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

April 2017

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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

FY2017 Financials (as of April 28, 2017)

	November	YTD
Carryover funds	$3,729,525	
Funds Allocated YTD	$4,524,000	
Carryover plus YTD funds	$8,253,525	
Cost, burdened amount	$3,843,444	
Uncosted Funds	$4,410,082	
Commits, burdened total	$2,538,921	
Current fiscal year uncommitted funds	$1,871,161	
Subsequent fiscal year (SFY)commits	$419,008	
Total uncommitted funds, including SFY commits	$1,452,153	
Fully Burdened Staff Costs	$322,000	
Fully Burdened Contract Costs	$213,000	
Fully Burdened Total Costs	$534,000	$3,843,000

3 Safety

AMF3- No incident/Injury

Barrow - No Incident/Injury

4 Instrument Status – Provided by Martin Stuefer

AMF3

INFORMAL AMF3 INSTRUMENT STATUS REPORT FOR April 21, 2017 - April 28, 2017

BRIEF STATUS OF INSTRUMENTS and site IN OLIKTOK AS OF 2017/04/28:

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

MFR3m - Multifilter Radiometer at 3m height Operational

MET - Meteorological Instruments on Tower Partly Operational

CMH - Chilled Mirror Hygrometer Not 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

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

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

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

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

TSI - Total Sky Imager Operational

AOS - Aerosol Observing System Partly Operational

AOSMET - AOS Meteorological Measurements Operational

CPC - Condensation Particle Counter Operational

CAPS - Cavity Attenuated Phase Shift Extinction Monitor Not Operational

ACSM - Aerosol Chemical Speciation Monitor Not Operational

HTDMA - Humidified Tandem Differential Mobility Analyzer 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

TRACEGAS - AOS CO, N2O, H2O Operational

AERI - Atmospheric Emitted Radiance Interferometer Operational

BBSS - Balloon Borne Sounding System Operational

CIMEL - Cimel Sunphotometer Operational

MASC - Multi Angle Snowflake Camera Operational

PIP - Precipitation Imaging Package Operational

LPM - Laser Precipitation Monitor Operational

GEONOR - Geonor Weighing Gauge Operational

SR50A - Snow Depth Sensor Operational

MET-AIR - DataHawk Unmanned Aerial System Operational

TBS - Tethered Balloon System Operational

CCN - Cloud Condensation Nuclei Particle Counter Operational

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* Oliktok Instruments in Detail: *

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INFRASTRUCTURE --- Facilities --- Operational.

2017/04/21, CM-2017-AMF3-VSN-1943: The site experienced a momentary power loss after a generator failure. The back-up generator had already been running this morning, so technicians were able to switch over to this generator right away. Power was restored to the site within 5 minutes.

INFRASTRUCTURE --- Data Systems --- Operational.

2017/04/27, CM-2017-AMF3-VSN-1953: HDD S/N NA76MA83 was full, so operators replaced it with HDD S/N NA7JSC9Q. HDD S/N NA76MA83 will be shipped via USPS tracking # 9114 9014 9645 0952 4700 06.

2017/04/25, CM-2017-AMF3-VSN-1950: HDD S/N NA7Q2C9B was full, so operators replaced it with HDD S/N NA76MA83. HDD S/N NA7Q2C9B will be shipped via USPS tracking # 9114 9014 9645 0952 4700 06.

2017/04/23, CM-2017-AMF3-VSN-1946: HDD S/N NA76M78N was full, so operators replaced it with HDD S/N NA7Q2C9B. HDD S/N NA76M78N will be shipped via USPS tracking # 9114 9014 9645 0952 4699 94.

2017/04/22, CM-2017-AMF3-VSN-1944: HDD S/N NA7Q2CY2 was full, so operators replaced it with HDD S/N NA76M78N. HDD S/N NA7Q2CY2 will be shipped via USPS tracking # 9114 9014 9645 0952 4699 94.

INFRASTRUCTURE --- Vehicles --- Operational.

INFRASTRUCTURE --- Desktop Computers --- Operational.

SKYRAD --- SKYRAD general --- Operational.

SKYRAD --- IRT --- Operational.

2017/04/14, DQPR-6094: Adam asked Victor if the jumps in data need to be examined a bit more. The most recent DQPR status is "in progress - assignments."

2017/04/04, DQPR-6094: A spike in the standard deviation also occurs on 3/26, 3/27, 3/28, 4/1, and 4/4 between 14:00 and 15:00, but not at exactly the same time. This spike is very typical when the mirror is cleaned, but it occurs just before sunrise. Adam asked if this could be dew contamination.

2017/03/24, DQPR-6094: Adam Theisen added that it looks like there are 2 periods of missing data to DQR. 1st, from 2017/03/06 @ 21:34 - 2017/03/09 @ 17:02. 2nd, from 2017/03/09 @ 17:44 - 2017/03/21 @ 13:17. Before this DQPR is closed out, Adam wanted to get thoughts on this issue: on 03/22 - 03/23 at almost the exact same time (15:20), the standard dev jumps up, which can also be seen in the noise in the 200ms IRT data. This signal is not as pronounced, but is present in past data.

2017/03/21, DQPR-6094: David Swank restarted the IRT software this morning, and the program appears to be creating valid data. Strangely, DSView has been reporting "successful collection" the whole time.

2017/03/20, DQPR-6094: The IRT still remains down after many OLI instruments were brought back up on 2017/03/09 after the site power outage that began on 2017/03/06. Recently submitted DQR D170320.6 describes this outage for all OLI DataStream’s from 03/06 - 03/09/2017, but the IRT outage extends beyond that time period.

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.

TIPTWR --- GNDRAD general --- Operational.

TIPTWR --- MFR3m --- Operational.

TIPTWR --- PIRgnd --- Operational.

TIPTWR --- IRTgnd --- Operational.

TIPTWR --- PSPgnd --- Operational.

MET --- METTOWER general --- Operational.

MET --- CMH --- Not Operational.

2017/04/13, Biweekly Telecon: The CMH is still unresponsive.

2017/04/04, DQPR-5428: The spare unit is under repair (after delay), and will be tested next week. The most recent DQPR status is "in progress - assignments."

2017/03/29, DQPR-5428: The status of Jenni Kyrouac's assignment was updated to 'accepted/open.'

2017/03/24, DQPR-5428: Jenni escalated the DQPR to PRB attention.

2017/03/03, DQPR-5428: The manufacturer has not responded to follow ups or to the repair contract for the spare. Data are missing at this point. The most recent DQPR status is "in progress- assignments."

2016/12/09, DQPR-5428: Jenni Kyrouac has submitted an open-ended DQR (D161118.6) documenting this on-going issue, and it has been reviewed and accepted by the PRB.

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.

2016/10/21, 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.

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, and 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.

2017/04/22, CM-2017-AMF3-VSN-1945: The LI-7700 methane sensor was installed for the season (S/N TG1-0298, WD80434).

ECOR --- SEBS --- Operational.

MW RADIOMETERS --- MWR3C --- Operational.

LIDAR --- MPL --- Not Operational.

2017/04/24, CM-2017-AMF3-VSN-1947: The polarization module on the MPL failed, so technicians uninstalled the instrument, and boxed it up in its shipping case. The instrument will be shipped to Sigma Space to be repaired.

2017/04/10, DQPR-6142: The DQ plots indicate that polarization is no longer working. Technicians uninstalled the instrument, and boxed it up in its shipping case to be sent to Sigma Space for repair. The start time of unavailable data is 4/19 @ 13:10. The most recent DQPR status is "waiting - for spares."

2017/04/07, DQPR-6142: The co and cross-ol channels are nearly equal. This normally should not happen for clouds, and this issue looks to have occurred after coming back on 03/09 from the outage.

LIDAR --- Doppler LIDAR --- Operational.

LIDAR --- Raman LIDAR --- Not Operational.

2017/03/31, DQPR-5906: The laser heads are scheduled to be repaired by the first week of April. John Goldsmith will coordinate with Todd Houchens to have them installed at AMF3 as soon as possible. The most recent DQPR status is "waiting for spares."

2017/02/03, DQPR-5906: The heads in the front bench showed possible signs of damage, so they will be sent to Continuum for inspection. Operators were not successful in bringing the system up using the rear bench (with low laser power). The IM and operators will consult Continuum about this difficultly before deciding how to proceed. The most recent DQPR status is "waiting - for spares."

2017/01/20, DQPR-5906: The RL went down due to the power outage on site, and has yet to come back online. This DQPR is just for documenting the longer outage compared to many of the other instruments. IM John Goldsmith added that Todd Houchens will be on site the week of 2017/01/23 to check the laser for damage due to the cooling water freezing. He will work with John to determine if the system can be brought back into service, or if repairs are necessary.

LIDAR --- CEIL --- Operational.

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

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

2017/04/24, CM-2017-AMF3-VSN-1949: The transmitter was offline, so David Oaks turned it back online, and restarted the PACSI file.

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

2017/04/14, DQPR-5979: The latest data from 4/1 shows that this issue is still occurring. Adam Theisen asks what the next steps are. The most recent DQPR status is "in progress - assignments."

2017/03/10, DQPR-5979: The W-band will be operated only sporadically for trouble shooting, and the KaSACR will be down for extended periods as technicians work to help diagnose the issue. The most recent DQPR status is "in progress - assignments."

2017/02/24, DQPR-5979: Work has been done with Todd Houchens and on-site techs to get reinforcement for the flexible waveguide installed on 2017/02/16. The effectiveness of this fix is still being evaluated, and the most recent DQPR status is "open - requires action."

2017/02/06, DQPR-5979: The differential phase from the hemispheric RHI scans is consistently higher at negative distance ranges than at positive ranges. This difference appears to be independent of the spatial structure of the reflectivity, differential reflectivity, and correlation coefficient fields. See the attached plot on the DQPR for an example.

2017/01/27, DQPR-5704: An increased noise floor occurred twice on 2017/01/03. Prior to this occurrence, the last events were on 2016/12/29, when there was an increased noise floor three times.

2017/01/23, DQPR-5947: When switching to ppivh mode, one of the boards that controls transmit switching is getting confused, and the mode defaults to single pol mode. The radar is transmitting on H, but not V. This also causes the drop in rhohv, as it's correlating the H return with what is mostly a noise field (plus the cross polar signal). Unfortunately, these files won't be fixable, and so neither should be used. At the very least, their polarimetric variables should not be used. This is a sporadic problem, and does appear to be fairly infrequent. These files will need to be DQPR'd.

2017/01/09, DQPR-5848: Just to document, this apparent ingest issue is occurring in the latest data up through 2016/12/22.

2016/12/15, DQPR-5848: Starting on 2016/09/27 at 19:30 UTC, there looks to be an issue with how the ingest is setting the transition flag, and getting the sweeps for the HSRHI data. The number of sweeps in the HSRHI files start to shift between 1-3, when the shifting should not start until 4. Some examples of the azimuth and transition flags are posted below.

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 more subtle going on here that we are attempting to track down. It does seem to be very infrequent (once a day or less per mode).

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

2017/04/14, DQPR-5979: The latest data from 4/1 shows that this issue is still occurring. Adam Theisen asks what the next steps are. The most recent DQPR status is "in progress - assignments."

2017/04/14, DQPR-5971: Joseph Hardin has an assignment to write DQR D170414.5. The most recent DQPR status is "in progress - assignments."

2017/04/07, Radar.arm.gov: The WSACR was pinned last week due to weather.

2017/04/03, DQPR-5971: This issue looks to have been resolved. If Joseph agrees, Adam will assign him a DQR to document this.

2017/03/24, DQPR-5971: Adam Theisen is waiting for data to arrive at the DMF to verify.

2017/03/10, DQPR-5979: The W-band will be operated only sporadically for trouble shooting, and the KaSACR will be down for extended periods as technicians work to help diagnose the issue. The most recent DQPR status is "in progress - assignments."

2017/02/01, DQPR-5971: Horizontal polarization was not being transmitted by the radar. This has been going on for at least 2 weeks, and it is currently being diagnosed. In the meantime, the W-band will be operated only sporadically for troubleshooting, and the KaSACR will be down for extended periods as technicians work to help diagnose the issue. The most recent DQPR status is "open- requires action."

2017/01/11, DQPR-5705: PPI missing data was found on 2016/12/29, and HSRHI missing data was found on 2016/12/11. The most recent DQPR status is "open- requires action."

2016/12/09, DQPR-5705: Adam Theisen added that the latest data from the DMF is from 09/19.

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.

IMG --- TSI --- Operational.

AOS --- General --- Partly Operational, Some Data Dropouts.

2017/03/14, DQPR-5858: The status of Cynthia Salwen's assignment has been updated to 'accepted/open' by the PRB, and the most recent DQPR status is "in progress - assignments."

2017/03/02, DQPR-5858: Joshua King suggested escalating this DQPR due to the nature of this problem.

2017/02/22, DQPR-5858: Cynthia is still trying to troubleshoot the data dropout problem. Her next step is to set up a virtual machine server as a test platform at BNL. There have been delays in getting the ANL-BNL network link back up, and this step is necessary before setting up the VM server. Rob Denney has been working with BNL ITD to get this working again, but so far, neither side has found the solution.

2017/01/06, DQPR-5858: IM Cynthia Salwen has added the following: Brent has not found anything in the logs yet. He spoke with an instrument mentor who developed serial software; this mentor said that moving to a VM caused problems with the serial, and consequently, the mentor had to use a different serial library. Since the software was

developed with LabVIEW, the options are different. Cynthia will try other tests, and Brent will talk to his team about this.

2016/12/20, DQPR-5858: OLI and SGP both have virtual machines for the AOS computers, and both are showing data dropouts on multiple instruments at the same time. These dropouts can be as short as a couple of seconds, or up to 30 seconds or more. In OLI there are missing data lines at the same time in the files for the WXT520, which is on Unit 1, and the CPC3772, CPC3776, and Dry Neph, which are on Unit 2. There are no dropouts on the Wet Neph. SGP shows dropouts in the data files of the WXT520, which is on Unit 1 and the TAP, CPC3772, and the Dry Neph at the same time. At both sites, the dropouts seems to have started at the beginning of the deployments. There are no other error indications that the data is not being received from the instruments. Brent Kolasinski is looking into the VMWare logs and expects to consult with VMware support.

AOS --- aosmet --- Operational.

AOS --- CPC --- Operational.

2017/04/13, DQPR-6093: Once DQRs for the PSAP and O3 are completed, this DQPR can be closed.

2017/03/29, DQPR-6093: The CPCF was brought back online at 22:00 UTC on 03/23, and the CPCU was brought back online at 02:54 UTC on 03/24.

AOS --- CAPS-PMEX --- Not Operational. Pulled and sent for Repair (BNL).

2017/03/20, DQPR-5816: Joshua asked if there is an update on the CAPS. Was it sent to BNL? It looks like the DMF are still collecting raw (00-level) data, but ingests are currently disabled.

2017/01/20, DQPR-5816: This instrument continues to have problems. As a result, IM Arthur is asking that the OLI-CAPS be sent to BNL for servicing, as the problem cannot be diagnosed remotely. Scott Smith will send the shipping container for the instrument to OLI. Joshua King suggested that this DQPR be escalated to PRB attention, given the ongoing issues. Arthur Sedlacek has started the logistics of sending the unit to BNL. The most recent DQPR status is "in progress - assignments."

2017/01/04, DQPR-5816: This DQPR has been linked to DQPR 5895. Joshua King added that he opened 5895 to separately resolve the raw data/collection/ingest issues described for the CAPS and CO beginning 2016/12/28. This DQPR can continue to serve as a resolution point for the potential NO2 contamination issues affecting the CAPS.

2016/12/15, DQPR-5816: Joshua asked Art what kind of timeline he needs for further investigation. Art responded that we are currently collecting data on particle-free ambient air via a HEPA filter. We are doing so to confirm that the molecular interference is coming from NO2, to identify the wind directions which bring in the NO2, and to collect enough data in the current configuration to figure out if one channel could serve as the molecular interference monitoring channel. This monitoring channel is likely to be the blue channel, which will allow us to correct the green channel. Upon Art C s return to BNL next week, he will look at the data to see if the statistics will allow for this. 2016/12/02, DQPR-5816: Arthur added that only the red channel will be free of NO2 signal contamination. Therefore, the red channel data are fine.

2016/12/01, DQPR-5816: Since the CAPS takes a measurement of the molecular extinction every 20 minutes, and subtracts this quantity from the total extinction measured during normal operation, the only way to consistently generate a negative extinction is to have a baseline (acquired on particle-free air) that is larger than the total extinction. The only way this could happen is if a time-varying molecular species is present. Further investigation has suggested that locally sourced anthropogenic emissions of NO2 is the likely origin of these episodic periods. There are 3 pieces of evidence that NO2 is the culprit: firstly, optical extinction under particle free conditions (which are achieved with a HEPA filter) reveals that these episodes characterized by negative extinction also exhibit a wavelength dependence in light absorption that parallels the known absorption spectrum of NO2 (see 2nd attached file on DQPR page); secondly, negative signals are tightly correlated with CO, a known tracer from combustion activities; lastly, the local prevailing wind direction is from the north, where there are sources of diesel emissions. Taken together, this is strong evidence for the presence of NO2 emissions impacting the OLI AOS. Using a calibration for the green, it is estimated that the NO2 loading is over 1.2 ppb. The CAPS simply measures optical extinction, irrespective of whether the extinction is molecular or particulate in origin. The CAPS takes a particle-free background reading every 20 minutes in an effort to account for variations in molecular extinction caused by

changes in the molecular composition of air masses. However, the large absorption cross-section of the NO2, and shifts in particle loadings thwart the background correction scheme employed by the CAPS instrument. Since we do not have an NO2 measurement at the OLI site to determine NO2 to be the culprit, IM Arthur Sedlacek has asked the AOS technicians to install a HEPA filter in the CAPS sampling line to confirm that the behavior described above is due to molecular species, and not particles. Arthur will also contact the manufacturer about the idea of converting the blue channel to a particle-free green channel. In this way, we will have a constant measure of NO2, thereby enabling the green aerosol channel to be corrected for these episodes. In the long term, we may want to terminate aerosol extinction measurements via the CAPS at Oliktok, or, live with the issue, and simply flag data as bad (unusable) when the wind direction is from the north, where the desalination plant is located. Other long-term options include adding a fourth channel to the CAPS that measures NO2 full-time, using an NO2 scrubber on the front end of the CAPS (this is a consumable, and particle loss issues would have to be determined), or procuring a separate way of locally measuring NO2. This observation does raise the question as to what is precisely present in these plumes. It is possible that other molecular species (e.g., hydrocarbons) could be present locally, and have the potential of impacting other instruments. Several informative graphs have been posted to the DQPR.

AOS --- ACSM-- Not Operational, Shipped to Aerodyne for Repair.

2017/04/28, DQPR-6123: Thomas Watson was assigned an open-ended DQR to cover the data outage. The most recent DQPR status is "in progress - assignments."

2017/04/24, CM-2017-AMF3-VSN-1948: The ACSM has an electronics issue. Technicians removed the instrument out of the AOS shelter, boxed it up and shipped it to Aerodyne for further repair.

2017/04/14, DQPR-6123: Thomas Watson updates that troubleshooting with this issue is going slowly. He is in discussions about returning the instrument to Aerodyne for a hands-on look. The most recent DQPR status is "open - requires action."

2017/03/29, DQPR-6123/6093: After the power was restored, the Tof ACSM is not recording data. There is an unknown problem with the instrument, and Aerodyne and Tof Werks have been contacted. This is a new issue. All voltages and pressures are nominal, but there is no signal. The most recent DQPR status is "open - requires action."

AOS --- GHG-Picarro --- Operational.

2017/04/21, DQPR-6160: There is another period of missing data: 01:07 UTC on 04/17 - 16:52 UTC on 04/19. Ken Reichl has been assigned a DQR to cover both periods. The most recent DQPR status is "in progress - assignments."

2017/04/19, DQPR-6160: Data was unavailable for more than 24 hours from 2017/04/11 at 13:09 UTC to 2017/04/12 at 20:53 UTC.

AOS --- HTDMA --- Operational.

2017/04/26, CM-2017-AMF3-VSN-1951: The MCPC component of the HTDMA failed. Technicians replaced the unit with one sent from BNL. The first part of the install was completed at 15:30 UTC. The mentor ran a test, checking data to make sure that the MCPC was working properly. Technicians proceeded to finish the installation, which concluded at 19:20 UTC.

2017/04/06, DQPR-5805: The manufacturer discovered a mixture of butanol and water in one of the failed MCPCs. This indicates that the incident where waste water was accidentally poured into the other CPCs (see DQR D170221.6) affected the HT-DMA MCPCs as well. The butanol bottle and lines were cleaned. Janek will try to clean the MCPC that's currently installed there, but he will probably have to send it to the manufacturer, as it is not easy to clean the MCPC in the field. The most recent DQPR status is "waiting - for spares."

2017/03/29, DQPR-5805: The new MCPC was installed, but is not showing any counts. The AOS van temperatures had risen to 35-40 C, (higher inside the HT-DMA) which caused an error message in the MCPC and an automatic shut-down to protect itself. There is possible temperature damage to the unit, and Janek is talking to the manufacturer.

2017/03/20, DQPR-5805: The repaired MCPC was received and tested, and will be shipped out ASAP.

2017/02/16, DQPR-5805: HT-DMA is back up and running, with perfect flo5ws. However, the MCPC is still showing no counts. It appears that the MCPC was damaged by the previous power loss, so the MCPC was shut down and sent in for repairs. A spare MCPC should be available soon, and the most recent DQPR status is "waiting - for spares."

2017/02/14, DQPR-5805: The Pentras is overheating after the latest power loss. The HT-DMA was shut down to protect it. The Pentras is working, but has large temperature spikes. Janek is troubleshooting. The most recent DQPR status is "in progress - assignments."

2017/02/08, DQPR-5805: MCPC is not showing any counts after AMF3 experienced a loss of power. Janek will keep this DQPR open as the instrument was still under observation when this happened.

2017/02/03, DQPR-5805: The instrument is working well. This DQPR should be closed, as data has been processed, and ingest enabled.

2017/01/12, DQPR-5805: Janek said that restarting the HTDMA went fine, and overall, the instrument is ok. However, the MCPC condenser cooler is not working. Tests show no voltage on the cooler pins. The manufacturer has been contacted, and Janek has a spare MCPC at hand that may be sent to the site if needed. Janek submitted DQR D161208.2, which was reviewed and accepted by the PRB.

2017/01/06, DQPR-5805: Ingests are still off. After several power outages at AMF3, the instrument is currently offline. As of the last check on 2016/12/22, the HTDMA was producing good quality data with some minor flow issues. These will be checked on once the power is restored. AMF3 is currently experiencing Phase 3 blizzard conditions, and the emergency heating system reportedly kicked in. Operators will have to check the system to see if there is any freezing damage.

2016/12/16, DQPR-5805: Janek replied to Joshua's request for turning on ingest/collection, asking for DMF to wait until the valve is fixed. Operators discovered something with the valve that could be the cause for the flows we are seeing, and it will be tested today.

2016/12/15, DQPR-5805: Joshua King asked the DMF team if collection/ingests could be turned back on given Janek's comments from yesterday.

2016/12/14, DQPR-5805: The MCPC was successfully installed, and is showing counts. The scanning works nicely, but the humidifier sheath RH is low. This is probably due to a stuck internal valve, which we will test.

2016/12/06, DQPR-5805: After numerous tests on the MCPC have failed to pinpoint the cause for zero counts, a spare MCPC is being shipped in, and the old one returned for maintenance. Janek Uin has an assignment to write an open-ended DQR D161208.2.

2016/11/29, DQPR-5805: Beginning at around 20:00 UTC on 2016/11/21, HTDMA size distributions and aerosol concentrations have flatlined at 0/cm^3 (see attached graph). IM Janek Uin responded that the MCPC was flooded, and the temperature in the AOS dropped to the levels where the HTDMA RH is too low. The MCPC was drained, and we are waiting to see if that worked. We are looking into insulating the HTDMA, and raising the AOS temperature.

AOS --- UHSAS --- Operational.

2017/04/13, DQPR-6093: Once DQRs for the PSAP and Ozone are completed, this DQPR can be closed.

2017/03/29, DQPR-6093: For some reason, the UHSAS was left switched off post power outage. It was switched back on at 15:35 UTC on 03/29. The most recent DQPR status is "waiting for spares."

AOS --- NEPH --- Operational.

2017/04/13, DQPR-6093: Once DQRs for the PSAP and Ozone are completed, this DQPR can be closed.

2017/03/31, DQPR-6093: The NEPHs (dry and wet) were brought back online at 21:40 UTC on 03/23. The most recent DQPR status is "waiting for spares."

AOS --- IMPACTOR --- Operational.

2017/04/13, DQPR-6093: Once DQRs for the PSAP and Ozone are completed, this DQPR can be closed.

2017/03/31, DQPR-6093: The IMPACTOR's state was not verified by Dry Neph pressure until 21:40 UTC on 03/23. The most recent DQPR status is "waiting for spares."

AOS --- OZONE --- Operational, but No Ingest.

2017/04/13, DQPR-6093: Once DQRs for the PSAP and Ozone are completed, this DQPR can be closed.

2017/03/31, DQPR-6093: The Ozone had a noisy signal until ~23:00 UTC on 03/23. The most recent DQPR status is "waiting for spares."

AOS --- TRACEGAS --- Operational.

AOS --- PSAP --- Operational.

2017/04/13, DQPR-6093: Once DQRs for the PSAP and Ozone are completed, this DQPR can be closed.

2017/03/31, DQPR-6093: The PSAP came back online at 21:39 UTC on 03/23. The most recent DQPR status is "waiting for spares."

AOS --- IMPACTOR --- Operational.

AOS --- TRACEGAS --- Operational.

Other --- AERI --- Operational.

Other --- BBSS --- Operational.

Other --- CIMEL --- Operational.

Precip --- MASC --- Operational.

Precip --- PIP --- Operational, Working on Beginning Data Ingest to DMF Archives.

Precip --- LPM --- Operational, Working on Beginning Data Ingest to DMF Archives.

Precip --- GEONOR --- Operational, Working on Beginning Data Ingest to DMF Archives.

Other --- SR50A --- Operational.

Other --- DataHawk Unmanned Aerial System --- Operational, not a full time instrument.

Other --- TBS --- Operational. Sensor will not be running full time.

Other --- CCN --- Operational.

2017/04/19, DQPR-5447: Technicians finished the install and the mentor powered the instrument on at 17:11 UTC. The instrument was installed and is working, and data is being copied. Collections can be turned on. The most recent DQPR status is "in progress - assignments."

2017/04/06, DQPR-5447: The water bottle holder modification has been completed, and the holder is on its way to OLI.

2017/03/20, DQPR-5447: CCN is installed and ready. The CCN water bottle holder needs modifications, and afterwards, the instrument can be switched on.

2017/03/03, DQPR-5447: The CCN is packed and ready for shipping. Janek is waiting for some accessories to arrive so they can be included in the equipment. The most recent DQPR status is "waiting for spares."

2017/02/16, DQPR-5447: The CCN was calibrated, and Janek is running it to verify proper operation.

2017/01/31, DQPR-5447: The instrument sent back to the vendor was actually the CCN for SGP. The CCN covered in this DQPR is waiting for calibration. Janek just got new power supplies from DMT, and will proceed ASAP.

2017/01/27, DQPR-5447: Stephen noted on this week's DQPR coordination call that the instrument was being sent back to the vendor for additional troubleshooting.

2017/01/06, DQPR-5447: The instrument started showing that wide distribution again. The OPC was switched out, and the distribution looks normal again. Concentrations between the columns are currently different at the same

supersaturations. Most likely, the calibration changed with the OPC switch. The instrument will be re-calibrated as soon as possible.

2016/12/20, DQPR-5447: Janek received the power supply, and he is letting the instrument run to confirm the previous issue. He is currently not seeing the wide size distribution at high supersaturations, and has a spare OPC at hand to install if needed.

2016/12/06, DQPR-5447: Janek added that we are awaiting a spare CCN power supply to turn the instrument on as to provide data to DMT.

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 April 21, 2017 - April 28, 2017
BRIEF STATUS OF INSTRUMENTS IN BARROW (C1) AS OF 2017/04/28:
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
METTOWER - Surface Meteorological Instrument on tower Operational
AMC - Soil, up/downwelling radiation measurements Partly Operational
ECOR-twr - Eddy Correlation Flux System Operational
ECOR-PtBRW - Eddy Correlation Flux System Not Operational
MWR - Microwave Radiometer Operational
MWRP - Microwave Radiometer Profiler 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 as per http://radar.arm.gov
KaWSACR - Ka-Band Scanning ARM Cloud Radar Not Operational, undergoing testing 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 Operational
CLAP - Continuous Light Absorption Photometer Operational

CPC - Condensation Particle Counter Operational
NEPH - Nephelometer Operational
IMPACTOR - AOS Impactor Operational
TOWERCAM - 40m tower camera Operational
TSI - Total Sky Imager Operational
LPM - Laser Precipitation Monitor Operational
SR50A - Snow Depth Sensor Operational
AERI - Atmospheric Emitted Radiance Interferometer Operational
BBSS (Autosonde) - Balloon Borne Sounding System Operational
CIMEL - Cimel Sunphotometer Operational
IOP - CAM Operational
****
* Barrow Instruments in Detail: *
****
INFRASTRUCTURE --- Facilities --- Operational.
INFRASTRUCTURE --- Data Systems --- Operational.
2017/04/24, CM-2017-NSA-VSN-4306: A data disk was filled, so it was replaced and mailed out. There are 51 more available.
INFRASTRUCTURE --- Vehicles --- Operational.
INFRASTRUCTURE --- Desktop Computers --- Operational.
2017/04/21, CM-2017-NSA-VSN-4304: The duplex computer was patched, and Tim Grove requested a reboot.
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 --- Operational.
SKYRAD --- NIMFR --- Operational.
TIPTWR --- GNDRAD general --- Operational.
TIPTWR --- MFR10m --- Operational.
TIPTWR --- PIRgnd --- Operational.
2017/04/21, CM-2017-NSA-VSN-4305: The calibration coefficients needed to be updated in the Campbell 3000 datalogger to account for the recent PIR exchange. PIR SN 32050F3 was removed on 3/14/17 (due to failure), and PIR 31299F3 was installed on 3/14/17. The NSA GNDRAD CR3000 program was updated with the new calibration coefficients. See the CM report for the coefficients.
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 --- Partly Operational.
2016/11/03, DQPR-5694: This DQPR has been linked to DQPR 5756, and DQR D161011.3 has been submitted and reviewed by PRB. The most recent status of this DQPR is “in progress - assignments.”
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.
2017/04/25, CM-2017-NSA-VSN-4308: The Licor (LI-7700) was calibrated over the winter, and it was reinstalled. S/N TG1-0182, WD79502.
ECOR --- ECOR-Pt. Barrow --- Not Operational, End of Season.
MW RADIOMETERS --- MWR --- Operational.
MW RADIOMETERS --- MWRP --- Operational, but Questionable and Unreliable Data.
2017/04/13, Biweekly Telecon: Maria is monitoring issues and determining if the MWRP needs to go back to the factory.
2017/04/07, DQPR-6119: Maria submitted an open-ended DQR (D170403.2) which is pending PRB review. The most recent DQPR status is "waiting - for spares."
2017/03/27, DQPR-6119: The MWRP data are questionable and unreliable. It is possible that there is a strong uncorrected temperature dependence of the calibration. Maria plans that operators will collect one more month of data to have enough calibration points to try to develop a correction. However, because of the likely non-linear temperature dependence, it is possible that a recalibration will not be necessary. The most recent DQPR status is "open - requires action."
MW RADIOMETERS --- MWRHF --- Operational (External Noise Interference).
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. DQRs D140610.1 and D160426.3 have been reviewed and accepted by the PRB.
MW RADIOMETERS --- GVR --- Operational.
LIDAR --- HSRL --- Operational.
LIDAR --- MPL --- Operational.
LIDAR --- CEIL --- Operational.
2017/04/25, CM-2017-NSA-VSN-4307: The dew blower had an issue--it was removed (CLB311 - 115, K0810010). The CLB311 - 115, K1510002 blower was installed in it's place. Power and communication was restored.
2017/04/20, DQPR-6153: Adam Theisen added that this might be due to blower failure. The most recent DQPR status is "open - requires action."
2017/04/16, DQPR-6153: From 03/19/2017, at least one alarm has been consistently active.
LIDAR --- Doppler LIDAR --- Operational.
2017/04/28, CM-2017-NSA-VSN-4309: The dew blower failed, and a replacement blower was received. There was no label on this replacement. It was installed and connected, and both red and blue switches were turned on.
2017/04/18, Email from SGP: Doppler LIDAR blower sent to NSA.
RADAR --- RWP --- Operational.
RADAR --- KAZR --- Operational.
2017/03/23, Radar.arm.gov: The RDS1 power supply was replaced and the signal processor is operational. The system will be taken out for maintenance for a short time to replace a fan.
RADAR --- KaWSACR --- Not Operational, undergoing testing per http://radar.arm.gov. Chiller sent to RMA.
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.
2017/02/16, Biweekly Telecon: Andrei is looking at parts replacement/repairs/upgrade for June.
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 it being open-ended. Adam Theisen's DQR D160719.1 has been reviewed and accepted by the PRB.
AOS --- General --- Operational.
AOS --- AETH --- Operational.
2017/04/26, DQPR-6166: All data is missing for a ~24 hour period (from 20:00 UTC on 2017/04/13 to 18:11 UTC on 2017/04/14). These do return to what appear to be normal readings. The most recent DQPR status is "in progress - assignments."
AOS --- CLAP --- Operational.
AOS --- CPC --- Operational.
AOS --- NEPH --- Operational.
AOS --- IMPACTOR --- Operational.
IMG --- TOWERCAM --- Operational.
IMG --- TSI --- Operational.
Precip --- LPM --- Operational, Logger Program Being Worked On.
Other --- SR50A --- Operational.
Other --- AERI --- Operational.
2017/04/27, DQPR-6173: Data was unavailable for more than 24 hours from 2017/04/17 at 13:07 UTC to 2017/04/18 at 19:48 UTC. Adam Theisen asked if the program has been stopping more than normal this month. The most recent DQPR status is "open - requires action."
Other --- BBSS --- Operational.
2017/04/19, DQPR-6159: Data was unavailable for 24 hours from 2017/04/08 at 00:00 UTC - 2017/04/09 at 05:29 UTC. There were no launches from the 17:30 launch on 2017/04/07 to the 17:30 launch on 2017/04/08 due to operator error. Automatic scheduling was turned back on. Donna Holdridge has been asked to DQR (D170419.1) this period of missing data. The most recent DQPR status is "in progress - assignments."
2017/04/13, Biweekly Telecon: Autosonde deck extension begins next week. Snow cleared was cleared, and materials transported to the site.
Other --- CIMEL --- Operational.
IOP --- CAM --- Operational.

5 North Slope Facilities

AMF3

Current and Upcoming Site Visits

Fred Helsel-SNL	May 1-10	Site overview
Telayna Gordon-UAF	May 1-4	PIP Data/site support
Al Bendure-SNL, John Hubbe/Peter Carroll-PNNL	May 14-27	DataHawk flights
Dari Dexheimer, Casey Longbottom, Monty Apple-SNL	May 13-25	Tethered balloon operations

Current and Upcoming IOPs

Black Carbon on the North Slope (Baylor)
Ice Nucleating Particle Sources (Jessie Creamean on-site) KERRI PRATT, RACHEL KIRPES, NICHOLAS

Site News/Issues

Site access had been increasingly difficult due to snow drifting and an inexperienced ARCTEC equipment operator. ARCTEC recently sent in a new operator with good snow plowing skills, and the site is back to normal winter operations with good cleared road access.

Unmet Needs

We are running on leased diesel generators while other options are investigated and evaluated.

Site Upgrades

NA

Site Safety

We are investigating winter operation options for AMF-3 going forward. These include repair and refurbishment of the microturbines along with analyses of operating options. We plan to have this analysis completed by May 5.

Site Staffing Issues

Erich Havner aggravated a chronic shoulder injury while working at AMF3. He is currently out on leave while he is treated for the condition.

Tethered Balloon Operations

Eight hours and thirty minutes of tethered balloon flights were conducted from 4/2/17 – 4/9/17 at the AMF3. Excessively high winds prevented flights for the majority of the deployment period.

• On 4/2/17 two flights were conducted totaling 4.5 hours. One flight ascended to 240m and a second flight ascended to 260m. The Condensation Particle Counter (CPC), two Printed Optical Particle Spectrometers (POPSs), and a tethersonde were flown. An apparent EMI hotspot was observed at 40m and 100m.
A smaller, portable winch was used on these flights due to an issue being observed with the larger aerostat winch during a load test. The aerostat winch overheated during a descent in relatively high winds and cold conditions in October 2016. The winch was modified and a 1,100 lb load test was conducted upon arriving at the AMF3 in April 2017. The winch failed the load test and it was determined that the existing batteries did not provide sufficient amperage to the winch during cold temperatures (-22 °C at time of test). Additional batteries were added to the winch battery bank and it henceforth passed a load test on 4/5. We will pursue adding even more batteries, and adding batteries with higher cold cranking amps, before fall 2017.

Figure 1: 04/02/17 17:31 AKDT

• On 4/3/17 one two-hour flight was conducted. The flight ascended to 200m, which was the maximum altitude that could be achieved with the portable winch at the relatively steep tether

angle induced by the winds. The payload consisted of a tethersonde and SLWC, then a 10m separation to a bundle of two SLWCs and two iMet radiosondes, and a 10m separation to a single SLWC and iMet radiosonde. The flight ascended through low cloud with a ceilometer-identified cloud base around 100m, and tops around 250m. The cloud dissipated midway through the flight, around when the balloon was at peak altitude. The data were used to characterize SLWC sensor performance and uncertainty.

We intended to fly the aerosol equipment below the cloud base, but the winds continuously increased and decreased keeping us on edge – since they were forecasted to pick up dramatically. We did not want to be unable to retrieve the helikite and expected it to be difficult using the truck bed. We opted not to fly the aerosol instrumentation in order to keep the flight as quick to descend and retrieve as possible.

We considered doing a second flight with the aerosol equipment in the afternoon, but after talking with Joe Hardin, we decided to try for a radar calibration flight. We worked with Joe for several hours this afternoon to try to get a flight in, but could not get sufficient distance between the calibration sphere and the SACR with the limits of the plowed road at the AMF3, the wind direction from those roads pushing the balloon towards the SACR, and the altitude limits of the portable winch.

Figure 2: Helikite on descent with AOS inlet tower in foreground

• Three flights were conducted over three hours. The flight one payload was a tethersonde and SLWC, a 10m separation to a bundle of two SLWCs and two iMet radiosondes, a 10m separation to a single SLWC and iMet radiosonde, 30m to dry POPS, .3m to iMet radiosonde, .3m to wet POPS, and .3m to CPC. Flights two and three payloads were a tethersonde and SLWC, 30m to dry POPS, .3m to iMet radiosonde, .3m to wet POPS, and .3m to CPC. Flight one ascended to 115m. The flight struggled to gain altitude in the high winds, and the severe tether angle was grinding the tether against the winch cover plate. We descended quickly and removed the winch cover plate and cloud equipment in order to move the aerosol equipment closer to the balloon and hopefully increase altitude. On flight two we ascended to 200m in 30 minutes. There was still a very severe tether angle (45°), and we were not gaining much altitude. On flight three we ascended to 230m in 15 minutes. We encountered almost 14 m/s winds at maximum altitude, which reached the TBS Aviation Safety Plan operating limits, and immediately began to descend.

A few operational issues were identified with both POPSs, and they were returned to Handix for further testing and modifications at the end of the campaign. While the April TBS campaign did not record as much flight time as we would've like due to high winds, we did accomplish several equipment tasks that were needed to conduct a successful campaign in May with the PNNL DataHawks.

Barrow

Current and Upcoming Site Visits

Dan Lucero and crew/SNL	April 18-27	Autosonde deck extension
Telayna Gordon/UAF	May 4-5	GNSS Ground Station, site support
Ray Bambha/SNL	May 9-18	Pack up IOP equipment

Current and Upcoming IOPs

SNPP/NPOESS Ground Truth Sonde Launch, Phase 5 – Started Oct 1, 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

Red Ranger still not operational, need to schedule time in shop for repair.

Expedition leaking power steering fluid and heater blower motor not operational, in shop for repairs.

Unmet Needs

NA

Site Upgrades

Balloon auto launcher deck extension completed April 17-28.

Before

After

Deck extension crew

Site Safety

NA

Site Staffing Issues

NA

Distribution

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