Matthew C. Long

Curriculum Vitae

Contact

National Center for Atmospheric Research
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Research interests

Modeling ocean ecosystems and biogeochemistry

Interactions between ocean physics and biology

Global carbon cycle

Ocean tracers and stable isotope biogeochemistry

Impacts of climate change on ecosystems and biogeochemistry

Education

2010 **Ph.D., Oceanography**, Stanford University, Stanford, CA

2000 **M.S., Environmental Engineering**, Tufts University, Medford, MA

1998 **B.S., Environmental Engineering**, Tufts University, Medford, MA

Professional Experience

2018–present **Scientist II**, National Center for Atmospheric Research,
Climate and Global Dynamics Laboratory, Oceanography Section

2014–2018 **Scientist I**, National Center for Atmospheric Research,
Climate and Global Dynamics Laboratory, Oceanography Section

2012–2014 **Project Scientist I**, National Center for Atmospheric Research,
Climate and Global Dynamics Division, Oceanography Section

2010–2012 **Postdoctoral Fellow**, National Center for Atmospheric Research,
Advanced Study Program, Climate and Global Dynamics Division

2005–2010 **Research Assistant**, Stanford University
Developed computer-automated analytical instruments to measure inorganic carbon, alkalinity and pH in seawater. Operated and maintained Finnigan MAT 252 isotope ratio mass spectrometer with Kiel carbonate device and Finnigan MAT Delta+ with Carlo Erba elemental analyzer.

2004–2009 **Teaching Assistant**, Stanford University
Courses: Introduction to Geology,
Stanford at SEA, Coastal Oceanography, Antarctic Marine Geology and Geophysics, Advanced Oceanography, Oceanic Fluid Dynamics. Led Engineers for a Sustainable World course to design an energy-efficient secondary school in Iringa, Tanzania.

2003–2004 **Water Resources Engineer**, Camp Dresser & McKee Inc., Cambridge, MA
Developed hydrologic, hydraulic, and water quality models for management and system optimization of sewer networks and urban rivers.

2003 **Field and Laboratory Technician**, Desert Research Institute, Reno, NV Species diversity surveys of freshwater springs in Mohave National Preserve.
Surface and ground water quality sampling and analysis on the Truckee River.

2000–2002 **High School Physics & Geography Teacher**, US Peace Corps, Tanzania, Ashira Girls Secondary School, Marangu, Tanzania US Peace Corps, Tanzania
Ashira Girls Secondary School, Marangu, Tanzania
Taught topics in physical science, weather and climate, & economic development. Wrote a computer manual and taught computer literacy. Led a student (16 girls) climb of Mt. Kilimanjaro (5,895 m); taught teachers to teach an HIV/AIDS curriculum; co-organized a nationwide review of the national science and math curriculum.

1998–2000 **Teaching Assistant**, Tufts University, Dept of Civil and Env. Engineering Managed environmental engineering teaching laboratory. Taught analytical methods, statistical experimental design, data analysis and interpretation.

1999 **Environmental Analyst**, MA Dept of Public Health,
Bureau of Env. Health Assessment, Epidemiology Unit
Developed a GIS-based environmental exposure-assessment protocol examining the effect of air pollution on the prevalence and distribution of pediatric asthma.

Publications

(*student led; †postdoc led)

Manscripts in preparation

Manuscripts submitted or in revision

1. *Eddebbar, Y., K. Rodgers, **M. C. Long**, and R. Keeling (2018), Volcanic modulation of air-sea heat, carbon and oxygen exchange, *J. Climate*, **in revision**.

2. Ito, T., **M. C. Long**, C. Deutsch, S. Minobe, D. Sun (2018), Mechanisms of low-frequency oxygen variability in the North Pacific. *Global Biogeochem. Cycles*, **in revision**.

3. **Long, M. C.**, P. Gaube, D. J. McGillicuddy, Jr., and F. O. Bryan, (2018) The role of mesoscale eddies in sustaining oceanic production. *Global Biogeochem. Cycles*, **in revision**.

4. Manizza, M., R. F. Keeling, L. Resplandy, S. Mikaloff-Fletcher, C. D. Nevison, J. B. Bent, O. Aumont, S. C. Doney, J. G. John, I. D. Lima, **M. C. Long**, K. B. Rodgers (2018), Testing ocean physical-biogeochemical models at extra-tropical latitudes using measurements of atmospheric potential oxygen (APO) and Ar/N_2 ratio. *J. Geophys. Res.*, **accepted**.

5. **Long, M. C.**, T. Ito, and C. Deutsch (2018), Oxygen projections for the future, in *Ocean deoxygenation: everyone's problem. Causes, impacts, consequences and solutions.*, edited by D. Laffoley and J. Baxter, IUCN, Gland, Switzerland, **in press**.

Published, peer-reviewed articles

1. Lovenduski, N. S., S. G. Yeager, K. Lindsay, and **M. C. Long** (2019), Predicting near-term variability in ocean carbon uptake, *Earth System Dynamics*, *10*(1), 45–57, doi:10.5194/esd-10-45-2019.

2. Resplandy, L., R. F. Keeling, Y. Eddebbar, M. K. Brooks, R. Wang, L. Bopp, **M. C. Long**, J. P. Dunne, W. Koeve, and A. Oschlies (2018), Quantification of ocean heat uptake from changes in atmospheric O_2 and CO_2 composition, *Nature*, *563*(7729), 105–108, doi:10.1038/s41586-018-0651-8.

3. Song, H., **M. C. Long**, P. Gaube, I. Frenger, J. Marshall, and D. J. McGillicuddy (2018), Seasonal variation in the correlation between anomalies of sea level and chlorophyll in the antarctic circumpolar current, *Geophysical Research Letters*, *45*(10), 5011–5019, doi:10.1029/2017GL076246.

4. Resplandy, L., R. Keeling, C. Rödenbeck, B. B. Stephens, S. Khatiwala, K. Rodgers, **M. C. Long**, L. Bopp, and P. Tans (2018), Revision of global carbon fluxes based on a reassessment of oceanic and riverine carbon transport, *Nature Geoscience*, *11*(7), 504–509, doi:10.1038/s41561-018-0151-3.

5. Freeman, N. M., N. S. Lovenduski, D. R. Munro, K. M. Krumhardt, K. Lindsay, **M. C. Long**, and M. Maclennan (2018), The variable and changing Southern Ocean Silicate Front: Insights from the CESM Large Ensemble, *Global Biogeochem. Cycles*, doi:10.1029/2017GB005816.

6. Moore, J. K., W. Fu, F. Primeau, G. L. Britten, K. Lindsay, **M. C. Long**, S. C.Doney, N. Mahowald, F. Hoffman, and J. T. Randerson (2018), Sustained climate warming drives declining marine biological productivity, *Science*, *359*(6380), 1139–1143, doi:10.1126/science.aao6379.

7. Yeager, S. G., G. Danabasoglu, N. Rosenbloom, W. Strand, S. Bates, G. Meehl, A. Karspeck, K. Lindsay, **M. C. Long**, H. Teng, and et al. (2018), Predicting near-term changes in the earth system: A large ensemble of initialized decadal prediction simulations using the community earth system model, *Bull. Amer. Meteor. Soc.*, doi:10.1175/bams-d-17-0098.1.

8. †Harrison, C., **M. C. Long**, N. Lovenduski, and J. K. Moore (2018), Mesoscale effects on carbon export: a global perspective. *Global Biogeochem. Cycles*, doi:10.1002/2017GB005751.

9. Muller-Karger, F. E., et al. (2018), Satellite sensor requirements for monitoring essential biodiversity variables of coastal ecosystems, *Ecological applications*, doi:10.1002/eap.1682.

10. Yang, S., N. Gruber, **M. C. Long**, and M. Vogt (2017), ENSO-driven variability of denitrification and suboxia in the eastern tropical pacific ocean, *Global Biogeochem. Cycles*, *31*(10), 1470–1487, doi:10.1002/2016gb005596.

11. Hamme, R. C., S. R. Emerson, J. P. Severinghaus, **M. C. Long**, and I. Yashayaev (2017), Using noble gas measurements to derive air-sea process information and predict physical gas saturations, *Geophysical Research Letters*, *44*(19), 9901–9909, doi:10.1002/2017gl075123.

12. Stephens, B. B., **M. C. Long**, R. F. Keeling, E. A. Kort, C. Sweeney, and others, The O_2/N_2 Ratio and CO_2 Airborne Southern Ocean (ORCAS) Study (2018), *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMS-D-16-0206.1.

13. *Rohr, T., **M. C. Long**, M. T. Kavanaugh, K. Lindsay, and S. C. Doney (2017), Variability in the mechanisms controlling Southern Ocean phytoplankton bloom phenology in an ocean model and satellite observations, *Global Biogeochem. Cycles*, doi:10.1002/2016GB005615.

14. Ito, T., S. Minobe, **M. C. Long**, and C. Deutsch (2017), Upper Ocean O_2 trends: 1958–2015, *Geophy. Res. Lett.*, doi:10.1002/2017GL073613.

15. *Eddebbar, Y. A., **M. C. Long**, L. Resplandy, C. Rödenbeck, K. B. Rodgers, M. Manizza, and R. F. Keeling (2017), Impacts of enso on air-sea oxygen exchange: observations and mechanisms, *Global Biogeochem. Cycles*, doi:10.1002/2017gb005630.

16. Henson, S., C. Beaulieu, T. Ilyina, J. John, **M. C. Long**, R. Seferian, J. Tjiputra, and J. Sarmiento (2017), Rapid emergence of climate change in environmental drivers of marine ecosystem stress. *Nature Communications*, *8*, doi:10.1038/NCOMMS14682.

17. *Krumhardt, K. M., N. S. Lovenduski, **M. C. Long**, and K. Lindsay (2017), Avoidable impacts of ocean warming on marine primary production: Insights from the CESM ensembles. *Global Biogeochem. Cycles*, **30**, doi:10.1002/2016GB005528.

18. *Asher, E. C., J. W. H. Dacey, M. Stukel, **M. C. Long**, and P. D. Tortell (2016), Processes driving seasonal variability in DMS, DMSP, and DMSO concentrations and turnover in coastal Antarctic waters. *Limnol. Oceanogr.*, doi:10.1002/lno.10379.

19. Lovenduski, N. S., G. A. McKinley, A. R. Fay, K. Lindsay, and **M. C. Long** (2016) Partitioning uncertainty in ocean carbon uptake projections: Internal variability, emission scenario, and model structure. *Global Biogeochem. Cycles*, **30**, 1276–1287, doi:10.1002/2016GB005426.

20. Nevison, C. D.,M. Manizza, R. F. Keeling, B. B. Stephens, J. D. Bent, J. Dunne, T. Ilyina, **M. C. Long**, L. Resplandy, J. Tjiputra, S. Yukimoto (2016), Evaluating CMIP5 ocean biogeochemistry and Southern Ocean carbon uptake using atmospheric potential oxygen: Present-day performance and future projection, *Geophy. Res. Lett.*, **43**, 2077-2085, doi:10.1002/2015GL067584.

21. **Long, M. C.**, C. A. Deutsch, and T. Ito (2016), Finding forced trends in oceanic oxygen. *Global Biogeochem. Cycles*, **30**, 381-397, doi:10.1002/2015GB005310.

22. Bishop, S. P., P. R. Gent, F. O. Bryan, A. F. Thompson, **M. C. Long**, and R. Abernathy (2016), Southern Ocean Overturning Compensation in an Eddy-Resolving Climate Simulation. *J. Phys. Oceanogr.*, **46 (5)**, doi:10.1175/JPO-D-15-0177.1.

23. McKinley, G. A., D. J. Pilcher, A. R. Fay, K. Lindsay, **M. C. Long**, and N. Lovenduski (2016), Timescales for detection of trends in the ocean carbon sink. *Nature*, **530**, 469–472, doi:10.1038/nature16958.

24. Farneti, R., et al. (2015), An assessment of Antarctic Circumpolar Current and Southern Ocean Meridional Overturning Circulation sensitivity during 1958–2007 in a suite of interannual CORE-II simulations. *Ocean Modelling*, doi:10.1016/j.ocemod.2015.07.009.

25. **Long, M. C.**, K. Lindsay, and M. M. Holland (2015), Modeling photosynthesis in sea ice covered waters. *J. Adv. Model. Earth Syst.*, **07 (3)**, 1189–1206, doi:10.1002/2015MS000436.

26. Lovenduski, N. S., **M. C. Long**, and K. Lindsay (2015), Natural variability in the surface ocean carbonate ion concentration. *Biogeosci.*, **12**, 6321–6335, doi:10.5194/bg-12-6321-2015.

27. Ito, T., A. Bracco, C. Deutsch, H. Frenzel, **M. C. Long**, and Y. Takano (2015), Sustained growth of the Southern Ocean carbon storage in a warming climate. *Geophy. Res. Lett.*, **42**, doi:10.1002/2015GL064320.

28. Burd, A. B., S. Frey, A. Cabre, T. Ito, N.M. Levine, C. Lønborg, **M. C. Long**, M. Mauritz, R. Q Thomas, B. Stevens, T. Vanwalleghem, N. Zeng (2015), Terrestrial and marine perspectives on modeling organic matter degradation pathways and controls. *Global Change Biology*, doi:10.1111/gcb.12987.

29. Downes, S. M., et al. (2015), An assessment of Southern Ocean water masses and sea ice during 1988–2007 in a suite of interannual CORE-II simulations. *Ocean Modelling*, doi:10.1016/j.ocemod.2015.07.022.

30. Doney, S. C., L. Bopp, and **M. C. Long** (2014), Historical and future trends in ocean climate and biogeochemistry. *Oceanogr.*, **27 (1)**, 109–119, doi:10.5670/oceanog.2014.14.

31. Lindsay, K., G. Bonan, S. C. Doney, F. Hoffman, D. M. Lawrence, **M. C. Long**, N. Mahowald, J. K. Moore, J. T. Randerson, and P. E. Thornton. (2014), Preindustrial control and 20th Century experiments with the earth system model CESM1-(BGC). *J. Clim.*, **27 (24)**, 8981–9005, doi:10.1175/JCLI-D-12-00565.1.

32. Moore, J. K., K. Lindsay, S. C. Doney, **M. C. Long**, and K. Misumi (2013), Marine ecosystem dynamics and biogeochemical cycling in the community earth system model [CESM1(BGC)]: Comparison of the 1990s with the 2090s under the RCP4.5 and RCP8.5 scenarios. *J. Clim.*, **26 (23)**, 9291–9312, doi:10.1175/JCLI-D-12-00566.1.

33. Lovenduski, N. S., **M. C. Long**, P. R. Gent, and K. Lindsay (2013), Multi-decadal trends in the advection and mixing of natural carbon in the Southern Ocean. *Geophy. Res. Lett.*, **40 (1)**, 139–142, doi:10.1029/2012GL054483.

34. Smith, W. O., S. Tozzi, **M. C. Long**, P. S. Sedwick, G. R. DiTullio, J. A. Peloquin, R. B. Dunbar, D. A. Hutchins, Z. Kolber (2013), Spatial and temporal variations in variable fluorescence in the Ross Sea (Antarctica): Oceanographic correlates and bloom dynamics. *Deep Sea Res.*, **79**, 141–155, doi:10.1016/j.dsr.2013.05.002.

35. Hurrell, J. W., M. M. Holland, P. R. Gent, S. Ghan, J. E. Kay, P. J. Kushner, J.-F. Lamarque, W. G. Large, D. Lawrence, K. Lindsay, W. H. Lipscomb, **M. C. Long**, N. Mahowald, D. R. Marsh, R. B. Neale, P. Rasch, S. Vavrus, M. Vertenstein, D. Bader, W. D. Collins, J. J. Hack, J. Kiehl, S. Marshall (2013), The Community Earth System Model: A framework for collaborative research. *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMS-D-12-00121.1.

36. **Long, M. C.**, K. Lindsay, S. Peacock, J. K. Moore, and S. C. Doney (2013), Twentieth-Century Oceanic Carbon Uptake and Storage in CESM1(BGC). *J. Clim.*, **26 (18)**, 6775–6800, doi:10.1175/JCLI-D-12-00184.1.

37. **Long, M. C.**, L. N. Thomas, and R. B. Dunbar (2012), Control of phytoplankton bloom inception in the Ross Sea, Antarctica, by Ekman restratification. *Global Biogeochem. Cycles*, **26 (1)**, GB1006, doi:10.1029/2010GB003982.

38. Tortell, P. D., **M. C. Long**, C. D. Payne, A.-C. Alderkamp, P. Dutrieux, and K. R. Arrigo (2012), Spatial distribution of pCO_2, $\Delta O_2/Ar$ and dimethylsulfide (DMS) in polynya waters and the sea ice zone of the Amundsen Sea, Antarctica. *Deep Sea Res.*, **71**, 77–93, doi:10.1016/j.dsr2.2012.03.010.

39. Sedwick, P. N., C. M. Marsay, B. M. Sohst, A. M Aguilar-Islas, M. C. Lohan, **M. C. Long**, K. R. Arrigo, R. B. Dunbar, M. A. Saito, W. O. Smith, G. R. DiTullio (2011), Early season depletion of dissolved iron in the Ross Sea polynya: Implications for iron dynamics on the Antarctic continental shelf. *J. Geophys. Res.*, **116**, C12019, doi:10.1029/2010JC006553.

40. Tortell, P. D., C. Guéguen, **M. C. Long**, C. D. Payne, P. Lee, and G. R. DiTullio (2011), Spatial variability and temporal dynamics of surface water pCO_2, $\Delta O_2/Ar$, and dimethylsulfide in the Ross Sea, Antarctic. *Deep Sea Res.*, **58 (3)**, 241–259, doi:10.1016/j.dsr.2010.12.006.

41. Berg, G. M., M. M. Mills, **M. C. Long** and R. Bellerby, V. Strass, N. Savoye, R. Röttgers, P. L. Croot, A. Webb, and K. R. Arrigo (2011), Variation in particulate C and N isotope composition following iron fertilization in two successive phytoplankton communities in the Southern Ocean. *Global Biogeochem. Cycles*, **25**, GB3013, doi:10.1029/2010GB003824.

42. **Long, M. C.**, R. B. Dunbar, P. D. Tortell, W. O. Smith, D. A. Mucciarone, and G. R. DiTullio (2011), Vertical structure, seasonal drawdown, and net community production in the Ross Sea, Antarctica. *J. Geophys. Res.*, **116 (C10029)**, doi:10.1029/2009JC005954.

43. Feng, Y., C.E. Hare, J.M. Rose, S.M. Handy, G.R. DiTullio, P.A. Lee, W.O. Smith Jr., J. Peloquin, S. Tozzi, J. Sun, Y. Zhang, R.B. Dunbar, **M. C. Long**, B. Sohst, M. Lohan, and D.A. Hutchins (2010), Interactive effects of iron, irradiance and CO_2 on Ross Sea phytoplankton. *Deep Sea Res.*, **57**, 368–383, doi:10.1016/j.dsr.2009.10.013.

44. Munro, D. R., R. B. Dunbar, D. A. Mucciarone, K. R. Arrigo, and **M. C. Long** (2010), Stable isotope composition of dissolved inorganic carbon and particulate organic carbon in sea ice from the Ross Sea, Antarctica. *J. Geophys. Res.*, **115 (C9)**, C09005, doi:10.1029/2009JC005661.

45. Tortell, P. D. and **M. C. Long** (2009), Spatial and temporal variability of biogenic gases during the Southern Ocean spring bloom. *Geophy. Res. Lett.*, **36**, L01603, doi:10.1029/2008GL035819.

46. Rose, J. M., Y. Feng, Y., G. R. DiTullio, R. B. Dunbar, C. E. Hare, P. A. Lee, M. Lohan, **M. C. Long**, W. O. Smith Jr., B. Sohst, S. Tozzi, Y. Zhang, and D. A. Hutchins (2009), Synergistic effects of iron and temperature on Antarctic plankton assemblages. *Biogeosci.*, **6 (12)**, 3131–3147, doi:10.5194/bg-6-3131-2009.

47. Arrigo, K. R., G. van Dijken, and **M. C. Long** (2008), Coastal Southern Ocean: A strong anthropogenic CO_2 sink. *Geophys. Res. Lett.*, **35**, L21602, doi:10.1029/2008GL035624.

Non-refereed

1. Fassbender, A. J., J. B. Palter, **M. C. Long**, T. Ito, S. P. Bishop, and M. F. Cronin (2018), Ocean Carbon Hot Spots. A Joint US CLIVAR and OCB Workshop Report, 2018-3, 34 pp., doi:10.5065/D6Z036ZS.

2. **Long, M. C.**, The oceans are gasping for air (2018), editorial, *The Mark News*.

3. DiNezio, P. N., L. Barbero, **M. C. Long**, N. Lovenduski, and C. Deser (2015), Anthropogenic changes in the tropical ocean carbon cycle masked by Pacific Decadal Variability? *US-CLIVAR Variations*, **13 (2)**.

4. Bracco, A., **M. C. Long**, N. M. Levine, R. Q. Thomas, C. Deutsch, and G. A. McKinley (2015), NCAR's Summer Colloquium: Capacity building in Cross-disciplinary Research of Earth System Carbon-climate Connections. *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMS-D-13-00246.1.

5. Thomas, R. Q., G. A. McKinley, and **M. C. Long** (2013), Examining uncertainties in representations of the carbon cycle in Earth system models. *Eos*, **94 (48)**, 460–460, doi:10.1002/2013EO480006.

6. **Long, M. C.** (2010), Upper ocean physical and ecological dynamics in the Ross Sea, Antarctica. Ph.D. thesis, Stanford University.

7. **Long, M. C.** (2007), Climate driving of marine ecosystem changes: a perspective on physical-biological coupling. *IMBER Update, newsletter of Integrated Marine Biogeochemistry and Ecosystem Research*.

Funded proposals

2017–2020 NSF OCE-1737158, *Collaborative Research: Combining Theory and Observations to Constrain Global Ocean Deoxygenation*, T. Ito (GT), C. Deutsch (UW), **M. C. Long** (NCAR).

2017-2020 NSF OCE-1735846, *Collaborative Research: Biogeochemical and physical conditioning of Subantarctic Mode Water in the Southern Ocean*, W. Balch (Bigelow Laboratory), N. Bates (BIOS) P. Morton (Florida State), D. McGillicuddy (WHOI), **M. C. Long** (NCAR).

2017-2020 NSF OCE-1658541, *Collaborative Research: The impact of climate change on the physics and biology of the ocean on scales down to the submesoscale*, K. Richards (UH), F.O. Bryan (NCAR), **M. C. Long** (NCAR), A. Thompson (Caltech).

2015–2017 NSF PLR-1501993, *O_2/N_2 Ratio and CO_2 Airborne Southern Ocean (ORCAS) Study*, B. Stephens (NCAR) and **M. C. Long** (NCAR) ($1.4M).

2014–2017 DOE/SciDAC, DE-SC0012603, *A modular biogeochemical modeling suite for next-generation ocean models*, **M. C. Long** (NCAR), K. Lindsay (NCAR), M. Vertenstein (NCAR), M. Maltrud (LANL), and T. Ringler (LANL) ($1.5M).

2014–2017 DOE/SciDAC, SC0012605, *Southern Ocean Uptake in the MPAS-Ocean Model*, W. G. Large (NCAR), **M. C. Long** (NCAR), G. Danabasoglu (NCAR), T. Ringler (LANL), J. Edwards (NCAR), M. Levy (NCAR) ($1.2M).

2014–2017 NASA 13-TERAQ13-0089, *Multi-scale biophysical dynamics governing ocean phytoplankton community structure*, S. C. Doney (WHOI), D. Glover (WHOI), M. Kavanaugh (WHOI), **M. C. Long** (NCAR) ($0.9M).

2014–2015 NSF Lower Atmospheric Observing Facilities, *O_2/N_2 Ratio and CO_2 Airborne Southern Ocean (ORCAS) Study*, B. Stephens (NCAR) and **M. C. Long** (NCAR) ($20K).

2013–2014 USDA-NIFA, GRANT11362158, *Key uncertainties in the global carbon cycle: Perspectives across terrestrial and ocean ecosystems*, **M. C. Long** (NCAR), N. M. Levine (USC), R. Q. Thomas (VT), G. A. McKinley (U. Wisc.) ($20K).

Mentoring

Postdoctoral researchers supervised

- Jessica Luo (2016–2019)
- Daniel Whitt (2017; currently Project Scientist at NCAR)
- Cheryl Harrison (2015–2017; currently research scientist at CU Boulder)

Ph.D. Dissertation committees

- Yassir Eddebbar (Scripps, Advisor: Ralph Keeling), *Climate Modulations of Air-Sea Oxygen, Carbon, and Heat Exchange*
- Tyler Rohr (MIT/WHOI, Advisor: Scott Doney): *Untangling the controls on Southern Ocean phytoplankton ecosystem dynamics*
- F. Garrett Boudinot (CU Boulder, Advisor: J. Sepulveda): *Changes in marine ecology and nitrogen cycling during during a Cretaceous Ocean Anoxic Event*
- Riley Brady (CU Boulder, Advisor: N. Lovenduski: *TBD*)

Graduate student visitors hosted at NCAR

- Mariela Brooks (Scripps, Advisor: Ralph Keeling, Apr 2018): Analysis of oceanic ^{13}C in CESM and comparison to ocean time series.
- Sean Ridge (Univ. Wisconsin, Advisor: Galen McKinley, May–Aug 2017): Analysis of oceanic carbon-climate feedbacks in the Community Earth System Model (CESM).
- Elizabeth Asher (Univ. British Columbia, Advisor: Philippe Tortell, Sept 2013–Apr 2014): worked on modeling oxidation pathways of dimethyl sulfide in the atmospheric chemistry component of the Community Earth System Model (CESM).

– Simon Yang (ETH, Advisor: Nicolas Gruber, Jun–Jul 2013): added nitrogen isotopes to CESM marine ecosystem model and investigating climate and anthropogenic controls on N cycling.
– Rebecca Asch (Scripps, Advisor: David Checkley, Mar 2013): Phenology of phytoplankton blooms in CESM.

Expeditions

2016	O_2/N_2 Ratio and CO_2 Airborne Southern Ocean Study (ORCAS), NSF/NCAR HIAPER Gulfstream V aircraft, Punta Arenas, Chile, Jan–Feb 2016 https://www.eol.ucar.edu/field_projects/orcas
2006	*R/V Nathaniel B. Palmer*, Ross Sea, Antarctica Controls on Ross Sea Algal Community Structure
2005	*Heron Island Research Station*, Great Barrier Reef, Queensland, Australia Coral calcification/dissolution *in situ* control volume experiment
2005	*R/V Nathaniel B. Palmer*, Ross Sea, Antarctica Controls on Ross Sea Algal Community Structure
2005	*SSV Robert C. Seamans*, Honolulu to Line Islands and return Stanford at SEA teaching cruise, sailed as a teaching assistant
1995 & 1996	Geologic mapping, John Muir Wilderness, Sierra Nevada Mapped small-scale faults and fractures in granitic exposures. Managed backcountry base camp and travel logistics. Wilderness medical technician.

Professional Activities

2018–2020	Member: Ocean Carbon & Biogeochemistry (OCB) Scientific Steering Committee
2018	Member: NOAA Integrated Ecosystem Assessment (www.noaa.gov/iea) Climate Change Working Group
2015	Member: Steering group and writing team for the NASA Ocean Biology and Biogeochemistry Advanced Science Plan and pre-Decadal Survey Report
2012-2015	Member: CLIVAR/OCB Working Group, Oceanic carbon uptake in CMIP5 models
2013	Lead organizer of the 2013 NCAR Advanced Study Program Graduate Student Colloquium: *Carbon-climate connections in the Earth System* http://www2.cgd.ucar.edu/events/asp-colloquium-2013
2010-present	Reviewer: *Biogeosciences*, *J. Climate*, *Climate of the Past*, *J. Geophys. Res.*, *Geophys. Res. Let.*, *Mar. Ecol. Prog. Ser.*, *PLOS One*, *Ocean Sci.*
2006	Antarctic Service Medal
2004-present	Member, American Geophysical Union

Special training

2008 Climate Driving of Marine Ecosystem Changes (CLIMECO), Brest, France
Physical climate system interactions with ocean biogeochemistry and ecosystems.

2008 Numerical Techniques for Global Atmospheric Models,
NCAR Advanced Study Program
Course examining the latest developments in numerical methods for the dynamical cores of atmospheric general circulation models.

2007 Atmospheric Modeling Course, Stanford Engineering
Wrote a global atmospheric circulation model (hydrostatic, dry).

2000 U.S. Peace Corps Math and Science Educator training
3 month course focused on pedagogical theory and classroom management.

Technical skills

Proficient

- CDO, Fortran, LabVIEW, LaTeX, Matlab, NCL, NCO, Python, shell scripting
- Manipulation and analysis of large geophysical datasets, including model output
- Configuring and running geophysical models, including ROMS & CESM

Familiar

- ArcGIS, C, Ferret, IDL, R

24 January 2019