Research and Conservation June 2021

Flagship Programs

FLOOR

- We are starting to see the light at the end of the oyster table tunnel! The departure of season has lessened our load and we have been able to take down our temporary oyster table. We are hopeful to get back to a better balance of rotating tables in the next few months.
- We have collected 14.78 tons of shell this year.
- We held six volunteer bagging events this month, bagging approximately 1,200 bags. We plan to hold four bagging's next month to help us get through the loose cultch.
- Oyster spat was collected and counted on June 23rd. The next oyster spat collection is scheduled for June 21st, 2021.
- We were awarded a small grant ($1,500.00) from the Florida Department of Agriculture and Consumer Services (FDACS) for oyster shell recycling materials. With the funds we were able to buy 100 5-gallon buckets and screw on tops, and a new bilge pump for bucket cleaning.

FOSTER

- The ***Citizen Science Seagrass Network (CSSN)*** is full steam ahead! From the data gathered during June 2021 (Figure 2),
    - One of the sites monitored was recorded as having *continuous* seagrass condition, five sites were recorded as *sparse* and four sites were recorded as *patchy*.
    - Seagrass species were recorded within haphazard quadrats at seven of our ten sites. *Halodule wrightii* was prominently observed within quadrats at seven sites and the threatened species *Halodule johnsonii* was recorded within quadrats at six different sites. Less commonly *Thalassia testudinum* and *Halodule Decipiens* were both recorded at two of our sites each, and *Syringodium filiforme* was found at only one site.
    - *Caulerpa* algae was only noted within the sampling areas at two of our sites but drift algae (all spp.) was recorded within quadrats at seven different sites.
- The seagrass fragment collection program is up and running again. We currently have two dedicated volunteers that walk the beach looking for seagrass fragments. They bring them to us and we plant them in our nursery for restoration and research purposes. We currently have 3 species of seagrass in our nursery, we are hoping to expand our species list through this process.

WaterQUEST

- We signed up and trained two new testers this month.
- Out of the 35 active testing sites, we are averaging 27 sites a week.
- Weekly water quality reports are being published each week: Click here to see the latest report.
- Click here to subscribe to the weekly Water Quality report.

Living Shorelines

- We have ten homeowners interested in a living shoreline (oyster bags) on their property. Three permits were submitted on April 1st. The DEP came back on April 23rd with a list of *Require Additional Information* (RAI's).

Some of the required information relies on DEPs resources and I cannot re-submit the permits until I hear back from them. We are going on eight weeks of silence from our permit processor.

- ***Plastic-Free Alternatives to Oyster Bags (Grant)*** –We had three volunteer events this month. Oyster CORE modules and oyster prisms were constructed. We plan on having two events in July to construct more oyster prisms.

Additional Projects and Activities

FL Sea Grant – Our full proposal was submitted on June 4th. Funded projects will be alerted in August. The abstract of our proposed work is as follows:

Oyster reefs provide critical ecosystem services including water quality improvement, protection for coastal ecosystems and shorelines, and fisheries habitat. Unfortunately, anthropogenic stressors have resulted in the deterioration and loss of oyster reefs globally. In Florida, nutrient rich, freshwater diversion from upland watersheds has contributed to the loss of over 90% of historic oyster beds on the Atlantic coast. To combat the loss of oyster reef area and maintain reef services, managers and institutions heavily invested in constructing human-made reefs. While human-made reefs can eventually provide key ecosystem services and recoup the economic cost of restoration, there is less certainty around the timing of both the development of ecosystem services, subsequent cost recovery, and the effects of environmental conditions on these trajectories. Here we propose to address intervention 1 in Florida Sea Grant's Strategic Plan focus area of Healthy Coastal Environments, by using science-based monitoring to effectively evaluate the impacts of water quality on the return of ecosystem services to restored reefs. We will quantify the trajectory of ecosystem service (shoreline protection, benthic diversity and nitrogen removal) recovery along an oyster reef restoration chronosequence (0-11yrs) in two Florida systems (IRL and SLE) under different levels of anthropogenic stress. These data will then be used to quantify the value of restored ecosystem services using the benefit transfer method, which will guide restoration efforts to maximize return on investment and inform policy decisions regarding environmental protection.

Research Lab Replacement – Stop by to check out our new shade structure! We are now putting in the finishing touches (landscape cloth, work benches, picnic table).

Clam Restoration Workshop – No updates for the workshop scheduled for September 17th, 2021. We have a collaborator meeting on June 29th to start pulling the day together.

Clam Restoration in the IRL – We are working on seagrass permitting requirements for the Hogs Cove clam lease. We plan on doing our site visit on July 9th, 2021. Check out the Water Ambassadors talk given by our collaborator Dr. Todd Osborne on August 10 – Clam Restoration in the Indian River Lagoon. Click the link to register for the webinar!

- ***Clam + Seagrass Experiment***: The experiment has officially begun!

Samson Island Restoration – The project has been invoiced. We are waiting on payment.

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Jensen Beach Impoundment Restoration – We are still maintaining a water quality monitoring device for FWC in the impoundment. Some of our work will be highlighted during Zachary Hughes (Martin County) Water Ambassadors talk on July 27 – Jensen Beach Impoundment Hydrological Restoration Project. Click the link to register for the webinar!

Tucker Cove Restoration – No updates.

Coastal Estuarine and Research Federation - Dr. Simpson is chairing a session at the 26th Biennial Coastal Estuarine and Research Federation (CERF) Conference. The special session will focus on the science behind mangrove encroachment and will give FOS a platform to expand our scientific reach. The session mockup has been submitted.

Summer Interns - Our summer interns began on June 2nd and have been busy with their independent projects.

- *Seagrass Intern:* The seagrass intern has taken on a project associated with the ongoing seagrass and clam mesocosm study assessing the health of *Halodule wrightii* seagrass grown in conjunction with *Mercenaria mercenaria* clams under varying levels of light stress. They also assist with seagrass nursery and mesocosm maintenance and are responsible for monthly seagrass data collection.
- *Oyster Intern 1*: This oyster intern is responsible for a project aimed at assessing seasonal survivability of oysters recruiting to the St. Lucie Estuary and Indian River Lagoon. This project is an off shoot of our monthly spat monitoring with which the intern actively participates in.
- *Oyster Intern 2*: This oyster intern is accountable for a project monitoring the plastic-free modules we have been constructing. This project aims to help us choose the best module for restoration purposes in the IRL and SLE.
- *Mangrove Intern*: The mangrove intern is carrying out a project looking at the growth of mangroves when grown in conjunction with *Sargassum spp*. This project is aimed at understanding the implications of *Sargassum* overabundance in our coastal ecosystems.

SOAR Grant – We submitted a Nature Conservancy grant on June 14th with industry partners for oyster restoration work. The project summary is as follows:

The goal of this project is to characterize the natural selection occurring within Eastern oysters (Crassostrea virginica) due to alterations in the average and range of salinity within the Indian River Lagoon (IRL) and St. Lucie Estuary (SLE), Florida and to provide solutions to restoration projects and industry growers to mitigate the impacts of these altered salinity regimes. The cause of oyster collapse and their vital ecological services within Florida estuaries has been well documented. However, less attention has been focused on finding solutions that facilitate recovery and resilience for the ecological and human communities of Florida. Our research will directly address 2 key research priorities of the SOAR program: (1) long-term markets for restoration and (2) new products and species. Specifically, we propose characterizing the role salinity has on natural selection of eastern oysters within the southern IRL through: Objective 1: tank based crossover design of survival and growth of oyster spat and Objective 2: field based crossover design on survival and growth of oyster juveniles. The results of these trials will be integrated Objective 3: to inform best management practices for eastern oyster restoration and commercial industry production.

Teen Ambassadors – We participated in Teen Ambassadors on June 24th. We taught the teens about oysters in the IRL and our oyster spat monitoring program. They went into the field with us and helped us swap out oyster spat stringers and then collect the data from each shell. It was a great experience for all.

Oyster Spat Monitoring – We are 1 year into our monthly monitoring program. We monitor oyster spat recruitment at three sites in the SLE (0.25 – 12 ppt) and three sites in the IRL (15 – 27 ppt). Each month we put out oyster shells and then collect them a month later. The number of spat per shell is counted (Figure 1). Oyster recruitment is starting to pick back up.

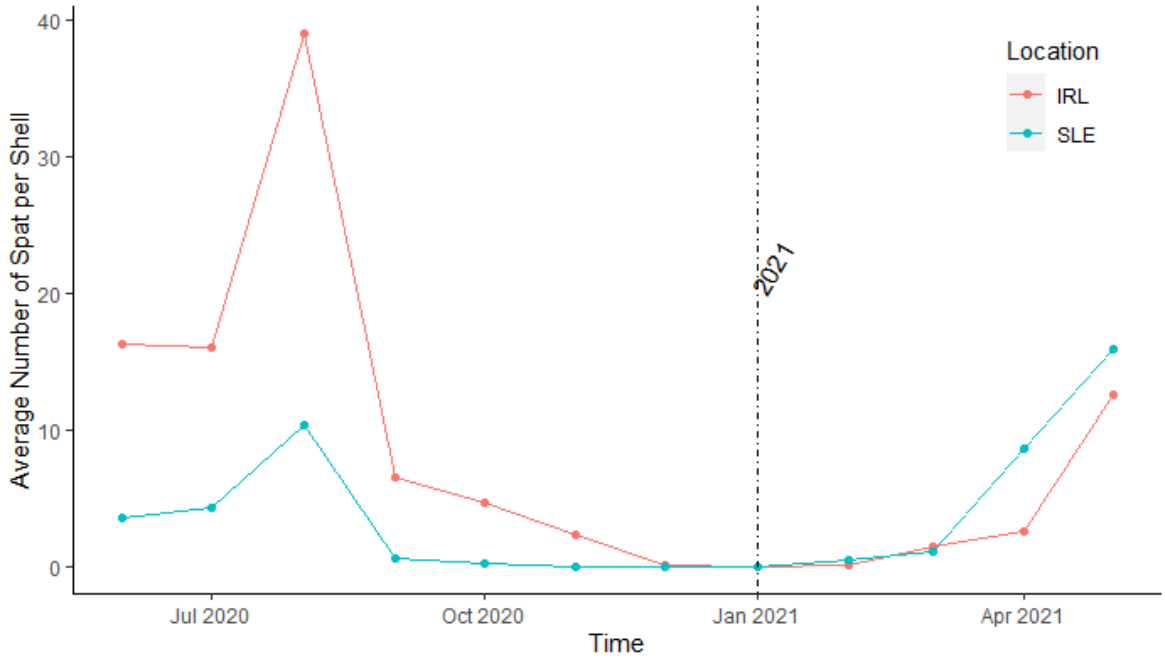

Figure 1. Oyster spat per shell in the Indian River Lagoon (IRL) (blue) and St. Lucie Estuary (SLE) (orange). Data are means ± SE. Each month oyster shells are deployed at 6 sites and then collected a month later. The number of spat per shell is counted.

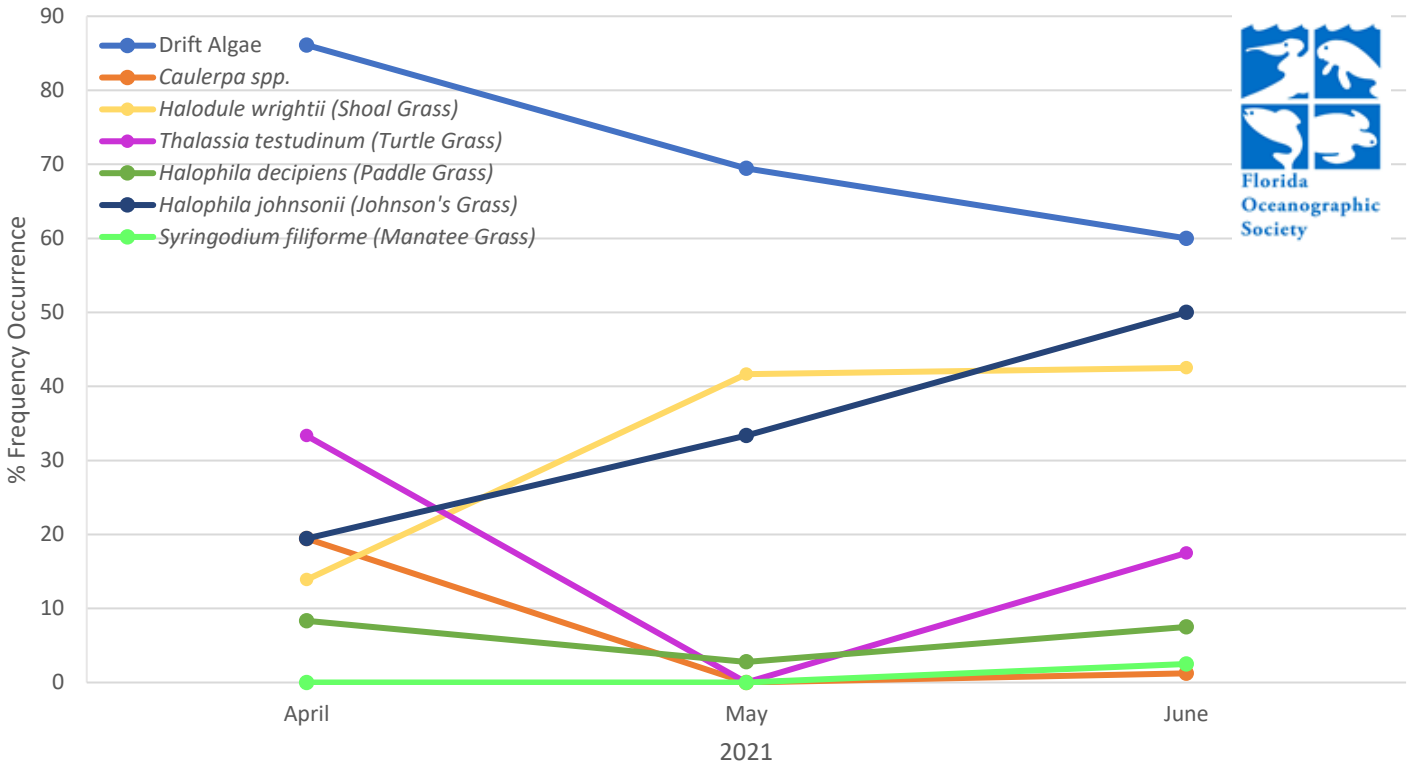

Figure 2. Monthly percentage frequency occurrence of present *seagrass species*, *drift algae* and *Caulerpa* algae species in the Indian River Lagoon and St. Lucie Estuary. Data is gathered across 10 sites on a monthly basis by citizen science volunteers.

Additional details on all projects and programs are available by contacting Dr. Simpson at: lsimpson@floridaocean.org – 772.225.0505 x 114. Or check out our website!