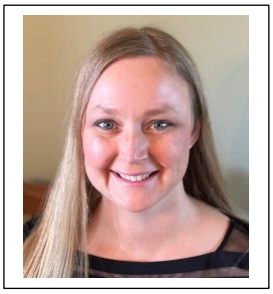

Rebecca Adams-Selin, PhD

Convection and Precipitation Microphysics Scientist
Lead, Atmospheric Components and Processes Section
Research and Development Division

Atmospheric and Environmental Research

Dr. Rebecca Adams-Selin joined AER in 2009. She leads the Atmospheric Components and Processes Section within AER's Research and Development division. Her research interests focus on convection, including microphysical processes and impacts, convectively generated gravity waves, and hail formation, growth, and forecasting.

Dr. Adams-Selin led the creation of CAM-HAILCAST, a pseudo-Lagrangian hail model designed to be embedded in a convection allowing model (CAM), in conjunction with Conrad Ziegler of the National Severe Storms Laboratory. CAM-HAILCAST explicitly models the growth of a hailstone within a convective updraft to produce forecasts of maximum hail size (Adams-Selin and Ziegler 2016; Adams-Selin et al. 2019, 2023). By creating a novel clustering algorithm to cluster 4D hail trajectories she was able to establish the truly stochastic nature of in-storm hail development, explaining the difficulty the scientific community has had in forecasting large (> 2 in) hail (Adams-Selin 2023a, b). Dr. Adams-Selin has also conducted original work examining gravity wave impacts on the environment in advance of Mesoscale Convective Systems observed in idealized simulations (Adams-Selin 2020a,b), PECAN field campaign data (Groff et al. 2021).

Education

- PhD and MS, Atmospheric Sciences, Colorado State University
- BS, Atmospheric Science, Creighton University
- BS, Mathematics, Creighton University

Memberships

- American Meteorological Society (AMS)

Publications

- For a list of publications, see Rebecca Adams-Selin's Google Scholar page.

Dr. Adams-Selin's current projects, and their primary objectives, include:

- *Establishing a Holistic Understanding of Mesoscale Convective System Stratiform Precipitation Regions*: Use ARM-sourced observations, complemented by large-eddy-scale (LES) numerical simulations, to examine how the characteristics of midlatitude MCS stratiform precipitation regions are generated and modified by low-frequency gravity waves, line-end vorticity-induced wind flows, and large- scale environmental conditions. (DoE ASR funding, in collaboration with Univ. of Wisconsin-Milwaukee).
- *Use of GPM to Understand Production of Hail in South America:* Use NASA GPM and GOES observations, coupled with sophisticated hail trajectory modeling and clustering techniques, to understand how organized multicellular systems in Subtropical South America produce hail so frequently. (NASA PMM funding).
- *Lightning Data Assimilation for Convection:* A demonstrated lightning assimilation method is used improve the timing and location of parameterized deep convection during the NASA DC3 and SEAC4RS airborne campaigns and to answer fundamental scientific questions about deep convective trace gas transport. (NASA ACCDAM funding, in collaboration with Florida State University).
- *A Multi-Perspective Analysis of Hail Processes, Melting, and their Environments:* Use Global Precipitation Measurement (GPM) passive and active sensor data, T-28 aircraft in-situ observations, GPM Validation Network (VN) data, and HAILCAST simulations to investigate the relationship between signatures of hailstones aloft and the dynamic processes and environments with which they interact throughout their trajectories. (NASA PMM funding, led by NASA Marshall).

Dr. Adams-Selin serves as an Associate Editor for the AMS journal *Monthly Weather Review*. She chaired the AMS Annual Meeting Oversight Committee from 2021-2023 and the AMS Committee of Weather, Analysis, and Forecasting from 2018-2021. She received her PhD in Atmospheric Sciences from Colorado State University in 2012, working with Dr. Richard Johnson to understanding microphysical and gravity wave impacts on bow echoes (Adams-Selin et al. 2013a, b; Adams-Selin and Johnson 2013, 2010).