

## Fire Contribution to Reduced Gaseous Nitrogen Species at Grand Teton National Park

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Grand Teton National Park (GTNP) contains sensitive high elevation ecosystems that are sensitive to additional increments of nitrogen beyond natural background levels. The park is located in proximity to large agricultural and concentrated animal feeding operations (CAFO), both sources of reactive nitrogen emissions ( $N_r$ ) and it is also impacted by wildfire emissions which are known sources of  $N_r$ . The nitrogen compounds include both oxidized and reduced nitrogen. The Grand Teton Reactive Nitrogen Deposition Study (GrandTReNDS) was conducted in spring-summer 2011, with the objectives of better understanding sources of reactive nitrogen impacting GTNP as well as identifying the concentration levels of various species that impact the park. As part of the measurement program a sampling strategy was designed to estimate gas phase reduced organic nitrogen compounds, species which have not been routinely measured in long-term monitoring networks or during special studies. Of specific interest is reduced organic nitrogen species other than ammonia, referred to here as RNHx. Surprisingly, smoke aerosol contains significant amounts of RNHx as well as ammonia. Nearly all the RNHx was associated with fire emissions and about 16% of the measured ammonia was fire related. Therefore, combining fire related ammonia and RNHx concentrations, it is estimated that fire emissions made up about 44% of total reduced measured nitrogen concentrations. Ammonia concentrations, other than fire, made up about 84% of measured concentrations.

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