Recommended Reading

Notable publications from CODAR user community

SeaSondes & Hurricane Intensity Prediction

Satellite view of Hurricane Irene, 27 August 2011. Image Credit: NASA/NOAA GOES Project

While the science of predicting hurricane tracks is well established, the understanding and forecasting of the mechanisms driving storm intensity near landfall have lagged. With the aid of data from the Mid-Atlantic Regional Association Coastal Ocean Observing System, including a large-scale CODAR SeaSonde network, a key oceanic influence on tropical storm intensity in the coastal ocean has now been identified.

Researchers have described their findings in the *Nature Communications* journal, March 2016 edition. They found that a stratification-driven cooling mechanism on the shallow continental shelf inhibited development of all 11 studied Mid-Atlantic Bight summer storms, including Hurricane Irene of August 2011. Further, this same driver was found in data of other storm events in the Yellow and East China Seas.

According to study co-author Dr. Hugh Roarty, "The mid-Atlantic's extensive network of surface current mapping radars indicated that the strong winds on the leading edge of the storm set up the circulation pattern that cooled the ocean surface." (*Rutgers Today*, March 8, 2016). [Though not mentioned in this paper, it is worth noting research findings also indicated that autumn storms like 2012's Hurricane Sandy may experience rapid intensification near landfall under non-stratified warmer water conditions.]

As tropical cyclone intensities continue to increase, better forecasting of storm intensity will be key in making informed, emergency planning decisions for coastal communities. Maintaining long-term coastal ocean observation systems that include SeaSondes will play an important role.

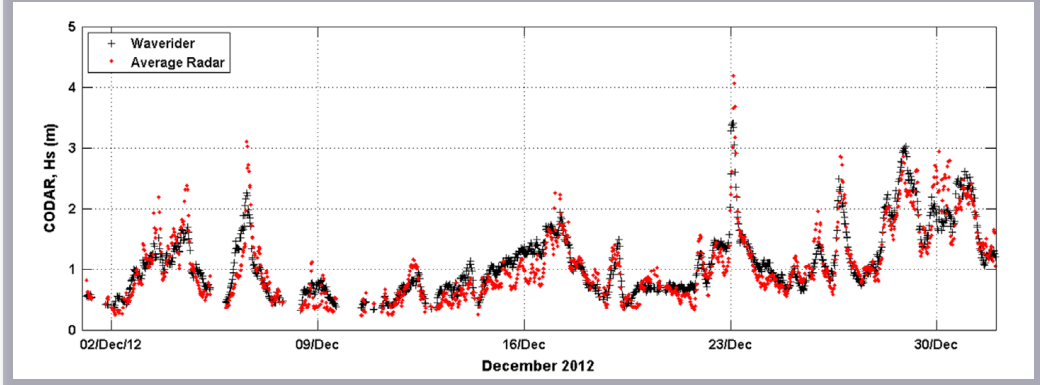
Glenn, S.M., T.N. Miles, G.N. Seroka, Y. Xu, R.K. Forney, F. Yu, H. Roarty, O. Schofield, and J. Kohut. "Stratified Coastal Ocean Interactions with Tropical Cyclones." Nature Communications, 1–10 (2016).

SeaSonde Wave Data Used in Galway Bay Wave Harvesting Assessment

Global estimates of deep water wave power show that Ireland's west coast is a prime candidate for harnessing wave energy. A suite of wave data sources, including CODAR's SeaSonde HF Radar, is examined to quantify the potential of the Galway Bay 1/4-scale wave energy test site. A recent *Ocean Engineering* article details this research, performed at the Centre for Marine and Renewable Energy and the Ryan Institute for Environmental, Marine and Energy Research at the National University of Ireland, Galway.

An approach developed by the authors establishes relationships between wave parameters (such as waveheight thresholds) with wind characteristics (such as strength and direction) to determine wave harvesting viability and annual and seasonal variation at a given location. SeaSonde coastal wave measurements can serve as a valuable planning tool for the exploration of this alternative energy resource.

Atan, R., J. Goggins, M. Harnett, P. Agostinho, and S. Nash. "Assessment of Wave Characteristics and Resource Variability at a 1/4-Scale Wave Energy Test Site in Galway Bay Using Waverider and High Frequency Radar (CODAR) Data." Ocean Engineering, Vol. 117, 272–291 (2016).



Adjacent Figure: Time series of significant waveheight (Hs) during December 2012 generated by a 25 MHz CODAR SeaSonde (red points) against waverider buoy Hs (black points). From Atan, R., J. Goggins, M. Harnett, P. Agostinho, and S. Nash. "Assessment of Wave Characteristics and Resource Variability at a 1/4-Scale Wave Energy Test Site in Galway Bay Using Waverider and High Frequency Radar (CODAR) Data." Ocean Engineering, Vol. 117, 272–291 (2016).