

PALMER STATION MONTHLY SCIENCE REPORT

JANUARY 2015



Adélie penguin with satellite transmitter on a foraging trip. Adélie penguins are outfitted with satellite transmitters for three to four days at a time to evaluate foraging trip locations and dive depths. This was a chance sighting of one of three tags currently deployed on Adélies by the Fraser LTER team (C-013-P). (Image Credit: Sean Bonnet)

NEWS FROM THE LAB

Josh Kohut, Station Science Leader and Carolyn Lipke, Summer Laboratory Supervisor

As usual, January was the peak of the summer science season at Palmer Station, with 22 grantees working down in the lab and eight zodiacs in operation. The pace of science this month was fast and furious. Looking back, it is amazing how much work has been done. This work involved a lot of zodiac time, as is evidenced by the six and a half drums of gasoline we went through in January. We want to send a huge thank you to our Marine Technician Rosemary McGuire for facilitating all of that boating, and doing so with a smile.

The month began with an *ARSV Laurence M. Gould* (LMG) port call marking the beginning of the annual LTER cruise. This is the 23rd year of the LTER cruise and it's always a bit like a family reunion when they stop by Palmer. This month we also welcomed the Saba and Friedlaender groups to station (B-068-P and C-024-P), who will be studying krill physiology and local whale demography respectively. We also had four cruise ship visits, and three visits by

small yachts. One yacht was picking up a group of mountaineers that had just climbed Mount Rennie, a 1554 meter peak on the interior of Anvers Island. A small group from the newly re-opened Chilean station Yelcho also stopped by one day in their zodiac. It was fun getting to meet our new neighbors.

January brought us many nice weather days, but also our first big rains of the season. Shovels have been traded in for mops. We all enjoyed a fun Trivia Night, and celebrated the first sightings of two sheathbill chicks (the nest is under the Mash and Grind deck again). Another highlight of the month was the morning we awoke to find a leopard seal lounging on the floating dock. As the month comes to a close we're preparing for the LMG to return at the end of the LTER cruise. We'll say goodbye to the Friedlaender group, and several others, and wish everyone a smooth crossing on their trip home.

JANUARY 2015 WEATHER

Mark Dalberth, Research Associate

The big weather news for January is that the snow has finally melted away leaving only isolated pockets where it was drifted in. The snow stake measurement was zero on January 9. The skuas and kelp gulls are enjoying the resulting melt pond in the backyard behind Terra Lab. Earlier in the season I had seen skuas sitting in the snow in that location. They seemed to be waiting for the pond to form. The melted precipitation was 53 mm for the month.

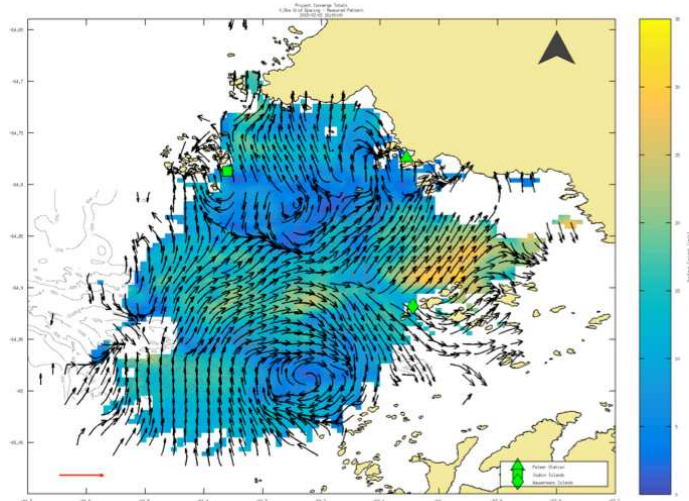
The maximum and minimum temperatures for the month were 7.9 C and -2.2 C and the average temperature was 1.7 C. The 26 year average is 2.2 C. On January 23, we experienced the month's highest wind gust of 45 knots. The average wind speed was 7 knots which is right on the 26 year average. Sea ice has kept away from station although we have had six to seven large icebergs in the area for the entire month.

The weather has been generally good for boating operations although towards the end of January a series of low pressure systems moved across the Peninsula from the Bellingshausen Sea and brought high winds and rain.

B-005-P: COLLABORATIVE RESEARCH: IMPACTS OF LOCAL OCEANOGRAPHIC PROCESSES ON ADÉLIE PENGUIN FORAGING ECOLOGY

Dr. Josh Kohut, Principal Investigator, Rutgers University, Institute for Marine and Coastal Sciences; Dr. William R. Fraser, Co-PI, Polar Oceans Research Group; Dr. Kim Bernard, Co-PI, Oregon State University; Chris Linder, Co-PI; Dr. Matt Oliver, Co-PI, University of Delaware; Hank Statscewich, Co-PI, University of Alaska Fairbanks; Dr. Peter Winsor, Co-PI, University of Alaska Fairbanks

Personnel on Station: Kim Bernard, Megan Cimino, Josh Kohut, Chris Linder, Matt Oliver, Hugh Powell, Shenandoah Raycroft, and Katherine Todoroff

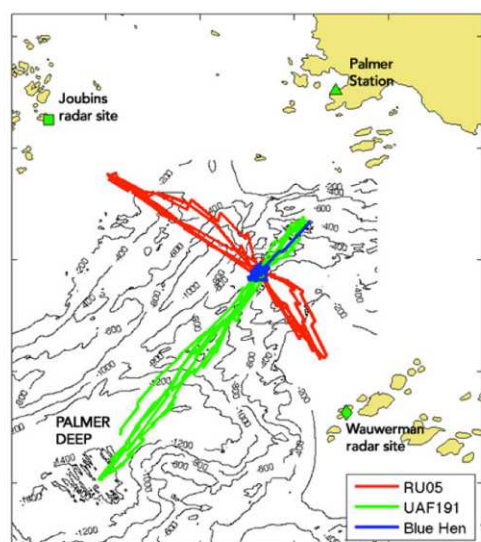


January 2015 was the continuation of the CONVERGE field season. In addition to the continuation of the zodiac based krill surveys and the HF radar sampling, we deployed underwater gliders and coordinated with the penguin tracker data of the Fraser birder team

Codar: The CODAR network deployed by Peter Winsor's team (UAF) in November 2014 operated throughout the month. Data was delivered in real time through the Palmer Station network back to Rutgers for processing. Real-time maps of surface currents were calculated

each hour across Palmer Deep (example above). Over the month we visited each site in the network. At each site we completed required maintenance along with calibration runs at the Joubin Island and Palmer Station sites. The Remote Power Modules at each outer island site have now been running for 81 days. Over that time the battery bank has not dropped below 25.5 volts at either site since installation that tells indicates there has been plenty of charging from the sun and wind to keep the systems running continuously.

Glider AUVs: On Jan 5, two days after the larger CONVERGE team arrived at Palmer Station, we deployed four gliders (UD, UAF, 2 from RU), a record for number of deployments in one day at Palmer. Three gliders supported project CONVERGE and the forth supported PAL-LTER (C-019). The UAF glider, outfitted with lithium primary batteries, is running an along canyon transect between Station E and Palmer Deep. The Rutgers glider is running a cross canyon line with a single section inside the boating limit that was coordinated with the zodiac krill surveys. The Blue Hen (UD) is running a station keeping mission at the intersection of the UAF and RU lines (Below). The gliders are equipped with various sensors including a CTD, Aquadropp, optics sensors, and oxygen optode. These gliders will continue to fly in along/across canyon transects, or station keep in one region for a few more weeks as battery life allows.

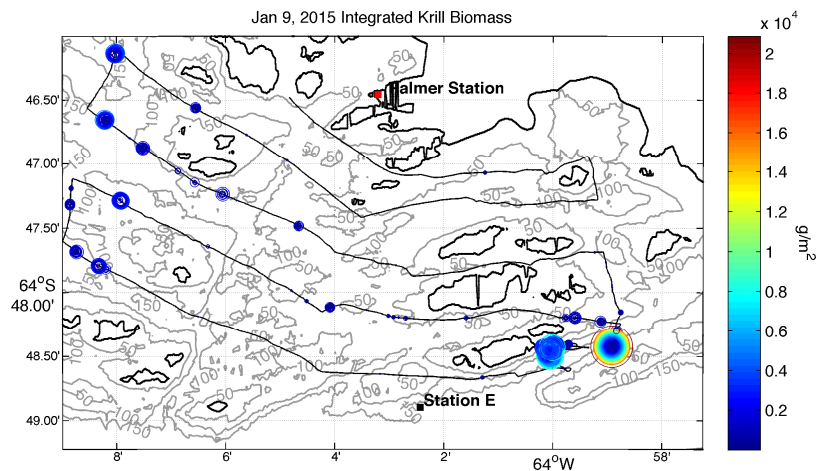


Zodiac based krill surveys: To date, we have completed 12 full grid acoustic surveys and 6 targeted acoustic surveys (Below). Krill biomass within the Palmer Station nearshore boating limit was highly variable, with "catch per unit effort" ranging from <1 g/m² (integrated through the depth of the water column or to 250m, whichever was shallowest) to 300 g/m². *** Our estimate of catch per unit effort is total integrated biomass (g/m²) divided by survey length (km) *** On January 9 we were able to catch a small sample of krill off Jacob's Island. We used these individuals to measure length frequencies. The krill population is currently dominated by large individuals ~40mm in length.

Penguin Telemetry: From Jan 5 - 24, 15 Adélie penguins were tagged with satellite transmitters and time depth recorders. Since Jan 27, we tagged five gentoos penguins and the Fraser group will continue to switch out transmitters until the chicks fledge. In general, the Adélies foraged in nearshore waters between Palmer Station and Outcast Islands while the gentoos foraged between Biscoe point, Wauwerman Islands and into Palmer Deep. The Adélies foraged in the upper 50m (with a maximum depth ~ 80m) of the water column while the gentoos foraged at deeper depths up to 120m. The penguins have been foraging within the CODAR range and occasionally, near the gliders in Palmer Deep.

Broader Impacts: To date the broader impacts team have published 25 posts, not counting the post in November we put together documenting the installation of the CODAR sites off LMG 14-10. These posts feature 212 photos and just over 30,000 words (see <http://coseenow.net/converge/>). The blog has had 515 comments, including both questions and the answers we provided (with about 40 more still to answer during the crossing north across the Drake Passage). So far, the blog has received just over 43,000 views. Students following the blogs interacted directly with the scientist through 8 30-minute blackboard session VTCs. We also conducted two 1-hour VTCs with the general public via the Cornell Lab of Ornithology. They've attracted 4,882 total views so far (view count is growing because people are viewing archived videos of the sessions).

We would like to thank all station staff for their support of our project. We recognize the significant logistical support required for our project, including zodiac support, cargo, and information Technology. We would also like to thank the LTER science team for accommodating our Joubin and Wauwermans maintenance from the LMG into their busy schedule.



B-068-P: COLLABORATIVE RESEARCH: SYNERGISTIC EFFECTS OF ELEVATED CARBON DIOXIDE (CO₂) AND TEMPERATURE ON THE METABOLISM, GROWTH, AND REPRODUCTION OF ANTARCTIC KRILL (*Euphausia superba*)

Dr. Grace Saba, Principal Investigator, Rutgers University, Institute for Marine and Coastal Sciences; Dr. Brad Seibel, Co-PI, University of Rhode Island

Personnel on Station: Abigail Bockus, Brad Seibel, Tracy Shaw, and Monisha Sugla

Our whole field team arrived at Palmer Station aboard the *ARSV Laurence M. Gould* on January 3. Our first few days were busy with unpacking and setting up instruments since we did not have anyone on station prior to our arrival. We are very grateful to the LTER cruise for collecting krill for us the night they departed and bringing them to us on station by Zodiac. They caught a

large amount of krill in several size classes, giving us greater options for types of experiments we could conduct. Using the larger size class of krill, we conducted two short-term CO₂ exposure experiments, holding krill at two temperatures and two pH levels and monitoring their responses after 1, 6, 12, 24, and 48 hours. We also conducted a long-term CO₂ exposure experiment using the larger krill, measuring their responses after 7, 14, and 19 days. We had intended to have a 21-day time point but the change in the Gould's schedule meant we needed to end that experiment early. We measured blood pH and lactate levels at each time point, other samples were frozen for later analyses. We started a long-term growth experiment with n=120 of the medium size class (~30mm) of krill three weeks ago and this experiment is still ongoing. Krill and molts are measured on station and the krill are frozen for later analysis of body composition. Monisha Sugla has been running alkalinity samples from all of these experiments.

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: Ben Cook, Shawn Farry, Donna Fraser, Carrie McAtee, Erin Pickett, and Kirstie Yeager

The arrival of Donna Patterson-Fraser, Kirstie Yeager and Erin Pickett in early January briefly increased C-013 personnel at Palmer Station to six. However, on January 5th Carrie McAtee and Ben Cook departed on the annual LTER cruise leaving four birders at Palmer Station for the remainder of January.

While wet and windy weather conditions this month were less than ideal, we were nevertheless able to conduct boating field work on all but one day during January. Monitoring of Adélie, gentoo and chinstrap penguin breeding chronology continued this month with indicator colony counts as well as an all-colony chick census on local islands as well as on Dream Island and Biscoe Point. Adélie chick measurements occurred in conjunction with our LTER cruise team's measurements on Avian Island. Foraging ecology studies of Adélie and gentoo penguins continued this month with the deployment of presence/absence radio transmitters, satellite transmitters, and dive depth recorders. We also began diet sampling Adélie penguins on Torgersen Island and gentoo penguins on Biscoe Point.

Skua work continued this month documenting hatches and monitoring chick growth of brown skuas on local islands as well as on Dream Island and Biscoe Point. Similar south polar skua nest monitoring as well as sample collections continue on Shortcut Island. Monitoring of the blue-eyed shag colony on Cormorant Island also continued. We also completed our local island giant petrel census and banding project that was begun in December. Our annual Humble Island giant petrel study also began in January which closely records petrel chick survival and growth from hatching through fledging.

C-013 personnel assisted the CONVERGE group (B-005) with transit, repairs and maintenance to the CODAR stations in the Wauwermans Islands on January 22nd and the Joubin Islands on

January 25th. During the Joubins trip the C-013 personnel also conducted penguin censuses with particular interest in chick numbers. Donna Fraser also collaborated with other CONVERGE group members in two video livestream broadcasts sponsored by the Cornell Lab of Ornithology.

Monitoring of marine mammals continued with large numbers of humpback whales observed in mid-January. Lab work continued this month dominated by penguin diet sample processing.

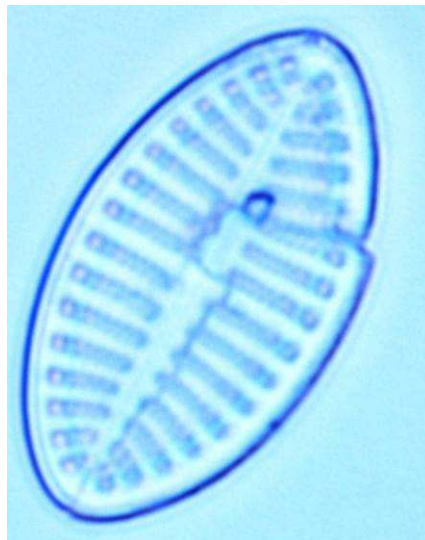
C-019-P: PALMER LONG TERM ECOLOGICAL RESEARCH (LTER): LOOKING BACK IN TIME THROUGH MARINE ECOSYSTEM SPACE, PHYTOPLANKTON COMPONENT

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

Personnel on Station: Jim Fiorendino and Nicole Waite

January has been a busy month for the Schofield group. We welcomed Jim to the lab and to Palmer Station at the start of the month. Jim is a Rutgers undergraduate and will be at Palmer until the close of the summer science season.

Just as we've been busy, the phytoplankton have also been busy. Chlorophyll concentrations and fluorescence increased throughout the month as expected for the summer in Antarctica, with a peak in the bloom occurring on between January 16th and 22nd. We have also seen an increase in primary production in our ¹⁴C incubations alongside the increase in chlorophyll. Here are some pictures we've taken under the microscope of some of the phytoplankton that have been blooming here.



We have also been coordinating our sampling efforts at station E with several glider deployments to provide quality control and calibrations of the instruments on the gliders, including CTD data and chlorophyll-a data.

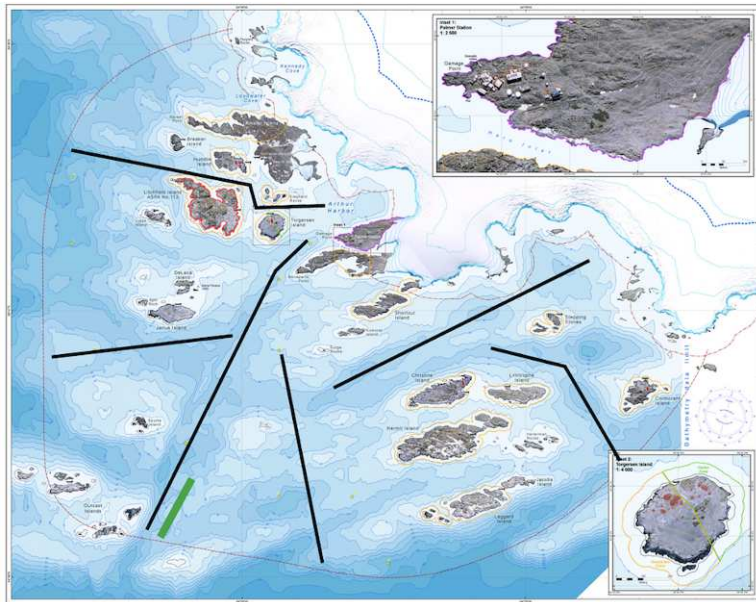
In addition to continuing our bi-weekly sampling at stations B and E, we have been conducting some side projects to investigate the response of phytoplankton to various temperatures and light levels using two incubators, the TemperTron and the Photosynthetron.

We also say goodbye to Nicole this month, who left on 15-01 as the LTER cruise wrapped up and headed north. Nicole wants to extend a big thank you to everyone at Palmer Station for all of their help, support, and friendship this season. A special thanks to Carolyn, Juliet, and Rachel and Conor of the Ducklow group! Good luck on Bruiser!

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: Andrew Read and Zachary Swaim

January 2014 marked the formal beginning of the whale component of the Palmer LTER, with teams working aboard the *ARSV Laurence M. Gould* and at Palmer Station. Work from Palmer was facilitated by excellent weather conditions and abundant whales within the boating limits, particularly during the first half of the month. Zach Swaim and Andy Read arrived with the *Gould* on 03 January and were able to conduct fieldwork on 25 of the 27 remaining days in the month.



Initial work at Palmer Station involved installing SIMRAD 38 and 120 kHz echosounders on our Zodiac and calibrating the system for use mapping the distribution and density of krill. We established a series of six transects, covering most of the available habitat types within the boating area and mapped each transect with the echosounder system once or twice each week. We completed 35 krill survey transects during the month. In addition, on 13 January, we conducted a synoptic krill survey with Dr. Kim Bernard of the CONVERGE team over the path of

one of their gliders. We calibrated the echosounders again at the conclusion of the field season on 31 January.

Most of our time was spent surveying the boating area for humpback whales *Megaptera novaeangliae*. We recorded 63 sightings of this species, together with a single Antarctic minke

whale, *Balaenoptera bonarensis*. The dominant activity we observed was foraging, with frequent surface lunging and bubble net feeding. We were able to map krill around foraging whales on eight occasions and obtained fecal samples from three animals.

We attempted to obtain digital photographs of the ventral surface of the flukes of each whale to facilitate their identification. We identified 23 adult females accompanied by calves, allowing us to begin documenting the reproductive histories of these animals. The fluke photographs we obtained will populate the Palmer Humpback Whale Catalog, which will underpin our future work in the LTER project. We will also archive a copy of each fluke photograph with the Antarctic Humpback Whale Catalog.



Once we obtained fluke photographs, we took photographs of the dorsal fin of each whale. We then used a remote biopsy dart system to obtain small samples of skin and blubber. These samples will be used for analyses of sex, population structure, diet, reproductive hormones and health assessment. We obtained 63 biopsy samples from humpback whales near Palmer Station during January.

In addition, we accompanied the birders to trips to Biscoe Point and Dream Island, collecting fluke photographs and biopsy samples from both areas. Chris Linder and Hugh Powell accompanied us on several whale surveys and described our work in their excellent CONVERGE blog. Finally, we also accompanied the CONVERGE team on a trip to the Wauwermans Islands to help service the CODAR site there.



All in all, this was a remarkably good first field season, with more data and samples collected than we had envisioned. Our work was facilitated in great part by the hard work of Rosemary McGuire, the Palmer Marine Technician, the assistance of Donna Fraser and the birders, and the collegiality of Josh Kohut, Matt Oliver and the rest of the CONVERGE team.

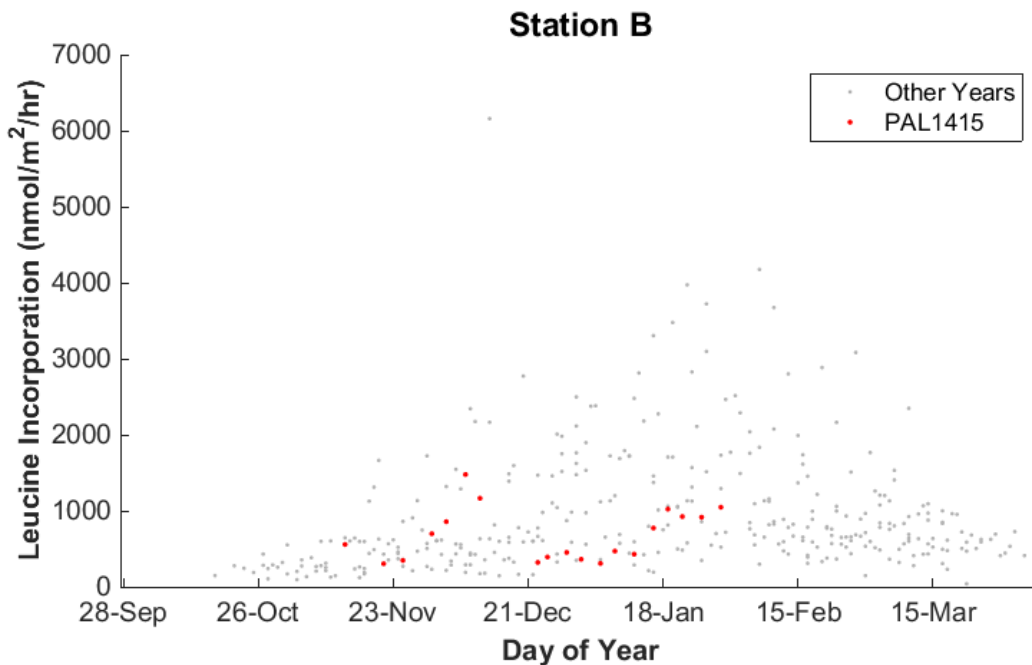
C-045-P: PALMER, ANTARCTICA LONG-TERM ECOLOGICAL RESEARCH (LTER): CLIMATE MIGRATION, ECOSYSTEM RESPONSE AND TELECONNECTIONS IN AN ICE-DOMINATED ENVIRONMENT: MICROBIAL / BIOGEOCHEMICAL COMPONENT

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

Personnel on Station: Rachel Kaplan and Conor Sullivan

January was a busy and productive month for the Ducklow group, not only at Palmer, but off much of the Western Antarctic Peninsula. We rang in 2015 with a busy and efficient port call, as the annual LTER cruise prepared to sample its WAP grid for the 23rd year in a row. In addition to the bacterial productivity and abundance data set we collect on station, the C-045-L crew prepared to collect sediment trap samples, deploy and recover moorings, and more.

While the Gould made its way south, we continued sampling at Palmer, sometimes in concert with glider deployments (see Project CONVERGE, B-005-P), for purposes of glider calibration and quality control. We observed that bacterial production steadily increased throughout the month, rebounding after the crash that followed the December ice-in. As the flow cytometer was on the cruise, we do not yet have bacterial abundance data from January. We look forward to those results, as well as those from the cruise, giving us the year's fullest picture of microbial ecology along the WAP.



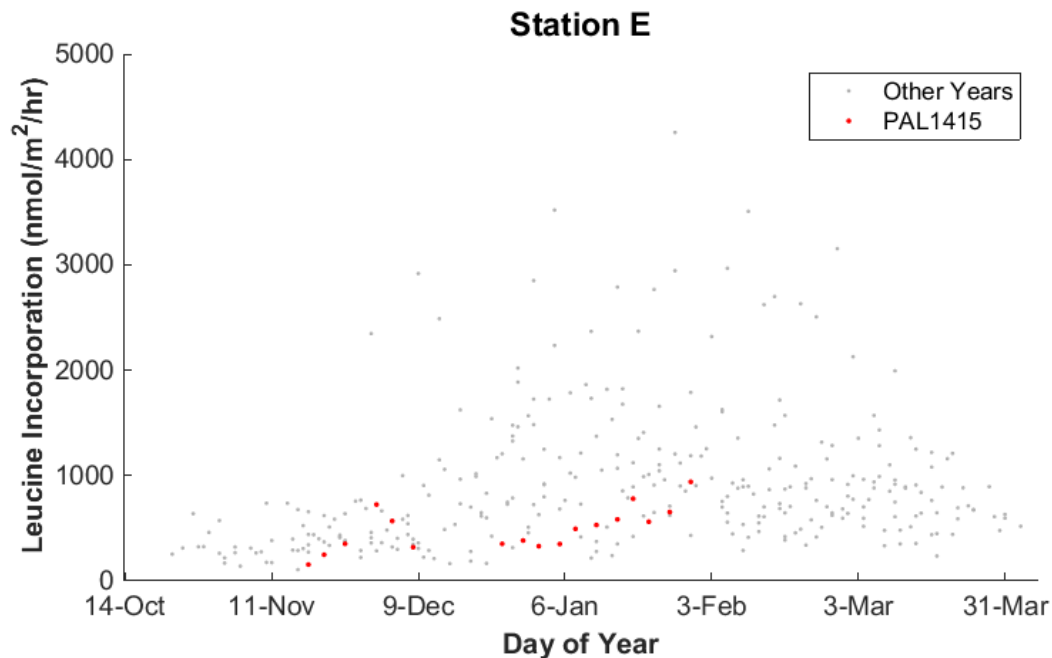


Figure One. Integrated leucine incorporation data (nanomoles/m²/hr) from the last thirteen years of sampling at Palmer, at stations B and E. The rate of leucine incorporation corresponds to the productivity of the microbial communities sampled. We observed a drop off in bacterial production following the ice-in at the end of December, and then increasing rates throughout January.

PALMER STATION RESEARCH ASSOCIATE MONTHLY REPORT JANUARY 2015

Mark Dalberth

Things have been running smoothly in Terra Lab. There was one planned power outage on January 19, and all systems came back on line easily. The coastal ocean radar system installed by B-005-P (Kohut) has been operating all month, generating data that provides a new way to understand the area's ecosystem.

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.

Josh Kohut provided training for the daily checks that should be performed.

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 seismograph station operated without any problems for the entire month.

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.

I changed the external hard disks used to archive the system's data. The system has been functioning well throughout the month.

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 operated normally throughout the month. Weather data was transferred to servers at AMRC on the first and the sixteenth of the month.

O-264-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 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. Three crates of filled flasks were sent north to Scripps Institution of Oceanography.

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 the carbon cycle and the halocarbon and trace species projects. The wind was much more cooperative in January than in December.

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.

Data was taken normally throughout the month. Daily maintenance and bi-weekly calibration scans were completed as scheduled.

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. Daily quality checks of the downloaded data were performed as scheduled.

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 throughout the month.

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 operated normally throughout the month. The tape drive I installed last month has had no problems.

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 has functioned normally this month.

B-466-P: FLUORESCENCE INDUCTION AND RELAXATION (FIRe) FAST REPETITION RATE FLUOROMETRY (FRRF)

Deneb Karentz, Joe Grzyski, Co-Principal Investigators, University of San Francisco

The focus of this project is to identify and evaluate changes that occur in genomic expression and physiology of phytoplankton during the transition from winter to spring, i.e., cellular responses to increasing light and temperature. A Fast Repetition Rate Fluorometer (FRRF) with a FIRe (Fluorescence Induction and Relaxation) sensor is installed in the Palmer Aquarium. The Research Associate downloads data and cleans the instrument on a weekly basis.

Daily instrument checks, weekly cleaning and data downloads were performed as scheduled. I asked the group if they wanted the text data file instead of the binary file that I have been sending them. They said they would. I sent them the files they needed.

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 continued operating normally throughout the month. I archived filters and prepared them for shipment.

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.

The tide gauge operated with its usual level of crankiness. The communication with the instrument failed on January 30 at 11:30 UTC, and it needed to have its power cycled. The last time this happened was December 3. This malfunction used to occur at a much higher frequency. A new tide gauge will be arriving mid-February, and this might fix the problem.

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.

PalMOS operated normally for the most part. The recurring problem of bad lines written to the data files occurred once. I think that I can fix this problem by changing the timing of the software. I think that this is a software timing issue. Data has been archived locally and also at University of Wisconsin.