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

November 2016

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1 North Slope Facilities Management Executive Summary and Major Issues

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- AMF3 Site Manager (SNL)
* Dan Lucero- Barrow 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

FY2016 Financials (as of November 25, 2016)

	November	YTD
Carryover funds	$3,729,525	
Funds Allocated YTD	$2,146,000	
Carryover plus YTD funds	$5,875,525	
Cost, burdened amount	$1,152,142	
Uncosted Funds	$4,723,383	
Commits, burdened total	$1,419,560	
Current fiscal year uncommitted funds	$3,303,823	
Subsequent fiscal year (SFY)commits	$1,238,042	
Total uncommitted funds, including SFY commits	$2,065,781	
Fully Burdened Staff Costs	$468,316	$468,316
Fully Burdened Contract Costs	$365, 133	$365,133
Fully Burdened Total Costs	$833,449	$833,449

3 Safety

AMF3– No Incident/Injury

Barrow - No Incident/Injury

4 Instrument Status – Provided by Martin Stuefer

AMF3

INFORMAL AMF3 INSTRUMENT STATUS REPORT FOR November 18, 2016 - November 23, 2016

BRIEF STATUS OF INSTRUMENTS IN OLIKTOK AS OF 2016/11/23:

DATA SYSTEMS

SKYRAD - SKY Radiometer on Stand for downwelling Operational

MFRSR - Multifilter Rotating Shadowband Radiometer Not Operational

GNDRAD - Ground Radiometer on Stand for Upwelling Operational

MFR3m - Multifilter Radiometer at 3m height Not Operational

MET - Meteorological Instruments on Tower Partly Operational

AMC - Soil, up/downwelling radiation measurements Operational

ECOR - Eddy Correlation Flux System Operational

MWR3C - Three Channel Microwave Radiometer Operational

MPL - Micropulse Lidar Operational

DL - Doppler LIDAR Operational

RL - Raman Lidar Operational

CEIL - Vaisala Ceilometer Operational

RWP - Radar Wind Profiler Operational as per http://radar.arm.gov

KAZR - Ka ARM Zenith Radar Operational as per http://radar.arm.gov

KaWSACR - Ka-Band Scanning ARM Cloud Radar Operational as per http://radar.arm.gov

TSI - Total Sky Imager Not Operational

MASC - Multi Angle Snowflake Camera Operational

AOS - Aerosol Observing System Operational

AERI - Atmospheric Emitted Radiance Interferometer Partly Operational

CPC - Condensation Particle Counter Operational

ACSM - Aerosol Chemical Speciation Monitor Operational

HTDMA - Humidified Tandem Differential Mobility Analyzer Operational

GHG - PICARRO Operational

NEPH - Nephelometer Operational

BBSS - Balloon Borne Sounding System Operational

CIMEL - Cimel Sunphotometer Not Operational

PIP - Precipitation Imaging Package Operational

CCN - Cloud Condensation Nuclei Particle Counter Not installed at site yet.

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* Oliktok Instruments in Detail: *

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INFRASTRUCTURE --- Facilities --- Operational.

2016/11/19, CM-2016-AMF3-VSN-1769: The air handler fan went bad, and it was replaced with the last one from the inventory. Air handler fans (model LPE12VA) will need to be reordered.

INFRASTRUCTURE --- DATA SYSTEMS --- Operational.

2016/11/22, CM-2016-AMF3-VSN-1772: HDD SN NA76LXMF was filled, so it was replaced with HDD SN NA7Q2CQ8. HDD SN NA76LXMF will be shipped via USPS tracking # 9114 9012 3080 1784 5144 62.

2016/11/20, CM-2016-AMF3-VSN-1770: HDD SN NA7Q2C6Y was filled, so it was replaced with HDD SN NA76LXMF. HDD SN NA7Q2C6Y will be shipped via USPS tracking # 9114 9012 3080 1784 5144 86.

2016/11/18, CM-2016-AMF3-VSN-1768: HDD SN NA75FEWG was filled, so it was replaced with HDD SN NA7Q2C6Y.

SKYRAD --- SKYRAD general --- Operational.

SKYRAD --- IRT --- Operational, No Ingest

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 --- Not Operational, Removed for the Winter.

TIPTWR --- GNDRAD general --- Operational.

TIPTWR --- MFR3m --- Not Operational, Removed for the Winter.

TIPTWR --- GNDRAD general --- Operational.

TIPTWR --- PIRgnd --- Operational.

TIPTWR --- IRTgnd --- Operational.

TIPTWR --- PSPgnd --- Operational.

MET --- METTOWER general --- Operational.

MET --- CMH --- Not Operational.

2016/11/18, DQPR-5428: Jenni Kyrouac has an assignment to write an open-ended DQR documenting this on-going issue.

2016/11/14, DQPR-5428: Joshua asked Jenni if there has been any update from the manufacturer, and states that CMH behavior has been fairly consistent since late October. Jenni responded that there has been no response from the manufacturer yet, and there are no available spares.

2016/11/14, DQPR-5784: Temperature and vapor pressure data appears sporadically, and does not appear correct for the time period of 2016/10/19 to 2016/10/21. Since this DQPR is related to previous CMH issues tracked in DQPR 5428, this DQPR will be rejected to focus on the problem there.

2016/10/21, DQPR-5428: IM Jenni Kyrouac responded that she is awaiting response from the manufacturer regarding the dew point/RH problem. As Josh notes, as of 2016/10/19, the CMH is completely stagnant. Jenni will want to check the error message on Monday, and she suspects a dew point assembly circuitry problem. The most recent DQPR status is "open - requires action."

2016/10/20, DQPR-5428: Josh Remitz posted about maintenance performed after site technicians noticed CMH temperature readings were over 90c this morning. Site technicians went out to the field and physically inspected the instrument unit, finding nothing out of the ordinary. CMH relative humidity continues to read higher than 100%.

2016/09/15, DQPR-5428: Starting from 2016/07/12 the CMH data (dew point, RH and vapor pressure) dropped to unusually low values. Aspirator and mirror were cleaned and instrument power was cycled but the problem did not resolve. IM Jenni reports that no error messages are reported by the instrument and calibration info looks ok. Data have recovered after the most recent self-check. The manufacturer was contacted for suggestions. Instrument recovered, then dropped out again on 7/24. An RMA was received from the manufacturer to send the instrument for service. Spare CMH from NSA was sent to OLI and the faulty CMH was replaced with the spare from NSA. Power was restored to the replacement instrument on 08/02, 22:45 UTC. Dew point and RH were observed to be off 08/05 and 08/06. Technicians cleaned the instrument's mirror and ran through the calibration process starting on 08/08 at 22:00 UTC. Issue reoccurred on 8/6. Data drop out on 8/9 for a few hours. Problem is ongoing as on 9/1. IM Jenni will contact the manufacturer.

MET --- Barometer --- Operational.

MET --- TEMPERATURE / HUMIDITY —— Operational.

MET --- WIND INSTRUMENTS (SONIC) --- Operational.

MET --- PWD --- Operational.

MET --- AMC --- Operational.

ECOR --- ECOR --- Operational.

2016/11/21, DQPR-5783: David responded that the LI-7500 CO2/H2O sensor was probably obscured by frost or fog, accounting for the missing water vapor density and CO2 flux. He has submitted DQR D161121.16, and it is pending PRB review. The most recent status of this DQPR is “in progress- assignments.”

ECOR --- SEBS --- Operational.

2016/11/21, DQPR-5785: David confirmed that the persistent value near 1 is due to frost or snow on the wetness sensor, and cannot be prevented during winter. He confirmed that this DQPR may be deleted. However, the most recent status of the DQPR is “open - requires action.”

MW RADIOMETERS --- MWR3C --- Operational.

2016/10/14, DQPR-4873: The DQO/DQO-SSG/PRB has updated the DQPR status to "waiting- for spares."

2016/10/12, DQPR-4873: IM/VAP Maria Cadeddu responded that the vendor is testing the IRT sensor, but has not yet provided a timeline for return.

2016/08/08, DQPR-4873: The vendor reported on March 15 that they could not identify the IRT sensor problem yet, and there are no further updates to date. They continue with tests at the vendor's facility in Germany. An open-

ended DQR will be submitted to communicate the IRT problems tracked in DQPR-4873. The RH and Temperature data were noisy. The pressure also had trouble (noisy, drop outs) up to 4/7. A new Vaisala RPG sensor was installed 12/08/2015. The new software was installed and after a few initial hiccups started working. The radiometer is now correctly detecting the station. An open-ended DQR D160226.1 was submitted by Maria because of the inaccurate IRT sensor data. The IR sensor was shipped to the vendor for repair. As of March 2015, the vendor could not figure out the issue. No further update from the vendor since then.

LIDAR --- MPL --- Operational.

LIDAR --- Doppler LIDAR --- Operational.

LIDAR --- Raman LIDAR --- Operational.

LIDAR --- CEIL --- Operational.

RADAR --- RWP --- Operational as per http://radar.arm.gov/.

RADAR --- KAZR --- Operational as per http://radar.arm.gov/.

2016/11/23, CM-2016-AMF3-VSN-1773: The KAZR transmitter was offline, so it was restarted and the pax file was executed.

RADAR --- KASACR --- Operational as per http://radar.arm.gov/.

2016/10/12, DQPR-5704: The data looks saturated at times. It looks like we are still getting some returns, so it does not seem that the transmitter is going out. This is occurring in both RHI (Range Height Indicator) and PPI (Plan Position Indicator) plots at random times. This was brought up during the data review, but it looks to be an ongoing problem. See DQPR for attached plots. IM Joseph Hardin replied that this might just be an issue of terminology, but that he does not see any saturation, nor missing data. Adam Theisen posted previous scan plots for reference. He noted that it is probably a terminology issue, but if you look at the previous RHI scan, there is a large difference in the background reflectivity, as well as a jump in the Zdr (differential reflectivity) values. Joseph replied that we tend to refer to these particular plots as having an increased noise floor. There is something subtler going on here that we are attempting to track down. It does seem to be very infrequent (once a day or less per mode). The most recent DQPR status is "open- requires action. “RADAR --- KaWSACR --- Operational as per http://radar.arm.gov/.

2016/10/12, DQPR-5705: WSACR is sometimes showing some degraded/missing data. In the PPI (Plan Position Indicator) plots, there are missing data between 60-90 degrees. In the RHI (Range Height Indicator) plots, there are missing data throughout the scans. In the RHI, the background Zdr signal drops out, and the values in the echo region are high compared to bracketing scans. The most recent DQPR status is "open- requires action."

IMG --- TSI --- Not Operational, Removed for the Winter.

IMG --- MASC --- Operational.

AOS --- General --- Operational.

AOS --- UHSAS --- Operational.

2016/10/24, DQPR-5716: Joshua King updated the DQPR status to “waiting for spares.” He agreed with Adam that this DQPR was prematurely closed out with PRB approval of the connected DQR D161011.4. However, that DQR was not directly related to the file copy issue documented in Janek’s comments within the DQPR. Thus, he put this DQPR into a waiting state until the raw file work Janek proposed (and re-ingesting by DMF personnel?) can be carried out. Janek responded that he is working on getting the new SGP AOS ready, and will process the raw files afterwards (end of next week).

AOS --- CPC --- Operational.

2016/10/27, DQPR-5718: Robert has submitted DQR D161027.5, and it is pending PRB review. The most recent DQPR status is “in progress - assignments.”

2016/10/18, DQPR-5718: IM Robert Bullard responded that this problem has happened before with the CPC, but a simple power cycle starts data collection again. He will talk to site ops about following up with a phone call when this problem occurs.

2016/10/17, DQPR-5718: CPCF data are set entirely to missing values (all fields), beginning 19:58 UTC on 2016/10/11 to present. This comes after a (related?) period of elevated noise in the reported CPCF concentrations (rapidly varying between approximately 100 - 10,000/cc) earlier on 2016/10/11.

AOS --- CAPS-PMEX --- Operational.

AOS --- ACSM-- Operational.

AOS --- GHG-Picarroó Operational.

AOS --- HTDMA --- Operational.

AOS --- UHSAS --- Operational

AOS --- NEPH --- Operational.

AOS --- IMPACTOR --- Operational.

AOS --- OZONE --- Operational.

Other --- AERI --- Partly Operational.

2016/11/23, DQPR-5630: Denny added that the short periods of data NA, occurring 1-4 times a day, happen on all AERIs when they lose connection to the interferometer. The vendor ABB has been trying to fix this issue for a while. He noticed on 2016/11/02 that data collection stalled around 14 UTC for the day. It looks like a call to acquire data from the interferometer didn't return until the 0z restart. The error is similar to the previous stalling of killing executables, however, the error appears in a different section of code. He plans to add a "while" or "for" loop that will run for up to 20 minutes, and fail if a call doesn't return. This way, the software will restart upon failure. The most recent status of this DQPR is "open- requires action."

2016/10/21, DQPR-5630: Adam Theisen reported that these short periods of data NA are still occurring anywhere from 1-4 times per day, and data are NA for 20-40% for each hour this occurs. He attached a link to DQ metrics: http://bit.ly/2edFbQB . The most recent DQPR status is "open- requires action."

2016/10/13, DQPR-5630: The AERI-110 at Barrow with a VM was also having a similar problem, so Denny updated the code on that VM as well. The most recent DQPR status is "open- requires action."

2016/10/12, DQPR-5630: Denny added an os.P_NOWAIT option to the code, checking that the process exited. We will have to monitor this for 3-4 weeks to see if this corrects the timeouts or not.

2016/10/11, DQPR-5630: IM Denny Hackel says that the software is stalling because a process' exit code is not being returned after it is killed. He has not seen this issue before, so it might be due to running the software on the VM, or a new intermittent feature of Windows. On September 21st, it took about 6 hours for the exit code to be returned (see DQPR for the code log). when the interferometer is unresponsive, we have had to kill the control and calibration software, and restart. After 4 tries without success, we reboot the interferometer internal and AERI computers. We will look into alternative calls to kill processes, and/or figure out why the exit code isn't being returned. The process isn't found in task list, but can be seen under cygwin running "ps -a." You cannot kill the process from the cygwin window either.

2016/09/30, DQPR-5630: After coming back online the AERI had numerous periods of data NA. All periods have been less than 24 hours so far. Adam asks the instrument mentors if the problem is related to the switch to a VM (virtual machine)?

Other --- BBSS --- Operational.

2016/11/21, CM-2016-AMF3-VSN-1771: Site technicians found a helium system leak stemming from one of the valves in the back of the helium trailer. Technicians will compile a "to order" parts list for making repairs to the system. Operators recommend closing cylinders and valves between balloon launches.

Other --- CIMEL --- Not Operational.

Other --- PIP --- Operational.

Other --- CCN --- Not at the site yet.

2016/11/17, DQPR-5447: Nothing has changed, and Janek is discussing with others on how to approach DMT.

2016/10/24, DQPR-5447: Email distribution flag changed - distribution will exclude site operations. Janek received no reply from DMT, but will try again. The most recent DQPR status is "waiting- for spares." The DQPR requires an end date to close it.

2016/10/13, DQPR-5447: An issue with one of the OPCs (Optical Particle Counter) was discovered. The OPC's particle size distribution is very wide, and does not match the other OPC under the same conditions. Contacting DMT.

2016/09/12, DQPR-5447: Janek Uin reports that the CCN was calibrated and proper operation verified before shipping the instrument to the OLI site (Linked DQPR-5290). A difference in concentrations between the columns at 1% supersaturation was discovered after calibration.

Barrow

INFORMAL NSA INSTRUMENT STATUS REPORT FOR November 18, 2016 - November 23, 2016

BRIEF STATUS OF INSTRUMENTS IN BARROW (C1) AS OF 2016/11/23:

DATA SYSTEMS Operational

SKYRAD - SKY Radiometer on Stand for Downwelling Operational

MFRSR - Multifilter Rotating Shadowband Radiometer Not Operational

NIMFR - Normal Incidence Multifilter Radiometer Not Operational

GNDRAD - Ground Radiometer on Stand for Upwelling Operational

MFR10m - Multifilter Radiometer at 10m height Not Operational

METTOWER - Surface Meteorological Instrument on tower Operational

AMC - Soil, up/downwelling radiation measurements Operational

ECOR-twr - Eddy Correlation Flux System Operational

ECOR-PtBRW - Eddy Correlation Flux System Not Operational

MWR - Microwave Radiometer Operational

MWRP - Microwave Radiometer Profiler Not Operational

MWRHF - Microwave Radiometer High Frequency Operational

GVR - G-band Vapor Radiometer Operational

HSRL - High Spectral Resolution Lidar Operational

MPL - Micropulse Lidar Operational

CEIL - Vaisala Ceilometer Operational

DL - Doppler LIDAR Operational

RWP - Radar Wind Profiler Operational as per http://radar.arm.gov

KAZR - Ka ARM Zenith Radar Operational

KaWSACR - Ka-Band Scanning ARM Cloud Radar Not Operational in testing mode as per http://radar.arm.gov

XSAPR - X-Band Scanning ARM Precipitation Radar Not Operational as per http://radar.arm.gov

AOS - Aerosol Observing System Not Operational

CLAP - Continuous Light Absorption Photometer Not Operational

CPC - Condensation Particle Counter Not Operational

NEPH - Nephelometer Not Operational

TOWERCAM - 40m tower camera Operational

TSI - Total Sky Imager Not Operational

AERI - Atmospheric Emitted Radiance Interferometer Operational

BBSS - Balloon Borne Sounding System Operational

CIMEL - Cimel Sunphotometer Not Operational

PIP - Precipitation Imaging Package Operational

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* Barrow Instruments in Detail: *

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INFRASTRUCTURE --- Facilities --- Operational.

INFRASTRUCTURE --- Data Systems --- Operational.

SKYRAD --- SKYRAD General --- Operational.

SKYRAD --- IRT --- 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 --- Not Operational, Removed for the Winter.

SKYRAD --- NIMFR --- Not Operational, Removed for the Winter.

TIPTWR --- GNDRAD general --- Operational.

TIPTWR --- MFR10m --- Not Operational, Removed for the Winter.

TIPTWR --- PIRgnd --- Operational.

TIPTWR --- IRTgnd --- Operational.

TIPTWR --- PSPgnd --- Operational.

MET --- METTOWER general --- Operational.

MET --- CMH --- Operational.

MET --- Barometer --- Operational.

MET --- TEMPERATURE / HUMIDITY --- Operational.

MET --- WIND INSTRUMENTS (SONIC) --- Operational.

MET --- PWD --- Operational.

MET --- AMC --- Operational, no ingest.

2016/10/11, DQPR-5694: Joshua responds to IM Ken Reichl that after conferring with others at the Data Quality Office, the best action is to create another DQR about this behavior, like the one that exists for OLI. Joshua has assigned an open-ended, "transparent" DQR to Ken. He then asks what the relevant time period was for this issue within the NSA C1 AMC data record. The status of this DQPR is "in progress-assignments."

2016/10/10, DQPR-5694: Joshua King adds that vmc from sensor 4 was missing from 14:30 UTC 2016/07/12- 15:30 UTC 2016/09/25. Since returning 2016/09/25, vmc has been decreasing to below 0.3. He is asking mentors if they have thoughts on what is causing this behavior. An attached image can be found on the DQPR page. IM Ken Reichl responds that this is an issue outlined in DQPR-4793 for the analogous site, OLI. The instrument reports soil data as 9999999, or a non-numerical character (for data SGP) for soil systems. The AMC systems may report missing data during warm seasons for instruments that are not sufficiently calibrated. The OLI datastream has an open-ended DQR D151023.3. Ken asks if he should make one for the NSA data as well, and is the DQR system the best way to characterize this issue?

2016/10/09, DQPR-5694: Vwc (volumetric water content) 4 is missing for the entire period starting 16/07/12 to 16/09/25.

ECOR --- ECOR-twr --- Operational.

ECOR --- ECOR-Pt. Barrow --- Not Operational.

2016/11/22, CM-2016-NSA-4180: Operators have not been able to connect to the ECOR/SEBS CR1000 data logger for some time. In addition, the PS100 power supply case/wiring needed to be replaced, so a new Campbell PS100 case was installed. The COM port setting within the Loggernet program was changed to allow communication between the program and the instrument, and Martin Stuefer was able to connect to the CR10000. Through Loggernet, the correct UTC time was set on the machine, and data was able to be downloaded onto the Toughbook borrowed from the Great White.

2016/11/22, CM-2016-NSA-4179: Operators were requested by David Swank to power cycle the wireless antenna.

2016/10/07, DQPR-5153: IM David Cook explains that we are continuing to experience communications problems with the new pair of radios. The mentor is in the process of gathering information to help the vendor diagnose the problem. The status of this DQPR is "in progress- assignments."

2016/10/07, DQPR-4322: IM David Cook says that the ECOR/SEBS system was reinstalled and running at approximately 2400 CST on 9/28/2016. However, reliable radio communication has not been established with the instrument system, and manual data collection may be needed as the radio communication problem is actively being investigated. The most recent status of this DQPR is "in progress- assignments."

2016/09/23, DQPR-4322: The SEBS re-installation is scheduled for September 26-30, 2016.

2016/07/25, DQPR-5153: Data was recovered from the ECOR computer from 2015/06/14 to 2015/09/28. Data again went missing at 1830 UTC 2015/12/30. DQR D160711.3 has been submitted for ECOR.

MW RADIOMETERS --- MWR --- Operational.

MW RADIOMETERS --- MWRP --- Not Operational. The MWRP was shipped to Radiometrics.

MW RADIOMETERS --- MWRHF --- Operational.

2016/09/30, DQPR-4165: The 150 GHz channel was showing high noise levels probably because of an external source of interference. Adam inquires if there is a path forward to solve the interference issues? The current DQPR status is “in progress- assignments “, and it is open-ended.

MW RADIOMETERS --- GVR --- Operational.

LIDAR --- HSRL --- Operational.

LIDAR --- MPL --- Operational.

LIDAR --- CEIL --- Operational.

LIDAR --- Doppler LIDAR --- Operational.

RADAR --- RWP --- Operational.

2016/11/21, DQPR-5790: The noise issue appears to be back, beginning on 2016/11/14, when the issue starts off very small. The noise issue appears consistently on 2016/11/17, and from 2016/11/18, the issue occurs throughout that day and onward. The issue appears to be cyclical, like the heater/ac is turning on and off. The most recent status of this DQPR is “open - requires action.”

RADAR --- KAZR --- Operational.

RADAR --- KaWSACR --- Not Operational in testing mode per http://radar.arm.gov.

2016/10/23, CM-2016-NSA-VSN-4158: The Ka Band chiller overflowed, and we suspect it is because of a faulty pump. The unit was shipped to SGP until repair paperwork can be generated. The chiller (S/N 10080330) was removed and drained, and we are awaiting a spare, or for this unit to be rebuilt.

2016/03/12, DQPR-4041: After much coordination with the pedestal manufacturer and while working with the instrument mentors, the azimuth DSA was re-programmed. Once a reprogrammed Azimuth DSA was installed and verified the Elevation DSA was also found to be faulty. It was replaced with another unit and the system now accepts azimuth and elevation commands. The most recent DQPR status is “waiting- for spares.”

RADAR --- XSAPR --- Not Operational as per http://radar.arm.gov.

2016/08/04, DQPR-4841: The elevation servo amplifier failed, the radar cannot scan in elevation. The radar will be upgraded by the end of this year, and will be turned off until then. A DQR was submitted and reviewed by PRB. The DQPR status is “in progress” due to being open-ended. Adam Theisen's DQR D160719.1 has been reviewed and accepted by the PRB.

AOS --- General --- Not Operational.

2016/10/27, DQPR-5524: Joshua King asks if there is any update on the raw data file update work that Annette outlines in her 2016/09/23 comment? The most recent status of this DQPR is "in progress - assignments."

2016/09/23, DQPR-5524: Annette Koontz says that NOAA will provide a csv text file with measurements for the instruments that are running. We will need to generate a new ingest for this new raw data format, and work is expected to start sometime in October 2016. The goal is to make the nsaaos*X1.a1 files look identical to the existing nsaaos*.a1 for the instruments contained in this new raw file.

2016/09/22, DQPR-5524: Joshua King requests that this DQPR be escalated to PRB attention.

2016/08/29, DQPR-5524: Beginning at 12:00 UTC on 08/18/2016, data for all ingested NSA X1 AOS data products are missing. It looks like a collection issue. On switching to new data acquisition system, some bugs were found especially with the new instruments that came online. Also, there was a power outage on site on 8/21 and the instruments do not seem to be back up. There are some issues with data acquisition timing as some instruments are wind-sectored and turn off/on with WD and WS. Chemical filter measurement is the main concern as data collection works differently for this instrument. According to IM Anne, Aethelometer compact disk card (8 GB) fills up with 1 second data frequency. The card filled up causing the instrument to stop collecting data, other problems ensued. If there are changes in the raw data, BCR will be needed to do the ingest updates. According to Joshua King, this

seems to be affecting the flow of data from all NSA X1 AOS instrument systems and ingest issue is related to a lack of nsaaosX1.00 raw data files since 08/18. This DQR is linked to DQPR 5561 and 5562.

AOS --- AETH --- Not Operational.

AOS --- CLAP --- Not Operational.

AOS --- CPC --- Not Operational.

AOS --- NEPH --- Not Operational.

2016/11/17, DQPR-5742: Anne Jefferson has been assigned to write a DQR D161117.2.

2016/11/17, DQPR-5743: DQR D161116.4 has been connected to this DQPR, has been submitted, and is pending PRB review. The status of the DQPR has been updated to “in progress- assignments.”

2016/10/28, DQPR-5743: There is electrical instability in the nephelometer, causing high spikes in the instrument PMTs from 2016/10/25 to 2016/10/27. In response, the instrument was turned off, and we are awaiting a replacement. The status of this DQPR is "open - requires action."

2016/10/28, DQPR-5742: The inlet temperature sensor is giving bad readings, so use the internal nephelometer temperature sensor. The status of this DQPR is "open - requires action.

IMG --- TOWERCAM --- Operational.

IMG --- TSI --- Not Operational, Removed for the Winter.

Other --- AERI --- Operational.

2016/11/21, CM-2016-NSA-4178: The AERI hatch was not opening. Operators were seeing frost build up on the external rain sensor every day for about a week. They took pictures for the mentor, and were requested to use the internal rain sensor until a new external rain sensor can be sent up.

2016/11/18, DQPR-5655: Jonathan has an assignment to write a DQR, D161118.4. The status of this DQPR is “in progress - assignments.”

2016/11/11, DQPR-5655: Jonathan was on site as scheduled, and the instrument was repaired. Data collection on the new VM system was confirmed to be operating successfully. Science data will be collected on the VM (94.38) beginning 2016/11/08.

Other --- BBSS --- Operational.

Other --- CIMEL --- Not Operational.

Other --- PIP --- Operational.

5 North Slope Facilities

AMF3

Current and Upcoming Site Visits

Fred Helsel/SNL, winter prep-SNL Management Tour	November 9-15
Lori Parrott, Bill Spotz/SNL, Management Tour	November 15
Todd Houchens/SNL, Joseph Hardin/PNNL, Radar repair/calibration	December 12-16

Current and Upcoming IOPs

Black Carbon on the North Slope (Baylor)

Site News/Issues

AMF3 Turbines and Power Shelter 2 have arrived at SNL/NM.

Lori Parrott (our new organizational manager at SNL) launches afternoon sonde during her tour of the Site.

Lori Parrot and William Spotz from Sandia National Laboratories toured AMF3 on November 15. Lori is the new manager for the Atmospheric Sciences Department at Sandia, she replaces Amy Halloran.

Unmet Needs

AMF3 still lacks a permanent source of power.

Site Upgrades

Site has been winterized.

Contract for snow removal with ARCTEC has been awarded and is in place.

Site Safety

AMF3 has had numerous polar bears on site the past few months.

Site Staffing Issues

None

Tethered Balloon Operations

AALCO at AMF3 in November 2016

- Eleven hours of thermodynamic and supercooled liquid water measurements were collected from tethered balloon flights at the ARM AMF3 Site in Oliktok Point, Alaska, from 11/15/16 – 11/17/16.

11/15/16

Cloud base was about 100 m, cloud top was 500 m, and there was heavy icing. Flights were conducted with the autoreeler and a sonde balloon filled to the standard 1,600L. There was too much drag created by flying two iMet sondes and SLWCs back to back with the 1,600L balloon. Flights could not maintain 200m AGL.

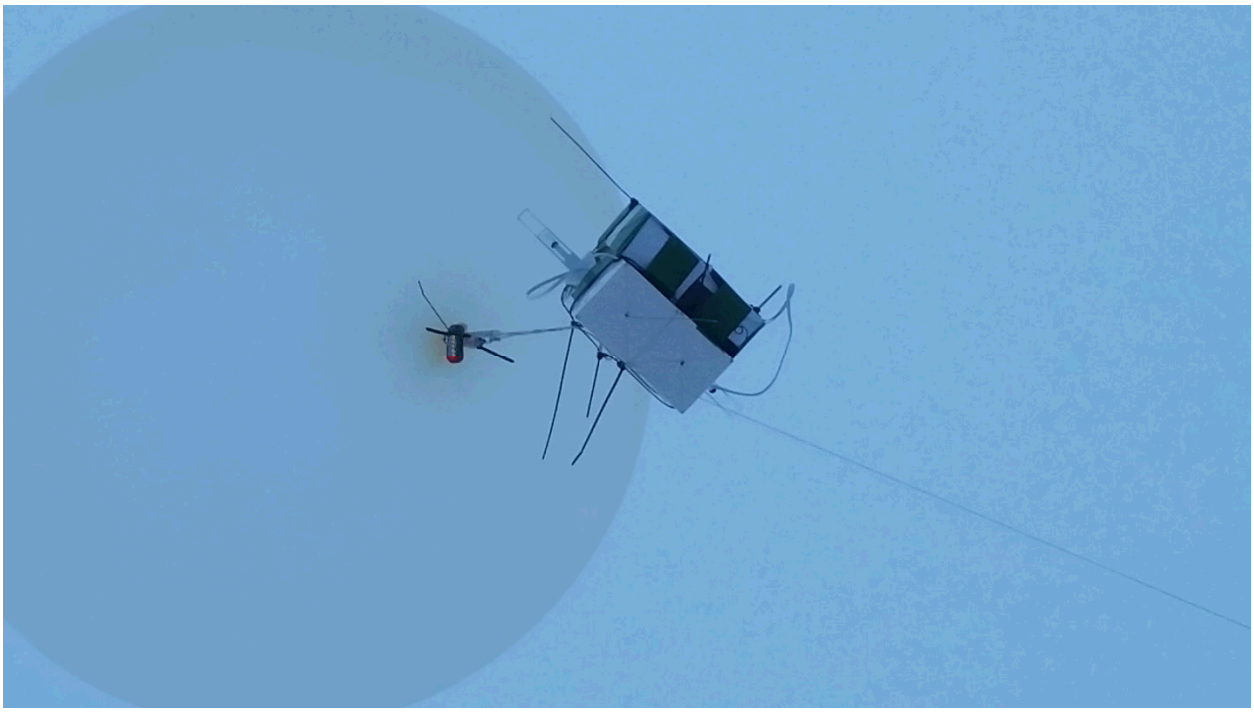

Figure 1: Original side-by-side configuration with 1,600L balloon was unsuccessful

Another sonde balloon was filled to 2,115 L. We flew a single SLWC at 200m for 30 minutes, then ascended to 300m and flew for another 30 minutes. After an hour we descended, deiced, and returned to 300m for 40 minutes.

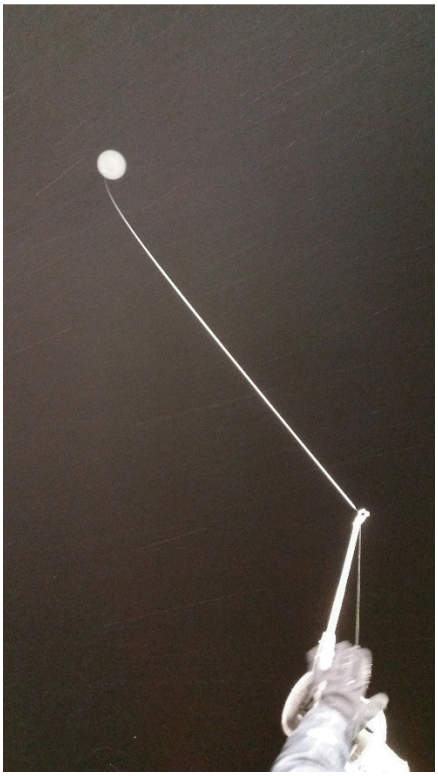

Figure 2: 2,115L sonde balloon with single SLWC on 11/15/16

11/16/16

We attempted to fly with the same 2,115 L sonde balloon. Winds were higher than on the 15th, about 5.5 m/s, and we didn't have enough lift to gain much altitude against the wind. The balloon also spiraled roughly on descent and the fine-wire temperature probe on the iMet broke.

To try for better altitude and more stable flight we investigated some pre-existing Vaisala balloons in the AMF3 hangar. We pieced together one to fly that was from '04. The balloon lift capacity was ~14 lbs when tested.

Conditions were similar with cloud bases around 100m and tops around 500m. We flew two SLWCs separated by ~ .5 m at 200 m AGL for 40 minutes. The data were very dynamic with varying SLW amounts.

Figure 3: Vaisala balloon prepared for flight on 11/16/16

We then descended and deiced the SLWCs in order to reascend at the same time as the 2:30 pm AMF3 sonde launch. Shortly after ascent (at ~25m AGL) the autoreeler line snapped at the reel. There was no obvious reason why the line snapped but it was cold, -11 F°, and everything was brittle. Both SLWCs reported data for the length of the flight. The flight ended about 1.5 hrs later to the northwest about 35 km away. The AMF3 sonde track was similar.
This should be an ideal dataset since we have the simultaneous AMF3 sonde, we'd just collected data aloft and then deiced the SLWCs before reascending, and we had two SLWCs close together to see how much variability they exhibit. We had also previously considered doing a free balloon launch for comparison, since all of the literature on the SLWCs is from sonde launches.
While we didn't fully intend for the balloon to launch we knew there were good odds this could occur and had discussed that this was a potentiality before the campaign. The iMets both already had broken sensors and the SLWCs were previously used in October.

11/17/16
We flew with both small sonde balloons (the previously inflated 1,600 and 2,215L balloons). We operated one SLWC for about 4.5 hours up to 650m. We collected while two cloud layers moved in (300 and 600m bases) and saw increasing SLWC. We ascended at the same time as the 8:30 am sonde launch.
The autoreeler struggled on the way in, two balloons together created a lot of surface area and drag.


Figure 4: 2,215L and 1,600L sonde balloons prepared for flight on 11/17/16

Overall the autoreeler proved to be a cost-effective and low-risk method of obtaining TBS data from lightweight, inexpensive sensors. To improve the autoreeler motor strength we would like to replace the 12 V motor with a 24 V and increase the braid (line) strength to 250 lb in 2017. The cost for this would be $525.

Aerostat trailer and motor failure investigation:

The winch motor on the aerostat trailer failed on the last day of flights in October. The motor was shipped to Albuquerque and it was revealed that all of the windings were burnt and it would be more cost-effective to purchase a new motor than to repair it. We believed that the windings had burned due to insufficient current output from the battery bank on the winch trailer.
When in Oliktok we investigated the batteries and determined that the welds on one of the battery charger mounts had broken and as a result the charger had unplugged and was not charging one of the batteries. Both batteries also tested poorly on a load tester

and were charged and removed to warm storage for the winter. The trailer was taken to CH2MHill in Deadhorse for repair and there it was found that the welds on the second battery charger were also about to fail. Both chargers were remounted.

Figure 5: Broken charger behind panel on aerostat trailer

Barrow

Current and Upcoming Site Visits

Jonathan Gero/U of Wisconsin, AERI repair	November 7-9
Lori Parrott, Bill Spotz/SNL, management tour	November 16
Martin Stuefer, Telayna Gordon/UAF, Pt ECOR/SEBS troubleshoot	November 21-23
Todd Houchens/SNL, KAZR/SACR work	November 29 – December 2
Dan Lucero/SNL, Pt ECOR	December 6-9

Current and Upcoming IOPs

COSMOS, Soil Moisture Probes, - Task order under CPA 1260749 for labor – POP Ends - 2016
SNPP/NPOESS Ground Truth Sonde Launch, Phase 5 – Started Oct 1, 2016
Sea Ice Effects on Arctic Climate, Rain sample collection - Dartmouth University – POP Ends Dec 2016
Seismic Probes for NSF– POP Ends, Oct 31, 2018
Carbon Aerosol/Methane Gas, - Task order under CPA 1260749 for labor – POP Ends – 2018
Multi-faceted Approach to Characterizing Potential Radiative Forcing on the NSA using Two Coastal Sites, Baylor – June 2016 – Sept 2017.

Site Issues

The electric failed, polar bears have knocked over part of the fence. It was determined the ECOR system will be retrieved for winter storage.

Unmet Needs

Auto Launcher deck arrived, and is currently stored for installation next Spring.

Site Upgrades

None

Site Safety

ES&H safety – Contractor Site Safety Plan is in the process of being updated to include confined space training, which was identified in the last safety inspection completed in August.

Site Staffing Issues

None

Distribution

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