Adélie penguin populations near Palmer Deep Canyon in Antarctica have been in serious decline since the 1970’s. According to Principal investigator Dr. Josh Kohut of Rutgers University, the project CONVERGE multi-year mission, sponsored by the U.S. National Science Foundation (NSF), aims to “investigate the impact of local coastal physical processes (e.g., tides, currents, upwelling events) on Adélie penguin foraging ecology in the vicinity of the Palmer Deep submarine canyon, off Anvers Island on the Western Antarctic Peninsula (WAP). Guided by real-time maps of surface convergent features derived from the SeaSonde HF radar network, a multidisciplinary research team adaptively sampled the distribution of phytoplankton and zooplankton, which influence Adélie penguin foraging ecology, to understand how local oceanographic processes structure the ecosystem.”

This part of the world’s ocean is highly under-sampled and even general ideas of current velocities, wave conditions and variabilities on spatial and temporal scales of the canyon were not known prior to start of this project. The first season HF radar deployments in early 2014 served to determine the optimal system operating parameters for this region via a series of field tests. In the next summer season of 2015 three SeaSonde radars were redeployed using optimal configurations and settings having been pre-determined inside the initial season, with data outputs guiding adaptive biological sampling. Two sites were deployed on remote islands beyond the reach of any existing power and communication. At these locations, the team from the University of Alaska, Fairbanks designed and deployed a remote power and communication system based on solar and wind energy. These remote systems worked flawlessly throughout the summer penguin foraging season needed to address the proposed science. Despite the remote locale, this SeaSonde network performed reliably through sampling season. The field campaign was a success and subsequent analysis of the data collected has proved it invaluable.

Details about the study, with specific focus on the HF radar network aspect, were presented by Hank Statscewich of University of Alaska Fairbanks and other project collaborators in 2016 at the AGU Ocean Sciences meeting in New Orleans, Louisiana. We thank Hank and the rest of the Project CONVERGE team for allowing us to re-post a few of their findings here.
As the analysis of this valuable data set continues, more results are being shared. For example, at the MTS/IEEE Oceans ’17 Anchorage meeting Ms. Nicole Cuoto of Rutgers University will give presentation entitled, “Pathways and retention times in a biologically productive canyon system on the West Antarctic Peninsula”. For anyone keen on linking physical with biological oceanography this is a must-see presentation.

But the value of this data extends far beyond the most elite scientific circles. Given the awe-inspiring location of the research and heart-wrenching plight of the Adélie penguins, this program has been warmly embraced by the education outreach community. In July 2017 Dr. Kohut came to Monterey, California where he participated in the 2017 Education And Research: Testing Hypotheses (EARTH). At the workshop, he engaged with over 20 teachers who work with middle and high school students across the country. Together they developed classroom lesson plans that incorporate the science of the CONVERGE team. Through these lesson plans, their students will be introduced to the CODAR data collected over Palmer Deep and the science it supports.

He will again address CONVERGE outreach inside the MTS/IEEE Oceans ’17 Anchorage meeting, in session on Maritime Law, Policy, Education and Outreach, with a talk entitled, “Project Converge: A broader impact plan that engaged educators and students in the process of polar ocean science campaigns”.

HF Radar January mean surface currents with divergence contours and satellite tagged Adélie (red) and Gentoo (green) penguin foraging locations reveal a preference for foraging at convergent features. During semi-diurnal periods, a region of persistent convergence exists to the south of the Joubin Island site. This feature may help to explain the foraging behavior of the penguins in Palmer Deep and why they are moving into dangerous waters for their predator enemies.

Continued from previous page...