

Thomas J. Kilpatrick

Scripps Institution of Oceanography
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Current Position

Assistant Project Scientist, Scripps Institution of Oceanography, Climate, Atmospheric Sciences, and Physical Oceanography.

Research Interests

Satellite observations of surface winds, sea level, clouds, and rainfall; winds and ocean circulation around capes and islands; atmosphere–ocean interaction and its role in climate; Ekman boundary layer dynamics; mesoscale atmospheric (WRF) and ocean (ROMS) modeling.

Education

Ph.D., Oceanography, University of Hawaii at Manoa, 2013.

M.S., Oceanography, University of Hawaii at Manoa, 2009.

B.S., Mathematics, Massachusetts Institute of Technology, 2006.

Non-degree student, Dept. of Mathematics, University of Michigan, Ann Arbor, 2000–2001.

Publications

Kilpatrick T., S.-P. Xie, A. J. Miller, and N. Schneider, 2018: Satellite observations of enhanced chlorophyll variability in the Southern California Bight. *Journal of Geophysical Research: Oceans*, **123**, 7550–7563, doi:10.1029/2018JC014248.

Kilpatrick T., S.-P. Xie, and T. Nasuno, 2017: Diurnal convection–wind coupling in the Bay of Bengal. *Journal of Geophysical Research: Atmospheres*, **122**, 9705–9720, doi:10.1002/2017JD027271.

Kilpatrick T. and S.-P. Xie, 2016: Circumventing rain-related errors in scatterometer wind observations. *Journal of Geophysical Research: Atmospheres*, **121**, 9422–9440, doi:10.1002/2016JD025105.

Kilpatrick T., N. Schneider, and B. Qiu, 2016: Atmospheric response to a midlatitude SST front: Along-front winds. *Journal of the Atmospheric Sciences*, **73**, 3489–3509, doi:10.1175/JAS-D-15-0312.1.

Kilpatrick T. and S.-P. Xie, 2015: ASCAT observations of downdrafts from mesoscale convective systems. *Geophysical Research Letters*, **42**, 1951–1958, doi:10.1002/2015GL063025.

Kilpatrick T., N. Schneider, and B. Qiu, 2014: Boundary layer convergence induced by strong winds across a midlatitude SST front. *Journal of Climate*, **27**, 1698–1718, doi:10.1175/JCLI-D-13-00101.1.

Kilpatrick T., N. Schneider, and E. Di Lorenzo, 2011: Generation of low-frequency spiciness variability in the thermocline. *Journal of Physical Oceanography*, **41**, 365–377, doi:10.1175/2010JPO4443.1.

Honors and Awards

2018 study *Satellite observations of enhanced chlorophyll variability in the Southern California Bight* (see Publications) was featured on the cover of *J. Geophys. Res.-Oceans*: <https://agupubs>.

onlinelibrary.wiley.com/doi/epdf/10.1002/jgrc.22477.

AGU Research Spotlight, for *ASCAT observations of downdrafts from mesoscale convective systems* (see Publications), 2015. The manuscript was highlighted in *EOS* magazine (Oct 15 issue) and on the AGU web page for its innovative use of satellite wind observations around tropical storms.

Physical Oceanography Dissertation Symposium (PODS) attendee, Kauai, HI, 2014. Presented graduate work on atmosphere–ocean interaction around midlatitude SST fronts.

Outstanding oral presentation by a student (second place) at the AMS 17th Conference on Air–Sea Interaction, Annapolis, MD, 2010.

University of Hawaii oceanography department Ka Malama Kai award for outstanding thesis/paper by a graduate student, for master’s thesis on spiciness variability, 2009.

Woods Hole Oceanographic Institution Summer Student Fellowship, 2004.

Research Experience

Postdoctoral Scholar 2013–2018
Advisor: Prof. Shang-Ping Xie Scripps Institution of Oceanography
Researched atmosphere–ocean interactions by synthesizing satellite observations of surface winds, sea level, sea surface temperature, clouds, and rainfall; and model simulations. Utilized satellite observations of sea level, SST, and winds to study coastal winds and ocean circulation. Developed a novel technique to circumvent rain-related errors in satellite observations of surface winds.

Research Assistant 2006–2013
Advisor: Prof. Niklas Schneider Department of Oceanography, U. Hawaii/IPRC
Researched the impact of SST fronts on the atmosphere, in particular the boundary layer wind profile, boundary layer convergence, vertical motion, free atmosphere response, and role in climate variability. Performed numerical modeling experiments with the Weather Research and Forecasting (WRF) atmospheric model.

Professional Service

Member of AMS Air–Sea Interaction Committee.

Co-chair: Winds and currents session, Ocean Sciences Meeting, 2018; air–sea interaction session, Ocean Sciences Meeting, 2016.

Co-chair: Meteorological Applications session, IOVWST Meeting, 2015–2017; Ocean Applications session, IOVWST Meeting, 2019.

Reviewer: *Journal of Climate*, *Journal of Physical Oceanography*, *Journal of the Atmospheric Sciences*, *Journal of Geophysical Research: Oceans*, *Journal of Geophysical Research: Atmospheres*, *Climate Dynamics*, *Journal of Advances in Modeling Earth Systems*, *Progress in Oceanography*, *Atmospheric Science Letters*, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, *Remote Sensing*, *Atmosphere*.

Member: American Geophysical Union

Selected Presentations

Kilpatrick T., S.-P. Xie, H. Tokinaga, D. Long, and N. Hutchings: Systematic scatterometer wind errors near coastal mountains (talk), International Ocean Vector Winds Science Team (IOVWST) Meeting, Portland, ME, 31 May 2019.

Kilpatrick T., S.-P. Xie, and N. Schneider: Upwelling hot spot in the Southern California Bight (talk), IOVWST Meeting, Barcelona, Spain, 24 Apr 2018.

Kilpatrick T. and S.-P. Xie: Satellite observations of interannual wind variability and ocean response in the California Current System (talk), Ocean Sciences Meeting, Portland, OR, 15 Feb 2018.

Kilpatrick T. S.-P. Xie, and T. Nasuno: Diurnal convection–wind coupling in the Bay of Bengal (talk), IOVWST Meeting, La Jolla, CA, 4 May 2017.

Kilpatrick T.: Satellite observations of convection–wind coupling (invited talk), Woods Hole Oceanographic Institution, 11 April 2017.

Kilpatrick T.: Satellite observations of convection–wind coupling (talk), Scripps Institution of Oceanography, UC San Diego, 14 March 2017.

Kilpatrick T., N. Schneider, and B. Qiu: Atmospheric response to a midlatitude SST front: Along-front winds (talk), 20th Conference on Air–Sea Interaction, Madison, WI, 17 August 2016.

Kilpatrick T. and S.-P. Xie: Satellite observations of convection–wind coupling (invited talk), Hokkaido University, Sapporo, Japan, 16 May 2016.

Kilpatrick T. and S.-P. Xie: Exploring convection–circulation interactions with satellite winds (invited poster), NASA Coupled Ocean Surface Variables Workshop, Seattle, 12–14 April 2016.

Kilpatrick T., S.-P. Xie, and S. Gille: Diurnal wind variability observed by RapidSCAT and comparison to model simulations (talk), IOVWST Meeting, Portland, OR, 20 May 2015.

Kilpatrick T., S.-P. Xie, and T. Nasuno: Exploring the relationship between surface wind convergence and convective rainfall in the tropics (talk), AGU Fall Meeting, San Francisco, December 2014.

Kilpatrick T.: A modeling study of the atmospheric response to an SST front (talk). University of Exeter, England, 6 June 2014.

Kilpatrick T. and N. Schneider: Boundary layer convergence above a midlatitude SST front and free atmosphere response (talk). Frontal Scale Air–Sea Interaction Workshop, National Center for Atmospheric Research, Boulder, CO, 5 August 2013.

Kilpatrick T., N. Schneider, and E. Di Lorenzo: Generation of low-frequency spiciness variability in the thermocline (talk). 17th Conference on Air–Sea Interaction, Annapolis, MD, 30 September 2010.

Teaching

Guest lecturer for Prof. Roger Lukas’s graduate course on large-scale ocean–atmosphere interactions at the University of Hawaii, 15 November 2012.

Teaching assistant for graduate course *Introduction to Physical Oceanography* at the University of Hawaii, Fall 2008. Graded homeworks; maintained the course web site; and filmed and edited lecture videos.