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An East-Coast Center for MRE

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The Center for Ocean Energy Technology was founded at Florida Atlantic University in 2007 based on an award from the State University System’s Centers of Excellence Program.

In July, 2010, COET was designated by the U.S. Department of Energy as the **Southeast National Marine Renewable Energy Center**, the third such Center created for the purpose of advancing the recovery of energy from the oceans.

The SNMREC focus on open-ocean current energy recovery and on OTEC potential on the OCS complements that of the other two NMRECS, and the three Centers are working toward common goals.
Thrust Areas: Technology

Energy recovery from the Florida Current has similarities to tidal energy recovery as well as important and challenging differences:

- Current is more uni-directional and steady, and much less restricted –
  - meanders, surges, and turbulence are still a challenge
  - extensive arrays of systems need research

- Water is deeper, requiring moored deployments –
  - system design implications
  - mooring dynamics become an additional challenge
Technology Milestones

Computer-controlled, 20kW class dynamometer: generator and intelligent monitoring systems testing in progress.

Instrumented mooring and telemetry buoy: sea-tested and ready for summer deployment in the Florida Current. Experimental turbine system ~50% complete.
Thrust Areas: Environment

Environmental issues are two-way:
- the ocean affects MRE equipment;
- MRE equipment affects the ocean.

Assessing the potential of the resource is an ongoing research challenge.

Experimental platforms are required to acquire critical data for all environmental interactions and for assessing resource potential.

Endangered species in the water column and on the bottom pose special challenges.
Environmental Milestones

- 14-month time series of Florida Current velocity profile;
- Offshore observatory being developed (ADCPs, CODAR)
- First simulations of current as perturbed by energy extraction;
- Benthic survey of operations area complete;
- Aerial surveys for sea turtles and marine mammals in progress, including automated video recognition system.
Thrust Areas: Community

Compared to traditional ocean-energy extraction (e.g., oil & gas), MRE is a new endeavor overall. Open-ocean-current MRE is far less developed than wave and tidal technologies:

- The regulatory agencies have no model for it (they tend to think of it like they do oil & gas)
- Developers are challenged by technology requirements;
- The general public is puzzled by and worried about it;
- Specialized stakeholders wonder if they should feel threatened by it;
- *We’re* only beginning to understand it.

By starting small and conducting basic research, SNMREC is addressing these concerns.
Stakeholder Interactions

- Close connections with cognizant federal agency for regulatory oversight (BOEMRE)
- Scientific collaborations with primary consultative agency (NOAA/NMFS)
- Industry / agency / academia workshops & conferences
- Curriculum development for high-school students
- Outreach to public venues (e.g., science museums)
- Media interviews (primarily local)
- Lots of frequent flyer miles for meetings like this
Next Steps

- Continue working with regulators to develop appropriate mechanisms for and approaches to permitting;
- Deploy and begin use of mooring buoy as experimental platform:
  - Flow measurements (including turbulence);
  - Environmental monitoring;
  - Telemetered data streams;
- Integrate shore-based observations (CODAR) with in-water datasets;
- Complete turbine system fabrication, tow test, deploy;
- Continue phased installation of ocean observatory.