Dr. Megan Devlan Fowler
Postdoctoral Associate (CIRES/NOAA ESRL)

325 Broadway, Boulder, CO 80305
sites.uci.edu/fowler megan.fowler@noaa.gov

EDUCATION

Ph.D. Earth Systems Science **2015-2019**
University of California – Irvine, Irvine, CA
Advisor: Michael S. Pritchard
Dissertation title: *Understanding how irrigation, plant physiology, and the Madden-Julian Oscillation shape regional water cycles and their extremes*

M.S. Earth System Science **Dec 2017**
University of California – Irvine, Irvine, CA

B.S. Meteorology **Dec 2014**
Texas A&M University, College Station, TX
Summa Cum Laude

PUBLICATIONS

Fowler, M.D. and M.S. Pritchard (2019; *under revision for Geophysical Research Letters.*): Regional MJO modulation of Northwest Pacific tropical cyclones driven by multiple transient controls.

Fowler, M.D., G.J. Kooperman, J.T. Randerson and M.S. Pritchard (2019): Identifying the effect of plant-physiological responses to rising CO_2 on global streamflow.

Kooperman, G.J., M.D. Fowler, F.M. Hoffman, C.D. Koven, K. Lindsay, M.S. Pritchard, A.L.S. Swann, J.T. Randerson (2018): Plant physiological responses to rising CO_2 modify simulated daily runoff intensity with implications for global-scale flood risk assessment. *Geophysical Research Letters*, 45, 12457–12466. doi: https://doi.org/10.1029/2018GL079901

Fowler, M.D., M.S. Pritchard and G.J. Kooperman, (2018*)*: Assessing the impact of Indian irrigation on precipitation in the irrigation-enabled Community Earth System Model. *J. Hydromet.*, 19, 427–443, doi: https://doi.org/10.1175/JHM-D-17-0038.1

Bowman, K.P., and M.D. Fowler (2015): The diurnal cycle of precipitation in tropical cyclones. *J. Climate*, 28, 5325-5334. doi: http://dx.doi.org/10.1175/JCLI-D-14-00804.1

PRESENTATIONS

Fowler, M.D., G.J. Kooperman, J.T. Randerson, and M.S. Pritchard (2019): *Global river responses to rising CO_2: Separating the effects of physiological and radiative*

changes on streamflow and flooding. Oral Presentation. NOAA Physical Sciences Division Seminar, Boulder, CO. Nov 21.

Fowler, M.D., G.J. Kooperman, J.T. Randerson, and M.S. Pritchard (2019): *Global river responses to rising CO_2: Separating the effects of physiological and radiative changes on streamflow and flooding*. Oral Presentation. Land Model Working Group, Boulder, CO. Feb 12.

Fowler, M.D., M.S. Pritchard, G.J. Kooperman, and J.T. Randerson (2018): *Global river responses to rising CO_2: Separating the effects of physiological and radiative changes on streamflow and flooding*. Poster. American Geophysical Union Fall Meeting, Washington D.C. Dec 13.

Fowler, M.D., M.S. Pritchard, G.J. Kooperman, and J.T. Randerson (2018): *Global river responses to rising CO_2: Separating the effects of physiological and radiative changes on streamflow and flooding*. Oral and poster presentation. U.S. Department of Energy Regional & Global Climate Modeling (RGCM) Program – Principal Investigators Meeting, Potomac, MD. Nov. 8.

Fowler, M.D. and M.S. Pritchard (2018): *Investigating the Ability of Global Climate Models to Simulate MJO Modulation of Tropical Cyclone Activity in the Pacific Basin*. Poster. American Meteorological Society Annual Meeting, Austin, TX. Jan 8.

Fowler, M.D., G.J. Kooperman, M.S. Pritchard, and J.T. Randerson (2017): *Attributing increased river flooding in the future: hydrodynamic downscaling reveals role of plant physiological responses to increased CO_2 is first order*. Poster. American Geophysical Union Fall Meeting, New Orleans, LA. Dec 15.

Fowler, M.D. and M.S. Pritchard (2017): *Using observed MJO-modulation of tropical cyclone activity to test a downscaling framework with potential for climate change analysis*. Oral presentation. Graduate Climate Conference, Woods Hole, MA. Nov. 11.

Fowler, M.D., M.S. Pritchard, and G.J. Kooperman (2016): *Assessing the Impacts of Central Valley Irrigation on Downstream Precipitation in the Irrigation-Enabled Community Earth System Model*. Oral presentation. American Geophysical Union Fall Meeting, San Francisco, CA. Dec 16.

Fowler, M.D., M.S. Pritchard and G.J. Kooperman (2016): *Assessing the Impacts of Indian and Californian Irrigation on Non-Local Precipitation in the Irrigation-Enabled Community Earth System Model*. Oral and poster presentation. U.S. Department of Energy Regional & Global Climate Modeling (RGCM) Program – Principal Investigators Meeting. Nov 29.

Fowler, M.D. and G. Izzi (2014): *Assessment of Heat Related Casualties in Chicago.* Oral presentation. NOAA Hollings Science and Education Symposium**.** July 29.

AWARDS AND HONORS

Andrew Slater Award **2019**
Best student or post-doc presentation at the Land Model

Working Group Meeting 2019.

1st Place Student Poster Presentation **2018**
AMS Annual meeting – 6th Symposium on the Madden-Julian Oscillation and Sub-Seasonal Monsoon Variability

Honorable Mention **2017**
National Science Foundation Graduate Research Fellowship

Outstanding Undergraduate Award **2014**
Department of Atmospheric Sciences, Texas A&M University

Hollings Scholar **2013-2014**
National Oceanic and Atmospheric Administration

RESEARCH EXPERIENCE

CIRES / NOAA Earth System Research Lab **Boulder, CO**
Postdoctoral Associate, Advisors: Cécile Penland, Rob Cifelli, and Roger Pulwarty
Probabilistic forecasting of western US soil moisture *2019-present*

- As part of the NOAA program, Forecasting a Continuum of Environmental Threats (FACETS), assisted in building a framework in which soil moisture in the western United States can be predicted probabilistically using linear inverse modeling (LIM).

University of California – Irvine **Irvine, CA**
Thesis projects, Advisor: Mike Pritchard
Madden-Julian Oscillation modulation of tropical cyclone genesis *2017-2019*

- Developed a new downscaling methodology to assess MJO modulation of TC genesis in the West Pacific
- Identified unique progression of environmental drivers behind observed and downscaled progression of regions favorable for TC formation

Attributing streamflow changes in the future *2017-2019*

- Examined the impact of plant-physiological responses to increased CO_2 on future flood frequency and seasonal streamflow cycles in comparison to the role of radiatively-driven temperature and precipitation changes
- Large datasets generated for four 30-year sensitivity experiments of daily runoff downscaled to global 0.25˚ river runoff through CaMa-Flood
- Analysis of data required heavy use of both Python and MATLAB, including management of big data through parallel loops

Impacts of Indian and Californian irrigation on non-local precipitation *2015-2017*

- Ran and modified a series of Community Earth System Model (CESM1) experiments with irrigation to determine the effect of local irrigation in modifying non-local hydroclimate
- Focus on California's Central Valley and the Indian subcontinent
- Developed a bash script for easily running large ensembles of simulations without rebuilding the climate model each time

National Weather Service – Chicago **Romeoville, IL**

Hollings Scholar, Advisors: Gino Izzi and Eric Lenning
Heat-related casualties in Cook County *June-July 2014*

- Assessed the current heat warning system in Cook County in terms of avoiding heat-related fatalities reported by local hospitals
- Developed an alternative method of measuring and warning of heat stress in coordination with meteorologists at the office

Texas A&M University **College Station, TX**
Undergraduate student researcher, Advisor: Kenneth P. Bowman
Diurnal cycle of precipitation in tropical cyclones *2012-2014*

- Investigated the diurnal cycle of rainfall in tropical cyclones by utilizing the IBTrACS database in conjunction with TRMM satellite measurements of precipitation
- Analysis was conducted by writing more than 100 programs in IDL

TEACHING EXPERIENCE

University of California – Irvine **Irvine, CA**
Teaching Assistant

ESS1: Introduction to Earth System Science	Fall 2018
ESS116: Data Analysis	Spring 2018, 2015
ESS19: Modeling the Earth System	Winter 2017
ESS16: Climate Change	Fall 2016

C2 Education **Southlake, TX**
Tutor *Jan-May 2015*

Texas A&M University **College Station, TX**
Meteorology Help Desk *2013-2014*

LEADERSHIP AND OUTREACH

zotCAMS: Student Chapter of the American Meteorological Society at University of California – Irvine
Secretary, Apr 2017 – Jun 2019

NASA DIRECT-STEM Buddy
Contact point to visiting Cal-State LA students, Jun 2016, Aug 2017, & Aug 2018

School of Physical Sciences Undergraduate Mentorship Program (PSUM)
Mentor to two students at UCI, Oct 2016 – August 2017

Water UCI Middle School Water Conservation Challenge
UCI representative in multiple middle school science classes to help students develop new water conservation ideas, Feb-Mar 2017

CERTIFICATES AND WORKSHOPS

American Meteorological Society (AMS) Summer Policy Colloquium ***2018***

Certificate of Mentoring Excellence ***2017***

TECHNICAL SKILLS

- Scripting: advanced in MATLAB and Python; proficient in bash scripting and Linux OS; familiar with Fortran and NCL
- Models: experience running/modifying Community Earth System Model (CESM) and the Community Land Model (CLM); experience running the Catchment-Based Macroscale Floodplain Model (CaMa-Flood)
- Supercomputers: experience running on NERSC (Cori, Edison), and XSEDE (Stampede, Stampede2) machines