ArcticCap: Arctic Carbon Aircraft Profile

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ABoVE – ArcticCAP
Arctic Carbon Aircraft Profiles

Campaign Statistics:
- 6 campaigns (April – November)
- 56 Flights (316 hours)
- 25 Vertical profiles per campaign
- Measured insitu CO2, CH4, CO and H2O
- Multi-species flasks (CO2, CH4, CO, Hydrocarbons, Halocarbons)
Basic Observations

**CO** 
- Short drawdown period (July).

**CH$_4$** 
- Enhancements were observed in PBL throughout the 6 campaigns

**CO** 
- Indicate July was the largest fire month.
Surface influence

The actual flight paths
Surface influence

Shape of profiles are the result of recent surface influence
2017 Season in the ABoVE domain

**Altitude**

**Time of year**

**Flight Platform**

- **ActicCAP**: April – November
- **ASCENDS**: July – August
- **Coast Guard C130**: June, July, August, September
- **Atom -3**: February, October

ActicCAP CO$_2$, CH$_4$ and CO measurements were substantially enhanced by measurements on several other flight platforms.
This study will benefit from many different aircraft and ground measurements that have been made in Arctic over the last 8 years.
Planned analysis

Quantify spatially explicit, temporally resolved CO\textsubscript{2} and CH\textsubscript{4} flux for 2017

- Vertical profile measurements [CO\textsubscript{2}], [CH\textsubscript{4}]
- Measured column enhancements
- Modeled column enhancements
- Geostatistical inverse model (GIM) minimize model-measure difference
- Simulated flux + Additive flux → Optimized flux

WRF-STILT footprints × PVPRM-SIF simulated flux

(Schiferl, poster)