

# Oyster Integrated Mapping and Monitoring Program Workshop Agenda

**Guana Tolomato Matanzas National Estuarine Research Reserve  
505 Guana River Rd, Ponte Vedra Beach, FL 32082  
23-24 February 2017**

**Goals:**

The goals of this workshop include the following:

- Exchange of information regarding oyster mapping and monitoring programs within Florida, including comparison of methodologies and protocols
- Identify duplicate efforts, data gaps, and needs for future oyster mapping, monitoring, and management

**Thursday, February 23<sup>rd</sup>**

*Outside food and bagged lunches are welcome, no food is provided.*

**12:30-1:15 pm Introduction to OIMMP and summary of oyster mapping and monitoring data**

Ryan Moyer, Kara Radabaugh, and Steve Geiger, FWC

Attendee Presentations (12 min talk, followed by 2-3 min Q&A)

<u>Time</u>	<u>Presenter</u>	<u>Affiliation</u>	<u>Title</u>
1:15	<b>Erica Hernandez</b> , Ron Brockmeyer, Linda Walters, Andrea Noel, Nikki Dix, Kelly Smith, Todd Osborne, Joel Steward	St Johns River Water Management District	Preliminary oyster reef condition in NE Florida's Northern Coastal Basin and Northern Mosquito Lagoon
1:30	<b>Nikki Dix</b> , Pam Marcum, Matt Monroe	GTMNERR	GTMNERR oyster monitoring (2014-2016)
1:45	<b>Emily Dark</b> , Susan Laramore, Elizabeth Urban, Carolyn Sinacore, Emily Davidson, Erica Rose, Jeffrey Beal, Matthew Anderson	FDEP, Indian River Lagoon Aquatic Preserves	Investigation into the health of oysters ( <i>Crassostrea virginica</i> ) in natural and restored reefs across a latitudinal gradient in the Indian River Lagoon (IRL), Florida

**2:00-2:15 pm Break**

Attendee Presentations (12 min talk, followed by 2-3 min Q&A)

<u>Time</u>	<u>Presenter</u>	<u>Affiliation</u>	<u>Title</u>
2:15	<b>Jaime Boswell</b> , Judy Ott, Liz Donley	Charlotte Harbor National Estuary Program	CHNEP volunteer oyster habitat monitoring: methods for citizen scientists

2:30	<b>Laura Geselbracht</b> , Andrea Graves, Anne Birch	The Nature Conservancy	Oyster Reef Restoration at Trabue Harborwalk, Punta Gorda, Florida: 1 Year Post Installation Results
2:45	<b>Jay Leverone</b>	Sarasota Bay Estuary Program	Sarasota Bay oyster habitat mapping, monitoring, and restoration
3:00	<b>Katie Konchar</b> , Jacob Berninger, Maria Merrill, Kent Smith	FWC, Tallahassee	Oyster reef habitat restoration in St. Andrew Bay, FL

**3:15-3:30 pm** *Break*

Attendee Presentations (12 min talk, followed by 2-3 min Q&A)

<u>Time</u>	<u>Presenter</u>	<u>Affiliation</u>	<u>Title</u>
3:30	<b>Stephanie Garvis</b> , Melinda Donnelly, Linda Walters, John Weishampel, Nikki Dix, Erica Hernandez and Ron Brockmeyer	University of Central Florida	Intertidal oyster reef mapping projects in Mosquito Lagoon, the Northern Coastal Basins region and Apalachicola, FL
3:45	<b>Andrea Noel</b> , Nikki Dix	FDEP, NE FL Aquatic Preserves	Mapping oyster reefs using drones versus aerial photo
4:00	<b>Loren D. Coen</b> , K. E. Schulte and others	Florida Atlantic University	An overview of a comprehensive assessment of SC's intertidal oyster habitats using high resolution, multi-spectral digital imagery for management and restoration
4:15	<b>Ray Grizzle</b> , Krystin Ward	University of New Hampshire	Options for mapping subtidal and intertidal oyster reefs
4:30	<b>Thomas Ries</b> , Dianne Rosensweig	Scheda Ecological Associates	Rookery Bay NERR SAV/oyster mapping

**4:45-5:15 pm** *Conclusions from Day 1*

**6:30-8:00 pm** *Social upstairs at Frida Taqueria (12 Avenida Menendez, St Augustine, FL 32084)*

**Friday, February 24<sup>th</sup>**

Complete travel paperwork for attendees needing reimbursement during break (bring hotel receipts)

**8:30-8:45 am** Day 2 Introduction

Attendee Presentations (12 min talk, followed by 2-3 min Q&A)

<u>Time</u>	<u>Authors (presenter)</u>	<u>Affiliation</u>	<u>Title</u>
8:45	<b>Laurie Rounds</b>	NOAA Restoration Center	Gulf of Mexico Oyster Restoration: Deepwater Horizon Oyster Restoration Strategy

9:00	<b>Gary Raulerson</b> , Ed Sherwood, Kris Kaufman, Maya Burke	Tampa Bay Estuary Program	Tampa Bay Oyster Target Setting
9:15	<b>Steve Geiger</b>	FWC, St. Petersburg	Summary of the status of oyster mapping and monitoring in Florida: can we balance massive scale and fine precision and what should be our priorities?

**9:30-10:15 am** Regional breakout: Discuss available maps, identify existing mapping and monitoring programs and gaps

**10:15-10:30 am** Reconvene. Breakout groups report.

**10:30-10:45 am** *Break*

**10:45-11:30 am** Regional breakout: Modify boundaries, report card feedback

**11:45-12:00 pm** Reconvene. Breakout groups report.

**12:00-12:15 pm** Conclusion and future directions

**Resources:**

Coastal Habitats Integrated Mapping and Monitoring Program:

<http://ocean.floridamarine.org/CHIMMP/>

Seagrass Independent Mapping and Monitoring Program:

<http://myfwc.com/research/habitat/seagrasses/projects/active/simm/>

Oyster Restoration Workgroup

<http://www.oyster-restoration.org/>

<http://www.oyster-restoration.org/participants/participant-signup-page/>

Marine Resources GIS

<http://ocean.floridamarine.org/mrgis>

FWC GIS data downloads:

<http://geodata.myfwc.com/>

## Registered Workshop Attendees (\*\*remote attendees)

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**Table 1.** Selected habitat classification schemes for oyster reefs

Name	Affiliation	Region	Classification Scheme	Reference
Florida Land Use and Cover Classification System (FLUCCS)	Florida Department of Transportation	Florida	Wetlands <ul style="list-style-type: none"> <li>○ Non-vegetated</li> <li>● Oyster bars</li> </ul>	FDOT 1999
System for Classification of Habitats in Estuarine and Marine Environments (SCHEME)	Florida Fish and Wildlife Conservation Commission	Florida	Reef/Hardbottom <ul style="list-style-type: none"> <li>○ Mollusk reef</li> <li>● Bivalve reefs</li> </ul>	Madley et al. 2002
Guide to the Natural Communities of Florida	Florida Natural Areas Inventory	Florida	Marine and estuarine <ul style="list-style-type: none"> <li>○ Mollusk reef</li> </ul>	FNAI 2010
Florida Land Cover Classification System	Florida Fish and Wildlife Conservation	Florida	Estuarine <ul style="list-style-type: none"> <li>○ Intertidal</li> <li>● Oyster bar</li> </ul>	Kawula 2009, 2014

	Commission			
Sarasota County Water Quality Planning Methods Manual for Field Mapping of Oysters	Sarasota County	Sarasota and Tampa Bays	Oyster habitat <ul style="list-style-type: none"> <li>○ Shell</li> <li>○ Scattered shell</li> <li>○ Oyster clumps</li> <li>○ Scattered oyster clumps</li> <li>○ Oyster reef</li> <li>○ Oyster clumps/reef</li> <li>○ Mangrove apron</li> <li>○ Mangrove root oysters</li> <li>○ Seawall</li> <li>○ Rip rap</li> <li>○ Pilings</li> <li>○ Floating docks</li> </ul>	Meaux 2011
Classification of Wetlands and Deepwater Habitats of the United States	U.S. Fish and Wildlife Service	National	Estuarine <ul style="list-style-type: none"> <li>○ Subtidal               <ul style="list-style-type: none"> <li>● Reef                   <ul style="list-style-type: none"> <li>▪ Mollusk</li> </ul> </li> </ul> </li> <li>○ Intertidal               <ul style="list-style-type: none"> <li>● Reef                   <ul style="list-style-type: none"> <li>▪ Mollusk                       <ul style="list-style-type: none"> <li>● Regularly flooded</li> <li>● Irregularly flooded</li> </ul> </li> </ul> </li> </ul> </li> </ul>	Cowardin et al. 1979, FGDC 2013
Coastal Change Analysis Program (C-CAP) Classification System	National Oceanic and Atmospheric Administration	National	Marine/Estuarine reef <ul style="list-style-type: none"> <li>○ Mollusk reef</li> </ul>	Klemas et al. 1993, Dobson et al. 1995
Coastal and Marine Ecological Classification Standard (CMECS)	Federal Geographic Data Committee	National	Geoform origin: Biogenic <ul style="list-style-type: none"> <li>○ Geoform: Mollusk reef               <ul style="list-style-type: none"> <li>● Fringing mollusk reef</li> <li>● Linear mollusk reef</li> <li>● Patch mollusk reef</li> <li>● Washed shell mound</li> </ul> </li> </ul> Substrate: Biogenic <ul style="list-style-type: none"> <li>○ Shell substrate               <ul style="list-style-type: none"> <li>● Shell reef substrate                   <ul style="list-style-type: none"> <li>▪ Oyster reef substrate</li> </ul> </li> <li>● Shell rubble                   <ul style="list-style-type: none"> <li>▪ Oyster rubble</li> </ul> </li> <li>● Shell hash                   <ul style="list-style-type: none"> <li>▪ Oyster hash</li> </ul> </li> </ul> </li> </ul> Biotic setting: Benthic/attached biota <ul style="list-style-type: none"> <li>○ Reef biota               <ul style="list-style-type: none"> <li>● Mollusk reef biota                   <ul style="list-style-type: none"> <li>▪ Oyster reef (<i>Crassostrea</i>, <i>Ostrea</i>)</li> </ul> </li> </ul> </li> <li>○ Faunal bed               <ul style="list-style-type: none"> <li>● Attached fauna                   <ul style="list-style-type: none"> <li>▪ Attached oysters (<i>Crassostrea</i>, <i>Ostrea</i>)</li> </ul> </li> <li>● Soft sediment fauna                   <ul style="list-style-type: none"> <li>▪ Oyster bed (<i>Crassostrea</i>, <i>Ostrea</i>)</li> </ul> </li> </ul> </li> </ul>	FGDC 2012

**Table 2.** Large-scale providers of oyster reef data in the state of Florida

Program	Affiliation	Region of map extent	Data origin, most recent data	Classification scheme	Reference
National Wetlands Inventory (NWI)	U.S. Fish and Wildlife Service	National	Composite of multiple data and aerial image sources, image years vary from 1970s to 2010s	Cowardin et al. 1979	<a href="http://www.fws.gov/wetlands">www.fws.gov/wetlands</a>
Florida Water Management Districts (WMD)	NFWFMD	NFWFMD	Color infrared or true color aerial photography, 2009-2010	FDOT 1999	<a href="http://www.fgd.org/metadataexplorer/explorer.jsp">www.fgd.org/metadataexplorer/explorer.jsp</a>
Land Use Land Cover (LULC) maps	SRWMD	SRWMD	Color infrared or true color aerial photography, 2010-2011	FDOT 1999	<a href="http://www.srwmd.state.fl.us/index.aspx?NID=319">www.srwmd.state.fl.us/index.aspx?NID=319</a>
SRWMD oyster mapping	SRWMD	SRWMD	Composite of multiple data and aerial image sources, 2001	Customized FDOT 1999	<a href="http://www.srwmd.state.fl.us/index.aspx?NID=319">www.srwmd.state.fl.us/index.aspx?NID=319</a>
SWFWMD seagrass mapping	SWFWMD	SWFWMD	Color aerial photography, oysters included in seagrass mapping efforts, 2016	Customized FDOT 1999	<a href="http://data-sfwmd.opendata.arcgis.com/">data-sfwmd.opendata.arcgis.com/</a>
Northern Coastal Basin Intercoastal Oysters	SJRWMD, UCF	NE FL	Color aerial photography, 2009-2016	Custom classification	<a href="http://www.arcgis.com/home/item.html?id=ac2979f9260e404f874a5f765daeaaa3">www.arcgis.com/home/item.html?id=ac2979f9260e404f874a5f765daeaaa3</a>
Oyster Beds in Florida	Florida Fish and Wildlife Conservation Commission (FWC)	Florida	Compilation of many sources, see metadata. Source years vary, published in 2011	FDOT 1999 and others	<a href="http://geodata.myfwc.com/datasets/a78160f5acaf4439b49f9fbef4c100ac_5">geodata.myfwc.com/datasets/a78160f5acaf4439b49f9fbef4c100ac_5</a>
Cooperative Land Cover (CLC) map	Florida Natural Areas Inventory, FWC	Florida	Compilation of many sources, see metadata. Version 3.2 published 2016	FNAI 1990, FDOT 1999, Kawula 2014, and others	FNAI and FWC 2010 <a href="http://myfwc.com/research/gis/applications/articles/Cooperative-Land-Cover">myfwc.com/research/gis/applications/articles/Cooperative-Land-Cover</a>
Gulf of Mexico Data Atlas	NOAA, Gulf of Mexico coast	Gulf of Mexico coast, all of Florida	Compilation of many sources, see metadata. Source years vary, published in 2011.	FNAI 1990, FDOT 1999, and others	<a href="http://gulfatlas.noaa.gov/catalog/living-marine/">gulfatlas.noaa.gov/catalog/living-marine/</a>

**Table 3.** Shellfish monitoring protocols.

<b>Name</b>	<b>Association</b>	<b>Focus</b>	<b>Reference</b>
Design and monitoring of shellfish restoration projects	The Nature Conservancy	Instructional guide for bivalve restoration projects and monitoring	Brumbaugh et al. 2006
Oyster habitat restoration monitoring and assessment handbook	NOAA, TNC, University of South Alabama, Florida Atlantic University	Instructional guide for monitoring and characterization of oyster restoration sites	Baggett et al. 2014
Science-based restoration monitoring of coastal habitats	NOAA	Volume 1: A framework for monitoring plans under the estuaries and clean waters act of 2000; Volume 2: Tools for monitoring coastal habitats	Thayer et al. 2003, Thayer et al. 2005
Best management practices for shellfish restoration	Interstate Shellfish Sanitation Conference, TNC, NOAA	Methods for shellfish restoration including community outreach and harvesting concerns	Leonard and Macfarlane 2011
Restoration goals, quantitative metrics and assessment protocols for evaluating success on restored oyster reef sanctuaries	Chesapeake Bay Program	Monitoring protocols and success metrics for restored oyster reefs	Oyster Metrics Workgroup 2011
Effective monitoring to evaluate ecological restoration in the Gulf of Mexico	National Research Council	General and specific guidelines for monitoring numerous restored habitats, including oyster reefs	NRC 2017
Oyster-generated marine habitats: their services, enhancement, restoration, and monitoring.	Florida Atlantic University, University of Rhode Island	TBD, in press	Coen and Humphries, in press
Oyster Condition Assessment Protocol	UCF, SJRWMD, GTMNERR, NE Florida Aquatic Preserves	Instructional guide for standardized oyster reef monitoring	Walters et al. in prep

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