

PALMER STATION MONTHLY SCIENCE REPORT

FEBRUARY 2016



Watercolor illustration of the snowy sheathbill. *Image Credit: Terri Nelson (W-488-P) © 2016*

NEWS FROM THE LAB

Carolyn Lipke, Summer Laboratory Supervisor

This month we were quite busy with two *ARSV Laurence M. Gould* (LMG) port calls, seven cruise ship visits, one yacht visit, and a visit by the Argentinian naval vessel *Suboficial Castillo*. The Gao group (O-231-P) concluded their first field season at Palmer Station and the Amsler/Baker/McClintock group (B-022-P) arrived at the end of the month.

We all had the pleasure of attending a field sketching lecture, presented by our artist in residence Terri Nelson. She encouraged us all to take the time to sit and observe this ecosystem that we all live and work in. She showed us how anyone, despite what they think their artistic talents are, can make useful visual observations. It's a good reminder to sometimes slow down and really look at the place where you are. Important observations are noticed that way, instead of just conducting drive by sampling. You'll find our field sketches throughout this report.

FEBRUARY 2016 WEATHER

Mark Dalberth, Research Associate

| |
|---|
| Temperature |
| Average: 1.2 °C / 34.1 °F |
| Maximum: 7.2 °C / 45.0 °F on 27 Feb 14:15 |
| Minimum: -2.9 °C / 26.8 °F on 11 Feb 03:38 |
| Air Pressure |
| Average: 982 mb |
| Maximum: 1005.1 mb on 2 Feb 02:03 |
| Minimum: 957.4 mb on 16 Feb 11:24 |
| Wind |
| Average: 8.5 knots / 9.8 mph |
| Peak (5 Sec Gust): 47 knots / 54 mph on 18 Feb 19:05 from 10 deg |
| Prevailing Direction for Month: NW |
| Surface |
| Total Rainfall: 58.2 mm / 2.3 in |
| Total Snowfall: 1 cm / 0.4 in |
| Greatest Depth at Snow Stake: 0 cm / 0 in |
| Sea Ice Observation: The whole month there were more than 20 icebergs in the area with associated brash. |
| Average Sea Surface Temperature: 0.3 °C / 32.5 °F |

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

Dr. Chuck Amsler and Dr. Jim McClintock, University of Alabama Birmingham; Dr. Bill Baker, University of South Florida, Principle Investigators

Personnel on Station: Bill Baker, Charles Amsler, Margaret Amsler, and Ryan Young

B-022 arrived at Palmer late on the afternoon of 26 February with LMG16-02. Initial efforts have centered on setting up our lab space, dive locker, and our portion of the aquarium building as well as on mandatory boat training.

We are grateful for the generous and professional assistance of numerous ASC staff in assisting our set-up activities. Carolyn Lipke, Gabby Inglis, Mark Dalberth, Dave Moore, and Jennie Mowatt deserve special thanks for facilitating our efforts.

B-256-P: COLLABORATIVE RESEARCH: WINTER SURVIVAL MECHANISMS AND ADAPTIVE GENETIC VARIATION IN AN ANTARCTIC INSECT

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

Personnel on station: Richard Lee, David Denlinger, Natalie Ylizarde, J.D. Gantz, and Drew Spacht

Field collections of midge larvae continued this month on numerous islands and peninsulas. We now have an extensive collection of larvae from different microhabitats within several islands as well as samples from most of the nearby islands. These samples will provide a robust data set for our studies of population structure and gene flow between islands, and adaptive genetic variation in diverse larval microhabitats.

In previous years, we only observed adults and egg masses in early to mid-January. Interestingly, adults were commonly observed throughout January and into February, likely a consequence of the unusually low temperatures, approximately 2-3°C lower than during this summer field season (Fig. 1), and an extended period of snowcover for many of larval microhabitats.

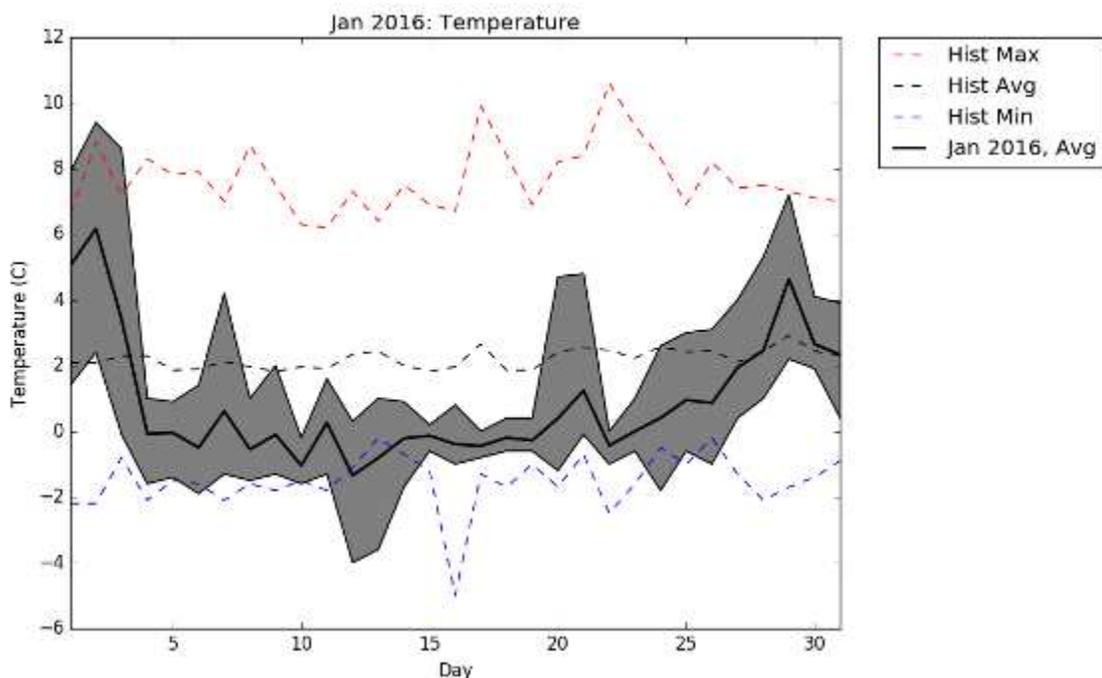


Figure 1. Plot of daily temperature in January 2016. Shown in black/shaded gray is the daily average, the minimum, and the maximum for this year. The dotted lines on the graph indicate average, minimum, and maximum values for “historical values” for 2002 to 2015. (We thank Mark Dalberth for providing these data and the figure.)

At the beginning of February, our team launched a new educational outreach website called “A Fly on the Pole” (www.aflyonthepole.com). This website features an interactive blog, photo and video galleries, and a variety of educational resources for K-12 teachers. Updated daily by the educator on our team (Natalie), this site has so far attracted K-16 teachers and students from across 20 states. Natalie has also held Skype sessions, created personalized movies, and chatted live over the phone with classrooms from Palmer Station. She is currently creating a short movie for teachers on how engineering, a Next Generation Science Standards (NGSS) crosscutting concept, supports the science at Palmer Station.

We are grateful to station personnel for their continued support and helpfulness during our first field season on this project. We also thank the Shawn Farry, Ben Cook and Matt Porter for providing transportation to Dream Island.

C-013-P: PALMER LONG TERM ECOLOGICAL RESEARCH (LTER): LOOKING BACK IN TIME THROUGH MARINE ECOSYSTEM SPACE, APEX PREDATOR COMPONENT

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

Personnel on station: Bill Fraser, Shawn Farry, Ben Cook, Carrie McAtee, Darren Roberts, and Matthew Porter

On February 6th C-013 principle investigator Bill Fraser arrived at Palmer Station and Matthew Porter, our technician on loan from the Detroit Zoo, departed. On February 9th the Laurence M. Gould returned to Palmer Station with C-013 team members Carrie McAtee and Darren Roberts at the conclusion of the LTER cruise. Due to significant ice on the southern portion of the LTER grid several days of ship time were available for work in the Palmer area. On February 9th all C-013 personnel gathered on the LMG and transited to the Rosenthal Islands on the southwestern side of Anvers Island with the goal of conducting gentoo, chinstrap and Adélie chick counts. Large swell and high winds limited boating on February 9th and 10th; however on February 11th we successfully completed counts on all islands.

Back in the Palmer Station area Adélie penguin studies concluded this month with beach counts and measurements of Adélie fledglings. Adélie penguin foraging ecology studies were also concluded in February with the completion of our radio transmitter study on Humble Island. Gentoo penguin satellite tag deployments and diet studies on Biscoe Island also ended in February, however gentoo fledgling counts and measurements will continue into March.

Skua work continued with monitoring and banding of brown skua chicks on local islands as well as on Dream and Biscoe Islands. South polar skua reproductive monitoring on Shortcut Island continued throughout February as did the monitoring of the blue-eyed shag colony on Cormorant Island. Kelp gull surveys and chick counts were also completed for local islands. Giant petrel chick banding began in late February and should be completed by early March. Growth measurements of giant petrel chicks on Humble Island will continue through the end of the season. Monitoring of marine mammals continued in February with expected increases in fur seal number and decreases in elephant seal numbers.

ASC continued to provide great support this month with special thanks to Chuck Kimball for keeping our Humble Island penguin presence/absence receiver functioning. Also special thanks to Matthew Porter from the Detroit Zoological Society for all his assistance this season.

C-019-P: PALMER LONG TERM ECOLOGICAL RESEARCH (LTER): LOOKING BACK IN TIME THROUGH MARINE ECOSYSTEM SPACE, PHYTOPLANKTON COMPONENT

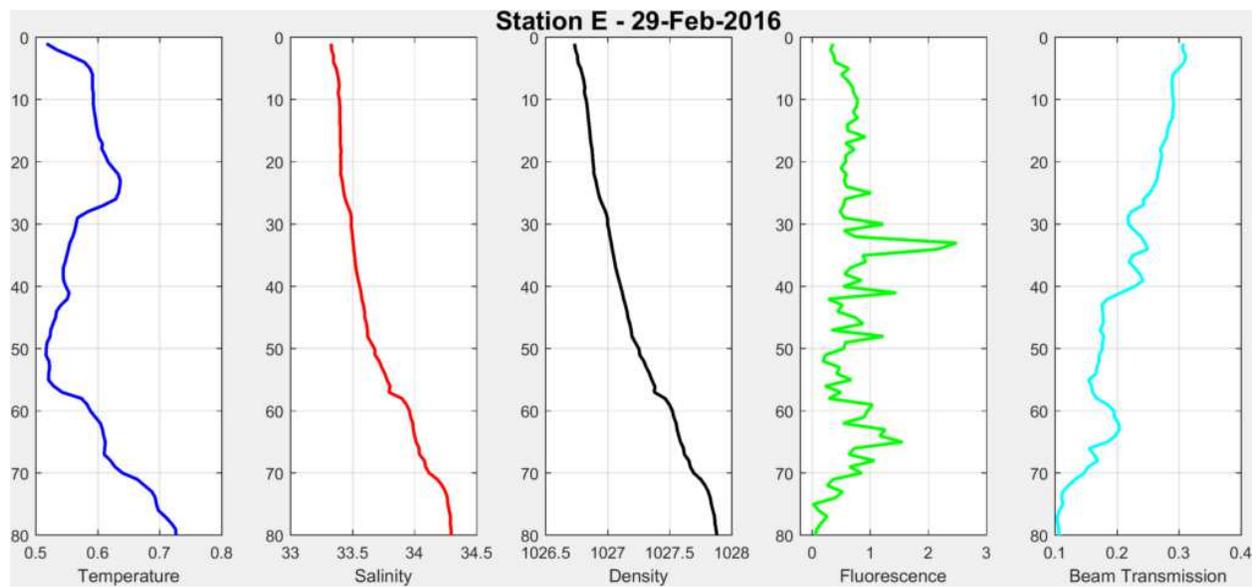
Dr. Oscar Schofield, Principal Investigator, Rutgers University, Institute for Marine and Coastal Sciences

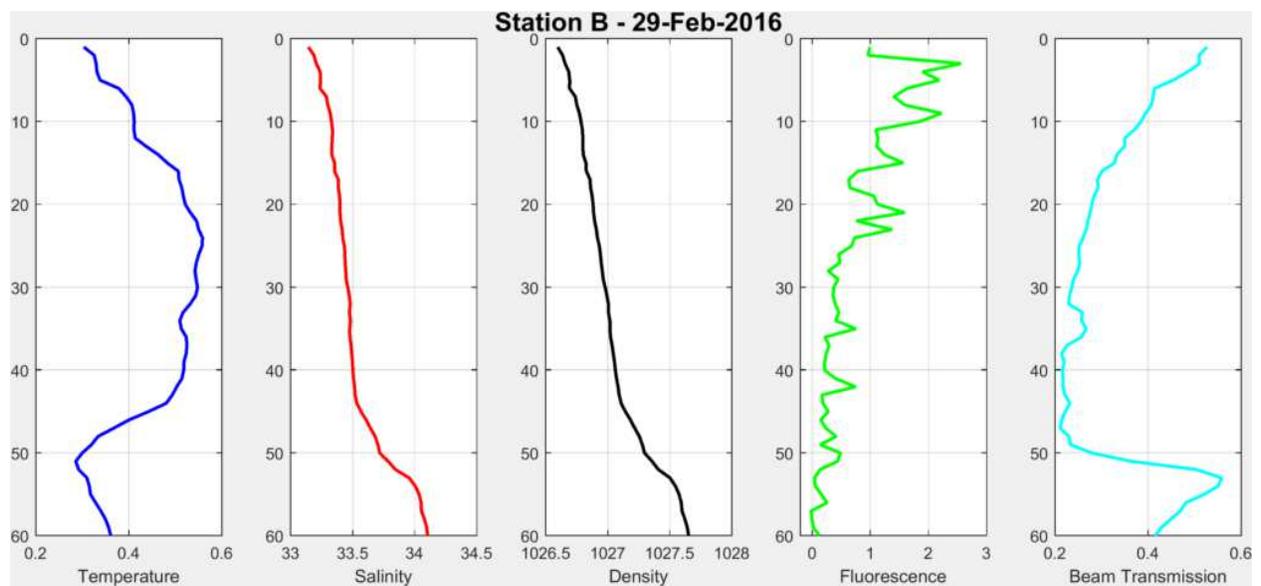
Personnel on Station: Mike Brown, Chelsea Farischon, Ashley Goncalves, and Emily Olsen

WHAT'S NEW? February was a very active month for the C-019 group! The 2016 LTER Cruise ended on February 11th and Nicole, Chelsea, and Ashley headed north with the Gould when it left. Emily Olson, a recently graduated Master's student, stayed behind after the cruise to continue the Palmer Station LTER sampling and assist Mike with his work. LTER sampling at the station was continued biweekly uninterrupted. Additionally, one run of Mike's incubation experiment was completed, and another subsequently initiated. We also retrieved two gliders: one deployed by Rutgers this month and one from the British Antarctic Survey. We also participated in another ORCAS flyover.

LTER DATA AND TRENDS:

Below are two interesting figures from our weekly LTER sampling. The weekend of Feb 27-28 was very windy, with sustained wind speeds of 40 knots. Initial visual inspection while filtering in the field on Monday Feb 29 suggested low biomass and a mixed water column, and this was verified back in the lab during sample processing and with the CTD data. The CTD profiles at both stations E and B showed a distinct mixed layer of ~50 meters due to the strong winds, and that likely explained the low biomass present in our samples.

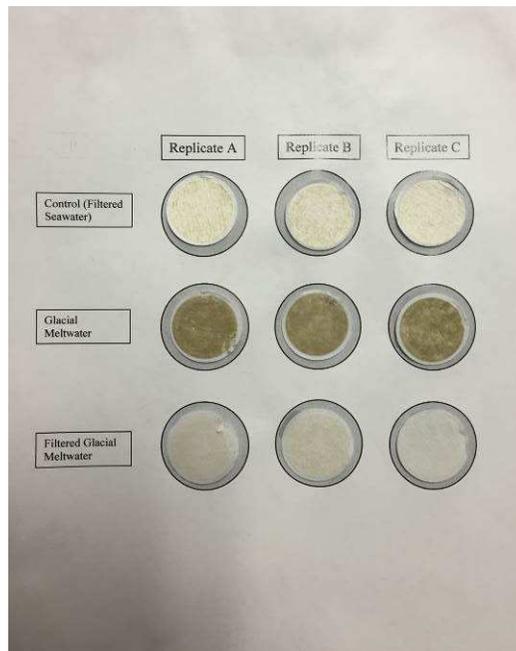




INCUBATION EXPERIMENT: In the January report we described an incubation experiment that Mike is running to examine the observed association between cryptophytes and low salinity water along the WAP. This experiment consists of treatments where either filtered or unfiltered glacial melt water is added to whole seawater, and incubated for a week, to see if a change in phytoplankton community composition occurs. As discussed, in February we completed one run of this experiment, and started another. Glacial melt water was collected in the backyard, and below is a picture of it:



As you can see, the water is quite cloudy, suggesting it might have some constituent (e.g. Fe or P) that could drive a community shift. Below are filters with collected biomass from the final day of the experiment.



There was nice consistency within treatments, and differences between them. The latter observation indicates that the phytoplankton responded differently to the various treatments, and perhaps there was a shift in community composition due to the glacial melt water. This will be verified in the lab back at Rutgers, and we will keep you posted!

Field Observation: by Emily Olson

Here at Palmer station, seals are a consistent presence. It is easy to forget, though, that these denizens of the icy sea are more than just occasional visitors to the side of your zodiac or the boat ramp on station. They are integral parts of the ecosystem here along the Western Antarctic Peninsula, and we were reminded of that in the field when we saw a seal, of unidentified species, chowing down on an unlucky prey item. The seals around station appear to spend the entirety of their days bobbing carelessly on ice floes and bergs, but in reality they are predators in this marine environment. To see one coming up with a kill was a brief glimpse into the reality of these seemingly cute and lazy creatures, reminding us that they are anything but.



Photos by Emily Olson

C-024-P: PALMER LONG TERM ECOLOGICAL RESEARCH (LTER): LOOKING BACK IN TIME THROUGH MARINE ECOSYSTEM SPACE, WHALE COMPONENT

Dr. Ari Friedlaender, Principal Investigator, Oregon State University, Newport, OR

Personnel on Station: Doug Nowacek, Logan Pallin, and Erin Pickett

For the month of February, the ‘whalers’ stationed at Palmer as part of the LTER, project C-024, have continued our two primary projects that involve humpback whale photo id/biopsy sampling and acoustic-based prey mapping. Upon completing the LTER research cruise in mid-February, Erin Pickett joined Logan Pallin at Palmer Station, and Dr. Doug Nowacek and Dr. Ari Friedlaender departed station. Despite our continued survey effort (116 hrs) within the Palmer boating area and beyond to Dream and Biscoe Islands, we observed few whales during the month of February (in fact, no whales were seen between Feb 4 and 21). We sighted a total of 7 whales this month and obtained photos and biopsy samples from all, with the exception of one calf that we did not biopsy sample (Fig 1). Overall there have been significantly fewer whales this year compared to last season where over 50 biopsy samples were obtained in the month of January alone. Our satellite tracking data from the January LTER cruise and the limited photo identification data we have both indicate that the few whales we have seen this season have moved through this area rather quickly. In addition to whale surveys, we completed 16 active acoustic surveys this month. Overall we found that krill patches were sparsely distributed and aggregations were generally found between 75 and 150 meters. In addition to our main projects this month, we opportunistically collected three fecal samples that will be used for future crabeater seal diet studies. Finally, we both contributed to and benefitted from collaborative assistance with other LTER projects operating at Palmer; the collaboration between and among the projects was evident and helpful and we would like to thank all those who have helped guide us to whales in the area.



Figure 1. Presumed humpback mom and calf sighted near Dream Island on the 22nd of February.

C-045-P: PALMER, ANTARCTICA LONG-TERM ECOLOGICAL RESEARCH (LTER): CLIMATE MIGRATION, ECOSYSTEM RESPONSE AND TELECONNECTIONS IN AN ICE-DOMINATED ENVIRONMENT: MICROBIAL / BIOGEOCHEMICAL COMPONENT

Dr. Hugh Ducklow, Principal Investigator, Columbia University, Lamont Doherty Earth Observatory

Personnel on Station: Rachel Kaplan and Conor Sullivan

February was an exciting month for the microbial/biogeochemical component of the Palmer LTER. Our sampling efforts at Palmer were uninterrupted by weather, and the annual LTER cruise returned to station in the middle of the month after an exceptional cruise sampling along the Peninsula. In addition to our regular LTER sampling, we collected the third year of soil temperature data from loggers deployed in the Palmer backyard in 2013, and helped the C-019-P group set up a series of experiments studying the effect of glacial meltwater on phytoplankton community dynamics. We also teamed up with C-019-P to recover a glider on behalf of our colleagues at the British Antarctic Survey, ending its incredible journey north from Rothera Research Station. Finally, we celebrated Leap Day by performing only the second Leap Day sampling event in the history of the bacterial dataset.

Bacterial production was elevated at both station B and E for most of the month of February, with spikes in integrated production on February 8 and 18-22, and on the 29th after a substantial decrease in production on the 25th (Fig. 1). Interestingly, we also observed that the average temperature of the water column at both station B and E increased linearly from the beginning of the season through January, and then leveled off around 0.3°C and 0.4°C, respectively (Fig. 2).

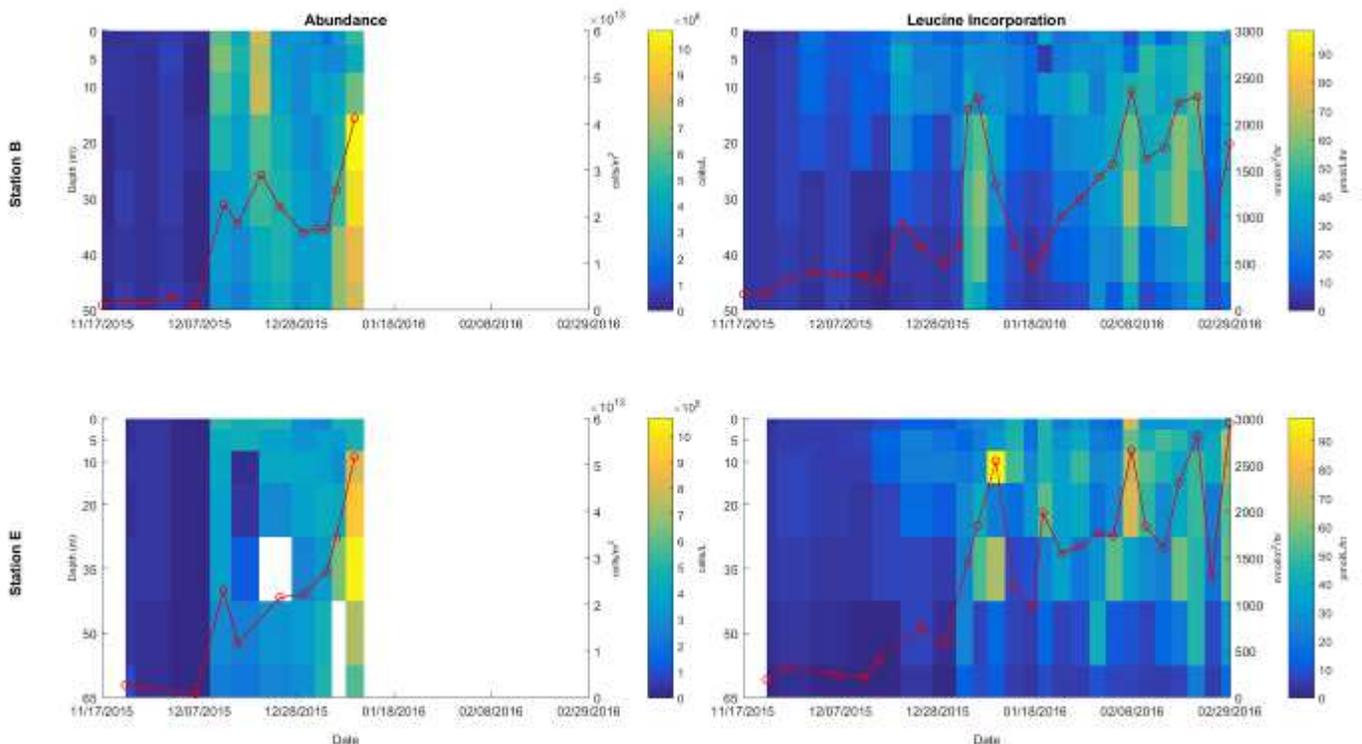


Figure 1: Bacterial abundance and production (3H-Leucine incorporation) at PAL LTER stations B and E. The red line shows depth-integrated values at each sampling date (right vertical axis). The colored blocks show values at each discrete depth and sampling date (the intersection of depth and date for a given measurement falls within its corresponding block). White blocks signify missing data.

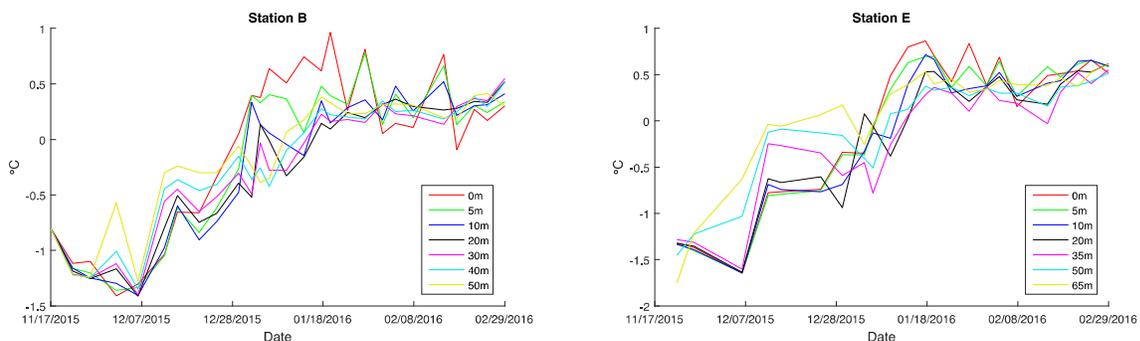


Figure 2: Temperature over time at discrete depths at PAL LTER stations B and E. Each line represents a different depth.

Field Observation: by Rachel Kaplan

March 5, 2016

2232

Wind: NE 4 kt, gusting 5 kt

-1° C

Pressure 992 mb and falling slowly

I was brushing my teeth at 2220 when I heard that the stars were out, and Orion's Belt visible. I hadn't seen stars since coming south in January, and went to the walkway by the galley to look. It felt colder than -1° C, so I only stayed long enough to see the Southern Cross and follow its point to the pole. Light on the horizon turned the clouds above Janus and DeLaca deep blue, and only four of the five stars in the Cross were visible. As I turned to go inside, the glacier calved, so loudly that I jumped. The *crack* was so booming and sustained I wondered for a few seconds whether it really was a calving event, or an explosion.

O-231-P: QUANTIFYING ATMOSPHERIC IRON PROPERTIES OVER WEST ANTARCTIC PENINSULA

Dr. Yuan Gao, Principle Investigator, Rutgers University

Personnel on Station: Yuan Gao and Shun Yu

Air sampling for the 2015-2016 season at Palmer backyard was successfully finished by 5 February 2016, and the team departed Palmer on Feb 13, 2016 on LMG16-01. During this season, bulk aerosol samples were collected by a high-volume aerosol sampler for the concentrations of a suite of atmospheric trace elements and species. The size-segregated aerosol samples were also collected for mass-size distributions to constrain atmospheric dry deposition velocity, a key parameter for atmospheric dry deposition calculations. Both total atmospheric deposition and wet deposition-only were sampled. Individual aerosol particles were also collected for chemical composition. Sampling of surface snow was made on the glacier and around Palmer. The operation of aerosol samplers was controlled by a wind sector to minimize local impact. A portion of the aerosol samples was analyzed for atmospheric Fe speciation in the

Palmer lab, using a spectrometer module with a 200 cm liquid waveguide capillary flow cell. Samples and analytical devices were handled within a HEPA-filtered laminar flow 100-class clean-room bench in the lab. The results we generated in the Palmer lab are intriguing and promising, and some are the data that we had never seen before! We didn't get more samples analyzed as we wished due to the time limit. Later in this season, however, we faced an unexpected problem: one key sampler stopped running and this sampler should operate throughout the winter at Palmer under this project. We are grateful to Jeff Keller and Gabby Inglis for trying their best to fix the instrument during that time and to Joe Bissonnette who worked with us at every step on problem solving even though he was off site. Thanks to Adam Rivers on the electricity aspect- Adam spent his spare time to work on our problems besides during work days and to Mark Dalberth who helped a great deal with our positioning the wind sector and met data. We thank Dave Morehouse and Tyler Regan for making our packing and shipping such a smooth process at the end. Carolyn Lipke is the best lab supervisor we could ever have who is always on the top of everything and our work wouldn't have got done this much without her!

W-488-P: OBSERVING THE SNOWY SHEATHBILL AND ITS BEHAVIOR

Ms. Susan McCarthy, Principle Investigator, San Francisco, CA; Ms. Terri Nelson, Collaborator, Portland, OR

Personnel on Station: Susan McCarthy and Terri Nelson

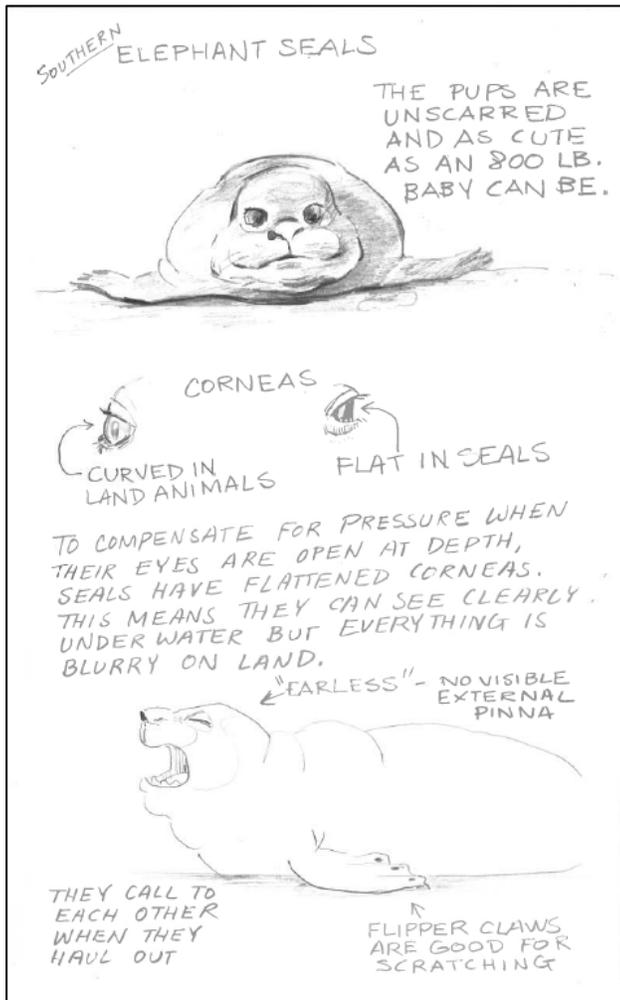
Work on drafting and illustrating the sheathbill book is underway.

Unfortunately, all three nests at Palmer Station have failed. Locating sheathbills away from station continues to be unsuccessful. Reports from Fraser's bird research team confirm that they are not present elsewhere in the near vicinity of the station. Frustratingly, we hear that sheathbills are seen in the somewhat wider area, including chicks. Port Lockroy, Paradise Bay, and the Rosenthals are among locations mentioned.

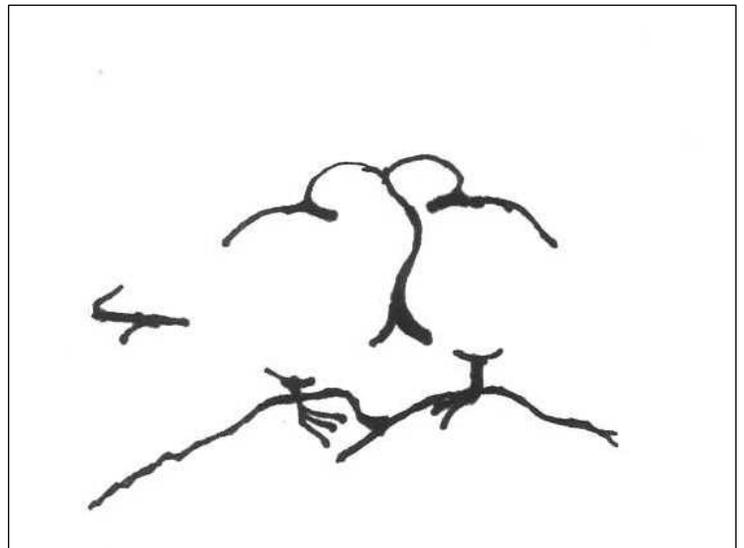


All three pairs remain on station, and it is useful and interesting to observe their behavior in the absence of chicks. With the kind help of Fraser's team, we have examined a specific site near the station where sheathbills formerly nested in a now-defunct cormorant colony.

A photograph taken in February by project member Terri Nelson shows the presence of the curious wing spur they possess, possibly the first time this has been documented on a living sheathbill.



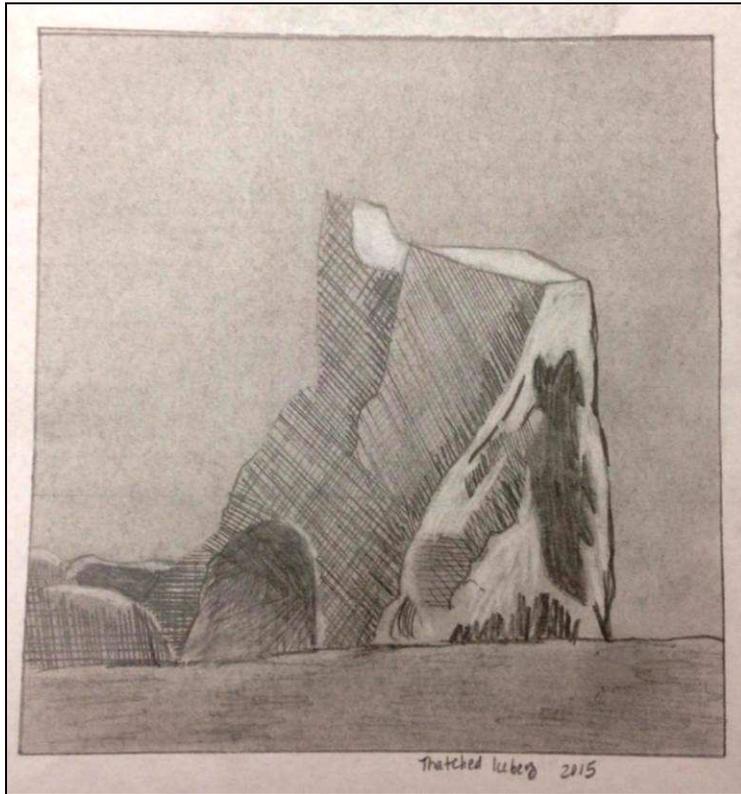
Field Sketch by Terri Nelson © 2016



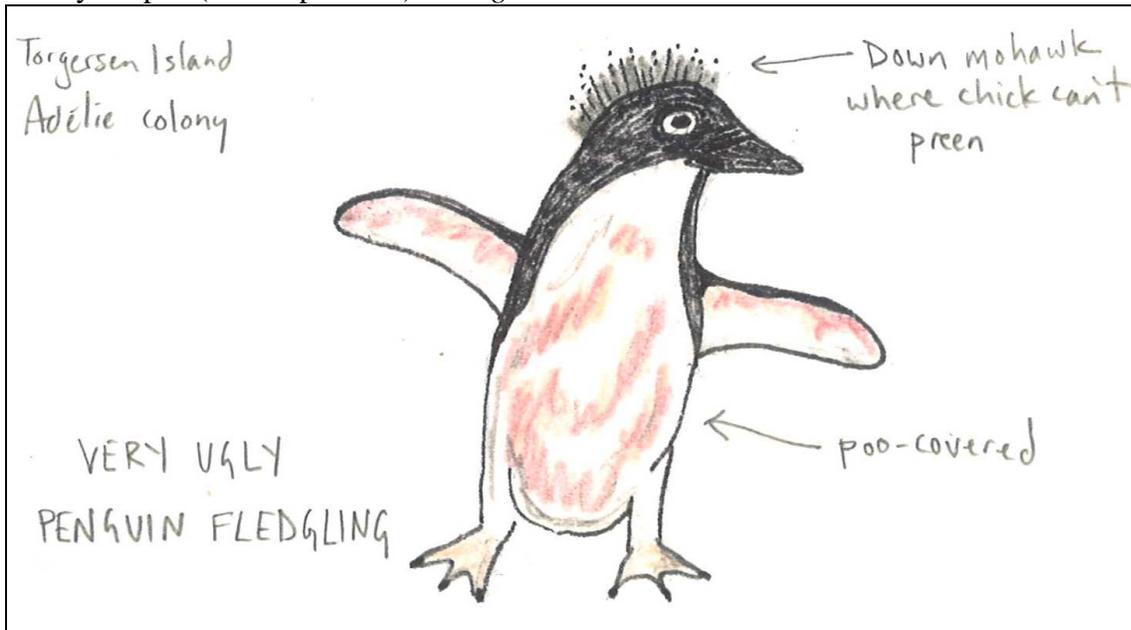
Field Sketch "together whatever" by Susan McCarthy

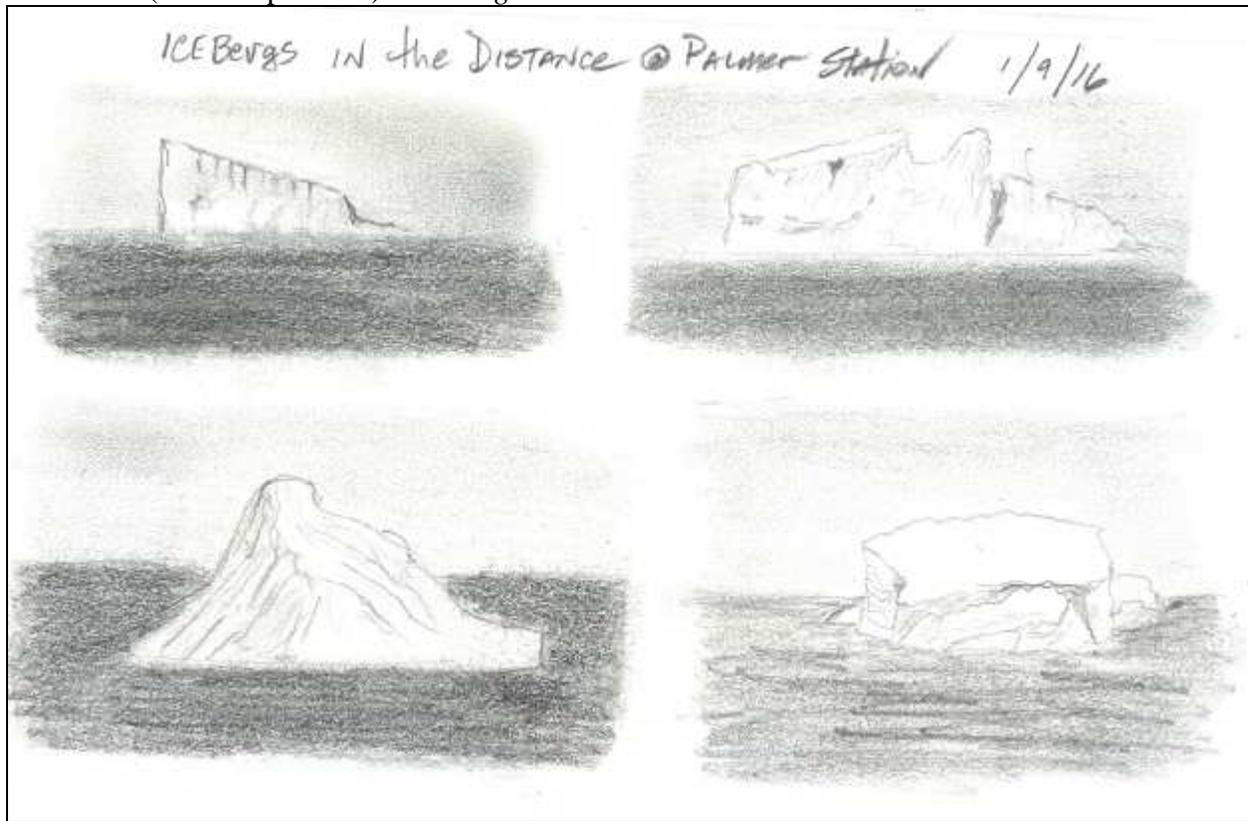
Field Sketches by ASC staff

Jamee Johnson (Peninsula Science Manager) - *Thatched Iceberg*



Carolyn Lipke (Lab Supervisor) – *Torgersen Adélie's 8Feb16*





**PALMER STATION
RESEARCH ASSOCIATE MONTHLY REPORT
FEBRUARY 2016**

Mark Dalberth

**B-005-P: IMPACTS OF LOCAL OCEANOGRAPHIC PROCESSES ON ADELIE
PENGUIN FORAGING OVER PALMER DEEP: COASTAL OCEAN DYNAMICS
APPLICATIONS RADAR (CODAR)**

Josh Kohut, Principal Investigator, Rutgers University

The CODAR system consists of three transmitters/receivers located on Anvers Island, Wauwerman Island and on Howard Island in the Joubins. The data from all three transmitters is compiled on computers in Terra Lab and plots of the surface currents over the Palmer Deep are generated.

The system operated normally this month. We were able to exchange an external hard drive at the Joubin's CODAR site for the grantee.

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

Kent Anderson, Principal Investigator, Incorporated Research Institutions for Seismology (IRIS)

Station PMSA is one of more than 150+ sites in the GSN, monitoring seismic waves produced by events worldwide. Real-time telemetry data is sent to the U.S. Geological Survey (USGS). The Research Associate operates and maintains on-site equipment for the project.

The system operated normally throughout the month. A lock was put on the seismic hut door.

A-109-P: ANTARCTIC EXTREMELY LOW FREQUENCY/VERY LOW FREQUENCY (ELF/VLF) OBSERVATIONS OF LIGHTNING AND LIGHTNING-INDUCED ELECTRON PRECIPITATION (LEP).

Robert Moore, Principal Investigator, University of Florida

ELF/VLF radio wave observations at Palmer Station are used to provide a deeper understanding of lightning and its effects on the Earth's inner radiation belt. The Research Associate operates and maintains on-site equipment for the project.

The VLF/ELF system has operated well throughout the month. I changed the external hard drives.

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

Mathew Lazzara, Principal Investigator, University of Wisconsin

The AMRC 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 Research Associate operates and maintains on-site equipment for the project.

The data ingestor computer system has been operating normally all month.

O-231-P: QUANTIFYING ATMOSPHERIC IRON PROPERTIES OVER THE WESTERN ANTARCTIC PENINSULA

The primary goal of this project is to quantify atmospheric iron properties in the marine atmospheric boundary layer of the Western Antarctic Peninsula (WAP). The specific objectives are to identify the sources of atmospheric iron; determine iron solubility, aerosol composition, and the iron-sulfur relationships; and to measure the temporal and spatial variability of atmospheric iron/dust fluxes.

The Gao group has left two samplers operating on the platform in the backyard. There is a Total Deposition Sampler and a Wet Deposition Sampler. The samplers need to be covered when the LMG is tied up at the pier, or when incinerating chicken bucket waste. Dr. Gao taught me the procedures to collect these samples every 3-4 weeks. Dr. Gao will be back later this year to finish installing a high volume air sampler.

O-264-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 help to determine rates of marine biological productivity and ocean mixing as well as 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. The Research Associate collects samples fortnightly from Terra Lab.

Air samples were taken on schedule this month. To make the flasks on-hand last until more arrived on LMG16-02, I only sampled two instead of three a couple of times this month. We received six boxes of flasks on LMG16-02, so we have enough for three months now.

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

Don Neff and Steve Montzka, Principal Investigators, National Oceanic and Atmospheric Administration / Global Monitoring Division; Boulder, CO

The NOAA ESRL Carbon Cycle Greenhouse Gases (CCGG) group makes ongoing discrete measurements to document the spatial and temporal distributions of carbon-cycle gases and provide essential constraints to our understanding of the global carbon cycle. The Halocarbons and other Atmospheric Trace Species (HATS) group quantifies the distributions and magnitudes of the sources and sinks for atmospheric nitrous oxide (N₂O) and halogen containing compounds. The Research Associate collects weekly air samples for the CCGG group and fortnightly samples for the HATS group.

Samples were collected for both CCGG and HATS this month. The HATS flasks that were shipped to the South Pole arrived on the LMG16-02SB.

O-264-P: ULTRAVIOLET (UV) SPECTRAL IRRADIANCE MONITORING NETWORK

James Butler, Principal Investigator, National Oceanic and Atmospheric Administration / Global Monitoring Division; Boulder, CO

A Biospherical Instruments (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. A BSI GUV-511 filter radiometer, an Eppley PSP Pyranometer, and an Eppley TUVR radiometer also continuously measure hemispheric solar flux within various spectral ranges. The Research Associate operates and maintains on-site equipment for the project.

The system operated well this month, but it did lose wavelength calibration once. The grantees gave me a procedure to calibrate the wavelength should this happen again. This has been occurring about once every month this season.

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

Mathew Lazzara, Principal Investigator, University of Wisconsin

AWS transmissions from Bonaparte Point are monitored using the TeraScan system and the University of Wisconsin's Data Ingestor system. Data collected from this station is freely available from the University of Wisconsin's Antarctic Meteorological Research Center (AMRC) website. The Research Associate monitors data transmissions for the project and performs quarterly maintenance on the station at Bonaparte Point.

The system operated normally throughout the month.

T-295-P: GPS CONTINUOUSLY OPERATING REFERENCE STATION.

Joe Pettit, Principal Investigator, UNAVCO

Continuous 15-second epoch interval GPS data files are collected at station PALM, compressed, and transmitted to the NASA-JPL in Pasadena, CA. The Research Associate operates and maintains on-site equipment for the project.

The system operated normally.

T-312-P: TERASCAN SATELLITE IMAGING SYSTEM

The TeraScan system collects, processes, and archives DMSP and NOAA satellite telemetry, capturing approximately 25-30 passes per day. The Research Associate operates and maintains on-site equipment for the project. The TeraScan weather and ice imagery is used for both research and station operations.

The system has been operating well. The data from it has been used to support O-541 (ORCAS) and the Lamanna (G-182-N) cruise. A spare antenna cable was moved out of T-5 for storage in the warehouse in Punta Arenas.

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. The Research Associate maintains the on-site system.

The magnetometer was operational all month.

A-373-P: TROPOSPHERE-IONOSPHERE COUPLING VIA ATMOSPHERIC GRAVITY WAVES

Vadym Paznukhov, Principal Investigator, Boston College

The goal of this project is to enhance the comprehensive research understanding of troposphere-ionosphere coupling via Atmospheric Gravity Waves (AGWs) in the Antarctic region. Both experimental and modeling efforts will be used on the Antarctic Peninsula to investigate the efficiency and main characteristics of such coupling and will address several questions remaining in the current understanding of this coupling process.

The system operated well throughout the month.

T-998-P: INTERNATIONAL MONITORING STATION (IMS) FOR THE COMPREHENSIVE NUCLEAR TEST BAN TREATY ORG. (CTBTO)

Managed by General Dynamics

The IMS Radionuclide Aerosol Sampler and Analyzer (RASA) is part of the CTBTO verification regime. The automated RASA continually filters ambient air and tests for particulates with radioisotope signatures indicative of a nuclear weapons test. The Research Associate operates and maintains the instrument.

The system operated normally throughout the month.

OCEANOGRAPHY

Daily observations of sea ice extent and growth stage are also recorded, along with continuous tidal height, ocean temperature, and conductivity at Palmer's pier.

Daily observations of the ice around station were made.

After removing files from the tide gauge data logger SD card, it stopped putting new headers in the middle of data files. I also updated the data logger's firmware at the urging of the vendor.

I stopped the ocean color images at the end of the LTER cruise.

METEOROLOGY

The Research Associate acts as chief weather observer, and compiles and distributes meteorological data. 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 three hours by the Palmer Meteorological Observing System (PalMOS) and emailed to the National Weather Service for entry into the Global Telecommunications System.

I've continued sending out an email to station personnel with weather forecasts from the Antarctic Mesoscale Prediction System (AMPS). Links to these forecasts have been created on the station's intranet, so this practice can end once the grantees leave this season. Also, I have

made animations from weather charts that I download daily from the AMPS website. These are also available on the intranet.

The antenna for the remote weather stations was put in its permanent location in the northeast corner of Terra Lab.

We installed a remote weather station on Howard Island in the Joubin's, and it is currently collecting data. I made a script that graphs the data and these graphs are available on the station's intranet.