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North Slope of Alaska ARM Facilities
Monthly Status Update
Sandia National Labs

October 2018

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1 North Slope Facilities Management Executive Summary

This monthly report is intended to communicate the status of North Slope ARM facilities managed by Sandia National Labs.

Operations Team

* Mark Ivey- ARM Alaska Sites Manager (SNL)
* Fred Helsel- Barrow and AMF3 Site Manager (SNL)
* Darielle Dexheimer- Tethered Balloon Operations (SNL)
* Valerie Sparks- ARM Project Office (SNL)
* Martin Stuefer- Rapid Response Team (UAF)
* Randy Peppler- ARM DQ Office Manager (OU)

2 Budget

FY2017 Financials (as of October 26, 2018)

	October	YTD
Carryover funds	$4,850,599	
Funds Allocated YTD	$527,000	
Carryover plus YTD funds	$5,377,599	
Cost, burdened amount	$716,817	
Uncosted Funds	$4,660,782	
Commits, burdened total	$1,617,127	
Current fiscal year uncommitted funds	$3,043,655	
Subsequent fiscal year (SFY)commits	$1,373,171	
Total uncommitted funds, including SFY commits	$1,670,484	
Fully Burdened Staff Costs	$62,000	$3,462,000
Fully Burdened Contract Costs	$197,000	$2,964,000
Fully Burdened Total Costs	$259,000	$6,427,000

3 Summary of Current Management Issues

Management summary of current issues for October 2018

1. Instruments/systems winterization is complete at both NSA and AMF3.
2. We are still attempting to get an Interagency Agreement in place with the Air Force for use of facilities (e.g. lodging) at the Oliktok Long Range Radar station. The Sandia Field Office/SFO has requested information from USAF-Elmendorf to get this moving.
3. Problems encountered from RF/EMF interference during POPEYE at Oliktok damaged instruments and the UAVs (DataHawks/DH), resulting in cancelation of half the DH campaign. While TBS flight was not affected by the RF/EMF interference, instrument modifications/shielding were performed to allow continued TBS flights throughout the campaign. The source of RF/EMF interference has been attributed to the USAF radar system, which they have also acknowledged as the likely source. Dari and Casey are conducting spectrum scans at Barrow/Utqiagvik (Oct. 30-31) for comparison with scans collected in Oliktok this summer. We have been and continue collecting information on the radars that we are aware of at Barrow for proper attribution. We are in the process of following up with USAF to evaluate possible avenues to minimize and mitigate future disruptions and damage – with a trip planned to Elmendorf during the week of November 12.
4. The Oliktok site has no access to ServiceNow. Brad Perkins is buying more licenses for the Software so OLI can use it. We have asked Mentors to update the AMF3 observers via emails until Service Now is installed and then updates made in the system.
5. We now have the FAA Airspace Awareness Detection System (AADS) 3.1 up and running. This system gives us views of near-real-time air traffic at Oliktok and North Slope locations, or anywhere in the U.S. National Air Space. We have 6 licenses for AADS. It was successfully tested for access (not actual use at this time) from Oliktok Point.
6. FY18 Controlled Airspace Usage Reports, as required by FAA for records of R2204 and W220 airspaces; we have prepared draft reports and updated flight logs for these airspaces. Final versions will be submitted to the FAA after review.
7. Microturbines at Oliktok seem to be running reliably now after resolution of thermal problems with controllers. Switchover of AMF3 from diesel generators to the microturbines is scheduled for the week of 11/04, with parts now stored in the OLI Sprung to do transfer work.
8. ENI has notified us that they can again accommodate us at their NOC camp for lodging/billeting, beginning November 01.
9. We are talking with Anne Jensen at UIC about hiring additional staff for Barrow, to train before Walter retires. We just learned that Jimmy Ivanoff received a clean medical report (there was some concern), and should be able to continue as an observer at Barrow.
10. Randy Davis from NWS was in Barrow last week to configure software for NWS to obtain all launch messages, in preparation for taking over Weather Service launches. Software has been restored to normal configuration until NWS launches take place (after install of NWS hydrogen generator and system in late Spring 2019 (tentatively).
11. Dari, Casey and crew completed the last phase of POPEYE TBS activities, with the last flights on September 28. For the TBS operations of POPEYE 2018, we were able to log 118 hours of flight time over 4 TBS campaign periods, which met our goal of about 40 hours/campaign for the first two periods, despite flooding and road closures. While flight time during the last two periods were reduced due to unforeseen RF/EMF interference, numerous polar bears, frequent winds and precipitation, and “musical chairs” lodging logistics, the TBS crew was able to average ~30 hours/campaign period in addition to performing spectrum scans to troubleshoot the RF/EMF

issues (with analysis assistance from a Sandia radar group). Including the DataHawk flights by PNNL, the campaign logged a total of 151.6 flight hours. Coordination with the Oliktok Science Team, the PI, PNNL and on-site observers went very well, including scheduling of travel and calibration tests, overlap of UAV and TBS teams on site, and mutual support of campaigns and troubleshooting.

12. Al Bendure coordinated activation of DOE airspace in W220 for the SODA flights of SeaHunter during 05-26 October from Kuparuk to across the Arctic Ocean. The campaign was delayed due to difficulty finding a dual-propeller chase plane for transition flights between Kuparuk and W220. The campaign involved launching the SeaHunter unmanned aircraft (by UAF-ACUASI) and a chase plane from the Kuparuk airstrip to W-220 under a COA, executing a defined flight pattern in W-220, and returning to the southern boundary of W-220 where the chase plane met and accompanied the SeaHunter on its return to Kuparuk. The transition to/from W-220 was conducted well outside R-2204 to assure deconfliction. Two flights were executed in W-220 segments A and B on October 8 for a total of 4.6 hours. Adverse weather (low ceiling; wind; icing) prevented flights on the remainder of the campaign days. There were no incidents during the campaign. Al Bendure was impressed by the professionalism of the UAF flight crew and management and the principal investigator (Gijs DeBoer) who jointly made decisions concerning flights that were based on ensuring safety. The UAF flight crew worked closely with Kuparuk Airstrip operations management to ensure SeaHunter operations would not conflict with manned aircraft operations at Kuparuk. Characteristically, the FAA Air Route Traffic Control Center, ZAN, responded promptly and accurately for requests to activate/deactivate W-220 segments A, B, C, D, and E for the campaign. This punctuates the need for instrument flight/IFR and de-icing platform capabilities to fly during icing season/late Fall across W220.

4 Safety

AMF3- No incident/Injury

Barrow - No Incident/Injury

5 Tethered Balloon Operations

TBS Report for October 2018

The Oliktok TBS winch motor was returned to Albuquerque for maintenance and upgrades over the winter. Upgrades to be performed include:

- The existing diesel generator will be replaced with a quieter gas generator.
- The existing 2.1 km-capacity winch drum will be replaced with a 3 km-capacity winch drum. This will allow TBS flights to occur closer to the 2.1 km altitude limit of R-2204. Due to angle of the tether in flight, the highest altitude achieved with the existing 2.1 km-capacity winch drum is 1.45 km.
- The existing 2 HP single-speed winch motor will be replaced with a variable-speed motor. This will allow quicker retrieval of the balloon in developing adverse conditions. It will also allow variety in TBS flight patterns, such as different rates of ascent or descent between cloud or aerosol layers of interest.
- The NM winch will also be upgraded to serve as a backup in case of a mechanical failure of the primary winch.

The TBS tether used in 2018 for almost 140 hours of flight will be unspooled and returned to the manufacturer for load testing.

The Silixa DTS unit experienced an internal battery failure during the final leg of TBS flights for POPEYE. It had been returned to the manufacturer for repair and annual calibration.

The collaboration with University of Reading (UK) continues on supercooled liquid water sensor results from POPEYE, and a journal article is on track to be submitted by the end of 2018.

RF survey activities, including low altitude tethered weather balloon flights, will occur in Barrow from 10/30 – 11/2.

6 North Slope Facilities

AMF3

Current and Upcoming Site Visits

Fred Helsel, Al Bendure/SNL	11/09- 12	Switch site power to turbines
Ben Bishop/SNL	11/09-12	Switch site power to turbines/ radiometers

Current and Upcoming IOPs

Snowflake Settling Speed Experiment: MASC
Timothy Garrett –University of Utah: Presently out for repair IOP ends 9/30/2018
Evaluate NASA PIP Instrument at Oliktok - **ENG0003203**
POPEYE - July 2018 through September 2018
SODA – October 2018

Site News

NA

Site and Safety Issues

ENG0003771 Modify the CSPHOT deployment at NSA and OLI, DQPR 7346 new moon tracking CIMEL TS has communications errors. Unfortunately, the CIMELTS has not functioned properly since its arrival and leads us to believe it may be a manufacturer defect. We don't believe this unit was tested before it was sent to AMF3.

ENG0000990 IRT communications - Until a solution is found, the NPort IA5250s at both sites will not be put back into service. The communications hardware was sent back to SDS team for testing then returned to sites, but was never tested with a CR1000 logger. Sites still have communications issues and will be put on hold until a solution and weather permits.

Unmet Needs

NA

Site Changes/Upgrades

ENG0003770 Upgrade Arctic precipitation measurement suite.

OLI Laser Precipitation Monitor (LPM): In the summer of 2017, the NSA LPM was enclosed in a Belfort double alter shield. To establish consistency between the NSA and OLI LPMs, the OLI LPM should be moved from its current position within the Geonor's double fencing to a new location and enclosed by the Belfort shield. Thus, we need to determine a new location (not far from the Geonor and the SRSs) for the OLI LPM, setup the new Belfort double alter shield, move the LPM, and extend power/data cables to the new location. The data logger would be moved as well, likely remaining on the LPM stand. No change to the data stream will result from this change.

OLI/NSA Snow Depth Msmts (SRS): Expand the snow depth measurements to include three additional sensors at each site. These three new sensors will be set up perpendicular to the three currently installed, allowing a better interpretation of the wind effects on the snow. The instruments will be mounted on a quadpod identical to the sensors already there. These new sensors will have to be added to the ingest and archiving schema.

OLI/NSA Cameras: Improve the camera system at each site to get better imaging of the LPMs.

ENG0004004 AOS03 TOF-ACSM installed in AOS02 to support MOSAiC. The ACSM is being shut down and being shipped to BNL the week of 10/29 to support MOSAiC.

Site Staffing - N/A

Barrow

Current and Upcoming Site Visits

Jun Lui, Jamy Lee/University of Michigan	10/28-12/22	Arctic Aerosol Sources & Mixing States IOP
Dari Dexheimer, Casey Longbottom/SNL	10/30-11/02	RF survey; TBS test flights
Kerri Pratt/University of Michigan	11/2-9	Arctic Aerosol Sources & Mixing States IOP
Ben Bishop/SNL	11/12-13	Power supply upgrade, SKYRAD

Current and Upcoming IOPs

SNPP/NPOESS Ground Truth Sonde Launch, Phase 5 – start date Oct 1, 2016
Seismic Probes for NSF– POP Ends, Oct 31, 2018
Global Navigation Satellite System (GNSS) – start date July 2017
Heated Pyrheliometer IOP requesting extension - winter 2018
RIVAL - Sonde RS92 RS41 comparison. (Donna Holdridge)
ARM Field Campaign: 2018-6948- Arctic Aerosol Sources & Mixing States. Oct 28 – Dec 20, 2018.

Site News

NA

Site and Safety Issues

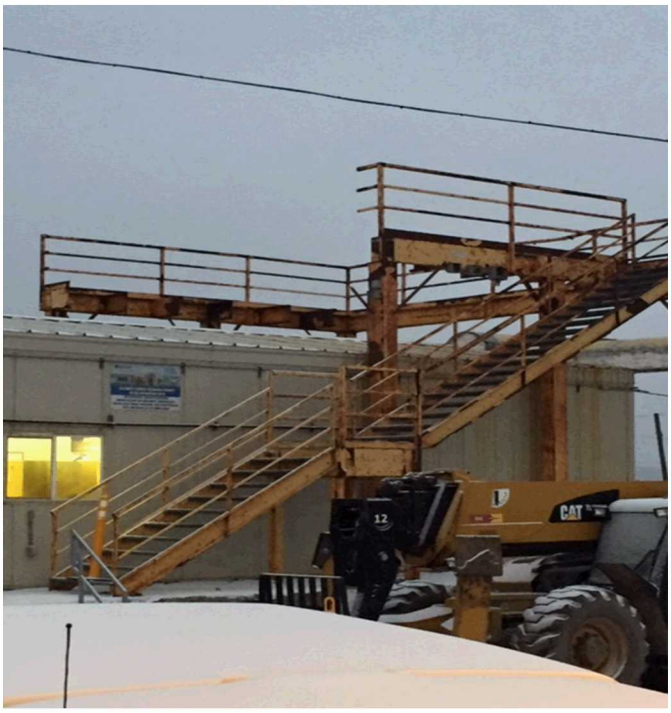
ENG0000990 IRT communications - Until a solution is found, the NPort IA5250s at both sites be put back into service. The communications hardware was sent back to SDS team for testing then returned to sites, but was never tested with a CR1000 logger. Sites still have communications issues and will be put on hold until a solution and weather permits.

Unmet Needs

NA

Site Changes/Upgrades

Maintenance building deck was removed. Rust was dripping from deck making rust stains on the maintenance building. It was felt that the deck was no longer safe to use.



Complete- ENG0003801 Move snow imaging instruments (MASC and PIP) from Oliktok to Barrow to support the SACR.

ENG0003771 Modify the CSPHOT deployment at NSA and OLI
New moon tracking CIMEL TS was installed and now operating.

ENG0003770 Upgrade Arctic precipitation measurement suite.

OLI/NSA Snow Depth Msmts (SRS): Expand the snow depth measurements to include three additional sensors at each site. These three new sensors will be set up perpendicular to the three currently installed, allowing a better interpretation of the wind effects on the snow. The instruments will be mounted on a quadpod identical to the sensors already there. These new sensors will have to be added to the ingest and archiving schema.

OLI/NSA Cameras: Improve the camera system at each site to get better imaging of the LPMs.

Site Staffing Issues

NA

Appendices: Instrument Status – Provided by Martin Stuefer and Telayna Gordon

- Appendix A: AMF3

INFORMAL AMF3 INSTRUMENT STATUS REPORT FOR October 19 - October 26, 2018
BRIEF STATUS OF INSTRUMENTS AND SITE IN OLIKTOK AS OF 2018/10/26:
Facilities Operational
Data Systems Operational
Vehicles Operational
Desktop Computers Operational
SKYRAD - SKY Radiometer on Stand for downwelling Operational
MFRSR - Multifilter Rotating Shadowband Radiometer Operational
GNDRAD - Ground Radiometer on Stand for Upwelling Operational
MFR2.5m - Multifilter Radiometer at 2.5m height Operational
MAWS - Automatic Weather Station Operational
MET - Surface & Tower Meteorological Instruments Operational
CMH - Chilled Mirror Hygrometer Operational
AMC - Soil, up/downwelling radiation measurements Operational
ECOR - Eddy Correlation Flux System Operational
MWR3C - Three Channel Microwave Radiometer Operational
MPL - Micropulse Lidar Not Operational
DL - Doppler Lidar Operational
RL - Raman Lidar Not Operational
CEIL - Vaisala Ceilometer Operational
KAZR - Ka ARM Zenith Radar Operational as per warno.arm.gov
BBSS - Balloon Borne Sounding System Operational
TSI - Total Sky Imager Operational
AOS - Aerosol Observing System Partly Operational
AOSMET - AOS Meteorological Measurements Operational
CO - AOS Carbon Monoxide Analyzer Operational
CPC - Condensation Particle Counter Operational
CAPS - Cavity Attenuated Phase Shift Extinction Monitor Not Operational
ACSM - Aerosol Chemical Speciation Monitor Operational
HTD-MA - Humidified Tandem Differential Mobility Analyzer Not Operational
GHG - PICARRO Operational
NEPH - Nephelometer Operational
PSAP - Particle Soot Absorption Photometer Operational
UHSAS - Ultra-High Sensitivity Aerosol Spectrometer Operational
IMPACTOR - AOS Impactor Operational
OZONE - AOS Ozone Operational
CCN - Cloud Condensation Nuclei Particle Counter Not Operational
LPM - Laser Precipitation Monitor Operational
GEONOR - Geonor Weighing Gauge Operational
SRS - Snow Depth Sensor Operational
AERI - Atmospheric Emitted Radiance Interferometer Operational
CIMEL - Cimel Sunphotometer Operational
IRT - Infrared Thermometer Operational
MET-AIR - DataHawk Unmanned Aerial System Operational
TBS - Tethered Balloon System Operational
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* Oliktok Instruments in Detail: *
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INFRASTRUCTURE --- Facilities --- Operational.
2018/10/26, CM-2018-AMF3-VSN-2685: The South Delta-owned CAT 80 kW Gen-Set failed at 13:10 UTC, so operators arrived onsite to find that the South Delta-owned CAT 80 kW had overheated and shut down. Site ops then fired up the North Delta-owned CAT 80 kW and switched site power over to it @ 13:30 UTC. All systems and instruments were operational again as of 13:57 UTC. The Delta mechanic was notified of the failure.
2018/10/22, CM-2018-AMF3-VSN-2680: The thermostat in the north generator shelter failed in the closed position, so ops removed and replaced the failed thermostat between 18:35 and 18:55 UTC.
2018/10/21, CM-2018-AMF3-VSN-2676: Preventative maintenance was necessary for the North Delta-owned CAT 80 kW Gen-Set. Site operators switched site power from the North Delta-owned CAT 80 kW to the South Delta-owned CAT 80 kW @ 15:26 UTC. Preventative maintenance was performed by the Delta mechanic and the North Delta-owned CAT 80 kW will be left as standby.
INFRASTRUCTURE --- Data Systems --- Operational.
2018/10/24, CM-2018-AMF3-VSN-2682: HDD S/N NA7Q2CQC was filled, so it was replaced with HDD S/N NA7Q2CPE. Ops will ship HDD S/N NA7Q2CQC via USPS tracking # 9114 9014 9645 0852 3624 18.
2018/10/21, CM-2018-AMF3-VSN-2679: HDD S/N NA7Q2CDN was filled, so it was replaced with HDD S/N NA7Q2CQC. Ops will ship HDD S/N NA7Q2CDN via USPS tracking # 9114 9014 9645 0852 3624 56.
INFRASTRUCTURE --- Vehicles --- Operational.
INFRASTRUCTURE --- Desktop Computers --- Operational.
SKYRAD --- SKYRAD general --- Operational.
2018/10/17, DQPR-7365: After a period of not available data, the time step of the measurement has increased to 1 hour. Data changes began at 14:02 UTC on 2018/10/13. The values appear to OK, but are maybe averaged to one hour time steps. Ken Kehoe posted an example plot on the DQPR showing the issue. The most recent DQPR status is "open - requires action."
2018/10/07, DQPR-7342: Beginning on 2018/09/19, there is a dropout in down short hemispheric data on sunny days from 1:30 - 2:00 UTC. The azimuth range associated with this dip is 236.0 - 240.9 degrees (from analysis on 2018/10/01). Solar elevation during this period is 6.6 - 8.0 degrees. Kenneth Kehoe asks that someone at the site look for obstructions from this direction. The most recent DQPR status is "open - requires action."
SKYRAD --- PIR 1 shaded --- Operational.
SKYRAD --- PIR 2 shaded --- Operational.
SKYRAD --- SOLAR Tracker --- Operational.
SKYRAD --- B&W diffuse --- Operational.
SKYRAD --- NIP --- Operational.
SKYRAD --- PSPg --- Operational.
SKYRAD --- MFRSR --- Operational.
2018/08/27, DQPR-7179: Christian Herrera is still seeing shading as of 8/12 after 18:00 UTC. The most recent DQPR status is "open - requires action."
2018/07/13, DQPR-7179: There appears to be a slight shading problem from roughly 12:00 - 14:00 UTC. Adam Theisen posted a plot of diffuse hemispheric irradiance to show this shading. Christian Herrera requests that operators check for possible instrument shading and confirm North/South alignment.
TIPTWR --- GNDRAD general --- Operational.
TIPTWR --- MFR2.5m --- Operational.
TIPTWR --- PIRgnd --- Operational.
TIPTWR --- PSPgnd --- Operational.
MAWS --- Automatic Weather Station --- Operational.
2018/09/14, DQPR-7268: Donna Holdridge has been assigned DQR D180914.6. The most recent DQPR status is "in progress - assignments."
2018/09/14, DQPR-7257: DQR for this missing data period will be handled in DQPR 7268. The most recent DQPR status is "open - requires action."
MET --- METTOWER general --- Operational.
MET --- CMH --- Operational.

2018/09/14, DQPR-7241: Adam asked Jenni for her thoughts on the CMH RH and dew point data quality. It looks like there is a lot of noise and jumps in the CMH data at time. The most recent DQPR status is "open - requires action."
MET --- Barometer --- Operational.
MET --- TEMPERATURE / HUMIDITY --- Operational.
MET --- WIND INSTRUMENTS (SONIC) --- Operational.
MET --- PWD --- Operational.
MET --- AMC --- Operational.
ECOR --- ECOR --- Operational. CH4 Analyzer Removed for winter.
ECOR --- SEBS --- Operational.
MW RADIOMETERS --- MWR3C --- Operational.
LIDAR --- Micropulse LIDAR --- Not Operational. A Network to USB Adapter was shipped.
2018/10/17, DQPR-7362: After ~ 13:40 UTC on 2018/10/13 the energy monitor dropped to near 0, and then data went missing after ~07:00 UTC on 10/14. The MPL hard drive failed on 10/14. Ops is currently working with the instrument mentor and SDS to set up a virtual machine to bypass the onsite computer. A purchase order is also in place for a new laptop with instrument specific calibrations and configuration to be kept with the system. But this will take a little while to be delivered to OLI. The most recent DQPR status is "open - requires action."
LIDAR --- Doppler LIDAR --- Operational.
2018/09/14, DQPR-7256: Rob Newsom was assigned DQR D180914.7 for the periods of missing data. The most recent DQPR status is "in progress - assignments."
2018/08/28, DQPR-7256: Data was not available for the DLFPT and DLPPI from 16:00 UTC on 8/21 to 15:38 UTC on 8/22, and 14:19 UTC on 8/23 to 22:29 UTC on 8/27. The duration was longer than 24 hours. A CM log notes that from 19:00 UTC on 8/24 to 23:05 UTC on 8/27, the DL software and instrument was not responding.
LIDAR --- Raman LIDAR --- Not Operational. Shut Down for winter.
2018/10/11, DQPR-7349: The AMF3 suffered a power outage on 9/30 at 21:00 UTC; power was restored to the site within 5 minutes of going down. After power was restored, ops restarted all instruments that were affected by the outage. The last instrument restored was the RL, which was restarted at approximately 22:30 UTC.The most recent DQPR status is "open - requires action."
2018/09/30, DQPR-7320: Jumpy data, especially on the nitrogen, high elastic, and high depolarization channels indicate a possible alignment issue. The time period is not specified because this appears to be an issue that has been going on for a while. The most recent DQPR status is "open - requires action."
2018/09/22, DQPR-7307: No data was available during this time period from 2018/09/06 at 22:00 UTC to 2018/09/07 at 18:00 UTC. The most recent DQPR status is "open - requires action."
LIDAR --- CEIL --- Operational.
RADAR --- KAZR --- Operational as per warno.arm.gov. Failed PDU Fans were replaced.
2018/10/26, CM-2018-AMF3-VSN-2686: After a site power failure at 13:10 UTC, ops discovered the radiate light to be off, so they logged in and executed the PASCI start file @ 14:03 UTC.
Sonde --- BBSS --- Operational.
2018/10/24, CM-2018-AMF3-VSN-2681: Technicians are unable to launch the 17:30 UTC balloon due to high wind conditions. Winds are >30 mph sustained and gusting >40 mph. Launches will resume when weather conditions permit.
2018/10/21, CM-2018-AMF3-VSN-2677/2678: Technicians are unable to launch the 17:30 and 23:30 UTC balloons due to high wind conditions. Winds are >30 mph sustained and gusting >40 mph. Launches will resume when weather conditions permit.
2018/10/19, CM-2018-AMF3-VSN-2675: The SONDE temperature check failed at the 23:30 launch, so site ops rebooted the system and will continue launches in the morning.
IMG --- TSI --- Operational. Shadowband Adjusted.
2018/10/02, DQPR-7321/CM-2018-AMF3-VSN-2644: The shadowband alignment was adjusted at 21:00 UTC on 2018/10/02, and DQR D181002.2 was assigned to Victor Morris. The mirror home position was adjusted -1 degree, and the control board time (mirtimeHT.exe) was changed. The most recent DQPR status is "in progress - assignments."

2018/10/01, DQPR-7321: The shading band was slightly misaligned since 2018/09/15 at 00:00 UTC. Adam Theisen removed the end date as the issue may still be ongoing, and believes that the issue start date will need to be verified also. The most recent DQPR status is "open - requires action."
AOS --- General --- Partly Operational, Some Instruments Shut Down.
2018/10/25, CM-2018-AMF3-VSN-2684: The PDU board for the PID1 (Hat Heater) failed, so ops removed and replaced it with a higher amperage board and quick blow fuses in order to prevent the loss of PDUs in the future. The issue started on 10/9/18 at 10:00 UTC and continued until 10/25/18 at 16:20 UTC.
AOS --- AOSMET --- Operational, but the Wind Sensor is Iced Over.
AOS --- CO - Analyzer --- Operational.
AOS --- CPC (CPCU and CPCF) --- Operational.
AOS --- CAPS --- Not Operational, Instrument at BNL.
2018/10/05, DQPR-5816: The repaired unit is back at BNL and was just used in the ARM-sanctioned PSAP filter laboratory study. One of the three pumps failed during this study and BNL is awaiting the delivery of the replacement pumps. Once replaced, the instrument can be shipped back to the site. DQR D181005.1 has been assigned to Arthur Sedlacek. The most recent DQPR status is "in progress - assignments."
AOS --- ACSM --- Operational.
2018/09/17, DQPR-7293: Between 09/07 - 09/14/2018, the ionizing filament was off, and molecules were not being ionized. Therefore, there was no mass spectrometer signal. The most recent DQPR status is "open - requires action."
AOS --- HT-DMA --- Not Operational. Instrument Removed for the winter.
2018/10/04, DQPR-7330: Since 2018/09/07 at 00:00 UTC, the instrument was offline for winter to protect it from accidental freezing in case of a power loss. The most recent DQPR status is "open - requires action."
2018/09/26, DQPR-7304/CM-2018-AMF3-VSN-2630: The HT-DMA needed to be shut down for the winter as requested by the instrument mentor. Site technicians shut down the HT-DMA system to dry it out. Upon completion, technicians stopped scans, turned off valves on the back of the instrument, the flow controls, vacuum and compressed air supplies, software, and computers. The system was uninstalled, packaged in its crated and dropped off in town to be shipped to BNL. The instrument was shipped via Fed Ex tracking # 8121-8758-3905. The most recent DQPR status is "open - requires action."
AOS --- GHG-Picarro --- Operational.
AOS --- UHSAS --- Operational.
AOS --- NEPH --- Operational.
2018/10/25, DQPR-7384: b1 level data are not available for 'aosnephdry' and 'aosnephwet' from 00:00 UTC on 4/13 to 00:00 UTC on 4/15. DQPR 7072 was issued for N/A b1 level data a couple of days after this period, and it was found to be a processing issue. The most recent DQPR status is "open - requires action."
AOS --- IMPACTOR --- Operational.
AOS --- Ozone --- Operational.
AOS --- PSAP --- Operational.
AOS --- IMPACTOR --- Operational.
AOS --- CCN --- Not Operational. At BNL, Waiting for Parts and Working on Performance Issues.
2018/08/13, DQPR-7136: New parts were installed, and a full flow calibration and a zero test was performed. The instrument is working well. Janek is waiting for an SMPS to become available for SS% calibration. The most recent DQPR status is "in progress - assignments."
Precip --- LPM --- Operational, but No Ingest.
2018/08/29, DQPR-7265: The ingest is not yet operational. The most recent DQPR status is "open - requires action."
Precip --- GEONOR --- Operational, but No Ingest.
2018/08/29, DQPR-7267: The Geonor will be worked on in OLI/AMF3 from 08/29 to 09/01. The instrument will be physically relocated. Expect disruptions in data flow and data quality. The most recent DQPR status is "open - requires action."
Precip --- SRS --- Operational, but No Ingest.
Other --- AERI --- Operational.

2018/10/24, CM-2018-AMF3-VSN-2683: During afternoon rounds a technician found the AERI sensor covered in ice. The technician used the lens cleaning wipe and heat from their hand to remove ice from the sensor between 20:40 and 20:50 UTC on 2018/10/24.
Other --- CIMEL --- Operational, but a Communication Problem.
2018/10/26, DQPR-7346: Per the mentor's request, ops checked on the DCP parameter status, which was listed as off on the TS box. Ops then ensured that there was a proper connection from the TS box to the MOXA and switched to serial port 2. However, the serial port 2 (COM4) also did not work. Line voltage was checked, and this also looks fine. Richard Wagener has now asked the operators to take pictures of the circuit boards inside so that he can look for any damaged components. He also asked ops if they could get a laptop configured with PhotoGetData software and a specific USB driver to attach to the USB port on the new control box. The most recent DQPR status is "open - requires action."
2018/10/18, DQPR-7346: Lynn Ma still has not found the cause of the serial communication problem at OLI yet. There is no data loss since we can download the Cimel data from the instrument to the computer via PhotoGetData software and manually send the data to AEronet as needed. The problem only affects the automatic data transfer to AEronet. Site ops has re-synced the GPS and left the GPS connected to the control box after the sync. A short data cable inside the black flight case was used to replace the long data cable.
Other --- DataHawk Unmanned Aerial System --- Operational, not a full time instrument.
Other --- IRT --- Operational.
2018/10/11, DQPR-7348/CM-2018-AMF3-VSN-2655: The two heaters were drawing the power too low to maintain consistent operation of the datalogger. The 12V power supply for the heater was moved from the IRT logger supply to an available supply in the SKYRAD logger enclosure at 18:04 UTC, ended the variation in logger power. DQR D181011.5 was assigned to Victor Morris. The most recent DQPR status is "in progress - assignments."
2018/10/10, DQPR-7348/CM-2018-AMF3-VSN-2655: Heating pads were temporarily hardwired into the IRT enclosure's 12 V power supply, and this caused the datalogger to power-cycle about every 30 minutes since 2018/10/05 at 23:00 UTC. This created multiple raw 'irtstart' files and caused splits in the CDF files. To prevent this, ops installed a terminal block into the enclosure and proceeded to connect the heating pads through it. The terminal block was then connected to the 12V power supply, and the enclosure is now being heated with a stable output voltage as of 2018/10/10 at 16:30 UTC. The most recent DQPR status is "open - requires action."
2018/10/09, DQPR-7207: The ICF serial-to-fiber converters from OLI were tested at SGP where it was determined that a null modem also needs to be included. The ICF devices were returned to OLI and DB9 null modem adapters were purchased for the site. The most recent DQPR status is "waiting - for spares."
Other --- TBS --- Operational.

- Appendix B- Barrow

INFORMAL NSA INSTRUMENT STATUS REPORT FOR October 19 - October 26, 2018
BRIEF STATUS OF INSTRUMENTS AND SITE IN Utqiaġvik (C1) AS OF 2018/10/26:
Facilities Operational
Data Systems Operational
Vehicles Operational
Desktop Computers Operational
SKYRAD - SKY Radiometer on Stand for Downwelling Operational
MFRSR - Multifilter Rotating Shadowband Radiometer Operational
NIMFR - Normal Incidence Multifilter Radiometer Operational
GNDRAD - Ground Radiometer on Stand for Upwelling Operational
MFR10m - Multifilter Radiometer at 10m height Operational
MET - Surface & Tower Meteorological Instruments Operational
AMC - Soil, up/downwelling radiation measurements Operational
ECOR-twr - Eddy Correlation Flux System Operational
MWR - Microwave Radiometer Operational
MWRP - Microwave Radiometer Profiler Operational

MWRHF - Microwave Radiometer High Frequency Operational
GVR - G-band Vapor Radiometer Not Operational
GVRP - G-band Vapor Radiometer Profiler Operational
HSRL - High Spectral Resolution Lidar Operational
MPL - Micropulse Lidar Operational
CEIL - Vaisala Ceilometer Operational
DL - Doppler LIDAR Operational
KAZR - Ka ARM Zenith Radar Operational
KaWSACR - Ka-Band Scanning ARM Cloud Radar Operational
XSAPR - X-Band Scanning ARM Precipitation Radar Operational
BBSS (Autosonde) - Balloon Borne Sounding System Operational
AOS - Aerosol Observing System Operational
CLAP - Continuous Light Absorption Photometer Operational
CPC - Condensation Particle Counter Operational
NEPH - Nephelometer Operational
IMPACTOR - AOS Impactor Operational
TSI - Total Sky Imager Operational
TOWERCAM - 40m tower camera Operational
Great White Camera Operational
MASC - Multi-angle Snowflake Camera Operational
LPM/LDIS - Laser Precipitation Monitor Operational
SRS - Snow Depth Sensor Operational
PIP - Precipitation Imaging Package Operational
AERI - Atmospheric Emitted Radiance Interferometer Operational
CIMEL - Cimel Sunphotometer Operational
IRT - Infrared Thermometer Operational
IOP - OYESNSA Operational
IOP - RIVAL Operational
IOP - CHP1 Not Operational
IOP - GNSS Operational

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* Barrow Instruments in Detail: *
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INFRASTRUCTURE --- Facilities --- Operational.
INFRASTRUCTURE --- Data Systems --- Operational.
2018/10/26, CM-2018-NSA-VSN-4756: The HSRL and SACR POE phones were power cycled between 23:30 and 23:45 UTC.
INFRASTRUCTURE --- Vehicles --- Operational.
INFRASTRUCTURE --- Desktop Computers --- Operational.
SKYRAD --- SKYRAD General --- Operational.
SKYRAD --- PIR 1 Shaded --- Operational.
SKYRAD --- PIR 2 Shaded --- Operational.
SKYRAD --- SOLAR Tracker --- Operational.
SKYRAD --- B&W diffuse --- Operational.
SKYRAD --- NIP --- Operational.
SKYRAD --- PSPg --- Operational.
SKYRAD --- MFRSR --- Operational, but a Shading Problem.
2018/10/01, DQPR-6995: The shading issue is still ongoing. Ops was not able to get the MFRSR shading properly for much of the year due to instrument issues; however, this setup has worked well in the past. This year, when Walter sends the heads back to SGP for characterization, Gary will ask him to send the stand and motor as well. The most recent DQPR status is "open - requires action."

SKYRAD --- NIMFR --- Operational, but Data Quality Issue.
2018/09/21, DQPR-7224: Walter checked the instrument a few days ago. There is plenty of slack in the cables for the tracker to rotate, so the issue may be with the cables themselves. Walter will send both the heater and data cable back with the instrument during winter removal. It would be great if the cables could be checked and tested before sending the instrument back in the spring. The most recent DQPR status is "open - requires action."
2018/08/14, DQPR-7224: Detector temperature is flagged "bad" (less than valid minimum of 34°C) intermittently on most days since 2018/05/06 at 16:08 UTC. The problem usually occurs between 15:00 UTC and 02:00 UTC of the following day.
TIPTWR --- GNDRAD general --- Operational.
TIPTWR --- MFR10m --- Operational.
TIPTWR --- PIRgnd --- Operational.
TIPTWR --- PSPgnd --- Operational.
MET --- METTOWER general --- Operational.
MET --- CMH --- Operational.
2018/10/15, DQPR-7314: The chilled mirror was cleaned and calibrated on 10/5, and readings have returned to normal. DQR D181015.2 was assigned to Jenni Kyrouac. The most recent DQPR status is "in progress - assignments."
MET --- Barometer --- Operational.
MET --- TEMPERATURE / HUMIDITY --- Operational, but Noisy Data is Being Investigated.
2018/06/07, DQPR-7034: The caps can be replaced during the annual change out toward the end of summer. Walter suggests using a drop of threadlocker to keep the caps on, and perhaps buy extra caps. The most recent DQPR status is “open - requires action.”
2018/04/12, DQPR-7034: The 10m level humidity data are often spiking twice a day, around the same times. This problem was apparent prior to maintenance and is addressed in DQPR-6542. This issue has continued after swap, with a suspected start date of 2017/10/09 at 22:00 UTC. Site ops noted that caps are missing from the shield at that level, which may be causing the problem. Jenni posted a picture of the instrument with the missing cap on the DQPR.
MET --- WIND INSTRUMENTS (SONIC) --- Operational.
MET --- PWD --- Operational.
MET --- AMC --- Operational.
ECOR --- ECOR-twr --- Operational.
ECOR --- SEBS --- Operational.
2018/09/04, DQPR-7280: Since 2018/06/10 the wetness sensor readings are greater than the valid max value (3V). Ryan Sullivan asked that the wetness sensor be checked for debris, and that the lead connections for the wetness sensor to the multiplexer be checked. If no problems are found, he would like the wetness sensor replaced. The most recent DQPR status is "open - requires action."
MW RADIOMETERS --- MWR --- Operational. Temperature Sensor Replaced.
2018/10/25, CM-2018-NSA-VSN-4754: The MWR blower condition was checked. The MWR blower housing was checked for the power input, and the final connection is the 3 pin MWR blower.
2018/10/22, CM-2018-NSA-VSN-4749: The air temperature sensor failed, so ops removed the blower unit and soldered in a new sensor between 18:45 and 19:45 UTC. The main blower connector is showing signs of a heat issue, so we should consider arranging blower repairs or getting replacement connectors.
2018/10/20, DQPR-7376: Tkair data on 10/15 (beginning at 05:37 UTC) dropped down as low as -200 C. There are also extended periods of missing data. The most recent DQPR status is "open - requires action."
MW RADIOMETERS --- MWRP --- Operational.
MW RADIOMETERS --- MWRHF --- Operational, but Data Still Shows Excessive Noise Conditions.
2018/10/22, CM-2018-NSA-VSN-4748: No data was collected from the MWRHF since ~ 17:00 UTC on 10/19 due to a software issue. Therefore the radiometer configuration file was resent to the radiometer ~ 17:15 UTC on 10/22. This restarted the plots on the software. Ops has checked with the mentor regarding whether this was the right procedure.
2018/02/09, DQPR-4165: Adam Theisen asked Maria Cadeddu if there has been any discussions on the future of the MWRHF. The current DQPR status is “in progress- assignments.”

MW RADIOMETERS --- GVR --- Not Operational Due to Motor Issue. Shipped to ProSensing.
2018/08/13, DQPR-7222: Data became erratic on 2018/07/31 at 07:00 UTC, and a red DQR is needed. Open-ended DQR D180813.2 was submitted. The most recent DQPR status is "in progress - assignments."
MW RADIOMETERS --- GVRP --- Operational.
2018/10/03, DQPR-7236: From 2018/09/13 at 23:26 UTC to 9/19 at 16:59 UTC all metrics were unavailable. Maria Cadeddu was assigned DQR D181003.2. The most recent DQPR status is "in progress - assignments."
2018/09/14, DQPR-7216: Data looks good, so Maria has been requested to add an end date to the DQR. The most recent DQPR status is "in progress - assignments."
LIDAR --- HSRL --- Operational.
2018/10/09, DQPR-7345: Data goes missing starting on 9/30 due to ongoing ingest work. The latest updates on the HSRL ingest can be found on the DQPR page. The most recent DQPR status is "open - requires action."
LIDAR --- MPL --- Operational.
LIDAR --- CEIL --- Operational.
2018/10/26, DQPR-7332: The instrument was powered down and AC power and battery power was cycled on 10/04/18. The most recent DQPR status is "open - requires action."
2018/10/04, DQPR-7332: The CEIL is exhibiting a noisy laser temperature. The DQA indicates "extremely low back scatter heights," and the site operator reports that the blower is not working. This behavior corresponds to a period of very clear sky cover. I don't know if there is a problem with the instrument or if it is due to atmospheric conditions. Victor Morris asks that ops please power-cycle the CEIL with both the main and battery switch.
LIDAR --- Doppler LIDAR --- Operational.
RADAR --- KAZR --- Operational.
RADAR --- KaWSACR --- Operational.
2018/08/31, Warno.arm.gov: The mentor visited the site and performed RF measurements on the subsystems. Configuration, calibration, and testing will continue.
RADAR --- XSAPR --- Operational.
2018/08/31, Warno.arm.gov: The upgrade is completed and the latest repairs are being tested. Discussion for the baseline mode will be initiated soon. The baseline will be discussed in conjunction with the SACR baseline.
Sonde --- BBSS (Autosonde or Great White Manual Launches) --- Operational.
AOS --- General --- Operational.
AOS --- AETH --- Operational.
AOS --- CLAP --- Operational.
AOS --- CPC --- Operational, but Some Data Quality Issues.
2018/09/14, DQPR-7248: It looks like the following QC flags were tripped from the b1-level processing: qc_concentration starting around 8/26 ('value less than valid_min 5.0 1/cm3'; 'concentration is less than min_concentration_warning'). There also look to be extended periods where the values were flatlined at 0 (http://dq.arm.govdqzoom#ds=nsaaoscpcX1.b1&variable=concentration&sdate=20180821&edate=20180914). The most recent DQPR status is "open - requires action."
AOS --- NEPH --- Operational.
AOS --- IMPACTOR --- Operational.
IMG --- TSI --- Operational.
IMG --- TOWERCAM --- Operational.
IMG --- Great White Camera --- Operational.
Precip --- MASC --- Operational.
2018/10/22, CM-2018-NSA-VSN-4751: The MASC was installed at NSA C1 (CM-2018-AMF3-VSN-2581). The MASC calibration was checked on 10/18/18 starting at 4:30 UTC. The instrument was confirmed to be operating correctly, and the focus of all cameras was checked. The acquisition file was updated to refer to NSA in file names and metadata. All previous data from the previous installation at the AMF3 site at Oliktok were backed up and moved from the collections directory, and at 15:00 UTC on 10/19, new ethernet settings were put on the Mac mini. Following this, the instrument was installed at its new site at NSA C1. The MASC was attached to its strut mount, and it was checked for proper orientation and a slight slope to prevent water runoff onto the camera windows. The MASC computer enclosure was then mounted with 2 sets of pole straps, and cables (USB, firewire, and MASC computer power) were routed inside. The Mac mini that operates the software was put inside the enclosure. The MASC heater pads power cable, instrument power cable, and enclosure power cable were plugged

into the separate power box on the leg of the MASC mount. The MASC has been operational immediately, but network connectivity was not working until 22:25 UTC on 10/22. The Mac mini was offline at this time. The instrument computer was restarted and software was confirmed operational at this time. David Swank was notified to restart collections, and dmfops@arm.gov will be contacted to begin the new NSA ingest.
2018/10/22, CM-2018-NSA-VSN-4750: The MASC network connection was not working, so ops checked the ethernet cable and MASC computer. Walter noticed that the computer was offline, so he powered it back up between 22:00 and 22:25 UTC, and the computer was then accessible.
Precip --- LPM/LDIS --- Operational. Second LPM Installed.
Precip --- SRS --- Operational.
Precip --- PIP --- Operational.
2018/10/23, CM-2018-NSA-VSN-4752: The PIP was moved from AMF3 to NSA (CM-2018-AMF3-VSN-2580).The steel mount was put together in the field starting at 20:00 UTC on 10/19. After the mount was put together, it was moved in place to ensure that the camera is mounted perpendicular to the wind direction. The frame was weighed down with sandbags at each leg u-bolted to angle iron. The PIP camera was mounted on a steel plate on the instrument frame, and ethernet and power connections were made inside the camera housing. The light was mounted on a small pole across from the camera with 2 pipe clamps after the light bulb was replaced. The camera and light power cables are plugged into the power box on one of the legs of the MASC mount. The PIP computer was installed in shelter E5 on the workbench at 01:30 UTC. The ethernet cable plugged into the PIP camera runs inside to this shelter and terminates at the computer. At this time the software was determined to be operational and connected to the PIP camera. Another ethernet cable was run from the computer to the dssw2 switch. The computer is now accessible on the network. The instrument still needs to be finely aligned with the help of site operators. A CM will be filed after this process. Instrument setup files were modified and replaced within the computer per instrument developer instructions. Data backup is ongoing, and collections/ingest will begin once the computer is confirmed ready by the instrument developer.
Other --- AERI --- Operational. Calibration is planned for Next Week.
Other --- CIMEL --- Operational. GPS Antenna Permanently Installed.
Other --- IRT --- Operational.
2018/10/09, DQPR-7206: The ICF serial-to-fiber converters were tested at SGP and it was determined that a null modem also needs to be included in the configuration. The ICF devices have been returned to NSA and DB9 null modem adapters were purchased for the site. The most recent DQPR status is "waiting - for spares."
IOP --- OYESNSA --- Operational.
IOP --- RIVAL --- Operational.
IOP --- CHP1 --- Not Operational.
IOP --- GNSS --- Operational. Troubleshooting Network Connectivity Issue with the TinyPC.
2018/10/25, CM-2018-NSA-VSN-4753/4755: There is a communication issue with the GNSS Computer, so Walter relocated the operator laptop from the Great White, connected it in E5, and connected the laptop to the GNSS computer box for testing and configuration. Then he informed Telayna at UAF to check the computer. The instrument computer's ethernet cable was also checked by swapping it with the one plugged into the ops laptop; the cable was determined to be fine. The ops laptop also worked when plugged into port 39 on the E5 network, the port where the instrument computer is normally plugged into. Walter believes that the problem lies within the GNSS computer box; troubleshooting is ongoing.

Distribution

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