



PROJECT NEWSLETTER
ISSUE 2
 JUNE 2014

The updates included in this newsletter serve to keep project personnel informed of other task group accomplishments and to remind us of our individual as well as collective goals.



Figure 1. SFWSC personnel at the 2nd Annual Meeting (1/21/2014, Haines City, FL)

PROJECT UPDATES AND INFORMATION

OVERVIEW

Over the past twelve months we have made steady progress toward our project objectives. In addition to working toward individual and task group goals, we are also working within the context of the larger project goals. These goals are to develop: 1) a hydro-economic model for south Florida, 2) new information on the economic value of ecosystem services that can be used in modeling exercises, 3) management schemes to increase the resilience of the system to climate change and sea level rise, 4) our understanding of cognitive and perceptual biases in risk assessment and decision-making, and 5) adaptive management plans that optimize economic productivity, the value of ecosystem services, and which foster sustained public support in south Florida. Significant progress has been made on the first of these objectives, the development of the hydro-economic optimization model. We are still working to refine the penalty functions, which will drive the model.

Over the next several months, the primary goal is to have the different penalty functions fully developed. In order to allow us to meet these goals, members of our project research team will be participating in a March workshop in Miami, which will be focused on agricultural economic penalty functions. Research in other areas including ecosystem service valuation, fisheries evaluation, and the decision and behavioral sciences continues to progress.

Upcoming Events:

- Graduate Student Symposium, June 25th, 1:30pm
- Penalty Function Workshop, TBD
- Task Group Meetings, Ongoing (see Page 5)

Related conferences:

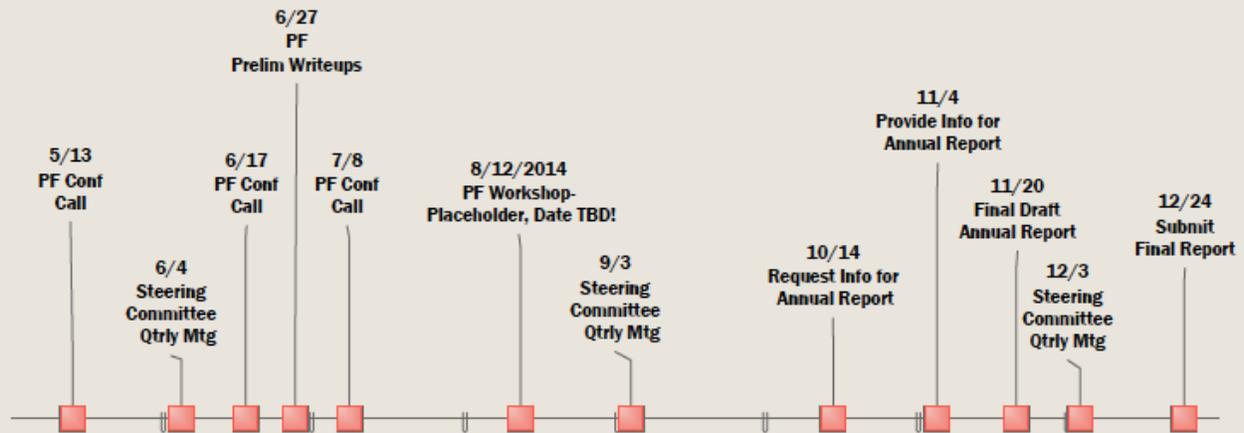
- CEER (Ecosystem Restoration), July 28th- Aug. 1st, NOLA
- Rising Seas Summit, September 24-26th, NY, NY
- ACES (Ecosystem Services), December 8-11th, Wash. DC

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WSC High Level Milestones

May – December 2014



TASK GROUP 1- Water Resource Economics (*Julie Harrington, Richard Weisskoff, Yuki Takatsuka*)

Group members have been working on developing two penalty functions, the agricultural economic penalty function and the urban water supply penalty function. Working with colleagues, Yuki Takatsuka and Julie Harrington have made progress developing an agricultural penalty function, where the penalty is the loss of producer surplus based on the total irrigation water level in two cases; 1) where farms are currently maximizing profit and 2) where Palm Beach County consumes irrigation water at the level of 2005. Yuki is still working on gathering data on crop yield by irrigated land for the Everglades Agricultural Area and looking to estimate the relationship between the value of water in irrigated and unirrigated land. Yuki presented her work at the Economic Penalty Function workshop held by the SFWSC project at the University of Miami on March 21st and 22nd. Chris Martinez, who also attended the meeting, has also been contributing to the development of the agricultural penalty function.

Jeff Czajkowski and Huong Nguyen, a University of Miami PhD student who has been working with Rich Weisskoff on the project, presented their results

from the development of urban water penalty functions at the UM meeting as well. Jeff is working out the relationship between flood insurance claims and water levels for Palm Beach County while Huong and Rich are calculating penalties associated with not meeting urban water supply. Yuki, Huong, and Jeff, agreed to provide written reports documenting their progress and the details behind the penalty functions they have developed for the rest of the SFWSC team by mid-June. Updated (near final) versions of all of the economic penalty functions will be presented again at a summer/fall penalty function workshop.

TASK GROUP 2 -Fisheries (*Jennifer Rehage, Jerald Ault*)

Members of Task Group Two have expanded their movement research in relation to hydrological drivers by adding two new species to the Shark River Slough (SRS) acoustic array: common snook (*C. undecimalis*, 61 tags deployed) and largemouth bass (*M. salmoides*, 8 tags deployed). Data downloads are conducted every 2-3 months. Jennifer Rehage obtained Natural System Model (NSM) stages for restoration for Central Everglades Planning Project (CEPP) at sites in the study from the SFWMD and is working on getting

paleo-corrected salinities. Rehage is collaborating with the Carbon Group (Task Group 3) to share this data. Ross Boucek (FIU PhD student) has been working with Christine Harvey, a RSMAS PhD student working with Jerry Ault, and other students from the Heithaus Research Lab on a joint paper focusing on species movement. Group members are interested in sharing their work and building upon collaborative efforts. To this end, they are working closely with Mahadev Bhat's team on an angler survey and will share results with the broader group through a summer webinar (date TBD). Additionally, FIU graduate student Jessica Lee will be preparing a presentation on methods for data management, which she'll present to the SFWSC team as part of the Graduate Student Symposium.

TASK GROUP 3- Carbon Cycle (*Donny Smoak, Rudolph Jaffe, David Ho, Ross Hinkle, Jose Fuentes*)

Task Group Three members have been conducting field research across multiple sites in Everglades National Park (ENP). Their research has included the installation of a pCO₂ sensor at the SRS6 site on the banks of Shark River and the collection of soil cores (18) from ENP. being counted and processed and several of the team's half cores have been run

through the core logger and XRF scanner at the University of Miami. Eddy covariance flux measurements continue in the Shark River mangrove forest (site SRS6).

The Carbon Group has some new results. Their mangrove core data suggests stabilization in the 1950s-1960s in storm records. They are still working on isotopes and pigments for their cores and have discussed including fluorescence, but constraints including time and cost may be prohibitive. Rudolph Jaffe has finished his transects and is currently working on a manuscript. Donny Smoak and Josh Breithaupt are nearly finished analyzing cores and will be working on values in months ahead. David Ho and Ross Hinkle have worked on some additional data collection and Ross has recruited a student to help with his ecosystem services research. David Ho was awarded an \$800,000 research grant to continue his research. Rudolph and Josh will be presenting their research at ASLO.

As part of the Florida Coastal Everglades Long Term Ecological Research All Scientists Meeting (FCE LTER ASM), members of the Carbon group including David Ho, Jordan Barr, Josh Breithaupt and Rudolf Jaffe met in March and attended an LTER Carbon group meeting where they discussed WSC objectives and details. In addition, Task Group 3 members intend to hold another November meeting and to have more regular interactions in the later part of the year.

TASK GROUP 4- Ecosystem Services (*Pallab Mozumder, Mahadev Bhat, Jeffrey Czajkowski, Jennifer Rehage*)

Task Group Four has been pursuing two different areas of work, ecosystem service valuation and recreational fisheries valuation. The ecosystem services valuation survey, which was designed by Pallab Mozumder and Nadia Seeteram (FIU Masters student), has



Figure 2. SFWSC personnel who participated in a buggy ride at the Nature Conservancy's Disney Wilderness Preserve (1/18/2014, Kissimmee, FL)

been closed and results are now being analyzed. The response rates were similarly low for the general public (< 1%, or 970 completed responses) and saltwater anglers (around 1%, or 873 responses), however the numbers are adequate for their analyses. Nadia Seeteram is in the early stages of survey data analysis, and has begun running regressions and generating new interaction variables to experiment with. For the group's recreational fisheries valuation research, Mahadev Bhat has been collaborating with members of the fisheries group (Task Group 2) and others in preparation of a different survey targeted for anglers. A draft of the angler survey has been circulated for comments. Group members are also working to identify recreational fishery stakeholders, including self-guided anglers, guided tour anglers, and guides themselves, who may take the survey, and are assessing permitting requirements for conducting the survey. Upcoming SFWSC webinars will focus on both of Task Group 4's surveys.

TASK GROUP 5- Hydroeconomic Modeling (*David Watkins, Richard Weisskoff, Chris Martinez, David Letson, Joseph Hughes, Julie Harrington*)

A working prototype of the model has

been developed and members of Task Group Five are working with those of us who are developing penalty functions to incorporate new information into the model.

Ali Mirchi, a postdoctoral researcher at Michigan Tech who has been working on the model, will be coming to south Florida to work with folks from the SFWMD in July. His main goals at the SFWMD will be to obtain hydrologic data, to gather more information needed for penalty functions, such as pumping costs, and to continue improving upon the model. The results of his work will be shared with the larger group during the fall meeting.

TASK GROUP 6- Scenarios (*Michael Flaxman, Julie Harrington, Joseph Hughes, Michael Mann, Richard Weisskoff*)

Michael Flaxman and his team have been developing scenarios including those that will be used with penalty functions. Their focus has been on collecting and analyzing data first, and they plan to develop the scenario visualizations in the coming months. Completed tasks include the ability to use tools with the scenarios to summarize land cover change dynamically and the development

of a model that will summarize land cover types and demographics, with outputs available in spreadsheet format. This will provide an aggregate picture of what is going on across the study region for diverse scenario users. They are sharing their landcover data with other groups and are waiting for results on possible population shifts due to sea level rise from the Behavioral Task Group (TG7), which will also be incorporated into scenarios. There will be a meeting in Miami on June 16th between Flaxman and members of TG7 to work out the details of their integrated product.

TASK GROUP 7- Behavioral

Decision Analysis (*Jessica Bolson, Kenny Broad, Jeffrey Czajkowski, Michael Flaxman, David Letson, Pallab Mozumder, Robert Meyer*)

As decided during the Annual Meeting, members of the Behavioral Task Group held a workshop in Philadelphia in March. At the workshop, Flaxman, Meyer, Broad, Bolson, Treuer, and Czajkowski discussed research plans and made some decisions regarding experimental design and how to integrate the output of the group's research with the project scenarios. The group has made progress toward the goals that were set including the development of HazSim, the simulation tool that Kenny Broad presented on at the Annual Mtg., and should begin collecting data in July.

Another line of research TG7 is working on is more directly related to the SFWSC hydroeconomic model. In July/August, team members will begin collecting data on how the decisions that are reflected in the model are actually made. They will also gather feedback from stakeholders on the penalty functions that are being developed. Ideally this input will be incorporated into later iterations of the model and the penalty functions. A stakeholder workshop will be planned for the early 2015 to explore model simulations.

NEXT GRADUATE STUDENT WEBINARS

Presenter: Galen Treuer, UM PhD student

Date: June 25, 2014

Presenter: Jessica Lee, FIU Masters student

Date: July 18, 2014

<https://connect.fiu.edu/WSC>

GRADUATE STUDENT NEWS

Achievements

Ross Boucek, FIU PhD candidate, published his work, titled "Climate extremes drive changes in functional community structure," in the journal *Global Change Biology* in April. The paper was featured in FIU News (<http://news.fiu.edu/2014/05/researchers-study-effects-of-rare-climate-extremes-on-fish-communities/77789>).

Josh Breithaupt, a PhD candidate at USF, and Jessica Lee, an FIU Masters student, both won poster awards at the Florida Coastal Everglades Long Term Ecological Research Project All Scientists' Meeting.

Galen Treuer, a PhD candidate at the University of Miami, was accepted into the National Center for Atmospheric Research Advanced Study Program, "Uncertainty in climate change research: An integrated approach" (<http://www.asp.ucar.edu/colloquium/2014/>).

Congratulations to our hard working graduate students!

Graduate Student Symposium

Since January, we have held regular webinars, which have been led by project-supported graduate students. These webinars have created a venue for cross-fertilization and idea sharing, providing participants an opportunity to learn more about the diverse topics of research covered by our project.

Past webinars including those given by Ross Boucek, Josh Breithaupt, and Nadia Seeteram have been uploaded to the project website (<http://sfwsc.fiu.edu/>).

All SFWSC team members are encouraged to attend and participate in upcoming webinars. In addition to reading email reminders, please regularly check the calendar on our website to see the schedule of talks.

Additionally, if you are a graduate student who has not yet scheduled your webinar, please contact Ross Boucek or Jessica Bolson to find a date!

PROJECT CALENDAR

Specific Task Group meeting Dates through August 2014 (all times Eastern)

TG-1	Economics	Harrington	Mondays, 2:00 pm: 6/2, 7/7, 8/4
TG-2	Fisheries	Rehage	Thursdays, 2:00 pm: 6/19, 7/17, 8/21
TG-3	Carbon	Smoak	Tuesdays, 1:30 pm: 6/24, 7/22, 8/26
TG-4	Ecosystem Services	Mozumder	Thursdays, 11:00 am: 6/3, 7/1, 8/5
TG-5	Modeling	Watkins	Tuesdays, 2:05 pm: 6/10, 7/8, 8/12
TG-6	Scenarios	Flaxman	Thursdays, 2:00 pm: 6/26, 7/24, 8/28
TG-7	Behavioral	Bolson	Tuesdays, 11:00 am: 6/17, 7/15, 8/14

The intent of these monthly meetings is to enhance communications between lead PIs and task groups. Participants include Vic Engel, Mike Sukop, Jessica Bolson, and task group leaders and members as appropriate.

SELECTED PUBLICATIONS:

Bin, O., Czajkowski, J. (2013). The Impact of Technical and Non-Technical Measures of Water Quality on Coastal Waterfront Property Values in South Florida, *Marine Resource Economics* 28(1):43-63.

Boucek, R.E. & J.S. Rehage. (2013). A tale of two fish: using recreational angler records to examine the link between fish catches and freshwater inflows in a subtropical mangrove estuary. *Estuaries & Coasts*. Miami Herald Feature, July 2013:
<http://www.miamiherald.com/2013/07/18/3505486/local-anglers-tag-fish-for-fiu.html>

Boucek, R.E. & J.S. Rehage. (2013). Exotic foods: examining the effectiveness of consumer diet sampling as a nonnative early detection tool in a subtropical estuary. *Transactions of the American Fisheries Society*.

Cawley K., Yamashita Y., Maie N. Jaffé R. (2013). Using optical properties to quantify fringe mangrove inputs to the dissolved organic matter (DOM) pool in a subtropical estuary. *Estuaries and Coasts*.

Czajkowski, J. (2013). "Tropical Cyclone Flooding: Not Just a Coastal Storm-Surge Phenomenon", *Risk Management Review - Wharton Risk Management and Decision Processes Center Newsletter*, Fall 2013.

Mirchi, A., D.W. Watkins, Jr., C.J. Huckins, K. Madani, and P. Hjorth (2013). "Water Resources Management in a Homogenizing World: Averting Growth and Underinvestment," *Water Resources Research*.

Pierce, B. and P. Mozumder (2013). "Perceptions and Preferences of Commercial Fishers in a Multi-species Fishery for Dedicated Access Privilege Framework", Accepted in *Marine Policy*.

Rehage, J.S., A. Saha, M. Cook, R.E. Boucek, E. Cline & M. Kobza. (2013). Turning passive detection systems into field experiments: an application using wetland fishes and enclosures to track fine-scale movement and habitat choice. *Acta Ethologica*.

Robertson, B.A., J.S. Rehage and A. Sih. (2013). Ecological novelty, and the emergence of evolutionary traps. *Trends in Ecology & Evolution* 28: 552-560.

