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RESEARCH INTERESTS

I am interested in the physiology, behavior, and distribution of organisms in physically and chemically complex marine ecosystems. Topics include identifying geographic variation in climatic sensitivity of mussel populations on intertidal shores, determining how multiple stressors alter pelagic habitats under present and future conditions, and modeling particle-attached bacteria to understand and forecast patterns of ocean acidification and deoxygenation. I have additional interests in data science, scientific reproducibility, and data visualization within the fields of ecology and oceanography.

EDUCATION

| | |
|------|---|
| 2010 | Ph.D., Biological Sciences, University of South Carolina |
| 2005 | M.A., Ecology and Evolutionary Biology, University of California, Los Angeles |
| 2002 | Fulbright Student, Marine Sciences, University of Auckland, New Zealand |
| 2001 | B.S., Biology, <i>distinction</i> , Duke University |

PROFESSIONAL EXPERIENCE

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|----------------|---|
| 2014 - present | Moore/Sloan Data Science Postdoctoral Fellow , eScience Institute, School of Oceanography, University of Washington |
| 2014 - present | Washington Research Foundation Innovation Postdoctoral Fellow in Data Science , eScience Institute, School of Oceanography, University of Washington |
| 2013 - 2014 | Associate Research Scholar , Program in Atmospheric and Oceanic Sciences, Princeton University |
| 2010 - 2013 | Postdoctoral Research Associate , Program in Atmospheric and Oceanic Sciences, Princeton University |

AWARDS AND FELLOWSHIPS

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|------------------|---|
| 2012 | Best Presentation Award, Symposium on the Effects of Climate Change on the World's Ocean, Yeosu, Korea |
| 2007-2010 | NASA Earth and Space Science Fellowship |
| 2009 | Second Place Presentation, Graduate Student Day, University of South Carolina |
| 2006, 2007, 2008 | Elsie Taber Fellowship, University of South Carolina |
| 2007, 2009 | Graduate School Travel Grant, University of South Carolina |
| 2002-2003 | Fulbright U.S. Student Grant, Institute of International Education, United States Department of State, Bureau of Educational and Cultural Affairs |
| 1999, 2000, 2001 | NSF-REU Fellowships |

PUBLICATIONS

**** (I publish as K. A. S. Mislán) ****

Peer Reviewed (published/in press/accepted)

Mislán, K. A. S., Dunne, J. P., and Sarmiento, J. L. (in press). The fundamental niche of blood-oxygen binding in the pelagic ocean. *Oikos*.

Mislán, K. A. S. (in press). Geographic range. In *Oxford Bibliographies in Ecology*. Ed. David Gibson. New York: Oxford University Press.

Mislán, K. A. S. and Wethey, D. S. (2015). A biophysical basis to patchy mortality during heat waves. *Ecology*, 96:902-907.

Mislán, K. A. S., Stock, C. A., Dunne, J. P., and Sarmiento, J. L. (2014). Group behavior among model bacteria influences particulate carbon remineralization depths. *Journal of Marine Research*, 72:183-218.

Mislán, K. A. S., Helmuth, B., and Wethey, D. S. (2014). Geographical variation in climatic sensitivity of intertidal mussel zonation. *Global Ecology and Biogeography*, 23:744-756.

Stukel, M., **Mislán, K. A. S.**, Décima, M., and Hmelo, L. R. (2014). Detritus in the marine environment. *L&O: eBooks*, pages 49-76.

Bianchi, D., Galbraith, E. D., Carozza, D. A., **Mislán, K. A. S.**, and Stock, C. A. (2013). Intensification of open-ocean oxygen depletion by vertically migrating animals. *Nature Geoscience*, 6:545-548.

Mislán, K. A. S. and Wethey, D. S. (2011). Gridded meteorological data as a resource for mechanistic macroecology in coastal environments. *Ecological Applications*, 21(7):2678-2690.

Mislán, K. A. S., Blanchette, C. A., Broitman, B. R., and Washburn, L. (2011). Spatial variability of emergence, splash, surge, and submergence in wave-exposed rocky-shore ecosystems. *Limnology and Oceanography*, 56(3):857-866.

Wethey, D. S., Brin, L. D., Helmuth, B., and **Mislán, K. A. S.** (2011). Predicting intertidal organism temperatures with modified land surface models. *Ecological Modelling*, 222(19):3568-3576.

Helmuth, B., Broitman, B. R., Yamane, L., Gilman, S. E., Mach, K., **Mislán, K. A. S.**, and Denny, M. W. (2010). Organismal climatology: analyzing environmental variability at scales relevant to physiological stress. *The Journal of Experimental Biology*, 213(6):995-1003.

Mislán, K. A. S., Wethey, D. S., and Helmuth, B. (2009). When to worry about the weather: role of tidal cycle in determining patterns of risk in intertidal ecosystems. *Global Change Biology*, 15(12):3056-3065.

Broitman, B. R., Szathmary, P. L., **Mislán, K. A. S.**, Blanchette, C. A., and Helmuth, B. (2009). Predator-prey interactions under climate change: the importance of habitat vs body temperature. *Oikos*, 118(2):219-224.

Mislán, K. A. S. and Helmuth, B. (2008). Microclimate. In Jørgensen, S. E. and Fath, B. D., editors, *Encyclopedia of Ecology*, volume 3, pages 2389-2393, Oxford. Elsevier.

Mislan, K. A. S. and Babcock, R. C. (2008). Survival and behaviour of juvenile red rock lobster, *Jasus edwardsii*, on rocky reefs with varying predation pressure and habitat complexity. *Marine and Freshwater Research*, 59(3):246-253.

Submitted (drafts available upon request)

Bianchi, D. and **Mislan, K. A. S.** (in review). Global patterns of diel vertical migration times and velocities from acoustic data. *Limnology and Oceanography*.

Mislan, K. A. S., Heer, J. M., and White, E. P. (invited-submitted). Elevating the status of code in ecology. *Trends in Ecology and Evolution*.

Dissertation and Theses

Smith, K. Allison (2010). *Measuring and Forecasting Environmental Conditions from the Perspective of Rocky Intertidal Organisms*. PhD thesis, University of South Carolina.

Smith, K. Allison (2005). *The Influence of Large Predatory Fish on Juvenile Red Rock Lobster, Jasus edwardsii, Behavior and Survival*. Master's thesis, University of California - Los Angeles.

Smith, K. Allison (2001). *Understanding Species Interactions Using Case Studies of Mussels and Algae, Beetles and Fungi, and Crabs and Anemones*. Undergraduate Honors Thesis, Duke University.

CODE RELEASES

NOAH LSM Mussel v2.0 (2015) (<http://dx.doi.org/10.5281/zenodo.13380>)

Microbial Remineralization Model v1.0 (2014) (<http://dx.doi.org/10.5281/zenodo.16145>)

PRESENTATIONS

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| Mar., 2015 | Smith, K. A. , Dunne, J. P., and Sarmiento, J. L. Diversity of blood-oxygen binding traits in the global ocean. Oral Presentation, Symposium on the Effects of Climate Change on the World's Oceans, Santos City, Brazil |
| Jan., 2015 | Smith, K. A. , Stock, C. A., Dunne, J. P., and Sarmiento, J. L. Group behavior of bacteria to produce exoenzymes linked to diffusion in a model of sinking marine particles. Oral Presentation, Marine Microscale Biophysics Conference, Aspen, CO, USA |
| Jan., 2015 | Smith, K. A. , Dunne, J. P., and Sarmiento, J. L. Regional variability in the vertical zonation of P ₅₀ depths in the global ocean. Oral Presentation, Society for Integrative and Comparative Biology, West Palm Beach, FL, USA |
| Jul., 2014 | Smith, K. A. , Dunne, J. P., and Sarmiento, J. L. Predictions of vertical partitions in water column utilization by pelagic species in a changing environment. Poster Presentation, Gordon Research Conference on Ocean Global Change Biology, Waterville Valley, NH, USA |
| Feb., 2014 | Smith, K. A. , Stock, C. A., Dunne, J. P., and Sarmiento, J. L. Group behavior among model bacteria influences particulate carbon remineralization depths. Poster Presentation, AGU/ASLO Ocean Sciences Meeting, Honolulu, HI, USA |

- Aug., 2013 **Smith, K. A.**, Stock, C. A., Dunne, J. P., and Sarmiento, J. L. A role for bacterial group behavior in particle remineralization. Poster Presentation, Trait-based approaches to Ocean Life Workshop, Copenhagen, Denmark
- Feb., 2013 **Smith, K. A.**, Stock, C. A., Dunne, J. P., and Sarmiento, J. L. Modeling bacteria-particle processes in the dark ocean. Oral Presentation, ASLO Aquatic Sciences Meeting, New Orleans, LA, USA
- Jan., 2013 **Smith, K. A.**, Carter, B., Dunne, J. P., and Sarmiento, J. L. Predicting the effect of multiple stressors on respiratory niches in the pelagic ocean over the next century. Oral Presentation, Society of Integrative and Comparative Biology Meeting, San Francisco, CA, USA
- Dec., 2012 **Smith, K. A.**, Changing climate, changing habitats: Predicting the future for marine organisms. Invited Seminar. University of Rhode Island, Kingston, RI, USA
- July, 2012 **Smith, K. A.**, Stock, C. A., Dunne, J. P., and Sarmiento, J. L. An ecophysiological model of particle remineralization in the deep ocean. Poster Presentation. Ocean Carbon & Biogeochemistry Summer Science Workshop, Woods Hole, MA, USA
- May, 2012 **Smith, K. A.**, Dunne, J. P., Carter, B., and Sarmiento, J. L. Predicting future habitat changes above oxygen minimum zones. Oral Presentation. Symposium on the Effects of Climate Change on the World's Oceans, Yeosu, Korea
**Best Presentation Award*
- Feb., 2012 **Smith, K. A.**, Stock, C. A., Dunne, J. P., and Sarmiento, J. L. Attached bacteria flux as a mechanistic control on mesopelagic particle remineralization. Poster Presentation. AGU/ASLO Ocean Sciences Meeting, Salt Lake City, UT, USA
- Feb., 2012 **Smith, K. A.**, Dunne, J. P., and Sarmiento, J. L. Predicting the impact of climate change on habitat size in the mesopelagic zone. Poster Presentation. AGU/ASLO Ocean Sciences Meeting, Salt Lake City, UT, USA
- Nov., 2011 **Smith, K. A.**, Stock, C. A., Dunne, J. P., and Sarmiento, J. L. Quantifying the role of bacterial extracellular enzymes in particle remineralization processes. Poster Presentation. GEOTRACES Data-Model Synergy Workshop on ocean particles their role in the biogeochemical cycle of trace elements & isotopes, Barcelona, Spain
- Oct., 2011 **Smith, K. A.**, Dunne, J. P., and Sarmiento, J. L. Climate change impacts on the mesopelagic habitat area above oxygen minimum zones. Poster Presentation. EUR-OCEANS Conference on ocean deoxygenation and implications for biogeochemical cycles and ecosystems, Toulouse, France

- June, 2011 **Smith, K. A.**, Stock, C. A., Dunne, J. P., and Sarmiento, J. L. Quantifying the role of bacterial extracellular enzymes in particle remineralization processes. Oral Presentation. Advances in Marine Ecosystem Modelling Research Symposium, Plymouth, UK
- Aug., 2010 **Smith, K. A.** Modeling body temperature as a mechanistic explanation for mussel bed limit line positions in the rocky intertidal: A continental scale evaluation. Oral Presentation. Ecological Society of America Meeting, Pittsburgh, PA, USA
- May, 2010 **Smith, K. A.** Modeling temperature and survival of rocky intertidal mussels at upper limits. Poster Presentation. NASA Biodiversity and Ecological Forecasting Team Meeting, Washington D.C., USA
- Dec., 2009 **Smith, K. A.** The ins and outs of modeling mussel body temperature. Invited Oral Presentation. NOAA Geophysical Fluid Dynamics Laboratory, Princeton, NJ, USA
- Nov., 2009 **Smith, K. A.** Diel partitioning of surge and submergence influences intertidal barnacle species distribution patterns. Oral Presentation. Western Society of Naturalists Meeting, Monterey, CA, USA
- Sept., 2009 **Smith, K. A.** The frequency of mussel mortality at upper zonation limits caused by high temperatures. Invited Oral Presentation. Theoretical Ecology Seminar Series, Princeton, NJ, USA
- Aug., 2009 **Smith, K. A.**, Wethey, D., and Helmuth B. A comparison of weather data in a mechanistic model of organism body temperature. Oral Presentation. Ecological Society of America Meeting, Albuquerque, NM, USA
- May, 2009 **Smith, K. A.** Progress towards large-scale analyses of mussel body temperatures. Oral Presentation. NASA Biodiversity and Ecological Forecasting Team Meeting, New York, NY, USA
- May, 2009 **Smith, K. A.** An assessment of the mechanisms determining the upper limits of *Mytilus californianus* beds along 1500 km of the Pacific Coast of North America. Oral Presentation. Benthic Ecology Meeting, Corpus Christi, TX, USA
- Jan., 2009 **Smith, K. A.** An assessment of the mechanisms determining the upper limits of *Mytilus californianus* beds along 1500 km of the Pacific Coast of North America. Oral Presentation. International Temperate Reefs Symposium, Adelaide, Australia
- Nov., 2008 **Smith, K. A.** Splash, Surge, Submerge: A biophysical analysis of ocean influx in the rocky intertidal. Oral Presentation. Western Society of Naturalists Meeting, Vancouver, BC, Canada

- May, 2008 **Smith, K. A.**, Wethey, D. S., and Helmuth, B. Patterns of potential temperature risk during intertidal emergence in different tide regimes. Poster Presentation. NASA Carbon Cycle and Ecosystems Joint Science Workshop. College Park, MD, USA
- April, 2008 **Smith, K. A.**, Wethey, D. S., and Helmuth, B. Patterns of potential temperature risk during intertidal emergence in different tide regimes. Oral Presentation. AGU/ASLO Ocean Sciences Meeting, Orlando, FL, USA
- Nov., 2007 **Smith, K. A.** and Helmuth, B. When mussels die... An assessment of the mechanisms determining the upper limit of *Mytilus californianus* beds along the Pacific Coast of North America. Oral Presentation. Western Society of Naturalists Meeting, Ventura, CA, USA
- Nov., 2006 **Smith, K. A.** Determining patterns of weather risk: Can we extrapolate on a global basis? Oral Presentation. Western Society of Naturalists Meeting, Redmond, WA, USA
- Nov., 2003 **Smith, K. A.** and Babcock, R. C. The effects of marine reserves on juvenile lobster, *Jasus edwardsii*, survival and behaviour. Oral Presentation. Western Society of Naturalists Meeting, Long Beach, CA, USA
- Jan., 2003 **Smith, K. A.** and Babcock, R. C. The effects of marine reserves on juvenile *Jasus edwardsii*, survival. Poster Presentation. International Temperate Reefs Symposium, Christchurch, New Zealand
- Sept., 2002 **Smith, K. A.** and Babcock, R. C. The effects of predators on juvenile *Jasus edwardsii*, foraging and sheltering behavior. Poster Presentation. New Zealand Marine Sciences Society Meeting, Nelson, New Zealand

TEACHING EXPERIENCE

- Spring, 2012 Guest Lecturer *Benthos*; Biological Oceanography; Princeton University
- Spring, 2012 Guest Lecturer *Coastal Ecosystems*; Ocean, Atmosphere and Climate; Princeton University
- Spring, 2011 Guest Lecturer *Coastal Ecosystems*; Ocean, Atmosphere and Climate; Princeton University
- Fall, 2006 Guest Lecturer *Hydrothermal Vents*; Biophysical Ecology; University of South Carolina
- Fall, 2006 Teaching Assistant; Biological Principles; University of South Carolina
- Fall, 2005 Teaching Assistant; Biology of Marine Organisms; University of South Carolina
- Summer, 2004 Teaching Assistant; Evolution, Ecology, and Biodiversity; UCLA
- Spring, 2004 Teaching Assistant; Introduction to Marine Science; UCLA
- Winter, 2004 Teaching Assistant; Invertebrate Zoology; UCLA
- Fall, 2003 Teaching Assistant; Introduction to Marine Science; UCLA
- Spring, 2003 Teaching Assistant; Evolution, Ecology, and Biodiversity; UCLA

STUDENTS MENTORED

- 2012-2013 **Lydia Rudnick**, Senior Thesis, Geosciences Department, Princeton University
Thesis title: Predicting potential geographic distribution of *Siganus luridus* and *Siganus rivulatus*, two invasive fish species in the Mediterranean Sea
- Summer, 2012 **Jeanette Ferrara**, Princeton University Undergraduate, PEI Internship
Project: Environmental barriers during salmon smolt migration to the Pacific Ocean
- Fall, 2011 **Alyson Tockstein**, Museum Anthropology, Columbia University
Reader for Master's Thesis: *Climate change issue-based exhibits at the American Museum of Natural History lead the way in science communication exhibit theory, and design*
- Summer, 2011 **Devika Balachandran**, Princeton University Undergraduate, PEI Internship
Project: Patterns of zooplankton diel vertical migration in the global ocean

WORKSHOPS ATTENDED

- May, 2015 Berkeley Institute for Data Science, Reproducibility Workshop, Berkeley, CA, USA
- Mar., 2015 Effects of Climate Change on the World's Oceans Workshop: Effects of climate change on the biologically-driven ocean carbon pumps, Santos City, Brazil
- July, 2014 Ocean Carbon & Biogeochemistry (OCB) Summer Science Workshop, Woods Hole, MA, USA
- Aug., 2013 Trait-based approaches to Ocean Life Workshop, Copenhagen, Denmark
- July, 2012 Ocean Carbon & Biogeochemistry (OCB) Summer Science Workshop, Woods Hole, MA, USA
- May, 2012 Effects of Climate Change on the World's Oceans Workshop: Climate change projections for marine ecosystems: Best practice, limitations and interpretations, Yeosu, Korea
- May, 2012 Effects of Climate Change on the World's Oceans Workshop: Ocean observation: Strategic framework, Yeosu, Korea
- Nov., 2011 GEOTRACES Data-Model Synergy Workshop: Ocean particles their role in the biogeochemical cycle of trace elements & isotopes, Barcelona, Spain
- May, 2011 OCB Scoping Workshop: Biogeochemical Flux program aligned with the Ocean Observatories Initiative, Woods Hole, MA, USA
- Nov., 2010 SOLAS Mid-Term Strategy Meeting: Air-Sea Gas Fluxes in Eastern Boundary Upwelling System and Oxygen Minimum Zones (OMZs), Lima, Peru
- Oct., 2010 Ecological Dissertations in the Aquatic Sciences (Eco-DAS) Symposia, Honolulu, Hawaii, USA

SERVICE

Helper at Software Carpentry Workshop, University of Washington, Seattle, WA, USA. Assisted students learning to code in R.

Volunteer at the New York City Girls Computer Science and Engineering Conference. 2013. New York City, NY, USA. Assisted with activities and was a panelist.

Volunteer at the Children's Aid Society with the Duke Alumni Association. 2011, 2013. New York City, NY, USA. Mentored underrepresented minorities and encouraged them to pursue higher education and healthier lifestyles.

Created an exhibit on climate change and thermal physiology for students in 7th to 10th grade attending the Young Women's Conference in Science, Mathematics, Technology and Engineering, Princeton University, March, 2013, 2014

Program coordinator for six interns in the Atmospheric and Oceanic Sciences Program, Princeton University. Summer, 2012. Organized activities including orientation, journal clubs, and final presentations

Volunteer docent for Students Engaged in Aquatic Science (SEAS) outreach program. February 2010. Hopkins Middle School, Columbia, SC, USA

Volunteer for the South Carolina and Georgia Regional Competition National Ocean Sciences Bowl. February 2009. Columbia, SC, USA

Gradstudies Student Representative, University of South Carolina. 2006-2007. Columbia, SC, USA

Volunteer for Arbor Day at Belser Arboretum. October 2006. University of South Carolina, Columbia, SC, USA

Volunteer tutor for high school students, Student Action with Farmworkers. 1998-1999. Duke University, Durham, NC, USA

Peer reviews of manuscripts for the scientific journals: *Marine and Freshwater Research*, *Marine Ecology Progress Series*, *PLoS One*, *Deep Sea Research*, *Global Change Biology*, *Integrative and Comparative Biology*, *Marine Biology*

Peer reviews of proposals for the following agencies: United States National Science Foundation (NSF), Chilean National Commission for Scientific and Technological Research (FONDECYT)

ACADEMIC ADVISORS

Curtis Deutsch (postdoctoral advisor)
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Jeffrey Heer (postdoctoral advisor)
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 642 Paul G. Allen Center, Box 352350
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Jorge L. Sarmiento (postdoctoral advisor)
 Atmospheric and Oceanic Sciences Program
 Princeton University
 300 Forrestal Road
 Princeton, NJ 08544

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Brian Helmuth (doctoral co-advisor)
 Marine and Environmental Sciences
 Northeastern University
 430 Nahant Road
 Nahant, MA 01908

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David Wethey (doctoral co-advisor)
 Department of Biological Sciences
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 Columbia, SC 29208

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Russ Babcock (master's advisor)
 Marine and Atmospheric Research
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Richard Forward (undergraduate advisor)
 Duke University Marine Laboratory
 135 Duke Marine Lab Rd.
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Dan Rittschof (honors thesis advisor)
 Duke University Marine Laboratory
 135 Duke Marine Lab Rd.
 Beaufort, NC 28516

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 Phone: (252) 504-7634

PROFESSIONAL MEMBERSHIPS

Association for the Sciences of Limnology and Oceanography (ASLO)
 The Society for Integrative and Comparative Biology (SICB)

TECHNICAL STRENGTHS

Computer Languages/Applications: R, Python, Fortran, Ferret, AWK, html5, D3.js

Instrument Experience: Temperature and Water Level Loggers, Weather Stations, Temperature Controllers, Thermocouples, Topcon Laser Level, Brunton

SCUBA: Scuba Schools International (SSI) Rescue Diver (200+ scientific dives)