Powering North Carolina's Blue Economy

George Bonner, P.E.
ggbonner@ncsu.edu

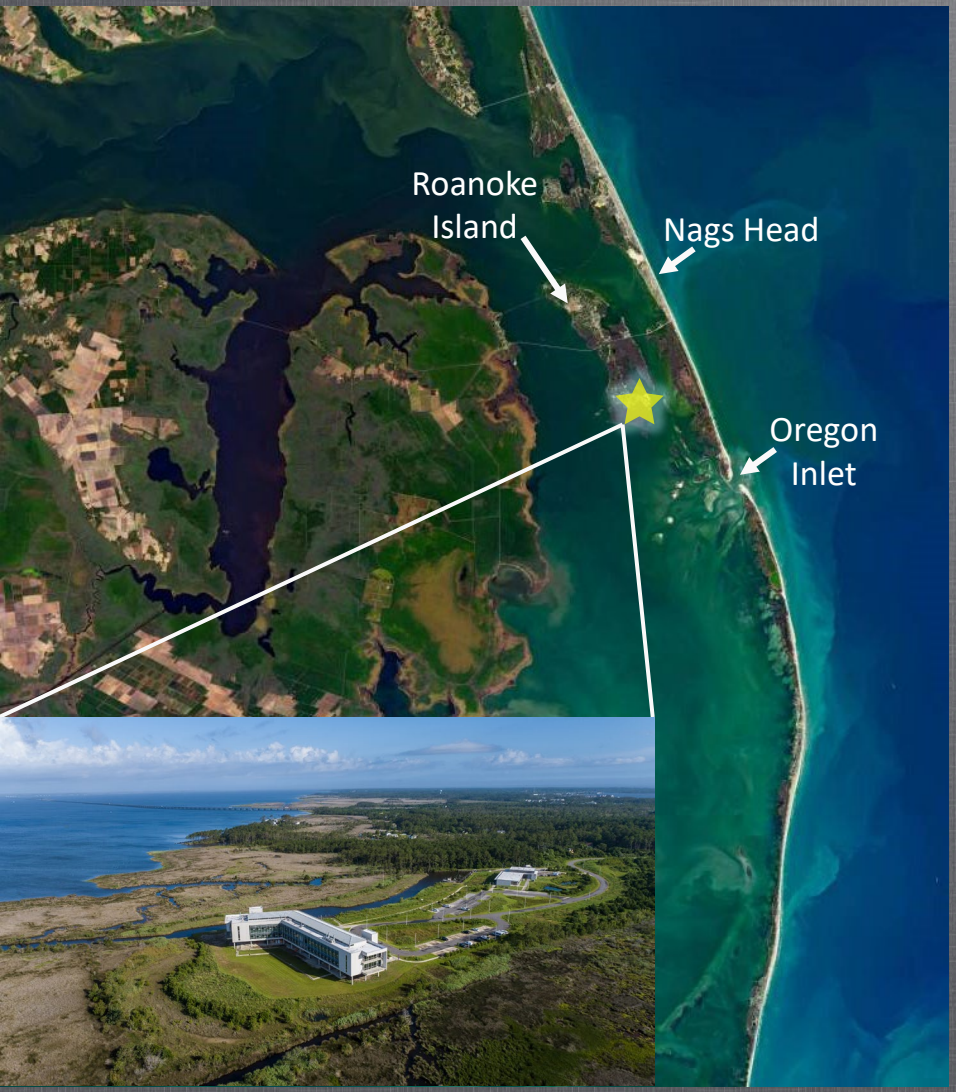
Mission

Use renewable ocean energy wisely to effectively and economically fulfill part of the energy needs of the State, and in the process create jobs and economic opportunities.

Research, Education and Outreach

ECU®
INTEGRATED COASTAL PROGRAMS

Coastal Studies Institute
A Multi-Institutional Research Partnership



ECU
OUTER BANKS CAMPUS

- Located along the shore of the Croatan Sound on Roanoke Island
- ~230 acres of marsh, scrub wetlands and maritime forests
- Research and Education Building 55,000 ft^2
- Marine Operations Building 15,000 ft^2
- Marina and boat ramp

Coastal Studies Institute

A Multi-Institutional Research Partnership

ECU

NC STATE UNIVERSITY

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

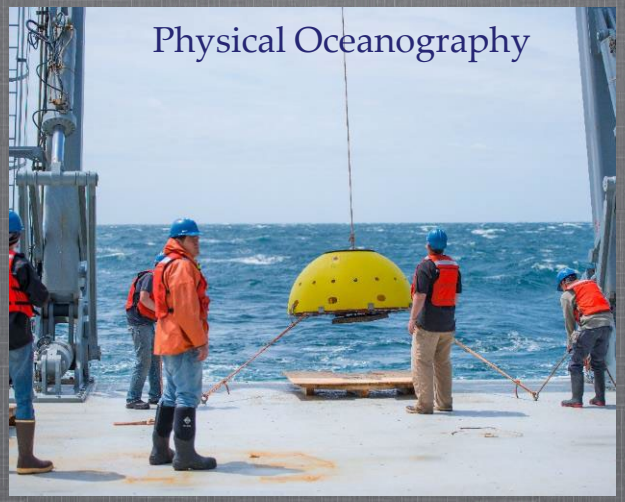
UNCW

ECSU

ELIZABETH CITY STATE UNIVERSITY

FOUNDED 1891


Fisheries Ecology


Physical Oceanography

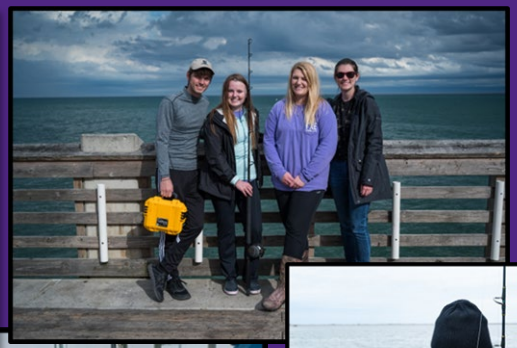

Maritime History

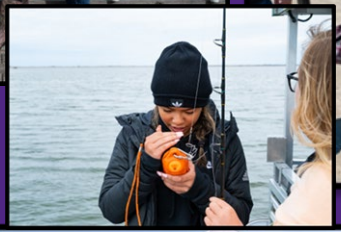

Coastal Change


Ecology & Biogeochemistry


Human Geography

Semester Experience at the Coast

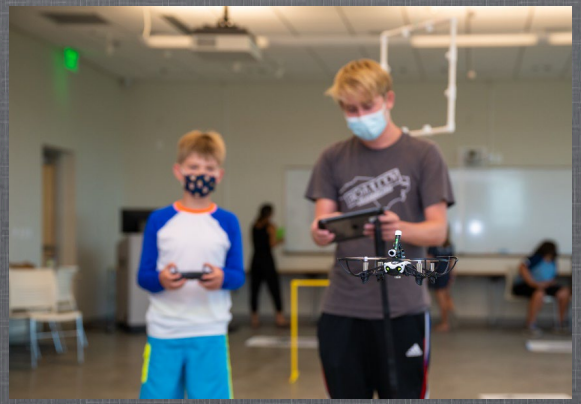





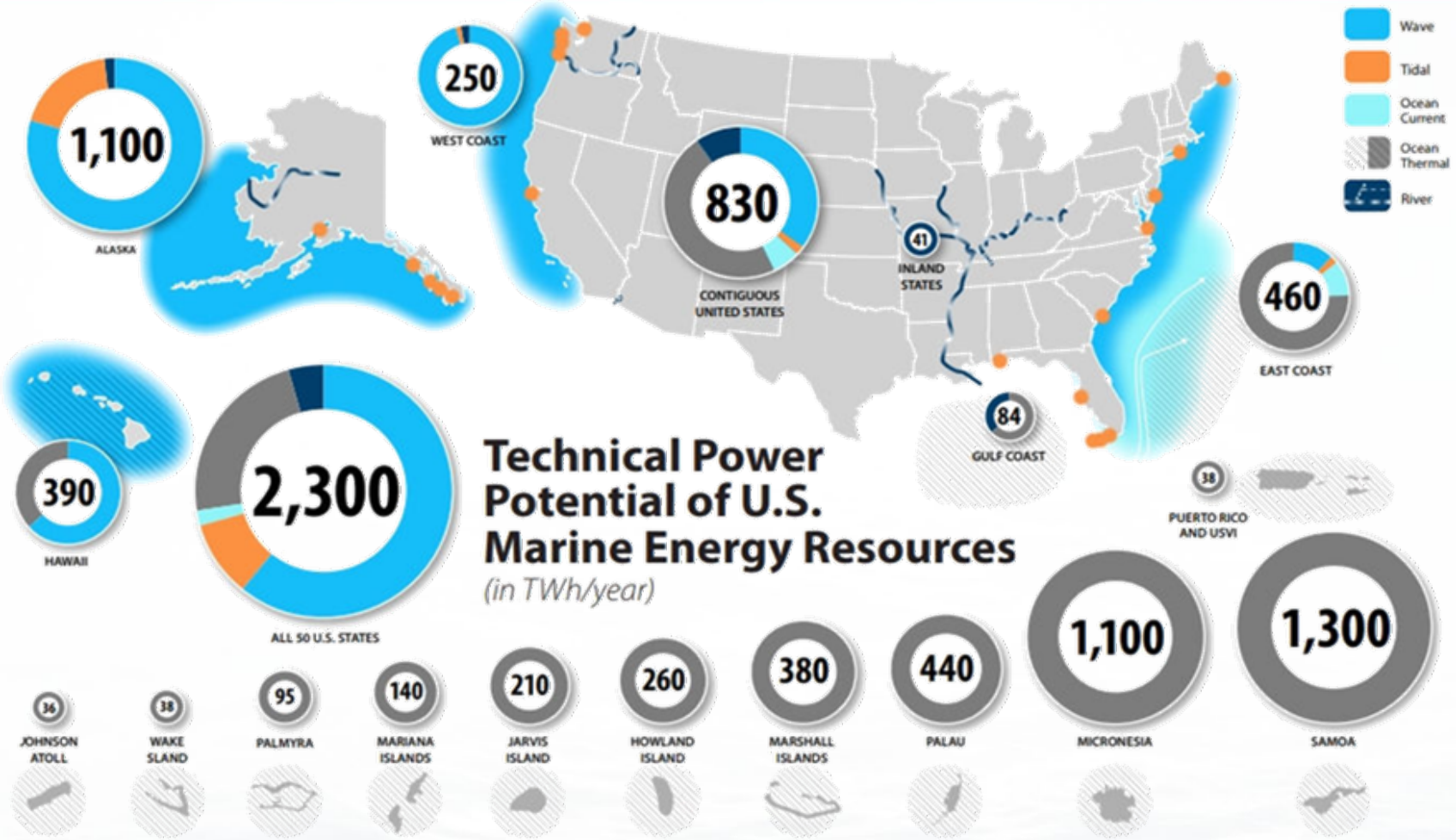
ECU
OUTER BANKS CAMPUS

Youth Programs



Public Programs

U.S. Marine Energy Resource

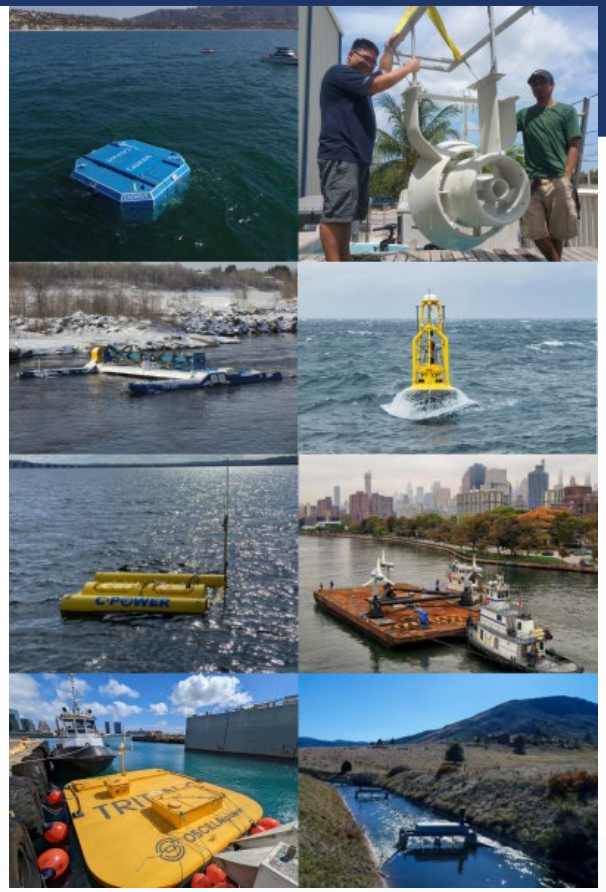


Background:
Benefits of Marine Energy

- Significant untapped resource (waves, tides, ocean and river currents) that can help decarbonize the U.S. energy portfolio while building energy independence and security.

- Predictable and Reliable:
  - Unlike intermittent renewables, tidal patterns and wave movements are highly predictable, providing a more stable and reliable source of power.
  - Predictability allows for better planning and integration into the energy grid.

- Economic Development:
  - The development of marine energy technologies can create new industries and job opportunities in research, manufacturing, installation, and maintenance.
  - Marine energy can stimulate economic growth, particularly in coastal and maritime regions.



NCROEP Overview

NC State Legislation

- Develop Partnership CSI, NCSU, UNCC, NCA&T
- Conduct research to conceptualize, design, construct, operate and market new and innovative technologies
- May be used to leverage federal or private funding
- Shall be interdisciplinary

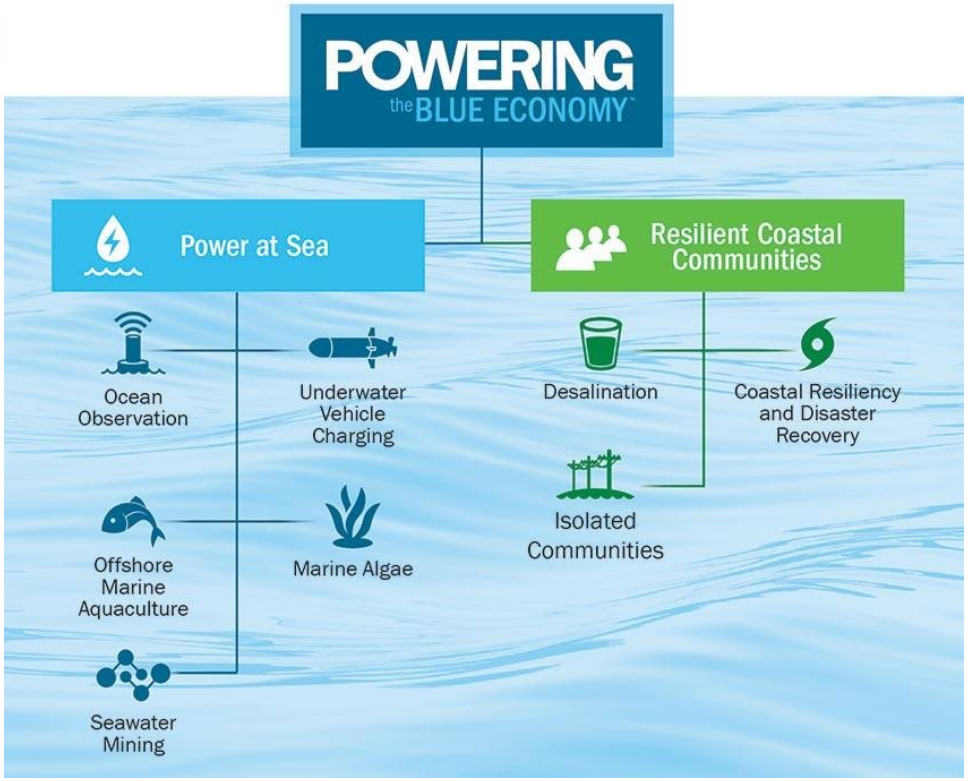
Coastal Studies Institute
A Multi-Institutional Research Partnership

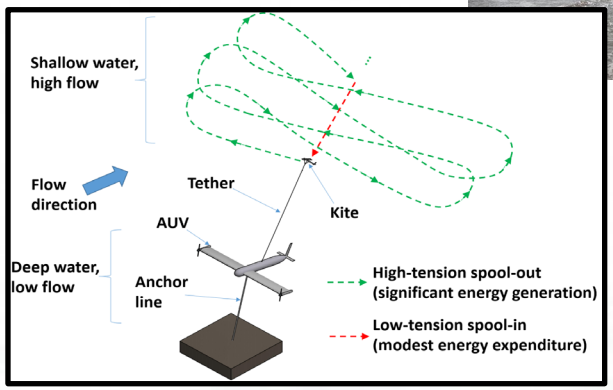
NC STATE Engineering

LEE College of Engineering
UNC CHARLOTTE

North Carolina Agricultural and Technical State University

Powering NC's Blue Economy



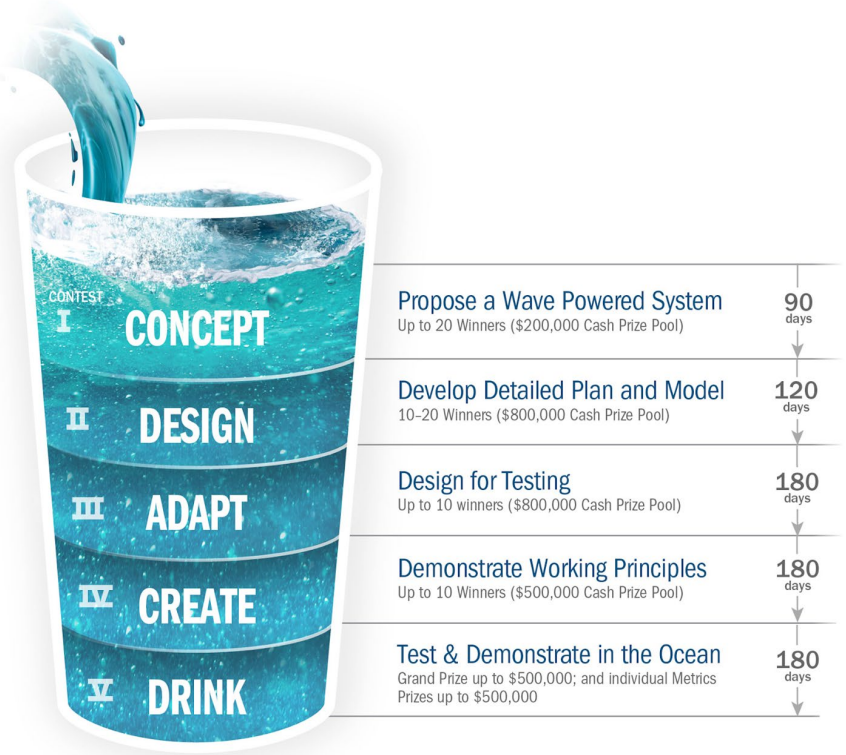


North Carolina Renewable Energy Challenge

March 23, 2024

Waves to Water Prize

The Waves to Water Prize is a 5-Stage, $3.3M contest to accelerate the development of small, modular, wave-powered desalination systems capable of providing potable drinking water in disaster relief scenarios and remote coastal locations.



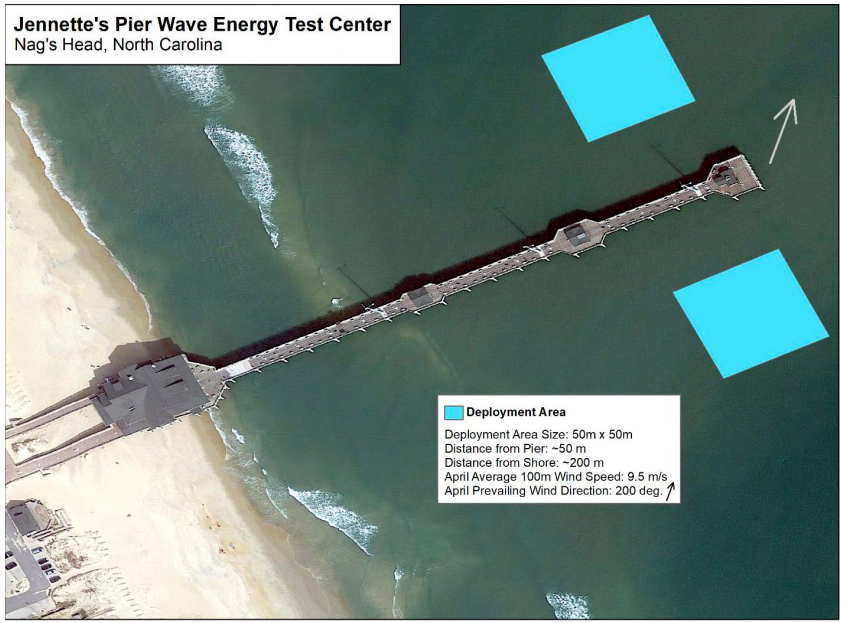
Prize Goals

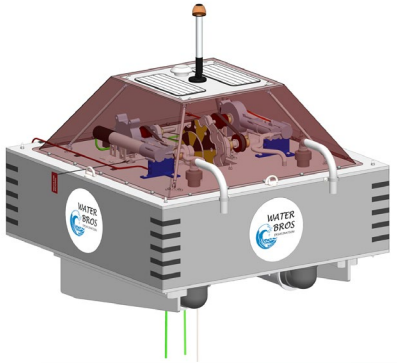
- Develop systems that are ***flexible in varied wave conditions***
- Deploy systems in ***less than 48 hours***
- Standardize shipping parameters
- Deliver minimum ***water quality***
- Operate without environmental degradation

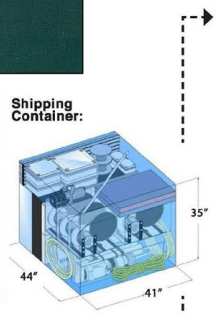
Waves to Water Prize

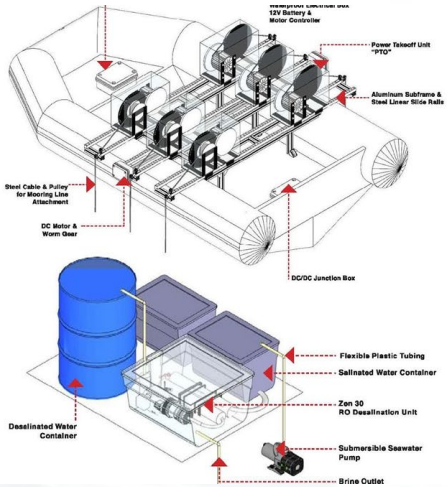
AMERICAN MADE WATER PRIZE

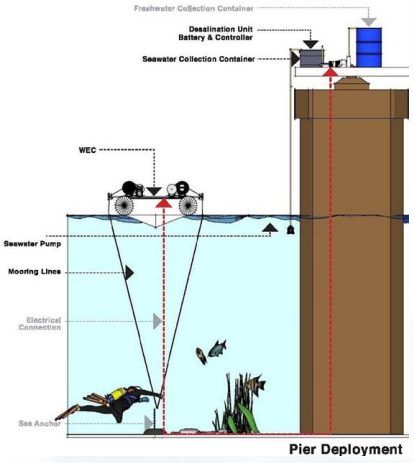
U.S. DEPARTMENT OF ENERGY







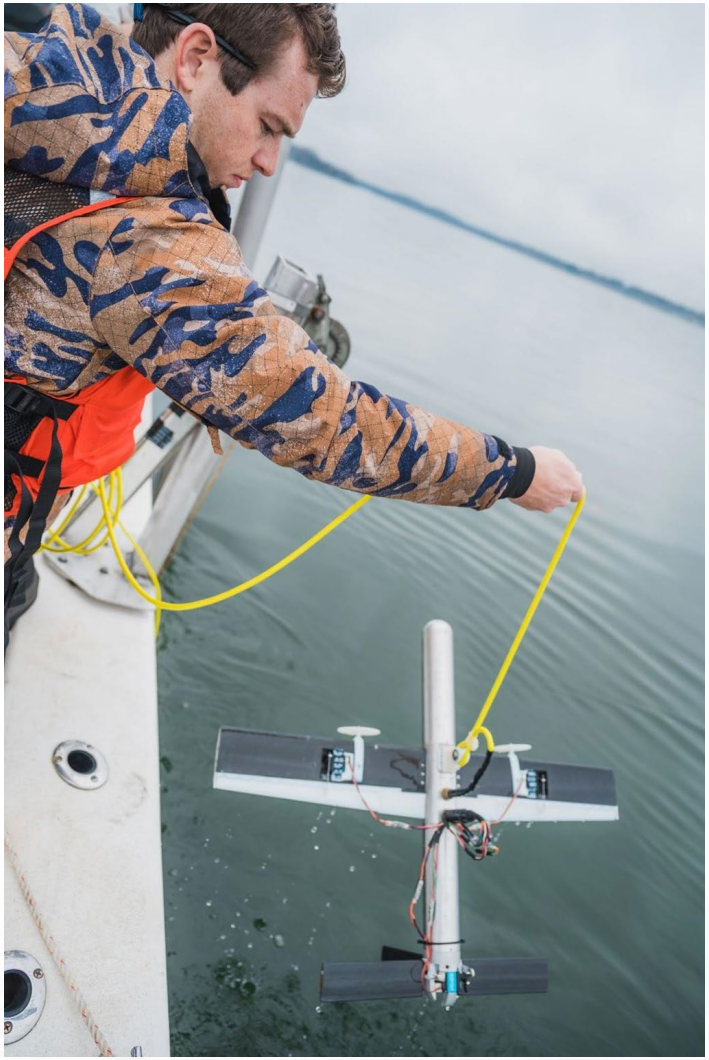




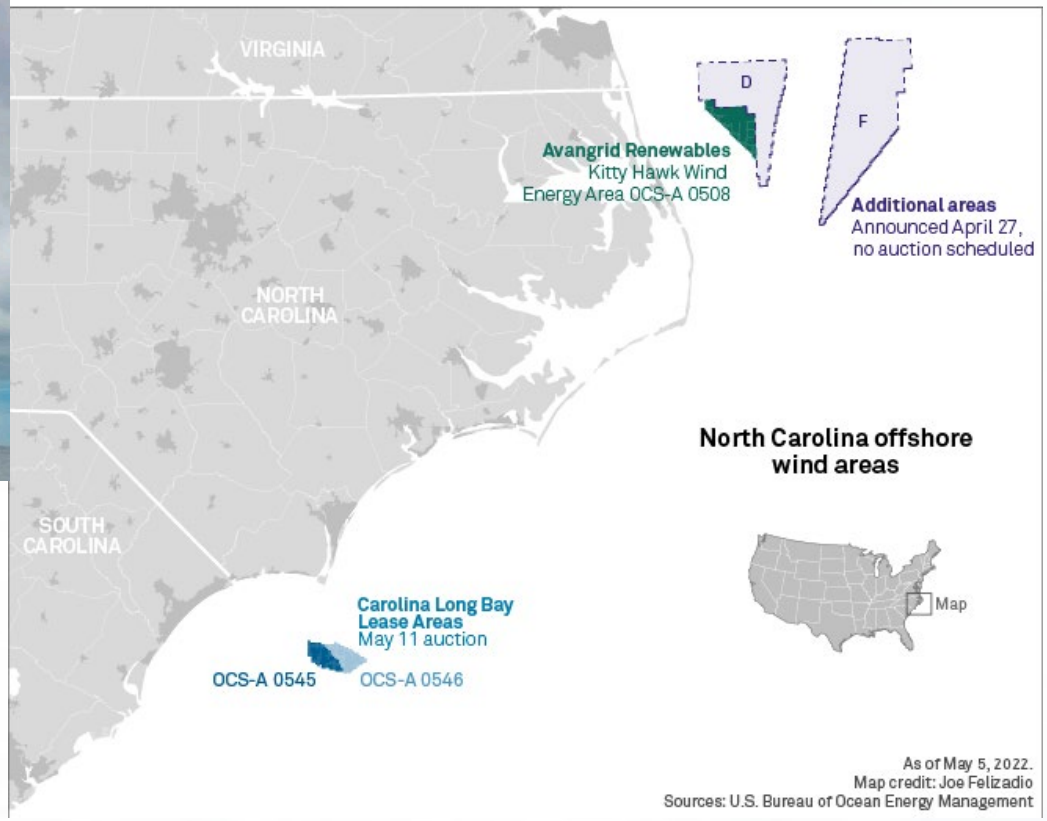
Pier Deployment

NORTH CAROLINA RENEWABLE OCEAN ENERGY PROGRAM

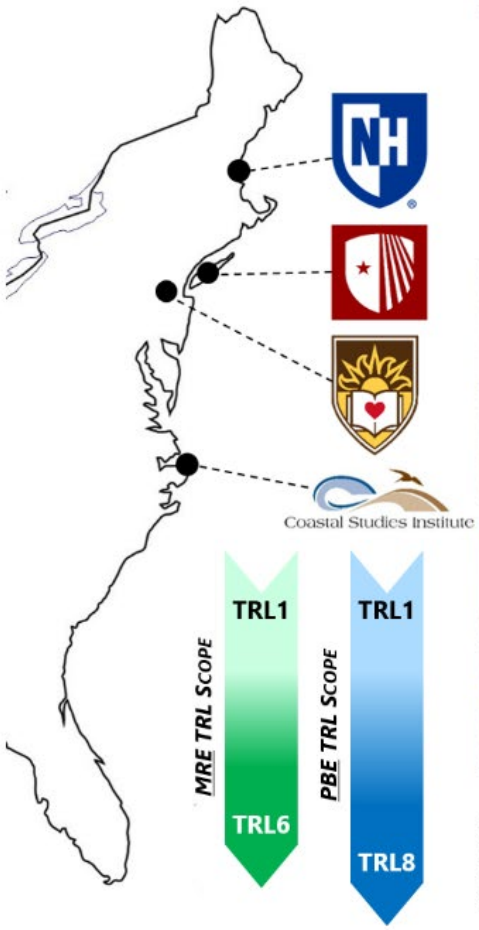
Testing Programs

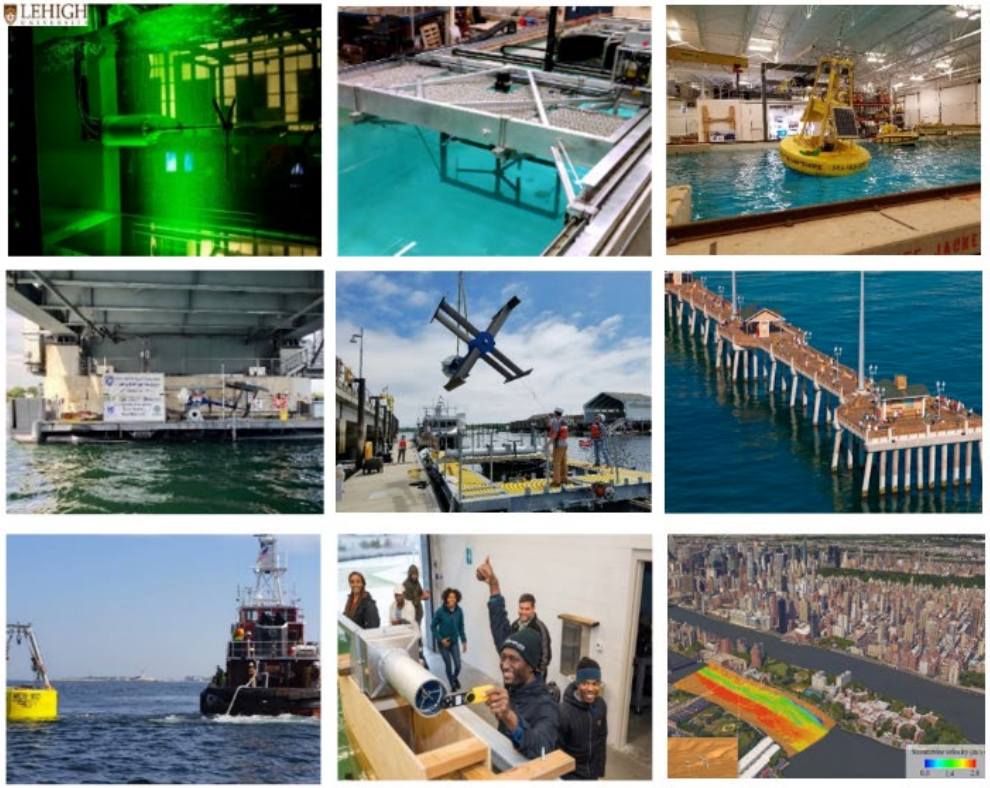


Powering NC's Blue Economy



Atlantic Marine Energy Center (AMEC)





Advancing the Marine Renewable Energy Industry and Powering the Blue Economy

U.S. DEPARTMENT OF ENERGY

Partners

Pacific Northwest NATIONAL LABORATORY

Sandia National Laboratories

NREL NATIONAL RENEWABLE ENERGY LABORATORY

EMEC THE EUROPEAN MARINE ENERGY CENTRE LTD

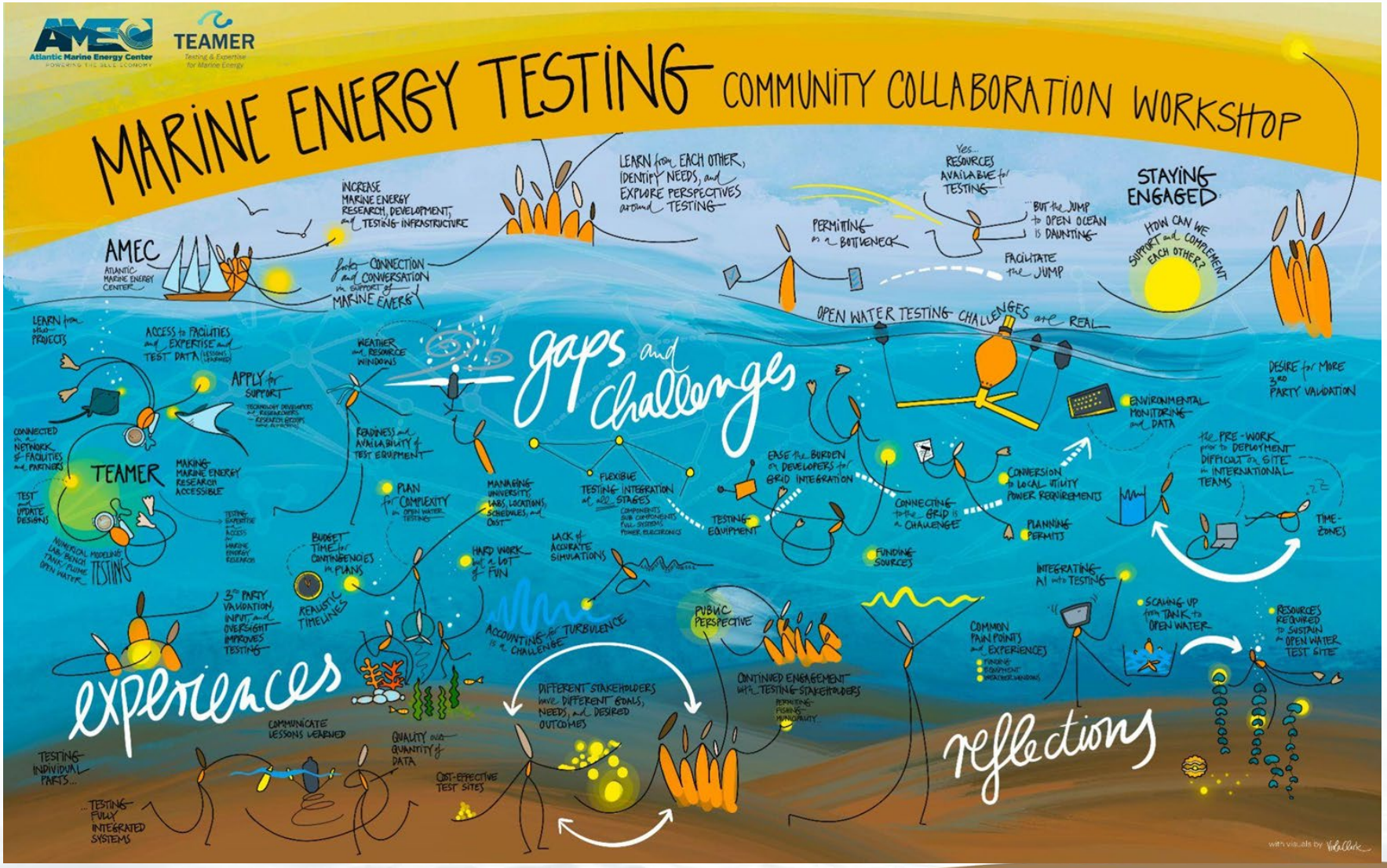
Other Participants

OLD DOMINION UNIVERSITY

AMEC Atlantic Marine Energy Center

NORTH CAROLINA RENEWABLE OCEAN ENERGY PROGRAM

Atlantic Marine Energy Center (AMEC)



Source:https://www.amec-us.org/

International Partnerships

Celebrating 10 years
International
WaTERS

ICOE
INTERNATIONAL CONFERENCE
ON OCEAN ENERGY

MELBOURNE 2024

Building Innovators & Stewards