The Oliktok Point Observational Facility

Gijs de Boer[1,2]

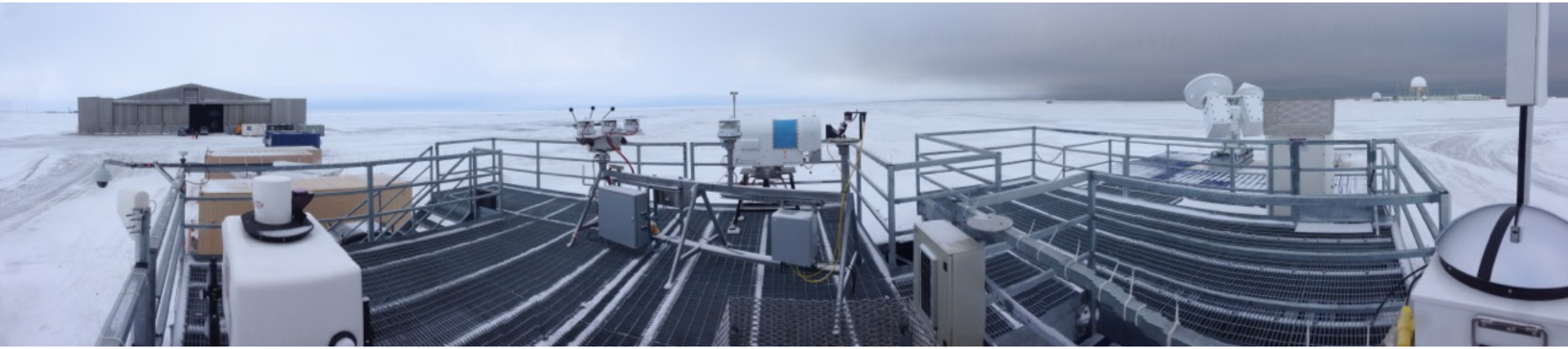
On behalf of: the Site Science team[1,2], Mark Ivey[3] and the operations team, and Martin Stuefer[4] and the quick response support team

(1) CIRES (2) NOAA (3) Sandia National Laboratories (4) UAF University of Alaska Fairbanks

Funding: ARM Climate Research Facility; ASR Atmospheric System Research

Introduction

AMF-3 Instrumentation



AMF3 includes:

Clouds
Lidars: MPL, Raman, Ceilometer
Radars: KAZR, KASACR, WSACR
3-channel MWR
TSI

Surface Meteorology/Precip
Surface Met
ECOR, AMC
MASC

Aerosols
AOS
CSPHOT

Profiling
2x daily Radiosondes
915 MHz RWP
Doppler Lidar

Radiometric
AERI
MFR, MFRSR
Up/Down broadband radiation
IRT

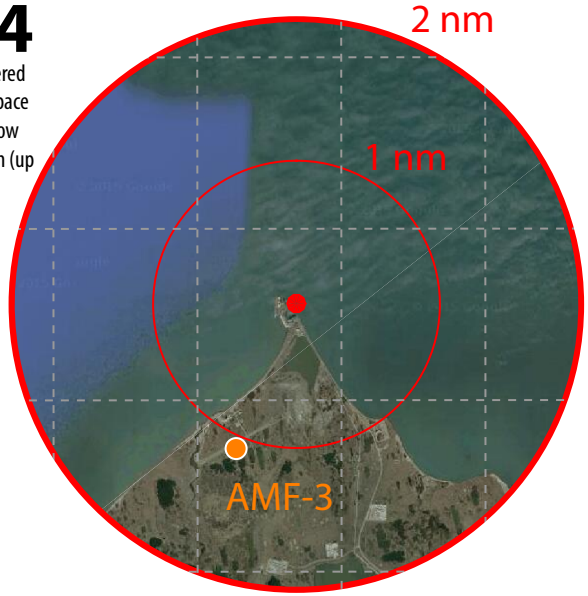
Additional Capabilities
Gases: Picarro Greenhouse Gasses
Tethered-balloon profiling
UAS

Installed and Operational Coming 2016 Campaign-Deployed

Opportunities for UAS and TBS

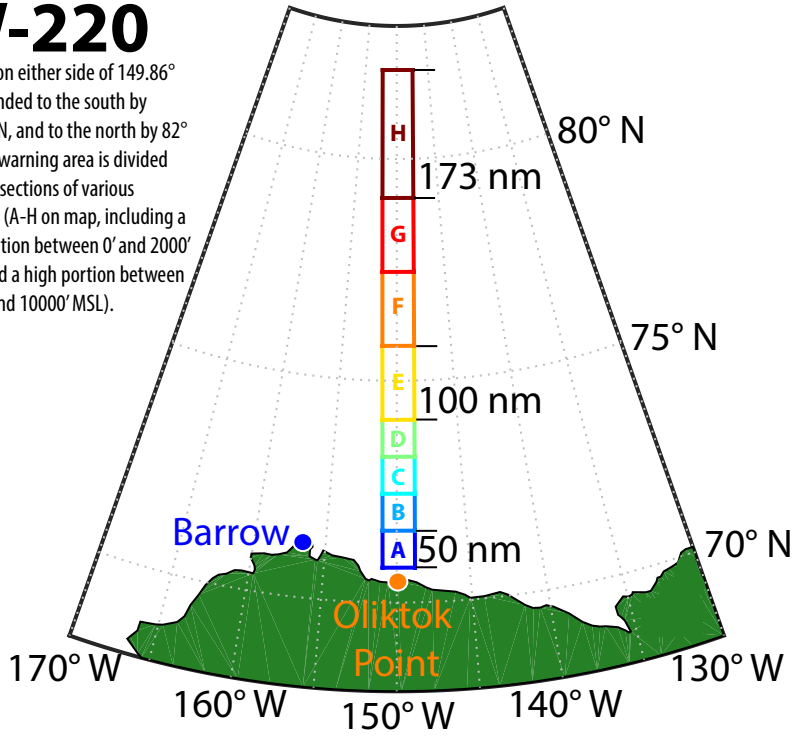
R-2204

4 nm diameter circle centered on Oliktok Point. This airspace is split into two sections, low (up to 1500′ MSL) and high (up to 7000′ MSL).



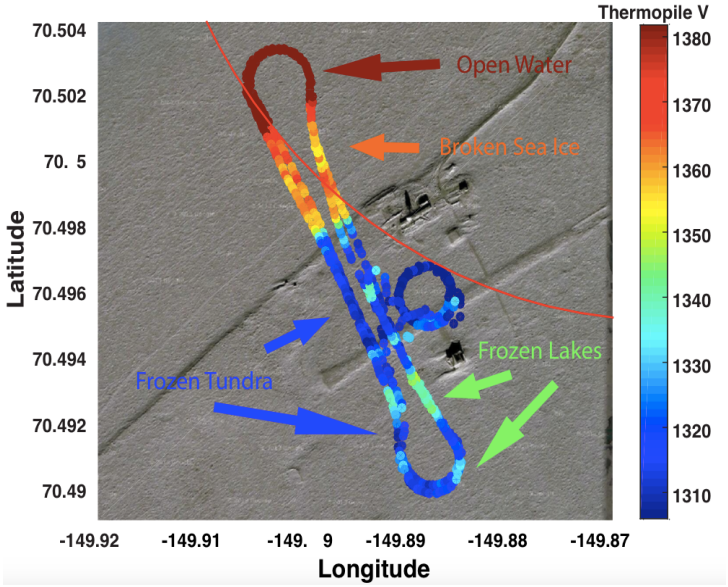
W-220

20 nm on either side of 149.86° W, bounded to the south by 70.78° N, and to the north by 82° N. The warning area is divided into 16 sections of various lenghts (A-H on map, including a low portion between 0′ and 2000′ MSL and a high portion between 2000′ and 10000′ MSL).

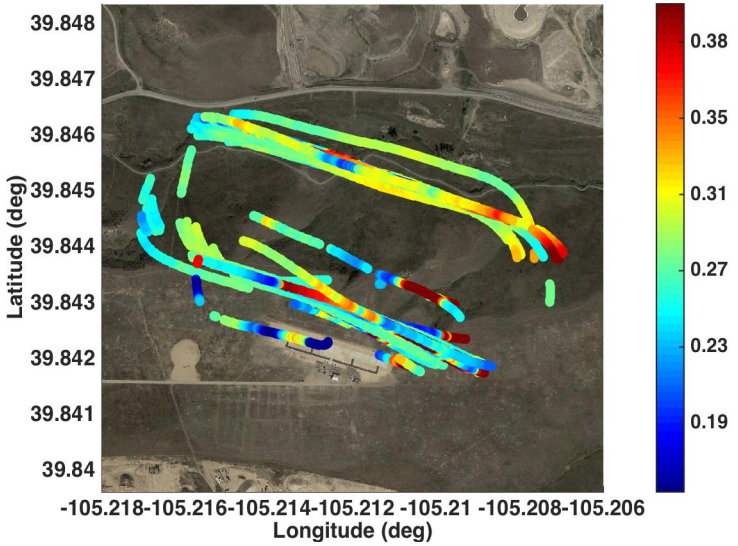


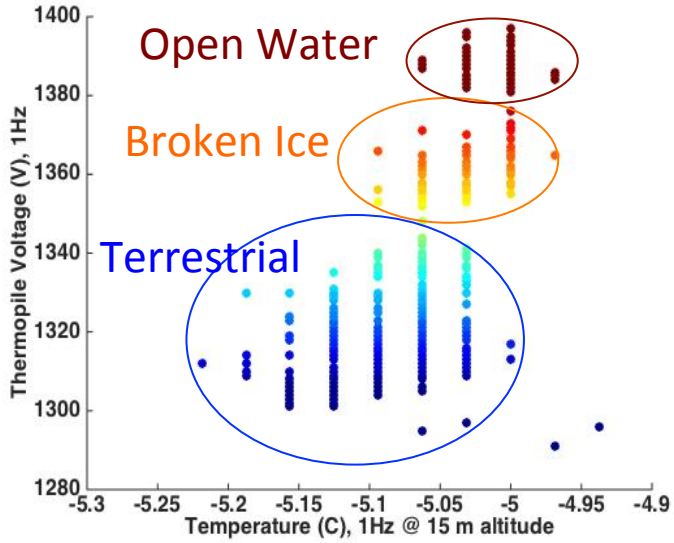
What can UAS provide?

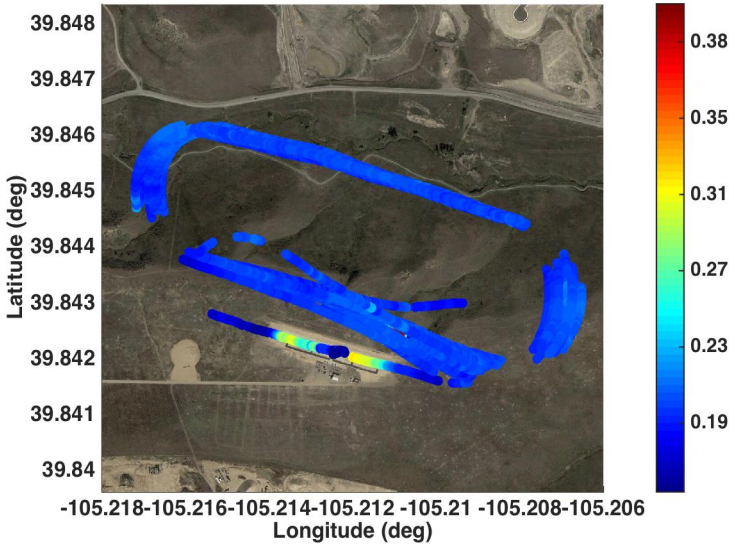
Spatial Context



Albedo



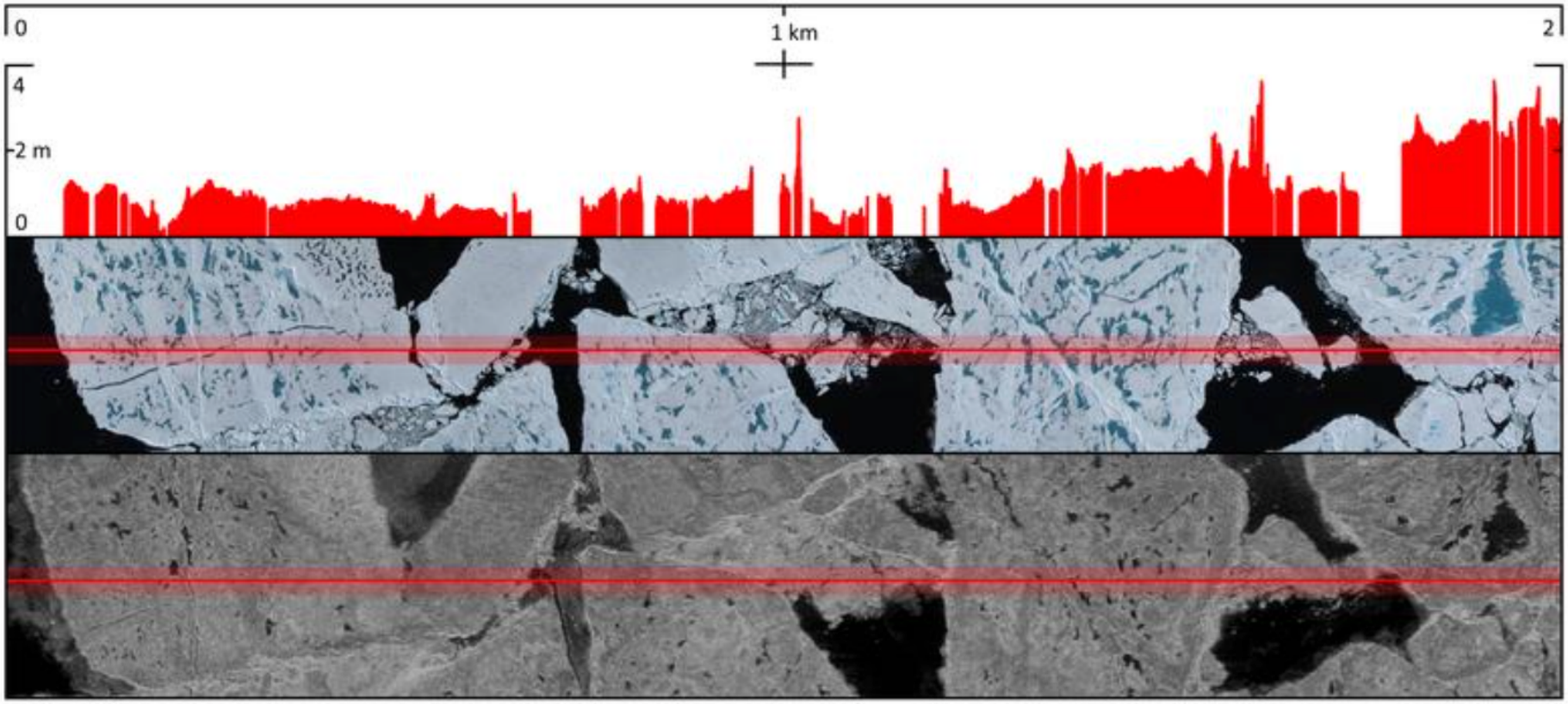




What can UAS provide?

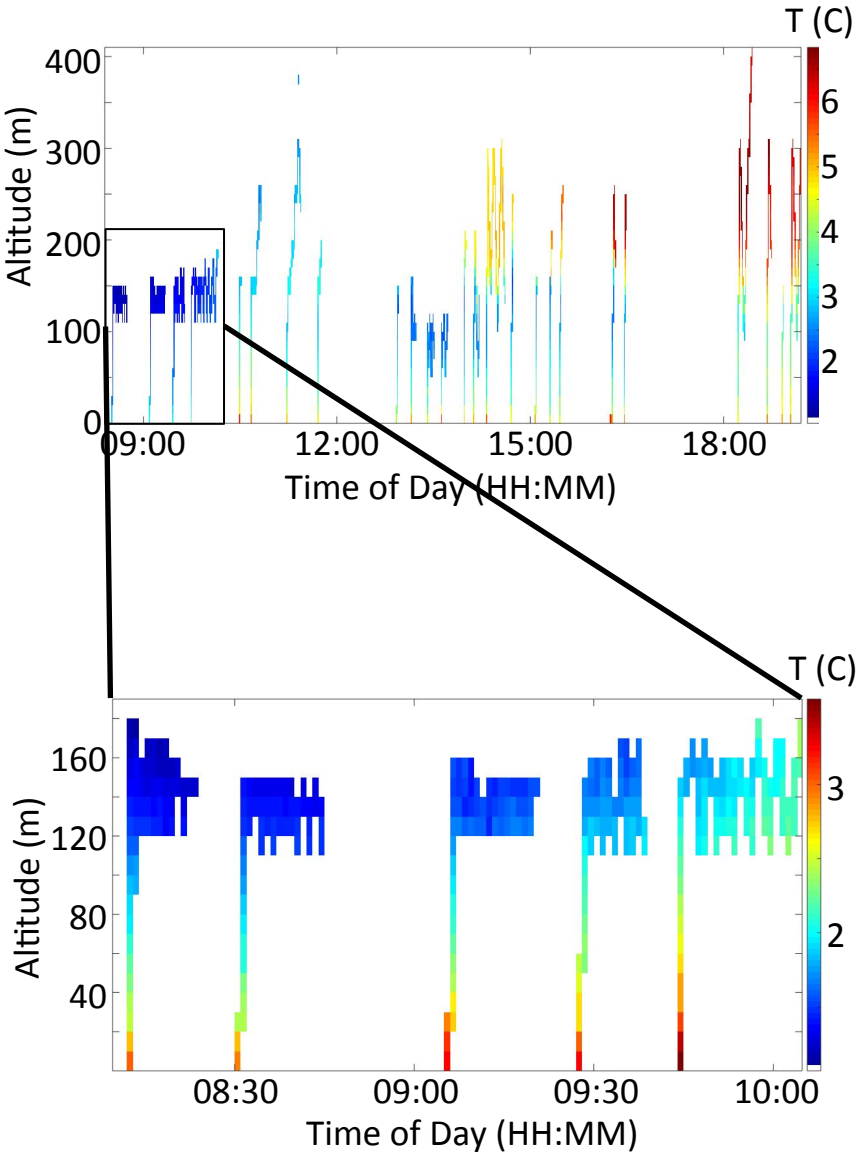
Spatial Context

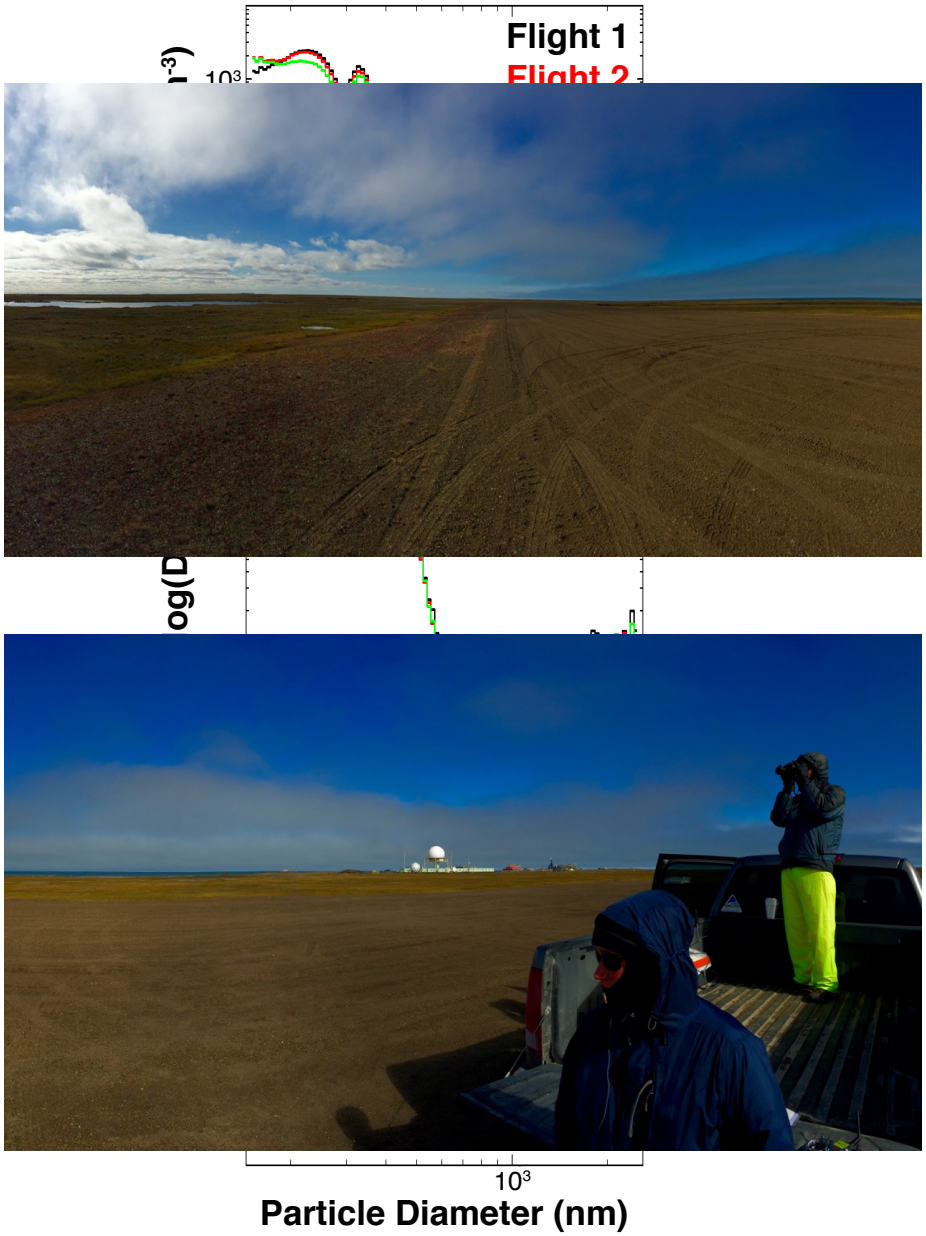
[Figure from Crocker et al., 2012]



What can UAS provide?

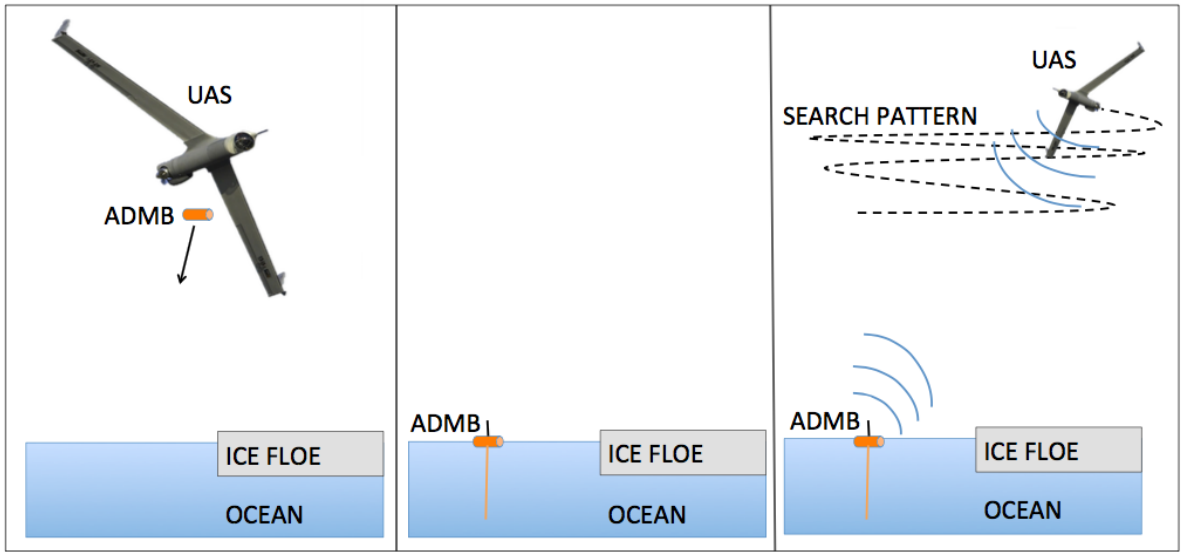
Profile Information

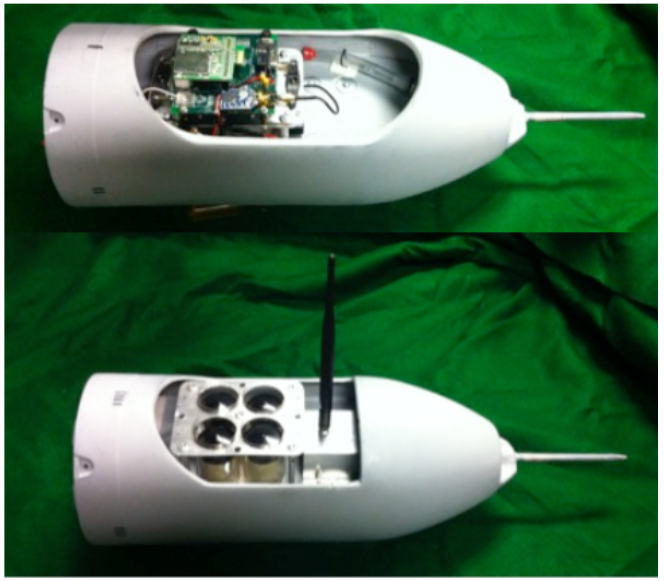




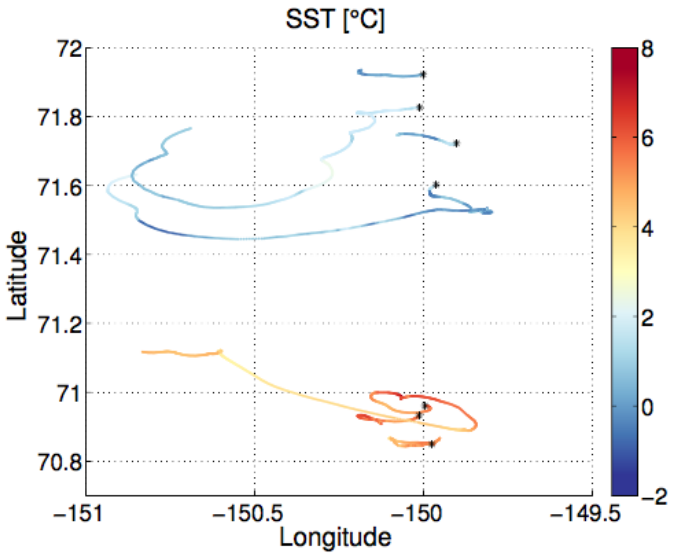
What can UAS provide?

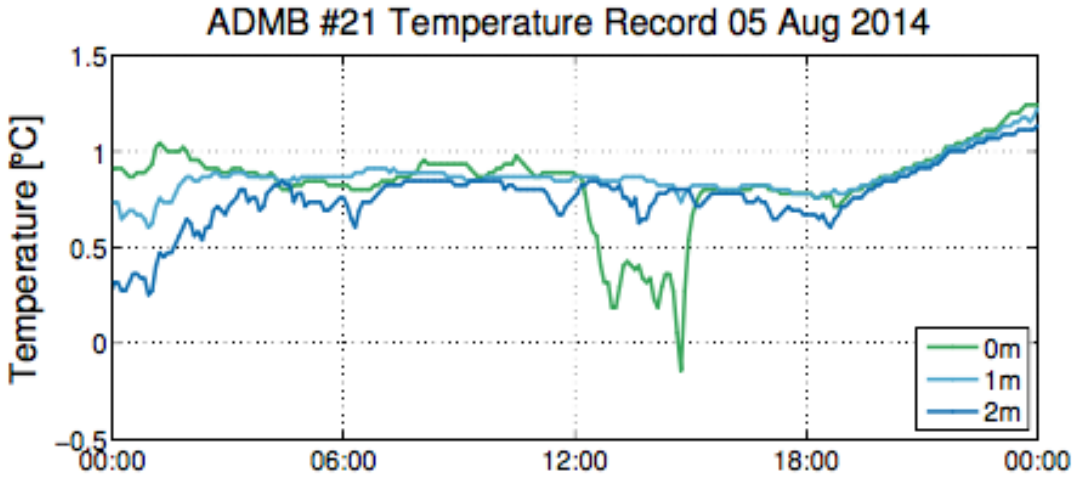
A Launch Platform





[Figures from Bradley et al., 2015]





The Site Science Team

Gijs de Boer

Matthew Shupe

Allison McComiskey

Christopher Williams

Sergey Matrosov

Amy Solomon

Dave Turner

Jessie Creamean

?

Postdoc (TBD)

Matthew Norgren

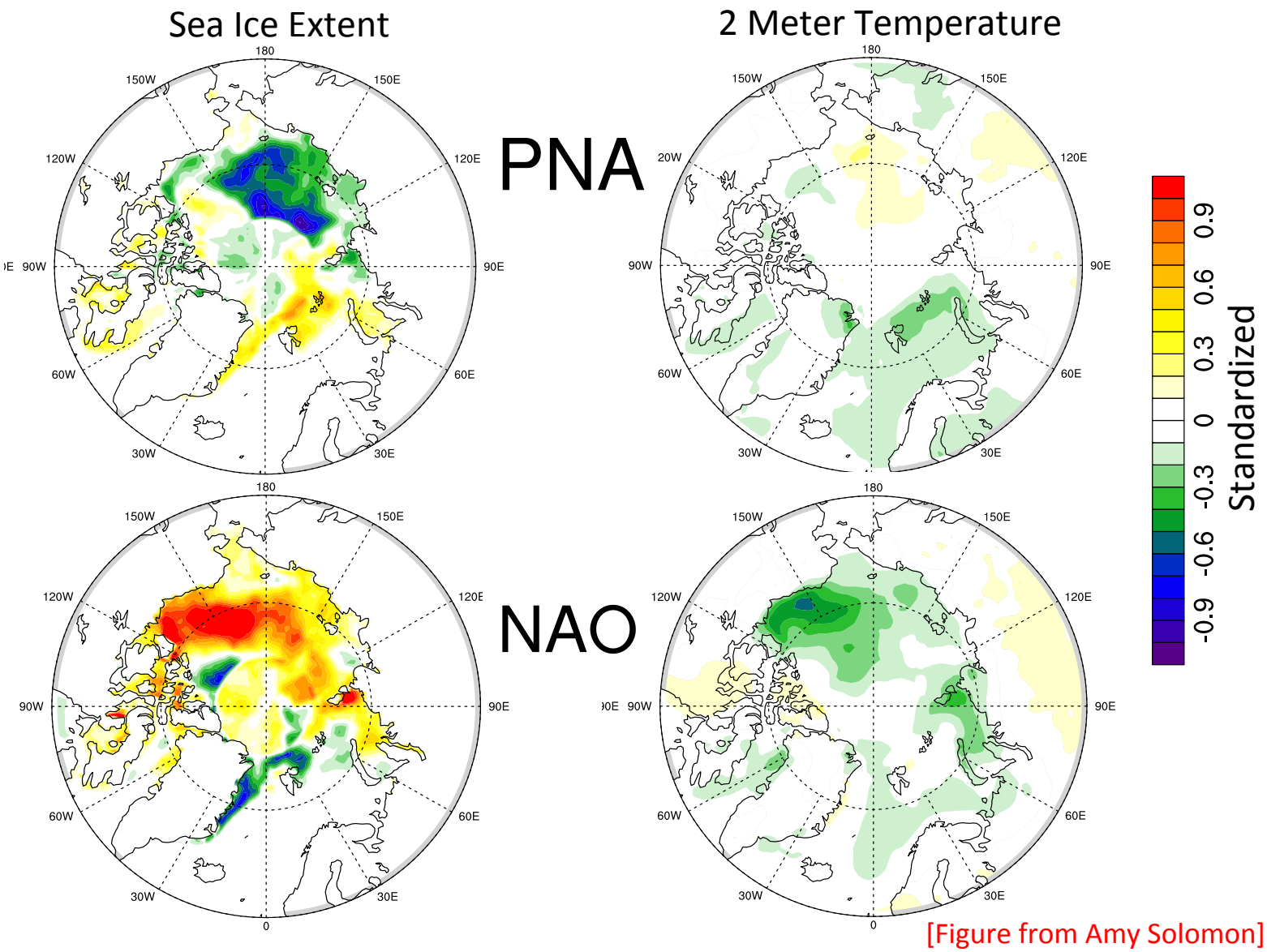
ASR Atmospheric System Research

CIRES

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

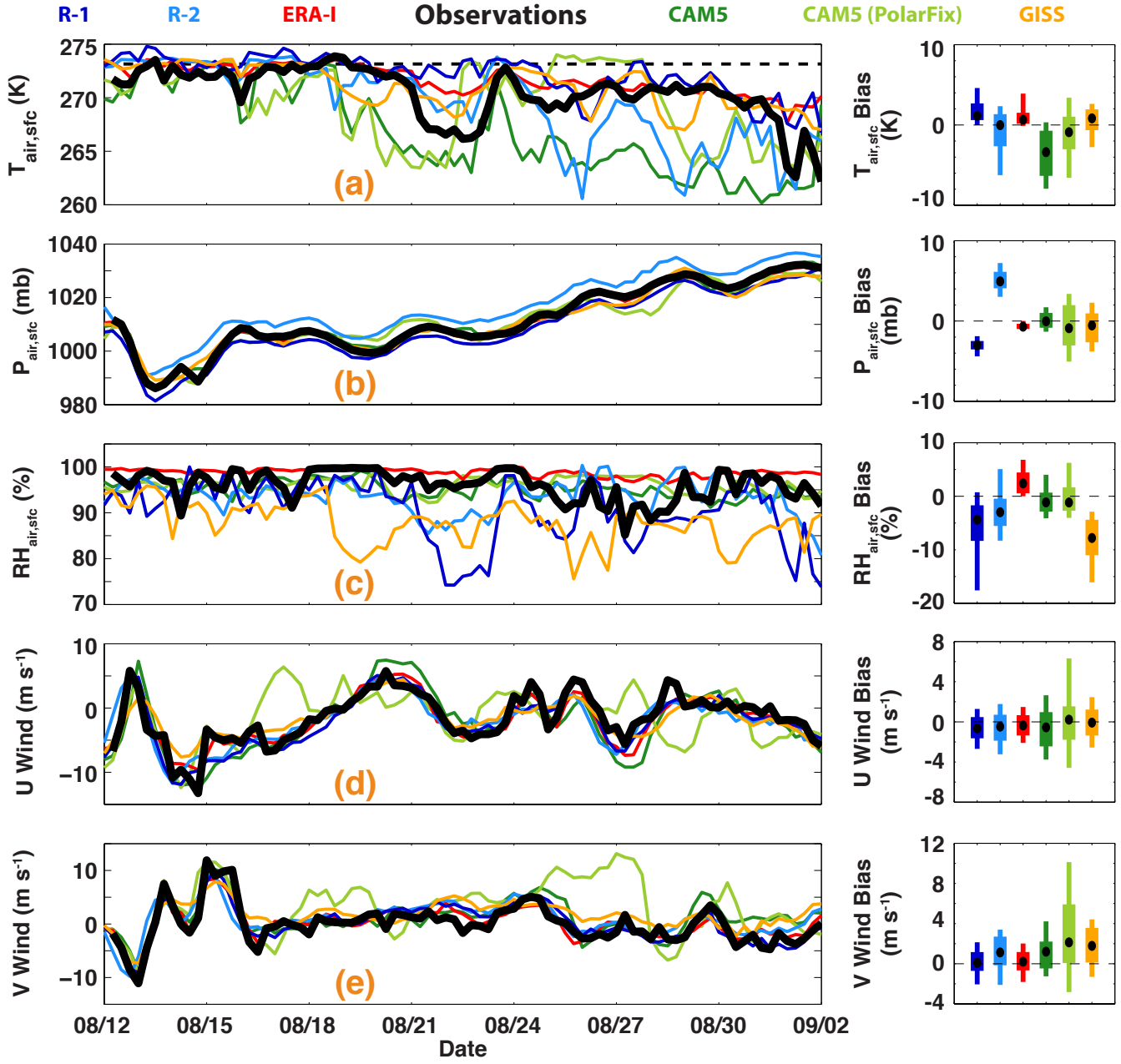
Ongoing Site Science Activities

Regression Coefficients Between ERA 1979-2014 JJA Index and SON Surface Fields



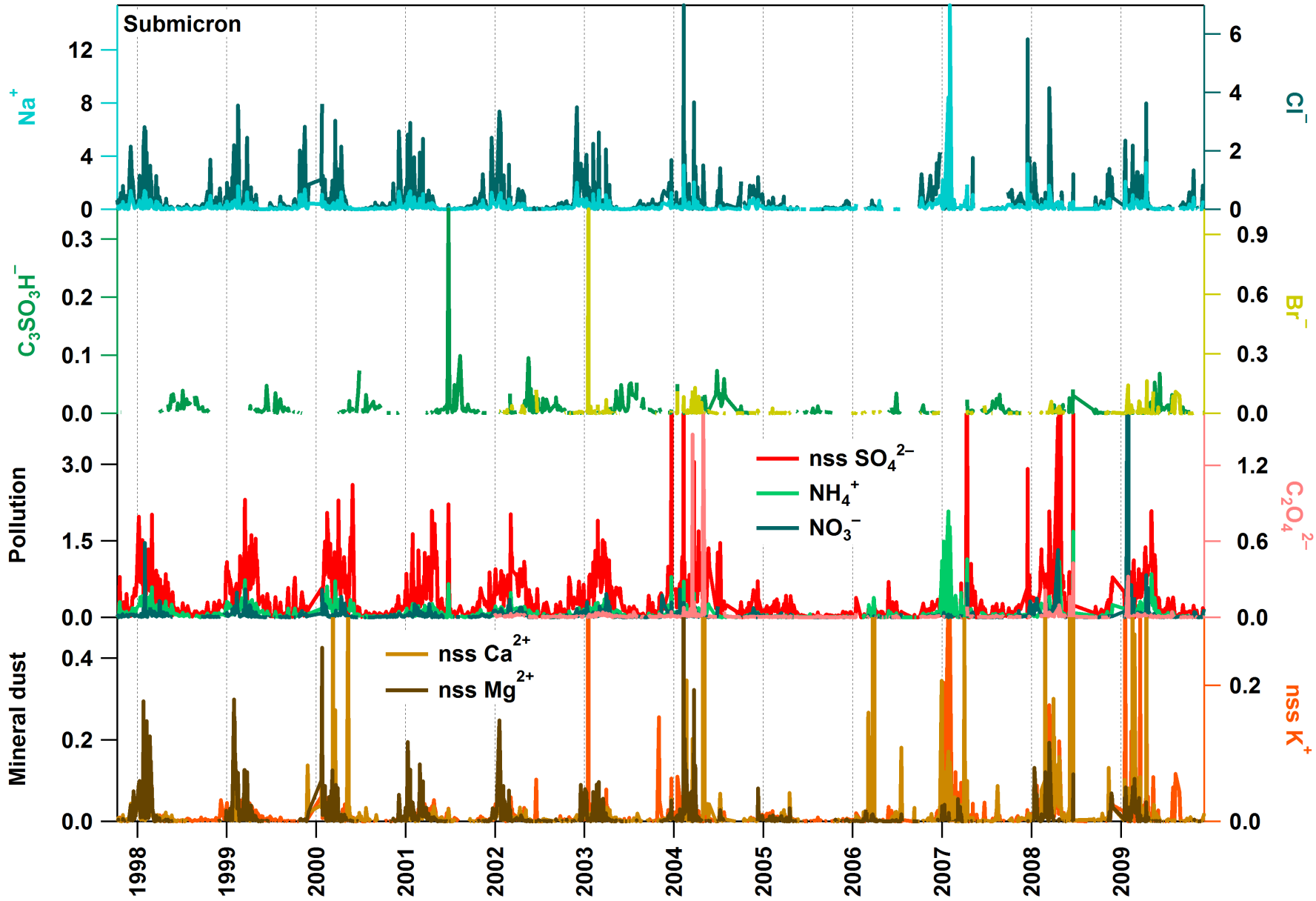
[Figure from Amy Solomon]

Ongoing Site Science Activities



Ongoing Site Science Activities

[Figure from Jessie Creamean]



Summary

- The DOE ARM Oliktok Point observatory has been operating on Alaska's North Slope since 2013
- This facility offers a variety of instrumentation for analysis of clouds, aerosols, radiation, surface fluxes, atmospheric state and greenhouse gasses
- Additionally, this observatory is unique in that it provides access to airspace for unmanned aircraft, tethered balloons, and manned research aircraft. These aircraft can be used to profile the atmosphere and reach ice and oceanic areas offshore
- The DOE Atmospheric System Research program is supporting a site science team who are diving into analysis of the datasets. For those interested in high latitude processes – let us know how we can help!