Florida International University Institute of Water and Environment (InWE): Research, Education and Engagement that is Relevant

Dr. Todd A. Crowl
Founding Director, Institute of Water and Environment
Director, Southeast Environmental Research Center
Co-Founder, Sea Level Solutions Center

Universita per Stranieri di Perugia
Perugia, Italy
November 9, 2017
Vision statement
Advancing the science needed to address complex water and environmental issues, both locally and globally, through interdisciplinary research, education, and public engagement by linking scientists with local, state, and federal stakeholders to foster environmental sustainability.

Mission Statement
The FIU Institute of Water & Environment brings together existing centers, research programs and scientists and engineers from throughout the university to address regional, national and global water and environmental issues through innovative interdisciplinary research and cutting edge technology.
Institute for Water and Environment (InWE)

Director: T. Crowl
Associate Directors: P. Gardinali, J. Fourqurean, T. Troxler (interim)
Program Manager: J. Guevara
Human Resources: R. Beades
Instructional Technology/Instrument Manager: M. Kershaw
Grant Administrator: C. Valois
Director of Communications: C. Allouch

**MERI**

Marine Education and Research Initiative

Director: J. Fourqurean
Asst. Dir., Education and Outreach: A. Soto
Asst. Dir., Marine Operations: T. Potts

*Medina Aquarius*

*Lead: J. Fourqurean*

*NOAA – FKNMS (Florida Keys National Marine Sanctuary)*

*RB-NERR (Rookery Bay Estuarine Research Reserve)*

**SLSC**

Sea Level Solutions Center

*Interim Director: T. Troxler*

**SERC**

Southeast Environmental Research Center

*Co-Directors: T. Crowl, P. Gardinali*

**CREST-CAChE**

Center for Aquatic Chemistry and Environment

*Leads: Gardinali, Teutonico, Graham*

*Facility:*

- CAChE Nutrient Analysis Lab

**FCE Everglades Program**

*Lead: Gaiser*

*Office of Everglades Restoration Initiative (DOI)*

**Cross-Cutting Programs**

*SBEI (Sustainable Built Environment and Informatics) - Vassigh*

*SES (Socia-Ecological Systems) - Mozumder*

*IWG (International Water Programs) – Boukerrou, Donoso*
Jim Fourqurean; fourqure@fiu.edu

http://www.twitch.tv/boswell_lab3

http://www.twitch.tv/boswell_lab

https://aquarius.fiu.edu/media/watch-live/
Epigenetic biomarkers of brevetoxin exposure during Florida Red Tides in Eastern Oyster

Harmful algal blooms caused by massive proliferations of brevetoxin-producing dinoflagellates and the genotoxic effect of the toxin on the hereditary material

Epigenetic biomarker for brevetoxin biomonitoring
Characterization of procedures for rapid and sensible brevetoxin detection
Chemical and Biological Diversity of Novel Cyanobacteria in Florida with Biomedical Relevance

O. plumata
O. hirsuta
O. lorea
O. erythroflocculosa
D. pleousa
M. producens
C. penicilliata

Antimicrobial
Anticancer
Toxic

Autonomous Surface Vessel
Kevin Boswell; Kevin.boswell@fiu.edu

Supports:
- Fisheries Ecology
- Behavioral Studies
- Habitat Classification
- Bathymetric profiles

Fisheries Ecology and Acoustics Laboratory- FIU
Autonomous Surface Vessel

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Fisheries Ecology and Acoustics Laboratory - FIU
Multibeam

Multifrequency/Wideband Acoustics

Multibeam

Fisheries Ecology and Acoustics Laboratory - FIU
Fine-scale bathymetry in shallow coastal waters

Kongsberg M3 Multibeam sonar
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*Co-Directors:* T. Crowl, P. Gardinali  
**Facilities:**  
- Field Operations Center (FOC)  
- Analytical Facilities

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The SLSC is a university-wide interdisciplinary center

- Bringing research and education together, to advance our understanding of the causes and impacts of sea level rise
- Our mission is to convert this knowledge into actions for the benefit of society.
The SLSC collaborates with interdisciplinary organizations, both local and regional

- To design and implement adaptation and mitigation strategies, for a more resilient and prosperous South Florida
Sustainable Built Environment and Informatics
Dr. Shahin Vassigh - svassigh@fiu.edu
Retrofitting Existing Buildings

08 Dry Floodproofing

09 Wet Floodproofing

10 Elevate on Piles

11 Protect Building Systems

Bulkheads

Beaches and Dunes

Portland Green Streets
A photo contest to enhance the Trasimeno: on the weekend ends the "The magic of the lake" of Perugia Online Publishing - September 8, 2017

FIU-SLSC
Holding King Tide Photo Challenge To Document Rising Sea
By NANCY KLINGENER
OCT 31, 2017
Water Quality Monitoring
Canal Remediation

- Perform a monitoring program to evaluate canal water quality restoration technologies
PARAMETERS

Dissolved Oxygen
%DO Saturation
Light Attenuation
Sulfide

Depth
Turbidity
CDOM

Salinity
Temperature
pH

mouth
middle
head
New partnership with Miami-Dade Water And Sewer Department

- $32.4 billion needed in drinking and Wastewater infrastructure
- Data for prioritization
- Enhanced monitoring infrastructure
- Data management and access
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Florida Coastal Everglades Long Term Ecological Research
FCE LTER by the Numbers

- 65 collaborators
- 30 institutions
- 135 datasets
- > 500 publications
- 5 books
- 88 graduate students
- 90 graduate degrees
- 80 undergrads in labs
- 1,200 K-12 students & teachers/year
- Everglades Foundation Fellow Jessica Lee

Funded by National Science Foundation and agency partners*
Restoring CLEAN freshwater flow

2000 - Central Everglades Restoration Plan
Hydrologic response: historical, near-term, long-term

Historical

Near-term

Long-term

Average surface water depths for the period of simulation.
Phosphorus accumulation response: historical, near-term, long-term
CREST CACHe Research Mission

To detect the sources, transport, transformation and ecosystem responses to contaminants, pollutants and other natural stressors, under changing land-use and environmental conditions.
Context:
The hydrologic connectivity between the natural, agricultural, and urban landscapes results in a highly complex network of contaminant sources that are transported throughout the landscape.
The lives of the ~7 million inhabitants of South Florida are critically tied to the Greater Everglades, the area’s main source of freshwater.
## Research and Education Focus Areas

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<th>Detection and Identification</th>
<th>Fate and Transport</th>
<th>Impacts and Visualization</th>
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- **Everglades**
- **Mangroves**
- **Shallow Marine Habitats**

### Critical Ecosystems