

Surface Current Measurement Program

The Southeast National Marine Renewable Energy Center (SNMREC) at Florida Atlantic University — one of three U.S. Department of Energy-designated marine renewable energy centers — is working toward helping pioneer the commercial implementation of marine renewables for a more diversified and sustainable energy future. The Center focuses public and private investment on ocean resource characterization, technology development, testing and experimental infrastructure installation, environmental assessment, regulatory framework development assistance, and workforce development.

The goal is to help private industry achieve responsible conversion of various marine renewable energy resources into usable power for our community electrical grids.

One of the Center's initial tasks is to measure and model forms of energy in the oceans to better understand how to harness them. Off our shores, vast amounts of energy are available in either the Gulf Stream flow (an ocean current) or in the temperature difference between the warm surface waters and cold bottom waters (ocean thermal energy conversion). The antennas installed here allow researchers to view snapshots of the direction and speed of the surface of the ocean (up to 1 meter deep). Every 30 minutes this ocean surface radar system averages the surface currents, and by correlating with known features of the current offshore, researchers are able to build a three-dimensional picture of the location and intensity of the Gulf Stream as it flows northward past Florida. This will help the marine renewable energy industry to be better informed about where and how future projects may be installed.

The system in use at this location is manufactured by CODAR Ocean Sensors and is a high-frequency (HF) radar (operating in the 3-30 MHz range). Two antennas are needed, one to transmit the signals and one to receive them. Another similar dual-antenna system is located approximately 30 miles away. When measurements from both sites are combined, it allows the SNMREC's researchers to put together a snapshot of the surface currents between the beach and 30 nautical miles offshore, and from north Miami Beach to Lighthouse Point. All data is processed and sent via Internet to the SNMREC's computers, where it is stored and later analyzed. This SNMREC project also participates in the Integrated Ocean Observing System initiative, which aims to provide real-time measurements and forecasts of coasts to improve safety, enhance the economy, and protect our environment.

