

MS / PhD Opportunities in the School of Meteorology at the University of Oklahoma



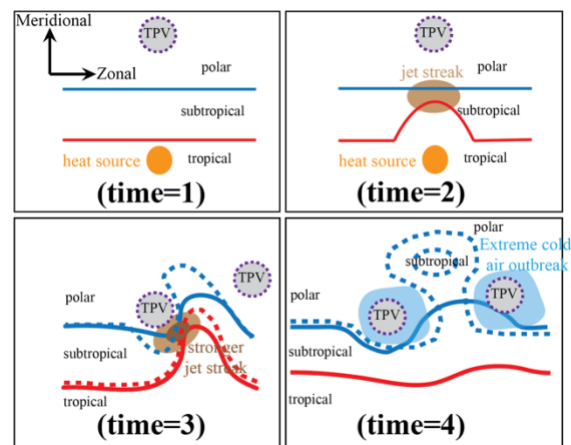
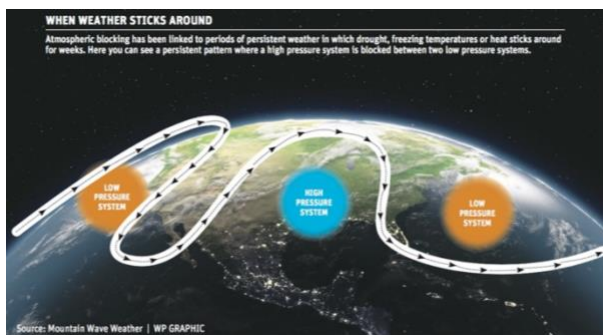
Toward Improving the Simulation and Prediction of Extratropical Northern Hemisphere Blocking Patterns and Extreme Weather

Position Description: The research groups of Drs. Furtado, Cavallo, and Ruppert are jointly recruiting two motivated M.S./Ph.D. students, to begin in the Fall of 2024, who are interested in leadership roles to improve the knowledge, prediction, and simulation of the lifecycle of **atmospheric blocking patterns** in the Northern Hemisphere extratropics that can lead to **extreme weather events**. Both positions are advertised at Ph.D. level, but outstanding M.S. applicants will be considered.

Position 1: The student will work with atmospheric reanalysis data and the latest operational subseasonal-to-seasonal (S2S) forecast models to identify blocking events, favorable precursors to these events, and explore the importance of these precursors in specific case studies within the forecast models. The ultimate deliverable from this student's research will be a **new and improved framework** on the formation and maintenance of atmospheric blocks and how that information can improve the prediction of extreme weather across timescales.

Position 2: The student will lead the design and execution of a numerical model experiment using the [E3SM](#) Earth system model. This experiment is motivated by the hypothesis that disturbances within the tropical and polar regions serve as key triggers and disruptors for midlatitude blocking events. The student will leverage this model with reanalysis data to include/exclude these "external" forcing agents and characterize how blocking responds. This research is expected to yield **both a new framework for understanding what controls blocking** events and new hypotheses related to teleconnection patterns involving blocking.

We seek candidates with: (1) strong computer programming skills in a Unix environment (Python preferred); (2) an understanding of large-scale atmospheric and/or climate dynamics, and synoptic-scale meteorology; (3) an intellectual curiosity to learn and innovate in extreme weather dynamics, S2S prediction, and climate change; and (4) strong scientific oral and writing skills. For Position 2, (5) a strong interest in numerical modeling (prior experience is beneficial). The two students will work both independently and in a collaborative team setting led by the project PI team, which also includes Dr. Jim Benedict of Los Alamos National Laboratory. The skills these students will develop will be highly marketable for both academic and private-industry markets in weather and climate.



Interested students should contact Drs. Jason Furtado (jfurtado@ou.edu), Steven Cavallo (cavallo@ou.edu), and James Ruppert (jruppert@ou.edu). Please include a copy of your resumé, academic transcript, and short statement of interest.