

Institute of Environment (IoE)

Capabilities Brief 2024



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Our Mission

- Our mission is to ***pioneer groundbreaking environmental research, education, and sustainable solutions***. We are dedicated to tackling pressing environmental challenges with rigor, integrity, and innovation.
- By fostering interdisciplinary collaboration, promoting global engagement, and nurturing a culture of excellence, we strive to be a leading force in advancing environmental science and ensuring a sustainable future for all.



Who we are

- The Institute of Environment brings together one of the largest groups of faculty and students associated with environmental science in the United States.
- A comprehensive solutions center, we are dedicated to combating environmental crises that devastate ecosystems, disrupt communities and destroy natural resources.
- From ***ridge to reef***, institute researchers are addressing both current and unprecedented future threats of environmental change, providing data-driven solutions to society's greatest and most urgent challenges.

FIU

Institute of
Environment

170

Research
Faculty

14

Departments

60

Countries Involved
in Research

\$243 million

Research Funding
Since 2010

2,000

Peer-Reviewed
Publications

Flagship Initiatives

- NSF-funded Florida Coastal Everglades LTER
- Medina Aquarius Program
- FIU Sea Level Solutions Center
- NSF-funded CREST Center for Aquatic Chemistry and Environment (CACHÉ)
- NSF-funded Coastal Research Experiences for Undergraduates and for Teachers
- FIU International Center for Tropical Botany at The Kampong



Institute of
Environment

Achievements

- In 2023, the Institute supported 78 PhD students and 89 post docs
- Grant expenditures totaled \$23 million
- New Awards totaled \$36 million
- IoE personnel have made over 2,000 contributions to peer-reviewed literature since 1993
- In 2023, 121 peer reviewed scientific articles were published



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Leadership

Institute Director

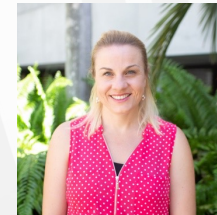


[Todd Crowl](#)

Division Directors



[Piero R. Gardinali](#)
Freshwater Resources Division



[Heather Bracken-Grissom](#)
Coastlines and Oceans Division



[James W. Fourqurean](#)
Coastlines and Oceans Division



[Christopher Baraloto](#)
Land and Biodiversity Division

Institute of Environment: Structure

EXECUTIVE DIRECTOR: T. Crowl

ASSOCIATE DIRECTORS: P. Gardinali, J. Fourqurean, C. Baraloto

STAFF: Executive Program Director: J. Guevara; Program Director of Communications: TBD; IT/Instrument Manager: M. Kershaw; Human Resources: V. Montes; Grants

Associates: D. Dominguez, M. Marquez

Cross-Cutting Programs:

Environmental Forensics & Public Health

Co-Directors: D. Mills & K. Lothridge

Facilities:

- International Forensic Research Institute (IFRI)
- Robert Stempel College of Public Health & Social Work

Environmental Finance & Risk Management

Director: M. Loyola

Director of Education: E. Villamor

Facilities: TBD

Innovation for Sustainable Built Environments

Director: S. Vassigh

Facilities:

- Robotics and Digital Fabrication Lab
- Metropolitan Center
- Lehman Center for Transportation Research

Coastal Environmental Data, Innovation and Modeling Initiative

Co-Directors: J. Liu, J. Obeysekera, T. Crowl

Freshwater Resources Division

Associate Director: P. Gardinali

Facilities:

- Field Operations Center (FOC)
- CACHe Nutrient Analysis Lab
- Analytical Facilities

CREST CACHE

(NSF Center for Aquatic Chemistry and Environment)

Leads:

P. Gardinali
R. Teutonico
S. Graham

Program Manager:
B. Schonhoff

FCE-LTER

(Florida Coastal Everglades – Long Term Ecological Research)

Lead: E. Gaiser

Office of
Everglades
Restoration
Initiative
(DOI)

UNESCO
Chair (M.
Donoso)

Barley Chair
(E. Gaiser)

Coastlines & Oceans Division

Associate Director: J. Fourqurean

Assistant Director: H. Bracken-Grissom

Medina Aquarius

Lead:

J. Fourqurean

Facilities:

- Reef Base

NOAA- FKNMS

(Florida Keys
National
Marine
Sanctuary)

RB-NERR

(Rookery Bay
Estuarine
Research
Reserve)

Sea Level Solutions Center

Director: J. Obeysekera

Director of Science: T. Troxler

Facilities:

- SLSC @ Miami Beach
Urban Studios

MetroLab
Network
Partnership

FCI
Cooperative
Agreement
(Florida Climate
Institute)

Land & Biodiversity Division

Associate Director: C. Baraloto

International Center for Tropical Botany

Director: C. Baraloto

Program Director: TBD

Facilities:

- ICTB @ The Kampong

Agroecology Program

Co-Directors:

K. Jayachandran
M. Bhat

Facilities:

- Organic Garden
- Possum Trot

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Structure

Freshwater Resources Division



Coastlines and Oceans Division



Land and Biodiversity Division



Areas of Expertise

Freshwater Ecosystems and Water Security:

- Wetland ecosystem dynamics and restoration
- Nutrient monitoring and mitigation
- Green technologies for water treatment
- Wastewater characterization
- Water flow dynamics modeling
- Hydrogeology, ecohydrology, biogeochemistry
- International water security and policy
- Clean drinking water supply
- Emerging contaminants and PFAS assessment
- Water quality monitoring
- Aquatic chemistry and ecotoxicology



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Areas of Expertise

Ocean and Marine Sciences:

- Fisheries assessment using acoustic surveys
- Crustacean population modeling
- IUU fishing monitoring and policy
- Conservation of protected species (whales, dolphins, manatees, sea turtles, sharks)
- Coral reef ecology and restoration
- Seagrass ecosystem management
- Blue carbon valuation
- Marine robotics and technology
- Providing platforms for marine science research, training of astronauts and military, and industrial testing
- Investigates the evolution of systems and structures such as bioluminescence, vision, and color in marine invertebrates.
- Hydrological modeling for water quality and plastic pollution studies
- Harmful algal blooms



Areas of Expertise

Coastal Resilience Adaptation and Urban Environments:

- Sea level rise monitoring and modeling
- Storm surge modeling
- Nature-based solutions for sea level rise
- Extreme heat impact assessment
- Sustainable infrastructure development
- Saltwater intrusion monitoring
- Land subsidence analysis



Areas of Expertise

Botany and Agriculture:

- Tropical botany research
- Plant conservation efforts
- Sustainable agriculture practices
- Urban canopy cover enhancement
- Community forest management

Conservation, Wildlife Management, and Forensics:

- Species recovery and reintroduction
- Wildlife conservation strategies
- Combatting illegal wildlife trade
- Environmental forensic techniques
- Invasive species management
- Genetic species identification



Areas of Expertise

Evolutionary Biology:

- Conducts research on phylogenetics and genomics to uncover evolutionary relationships and origins.
- Analyzes genetic data and morphological traits to understand mechanisms driving evolutionary change.

Diversity Expertise:

- Explores biodiversity, ecology, and taxonomy across various organisms.
- Studies key morphological traits promoting diversification and speciation, contributing to conservation efforts.



Areas of Expertise

Environmental Health:

- Environmental forensics
- Disease impact assessment

Environmental Finance and Risk Management:

- Advanced financial modeling
- Risk assessment

Environmental Education and Training:

- Training programs
- Outreach initiatives

Environmental Communication:

- Public awareness campaigns
- Stakeholder engagement



Facilities

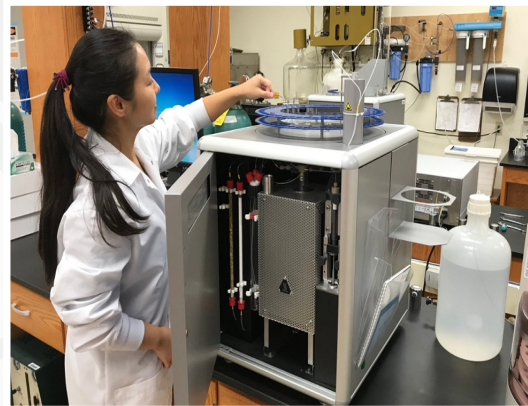
- The FIU Institute of Environment offers over 14 cutting-edge facilities, providing researchers and students with state-of-the-art resources for environmental research and conservation.

Periphyton and Harmful
Algal Bloom Analysis Lab



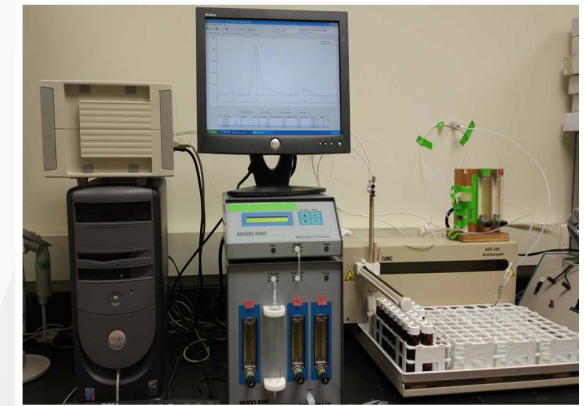
Specializes in the analysis and identification of microalgae, including periphyton and phytoplankton.

CAChE Nutrient Analysis
Core Facility



Offers analysis of dissolved and total nutrients, chlorophyll-a, and organic carbon.

Bioinorganic and Environmental
Analytical Facility



Specialized in the analysis of mercury, methylmercury, metals, and organometallic compounds.

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Facilities

Stable Isotope Laboratory



Conducts analysis of stable isotopes of carbon, hydrogen, nitrogen, and oxygen in various materials.

Emerging Contaminants of Concern (ECC) Research Lab



Advanced analytical tools for PFAS characterization in environmental and biological samples.

Environmental Analysis Research laboratory



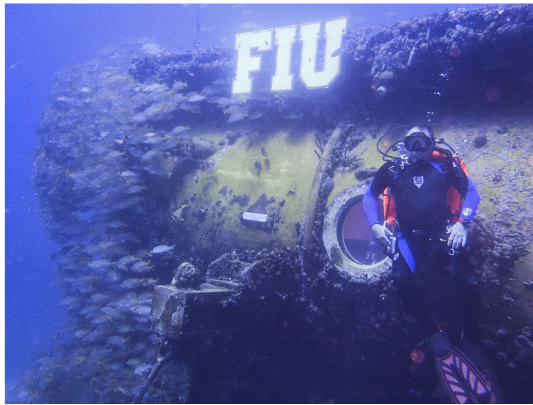
Advanced analytical tools for characterization of legacy and emerging contaminants in environmental samples.

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Facilities

Aquarius Reef Base



The world's sole undersea research laboratory, facilitating dive training and ecosystem research.

Marine Robotics Facility



Features advanced sampling technologies and autonomous surface watercraft.

Coastal Conservation and Restoration Laboratory



Provides indoor and outdoor facilities for toxicology, behavioral, and swim performance studies.

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Blue Carbon Analysis Laboratory



Conducts analysis of plant and soil elements.

Robotics & Digital Fabrication Lab



Dynamic, interdisciplinary hub dedicated to advancing the built environment through technological innovation

Field Operations Center



Equipped with airboats, saltwater boats, and other vehicles for field research.

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Facilities

International Center for
Tropical Botany at The
Kampong



Research center focused
on tree canopy, invasive
species, botanic
medicines, and climate
change.

Agroecology Facilities



Organic garden and
Possum Trot Experiment
Station for research and
teaching.

IoE Omics Laboratory



Collaborative facility for
environmental DNA , whole-
genome sequencing,
transcriptomics, proteomics,
and metabolomics.

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Centers & Programs

Education, research and community initiatives are organized within thematic programs and centers which bring together experts from across the Institute of Environment.

Florida Coastal Everglades LTER



Investigates climate change's interaction with freshwater resource management, revealing coastal ecosystem dynamics.

CREST Center for Aquatic Chemistry and Environment



Addresses environmental contamination by tackling pollutants' effects on ecosystems, supported by the NSF.

Medina Aquarius Program



Researches oceans, develops tech, trains divers, engages public at Aquarius Reef Base, Florida Keys.

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Centers & Programs

Sea Level Solutions Center



Serves as a hub for sea level and climate change research, collaboration, and practical solutions.

International Center for Tropical Botany



Develops research, education, and outreach programs related to tropical botany, integrating global research programs.

Agroecology Program



Integrates agriculture, ecosystems, and urban development through education and research.

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UNESCO Chair on Sustainable Water Security



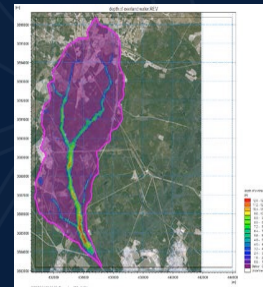
Tackles global water security through research, education, and sustainability partnerships.

Lead Co-host of the UNESCO Intergovernmental Hydrological Programme International Initiative on Water Quality



Water Quality

- Microplastics
- Emergent pollutants
- From source to sea



Water Quantity

- Compound events modelling and analysis



Safeguarding the Resource and the Water Sector

- Cybersecurity for Water Security

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Cross-cutting Initiatives

Environmental & Human Health Initiative



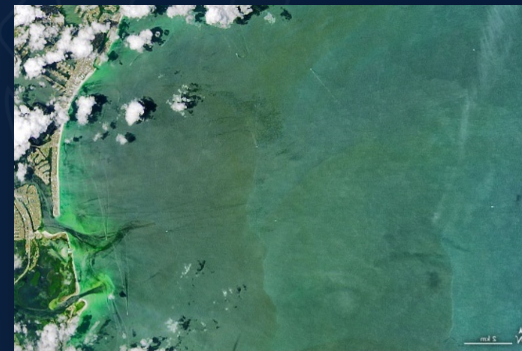
Environmental Finance & Risk Management



Innovation for Sustainable Built Environments



Coastal Environmental Data and Modeling Initiative



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