Oyster Integrated Mapping and Monitoring Program

Oleta River Oyster Reef Mapping 2022



Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute 100 8th Ave SE St. Petersburg, FL 33701 Report Date: March 14th, 2023

Overview

The Oyster Integrated Mapping and Monitoring Program (OIMMP) (https://myfwc.com/research/habitat/coastal-wetlands/projects/oimmp/), based at the Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute in St. Petersburg, Florida, compiles oyster mapping and monitoring data across Florida and fills selected mapping and monitoring data gaps. Biscayne Bay was identified as a regional data gap in need of mapping. While Biscayne Bay once supported healthy oyster populations (Smith 1896, Meeder et al. 1999, 2001, Gambordella 2007), the canalization of Miami in the 1800s and 1900s drastically altered the hydrology of the bay by concentrating freshwater flow into the canals and the oyster populations collapsed (Geiger et al. 2019). While the presence of some extant oysters has been noted in published sources (FDEP 2013, Geiger et al. 2019), current maps of oyster reefs in Biscayne Bay were not available due to the difficulty of identifying the remaining reefs using aerial imagery.

Methods and Results

With the assistance of the Watershed Action Lab (<u>https://www.watershedactionlab.com/</u>) and graduate students from the Rosenstiel School of Marine, Atmospheric, and Earth Science (RSMAES), a total of 12 potential oyster reefs were identified in Oleta River, the river linking the Northern Everglades with Biscayne Bay. The Watershed Action Lab has been using a mobile citizen science monitoring application (<u>https://watershedactionlab.ushahidi.io</u>) on which oyster reefs can be reported with GPS coordinates and photographs of the reefs can be uploaded (Figure 1). From those reports, a list of potential oyster reefs was compiled and ground truthing efforts were conducted by OIMMP personnel alongside Miami collaborators on November 29, 2022 (Figures 2 and 3).

Only sites with live, intact oyster reefs qualified for oyster reef classification and mapping. Sites with scattered shell, scattered oyster clumps, or oysters growing on mangrove roots or artificial substrate were not considered oyster reefs for this effort. Five of the 12 ground truthed locations were classified as live oyster reef (Figure 3). The remaining sites had shell bottom, but no live oysters. Citizens have reported areas in Oleta River and Biscayne Bay where oysters are observed seasonally. Further investigation is needed to confirm the presence of these transient populations and determine the reasons for their seasonal fluctuation.

A positive ground truthing confirmation was mandatory for all reefs to be included in the final map. When an oyster reef was confirmed, the outline of the reef was mapped with a realtime kinematic global positioning system (RTK GPS), which included an M5 GNSS receiver (eGPS, Norcross, GA) paired with Cedar CT8X2 Tablet (Juniper Systems, Logan, UT) equipped with X-Pad Ultimate software (Geomax, Widnau, Switzerland). Datapoints were collected on the RTK GPS while walking around the perimeter of the reef. The collected datapoints were then used to draw a polygon outlining the reef and create a shapefile in ArcMap version 10.7 (ESRI, Redlands CA) (Figures 4 and 5). Shapefiles of all mapped oyster reefs (Figures 6 and 7) were then submitted for inclusion in the statewide oyster reef map, *Oyster Beds in Florida*. The statewide oyster reef map, including these newly mapped reefs, is available at https://geodata.myfwc.com/datasets/oyster-beds-in-florida.





Photo





Figure 1. Examples of Oleta River oyster reefs reported through the Watershed Action Lab oyster monitoring app (<u>https://watershedactionlab.ushahidi.io</u>).



Figure 2. OIMMP personnel and Watershed Action Lab and Rosenstiel School of Marine, Atmospheric, and Earth Science (RSMAES) graduate students ground truthed potential oyster reefs not visible with satellite imagery.



Figure 3. Locations of reported oyster reefs in Oleta River that were ground truthed in November 2022. Confirmed live oyster reefs (yellow) were mostly submerged; sites that were found to only contain dead shell or sparse clusters (red) were not included in the state oyster map.



Figure 4. An RTK GPS was used to map confirmed oyster reefs by walking the perimeter of the reef and recording multiple datapoints (left) that were then used to draw a polygon and create a shapefile in ArcMap version 10.7 (right).



Figure 5. OIMMP personnel alongside a RSMAES graduate student using the RTK GPS to trace a live subtidal oyster reef not visible using satellite imagery (left). Example of a live oyster cluster from the oyster reef (right).



Figure 6. Reefs mapped by this effort.



Figure 7. Close up of each of the newly mapped oyster reefs in Oleta River. These oyster reefs are often underwater and are difficult to visually separate from lighter-colored sand and muddy bottom along mangrove shorelines. Thus, had not been previously mapped using aerial imagery.

Acknowledgements

Compilation of mapping data for the Oyster Integrated Mapping and Monitoring Program (OIMMP) is made possible by funds from the Florida Fish and Wildlife Conservation Commission, Florida's Wildlife Legacy Initiative, and the U.S. Fish and Wildlife Service's funding support of Florida's State Wildlife Grants Program. Mapping, ground truthing, and/or writing were conducted by Heather A. Stewart, Casey Craig, Alberto Aran, Wei Fan Chiu and Giovanna Vazquez Anderson.

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