Coastal Studies Institute:

Leveraging our Team and Technology for Coastal Restoration and Resilience

Reide Corbett

Dean, Integrated Coastal Programs Executive Director, Coastal Studies Institute East Carolina University









INTEGRATED COASTAL PROGRAMS

ECU's Coastal Enterprise

- Department of Coastal Studies
 - Interdisciplinary fields natural and social sciences
 - PhD Integrated Coastal Sciences
 - Undergraduate Semester Experience at the Coast
- Coastal Studies Institute
 - NC Renewable Ocean Energy Program
- ECU Office of Diving & Water Safety



COASTAL Studies Institute A MULTI-INSTITUTIONAL RESEARCH PARTNERSHIP







FOUNDED 1891

THE UNIVERSITY

CHAPEL HILL

NORTH CAROLINA



Research Focus Areas

- Coasts and People
- Marine & Coastal Ecosystems
- Oceanographic & Coastal Processes

- Fisheries Ecology
- Marine & Coastal Resource Management
- Renewable Ocean Energy



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.



Sra

ean Energ





Reneway

Marine Energy – a new use of the ocean

- Energy harvested from movement of seawater, other features
- Tides, waves, ocean currents, large rivers, thermal & salinity gradients

















Fred. Olsen





Corpower

Slide from: Andrea Copping, PNNL

U.S. Marine Energy Resource



"...utilizing just one-tenth of the technically available marine energy resources in the 50 states would equate to 5.7% of our nation's current electricity generation enough energy to power 22-million homes."

Kilcher, Levi, Michelle Fogarty, and Michael Lawson. 2021. Marine Energy in the United States: An Overview of Opportunities. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5700-78773.

NORTH CAROLINA RENEWABLE OCEAN ENERGY PROGRAM



Atlantic Marine Energy Center (AMEC)



Advancing the Marine Renewable Energy Industry and Powering the Blue Economy





NORTH CAROLINA RENEWABLE OCEAN ENERGY PROGRAM



Powering the Blue Economy







The Waves to Water Prize was a 5-Stage,

ropose a Wave Powered Syster WAVES 10 WATER evelop Detailed Plan and Mode DESIGN PRIZE ADAPT monstrate Working CREATE Shipping \$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 Pier Deployment

MERICA

coastal locations.



Oceanography & Marine Hydrokinetic Ocean Energy Lab



Dr. Mike Muglia – Physical Oceanographer



Resource Observations

Adhere to **Q**uality **A**ssurance of **R**eal **T**ime **O**ceanographic **D**ata standards (QARTOD)

- Jennette's Pier Spotter Buoys
- Waverider Buoys
- 5 MHz HF Radar Sites
- 13 MHz HF Radar Sites
- Moored 150 kHz ADCP Instrument Pod (Acoustic Doppler Current Profiler)
- Moored 300 kHz ADCP Instrument Pod
 - Repeated Research Vessel Transects Current, Temperature, Salinity Measurements



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Meteorological Observing Buoy

Glider transects of Temperature, Salinity, Current, Chlorophyll Measurements

Coasts & Oceans Observing Lab



Dr. David Lagomasino– Remote Sensing

Ecology & Biogeochemistry Lab







Dr. Lindsay Dubbs – Marine Ecologist Marine Fisheries Ecology Lab

Project—Using SONAR technology to understand fish use of coastal inlet habitat and responses to dredging

Dredging sediment plume



Displaced school of fish

Dr. Jim Morley – Fisheries Ecologist



Marine Fisheries Ecology Lab

Project—Estimating habitat enhancement value of Oyster Sanctuaries in Pamlico Sound



Acoustic imaging sonar

Undergraduate Programs



Graduate Programs





ABOUT THE PROCRAM

The Integrated Coastal Sciences PhD is a research intensive graduate degree at ECU that educates students to resolve complex problems facing coastal systems today, using multidisciplinary solutions that integrate across both natural and social sciences.



Four Major Fields of Study

- Coastal Geosciences
- Coastal Economics
- Coastal & Estuarine Ecology
- Coastal Social Science & Policy





INTEGRATED

Program Benefits Include

- Work across two campuses
 (ECU & ECU Outer Banks Campus)
- Integrative courses
 \$24,000 annual stipend
- Tuition waiver
- Health insurance















Youth Programs



Public Programs



Questions?