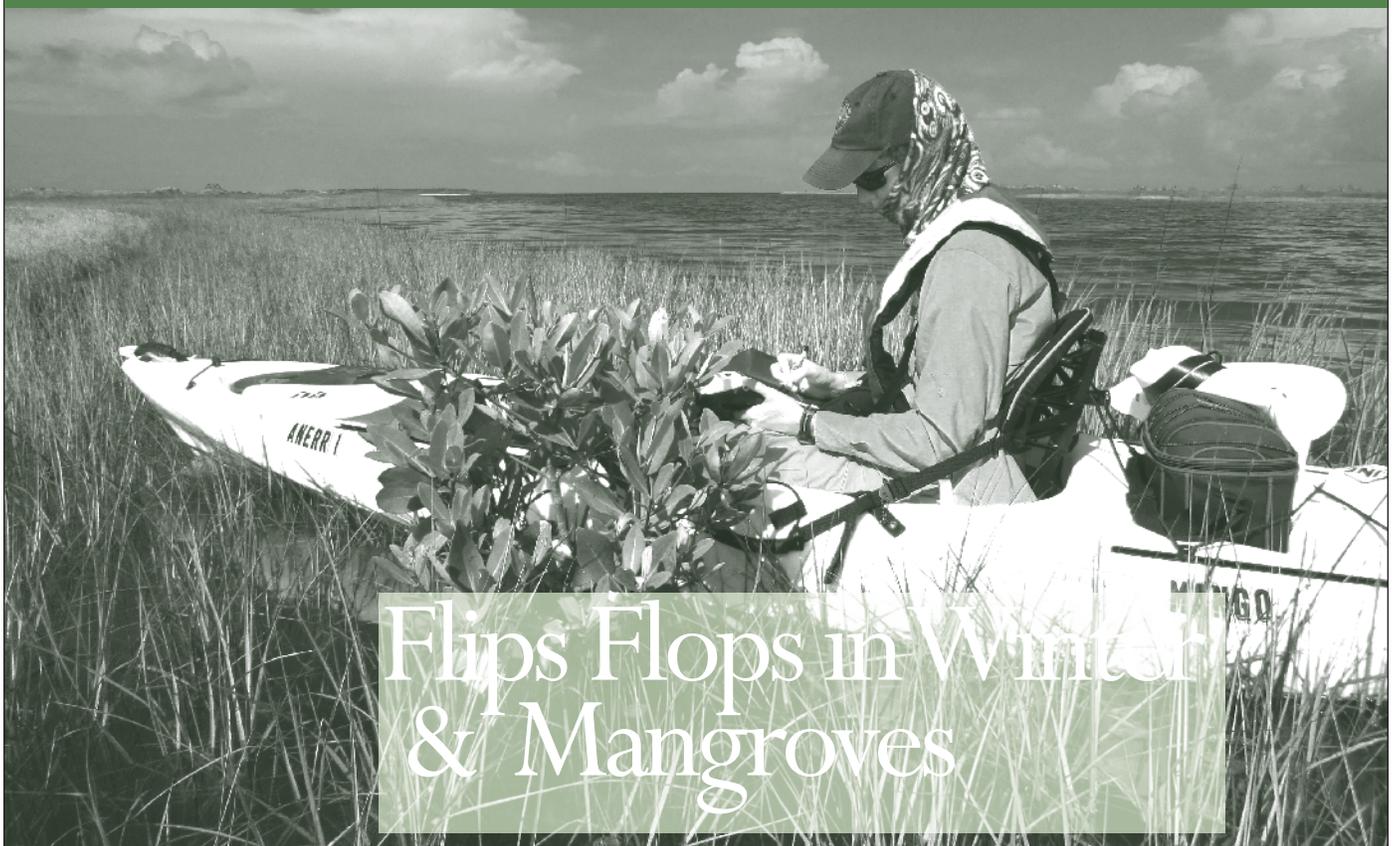


OYSTER CATCHER



A publication of the Apalachicola National Estuarine Research Reserve Spring 2021



Flips Flops in Winter & Mangroves

Most people have never observed mangroves here, but there were rumors of sightings in the Apalachicola Bay area. So, Reserve staff set out to investigate.

By Caitlin Snyder, Stewardship Coordinator

As we make our way past another winter season, you may have heard “we just don’t have winters like we used to.” We are aware of the trends and variabilities in temperatures and rainfall in the Apalachicola Bay region – together over time called climate. Climate is never stagnant, although it can seem as such in our short time on Earth. Changes happen gradually and abruptly, and can occur naturally as well as be influenced by human activities. Small changes over a lifetime can go unnoticed amidst our packed to-do lists, pandemics, social insecurity and screens.

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However, subtle signs of climate change may be becoming more detectable, tangible, and impactful by those not only aged to their 80s, but in their 20s too. Have you noticed anything? Changes in plants blooming, honey production, seasonal allergies, flood tide frequency, shoreline erosion, seafood hauls, sport fish, or duck migrations? Tropical systems have long threatened this coastline, but the 2020 hurricane season seemed endless with 30 named storms. Have you worn flip flops in recent winters?

For me, one piece of the climate story was revealed in 2013, when I first started at the Reserve as a GIS Specialist. Most people I had talked to had never observed mangroves

*See **Mangroves**, page 7*

Happy New Year!

By Jenna Harper, Reserve Manager

Although we are starting off the year with many of the same challenges as last year, I am looking forward to the successes that 2021 will bring. First, we are anticipating that we'll be back open to the public by mid- to late-Spring. While we've been closed, we have been working on catching up on repairs and maintenance around the building, so we should soon be back to 100%, including the aquaria. We are also planning to have a new exhibit in the transitional space of the Nature Center when we welcome back visitors, so

something new and different for those who have visited before.

The staff has also been working very hard on completing the management plan and we are anticipating approval of the plan by both the State of Florida and NOAA this year. This plan will guide

Reserve activities over

the next five years, so we are looking for as much input as possible. Public meetings will be held this Summer to complete the review of the draft, and we will gather comments from the Reserve Advisory Committee and state, federal and NGO stakeholders before final approval.

Lastly, NOAA will be conducting a five-year review of the Reserve in August. These reviews are mandated under the Coastal Zone Management Act to ensure compliance of the Reserve with NOAA guidance. The first step in the review is a compilation of challenges and accomplishments over the last five years. This document was submitted to NOAA in December. From this document, the review team will select three focal areas to pursue further. Based on these focal areas, specific stakeholders and partners will be invited to participate in the review next summer. Although this can be a stressful experience, it is incredibly valuable to the Reserve for planning purposes, and the timing aligns with the development of the management plan.

I wanted to take this opportunity to say "thank you" to you, for your continued support of the NERR and the Friends of the Reserve. While our funding comes from the State of Florida and NOAA, our mission is to serve our local community (and our visitors). I am looking forward to new and expanded opportunities in 2021 to connect with you and further our mission.

COMING UP

The Oyster Corps

April 29

Kim Wren and Joe Taylor will give an introduction and overview of the newly formed Oyster Corps.

The Oyster Corps is a project of the Forgotten Coast Conservation Corps, a conservation service program for youth, young adults and Veterans. Kim is the Assistant Manager for the Apalachicola National Estuarine Research Reserve and Joe is the Executive Director of Franklin's Promise Coalition, the managing entity for the Conservation Corps of the Forgotten and Emerald Coasts.

Please register for Sci-Café Virtual Series: The Oyster Corps on April 29th, 2021 3:00pm at: <https://attendee.gotowebinar.com/register/8192155886799102224>. After registering, you will receive a confirmation email containing information about joining the webinar.



Reserve Adapts Outreach Efforts

By Anita Grove, CTP Coordinator

The Reserve's Coastal Training Program (CTP) provides training, resources and science-based information to coastal decision makers and offers classes to the community that aim to foster a sense of stewardship for our coastal resources. Most familiar to the public are our Stewardship Series of classes—Bay-Friendly Landscaping, Oyster Ecology, Apalachicola River and Floodplain and Estuary Ecology, as well as our Sci-Cafes series. Formerly our trainings and classes were offered in-person, and generally in the field. However, the pandemic has forced us to cancel our in-person classes and effectively reinvent our CTP program.

Pivoting Effectively - The Apalachicola National Estuarine Research Reserve CTP staff, Anita Grove and Josh Eaton, along with CTPs across the country, have spent the past few months becoming proficient using virtual platforms like GoToWebinar, Zoom, and Adobe Connect, in order to produce engaging virtual meetings that are useful to our stakeholders. Our first virtual training was held in May, Exploring Sea-Level rise: Moving the Overwhelm to Practical Solutions. This training introduced a decision tool for land managers to address climate change. We also partnered with other Reserves—Rookery Bay and Guana, Tolomato, Matanzas in Florida, and Narragansett Bay National Estuarine Research Reserve in Rhode Island to host a workshop on how to talk about climate change. This fall we offered several courses in conjunction with NOAA's Office of Coastal Management, Fostering Behavior Change for Coastal Management on November 18 and Tools and Techniques for Facilitating Virtual Meetings on December 2nd. Upcoming, we have Social Science Basics for Coastal Mangers on January 12-13, 2021.



Formerly our trainings and classes were offered in-person, and generally in the field. However, the pandemic has forced us to cancel our in-person classes and effectively reinvent our CTP program.

Advantages and Disadvantages of Virtual - Over the past few months, we have learned a great deal about how people learn in the virtual world. Online meetings and classes take more effort than in-person learning. When meeting with other in-person we receive many non-verbal cues. Eye movements, hand gestures, and body language convey messages that help us communicate with each other. These subtle communication queues can easily be missed during virtual communication. Our brains, however, continuously search for these queues, making your brain work harder in a virtual setting. This can be very energy consuming. Successful virtual meetings must factor in these considerations.

Virtual meetings do have some advantages. They are relatively easy to set up, less costly in terms of travel time, and can bring new exciting opportunities to collaborate. Meetings with people in Franklin County are just as easy as meeting with someone in Alaska.

In addition to our online webinars and trainings, the CTP has also reached out to stakeholders through the Friends of the Reserve social media pages [Facebook.com/ApalachicolaNationalEstuarineResearchReserve](https://www.facebook.com/ApalachicolaNationalEstuarineResearchReserve) and [Facebook.com/bayfriendlylandscaping](https://www.facebook.com/bayfriendlylandscaping) to address issues and regularly share interesting resources and tips. We also partnered with the Franklin County Master Gardeners, the Franklin County Libraries in Eastpoint and Carrabelle, and the Apalachicola Library to create a seed library. The Seed Library offers over 15 types of wildflower and vegetables seeds for free and in turn disperses information on and helps to facilitate the planting of plants popular with local pollinators. To date we have distributed over 1,600 packets of seeds.





It is true too much public presence will diminish the quality of a space and that special places need protection,...

Sharing creates the appreciation for protection

A Glorious Walk

By Jeff Dutrow, Education Coordinator

But don't tell anyone. That's what my friends said when I told them about the incredibly beautiful hike I took to Gap Point in the State Park on St. George Island, and that I was going to write a story about it. I understand how they feel, and I could be wrong, but I think you should know about it. And you should take the hike too. Of course it is true that too much public presence will diminish the quality of a space and that special places need protection. But it is also true that the will to protect special places only comes from the joy of being in them. In the air, flowers, dirt, lizards, logs, bugs, leaves, birds, trees, and memories. It is a matter of balance to the friends this readership.

The balance of nature in any strict sense has been upset long ago...The only option we have is to create a new balance objectively determined for each area in accordance with the intended use of that area." --Aldo Leopold.

The 2.5-mile trail to Gap Point begins in the campground and meanders through the pine flatwood forest to the bay. The East Slough Overlook Trail can be accessed one half-mile down the trail from the campground or at the East Slough Beach Use Area. The one-mile long East Slough Overlook Trail features boardwalks, resting benches and information on the resources. Trailhead kiosks contain fliers about the current trail conditions. The trails were evaluated using the Universal Trail Assessment Program (UTAP). The Universal Trail Assessment Process and the High Efficiency Trail Assessment Process are inventory processes that provide objective

information about trail conditions (e.g. grade, cross slope, width). The information obtained through an assessment can be used by land managers to enhance the safety and enjoyment for trail users (by providing accurate, objective information about trail conditions). The information obtained can also be used in monitoring environmental impacts on the trail, preparing budgets, developing maintenance and construction plans, and identifying potential access barriers.

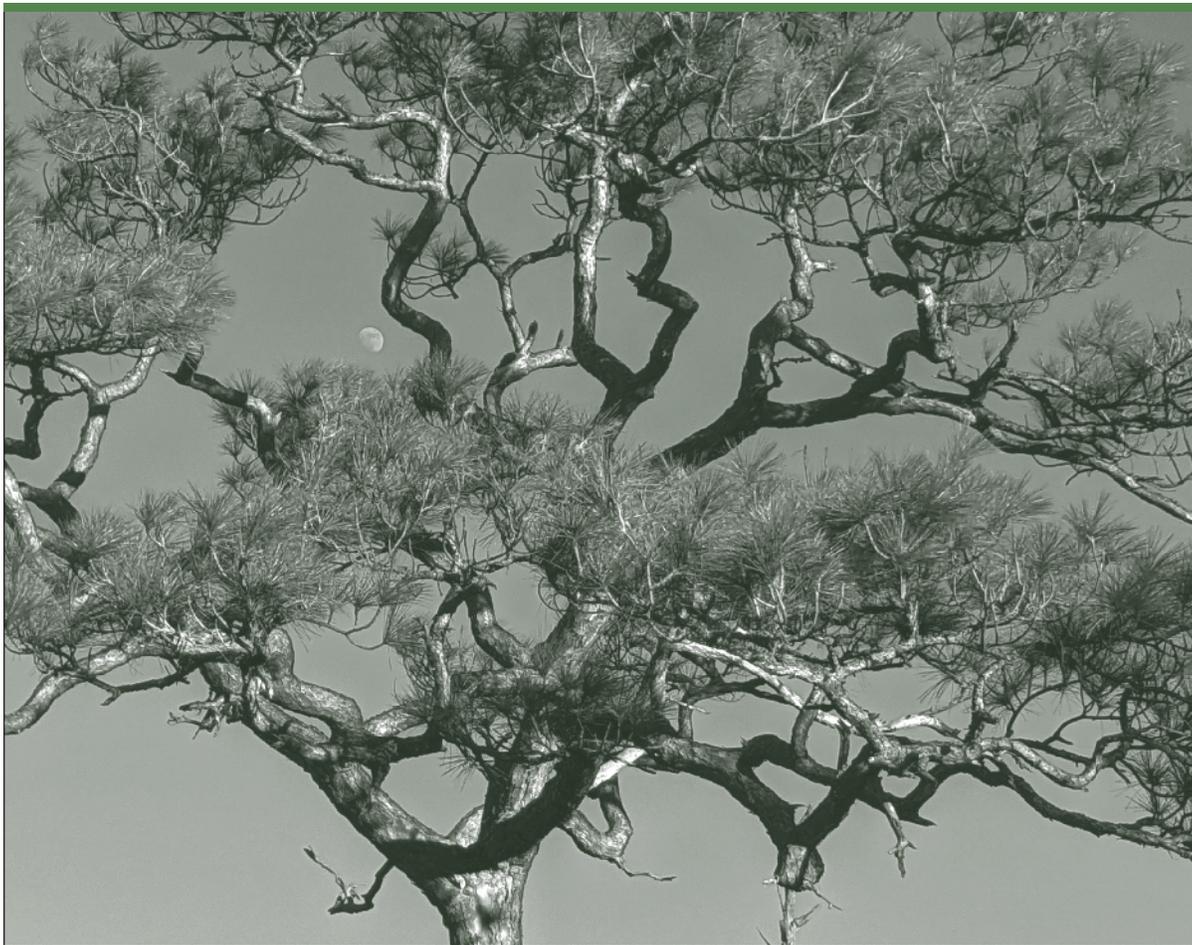
Gap Point Trail

- Geocaching.
- Goes through Pine Flatwoods and relic dune systems.
- Excellent for birding.
- Two primitive campsites on Apalachicola Bay. Excellent for sunset viewings and fishing from your campsite. Accessed by foot or boat.
- This area was used for cattle ranching and turpentine. Evidence of the turpentine industry can still be seen on the trail with cat-faced trees.
- One-half mile down the Gap Point Trail is an intersection with a raised boardwalk that follows the shoreline of East Slough.

- A new 20-station fitness trail begins at the campground and goes out for one mile to hit ten stations and then return for ten more.

East Slough Overlook Trail

- Raised boardwalks to access the an overlook platform.
- The trail lines the shoreline of East Slough and connects with the Gap Point Trail.
- Look at the shallow waters and estuary - watch the herons and egrets fish for dinner. See a bald eagle nest across the water near Gap Point.
- Interpretive signs touting the flora and fauna along the trail.
- Listen to the wind in the pines - very tranquil.



...however, the will to protect special places only comes from the joy of being in those special places.



Methane & Marshes

By Samantha Lucas, Research Technician

This past November, Reserve staff collaborated with the Smithsonian Environmental Research Center (SERC) on a NASA Carbon Monitoring System-funded project. The project focused on the relationship between porewater methane concentrations and various factors such as plant biomass, elevation, sulfate concentrations, and iron concentrations within tidal wetlands. Sampling is being conducted across all National Estuarine Research Reserves providing SERC with a large array of spatially rich data.

Porewater is a term used to describe water within the particles of soil, and in this case, water within the soil of tidal wetlands. Studying porewater can help researchers decipher what is occurring beneath the soil and how it may influence vegetation and the surrounding watershed.

Tidal wetlands, and all wetlands, are an integral ecosystem; their productivity is comparable to that of rainforests and coral reefs. Wetlands provide essential habitat, flood protection, function as natural water purifiers, and provide erosion control among many other benefits. Visitors to wetlands often recognize these areas for their distinct odor and may have you wondering “what is that smell?”. This odor is created by bacteria and fungi within the soil producing gas as a byproduct of their biological activities. The two most common gasses are sulfur and methane, giving wetlands their signature “rotten egg” or “manure” odor.

Methane is a greenhouse gas more potent than carbon dioxide, with a remarkable ability to trap heat due to its chemical structure. Methane is naturally found within wetlands and the digestive track of grazing animals such as cows. It can also be found near gas and oiling drilling sites and within landfills and sewage treatment centers.

SERC is interested in methane concentrations within tidal wetlands. The soil microbiome is extremely diverse with high competition amongst bacteria and fungi. High sulfate concentrations in low to no oxygen conditions have been found to outcompete microorganisms that produce methane. Salinity is often used to assess sulfate concentrations within tidal wetlands as sulfate is naturally present within seawater. The two have been observed to have a direct relationship, the higher the salinity of a wetland, the higher the sulfate concentration. Brackish to freshwater wetlands have typically been found to emit higher levels of methane while saline wetlands have been found to emit little to none. However, more information is needed to further study wetland methane concentrations and the role it plays on global environmental change.

For this project, Reserve staff sampled at three locations, each chosen to represent a different salinity level within the Reserve. At each location, four plots were sampled



This project spans 2020 to 2022 and will contribute to enhancing the knowledge of wetland methane concentrations.

within the tidal wetland. Quadrats were placed and vegetation coverage was assessed. Plant species were identified, and clippings were taken from a predetermined area within the quadrat. Porewater was extracted from the wetland with a tool known as a sipper well and a syringe. Methane gas was obtained first by extracting a determined amount of porewater, introducing atmosphere (pulling air into the syringe), shaking to mix the two, then all water within the syringe was expelled leaving only gas remaining. This sample was filtered and injected into a glass exetainer. Once the methane sample was taken, porewater was extracted three more times and filtered into vials for sulfate and other components of porewater, such as iron, to be studied.



Reserve staff sampled at three locations, quadrats were placed and vegetation coverage was assessed.

This project spans 2020 to 2022 and will contribute to enhancing the knowledge of wetland methane concentrations. It will assist SERC in developing future sampling methods, and help to build algorithms for improved salinity, elevation/inundation, and biomass mapping.

Mangroves, continued from page 1

here, but there were rumors of sightings in the Apalachicola Bay area. So, Reserve staff set out first to Little St. George and Dog Islands to investigate. Indeed, we found clusters of dark-leaved black mangroves (*Avicennia germinans*), often dwarfed in height. We observed red mangroves (*Rhizophora mangle*), too, but fewer in number and often standing singularly. The tangled trees appeared to be well established; flowering and fruiting happily.

Seven years later and mapping efforts have rapidly accelerated to capture current mangrove extent. We collected data including GPS locations, height, marsh type and reproductive activity at every mangrove found in Franklin County. Turns out, there at least 20 acres of mangroves spread through the islands – and thousands of individual trees, some taller than 3m (9ft). Establishing current spatial data on species distributions is critical for future monitoring and management.



There at least 20 acres of mangroves spread through the islands – and thousands of individual trees.

Historic herbarium and literature records indicate that mangroves have been present in our region for at least 150 years (although Cedar Key is often cited as the northernmost limit for mangroves along Florida’s Gulf coast). Our abundance and structural data indicate that mangroves are currently reaching heights, densities, and reproductive stages not historically reported. We also found a broad distribution and high number of red mangroves, which is unlike black mangrove-dominated range limits in Louisiana and Texas (black mangroves are more freeze-tolerant).

Over time, mangrove populations have been in a game of expansion and contraction along northern range limits, fluctuating in concert with mild and severe winter periods, respectively. More recently, however, the number, intensity, and duration of cold spells in the region has lessened and therefore tipped the climate balance in favor of mangrove survivability. In Apalachicola, the last time temperatures dipped below the mangrove threshold was in 1989. Increasing

Continued next page



Mangroves, continued from page 7

establishment and survivorship of mangroves could be one indicator of tropicalization – a warming climate offering a place for more tropical plants.

What this means remains to be seen as this shift is new, complex and not unidirectional. Species diversity, shoreline



Mangroves are probably here to stay if winters continue to be milder.

stability and structure, and coastal resiliency could be affected. For example, snook populations, a mangrove affiliate, have been increasing in the Big Bend region since 2007 due in part to warming waters. Many mangrove obligate bird species, crustaceans, and invertebrates could expand synchronously with mangroves and warmer climates. Given the rapid pace of change and the potential for abrupt landscape-scale transformation, the findings reinforce the pressing need to continue researching mangrove and other species dynamics near northern range limits.

Mangroves are probably here to stay if winters continue to be milder. Tracking change starts with observation – noting the first blooms in spring, the last tomato in summer, monarch arrivals in fall, and unusual evergreen shrubs persisting in the salt marsh in winter (i.e. mangroves!). Appreciation and awareness of the current natural world will help serve as a baseline for research and management of our ever changing, coastlines and communities.

Future Programs - We want to offer in-person programs again to get us back out in the estuary and possibly Bay-Friendly Landscaping classes soon at the Reserve.

To learn about upcoming offerings and sign up, check out the calendar at ApalachicolaReserve.com.

Solicitation of Contributions Act Registration No. CH48389: A copy of the official registration and financial information may be obtained from the Division of Consumer Services by calling toll-free (800-435-7352) within the state. Registration does not imply endorsement, approval or recommendation by the state.

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Join the Friends of the Reserve, a non-profit organization providing support to the Apalachicola National Estuarine Research Reserve. Be a part of a group of people directly involved with the Reserve's research, stewardship and education programs. To join, complete and mail this form, along with your check to: Friends of the Reserve, P.O. Box 931, Apalachicola, FL 32329.



Follow at [Facebook.com/ApalachicolaNationalEstuarineResearchReserve](https://www.facebook.com/ApalachicolaNationalEstuarineResearchReserve)

The Reserve was established in September 1979 as a cooperative effort between Franklin County, the State of Florida and the National Oceanic and Atmospheric Administration and is administered by the Florida Department of Environmental Protection. The Reserve's purpose is to support research relating to the Apalachicola River & Bay estuarine system, disseminate research information, educate the public about estuarine processes, and encourage resource protection. Visit the Reserve online at ApalachicolaReserve.com, nerrs.noaa.gov, Apalachicola/welcme.html, or dep.state.fl.us/coastal/sites/apalachicola/.

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