The long term objective of Palmer LTER is to understand the mechanistic linkages by which climate, physical oceanographic forcing and sea ice extent and duration control ocean productivity, food web processes, krill and penguin recruitment and carbon biogeochemistry in the marginal sea ice zone of the western Antarctic Peninsula (WAP) region. The WAP is one of the most rapidly-warming regions on the planet, and we have documented responses throughout the foodweb, from phytoplankton to penguins. The annual oceanographic cruise (now in our 23rd year) provides a large scale regional view of physical-trophic-biogeochemical processes in the region, and contributes to a time series of ecosystem transformation in response to regional warming and sea ice loss. The program consists of a 6-month team deployment at Palmer Station and an annual 30-day ship survey in January along the WAP. The program was just renewed for another 6 years of funding through the year 2020.
NATURAL FERTILIZATION IN THE SOUTHERN OCEAN. RU’s Rob Sherrell and Jessica Fitzsimmons lead a team focused on determining if the West Antarctic Peninsula is a natural iron fertilization source for the adjacent continental shelf. The Southern Ocean surrounding Antarctica is the largest region of the ocean where the biological productivity is limited by the supply of the micronutrient iron (Fe). Along the western side of the Antarctic Peninsula (WAP), however, satellite observations show considerably higher densities of phytoplankton cells, suggesting sufficient Fe in the surface waters to support a vibrant community of seals, penguins and whales. Rob Sherrell (Professor, DMCS and EPS) joined the LTER (see front page) on the R/V LM Gould, to make comprehensive observations of the distribution and dynamics of Fe and other micro-nutrient trace metals in the WAP shelf region. He was assisted by DMCS Postdoc Jessica Fitzsimmons, Rutgers Env. Sci. PhD student Philip Sontag, and MIT Postdoc Cheryl Zurbrick. Sampling trace metals without contamination requires specialized equipment, and the group was stunned by the loss of the US Antarctic Program’s only trace metal CTD/rosette, when a cable unexpectedly broke, just weeks before the LTER cruise. Fortunately, a replacement was cobbled together and assembled over long days at the start of the cruise. Data collected will answer: How does bioavailable Fe get delivered from the continent to the shelf surface waters? Are the melting glaciers along the peninsula an important source? Is soluble Fe from the sediments carried with warm offshore water that is known to upwell in certain regions along the coast? Is the seasonal melting of floating sea ice a substantial Fe input? What is the effect of the rapid climate change in this area on the supply of Fe to phytoplankton?

HOW WILL AN ACIDIFYING OCEAN WILL AFFECT ANTARCTIC KRILL? RU’s Grace Saba and her co-PI Brad Seibel (University of Rhode Island) have deployed to Palmer station for the second field year of their National Science Foundation program. The team is focused on understanding the physiology of krill stress in altered environmental conditions such as increased CO2 and/or increased temperature. The Antarctic krill is a keystone species in the Antarctic food-web, as a critical food source for the whales, penguins, fish, and seals. Evidence suggests ocean acidification in response to increased CO2 in the atmosphere and warming temperatures may detrimentally impact the Antarctic krill. The project is focused understanding the physiology of the stress, which will provide insight into the potential growth and reproduction of krill in the future. Field experiments this year are focused on both long- and short-term responses. Grace’s team includes two undergraduates Ryan Fantasia (2014 field season) and Monisha Sugla (2015 field season).
WHERE DO THE PENGUINS FEED? Rutgers in partnership with U. Delaware, Oregon State University, Polar Associates Inc. and the U. Alaska Fairbanks have been conducting a multi-platform field study to investigate the impact of local physical processes on Adélie penguin foraging ecology off Anvers Island on the Western Antarctic Peninsula (WAP). The team, lead by Dr. Josh Kohut has deployed and operated a network of High Frequency Radars (HFRs, an antenna is pictured above in the distance). This involved building and setting up these radar installations (first ever deployed in Antarctica) in November 2014 at remote islands under extremely rough conditions. The team been using the radar output to direct adaptive sampling the distribution of the phytoplankton and zooplankton in order to understand the variability in Adélie penguin foraging ecology. During January the team used the radars and radio-tagged penguins to direct the sampling of 5 underwater gliders and zodiac-based sampling. The team also had an extensive outreach effort with beautiful photos and stories, so check out the great stuff at coseenow.net/converge. 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. They also conducted two 1-hour VTCs with the general public via the Cornell Lab of Ornithology which has to date attracted 4,882 total views.

RUTGERS UNDERGRADUATES ARE LEADERS IN THE FIELD We are extremely proud of the Rutgers undergraduates who are critical members of the Antarctic field team. The students continually distinguish themselves as critical and indispensable parts of the Rutgers team and are amazing ambassadors for our great University. As an example, despite the fact that the ship field season for 2015 has ended and most of the team is in transit home, two undergraduates Monisha Sugla and James Florendino remain at Palmer Station to close out the remainder of the season until late March. We thank all the students of the past year James Florendino, Frank McQuarrie, Monisha Sugla, and Katherine Todoroff. GREAT WORK!!!!!!!

Complex real-time currents measured by HF-radar installations deployed in Antarctica.
GET YOUR RU OCEAN SWAG!!!!

Rutgers Oceanography tee-shirts have arrived for the winter. Proudly wear the Rutgers Oceanography tee-shirts - funds are raised to host science socials for the undergraduate and graduate students. Tee-shirts go for $15 and will make you look athletic, smart, and dashing. Such a great deal for a great cause. Contact Sarah Kasule if interested (kasule@marine.rutgers.edu). To see the quality people your contribution would support check out our featured graduate students at http://marine.rutgers.edu/main/Featured-Student/.

Please help us enable Rutgers oceanography to support the next generation!

Rutgers oceanography needs your support to meet the environmental and educational challenges facing the world today. Your support is critical to enabling high risk and high reward research, developing students to be the leaders of tomorrow and bringing the public with our scientists into the ocean. Your private gifts will create new laboratories, student fellowships, endowments and feed ambitious new programs. Come join us!

New Publications
