

**MICHELA BIASUTTI**

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I am an atmospheric scientist and a climate dynamicist focusing on the mechanisms of variability in tropical rainfall, its response to external forcing, and the impact of its changes on human wellbeing. I endeavor to make science research inclusive of everybody and relevant for the broader community.

## **EDUCATION**

**2003:** Ph.D. – Atmospheric Sciences, University of Washington, Seattle, WA. (Advisors: David Battisti and Ed Sarachik. Thesis: On the Annual Cycle over the Atlantic Sector. The Relative Role of Land and Ocean.)

**2000:** M.S. – Atmospheric Sciences, University of Washington, Seattle, WA. (Advisors: David Battisti and Ed Sarachik. Thesis: Decadal Variability in the Tropical Atlantic as simulated by the Climate System Model and the CCM3 coupled to a Slab Ocean Model.)

**1995:** Bachelor in Science (Physics) cum laude, Università degli Studi di Trieste, Italy. (Thesis: Variability of precipitation in response to Sea Surface Temperature variability in the COLA General Circulation Model.)

## **EMPLOYMENT**

**2014-present:** Lamont Associate Research Professor, Senior Staff, Lamont-Doherty Earth Observatory; The Earth Institute at Columbia University (LDEO).

**2013-2014:** Lamont Associate Research Professor, Junior Staff, LDEO.

**2010-2013:** Lamont Assistant Research Professor, LDEO.

**2007-2010:** Doherty Associate Research Scientist, LDEO.

**May 2007-April 2008:** Maternity and parental leave.

**2004-2006:** Post-Doctoral Research Scientist, LDEO.

**1996–2003:** Research Assistant, Department of Atmospheric Sciences, University of Washington, Seattle, WA.

**1998:** Teaching Assistant for undergraduate class “Introduction to Weather and Climate”, Department of Atmospheric Sciences, University of Washington, Seattle, WA.

**1996:** Research Assistant, IMGA-CNR, Modena, Italy.

## **COMMENTARIES and OTHER PUBLICATIONS**

**2017** Biasutti, Michela, Aiko Voigt, Benjamin R. Lavon, Jacob Scheff. [Sources of Inter-Model Scatter in TRACMIP, the Tropical Rain Belts with an Annual cycle and a Continent - Model Intercomparison Project](#). *Extended Abstract* for the AMS 21<sup>st</sup> Conference on Atmosphere and Ocean Fluid Dynamics. Portland, OR.

**2016** Biasutti, Michela. Hydrology: [What Brings Rain to the Sahel?](#) *Nature Climate Change* 6 (10) 897-98. doi:10.1038/nclimate3080.

**2015** Janicot, S., M. Gaetani, F. Hourdin, A. Giannini, M. Biasutti, E. Mohino, Y. Xue, A. Boone, A. Gaye, S. Salack and C. Lavaysse “[The Recent Partial Recovery in Sahel Rainfall: A Fingerprint of Greenhouse Gases Forcing?](#)” *GEWEX News*, Vol. 27 No. 4., 11-15.

**2013** M. Biasutti “[Climate change: Future rise in rain inequality.](#)” *Nature Geoscience*, 6(5), 337-338. doi:10.1038/ngeo1814

**2013** M. Biasutti “Sahel Rainfall Trends in CMIP5 models” *Variations: the U.S. CLIVAR Newsletter*

**2011** M. Biasutti. “[Atmospheric science: A man-made drought.](#)” *Nature Climate Change*, 1(4), 197-198. doi:10.1038/nclimate1151

**2007** Biasutti, M., A. Giannini, A. H. Sobel, I. M. Held, and J. C. H. Chiang. Sahel climate change. *EOS, Transactions American Geophysical Union*, 88:295.

## **BOOK CHAPTERS**

**2014** Jean-Philippe Lafore, Michela Biasutti, Peter Knippertz, and Chris Taylor: “The West African Monsoon”, in “The Global Monsoon Systems: Research and Forecast”, edited by Chih-Pei Chang, Hung-Chi Kuo, N.C. Lau, R.H. Johnson, Bin Wang, and Matthew C Wheeler, *World Scientific Series on Asia-Pacific Weather and Climate. Vol.9 35-39*

**2013** Contributing Author: IPCC AR5, Chapter 14: Climate Phenomena and their Relevance for Future Regional Climate Change.

## **JOURNAL PUBLICATIONS**

See [ResearcherID](#) or [Google Scholar](#) for assessments of the impact of my publications. My current h-index is 19±1. NB: An asterisk indicates publications lead by a mentee.

**(2018)** Biasutti, M. [Rainfall Trends in the African Sahel: characteristics, processes, and causes.](#) *WIREs Climate Change*. (Invited Advanced Review, submitted).

**2018** Biasutti, M., Voigt, A., Boos, W. R., Braconnot, P., Hargreaves, J. C., Harrison, S. P., et al. [Global energetics and local physics as drivers of past, present and future monsoons.](#) *Nature Geoscience*, vol 11(6) pp. 392-400

**2018** Guan, Kaiyu, Stephen Good, Kelly Caylor, David Medvigy, Ming Pan, Eric Wood, Hisashi Sato, Michela Biasutti, Min Chen, Anders Ahlström, Xiangtao Xu. [Simulated sensitivity of African terrestrial ecosystem photosynthesis to rainfall frequency, intensity, and rainy season length.](#) *Environmental Research Letters*, vol 13(2) 025013

- 2017** Marvel, Kate, Michela Biasutti, Celine Bonfils, Karl E Taylor, Yochanan Kushnir, and Benjamin Cook. [Observed and Projected Changes to the Precipitation Annual Cycle](#). *Journal of Climate*, 30(13), 4983–4995. doi:10.1175/JCLI-D-16-0572.1
- 2017** Guan, Kaiyu, Benjamin Sultan, Michela Biasutti, Christian Baron, and David B Lobell. [Assessing Climate Adaptation Options and Uncertainties for Cereal Systems in West Africa](#). *Agricultural and Forest Meteorology* 232 (January): 291-305, doi:10.1016/j.agrformet.2016.07.021.
- 2016** Voigt, Aiko, Michela Biasutti, Jacob Scheff, Jürgen Bader, Simona Bordoni, Francis Codron, Ross D Dixon, et al. [The Tropical Rain Belts with an Annual Cycle and a Continent Model Intercomparison Project: TRACMIP](#). *J. Adv. Model. Earth Syst* 8 (4): 1868-91. doi:10.1002/2016MS000748.
- 2016** Biasutti, Michela, Richard Seager, and Dalia B Kirschbaum. [“Landslides in West Coast Metropolitan Areas: the Role of Extreme Weather Events”](#). *Weather and Climate Extremes* 14 (December): 67-79. doi:10.1016/j.wace.2016.11.004.
- 2016** Dixon, Ross D, Anne Sophie Daloz, Daniel J Vimont, and Michela Biasutti. 2016. [“Saharan Heat Low Biases in CMIP5 Models”](#). *Journal of Climate*, December, doi:10.1175/JCLI-D-16-0134.1.
- 2016\*** Paul-Arthur Monerie, Michela Biasutti, and Pascal Roucou. [“On the projected increase of Sahel rainfall during the late rainy season”](#). *International Journal of Climatology*. doi: 10.1002/joc.4638.
- 2015** Kaiyu Guan, Benjamin Sultan, Michela Biasutti, Christian Baron and David B. Lobell. [“What aspects of future rainfall changes matter for crop yields in West Africa?”](#) *Geophysical Research Letters* 42, 8001-8010, doi:10.1002/2015GL063877.
- 2015** John Dwyer, Suzana Camargo, Adam Sobel, Michela Biasutti, Kerry Emanuel, Gabriel Vecchi and Ming Zhao. [“Projected Twenty-First-Century Changes in the Length of the Tropical Cyclone Season”](#). *J Climate*, 28(15), 6181-6192. doi:/10.1175/JCLI-D-14-00686.1
- 2015** Biasutti, Michela and Richard Seager. [“Projected changes in US rainfall erosivity”](#). *Hydrology and Earth System Sciences*, 19(6), 2945-2961. doi:10.5194/hess-19-2945-2015
- 2015** Rodriguez-Fonseca, B., E. Mohino, R. C. Mechoso, C. Caminade, M. Biasutti, M. Gaetani, J. Garca-Serrano, E. K. Vizy, K. Cook, Y. Xue, I. Polo, T. Losada, L. Druyan, B. Fontaine, J. Bader, F. J. Doblas-Reyes, L. Goddard, S. Janicot, A. Arribas, W. Lau, A. Colman, M. Vellinga, D. P. Rowell, F. Kucharski, A. Voltaire: [“Variability and Predictability of West African Droughts: A Review on the Role of Sea Surface Temperature Anomalies”](#). *J Climate*, 28(10), 4034-4060. doi:10.1175/JCLI-D-14-00130.1
- 2015** Shelley Welton, Michela Biasutti, and Michael Gerrard. [“Legal and Scientific Integrity in advancing a ‘Land Degradation Neutral World’ ”](#). October, 2014 *Columbia Law Review*.
- 2014** Sultan B., K. Guan, M. Kouressy, M. Biasutti, C. Piani, G. L. Hammere, G. McLean, and D. Lobell. [“Robust features of future climate change impacts on sorghum yields in West Africa”](#). *Environmental Research Letters*, 9(10), 104006. doi:10.1088/1748-9326/9/10/104006
- 2014** \* Lee, D-E and M. Biasutti: [“Climatology and variability of rainfall in the 20th century reanalysis”](#). *Journal of Climate* 27(15), 5964-5981. doi:10.1175/JCLI-D-13-00630.1

- 2014** \* Dwyer, J.G., M. Biasutti, A.H. Sobel: “[The effect of greenhouse-gas-induced changes in SST on the annual cycle of zonal-mean tropical precipitation.](#)” *Journal of Climate* 27(12), 45444565. doi:10.1175/JCLI-D-13-00216.1.
- 2013** Biasutti, M. and S.E. Yuter: “[Observed frequency and intensity of tropical precipitation: the importance of instantaneous estimates.](#)” *Journal of Geophysical Research- Atmosphere* 118(17), 95349551. doi:10.1002/jgrd.50694
- 2013** \* Saba, A., M. Biasutti, M.B. Gerrard, and D.B. Lobell: “[Getting ahead of the curve: Supporting adaptation to long-term climate change and short-term climate variability alike](#)” *Carbon and Climate Law Review* 7(1), 323.
- 2013** A. Seth, S.A. Rauscher, M. Biasutti, A. Giannini, S.J. Camargo, and M. Rojas: “[CMIP5 Projected Changes in the Annual Cycle of Precipitation in Monsoon Regions.](#)” *Journal of Climate*, 26(19), 73287351. doi:10.1175/JCLI-D-12-00726.1
- 2013** Biasutti, M.: “[Forced Sahel rainfall trends in the CMIP5 archive.](#)” *Journal of Geophysical Research-Atmospheres*, 118, doi:10.1002/jgrd.50206.
- 2013** Sobel, A.H., C.D. Burleyson, .E. Yuter, and M. Biasutti: “[Correction to Rain on small tropical islands](#)” *Journal of Geophysical Research-Atmospheres*, 118, doi:10.1002/jgrd.50205.
- 2012** Lintner, R.B., M. Biasutti, N.S. Diffenbaugh, J.-E. Lee, M.J. Niznik, K.L. Findell. “[Amplification of wet and dry month occurrence over tropical land regions in response to global warming.](#)” *Journal of Geophysical Research-Atmospheres*, 117(D11), D11106. doi:10.1029/2012JD017499
- 2012** \* Dwyer, J.G., M. Biasutti, A.H. Sobel: “[Projected Changes in the Seasonal Cycle of Surface Temperature](#)” *Journal of Climate*, 120419124110000. doi:10.1175/JCLI-D-11- 00741.1
- 2011** Biasutti, M., S.E. Yuter, C.B. Burleyson, and A.H. Sobel: “[Very High Resolution Rain- fall Patterns measured by TRMM Precipitation Radar: Seasonal and Diurnal Cycles](#)”. *Climate Dynamics*, doi:10.1007/s00382-011-1146-6
- 2011** Biasutti, M., A.H. Sobel, S.J. Camargo, and T.T. Creyts: “[Projected changes in the physical climate of the Gulf Coast and Caribbean](#)”. *Climatic Change*, doi:10.1007/s10584- 011-0254-y
- 2009** Biasutti, M. and A.H. Sobel: “[Delayed Seasonal Cycle and African Monsoon in a Warmer Climate](#)”. *Geophysical Research Letters*. 36, doi:10.1029/2009GL041303.
- 2009** Biasutti, M., A. H. Sobel, S.J. Camargo: “[The role of the Sahara Low in Sahel rainfall variability and change in the CMIP3 models](#)”. *Journal of Climate*, 22: 5755-5771. doi:10.1175/2009JCLI2969.1
- 2008** Giannini, A., M. Biasutti, M.M. Verstraete. “[A climate model-based review of drought in the Sahel: Desertification, the re-greening and climate change.](#)” *Global and Planetary Change* 64 119-128.
- 2008** Biasutti, M., I. M. Held, A. H. Sobel, A. Giannini: “[SST forcings and Sahel rainfall variability in simulations of the 20<sup>th</sup> and 21<sup>st</sup> centuries](#)”. *Journal of Climate*, 21 3471- 3486.
- 2008** Giannini, A., M. Biasutti, I. M. Held, A. H. Sobel: “[A global perspective on African climate](#)”. *Climatic Change*. 14 March 2008. doi:10.1007/s10584-008-9396-y

- 2006** Biasutti, M., A. Giannini: "[Robust Sahel drying in response to late 20<sup>th</sup> century forcings](#)". *Geophysical Research Letters*, 33, L11706, doi:10.1029/2006GL026067.
- 2006** Biasutti, M., A.H. Sobel, Y. Kushnir: "[AGCM precipitation biases in the tropical Atlantic](#)". *J. Climate*, 19 935-958.
- 2005** M. Biasutti, D. S. Battisti, and E. S. Sarachik. "[Terrestrial influence on the annual cycle of the Atlantic ITCZ](#)." *J. Climate*, 18 211-228.
- 2004** M. Biasutti, D. S. Battisti, and E. S. Sarachik. "[Mechanisms Controlling the Annual Cycle of Precipitation in the Tropical Atlantic Sector in an Atmospheric GCM](#)." *J. of Climate*, 17 4708-4723.
- 2003** J. Chiang, M. Biasutti, and D. S. Battisti. "[Sensitivity of the Atlantic ITCZ to last glacial maximum boundary conditions](#)." *Paleoceanography*, 18:10.1029/2003PA000916.
- 2003** M. Biasutti, D. S. Battisti, and E. S. Sarachik. "[The annual cycle over the tropical Atlantic, South America, and Africa](#)." *J. Climate*, 16:2491-2508.
- 2000** Navarra, A., Biasutti, M., Gualdi, S., Roeckner, E., Schlese, U., Shulzweida, U. "[Sensitivity experiments to mountain representations in spectral models](#)." *Annals of Geophysics*, 43(3). doi:10.4401/ag-3658

#### **MEETINGS ORGANIZED:**

[WCRP Grand Challenge on Clouds, Circulation and Climate Sensitivity: 2nd Meeting on Monsoons and Tropical Rain Belts](#). International Centre for Theoretical Physics, July 2-5, 2018 (Secured NSF funds for Early Career Scientists)

[Monsoons and ITCZ: The annual cycle in the Holocene and the future](#). Columbia University, September 15-18, 2015 (Secured NSF funds for Early Career Scientists)

Dynamics of Climate Change and their impacts on the hydrologic cycle at regional scales: Session Convener at 2011 AGU Fall Meeting.

[Workshop on Climate Change in the Sahel](#): Columbia University, March 19-21 2007.

#### **DATASETS PRODUCED or FACILITATED:**

TRMM Precipitation Radar Climatology at 5km Resolution: [Data](#). [Paper](#).

TRACMIP: Tropical Rainfall with an Annual cycle and Continent Model Inter-comparison Project. [Data](#). [Paper](#).

#### **RECENT INVITED SEMINARS:**

**2018:** Caltech, Pasadena CA. Water & Climate Change Workshop, MIT.

**2017:** International Training Course: Climate Services for disaster prevention, IBIMET, Firenze, Italy. Fourth International Conference on Earth System Modelling (4ICESM), MPI, Germany. EGU Annual Assembly, Vienna, Austria; Hamburg University, Germany. NE Tropical

Workshop, Albany NY.

**2016:** AGU Fall Meeting, San Francisco, CA; EGU Annual Assembly, Vienna, Austria; WCRP Model Hierarchies Workshop, Princeton University, NJ.

**2015** Linde Workshop on Monsoons: Past, Present and Future, CalTech, Pasadena, CA; Our Common Future under Climate Change, UNESCO, Paris, France; AOS Colloquium, University of Wisconsin, Madison, WI.

**2014** WCRP Grand Challenge Workshop, Schloss Ringberg, Germany; Colloquium, Dept. of Atmospheric Sciences, University of Washington, Seattle, WA; MPI-M/CliSAP Workshop on Climate, Land Use, and Conflict in Northern Africa, Lübeck, Germany.

**2013** WAMME Workshop, San Francisco, CA; CCCM (Center for Climate Change in the Mediterranean), Bologna, Italy.

**2012** Workshop on Convection, Water Vapor, and Climate, MIT, Cambridge, MA; Climate Dynamics of Tropical Africa Workshop, John Hopkins, Baltimore, MD; Department of Earth and Atmospheric Sciences, Cornell, Ithaca, NY; NOAA MAPP Webinar: Evaluation of Reanalysis Products.

#### ***RECENTLY FUNDED PROJECTS:***

**2016-2019** NSF-ATG: The essential dynamics of tropical rain belts: Monsoons and ITCZ in a multi-model ensemble of idealized simulations. (M. Biasutti, A. Voigt, J. Scheff)

**2016-2019** NASA-SERVIR: Desertification or “re-greening”? Adaptation lessons learned in coping with late 20th century drought in West Africa. (A. Giannini et al.)

**2015-2018** DOE-BER Understanding recent global hydroclimate change using multivariate detection and attribution techniques and GCM Experiments

**2013-2018** NSF-EaSM: Linking near term future changes in weather and hydroclimate in western North America to adaptation for land management. (R. Seager, M. Ting., Y. Kushnir, M. Biasutti, J. Smerdon, B. Cook, A. Greene, A. Ray, B. Rajagopalan)

**2011-2012** NOAA: Climatology and variability of tropical rainfall in the 20<sup>th</sup> century reanalysis. (M. Biasutti)

**2011-2014** NSF-EaSM: Use of Climate Information in International Negotiation for Adaptation Resources. (M. Biasutti, M. Gerrard, D. Lobell, A. Sobel)

**2011-2012** NOAA: The role of greenhouse gases in the forcing of 20<sup>th</sup> Century Precipitation Changes in the African Sahel. (M. Biasutti, A. Giannini)

**2010-2013** NSF-ATG: Future Changes in the Seasonal Cycle: Mechanisms and Implications. (M. Biasutti, A. Sobel)

#### ***STUDENTS ADVISED:***

**Graduate:** John Dwyer (PhD student in the Department of Applied Physics and Applied Math).

Co-advised with Adam Sobel. Catherine Pomposi and Xiaoqiong (Sage) Li, Rebecca Herman, and Nathan Lenssen (PhD students in the Department of Earth and Environmental Sciences), PhD committee.

**Undergraduate:** Alyssa Poletti (Caltech summer intern); Charles Blackmon-Luca (APAM/CS Earth Institute Undergraduate RA); Lucas Vargas Zeppetello (APAM senior / Earth Institute Undergraduate RA); Priscilla Bell (APAM sophomore / Earth Institute Undergraduate RA); Ben Lavon (APAM, post graduate); Deanna Tufano, Julio E. Herrera Estrada (APAM Seniors), Ségolène Berthou (exchange from the École Normale Supérieure de Paris).

***CLASSROOM TEACHING:***

EESC GU4404: Regional Climate & Climate Impacts (in development)

SUSC PS5010: Climate Science for Decision Makers: Modeling, Analysis, and Applications (co-developed)

**Guest Lectures:**

EESC UN2100: Earth's Environmental Systems: Climate System

EESC G6928: Tropical Meteorology

**Summer Schools:**

NCAR colloquium on African Weather and Climate, Boulder, CO.

***OUTREACH ACTIVITIES:***

**Lamont Open House:** Wind & Water; Salinity & the Global Water Cycle; Temperature, Radiation & the IR gun; Two Centuries of Climate History; Climate Science Photo Booth.

**Public Lectures & Panels:** Municipal Art Society of NY; NYC Dept. of Construction & Design; Marfa Dialogue; Different Directions; Maplewood, NJ, Climate Change Panel; American Museum of Natural History ([within "Our Earth's Future"](#))

**Lobbying Activities:** AGU Congressional Visits.

***DIVERSITY IN SCIENCE ACTIVITIES:***

**LDEO:** Committee on Professional Conduct

**LDEO:** Campus Life and Work Environment Survey

**@WCRP Monsoon & ITCZ Meeting:** Diversity Discussions

**Outreach to Girls** (career fairs in grade schools, girl scout troops)