

ATOC Seminar
Thursday, March 23, 2017 at 100pm
LASP Space Sciences Building (3665 Discovery Drive)
Room W120

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**From North Dakota to the Southern Ocean:
Atmospheric observations with climate and air quality implications**

The earth's atmospheric composition is experiencing a perturbation unprecedented in recent history. Various human activities, including large-scale deforestation, fossil fuel harvesting and combustion, and industrial scale crop fertilization have tremendously upset the planet's carbon and nitrogen cycles and led to large increases in the atmospheric abundance of pollutants and greenhouse gases. These changes are ongoing and dynamic. Anthropogenic emissions of pollutants and greenhouse gases are undergoing rapid shifts in response to technological, economic, and regulatory pressures. Natural sources and sinks are dynamically responding to the warming environment with unknown feedbacks and consequences. With direct atmospheric measurements we can observe, attribute, and quantify the impacts and responses of both anthropogenic and natural systems. In this talk I will discuss recent work towards advancing our understanding of anthropogenic emissions and natural systems responses. I will focus on recent changes in oil and gas production in the U.S., and surprising impacts on climate and air quality we discovered using airborne and space-based observations. Moving from the U.S. to the Southern Ocean, I will then present results from the recent O₂/N₂ Ratio and CO₂ Airborne Southern Ocean Study (ORCAS) where we collected airborne data between Patagonia and Antarctica in an attempt to improve our understanding of the Southern Ocean carbon sink.