

KATHARINA BILLUPS

Curriculum Vitae

School of Marine Science and Policy
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PROFESSIONAL PREPARATION

1998-2000	Postdoctoral Researcher, Harvard University
1998	Ph.D. Earth Sciences, University of California, Santa Cruz
1993	M. S. Geology, University of California, Davis
1991	B. S. Geology University of California, Davis

APPOINTMENTS

2013 - present	Professor, University of Delaware
2009 - present	Associate Director of the Oceanography Program
2006 - 2013	Associate Professor, University of Delaware
2000 - 2006	Assistant Professor, University of Delaware

HONORS AND AWARDS

2006/07	JOI/USSAC Distinguished Lecturer
2004	AGU Editor's citation for excellence in refereeing
1998	NSF Earth Sciences postdoctoral research fellowship
1998	Dissertation Year Fellowship, Univ. of Calif. Santa Cruz
1996	JOI/USSAC Fellowship
1996	Elected to Sigma Xi
1991/1990	Edward Jackson Scholarship, Univ. of Calif., Davis

PROFESSIONAL MEMBERSHIPS

American Geophysical Union
Geological Society of America
Sigma Xi

INVITED EDITORIALS

Billups, K., Timing is everything during deglaciations, *Nature News and Views*, 522, 163-164, 2015.

Billups, K. Microfossils reveal the working of a water planet, *Geology*, 38, 863-864, 2010.

Billups, K., A Tale of Two Climates, *Nature Geosciences*, 1, 294-295, 2008.
Billups, K., A snow maker for the ice ages, *Nature News and Views*, 433, 809-810, 2005.
Billups, K., Low-down on a rhythmic high, *Nature*, 427, 686-687, 2004.

PUBLICATIONS

*denotes a graduate student in my group

** denotes an undergraduate student in my group

denotes high school student in my group

2019

K. Billups, K., P. Eichler and H. Vital, Sensitivity of benthic foraminifera to carbon flux in the tropical western Pacific Ocean, *Journal of Foraminiferal Research*, accepted.

**Kaiser, E. *Caldwell A., and K. Billups, Subtropical gyre geometry during the mid-Pleistocene climate transition, *Paleoceanography and Paleoclimatology*, 34, <https://doi.org/10.1029/2018PA003502>.

2018

Diester-Haass, L., K. Billups, C. Lear, Investigating Productivity Changes across the mid Pleistocene climate transition, *Earth Science Reviews*, 179, 372-391, 2018.

Billups, K., K. York, L. Bradtmiller, Water column stratification during the mid-Pleistocene climate transition, *Paleoceanography and Paleoclimatology*, 33, <https://doi.org/10.1029/2018PA003327>.

2017

Venti, N*., K. Billups, and T. Herbert, Paleoproductivity in the North Pacific during the Pliocene-Pleistocene climate transition (3.0-1.8 Ma), *Paleoceanography*, 32, 92–103, doi:10.1002/2016PA002955.

2016

Lear, C. H., K. Billups, R. E.M. Rickaby, L. Diester-Haass, E. M. Mawbey, and S. M. Sosdian, Breathing more deeply: Deep ocean carbon storage during the mid-Pleistocene climate transition, *Geology*, doi:10.1130/G38636.1, 2016.

Billups, K., H. Kunz**, I. Rew**, and C. Hudson#, Exploring *Globorotalia truncatulinoides* coiling ratios as a proxy for subtropical gyre dynamics in the northwestern Atlantic Ocean during late Pleistocene Ice Ages, *Paleoceanography*, 31, doi:10.1002/2016PA002927.

2014

Poirier, R. K.*, and K. Billups, The intensification of northern component deepwater formation during the mid-Pleistocene climate transition, *Paleoceanography*, 10.1002/2014PA0026661.

Eichler, P., K. Billups, H. Vital, Tracing thermohaline properties and productivity of shelf water masses with the stable isotopic composition of benthic foraminifera, *Journal of Foraminiferal Research*, 44, 352-364, 2014.

Billups, K., A. Scheinwald*, Origin of millennial-scale climate signals in the subtropical North Atlantic, *Paleoceanography*, 29, 612-627, 2014.

2013

Venti, N*., K. Billups, and T. Herbert, Increased sensitivity of the Plio/Pleistocene northwest Pacific to obliquity forcing, *EPSL*, 384, 121-131, DOI: 10.1016/j.epsl.2013.10.007, 2013.

Diester-Haass, L., Billups, K., Jacquemin, I., Emeis, K. C., Lefebvre, V., and François, L., Paleoproductivity during the middle Miocene carbon isotope events: A data-model approach, *Paleoceanography*, 28, 334-346, 2013.

Venti N.* and K. Billups, Surface Water Hydrography of the Kuroshio Extension during the Plio/Pleistocene climate transition, *Marine Micropaleontology*, 101, 106-114. *Featured article in SedDB*: <http://www.earthchem.org/seddb>

Billups, K., Aufdenkampe, A., R. Hays, Late Miocene through early Pleistocene nutrient utilization and export production in the Antarctic Zone of the Southern Ocean, *Global and Planetary Change*, <http://dx.doi.org/10.1016/j.gloplacha.2012.11.014>.

Kaufman, D., K. Cooper, R. Behl, K. Billups, J. Bright, K. Gardner, P. Hearty, M. Jakobsson, I. Mendes, M. O'Leary, L. Polyak, T. Rasmussen, F. Rosa, M. Schmidt, Amino acid racemization in mono-specific foraminifera from Quaternary in 2 deep-sea sediments, *Quaternary Geochronology*, <http://dx.doi.org/10.1016/j.quageo.2012.07.006>.

2012

Venti, N.*, and Billups K. Stable-isotope stratigraphy of the Pliocene-Pleistocene climate transition in the northwestern subtropical Pacific, *Palaeoecology, Palaeogeography, Palaeoclimatology*, doi: 10.1016/j.palaeo.2012.02.001.

2011

Billups, K., N. Rabideaux**, and J. Stoffel**, Suborbital-Scale Surface and Deep Water Records in the Subtropical North Atlantic: Implications on Thermohaline Overturn, *Quaternary Science Reviews*, 30, 2976-2987, 2011.

Diester-Haass, L., K. Billups, and K. C. Emeis. Enhanced paleoproductivity across the Oligocene/Miocene boundary as evidenced by benthic foraminiferal accumulation rates, *Palaeoecology, Palaeogeography, Palaeoclimatology*, 302, 464-473, 2011.

2010

Voelker, A. H. L. , T. Rodrigues. R. Stein, J. Hefter, K. Billups, D. Oppo, J. McManus, and J. O. Grimalt. Variations in mid-latitude North Atlantic surface water properties during the mid-Brunhes (MIS 9–14) and their implications for the thermohaline circulation, *Climate of the Past*, 6, 531-552, 2010.

Eichler, P., K. Billups, and C. C. Velez Cardona, Investigating Faunal and geochemical methods for tracing salinity in an Atlantic coastal lagoon, Delaware, USA, *Journal of Foraminiferal Research*, 40, 14-33, 2010.

2009

Billups, K., and K. Scheiderich*, A synthesis of Late Oligocene through Miocene deep sea temperatures as inferred from foraminiferal Mg/Ca ratios, *Int. Assoc. Sedimentol Spec. Publ.* 42, 1-16, 2009.

Diester-Haass, L., K. Billups, D. R. Gröcke, L. François, V. Lefebvre, and K. C. Emeis (2009), Mid-Miocene paleoproductivity in the Atlantic Ocean and implications for the global carbon cycle, *Paleoceanography*, 24, PA1209, doi:10.1029/2008PA001605.

2008

Weirauch, D.* , Billups, K. and P. Martin, Evolution of Millennial-Scale Climate Variability During the Mid Pleistocene, *Paleoceanography*, 23, PA3216, doi:10.1029/2007PA001584.

Billups, K., Kelly, C., Pierce, E.** , The Late Miocene to Early Pliocene Climate Transition in the Southern Ocean, *Palaeoecology, Palaeogeography, Palaeoclimatology*, 267, 31-40, 2008.

Lazarus, D., Bittniok, B., Diester-Haass, L., Billups, K., Ogaway, Y., Takahashi, K., Meyers, P., Radiolarian and sedimentologic paleoproductivity proxies in late Pleistocene sediments of the Benguela Upwelling System, ODP Site 1084, *Marine Micropaleontology*, 68, 223-235, 2008.

Waite, A.* , L. Diester-Haass, S. Gibbs, R. Rickaby, and K. Billups, A Top-down and Bottom-up Comparison of paleoproductivity proxies: Calcareous Nannofossil Sr/Ca Ratios and Benthic Foraminiferal Accumulation Rates, *G-Cubed*, 9, doi: 10/1029/2007GC001812, 2008 2008.

2007

Ravelo, A.C., K. Billups, PS. Dekens, T.D. Herbert, and K.T. Lawrence. Onto the Ice Ages: Proxy Evidence for the onset of Northern Hemisphere Glaciation, in *Deep-time perspectives on climate change: marrying the signal from computer models and biological proxies*, M. Williams, A. M. Haywood, J. Gregory and D. Schmidt (eds), The Geological Society of London & The Micropalaeontological Society, (2007).

2006

Diester-Haass, L., K. Billups, and K. C. Emeis, The late Miocene carbon isotope shift and marine biological productivity in the Indo-Pacific Ocean (ODP Sites 721, 1172, 1146, and 846): a (dusty) link? *Paleoceanography*, 21, doi.:10.1029/2006PA001267, 2006.

Billups, K., C. Lindley*, J. Fisler**, and P. Martin, Mid Pleistocene climate instability in the subtropical northwestern Atlantic, *Global Planetary Change*, 54, 251-262, 2006.

Lazarus, D., Bittniok, B., Meyers, P., Diester-Haass, L., and K. Billups, Comparison of radiolarian and sedimentologic Paleoproductivity proxies in the latest Miocene-Recent Benguela Upwelling System, *Marine Micropaleontology*, 60, 269-294, 2006.

2005

Diester-Haass, L., K. Billups, and K. C. Emeis, In search of the late Miocene-early Pliocene „Biogenic Bloom“ in the Atlantic Ocean, (ODP Sites 982, 925, 1088) *Paleoceanography*, 20, 10.1029/2005PA001139.

Niemitz, M. D.** , and K. Billups, Millennial-scale variability in western tropical Atlantic surface ocean hydrography during the early Pliocene, *Marine Micropaleontol.*, 54, 155-166, 2005.

2004

- Billups, K., R. Rickaby, and D. P. Schrag, Cenozoic pelagic Sr/Ca records: Exploring a link to paleoproductivity, *Paleoceanography*, 19, doi:10.1029/2004PA001011, 2004.
- Billups, K., W. Chaisson, M. Worsnopp**, and R. Thunell, Millennial-Scale Fluctuations in Subtropical Northwestern Atlantic Surface Ocean Thermal Stratification, *Paleoceanography*, 19, doi: 10.1029/2003PA000990, 2004.
- Billups, K., H. Paelike, J. Channell, J. Zachos, N. Shackleton, Astronomic Calibration of the Late Oligocene Through Early Miocene Geomagnetic Polarity Time Scale, *EPSL*, 224, 33-44, 2004.
- Rosenthal, Y., S. Perron-Cashman, C. H. Lear, E. Bard, S. Barker, K. Billups, M. Bryan, M. L. Delaney, P. B. deMenocal, G. S. Dwyer, H. Elderfield, C. R. German, M. Greaves, D. W. Lea, T. M. Machiotto, D. K. Pak, A. C. Ravelo, G. L. Paradis, A. D. Russell, R. R. Schneider, K. Scheiderich, L. Stott, K. Tachikawa, E. Tapa, R. Thunell, M. Wara, S. Weldeab, P. A. Wilson, Inter-laboratory comparison study of Mg/Ca and Sr/Ca, measurements in planktonic foraminifera for paleoceanographic research, *Geochemistry, Geophysics, Geosystems*, 5 (4), 10.1029/2003GC000650, 2004.

2003

- Billups, K., and D. P. Schrag, Application of benthic foraminiferal Mg/Ca ratios to questions of early Cenozoic climate change, *Earth and Planetary Science Letters*, 209, 181-195, 2003.
- Channell, J.E.T., S. Galeotti, E.E. Martin, K. Billups, H. Scher, and J.S. Stoner, Eocene to Miocene magnetic, bio- and chemostratigraphy at ODP Site 1090 (subantarctic South Atlantic), *Geological Society of America Bulletin*, 115, 607-623, 2003.

2002

- Billups, K., Late Miocene through early Pliocene deep water circulation and climate change viewed from the subantarctic Southern Ocean, *Palaeoecology, Palaeogeography, Palaeoclimatology*, 185, 287-307, 2002.
- Billups, K., J. Channell, and J. Zachos, Late Oligocene to Early Miocene Geochronology and Paleoceanography From the Subantarctic South Atlantic, *Paleoceanography*, 17 (1), 10.1029/2000PA000568, 2002.
- Billups, K., and D. P. Schrag, Paleotemperatures and Ice-Volume of the Past 27 myr Revisited with Paired Mg/Ca and Stable Isotope Measurements on Benthic Foraminifera, *Paleoceanography*, 17 (1), 10.1029/2000PA000567, 2002.

2001

- Zachos, J., M. Pagani, L. Sloan, E. Thomas, and K. Billups, Trends, rhythms, and aberrations in global climate 65 Ma to present, *Science*, 292, 686-693, 2001.

2000

- Billups, K., and D. P. Schrag, 2000, Surface Ocean Density Gradients during the Last Glacial Maximum, *Paleoceanography*, 15, 110-123.

1999

- Billups, K., A. C. Ravelo and J. C. Zachos, and D. Norris, 1999, Link between oceanic heat transport, thermohaline circulation and the Intertropical Convergence Zone in the early Pliocene Atlantic, *Geology*, 27, 319-322.

1998

Billups, K., A. C. Ravelo and J. C. Zachos, 1998b, Early Pliocene Climate: A Perspective From the Western Equatorial Atlantic Warm Pool, *Paleoceanography*, 13, 459-470.

Billups, K., A. C. Ravelo and J. C. Zachos, 1998a, Early Pliocene Deep Water Circulation in the Western Equatorial Atlantic: Implications for High Latitude Climate Change, *Paleoceanography*, 13, 84-95.

1997

Billups, K., A. C. Ravelo and J. C. Zachos, 1997, Early Pliocene Deep-Water Circulation: Stable Isotope Evidence for Enhanced Northern Component Deep-Water Formation. *Proc. ODP, Sci. Results*, 154, 319-330.

1996

Billups K. and H. J. Spero, 1996, Reconstructing the Stable Isotope Geochemistry and Paleotemperatures of the Equatorial Atlantic During the Last 150,000 years: Results from Individual Foraminifera. *Paleoceanography*, 11, 217-238.

1995

Billups K. and H. J. Spero, 1995, Relationship Between Shell Size, Thickness and Stable Isotopes in Individual Planktonic Foraminifera from Two Equatorial Atlantic Cores. *Journal of Foraminiferal Research*, 25 (1): 24-37.

1991

Hofmeister, A. M. and K. Billups, 1991, Comparison of Infrared Reflectance Spectra of KXF₃ Perovskites. *Spectrochimica Acta* 47a, 1607-1617.

Invited Presentations at Conferences and Workshops

2018

K. Billups, E. A. Kaiser, and A. Caldwell, (2018). North Atlantic upper ocean hydrography during the mid-Pleistocene Transition Katharina Billups, PP23F-1552, Washington, DC 9-14 Dec. (INVITED)

2016

K. Billups, C. H. Lear, R. E.M. Rickaby, L. Diester-Haass, E. M. Mawbey, and S. M. Sostdian, Evidence for increased deep ocean carbon storage during the mid-Pleistocene climate transition, Fall AGU 2016. (INVITED)

2009

Billups, K., and Venti, N. L., (2009). Cenozoic climate change: geochemical proxy records from deep sea sediments, EGU general Assembly, Vienna, EGU2009-5134 (INVITED).

2008

Billups, K. (2008), A Synthesis of Late Miocene Through Pliocene Evolution of Glaciation as Inferred From Deep Sea Geochemical Records, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract C34B-01 (INVITED).

2005

Billups, K., and K. Scheiderich (2005), Paired Mg/Ca and $\delta^{18}\text{O}$ records reveal mid Miocene paleoceanography, Goldschmidt Conference, *Geochimica et Cosmochimica Acta*, 69 (INVITED).

Billups, K., (2005), Late Oligocene through Miocene paleotemperatures, Miocene workshop, Potsdam, Germany (INVITED).

2003

Billups, K., and K. Scheiderich (2003), Cenozoic Ice Volume History Revisited With Paired Mg/Ca And Oxygen Isotope Measurements, *Geophys. Res. Abstracts*, 5, 04425 (INVITED).

2002

Billups, K. and D. P. Schrag (2002), Evaluating the utility of benthic foraminiferal Mg/Ca ratios to questions of early Cenozoic climate change, *Eos Trans. AGU*, 83(47), Spring Meet. Suppl., Abstract GS31A-06 (INVITED).

2001

Billups K. (2001), Glacial Evolution of Antarctica: Evidence from the deep sea record, *Quaderni di geofisica*, 16, 21 (INVITED).

Droxler, A. W., A. V. Belopolsky, K. Billups, E. Vincent (2001), Miocene Carbonate Sequence Stratigraphy Pattern in the Maldives Reconciled with Foraminiferal Oxygen Isotope Records Used as Proxies for Ice Volume Variations, *AAPG Meeting*, Houston, TX, INVITED.

2000

Billups, K., J. Channell, J. Zachos, J. Stoner (2000). Late Oligocene to early Miocene Paleooceanography from the subantarctic Southern Ocean (ODP Leg 177 Site 1090), *EOS*, 81, 743 (INVITED).

Contributed Presentations at Conferences and Workshops

2019

Kaiser, E., L. Bradtmiller, K. Billups, (2019). Southern Ocean Water Column Hydrography during the mid-Brunhes Event, AGU Fall Meeting, San Francisco, PP53C-1464.

Eichler, P, K. Billups, H. Vital, (2019). Sensitivity of benthic foraminiferal species in intermediate and deep waters of the tropical western Pacific Ocean to water mass changes, AGU Fall Meeting, San Francisco, PP51C-1394.

Billups, K., P. Eichler, H. Vital, A.C. Ravelo, (2019), Benthic Foraminifera as Indicative of Austral Summer Monsoon Precipitation and Winter Monsoon Wind-Driven Upwelling, AGU Fall Meeting, San Francisco, PP51C-1389.

2018

Watson, E., K. Billups, D. Kaufman, (2018). Amino Acid Racemization of Planktonic Foraminifera: Testing the Effects of Bleaching Pretreatment, Washington, DC, 9-14 Dec. PP13F-1395

Vizcaíno, M., J. Chiarello, A. Caldwell, and K. Billups, (2018), Reconstructing Upper Ocean Water Column Structure on the Millennial-Scale in the North Atlantic Subtropical Gyre by Using Foraminiferal (*Globorotalia truncatulinoides*) Coiling Directions PP13F-1400, Washington, DC, 9-14 Dec.

Kaiser, W. A. and K. Billups, (2018). Precessional forcing in the Western Equatorial Atlantic during the mid-Pleistocene Transition, PP-23F-1551, Washington, DC, 9-14 Dec.

Kaiser, E., Caldwell, A., Billups, K. (2018), Using Coiling Ratios of Planktonic Foraminifera to Trace Past North Atlantic Surface Currents During the Mid Pleistocene Transition, PC24B-0580 presented at 2018 Ocean Sciences Meeting, Portland, OR, 12-16 Feb.

Kaiser, E., Caldwell, A., Billups, K. (2018), Using coiling ratios of planktonic foraminifera to trace past North Atlantic Surface currents during the Mid Pleistocene Transition, ED21A-06 presented at 2018 Ocean Sciences Meeting, Portland, OR, 12-16 Feb.

2017

Eichler, Patricia, Katharina Billups, Helene Vital, Moab Praxedes Gomes, Exp363 WPWP Scientists, 2017 Foraminiferal tolerance to physical pressure in recent and past sediments of the WPWP (IODP Exp 363), 17^o Congresso Latino-Americano de Ciências do Mar – COLACMAR, 2017.

2016

Rew, I.,*, and K. Billups, Planktonic Foraminifer *Globorotalia truncatulinoides* Coiling Ratio as Recorder of Upper Ocean Conditions in the Subtropical Atlantic Ocean During Marine Isotope Stages 7 and 8, ASLO Abstract PC14A-2057, 2016.

2013

Billups, K., A. Scheinwald and P. Dahl, Origin of millennial-scale climate instabilities in the subtropical Atlantic Ocean, PP21A-1884, Fall Meeting of the AGU, 2013.

Venti, N. L., K. Billups, T. Herbert, North Pacific Origins of Northern Hemisphere Glaciations: The View from the Kuroshio Extension, PP53C-2013, Fall Meeting of the AGU, 2013.

Diester-Haass, L., K. Billups, The mid Pleistocene transition: did marine biological productivity lead to pCO₂ changes? (New project), IODP Colloquium, Freiberg, Germany.

Venti, N. L., Billups, K., Herbert, T. D., North Pacific origins of Northern Hemisphere glaciations, 2nd Pliocene workshop, Bristol (UK), September 9-10, 2013

2012

- Poirier, R. K., K. Billups, The intensification of deep-water mass changes in the deep Atlantic Ocean throughout the Mid-Pleistocene climate transition, PP13B-2107, Fall Meeting of the AGU, 2012.
- Scheinwald, A., K. Billups, Millennial-scale climate instabilities in the subtropical Atlantic during MIS 6 and 7, PP31C-2050, Fall Meeting of the AGU, 2012.
- Eichler, P., K. Billups, H. Vital. Tracing thermohaline properties and productivity of shelf water masses with stable isotopic composition of benthic foraminifera, GC33C-1027, Fall Meeting of the AGU, 2012.

2011

- Billups, K. Origin of millennial-scale climate signals in the subtropical North Atlantic, PP43A-1803, presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Hays, R., A. Aufdenkampe, K. Billups, Southern Ocean Nutrient Utilization And Productivity During The Late Miocene Through Early Pleistocene, PP11B-1788, presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Venti, L., K. Billups; T. Herbert, Subtropical North Pacific sea surface temperatures reconstructed at the orbital timescale during the Plio/Pleistocene climate transition, PP13A-1812, presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Diester-Haass, L., K. Billups, K.-C. Emeis, Marine biological productivity, carbon cycling, and climate cooling during the Oligocene to Miocene transition in the Indo-Pacific Oceans. German IODP Meeting, March 2011.
- Diester-Haass, L., K. Billups, L.Francois, and K.-C. Emeis, Cenozoic carbon isotope shifts and marine biological productivity, EGU Vienna, April 2011,
- Hays, R.L., Aufdenkampe, A. K., and K. Billups. 2011. A Streamlined Method for Determination of $d^{15}N$ of Diatom-bound Organic Matter: Application to the Pliocene Southern Ocean. Abstract for the Geological Society of America Northeastern/North-Central Joint Meeting 2011, Pittsburgh, PA, March 2011.

2010

- Venti, N., K. Billups, and T. Herbert, The Kuroshio Extension during the Pliocene-Pleistocene climate transition: orbital-scale temperature reconstructions from ODP Site 1208, PP13C-1543, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Keating-Bitonti, C., C. Kelly, S. Peters, and K. Billups, Influence of North Atlantic Deep Water on Global Carbon Cycling during the Late Miocene, GSA, 2010.
- Billups, K., D. S. Kaufman, J. Wehmiller, A Test of Amino Acid Racemization Geochronology in MIS 9 Planktic Foraminifera from the Northwestern Atlantic, 10th International Conference on Paleoceanography, San Diego, 2010.
- Diester-Haass, K. Billups, K.-C. Emeis, The Oligocene-Miocene transition: marine biological productivity, $\delta^{13}C$ and climate change. EGU Vienna, 2010.

2009

- Billups, K., L. Diester-Haass; K. Emeis Marine biological productivity and carbon cycling during the Oligocene to Miocene climate transition, PP41A-1495, Fall AGU 2009.
- Venti, N. L., and Billups, K. New records from the subtropical North Pacific over the Pliocene climate transition, PP11D-1345, Fall AGU 2009.

Venti, N. L., and Billups, K., The Kuroshio Extension during the Pliocene climate transition via $\delta^{18}\text{O}$ records from ODP Site 1208, Pliocene workshop, Bordeaux, October 2009.

Diester-Haass, K. Billups, K.-C. Emeis 2009, The Oligocene-Miocene transition: marine biological productivity, $\delta^{13}\text{C}$ and climate change. IODP meeting, March 2009.

2008

Diester-Haass, L, Billups, K., Gröcke, D R., François, L., Lefebvre, V., Emeis, K C. (2008), Mid-Miocene Carbon Isotope Maximum: Marine Versus Terrestrial Carbon Burial, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract PP33A-1525.

2007

Diester-Haass, L., K. Billups, D. Groecke, L. Francois, V. Lefebvre, K.-C. Emeis, Mid-Miocene Paleoproductivity and Implications for the Global Carbon Cycle, IODP Kolloquium der deutschen community (March, 2008).

Louis François, Vincent Lefebvre, Liselotte Diester-Haass, Kay C. Emeis, Katharina Billups, Darren R. Gröcke, Modelling the middle Miocene excursion in the ^{13}C isotopic composition of deep seawater, EGU Vienna, April 2008-01-10

Diester-Haass, L., Billups, K., Roth-Nebelsick A., The Miocene on land and in the oceans. EGU Vienna, April 2008-01-10

Billups, K., Mid Pleistocene climate instability in the subtropical northwestern Atlantic, INQUA-MORSS Workshop on MIS 11, WHOI.

Billups, K., Weirauch, D., Martin, P. Millennial-Scale Climate Variability During the Mid Pleistocene, *Eos Trans. AGU*, 88 (52), Fall Meet. Suppl. Abstract PP41C-0691.

Martin, P., Eshel, G., and Billups, K., Lessons from the Mid-Pleistocene on Orbital-Scale Tropics-Subtropics Phase Locking, *Eos Trans. AGU*, 88 (52), Fall Meet. Suppl. Abstract U43A-0862.

Eichler, P. B. and Billups, K., Tracing Water Masses Along the subtropical South American Coast with the Stable Isotopic Composition of Benthic Foraminifera, *Eos Trans. AGU*, 88 (52), Fall Meet. Suppl. Abstract OS13A-0998.

2006

Bauska, T., Sommerfield, C., Martin, P., Billups K., Sub-millennial Scale Hydrographic Variation on the New Jersey Margin (2006), *Eos Trans. AGU*, 87 (52), Fall Meet. Suppl., Abstract PP23B-1749.

Martin, P., Bauska, T., Billups, K., (2006), Subtropical Atlantic sea surface temperatures during the Mid- Pleistocene: ice volume, temperature change and climate instability, *Eos Trans. AGU*, 87 (52), Fall Meet. Suppl., Abstract PP21E-05.

Diester-Haass, L., K. Emeis, K. Billups, (2006), Paleoproductivity during the mid Miocene climate transition, *Trans. AGU*, 87 (52), Fall Meet. Suppl., Abstract PP21B-1683.

Bittniok, B., Lazarus, D., Diester-Haass, L., Billups, K., Meyers, P., (2006) Radiolarian Indices of Paleoproductivity Variation in the late Pleistocene Benguela Upwelling System, ODP Site 1084, *Eos Trans. AGU*, 87 (52), Fall Meet. Suppl., Abstract PP23C-1779.

Groecke, D., R., Diester-Haass, L., and K. Billups (2006) Organic carbon isotopes through the mid-Miocene: lack of a global signal, *Eos Trans. AGU*, 87 (52), Fall Meet. Suppl. Abstract PP21B-1684.

Eichler, P., K. Billups and P. McLaughlin (2006), Relationship of $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ of foraminiferal tests to bottom-water salinity in an Atlantic Coastal Lagoon, Delaware, GSA Abstracts with Programs, 38, 87-9.

2005

Billups, K., Gibbons, F., and P. Martin, Mid Pleistocene climate stability in the subtropical northwestern Atlantic, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract PP21C-1566, 2005.

Diester-Haass, L., and K. Billups, Investigation of mid Miocene paleoproductivity, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract PP51B-0588, 2005.

Waite, A., L. Diester-Haass, S. Gibbs, R. Rickaby, H. Stoll, and K. Billups, Geochemical support for insolation linked nanofossil productivity changes during the mid-Pliocene, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract PP51B-0586, 2005.

2004

Gibbons, F., P. Martin, J. Fislser, and K. Billups, Millennial-scale climate variability in the subtropical Atlantic during the middle Pleistocene, Eos. Trans. AGU 85 (47), Fall Meet. Suppl., Abstract PP13A-0600, 2004.

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K. Billups and K. Scheiderich, Geochemical evidence for the role of the Indonesian Throughflow in subtropical Indian and Pacific Ocean Paleoclimate, *8th International Conference on Paleoceanography*, Biarritz, France, 2004.

Lindley, C., and K. Billups, Milankovitch cycles. Atlantic heat transport, and the mid Pleistocene climate transition, GSA Abstracts with Programs Vol. 36, No. 2, March 2004.

2003

Billups, K., H. Paelike, J. Channell, J. Zachos, N. Shackleton, Astronomical Calibration of the Late Oligocene Through Early Miocene, Eos. Trans. AGU 84 (46), Fall Meet. Suppl., Abstract U11B-0008, 2003.

- Scheiderich, K., and K. Billups, Mid Miocene paleoceanography at western subtropical Pacific Site 588: Results from paired Mg/Ca and $\delta^{18}\text{O}$ values of benthic foraminifera, *Eos. Trans. AGU* 84 (46), Fall Meet. Suppl., Abstract PP32C-06, 2003.
- Niemitz, M., and Billups, K., Millennial scale variability of thermocline depth in the Early Pliocene: Evidence from the western Equatorial Atlantic Ocean, *Eos. Trans. AGU* 84 (46), Fall Meet. Suppl., Abstract PP21C-1183, 2003.
- Rickaby, R., and K. Billups, Cenozoic pelagic Sr/Ca records: Exploring a link to paleoproductivity, *Eos. Trans. AGU* 84 (46), Fall Meet. Suppl., Abstract PP51B-0929, 2003
- Diester-Haass, L. and K. Billups, A Closer Look at the Late Miocene-Early Pliocene „Biogenic Bloom“ *Eos. Trans. AGU* 84 (46), Fall Meet. Suppl., Abstract PP51B-0923, 2003.
- Petter, A. ; Droxler, A.W. ; Billups, K. ; Vincent, E. Determination of mid/late Miocene ice sheet stability: Reconciling oxygen isotopes and sequence stratigraphy, *Geophys. Res. Abstracts*, 5, 14475, 2003.

2002

- Chaisson, W., K. Billups, and R. Thunell, Millennial-scale variation in upper ocean thermal stratification in the subtropical northwestern Atlantic during MIS 10 and 12, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., Abstract PP71B-0396, 2002. Scheiderich, K., and K. Billups, Neogene Benthic Foraminiferal Mg/Ca Records, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., Abstract PP11A-0297, 2002.
- Billups, K. and D. P. Schrag, Application of Benthic Foraminiferal Mg/Ca Ratios to Questions of Cenozoic Climate Change, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., Abstract PP22B-09, 2002.
- Filippelli, G., Jennifer Latimer, Sharon Kanfoush, David Hodell, Katharina Billups, Jose Flores, Francisco Sierro, Nutrient Cycling and Carbon Burial in the Southern Ocean During the Oligocene and Early Miocene, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., Abstract PP12A-0341, 2002.

2001

- Howell, M W., Miller, J., Schrag, D., Billups, K., Surface Water Variations During Late Pleistocene Sapropel Formation in the Mediterranean Sea: Results of Isotope and Geochemical Analyses
- Channell, J E., Galeotti, S., Martin, E. E., Billups, K., Scher, H. Stoner, J S., Eocene to Miocene Magnetic, Bio- and Chemostratigraphy at ODP Site 1090 (Sub-antarctic South Atlantic), *EOS*, 82 (47), 318, 2001.
- Billups, K., 2001, Enhanced thermohaline circulation during the latest Miocene through early Pliocene: Early response to an emerging Central American Seaway? *7th International Conference on Paleoceanography*, 2001, Sapporo, Japan
- Billups, K., and D. P. Schrag, 2001, Miocene Antarctic ice-volume history revisited with paired Mg/Ca and stable isotope measurements, *EOS*, 82 (20), 220.
- Chaisson, W. P., and K. Billups, 2001, Millennial-scale fluctuations in the position of the Gulf Stream: The Importance of mid-latitude processes to Global Climate Change? *EOS*, 82 (20), 219.

1999

Billups, K. and D.P. Schrag, 1999, Towards a Cenozoic Benthic Foraminiferal Mg/Ca Record, *EOS*, 80 (46), 488.

Billups, K., and J. C. Zachos, 1999, High-resolution late Oligocene to early Miocene deep-water paleoceanography of the Southern Ocean: First results from ODP Leg 177, Site 1090, *EOS*, 80, 183.

1998

Billups, K., A. C. Ravelo and J. C. Zachos, 1998, Early Pliocene Climate: An Equatorial Ocean Warm Pool Perspective. International Conference of Paleoceanography, Lisbon, August, 1998.

1997

Billups, K. and L. C. Sloan, 1997, Latitudinal Position of the Intertropical Convergence Zone as a Function of Polar Ice: A Climate Model Sensitivity Study, Fall AGU, 1997.

Billups, K., A. C. Ravelo and J. C. Zachos, 1997, Evidence for Sustained Northern Component Deep-Water Flux During the Early Pliocene From High Resolution Ceara Rise Benthic Stable Isotope Stratigraphies. *EOS* 78:187.

1996

Billups, K., A. C. Ravelo and J. C. Zachos, 1996, Early Pliocene Sea Surface Hydrography in the Western Equatorial Atlantic (ODP Leg 154): Oxygen Isotope Evidence for Enhanced Cross-Equatorial Heat Transport. *EOS* 77:300.

Billups, K., A. C. Ravelo and J. C. Zachos, 1996, Regional Response of Western Equatorial Atlantic Surface and Deep Water Hydrography to the Final Closure of the Central American Seaway. *GSA Abstracts*, 28 (7).

Billups, K., A. C. Ravelo and J. C. Zachos, 1996, Reconstructing Deep Water Circulation in the Early Pliocene (3.2 Ma -4.7 Ma): Stable Isotope Results. *EOS* 76:305.

1995

Billups, K., A. C. Ravelo and J. C. Zachos, 1995, Reconstructing Deep-Water Circulation in the Early Pliocene (3.2 Ma -4.7 Ma): Stable Isotope Results. *5th International Conference on Paleoceanography*, 1995, Halifax, Canada.

1994

Billups, K. and H. J. Spero, 1994, Reconstruction of the Stable Isotopic Composition of Sea Water and Seasonal Paleotemperatures Using Individual Foraminifera. *EOS* 75:208.

1993

Billups, K. and H. J. Spero, 1993, Glacial and Interglacial Paleotemperatures and the $\delta^{13}\text{C}$ of ΣCO_2 in the Western Equatorial Atlantic: Stable isotope Results from Individual Planktonic Foraminifera. *EOS* 74:183.

Billups, K. and H. J. Spero, 1993, Seasonal paleotemperatures and the $\delta^{13}\text{C}$ of CO_2 of Sea Water in the Western and Eastern Equatorial Atlantic: Results from Individual Planktonic Foraminifera. *PaleoBios*, v.14 no. 4:2.

1992

- Billups, K. and H. J. Spero, 1992, Estimating Absolute Seasonal Sea Surface Paleotemperature Ranges for the Past 20,000 Years from two Equatorial Atlantic Cores. *PaleoBios*, v.14 no. 1:1.
- Billups, K. and H. J. Spero, 1992, Absolute Seasonal Paleotemperatures in the Equatorial Atlantic: Stable Isotope Results from Individual Planktonic Foraminifera. *EOS*, 73:274.
- Billups, K. and H. J. Spero, 1992, Absolute Seasonal Paleotemperatures in the Eastern and Western Equatorial Atlantic: Oxygen Isotope Results. *GEOMAR Report 15/ Berichte Reports*, Geol. Paläont. Inst. Kiel Nr. 57:67.

INVITED SEMINARS

- 2015 Chesapeake Biological Laboratory, *Reconstructing Climate History: The Evolution of Antarctic Glaciation* (November 2015)
- 2014 University of Delaware, *Origin of Millennial-scale Climate variability in the Subtropical Atlantic*
- 2013 Lafayette College, *Exploring the Applicability of benthic foraminiferal Mg/Ca ratios to early Cenozoic Climate Change*
- 2012 University of Pennsylvania, *Exploring the Applicability of benthic foraminiferal Mg/Ca ratios to early Cenozoic Climate Change*
- 2010 Student Presentation: N. Venti, United States Geological Survey, Reston , VA: *The Kuroshio Extension during the Plio-Pleistocene climate transition: benthic foraminifer $\delta^{18}\text{O}$, $\delta^{13}\text{C}$ and lithology at ODP Site 1208.*
- 2009 University of Delaware (Geography Department): *Reconstructing Climate History: The Evolution of Antarctic Glaciation*
- 2007 JOI-USSAC Distinguished Lectures: Florida International University, University of Miami, Colorado College: *Exploring the Applicability of benthic foraminiferal Mg/Ca ratios to early Cenozoic Climate Change*
Columbia University, LDEO: *Millennial-scale climate instabilities during the mid Pleistocene transition*
Rutgers, The State University of New Jersey: *Millennial-scale climate instabilities during the mid Pleistocene transition*
- 2006 JOI-USSAC Distinguished Lectures: Syracuse University, University of Wisconsin, Madison, Indiana State University, Terra Haute, *Exploring the Applicability of benthic foraminiferal Mg/Ca ratios to early Cenozoic Climate Change*
- 2003 Brown University: *Application of benthic foraminiferal Mg/Ca ratios to Cenozoic climate change*
College of William and Mary: *Application of benthic foraminiferal Mg/Ca ratios to Cenozoic climate change*
Department of Geology, University of Delaware: *Application of benthic foraminiferal Mg/Ca ratios to Cenozoic climate change*
- 2002 Rutgers, The State University of New Jersey: *Neogene Sea Level*
University of California, Davis: *Neogene Sea Level*
- 2001 Woods Hole Oceanographic Institution: *Application of benthic foraminiferal Mg/Ca ratios to Cenozoic climate change*
- 2000 Department of Geology, University of Delaware, *Neogene Sea Level*

TEACHING

Graduate Advisees (date graduated)

- 2020 Emily Kaiser, MS current
- 2019 Emily Watson, MS
Amino acid racemization of planktic foraminifera: Pretreatment effects and temperature reconstructions
- Maoli Viscaino, MS
Reconstructing upper ocean water column structure on the millennial-scale in the North Atlantic subtropical gyre using foraminiferal (*Globorotalia truncatulinoides*) coiling ratios
- 2018 Andrew Caldwell, MS
Coiling Direction of the planktic foraminifer *Globorotalia truncatulinoides* as a proxy for reconstructing upper ocean hydrography in the North Atlantic during the mid-Pleistocene climate transition
- 2013 Andre Scheinwald, MS
Millennial-Scale variations in the subtropical Atlantic during MIS 7
- 2013 Robert Poirier, MS
Tracing North Atlantic Deep Water (NADW) influence in the deep subtropical North Atlantic, at orbital and millennial timescales, within the Mid-Pleistocene climate transition
- 2011 Nicholas Venti, PhD
The Role of the Kuroshio Current Extension in the Pliocene/Pleistocene Climate transition
- 2007 Daniel Weirauch, MS
A high resolution record of climate instability spanning ~1.0 million years across the mid-Pleistocene transition.
- 2005 Amanda Waite, MS
Top down and bottom up: A comparison of nannofossil Sr/Ca and benthic foraminiferal accumulation rates as paleoproductivity indicators
- 2004 Kathleen Scheiderich, MS
Multiple uses for paired Mg/Ca and oxygen isotope measurements of foraminiferal calcite: paleoclimatic, paleoceanographic, and tectonic applications
- 2004 Carolyn Lindley, MS

Millennial-scale variability during the Pleistocene: An investigation of climate stability during Marine Isotope Stages 12-16

Undergraduate Honors/Senior Theses

- 2017 Emily Kaiser (Eckard College) Using coiling ratios of *G. Truncatulinoides* to trace changes in North Atlantic upper ocean hydrography across the mid Pleistocene Transition
- 2015 Brian Simmons (Marshall College)
Deep Water Circulation during the Late Pliocene in the Atlantic Basin: Interchange of Antarctic Bottom Water and North Atlantic Deep Water
- 2005 Marianne Dietz
Investigating Sub-Milankovitch Climate Fluctuations in the Mid-Pleistocene (University of Delaware)
- 2004 Janine Fisler
Mid-Pleistocene Sea Surface Temperatures in the Northwestern Subtropical Atlantic (Penn State)
- 2002 Matthew Niemitz
Millennial-Scale Changes of Thermocline Depth in the Early Pliocene: Evidence From the Western Equatorial Atlantic Ocean (College of William and Mary)

Undergraduate Research Advising (Summer Interns)

- 2019 Alexis Bolger, *NSF REU*, University of Florida, Gainesville, FL
- 2018 Josephine Chiarello, *NSF REU*, SUNY Genesco, NY
- 2017 Emily Kaiser, *NSF REU*, Eckard College
- 2016 Catherine Prunella, *NSF REU*, City College, New York
- 2015 Isabelle Rew, *NSF REU*, Oberlin College, Illinois
- 2014 Brian Simmons, *NSF REU*, Marshall College, West Virginia
- 2010 Jared Stoffel, *NSF REU*, University of Dayton, OH
- 2009 Nathan Rabideaux, *NSF REU*, Fort Lewis College, Colorado
- 2008 Jessica Mastermann, *NSF REU*, University of Wisconsin,
- 2007 Gabrielle Munn, *NSF REU*, College of Charleston
- 2006 Thomas Bauska, *NSF REU*, University of Chicago
- 2005 Elizabeth Pierce, *NSF REU*, Williams College
- 2004 Erin King, *NSF REU*, Minnesota State University
- 2004 Marianne Dietz, *Science and Engineering Scholar*, UDEL
- 2003 Janine Fisler, *NSF REU*, Pennsylvania State University

2003 Andrea Kalb, *Science and Engineering Scholar*, UDEL
2002 Madeline Worsnopp, *NSF REU*, University of Rochester
2001 Matthew Niemitz, *NSF REU*, College of William and Mary

High School Student Mentoring

2014 Mason Jones (Fall)
2015 Ryan Carey (Spring), Corbin Hudson (Fall)
2016 Corbin Hudson (Spring and Summer)
2019 Robert Rickenbach

Postdoctoral Researchers

2010 Dr. Rebecca Hays

Courses Taught in the Classroom (F= Fall semester, S= Spring semester)

Semester	Title	Enrollment (4xx/6xx)
Fall 2010	9-GEOG/GEOL/MAST 458/658 <i>Paleoclimatology</i> (co-taught with Veron)	26/6
S 2019	-MAST 315 <i>It's in the Past</i>	9
S 2019	-MAST 382 <i>Intro to Ocean Sciences</i> (co-taught with D. Wozniak)	40
F 2018	-sabbatical	
S 2018	-MAST 382 <i>Intro to Ocean Sciences</i> (co-taught with D. Wozniak)	35
S 2018	-MAST 315 <i>It's in the Past</i>	8
F 2017	-GEOG/GEOL/MAST 458/658 <i>Paleoclimatology</i> (co-taught with O'Neal and Veron)	10/6
	-MAST 853 <i>Oceanography Seminar</i>	16
S 2017	-MAST 315 <i>It's in the Past</i>	10
F 2016	-GEOG 101 <i>Physical Geography</i> -GEOG 111 <i>Climate Processes Laboratory</i> (led by TAs)	70 44
S 2016	-MAST 367 <i>Seminar (It's in the Past)</i> -MAST 852 <i>Isotope Geochemistry</i> (co-taught with Ullman, Sturcio)	16 7
S 2015	-MAST 367 <i>Seminar (It's in the Past)</i>	14
S 2015	-MAST 637 <i>Geological Oceanography</i> (co-taught with Sommerfield, I had 1/3)	10
F 2014	-GEOG/GEOL/MAST 458/658 <i>Paleoclimatology</i> (co-taught with Veron, I had 2/3 of the course)	11/7
S 2014	-MAST 437/637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	20/11
F 2013	-MAST 482 <i>Introduction to Ocean Sciences</i> (co-taught with Hanson)	26
S 2013	-MAST 437/637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	14/12
F 2012	-MAST 482 <i>Introduction to Ocean Sciences</i> (co-taught with Hanson) -GEOG/GEOL/MAST 458/658 <i>Paleoclimatology</i> (co-taught with O'Neal and Veron)	29 11/7
S 2012	-MAST 852 <i>Isotope Geochemistry</i> (co-taught with Ullman) -MAST 437/637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	7 8/9
F 2011	-Sabbatical Leave	
S 2011	-MAST 437/637 <i>Geological Oceanography</i>	5/11
F 2010	-MAST 482 <i>Introduction to Ocean Sciences</i> (co-taught with Ullman) -GEOG 458/658 <i>Paleoclimatology</i> (co taught with O'Neal and Veron)	19 6/8
S 2010	-MAST 437/637 <i>Geological Oceanography</i> (co-taught with Sommerfield) -MAST 853 <i>Oceanography Seminar</i>	5/15 7
F 2009	-MAST 667/857 <i>Paleoceanography</i>	1/3
S 2009	-MAST 637 <i>Geological Oceanography</i> (co-taught with Sommerfield) -MAST 866 <i>Special Problem Time Series Analysis</i>	14 1
S 2008	-MAST 637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	8
F 2007	-MAST 866 <i>Special Problem Isotope Mass Spectrometry</i>	1
S 2007	-MAST 853 <i>Oceanography Seminar</i> -MAST 637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	17 7

F 2006	-MAST 666 <i>Special Problem Mass Spectrometry</i>	1
S 2006	-MAST 637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	8
	-MAST 852 <i>Isotope Geochemistry</i> (co-taught with Ullman and Church)	9
F 2005	-MAST 866 <i>Special Problem Paleoceanography</i>	5
S 2005	-MAST/GEOL 637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	6
F 2004	-MAST 866-007 <i>Special Problem in Mass Spectrometry</i>	1
S 2004	-MAST/GEOL 637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	10
F 2003	-MAST 866-007 <i>Special Problem in Geochemical Analyses</i>	1
	-MAST/GEOL 857 <i>Paleoceanography</i>	6
S 2003	-MAST 866-007 <i>Special Problem in Geochemical Analyses</i>	1
	-MAST/GEOL 637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	7
S 2002	-MAST/GEOL 637 <i>Geological Oceanography</i> (co-taught with Sommerfield)	7
F 2001	-MAST/GEOL 857 <i>Paleoceanography</i>	7
S 2001	-GEOL/MAST 631 <i>Marine Geology</i> , (co-taught with Sommerfield)	7

SERVICE

To the School, College, and University

2019	-Chair, Graduate Curriculum Committee -Member of the Academic Review Committee -NSF REU selectin committee
2018	-Associate Director of the Oceanography Program -P&T committee -NSF REU selection committee
2017	-Associate Director of the Oceanography Program -P&T committee -SMSP search committee for Marine Organic Geochemist -NSF REU selection committee
2016	-Associate Director of the Oceanography Program -SMSP search committee for Marine Organic Geochemist
2015	-Associate Director of the Oceanography Program -SMSP search committee for four positions in coastal/estuarine systems
2014	-Associate Director of the Oceanography Program -SMSP search committee for four positions in coastal/estuarine systems
2013	-Associate Director of the Oceanography Program -Search committee for a Geochemist in the Dept. of Geol. Sciences
2012	-Associate Director of the Oceanography Program -Search committee for a Geochemist in the Dept. of Geol. Sciences
2011	-Associate Director of the Oceanography Program
2010	-Search committee for the new Director of School of Marine Science and Policy
2009	-Associate Director of the Oceanography Program -Faculty Senate (through March)

- 2008
 - Lewes Invitations Seminar Co-Coordinator
 - NSF REU intern selection committee
 - Faculty Senate
- 2007
 - Lewes Invitations Seminar Co-Coordinator
 - Student awards committee
 - NSF REU intern selection committee
 - Faculty Senate
 - Search committee for a Phytoplankton Oceanographer
 - Student awards committee
- 2006
 - NSF REU intern selection committee
 - CMES Website Committee
 - Search committee for a Hydrogeologist
 - Search committee for a Phytoplankton Oceanographer
 - Student awards committee
- 2005
 - NSF REU intern selection committee
 - CMS Futures Committee 2
 - NSF REU intern selection committee
 - Search committee for an administrative position
- 2004
 - Coast Day participant with hands on display of microfossils
 - Coordinator of the Lewes invitational seminar series
- 2003
 - Coordinator of the Lewes invitational seminar series
 - CMS Futures Committee
 - Summer Intern Presentation
- 2002
 - Public Lectures: Ocean Current Seminar, Wilmington, DE
- 2001
 - Public Lectures: Ocean Current Seminar, Lewes, DE

To the Profession

Professional Activities

- 2015
 - Session co-convener, Geological Society of America, Baltimore
- 2013
 - Session co-convener and chair, Fall AGU meeting, San Francisco
- 2011
 - Session co-convener and chair, Fall AGU meeting, San Francisco
 - NSF review panel
- 2010
 - Session co-convener and chair, EGU meeting, Vienna
- 2009
 - Associate Editor, *Paleoceanography*
- 2008
 - Associate Editor, *Paleoceanography*
 - NSF review panel
 - Reviewed a dossier submitted for promotion with tenure
- 2007
 - Associate Editor, *Paleoceanography*
- 2006
 - NSF review panel
 - Associate Editor, *Paleoceanography*
- 2005
 - Session co-convener and chair, Fall AGU 2005

- Nominated to be a USSAC Distinguished Lecturer for 2006-2007
- Contributed a biographical sketch to a special issue of *Oceanography*
- Session co-chair, Goldschmidt Conference, Idaho
- Appointed Associate Editor, *Paleoceanography*
- 2005 -Search Committee for a new Editor, *Paleoceanography*
- 2004 -NSF review panel
- Chronos workshop participant
- Pliocene workshop participant
- 2003 -Session co-convener and chair, Fall AGU
- 2002 -Session co-convener and chair, Spring AGU
- 2001 -ANTOSRTAT workshop participant

Reviewer for

Manuscripts for the following journals:

American Geophysical Union Monograph Series
 Aquatic Geochemistry
 Climates of the Past
 Earth and Planetary Science Letters
 Estuaries and Coasts
 Geobiology
 Geochimica et Cosmochimica Acta
 Geochemistry, Geophysics, Geosystems
 Geology
 Geophysical Research Letters
 Global and Planetary Change
 Indian Journal of Marine Sciences
 Journal of Geophysical Research
 Journal of the Geological Society
 Marine Micropaleontology
 Marine Geology
 Nature
 Nature Geosciences
 Nature Communications
 Ocean Drilling Program Scientific Results
 Palaeoecology, Palaeogeography, Palaeoclimatology
 Paleoceanography
 Quaternary Research
 Quaternary Science Reviews
 Reviews of Geophysics
 Science
 Science Reports

Proposals

for the following US funding agencies

American Association of the Advancement of Science (WISC)
American Chemical Society, Petroleum Research Fund
Hudson River Foundation
International Ocean Drilling Program
National Science Foundation

for the following foreign funding agencies

European Science Foundation/Euroclimate
European Research Council
Eidgenössische Technische Hochschule, Zürich Switzerland
Deutsche Forschungsgemeinschaft
Marsden Fund
NWO Research Council for Earth and Life Sciences, Netherlands
Vernieuwingsimpuls/Innovational Research Incentives Scheme
Fonds québécois de la recherche sur la société et la culture

Text book review

(St. John et al., 2012, *Reconstructing Earth's Climate History*, Wiley-Blackwell)

Promotion and Tenure reviews

(Franklin & Marshall College, 2008; San Francisco State University, 2012; Queen's College, City University of New York, 2015)

To the Public

2000-ongoing: Coast Day participant with hands-on display of microfossils (except in years 2011; 2014, 2015, 2016)

2008-2007

I participated in the "What in the World?" program of the Delaware Business, Industry, and Education Alliance. The program is to expose students to different careers by bringing in an object and explaining how it relates to the work. I talked to students about how we study past climate change bringing a microscope and sediment samples. I gave a total of three presentations at H. O. Brittingham Elementary School (December 2007), Cape Henlopen High School (February 7, 2008), and Mariner Middle School (May 2008).