



North Slope Alaska and Tethered Balloon Systems
ARM Facilities Monthly Status Update
Sandia National Labs

December 2022

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Mission Statement

In support of the DOE Office of Science, Sandia National Labs is one of nine national laboratories which oversees the Atmospheric Radiation Measurement (ARM) Program. The Sandia ARM team has an obligation to fulfill its mission to provide the nation with data to improve the understanding of climate processes and the representation of those processes in climate models. Sandia's ARM team's ability to provide detailed and accurate descriptions of the Earth's atmosphere in diverse climate regimes assists the DOE in development of sustainable solutions to the nation's energy and environmental challenges. Sandia Labs manages ARM atmospheric facilities along the North Slope of Alaska (NSA) at Utqiāġvik as well as the Tethered Balloon System (TBS). Activities conducted at NSA and with the TBS aide in data collection for the ARM data archive. An overview of these activities for the month of December follows.

NSA and Tethered Balloon Facilities Operations Team

Management

- * Andrew Glen - ARM Sandia Labs Manager (SNL)
- * Mark Ivey - ARM Alaska Sites Assistant Manager (SNL)

NSA Operations Team

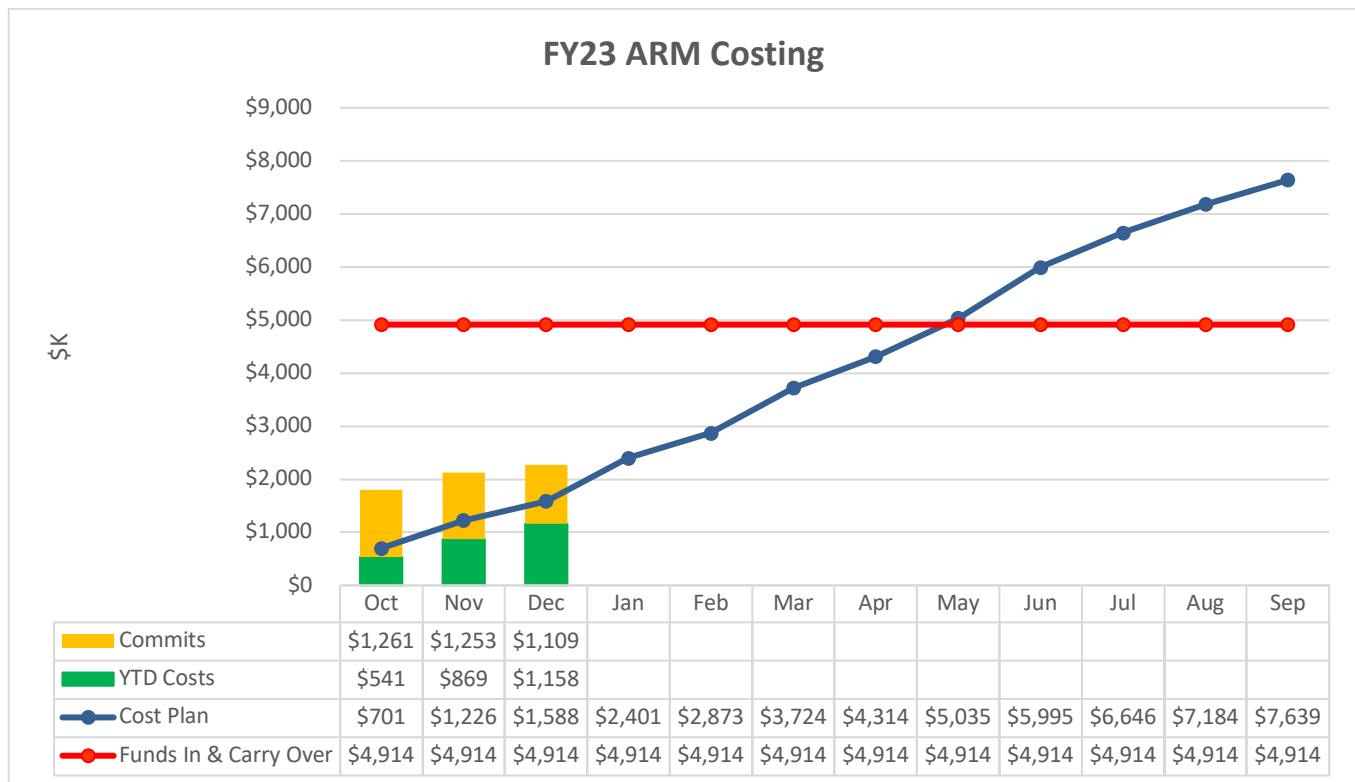
- * Fred Helsel - NSA Site Manager (SNL)
- * James Ivanoff - NSA Facilities Manager (UIC)
- * Valerie Sparks - ARM Project Office (SNL)
- * Justin LaPierre – NSA Site Operations (SNL)
- * Ben Bishop – NSA Site Operations (SNL)
- * Todd Houchens – NSA Site Operations (SNL)
- * Martin Stuefer - Rapid Response Team (UAF)
- * Telayna Wong – Rapid Response Team (UAF)
- * Randy Peppler - ARM DQ Office Manager (OU)

TBS Operations Team

- * Darielle Dexheimer - TBS Operations Lead/Lead Instrument Mentor (SNL)
- * Casey Longbottom – TBS Engineering Lead (SNL)
- * Gabrielle Whitson - TBS Associate Instrument Mentor (SNL)
- * RaeAnn Cook – ARM Project Office (SNL)
- * Dennis De Smet – TBS Operations (SNL)

Budget

	December	YTD
Carryover funds	\$4,914,049	
Carryover plus YTD funds	\$4,914,049	
Cost plus Baseline burdened amount	\$7,209,014	
Cost burdened YTD amount	\$1,157,903	
Commits burdened amount	\$1,108,964	
Current fiscal year commits	\$824,899	
Subsequent fiscal year commits	\$284,065	
Uncosted, uncommitted amount	\$2,647,182	
Fully Burdened Staff Costs	\$198,222	\$896,473
Fully Burdened Contract Costs	\$90,226	\$261,430
Fully Burdened Total Costs	\$288,448	\$1,157,903



Overview, Summary of Capabilities

Summary of Capabilities for December 2022

TBS Coordination:

Helium:

- Albuquerque Matheson still has 64 cylinders of Helium for the TBS team that are filled and ready for shipment.

Helium Needs FY23

Location	Needed	Available	Deadline
SAIL I	*0	83	N/A
SAIL II	30	TBA; upon completion of SAIL I	30 by 3/24/23
SAIL III*	30	TBA upon completion of SAIL II	30 by 4/17/23
SAIL IV	30	TBA upon completion of SAIL III	30 by 5/26/23
SGP	64	11	45 by 5/3/23 30 by 7/3/23
ABQ Matheson	N/A	64	N/A

**Pending snow melt*

TBS SAIL

- The TBS team prepared for the January SAIL deployment during the month of December. A Sandia-owned snowmobile and additional leased snowmobiles will be used to access the site during the winter deployments. A daily communication protocol between the Sandia team and Crested Butte Mountain Resort (CBMR) will be followed to ensure the pumphouse area is accessed safely and any potential avalanche exposure is mitigated.
- The TBS will operate at a fourth SAIL deployment that will take place at the end of April/beginning of May 2023, pending peak snowmelt.

TBS SGP

- The next TBS deployment at SGP will take place in May 2023.

NSA Sites:

Utqiagvik/NSA:

- The NSA facilities operated normally for winter Arctic conditions during December, with temperatures in the single digits above and below 0°F, high winds and snow.
- Observers from Ukpeagvik Iñupiat Corporation (UIC) Science are maintaining the NSA site and following COVID safe practices for the appropriate masking and testing protocol status.
- UIC has hired Craig Moore as a replacement for Walter Brower. He started at NSA on January 3rd.
- On Thursday December 1st, the maintenance building at the NSA facility was burglarized and several items were stolen. Valerie Sparks was on site and filed a police report, and the incident was reported to SNL and ARM. Most items taken were tools, power tools and portable equipment such as generators. We will be upgrading locks/security measures over upcoming trips.

- AS41 Radiosonde Autolauncher - Jimmy Ivanoff worked with Brian from Vaisala to change and test the nominal current values for the two frequency converters. He then opened and closed the launch tube covers without errors. This should take care of the inconsistent operation of the launch tube covers.
- [AFC10114](#) AFRL sampled for a week and plan on returning in February, July, & October for a week during each of those months.

NSA-South (E12) site:

- E12 has been operating with minimal issues.

AMF3 SEUS:

- Lean Northwest is proceeding with work on the AMF3 containers.

Environmental Safety & Health

Safety:

Utqiagvik/NSA – No incident/injury

TBS – No incident/injury

Tethered Balloon Operations

TBS Approved Deployments and Projects FY23

The figure below shows the currently scheduled field deployments of the TBS supporting field campaigns.

		Anticipated TBS Deployments and Projects FY23																								
Location	Campaign	19-Dec	26-Dec	2-Jan	9-Jan	16-Jan	23-Jan	30-Jan	6-Feb	13-Feb	20-Feb	27-Feb	6-Mar	13-Mar	20-Mar	27-Mar	3-Apr	10-Apr	17-Apr	24-Apr	11-May	8-May	15-May	22-May	29-May	5-Jun
Central OK	SGP II																									
	SGP III																									
Crested Butte, CO	SAIL Winter I																									
	SAIL Winter II																									
	SAIL Winter III																									
	SAIL Summer I																									

Approved Campaign Dates – FY23

SAIL Winter I: Jan 16 – Jan 29, 2023

SAIL Winter II: Mar 27 – Apr 9, 2023

SAIL Winter III: Apr 22 – May 1, 2023 (dates pending peak snow melt)

SGP II: May 6 – May 22, 2023

SAIL Summer I: Jun 1 – Jun 14, 2023

SGP III: July 6 – July 19, 2023

Current and Upcoming TBS Field Campaigns

AFC	Title	Start	End*	Status*	Notes
AFC07019	<i>Size and Time-Resolved Automated Aerosol Sampling (STRAAS); PI: Swarup China</i>	6/1/20	12/31/22	In Progress	Expected to continue to end of CY22
AFC10058	<i>Understanding Contributions of Agricultural Dust to Vertical Profiles of Ice-Nucleating Particles in the Central Great Plains (DustINP); PI: Susannah Burrows</i>	2/1/22	7/31/23	In Progress	Expected to continue through July '23 SGP
AFC10055	Investigation of the Aerosol Impact on the Surface (SAIL-AIS); PI: Alex Laskin	4/1/22	6/30/23	In Progress	Flights expected to continue through the end of the SAIL campaign
AFC10081	<i>FICUS-GOLDSTEIN-Vertically and Size-Resolved Chemical Speciation of Aqueously Processed Organic Aerosols; PI: Allen Goldstein</i>	8/1/22	7/31/23	In Progress	Flights continuing through July '23 SGP
AFC10083	<i>FICUS-ZAWADOWICZ- Characterization of the Aerobiome during ARM Surface-Atmosphere Integrated Laboratory (SAIL) Campaign; PI: Maria Zawadowicz</i>	8/1/22	6/15/23	In Progress	Flights expected to continue through the end of the SAIL campaign
AFC10087	<i>FICUS-AIKEN-Seasonal vertical aerosol profiling for aerosol-cloud-precipitation interactions to advance mountainous hydrological process science; PI: Allison Aiken</i>	8/1/22	6/15/23	In Progress	Flights expected to continue through the end of the SAIL campaign
AFC10075	Boundary Layer gradients in New Particle Formation PI: Eleanor Browne	4/25/23	5/25/23	Approved	Flights expected to begin at SGP in May '23

*End dates provided are based on current plans as coordinated with ARM and the PIs. These include any delays and may differ from what is indicated in the ServiceNow record.

*Status provided above is based on current TBS activities for each campaign. This may differ slightly from the "status" indicated in the ServiceNow record.

TBS ENGs

ENG	Title	Status	Last update
ENG0004334	Developing TBS data products & visualization	In Progress	Krista Gaustad has successfully created two VAPS, tbsmerged_incloud and tbsmerged. Data for OLI and SGP became available on 10/19/22. GUC and HOU data are expected to be processed in early 2023. IM Dexheimer began work on a technical report for the VAP at the end of 2022.
ENG0004437	TBS networking equipment, collections, & ingest for SAIL Pilot Deployment	In Progress	The guctbsground logger was replaced in November. Data files will be manually uploaded to transfer.adc.arm.gov whenever the TBS team is onsite at the pumphouse.
ENG0004130	Create tbsslwcb1 datastream	In Progress	Erol Cromwell has completed ingesting the data from IFFEXO in November 2020 and b0 data are available on Data Discovery. No b1 level data are yet available and no slwc data are currently included in the olitbsmergedincloud VAP.

<u>ENG0004542</u>	Procurement of an IcePuck	In Progress	The IcePuck will be deployed during SAIL I.
<u>ENG0004561</u>	AMF3 BNF: Evaluation of a Distributed Temperature Sensing System (DTS) on the Tower	In Progress	IM Dexheimer will begin work in late 2022 on a design document to deploy DTS on the 40 m tower at SEUS to capture finer-scale evolution of thermals from the surface to the atmosphere. Members of the Sandia team are expected to accompany ANL on a site visit to SEUS in January 2023 to better inform the design.

TBS Deployments and Operations

- SAIL:
 - The next deployment for SAIL is expected to occur in early January to support [AFC10055](#), [AFC10083](#), and [AFC10087](#).
- SGP CF:
 - The next deployment for SGP is expected to occur in May 2023 to support [AFC10058](#) and [AFC10081](#).

TBS Data and Datastreams

- We will upload all 2023 SAIL TBS data via transfer.adc.arm.gov.
- No olitbsimetM1.b1 data are available on Data Discovery for 11/17/20, 11/18/2. Data missing for 11/17/20 and 11/18/20 was re-uploaded to transfer.adc.arm.gov in December. The team is working with ARM data services to get the missing files on Data Discovery.
- No sgptbsimetC1.b1 data are available on Data Discovery for 4/10/22. Data missing for 4/10/22 was re-uploaded to transfer.adc.arm.gov in December. The team is working with ARM data services to get the missing files on Data Discovery.
- Several missing sgptbswind files were discovered through missing data gaps in the sgptbsmerged VAP. The team will work with Data Services to resolve these gaps.

North Slope Facilities NSA/Utqiāġvik (Barrow)

Anticipated NSA Travel FY23

The tables below show the currently scheduled campaigns and field deployments of the NSA team.

Who	Purpose	Dec	Jan	Feb	Mar	Apr	11-Apr	18-Apr	May	16-May	23-May	30-May	6-Jun	13-Jun	20-Jun	27-Jun	Jul	11-Jul	18-Jul	25-Jul	1-Aug	8-Aug	15-Aug	22-Aug	Sept
Sandia Tech	Site/IOP support 2 weeks a month																								
Matthew Strum, Jennifer Delamere, and team	AFC06937																								
NSA Site Manager, Sandia ES&H Coordinator	Site Review																								
Sandia Techs & NSA Site Manager	Spring Cleaning,																								
Rebecca Sheesley and team	AFC06964																								
Sandia Tech	Tower maintenance																								
Sandia Techs & NSA Site Manager	Radiometer swap out																								
AFRL	AFC10114																								

Confirmed Current and Upcoming Site Visits

Fred Helsel Marc Williams Todd Houchens Ben Bishop	Dec 13 – Dec 15 Dec 13 – Dec 14 Dec 05 - Dec 09 Feb 20-Mar 05	ES&H Surveillance/Verify Site ready for winter ES&H Surveillance Radar Support AFC support
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NSA Approved Field Campaigns FY23

Location	Campaign	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep
NSA	AFC10114 - Extinction of Laser light due to Arctic Haze											
	AFC06879 - One Year Electric Field Study-NSA (OYESNSA)											
	AFC06894 - Arctic Observing experiment (AOX2)											
	AFC06900 - Global Navigation Satellite System (GNSS)											
	AFC06916 - ARM Radiosondes for SNPP/JPSS Validation											
	AFC10039 - Seasonal Evolution of Land and Sea Ice Albedo (SALVO-II)											
	AFC06964 - BEAR-oNS											
	AFC07053 - Distributed Acoustic Sensing (DAS)											
	AFC10046 - SoRcer Test Utqiagvik Deployment for ionograms (STUDI)											
	AFC10060 - Next Generation Ecosystem Experiment/ORNL											
NOAA	AFC07014 - PINE											

*Extended, end date is tentative

Current and Upcoming NSA Field Campaigns/FCs

AFC	Title	Start	End	Status	Notes
AFC0114	Extinction of Laser light due to Arctic Haze; PI: Greg Pitz	Nov 4, 2022		Pre- Campaign	
AFC06879	One Year Electric Field Study- NSA (OYESNSA); PI: Chuntao Liu/TAMU	June 1, 2016	June 1, 2024	In Progress	Extended to 2024
AFC06894	Arctic Observing eXperiment (AOX2); PI: Ignatius Rigor	Apr 4, 2017	Mar 31, 2021	In Progress	Extended, end date TBD
AFC06900	Global Navigation Satellite System (GNSS); PI: Martin Stuefer/UAF	Apr 15, 2017	Apr 14, 2025	In Progress	
AFC06916	ARM Radiosondes for SNPP/JPSS Validation; PI: Lori Borg	Oct 10, 2017	Sept 30, 2021	In Progress	Extended, end date TBD
AFC10039	Seasonal Evolution of Land and Sea Ice Albedo (SALVO-II); PI: Jen Delamere/UAF	April 10, 2022	June 19, 2023	First season completed	Continuation of SALVO in 2019 (AFC06937 , interrupted by COVID). Rescheduled for Spring/Summer 2022 (Completed) and Spring/Summer 2023
AFC06964	BEAR-oNS ; PI: Rebecca Sheesley/Baylor Univ.	Jun 1, 2022	Aug 31, 2023	First Season Completed	Tentatively rescheduled to Summer of 2022 and 2023
AFC07014	PINE at NSA; PI: Naruki Hiranuma/WTAM	Oct 18, 2021	Dec 31, 2024	In Progress	Coordinated with NOAA to proceed with IAA renewal to include this AFC. Installed at NOAA.
AFC07053	Distributed Acoustic Sensing (DAS); PI: Ming Xiao/PSU	Sept 1, 2021	Dec 31, 2024	In Progress	Installed at NSA/Utqiāġvik
AFC10046	SoRcer Test Utqiāġvik Deployment for Ionograms (STUDI); PI: Chris Fallen/AFRL	Dec 12, 2021	Nov 30, 2022	In Progress	Problems obtaining an abstract for ARM website, seems Air Force has moved up information into classified realm(?). ARM is coordinating changes if proprietary data is collected.
AFC10060	Next Generation Ecosystem Experiment/ORNL; PI: Stan Wullschleger	TBD	TBD	In Review	

Site News

Utqiāġvik/NSA:

- The NSA facilities operated normally for winter Arctic conditions during December, with temperatures in the single digits above and below 0°F, high winds and snow.
- On Thursday December 1st, the maintenance building at the NSA facility was burglarized and several items were stolen. Valerie Sparks was on site and filed a police report, and the incident was reported to SNL and ARM. Most items taken were tools, power tools and portable equipment, such as generators. We will be upgrading locks/security measures over upcoming trips.
- [AFC10114](#) AFRL sampled for a week and plan on returning in February, July, & October for a week during each of those months.
- AS41 - Jimmy Ivanoff worked with Brian from Vaisala to change and test the nominal current values for the two frequency converters. He then opened and closed the launch tube covers without errors. This should take care of the inconsistent operation of the launch tube covers.

- The Ka/W SACR was determined to have a coolant leak which is suspected to have caused the pedestal circuit breaker to fail. The system is not operational and will require further coordination for repair/restart.

NSA-South (E12) site:

- E12 has been operating with minimal issues.
- The MAWS MOXA was set up with a maintenance port cable. Configuration settings were verified.

Site Staffing Issues

- UIC has found a candidate to hire to replace Walter, Craig Moore. His first day will be January 3, 2023.

Site Changes/Upgrades/Training

- A plan is being developed to add a new scanning HSRL. The HSRL requires a shelter for support and the team plans to utilize an old AMF3 shelter. Follow up discussion with the manufacturers occurred in December.

Barrow Arctic Research Center (BARC)

- Visiting organizations will continue to use the ARM Site Request form to reserve time in the lab as to not conflict with other ARM users. The ARM Site Request will also identify personnel who qualify as foreign nationals, so that an FNR (Foreign National Request) can be put in place before they utilize the laboratory. This worked well and will continue with the 2023 season of field campaigns.

NSA Down Instruments List

INSTRUMENTS DOWN AT SITE Utqiāgvik (C1) AS OF 01/01/2023:

MFRSR - Multifilter Rotating Shadowband Radiometer	Not Operational – removed for solar winter
NIMFR - Normal Incidence Multifilter Radiometer	Not Operational – removed for solar winter
GNDRAD - Ground Radiometer on Stand for Upwelling	Partly Operational – sensor removed for solar winter
MFR10m - Multifilter Radiometer at 10m height	Not Operational – removed for solar winter
ECOR-twr - Eddy Correlation Flux System	Partly Operational – sensor removed for solar winter
KaWSACR - Ka-Band Scanning ARM Cloud Radar	Not Operational – removed for solar winter
TSI - Total Sky Imager	Not Operational – removed for solar winter
CIMEL - Cimel Sunphotometer	Not Operational – removed for solar winter

Distribution List

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