

## **Alex O. Gonzalez**

Postdoctoral Scholar

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### **Means of Contact**

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### **Education**

2015	P.h.D.	Colorado State University	Atmospheric Science
2011	M.S.	Colorado State University	Atmospheric Science
2008	B.S.	The Pennsylvania State University	Meteorology (Minor: Mathematics)

### **Research Experience**

12/2015-Present     *Joint Institute for Regional Earth System Science and Engineering*  
*Postdoctoral Scholar (Supervisors: Drs. Xianan Jiang and Duane E. Waliser)*

My research focuses on physical processes involved in the Madden Julian Oscillation (MJO) initiation and maintenance studied using many climate models, mainly focusing on the GFDL AM4 climate model. I am analyzing feedbacks related to tropical convection, radiation, boundary layer processes, and the large scale dynamics.

08/2015-12/2015     *Colorado State University*  
*Postdoctoral Research Assistant (Supervisor: Dr. Wayne H. Schubert)*

Worked on publications from my Ph.D. research. Paper one is entitled, “Dynamics of the ITCZ boundary layer,” paper two is entitled, “Transient aspects of the Hadley circulation,” and paper three is entitled, “Dynamics of the eastern Pacific ITCZ boundary layer.” Refer to the description below for more information.

01/2009-08/2015     *Colorado State University*  
*Graduate Research Assistant (Advisor: Dr. Wayne H. Schubert)*

Worked toward better understanding dynamical aspects of multi-scale atmospheric circulations in and around the intertropical convergence zone (ITCZ). Formulated linear idealized models to investigate balanced and transient features of deep and shallow overturning circulations forced by ITCZ convection and boundary layer vertical motion. Studied the dynamics of ITCZ formation using a nonlinear atmospheric boundary layer model at horizontal resolutions on the order of 100-500 m. Compared boundary layer model results to those in the model used in ECMWF's Year of Tropical Convection (YOTC) reanalysis, which has a resolution more typical of climate models - on the order of 10-50 km. One paper has been published from this work (Gonzalez and Mora Rojas 2014), one has been accepted (Dynamics of the ITCZ boundary layer), and two more are in preparation.

Summer 2011-2012     *National Center for Atmospheric Research*  
*Visiting Graduate Student (Mentor: Dr. Clara Deser)*

Analyzed the atmosphere and ocean coupled Community Climate System Model (CCSM) 3.5,

ECMWF Re-Analysis Interim (ERA-Interim), and YOTC reanalysis to help explain the seasonal variability of deep and shallow overturning circulations and convection over the tropical central and eastern Pacific Ocean. This work is included as a chapter in my Ph.D. dissertation.

### **Teaching Experience**

Fall 2014 *Colorado State University*  
*Atmospheric Dynamics I Teaching Assistant (Instructor: Dr. Thomas Birner)*

Helped Dr. Birner construct homework assignments and exams, and graded homework. Held bi-weekly office hours with students. Typically had 3-5 students per office hour session, with about 10 students closer to exams. Led homework review sessions on multiple occasions, and led a solo lecture on shallow water vorticity and potential vorticity.

Summer 2012-2013 *Autonomous University of the Yucatán (UADY)*  
*Instructor (Supervisor: Dr. Juan Ernesto Vázquez Montalvo)*

Co-taught, along with one-two other other graduate students, a 36-hour, two week course focusing on introductory material of meteorology and hurricanes. The class consisted of 25 undergraduate and graduate students from the UADY Department of Engineering who had little to no background in meteorology. Lectured about 12 hours during 2012 and 18 hours during 2013, focusing on introductory material, atmospheric dynamics, history, hurricanes, and tropical meteorology.

Spring 2012 *Colorado State University*  
*Atmospheric Dynamics II Teaching Assistant (Instructor: Dr. David A. Randall)*

Helped Dr. Randall construct homework assignments and exams and the solutions to them, and graded homework. Held bi-weekly office hours with students. Typically had 2-4 students per office hour session, with a few more students closer to exams. Led a solo lecture on classic theories of barotropic instability and combined barotropic-baroclinic instability.

### **Mentoring Experience**

Summer 2014 *Colorado State University*  
*CMMAP Intern Mentor (Student: Franchesca Espinosa)*

Along with Dr. Wayne Schubert and Christopher Slocum, helped formulate a summer research project for Franchesca on warm ring structures in tropical cyclones. Franchesca presented at the 2014 CMMAP Summer Team Meeting and 2014 AGU annual meeting.

Summer 2011 *National Center for Atmospheric Research*  
*SOARS Writing Mentor (Student: Andre Perkins)*

Helped provide feedback for Andre's writing material and oral presentations throughout the summer. Andre wrote a short paper published on NCAR's OpenSky and presented at the AMS Annual Meeting.

Spring 2010 *Colorado State University*  
*Undergraduate Research Mentor (Student: Rachel Meier)*

Along with Dr. Wayne Schubert, helped formulate a semester research project on equatorial waves and the Madden Julian Oscillation. Held bi-weekly meetings with Rachel to discuss the project and the

fundamentals of meteorology. Rachel presented the work at the 2010 CSU Celebrate Undergraduate Research and Creativity Showcase and received High Honors in the College of Natural Sciences.

### **Other Work Experience**

November 2011      *Malé, Maldives*  
*DYNAMO Field Project Assistant (Supervisor: Paul Ciesielski)*

Assisted the Dynamics of the Madden Julian Oscillation (DYNAMO) field campaign by preparing and launching radiosondes (with a 100% success rate) as well as maintaining equipment at the Ibrahim Nasir International Airport station in Malé, Maldives. Performed necessary data analyses after radiosonde launches and assisted with quality control of data from other field stations in DYNAMO array.

### **Academic Honors**

2009-2015      SOARS Scholarship  
2009-2015      CMMAP Fellowship  
June 2013      Student Oral Presentation Award at the AMS 19<sup>th</sup> Conference of  
                         Atmospheric and Oceanic Fluid Dynamics  
Fall 2013      2012 Editors' Citation for Excellence in Refereeing for the AGU Journal  
                         of Advances in Modeling Earth Systems

### **Professional Affiliations**

2014-Present      American Geophysical Union  
2007-Present      American Meteorological Society

### **Technical Skills**

Scripting experience using Fortran, NCL, Python, LaTeX, Matlab, and Mathematica.

### **Refereed Publications**

**Gonzalez, A. O.**, G. Mora Rojas, R. K. Taft, and W. H. Schubert, Transient aspects of the Hadley circulation, *J. Adv. Model. Earth Syst.*, submitted.  
**Gonzalez, A. O.**, C. J. Slocum, R. K. Taft, and W. H. Schubert, Dynamics of the ITCZ boundary layer, *J. Atmos. Sci.*, accepted.  
**Gonzalez, A. O.**, and G. Mora Rojas (2014), Balanced dynamics of deep and shallow Hadley circulations in the tropics, *J. Adv. Model. Earth Syst.*, **6**, doi:10.1002/2013MS000278.  
W. H. Schubert, L. G. Silvers, M. T. Masarik, and **A. O. Gonzalez** (2009), A filtered model of tropical wave motions, *J. Adv. Model Earth Syst.*, **1**, Art. #3, 11 pp., doi: 10.3894/JAMES.2009.1.3.

### **Non-refereed Publications**

**Gonzalez, A. O.**, and W. H. Schubert, Dynamics of the eastern Pacific ITCZ boundary layer, *J. Atmos. Sci.*, in preparation.  
**Gonzalez, A. O.** (2015), Balanced and transient aspects of the Intertropical Convergence Zone, Ph.D. Dissertation, Colorado State University, 172 pp.  
**Gonzalez, A. O.** (2011), Steady-state circulations forced by diabatic heating and wind stress in the Intertropical Convergence Zone, M.S. Thesis, Colorado State University, 119 pp.

### **Invited Presentations**

“Balanced and transient dynamics of deep and shallow Hadley circulations, AGU Annual Meeting, San

Francisco, CA, 2014.

**Selected Oral Presentations**

“Boundary layer shock-like dynamics of the ITCZ,” AMS 31<sup>st</sup> Conference on Hurricanes and Tropical Meteorology, San Diego, CA, 2014.

“Dynamical aspects of deep and shallow Hadley circulations,” Workshop on Advances in Tropical Dynamics, Honolulu, HI, 2014.

"Deep and shallow Hadley circulations," AMS 19th Conference on Atmosphere and Ocean Fluid Dynamics, Newport, RI, 2013.

"The deep and shallow Hadley circulations," AMS 30<sup>th</sup> Conference on Hurricanes and Tropical Meteorology, Ponte Vedra Beach, FL, 2012.

"A filtered model of convectively coupled waves associated with the Madden-Julian Oscillation," AMS Annual Meeting, Phoenix, AZ, 2009.