

# Travis Allen O'Brien

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## PROFESSIONAL PREPARATION

University of California, Santa Cruz	B. S. Physics	2001-2005
University of California, Santa Cruz	M. S. Earth Science	2006-2008
University of California, Santa Cruz	Ph. D. Earth Science	2008-2011
Lawrence Berkeley National Lab	Postdoc, Climate Science	2011-2013

## ACADEMIC POSITIONS HELD

2017-Present	Career Earth Research Scientist, LBNL
2015-2019	Climate and Atmosphere Process Program Lead, LBNL
2015-2018	Assistant Adjunct Professor, UC Davis
2014-2017	Career-Track Earth Research Scientist, LBNL
2011-2013	Geological Postdoctoral Fellow, LBNL
2010	Associate in Atmospheric Sciences, UC Davis
2009-2011	Ph. D. Candidate, UC Santa Cruz
2006-2009	Graduate Student Researcher, UC Santa Cruz
2006	Research Consultant, LANL
2004-2005	Research Assistant, UC Santa Cruz
2004	Student Intern, SLAC

## 5 SELECT REFEREED PUBLICATIONS

Donner, L. J., **O'Brien**, T. A., Rieger, D., Vogel, B., and Cooke, W. F. (2016). Are atmospheric updrafts a key to unlocking climate forcing and sensitivity? *Atmospheric Chemistry and Physics*, 16(20):12983–12992

**O'Brien**, T. A., Collins, W. D., Kashinath, K., Rübél, O., Byna, S., Gu, J., Krishnan, H., and Ullrich, P. A. (2016c). Resolution dependence of precipitation statistical fidelity in hindcast simulations. *Journal of Advances in Modeling Earth Systems*, 8(2):976–990

**O'Brien**, T. A., Li, F., Collins, W. D., Rauscher, S. A., Ringler, T. D., Taylor, M., Hagos, S. M., and Leung, L. R. (2013d). Observed scaling in clouds and precipitation and scale incognizance in regional to global atmospheric models. *Journal of Climate*, 26(23):9313–9333

**O'Brien**, T. A., Sloan, L. C., Chuang, P. Y., Faloona, I. C., and Johnstone, J. A. (2013f). Multi-decadal simulation of coastal fog with a regional climate model. *Climate Dynamics*, 40:2801–2812

**O'Brien**, T. A., Chuang, P. Y., Sloan, L. C., Faloona, I. C., and Rossiter, D. L. (2012a). Coupling a new turbulence parametrization to RegCM adds realistic stratocumulus clouds. *Geoscientific Model Development*, 5(4):989–1008

## 5 SELECT INVITED TALKS

**O'Brien**, T. A. (2017c). A Case for Missing Physics in Climate Models. San Jose State University Climate and Meteorology Seminar, San Jose, CA. (Invited)

**O'Brien, T. A., Collins, W., Rauscher, S., Kashinath, K., Rübél, O., S, B., Gu, J., Krishnan, H., and Ullrich, P. (2016a).** Understanding the resolution dependence of precipitation statistical fidelity in hindcast simulations. AGU Fall Meeting, San Francisco CA. (Invited)

**O'Brien, T. A. (2015).** Climate modeling of extremes: state of the science. Climate Change Impacts & Integrated Assessment Workshop XXI, Snowmass CO. (Invited)

**O'Brien, T. A. and Collins, W. (2015a).** Analyzing and leveraging self-similarity in climate models. EGU Spring Meeting, Vienna, Austria. (Invited)

**O'Brien, T. A., Collins, W., Li, F., Rauscher, S., Ringler, T., Taylor, M., Hagos, S., and Leung, L. (2013a).** Observed Scaling in Clouds and Precipitation and Scale Incognizance in Regional to Global Atmospheric Models. Pacific Northwest National Laboratory Climate Physics Seminar, Richland, WA. (Invited)

## COMMUNITY AND PUBLIC SERVICE

- Steering committee member and report co-author: DOE/NOAA Workshop on High-Resolution Coupling and Initialization to Improve Predictability and Predictions in Climate Models, September 30 – October 2, 2015 (report available online)
- Organizing committee, 2016 DOE/RGCM PI Meeting, Fall 2016
- Organizing committee, 2015 DOE/RGCM Team Leads Meeting, Fall 2015
- Invited participant in interdisciplinary Fog as a System workshop, 2013
- Guest on KQED Forum – discussed heatwaves and climate, 23 June, 2017 (<http://bit.ly/2t4wIad>)
- Referee for: JGR - Atmospheres, J. of Clim., J. of Atmos. Sci., Clim. Dyn., Earth Interact., Atmos. Sci. Lett., and GRL
- Session co-convenor for AGU Fall Meetings:
  - A026 (2018): Boundary Layer Clouds: Atmosphere, Biosphere, Ocean, and Land Interactions
  - A23E (2016): Fog: Atmosphere, Biosphere, Ocean, and Land Interactions
  - A32E (2015): Fog: Atmosphere, Biosphere, Ocean, and Land Interactions
  - A52B (2014): Innovative Insights into the Climate System and Climate Models: Exploring Scales and Parameter Spaces
  - A14B (2014): Fog: Atmosphere, Biosphere, Ocean, and Land Interactions
  - A033 (2013): Fog: Atmosphere, Biosphere, land, and ocean interactions
  - A025 (2012): Coastal Fog: Atmosphere, Biosphere, Ocean, and Land Interactions
  - A066 (2012): Scale Dependence, Scale Invariance, and Scale Aware Parameterization
- Developer of free, multidimensional probability estimation tool, fastKDE
- Community contributor to the ICTP RegCM regional climate model

## INSTITUTIONAL SERVICE

- 2015-present, Area Council, LBNL Earth and Environmental Sciences Area
- 2015-present, Division Council, LBNL Climate and Ecosystem Sciences Division
- 2015-present, Lead, LBNL Climate and Atmospheric Process Program Domain
- 2017-2018, Committee on Undergraduate Courses and Majors and Courses, UC Davis College of Agricultural and Environmental Sciences
- 2017, Internal Fellowship Review Committee, UC Davis Graduate Studies
- 2015-2017, Diversity and Inclusion Council, LBNL
- 2015-2016, Graduate Admission Committee, UC Davis Atmospheric Sciences Graduate Group
- 2014-2015, Deputy Lead, LBNL Climate Modeling Program
- Ph.D. Dissertation Committee Member:
  - 2017, Alan Rhoades, UC Davis, *Understanding 21<sup>st</sup> Century Hydroclimatic Trends in Western USA Mountain Ranges Using Variable-Resolution CESM*
  - 2016, Xingying Huang, UC Davis, *Studying Regional Climate with Variable-Resolution CESM*
- Qualifying Examination Committee Member:
  - 2018, Elizabeth McClenny, UC Davis, *Atmospheric Rivers in a Hierarchy of Models: Biases, Sensitivities, and Usability Insights*
  - 2017, John P. O'Brien, UC Santa Cruz, *The Quantification of Anthropogenic Contribution to Co-occurring Meteorological Extremes*
  - 2015, Meina Wang, UC Davis, *Observations and Regional Climate Simulations of Changes in Sea-Breeze and Coastal Fog*

## TEACHING EXPERIENCE

Professor	ATM298	Python for Environmental Sciences	UCD	Spring 2017
Professor	ATM290	Atmospheric Science Seminar	UCD	Spring 2017
Professor	ATM298	Python for Environmental Sciences	UCD	Spring 2016
Instructor		L <sup>A</sup> T <sub>E</sub> Xfor Science	LBNL	Summer 2013
T.A.	ES110B	Earth as a Chemical System	UCSC	Winter 2011
Assoc. in Atm. Sci.	ATM120	Atm. Thermodyn. & Cloud Phys.	UCD	Fall 2010
T.A.	ES80C	Introduction to Weather and Climate	UCSC	Fall 2009
T.A.	ES110B	Earth as a Chemical System	UCSC	Winter 2009
T.A.	ES10	California Geology	UCSC	Fall 2007
T.A.	ES80D	Earth Sciences in the Cinema	UCSC	Spring 2007

## CURRENT, PENDING, & PAST SUPPORT

### *Current*

10/18–09/21	Co-PI, DOE	DE-FOA-0001862	Monsoon Extremes: Impacts, Metrics, and Synoptic-Scale Drivers
	(\$349K)		
10/16–09/19	Co-PI, DOE	Scientific Focus Area (\$7.4M)	Calibrated And Systematic Characterization, Attribution, and Detection of Extremes (CASCADE)
10/16–09/19	Co-I, DOE	DE-FOA-0001531	An Integrated Evaluation of the Simulated Hydroclimate System of the Continental US (Hyperion)
	(\$1.5M)		
10/16–09/19	Co-I, NSF	CoastalSEES (\$90K)	Coastal fog-mediated interactions between climate change, upwelling, and coast redwood resilience: Projecting vulnerabilities and the human response (Summen Project)
10/15–09/18	Co-I, DOE	DE-FOA-0001036	Developing Metrics to Evaluate the Skill and Credibility of Downscaling
	(\$150K)		

### *Pending*

07/18–06/21	Co-PI, DOE	SC-FOA-0001862	Scale-Interaction-Based Metrics and Diagnostics for Evaluating and Understanding Energy and Water Cycle Extremes in Earth System Models
	(\$209K)		
07/18–06/21	Co-PI, DOE	SC-FOA-0001862	A Better Understanding of Tropical Dynamics with E3SM at Cloud-Resolving Scales
	(\$180K)		
07/18–06/21	Co-I, DOE	SC-FOA-0001862	Development and Use of Tropical Moisture, Cloud, and Precipitation Metrics for Process Studies
	(\$325K)		
07/18–06/21	Co-I, DOE	SC-FOA-0001862	Assessing the influence of background state and climate variability on tropical cyclones using initialized ensembles and mesh refinement in E3SM
	(\$210K)		
07/18–06/21	Co-I, DOE	SC-FOA-0001862	Tropical Cyclone-Climate Interactions using E3SM
	(\$216K)		

### *Past*

10/13–09/16	Co-I, DOE	Scientific Focus Area (\$6.3M)	Calibrated And Systematic Characterization, Attribution, and Detection of Extremes (CASCADE)
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## AWARDS:

2014 Editor's Citation for Excellence in Refereeing, *Geophysical Research Letters* 2017  
Spot Award for Outstanding Contributions to Diversity & Inclusion

## GRADUATE AND POSTDOCTORAL ADVISORS:

Ph. D. Advisors: Lisa C. Sloan and Patrick Y. Chuang, *UC Santa Cruz*  
Postdoctoral Advisor: William D. Collins, *Lawrence Berkeley National Lab*

## GRADUATE AND POSTDOCTORAL ADVISEES:

John P. O'Brien, *LBNL/UC Santa Cruz* (graduate student 2014–present)  
Sarahí Arriaga-Ramirez, *LBNL/UC Davis* (graduate student 2016–present)  
Héctor Inda Díaz, *LBNL/UC Davis* (graduate student 2016–present)  
Nicholas Cavanaugh, *LBNL* (postdoc 2014–2016)

## OTHER SUPERVISEES

Ankur Mahesh, *LBNL/UC Berkeley* (undergraduate researcher 2017–present)  
Noel Keen, *LBNL* (software developer 2018–present)

## REFEREED CITATIONS, CHRONOLOGICAL

Note: '\*' indicates a major mentoring role.

Note: '†' indicates that specified co-authors contributed equally to the manuscript.

- 2019 [26] \*O'Brien, J. P., **O'Brien**, T. A., Patricola, C. M., and Wang, S.-Y. (2019). Metrics for Understanding Large-scale Controls of Multivariate Temperature and Precipitation Variability. *Climate Dynamics, Early Online Release*
- [25] Risser, M. D., Paciorek, C. J., Wehner, M. F., **O'Brien**, T. A., and Collins, W. D. (2019a). A probabilistic gridded product for daily precipitation extremes over the United States. *Climate Dynamics, Early Online Release*
- [24] Timmermans, B. W., Wehner, M. F., Cooley, D., **O'Brien**, T. A., and Krishnan, H. (2019). An Evaluation of the Consistency of Extremes in Gridded Precipitation Data Sets. *Climate Dynamics, In Press*
- 2018 [23] Shields, C. A., Rutz, J. J., Leung, L. R., Ralph, F. M., Wehner, M. F., **O'Brien**, T. A., and Pierce, R. (2018). Defining Uncertainties Through Comparison of Atmospheric River Tracking Methods. *Bulletin of the American Meteorological Society, in press*
- [22] Houlton, B., Lund, J., Greco, S., London, J., Margolis, H., Niemeier, D., Ogden, J., Ostoja, S., Ullrich, P., Wheeler, S., Almaraz, M., Harrison, S., Middleton, B.-R., Moyle, P., Nichols, S., **O'Brien**, T., Pinkerton, K., and Roberts, C. (2018). Sacramento Summary Report. In Cayan, D. and Wilhelm, S., editors, *California's Fourth Climate Change Assessment*, chapter SUM-CCCA4-2018-002
- [21] Kooperman, G. J., Pritchard, M. S., **O'Brien**, T. A., and Timmermans, B. W. (2018). Rainfall From Resolved Rather Than Parameterized Processes Better Represents the Present-Day and Climate Change Response of Moderate Rates in the Community Atmosphere Model. *Journal of Advances in Modeling Earth Systems*, 7(2):1–6
- [20] Stone, D. A., Risser, M. D., Angéilil, O. M., Wehner, M. F., Cholia, S., Keen, N., Krishnan, H., **O'Brien**, T. A., and Collins, W. D. (2018). A basis set for exploration of sensitivity to prescribed ocean conditions for estimating human contributions to extreme weather in CAM5.1-1degree. *Weather and Climate Extremes*
- 2017 [19] †Mudigonda, M., †Kim, S., †\*Mahesh, A., Kahou, S., Kashinath, K., Williams, D., Michalski, V., **O'Brien**, T. A., and Prabhat, M. (2017). Segmenting and Tracking Extreme Climate Events using Neural Networks. In *31st Conference on Neural Information Processing System*, pages 1–5, Long Beach, CA, USA
- [18] \*Cavanaugh, N. R., **O'Brien**, T. A., Collins, W. D., and Skamarock, W. C. (2017). Spherical Harmonic Spectral Estimation on Arbitrary Grids. *Monthly Weather Review*, 145(8):3355–3363
- 2016 [17] Donner, L. J., **O'Brien**, T. A., Rieger, D., Vogel, B., and Cooke, W. F. (2016). Are atmospheric updrafts a key to unlocking climate forcing and sensitivity? *Atmospheric Chemistry and Physics*, 16(20):12983–12992
- [16] **O'Brien**, T. A., Collins, W. D., Kashinath, K., Rübél, O., Byna, S., Gu, J., Krishnan, H., and Ullrich, P. A. (2016c). Resolution dependence of precipitation statistical fidelity in hindcast simulations. *Journal of Advances in Modeling Earth Systems*, 8(2):976–990
- [15] **O'Brien**, T. A., Kashinath, K., Cavanaugh, N. R., Collins, W. D., and O'Brien, J. P. (2016e). A fast and objective multidimensional kernel density estimation method: fastKDE. *Computational Statistics & Data Analysis*, 101:148–160

- [14] Rauscher, S. A., **O'Brien**, T. A., Piani, C., Coppola, E., Giorgi, F., Collins, W. D., and Lawston, P. M. (2016). A multimodel intercomparison of resolution effects on precipitation: simulations and theory. *Climate Dynamics*, 47(7-8):2205–2218
- 2015 [13] Martini, M. N., Gustafson, W. I., **O'Brien**, T. A., and Ma, P. L. (2015). Evaluation of tropical channel refinement using MPAS-A aquaplanet simulations. *Journal of Advances in Modeling Earth Systems*, 7(3):1351–1367
- 2014 [12] Torregrosa, A., **O'Brien**, T. A., and Faloon, I. C. (2014). Coastal Fog, Climate Change, and the Environment. *Eos, Transactions American Geophysical Union*, 95(50):473–474
- [11] **O'Brien**, T. A., Collins, W. D., Rauscher, S. A., and Ringler, T. D. (2014e). Reducing the computational cost of the ECF using a nuFFT: A fast and objective probability density estimation method. *Computational Statistics and Data Analysis*, 79:222–234
- [10] Güttler, I., Branković, Č., **O'Brien**, T. A., Coppola, E., Grisogono, B., and Giorgi, F. (2014). Sensitivity of the regional climate model RegCM4.2 to planetary boundary layer parameterisation. *Climate Dynamics*, 43(7-8):1753–1772
- 2013 [9] **O'Brien**, T. A., Li, F., Collins, W. D., Rauscher, S. A., Ringler, T. D., Taylor, M., Hagos, S. M., and Leung, L. R. (2013d). Observed scaling in clouds and precipitation and scale incognizance in regional to global atmospheric models. *Journal of Climate*, 26(23):9313–9333
- [8] **O'Brien**, T. A., Sloan, L. C., Chuang, P. Y., Faloon, I. C., and Johnstone, J. A. (2013f). Multidecadal simulation of coastal fog with a regional climate model. *Climate Dynamics*, 40:2801–2812
- 2012 [7] Giorgi, F., Coppola, E., Solmon, F., Mariotti, L., Sylla, M., Bi, X., Elguindi, N., Diro, G., Nair, V., Giuliani, G., Turuncoglu, U., Cozzini, S., Güttler, I., **O'Brien**, T., Tawfik, A., Shalaby, A., Zakey, A., Steiner, A., Stordal, F., Sloan, L., and Brankovic, C. (2012). RegCM4: model description and preliminary tests over multiple CORDEX domains. *Climate Research*, 52:7–29
- [6] **O'Brien**, T. A., Chuang, P. Y., Sloan, L. C., Faloon, I. C., and Rossiter, D. L. (2012a). Coupling a new turbulence parametrization to RegCM adds realistic stratocumulus clouds. *Geoscientific Model Development*, 5(4):989–1008
- 2010 [5] **O'Brien**, T. A., Sloan, L. C., and Snyder, M. A. (2010e). Can ensembles of regional climate model simulations improve results from sensitivity studies? *Climate Dynamics*, 37(5-6):1111–1118
- 2009 [4] Miller, N., Cayan, D., Duffy, P., Jin, H. H. J., Kanamaru, H., Kanamitsu, M., **O'Brien**, T., Schlegel, N., Sloan, L., Snyder, M., and Yoshimura, K. (2009). an Analysis of Simulated California Climate Using Multiple Dynamical and Statistical Techniques. Technical report. *Peer Reviewed*.
- 2007 [3] Bridges, F., Downs, C., **O'Brien**, T., Jeong, I. K., and Kimura, T. (2007a). Limitations on the extent of off-center displacements in TbMn O3 from EXAFS measurements. *Physical Review B - Condensed Matter and Materials Physics*, 76(9):1–11
- [2] Bridges, F., Downward, L., Jiang, Y., and **O'Brien**, T. (2007b). What Can We Learn from a Detailed Study of the Temperature Dependence of  $\sigma$ , the Width of the Pair Distribution Function? In *AIP Conference Proceedings*, volume 882, pages 59–63. AIP
- [1] **O'Brien**, T., Bridges, F., Downward, L., Mitchell, J., and Zheng, H. (2007a). Evidence for magnetic dimerons in the anisotropic bilayer system La<sub>1.2</sub>Sr<sub>1.8</sub>Mn<sub>2</sub>O<sub>7</sub>: An EXAFS study. *Physical Review B*, 75(6):064417

## MANUSCRIPTS IN REVIEW

Note: '\*' indicates a major mentoring role.

Risser, M. D., Paciorek, C. J., Wehner, M. F., **O'Brien**, T. A., and Collins, W. D. (2019b). Detected changes in precipitation extremes at their native scales derived from in situ measurements. *Journal of Climate, In Review*

## PUBLIC PRESENTATIONS, CHRONOLOGICAL

Note: '\*' indicates a major mentoring role.

- 2019 Kashinath, K., Prabhat, M., Mudigonda, M., Mahesh, A., Kim, S., Wu, J., Albert, A., Rupe, A., Fernandez, A., **O'Brien**, T., Wehner, M., and Collins, W. (2019). Deep Learning Recognizes Climate and Weather Patterns and Emulates Complex Processes Critical to the Modeling of Earth's Climate. 99<sup>th</sup> AMS Annual Meeting, Phoenix, TX
- O'Brien**, T., Mahesh, A., Risser, M., Paciorek, C., Wehner, M., Patricola, C., O'Brien, J., Prabhat, M., and Collins, W. (2019). Probabilistic AR Detection for Understanding Western Coastal Hydroclimate. 99<sup>th</sup> AMS Annual Meeting, Phoenix, TX
- \*Mahesh, A., **O'Brien**, T., Collins, W., Wehner, M., Prabhat, M., Kashinath, K., and Mudigonda, M. (2019). Probabilistic Detection of Extreme Weather Using Deep Learning Methods. 99<sup>th</sup> AMS Annual Meeting, Phoenix, TX
- Prabhat, Kurth, T., Treichler, S., Romero, J., Mudigonda, M., Mahesh, A., **O'Brien**, T., Fatica, M., Houston, M., Kashinath, K., Matheson, M., Shankar, M., Wehner, M., and Collins, W. (2019). Exascale Deep Learning for Climate Science. 99<sup>th</sup> AMS Annual Meeting, Phoenix, TX
- 2018 \*Mahesh, A., **O'Brien**, T., Collins, W., Wehner, M., Prabhat, M., Kashinath, K., and Mudigonda, M. (2018a). Probabilistic detection of extreme weather using deep learning methods (Invited). AGU Fall Meeting, Washington, DC
- Jian, C., Kashinath, K., Mudigonda, M., Mahesh, A., **O'Brien**, T., Marcus, P., and Prabhat, M. (2018). Deep learning on the Sphere: Convolutional Neural Network on Unstructured Mesh. AGU Fall Meeting, Washington, DC
- Kashinath, K., Prabhat, M., Mudigonda, M., Mahesh, A., Kim, S.-K., Liu, Y., Kahou, S., Toms, B., Racah, E., Beckham, C., Pal, C., Maharaj, T., Biard, J., Kunkel, K., Williams, D., **O'Brien**, T., Wehner, M., and Collins, W. (2018). Deep Learning recognizes weather and climate patterns (Invited). AGU Fall Meeting, Washington, DC
- \*Mahesh, A., **O'Brien**, T., Collins, W., Wehner, M., Prabhat, M., Kashinath, K., and Mudigonda, M. (2018b). Using deep learning for probabilistic detection of extreme weather. AGU Fall Meeting, Washington, DC
- Prabhat, M., Kurth, T., Treichler, S., Romero, J., Mudigonda, M., M, F., Houston, M., Mahesh, A., Kashinath, K., Matheson, M., Shankar, M., **O'Brien**, T., Wehner, M., and Collins, W. (2018). Towards Exascale Deep Learning for Climate Science (Invited). AGU Fall Meeting, Washington, DC
- O'Brien**, T., Risser, M., O'Brien, J., Patricola, C., and Collins, W. (2018d). Chance Rather than Trends in the Unusual 2017 California Wet Season. AGU Fall Meeting, Washington, DC
- Risser, M., Paciorek, C., Wehner, M., and **O'Brien**, T. (2018). Spatially-resolved trends in observed extreme precipitation over the United States. AGU Fall Meeting, Washington, DC
- Prabhat, M., Racah, E., Biard, J., Liu, Y., Mudigonda, M., Kashinath, K., Beckham, C., Maharaj, T., Kahou, S., Pal, C., **O'Brien**, T., Wehner, M., Kunkel, K., and Collins, W. (2017b). Deep Learning for Extreme Weather Detection. AGU Fall Meeting, New Orleans, LA
- Rhoades, A., Jones, A., **O'Brien**, T., Ullrich, P., and Zarzycki, C. (2018). Influences of Pacific Ocean domain extent on the western US hydroclimatology in variable-resolution CESM . AGU Fall Meeting, Washington, DC

Charn, A., Collins, W., Parishani, H., Risser, M., and **O'Brien**, T. (2018). Microphysical Sensitivity of Superparameterized Precipitation Extremes in the Continental US Due to Feedbacks on Large-scale Circulation. AGU Fall Meeting, Washington, DC

\***O'Brien**, J., **O'Brien**, T., Patricola, C., and Wang, S.-Y. (2018). Multivariate Metrics to Quantify Co-occurring Extremes Resulting from the Dipole Circulation Pattern. AGU Fall Meeting, Washington, DC

\*Mahesh, A., **O'Brien**, T., Prabhat, M., Collins, W., and Liu, Y. (2018d). Assessing Uncertainty in Deep Learning Techniques that Identify Atmospheric Rivers in Climate Simulations. 2<sup>nd</sup> ARTMIP Workshop, Gaithersburg, MD

**O'Brien**, T., Kashinath, K., Inda-Díaz, and Collins, W. (2018a). Convective Aggregation and the Intensity, Duration, Area, and Frequency of Precipitation. 8<sup>th</sup> GEWEX Open Science Conference, Canmore, Canada

**O'Brien**, T., O'Brien, J., Risser, M., Patricola, C., and Collins, W. (2018c). A Weakening of Rainy Events in CA. International Detection and Attribution Group Workshop, Berkeley, CA

Timmermans, B., Collins, W., **O'Brien**, T., and Risser, M. (2018). Parameter uncertainty in simulations of extreme precipitation and attribution studies. International Detection and Attribution Group Workshop, Berkeley, CA

\*Arriaga Ramirez, S., **O'Brien**, T., Rhoades, A., and Ullrich, P. (2018). Evaluating Variable Resolution-CESM for the North American Monsoon System. 98<sup>th</sup> AMS Annual Meeting, Austin, TX

Collins, W., Baird, J., Kashinath, K., Liu, Y., **O'Brien**, T., Pal, C., Prabhat, M., Racah, E., and Wehner, M. (2018). Deep Learning for Detecting Extreme Weather and Climate Patterns. 98<sup>th</sup> AMS Annual Meeting, Austin, TX

\*Mahesh, A., **O'Brien**, T., Prabhat, M., and Collins, W. (2018c). Assessing Uncertainty in Deep Learning Techniques that Identify Atmospheric Rivers in Climate Simulations. 98<sup>th</sup> AMS Annual Meeting, Austin, TX

**O'Brien**, T., Kashinath, K., Inda-Díaz, and Collins, W. (2018b). Convective Aggregation and the Size Distribution of Updrafts. 98<sup>th</sup> AMS Annual Meeting, Austin, TX

2017 \*Inda Díaz, H. and **O'Brien**, T. (2017). Contrasting self-aggregation over land and ocean surfaces. AGU Fall Meeting, New Orleans, LA

\*Mahesh, A., **O'Brien**, T., Prabhat, M., Collins, W., and Liu, Y. (2017). Assessing Uncertainty in Deep Learning Techniques that Identify Atmospheric Rivers in Climate Simulations. AGU Fall Meeting, New Orleans, LA

Prabhat, M., Racah, E., Biard, J., Liu, Y., Mudigonda, M., Kashinath, K., Beckham, C., Maharaj, T., Kahou, S., Pal, C., **O'Brien**, T., Wehner, M., Kunkel, K., and Collins, W. (2017b). Deep Learning for Extreme Weather Detection. AGU Fall Meeting, New Orleans, LA

Prabhat, M., Biard, J., Ganguly, S., Ames, S., Kashinath, K., Kim, S.-K., Kahou, S., Maharaj, T., Beckham, C., **O'Brien**, T., Wehner, M., Williams, D., Kunkel, K., and Collins, W. (2017a). ClimateNet: A Machine Learning Dataset for Climate Science Research. AGU Fall Meeting, New Orleans, LA

**O'Brien**, T. A. (2017c). A Case for Missing Physics in Climate Models. San Jose State University Climate and Meteorology Seminar, San Jose, CA. (Invited)

**O'Brien**, T. (2017b). The Uncertain Future of Coastal Fog. Riparian Summit 2017, Davis, CA. (Invited)

**O'Brien, T.** (2017a). A Case for Missing Physics in Climate Models. 7<sup>th</sup> Annual oSTEM Conference, Chicago, IL

Timmermans, B., Collins, W., **O'Brien, T.**, and Risser, M. (2017a). Parameter uncertainty in simulations of extreme precipitation and attribution studies. AGU Fall Meeting, New Orleans, LA

Timmermans, B., Collins, W., **O'Brien, T.**, and Risser, M. (2017b). Parametric uncertainty in simulations of extreme weather events. Statistical and Applied Mathematical Sciences Institute, Research Triangle Park, NC

\***O'Brien, J.** and **O'Brien, T.** (2017a). Identifying and Understanding Regional Differences in Temperature and Precipitation in California Under the Influence of PDO. The 28th Pacific Climate Workshop, Pacific Grove, CA

\***O'Brien, J.** and **O'Brien, T. A.** (2017b). Identifying and Understanding Regional Differences in Temperature and Precipitation in California Under the Influence of PDO. AMS Annual Meeting, Seattle, WA

Wehner, M., Stone, D., Johnson, J., Loring, B., Krishnan, H., and **O'Brien, T. A.** (2017). High resolution climate model simulations of stabilized 1.5 and 2 degree warming scenarios. AMS Annual Meeting, Seattle, WA

\*Inda Díaz, H., **O'Brien, T. A.**, and Stone, D. (2016). The anthropogenic influence on heat and humidity in the US Midwest. AGU Fall Meeting, San Francisco, CA

**O'Brien, T. A.**, Collins, W., Rauscher, S., Kashinath, K., Rübel, O., S, B., Gu, J., Krishnan, H., Ullrich, P., and Donner, L. (2016b). A case for missing cloud physics in climate models. AGU Fall Meeting, San Francisco CA. (Invited)

Wehner, M., Stone, D., Johnson, J., Loring, B., Krishnan, H., and **O'Brien, T. A.** (2016). High resolution climate model simulations of stabilized 1.5 and 2 degree warming scenarios. AGU Fall Meeting, San Francisco, CA

**O'Brien, T. A.**, Collins, W., Rauscher, S., Kashinath, K., Rübel, O., S, B., Gu, J., Krishnan, H., and Ullrich, P. (2016a). Understanding the resolution dependence of precipitation statistical fidelity in hindcast simulations. AGU Fall Meeting, San Francisco CA. (Invited)

Timmermans, B., **O'Brien, T. A.**, Wehner, M., and Krishnan, H. (2016). Uncertainty in extreme precipitation representation in numerical simulations and hydrological datasets. AGU Fall Meeting, San Francisco, CA

**O'Brien, T. A.** (2016). A Case for Missing Physics in Climate Models. UC Santa Cruz Whole Earth Seminar, Santa Cruz CA. (Invited)

\*Liu, Y., Kashinath, K., **O'Brien, T. A.**, and Prabhat, M. (2016). Systematic Characterization of Cyclogenesis in High Resolution Climate Model Simulations. 32nd Conference on Hurricanes and Tropical Meteorology, San Juan, PR

**O'Brien, T. A.**, Kashinath, K., Cavanaugh, N., Collins, W., and **O'Brien, J.** (2016d). A Fast and Objective Multidimensional Kernel Density Estimation Method for Climate Data Analysis: fastKDE. AMS Annual Meeting, New Orleans, LA

Krishnan, H., Loring, B., Byna, S., Wehner, M., **O'Brien, T. A.**, Prabhat, M., Paciorek, C., and Stone, D. (2016). Enabling End-to-End Climate Science Workflows in High Performance Computing Environments. AMS Annual Meeting, New Orleans, LA

Gittens, A., Cavanaugh, N., Kashinath, K., **O'Brien, T. A.**, Prabhat, M., and Mahoney, M. (2016). Large-scale Parallelized EOF Computation on the CSFR Ocean Temperature Field. AMS Annual Meeting, New Orleans LA

- \*Cavanaugh, N., **O'Brien**, T. A., and Collins, W. (2016). Reduced Weather Variability Indicated by Decreases in Atmospheric Energy Spectra. AMS Annual Meeting, New Orleans, LA
- 2015 **O'Brien**, T. A., Kashinath, K., and Collins, W. (2015a). A New Framework for Systematically Characterizing and Improving Extreme Weather Phenomena in Climate Models. AGU Fall Meeting, San Francisco, CA
- Krishnan, H., Byna, S., Wehner, M., Gu, J., **O'Brien**, T. A., Loring, B., Stone, D., Collins, W., Prabhat, M., Liu, Y., Johnson, J., and Paciorek, C. (2015). Enabling Efficient Climate Science Workflows in High Performance Computing Environments. AGU Fall Meeting, San Francisco, CA
- O'Brien**, T. A., Kashinath, K., and Collins, W. (2015b). The Role of SST and Large-Scale Dynamical Motions on the Onset and Shutdown of the Super Greenhouse Effect. AGU Fall Meeting, San Francisco, CA
- \*Liu, Y., Rao, P., Kashinath, K., Prabhat, M., and **O'Brien**, T. A. (2015). Systematic Characterization of Cyclogenesis in High Resolution Climate Model Simulations. AGU Fall Meeting, San Francisco, CA
- Collins, W., Wehner, M., **O'Brien**, T. A., Paciorek, C., Krishnan, H., Johnson, J., and Prabhat, M. (2015). Data informatics for the Detection, Characterization, and Attribution of Climate Extremes. AGU Fall Meeting, San Francisco, CA
- \*Cavanaugh, N., **O'Brien**, T. A., and Collins, W. (2015). Reduced weather variability indicated by decreases in atmospheric energy spectra. AGU Fall Meeting, San Francisco, CA
- \***O'Brien**, J. and **O'Brien**, T. A. (2015). The Joint Statistics of California Temperature and Precipitation as a Function of the Large-scale State of the Climate. AGU Fall Meeting, San Francisco, CA
- O'Brien**, T. A. and Collins, W. (2015d). Frontiers in climate modeling at the watershed scale. 13th IWA Special Conference on Watershed and River Basin Management, San Francisco, CA. (Invited)
- O'Brien**, T. A. (2015). Climate modeling of extremes: state of the science. Climate Change Impacts & Integrated Assessment Workshop XXI, Snowmass CO. (Invited)
- O'Brien**, T. A. and Collins, W. (2015b). Analyzing and leveraging self-similarity in climate models. San Jose State University Climate and Meteorology Seminar, San Jose, CA
- O'Brien**, T. A. and Collins, W. (2015c). Analyzing and leveraging self-similarity in climate models. UC Davis Atmospheric Science Seminar, Davis, CA
- O'Brien**, T. A. and Collins, W. (2015a). Analyzing and leveraging self-similarity in climate models. EGU Spring Meeting, Vienna, Austria. (Invited)
- 2014 **O'Brien**, T. A., Collins, W., Rauscher, S., and Ringler, T. (2014b). Scale-dependent vertical mass flux and a possible deficiency in current parameterization suites. Latsis Symposium, Zurich, Switzerland
- O'Brien**, T. A. (2014). Developing climate scenarios for the energy sector at LBNL/UC Berkeley. Climate Scenarios for the California Energy Sector, Sacramento CA
- O'Brien**, T. A., Collins, W., Kashinath, K., Rubel, O., and Krishnan, H. (2014a). Using the resolution dependence of modeled extreme event fidelity to drive model development: Model evaluation within the CASCADE SFA. DOE Integrated Climate Modeling Principal Investigator Meeting, Potomac, MD

- O'Brien, T. A., Collins, W., Rauscher, S., Ringler, T., and Taylor, M. (2014c).** Analyzing and leveraging self-similarity in climate models. UC Berkeley Geolunch Seminar, Berkeley, CA
- O'Brien, T. A., Collins, W., Rauscher, S., Ringler, T., and Taylor, M. (2014d).** Scale-dependent horizontal velocity fields drive vertical velocity resolution dependence. CESM Atmosphere Working Group Meeting, Boulder, CO
- 2013 **O'Brien, T. A., Collins, W., Rauscher, S., and Ringler, T. (2013c).** Fractal behavior drives resolution dependent vertical velocity fields. AGU Fall Meeting, San Francisco, CA
- O'Brien, T. A., Collins, W., Li, F., Rauscher, S., Ringler, T., Taylor, M., Hagos, S., and Leung, L. (2013b).** Observed Scaling in Clouds and Precipitation and Scale Incognizance in Regional to Global Atmospheric Models. CESM Atmosphere Working Group Meeting, Boulder, CO
- O'Brien, T. A., Collins, W., Li, F., Rauscher, S., Ringler, T., Taylor, M., Hagos, S., and Leung, L. (2013a).** Observed Scaling in Clouds and Precipitation and Scale Incognizance in Regional to Global Atmospheric Models. Pacific Northwest National Laboratory Climate Physics Seminar, Richland, WA. (Invited)
- O'Brien, T. A., Sloan, L., Chuang, P., and Faloon, I. (2013e).** The Recent Decline of Coastal Fog and the Drying of the Coastal Boundary Layer. Oregon State University Physics of Oceans and Atmospheres Seminar Series, Corvallis, OR. (Invited)
- 2012 **O'Brien, T. A., Collins, W., Li, F., Rauscher, S., Ringler, T., Taylor, M., Hagos, S., and Leung, L. (2012c).** Observed Scaling in Clouds and Precipitation and Scale Incognizance in Regional to Global Atmospheric Models. AGU Fall Meeting, San Francisco, CA
- Collins, W., **O'Brien, T. A.**, and Li, F. (2012). Observational constraints on scale-awareness: Scale-incognizant parameterizations in the Community Atmosphere Model. *Frontiers in Computational Physics* O35
- O'Brien, T. A., Sloan, L., Chuang, P., Faloon, I., and Collins, W. (2012f).** Simulating the Recent Decline in Coastal Fog. California Climate Change & Water Symposium, Davis, CA
- O'Brien, T. A., Collins, W., Sloan, L., Chuang, P., and Faloon, I. (2012d).** Sea Surface Temperatures Drive Fog Variability but not the Long-term Trend. Eastern Pacific Ocean Conference, Mt Hood, OR
- O'Brien, T. A., Sloan, L., Chuang, P., and Faloon, I. (2012e).** Changes in California Coastal Dynamics over the Last 100 Years. ICTP RegCM Workshop, Trieste, Italy. (Invited)
- O'Brien, T. A., Collins, W., and Li, F. (2012b).** Observational constraints on scale-awareness: Illumination of a scale-incognizant stratiform parameterization in CAM. BASC Symposium, Berkeley, CA
- 2011 **O'Brien, T. A., Sloan, L., Chuang, P., and Faloon, I. (2011a).** Simulating Coastal Fog with a Regional Climate Model. AGU Fall Meeting, San Francisco, CA
- O'Brien, T. A., Sloan, L., Chuang, P., and Faloon, I. (2011b).** What has caused the long-term decline in California coastal fog? UC Davis Atmospheric Sciences Seminar, Davis, CA. (Invited)
- 2010 Snyder, M. and **O'Brien, T. A. (2010).** Regional climate model ensemble techniques: Towards higher spatial resolution probabilistic climate scenarios. AGU Fall Meeting, San Francisco, CA
- Sloan, L., Graves, D., and Snyder, M. (2010). Climate Change and Wine: Observations, Impacts, and Implications. Seymour Center Lecture Series, Santa Cruz, CA

- O'Brien**, T. A., Sloan, L., Chuang, P., and Faloona, I. (2010b). Regional Simulation of Marine Stratus and Fog. UC Davis Symposium on Sea and Coast, Bodega Bay, CA
- O'Brien**, T. A., Sloan, L., Chuang, P., and Rossiter, D. (2010c). What can a regional climate model tell us about the long term climatology of marine stratocumulus off California's coast? AMS Cloud Physics Conference, Portland, OR
- O'Brien**, T. A., Sloan, L., Chuang, P., and Faloona, I. (2010a). Does a new boundary layer model improve simulation of coastal environments in RegCM3? ICTP RegCM Workshop, Trieste, Italy
- O'Brien**, T. A., Sloan, L., and Snyder, M. (2010d). Can Ensembles of Regional Climate Model Simulations Improve Results from Sensitivity Studies? BASC Symposium, Berkeley, CA
- 2008 Snyder, M., **O'Brien**, T. A., and Sloan, L. (2008). Future Changes in Surface Winds in the Western U.S. due to Climate Change. AGU Fall Meeting, San Francisco, CA
- Hutchison, K., **O'Brien**, T. A., and Sloan, L. (2008). The Regional Impact of Current and Future Dust Levels on Climate in Western North America. AGU Fall Meeting, San Francisco, CA
- O'Brien**, T. A., Hutchison, K., Sloan, L., and Solmon, F. (2008). Application of ICTP RegCM3' New Dust Model to Modern N. America: Challenges and Questions. AGU Fall Meeting, San Francisco, CA
- 2007 **O'Brien**, T. A., Solmon, F., Sloan, L., and Snyder, M. (2007b). Airborne Dust Modified the North American Climate During the 1930's Dust Bowl. AGU Joint Assembly, Acapulco, Mexico
- 2005 **O'Brien**, T. A., Downward, L., Larson, D., Downs, C., Bridges, F., Mitchell, J., and Zheng, H. (2005b). Evidence for Magnetic Dimerons in the Anisotropic Bilayer System La<sub>1.2</sub>Sr<sub>1.8</sub>Mn<sub>2</sub>O<sub>7</sub>: an EXAFS study. SSRL Users' Meeting Poster Session, Menlo Park, CA
- O'Brien**, T. A., Downward, L., Larson, D., Downs, C., Bridges, F., Mitchell, J., and Zheng, H. (2005a). Anisotropic Local Distortion of La<sub>1.2</sub>Sr<sub>1.8</sub>Mn<sub>2</sub>O<sub>7</sub> Through the Ferromagnetic Transition Temperature. American Physical Society Meeting, Los Angeles, CA
- 2004 **O'Brien**, T. A., Downward, L., Larson, D., Downs, C., Bridges, F., Mitchell, J., and Zheng, H. (2004). Anisotropic Local Distortion of La<sub>1.2</sub>Sr<sub>1.8</sub>Mn<sub>2</sub>O<sub>7</sub> Through the Ferromagnetic Transition Temperature. SSRL Users' Meeting Poster Session, Menlo Park, CA