

Initial Findings from GrandTReNDS: the Grand Teton Reactive Nitrogen Deposition Study

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Despite its sensitive alpine ecosystems and proximity to large agricultural and oil and gas operations, relatively little is known about air quality or nitrogen deposition in Grand Teton National Park (GTNP). The park is located east of large agricultural operations in Idaho's Snake River Valley and northwest of growing oil and gas operations in western Wyoming. Although the park is popular with visitors, it has not historically been home to air quality or deposition monitoring stations. The Grand Teton Reactive Nitrogen Deposition Study (GrandTReNDS) was conducted to provide a first look at air concentrations and deposition fluxes of various reactive nitrogen species. The study took place from April to September 2011. At the study's peak, twelve monitoring stations were in operation in GTNP and the surrounding region. A core measurement site was located on the west side of the park at the Grand Targhee ski resort. Other key measurement stations were located further west near Driggs, Idaho and on the east side of the park at the NOAA Climate Monitoring Station. Study measurements ranged from measurement of gaseous ammonia with Radiello passive samplers to daily URG denuder/filter-pack measurements of PM_{2.5} composition and gaseous ammonia and nitric acid concentrations to continuous measurements of key trace gas (NO_x, NO_y, NH₃) concentrations and PM₁ composition measurements with an aerosol mass spectrometer. This presentation will provide an overview of the study and a summary of initial findings. Topics to be discussed include spatial and temporal gradients in key gas and particle phase species concentrations, an overview of the reactive nitrogen deposition budget (including the importance of gaseous ammonia and wet organic nitrogen deposition) on the west and east sides of the park, and an analysis of the contributions of a wildfire that occurred during the study to concentrations of key reactive nitrogen species.

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