C U R R I C U L U M V I T A E

Kristopher Karnauskas

Woods Hole Oceanographic Institution
360 Woods Hole Road, M.S. #23
Woods Hole, MA 02543
(508) 289–3320
kk@whoi.edu

Research Interests

My research aims to understand the dynamics of the tropical ocean and atmosphere as a coupled system, its interaction with ecosystems and with higher latitude regions, how and why the climate system has changed in the past, and how climate will continue to change in the future–both naturally and as driven by human activities.

Education

Ph.D. 2007 Atmospheric & Oceanic Science, University of Maryland–College Park
Dissertation: Interannual variability of sea surface temperature in the eastern tropical Pacific Ocean and Central American rainfall
Advisor: Antonio J. Busalacchi

B.S. 2004 Atmospheric & Oceanic Sciences, University of Wisconsin–Madison (Honors)
Senior thesis: Planetary–scale flow features associated with periods of frequent rapid surface cyclolysis in the North Pacific Ocean
Advisor: Jonathan E. Martin

Appointments

Associate Scientist, Geology & Geophysics, Woods Hole Oceanographic Institution, 2013–
Assistant Scientist, Geology & Geophysics, Woods Hole Oceanographic Institution, 2009–
Adjunct Assoc. Res. Scientist, Ocean & Climate Physics, LDEO of Columbia University, 2009–
Lecturer, Department of Earth & Environmental Sciences, Boston College, Fall 2010 & 2011
Postdoctoral Fellow, Ocean & Climate Physics, LDEO of Columbia University, 2008–2009
Research Associate, ESSIC, University of Maryland–College Park, 2007–2008
Graduate Research Assistant, ESSIC, University of Maryland–College Park, 2004–2007
Undergraduate Research Assistant, CIMSS, University of Wisconsin–Madison, 2003–2004

Honors & Awards

Lamont Fellowship, LDEO of Columbia University, 2008–2009
Invited, Physical Oceanography Dissertation Symposium V (PODS V), Honolulu, HI, 2008
AGU Student Travel Grant ($1.5K, NSF), IUGG General Assembly XXIV, Perugia, Italy, 2007
Best Student Seminar, Department of A&OS, University of Maryland, 2006–2007
First in Theme, Graduate Student Interaction Day ($600), University of Maryland, 2007
Citation for Scientific Outreach, University of Maryland, 2005
Meteorological Satellite Applications Award ($500), National Weather Association, 2004
Hilldale Undergraduate Research Fellowship ($5K), University of Wisconsin, 2003–2004

Service & Synergistic Activities (External)

Associate Editor, *Journal of Geophysical Research–Oceans*, 2007–
Contributing Member, U.S. CLIVAR ENSO Diversity Working Group, 2012–
Member, CMIP5 Task Force, MAPP Program, NOAA Climate Program Office, 2011–
Co–Convener, The Response of the Tropical Pacific to Natural and Anthropogenic Forcing, AGU Fall Meeting, 2012
Co–Convener, Marine Regional Integrated Assessments: Observations, Predictions, and Uncertainty, WCRP Open Science Conference, 2011
Co–Chair, Regional Patterns of Global Warming, AGU Fall Meeting, 2010
Manuscript reviewer, *PNAS, J. Clim., Clim. Dyn., Ocn. Dyn., JGR–O./A., GRL, DSR–I/II, CJOL*
Proposal reviewer, NSF, NOAA, NASA, DOE
Panel reviewer, NASA Physical Oceanography
Expert reviewer, IPCC AR5 WG–I
Member, Chapter Affairs Committee, American Meteorological Society, 2006–2009
NOAA Cooperative Institutes Exchange Program (OSU/CIOSS), 2006
Visiting Scientist, NOAA R/V Ka'imimoana (28 days, Pacific Ocean), 2006
Invited, Preparing for an Academic Career in the Geosciences (NSF), 2005
President, UW–Madison Chapter of the American Meteorological Society, 2003–2004
NCAR Undergraduate Leadership Workshop, Boulder, CO, 2003
Member, American Association for the Advancement of Science, 2008–
Member, American Geophysical Union, 2004–
Member, American Meteorological Society, 2001–

Internal Committees

WHOI Scientific Staff Executive Committee (SciSEC), 2013–2015
WHOI Ocean and Climate Change Institute (OCCI) Advisory Committee, 2013–
WHOI HPC Cluster ("Scylla") Advisory Committee, 2011–
WHOI Summer Student/Minority Fellow Selection Committee, 2011–2013
WHOI Climate Initiative (Search) Committee, 2009–2011

Involvement in Education

MIT–WHOI Joint Program (J.P.) Faculty, 2009–
Co–mentor of Postdoctoral Fellow Daniel Griffin, 2013–
Co–advisor of J.P. student Julie Jakoboski, 2013–
Thesis co–advisor of J.P. student Elizabeth Drenkard, 2011–
Thesis committee member of J.P. student Alison Criscitiello, 2011–
Chair of Ph.D. thesis defense of J.P. student Philip Lane, 2011
Informally counsel J.P. students Alice Alpert, Hannah Barkley, and Sara Bosshart
Developed/taught "Climate Variability and Diagnostics" (MIT–WHOI J.P., Spring 2012)
Developed/taught "Climate Change and Society" (Boston College, Fall 2010 & 2011)
Mentor to WHOI Summer Guest Student, 2013
Mentor to WHOI Summer Student Fellow, 2010
Mentor to WHOI Winter Term Intern, Jan. 2012

High school science fair project advisor (3 students to date), 2009–

Grant Support

Impacts of changing climate on Pacific island–based defense installations, DoD Strategic Environmental Research and Development Program (SERDP), $2.5 million, 2013–17.

Repeat observations by gliders in the equatorial region (ROGER), NSF Physical Oceanography, $1.7 million, 2012–16.

An exploration of centennial climate variability in the tropics using coupled climate models and coral geochemistry, WHOI Ocean and Climate Change Institute, $75k, 2011–13.

The American midsummer drought: Causal mechanisms and seasonal–to–interannual predictability, NOAA Climate Program Office, $445k, 2010–13.

Constraining thermal thresholds and projections of temperature stress on Pacific coral reefs over the 21st century: Method refinement and application, NSF Biological Oceanography, $570k, 2010–13.

Examining the effects of Arctic warming on coastal landforms and estuarine ecosystems, WHOI Ocean and Climate Change Institute, $393k, 2010–12.

An orographic conduit for Atlantic forcing of Pacific decadal climate variability, WHOI Ocean and Climate Change Institute, $57k, 2009–11.

Understanding tropical–subtropical forcing and predictability of long–term North American drought in coupled models (CLIVAR DRICOMP), NSF Climate and Large–Scale Dynamics, $30k, 2007–08.

Publications (* student–led)

Manuscripts in preparation

Karnauskas, K.B., E. Mittelstaedt, R. Murtugudde, and D. Oppo (2013) The Plio–Pleistocene transition: An alternative view on Permanent El Niño. Revising for resubmission.

* Newby, P.E., J.P. Donnelly, K.B. Karnauskas, and B.N. Shuman (2013) A North Atlantic driver of centennial Holocene droughts in the U.S. Northeast. Revising for resubmission.

Gierach, M.M., M. Messié, M.-H. Radenac, and K.B. Karnauskas (2013) Equatorial Islands and Biophysical Responses in the Western Equatorial Pacific Ocean during El Niño/La Niña Transitions. In prep.

* Drenkard, E.J., and K.B. Karnauskas (2013) Strengthening of the Equatorial Undercurrent from 1871 to present. In prep.

* Leslie, W., K.B. Karnauskas, and J. Witting (2013) The Equatorial Undercurrent and TAO sampling bias from a decade at SEA. In prep.

Manuscripts submitted, in revision, or in press

Sheffield, J., *et al.* (2013) North American climate in CMIP5 experiments. Part II: Evaluation of historical simulations of intra–seasonal to decadal variability. *J. Climate*, accepted.

Karnauskas, K.B., R. Murtugudde, and W.B. Owens (2013) Climate and the global reach of the Galápagos Archipelago: State of the knowledge. *The Galápagos: A Natural Laboratory for the Earth Sciences*, d'Ozouville et al. (Eds.), Geophys. Monogr. Ser., AGU., accepted.

Karnauskas, K.B., G.C. Johnson, and R. Murtugudde (2013) On the climate impacts of equatorial atolls. *Nature Geoscience*, in revision.

Maloney, E., *et al.* (2013) North American climate in CMIP5 experiments. Part III: Assessment of 21st century projections. *J. Climate*, in revision.

Karnauskas, K.B. (2013) Can we differentiate canonical El Niño from Modoki? *Geophys. Res. Lett.*, in revision.

Karnauskas, K.B. (2013) Arctic forcing of decadal variability in the tropical Pacific Ocean in a high–resolution global coupled GCM. *Climate Dynamics*, in revision.

* Criscitiello, A., S. Das, K.B. Karnauskas, M. Evans, K. Frey, I. Joughin, E. Steig, and J. McConnell (2013) Tropical Pacific influence on source and transport of marine aerosols to West Antarctica. *J. Climate*, in revision.

Karnauskas, K.B. and C.C. Ummenhofer (2013) What drives the Earth's Hadley circulation? *Nature*, under review.

Published, peer–reviewed journal articles

Karnauskas, K.B., A. Giannini, R. Seager, and A.J. Busalacchi, 2013: A simple mechanism for the climatological midsummer drought along the Pacific coast of Central America. *Atmósfera*, **26**(2), 261–281.

Karnauskas, K.B., J.E. Smerdon, R. Seager, and J.F. Gonzalez–Rouco, 2012: A Pacific centennial oscillation predicted by coupled GCMs. *J. Climate*, **25**(17), 5943–5961.

Karnauskas, K.B., and A.L. Cohen, 2012: Equatorial refuge amid tropical warming. *Nature Climate Change*, **2**, 530–534.

Karnauskas, K.B., G.C. Johnson, and R. Murtugudde, 2012: An equatorial ocean bottleneck in global climate models. *J. Climate*, **25**(1), 343–349.

Karnauskas, K.B., R. Murtugudde, and A.J. Busalacchi, 2010: Observing the Galápagos–EUC interaction: Insights and challenges. *J. Phys. Oceanogr.*, **40**(12), 2768–2777.

Cantin, N.E., A.L. Cohen, K.B. Karnauskas, A.M. Tarrant, and D.C. McCorkle, 2010: Ocean warming slows coral growth in the central Red Sea. *Science*, **329**(5989), 322–325.

Karnauskas, K.B., R. Seager, A. Kaplan, Y. Kushnir, and M.A. Cane, 2009: Observed strengthening of the zonal sea surface temperature gradient across the equatorial Pacific Ocean. *J. Climate*, **22**(16), 4316–4321.

Karnauskas, K.B., and A.J. Busalacchi, 2009: The role of SST in the east Pacific warm pool in the interannual variability of Central American rainfall. *J. Climate*, **22**(10), 2605–2623.

Karnauskas, K.B., and A.J. Busalacchi, 2009: Mechanisms for the interannual variability of SST in the east Pacific warm pool. *J. Climate*, **22**(6), 1375–1392.

Karnauskas, K.B., R. Murtugudde, and A.J. Busalacchi, 2008: The effect of the Galápagos Islands on ENSO in forced ocean and hybrid coupled models. *J. Phys. Oceanogr.*, **38**(11), 2519–2534.

Karnauskas, K.B., A.J. Busalacchi, and R. Murtugudde, 2008: Low–frequency variability and remote forcing of gap winds over the east Pacific warm pool. *J. Climate*, **21**(19), 4901–4918.

Karnauskas, K.B., A. Ruiz–Barradas, S. Nigam, and A.J. Busalacchi, 2008: North American droughts in ERA–40 global and NCEP North American regional reanalyses: A Palmer Drought Severity Index perspective. *J. Climate*, **21**(10), 2102–2123.

Karnauskas, K.B., R. Murtugudde, and A.J. Busalacchi, 2007: The effect of the Galápagos Islands on the equatorial Pacific cold tongue. *J. Phys. Oceanogr.*, **37**(5), 1266–1281.

Karnauskas, K.B., 2006: The African meridional OLR contrast as a diagnostic for Atlantic tropical cyclone activity and implications for predictability. *Geophys. Res. Lett.*, **33**(6), L06809.

Invited articles & other reports

Hellmuth, M.E., D.E. Osgood, U. Hess, A. Moorhead, and H. Bhojwani (eds), 2009: Index insurance and climate risk: Prospects for development and disaster management. Climate and Society No. 2. International Research Institute for Climate and Society (IRI), Columbia University, New York, USA. (Contributing author)

Osgood, D., A. Giannini, J. Hansen, E. Holthaus, A. Ines, Y. Kaheil, K. Karnauskas, M. McLaurin, A. Robertson, K. Shirley, and M. Vicarelli, 2009: Designing index–based weather insurance for farmers in Central America, Final report to the Commodity Risk Management Group, ARD, World Bank. Tech. Rep. No. 09–01. International Research Institute for Climate and Society, Palisades, NY, USA, 79 pp.

Karnauskas, K.B., R. Seager, A. Kaplan, Y. Kushnir, and M.A. Cane, 2009: The response of the equatorial Pacific Ocean to global warming. Preprints, *AMS 89th Annual Meeting*, Phoenix, AZ, 8B.3.

Karnauskas, K.B., Murtugudde, R., and A.J. Busalacchi, 2008: The effect of the Galápagos Islands on ENSO. *Bull. Amer. Meteor. Soc.–Nowcast/Papers of Note*, **89**(7), 966–967.

Karnauskas, K.B., Murtugudde, R., and A.J. Busalacchi, 2007: Impact of the Galápagos Islands on the equatorial Pacific. *Bull. Amer. Meteor. Soc.–Nowcast/Papers of Note*, **88**(3), 302–303.

Karnauskas, K.B., 2006: Improved modeling of SST in the Pacific cold tongue: Implications for the NCEP GODAS and CFS. *NOAA/NWS Science and Technology Infusion Climate Bulletin*. July, 2006.

Seminars & Conference Proceedings (* student–led)

Invited talks (excluding primary home institution at the time)

They Hadley circulation: Dynamics, asymmetry, and CMIP5 projections. *Symposium on Climate Change: Recent Discoveries and Future Challenges Symposium, LDEO of Columbia University*, Palisades, NY. May 21–23, 2013.

La canícula (midsummer drought): Underlying mechanisms, interannual variability, and forced response. *AGU Meeting of the Americas*, Cancun, Mexico. May 14–17, 2013.

The ocean's role in centennial tropical climate variability and change. *LDEO of Columbia University*, Palisades, NY. Feb. 27, 2012.

A dynamical mechanism for ocean ecosystem refuge amidst tropical warming. *PAOC/EAPS, Massachusetts Institute of Technology*, Cambridge, MA. Dec. 7, 2011.

Climate dynamics and change in the equatorial Pacific with implications for marine ecosystems. *Earth & Environmental Sciences, Boston College*, Chestnut Hill, MA. Sep. 28, 2011.

Tropical Pacific Ocean mean circulation: A model–data intercomparison and implications for climate change projections. *AGU Fall Meeting*, San Francisco, CA. Dec. 13–18, 2010.

Observed and simulated response of the equatorial Pacific to global warming. *Meteorology and Physical Oceanography, RSMAS, University of Miami*, Miami, FL. May 15, 2009.
Dynamics of the equatorial Pacific: From the Galápagos to global warming. *Geology & Geophysics, Woods Hole Oceanographic Institution*, Woods Hole, MA. Apr. 29, 2009.
The effect of the Galápagos Islands on the mean state of the equatorial Pacific Ocean and ENSO dynamics. *PODS V Symposium*, Honolulu, HI. Oct. 6, 2008.
The tropical Pacific: Interesting aspects of variability, and key questions with respect to long–term N. American drought. *LDEO of Columbia University*, Palisades, NY. Feb. 8, 2007.
Interannual variability of SST and chlorophyll in the east Pacific warm pool: High–resolution satellite observations. *CIOSS, Oregon State University*, Corvallis, OR. Sep. 25, 2006.

Contributed talks

Persistent multidecadal variability in ocean climate recorded in the skeletal bands of tropical corals (Anne Cohen). *11th Int'l. Conf. on Paleocn.*, Barcelona, Spain. Sep. 1–6, 2013.
Can we differentiate canonical El Niño from Modoki? *Physical Oceanography, Woods Hole Oceanographic Institution*, Woods Hole, MA. Mar. 19, 2013.
El Niño typology and trends: Insight from three decades of weekly SST observations. *U.S. CLIVAR ENSO Diversity Workshop*, Boulder, CO. Feb. 6–8, 2013.
The American Midsummer Drought in CMIP5: Multi–Model Evaluation and Projections. *AGU Fall Meeting*, San Francisco, CA. Dec. 3–7, 2012.
The American Midsummer Drought in CMIP5: Multi–Model Evaluation and Projections. *NOAA Climate Program Office MAPP Webinar*. Nov. 13, 2012.
Simulated patterns of unforced centennial–scale climate variability in the tropical Pacific (Jason Smerdon). *AGU Fall Meeting*, San Francisco, CA. Dec. 5–9, 2011.
Climate dynamics and change in the equatorial Pacific: Implications for marine ecosystems. *Biology, Woods Hole Oceanographic Institution*, Woods Hole, MA. Oct. 13, 2011.
Observations of Galápagos Archipelago–EUC interaction: The current state–of–our knowledge. *AGU Ocean Sciences Meeting*, Portland, OR. Feb. 22–26, 2010.
Anthropogenic climate change in the equatorial Pacific. *Earth System Science Interdisciplinary Center, University of Maryland*, College Park, MD. Oct. 19, 2009.
Revisiting the EUC–Galápagos interaction: Observations and paleo implications. *Climate and Global Dynamics, NCAR*, Boulder, CO. Oct. 12, 2009.
The Galápagos Islands and the EUC: Time for a reality check? *Physical Oceanography, Woods Hole Oceanographic Institution*, Woods Hole, MA. Sep. 8, 2009.
The response of the equatorial Pacific Ocean to global warming. *AGU Fall Meeting*, San Francisco, CA. Dec. 15–19, 2008.
The effect of the Galápagos Islands on the mean state and ENSO dynamics. *Integrative Grad. Edu. and Res. Training (IGERT), Columbia University*, New York, NY. Feb. 5, 2008.
Interannual variability of SST in the east Pacific warm pool. *International Union of Geodesy and Geophysics (IUGG)*, Perugia, Italy. Jul. 2–13, 2007.
Low–frequency variability and remote forcing of gap winds in the eastern tropical Pacific. *International Union of Geodesy and Geophysics (IUGG)*, Perugia, Italy. Jul. 2–13, 2007.
The effect of the Galápagos Islands on the Pacific cold tongue and ENSO. *International Union of Geodesy and Geophysics (IUGG)*, Perugia, Italy. Jul. 2–13, 2007.

The incredible shrinking Iguana: Impact of Galápagos (Raghu Murtugudde). *AGU Joint Assembly*, Acapulco, Mexico. May 22–25, 2007.

Improvements to the equatorial Pacific cold tongue region in an OGCM: Possible implications for the NCEP GODAS/CFS. *NOAA NCEP/EMC*, Camp Springs, MD. Jun. 20, 2006.

Plans for the GOES–R series and comparing the Advanced Baseline Imager to that on METEOSAT–8 (James Gurka). *European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Meteorological Satellite Conference*, Prague, Czech Republic. May 31–Jun. 4, 2004.

Posters

* Strengthening of the Equatorial Undercurrent from 1871 to present (Elizabeth Drenkard). *AGU Fall Meeting*, San Francisco, CA. Dec. 3–7, 2012.

The Pliocene–Pleistocene Transition: An Alternative View on "Permanent El Niño" (Eric Mittelstaedt). *AGU Fall Meeting*, San Francisco, CA. Dec. 3–7, 2012.

* Tropical Pacific influence on source and transport of marine aerosols to West Antarctica (Alison Criscitiello). *International Partnerships in Ice Core Science (IPICS), First Open Science Conference*, Presqu'île de Giens, Côte d'Azur, France. Oct. 1–5, 2012.

Equatorial refuge amidst tropical warming. *World Climate Research Programme (WCRP) Open Science Conference*, Denver, CO. Oct. 24–28, 2011.

* Sensitivity of ENSO to anthropogenic SST pattern formations (Laurel Stephenson–Haskins). *ASLO Aquatic Sciences Meeting*, San Juan, PR, Feb. 13–18, 2011.

Coral growth declines as temperatures rise in the central Red Sea (Neal Cantin). *AGU Ocean Sciences Meeting*, Portland, OR. Feb. 22–26, 2010.

Low–frequency tropical Pacific forcing of multi–year North American drought in CMIP3 models. *NOAA Climate Diagnostics and Prediction Workshop/CLIVAR Drought Workshop*, Lincoln, NE. Oct. 20–24, 2008.

Interannual variability of sea surface temperature in the east Pacific warm pool and Central American rainfall. *AGU Ocean Sciences Meeting*, Orlando, FL. Mar. 2–7, 2008.

Incredible Shrinking Iguana: Gaia on Galápagos? (Raghu Murtugudde). *Ocean Carbon & Biogeochemistry Summer Workshop*, Woods Hole, MA. July 23–26, 2007.

Mechanisms for interannual variability in the east Pacific warm pool. *AGU Fall Meeting*, San Francisco, CA. Dec. 22–15, 2006.

Interannual variability of SST and Chlorophyll in the East Pacific Warm Pool: High–resolution satellite observations. *East Pacific Ocean Conference*, Mt. Hood, OR. Sep. 28–30, 2006.

A Palmer Drought Severity Index for the North American Regional Reanalysis and the ECMWF 40–year Reanalysis: Comparative analysis and linkages to interannual and decadal climate variability. *AGU Joint Assembly*, Baltimore, MD. May 23–26, 2006.

Interannual variability in the East Pacific Warm Pool: High–resolution satellite observations. *International Conference on Southern Hemisphere Meteorology and Oceanography*, Foz do Iguacu, Brazil. Apr. 24–28, 2006.

Seasonal and interannual variability of the East Pacific Warm Pool. *Eastern Pacific Investiation of Climate Processes (EPIC) Workshop*, Seattle, WA. May 11–13, 2005.

Introducing the Next Generation Geostationary Imager– GOES–R's Advanced Baseline Imager (Timothy Schmit). *AMS Annual Meeting*, San Diego, CA. Jan. 8–14, 2005.

Interannual variability of surface longwave radiation over the African continent as derived from AVHRR. *NOAA Climate Diagnostics and Prediction Workshop*, Madison, WI. Oct. 18–22, 2004.

Interannual variability of surface longwave radiation over the African continent as derived from AVHRR. *National Weather Association Ann. Meeting*, Portland, OR. Oct. 16–21, 2004.

Wisconsin Weather Stories (Anne Pryor). *AMS Annual Meeting*, Seattle, WA. Jan. 10–16, 2004.