



Florida Coastal Everglades Long Term Ecological Research

News from the Sloughs



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An Historic Earth Day for Everglades and FCE

When the president comes to your town all nations' eyes turn to watch, and listen. President Barack Obama flew to South Florida this Earth Day and delivered a speech in our Everglades. It was President Obama's first trip to the Everglades and a first presidential visit to an LTER site. Following the speech the president met with Everglades researchers, policy and decision makers, and stakeholders. Our Lead P.I. Dr. Evelyn Gaiser, who was there and met the president, gives this account: "It seemed particularly poignant that the storm clouds were

rolling in while he spoke about the threats we are under and the importance of acknowledging the sources of change in our ecosystem, climate change and rampant development. He then talked about our capacity for solutions including mitigation and adaptation. He spoke of setting an example for the world, and the importance of sustaining the Everglades for generations into the future as an example of our global commitment. He talked about the immediate need for large-scale restoration to move more clean water into the Everglades to sustain our natural resources, especially freshwater upon which the state depends. He introduced plans for both educating the public (free access to 4th graders) and specific Federal commitments for moving restoration forward." This historic event follows a geyser of Gaiser, FCE, FIU and Everglades Restoration publicity this week by [NPR](#), [The Washington Post](#) and [The Miami Herald](#).

TBAs Master The Art of Carbon in Diatoms & Macroalgae

It started as a collaborative effort between FCE researchers at Florida International University (FIU) and the Tropical Botanic Artists Collective (TBA), backed by Biscayne National Park (BNP) following their 'BioBlitz' event, an ecological weekend sponsored by the National Geographic Society in 2010, with hundreds of scientists and volunteers conducting an inventory of flora and fauna in Biscayne Bay. The project was presented to TBA, who responded with a resounding "YES", and an enthusiasm that paralleled that of the FIU marine biologists, who had discovered 37 species of macroalgae in the waters of BNP. The artists rose to the challenge: they had always devoted their time and energy to painting land flora, and now they attempted to depict the flora of a hidden and colorful marine environment. The ensuing exhibition, "Macroalgae: Hidden Colors of the Sea", opened at the Gallery at BNP in September 2011, and continued to tour several venues from Broward to Key West over the next several years appearing last month at our midterm review. The paintings were donated by the artists to the Hubert Library at FIU, where they are now part of their permanent collection. [Read the full story here](#). Above right: Macroalgal species *Caulerpa fragilissima* by TBA Complete story by Elsa Nadal (Part 1) and Pauline Goldsmith (Part 2)



Setting the Barr for Carbon + Water Research



FCE researchers build gas flux towers with the highest Barr. That is, Dr. Jordan G. Barr, who recently traveled to Spain for ASLO 2015 to present “Carbon cycle science in the Florida Coastal Everglades: research to inform carbon and water management”. He represented a multi-agency team with co-authors from NPS, universities (FIU, Penn State, and U. Alabama), the South Florida Water Management District, and Everglades Foundation. Dr. Barr describes the collaborative effort here: “The meeting provided a cross fertilization of ideas. The focus was substantially different than the mix of

research and ideas we might find in a given LTER meeting. The focus was generally on much larger or deeper systems such as oceans or large freshwater lakes. The challenge was to link these ideas of processes occurring offshore or in the open ocean to ideas we consider here in the Everglades.” Barr also described how the exchange of information is necessarily a two-way street. “I felt the challenge at ASLO was to find ways of cross fertilizing FCE science with ideas, processes, and research happening in deeper waters offshore. Much of the science was also a natural extension to the ideas exchanged at the recent North American Carbon Program in Washington DC. During a workshop, co-led by Dr. Tiffany Troxler, we thought about ways to integrate coastal and shelf carbon science with carbon processes occurring in tidal wetlands and estuaries (i.e. systems of interest to FCE LTER). [Click here to see figure, and more!](#) Above left Dr. Barr at the base of the Shark River Slough Site 6 flux tower.

Carbon Matters! Digestions from CCT Carbon Dynamics

Delicious discoveries have brewed from the Carbon Dynamics Cross Cutting Theme researchers in FCE III. These researchers hail from diverse backgrounds ranging from marine science to anthropology; all characterizing the who, what, where, when, and how, of carbon in FCE. Climate change effects on carbon stocks and exchange are being revealed through teasing out seasonal trends in carbon stores which have taken shape in the longer term data sets. Concurrently it becomes clear in the longer term data sets what climatic events are most affecting in the ecosystem and which of these events have “sticking power” on carbon cycling. Several of these latter discoveries are 1. lingering effects of storms and storm debris ranging from lower coastal mangrove production years later to higher interior marsh carbon and nutrient concentrations in water column and soils and 2. lingering effects of cold snap events on carbon stocks, ranging from a decrease in mobile carbon units like the shark above being tagged (photo by Dr. M. Heithaus), to changes in stock of our favorite S. Fla. game fish, the snook, and changes in carbon dioxide exchange in freshwater Everglades marshes and coastal mangroves. It is a small world of carbon after all and FCErers are collaborating locally, regionally, and globally with increased attention to characterizing carbon dynamics in coastal regions of the globe and understanding how carbon stocks and exchange fluctuate and interact with adjacent systems and forces of nature. [More FCE Carbon discoveries](#)



FCE's Dr. Jaffe MC (Master of Carbon)

Dr. Rudolf Jaffé has published more papers than any other collaborator in FCE III and he is hot on the trail of more groundbreaking research with a talented group of graduates in his Organic Geochemistry Lab which looks a bit like Wonka's Top Secret Lab, only better. The wonders are real because Organic means CARBON. Instead of Everlasting Gobstopper production they are testing organic properties in water, floc and sediment samples across FCE study sites, other LTER and iLTER sites, and from wetlands around the globe since 2000. Dr. Jaffé has driven carbon dynamics research and published full spectrum on organic matter based proxies to trace sources, transport and fate of carbon in waters of the Everglades and beyond, including food web studies (you are what you eat). Jaffé and his students have discovered unique chemical signatures in the water that help us understand a literal "Rainbow of Carbon" where molecular tracers are identified through spectral analysis to reveal periphyton, sawgrass, and mangrove ghostly residuals.



Photo by Dr. Y. Du: Dr. Jaffe and students in the Everglades W. Huang, P. Regier, O. Pisani, R. Jaffe, S. Wagner, A. Roebuck

The Oehm Factor



Add professional art curator to the many hats of FCE Education and Outreach coordinator Nicholas Oehm, who transported and displayed more than 500 pieces of artwork- all highly

unique, *FRAGILE*, and valuable for our FCE III Midterm review. Connecting FCE with South Florida artisans and their guilds, Oehm has built a network of FCE Art Outreach culminating in new artforms by Tropical Botanical Artists and FIU's Artist in residence, Xavier Cortada. [See his latest work here.](#) Oh, and Oehm is not just making the world more beautiful, he is making it smarter through efforts in his new STEM position at FIU working hands on with Miami-Dade science teachers. Above left Oehm with FCE RET's Teresa Casal and Terri Reyes

Dr. Malone's Climate Change Cache

FCE student Sparkle Malone, advisor FCE collaborator Dr. Gregory Starr, at University of Alabama, graduated this past semester and is now working for the Rocky Mountain Research Station. Dr. Malone



published 3 papers from her dissertation research and has more in review. Current carbon-centric Malone contributions focus on carbon dioxide exchange in Everglades freshwater marshes using an array of techniques ranging from eddy covariance to remote sensing. Malone and colleagues' research reveals climate change effects on carbon dynamics and how short-term climatic events of El Niño Southern Ocean Oscillations and cold snaps affect carbon exchange rates. [Click here to see Dr. Malone and colleagues' publications.](#)

FCE III Reviewed

This March, FCE III had its required NSF midterm review to bring the doings of FCE III into focus for NSF who in turn provide feedback. Assigned reviewers were treated to a concert of science and science outreach orchestrated by our Lead P.I. Dr. Evelyn Gaiser. Reviewers arrived to a warm FCE welcome from IEC members then were sent straight to bed with their FCE folders. Off sprightly at 6 am to FCE field sites in Everglades' dry season, they flew to the far interior of the sawgrass marshes, witnessed the lightning speed and efficiency of an FCE field sampling, watched researcher



presentations, whisked to the Shark River, wiped the salty spray from their eyes after a boat trip and learned of the ecotone and coastal Everglades. Our guests witnessed first-hand the importance and lifeblood of the Everglades and South Florida, WATER! and many of the features that make managing Everglades water flow such a cooperative and endless effort. Day one set with a Fairchild Tropical Gardens Miami in March evening of FCE research posters and outreach presentations and more than half of the FCE faces (86 registered) from S. Fla. and across the country, in solidarity of FCE research and outreach efforts. We sent the reviewers straight to bed to

awake fresh for a day of meticulously prepared presentations from each of the working group leads at FIU's MARC Pavillion. The crescendo was and is the new and building FCE science. [See also FCE III MidTerm Report.](#)

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