# Kelsey Dyez

Research Lab Specialist
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## Research Interests

Biogeochemistry, Paleoclimate/paleoceanography, Stable Isotope Geochemistry

## Education

2012 Ph.D., Earth and Planetary Sciences **University of California Santa Cruz**, Santa Cruz, CA
Thesis: *Pacific Ocean Pleistocene and Holocene surface temperature variability and implications for climate change*

2006 B.A. *magna cum laude*, Geology **Carleton College**, Northfield, MN
Thesis: *High-resolution* $\delta^{18}O$, $\delta^{13}C$, *and taphonomy records from* Acropora cervicornis *coral and implications for mid-Holocene climate*

## Employment

2018 – Research Lab Specialist, University of Michigan
2017 – 18 Associate Research Scientist, LDEO, Columbia University
2016 – 17 Postdoctoral Research Scientist, LDEO, Columbia University
2014 – 16 Postdoctoral Fellow, LDEO, Columbia University
2014 Visiting Faculty Lecturer, San Francisco State University, Oceanography
2012 – 13 Postdoctoral Fellow, Autonomous University of Barcelona
2006 – 12 Teaching and Research Assistant, Univ. Calif. Santa Cruz

## Research and Field Experience

- Built calibrations for surface ocean pH and $pCO_2$ records from the Pleistocene and Holocene using boron isotopes in planktic foraminifera. Built records of past ocean temperature and salinity records using Mg/Ca ratios and oxygen isotopes.
- Developed mechanistic framework for drivers of climate change, based on geochemical evidence
- Built surface ocean temperature using reconstructions from microfossil geochemistry (Mg/Ca), and organic biomarkers in marine samples
- Ship-based collection of open-ocean and coastal marine samples
- Taught field geology field in Yosemite National Park, Mono Lake, Inyo Mountains.

## Technical Experience

Instrumentation: Experience using and maintaining mass spectrometers (Triton N-TIMS, ThermoScientific MAT253, Micromass Optima and Prism), inductively-coupled plasma spectrometers (Neptune ICP-MS, ICP-OES), Micromill drill for small samples, clean-room and lab bench procedures.

Software: Data analysis, interpretation, and visualization using Microsoft Office, Adobe Suite, MATLAB, ArcGIS, *R* statistical software.

## Research Funding and Awards

2016 Co-PI on Climate and Life Award to host paleo-$pCO_2$ conference ($10,000)
2014 PI on NSF award: Climate Sensitivity to $CO_2$ in the Early Pleistocene ($174,000)
2012 Departmental Graduate Research Fellowship, UC Santa Cruz ($5,000)
2010 Consortium for Ocean Leadership – Schlanger Ocean Drilling Fellow ($28,000)
2010 Outstanding Presentation Award, International Conference on Paleoceanography

2009 CDELSI (Center for Dynamics and Evolution of Land-Sea Interface) Award ($1,500)
2006 CDELSI Research Fellowship ($15,000)
2006 Duncan Stewart Fellow, Carleton College

## Professional Engagement

2018 Invited guest lectures in Paleoclimate Seminar and Instrumental Methods at Univ. of Michigan
2017 Invited speaker at PAGES Warmer Worlds workshop, Lessons from Paleoclimate for a possible 1.5-2ºC warmer world in the future (April, 2017, Bern, Switzerland)
2017 Co-organized Cenozoic paleo-$CO_2$ conference (March, 2017, Palisades, NY)
2016 Chaired American Geophysical Union session: Phanerozoic Temperature and $pCO_2$ at Fall Meeting (San Francisco, CA)
2016 Attended the Professional Development Workshop for NSF Postdoctoral Researchers and teaching workshop with Steven Pollock (Boulder, CO)
2014 – 16 Interviewed NYC Earth Science teacher candidates for Math for America fellowships
2014 – 16 Columbia University Postdoctoral Society, governance body for postdoctoral scientists
2014 Contributed content for Columbia University's Earth Institute blog
2013 Geoscience Leadership Symposium, Washington DC. Attended this weeklong workshop, met with members of Congress to discuss Earth Science issues, met with NSF staff members to discuss future proposals
2012 – Reviewed manuscripts for Paleoceanography and Geology
2012 – Reviewed proposals for NSF Ocean Sciences and Earth Sciences Divisions
2011 Coordinated departmental seminar series, University of California Santa Cruz
2009 Curated sediment samples aboard NSF-funded research vessel in eastern Pacific, 3-week expedition
2008 Coordinated interdepartmental acquisition of laboratory instrumentation ($40,000)
2004 – 12 K-12 outreach: presented guest lectures and activities in public schools, managed outreach program that brought undergraduates into school classrooms

## Teaching Experience

2016 – 18 Classroom lectures in various climate, oceanography, geochemistry, and paleoclimate courses

2014 **Visiting Faculty Lecturer**, San Francisco State University, Earth and Climate Science
Our Dynamic Oceans (145 students, included lab sections)
Taught course, designed lectures, small laboratory sections, counseled students, and supervised teaching assistants. Course was an investigation of the components and operating principles of the ocean system, including ocean basins, currents, nutrient cycling, and climate impacts; emphasis on the process of student-led scientific discovery.

**Teaching Assistant**, Univ. Calif. Santa Cruz, Depts. of Earth Sciences, Ocean Sciences
2011 Marine Geology (24 students)
Led discussion section, guided students in individual preparation of a scientific research proposal. Topics included controls on the types, origin, and distribution of marine sediments; geology of oceanic crust; evolution of continental margins and plate boundaries; paleoceanography.

2011 Oceanography (110 students)
Led 5 small laboratory sections, consisting of hands-on activities to explore the ocean's physical environment including sea-floor bathymetry; ocean currents, waves, tides, changing sea level, beaches, marine resources, pollution, and human impacts.

2010 Ground Water (23 students)
Led 2 laboratory sections, consisting of lab-, field-, and computer-based exercises exploring processes involving water on and near Earth's surface, surface flow and runoff, flooding, meteorology, hydrology, and water quality.

2009 Field Geology (18 students)

Taught field methods and supervised student projects at field camp. Course covered tools and techniques used in geologic fieldwork, including field mapping, stratigraphy, petrology, and structure analysis.

2007 – 08 History of Life (200 students/course)
Led multiple hands-on laboratory sections; topics included major events in the history of life, from the origin of life to evolution and extinctions, paleontology skills and techniques.

2006 **Teaching Assistant**, Carleton College
Environmental Geology (25 students)
Co-led laboratory sections and field trips. Course introduced aspects of the physical environment which affect and are affected by humans including resource management, hazards, local air and water issues, population, land use, and energy.

## Research Articles and Citations

### Publications

**2019**

Khider, D., Emile-Geay, J., McKay, N. P., et al., including **Dyez, K. A.**, (2019) PaCTS 1.0 A Crowdsourced Reporting Standard for Paleoclimate Data. *Paleoceanography and Paleoclimatology*. http://dx.doi.org/10.1029/2019PA003632

**2018**

**Dyez, K. A.**, Hönisch, B., Schmidt, Gavin A. (2018) Early Pleistocene obliquity-scale $pCO_2$ variability at ~1.5 million years ago. *Paleoceanography and Paleoclimatology*. http://dx.doi.org/10.1029/2018PA003349

Fischer, H., Meissner, K. J., Mix, A. C., et al. including **Dyez**, **K**. (2018) Paleoclimate constraints on a future warmer world. *Nature Geoscience*. https://www.nature.com/articles/s41561-018-0146-0

Braun, K., Bar-Matthews, M., Zahn, R., Matthews, A., Avner, A., Cowling, R. M., Karkanas, P., Fisher, E., Zilberman, T., **Dyez, K**., Marean, C. W. (2018) A record of climate and environment between 463 and 41 ka from speleothem stable isotopic compositions at Pinnacle Point on the South African coast. *Quaternary Research*. https://doi.org/10.1017/qua.2018.61

**2017**

Haynes, L., Hönisch, B., **Dyez, K**., Eggins, S., Holland, K., Rosenthal, Y., Fish, C., Subhas, A. Calibration of the B/Ca proxy in the planktic foraminifer *Orbulina universa* to Paleocene seawater conditions (2017) ***Paleoceanography***, 32. http://dx.doi.org/10.1002/2016PA003069

**2016**

**Dyez, K. A.**, Ravelo, A. C., Mix, A. C. (2016) Evaluating drivers of Pleistocene eastern Pacific sea surface temperature. ***Paleoceanography***, 31. http://dx.doi.org/10.1002/2015pa002873

**2014**

**Dyez, K. A.**, Zahn, R., Hall, I. R. (2014) Multi-centennial Agulhas leakage variability and links to North Atlantic climate during the past 80,000 years. ***Paleoceanography***, 29. http://dx.doi.org/10.1002/2014pa002698

**Dyez, K. A.**, Ravelo, A. C., (2014) Dynamical changes in the tropical Pacific warm pool and zonal SST gradient during the Pleistocene. ***Geophysical Research Letters***, 41, 21, 7626-7633. http://dx.doi.org/10.1002/2014gl061639

**Older**

**Dyez, K. A**., Ravelo, A. C., (2013) Late Pleistocene tropical Pacific temperature sensitivity to radiative greenhouse gases. ***Geology***, 41, 1. http://dx.doi.org/10.1130/g33425.1

Schlung, S. A., Ravelo, A. C., Aiello, I. W., Andreasen, D. H., Cook. M. S., **Dyez, K. A**., Guilderson, T. P., LaRiviere, J. P., Stroynowski, Z. (2012) Millenial-scale climate change and intermediate water circulation in the Bering Sea from 90 ka: A high-resolution record from IODP Site U1340. ***Paleoceanography***, 28, 54-57. http://dx.doi.org/10.1029/2012pa002365

Ford, H. L., Schellenberg, S. A., Becker, B. J., Deutschman, D. L., **Dyck, K. A**., Koch, P. L. (2010) Evaluating the skeletal chemistry of *Mytilus californianus* as a temperature proxy: Effects of microenvironment and ontogeny. ***Paleoceanography***, 25. http://dx.doi.org/10.1029/2008pa001677

Presentations and Abstracts

Hönisch, B., Anderson, L., **Dyez, K** (2018) Exploring secular divergence in boron isotope records in planktic foraminifera. American Geophysical Union Fall Meeting. Washington, DC.

**Dyez, K**., Hönisch, B., deMenocal, P. (2017) Warming and surface ocean acidification over the last deglaciation: implications for foraminiferal assemblages. American Geophysical Union Fall Meeting. New Orleans, LA.

Ravelo, C., White, S., **Dyez, K**., Polissar, P., Ford, H. (2017) Extratropical control of tropical Pacific variability from orbital to interannual timescales. Open Science Meeting of PAGES in Zaragoza, Spain.

**Dyez, K. A.**, Hönisch, B., deMenocal, P. (2017) Deglacial surface ocean pH: implications for foraminifer assemblages and the carbon cycle. Postdoctoral Research Symposium, LDEO, Columbia University. Poster presentation.

**Dyez, K. A.** (2017) Paleo-$pCO_2$ in the early Pleistocene and Pliocene. PAGES Warmer Worlds Workshop in Bern, Switzerland. Oral presentation.

**Dyez, K.** (2017) Geologic evidence for Pleistocene temperature and atmospheric carbon variations. CSU Bakersfield. Bakersfield, CA. Oral presentation.

**Dyez, K. A.**, Hönisch, B. (2016) Early Pleistocene $pCO_2$ revisited: Boron-based records of carbon dioxide from Atlantic ODP Site 999. American Geophysical Union Fall Meeting. San Francisco, CA. Poster presentation.

**Dyez, K. A.** (2016) Microfossil $\delta^{11}B$ as a proxy for orbital-scale $pCO_2$ change in the early Pleistocene. Geological Society of America Annual Meeting. Denver, CO. Invited oral presentation.

**Dyez, K. A.**, Hönisch, B. (2015) Climate sensitivity derived from orbital-scale, $\delta^{11}B$-based $pCO_2$ estimates in the early Pleistocene, ~1.5 Ma. American Geophysical Union Fall Meeting. San Francisco, CA. Poster presentation.

**Dyez, K. A.** (2015) Tropical Pacific Ocean surface temperature variability in the Pleistocene. *Lamont-Doherty Earth Observatory*. Palisades, NY. Invited oral presentation.

**Dyez, K. A.** (2015) Can obliquity cycles in paleo-$pCO_2$ be resolved for the early Pleistocene? *Lamont-Doherty Earth Observatory*. Palisades, NY. Invited oral presentation.

**Dyez, K. A.** (2015) Past Ocean and Climate Change. *Columbia University*, for international policy graduate students. Palisades, NY. Invited oral presentation.

**Dyez, K. A**., Zahn, R., Hall, I. R. (2014) Linking Agulhas leakage variability and North Atlantic climate MIS 1-5e. American Geophysical Union Fall Meeting. San Francisco, CA. Poster presentation.

Braun, K., Bar-Matthews, M., Ayalon, A., Marean, CW, Zahn, R., **Dyez, K.,** Matthews, A. (2014) Terrestrial paleoclimate of Southern South Africa and the influence of Southern Hemisphere climate forcing. Climate Change: The Karst Record VII (KR7) Melbourne, Australia.

**Dyez, K. A.**, and Zahn, R. (2013) Records of surface temperature and salinity show Agulhas leakage variability over the past ~80,000 years. International Conference on Paleoceanography 11. Sitges, Spain. Poster presentation.

**Dyez, K. A.** and Zahn, R. (2013) Surface temperature and salinity of the Agulhas Back over the past glacial cycle. Ocean Gateways Past and Present: significance for ocean circulation and terrestrial climates. Jerusalem, Israel. Poster presentation.

**Dyez, K. A.** (2013) A paleoclimate perspective on climate sensitivity. *Universitat Autonoma de Barcelona*. Barcelona, Spain. Invited oral presentation.

**Dyez, K. A.** and Ravelo, A. C. (2012) Constraining tropical climate sensitivity: the need for improved Mg/Ca calibrations, Goldschmidt Conference, Geochemistry Society. Montreal, Canada. Oral presentation.

**Dyck, K. A**., Ravelo, A. C. (2011) Pleistocene tropical Pacific temperature sensitivity to radiative greenhouse gas forcing, American Geophysical Union Fall Meeting. San Francisco, CA. Oral presentation.

**Dyck, K. A.** (2011) Western Pacific warm pool temperature sensitivity to climate change. *for the US Advisory Committee for Scientific Ocean Drilling* (USAC). Washington, DC. Invited oral presentation.

**Dyck, K. A**., Ravelo, A. C., Mix., A. (2010) Tropical Pacific SST Patterns, Controls, and Effects. American Geophysical Union Fall Meeting. San Francisco, CA. Poster presentation.

**Dyck, K. A**. (2010) Glacial-interglacial Sea-Surface Temperature Variability in the Tropical Pacific. *UCSC Graduate Symposium.* Santa Cruz, CA. Invited oral presentation.

**Dyck, K. A**., Ravelo, A. C., Mix, A. (2010) Glacial-interglacial Surface Temperature Variability in the Eastern Tropical Pacific. International Conference on Paleoceanography 10. San Diego, CA. Poster presentation.

**Dyck, K. A**., Ravelo, A. C., Etourneau, J., Blanz, T. (2009) Glacial-interglacial sea-surface temperature (SST) variability in the eastern tropical Pacific: spatial patters from the late Pleistocene to present. American Geophysical Union Fall Meeting. San Francisco, CA. Poster presentation.

**Dyck, K. A**. (2008) Mid-Holocene climate variability and coastal upwelling: geochemical evidence from the California mussel*,* Geological Society of America. Houston, TX. Oral presentation.

**Dyck, K**., Koch, P., Schellenberg, S., Ford, H. (2007) Mid-Holocene climate variability and coastal upwelling: geochemical evidence from *Mytilus californianus*. American Geophysical Union Fall Meeting. San Francisco, CA. Poster presentation.

Greer, L., Jackson, J.E., Guilderson, T.P., Curran, H.A., Patterson, W.P., Mortlock, R.A., **Dyck, K.,** Teneva, L.T., Taggart, J.R., and Taylor, A. (2006) How vulnerable is *Acropora cervicornis* coral to climate change? Lessons from the mid-Holocene. Geological Society of America Annual Meeting.

Jackson, J.E., Greer, L., Guilderson, T.P., Curran, H.A., Patterson, W.P., Mortlock, R.A., **Dyck, K.**, Teneva, L.T. (2006) High resolution dating and taphonomy of an *Acropora cervicornis* reef reveal mid-Holocene reef architecture. Geological Society of America Annual Meeting.