

AUGUST WEATHER

Despite a higher than average snowfall for the month (54 cm compared to the average 43 cm), melted precipitation continues to be lower than the monthly and yearly averages. Melted precipitation for August measured 28.7 mm compared to the average of 53.0 mm, and year-to-date accumulation measures 228 mm compared to 503 mm. Interestingly, year-to-date snowfall is not significantly lower than the average (221 cm compared with 246 cm).

The monthly average temperature for August was -4.6°C , slightly warmer than the 15-year average for August of -6.1°C . The average temperature this month was highly influenced by a large storm system mid-month which brought several days of average daily temperatures above freezing. The high temperature this month was $+3.3^{\circ}\text{C}$ and the minimum temperature was -16.3°C .

Sea surface temperatures remained steady at -1.75°C throughout the month. Pack ice formed mid-month and stuck around for about a week and a half before a warm storm system broke it up. Pancake ice continues to form and move in and out of the area depending on wind direction.

PALMER STATION RESEARCH ASSOCIATE MONTHLY REPORT August 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. The 15-second epoch interval GPS data files were collected continually at station PALM throughout the month. Transmission of these files to the NASA/CDDIS data center in Reston, VA occurred without incident throughout the month.

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.

Issues concerning security scan “vulnerabilities” on the GPS receiver continued to be unresolved.

In preparation for the proposed power outage this month, the GPS system UPS was checked and set up to run the system off of a portable generator in case the outage lasted longer than ~30 minutes.

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 functioned normally throughout the month. The seismic vault was entered once this month in order to check on the equipment following data degradation during high winds.

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 operated normally throughout the month.

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

Ralph Keeling, Principal Investigator, Scripps Institution of Oceanography

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.

Air samples were taken according to schedule, with some delays due to poor wind conditions. One full crate was prepared for retro shipment on LMG07-12. It was confirmed that two new crates of flasks will be arriving on LMG07-12.

Preparations were made for the new sampler installation scheduled for the LMG07-12 port call. This included working with FEMC to determine the placement and installation of the mast and indoor equipment. Shelves were moved and space was made in TerraLab to accommodate the new sampler.

O-264-P COLLECTION OF AIR FOR THE NOAA ESRL/GMD WORLDWIDE FLASK SAMPLING NETWORK.

David Hofmann, Principal Investigator, Earth System Research Laboratory, Global Monitoring Division, National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA) Earth System Research 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 were taken on schedule, with some delays due to poor wind conditions. Two sample crates were prepared for retro shipment on LMG07-12 and confirmed that new flasks will be arriving on LMG07-12.

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 operated normally throughout the month except for one occasion when it was down for 2 days. The system began transmitting data again on its own.

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 ran normally except for a couple of incidents this month. The data acquisition machine, VLF_RECORD, crashed due to a driver error, requiring a hard reboot of the computer. Also, the DAQ software inexplicably stalled one evening, requiring a reboot of VLF_RECORD in order to restart the software. Approximately 18 hours of data was lost while the software was down. In addition, there was one incident of the nightly data transfer failing due to a full ftp server at Stanford.

Several days of extra data were recorded at PI request. Two hours of broadband data were ftp'd to Stanford during the gigantic jet this month.

The PIs were contacted to notify them of the proposed power outage this month and to discuss procedures for the VLF system during an extended power outage.

New summary plot routines were installed for displaying 24-hours of broadband data. The Matlab routines were installed on the synoptic data machine, VLF_EXTRA. VPN remote client software was also installed in order to allow PIs to help debug the new routines. A batch file was created to automatically transfer synoptic data for running the "vlfTool". The new program is run manually every day and the resulting plots are ssh'd to Stanford's server daily. The plots are displayed at www-star.stanford.edu/~vlf/hardware/fieldsites/palmer/palmer.php.

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 ORBVUEW-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). Sea ice images were provided to the LMG for cruise support.

A list of all custom scripts and ftp jobs on *sodas* were sent to the RPSC Image Specialist for the upcoming Linux upgrade. The system was fully backed up to tape.

In preparation for the planned power outage, this system's UPSs were checked. It was determined that, during an extended power outage, the system would be shutdown.

The NOAA-12 satellite was decommissioned; TeraScan auto-scheduler settings were modified to stop collecting the NOAA-12 telemetry.

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 through 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 normally throughout the month. The computer was rebooted following installation of Windows updates.

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/>.

Seawater flow to the system required adjustment several times during the month. The fluorometer remains uninstalled awaiting further direction from PIs.

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. Annual testing of the spare HRAD, DMM and power supply was performed. These spare units are functional.

Procedures for preparing the BSI system for an extended power outage were discussed with the PI. Based on these discussions, future planned power outages (>30 minutes) will need to be coordinated with the PI so that the system can be shut down remotely.

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.

The equipment operated well throughout the month. Third quarter samples were prepared for retro shipment in September.

Power outage procedures were discussed with PI and will be added to RA documentation. A portable generator would be needed for this system during an extended outage in order to keep the cryo-cooler running.

TIDE GAUGE

The Research Associate operates and maintains on-site equipment for the project. Tide height and seawater temperature are monitored on a continual basis by a gauge mounted at the Palmer Station pier. Although salinity (conductivity) is also recorded by the tide gauge, the measurements are incorrect and cannot be used.

The tidegauge computer was rebooted after the software was found to be not running during the daily checks. Several hours of data were lost while it was down. The cause of the software problem was undermined but another MS-DOS based program was also down at the time. The incident has not recurred.

The tidegauge folder was moved to the new Research Associate directory on Endeavor. The folder was organized and cleaned up and old files removed. Most of the data lost during last month's network-wide backup was found and restored. All tide gauge data was backed up to the RA directory.

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). Isobar images are sent to LMG for cruise support.

The problem with accessing the iceberg ftp server from the PalMOS machine remains unresolved and the automated ftp of meteorological data to the iceberg server for SPAWAR has been disabled until it is resolved. A subsequent request from a SPAWAR forecaster for precipitation data was fulfilled. Attempts to determine whether they are interested in having our meteorological data files was unsuccessful.

With help from the Comms Tech and Coastal Environmental support it was confirmed that the ceilometer is sending data properly, but the datalogger is not interpreting the signal. An attempt to communicate with the ceilometer via terminal pass-through mode froze the datalogger and it required power cycling in order to restore data acquisition.

All meteorological instrumentation and spare parts were re-organized, labeled, and inventoried. The meteorological sensor calibration worksheet was upgraded and updated.

Files and directories on the PalMOS computer were cleaned-up and re-organized. Path problems in PalMOS ftp and Matlab scripts due to the Weather directory move were fixed.

Various historical meteorological data products were provided at PI request.