Ocean Energy –

Challenges and Opportunities

Overview of the FAU

Center for Ocean Energy Technology

Howard P. Hanson
Professor, Department of Geosciences
Charles E. Schmidt College of Science
Scientific Director, COET
College of Engineering and Computer Science

hphanson@fau.edu

FAU
FLORIDA ATLANTIC UNIVERSITY

Ocean Energy

Kinetic sources: tides waves currents

Thermal sources:
thermocline ΔT

FAU/COET Focus

Phased Approach

COET is not going into the electric power business. Instead, we're creating a *National Open-ocean Energy Laboratory*:

Phase 1: Ocean Observing & Monitoring Systems

Phase 2: Ocean Current Experimental Prototype

These lead to industrial prototype testing. Then,

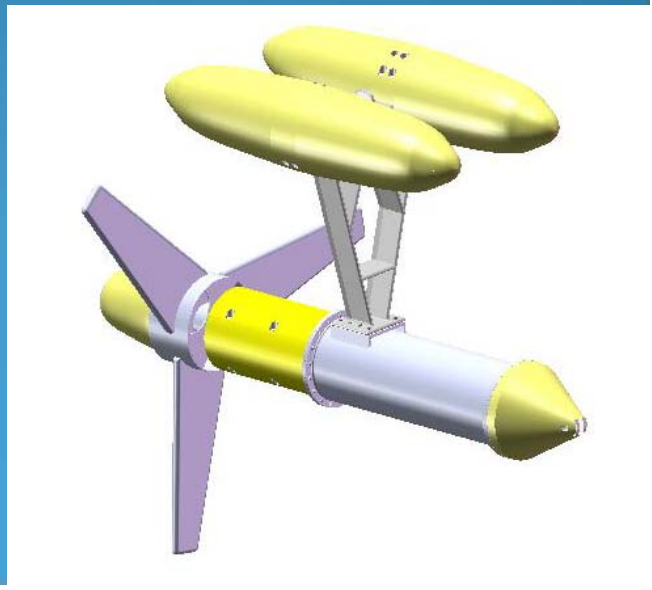
...beyond 2012

- Cold sea-water based air-conditioning
- Ocean Thermal Energy Conversion

COET's Role:

Maturing Research – Advancing Technology

- We view the ocean-energy challenge as an integrated problem that involves *environment, ecology, resource, and power systems*
- Meeting this challenge will require a systems approach:
  - Strategic phasing to acquire knowledge and facilitate development – e.g. permitting
  - State, federal and global policy discussions
  - Publicly available knowledge clearing house
  - Environmental considerations
  - Education & outreach
  - Workforce development
  - Tackling a host of technical R&D challenges.



Technical Challenges*

* Woefully incomplete list

- Materials (strength & corrosion protection, in particular)
- Biofouling prevention/control
- Energy transmission & grid integration
- System health monitoring and prognostics for continuous assessment and failure avoidance
- Integrated modeling & simulation
- Integrated demonstration & validation test plans.

We are borrowing a useful framework from NASA:

Technology Readiness Levels

Related R&D

Power to the grid provides a focus for early-stage work at COET and is appropriate for our S. Florida location.

But other locations may have other priorities:

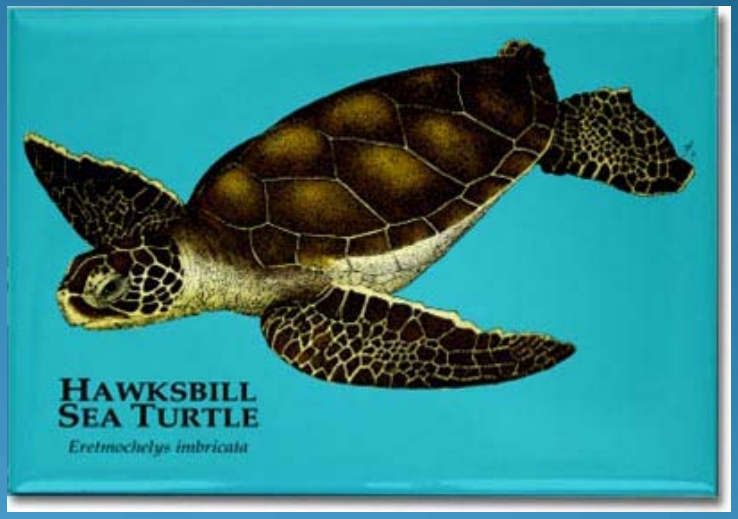
- Portable power via, say, H_2 production
- Desalination for potable water

In addition, various R&D areas are germane to COET:

- Economics & policy issues
- Data management, analysis, and visualization
- Environmental effects (the ocean and its life)

Potential Effects

- Wakes and their influences (alteration of currents and waves)
- Alteration of bottom substrates, sediment transport and deposition
- Alteration of benthic habitats
- Interference with animal movements and migrations
- Strikes and entanglement
- Inadvertent FADs issues
- User conflicts (shipping; fisheries)
- Noise & Electromagnetic fields
- Chemical toxicity



Interested?

We are constructing a database of capabilities and interests within the SUS, and if you'd like to be included please send ONE PAGE of information on a given topic (including capabilities and interests) to me at

hphanson@fau.edu

We will include the information in our database and use it to meet specific needs as they arise.

Our preferred mode of collaboration is to involve graduate students or post-docs at the working level and provide some summer salary for faculty advisors.

Contacts

Center for Ocean Energy Technology
College of Engineering and Computer Science
Florida Atlantic University
777 Glades Road, Boca Raton FL 33431

Susan H. Skemp, Executive Director: *sskemp@fau.edu*
Howard P. Hanson, Scientific Director: *hphanson@fau.edu*