

Travis Allen O'Brien

1 Cyclotron Rd, MS74R-316C
Berkeley, CA 94518
(510) 495-8047
TAOBrien@lbl.gov

EDUCATION

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

POSITIONS HELD

2015-Present	Assistant Adjunct Professor, UC Davis
2014-Present	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. (2016d). Resolution dependence of precipitation statistical fidelity in hindcast simulations. *Journal of Advances in Modeling Earth Systems*, 8(2):976–990

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

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

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

5 SELECT INVITED TALKS

O'Brien, T., Collins, W., Rauscher, S., Kashinath, K., Rübél, 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)

O'Brien, T., 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. (2016). A case for missing physics in climate models. UC Santa Cruz Whole Earth Seminar, Santa Cruz CA. (Invited)

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

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

SELECTED SYNERGISTIC ACTIVITIES

- 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)
- Invited participant in interdisciplinary Fog as a System workshop, 2013
- Session co-convenor for AGU Fall Meetings:
 - 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

TEACHING EXPERIENCE

Professor	ATM298	Python for Environmental Sciences	UCD	Spring 2016
Instructor		L ^A T _E X for Science	LBLN	Summer 2013
T.A.	ES110B	Earth as a Chemical System	UCSC	Winter 2011
Lecturer	ATM120	Atmospheric Thermodyn. & Cloud Physics	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

Pending

07/17–07/22 PI, DOE LAB 16-1625 (\$2.5M) Quantifying the Effect of Changing Climate Extremes on Terrestrial Carbon Storage

Current

10/16–09/19 Co-PI, DOE Scientific Focus Area (\$6.6M) Calibrated And Systematic Characterization, Attribution, and Detection of Extremes (CASCADE)

10/16–09/19 Co-I, DOE DE-FOA-0001531 (\$1.5M) An Integrated Evaluation of the Simulated Hydroclimate System of the Continental US (Hyperion)

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 (\$150K) Developing Metrics to Evaluate the Skill and Credibility of Downscaling

Past

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

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)

REFEREED CITATIONS, CHRONOLOGICAL

- 2016 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., Rübel, O., Byna, S., Gu, J., Krishnan, H., and Ullrich, P. A. (2016d). Resolution dependence of precipitation statistical fidelity in hindcast simulations. *Journal of Advances in Modeling Earth Systems*, 8(2):976–990
- 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
- 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 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 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

- 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
- 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 **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., Faloon, I. C., and Johnstone, J. A. (2013e). Multidecadal simulation of coastal fog with a regional climate model. *Climate Dynamics*, 40:2801–2812
- 2012 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
- O'Brien**, T. A., Chuang, P. Y., Sloan, L. C., Faloon, I. C., and Rossiter, D. L. (2012f). Coupling a new turbulence parametrization to RegCM adds realistic stratocumulus clouds. *Geoscientific Model Development*, 5(4):989–1008
- 2010 **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 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
- 2007 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
- Bridges, F., Downward, L., Jiang, Y., and **O'Brien**, T. (2007b). What Can We Learn from a Detailed Study of the Temperature Dependence of σ , the Width of the Pair Distribution Function? In *AIP Conference Proceedings*, volume 882, pages 59–63. AIP
- O'Brien**, T., Bridges, F., Downward, L., Mitchell, J., and Zheng, H. (2007a). Evidence for magnetic dimers in the anisotropic bilayer system La_{1.2}Sr_{1.8}Mn₂O₇: An EXAFS study. *Physical Review B*, 75(6):064417

PUBLIC PRESENTATIONS, CHRONOLOGICAL

Note: '*' indicates a major mentoring role.

- 2017 ***O'Brien**, J. and **O'Brien**, T. (2017). 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. (2017). High resolution climate model simulations of stabilized 1.5 and 2 degree warming scenarios. AMS Annual Meeting Seattle, WA

- 2016 *Inda Diaz, H., **O'Brien**, T., and Stone, D. (2016). The anthropogenic influence on heat and humidity in the us midwest. AGU Fall Meeting San Francisco CA
- O'Brien**, T., 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. (2016). High resolution climate model simulations of stabilized 1.5 and 2 degree warming scenarios. AGU Fall Meeting San Francisco CA
- O'Brien**, T., 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., Wehner, M., and Krishnan, H. (2016). Uncertainty in extreme precipitation representation in numerical simulations and hydrological datasets. AGU Fall Meeting San Francisco CA
- *Liu, Y., Kashinath, K., **O'Brien**, T., 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., Kashinath, K., Cavanaugh, N., Collins, W., and O'Brien, J. (2016c). 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., 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., 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., and Collins, W. (2016). Reduced weather variability indicated by decreases in atmospheric energy spectra. AMS Annual Meeting New Orleans LA
- 2015 **O'Brien**, T., 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., 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., 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. (2015). Systematic characterization of cyclogenesis in high resolution climate model simulations. AGU Fall Meeting San Francisco CA
- Collins, W., Wehner, M., **O'Brien**, T., 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. (Invited)

- *Cavanaugh, N., **O'Brien**, T., 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. (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. and Collins, W. (2015d). Frontiers in climate modeling at the watershed scale. 13th IWA Special Conference on Watershed and River Basin Management. (Invited)
- O'Brien**, T. (2015). Climate modeling of extremes: state of the science. Climate Change Impacts & Integrated Assessment Workshop XXI Snowmass CO. (Invited)
- O'Brien**, T. and Collins, W. (2015b). Analyzing and leveraging self-similarity in climate models. San Jose State University Climate and Meteorology Seminar
- O'Brien**, T. and Collins, W. (2015c). Analyzing and leveraging self-similarity in climate models. UC Davis Atmospheric Science Seminar
- O'Brien**, T. and Collins, W. (2015a). Analyzing and leveraging self-similarity in climate models. EGU Spring Meeting Vienna Austria. (Invited)
- 2014 **O'Brien**, T., 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. (2014). Developing climate scenarios for the energy sector at lbl/uc berkeley. Climate Scenarios for the California Energy Sector Sacramento CA
- O'Brien**, T., 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., Collins, W., Rauscher, S., Ringler, T., and Taylor, M. (2014c). Analyzing and leveraging self-similarity in climate models. UC Berkeley Geolunch Seminar
- O'Brien**, T., 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
- 2013 **O'Brien**, T., Collins, W., Rauscher, S., and Ringler, T. (2013b). Fractal behavior drives resolution dependent vertical velocity fields. AGU Fall Meeting NG41A-1659
- O'Brien**, T., 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. (Invited)
- O'Brien**, T., 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. (Invited)
- O'Brien**, T., Sloan, L., Chuang, P., and Faloon, I. (2013c). The recent decline of coastal fog and the drying of the coastal boundary layer. Oregon State University Physics of Oceans and Atmospheres Seminar Series. (Invited)
- 2012 **O'Brien**, T., Collins, W., Li, F., Rauscher, S., Ringler, T., Taylor, M., Hagos, S., and Leung, L. (2012b). Observed scaling in clouds and precipitation and scale incognizance in regional to global atmospheric models. AGU Fall Meeting A43G-0233

- Collins, W., **O'Brien**, T., 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., Sloan, L., Chuang, P., Faloon, I., and Collins, W. (2012e). Simulating the recent decline in coastal fog. *California Climate Change & Water Symposium*
- O'Brien**, T., Collins, W., Sloan, L., Chuang, P., and Faloon, I. (2012c). Sea surface temperatures drive fog variability but not the long-term trend. *Eastern Pacific Ocean Conference*
- O'Brien**, T., Sloan, L., Chuang, P., and Faloon, I. (2012d). Changes in california coastal dynamics over the last 100 years. *ICTP RegCM Workshop*. (Invited)
- O'Brien**, T., Collins, W., and Li, F. (2012a). Observational constraints on scale-awareness: Illumination of a scale-incognizant stratiform parameterization in cam. *BASC Symposium*
- 2011 **O'Brien**, T., Sloan, L., Chuang, P., and Faloon, I. (2011a). Simulating coastal fog with a regional climate model. *AGU Fall Meeting A31K-05*
- O'Brien**, T., Sloan, L., Chuang, P., and Faloon, I. (2011b). What has caused the long-term decline in california coastal fog? *UC Davis Atmospheric Sciences Seminar*. (Invited)
- 2010 Snyder, M. and **O'Brien**, T. (2010). Regional climate model ensemble techniques: Towards higher spatial resolution probabilistic climate scenarios. *AGU Fall Meeting GC42A-05*
- Sloan, L., Graves, D., and Snyder, M. (2010). Climate change and wine: Observations, impacts, and implications. *Seymour Center Lecture Series*
- O'Brien**, T., Sloan, L., Chuang, P., and Faloon, I. (2010b). Regional simulation of marine stratus and fog. *UC Davis Symposium on Sea and Coast*
- O'Brien**, T., 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 P2 32*
- O'Brien**, T., Sloan, L., Chuang, P., and Faloon, I. (2010a). Does a new boundary layer model improve simulation of coastal environments in regcm3? *ICTP RegCM Workshop*
- O'Brien**, T., Sloan, L., and Snyder, M. (2010d). Can ensembles of regional climate model simulations improve results from sensitivity studies? *BASC Symposium*
- 2008 Snyder, M., **O'Brien**, T., and Sloan, L. (2008). Future changes in surface winds in the western u.s. due to climate change. *AGU Fall Meeting GC53B-0721*
- Hutchison, K., **O'Brien**, T., and Sloan, L. (2008). The regional impact of current and future dust levels on climate in western north america. *AGU Fall Meeting GC53A-0693*
- O'Brien**, T., Hutchison, K., Sloan, L., and Solmon, F. (2008). Application of ictp regcm3's new dust model to modern n. america: Challenges and questions. *AGU Fall Meeting GC53A-0688*
- 2007 **O'Brien**, T., Solmon, F., Sloan, L., and Snyder, M. (2007b). Airborne dust modified the north american climate during the 1930's dust bowl. *AGU Joint Assembly A52A-03*
- 2005 **O'Brien**, T., Downward, L., Larson, D., Downs, C., Bridges, F., Mitchell, J., and Zheng, H. (2005b). Evidence for magnetic dimers in the anisotropic bilayer system la1.2sr1.8mn2o7: an exafs study. *SSRL Users' Meeting Poster Session*
- O'Brien**, T., Downward, L., Larson, D., Downs, C., Bridges, F., Mitchell, J., and Zheng, H. (2005a). Anisotropic local distortion of la1.2sr1.8mn2o7 through the ferromagnetic transition temperature. *American Physical Society Meeting N43 00003*

2004 | **O'Brien, T.,** Downward, L., Larson, D., Downs, C., Bridges, F., Mitchell, J., and Zheng, H. (2004). Anisotropic local distortion of $\text{La}_1.2\text{Sr}_{1.8}\text{Mn}_2\text{O}_7$ through the ferromagnetic transition temperature. SSRL Users' Meeting Poster Session