences Meeting, New Orleans LA. 2016.

Steering Committee, 37th Annual Larval Fish Conference, Miami, FL. 2013.

Manuscript and Grant Reviewer for Marine Ecology Progress Series, Scientia Marina, NOAA Bay Watershed Education and Training (B-WET) Program, and NSF Biological Oceanography.

TEACHING EXPERIENCE

Undergraduate Students

- Chase Cobb, Summer REU internship, Oregon State University 2014
- Ben Grassian, Senior Thesis, University of Miami 2012 – 2014
- Jenna Binstein, Senior Thesis, University of Miami 2012 – 2013

Mentorship and Supervision (16 total)

2011 – present

- Interns and research techs, Oregon State University and University of Miami
- Employees and science communication interns, National Park Service

Guest Lectures and Labs

- Plankton ecology and biological oceanography, Oregon State University 2014 – 2016
- Larval fish ecology and identification, University of Miami 2012
- Marine mammal conservation and management, University of Miami 2011

Aquatic & Marine Sciences Field Seminar, Point Reyes National Seashore, CA 2008 - 2010

- Developed and taught five field-seminars of varying lengths (2 weeks intensive, 1 week intensive, 6 week) for high school students on field techniques in the marine and aquatic sciences.

SKILLS AND CERTIFICATIONS

AAUS Science Diver, NAUI advanced open water, EANx

Scientific programming: R, Matlab, git, High Performance Computing, and familiarity with GIS, Python and UNIX environments.

SERVICE & OUTREACH

Plankton Portal

2012 – present

- Co-developed online citizen science website (www.planktonportal.org) through Zooniverse.org for crowd-sourcing plankton image identification. Organized social media outreach, developed blog.

Marine Science Social Media

2012 – present

- Twitter (@jessicayluo)
- Plankton Imaging Facebook Page (www.facebook.com/PlanktonImaging)
- Plankton Portal (Twitter: @PlanktonPortal, Facebook: www.facebook.com/PlanktonPortal, Blog: blog.planktonportal.org)
- National Data Science Bowl (datasciencebowl.com) guest blogger

Professional Development Seminars:

1. Zooniverse Professional Development Symposium, Alder Planetarian, Chicago, IL. August 2013.
2. COASTal Learning Symposium, Hatfield Marine Science Center, Newport, OR. October 2013.

Numerous public articles and newsletters, 2008-2016

Media outreach: Los Angeles Times, The Environmental Monitor, Christian Science Monitor, Corvallis Gazette-Times, local radio stations.