Oyster Integrated Mapping and Monitoring Program (OIMMP)

OIMMP workshop
May 22-23 2018
Guana Tolomato Matanzas
National Estuarine Research Reserve

Kara Radabaugh, Ryan Moyer, Steve Geiger
Florida Fish and Wildlife Conservation Commission
Fish and Wildlife Research Institute
OIMMP introduction

- OIMMP is funded by Florida’s State Wildlife Grants (SWG) Program in order to support the study of high-priority coastal habitats and meet requirements of the State Wildlife Action Plan.
OIMMP Team

Ryan P. Moyer, Ph.D. (PI)

Kara Radabaugh, Ph.D. (Coordinator, Co-PI)

Steve Geiger, Ph.D. (Co-PI)

Christi Santi (GIS specialist)

Kathleen OKeife (Geospatial support)

Many statewide collaborators!
IMMP Origins: SIMM

- Seagrass Integrated Mapping and Monitoring (SIMM) program by Laura Yarbro and Paul Carlson
- SIMM report:
  [myfwc.com/research/habitat/seagrasses/projects/active/simm/](myfwc.com/research/habitat/seagrasses/projects/active/simm/)
IMMP Origins: CHIMMP

- Coastal Habitat Integrated Mapping and Monitoring Program (CHIMMP)
IMMP Origins: CHIMMP

- Four year program, 2013-2017 funded by SWG
- Resources and presentations from three workshops available at [http://ocean.floridamarine.org/CHIMMP/](http://ocean.floridamarine.org/CHIMMP/)

Coastal Habitat Integrated Mapping and Monitoring Program

**2017 CHIMMP Workshop**

The Coastal Habitat Integrated Mapping and Monitoring Program (CHIMMP) is funded by Florida’s State Wildlife Grants (SWG) Program in order to support the study of high priority coastal habitats and meet requirements of the State Wildlife Action Plan. CHIMMP’s goals include bringing together representatives from mapping and monitoring programs across the State in order to increase communication, minimize duplicate efforts and identify data gaps, needs, and priorities. Additional goals are to create a statewide report on the status of mangroves and salt marshes in Florida modeled after the Seagrass Integrated Monitoring and Mapping Program (SIMM).

- 2017 Workshop Agenda and Summary
- Workshop CHIMMP Presentation
- Florida Mapping and Monitoring Resources

**2017 Workshop Presentations**

**Topic:** Assessing the Effects of Eutrophication on Mangrove’s Resiliency to Sea Level Rise
**Presenter:** Jeremy Conrad, U.S. Fish and Wildlife Service
**Reference Material:**

Effects of eutrophication on mangrove resiliency

**Topic:** Should RSET-MH data be used to forecast the effects of sea-level rise on wetland resilience and carbon sequestration?
**Presenter:** Randall W. Parkinson, Florida International University
**Reference Material:**

Should RSET-MH data be used to forecast the effects of sea-level rise
OIMMP goals

• Inventory existing mapping and monitoring programs
  ◦ Create publicly available mapping layer and collaborative statewide report

• Bring together representatives from mapping and monitoring programs across the state
  ◦ Increase communication
  ◦ Compare current mapping and monitoring methods
  ◦ Identify data gaps, needs, and priorities for future efforts

• Complete pilot studies of oyster mapping and monitoring
OIMMP workshops

- First workshop held in February 2017 at GTMNERR
Workshop Agenda

- **Day 1**
  - OIMMP updates and resources
  - Attendee presentations
  - Social event at Mill Top Tavern

- **Day 2**
  - Continuation of attendee presentations
  - Breakout groups
MISSION
To achieve the conservation of natural biodiversity and cultural resources by using the results of research to guide science-based stewardship and education strategies.
OIMMP Report updates

- Regions for statewide report determined at 2017 workshop
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<th>Chapter Area</th>
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<th>Contributor</th>
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<td>Big Bend and Springs Coast</td>
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<td>Emma Dontis</td>
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<td>Tampa/ Sarasota Bay</td>
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<td>Aaron Brown</td>
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<td>Matthew Anderson</td>
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39+ statewide contributors
OIMMP Report

- Introduction to Florida oyster reefs
  - Overview of methods used for mapping and monitoring
  - Summary of benthic habitat classification schemes
  - Summary of oyster reef mapping data
  - Summary of oyster monitoring parameters and resources

Oyster Integrated Mapping and Monitoring Program

2017 OIMMP Workshop

The Oyster Integrated Mapping and Monitoring Program (OIMMP) is funded by Florida’s State Wildlife Grants (SWG) Program in order to support the study of high priority coastal habitats and meet requirements of the State Wildlife Action Plan. OIMMP’s goals include bringing together representatives from oyster mapping and monitoring programs across the State in order to increase communication, minimize duplicate efforts, and identify data gaps, needs, and priorities. Additional goals are to create a statewide report on the mapping and monitoring status of oyster reefs in Florida modeled after the Seagrass Integrated Monitoring and Mapping Program (SIMM) and the Coastal Habitats Integrated Mapping and Monitoring Program (CHIMMP).
OIMMP report chapter contents

- Regional maps
- Introduction to regional history/ecology, description of local oysters
- Threats to oyster reefs
- Summary of regional mapping and monitoring programs
- Recommendations for management, mapping, and monitoring
OIMMP Report
example: Big Bend and Springs Coast

Mapping linked to published reports and websites
Map shapefiles available for downloads at
OIMMP Report example:
Big Bend and Springs Coast
FDACS Shellfish Harvesting Areas (SHAs) downloadable shapefiles:
Winter SHAs:
https://www.arcgis.com/home/item.html?id=ac228ede47b04ac0ad69abcdc06e3a1f#overview
Non-Winter SHAs:
https://www.arcgis.com/home/item.html?id=6cf9f4ec8edb4dd8949cb23bb591745a#overview
Oyster harvest data

- 1950 – 1983 data from printed copies of Summaries of Florida Commercial Marine Fish Landings
  - Will be available on OIMMP website and published as a report appendix
- 1986 – Initiation of mandatory FWC reporting system

![Graph showing oyster harvest data over the years](image-url)
Oyster harvest data

OIMMP Report Status

- Approved for FWRI Technical Report publication
- Drafts written for 5 (of 9) chapters and well underway for 3 more chapters
- Writing & review process
  - Write draft (Kara Radabaugh & coauthors)
  - OIMMP editor revisions (Kara Radabaugh, Ryan Moyer, Steve Geiger)
  - Technical review & revisions (Bill Arnold, Amber Whittle)
  - Science & copy editor review & revisions (Bland Crowder)
  - Formatting (Bland Crowder)
Statewide Oyster Mapping and FWC GIS Resources

Christi Santi
Florida Fish and Wildlife Conservation Commission
Fish and Wildlife Research Institute
Statewide Oyster Progress

- Data were added from 15 sources in additional areas or updates to existing areas.
- Any overlaps between multiple data sources were resolved.
- Additional “Comments” are added to retain details present in source data.
Statewide Oyster Progress

Existing Statewide Oyster Data (2017)

Legend
- Oyster

Existing Statewide Oyster Data (2018)

Legend
- Oyster

Some habitat distributions or locations may be misrepresented on this map due to size, resolution and insufficient data sources.
Statewide Oyster Progress
Updated Area: Apalachicola Bay
Updated Area: Lee County
Mapping Gaps

Vague maps

1992 maps

Lack subtidal maps

Incomplete maps

Everywhere: Peripheral oysters

Incomplete maps

Legend

Oyster reefs

Oysters extent not shown to scale

Legend

Oyster reefs

Oysters extent not shown to scale
Welcome to the Center for Spatial Analysis

The Center is part of the Information Science and Management Section and produces, analyzes, and manages scientific data and information used by federal, state, and local governments and the public to aid in the conservation of fish and wildlife.

The Center for Spatial Analysis develops a variety of products in response to the needs of the community including our popular Boating and Angling Guide series, multiple Geographic Information Systems (GIS) web applications and datasets, and coral reef mapping.

Additionally, through the use of GIS technology, the Center for Spatial Analysis assists the U.S. Coast Guard, the National Oceanic and Atmospheric Administration, and the Department of Environmental Protection in the event of an oil spill. These analyses assist decision-makers in developing response and cleanup strategies, in prioritizing response efforts, and in assessing damage after a spill.

Applications and Map Products

Web Mapping Applications are online mapping tools designed to allow users to view spatially-referenced data, create customized queries, design printable maps, view Federal Geographic Data Committee (FGDC) compliant metadata, and download GIS layers for use within a desktop GIS. FWC’s web-based GIS technologies allow efficient viewing and sharing of GIS data via the Internet in support of efforts to conserve and manage habitats important to fish and wildlife.

GISTM & Mapping Data Downloads

The GIS & Mapping Data Downloads page is an indexed catalog of FWC’s spatially referenced data available for viewing, downloading, and comparison. GIS data is available for use on a desktop GIS.

Marine

The Marine pages host information and applications that target a variety of specific resources within the marine environment. The Marine group includes FWC’s Boating and Angling Guide series and the Marine Resources GIS (MRGIS) application, which comprehensively catalogs marine habitat, species distribution, and coastal amenities.

Terrestrial

The Terrestrial page hosts a collection of applications and information related to habitat and species conservation. The Terrestrial Resources GIS (TRGIS) application allows visual comparisons of species distribution, habitat models, and land management actions. The group also features species-specific applications for osprey, Florida black bear, Florida panther, and more.

Freshwater

The Freshwater page hosts a collection of applications and information related to freshwater resources and habitats. Online mapping tools include applications targeting freshwater fisheries and wetland birds.

A historic map of the State of Florida published in 1846.

http://geodata.myfwc.com/
FWC GIS Data

Search GIS & Mapping Data

Downloaded data are in a Web Mercator projection. Please project data appropriately before using for measurements and analysis. If you have questions regarding projections, click here. For instructions on how to find, filter, and download data, click here.

Boating  Boundary  Elevation  Emergency Response  Fish and Wildlife Habitat  Fish and Wildlife Management
Fish & Wildlife Species Locations  Freshwater Ecosystems  Harmful Algal Bloom  Imagery  Land cover  Location
Contact the GIS Librarian  Manatees  Marine Ecosystems  Shoreline  Tranquitation  Quick Maps for Google Earth

http://geodata.myfwc.com/
FWC GIS Data

This GIS data set represents oyster coverage for available study areas in the state of Florida. Not all areas have been mapped, but this dataset represents the oyster data available to FWRI as of May, 2018. Source dates vary and many studies are much older than the compilation data. See the Source Information section for more details.

http://geodata.myfwc.com/
Resource links

- FWC GIS Downloads and Map Products: http://geodata.myfwc.com/
- FWC GIS Email: GISLibrarian@MyFWC.com
Mapping Gaps

Vague maps

1992 maps

Lack subtidal maps

Incomplete maps

 Everywhere: Peripheral oysters

Legend

Oyster reefs

Oysters extent not shown to scale

Miles

75 0 75
Monitoring Gaps

- Monitoring efforts highly localized
  - Limited comparison among bays
  - Not all bays monitored
  - Need standardized, long-term monitoring

- Need data hub
  - FDEP’s SEACAR program
    - [https://floridadep.gov/fco/fcmp/content/seacar-goals](https://floridadep.gov/fco/fcmp/content/seacar-goals)

- Need transition of data to management
  - Need harvest management plan
Major Threats

- Altered hydrology
  - Salinity (predation, disease, mortality)
- Loss of substrate
  - Dredging, sedimentation, harvest
  - Shoreline construction
- Climate change & sea-level rise
- Metapopulations
Pilot monitoring study

- Comparison of monitoring methods used by FWC and Northern Coastal Basin group (Walters et al. 2016)
Effort to fill mapping gaps

- Collaboration with UF to map subtidal oysters in Suwannee River sound

Lack subtidal maps
Online Resources

- SIMM/CHIMMP/OIMMP websites
- FWC oyster compilation shapefile
- FDACS Shellfish harvesting areas shapefiles
- Oyster harvesting data
- Oyster restoration workgroup
- Oyster fisheries data
- Historical habitat data
Online Resources

- Oyster restoration workgroup
- http://www.oyster-restoration.org
Online Resources

- Historical habitat data
- University of Florida Aerial Photo Library

http://ufdc.ufl.edu/aerials
Online Resources

- Historical habitat data
- University of Florida Aerial Photo Library

http://ufdc.ufl.edu/aerials
Online Resources

- Historical habitat data
- University of Florida Aerial Photo Library

http://ufdc.ufl.edu/aerials
Online Resources

- Historic habitat data
- NOAA topographic surveys (T-sheets)
- https://shoreline.noaa.gov/data/datasheets/t-sheets.html
Online Resources

- Historic habitat data
- NOAA topographic surveys (T-sheets)
Online Resources

- Historic habitat data
- NOAA topographic surveys (T-sheets)
Online Resources

- Historic habitat data
- NOAA topographic surveys (T-sheets)
  - Not all georeferenced (especially older T-sheets from 1800s)
Online Resources

- Salinity model for bays along the Gulf of Mexico
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<tr>
<th>Name</th>
<th>Association</th>
<th>Focus</th>
<th>Reference</th>
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<tr>
<td>Design and monitoring of shellfish restoration projects</td>
<td>The Nature Conservancy</td>
<td>Instructional guide for bivalve restoration projects and monitoring</td>
<td>Brumbaugh et al. 2006</td>
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<td>Oyster habitat restoration monitoring and assessment handbook</td>
<td>NOAA, TNC, University of South Alabama, Florida Atlantic University</td>
<td>Instructional guide for monitoring and characterization of oyster restoration sites</td>
<td>Baggett et al. 2014</td>
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<td>Best management practices for shellfish restoration</td>
<td>Interstate Shellfish Sanitation Conference, TNC, NOAA</td>
<td>Methods for shellfish restoration including community outreach and harvesting concerns</td>
<td>Leonard and Macfarlane 2011</td>
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<td>Restoration goals, quantitative metrics and assessment protocols for evaluating success on restored oyster reef sanctuaries</td>
<td>Chesapeake Bay Program</td>
<td>Monitoring protocols and success metrics for restored oyster reefs</td>
<td>Oyster Metrics Workgroup 2011</td>
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<td>Effective monitoring to evaluate ecological restoration in the Gulf of Mexico</td>
<td>National Research Council</td>
<td>General and specific guidelines for monitoring numerous restored habitats, including oyster reefs</td>
<td>NRC 2017</td>
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<td>Oyster-generated marine habitats: their services, enhancement, restoration, and monitoring.</td>
<td>Florida Atlantic University, University of Rhode Island</td>
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<td>Coen and Humphries, in press</td>
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<td>Oyster Condition Assessment Protocol</td>
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<td>Instructional guide for standardized oyster reef monitoring</td>
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Questions or comments?