

Bacteria in Thunderstorm Anvils

Harrison P. Rademacher and Dr. David Delene

Abstract: A research project at the University of North Dakota (UND), made possible by the Maximizing Access through Research Careers (MARC) program, is focused on collecting data from thunderstorms to see if bacteria exists in upper parts of thunderstorms. Bacteria are believed to be an important source of ice nuclei that can affect the microphysics of clouds. The project will collect bacteria on filters to determine their abundance and type. The proposed methodology is to conduct bacteria sampling using the North Dakota Citation Research Aircraft. The Citation Research Aircraft will be conducting a two week (20-30 flight hours) project in northern Florida during July of 2019 to obtain cirrus cloud measurements using a suit of in-situ cloud physics probes. The bacteria sampling will be auxiliary to the main measurement focus of the project; therefore, samples will be conducted when opportunities present themselves. The collected samples will be analyzed in the lab to determine the amount and type of bacteria found at different altitude levels and different flight days. Previous research indicates that bacteria do exist in thunderstorms; however, there are very few observations made in the upper parts of a thunderstorm where the temperatures are very cold. Previous observations will be reviewed, and the proposed sampling methodology and laboratory analysis details will be described.