Natalie Burls, PhD

Assistant Professor, Department of Atmospheric, Oceanic, and Earth Science
Research Scientist, COLA

Education

PhD, Physical Oceonography, Univesity of Cape Town

Key Interests

Climate Dynamics | Coupled Ocean-Atmosphere Interaction | Climate Variability | Seasonal and Decadal Climate Modeling | Paleoclimatology | Paleoclimate Modeling | Climate Change

CONTACT

Phone: 703-993-5756 | Email: nburls@gmu.edu
Website: https://natalieburls.com/

SELECT PUBLICATIONS

- Burls, N. J., & Fedorov, A. V. (2017). Wetter subtropics in a warmer world: Contrasting past and future hydrological cycles. *Proceedings of the National Academy of Sciences*, 114(49), 12888-12893.
- Burls, N. J., *et al*. (2017). Extra-tropical origin of equatorial Pacific cold bias in climate models with links to cloud albedo. *Climate Dynamics*, 49(5-6), 2093-2113.
- Fedorov, A. V., *et al*. (2015). Tightly linked zonal and meridional sea surface temperature gradients over the past five million years. *Nature Geoscience*, 8(12), 975.

Research Focus

My research is focused on improving our understanding of the key processes determining Earth's climate and climate variability on a variety of timescales ranging from seasonal, to decadal, to much longer geological scales. In particular, I am interested in the climatic role of ocean general circulation, ocean-atmosphere interactions and cloud dynamics.

My research efforts acknowledge that, to fully understand, model and predict changes in climate characteristics that have a large impact on society (especially temperature and precipitation patterns), a fully coupled ocean-atmosphere perspective is needed" one that accounts for changes in important variables such as the thermal structure of the slowly-adjusting ocean. Complimenting observations with theory, I endeavor to accompany complex simulations of climate phenomena with simple models capturing the essential dynamics required to explain unanswered questions within climate science.

Current Projects

- Understanding cloud feedback and natural aerosol fingerprints to interpret past warm climate forcing and constrain tropical climate sensitivity
- Examining the links between Atlantic Meridional Overturning Circulation and Atlantic Multidecadal Variability
- The Effect of Variations in Cloud Versus CO2 Radiative Forcing on Tropical SST Gradients, Atmospheric Circulation and Rainfall Patterns
- Characterizing and simulating ocean meridional overturning circulation during the warm Pliocene