

# Maria Gehne

NOAA Earth System Research Laboratory  
Physical Sciences Division R/PSD1  
325 Broadway  
Boulder, CO 80305-3328

Phone: (303) 497-4347  
Email: maria.gehne@noaa.gov  
Homepage: [www.esrl.noaa.gov/psd/people/maria.gehne](http://www.esrl.noaa.gov/psd/people/maria.gehne)

## Education

Ph.D. Mathematics and Atmosphere Ocean Science, New York University  
Received May 15, 2012.

*Dissertation topic:* Simple Stochastic Models Based on Analyses of Tropical Phenomena in Observational Data.

M.A. Mathematics (minor in Meteorology), Freie Universität Berlin  
Received August 21, 2007

*Thesis:* Mathematical Structure of the LPJ Dynamic Global Vegetation Model

## Employment

### *Cooperative Institute for Research in Environmental Sciences*

Research Associate (Associate Scientist II), May 2018 - present  
Research Associate (Research Scientist I), December 2013 - April 2018

Diagnostics of tropical forecast skill related to convection-moisture-dynamics coupling  
Tropical forecast skill improvements in the Unified Forecast System operational model (GFS)  
Uncertainty in precipitation estimates  
Multiscale interactions of convection associated with the MJO  
Improving near surface spread in the NCEP Global Ensemble Forecast System using surface parameter perturbations.

### *National Center for Atmospheric Research*

Postdoctoral Fellow, Kevin Trenberth, July 2012 - November 2013  
Global energy and water cycles

### *World Food Programme*

Internship, Joanna Syroka, April - September 2010  
Data analysis for Africa Drought Insurance project

## Fields of Research Interest

Weather and Climate Variability, Convectively Coupled Equatorial Waves, Stochastic Models, Scale Interactions, Predictability.

## Graduate Coursework

Geophysical Fluid Dynamics, broad range of classes on applied PDE's and Numerical Analysis in Climate and Atmospheric Dynamics, Stochastic Calculus, Dynamical Systems, Numerical Methods, Mathematical Models in Climate Research

## Teaching

### *New York University*

Calculus I, Teaching Assistant, Fall 2011.

Calculus I, Teaching Assistant, Spring 2009.

Transformations and Geometries, Teaching Assistant, Fall 2008.

Quantitative Reasoning, Teaching Assistant, Spring 2008.

## Conference and Seminar Presentations

102nd AMS Annual Meeting, January 2022, invited presentation at the Trenberth Symposium,

101st AMS Annual Meeting, January 2021,

AGU Fall Meeting 2020,

Unified Forecast System (UFS) User's Workshop, July 2020,

100th AMS Annual Meeting, Boston, MA, January 2020, session organizer and chair,

22nd Conference on Atmospheric and Oceanic Fluid Dynamics, Portland, ME, June 2019.

98th AMS Annual Meeting, Austin, TX January 2018.

21th Conference on Atmospheric and Oceanic Fluid Dynamics, Portland, OR, June 2017.

96th AMS Annual Meeting, New Orleans, LA, January 2016.

20th Conference on Atmospheric and Oceanic Fluid Dynamics, Minneapolis, MN, June 2015.

95th AMS Annual Meeting, Phoenix, AZ, January 2015.

19th Conference on Atmospheric and Oceanic Fluid Dynamics, Newport, RI, June 2013.

30th Conference on Hurricanes and Tropical Meteorology, Ponte Vedra Beach, FL, 15-20 April 2012

SEAS Colloquium in Climate Science, Columbia University, New York, March 1, 2012.

## Professional Activities

Reviewer for *Journal of the Atmospheric Sciences*, *MDPI - Water*, *Remote Sensing*, *Journal of Climate*, *International Journal of Climatology*, *Monthly Weather Review*, *MDPI - Sustainability*

Member, American Meteorological Society, 2010–Present.

Service:

Workplace Advisory Committee (2015 - present),

IT Steering Committee (2020 - present).

CIRES Mentorship Program mentor (2021-2022)

## Honors, Awards, & Fellowships

AMS Editor's Award 2021 for reviews in the *Journal of Atmospheric Sciences* with the citation: "For multiple concise, thoughtful, and thorough reviews".

MacCracken Fellowship, New York University, 2007 to 2012.

Grant to attend the summer school on Godunov Methods in Computational Engineering and Technology, Selwyn College, Cambridge University, UK, 2006.

## Publications

- Knippertz, P., Gehne, M., Kiladis, G.N., Kikuchi, K., Satheesh, A.R., Roundy, P.E., Yang, G.-Y., Zagar, N., Dias, J., Fink, A.H., Methven, J., Schlueter, A., Frank Sielmann, F., Wheeler, M.C. (submitted). The Art of Identifying Equatorial Waves. *Quarterly Journal of the Royal Meteorological Society*.
- Gehne, M., Wolding, B., Dias, J., Kiladis, G.N. (submitted). Diagnostics of Tropical Variability for Numerical Weather Forecasts. *Weather and Forecasting*.
- Amaya, D.J., Jacox, M.G., Dias, J., Alexander, M.A., Karnauskas, K.B., Scott, J.D., Gehne, M. (accepted). Subseasonal-to-seasonal forecast skill in the California Current System and its connection to coastal Kelvin waves. *JGR-Oceans*.
- Heath A; Gonzalez AO; Gehne M; Jaramillo A. (2021). Interactions of Large-Scale Dynamics and Madden-Julian Oscillation Propagation in Multi-Model Simulations. *Journal of Geophysical Research: Atmospheres* 126(11). 10.1029/2020jd033988.
- Dias J; Tulich SN; Gehne M; Kiladis GN. (2021). Tropical origins of Weeks 2-4 forecasts errors during Northern Hemisphere cool season. *Monthly Weather Review*. 10.1175/mwr-d-21-0020.1.
- Hoffmann CG; Kiladis GN; Gehne M; von Savigny C. (2021). A Python Package to Calculate the OLR-Based Index of the Madden-Julian-Oscillation (OMI) in *Climate Science and Weather Forecasting*. 9. 10.5334/jors.331.
- Bengtsson L; Dias J; Tulich S; Gehne M; Bao J-W. (2021). A Stochastic Parameterization of Organized Tropical Convection Using Cellular Automata for Global Forecasts in NOAA's Unified Forecast System. *Journal of Advances in Modeling Earth Systems* 13(1). 10.1029/2020MS002260.
- Bengtsson, L., and Coauthors, (2019): Convectively Coupled Equatorial Wave Simulations Using the ECMWF IFS and the NOAA GFS Cumulus Convection Schemes in the NOAA GFS Model. *Mon. Wea. Rev.*, 147, 4005-4025, <https://doi.org/10.1175/MWR-D-19-0195.1>.
- Gehne, M., T. M. Hamill, G. T. Bates, P. Pegion, and W. Kolczynski, (2019): Land Surface Parameter and State Perturbations in the Global Ensemble Forecast System. *Mon. Wea. Rev.*, 147, 1319-1340, <https://doi.org/10.1175/MWR-D-18-0057.1>.
- Dias, J., M. Gehne, G. N. Kiladis, N. Sakaeda, P. Bechtold, and T. Haiden, (2018): Equatorial Waves and the Skill of NCEP and ECMWF Numerical Weather Prediction Systems. *Mon. Wea. Rev.*, 146, 1763-1784, <https://doi.org/10.1175/MWR-D-17-0362.1>.
- Dole, R. M., and Coauthors, (2018): Advancing Science and Services during the 2015/16 El Niño: The NOAA El Niño Rapid Response Field Campaign. *Bull. Amer. Meteor. Soc.*, 99, 975-1001, <https://doi.org/10.1175/BAMS-D-16-0219.1>.
- Trenberth, K.E., Y. Zhang, and M. Gehne, (2017): Intermittency in Precipitation: Duration, Frequency, Intensity, and Amounts Using Hourly Data. *J. Hydrometeor.*, 18, pp. 1393-1412. DOI: 10.1175/JHM-D-16-0263.1
- Gehne, M., T. M. Hamill, G. N. Kiladis, and K. E. Trenberth (2016): Comparison of Global Precipitation Estimates across a Range of Temporal and Spatial Scales. *Journal of Climate*, Volume 29, Issue 21, pp. 7773-7795. DOI: 10.1175/JCLI-D-15-0618.1
- Kiladis, G. N., J. Dias, and M. Gehne (2016): The Relationship between Mixed Rossby-Gravity and Eastward Inertio-Gravity Waves. Part I. *Journal of the Atmospheric Sciences*, Volume 73, pp. 2123-2145, DOI: 10.1175/JAS-D-15-0230.1
- Gehne, M., R. Kleeman and K. E. Trenberth (2014): Irregularity and decadal variation in ENSO: A simplified model based on Principal Oscillation Patterns. *Climate Dynamics* DOI: 10.1007/s00382-014-2108-6
- Dias, J., P. L. Silva Dias, G. N. Kiladis, M. Gehne (2013): Modulation of shallow water equatorial waves due to a varying equivalent height background. *Journal of the Atmospheric Sciences*, Volume 70, pp. 2726-2750. DOI: 10.1175/JAS-D-13-04.1
- Gehne, M. and R. Kleeman, (2012): Spectral analysis of tropical atmospheric dynamical variables using a

linear shallow water modal decomposition. *Journal of the Atmospheric Sciences*, Volume 69, Issue 7, pp. 2300-2316. DOI: 10.1175/JAS-D-10-05008.1