

## **May River Project: Assessing Change After 20 Years**

### **Progress Report to Town of Bluffton**

**Q1: 7/21/2023 to 10/21/2023**

Prepared by: Pamela Marcum, Joe Cowan, Gary Sundin, Andrew Tweel

#### **Headwater Tidal Creek Studies**

Six tidal creeks were sampled in the May River estuary in July 2023. Within each creek, one site was sampled for water quality and six sites were sampled for benthic composition and community. One of the six benthic sites was also sampled for sediment chemistry and contamination.

##### *Objective 1: Water quality*

Water quality loggers were deployed at all six water quality sites for 25 hours collecting 15-min interval water quality data near-bottom for a total of 100 data points collected per site. Two water samples were collected from each site (12 total) for nutrient analysis. Two water samples were collected from each site (12 total) for Chlorophyll-*a* and bacteria analysis.

Water logger data has been downloaded and quality checked. 12 water samples were sent to Chesapeake Bay Laboratory for nutrient analysis, sample processing is in progress and SCDNR is awaiting results. SCDNR processed 12 samples each for *Enterococcus* and fecal coliform bacteria and Chlorophyll-*a* concentrations.

Data entry and quality checking is in progress.

##### *Objective 2: Sediment Quality*

40 sediment samples were collected for grain-size composition (seven from each creek except at Brighton Beach where only five samples were collected due to hazardous conditions in the upper portion of the creek). Six sediment samples each (one per creek) were collected for chemistry, Microtox, and pore water.

Six porewater samples were processed by SCDNR. 12 chemistry and 12 Microtox samples were sent to a NOAA laboratory for analysis, processing is in progress and SCDNR is awaiting results. Sediment composition samples are awaiting processing by SCDNR.

Data entry and quality checking is in progress.

##### *Objective 3: Biological Communities*

34 benthic grab samples were collected from each creek (six from each creek except at Brighton Beach where only five samples were collected due to hazardous conditions in the upper portion of the creek).

Sample processing is in progress by SCDNR.

Data entry and checking is in progress.

### **Tidal Creek and Open Water Studies**

Ten sites were sampled in the May River estuary in July 2023, six sites in the mainstem and four sites in adjoining tidal creeks.

#### ***Objective 1: Water quality***

At all 10 stations, 30 instantaneous water quality measurements were collected; one each at three depths: near-surface, mid-water column, and near-bottom. Water quality loggers were deployed at all 10 sites for 25 hours collecting 15-min interval water quality data near-bottom for a total of 100 data points collected per site. Two water samples were collected from each site (20 total) for nutrient analysis. Two water samples were collected from each site (20 total) for bacteria analysis. Two water samples were collected from each site (20 total) for Chlorophyll-*a* analysis. Secchi disk measurements were taken at nine sampling sites, one open water site was missed.

Water logger data has been downloaded and quality checked. 20 water samples were sent to Chesapeake Bay Laboratory for nutrient analysis, sample processing is in progress and SCDNR is awaiting results. SCDNR processed 20 samples each for *Enterococcus* and fecal coliform bacteria and Chlorophyll-*a* concentrations.

Data entry and quality checking is in progress.

#### ***Objective 2: Sediment Quality***

10 sediment samples each were collected for grain-size composition, chemistry, Microtox, Total Organic Carbon (TOC), microplastics, and contaminants. 20 sediment samples were collected for porewater analysis.

20 porewater samples were processed by SCDNR. Chemistry, Microtox, TOC, and contaminant samples were sent to a NOAA laboratory for analysis, processing is in progress and SCDNR is awaiting results. Sediment composition samples are awaiting processing by SCDNR.

Data entry and quality checking is in progress.

#### ***Objective 3: Biological Communities***

Two trawl tows were completed at each site for a total of 20 samples. Catch was identified to lowest practical taxonomic level, enumerated, and up to 30 specimens were measured.

Two benthic grab samples were collected from each site for a total of 20 samples. Sample processing is in progress by SCDNR.

Data entry and checking is in progress.

## **Oyster Studies**

### *Habitat trays:*

The Shellfish Research Section (SRS) placed habitat trays, each containing approximately two gallons of clean, loose oyster shell were placed at six locations in the May River watershed on April 17, 2023 (Figure 1). Two sites were chosen in each of the upper, mid, and lower watershed areas, based upon previous efforts. At each location, three trays were placed, for a total of 18 deployed.

### *Demographic samples:*

The SRS collected demographic samples on August 14 – 15, 2023 at locations near the habitat trays (Figure 1). At each sample location triplicate quadrat samples were collected using a 0.0625 m<sup>2</sup> quadrat. Samples were returned to the SCDNR laboratory, and all live and recently dead oysters were enumerated and measured and the data were entered into a secure Access database maintained on secure SCDNR servers.

### *Disease and oyster health:*

On the August 14 – 15, 2023 field days, SRS staff also collected oysters for the assessment of the oyster diseases Dermo (*Perkinsus marinus*) and MSX (*Haplosporidium nelsoni*), and for the assessment of several other oyster health metrics. At each of the six sites, 30 individual oysters were collected for Dermo and MSX and 30 individual oysters were collected for other oyster health metrics. Oysters were collected by stretching a tape along the reef at the approximate mean low water line, as determined by RTK GPS, and collecting oysters near the tape. Dermo and MSX samples were returned to the SCDNR laboratory where individual oysters were shucked and dissected. Dissected tissues were placed in formalin on August 17 – 18, 2023. Because the process is time-sensitive, all dermo samples were processed and read from August 24 – September 1, 2023, and the results are entered into spreadsheets on secure SCDNR servers. MSX samples, which are not time sensitive, are stored in the SCDNR laboratory and are scheduled for processing in the winter of 2023 – 2024. The 30 individual samples collected at each site for additional oyster health metrics were placed immediately on ice in the field and transported to the SCDNR campus at Fort Johnson, where they were delivered to NOAA staff on either the afternoon of collection or the following morning.

| Time Period | Project Segment | Status |
|-------------|-----------------|--------|
|-------------|-----------------|--------|

|                         |   |  |
|-------------------------|---|--|
| Spring 2023             | Deployment of oyster trays (not Town funded)                                  | Complete, to be retrieved in 2024                                |
| Early July 2023         | Project start   | Documents signed 7/21/23   |
| July-August 2023        | Field sampling (tidal creeks, open water sites and oyster disease/demography) | Field sampling complete. Tidal creek, open water sites, oysters. |
| Fall/Winter 2023        | Laboratory analyses incl. QAQC  | In progress  |
| Winter/Spring 2023/2024 | Data analyses incl. QAQC.<br>Collection of oyster trays                       |  |
| Spring/Summer 2024      | Writing and analysis  |  |
| Fall 2024               | Report complete   |  |
| December 2024           | Project end   |  |



Figure 1. Locations of habitat trays and quadrat data collection by the SCDNR Shellfish Research Section in the May River watershed.