

PALMER STATION MONTHLY SCIENCE REPORT

February 2007



February 15th Sunset from the glacier behind Palmer Station. Photo courtesy of Julie Schram

NEWS FROM THE LAB

Phil Spindler, Assistant Supervisor Laboratory Operations

February brought on a rapid dwindling in daylight hours as we moved into the austral autumn. Evening boating hours shrank by more than two hours over the course of the month. Losing daylight hours, we gained more gorgeous sunsets to enjoy before bedtime instead of missing them while we slept. February was a relatively rainy month, and sunsets took on even more beautiful colors and textures with the clouds left over from the day's weather.

The month was marked by some major events including the successful return of the LTER cruise, a visit from Paul Allen and guests aboard his *M/Y Octopus*, and a live internet feed of the International Polar Year Inauguration Ceremonies in Washington DC.

Two port calls with the *ARSV Laurence M. Gould* shaped station science with the departure of B-045-P (Ducklow) and the arrival of B-022-P (Amsler/Baker/McClintock). Chuck Amsler assumed the role of Station Science Lead. The chemical ecology divers quickly set up and commenced diving for specimens in the area. Our Polar Entomology group lost three of its five team members with the first port call, but the remaining two members still had a very productive month.

Adelie adults shed a proud tear as they watched their chicks loose their down and graduate from waddling on land to swimming in the water. With the help of volunteers from the community, B-013-P (Fraser) was able to successfully weigh and measure fledging Adelies about 3-4 times a week until the birds were gone. Unlike the Adelie parents, the field team does not have that Empty Nest feeling since there are still quite a few skua and giant petrel chicks to study in the area. Phytoplankton activity was minimal in the first half of February

with an increase in the second half. This corresponded to an observed rise in krill schools over the latter half of the month as well.

A research team aboard the *S/Y Spirit of Sydney* stopped by Palmer Station after a month-long whale tagging project. We assisted the project by accepting the transfer of humpback biopsy samples to be sent back to Dr. Bruce Mate and Dr. Scott Baker at Oregon State University. They will use the samples to determine the sex of the tagged whales and their genetic relationship to other sampled populations throughout the South Pacific.

Christina Hammock, Palmer Research Associate, maintained all geophysical projects. She also provided B-256-P (Lee) with data indicating amounts of incident light at various times of the year from the Palmer Meteorological Observing System (PalMOS) sensors. Using the roving GPS system, Christina estimated that the glacier behind station receded an average of 20 feet since last May.

We wish you all the best from Palmer Station, and we hope your February was as exciting and productive as ours.

FEBRUARY WEATHER

Christina Hammock, Research Associate

Summer started to give way in February, with the first trend toward cooler temperatures this season. The month was calm and rainy, with our first significant snowfall of the year in the last half of the month.

The glacier calvings reached their peak this month, often bringing thick brash ice and bergy bits around Palmer. Sea surface temperatures were still warm this month, peaking at +2.5C.

The coldest daily low temperature was on the 22nd at -1.3C and the warmest was on the 16th at 6.0C. The average temperature for the month was 2.0 C, which is about a half degree cooler than last month. Palmer received twice as much melted precipitation as last month at 50.8cm.

The following projects conducted research at Palmer Station during January:

B-013-P: PALMER, ANTARCTICA LONG-TERM ECOLOGICAL RESEARCH PROJECT: CLIMATE MIGRATION, ECOSYSTEM RESPONSE AND TELECONNECTIONS IN AN ICE-DOMINATED ENVIRONMENT: SEABIRD COMPONENT

Dr. William R. Fraser, Principal Investigator, Polar Oceans Research Group, Sheridan, MT

Personnel on station: Jennifer Blum, Brett Pickering, Peter Horne

February was marked by the returning of the *Laurence M. Gould* at the beginning of the month at the conclusion of the LTER cruise. Kristen Gorman and Eric Erdmann returned to station for a brief time, then headed home, along with Hannah Lucas. The remaining crew continued work throughout the month, hampered by some borderline weather and consistent wetness that did not postpone most daily outings but delayed specific work that requires handling of downy chicks.

The Adelie penguin work continued this month, highlighted by the chicks fledging. Adelie chick counts and measurements of chicks about to fledge were obtained on local islands. Samples continue to be salvaged for isotope analysis. Satellite transmitter work for the adults finished up at the beginning of the month, but the radio transmitter study on Humble Island continues into March. After the Adelies fledged we began collecting sediment trap samples located on local islands as well as Biscoe Island. During periods of inclement weather we processed these samples and made repairs to the traps.

Skua work continued with banding of Brown Skua chicks on local islands as well as on Dream Island, and South Polar Skua chick growth monitoring continues with our Shortcut Island study. Satellite transmitters were deployed on South Polar Skuas to examine foraging ecology. Our Giant Petrel satellite transmitter work finished up this month with the retrieval of all of our transmitters. Growth measurements of Giant Petrel chicks continue on Humble Island. Kelp Gull limpet trap samples were collected on numerous local islands.

Monitoring of marine mammals continued, characterized by a decreasing number of Elephant seals near the end of the month and a continuing increase of Fur seals. Sightings of Humpback and Minke whales have highlighted a few outings this month. Lab work continues with skua scat analysis and some sample preparation for isotope analysis. Data analysis projects continue as well.

RPSC continued to provide great support this month; field volunteers were very helpful. We again thank Phil Spindler for his efforts in coordinating this assistance. Chuck Kimball also provided some swift assistance with some field equipment. We appreciate Wendy Beeler and Rachel Rogers for providing such incredible meals; Wendy in particular has often made the extra effort to make sure we are well taken care of.

B-016-P AND B-032-P PALMER, ANTARCTICA LONG-TERM ECOLOGICAL RESEARCH PROJECT: CLIMATE MIGRATION, ECOSYSTEM RESPONSE AND TELECONNECTIONS IN AN ICE-DOMINATED ENVIRONMENT: PHYTOPLANKTON ECOLOGY AND BIO-OPTICAL COMPONENTS

Dr. Maria Vernet, Principle Investigator, Scripps Institution of Oceanography (B-016-P)

Dr. Raymond Smith, Principle Investigator, University of California Santa Barbara (B-032-P)

Personnel on station: Tristan Wohlford (016), Ryan Burner (016), Julie Schram (032), Katherine Haman (032)

Even with February being the short month that it is, we were able to sample Station E six times and Station B seven times. We sampled both stations on 5, 12, 15, 19, 22 and 26 February with an additional sampling of our inshore station B on 1 February. As usual, sampling included filtration for particulate carbon and nitrogen, determination of discrete chlorophyll a levels by fluorometry, pigment analysis using high performance liquid chromatography, measurement of dissolved inorganic nutrients, and estimation of primary production. CTD (Conductivity and Temperature outfitted with a transmissometer and fluorometer) and PRR (Profiling Reflectance Radiometer) data were also collected in the water column.

Chlorophyll levels were incredibly low for the first half of the month, averaging $2.65 \mu\text{g chlorophyll m}^{-2}$. There was a slight increase in chlorophyll levels during the second half of the month with a steady average of $59.45 \mu\text{g chlorophyll m}^{-2}$; however, this level was still well below that of a phytoplankton bloom. Primary production levels at Station E were also low during February, but remained steady throughout the month at 788 mg C m^{-2} . Interestingly, at Station B, while chlorophyll levels were at their lowest during the first week of February, the primary productivity levels were high, peaking at 2170 mg C m^{-2} on 1 February and declining to 1334 mg C m^{-2} by 5 February. Primary production levels then decreased to levels similar to Station E for the remainder of the month, averaging 618 mg C m^{-2} . An experiment was also conducted on 21 February which determined the grazing impact of the microzooplankton community on the phytoplankton at Station B to be zero.

B-016 and B-032 continue to thank boating coordinator Steve Barten for helping us with all of our zodiac issues and electronic technicians Curt Smith and Jeff Otten for all of their help with keeping our computers and software running smoothly. Phil Spindler and Ken Keenan have continued to provide stellar assistance with all laboratory issues as well. Team logistics, Rebecca Shoop, Cathy Borowsky and Bob DeValentino, have been invaluable in their help with coordinating movement of our stuff on and off the Gould. And UT Ben Buchwald is always there at a moment's notice if anything should go wrong with Ultra Low freezers, thermostats, etc.

B-028- PALMER, ANTARCTICA LONG-TERM ECOLOGICAL RESEARCH PROJECT: CLIMATE MIGRATION, ECOSYSTEM RESPONSE AND TELECONNECTIONS IN AN ICE-DOMINATED ENVIRONMENT: PREY COMPONENT.

Robin Ross and Langdon Quetin, Principle Investigators, Marine Science Institute, University of California at Santa Barbara (UCSB)

Personnel on station: Alex Lowe (team leader/ Marine Science Institute, UCSB), Sam Hammon (Marine Science Institute, USC B).

The *ARSV Laurence M. Gould* returned from the LTER cruise on 06 February. After an efficient port call, the ship departed, leaving B-028 with another research volunteer, Sam Hammon. Since then Sam and Alex have continued the weekly sampling.

The LTER hydroacoustic surveys were done twice a week throughout February. The number of krill schools observed decreased during the first two weeks of February. An increase in chlorophyll in the middle of the month was followed closely by the return of the krill. The end of the month brought much success in terms of sample collection. Krill abundance has been high, while sightings of feeding whales and seals common. When compared to January, the catch has been a better mixture of young of the year and adults. Whole body fluorescence measurements were continued to calculate *in situ* feeding rates. Chlorophyll sampling and CTD casts were conducted inside and out of schools.

The weekly sampling has gone smoothly thanks to the support from the Raytheon Staff and the other grantees.

B-022-P: THE CHEMICAL ECOLOGY OF SHALLOW-WATER MARINE MACROALGAE AND INVERTEBRATES ON THE ANTARCTIC PENINSULA

James McClintock and Charles Amsler, Principal Investigators, University of Alabama at Birmingham,
Bill Baker, Principal Investigator, University of South Florida

Personnel on station: Chuck Amsler, Jim McClintock, Maggie Amsler, Craig Aumack

The first four members of our field team arrived at Palmer on LMG07-02 on 21 February. Initial efforts centered on setting up our current lab space allotment, dive locker, and our portion of the aquarium building as well as on mandatory boat training. We completed our diving equipment check out dives on 23 February and took advantage of a very good low tide early on 26 February to collect intertidal green algae to be used in artificial foods throughout the season.

From February 23-28 our group completed 6 dives including two checkout dives off the Pier and several dives to collect amphipods for feeding studies. Gut content analyses of freshly-collected amphipods from both macroalgal and sponge hosts were well under way and preparations for laboratory feeding bioassays were nearly complete by the end of the month. A spongivorous amphipod species has been identified that appears likely to provide a model system for evaluation of invertebrate secondary metabolites to short-circuit molting.

We are grateful for the generous and professional assistance of numerous RPSC staff. Phil Spindler, Ken Keenan, Steve Barten, and Christina Hammock deserve special thanks for facilitating our laboratory and diving operations. We are also very grateful to Zee Evans and Alden Strong for rapid assistance in restoring small but critical functionalities to the dive locker.

B-256-P: PALMER, PHYSIOLOGICAL AND MOLECULAR MECHANISMS OF STRESS TOLERANCE IN A POLAR INSECT

Drs. Richard E. Lee, Jr. and David L. Denlinger, Principle Investigators, Miami University, Oxford, Ohio and Ohio State University, Columbus, Ohio.

Personnel on station: Joshua Benoit and Michael Elnitsky

Following the departure of three members of our field team in early-February, the remaining members continued laboratory experiments and field observations focusing on the mechanisms of stress tolerance in the wingless fly *Belgica antarctica*. While the relatively rainy month limited field work, several excursions were made to collect insects for use in laboratory experiments. Collections focused on Cormorant and Humble Islands, as again this season, large aggregations of larval *B. antarctica* were observed at these sites. Our laboratory experiments focused on mechanisms of larval freeze tolerance, cryoprotective dehydration, osmoregulation, and water balance. Molecular studies centered on the collection of RNA for studying differential gene expression in response to various types of environmental stress. Other experiments further investigated our discovery last season that larvae, but not adults, continuously produce heat shock proteins.

Our outreach efforts continue to connect the science activities of our team and other research projects on station with teachers and their students. Our website (www.units.muohio.edu/cryolab/), maintained by Juanita Constible at Miami University, provides K-12 classroom activities based on national and state standards, and a FAQ section. January field team member Glen Schulte, a high school teacher from Cincinnati, heads up our outreach efforts this year. He developed a second website (www.edonice.org) with activities, photo galleries and podcasts.

We are grateful to station personnel for their support and helpfulness during our third field season. We especially thank Phil Spindler and Ken Keenan for efficient and prompt laboratory assistance, Jeff Otten, Curt Smith, and Chuck Kimball for communication, computer and networking support, and Steve Barten for boating support.

PALMER STATION RESEARCH ASSOCIATE MONTHLY REPORT February 2007

G-295-P GPS CONTINUOUSLY OPERATING REFERENCE STATION.

Bjorn Johns, Principal Investigator, UNAVCO

The Research Associate operates and maintains on-site equipment for the project. Throughout the month, 15-second epoch interval GPS data files were collected continually at station PALM, compressed, and transmitted to the NASA/CDDIS in Reston, VA.

The GPS base station continues to operate using the spare base station receiver with apparently normal data, but unconfirmed configuration settings. Plans to change the base station receiver from the obsolete Ashtech Z-12 backup to the new Trimble NetRS are still on hold pending receipt of directions from the new project PI. The power supply for the backup Z-12 was upgraded to a wall AC-DC unit. Data were sent manually after this upgrade and after a couple routine computer restarts after Windows Update installations.

The roving GPS system and its associated base station operated well throughout the month. All batteries for all roving systems were charged.

G-090-P GLOBAL SEISMOGRAPH NETWORK (GSN) SITE AT PALMER STATION.

Rhett Butler, Principal Investigator, Incorporated Research Institutions for Seismology (IRIS)

The Research Associate operates and maintains on-site equipment for the project. Station PMSA is one of more than 143 sites in the GSN monitoring seismic waves produced by events worldwide. Data files are recorded to tape and also sent real-time to the U.S. Geological Survey (USGS).

The system operated well throughout the month. Two instances of unusual communications errors were reported to the project.

**O-202-P ANTARCTIC METEOROLOGICAL RESEARCH CENTER (AMRC)
SATELLITE DATA INGESTOR.**

Charles Stearns, Principal Investigator, University of Wisconsin

The Research Associate operates and maintains on-site equipment for the project. The AMRC SDI computer processes satellite telemetry received by the Palmer Station TeraScan system, extracting Automated Weather Station information and low-resolution infrared imagery and sending the results to AMRC headquarters in Madison, WI.

The system is running normally. A failed FTP of bi-weekly weather data to the AMRC was resolved by the project. The updated decoding of AWS data was verified.

**O-204-P A STUDY OF ATMOSPHERIC OXYGEN VARIABILITY IN RELATION
TO ANNUAL TO DECADAL VARIATIONS IN TERRESTRIAL AND MARINE
ECOSYSTEMS.**

Ralph Keeling, Principal Investigator, Scripps Institution of Oceanography

Air samples are collected on a semiweekly basis by the Station Physician.

The goal of this project is to resolve seasonal and interannual variations in atmospheric O₂ (detected through changes in O₂/N₂ ratio), which can aid in determining rates of marine biological productivity and ocean mixing. The results are also used to help determine the terrestrial and oceanic distribution of the global anthropogenic CO₂ sink. The program involves air sampling at a network of sites in both the Northern and Southern Hemispheres. Palmer Station is especially well situated for resolving signals of carbon cycling in the Southern Ocean. Samples taken from the station are sent to Scripps where the analysis of O₂ and CO₂ content takes place.

**O-264-P COLLECTION OF ATMOSPHERIC AIR FOR THE NOAA\CMDL
WORLDWIDE FLASK SAMPLING NETWORK.**

David Hofmann, Principal Investigator, Climate Monitoring and Diagnostics Laboratory,
National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA) Climate Monitoring and Diagnostics Laboratory continues its long-term measurements of carbon dioxide and other climate relevant atmospheric gases. The Palmer Station air samples are returned to the NOAA laboratory for analysis as part of NOAA's effort to determine and assess the long-term buildup of global pollutants in the atmosphere. Data from this experiment will be used in modeling studies to determine how the rate of change of these parameters affects climate. Air samples are collected on a weekly basis by the Station Physician.

O-283-P ANTARCTIC AUTOMATIC WEATHER STATIONS (AWS).

Charles Stearns, Principal Investigator, University of Wisconsin

The Research Associate monitors data transmissions for the project. AWS transmissions from Bonaparte Point were monitored using the TeraScan system. AWS data received were also forwarded to UCSB for B-032-P (Smith).

The Bonaparte Point AWS station was restarted and began to transmit signals normally.

A-306-P GLOBAL THUNDERSTORM ACTIVITY AND ITS EFFECTS ON THE RADIATION BELTS AND THE LOWER IONOSPHERE.

Umran Inan, Principal Investigator, Stanford University

Stanford University has been operating a Very Low Frequency (VLF) receiver antenna at Palmer Station since the 1970's. By receiving naturally and manmade signals between 1 and 40 kHz, the Stanford VLF group is able to study a wide variety of electromagnetic phenomenon in the ionosphere (uppermost layer of the atmosphere ionized by solar radiation) and magnetosphere (the area surrounding the earth dominated by the Earth's magnetic field and particles trapped by it. Many of these studies relate to the energetic releases associated with lightning. For example, Palmer Station's unique location enables it to pick up small bits of radiation from lightning strikes as far away as Africa, the USA, or the Pacific Ocean.

VLF data acquisition computers were restarted a few times during the month after routine Windows Update installations. A few short periods of anomalous data were reported to the project. Extra periods of interesting data were archived. Regular periods of increased data archiving were instituted for a special experiment. The main data acquisition PC crashed twice this month and is currently being diagnosed with the help of the PC technician. Some minor software changes were made and the computer is being restarted often to prevent data loss due to crashing during the special experiment period. Project was informed that experiment computers were renamed in external Domain Name Server.

The VLF antenna cable was serviced several times. All poles on the glacier have melted out and the cable has been placed laying over the downed poles. New holes were drilled for lower melted-out junction box poles. The poles holding the pre-amp box, the antenna guy wires and the sides of both loops were all re-drilled. The antenna was re-aligned vertically. During an inspection, an open shield wire on the recently soldered VLF connector was found. The wire was repaired and the project was informed.

Early in the month, the VLF antenna loop that was found to have a worn area was repaired. The loop was first moved from its position stuck on the side of the top pulley to the correct position on the insulator. The sides of the loop were then detached the worn area was pulled down easily. It was found to have exposed conductor and early signs of oxidation. The cable was repaired with electrical and rubber tape and the loop was returned to its regular position.

T-312-P TERASCAN SATELLITE IMAGING SYSTEM.

Dan Lubin, Principal Investigator, Scripps Institution of Oceanography

The Research Associate operates and maintains on-site equipment for the project. Throughout the month, the TeraScan system collected, archived, and processed DMSP, NOAA, and ORBVIEW-2 satellite telemetry, capturing approximately 25-30 passes per day. A weekly 85GHz SSM/I ice concentration image was produced and transferred to UCSB for B-032-P (Smith).

The system operated well throughout the month. The computer was restarted once after a fork error was reported. LTER images generated by the system were sent to LTER scientists and to the R/V LAURENCE M. GOULD daily until the end of the LTER cruise. Satellite image support from NASA was discontinued at the end of the LTER cruise. Inquiry was made into the upgrade of the computer system after notification that all support for the system was to be discontinued. Plans for documenting the TeraScan processes for future migration to a new system were made.

The lack of updates to the orbital elements for the DMPS satellites was noticed and diagnosed as being due to a change at SeaSpace. After an inquiry to SeaSpace, the updated procedure for obtaining the orbital elements was received. The provided fix was modified to work on USAP systems and shared with other USAP TeraScan sites.

A-357-P EXTENDING THE SOUTH AMERICAN MERIDIONAL B-FIELD ARRAY (SAMBA) TO AURORAL LATITUDES IN ANTARCTICA

Eftyhia Zesta, Principal Investigator, University of California Los Angeles

The three-axis fluxgate magnetometer is one in a chain of longitudinal, ground-based magnetometers extending down though South America and into Antarctica. The primary scientific goals are the study of ULF (Ultra Low Frequency) waves and the remote sensing of mass density in the inner magnetosphere during geomagnetically active periods. Palmer's magnetometer is also a conjugate to the Canadian Poste de la Baleine station, allowing the study of conjugate differences in geomagnetic substorms and general auroral activity. The station Research Associate maintains the on-site system.

The system performed well throughout the month. Magnetometer maintenance was conducted which including the removal, inspection, addition of Styrofoam to the bottom, reinstallation and realignment of the instrument. Final verification of the level and the hole filling was conducted and approved by the project PI.

B-390-P: THERMO-SALINOGRAPH

Vernon Asper, Principal Investigator, University of Southern Mississippi

Sea water is pumped continuously through a thermosalinograph (TSG) sampling system, recording the temperature, conductivity, salinity, and fluorescence. The real-time data, including graphs and web camera images of the ocean in the vicinity of Palmer Station, are compiled by a local server into web page format and relayed to a mirror site at Woods Hole

Oceanographic Institute, which is a collaborator in the project. The URL for the WHOI mirror site is <http://4dgeo.who.edu/tsg/>.

The system has operated well throughout most of the month. The TSG was thoroughly cleaned. Debris that was clogging the debubbler was removed, allowing for improved flow through the instrument. A problem with the fluorometer was diagnosed as being caused by a crack in the internal quartz tube that occurred while the instrument was being reassembled after cleaning. The reason for the breakage and options for repair were researched and documented. The spare fluorometer was found to be incompatible with present experimental setup and the project was informed of options for integration into experiment. The fluorometer was removed from the instrument and the tubing was re-routed to accommodate this.

Project was informed that experiment computers were renamed in external Domain Name Server.

Several projects have requested the bathymetry data prepared by B-390-P in 2005. The data were downloaded from a data sharing website, processed, and forwarded to various projects with instructions for proper citing.

T-513-P: ULTRAVIOLET (UV) SPECTRAL IRRADIANCE MONITORING NETWORK (UVSIMN)

Charles Booth, Principal Investigator, Biospherical Instruments, Inc

The Research Associate operates and maintains on-site equipment for the project. A BSI SUV-100 UV spectroradiometer produces full sky irradiance spectra ranging from the atmospheric UV cutoff near 290nm up to 605nm, four times per hour, while the sun is above the horizon. A BSI GUV-511 filter radiometer, which has four channels in the UV and one channel in the visible for measuring Photosynthetically Active Radiation (PAR), is located next to the SUV-100. Data from the GUV-511 instrument are made available on a daily basis on the project's website at <http://www.biospherical.com/nsf>.

The UV monitor operated normally throughout the month.

T-998-P: IMS RADIONUCLIDE MONITORING

Michael Pickering, Principal Investigator, General Dynamics

The International Monitoring System (IMS) radionuclide sampler is part of the Comprehensive Test Ban Treaty (CTBT) verification regime. The automated Radionuclide Aerosol Sampler and Analyzer (RASA) unit pumps air continuously through a filter for 24 hour periods, collecting particulates in the .2-10 micron range. The filter is then tested for particulates with radioisotope signatures indicative of a nuclear weapons test. The station Research Associate operates and maintains the instrument.

Project was informed of shipping information for archive samples from Punta Arenas to Vienna. The project was added to the email distribution list for the *ARSV LAURENCE M. GOULD* ship schedule.

TIDE GAGE

The Research Associate operates and maintains on-site equipment for the project. Tide height, seawater temperature, and salinity are monitored on a continual basis by a gage mounted at the Palmer Station pier.

The tide gauge data acquisition software was successfully moved from a Windows 98 to a Windows XP operating system, bringing the project into compliance with IT standards. A communication cable problem and a failed power supply were diagnosed and fixed. The wiring for the communication and power supply were completely re-done to make the system more robust, tidy, and electrically sound.

Finishing touches were put in place for the intranet tide display. Sea surface temperature data generation was integrated into the regular monthly reporting and added to the common drive.

METEOROLOGY

The Research Associate acts as chief weather observer, and compiles and distributes meteorological data. At the end of the month a summary report is prepared and sent to interested parties. Weather data collected using the automated electronic system are archived locally and forwarded twice each month to the University of Wisconsin for archiving and further distribution. Synoptic reports are automatically generated every six hours by the Palmer Meteorological Observing System (PalMOS) and emailed to the NOAA for entry into the Global Telecommunications System (GTS).

MAWS and PalMOS data acquisition computers were restarted a few times throughout the month after routine Windows Update installations. A problem with the ftp of data to the SPAWAR server was discovered and fixed. Documentation was updated to include all changes in meteorology operations and procedures implemented this season. All climatology and meteorology statistics documents were updated on the common drive.

PIs of the project B-256-P requested data indicating amounts of incident light at various times of the year. Data from the PalMOS sensors were compiled and sent to the project.

Problem in present weather sensor was discovered and troubleshot. Present weather sensor and its associated electronics unit were replaced with spares to fix the problem. Failed sensor was inspected and found to be full of water inside enclosure. Plans were initiated with manufacturer to send sensor back for repair. Dates of incomplete weather synoptics due to failed present weather sensor were logged.