

PALMER STATION MONTHLY SCIENCE REPORT

DECEMBER 2015



The lab lobby was decorated this month with a “Chemis-Tree” created by the C-019-P (Schofield) field team. *Image Credit: Gabrielle Inglis (ASC)*

NEWS FROM THE LAB

Carolyn Lipke, Summer Laboratory Supervisor

December began with one of the most exciting wildlife viewings I’ve seen during my time here at Palmer. A pod of orcas was seen in Arthur Harbor, and then made their way into Hero Inlet where they hunted a seal on an ice floe right between the pier and Bonaparte Point. It was fascinating to watch them work as a team to break up the ice floe and then surround the seal.

Mid-month the *ARSV Laurence M. Gould* (LMG) returned from their month-long cruise and the Waller group (B-248-P) departed station. It was really wonderful having them on station, and we had all grown quite fond of the baby corals. LMG and Palmer Station crews participated in a joint Open Mic Night during the port call. There were musical talents and hilarious parodies and good fun all around. We rang in the New Year with some fast ice still remaining in Arthur Harbor, which is unusual this time of year. Best wishes to everyone in the new year.

Every researcher is occasionally challenged by having to explain their work using everyday language to people who may not be familiar with their field of study. This month's special science report assignment took this to extreme, and we challenged everyone to explain what they do here on station using only the 1000 most commonly used words in the English language. This challenge was inspired by the web comic XKCD "Up Goer Five" project (<https://xkcd.com/1133>). Palmer Station "ten hundred most used words" summaries can be found throughout this month's report.

What we do, explained in the ten hundred most used words:

Here at our building in the land of ice we study things that live in the cold water. Some work happens on the water and smaller lands of rock. Some work happens in the building and people can take their water and see what things are in it. Some people also study the air. We all like watching the animals and very large pieces of ice out the windows.

DECEMBER 2015 WEATHER

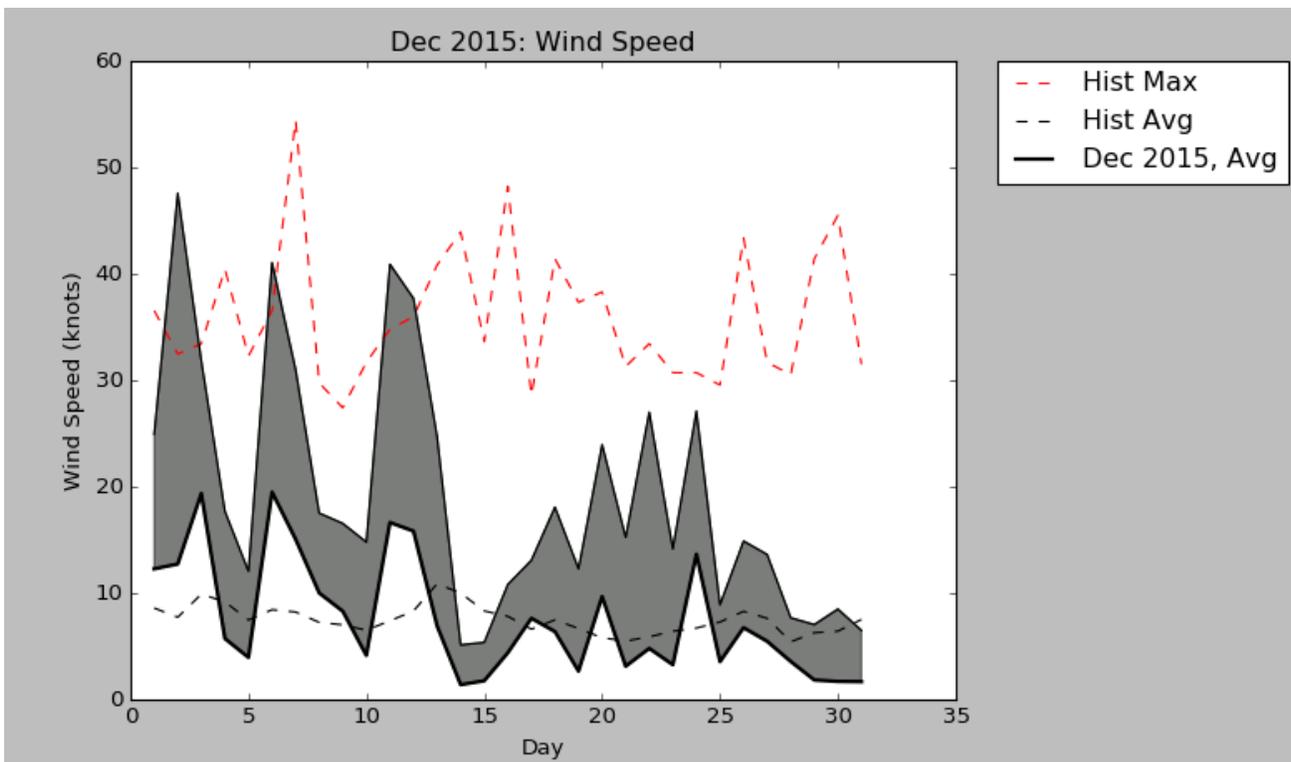
Mark Dalberth, Research Associate

Temperature
Average: -.1 °C / 31.8 °F
Maximum: 5.5 °C / 41.9 °F on 6 Dec 03:28
Minimum: -5.8 °C / 21.56 °F on 27 Dec 04:51
Air Pressure
Average: 982.2 mb
Maximum: 1004.2 mb on 16 Dec 21:12
Minimum: 962.4 mb on 3 Dec 03:10
Wind
Average: 7.5 knots / 8.7 mph
Peak (5 Sec Gust): 58 knots / 67 mph on 2 Dec 15:17 from NNE (27 deg)
Prevailing Direction for Month: W
Surface
Melted precipitation (Rainfall and Melted Snow): 28.7 mm / 1.13 in
Total Snowfall: 23 cm / 9 in
Greatest Depth at Snow Stake: 153 cm / 59.7 in
Sea Ice Observation: There are many icebergs in the Palmer area with growlers and bergy bits. Remnants of fast ice remain in the head of Arthur Harbor.
Average Sea Surface Temperature: -.57 °C / 31 °F

There is still quite a lot of snow around station at the end of this month. The depth of snow at the snow stake is 88 cm. In the last 10 years, there was only one December that ended with snow at the snow stake: 2014 when there was 26 cm. This snow could be insulating the fast ice in Arthur Harbor and helping to prevent its break-up.

The average temperature for the month was -0.1 C . This is low compared to the average temperature for December of 1 C from 2002 to 2014. These low temperatures have also contributed to the lingering snow and fast ice. There have been six days that gave us new daily low temperatures this month, but no new daily high temperatures.

The average wind speed of 7.5 knots is consistent with December's average for the last 12 years. The peak 5 sec gust of 58 knots is a new record for that day (2 Dec), but it is not out-of-line with gusts observed in December historically. The decrease in high wind events as the month progressed, I believe, is also consistent with historical data although I have not looked at this data yet. This December, there were more wind events with 2 minute average wind speeds over 30 knots in the first half of the month than in the second half. It always becomes difficult for the Research Associate to take air samples starting in December due to these low winds.



B-248-P: Cold Corals in Hot Water – Investigating the physiological responses of Antarctic coral larvae to climate change stress

Personnel on Station: Maggie Halfman and Jay Lunden

What we do, explained in the ten hundred most used words:

This was the final month for our field work. We continued checking our animals and got almost ten hundred fixed things by the middle of the month. We then spent a large part of the time cleaning up the area where we worked. Now we head home!

December was the final month for our field work at Palmer Station. We continued monitoring our experiment and had collected almost 1000 baby coral samples by the middle of December. We spent a large part of the time cleaning up the huge mess we made in the aquarium in November, and it took a good deal of scrubbing with hot water for us to get all the salt off the benches that had built up over 2 months! But, we were able to extend our experiment by an extra 2 weeks with the help of an extra shipment of bottom water from LMG15-10, and now we head back to Maine to examine the stress responses of *Flabellum impensum* to elevated temperatures.



Figure 1. Adult *Flabellum impensum*. Photo credit: Zee Evans (ASC)

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, Carrie McAtee, and Matthew Porter

What we do, explained in the ten hundred most used words:

This month the flying animal study people found new baby black and white flying under water animal babies. Also, new young in round white cases from mean brown flying animals. The flying animal study people also put out small black boxes on very large eat-dead-stuff-fly-far animals' backs for following their alone time plans. To our surprise a large grey water and land animal with teeth played bad with a smaller water and land animal of the different and very stupid kind. Big ice made move-fast-over-water-red-thing stay home a lot. We want ice to go away now. Big eyed grey baby door stop make trouble. Not fun anymore. Built wall to save human town. Saw family of not stupid black and white air using big things try to eat sleeping, then scared, no-leg animals. Big thank you to food-make people, make-thing-go people and computer-not-die people.

The return of heavy ice to the Palmer area impacted C-013-P field work during early December preventing all boating during the first week of the month and travel in the extended boating area throughout the month. However, on days when boating was possible we continued daily monitoring of nesting Adélie penguins on Humble and Torgersen Islands as well as maintaining regular censuses of all local Adélie colonies. While we were turned back numerous times by ice and wind we were able to complete several trips to Dream Island to conduct Adélie and chinstrap penguin counts and to Biscoe Island for Adélie and gentoo penguin counts.

A peak egg census was completed during December for chinstrap penguins on Dream Island and for gentoo penguins on Biscoe Island. Preparations for the Humble Island Adélie penguin radio transmitter project continued; equipment was installed on Humble Island and remote data collection and transfer was tested. We also prepared for the deployment of satellite transmitters and dive depth recorders on Adélie and gentoo penguins which will begin in early January.

Skua work continued this month as we began checking nests for newly hatched brown skua chicks on local islands as well as on Dream and Biscoe Islands. Our south polar skua mark-recapture and breeding monitoring study on Shortcut Island continued with nest initiation checks, band resighting, and scat collection. Our census of the blue-eyed shag colony on Cormorant Island continued with the first chicks of the season observed in early December. A gull survey was completed at all local kelp gull colonies as well as on Dream Island.

Our all-island census of giant petrel nests was also completed in December; new nests were identified, breeding pairs were identified and new breeders were banded. Foraging ecology studies of giant petrels were also conducted in December with satellite transmitter deployments at Kristie Cove, Shortcut Island and Humble Island.

Our surveys of marine mammals in the Palmer area also continued this month. In contrast to an abundance of molting elephant seals, there were few cetacean sightings in December.

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: Nicole Couto, Chelsea Farischon, and Ashley Goncalves

What we do, explained in the ten hundred most used words:

As a group, our idea is to get a lot of small green life things inside of bottles of water. We do this by putting (in the big water) a lot of empty bottles and filling them with water. The small green life things live inside the water and then we can take the small green life things home with us and figure out how many of the small green life things are in the water. We do this for many years, a very long time. This year there are three of us trying to figure out how many of the small green life things are in the water at a given time and how happy they are.

WHAT'S NEW? The ocean here is blooming! On a recent sampling day we noted how murky the water was and, as we lowered the CTD providing a white backdrop, we could see phytoplankton floating just below the surface with the naked eye. Our filtering pumps have been working extra hard to keep up with the increased biomass: whereas at the beginning of the season we were seeing barely a tinge of color after filtering 1L of seawater, the filters now become so thick with layers of phytoplankton that it can take as long as 12-15 minutes for just 300mL to move through them!

DATA AND TRENDS: Despite brash ice locking us in on several days during December, we have managed to get quite a few samples this month from both stations E and B. The winds have calmed down since November allowing the water column to become more stable. With fast ice still in Arthur Harbor, station B appears to see more of a cool, fresh, surface melt layer. Station E is warmer by comparison.



Figure 1. Ice congregation off Palmer Station. The Zodiacs cannot push through the thick ice, making for some missed sampling days. Photo credit: Ribanna Dittrich.

Phytoplankton concentrations have risen dramatically since the beginning of December (Fig. 2 and 3), but not all depths see the same rate of growth over time. While phytoplankton need sunlight to survive, they are vulnerable to overexposure and photosynthesis decreases due to a process called photoinhibition. This process appears to be at work at the surface of both stations where chlorophyll concentrations are always lower than they are just 5 m deeper (Fig. 4 and 5). In mid-December surface concentrations even experienced a decline while the 5 m population experienced a dramatic *increase* in their concentration.

Primary productivity has mirrored chlorophyll concentrations with station E developing a less productive bloom than station B (Fig. 4 and 5).

Thanks for all the science support this month. In addition to our boating and laboratory needs here on station, we have been preparing for the upcoming LTER cruise and are appreciative of all the logistical help we've received!

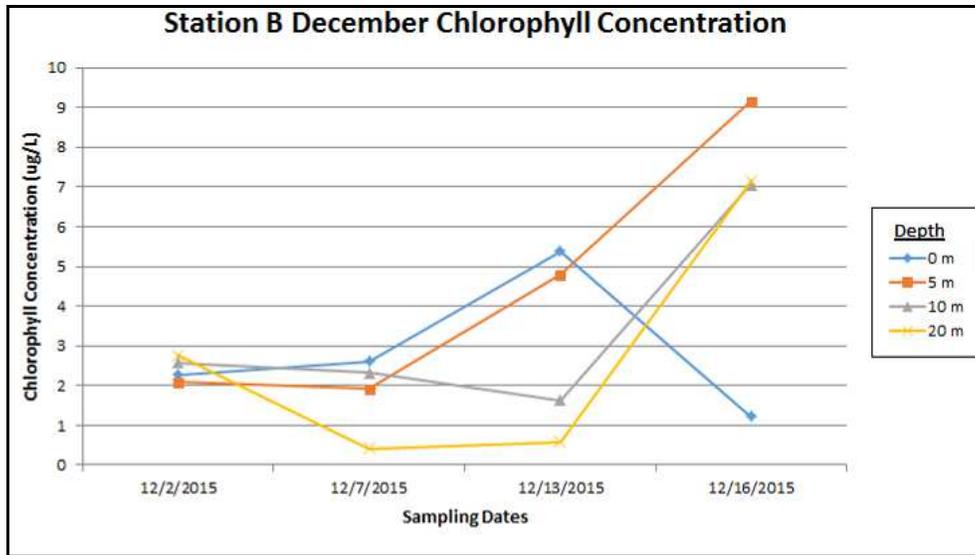


Figure 2. Station B Chlorophyll concentration trends during December 2016

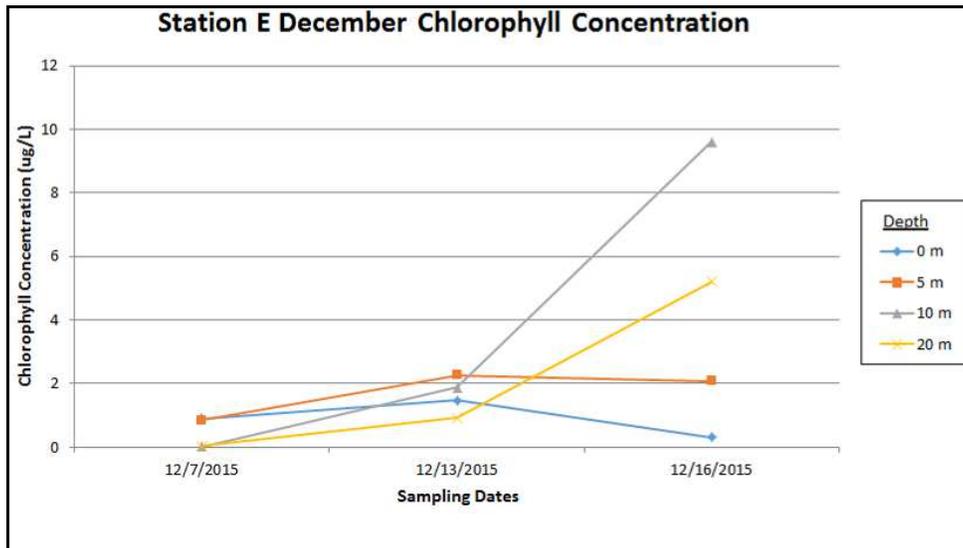


Figure 3. Station E Chlorophyll concentration trends during December 2015

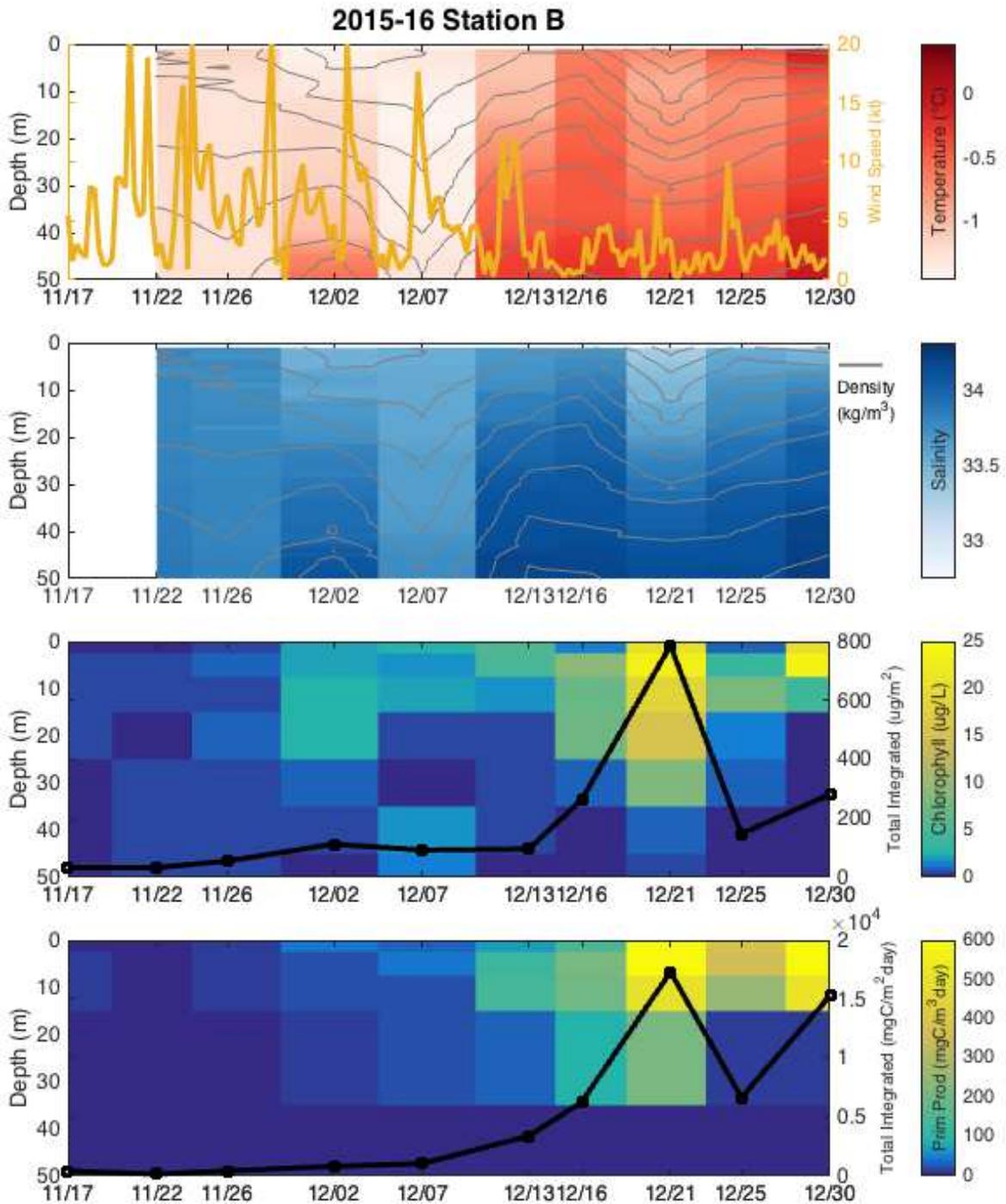


Figure 4. Temperature, wind speed, salinity, density, chlorophyll concentrations, and primary productivity at station B during November and December 2015

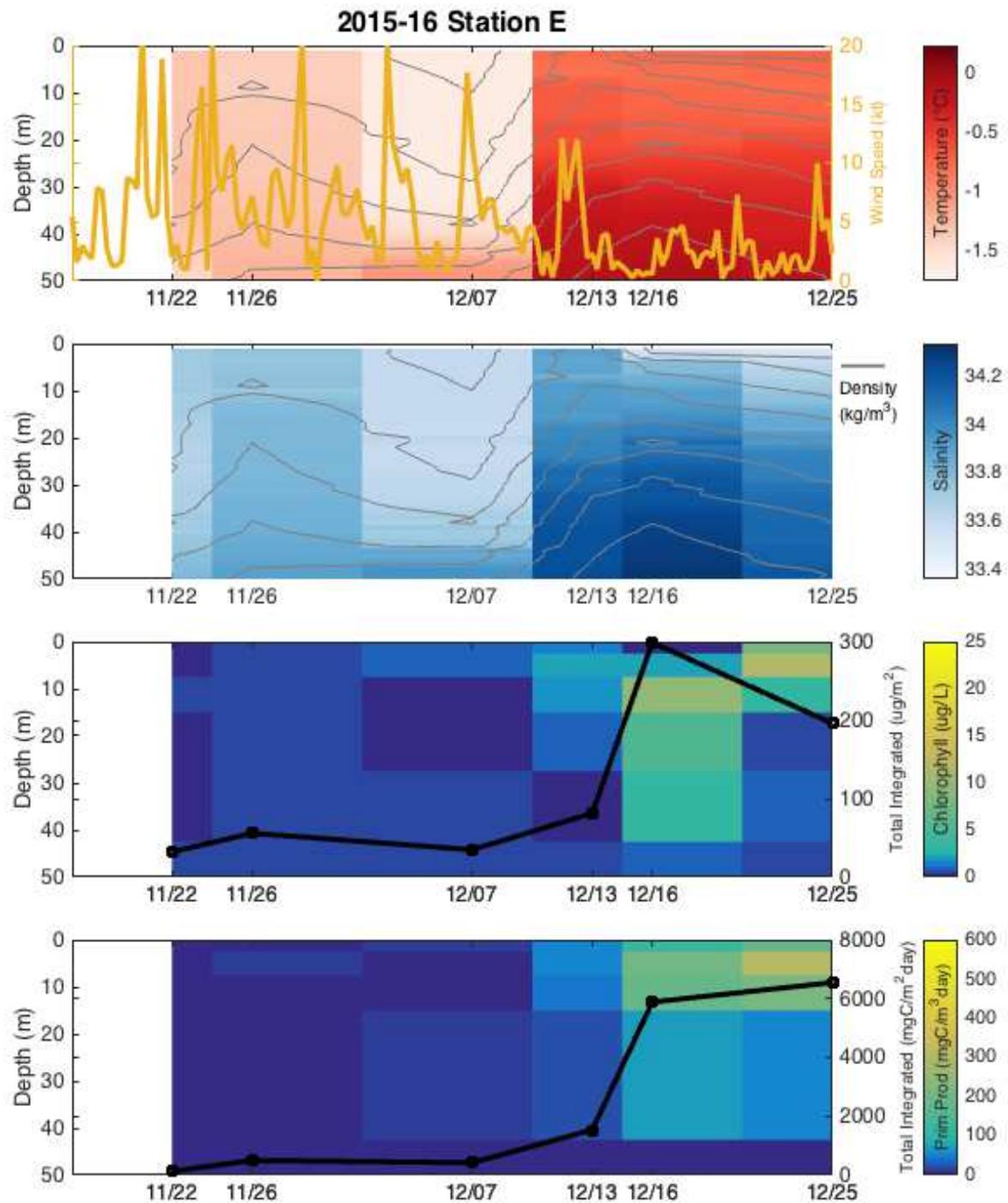


Figure 5. Temperature, wind speed, salinity, density, chlorophyll concentrations, and primary productivity at station E during November and December 2015

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: Jeff Bowman, Jamie Collins, Ribanna Dittrich, and Conor Sullivan

What we do, explained in the ten hundred most used words:

Here in the big waters of the area furthest down in the world, we go out in an over-water-going thing to get stuff from the water at different places. We then take them home and look into what is in them. We are very interested in the very small living stuff that is so small no one can see it. But they live every where, on land as well as in the water. We find out how many there are by using light (just like the light they use to fight in the movie about fights between stars) and those numbers change through the year. Also, we look into how happy they are by giving them stuff to eat and they show us how much of it they like to eat. This tells us if they like it where they are and if there is enough for them to eat. Usually, they like when slightly bigger living stuff is around them so that they can eat their left-overs.

Although we continued to see stormy weather and lots of sea ice in December, the microbial biogeochemistry group was able to sample more frequently at the LTER stations B and E. Jeff B. and Jamie C. also continued opportunistic sea-ice and water sampling until their departure on Dec 24th.

Improving weather conditions in December allowed us to go out sampling at least once a week. However, the sea-ice front remains close to Palmer Station and comes and goes on a frequent basis and so we missed 4 sampling days this month and were unable to reach Station E on several occasions even when we did get out.

Following the LTER C-045 mission, we collected samples at all depths and stations for nutrient, DOC, and POC analysis and also analyzed bacterial abundance and production on station using Flow Cytometry and ³H-Leucine Incorporation.

The phytoplankton bloom started in mid-December, and we see an increase in both bacterial abundance and leucine incorporation at the same time (see figure 1).

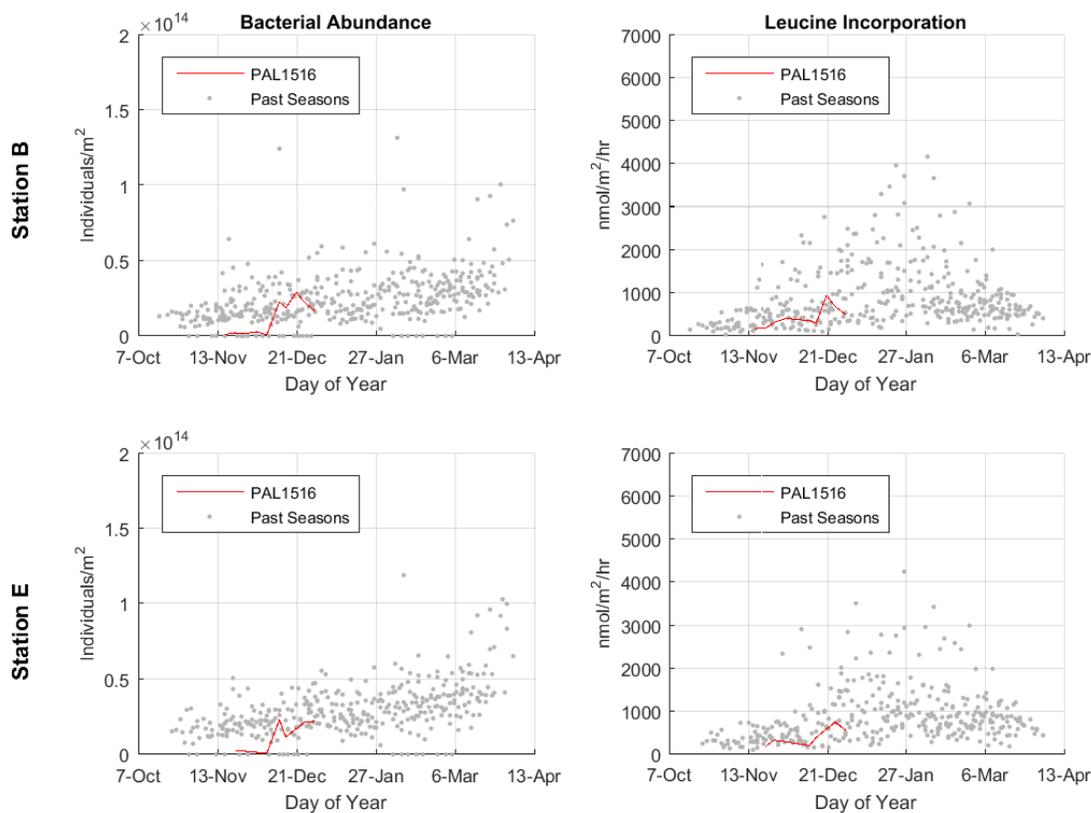


Figure 1: This season's bacterial abundance and leucine incorporation at station B and E. The data points in grey represent all past measurements.

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

Dr. Yuan Gao, Principle Investigator, Rutgers University

Personnel on Station: Yuan Gao, Shun Yu, and Wancheng Zhou

The atmospheric sampling at Palmer background has been operating since the beginning of December, and our efforts were on continued fine-tuning instruments and minor-problems solving. A wind sector was successfully added on the platform during this month that controls the operation of major instruments to reduce the impact of local emissions. Many thanks to Mark Dalberth and Adam Rivers for helping us with this task! Sample analyses in the lab were started during this month that kept us even busier. Many thanks to Carolyn Lipke and Gabby Inglis who help our work running smoothly in the lab, providing whatever we need and need to know! We learned no matter how much we prepared at home, it is never enough. Thanks Palmer for the support!

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

What we do, explained in the ten hundred most used words:

On our team we observe small white land birds, which is fun and has interest. They will eat anything and everything, and they do strange things to get food. One of them bit a big animal from the sea, right on the tail. They have eggs now. We will write about them and draw and paint them. Then we will make a book about them. The person who will draw and paint is not here yet. She will come very soon.



Since the November report sheathbills have nested, changing their behavior significantly. There are three pairs on station showing nesting behavior. Thanks to Jeff Otten's amazing work, a remote camera allows us to observe behavior inside one of the nests. The birds there take turns sitting on the nest. Sometimes a bird displays an unusual high-stepping gait inside the nest, perhaps a gait that minimizes the chance of stepping on eggs or offspring (when the chicks hatch).

Except for brief periods, there's usually one bird on the nest, so they don't go around in pairs as often. They avidly gather nesting material.

Because elephant seals are no longer coming on station, due to a new barricade on the boat ramp, they no longer provide a resource and focal point for sheathbills on station. We have yet to locate any sheathbills off station, but will still make efforts to do so, particularly in places where elephant seals congregate. It has been extremely interesting to review the videos made showing sheathbill interactions with elephant seals, and to compare those with other species.

The other half of our team is en route to Palmer Station and should be here within the week.

PALMER STATION STAFF MONTHLY SUMMARIES

What we do, explained in the ten hundred most used words:

Boathouse

The water car people are here for the managing of water cars at the ice covered place. When the not stupid college people want to get things to study, water cars are made ready for going in the water. All water cars go in the water on rolling land floors, which go down to the water car landing place. The water car people make sure that the not stupid college people are being safe and not breaking the water cars. When the water cars are broken, the water car people make the water cars not broken. If the not stupid college people need to be helped when their water car breaks, the far from land find and bring you home team goes out in a working water car to bring them back to the ice covered place. Sometimes the water car people must help the flying loud animal people to move the loud water babies when they climb on the water car landing place.

Waste Department

Make things go away people group of words for month doing. Cut wood for many warm people fire place. Used fast air fire, round box, for bad flying animal, kitchen go away things, two times. People give bad go away things. Collected bad go away things papers. Put together many same bad go away things, then put on paper. Bring down glass, many times, and put through ground glass thing. Make full, heavy, round box of glass. Made three full round boxes total. Made twenty three units of really heavy brown paper. Also, made many small, very pushed down boxes. Filled very big box with much go away things to send up on big red over water goer. Helped flying animal study people move one, big eyed, baby grey doorstep, many times. Helped stuff moving people, get big box of much stuff from large red over water goer. Drive stuff places, for stuff moving people. Help Kitchen people, move food from big cold food box and drive to kitchen. Happy cold day fun from make things go away people.

Galley

Woman get up early to heat hot machine and make hot brown water. Then cook two times a day, one time soft beat eggs one time meat and fresh food solution. Man get up to do paper work, make old Greek cow milk and prepare night time food for huge eat human army. Red happy day week is here, made small circle shape food to give away to eat a lot humans. Alone human team design sugar house, one with blood, one with car. Big red man come to give bright paper box, make happy sight tree with ball and string. Will leave out small circle shape food and milk. Large not red metal boat arrived to take new ice friends away across deep ocean. We will miss them, safe travels.

**PALMER STATION
RESEARCH ASSOCIATE MONTHLY REPORT
DECEMBER 2015**

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 CODAR system functioned well throughout the month.

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. For a couple of days, there was concern that an unauthorized user had gotten access to one of their control computers. This turned out not to be the case.

**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 functioned normally this month. I got the ELF working again. With the grantees help, I re-wired the line receiver and the pre-amplifier to use a different set of wires in the cable, which by-passed the damaged wires. The system is now up and running. While troubleshooting, I found a small hole in the outer insulation of the cable between the second junction box and the ELF hut. I taped this up to protect it from the elements.

I put a new external hard drive on the system.

**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-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.

The air samples were taken twice this month.

**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 CCGG four times and the HATS project two times this month.

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.

After a three lamp calibration scan this month, the grantees raised concerns that the data was dissimilar from previous calibration scans. They instructed me to cycle power on the instruments, and then perform another calibration scan. After they looked at the results, they had me run calibration scans on four of the lamps. The data convinced them that the system was operating normally after the power cycle.

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 after the re-alignment of the antenna.

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 new computer for the system should come down on LMG16-01.

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.

Their two computer systems were showing a high rate of network usage every morning. This was traced to operating system updates. The update schedule was changed so that it would no longer be so disruptive. Switched out an external drive and sent it north in the silver trunk on LMG15-10.

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.

The instrument has been sent back for repair.

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. The new tide gauge is operating normally although occasionally it resets itself and/or stops data logging. I think this will be fixed with a firmware upgrade.

I supplied more tide gauge data to B-037-P (Detrich). This involved converting raw data files that were taken by the previous tide gauge.

I started receiving the ocean color images from NASA for 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.

Old PalMOS and "backyard" PalMOS have continued to operate in parallel. I installed the pyranometer and the photosynthetically active radiation sensor on the tower in the backyard and that data is now being logged.

After exploring the SQL database of weather data, it is evident that we need to perform quality control on the database and also on the data that is archived at University of Wisconsin.