Monthly Report: October 2014

Faculty of FORESTY

School of AGRICULTURAL, FOREST, AND ENVIRONMENTAL SCIENCES

College of AGRICULTURE, FORESTRY & LIFE SCIENCES

Baruch Institute of Coastal Ecology and Forest Sciences
Hwy. 17 N.
177 Hobcaw Rd.
Georgetown, SC 29440

(843) 546-1013
FAX (843) 546-6296

To:
William Bailey and Mary E. Richards
Planning Division
Savannah District
US Army Corps of Engineers
100 W. Oglethorpe Ave.
Savannah, GA 31401

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By:
Jamie Duberstein
Baruch Institute of Coastal Ecology and Forest Science
Clemson University
PO Box 596
Georgetown, SC 29442
Cell: 706-410-6722

Bill and Mary:

Please see the bulleted list below for the major actions and accomplishments associated with Cooperative Agreement Number W912HZ-14-2-0002 for the month of October, 2014. Please let me know if you would like me to elaborate on the details of any items I've listed below, or if there are any status updates you'd like on unlisted topics.

Best Regards,

Jamie

Vegetation

- Completed the statistical analysis of the synoptic marsh vegetation sampling executed in June 2014.
    - All n=108 samples (from 12 marsh areas) were used in the analysis.
    - There were six discernable communities (see Table 1).
        - Spike rush
        - Cutgrass
        - Bullrush
        - Bullrush with green arrow arum
        - Cattail
        - Cordgrass
    - Historical analyses (e.g., Kitchens et al. 2003; Wetzel and Kitchens 2007) have identified between 7-8 different communities, though the datasets used included multiple samples per year and multiple years. We analyzed the June 2014 data only.
    - The results of this analysis were presented at a conference in South Carolina:
        - Duberstein JA (2014) Monitoring marsh vegetation during the Savannah Harbor Expansion Project Pre-Development Phase. South Carolina Water Resources Conference. 15-16 October. Columbia, SC. 20 mins.
        - An abstract of the presentation is available upon request.
        - Results were not submitted for publication in the conference proceedings.
- A synoptic sample of the 108 marsh monitoring locations was conducted on October 25th and 26th, the last of four synoptic sample events scheduled for 2014.
- Ninety-nine ground-truth locations were collected in October.
    - These are essentially GPS points with the general marsh community qualitatively assessed.
    - Locations are from areas outside regular monitoring areas.
    - Data will be used as part of the satellite imagery analysis.

Water Data

- Water level and salinity data were last downloaded (from deployed sensors) on October 25th and 26th, concurrent with the marsh vegetation sampling.
    - Post-processing of water level data is still underway.
        - Height or depth of water will be adjusted so that ground level represents zero (0).
- Average salinity was computed for 04/02/2014 – 06/30/2014, reflecting the 2014 growing season up to the end of June (Table 2).
    - Years of historic data analysis determined that June is one of the best times to sample vegetation.
    - Salinity measurements associated with this study began 04/02/2014.
    - Average salinities in each marsh area (12) ranged between 0.1 – 2.0 (psu).
    - These were relatively fresh conditions compared to 2001 data from the same time of year.
        - The most recent data we have from historical monitoring is from 2001.
        - It would be nice to know what the average salinity was at Back 4 during this time.

Forest monitoring

- Study design:
    - There are three forest monitoring areas.
    - Each forest monitoring area has two plots, 20x25 m.
- Complete surveys of all trees and shrubs in the tidal forest plots were conducted in early October.
- Two of the three areas had 10 baldcypress trees per plot fit with dendrometer bands.
    - Dendrometer bands allow for high resolution determination of tree growth rates.
    - The third area (Swamp 1), shared with a USGS climate change R&D program, will have trees fit with new dendrometer bands in December 2014.

Miscellaneous

- The barometric pressure sensor previously located at Back 4 has been repaired, recalibrated, and redeployed as of October 25th.

Table 1. Results of the marsh community analysis of the June 2014 dataset.

Zone	Community	Dominants	Average Importance	Max Spp. Richness	Avg Spp. Richness	Avg salinity April-June (std. err.)	No. plots
Freshwater	**Spike rush mix**	*Eleocharis mentevidensis*	52.28	19	12.4	0.18 (0.04)	15
		Zizaniopsis millacea	7.89				
		Aster elliotii	7.20				
		Murdania kesiak	2.92				
		Ludewegia spp.	2.87				
	Cutgrass	*Zizaniopsis millacea*	76.78	7	3.0	0.21 (0.02)	4
		Physo	6.08				
		Polygonum hydro	5.20				
		Panicum spp.	9.35				
Oligohaline	**Bullrush**	*Schoenoplectus tabernaemontani*	75.67	8	3.4	1.08 (0.10)	44
		Eleocharis mentevidensis	6.49				
		Zizaniopsis millacea	5.99				
		Typha spp.	3.95				
	Bullrush mix	*Schoenoplectus tabernaemontani*	42.07	10	5.9	0.45 (0.08)	33
		Eleocharis mentevidensis	11.28				
		Typha spp.	10.57				
		Petlandra virginica	6.85				
		Zizaniopsis millacea	6.49				
	Cattail	*Typha* spp.	61.52	6	4.0	0.74 (0.17)	4
		Schoenoplectus tabernaemontani	14.97				
		Eleocharis mentevidensis	7.93				
Mesohaline	**Cordgrass**	*Schoenoplectus tabernaemontani*	57.34	5	3.6	1.81 (<0.01)	8
		Spartina alterniflora	28.64				
		Bolboschoenus robustus	7.89				
		Symphyotrichum tenuifolium	3.29				

Table 2. Average salinity by area 01 April - 30 June. Question mark indicates an area that was being monitored in 2001, but salinity information is unknown.

	Salinity (psu)	
Area	2001	2014
Back 1	0.41	0.11
Back 2	0.58	0.17
Back 3	0.99	0.47
Back 3.5	-	1.68
Back 4	?	1.81
Front 1	0.83	0.14
Front 2	-	0.51
Middle 1	0.92	0.25
Middle 2	1.20	0.33
Middle 3	-	0.61
Middle 4	-	1.95
Middle 5	-	1.23