NERRS Science Collaborative Progress Report for the Period 03/01/13 through 08/31/13

Project Title: Florida Freshwater Resource Project

Principal Investigator: Alberto Chavez, Assistant Manager, Rookery Bay National Estuarine Research Reserve (RBNERR)

Project Start Date: Awarded 11/01/2011

Report Compiled By: Tabitha Stadler, Collaboration Lead**,** RBNERR

Contributing team members and their role in the project: There have been changes to the contributing team members during this reporting period and therefore the roles listed below are revised.

- On May 31, 2013, Dr. Victoria Vazquez resigned as RBNERR's Research Coordinator and Principal Investigator of the project.
- On June 21, 2013, Janel Vasallo resigned from RBNERR as a Coastal Training Program Specialist and the Project Coordinator.
- Tabitha Whalen Stadler, Project Collaboration Lead, resigned her position as Coastal Training Program Coordinator on February 28, 2013, but was retained as an employee of RBNERR and is continuing in her current role and serving as Project Coordinator. These duties are very likely to continue until the project is complete. These duties include overall project oversight including liaison with contractors and grantors, handling of procurement and payments, serving as the point of contact for the project, and coordinating communications and stakeholder meetings. In addition, she continues to handle the collaboration aspects such as creating the content for stakeholder meetings and outreach initiatives, she plans and implements collaborative meetings and projects that engage the community.
- Assistant Manager Alberto Chavez is currently serving as the Principal Investigator and Fiscal Agent. His intention is to relinquish these roles to either the new Research Coordinator or CTP Coordinator when they are hired. Interviews are scheduled and the hire dates should occur within approximately three months. Alberto will make the decision about who takes what roles based on skill sets, workloads, priorities and the timing of their arrival.
- Stewardship Coordinator Jeff Carter and System Wide Monitoring Program Coordinator Chris Panko-Graff are currently advisors to the project and provide restoration and research expertise respectively. They currently attend internal team meetings, whole team meetings and advise Tabitha upon request. It is likely that Chris and Jeff will continue advising on the project over the long-term.

A. Progress overview:

Project Summary:

Rookery Bay National Estuarine Research Reserve (RBNERR) is surrounded by the growing population of Collier County, in southwest Florida. Of particular interest to the Reserve is the Rookery Bay estuary, fed by the Henderson Creek watershed. The estuary is highly affected by altered freshwater inflows, which vary from nearly 134 million cubic feet per day in the wet season to zero during the dry season. To further complicate the coastal management situation, saltwater intrusion is a prevailing problem in South Florida with both private and local government wells becoming saltier over time. In response, local communities are requesting more water from the Henderson Creek watershed. Balancing the water needs of people with the needs of natural systems will be an ongoing issue for the community, which will intensify as the community grows and sea levels rise due to climate change.

Project Goals:

Restore and adaptively manage the quantity, timing and quality of the freshwater flowing into Henderson Creek and the Rookery Bay Estuary to ensure the health of the natural resources to meet long-term community needs. Successful completion of this project, and subsequent related efforts, will ensure important community needs such as:

- Ensuring continued sustainable availability of freshwater for the City of Marco Island,
- Ensuring recreational and commercial benefits to the community through protecting and enhancing habitat for fish, shellfish and myriad plants and wildlife,
- Coordinating stakeholder input on freshwater allocation by understanding and responding to community priorities related to the use, proximity to, and reliance upon the Rookery Bay Estuary, to create a long-term mechanism for community use
- Delivering on the Rookery Bay Reserve priority to serve as trustees for citizens of Florida and the Nation by conserving, researching and sharing these natural resources for future generations.

Progress Summary:

The planned focus of this reporting period was to engage the services of several contractors, including the creation of detailed scopes of work, and begin to implement the bulk of the project. In addition, we successfully managed several staff transitions. The thinking of internal and external partners and stakeholders continues to evolve at a rapid rate with exciting new directions and possibilities discovered that have resulted in new initiatives that are beginning to take shape.

<u>Applied Science</u>
The applied science portion of this project focuses on understanding the current and historical freshwater in-flows to the Rookery Bay Estuary. This work is underway through Taylor Engineering whose contract was signed on May 20, 2013. The subcontractor, Interflow Engineering, will be developing a local scale hydrologic/hydraulic model and they completed field reconnaissance and data review in July. That part of the project included two days of site visits to areas around the RBNERR, a fly over of the study site in a small

plane piloted by a RBNERR volunteer at no-cost, and a meeting with the Big Cypress Basis Water Management District.

Another subcontractor, Scheda Ecological has begun a literature review to determine changes to the ecological character of the Rookery Bay Estuary. No report or deliverables have been completed at this time. This is the first step in understanding the changes that occurred to the flora and fauna as a result of altered freshwater inflows. Several new projects and directions are proposed as a result of the RBNERR Team and Project Advisory Group (PAG) thinking about the ecological changes, including what could serve as a restoration indicator. Another reason for the new ideas is the importance of explaining to the community why altered flows need to be corrected and what was lost. This included asking ourselves the simple question, "What are we restoring and why is that important?" – with a complex answer.

RWA Engineering's contract was signed July 17, 2013 making this the final of the three large contracts that required execution to get the project's work into full-swing. The purpose of this contractor is to assist RBNERR staff in evaluating the work of Taylor Engineering, to create a master schedule for the project, and to take care of several loose ends and smaller, specific projects necessary to complete the full suite of project outcomes. The master schedule will be presented at the next August team meeting, and the main contact, Emilio Robau has been in good communication with RBNERR staff.

Social Science

Nova Southeastern University has submitted three monthly progress reports and participated in the required corresponding meetings (4/5/13, 5/17/13, 7/19/13, 8/1/13, and 8/12/13) and preliminary information has been shared with the PAG. The first draft of the final report will be submitted in September and will be formally presented at the next PAG meeting. The first draft of research questions has also been crafted for the next phase of research which will include interviews of local water stakeholders. A thorough report of that information and its impact on the direction of the project will be shared in the next progress report.

Project Coordination

Project coordination and communication activities are occurring frequently and being standardized for increased efficiency and documentation. Monthly whole team meetings with all of the contractors are booked through the end of the calendar year and a standard agenda and meeting minute's templates are being used by all parties. Internal team meetings are occurring at least monthly and often bi-weekly. A total of 44 meetings or events occurred during this reporting period for various reasons including to manage the creation of the contractor's scopes of work, to transition team members, recruit additional PAG members, educate stakeholders, and discuss developments. In summary, a great deal of effort was put into the project over the last six months and an overall plan for the remaining two years will be completed shortly.

B. Working with Intended Users:

Describe the progress on tasks related to the integration of intended users into the project for this reporting period.

Project Advisory Group (PAG) Meetings

The primary methodology for working with intended users is the PAG. Two meetings were held and two new members were added to the group. The next meeting will be in late September.

On April 12, 2013, a tour and meeting to investigate the primary freshwater inflow sites to the Rookery Bay estuary with an emphasis on the areas to the northwest of it was conducted for 14 members. Objectives included:

- Increase knowledge of the location and conditions where water is flowing into the Rookery Bay estuary. This includes quality and quantity of water, who built, manages, and monitors that site, and its environment
- Stimulate thought about how these inflow sites are *ideally* monitored and managed
- Generate ideas about how this information can be used for and feed decision-making related to the goals of restoring the Rookery Bay estuary

The day began with a field trip to various stormwater sites in the large developments along the border of the RBNERR and adjacent to the study site. This was followed by a lunch presentation on Collier County's water quality data which shows no particular trend in the study area, but will require the project team to investigate further. A final site visit to a maintenance road within the RBNERR's study area, which is also an easement for the Florida Power and Light Company, was also included. The overall event was rated unanimously by the seven who completed the post-event evaluation as a good use of time and one person wrote that "The group discussion is critical. Sharing information, concepts, working together to produce good results," which was a good outcome.

On July 12, 2013 another PAG meeting included a visit and trawl in nearby Naples Bay. The goals of this event were to learn more about the RBNERR's research related to altered freshwater inflows to estuaries and to understand the issues and approaches being applied in Naples Bay. RBNERR Fisheries Biologist Pat O'Donnell shared the research he has conducted within the Rookery Bay Reserve and the research conducted with the City of Naples in Naples Bay. City of Naples Natural Resource Manager Dr. Mike Bauer focused on the issues and approaches currently being applied to the restoration of Naples Bay. Since both Rookery Bay and Naples Bay are affected by altered freshwater inflows, are within the same bio-geographic region, and are managed by project partners, the event was designed to provide insights that could be applied directly to restoring the Rookery Bay Estuary and increasing regional cooperation and coordination related to restoration and water management efforts. Specific objectives of the day included:

- Increase knowledge of Rookery Bay Reserve research related to altered freshwater inflows, with a focus on work conducted by Pat O'Donnell,
- Increase knowledge of Naples Bay research and restoration efforts,

- Encourage restoration and research-related sharing, idea generation and management options,
- Stimulate increased cooperation and coordination related to restoration, research, and water management in the region.

All attendees who responded to the survey affirmed that the meeting was a good use of time and one wrote “Great job all around setting up and running the meeting.” The agendas and evaluation summary’s for these events are available upon request.

Two additional PAG members were suggested by existing PAG members and both of these have been recruited and agreed to participate in future meetings. Mac Hatcher is retired from 30 years of working with Collier County and was instrumental in the creation of their Watershed Management Master Plan. Jennifer Nelson is Environmental Administrator in the Florida Department of Environmental Protection’s Division of Environmental Restoration and Assessment’s Ft. Myers office. She has more than a dozen years of experience with local watershed issues including restoration, water quality and regulatory issues. Both new team members met with the project’s Collaboration Lead who briefed them and engaged them in the project. The next PAG meeting is tentatively scheduled for late September and effort is being made to identify the topics and dates for meetings over the next six months.

Working With Other Intended Users

As mentioned in the last progress report, this project has helped RBNERR staff realize that the people who maintain the upstream canals are important decision-makers in terms of what comes down those canals and into RBNERR’s managed areas. On April 8, 2013, 17 staff from the Big Cypress Basin Water Management District (SFWMD) canal maintenance team spent the day with RBNERR staff including a boat trip, tour of the Environmental Learning Center and formal and informal presentations. The event was aimed at sharing more information about the Reserve, its goals and mission, and allowing BCB staff to experience the area downstream of the canals they maintain. The 12 participants who completed the post-event evaluation unanimously agreed that they learned something that they will apply in their work and that the most important thing they learned was “how estuaries are very important to our ecosystem/environment” and “the impact the freshwater released into the estuary has.”

On May 22, 2013, 18 staff from the Collier County canal and road maintenance team spent the day with RBNERR staff following the same goals and schedule as the SFWMD event explained above. One attendee told the RBNERR team that he never knew what an estuary was and that he had lived in Collier County his whole life and raised a family here. Post-event evaluations were glowing, including similar statements about increased knowledge about the purpose and value of estuaries and how the mix of fresh and saltwater is critical. These two events highlight successful early efforts of this project to improve community-wide knowledge about the value of water and to affect decision-making among water managers.

On August 30, 2013 the RBNERR project team will host three staff from the City of Marco Island utilities for a boat trip tour in the morning and business meeting in the afternoon where we plan to present the project in detail, seek their input, gain buy-in and request information

from them. The information we are requesting is for the current conditions model and includes the parameters of their permit to withdraw water from Henderson Creek and their actual withdrawal rates and timing. This is a sensitive subject and they are a very important partner since we have the goal of balancing the water needs of the City with the needs of the estuary and to plan for sustained needs of both parties over the long-term. Prior to setting up this meeting, the Collaboration Lead met with our Marco Island PAG representative (7/23/13), Nancy Richie, who assisted in the timing and design of the meeting and who will also attend.

- **What did you learn? Have there been any unanticipated challenges or opportunities?**

A lot and yes. One of the scientific goals of this project is to determine historic and current freshwater inflows to the Rookery Bay Estuary. We already know that altered freshwater inflows from years of ditching and draining for flood control and water management have altered these flows. But how has this impacted the local estuary? This question occupied our time during the months of June, July and August and it will continue to be explored through some new initiatives explained below.

The realization began during our initial meetings with Sheda Ecological, whose literature review and historical aerial photo review is underway. The RBNERR team was dissatisfied with their approach because their lack of local knowledge hindered communication and understanding of the uniqueness of our system. This resulted in a realization that we have a system that is not easily compared to others across the state and that the people who have local knowledge need to be working on this aspect of the project. Discussion points included:

- Rookery Bay Estuary is most comparable to a biogeoraphic region from Estero Bay south to Cape Romano, with some comparability to the Ten Thousand Islands, but not Florida Bay
- We are in a transition zone from semi-tropical to sub-tropical and are aware of this in the upland areas, but have not explored the unique overlap of species that may be occurring in the marine areas
- While seagrasses are typical restoration indicators in much of Florida, they are not presently common in our muddy back bays. Local researchers theorize that macro-algae, another type of submerged aquatic vegetation (SAV), may serve in the typical role played by seagrasses. But whether it was historically seagrass that has been lost through habitat changes or whether macro-algae was always the most common SAV is entirely unknown and may never be known.
- The pros and cons of having restoration goals based on either historic conditions or a reference site or specific indicator species and which of these approaches will provide a better before and after restoration comparison to determine our future success.
- How much do we know about altered freshwater inflow effects on estuaries and who is working on this that could help us?
- RBNERR staff have been the most active on collecting data within the immediate project area including fisheries, SWMP, crabs, oyster and seagrass data over many years and therefore, it makes sense to try to incorporate analysis of this data into the project.

These extensive discussions led us to have a phone meeting with former RBNERR Research Coordinator Dr. Mike Shirley and others, including internet research about these topics that will continue. New approaches include:

- Initial investigation about getting an advisor to assist RBNERR research staff to analyze and publish their research. A local expert has been identified and grant funds would be used to hire them to speed up and improve this effort.
- A graduate student is being sought to comb through RBNERR's cultural resource files to tell the story of the history of the inhabitants within the study area. This includes Native American communities, pioneer home sites and recent development and conservation initiatives. This will help answer the question of why this area is important to focus on restoring.
- Upcoming PAG meetings will include speakers that can assist us in understanding these ecological variables.

An additional new area of interest came about while finalizing the scopes of work during March, April and May. This involved the use of the terms "Water Reservation" and "MFL," which stands for Minimum Flows and Levels. These were mentioned within our grant proposal but the RBNERR team did not fully understand the legal and regulatory framework that underpins these tools on the state and national levels. A meeting was held with RBNERR Director Gary Lytton and Assistant Manager Alberto Chavez on March 20, 2013 and several inquiries and internet searches have also taken place. The project team has identified a new need to further explore these two approaches which focus on guaranteeing, or setting aside, water for the RBNERR estuary. This was discussed with PAG, but more research will be necessary to understand the pros and cons, implications, and considerations related to whether these are the right tools for RBNERR to pursue in the future.

- **Who has been involved?**

PAG members and project team members listed above.

- **Has interaction with intended users brought about any changes to your methods for integration of intended users, the intended users involved, or your project objectives?**

After discussion at a PAG meeting and on the monthly whole team call with the contractors, the project team recognized that the PAG is more of a technical advisory group and not a typical diverse community stakeholder group. This is a small, but important, distinction since the project originally called for a community-wide decision-making body called the Water Council. Our current assessment of the freshwater inflow problem is that the SFWMD and government entities that sit on the PAG are the most critical groups to coordinate and prioritize, then move forward the type of expensive, long-term, earth-moving projects that are necessary to correct these water flow problems. While we continue to research the stakeholders and their interests, the actual decision-making that these other people may need to make relates to specific business or personal behaviors. For example, water conservation by a broad group in Marco Island would lessen the need for withdrawal of water from Henderson Creek. Another example is if private landowners built rain gardens or wetlands

which would lessen the need for the SFWMD to manage the runoff. These are more likely to be the type of decision-making necessary for the broader group of stakeholders and they are not likely to have an interest in the technical discussions that the PAG members enjoy. In addition, two new PAG members were recruited. For some time the project team has entertained the idea that a Water Council will not be necessary to meet project objectives, but will not make a final determination until the first two social science projects have been completed. The PAG is currently fulfilling the project objective related to water management decision-making and therefore some effort will be made to explore what resources will be needed to sustain this coordination body after the project concludes.

- **How do you anticipate working with intended users in the next six months?**

When the NSU literature review is completed in late September, we will digest the information and start on their phase II project which is to interview local stakeholders. We have already begun drafting those questions. The people who will be interviewed represent a broader stakeholder group than have previously been included in the project. The PAG will continue to meet every other month and additional members will be added as necessary. PAG meeting dates will be chosen based on the dates that contracted deliverables will be completed so that PAG members can be updated on project activities and can comment on the research as it unfolds. These dates will then be included in the master schedule.

We plan to continue our relationship building with the Collier County and SFWMD canal maintenance teams. Some meetings are already booked between the SFWMD Director and a new engineer that has joined their team. These exemplify the relationship building that has already occurred and will continue over the next six months. We will also be reaching out to the SFWMD West Palm Beach office who oversees the local SFWMD staff to better understand the MFL's and Water Reservations.

C. Progress on project objectives for this reporting period:

- **Describe progress on tasks related to project objectives for this reporting period.**

- Taylor Engineering is under contract and completing deliverables including field reconnaissance for the local scale hydrologic/hydraulic model. They have billed for June and July and participated in two PAG meetings, and two whole team meetings.
- RWA is under contract and the first draft of the master schedule for the project is completed and will be shared with the broader team on August 27, 2013. RWA has participated officially in one whole team meeting.
- NSU has submitted monthly progress reports and engaged in monthly meetings during April – August.
- Two RBNERR project team members left the Reserve and three new project team members have been brought up to speed and are actively working on the project.
- Two PAG meetings with stakeholders took place, two day-long events for canal maintenance workers occurred, and several individual meetings with partners and community members occurred to meet the engagement goals of the project.

- A critical meeting is taking place on August 30 with the City of Marco Island Utilities to engage with them more closely as a partner.
- Several new ideas and projects emerged as a result of the active thinking and collaboration occurring between all team members.

- **What data did you collect?**

No data was collected.

- **Has your progress in this period brought about any changes to your methods, the integration of intended users, the intended users involved or the project objectives?**

The use of an ecological firm that did not have local knowledge made the project team consider using some local people and companies, although these potential new approaches have not been finalized. The discussion and exposure to the science in this project is influencing the project team to think about and look for information in new areas. None of this however, has brought about any concrete changes to the methods or intended users.

- **Have there been any unanticipated challenges, opportunities, or lessons learned?**

Finalizing project contracts and paying invoices continues to be a challenge, although at this point in the project it is not really unanticipated. The inclusion of RBNERR's Chris Panko-Graff and Jeff Carter has been very beneficial to the project and has allowed for closer integration of the project into the RBNERR's Research Department activities and approaches. Chris is leading an effort to work with the University of Maryland's Integration and Application Network to create a Reserve report card. Since the data from this project is likely to be included and since we want to create outreach on the Rookery Bay estuary, this report card will become one of our main tools. There has also been some effort at RBNERR to plan changes to the Environmental Learning Center exhibits and that project will also work well with the types of outputs planned from this project.

- **What are your plans for meeting project objectives for the next six months?**

<u>Applied Science</u>
The local-scale historic and current conditions models will be constructed by January and the first model scenario related to a diversion of water from Naples Bay to Henderson Creek will be completed by February. The modeling of hydrologic conditions in Fakahatchee Bay will also be completed in February which is a potential reference site for this project. By the end of February, an interim modeling report will also be completed and shared with the PAG.

<u>Ecological</u>
The literature review and data collection from Scheda Ecological will be completed in September and the review of historical aerial maps and then a trend analysis will also be completed in November. That will be the time when the team and PAG can evaluate whether more research or other activities are necessary to identify indicator species. The team is

pursuing support for analyzing existing SWMP and fisheries data, so that approach will be finalized before the next progress report is due.

Social Science/Collaboration

NSU will have completed the literature review and will be half-way through the next phase of interviewing local stakeholders. The team is pursuing a graduate student to assist in telling the story of the historic human occupation of the study area, so that approach will be finalized before the next progress report is due. PAG meetings will continue to occur approximately every other month and stakeholder outreach events, such as for the canal maintenance workers, will also occur every other month. A webinar for scientists will take place during this next reporting timeframe and the project website will be updated and used for outreach. Some of the project team members will travel to the headquarters of our state agency in Tallahassee before the end of the year, to share this project as a good model for restoration that includes the community.

Coordination

The master schedule will be completed by next month and will then be used as a living document to better guide the work of all project members. Monthly internal team and whole team meetings will continue, along with documentation of all aspects of the project.

D. Benefit to NERRS and NOAA:

This project continues to work on an issue of great importance to NERRS, which is the altered freshwater inflow to estuaries and the associated decision-making and education that can help address this coastal management problem. The data and information gained from upcoming modeling, the ecological literature review, and interview activities will be shared widely and should be helpful to other natural resource managers, including our local community.

E. Describe any activities, products, accomplishments, or obstacles not addressed in other sections of this report that you feel are important for the Science Collaborative to know.

None to report.