

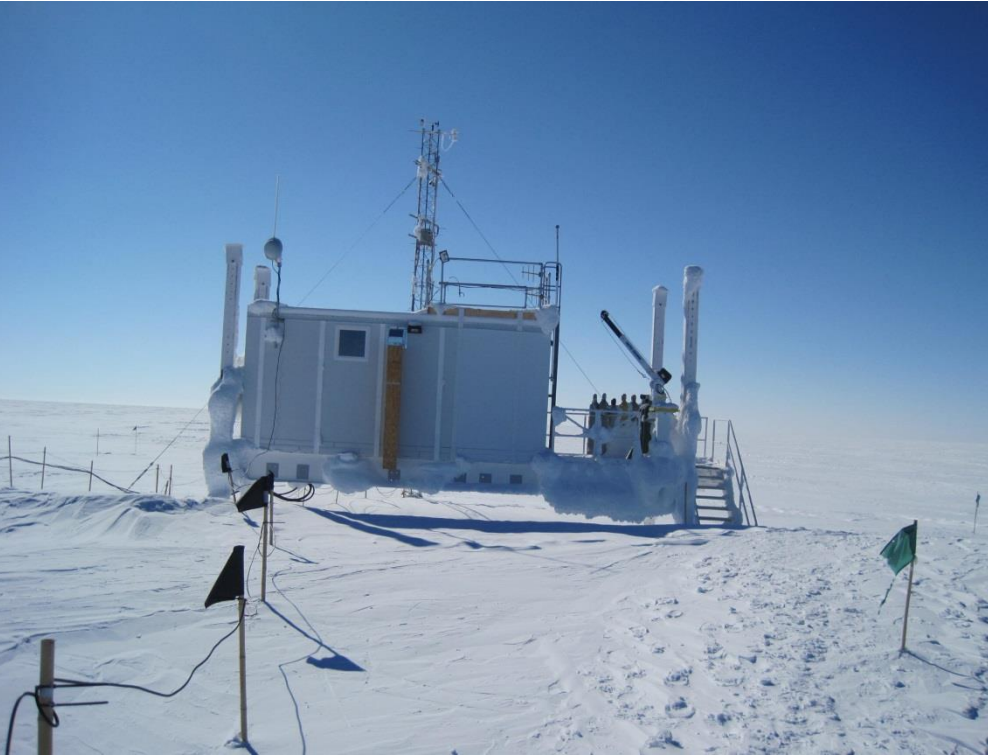
Long-term Measurements of Methane and Non-methane Hydrocarbons at Summit



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Project Description

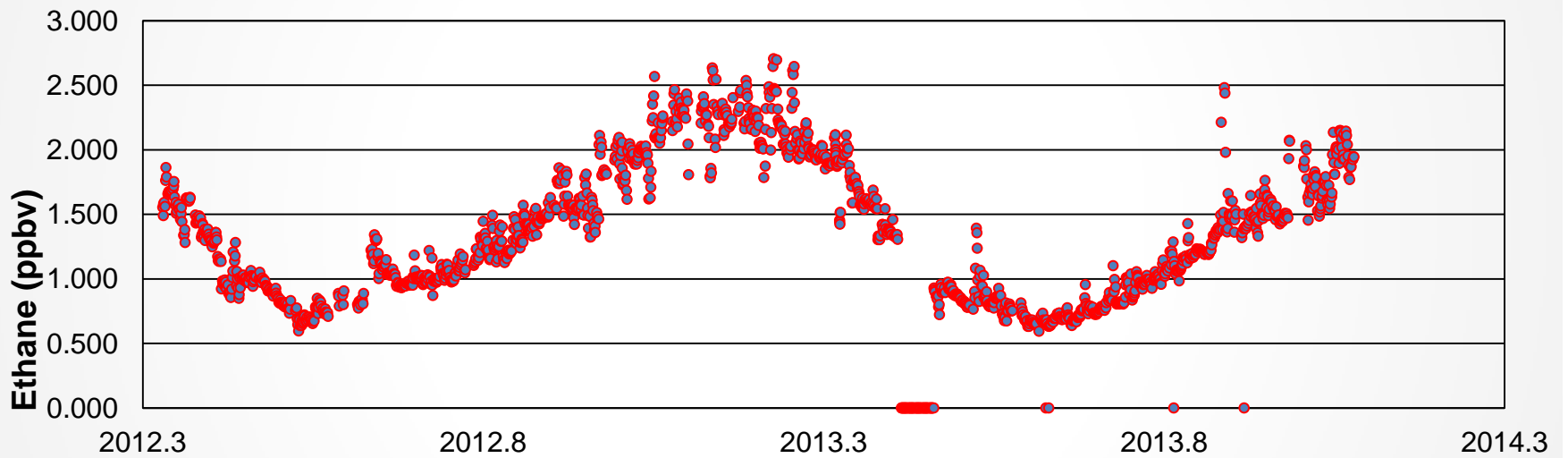
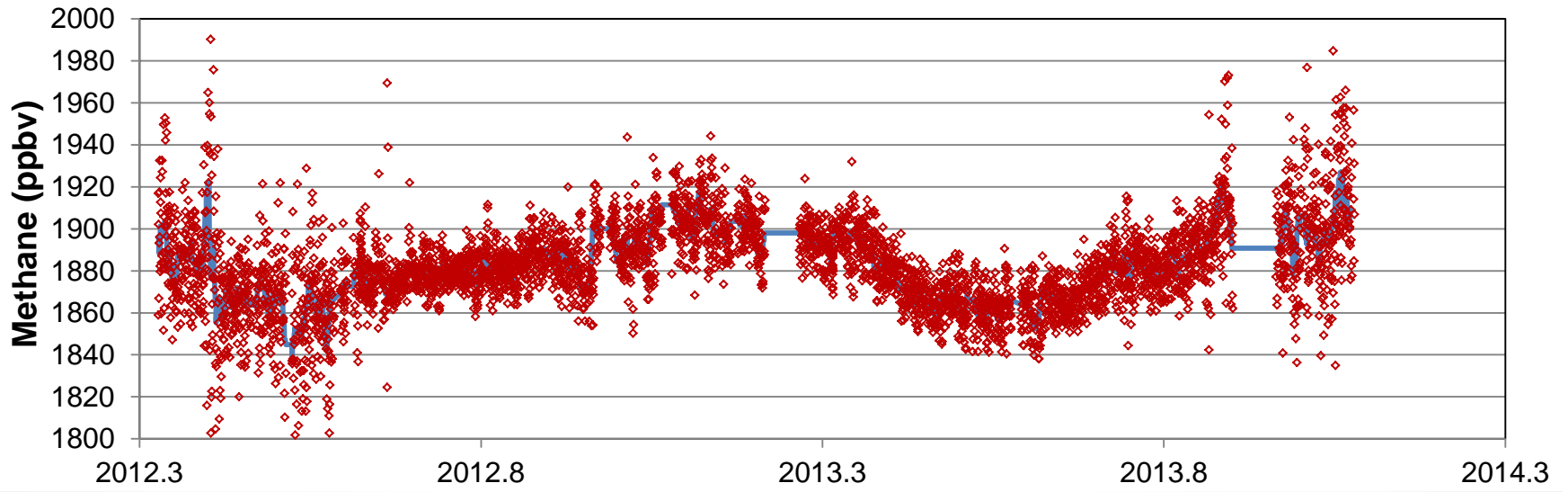
- Continuous, in situ methane and NMHC measurements sponsored by NSF Arctic Observing Network for 5 years
- Fully automated, remotely controlled GC-MS
 - Air dried to a dew point of -20°C then concentrated on a Peltier-cooled adsorbent trap at -35°C
 - Analysis via thermal desorption and separation on an Al_2O_3 PLOT column with flame ionization detection
- System operated from June 2008 – July 2010 with continuous NMHC measurements and recommenced in 2012 as part of AON with the addition of methane capability
- Greater than 90% data coverage, with 4411 methane and 1745 NMHC quantifications since 2012



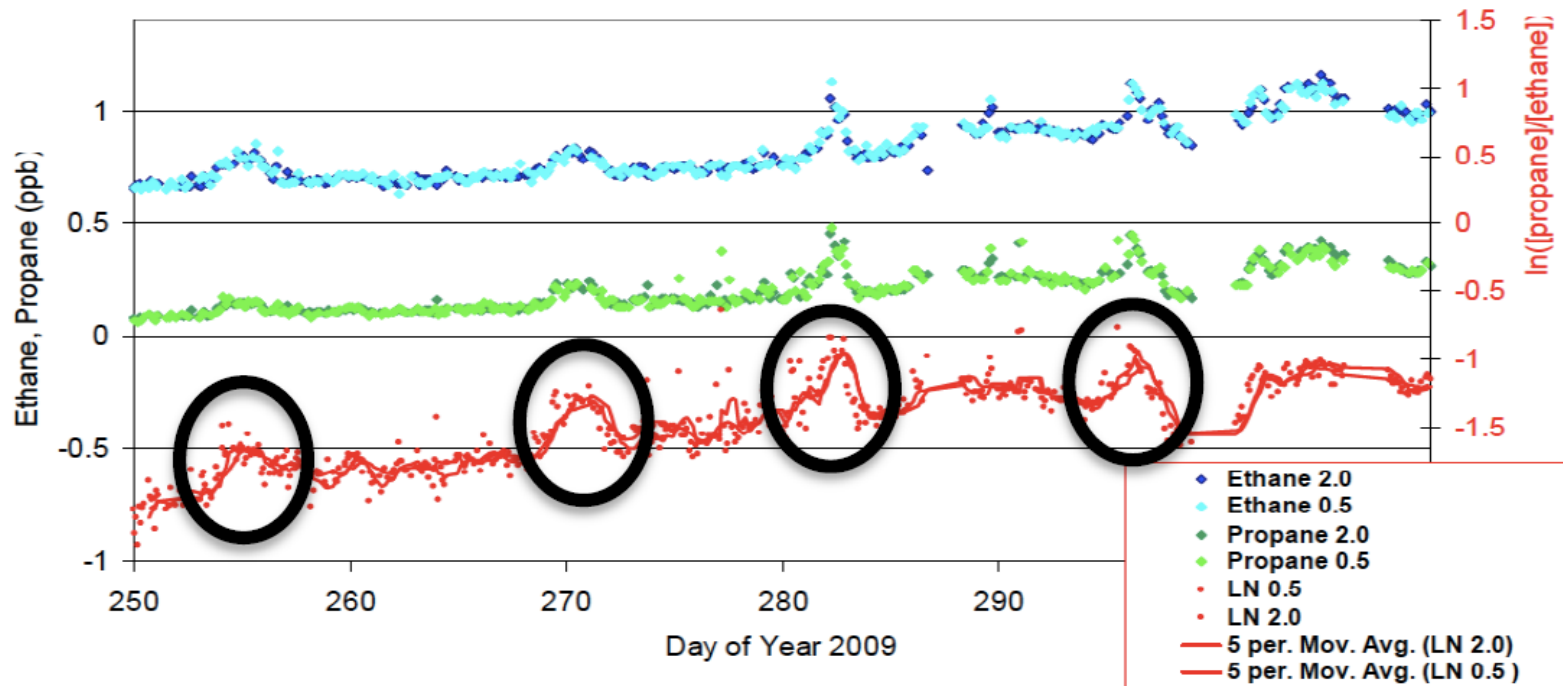
TAWO Building



Ambient Records

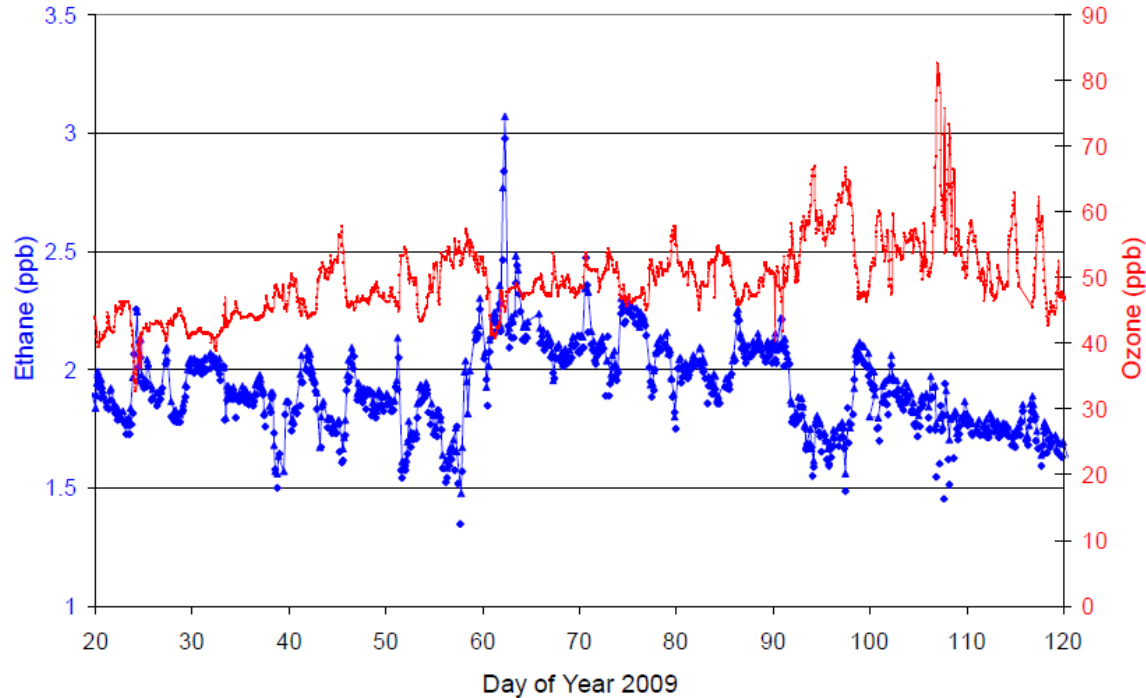


Applications



$\ln([\text{propane}]/[\text{ethane}])$ can be used to identify events of pollution transport from lower latitudes. In conjunction with FLEXPART analysis, source regions of these events can be identified.

Applications



Periodic drops in ethane mole fraction in the spring, accompanied by enhancements in ozone, are indicative of stratospheric intrusion events and can be used to investigate the influence of higher level air on surface layer composition at Summit.

Ongoing/Future Work

Chelsea awarded NSF AGS postdoc fellowship for analysis and modeling of Summit data.

First manuscript on this work recently published in Atmospheric Environment:

Atmospheric Environment 85 (2014) 234–246



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Seasonal behavior of non-methane hydrocarbons in the firm air at Summit, Greenland



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