

PALMER STATION MONTHLY SCIENCE REPORT
November 2006



Photo provided courtesy Nicole Middaugh 2006

NEWS FROM THE LAB

Tracey Baldwin, Supervisor Laboratory Operations

November was a very active month at Palmer for both Science and Station personnel. The open water around station has allowed for continuous sampling throughout the month with only minor weather delays. Several vessels made their way into Arthur Harbor this month, along with brash ice funneled into Hero Inlet from Loudwater Cove. Animals in the station vicinity continued their warm summer activities as the temperatures increased and the snow packs melted. The month concluded with our celebration of Thanksgiving and a delicious meal prepared by the station cook, Rachel Rogers.

During the month there were 14 members of 7 different science projects on station. Christina Hammock, Palmer Research Associate, continues to oversee data collection for 12 research projects, operate and maintain on-site equipment for the Palmer tide gage, and serve as chief weather observer for the station. The full compliment of RPSC summer support staff (25) was on station for the majority of the month. Station benefited from two Boating Coordinators as they performed turnover tasks and took advantage of extra time and good weather to complete some needed boat reinforcements.

The *Laurence M. Gould* returned to station in the first week of the month bringing the final compliment of LTER science groups and a small government contingency. Station said good bye to our friends aboard the *Sedna IV*, and the first cruise ship of the season made her way into Arthur Harbor. The winter season felt concluded this year when the *Sedna IV* returned to Palmer Station after wintering in the vicinity. It was a nice treat for those of us with friends on board to say one last goodbye as they quickly departed to take

advantage of nice weather in the Drake Passage. In contrast, it felt as if the summer season officially began when the *National Geographic Endeavor* arrived in Arthur Harbor on Thanksgiving Day with 103 passengers. The Station was spruced up with a new coat of deck staining, a refinishing of our flag pole, and a cleaning of the aquarium room. SCUBA divers and krill researchers Langdon Quetin and Kelly Moore thoughtfully collected marine invertebrate organisms to restock a newly cleaned display tank. These display tanks allow a close look at undersea life in Antarctica. This provides our visitors the opportunity to completely experience the peninsula area by connecting them to the organisms in the water.

A lucky group of recreational boaters spotted a Leopard seal playing with and then eating a penguin freshly snatched from an iceberg near Elephant Rocks. The Elephant seals have been as vocal as ever, often raising questions from folks on station as to their whereabouts- sometimes it is hard to believe that their voices travel so far and so clearly here. The various penguin colonies are still actively incubating their eggs and the Skuas continue their attempts to derail the penguin reproductive efforts. Wilson Storm Petrels fluttered around station and the ever present Antarctic Sheathbills entertained us as they pecked at various items around Palmer.

In this month of giving thanks, the Palmer Laboratory Staff would like to send out our gratitude and appreciation to our friends and supporters both near and far. It is through your tireless support that we have experienced a great start to the field season at Palmer. Thank You!

NOVEMBER WEATHER

Christina Hammock, Research Associate

The month saw a marked change from chilly, windy winter weather with common dustings of snow to warmer temperatures and sunny days melting off the snow completely. The windiest gust of 47 knots was recorded during the windy first half of the month, while the calmer last half of the month had sustained winds all below 15 knots.

Brash ice has blown in and out of the area surrounding Palmer station in increasingly smaller pieces. The glacier has begun to calve more often and bergs and bergy bits have become common.

The coldest daily low temperature was on the 2nd at -5.3C, while the warmest high was on the 29th at +5.9C. The last week of the month was particularly warm with several consecutive days with highs above +5C. The average temperature for the month was -0.5 C, which was the same as last month. Palmer received 19.8 mm of melted and 27 cm of snow precipitation with a maximum snow depth of 11 cm near the beginning of the month

The following projects conducted research at Palmer Station during November:

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, Kristen Gorman

Weather has been favorable for most of the month of November, allowing us regular field visits to all of the penguin colonies in the local area. We monitored the total number of Adelie adults and nests on Torgersen, Humble, Litchfield, Cormorant and Christine islands, as well as egg production for a subset of nests. From these data we determined the timing for the peak egg census, and completed this census on local islands as well as on Dream and Biscoe islands. Peak egg censuses were also completed for Chinstraps on Dream and Gentoos on Biscoe. Counts for our Adelie/snow fence experiment have also been obtained upon each visit to Dream. We obtained Adelie adult and egg measurements on Torgersen. We have been monitoring the number of depredated Adelie eggs on all islands and have made some collections of these depredated eggs for isotope analysis. We continued our snow depth measurements along transects across all local islands with penguin colonies. The first cruise ship of the season, the Endeavor, stopped for a visit at Palmer and we spent time speaking with tourists on Torgersen.

The brown skuas arrived in early November, thus beginning our skua work. We have been resighting leg bands and have begun to monitor nests for all brown skuas in the Palmer area, as well as on Dream and Biscoe. South polar skuas began arriving locally in the middle of the month; we began our band resighting and nest monitoring study of them on Shortcut Island. We have completed counts of the blue-eyed shag colonies on Cormorant Island and Elephant Rocks, and completed a survey of kelp gull nests in the Palmer area. Our monitoring of marine mammals continued this month and was highlighted by a few sightings of leopard seals in the Palmer area and near Dream Island. Lab work has continued with the skua scat analysis. Satellite transmitters were tested and databases were set-up for our upcoming giant petrel work.

RPSC has continued to provide great support for our project this month. The cover on our birder hut was recently replaced, thus improving our work conditions here on station and providing a safer harbor for much of our equipment and computers. Dave Zybowski and a few others completed the task quickly while we were out in the field, thus preventing our work from being interrupted; this effort was greatly appreciated. Chuck Kimball and Dave led the smooth installation of the new Humble island receiver station, and Chuck has been speedily testing the set-up. Ryan Wallace continues to provide stellar boating support and Steve Barten has been equally accommodating. The new engine for our Mark III has been put on already, thus giving us plenty of time to test it out before using it on the LTER cruise. Kerry Kells has been incredibly supportive and professional, accommodating our busy schedule without question. Many other RPSC personnel have been quick to provide assistance with various small tasks this month and we greatly appreciate their support.

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), Maria Vernet (016 until 11/22) Austen Thomas (032), Ryan Burner (016 since 11/18) and Katherine Haman (032) (Scripps Institution of Oceanography)

The weather cooperated beautifully with our sampling schedule in November and we were able to sample both Station E and Station B an amazing 10 times each. We sampled our offshore site, Station E, on 1, 3, 6, 10, 13, 16, 20, 23, 27 and 30 November. We were able to sample at our inshore station, B, on the same dates except for 13 November when the weather was rough enough that we delayed sampling Station B until the following day, 14 November. 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.

The amount of phytoplankton in the water column was relatively consistent throughout the month, averaging 53 ug chlorophyll m⁻² for both Station E and Station B. However, the primary production showed a doubling throughout the course of the month, from 663 mg C m⁻² d⁻¹ at the beginning of November to 1429 mg C m⁻² d⁻¹ after 23 November.

We also began conducting experiments to determine the grazing impact of the microzooplankton community on the phytoplankton. We were able to conduct 4 experiments in November, using water collected from the 50% light level depth at Station B. Grazing rates were calculated as zero for most experiments, although during one experiment, the grazing rate was 0.106 d⁻¹.

B-016 and B-032 would like to thank FEMC for all the hard work they've done for us. We would also like to thank boating coordinators Ryan Wallace and Steve Barten for zodiac maintenance. Our most heartfelt thanks go to Ken Keenan, Christina Hammock and everyone else that played a part in getting the PRR up and running again. Thanks also to the whole of station for a great Thanksgiving holiday!

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

Personnel on station: Langdon Quetin and Kelly Moore (Marine Science Institute, University of California at Santa Barbara).

Our field team arrived at Palmer Station on the evening of 5 November after assisting with season-opening logistics at Cape Shirreff. Thanks to everyone at the station we were able to promptly and efficiently move into the laboratories and meld smoothly into station life. A particular thanks to those folks responsible for cargo who ensured that all our cargo arrived as needed this season.

The rebuilt winch system for the Palmer scientific zodiac Rubber Duke III also arrived 05 November. Since the zodiac platform had to be mostly dismantled to reinstall the winch, we (a collective we between B-028-P and RPSC) decided to reconstruct the top half of the platform to make it stronger, lighter and a more efficient work platform. Thanks to all of those folks who contributed (and there were many) ideas, experience and construction, particularly Dave Zybowski, who did most of the design and all of the construction with materials on hand, and Ryan Wallace, for reinstalling the winch. The winch works well. Line speeds are 18-20 m/minute, twice the speed we saw last season, which greatly increases our ability to sample individual krill schools.

Due to the lack of pack ice in the vicinity of Palmer Station we have been collecting larval krill with nets rather than hand collecting while SCUBA diving, which is usually the method used this early in the season. However, the lack of ice coupled with terrific weather has enabled us to complete 8 acoustic transects as part of the Palmer LTER sampling protocol and successfully sample krill (*Euphausia superba*) with nets. Krill collected to date have been mostly those spawned last season, averaging around 18-20 mm with a molting period of 12 days. Also, while the zodiac platform was being rebuilt we finished analyzing samples from Palmer LTER cruise January 2006.

The lack of ice early in the season enabled us to dive on the Bahia Paraiso in relatively clear water. The ship continues to disintegrate. We found more holes opened in the hull and more debris below the cargo hatch. Each year, the Bahia Paraiso appears to be slowly settling onto its superstructure, rotating the hull toward being completely upside down. The ship continues to be a haven for algal and marine invertebrate species. There is another great RPSC crew at Palmer Station and we look forward to a successful season.

B-045-P PALMER, ANTARCTICA LONG-TERM ECOLOGICAL RESEARCH PROJECT: CLIMATE MIGRATION, ECOSYSTEM RESPONSE AND TELECONNECTIONS IN AN ICE-DOMINATED ENVIRONMENT: MICROBIAL/BIOGEOCHEMISTRY COMPONENT

Hugh Ducklow, Principal Investigator, School of Marine Science, The College of William and Mary

Personnel on station: Matthew Erickson and Kristen Myers (Virginia Institute of Marine Science)

During the month of November, we have completed two nutrient addition experiments along with sampling stations B and E weekly, weather permitting. For each 10 day experiment, 50 liter carboys were filled with surface water from Station B and incubated in the -1.5 °C cold room. Carbon (glucose) and nitrogen (ammonium chloride) are added several times over the course of the experiment to specific carboys and each carboy is sampled daily to monitor the affects of these additions on the bacterial community. The bacteria respond the strongest to the treatment combining carbon and nitrogen, increasing in activity and abundance. Water is filtered through Sterivex cartridges to collect the community DNA, than frozen until analysis can be performed back in the states to analyze the affects of the nutrient additions on the community. We are planning two more experiments for the season, one in December and one in January, to coincide with the yearly phytoplankton bloom.

We would like to thank Palmer RPSC personnel for all of their support this month.

B-114-P: PALMER STATION, ANTARCTICA: DISTRIBUTION, PHYLOGENETIC AFFINITIES, AND ECOLOGY OF AMMONIUM-OXIDIZING BACTERIA IN THE PALMER LTER STUDY AREA.

Dr. James T. Hollibaugh, Principal Investigator, School of Marine Science, University of Georgia

Personnel on station: Nicole Middaugh, Janet Barwell-Clarke

The month of November, with relatively calm and clement weather, allowed for consistent sampling and measurement. It also was a pleasant introduction for B-114's additional science technician, Janet Barwell-Clarke, to Palmer Station and Station E. We were able to sample biweekly, or more, at station E the entire November month without missing a day of sampling. Our consistent sampling and more efficient analysis enabled us to perform extra complimentary experiments, in addition to our nitrite temperature incubation and ammonium enrichment experiments, to further our examination of these slow-growing bacteria.

The first additional experiment, a toxicity experiment, was conducted to test the affect of the ammonium spike on the ammonium oxidizing bacteria in the seawater. So far, no change has been noted; however, it is still too early in our measurements to draw any

conclusions. We also collaborated with B-028-P during one of their routine dives off of the sunken vessel, Bahia, to collect a sediment sample from the ocean floor. From that sample we tested the sediment for nitrite content, which revealed extremely high levels of the compound present.

We would like to thank all RPSC personnel on station for their support this month, especially Steve Barten, Ryan Wallace, Ken Keenan for their time and effort spent fixing and improving our sampling zodiac.

W-220-P: ANTARCTIC ICE INTO CAST GLASS SCULPTURE

David Ruth, Principal Investigator.

Personnel on station: David Ruth and Arthur Quinn

As of today we are just over half way into our project at Palmer station. So far we have been having very good luck with getting the types of images and molds that I hoped to get in the original proposal.

We have used about half the 20 gallons of silicone mold material that we sent to Palmer. The very first experiment was a failure due to my forgetting the catalyst, but every successive mold, and by now we have about ten, has shown us more about the ice texture than the one before. Our elimination on the mold substrate thickener has yielded very accurate and void-free surfaces. The only problem is that we need to contain the liquid while molding, rather than buttering up the surfaces as I had expected. Our last mold has recorded the faceted textures of the clear glacier ice perfectly.

With Art Quinn, we have been able to photograph the surroundings at Palmer Station, particularly focusing on the floating ice. I have posted a web blog at <http://davidruth.blogspot.com> that has received great reviews and comments. It was “blog of the day” at Thanksgiving and has been listed as a “Blog of Note” since my first postings at Palmer. I was interviewed by Singapore International Radio on November 29th about my experience at Palmer station.

I would like to thank the support staff at Palmer Station for making this the most supportive art-making environment I have ever experienced. Everyone here has contributed to making this possible. Every idea has been entertained seriously and equipment and supplies have been readily available. We are on track to accomplish more than I thought possible at the end of the earth.

PALMER STATION RESEARCH ASSOCIATE MONTHLY REPORT
November 2006

G-052-P GPS CONTINUOUSLY OPERATING REFERENCE STATION.

Jerry Mullins, Principal Investigator, U.S. Geological Survey

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 operated normally for the first part of the month. Data was sent manually after a couple routine computer restarts after Windows Update installations. The memory on the GPS base station data acquisition computer was increased during one such restart. On November 18, the GPS base station data acquisition computer hard drive failed and was unrecoverable. With the assistance of the PC technician, a new computer was configured and implemented and data acquisition resumed normally. Efforts were made to retrieve lost data stored on the GPS base station receiver. During these efforts, the receiver failed to pass its own self-tests upon startup. A spare receiver was configured and brought online. One day of data was withheld due to changing of receiver configurations during the day. Data acquisition since appears normal, although configuration settings and data quality have not been verified due to lack of a project contact. Troubleshooting the failed receiver is difficult due to lack of manufacturer technical support for the obsolete device.

The roving GPS system and its associated base station operated well throughout the month. Batteries for roving receiver were tested extensively, including one long-term cold temperature lifetime test after the battery charge was reported to be dropping quickly. Tests confirmed that the batteries meet specifications. The Peterman Island project, B-086-E, was assisted in the use of their GPS roving system. Project B-013-P was also assisted with use of second repeater antenna for roving system. The high-power portion of the corrector radio transmitter was fixed with the help of the communications technician. This will allow for the resumption of farther transmission of corrector signals for remote real-time precision surveys. A test was conducted of the reception of high-powered correctors on Dream Island without a repeater antenna. Test showed that correctors were not able to be received, likely due to no direct line of sight.

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 130 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.

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. The project engineer implemented local decoding of Automatic Weather Station (AWS) data using the Satellite Data Ingestor computer. The project engineer was assisted with using a local time server for the project computer.

The Bonaparte Point AWS station stopped transmitting and was serviced. Cycling of the power brought the station back up, and a status of several station components was forwarded to the PI. Another failure later in the month was also fixed with a quick power cycle of the station.

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

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.

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. Mid-month, data transfer rates were abnormal and the problem was traced to a down server at Stanford. No data was lost during this period. A fan was added to the rack electronics to cool an abnormally warm line filter. A few short periods of anomalous data were reported to the project. A batch of consumables that had been erroneously received by another department was located. One data outage of approximately 20 hours occurred due to the failure of the data acquisition software. After a restart of the software, data acquisition continued normally.

The VLF antenna cable was serviced due to early melting out of the guide poles on the lower portion of the glacier. Several prussic knots were also found to be frayed and broken and were replaced or rotated. Update on present state of cable fastening tests and ideas for alternatives to try in the future were forwarded to project contacts.

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. A few passes failed to be captured during the month and the problem was fixed after rebooting the data acquisition computer twice. One ice image was produced for operations and planning for the R/V Laurence M.

Gould. Automatic post-processing of locally acquired satellite images was modified to produce images for upcoming LTER cruise.

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 flawlessly throughout the month. Plans for the possible replacement of the data acquisition computer were made with 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.whoi.edu/tsg/>.

The system has operated well throughout the month. Small periods of unavailable data on the remote TSG website were reported to PI. Data disturbances due to sea water intake maintenance were reported to PI.

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 is 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.

The system operated normally throughout the month. Filter samples were prepared for shipment and archival. One blank sample was prepared at the request of the CTBTO. The procedure for preparation of a blank filter were finalized and updated. A request for a normal sample to be sent to a special laboratory was received and will be carried out.

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 operated fine throughout the month. The tide gauge data acquisition was switched to a new rack-mount computer after all necessary configuration and software installation. The switch was particularly work intensive due to the obsolete operating system, Windows 98, required by the data acquisition software. The system is operating normally with a few small operational changes that do not affect the data.

A spreadsheet showing predicted tide levels was modified to display locally relevant data and was shared with interested groups on station and added to the Palmer Intranet.

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 is 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).

Isobaric charts were sent to R/V Laurence M. Gould in support of the current cruise. Weekly weather data summaries were sent to the Antarctic Sun. Several years of historical weather data was added to climate data spreadsheet available on the common drive to complete the historical monthly record of digitally acquired weather data.

MAWS and PalMOS data acquisition computers were restarted a few times throughout the month after routine Windows Update installations. Weather synoptic emails failed to be delivered to NOAA/NWS for entry into the GTS for a few days. The problem was traced to the NOAA mail server and were fixed by NOAA. MAWS data acquisition was switched to a new rack-mount computer after all necessary configuration and software installation. The system is operating normally.

The Automatic Weather System on Bonaparte Point that failed near the end of last month was repaired and inspected. Another failure was also repaired with a quick power cycle of the station.