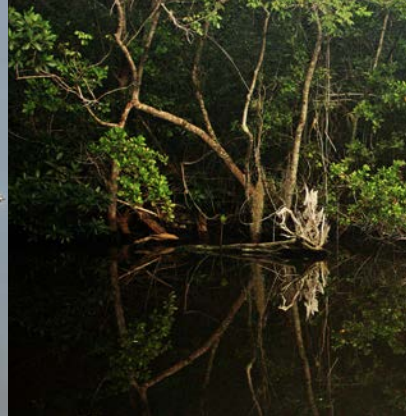


**Miccosukee Tribe of Indians of Florida
Endowment Report
2016-2017**







**Southeast
Environmental
Research Center**

OE-148, Florida International University, Miami, FL 33199
305-348-3095, 305-348-4096 fax, <http://serc.fiu.edu>

24 August, 2017

Miccosukee Tribe of Indians



Once again, it is time to extend my deepest appreciation for the support the Center receives from the **Miccosukee Tribe of Indians of Florida Endowment**. This endowment allows us to build on our highly interdisciplinary, innovative Everglades research program. This year, we continued to update our Field Operations Center (FOC) boat fleet within the Southeast Environmental Research Center (SERC). These upgrades include the upgrade of an electrofishing boat, the development and purchasing of a new unmanned field vehicle designed to remotely sample hard-to-access everglades habitats and the purchase of two new field vehicles needed to transport boats and researchers. These additions and upgrades will significantly enhance our growing number of Everglades researchers at SERC and especially our graduate students who do so much of the intensive field sampling.

In addition, we used these funds to:

1. Support our annual Florida Coastal Everglades Long-term Research Ecological Research Program's annual 'all-scientist meeting' attended by over 100 Everglades researchers, managers and conservationists.
2. Support graduate students' and post-doctoral associates' travel to national and international meetings to discuss Everglades-related research.
3. Support graduate students working on Everglades ecology, hydrology and management.

Again, I provide my sincerest thanks for the funding opportunities this endowment provides to further our mission in Everglades research and graduate student education. I very much look forward to meeting with you in person in the near future.

My very best,

Todd A. Cowl

Professor Todd A. Cowl
Director, Southeast Environmental Research Center
Director, Institute of Water & Environment
PI and Director, NSF CREST Center for Aquatic Chemistry & Environment
& Department of Biological Sciences
Florida International University
11200 SW 8th St, OE-148
Miami, FL 33199



With generous support from the Miccosukee Tribe of Indians of Florida, the Southeast Environmental Research Center (SERC) was able to purchase two modified, high-powered Ford F-250 diesel trucks for the start of 2017. These vehicles have contributed to the successful research collection process for a number of labs and research groups within SERC. These trucks have been used to transport personnel and cargo to off-road sites that would have otherwise been off-limits to our researchers and scientists.

Thanks to these new heavy-duty vehicles, SERC researchers are able to run tests on and collect samples from new, previously inaccessible areas. This additional data allows for a more accurate and far-reaching sample selection, which increases our researchers' understanding of the area's ecosystem, how it is impacted by different factors (like climatic changes or human interference), and how it responds to these factors.

The two Ford F-250 trucks are also being used to tow marine boats and airboats to and from docks for research purposes. The trucks were equipped with heavy-duty engines and towing capabilities in order to successfully load large vessels in and out of the water. Much of the research within SERC concerns coastal wetland areas, where marine vessels and airboats are necessary for sample collection. Without the ability to tow these vessels to and from the docks, SERC scientists would be unable to access critical near-shore sites in order to collect necessary data for their research.



Going Off the Beaten Path

2016 Graduate Student of the Year Award

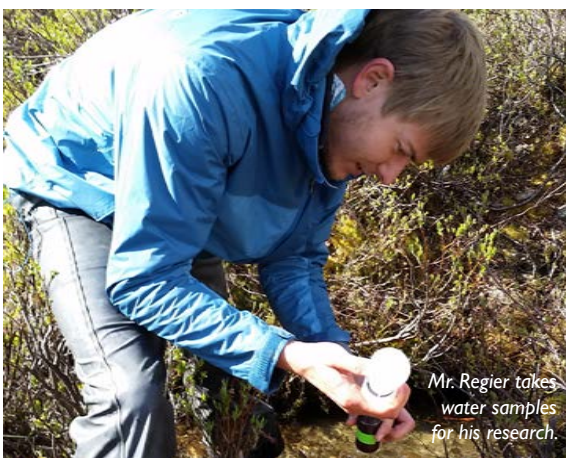
As part of the Miccosukee Tribe of Indians of Florida Endowment, InWE and SERC initiated the first ever Graduate Student of the Year Award. The Inaugural 2016 Graduate Student of the Year Award ceremony took place on November 17th 2016. The award consists of a \$500 grant to be utilized for career advancement purposes and recognizes a current student (or students) in InWE or SERC who deserve special acknowledgment for their accomplishments in research and contributions to the InWE and SERC communities. This year's award went to two highly distinguished students: Peter Regier and Ross Boucek.

Since being awarded the 2016 Graduate Student of the Year Award, Mr. Regier has successfully completed and defended his dissertation and earned his PhD from FIU. He is currently conducting research in boreal Alaska to understand how permafrost influences the transport of nutrients in headwater streams and the potential implications of these changes as they relate to a changing global climate. This research project is a collaborative effort between FIU and the University of Alaska Fairbanks, and expands on previous research questions that Mr. Regier investigated while at FIU related to the Everglades carbon cycle. He and his

team are using sensors deployed directly in the streams to collect information about changes in nutrients, hydrology and water quality. Through statistical analysis of their simultaneously collected data-sets, the team hopes to gain a deeper and more comprehensive understanding of the drivers of nutrient transport than is currently available.

Since receiving the 2016 Graduate Student of the Year Award, Mr. Boucek has also completed his PhD from FIU. His work investigates how and in what ways Everglades restoration initiatives impact certain fish populations in Everglades National Park. Mr. Boucek's work is critical in developing effective conservation strategies for improving species' resilience to human interventions and climactic fluctuations. This research can contribute to the implementation of better fisheries management strategies. It also provides a deeper and more elaborate comprehension of fish populations in the area.

Recently, Mr. Boucek has been named the Bonefish Tarpon Trust (BTT) Florida Keys Initiative Manager where he aims to conserve and restore fisheries and marine habitats through research and advocacy using science-based approaches.



Mr. Regier takes water samples for his research.



Mr. Boucek displays a snook specimen he caught for his research.

Our Students



Southeast Environmental Research Center
FLORIDA INTERNATIONAL UNIVERSITY

To the Miccosukee Tribe of Indians and the Southeast Environmental Research Center,

I would like to express my gratitude for funding I received to support travel associated with research I am conducting in Alaska as part of a collaboration between Florida International University and the University of Alaska, Fairbanks (UAF). Along with my collaborators at UAF, I am investigating how the carbon and nitrogen cycles in streams located in boreal arctic forests are responding to melting permafrost. The project ties closely into my research interests in the Everglades regarding the links between changes in the Everglades landscape, mediated both by humans and nature, and the carbon cycle. Funds from the Miccosukee Tribe and SERC have been instrumental in supporting my research in Alaska, which has expanded my career horizons and provided me with valuable new scientific tools in the lab and the field. I am deeply grateful for this financial support which has enriched the scope of my research, broadened my scientific skillset, and provided rich networking and travel experiences that will continue to benefit me throughout my career.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Regier'.

Peter Regier, PhD

Modesto Maidique Campus, OE 148 | Miami, FL 33199 | Tel: (305) 348-3095 | Fax: (305) 348-4096 | sercweb.fiu.edu

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s Thank You!

September 1st 2017



Dear Miccosukee Tribe of Indians,

My name is Ross Boucek, I currently serve as the Florida Keys Initiative Manager for Bonefish and Tarpon Trust. I earned my PhD in the department of Biology at Florida International University, and was awarded the 2016 Southeast Environmental Research Center graduate student of the year honor. My research focused on identifying how, and in what ways Everglades Restoration projects will impact the snook fishery with Everglades National Park. Thank you, Miccosukee Tribe of Indians, for supporting SERC and my graduate work. The SERC infrastructure and faculty were instrumental to my success in graduate school and in-turn finding a career in my field. The diverse background of the SERC faculty, and through their mentorship, helped me see linkages between snook and other dimensions of Everglades ecosystems that lead us to new discoveries about the species. Likewise, the fleet of boats and science equipment provided through SERC provided us the resources to do cutting edge science in the challenging Everglades environment. Early in my graduate studies I was awarded the Cristina Menendez Endowment Fellowship. The scholarship provided the funds to purchase transmitters to track the spawning migrations of snook. Following the 5-year study, data collected from these tags has led to 2 peer reviewed publications, and a third publication that is in review.

I am indebted to the Miccosukee Tribe of Indians for supporting SERC and providing me with the opportunity to do research at FIU that lead me to the career of my dreams.

Thank you,

A handwritten signature in black ink, appearing to read "Ross Boucek".

Ross Boucek PhD
Bonefish & Tarpon Trust
Florida Keys Initiative
Marathon, Florida



Update:

Electrofishing Vessel for Everglades Research

Fish biologists use electrofishing to study fish biology and fish populations. As its name suggests, electricity is used to catch fish, either using backpack shockers or electrofishing boats. With generous support from the Miccosukee Tribe of Indians of Florida, the Coastal Fish Ecology and Fisheries Lab, led by Dr. Jennifer Rehage at FIU, was able to purchase an electrofishing vessel last year. The boat was designed by one of the leading metal boat manufacturers in the United States, Oquawka Boats, and was tailored for use in deep habitats in the coastal Everglades.

Dr. Rehage's lab focuses on understanding how fish are impacted by both natural and human disturbances and how these impacts may influence key ecological processes and mechanisms. One of the lab's main objectives is to examine how valuable recreational fish populations may respond to Everglades restoration. In order to answer this question, the lab regularly conducts surveys using electrofishing.

Dr. Rehage's team has diverse research interests and needed a vessel that could accommodate the entire research group. This boat was designed to do just that, and has been invaluable to the lab's research capacity over the last year. The vessel's ability to navigate Shark River slough and the surrounding areas has allowed for the team to catch critical recreational and consumer fish populations (as well as non native species) in order to identify how the changing Everglades may influence them.

Much of the Coastal Fish Ecology and Fisheries Lab's research is collected via the donated vessel. Some of the data that the vessel helps to obtain includes fish specimen and hydrophone data. Hydrophone information allows scientists to track fish movements and identify patterns in behavior. This information contributes to our knowledge of how water management strategies are impacting coastal fisheries. The research coming out of Dr. Rehage's lab will be used to guide future fisheries management decisions.

Dr. Boucek and Dr. Santos reviewing movement detection data after downloading one of our receivers in Shark River.





Cody Eggenberger and Natasha Viadero collecting prey samples within the Coastal Everglades Lakes Array (CELA2) as part of Cody's MS project.

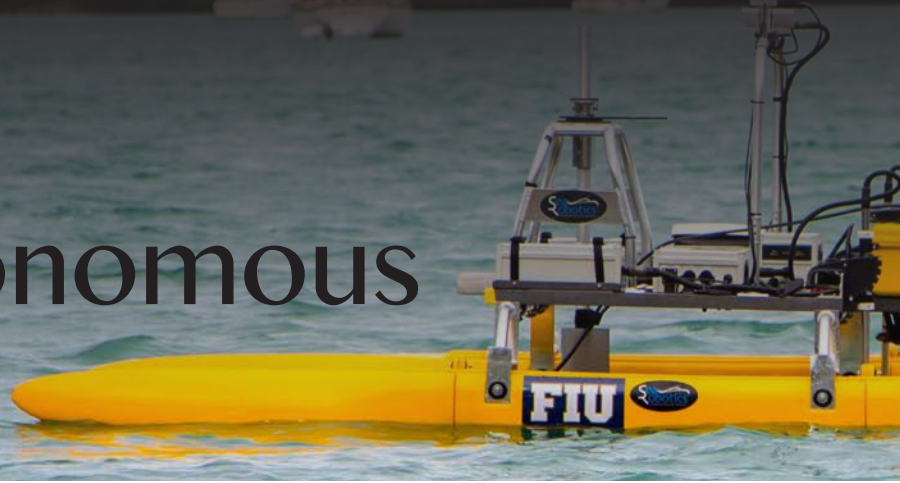


Dr. Santos preparing a receiver and base for redeployment after downloading movement data in Shark River.



Dr. Rehage and Cody Eggenberger collecting data and tagging a Snook in the Coastal Everglades Lakes Array (CELA2).

Update: Robust Autonomous



Thanks to generous support from the Miccosukee Tribe of Indians of Florida, FIU's Fisheries Ecology and Acoustics Laboratory (FEAL) has been able to implement the 4m SeaRobotics Autonomous Surface Vessel (ASV). Last year, the lab was able to add the ASV to its research toolbox. This year, the lab received and tested the vessel for speed and loading at the FIU Biscayne Bay Campus in late-spring 2017.

The vessel was created to conduct shallow water acoustic surveys in estuarine systems and is capable of collecting repeatable, high-resolution, spatially-referenced physical and biological data which is sent back to the base station in real-time for analysis. The team has configured the ASV with a motion sensor to provide high-resolution pitch, roll and heave measurements to improve the data quality collected during surveys. The ASV's remote platform allows for non-invasive methods of accessing and analyzing shallow habitats. The vessel can last up to four hours with the current sonar

sensor package that is used during surveys.

This new ASV was able to replace a prototype that SeaRobotics had developed for FEAL specifically for the lab's research and teaching efforts. Thanks to the addition of this new vessel, that prototype is now being utilized to enhance hands-on student learning and classroom engagement. The old platform is a full-time teaching vessel now. In order to promote STEM technology, the old vessel has been used in numerous activities in the classroom, as well as at public events for outreach purposes.

Meanwhile, the new ASV is frequently sent out on the water and collects acoustic data on large predators and prey fields. It also simultaneously maps bathymetric features to examine interactions between animal behaviors and their physical environments. FEAL uses the vessel to collect and interpret this data, which then informs scientists of behavioral and distributional patterns in coastal and marine nekton (organisms that swim freely).



Surface Vessel for Everglades Research

Currently, FEAL is planning their very first field survey in the Shark River to be conducted later in the fall where they will focus on deriving highly resolved spatial patterns of predators and prey distributed in the main channel of the Shark River valley. This project will be in coordination with existing efforts from the Coastal Fish Ecology and Fisheries Lab (Dr. Jennifer Rehage) and the Marine Community and Behavioral Ecology Lab (Dr. Mike Heithaus).



17 August 2017

Miccosukee Tribe of Indians of Florida Endowment

Dear Miccosukee Tribe of Indians of Florida Endowment:

On behalf of the Florida Coastal Everglades (FCE) Long Term Ecological Research (LTER) program, I thank you for the generous support you provided for this year's Florida Coastal Everglades LTER All Scientists Meeting, which was held at Fairchild Tropical Botanic Garden on May 8-9, 2017.

The FCE All Scientists Meeting provided an opportunity for approximately 100 FCE collaborators and students from over 14 institutions to meet, present their Everglades research findings from the past year, discuss directions for future research, and plan the next phase of the FCE LTER program. Over 30 students attended the FCE LTER Student Organization's annual lunch meeting and poster session during the All Scientist Meeting, too.

The FCE LTER program appreciates the support you provided for breakfast refreshments, lunches for FCE LTER students, and poster session refreshments during the FCE LTER All Scientist Meeting. This annual meeting is critical to advancing Florida Coastal Everglades research.

Sincerely,



Michael Ruggie
FCE LTER Program Manager

**College of Arts, Sciences & Education
Southeast Environmental Research Center**

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Update: Florida Coastal Everglades LTER

The Florida Coastal Everglades Long Term Ecological Research (FCE LTER) program includes 68 senior scientists and over 50 graduate students from 27 institutions. Researchers are conducting long-term studies to understand how climate change and resource management decisions interact with biological processes to modify Everglades coastal landscapes. Research focuses on the oligohaline ecotone of the Florida Everglades, where freshwater mixes with saltwater and the grassy marshes give way to mangrove forests.

Thanks to the Miccosukee Tribe of Indians of Florida, the 2017 FCE LTER All Scientists Meeting was a big success. Approximately 100 FCE scientists, students, and staff attended the FCE LTER All Scientists Meeting at Fairchild Tropical Botanic Garden in May 2017. This summer, FCE provided research experiences for high school students and undergraduates, who will present their results at the 2018 FCE LTER All Scientists Meeting. Five graduate students defended theses and dissertations that advanced FCE research during the spring and summer semesters of 2017. FCE researchers gave presentations about their Everglades research at local, national, and international conferences during the past year, including the Greater Everglades Ecosystem Restoration (GEER) Meeting in April and the Ecological Society of America (ESA) Meeting in August. They also communicated results of FCE research to decision makers and engaged with the south Florida community through a wide range of outreach activities. FCE researchers published over 20 journal articles and book chapters during the first half of 2017.



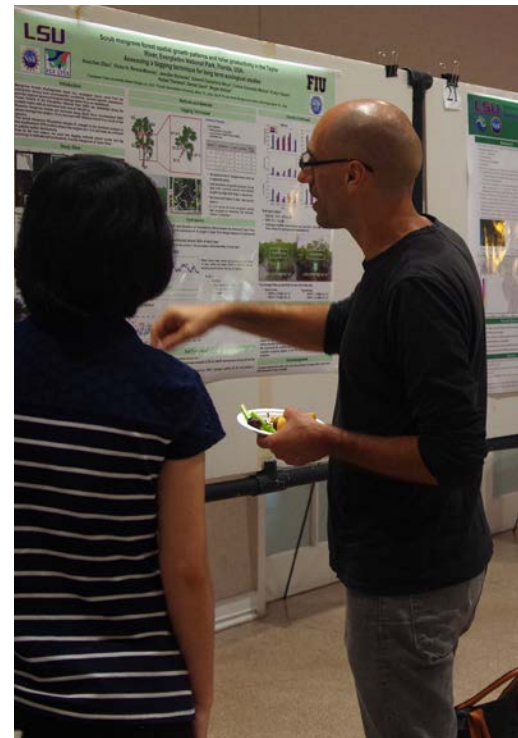
FCE Student Group members at the 2017 Florida Coastal Everglades All Scientists Meeting (May 8, 2017 | Photo by Mike Rugge)



Group photo taken at the 2017 Florida Coastal Everglades All Scientists Meeting



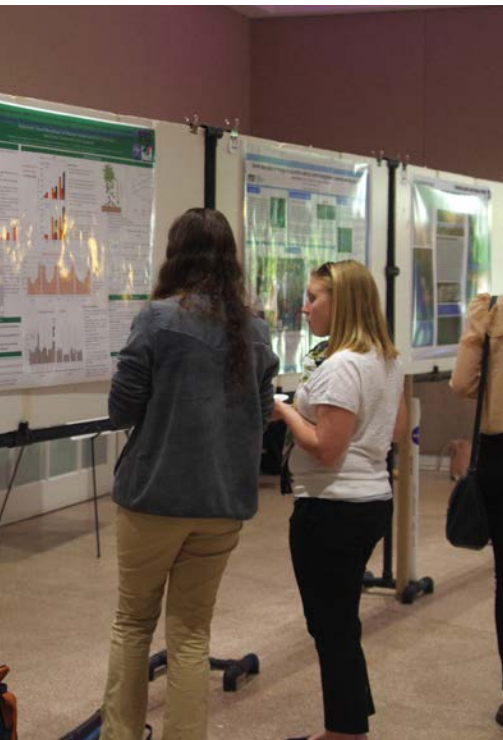
Poster session at the 2017 Florida Coastal Everglades All Scientists Meeting (May 8, 2017 | Photo by Mike Ruggie)



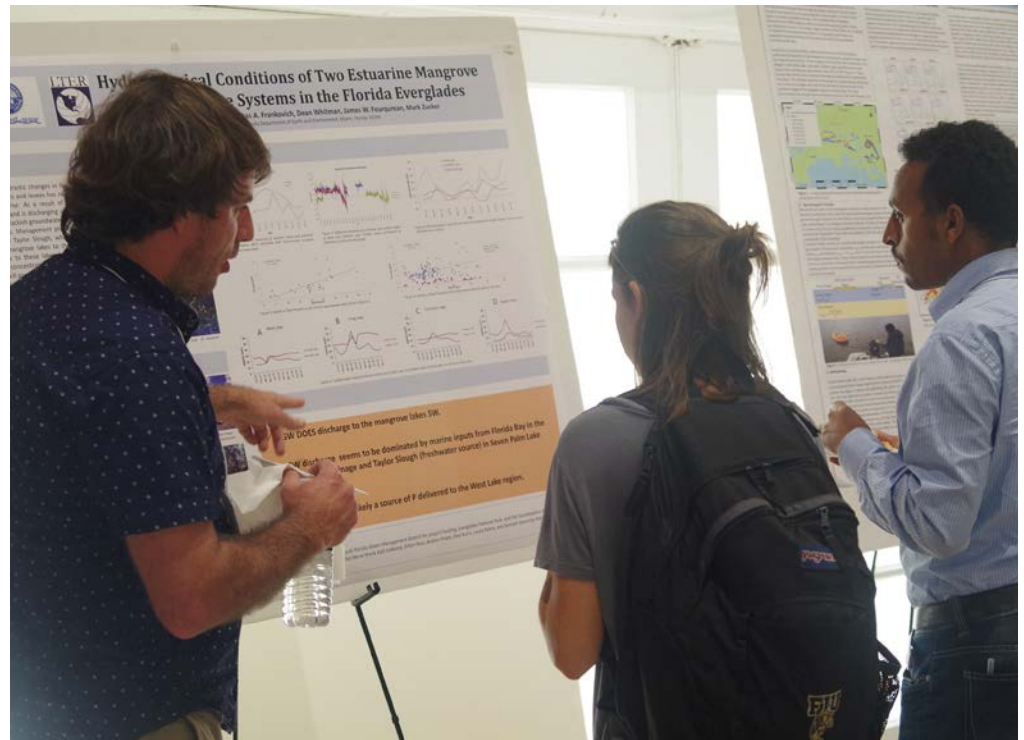
Poster session at the 2017 Florida Coastal Everglades All Scientists Meeting (May 8, 2017 | Photo by Mike Ruggie)



All Scientists Meeting (May 8, 2017 | Photo by Mike Rugge)



Everglades All Scientists Meeting (May 8, 2017 |



Poster session at the 2017 Florida Coastal Everglades All Scientists Meeting (May 8, 2017 | Photo by Mike Rugge)

Miccosukee Water Resources Team Partners with FIU CREST CACHe

After partnering the Miccosukee Tribe of Indians of Florida with FIU's newly-formed CREST Center for Aquatic Chemistry and Environment (CACHe), the Center hosted the Tribe's Water Resources Management team for an official tour of all CREST CACHe labs and facilities at the University (September 2016).

Potential areas of future collaboration between the two groups include: CREST CACHe student cohort building, as part of the Center's educational mission to train students for a variety of work and study in STEM fields; and the CACHe Nutrient Analysis Lab, which possesses two distinct arms for sample analysis as well as student education and training.

Following the tour, the Miccosukee Water Resources Management team invited a few CREST students to join the Tribe's annual Spring Sampling event in the Everglades, which surveys historical and culturally-significant sites within the Miccosukee Indian Reservation.

We are grateful for the Tribe's continued support to our students and environmental research, and look forward to a rewarding future of collaborative work!



The 2017 Summer CREST CACHe cohort at Everglades National Park.



Dr. Carmen Rodriguez analyzes samples in the CACHe Nutrient Analysis Lab.



Dr. Yan Ding analyzes samples in the CACHe Nutrient Analysis Lab.



FIU

**Institute of Water
and Environment**

FLORIDA INTERNATIONAL UNIVERSITY

