

NERRS Science Collaborative Progress Report for the Period 3/1/12 through 08/31/12

Project Title: Planning for Sea Level Rise: A Pilot Study to Evaluate and Improve the Development and Delivery of Habitat Vulnerability Assessments and Adaptive Conservation Designs to Coastal Decision Makers

Principal Investigator(s): Kathryn Frank, University of Florida

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Report compiled by: Kathryn Frank

Contributing team members and their role in the project: Emily Montgomery (Co-PI) at the Guana Tolomato Matanzas National Estuarine Research Reserve, and Caitlin Cerame (Research Assistant) at the University of Florida.

A. Progress Overview

The goal of the project is to develop an integrated sea level rise adaptation planning process that identifies potential impacts of future sea level rise on coastal habitats and species, designs ecological migration corridors, and builds governance and civic capacity for adaptation. The planning process is being piloted in the Matanzas Basin of Northeast Florida in partnership with the Guana Tolomato Matanzas National Estuarine Research Reserve, and with the aim of documenting a transferable model for use by other reserves in the National Estuarine Research Reserve System (NERRS).

The majority of the work this reporting period pertained to six project components, five of which relate to the Matanzas Basin pilot study:

(1) *Consultation with the project's **Matanzas Basin Steering Committee***. The Steering Committee held its first three quarterly meetings on March 5, May 14, and August 13. At the meetings, Steering Committee members became familiar with each other and their roles on the committee by discussing their individual perspectives about sea level rise. Project team members presented information about the science of sea level rise, draft ideas for the stakeholder workshops in Fall 2012 and Spring 2013, and results from the technical analyses (see next component). A Basecamp project site for the Steering Committee was established.

(2) ***Technical analyses***. The technical team conducted sea level rise vulnerability assessment modeling and geospatial analyses, and this is nearly complete. This includes: Sea Level Affecting Marshes Model (SLAMM) for all sea level rise scenarios; bathtub (digital elevation model) inundation for all sea level rise scenarios; and Hazus storm surge model for various storms (e.g., 100-year storm) and for several of the sea level rise scenarios. The technical team presented these results to our partners at GTM NERR and the Matanzas Basin Steering Committee on August 13. Interpretation and synthesis of the vulnerability assessment results is ongoing and will be the focus of the stakeholder workshops in Fall 2012 and Spring 2013.

The team also began additional analyses that will figure prominently during the following year's public workshops in Fall 2013 and Spring 2014. These analyses include: future land use modeling using Land Use Conflict Identification Strategy (LUCIS); and habitat and species migration corridor design. For the latter, the team conducted a literature review of species and habitats of the Matanzas Basin, assessed the usefulness of NOAA's Habitat Priority Planner for this project, and presented possible design strategies and needs for stakeholder input at the August 13 Steering

Committee meeting. An external hard drive was acquired to provide a central data archive, especially for the large modeling and geospatial analysis files.

(3) **Visualization and communication of sea level rise science and technical findings.** Two master's students completed theses linked to the project. Brad Weitekamp's thesis in Landscape Architecture identified the most effective ways to visualize sea level rise in the Matanzas Basin. Forrest Eddleton's thesis in Urban and Regional Planning developed a method of incorporating understanding of historic change into planning for future change and applied the method to sea level rise planning in the Matanzas Basin. The visualization and communication team incorporated the thesis findings, suggestions from the Steering Committee meetings, and best practices of public communication into presentation materials for the upcoming collaborative workshops (see next component).

(4) **Collaborative workshops with stakeholders.** With Steering Committee input, the collaboration team designed the overall structure of the stakeholder workshops that will be held in Fall 2012 and Spring 2013. The team also generated detailed agendas, and draft presentation materials and activities. The collaboration team piloted early versions of the presentation materials with the Steering Committee, and by invitation at a local Sierra Club meeting on May 7 in Ponte Vedra, Florida. The team wrote a draft evaluation plan for the workshops. The team is now developing general and targeted workshop invitations to be issued through GTM NERR.

(5) **Outreach and transfer.** NERRS Science Collaborative staff created, with project team input, a one-page project website and a two-page project brief for national and local (Matanzas Basin) uses. To further engage the public and professionals, the project team developed a website, planningmatanzas.org. This website includes a blog of current events and several pages of background information about the project, sea level rise, and the Matanzas Basin. The team also raised awareness of the project via a poster at a statewide professional conference, Risk and Response: Sea Level Rise Summit, on June 20-21 in Boca Raton, Florida.

(6) **Overall project management and reports.** The project team drafted outlines and began writing sections for two reports: (i) Matanzas Basin findings and recommendations and (ii) guidebook of the transferable planning process for use by other reserves.

B. Working with Intended Users

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

Several mechanisms for integrating users of the Matanzas Basin vulnerability assessments and habitat migration corridor designs have been utilized and expanded upon in this reporting period.

The project team has collaborated with the Matanzas Basin Steering Committee at three meetings, and the direct connection is ongoing via Basecamp, email, and phone calls. This diverse group of local leaders, businesses, and planners has provided guidance on project implementation and has served as a vital link between the research activities and the community. Steering Committee members expressed their high regard for the Matanzas Basin and area communities, and their commitment to assisting the project to bring the important issue of sea level rise to decision-makers, stakeholders, and the public. Steering Committee members have been deeply interested in

the technical findings and committed to their responsibilities of pre-testing workshop formats and techniques. Their guidance has been very helpful, and it is being incorporated into the stakeholder workshops.

The project partnership between the University of Florida researchers and the Guana Tolomato Matanzas Research Reserve staff has flourished due to continuous communication and recognition of each group's unique expertise, resources, and relationship with the Matanzas Basin community. In addition to face-to-face communication at the three Steering Committee meetings, members of the Reserve visited the University on May 31 for a technical update, and the Reserve staff invited the project PI (Kathryn Frank) to join them in at workshop of the Southeast and Caribbean Climate Community of Practice on June 12-14 in Jacksonville, Florida. At other times, UF and Reserve team members held conference calls, exchanged email, and posted files to Basecamp.

Last, the public can now access information about the project at their convenience through the main project website, planningmatanzas.org. Website visitors can learn of past and upcoming project events such as the stakeholder workshops, obtain answers to questions about sea level rise and how it affects the Matanzas Basin, read descriptions of the scientific models used, and learn about the importance of ecological conservation. The blog will be updated regularly through text and video formats. Visitors are encouraged to provide feedback in the comments section.

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

The project team has gained an even greater appreciation of the critical role of the Matanzas Basin Steering Committee, and we have recognized new opportunities for working with them. The Matanzas Basin Steering Committee has provided insights into the social, economic, and cultural aspects of planning for sea level rise in their communities. Their wisdom is greatly appreciated, and their suggestions have been incorporated into the design of the stakeholder workshops. For example, members have recommended that the stakeholder workshops present local and recent examples of coastal change and societal responses. Steering Committee members have stepped up to provide such examples, and they have video-recorded personal statements about "why the Matanzas Basin is a special place". Steering Committee members have also stressed that the workshops should describe the range of impacts of sea level rise but be clear about the project's focus and analyses not performed (such as hydrological modeling). Sea level rise potential impacts of most interest to the Steering Committee include reduction in the capacity of stormwater infrastructure, saltwater intrusion, and migration of saltwater marshes. Last, members advised the project team to connect with local officials before beginning the stakeholder workshops in their jurisdictions. As Steering Committee members learn more about the findings of the technical analyses and stakeholder workshops, their advisory and outreach roles will become even more critical to project success.

Who has been involved?

The University of Florida research team has worked closely with the GTM NERR staff on technical and community outreach matters. The Reserve staff members have proved invaluable in setting standards for the technical analyses (such as using high resolution, LiDAR-based elevation data), understanding ecological and social features of the Matanzas Basin, connecting with the local Steering Committee, developing a collaboration evaluation plan, and planning the stakeholder workshops.

There are currently twelve members of the Matanzas Basin Steering Committee, and they have been regularly attending the past three meetings. These citizens, business leaders, and planners have generously committed their time and have played an active, engaged role at the meetings and in additional conversations.

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?

No major changes in methods for integration have occurred during this reporting period. Minor changes are discussed above in response to “What did you learn?”.

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

Three of the stakeholders meetings will be in Fall 2012 (possibly October-November) and three in Spring 2013. The local stakeholder groups are: St. Augustine residents; Palm Coast residents; barrier island residents; government officials; inland developers; and natural resource-based economic interests. The team will continue to work with the Matanzas Basin Steering Committee to prepare for the stakeholder workshops. Members are assisting in identifying potential candidates for the stakeholder groups.

A third group of intended users of the project results is the NERRS reserves. The project team will communicate with the NERRS Climate Change Committee in the next six months to identify sea level rise adaptation planning process needs across the NERRS and specific reserves that may be most interested in the transferable process generated by this project.

The project website will continue to provide public and professional outreach. There will be frequent project updates with the direct opportunity for website visitors to provide feedback.

C. Progress on project objectives for this reporting period

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

The first project objective is to develop a transferable planning process for use by other NERRS reserves. The major accomplishments were to conduct literature reviews, create draft final report outlines, and begin writing report sections.

The second project objective is to pilot test the planning process in the Matanzas Basin. Major accomplishments were to hold three meetings of the Matanzas Basin Steering Committee, to finalize vulnerability assessments in the basin, to make substantial progress in designing the stakeholder workshops, and to launch a project website.

The third project objective is to coordinate the Matanzas Basin process with statewide ecological greenways planning. Statewide projects conducted by project team members and related to this objective are active and ongoing.

The fourth project objective is to conduct related science, social science, and applied research. Two master's theses were completed (as described above). Manuscript writing for scholarly journal publication is underway, including for the SLAMM habitat modeling results, which are the most complete. An evaluation plan for the upcoming stakeholder workshops is being finalized.

What data did you collect?

Information about the events and evolution of the project was collected through archived draft documents, meeting notes, the project website blog, Basecamp posts, and email messages. All major components of the project, including process transfer and collaboration, have included literature reviews.

The technical team has gathered existing geospatial and physical data from a variety of sources concerning land cover, elevation, tides, sea level rise trends, accretion, erosion, and storm frequency. Field data verifying land cover maps was also obtained. The team has conducted a literature review of resilience, adaptation capacity, and vulnerability of species and natural communities within the Matanzas Basin, including species and communities that are of high conservation importance. Species and communities were selected from the Florida Natural Areas Inventory (FNAI). Connectivity analysis will be based upon assessment of geospatial data collected from the Florida Cooperative Land Cover Map project, the Florida Land Use and Cover Classification System (FLUCCS), and the Critical Lands and Waters Identification Project (CLIP 2.0).

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?

Based upon the SLAMM results, the project team added a sixth stakeholder group, St. Augustine residents. The modeling shows that because land cover change is largely located within five kilometers (3 miles) of the ocean, St. Augustine is particularly vulnerable to the loss of developed and dry land. This will be the third resident stakeholder group in addition to Palm Coast and barrier island residents.

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

There have been several changes in project team member availability, but we have adapted and stayed on schedule. Dawn Jourdan, Collaboration Lead, accepted a position with the University of Oklahoma, but she is able to remain on the project in the same capacity at no additional expense to the project. Dr. Jourdan, for example, flew to Florida to attend the most recent Steering Committee meeting. She will not, however, be able to attend as many stakeholder workshops as she had

originally planned to do, but other team members have stepped up to perform her functions at these workshops. Several research assistants took personal leave or left the team for various reasons (e.g., graduation), but due to advance planning and new hires, this has not been a problem.

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

The project is on schedule to meet objectives during the next reporting period (September 2012-February 2013). The vulnerability assessments will be further interpreted and synthesized by the project team, including via geospatial data overlays of critical facilities and important sites, and with additional assistance by Kathryn Frank's Fall 2012 graduate level Advanced Environmental Planning class, as a group assignment. The collaboration team will make final preparations for the stakeholder workshops. A majority of the stakeholder workshops regarding the vulnerability assessments will occur during the next six months. Stakeholder input during these workshops will be recorded and will be reflected in the next set of public workshops focused on future scenarios (Fall 2013-Spring 2014). The vulnerability assessment workshops will be evaluated for building stakeholder capacity and generating useful planning information. Also during the next six months, the technical team will continue work on the analyses and designs that will inform the future scenarios presented at the next set of public workshops. Steering Committee input into the methodology for designing the habitat migration corridors will occur possibly through a sub-committee with leadership by Reserve staff. And the collaboration team will begin planning the next set of public workshops.

The team will also continue to conduct research at the NERRS level, work with NERRS Climate Change Committee, and coordinate team members' related specialized studies. Final report and journal article writing will be ongoing.

D. Benefits to NERRS and NOAA

No products have been finalized during this reporting period.

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.