

# **Sustaining FIU's CREST Center: A Strategic, Serendipitous Journey**

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**Institute of Environment**  
**Florida International University**

**Aug 19, 2025**

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# Founding Principles:

**Transdisciplinary**

**Globally & **Locally** Relevant**

**Catalytic**

**Transformative**

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# FIU

## Center for Aquatic Chemistry and Environment

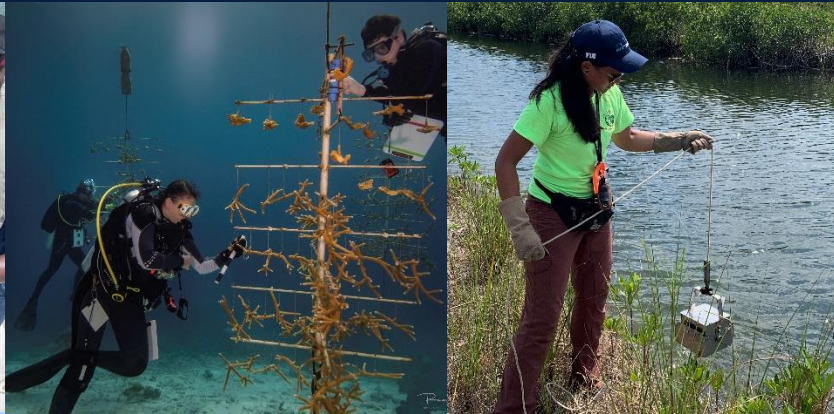
### NSF Center of Research Excellence in Science and Technology

## Phase II Research Focus Areas

**Novel Environmental Stressors**



**Multi-Level Organismal Impacts**



**Integrated Ecosystem Assessment**



## Education and Innovation

**Everglades**



**Mangroves**



**Near Shore Systems**



**Urban Waterways**



# Founding Principles:

## Transdisciplinary

25 faculty from 8 departments (4 colleges)

Graduate cohorts – team projects

Identified key facilities for development

(Env. Chemistry, Robotics and Digital  
Fabrication, Computing, STEM Institute)

*Gap = real-time sensing platforms*

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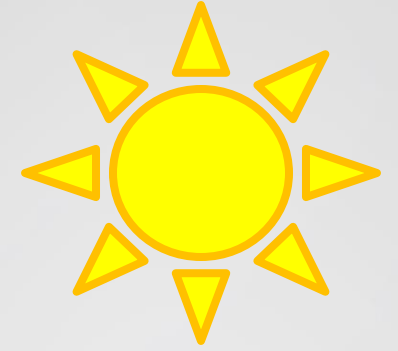
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# CREST Research Buoys





- **Temperature**
  - **Conductivity**
  - **Salinity**
  - **Dissolved Oxygen**
  - **pH**
  - **Turbidity**
  - **Chlorophyll**
  - **fDOM**
  - **Directional Flow Rate**
- 
- **Measurements taken ever 15 minutes, data sent via uplink every hour**









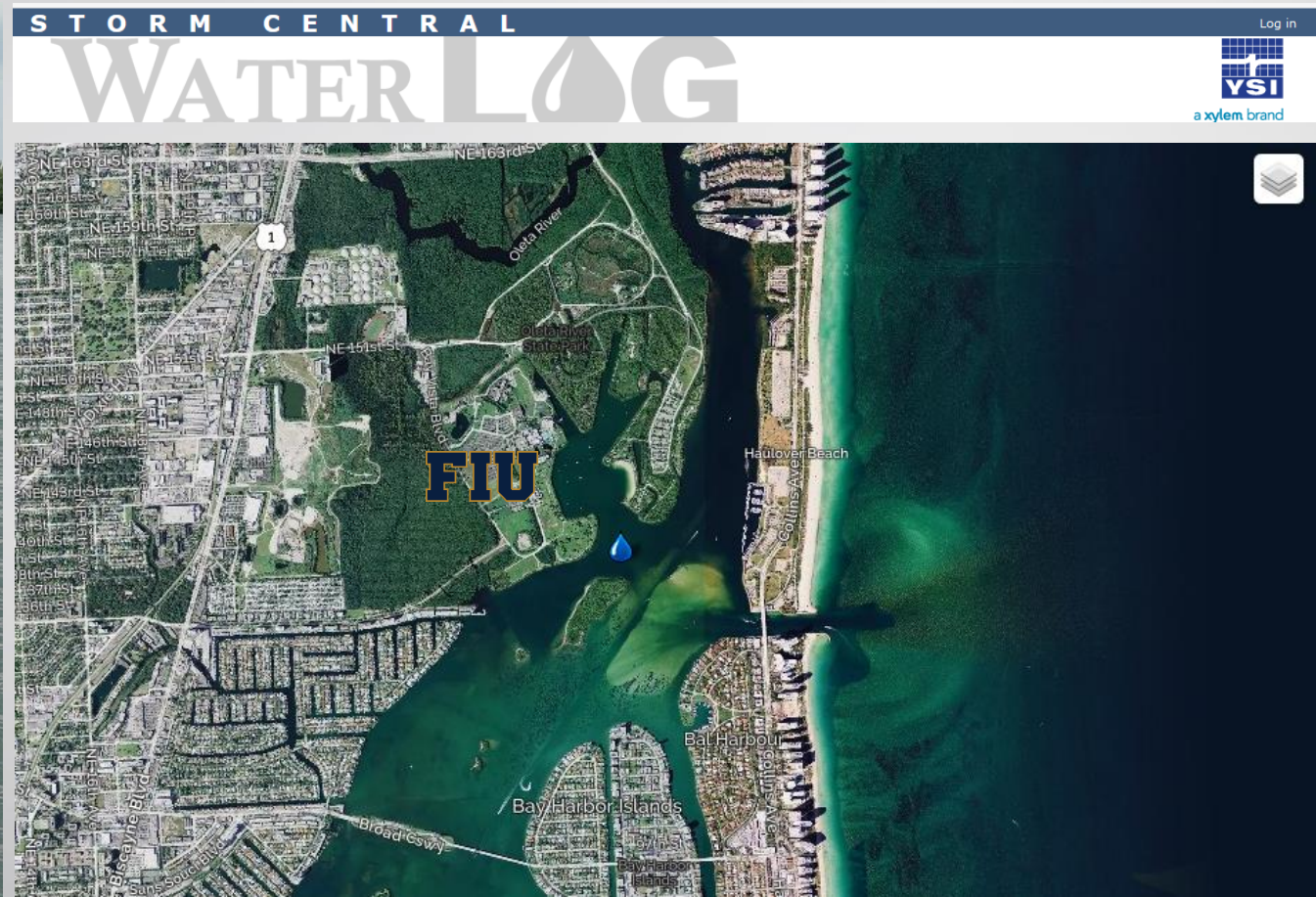
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# First Deployment: October 2018

In response to reports of **red tide** along Florida's southeast coast, our **first buoy** was deployed near FIU's Biscayne Bay Campus to monitor levels of **chlorophyll** for potential algal blooms



# Founding Principles:

**Transdisciplinary**

**Globally & Locally Relevant**

Solutions Oriented

Community Engaged Research

Local NGOs, Agencies, Community Groups

Summer Internships

Universities for the Future – Be a Leader

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Engineering  
Medicine



## Integrating AI into State and Local Government Decision Making

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Sciences  
Engineering  
Medicine

This PDF is available at <http://nap.nationalacademies.org/29177>

Higher Education's Path to Sustainability and Resilience:  
Proceedings of a Workshop—in Brief (2025)



BioScience

### Higher education institutions can accelerate societal climate action

Journal:	<i>BioScience</i>
Manuscript ID	Draft
Manuscript Type:	Viewpoint
Date Submitted by the Author:	n/a
Complete List of Authors:	Kopp, Robert; Rutgers University New Brunswick, Department of Earth & Planetary Sciences; Rutgers University New Brunswick, Rutgers Climate and Energy Institute Lippel, Philip ; Massachusetts Institute of Technology, Washington Office Teutonico, Rita ; Florida International University, College of Arts, Sciences & Education Dorhout, Peter ; Iowa State University, Iowa State Research Han, Sang ; University of Washington, Office of External Affairs Harvey, Erica ; Fairmont State University, College of Science and Technology Newman, Julie ; Massachusetts Institute of Technology, Office of Sustainability Thomas, Randi M; Miami University, ASPIRE Tolstoy, Maya ; University of Washington, School of the Environment Crowl, Todd; Florida International University, Institute of Environment; Florida International University Krosby, Meade; University of Washington, Climate Impacts Group and Northwest Climate Adaptation Science Center

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# Second Deployment Coral Gables





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# Second Deployment: Coral Gables

The **second buoy** is monitoring **urban water quality** to compare normal conditions with extremes, such as during heavy rains and high tides



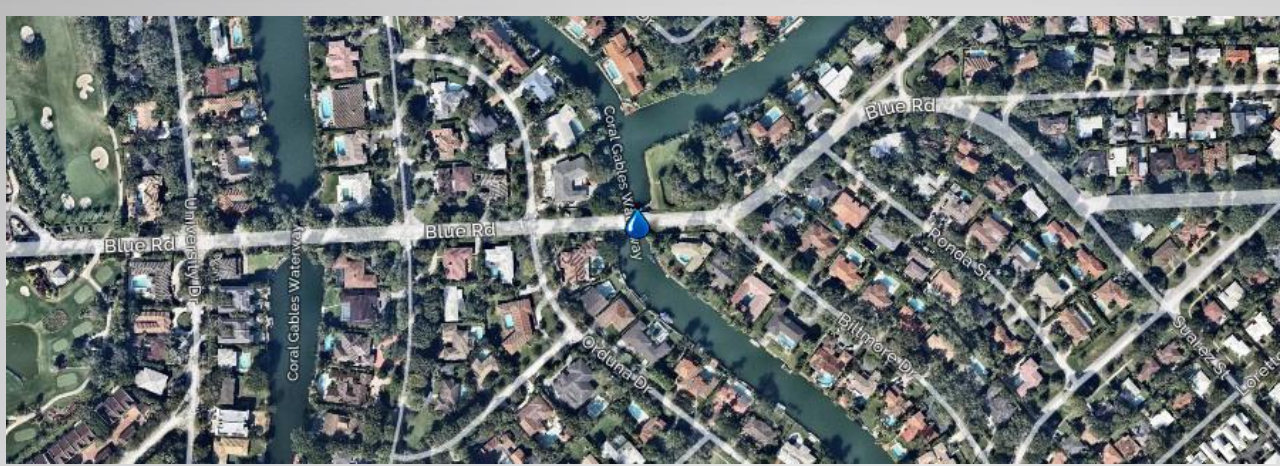


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# Deployed: January 2019



August, 2020



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**We had continuous monitoring with real-time data through our NSF Center of Excellence Program**

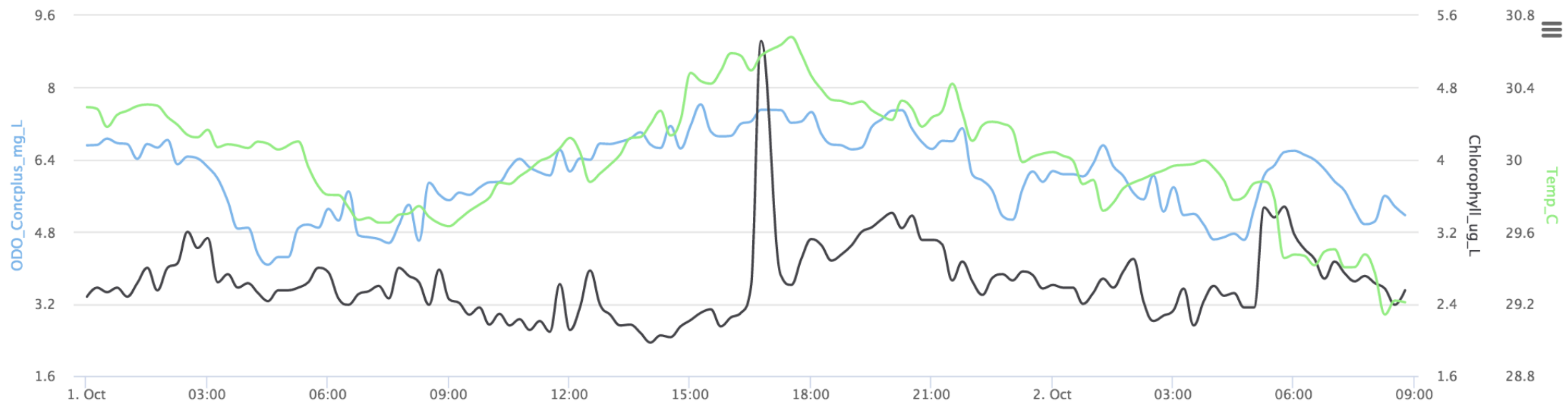


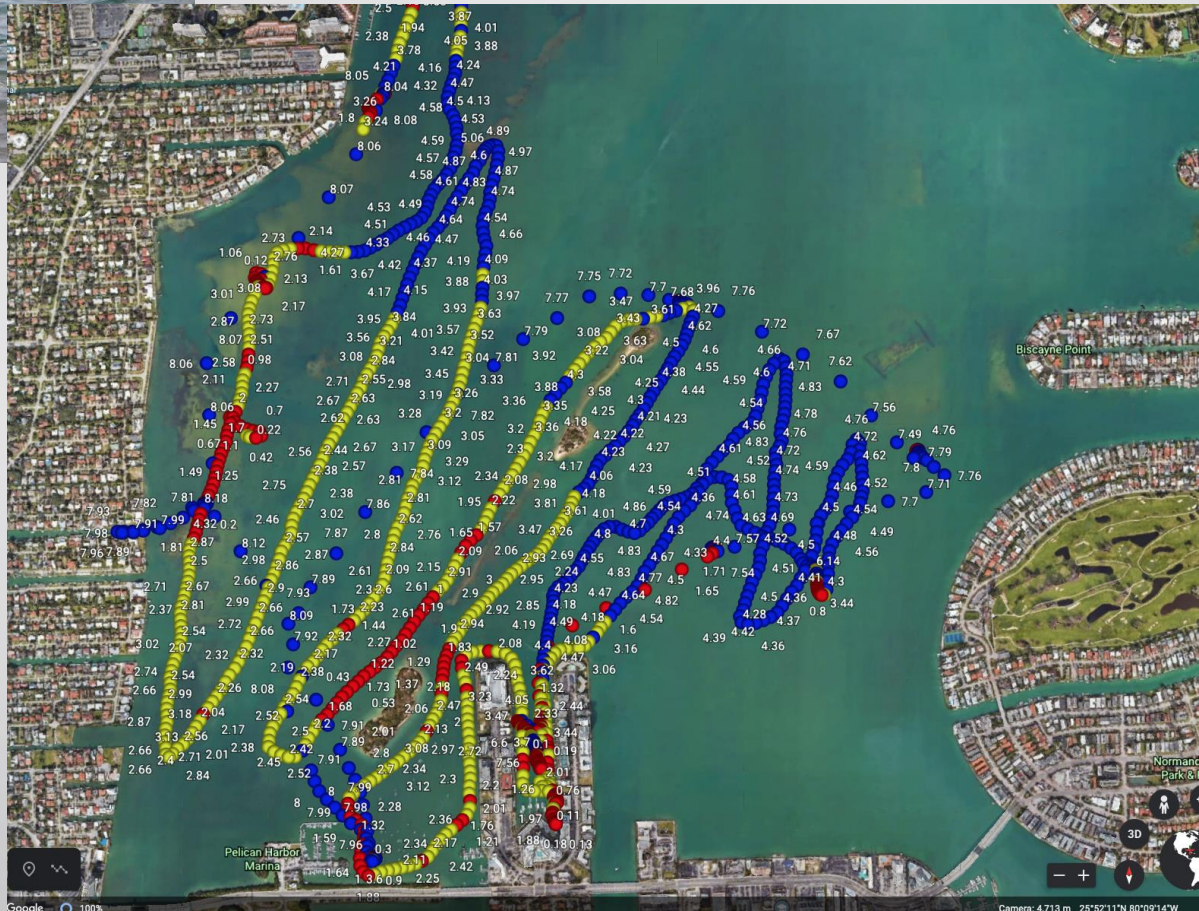
**Including night-time observations**

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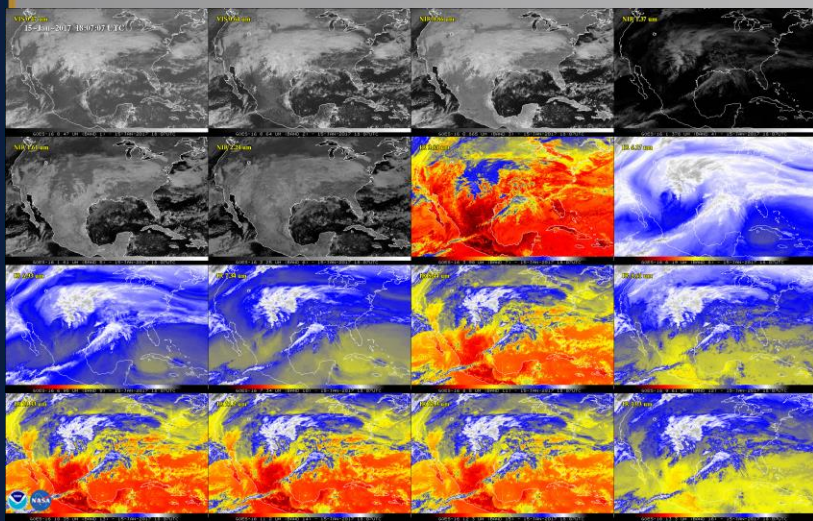
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**[environment.fiu.edu](http://environment.fiu.edu)**





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# 2024 Biscayne Bay Economic Impact Study

- **\$64 Billion in economic output**
- **\$24 Billion in income**
- **448,000 jobs**
- **\$4 Billion in tax revenue for Miami-Dade County**

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# Founding Principles:

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**Catalytic**

NSF REU and BioRETS Sites

Approx. \$100 million leveraged grants

Numerous Equipment Supplements

CREST 'Omics Facility

DOD Testbed for Marine Robotics

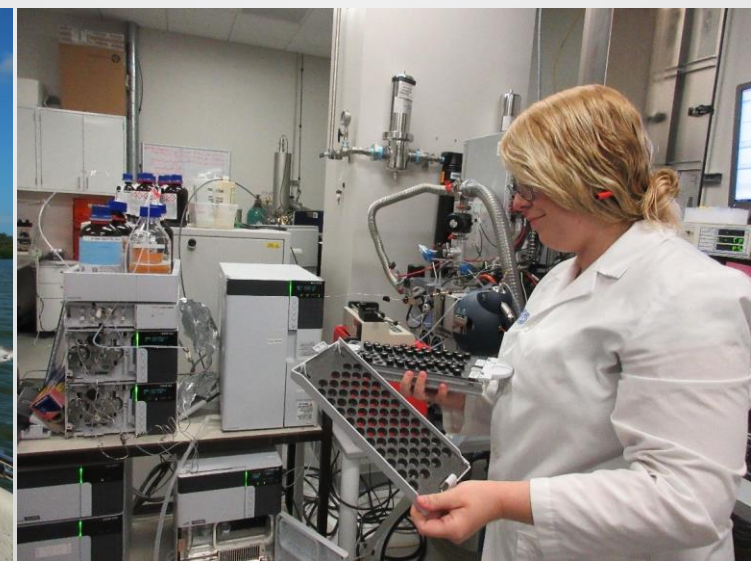
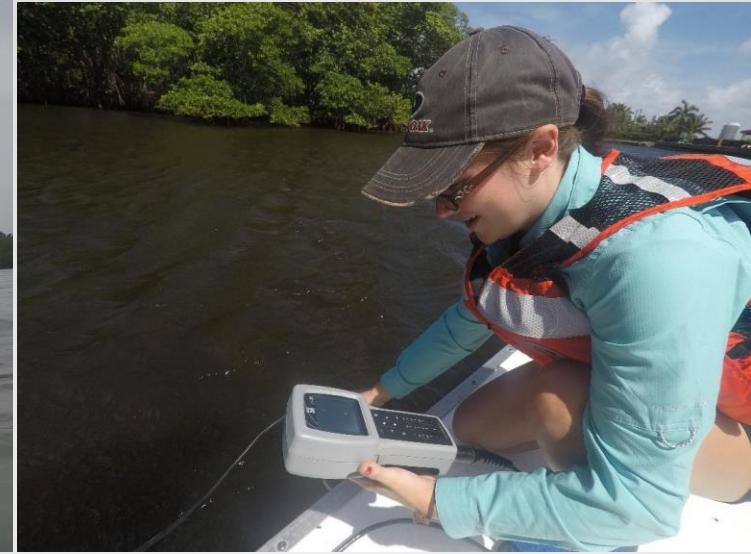
NIST Robotics & Autonomous Systems Facility

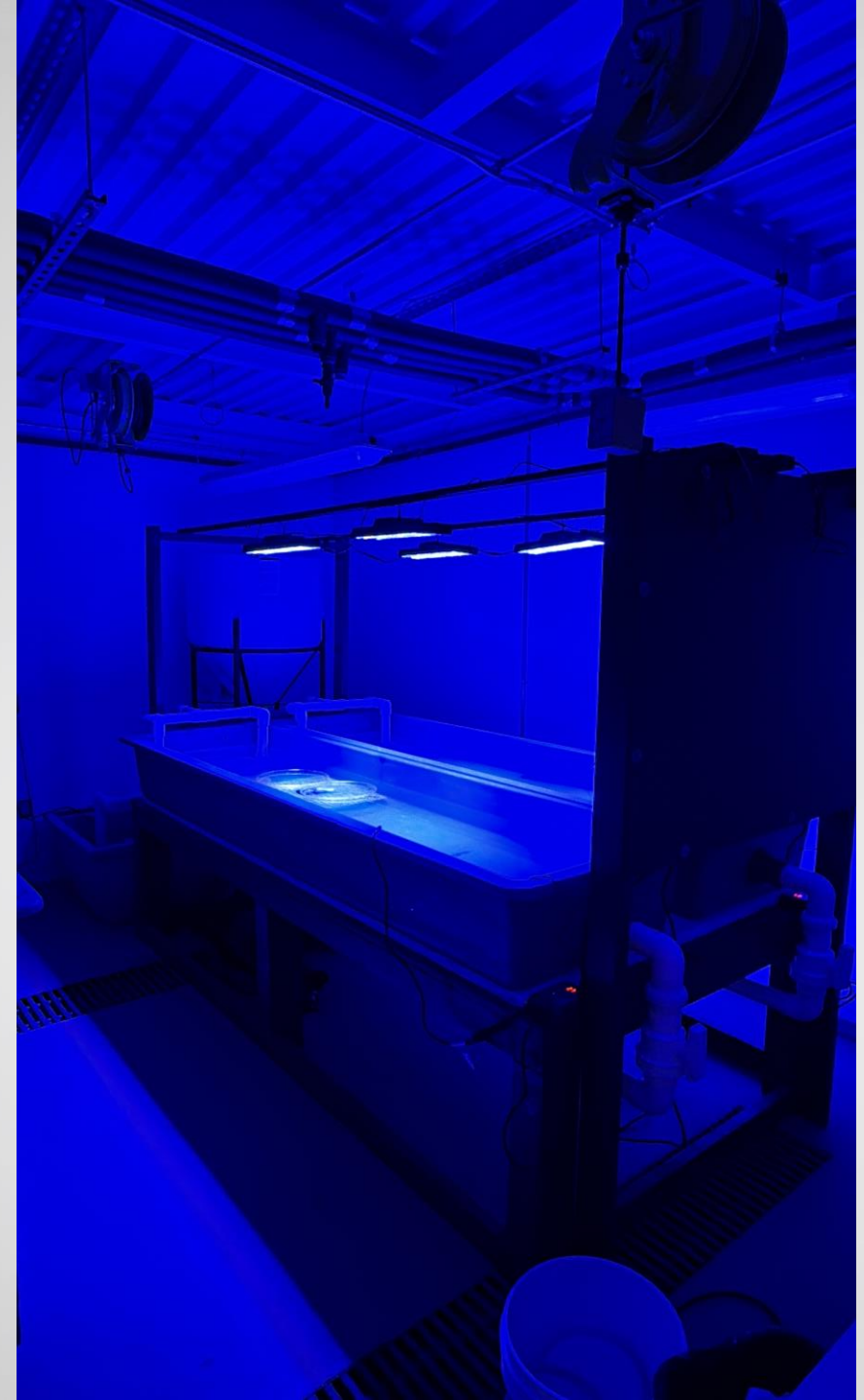
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# Coastal Ecosystems REU Site

## Student Project Development

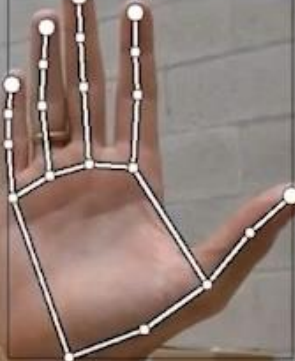




# Controlling Robot Gripper with Hand Gesture Recognition

1.5x

Left:Open





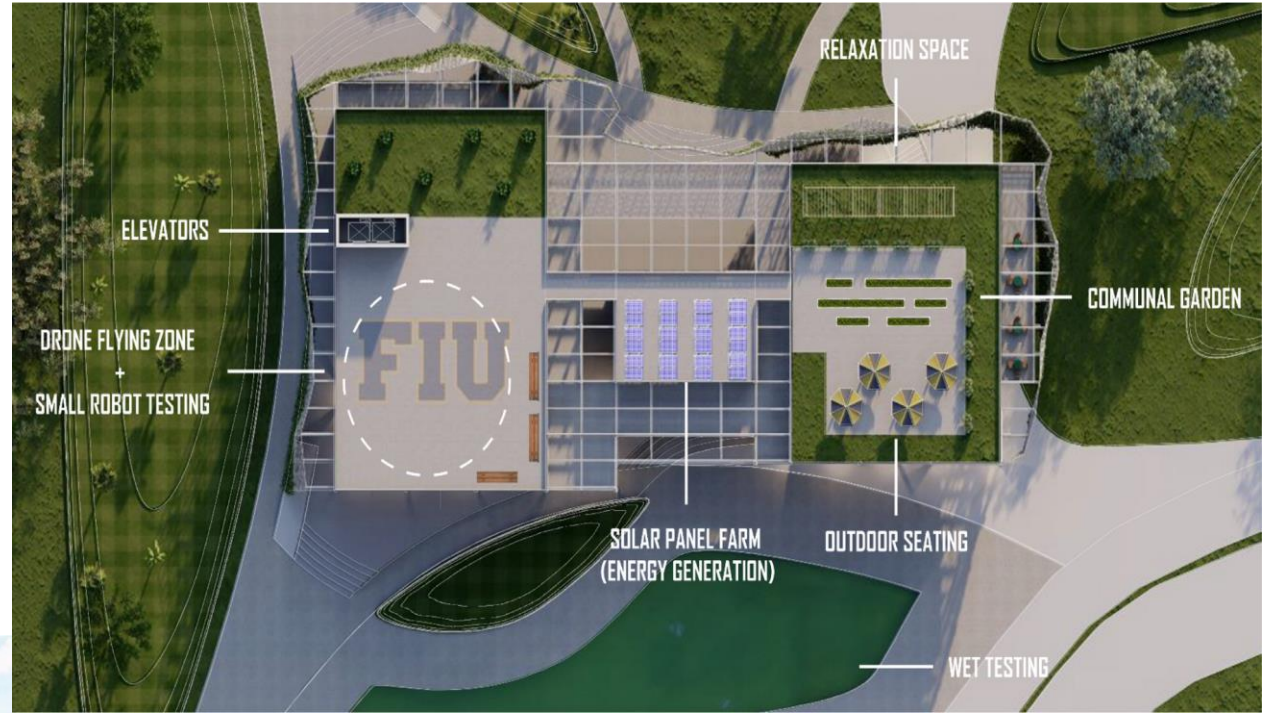
SARA MISIR

**National Institute of Standards and  
Technology Award = \$9.2 Million**





Roof Garden







**Hydrogen Sulfide Sensors  
Return near-real time data**

# Founding Principles:

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70 faculty from all 7 colleges (including medicine, law and business)

40 Post Docs

118 grad & 216 undergrads

*New PhD in Architecture*

*6 key faculty hires*

*Cross-college courses and credentials*

*University-wide initiatives in Environment and*


*Human Population Health and Coastal*

*Environmental Data, Innovation and Modeling*

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# Coastal Environmental Data, Innovation and Modeling Center

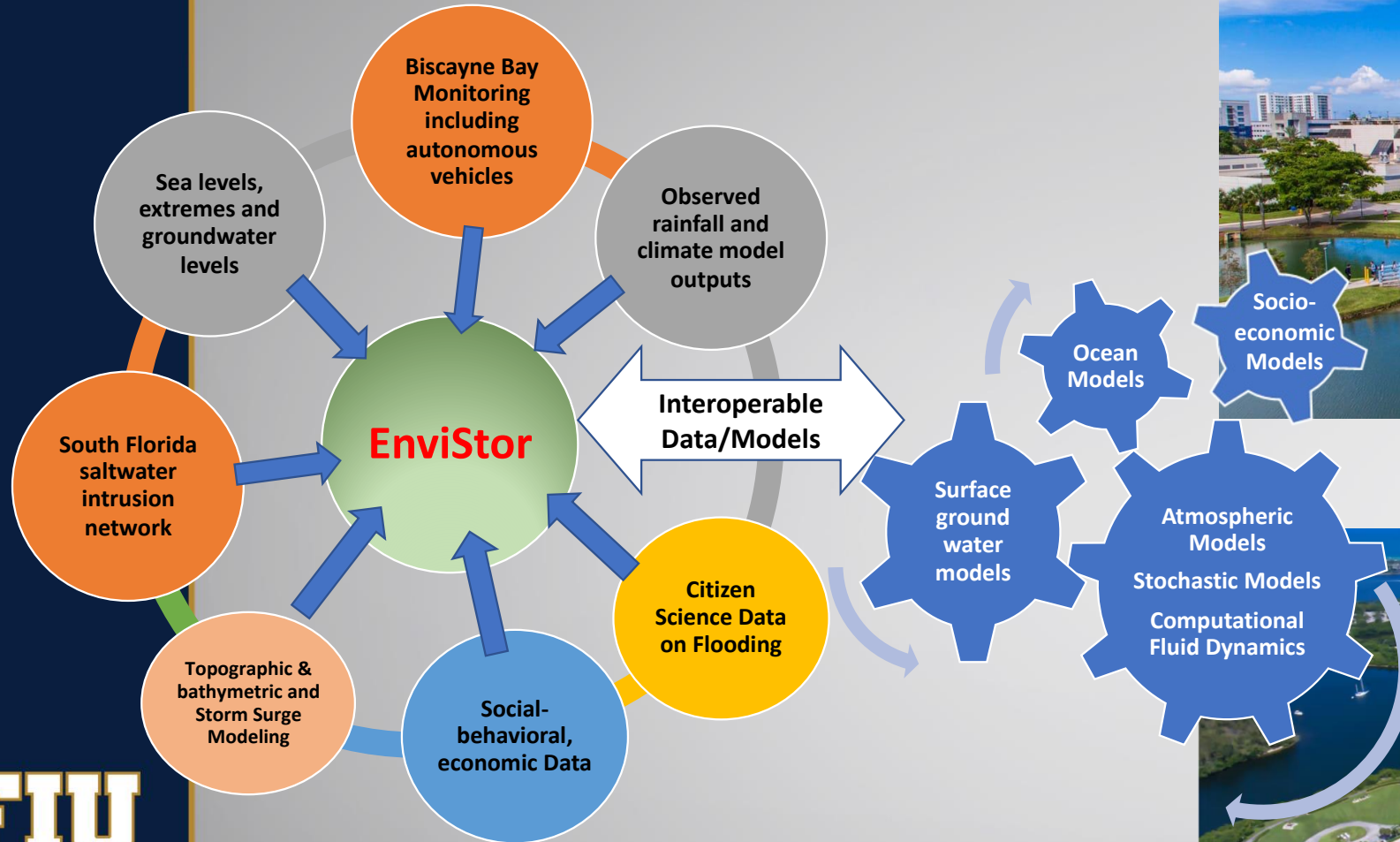
An underwater photograph showing a diver in a purple wetsuit and scuba gear swimming towards the left. On the right, a large, illuminated 'FIU' sign is mounted on a coral reef. The water is clear blue, and many small fish are visible swimming around the reef and the diver.

- Develop and promote AI/ML for coastal environmental science in Southeast Florida
- Provide a clearinghouse for environmental data collection, curation, analysis, and dissemination
- Serve as a community engagement and resource center

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# Coastal Environmental Data Sharing



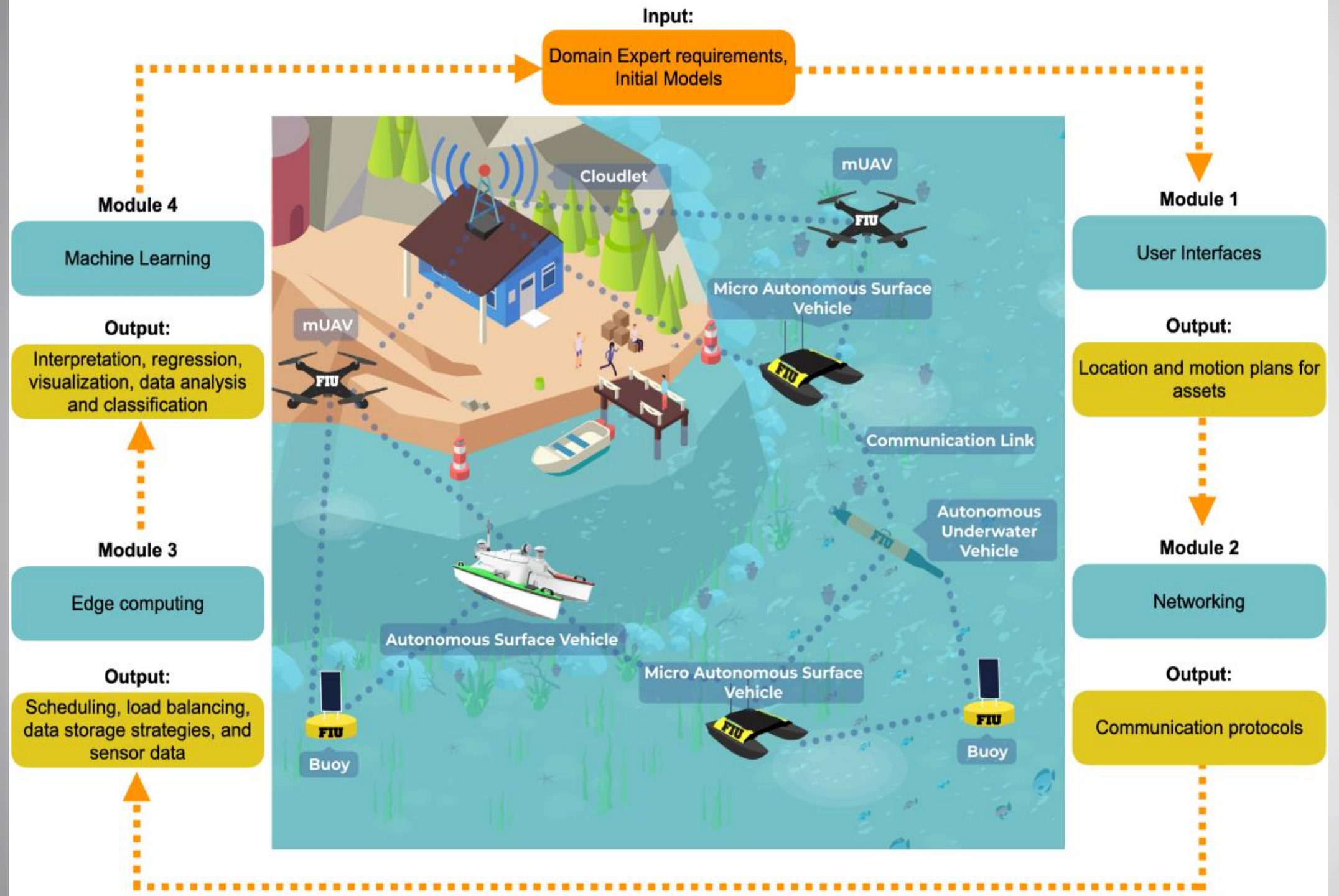
FIU Modesto A. Maidique Campus

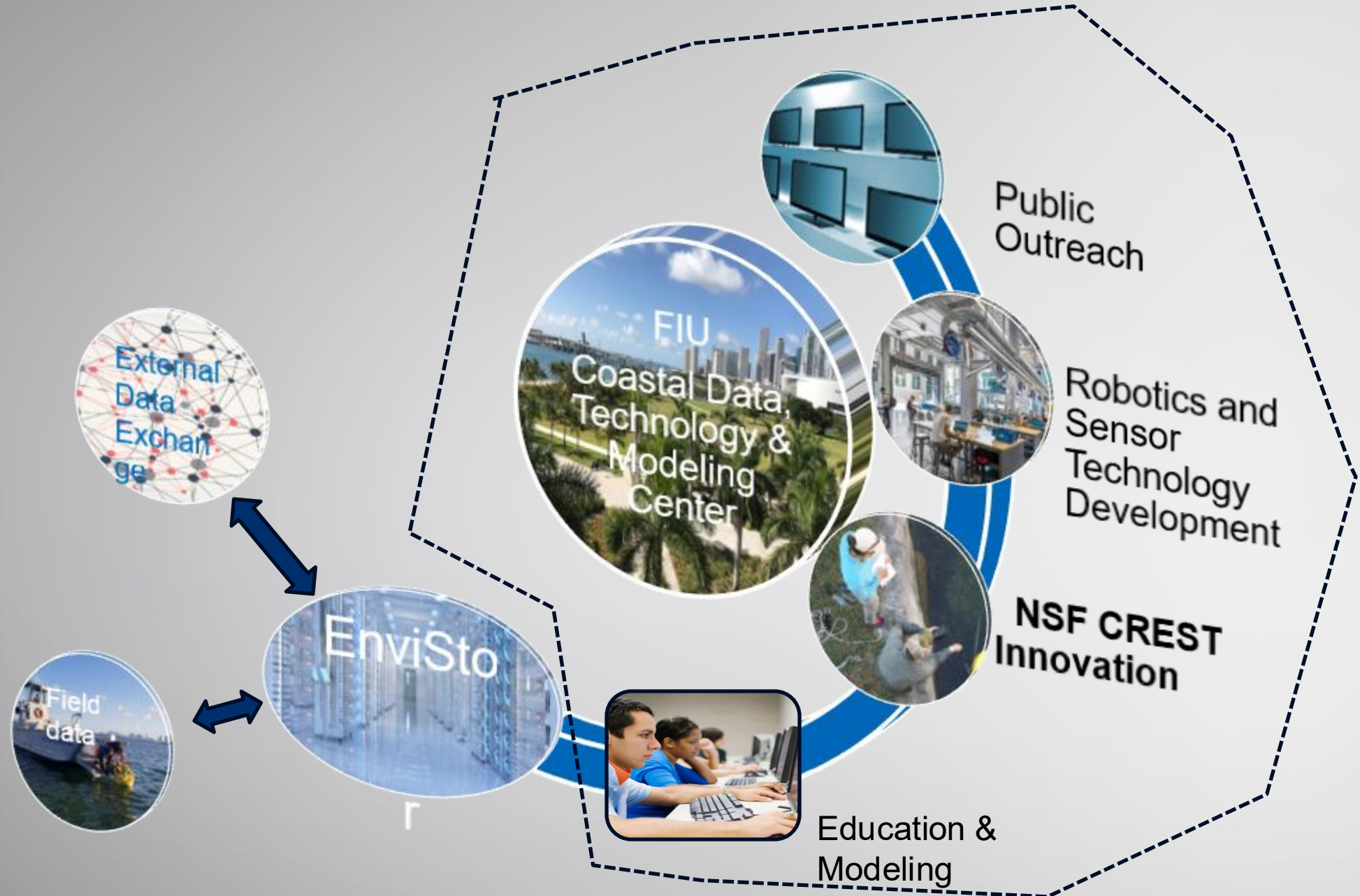


FIU Biscayne Bay Campus

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# Founding Principles:

**Transdisciplinary +  
Globally & Locally Relevant +  
Catalytic +  
Transformative**

**=**

**SUSTAINABILITY ???**

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# Founding Principles:

**Transdisciplinary + Globally & Locally Relevant +  
Catalytic + Transformative = SUSTAINABILITY**

**2023 – State of Florida Board of Governors awarded  
FIU's Institute of Environment \$2.8 million to continue  
and enhance the CREST Program and S. Florida's  
Coastal Resilience**

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**RECURRING !!!**

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I thank you for your time

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<https://crestcache.fiu.edu>