

MAY WEATHER

Several storms brought significant snowfall this month, but the glacier remains bare on the lower half due to the windy conditions and warm temperatures associated with these storms. The storms were interspersed with periods of clear skies and calm winds. Temperatures this month remained similar to last month. The coldest temperature was on the 18th at -7.0°C and the warmest was on the 14th at 4.7°C. The average temperature for the month was -2.1°C.

Sea surface temperatures hovered near -1°C throughout the month. Some sea ice has formed in the calm backwaters of Hero Inlet, but there is no sea ice beginning to form anywhere else. Brash ice and bergy bits continue to calve off of the glaciers.

Palmer received 37 cm of snowfall throughout the month and measured a total 27.2 mm of melted precipitation.

PALMER STATION RESEARCH ASSOCIATE MONTHLY REPORT May 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 in Reston, VA was suspended for 11 days due to hardware problems with the NASA server. During this period, the data files were stored locally. Upon reinstatement of the CDDIS data center, the backlog of files were sent without incident.

A backup data center was contacted so that the GPS-CORS data can be archived in case of future server problems. The UC San Diego Scripps Orbit and Permanent Array Center (SOPAC) data center will be used as the backup. A different procedure for sending the files is required since they archive the data in different format than what we send to the CDDIS. These new procedures were documented in the RA POP document.

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.

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 except for was one incident when the data processor (DP) was found unresponsive. When a simple reset did not restore system functionality, one of the project analysts was consulted and power to the DP was cycled. This restored the system, and little, if any, data was lost during this event due to buffering by the data acquisition computer.

The seismic vault was visited once during the month to take photos of the equipment as requested by the PIs. General checks and maintenance on the equipment in the vault were performed during this time.

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, except for a couple of ftp server problems on the UW end of things and one instance of station-wide connectivity loss on our end.

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 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.

All duties involved with collecting these semi-weekly samples were transferred to the Research Associate. The POC for the project was informed of this change.

Samples were taken on schedule. The air sampling shack was cleaned and project files and supplies were organized.

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.

All duties involved with collecting the weekly CCGG (Carbon Cycle Greenhouse Gases) and semi-weekly HATS (Halocarbon and Trace Species) flask samples were transferred to the Research Associate. The PIs for these projects were informed of this change.

Samples were taken on schedule. One crate of HATS flasks was received thanks to the help of Logistics (the crate had been mislabeled in Port Hueneme). The air sampling shack was cleaned and project files and supplies were organized.

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).

Last month's failure to transmit data was fixed by another cycling of the power. Data transmission has continued without problem throughout this 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 except for one problem with the data acquisition software which resulted in several hours of data loss. In addition, the synoptic data storage PC crashed and restarted itself once during the daily data transfer period, resulting in a short period of lost synoptic data files.

The new VLF project representative/POC was here for 2 weeks to perform the annual VLF antenna calibration and a noise survey for possible future locations of the VLF antenna. The antenna calibration procedure, which requires two people, daylight, and relatively good weather, was completed over the course of several days. The extra calibration data was recorded to disc.

Maintenance of the VLF antenna was conducted by the Riggers during the month. A longer length of rope was added to the ceramic pulleys at the top of the antenna loops in order to facilitate easier maintenance of the cable. The VLF grounding cable to Hero Inlet was also examined with the VLF project representative. It was determined that the cable replacement can wait until summer months due to snow cover and the fact that the ground is still fully functional.

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).

Gaps in satellite telemetry began on the 18th and deteriorated over the next couple of days. Extensive troubleshooting with help of the PC Technician and Communications Technician occurred over the next couple of days, before discovering that the RPSC time server in Denver that was used to update the system's clock was wrong. The Unix

network time server daemon was changed to point to our local Palmer time server and this fixed the problem immediately.

Ssh upgrades were successfully installed by the visiting Information Security Network Engineer. During this time, he also performed a vulnerability scan on the system, which was purposefully run while collecting a pass in order to test the stability of the system. No problems developed with the system following the scan.

An interview on various aspects of the TeraScan system was provided to visiting RPSC Information Security personnel. Also, the TeraScan system files were backed-up and the repository of data archive tapes were organized.

Sea ice images were provided to the LMG captain for LMG07-06 cruise support.

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 flawlessly 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/>.

The system operated well throughout the month, although the fluorometer is still offline and remains uninstalled. Seawater flow to the system required adjustment several times during the month.

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, except for one incident when the GPS clock failed to update the date properly. This affected the data acquisition software, but since the problem was caught before sunrise data loss was minimal.

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. Samples were prepared and set aside for the next quarterly shipment. A specially requested sample was prepared to be shipped out for analysis at a radionuclide laboratory. The sample was sent northbound on the May 30 sailing of the LMG.

TIDE GAUGE

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 gauge mounted at the Palmer Station pier.

The tide gauge operated normally throughout the month. Sea surface temperature data was provided at PIs request.

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 the LMG each day for cruise support.

Troubleshooting to determine the source of the problems with the weather display computers and data transfers to the southwind server began. A random drive mapping problem that was preventing transfers of PalMOS daily data files was resolved. An inventory of the PalMOS and MAWS meteorological instrumentation was begun.

With the help of the riggers, the PalMOS anemometer was changed-out with a recently-calibrated spare as part of the annual maintenance of the PalMOS weather station. The transition went smoothly and anemometer data was suspended for approximately one hour.

Several requests for Palmer Station meteorological data were fulfilled this month.