

## **Michael F. Wehner**

### Publications

#### **2017**

Ben Timmermans, Michael Wehner, Dan Cooley, Travis O'Brien, Emeric Thibaud, Hari Krishnan (2017) Consistency of extremes in gridded precipitation datasets (to be submitted to Climate Dynamics)

Wuebbles, D.J., D.R. Easterling, K. Hayhoe, T. Knutson, R.E. Kopp, K.E. Kunkel, A.N. LeGrande, C. Mears, W.V. Sweet, P.C. Taylor, R.S. Vose, M.F. Wehner (2017) Our globally changing climate. In: Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. XX-YY.

Knutson, T., J.P. Kossin, C. Mears, J. Perlwitz, M.F. Wehner (2017) Detection and attribution of climate change. In: Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. XX-YY

Hayhoe, K., J. Edmonds, R.E. Kopp, A.N. LeGrande, B.M. Sanderson, M.F. Wehner, D.J. Wuebbles (2017) Climate models, scenarios, and projections. In: Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. XX-YY

Vose, R.S., D.R. Easterling, K.E. Kunkel, M.F. Wehner (2017) Temperature changes in the United States. In: Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. XX-YY

Easterling, D.R., J.R. Arnold, T. Knutson, K.E. Kunkel, A.N. LeGrande, L.R. Leung, R.S. Vose, D.E. Waliser, M.F. Wehner (2017) Precipitation change in the United States. In: Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. XX-YY

Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande (2017) Droughts, floods, and hydrology. In: Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program [Wuebbles, D.J.,

D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)). U.S. Global Change Research Program, Washington, DC, USA, pp. XX-YY

Kossin, J.P., T. Hall, T. Knutson, K.E. Kunkel, R.J. Trapp, D.E. Waliser, and M.F. Wehner (2017) Extreme storms. In: Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. XX-YY

Sanderson, B.M. and M.F. Wehner (2017) Weighting strategy for the Fourth National Climate Assessment. In: Climate Science Special Report: A Sustained Assessment Activity of the U.S. Global Change Research Program [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. XX-YY

Christopher J, Paciorek, Dáithí Stone Michael Wehner (2017) Quantifying uncertainty in the attribution of human influence on severe weather. Submitted to *Climate Dynamics*.

Benjamin M. Sanderson, Yangyang Xu Claudia Tebaldi, Michael Wehner, Brian O'Neill, Alexandra Jahn, Angeline G. Pendergrass, Flavio Lehner, Warren G. Strand, Lei Lin, Reto Knutti, and Jean Francois Lamarque (2017) Community Climate Simulations to assess avoided impacts in 1.5 °C and 2 °C futures. Submitted to Earth System Dynamics

P. Pall, C. M. Patricola, M. F. Wehner, D. A. Stone, C. Paciorek, W. D. Collins (2017) Diagnosing Anthropogenic Contributions to Heavy Colorado Rainfall in September 2013. To appear in *Weather and Climate Extremes*. 10.1016/j.wace.2017.03.004

Michael F. Wehner, Kevin A. Reed and Colin M. Zarzycki (2017) High-Resolution Multi-Decadal Simulation of Tropical Cyclones. Chapter 8 in *Hurricanes and Climate Change*, Jennifer Collins and Kevin Walsh, eds., Springer, pp 187-207

Oliver Angelil, Dáithí Stone, Michael Wehner, Christopher J. Paciorek, Harinarayan Krishnan, William Collins (2017) An independent assessment of anthropogenic attribution statements for recent extreme weather events. *Journal of Climate* 30, 5-16, DOI: 10.1175/JCLI-D-16-0077.1

Mark D. Risser, Dáithí A. Stone, Christopher J. Paciorek, Michael F. Wehner, Oliver Angelil (2017) Quantifying the effect of interannual ocean variability on the attribution of extreme climate events to human influence. *Climate Dynamics* doi:10.1007/s00382-016-3492-x

Wehner, Michael, Federico Castillo, and Dáithí Stone (2017). "The Impact of Moisture and Temperature on Human Health in Heat Waves." Oxford Research Encyclopedia of Natural Hazard Science. 2017-04-26. Oxford University Press.  
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Benjamin Sanderson, Michael Wehner, Reto Knutti (2017) Skill and independence weighting for multi-model assessments. . Early release *Geoscientific Model Development* <https://doi.org/10.5194/gmd-2016-285>

Oliver Angelil, Daithi Stone, Sarah Perkins-Kirkpatrick, Lisa Alexander, Michael Wehner, Hideo Shiogama, Piotr Wolski, Andrew Ciavarella, Nikos Christidis (2017) On the nonlinearity of spatial scales in extreme weather attribution statements, early on release *Climate Dynamics* doi:10.1007/s00382-017-3768-9

Mathew Barlow, William Gutowski, John Gyakum, Richard Katz, Young-Kwon Lim, Russ Schumacher, Michael Wehner, Laurie Agel, Michael Bosilovich, Allison Collow, Alexander Gershunov, Richard Grotjahn, Ruby Leung, Shawn Milrad, Seung-Ki Min (2017) North American extreme precipitation events and related Large-Scale Meteorological Patterns: a review of statistical methods, dynamics, modeling, and trends. Submitted to *Climate Dynamics*

B. Timmermans, D. Stone, M. Wehner, H. Krishnan (2017) Impact of tropical cyclones on modeled extreme wind-wave climate. *Geophysical Research Letters* 44, 1393-1401

Jennifer Nakamura, Suzana Camargo, Adam Sobel, Naomi Henderson , Kerry Emanuel, Arun Kumar, Tim LaRow , Hiroyuki Murakami, Malcolm Roberts, Enrico Scoccimarro, Pier Luigi Vidale, Hui Wang, Michael Wehner, Ming Zhao (2017) Western North Pacific tropical cyclone model tracks in present and future climates. *to appear in Journal of Geophysical Research-Atmospheres.*

Mitchell, D., AchutaRao, K., Allen, M., Bethke, I., Forster, P., Fuglestedt, J., Gillett, N., Haustein, K., Iverson, T., Massey, N., Schleussner, C.-F., Scinocca, J., Seland, Ø., Shiogama, H., Shuckburgh, E., Sparrow, S., Stone, D., Wallom, D., Wehner, M., and Zaaboul, R.: Half a degree Additional warming, Projections, Prognosis and Impacts (HAPPI): Background and Experimental Design (2017). *Geoscientific Model Devevelopment*. 10, 571-583, <https://doi.org/10.5194/gmd-10-571-2017>, 2017

## **2016**

Oliver Angelil, Sarah Perkins-Kirkpatrick, Lisa Alexander, Dáithí Stone, Markus Donat, Michael Wehner, Hideo Shiogama, Andrew Ciavarella, Nikolaos Christidis (2016) Comparing regional precipitation and temperature extremes in climate model and reanalysis products. *Weather and Climate Extremes* 13, 35-43 DOI: 10.1016/j.wace.2016.07.001

Michael Wehner, Dáithí Stone, Hari Krishnan, Krishna AchutaRao, Federico Castillo (2016) The deadly combination of heat and humidity in India and Pakistan in

summer 2015 [in “Explaining Extremes of 2015 from a Climate Perspective”]. *Bull. Amer. Meteor. Soc.*, 97 (12), S81 –S86, doi: 10.1175/BAMS-D-16-0145.1.

Kamoru A. Lawal, Abayomi A. Abatan, Oliver Angélil, Eniola Olaniyan, Victoria H. Olusoji, Philip G. Oguntunde, Benjamin Lamptey, Babatunde J. Abiodun, Hideo Shiogama, Michael F. Wehner, Dáithí A. Stone (2016) The Late Onset of the 2015 Wet Season in Nigeria [in “Explaining Extremes of 2015 from a Climate Perspective”]. *Bull. Amer. Meteor. Soc.*, 97 (12), S63 –S69, doi: 10.1175/BAMS-D-16-0131.2.

Yunjie Liu, Evan Racah, Prabhat, Joaquin Correa, Amir Khosrowshahi, David Lavers, Kenneth Kunkel, Michael Wehner, William Collins (2016) Application of Deep Convolutional Neural Networks for Detecting Extreme Weather in Climate Datasets. International Conference on Advances in Big Data Analytics (ABDA) 2016. pp 81-88 <http://worldcomp-proceedings.com/proc/p2016/ABD6152.pdf>

Oliver Angelil, Sarah Perkins, Lisa Alexander, Dáithí Stone, Markus Donat, Michael Wehner, Hideo Shiogama (2016) Examining the probability of rainfall and temperature extremes in two model experiments designed for event Attribution. In preparation for submission to *Weather and Climate Extremes*.

Reinhard Schiemann, Marie-Estelle Demory, Len C. Shaffrey, Jane Strachan, Pier Luigi Vidale, Matthew S. Mizieliński, Malcolm J. Roberts, Mio Matsueda, Michael F. Wehner, Thomas Jung (2016) The resolution sensitivity of northern hemisphere blocking in four 25-km atmospheric global circulation models. Early online release *Journal of Climate*. <https://doi.org/10.1175/JCLI-D-16-0100.1>

S. E. Strazzo, J. B. Elsner, T. E. LaRow, H. Murakami, M. Wehner, M. Zhao (2016) The influence of model resolution on the simulated sensitivity of tropical cyclone maximum intensity to sea surface temperature. *Journal of Advances in Modeling Earth Systems*. 8, 1037–1054. DOI:10.1002/2016MS000635 <http://onlinelibrary.wiley.com/doi/10.1002/2016MS000635/abstract>

Soyoung Jeon, Christopher J. Paciorek, Michael F. Wehner (2016) Quantile-based Bias Correction and Uncertainty Quantification of Extreme Event Attribution Statements. *Weather and Climate Extremes* 12, 24-32 DOI:10.1016/j.wace.2016.02.001

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Claudia Tebaldi and Michael Wehner (2016) Benefits of mitigation for future heat extremes under RCP4.5 compared to RCP8.5. *Climatic Change*. DOI:10.1007/s10584-016-1605-5 <https://link.springer.com/article/10.1007/s10584-016-1605-5>

Hamed Ashouri, Kuo-Lin Hsu, Soroosh Sorooshian, Michael G. Bosilovich, Jaechoul Lee, Michael F. Wehner, Joey Jaw (2016) Evaluation of NASA's MERRA Precipitation Product in Reproducing the Trend and the Distribution of the U.S. Extreme Precipitation Events. *Journal of Hydrometeorology*. 17: 693-711. DOI:10.1175/JHM-D-15-0097.1

## **2015**

Wehner, M.F. and D.R. Easterling (2015) The global warming hiatus's irrelevance. *Science* 350, 1482-1483 (Originally entitled: Is the global warming hiatus important?)

Soyoung Jeon, Prabhat, Surendra Byna, Junmin Gu, William D. Collins, and Michael F. Wehner (2015) Characterization of Extreme Precipitation within Atmospheric River Events over California. *Advances in Statistical Climatology, Meteorology and Oceanography* 1, 45-57, doi:10.5194/asmo-1-45-2015, 2015.

Kevin J. E. Walsh, Suzana Camargo, Gabriel Vecchi, Anne Sophie Daloz, James Elsner, Kerry Emanuel, Michael Horn, Young-Kwon Lim, Malcolm Roberts, Christina Patricola, Enrico Scoccimarro, Adam Sobel, Sarah Strazzo, Gabriele Villarini, Michael Wehner, Ming Zhao, Jim Kossin, Tim LaRow, Kazuyoshi Oouchi, Siegfried Schubert, Hui Wang, Julio Bacmeister, Ping Chang, Fabrice Chauvin, Christine Jablonowski, Arun Kumar, Hiroyuki Murakami, Tomoaki Ose, Kevin Reed, R. Saravanan, Yohei Yamada, Colin Zarzycki, Pier-Luigi Vidale, Jeffrey Jonas, Naomi Henderson (2015) Hurricanes and climate: the U.S. CLIVAR working group on hurricanes. *Bulletin of the American Meteorological Society* **96**, 997–1017. doi: <http://dx.doi.org/10.1175/BAMS-D-13-00242.1>

Prabhat, Surendra Byna, Venkatram Vishwanath, Eli Dart, Michael Wehner, and William D. Collins. (2015) TECA: Petascale Pattern Recognition for Climate Science. *Lecture Notes in Computer Science (LNCS)* **9257**, 426-436 CAIP 2015: 16<sup>th</sup> International Conference on Computer Analysis of Images and Patterns.

Richard Grotjahn, Robert Black, Ruby Leung, Michael F. Wehner, Mathew Barlow, Mike Bosilovich, Sasha Gershunov, William Gutowski, Richard W. Katz, Yun-Young Lee, Young-Kwon Lim, Prabhat (2015) North American Extreme Temperature Events and Related Large Scale Meteorological Patterns: Statistical Methods, Dynamics, Modeling, and Trends. *Climate Dynamics* Early online access. DOI 10.1007/s00382-015-2638-6

Eli Dart, Prabhat, Michael F. Wehner, William D. Collins (2015) An Assessment of Data Transfer Performance for Large-Scale Climate Data Analysis and Implications for the Design of CMIP6. Submitted to the *Journal of Modeling the Earth System*

Michael Wehner, Prabhat, Kevin Reed, Daithi Stone, William D. Collins, Julio Bacmeister (2015) Resolution dependence of future tropical cyclone projections of

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## **2014**

Michael F. Wehner, Kevin Reed, Fuyu Li, Prabhat, Julio Bacmeister, Cheng-Ta Chen, Chris Paciorek, Peter Gleckler, Ken Sperber, William D. Collins, Andrew Gettelman, Christiane Jablonowski (2014) The effect of horizontal resolution on simulation quality in the Community Atmospheric Model, CAM5.1. *Journal of Modeling the Earth System* 06, 980-997. doi:10.1002/2013MS000276

Michael F. Wehner (2014) Perspective: A temporary hiatus in warming of extreme temperatures is not unusual, nor inconsistent with model simulations of human-induced climate change. *Environmental Research Letters*. 9 071001 doi:10.1088/1748-9326/9/7/071001

Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, S. Doney, R. Feely, P. Hennon, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville, 2014: Ch. 2: Our Changing Climate. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 2-1-2-nn.

Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville, 2014: Appendix 3: Climate Science Supplement. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 735-789. doi:10.7930/J0KS6PHH.

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Pardeep Pall, Michael Wehner, Dáithí Stone (2014) Probabilistic Extreme Event Attribution in *Dynamics and Predictability of Large-Scale, High-Impact Weather and Climate Events*, Richard Grojahn, Jianping Li, Richard Swinbank, Hans Volkert, editors. Cambridge University Press. 37-46, ISBN 978-1-107-07142-1.

Richard Smith and Michael Wehner (2014) Influence of Climate Change on Extreme Weather Events, To be submitted to the *Proceedings of the National Academy of Sciences*

Daniel A. Shaevitz, Suzana J. Camargo, Adam H. Sobel, Jeffrey A. Jonas, Daeyhun Kim, Arun Kumar, Timothy E. LaRow, Young-Kwon Lim, Hiroyuki Murakami, Kevin Reed, Malcolm J. Roberts, Enrico Scoccimarro, Hui Wang, Michael F. Wehner, Ming Zhao (2014) Characteristics of tropical cyclones in high-resolution models of the present climate. *Journal of Modeling the Earth System* 6, 1154–1172, DOI: 10.1002/2014MS000372

Oliver Angelil, Daithi A. Stone, Mark Tadross, Fiona Tummon, Michael Wehner, Reto Knutti (2014) Attribution of extreme weather to anthropogenic greenhouse gas emissions: sensitivity to spatial and temporal scales. *Geophysical Research Letters*, 41, 2150–2155, 10.1002/2014GL059234.

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## **2013**

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Dean N. Williams, Timo Bremer, Charles Doutriaux, John Patchett, Sean Williams, Galen Shipman, Ross Miller, David R. Pugmire, Brian Smith, Chad Steed, E. Wes Bethel, Hank Childs, Harinarayan Krishnan, Prabhat Prabhat, Michael Wehner, Claudio T. Silva, Emanuele Santos, David Koop, Tommy Ellqvist, Jorge Poco, Berk Geveci, Aashish Chaudhary, Andy Bauer, Alexander Pletzer, Dave Kindig, Gerald L. Potter, Thomas P. Maxwell, "Ultrascale Visualization of Climate Data," *Computer*, vol. 46, no. 9, pp. 68-76, Sept. 2013, doi:10.1109/MC.2013.119

M. Zhao, I.M. Held, G. Vecchi, E. Scoccimarro, H. Wang, M. Wehner, Y.-K. Lim, T. LaRow, S. J. Camargo, K. Walsh, S. Gualdi, A. Kumar, S. Schubert, K.A. Reed (2013) Robust direct effect of increasing atmospheric CO<sub>2</sub> concentration on global tropical cyclone frequency - A multi-model inter-comparison. *U.S. CliVAR Variations* Fall 2013, Vol. 11, No. 3, 17-23

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Dáithí A. Stone, Christopher J. Paciorek, Prabhat, Pardeep Pall, Michael Wehner (2013) Inferring the anthropogenic contribution to local temperature extremes. *Proceedings of the National Academy of Sciences*. 110 (17), E1543-E1543, doi:10.1073/pnas.1221461110



Malcolm Potts, Eliya Zulu, Michael Wehner, Federico Castillo, Courtney Henderson (2013) Crisis in the Sahel: Possible solutions and the consequences of inaction, OASIS: Organizing to Advance Solutions in the Sahel, A report of the conference hosted by the University of California, Berkeley and the African Institute for Development Policy held in Berkeley on September 21, 2012.  
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Michael F. Wehner (2013) Very extreme seasonal precipitation in the NARCCAP ensemble: Model performance and projections. *Climate Dynamics* **40**, 59-80. DOI: 10.1007/s00382-012-1393-1

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K.E. Kunkel, T.R. Karl, H. Brooks, J. Kossin, J. Lawrimore, D. Arndt, L. Bosart, D. Changnon, S. Cutter, N. Doesken, K. Emanuel, P. Ya. Groisman, R.W. Katz, T. Knutson, J. O'Brien, C. Paciorek, T. Peterson, K. Redmond, D. Robinson, J. Trapp, R. Vose, S. Weaver, M. Wehner, K. Wolter, D. Wuebbles (2013) Monitoring and Understanding Trends in Extreme Storms: State of Knowledge, *Bulletin of the American Meteorological Society*, **94**, 499-514, 10.1175/BAMS-D-11-00262.1

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