

## **JULY WEATHER**

July temperatures were normal for this time of year, staying well below 0°C except for a storm during the last 3 days of the month which produced the high temperature of +1.8°C. The minimum temperature this month was -13.7°C. The average temperature of -6.5°C is comparable to the 15-year average for July (-5.4°C).

Interestingly enough, precipitation remains quite low for the month and for the year. Melted precipitation for July measured only 16.2 mm compared to the July average of 52.7 mm, and only 199 mm for the year compared to the average of 449 mm. The snowfall amount was 27 cm for July compared with 47 cm average and only 167cm so far for the year compared with the average of 202cm. The snowstake depth stayed around 35 cm for most of the month, increasing to 51cm with a large storm that blew through at the very end of month.

Sea surface temperatures were between -1.5°C and -1.8°C throughout the month. Sea ice has been forming during most of the month, although it has broken up multiple times due to windy conditions. Southwesterly winds mid-month brought a number of impressively large bergs to the area.

## **PALMER STATION RESEARCH ASSOCIATE MONTHLY REPORT July 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.

**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. The seismic vault door was found ajar following a wind storm and the PIs were notified of the resulting data degradation. A new lock was put on the door to replace the old rusty one.

**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 DECADAL 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 O<sub>2</sub> (detected through changes in O<sub>2</sub>/N<sub>2</sub> 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 CO<sub>2</sub> 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 O<sub>2</sub> and CO<sub>2</sub> content takes place.

Samples were taken on schedule. The Scripps air sampling procedures were added to the Research Associate POP document and equipment and spare parts for this project were inventoried. The POC was contacted concerning resupply shipment of flasks in September.

**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.

Samples were taken on schedule. Both CCGG and HATS sampling procedures were added to the Research Associate POP and equipment and spare parts for the projects were inventoried. With the help of Logistics, we were able to verify for the PI that a time-critical HATS flask crate will arrive in Palmer on the first boat.

**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.

**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 throughout the month. An extended period of data was recorded to coordinate with a HAARP campaign. There was one instance of synoptic data missing following daily data transfer process.

### **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 and NOAA 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 network time protocol configuration file was changed to point back to the tick.usap.gov time server. Sodas was rebooted following a persistent memory allocation error. This fixed the problem, but a subsequent problem with the perfmeter application required some troubleshooting. The issue was resolved by starting the rpc.rstatd daemon.

### **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.

### **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. Two UPS batteries were prepared for retro shipment and the plywood flooring in the BSI "penthouse" was removed at the PI's request.

### **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. Second quarter samples were prepared for retro shipment in September. A special request blank filter measurement was performed.

### **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 tide gauge operated normally throughout the month except for a problem following the Palmer system-wide backup. It was discovered that the "full backup" of the tidegauge home drive was not actually a full backup and the files required to run the tidegauge data acquisition and display programs were lost. The files were restored from a December 2006 backup, but this did not return the system to functionality and further troubleshooting was required. The EMS memory setting for the QBasic software was changed in order to be able to run with Windows XP (a problem fixed once before). Also, the tidegauge home drive had to be remapped to the O: drive in order to run data acquisition software. One and a half days of data were lost due to this incident.

## **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 for the LMG are on hiatus until end of August.

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.

Extensive troubleshooting of the ceilometer determined that it is operating normally, but the PalMOS datalogger is not receiving the data it is sending. Troubleshooting procedures required the shut-down of the data acquisition software while changing settings in the datalogger, resulting in several short periods of missing data. The problem remains unresolved as of the end of this month and will continued to be worked on.

All of the meteorological documentation located in TerraLab was cleaned up and reorganized. A spreadsheet was created to graph daily MAWS data files for quality checks.