Coastal Habitat Integrated Mapping and Monitoring Program (CHIMMP)

CHIMMP workshop

April 29-30 2014

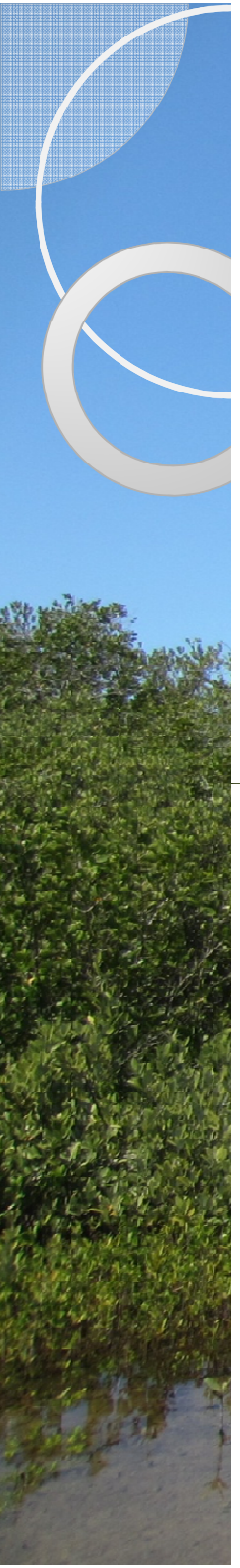
Florida Fish and Wildlife Conservation Commission

Fish and Wildlife Research Institute

St. Petersburg, Florida

CHIMMP introduction

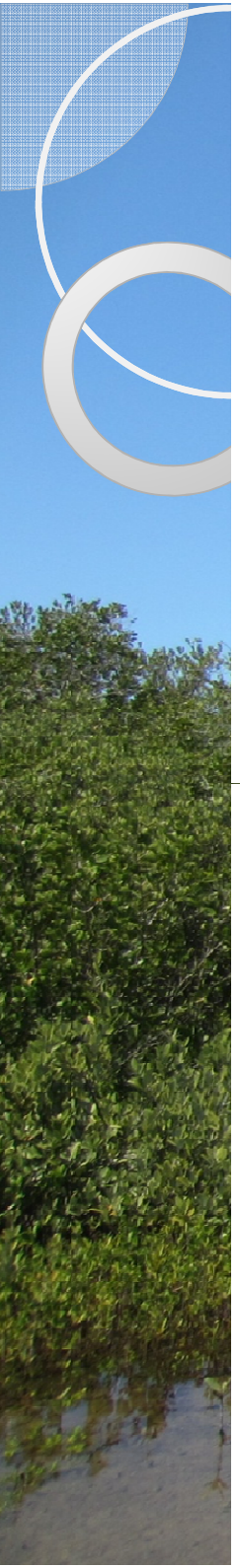
- CHIMMP is funded by Florida's State Wildlife Grants (SWG) Program in order to support the study of high priority coastal habitats and meet requirements of the State Wildlife Action Plan



CHIMMP goals

- **Bring together representatives from mapping and monitoring programs across the State**
  - Increase communication
  - Coordinate & minimize duplicate efforts
  - Identify data gaps, needs, and priorities

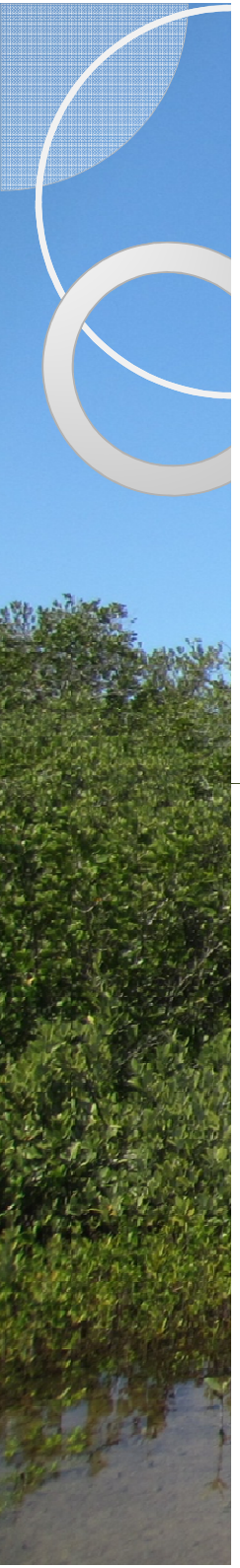
- **Create a statewide report on the status of mangroves and salt marshes in Florida**
  - Modeled after the Seagrass Integrated Monitoring and Mapping Program (SIMM)
  - Compare current mapping and monitoring methods
  - Utilize local experts to evaluate regional coastal wetland status, needs, and priorities



CHIMMP team

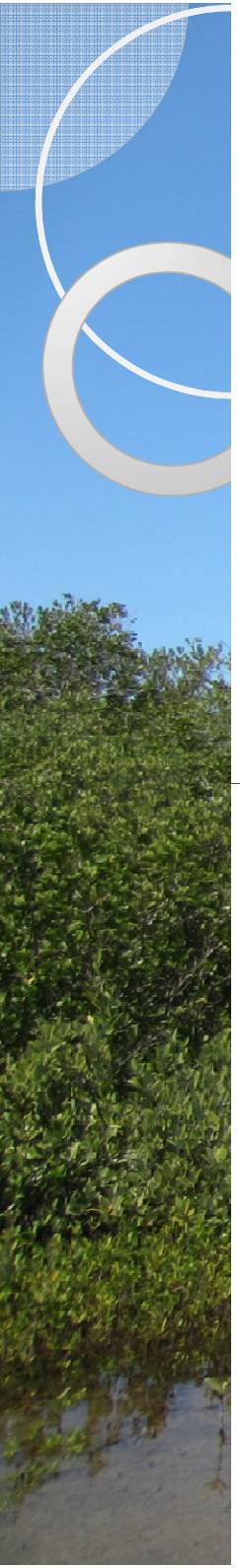
- **Ryan P. Moyer** (Principal investigator)
- **Amber Whittle** (Co-principal investigator)
- **Laura Yarbro** (Co-principal investigator, SIMM editor)
- **Kara Radabaugh** (Program coordinator)
- **Christina Powell** (Coastal wetlands technician)
- **Christi Santi** (GIS specialist)
- **Kathleen Okeife** (GIS support)

Workshop attendee introductions



Day 1 Itinerary

- **12-12:30 pm** Introduction to workshop and CHIMMP project
- **12:30-1 pm** Overview of Seagrass Integrated Mapping and Monitoring (SIMM) project
- **1-1:30 pm** Overview of coastal wetland spatial data currently available in the state of Florida
- Break
- **1:40-4:50 pm** Attendee Presentations
- **4:50-5:15 pm** Wrap up and Surveys
- **6:00-7:00 pm** Optional Social Hour at Hollander Hotel Tap Room

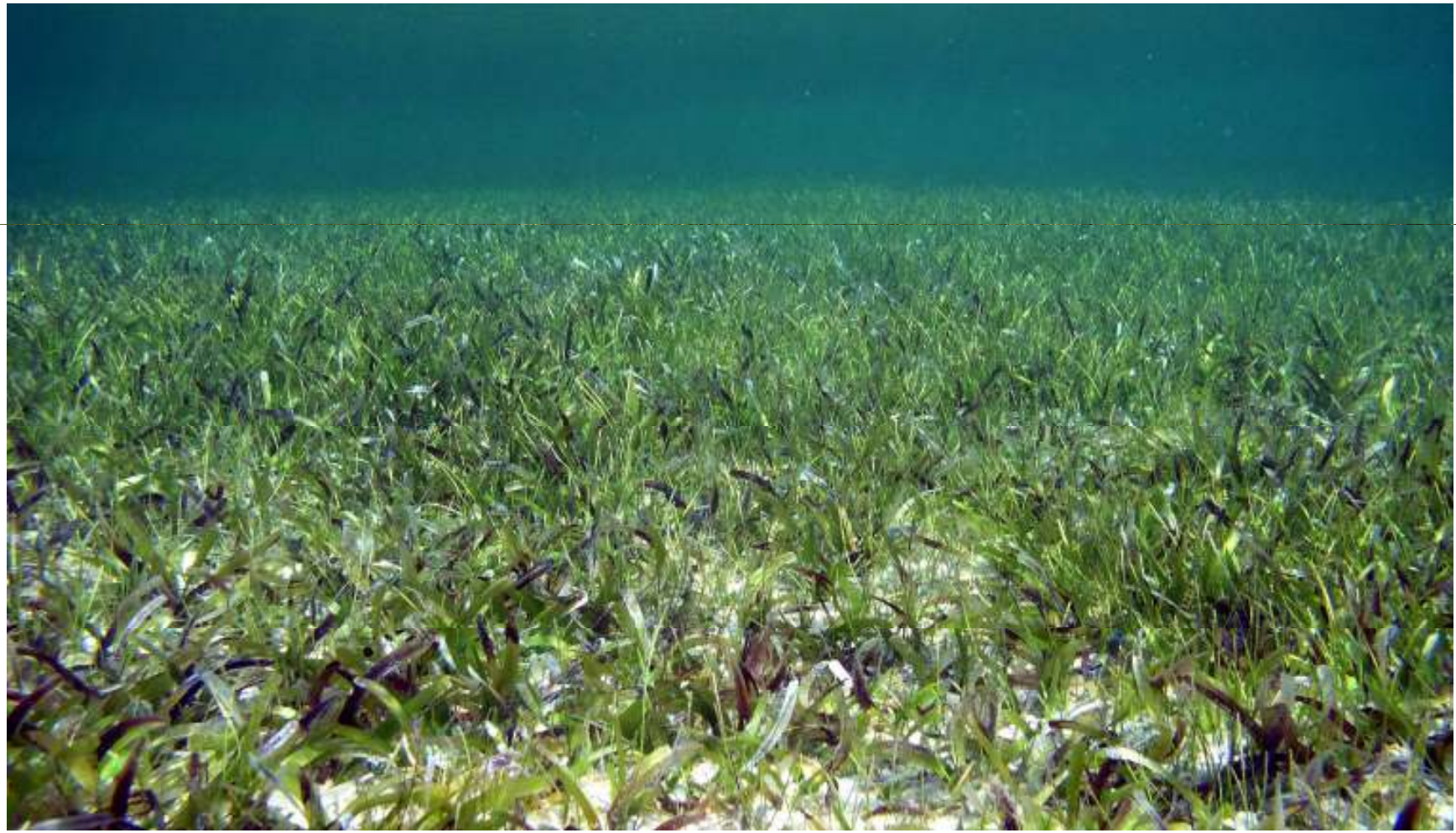


Day 2 Itinerary

- **8:30-9:00 am** Travel reimbursement paperwork
- **9:00-9:45 am** Overview of CHIMMP Report process
- **9:45-10:15 am** Regional breakout I
- **10:15-10:45 am** Reconvene and Discuss
- Break
- **11:00-11:30 am** Regional breakout II
- **11:30-12:30 pm** Reconvene and Conclusion

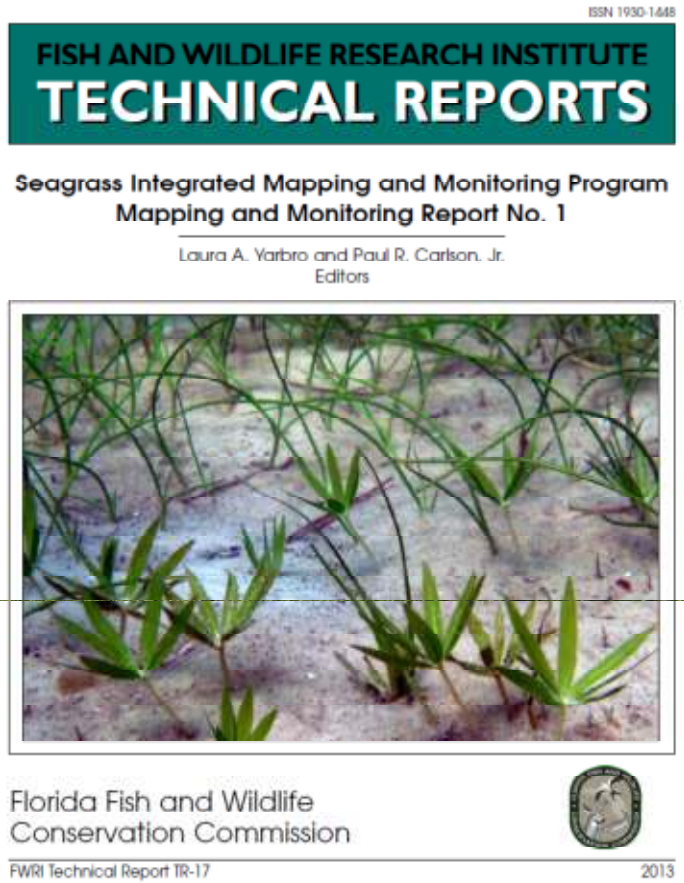
Overview of Seagrass Integrated Mapping and Monitoring (SIMM)

Laura Yarbro

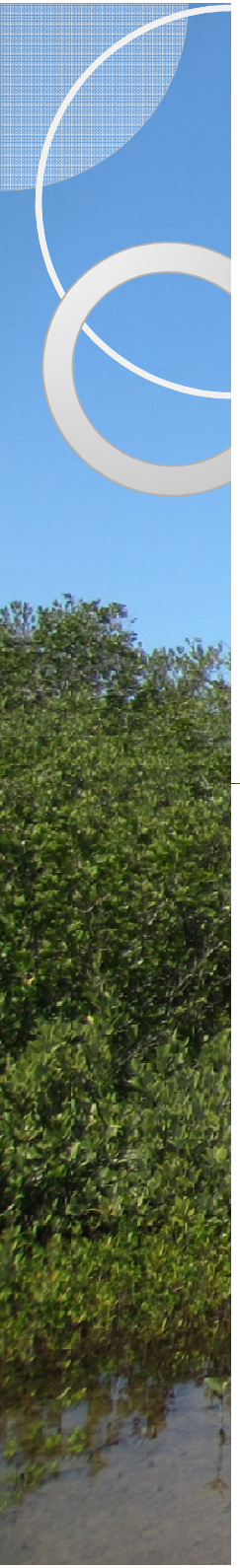


The Seagrass Integrated Mapping and Monitoring (SIMM) Program of Florida:

Providing information to a broad user community.

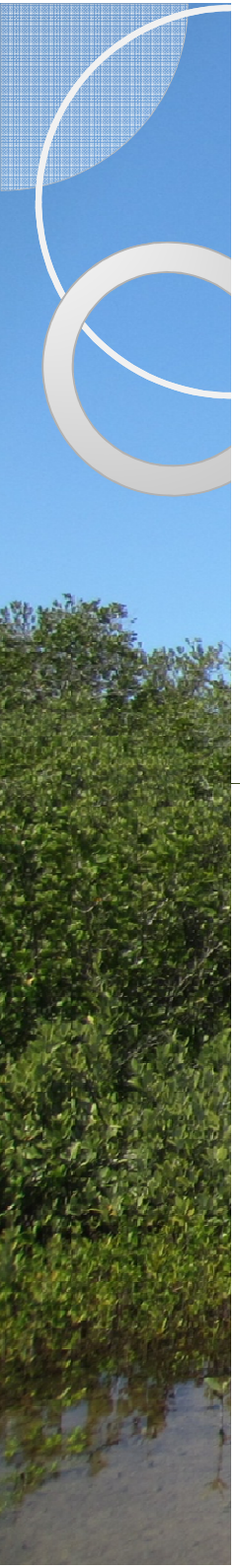


Report located at http://myfwc.com/research/habitat/seagrasses/publications/simm-report-1/



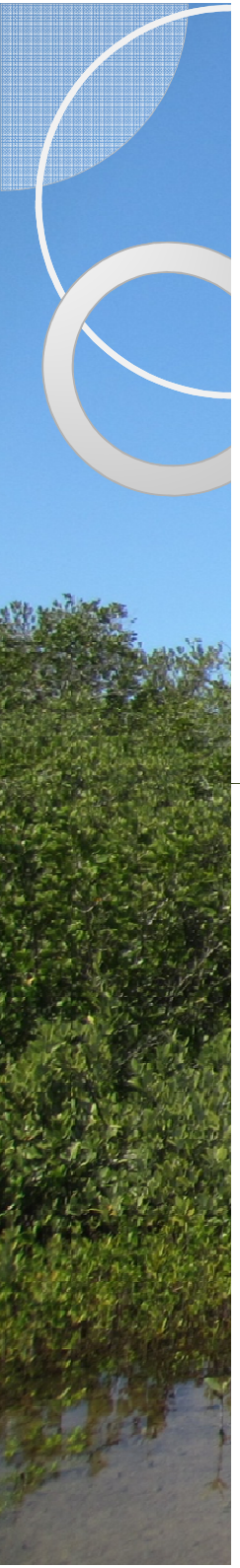
SIMM Program Goals:

- Collate and provide up-to-date seagrass mapping and monitoring information in Florida coastal waters for a variety of stakeholders and uses.
- Establish, maintain, and web-serve a database of monitoring and mapping data.
- Identify and fill spatial gaps and data needs
- Leverage scarce funding by collaborating with agencies to acquire and map imagery and to complete monitoring surveys.
- Evaluate new cost-effective data sources and mapping methods.



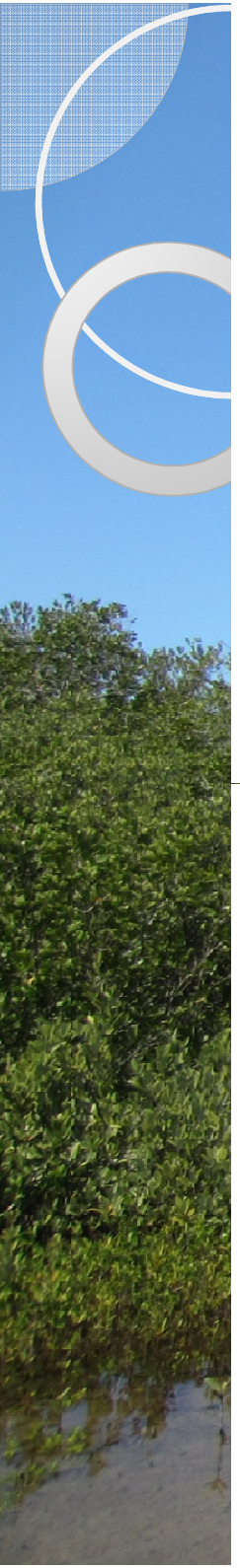
Benefits of the SIMM program and reports:

- A data and status resource for Florida seagrasses that is web-accessible;
- Format is easy to update and links allow ongoing access to new information and methods of data management;
- Authors continue to provide information;
- Information is readily available in an emergency situation (oil spill, storms, die-off);
- Summaries highlight information and data gaps—when $$ become available, we can readily provide proposed SOWs.



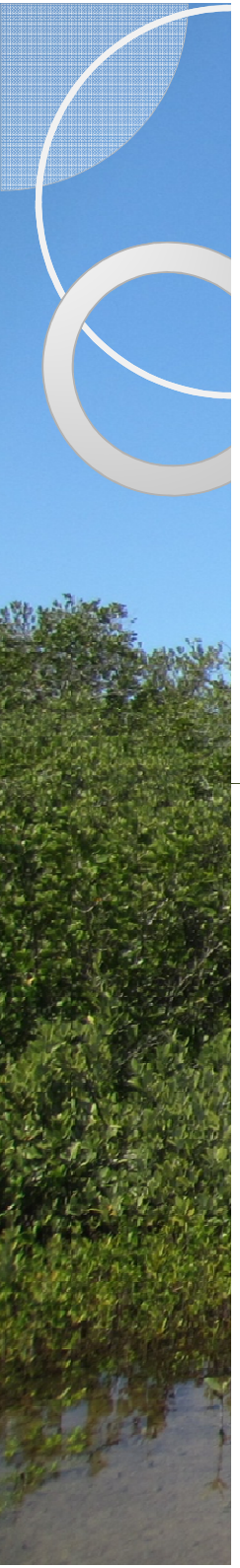
SIMM Mapping and Monitoring Goals

- Map all seagrass beds at least every six years and support programs where more frequent mapping is done.
- Monitor all seagrass beds at least every two years and support programs with annual monitoring.
- With a large network of collaborators and coauthors, publish a monitoring data report every two years and a comprehensive report every six years that combines site-intensive monitoring data and trends with statewide estimates of seagrass cover and maps showing seagrass gains and losses.



Goals of the SIMM Reporting Process:

- Engage local and regional scientists and managers as authors of estuary-specific chapters.
  - A single chapter may have multiple authors, each with his/her priorities and perspective.
- Provide a general structure and format for each chapter, as well as a format open enough so that authors can address estuary-specific issues, priorities and interests.



Each chapter has a minimal set of information:

- A written assessment
- A table listing areal extent, by sub-region if appropriate

Bay Segment	2006	2008	2010	2012	Change 2006-2012 Acres	Change 2006-2012 %
Clearwater North	3,522	3,784	3,759	3,526	4	0.1%
Clearwater South	914	1,000	907	743.2	-171	-18.7%
St. Joseph's Sound	10,546	12,639	12,819	12,914	2,368	22.5%
Boca Ciega Bay	8,961	8,457	8,554	8,544	-417	-4.7%
Total	23,943	25,880	26,039	25,727	1,784	7.5%

Report components:

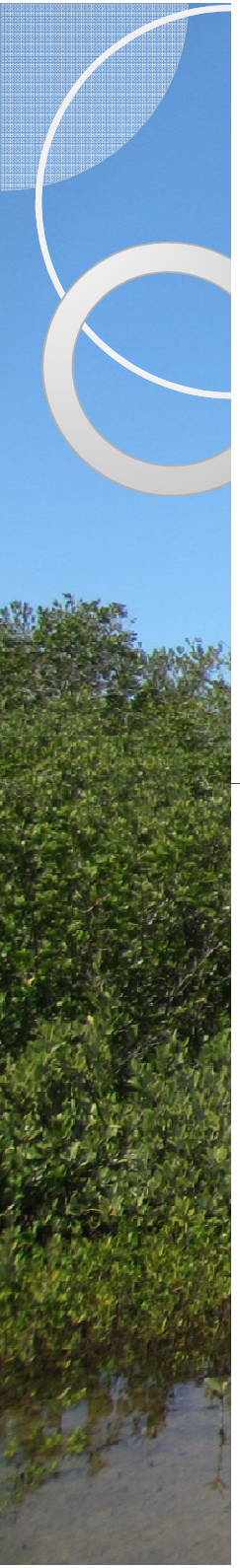
- A map

Report components:

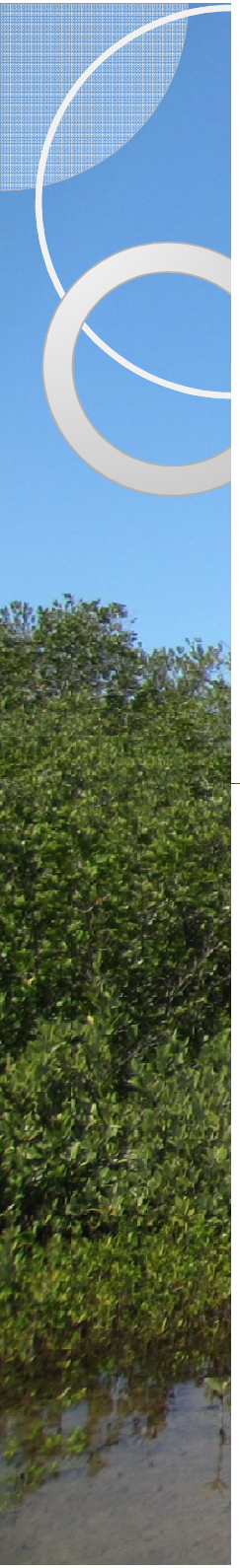
- Report cards of status, trends, and stressors

General Status of Seagrasses in Western Pinellas County			
Status and Stressors	Status	Trend	Assessment, Causes
Seagrass Acreage	Green	Increasing	Urban runoff a concern
Water Clarity	Yellow	Poor in Boca Ciega Bay	Urban runoff
Natural Events	Yellow	Sporadic	El Niño, tropical cyclones
Propeller Scarring	Yellow	Regional	Near high-use areas

Report components:



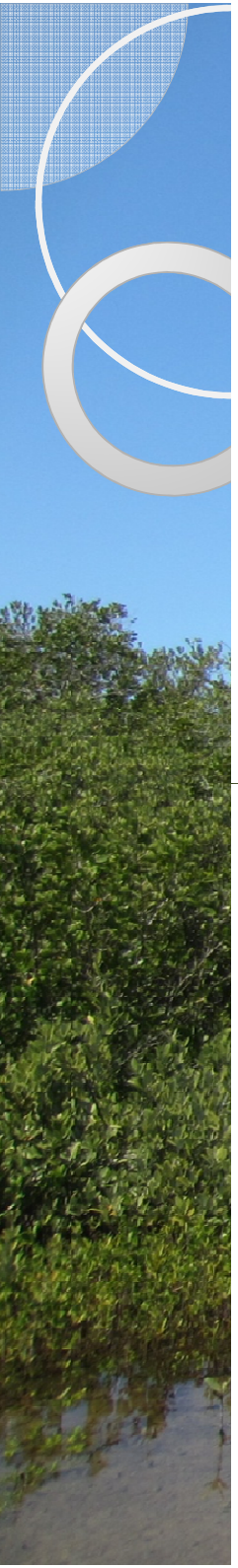
Seagrass Status and Potential Stressors in Western Pinellas County			
Status Indicators	**Status**	**Trend**	**Assessment, Causes**
Seagrass cover	Green	Increasing	All areas except Boca Ciega Bay
Seagrass meadow texture	Green	Stable	
Seagrass species composition	Green	Stable	
Overall seagrass trends	Green	Improving	
Seagrass Stressors	**Intensity**	**Impact**	**Explanation**
Water Clarity	Yellow	Poor in Boca Ciega Bay	Storm runoff
Nutrients	Orange	Increasing	
Phytoplankton	Yellow	Variable	Responsive to nutrients in storm runoff
Natural Events	Yellow	Low and sporadic	El Niño, tropical cyclones
Propeller Scarring	Yellow	Regional	Near high-use areas



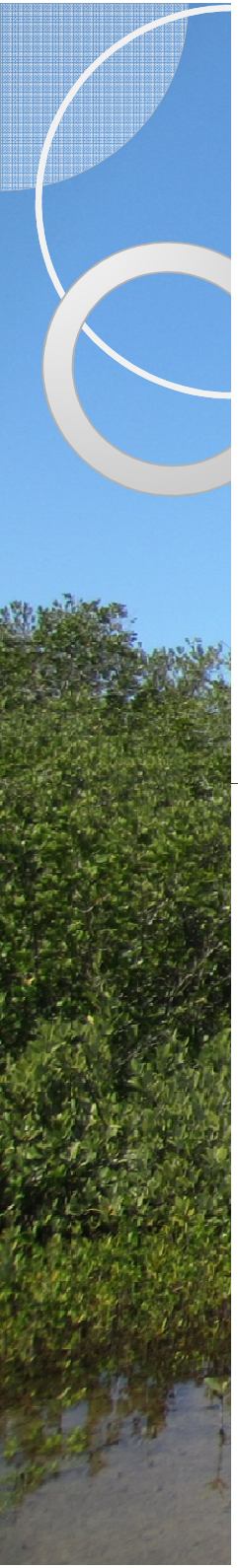
Other components of chapters:

- Availability of mapping and monitoring data
- Mapping and monitoring methods

- Author contacts
- Pertinent websites
- Publications



We use summary information from chapters to create a status and trend summary for the coastal waters of Florida.



Distribution of seagrass area across 5 coastal regions of Florida.

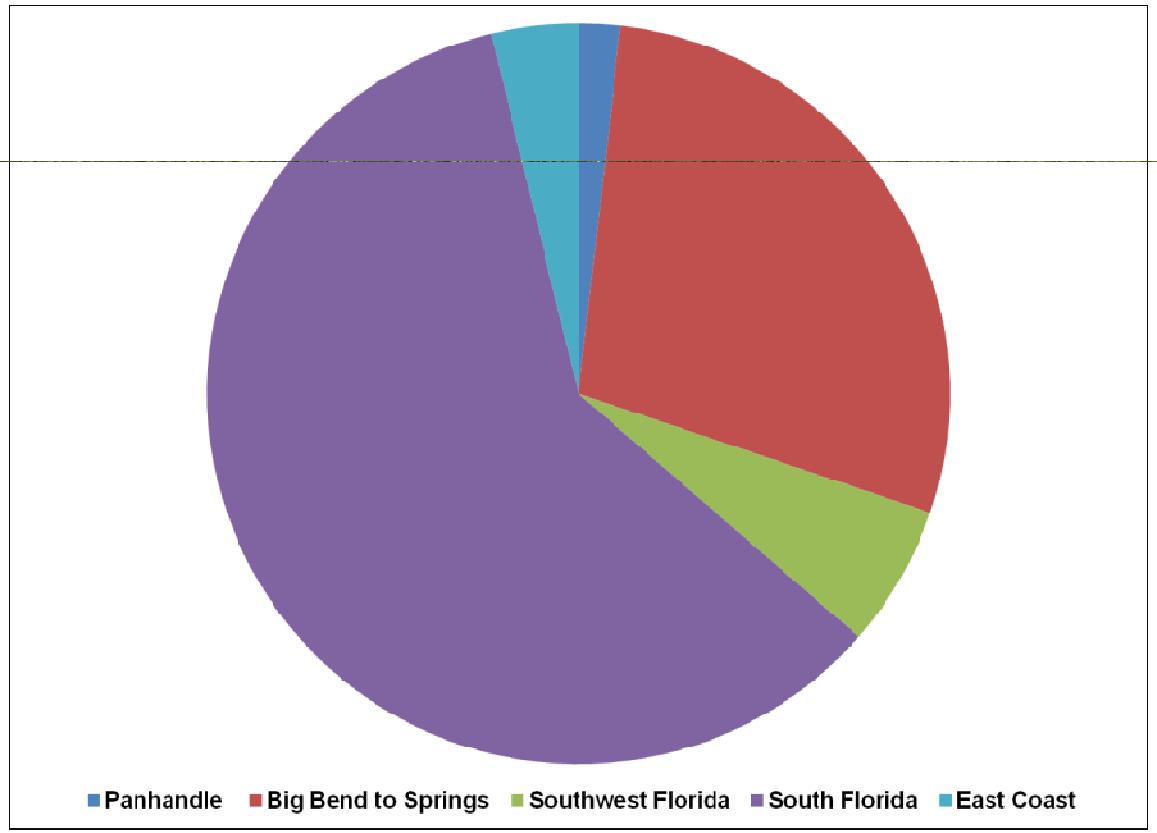
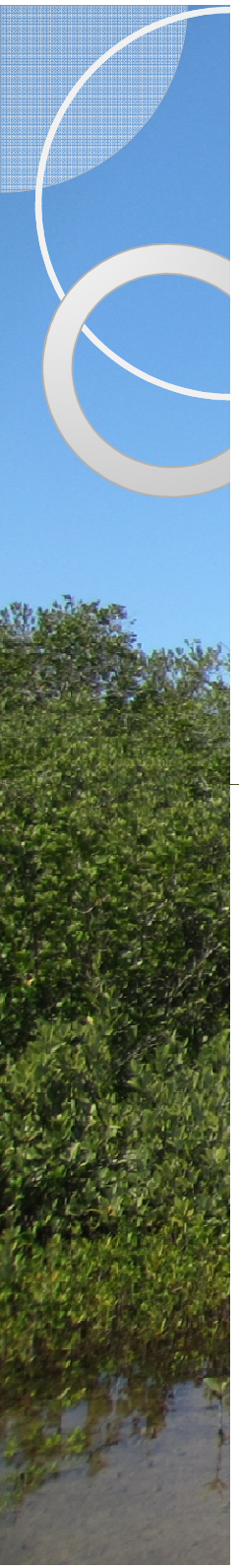


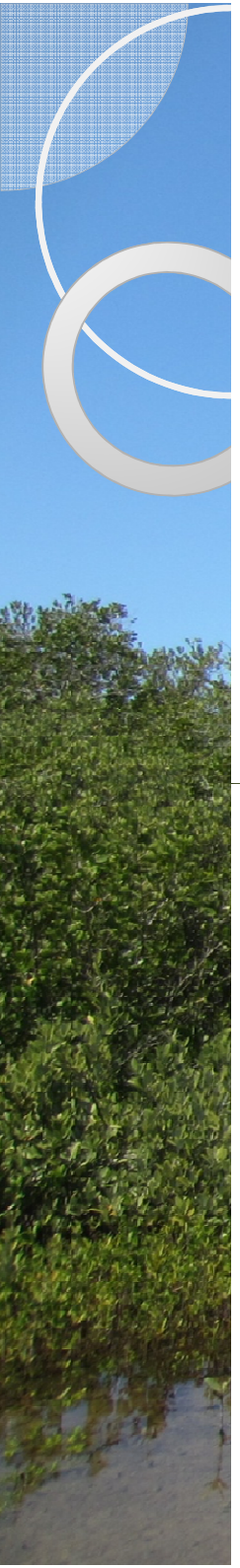
Table ES-4. Mapping estimates of seagrass acreage in estuarine and coastal waters of Florida.

	Mapping data				
	Previous		Most Recent		Change
Estuary/Region	Year	Acres	Year	Acres	(%/yr)
Perdido Bay	1987	642	2002	125	-5.4
Pensacola Bay System	1992	892	2003	511	-3.9
Big Lagoon	1992	538	2003	544	0.10
Santa Rosa Sound	1992	2,760	2003	3,032	0.90
Choctawhatchee Bay	1992	4,261	2003	2,623	-3.5
St. Andrew Bay	1992	9,832	2003	11,233	1.3
St. Joseph Bay	1993	8,170	2006	6,672	-1.4
Franklin County			1992	14,452	n/a
Northern Big Bend region	2001	149,840	2006	149,140	-0.093
Southern Big Bend region	2001	59,674	2006	56,146	-1.2
Suwannee, Cedar Keys, Waccasassa			2001	33,625	n/a
Springs Coast			2007	379,010	n/a
Western Pinellas County	2006	23,943	2008	25,880	4.0
Tampa Bay	2008	29,647	2010	32,897	5.5



How to make the report process work:

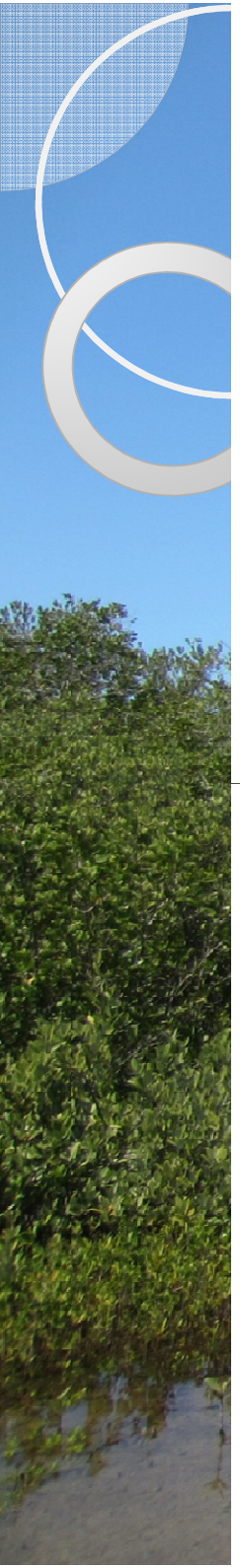
- Easy communication between editors and chapter authors
- Flexibility
- Editing/production support by FWRI a must.
- Web format will allow a continual process of revision and updating of chapters.



Benefits of the reporting process:

- Common methods, stressors, issues become readily apparent
- Enhanced communication among scientists and managers

- Communication about new methods, technologies, available $$
- Ability to quickly respond to RFPs
- Facilitates partnerships in obtaining funding and carrying out monitoring, mapping, development of new technologies.

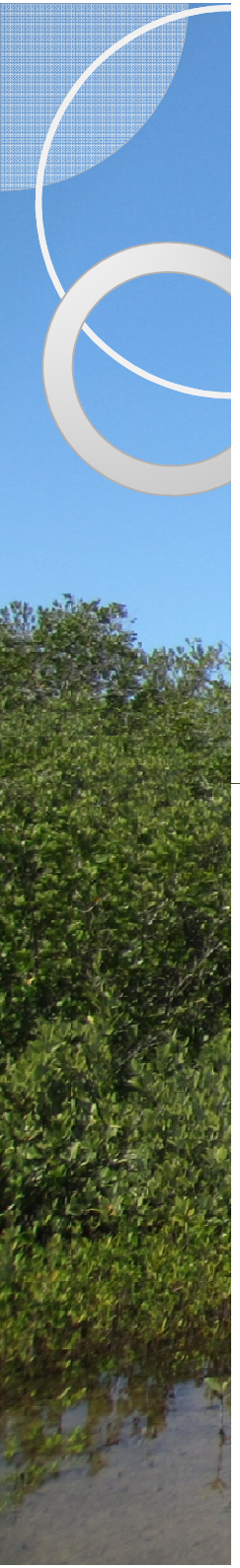


Future SIMM Tasks:

- Compare monitoring results collected using different sampling designs
- Continue to report seagrass status and trends in Florida.
- Optimize data management, statistical analyses, and Web sharing

---

- Close spatial gaps in monitoring programs
- Achieve consistency in mapping cycle times.
- Cut the lag times for seagrass mapping projects
- Reduce costs in imagery acquisition
- Address the limitations of conventional aerial photography
- Provide support for management actions and program maintenance



FWRI SIMM Team Members: Paul Carlson, Rene Baumstark, Christi Santi, Dave Palandro, Kathleen O'Keife, Harry Norris, Paul Julian, Makenzie Marsh, and Laura Yarbro.

Report editing and production staff: Bland Crowder, Jessica Pernell, Amber Whittle, Harry Norris, Aaron Shurtleff, Chris McHan.

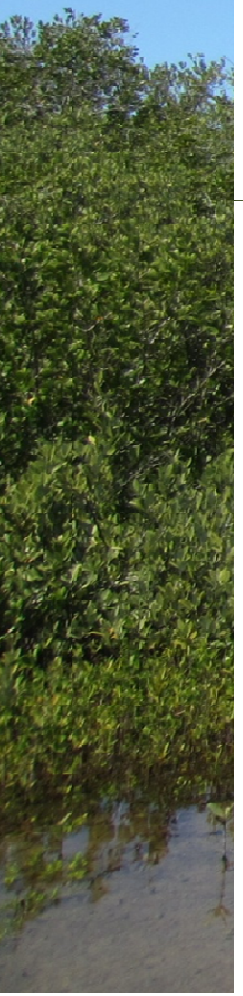
This report was funded, in part, through a grant agreement from the Florida Department of Environmental Protection, Florida Coastal Management Program, by grants provided by the Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act of 1972, as amended, National Oceanic and Atmospheric Administration (NOAA) Award Numbers *NA09NOS4190076, NA07NOS4190071,* and *NA08NOS4190415*. Specific grants are CZ820, CZ920, and CM023. The views, statements, findings, conclusions, and recommendations expressed herein are those of the authors and do not necessarily reflect the views of the State of Florida, NOAA, or any of their sub-agencies.

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NOAA U.S. DEPARTMENT OF COMMERCE

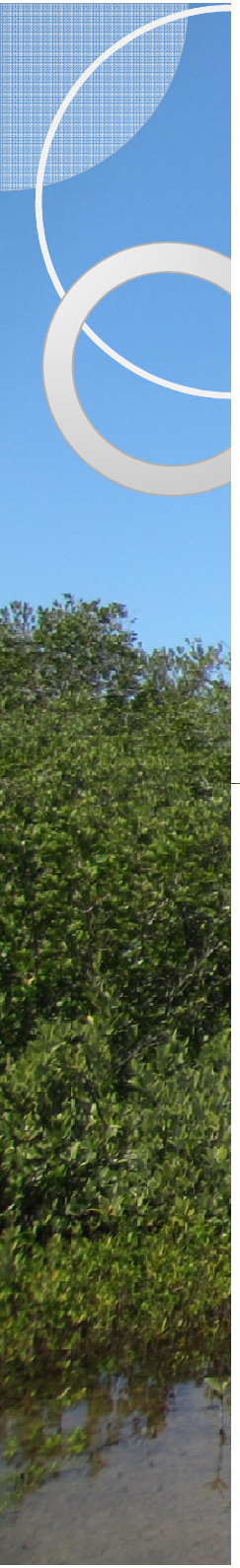
DEPARTMENT OF ENVIRONMENTAL PROTECTION FLORIDA

Florida Coastal Management Program



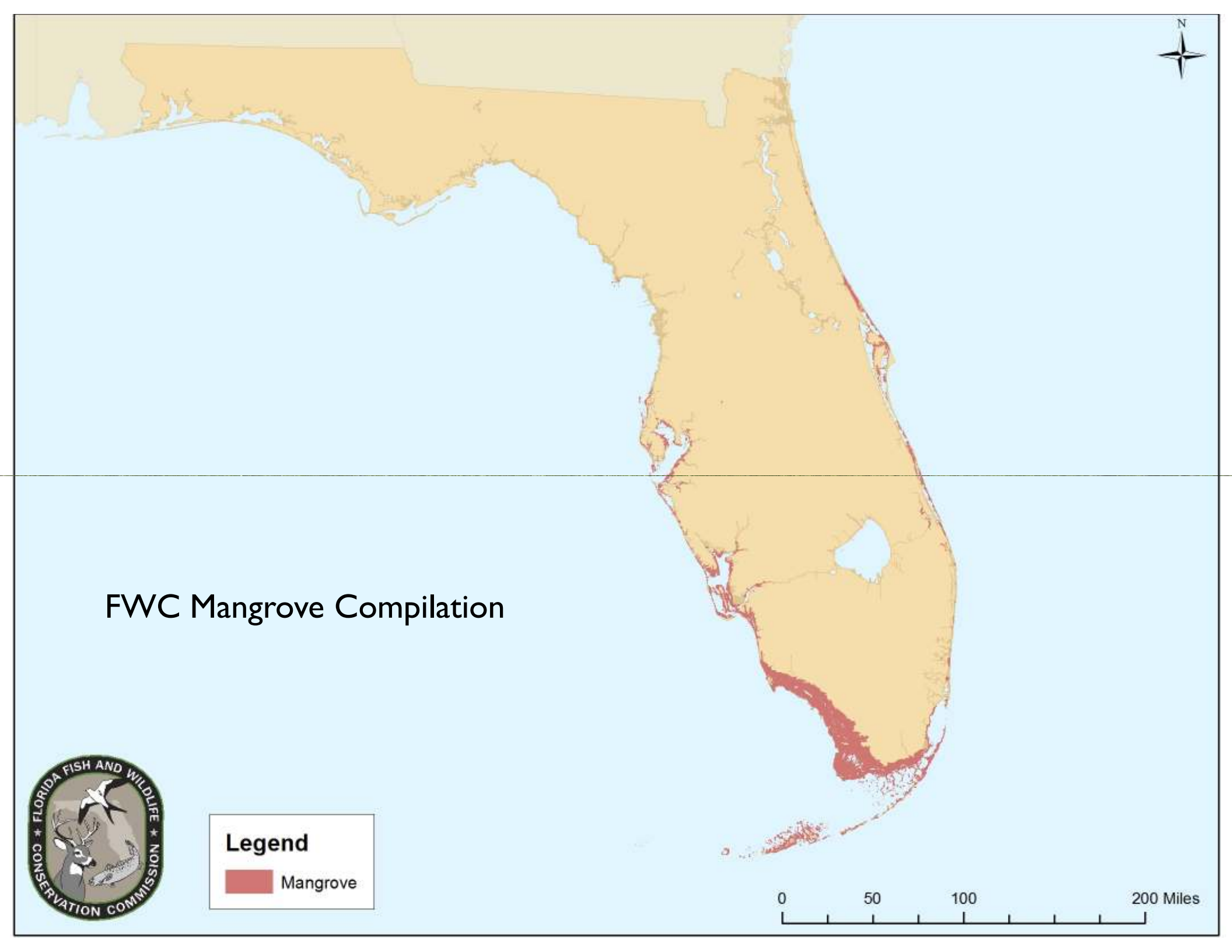
Overview of available coastal wetland geospatial data in Florida

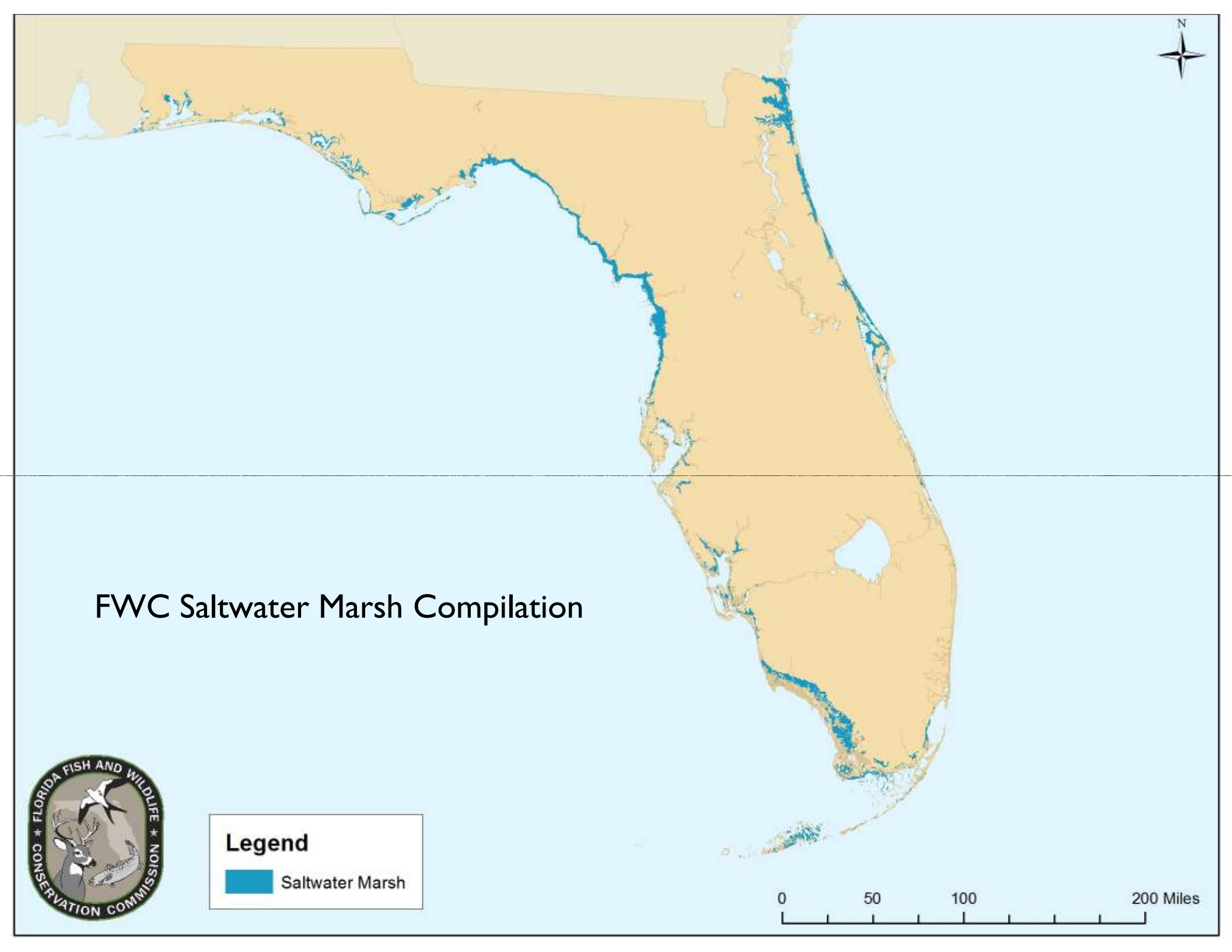
Christi Santi & Kathleen Okeife

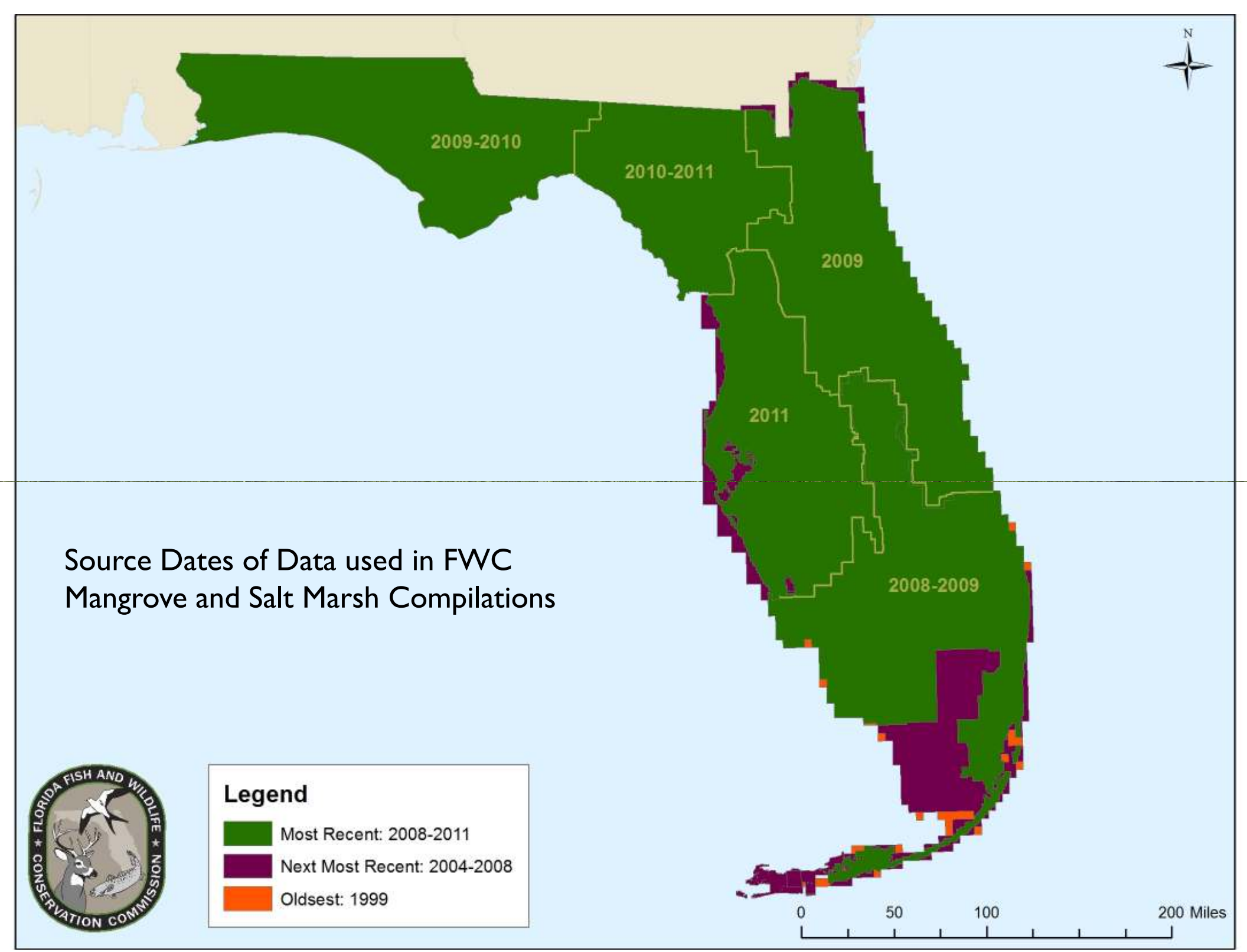


FWC GIS data for CHIMMP

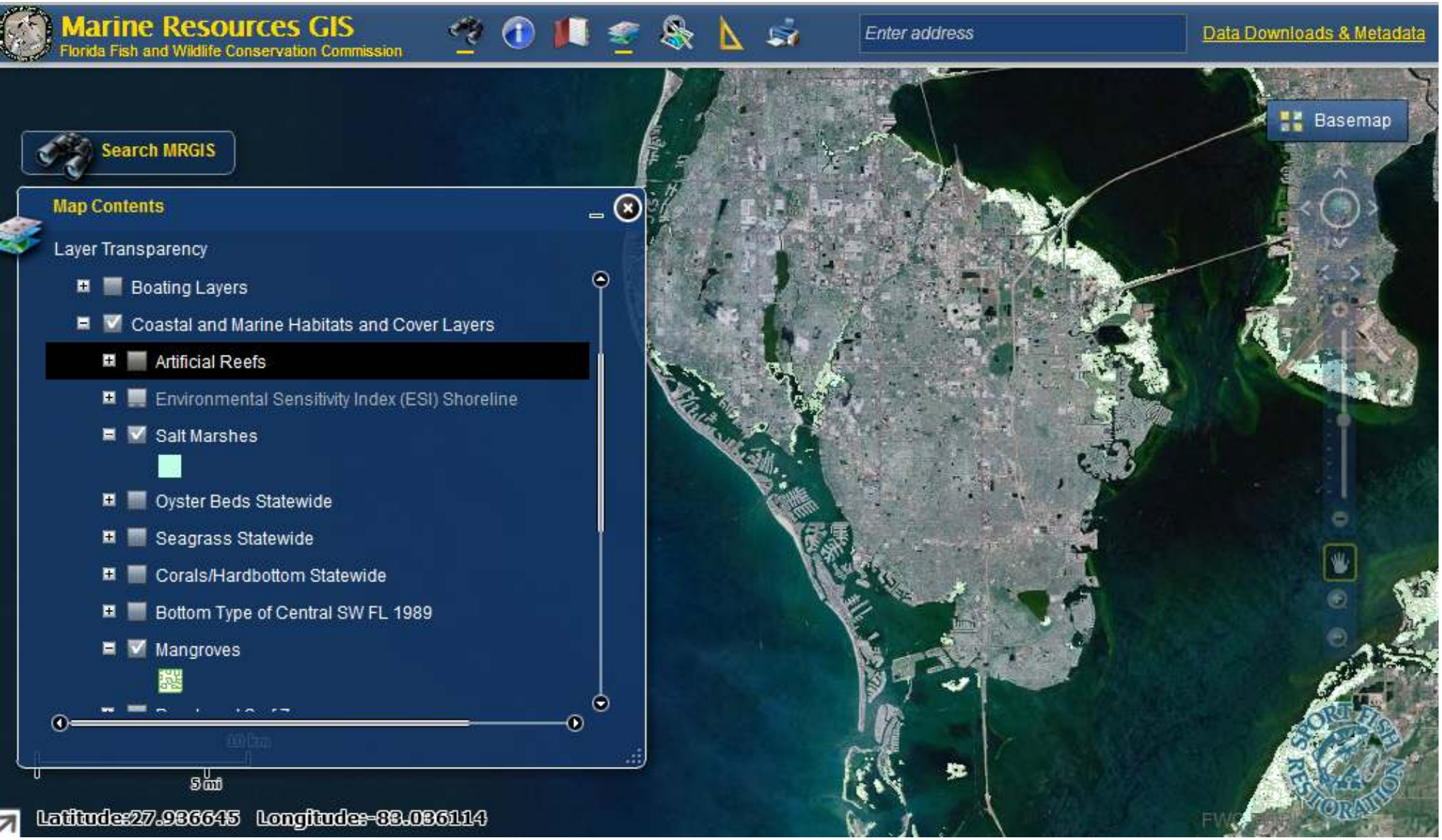
- Compilations of Mangrove and Saltwater Marsh based on Water Management Districts' Land Use - Land Cover data.
- FWC Landcover 2003
  - Raster data: 30 meter cell size
- Other area-specific projects date as far back as 1938.


N
FWC Mangrove Compilation
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
Legend
Mangrove
0
50
100
200 Miles


N
FWC Saltwater Marsh Compilation
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
Legend
Saltwater Marsh
0
50
100
200 Miles


2009-2010
2010-2011
2009
2011
2008-2009
N
Source Dates of Data used in FWC
Mangrove and Salt Marsh Compilations
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
Legend
Most Recent: 2008-2011
Next Most Recent: 2004-2008
Oldsest: 1999
0
50
100
200 Miles

Marine Resources GIS Map Service



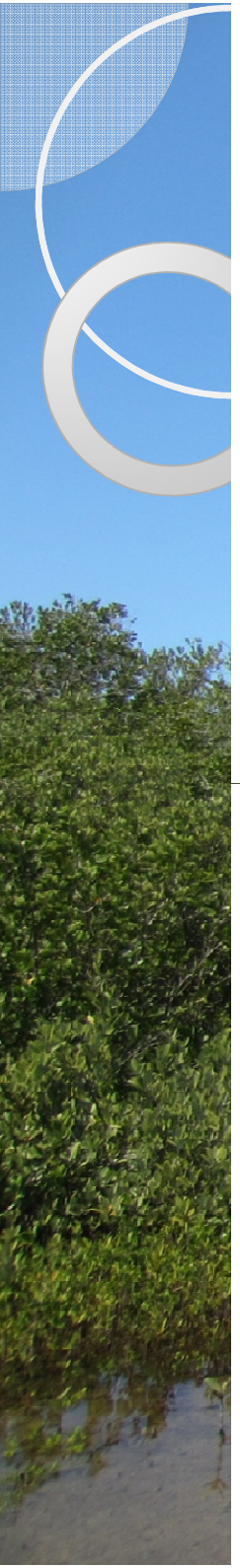
Marine Resources GIS
http://ocean.floridamarine.org/mrgis

The Geospatial Assessment of Marine Ecosystems (GAME) is a project that aims to define and describe marine ecosystems to assist management of coastal and marine waters.

Geospatial Assessment of Marine Ecosystems

G.A.M.E.

http://myfwc.com/research/gis/game



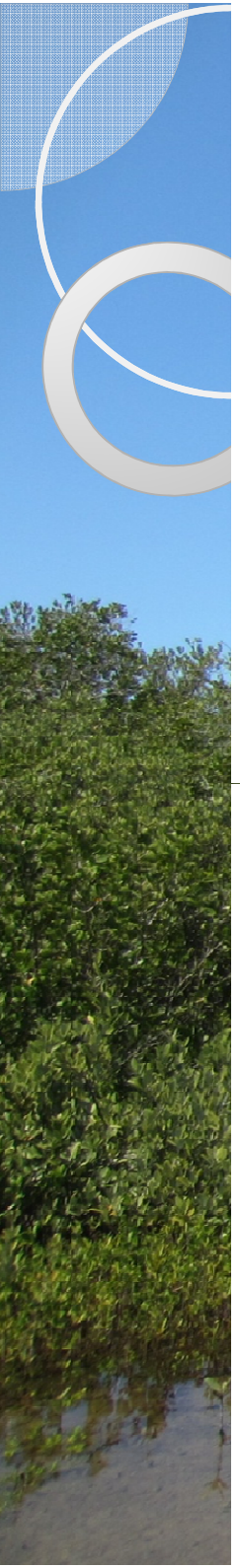
Resources

- Downloadable GIS data:

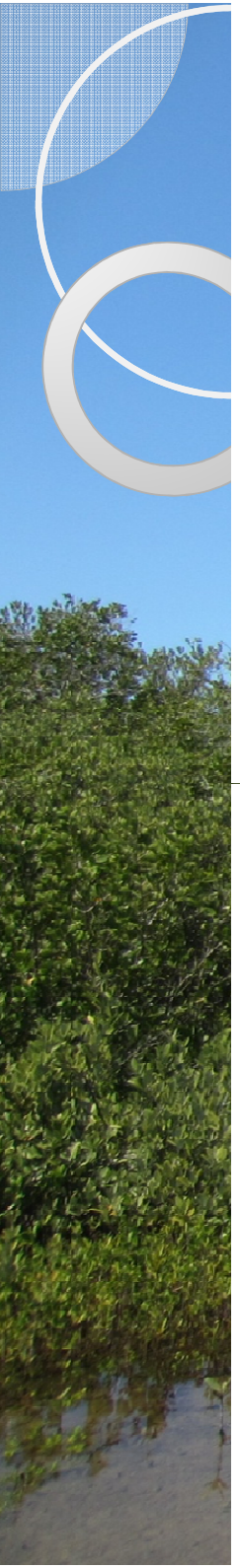
http://myfwc.com/research/gis/data-maps/

  - Freshwater Shapefiles
  - Marine Shapefiles
  - Terrestrial Shapefiles
  - KMZ files for Google Earth

- To order Marine Resources GIS CD or specific GIS data, email: GISLibrarian@MyFWC.com
- For other questions call Kathleen OKeife or Christi Santi 727-896-8626



Day 1
Wrap-up

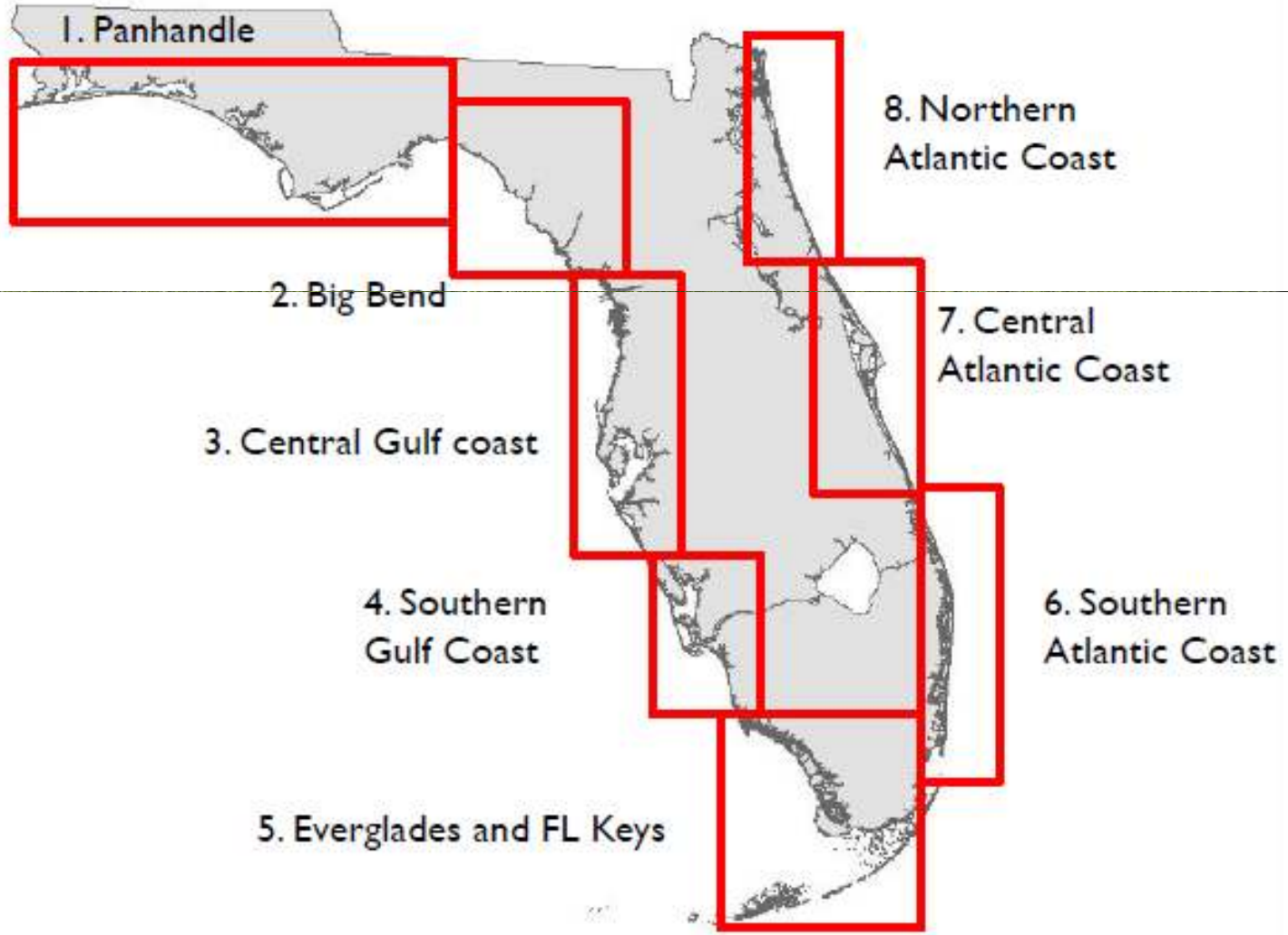


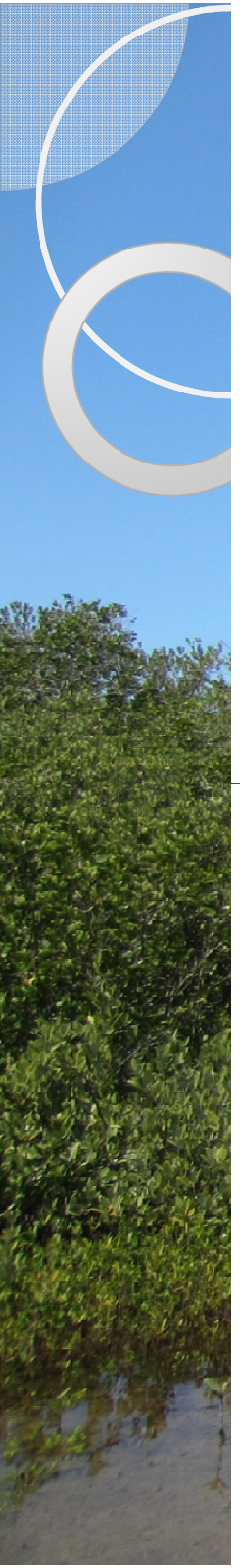
Day 2 Itinerary

- **8:30-9:00 am** Travel reimbursement paperwork
- **9:00-9:45 am** Overview of CHIMMP Report process
- **9:45-10:15 am** Regional breakout I
- **10:15-10:45 am** Reconvene and Discuss
- Break
- **11:00-11:30 am** Regional breakout II
- **11:30-12:30 pm** Reconvene and Conclusion

Complete Surveys

- Regions of expertise:

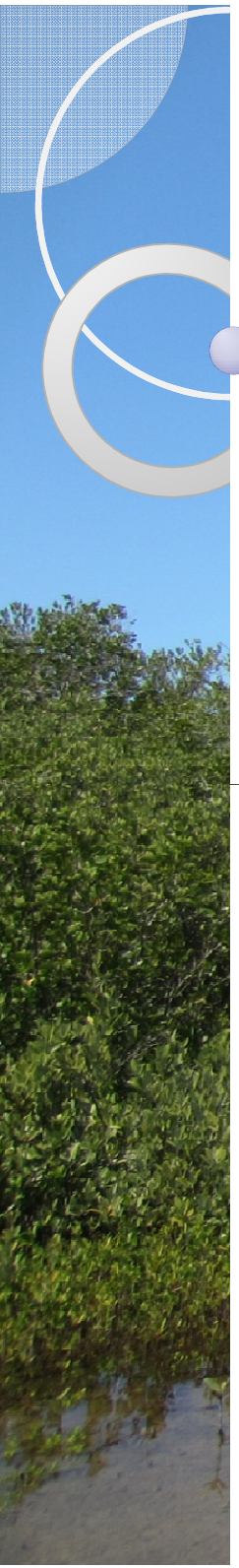




Travel Reimbursements

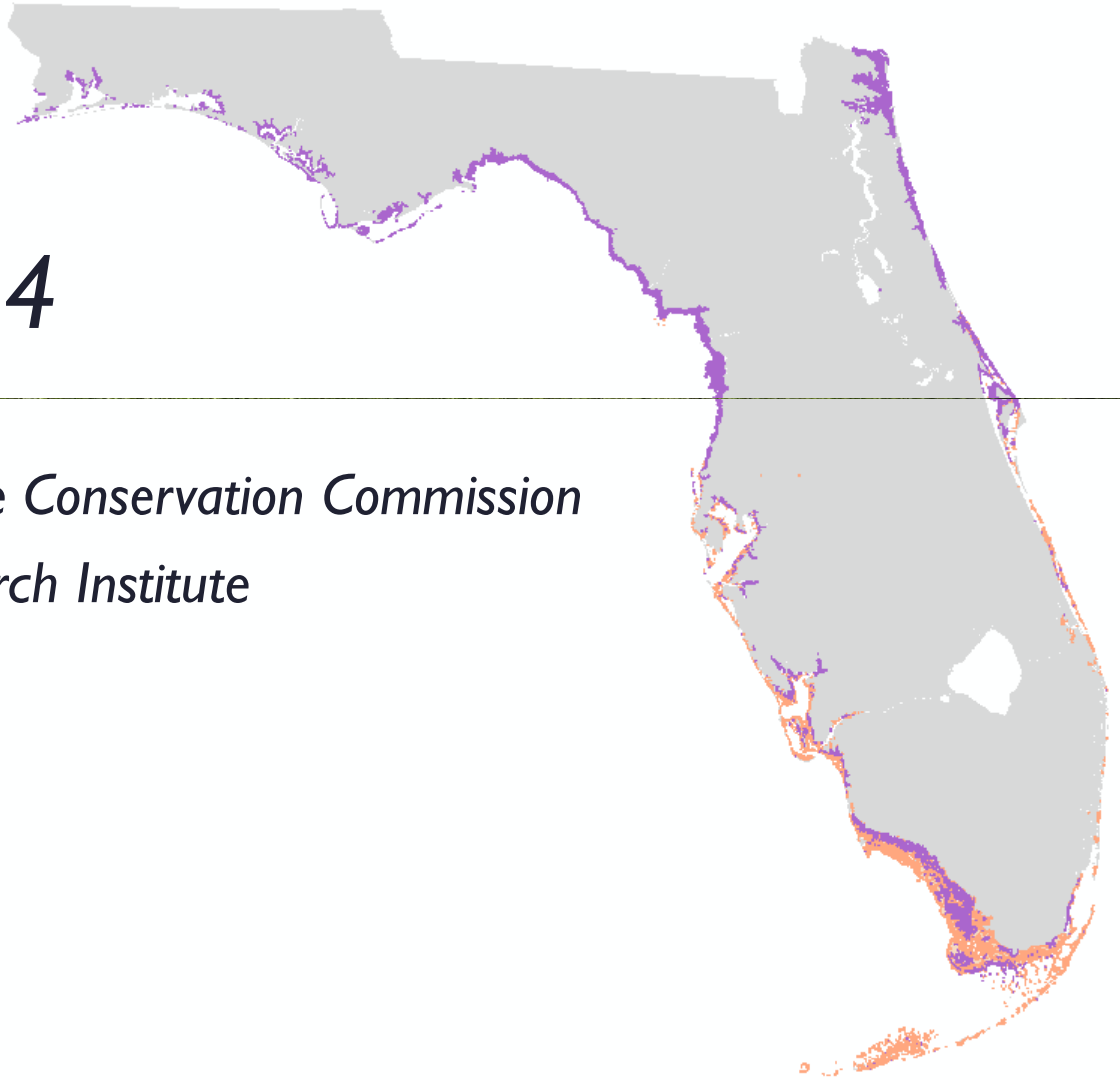
- Complete reimbursement paperwork between 8:30-9 am tomorrow
- Bring ***original*** hotel receipt
- 9 am start workshop

Coastal Habitat Integrated Mapping and Monitoring Program (CHIMMP)



Day 2

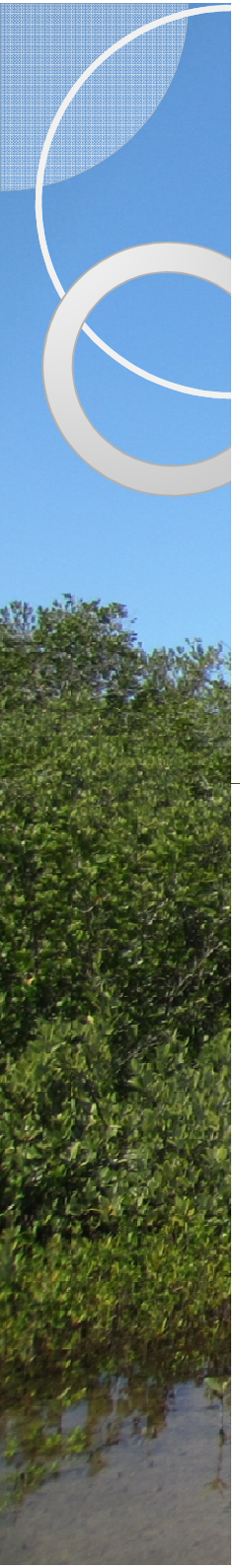
April 30 2014



Florida Fish and Wildlife Conservation Commission

Fish and Wildlife Research Institute

St. Petersburg, Florida

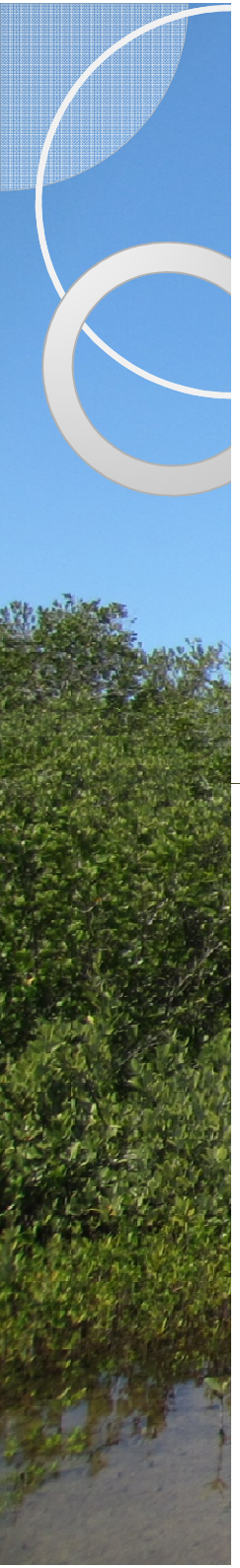


Day 2 Itinerary

- **8:30-9:00 am** Travel reimbursement paperwork
- **9:00-9:45 am** Overview of CHIMMP Report process
- **9:45-10:15 am** Regional breakout I
- **10:15-10:45 am** Reconvene and Discuss
- Break
- **11:00-11:30 am** Regional breakout II
- **11:30-12:30 pm** Reconvene and Conclusion

CHIMMP report overview

- **General introduction**
  - Compiled by FWC coastal wetlands group & CHIMMP team
- **Regional chapters**
  - Compiled by local experts



CHIMMP Report Contents (General, compiled by FWC coastal wetlands group)

- Introduction to coastal wetlands
  - Salt marsh/mangrove vegetation
  - Ecological & commercial value
  - Current threats to coastal wetlands

- Overview of methods used to determine land cover
- Summary of land cover classification schemes in FL
- Summary of land cover mapping data available in FL

Vegetation Classification Schemes

Name	Affiliation	Reference
Florida Land Use and Cover Classification System (FLUCCS)	FL Department of Transportation	FLUCCS 1999
Guide to the Natural Communities of Florida	FL Natural areas Inventory	FNAI 2010
Descriptions of vegetation and land cover types mapped using Landsat imagery	FWC	Gilbert and Stys 2004
Florida Land Cover Classification System	FWC	Kawula 2009
Classification of Wetlands and Deepwater Habitat of the United States	FWS	Cowardin et al. 1979

And many more….

Classification Crosswalk

Florida Land Cover Classification System (Kawula 2009)	FWC (Gilbert and Stys 2004)	Florida land use and cover classification system (FLUCCS 1999)	Guide to the Natural Communities of Florida (FNAI 2010)
5242 Saltwater marshes	**23 Salt marsh**	**642 Saltwater marshes**	**Salt marsh**
52421 Cordgrass	-	6421Cordgrass	-
52422 Needlerush	-	6422 Needlerush	-
-	-	-	Salt flat
5251 Mangrove	**24 Mangrove swamp**	**612 Mangrove swamp**	**Mangrove swamp**
-	**25 Scrub mangrove (Keys only)**	-	-
-	-	-	Buttonwood forest

(Kawula 2009)

Florida land cover data sets

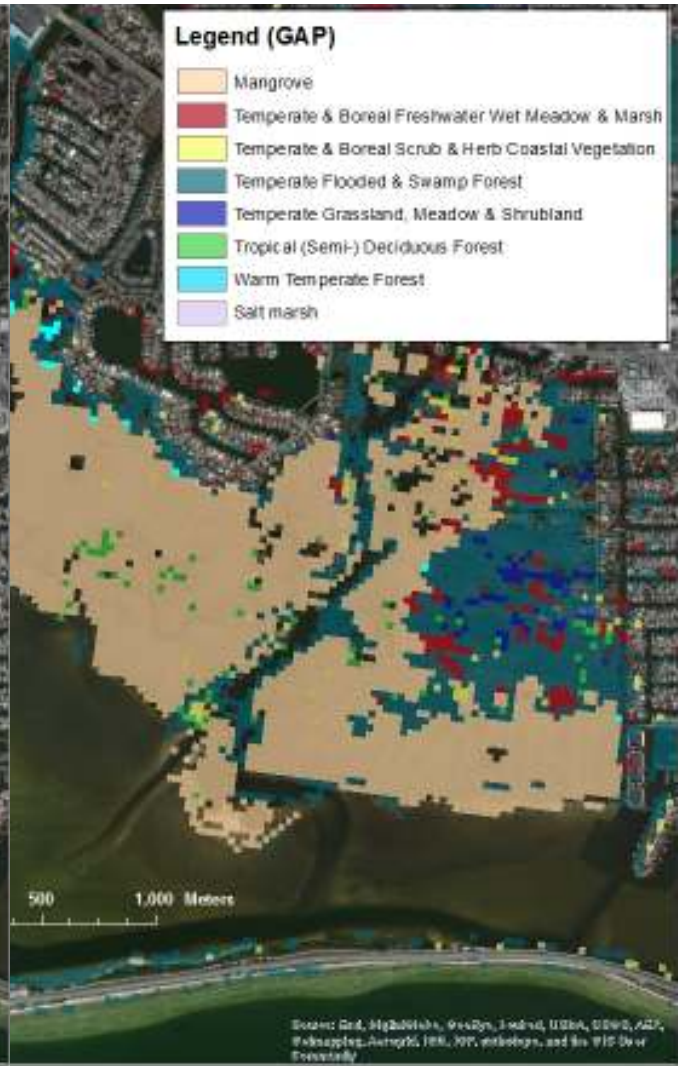
Program	Affiliation	Region, most recent dates	Classification scheme	Reference
FL water management districts (WMD)	WMD	WMD, 2008-2011	FLUCCS 1999	District-specific
2003 Florida Vegetation and Land Cover	FWC	Florida, 2003	Gilbert and Stys 2004	Stys et al 2004, Kautz et al. 2007 http://ocean.floridamarine.org/mrgis/
National Gap Analysis Program (GAP)	USGS	National, 1999-2001	NatureServe 2007 (and US NVC)	Gergely and McKerrow 2013, http://gapanalysis.usgs.gov/
National Wetlands Inventory (NWI)	NWS	National, 1970's to 2000's	Cowardin et al. 1979	FWS 2010 http://www.fws.gov/wetlands/
Cooperative Land Cover (CLC) map	FNAI, FWC	Florida, 2003-2010	Kawula 2009	CLC 2010 http://www.fnai.org/LandCover.cfm

Variable land cover maps – NE Tampa Bay

Water Management District (2010)

2003 Florida Vegetation and Land Cover (FWC)

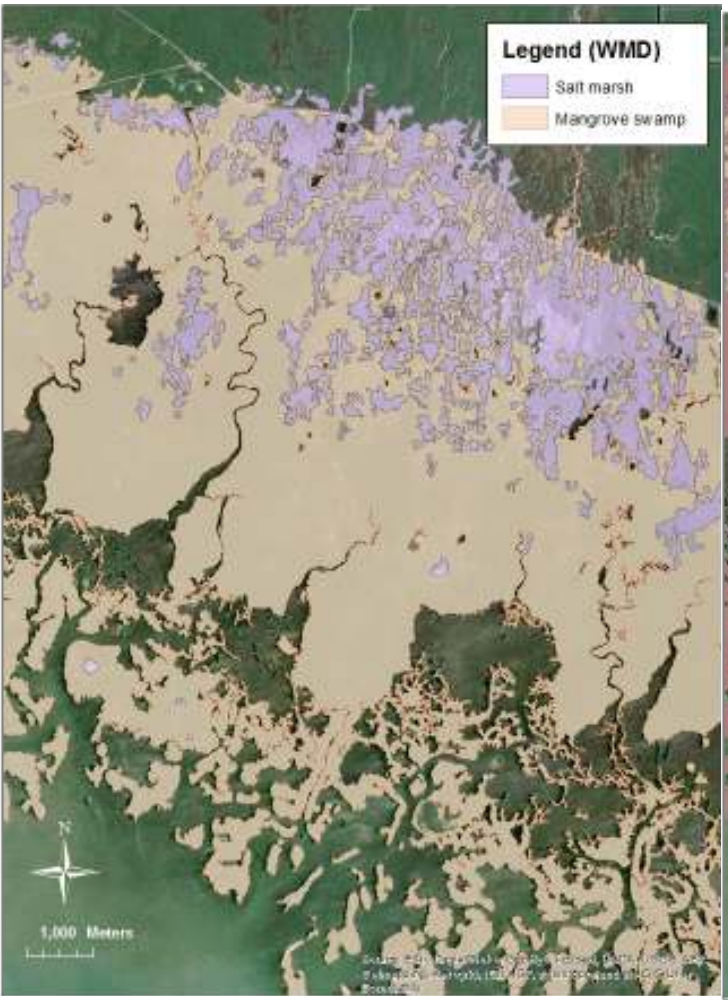
National Gap Analysis Program (1999-2001)



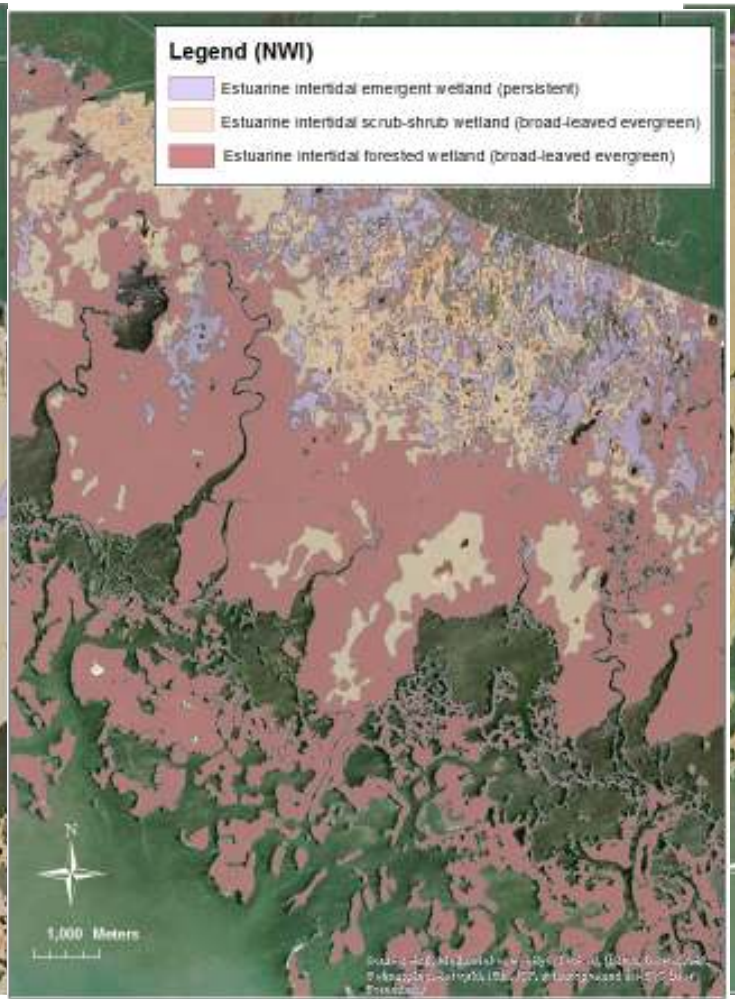
Cooperative Land Cover (CLC) maps are based upon WMD maps and so are very similar

Variable land cover maps – Ten Thousand Islands

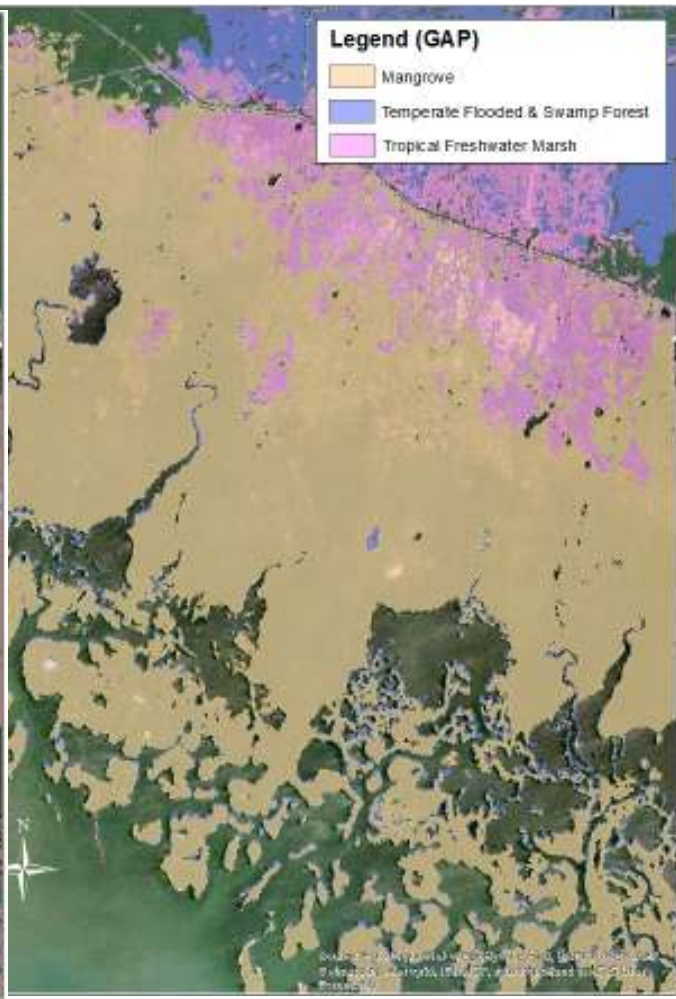
Water Management District (2008-2009)



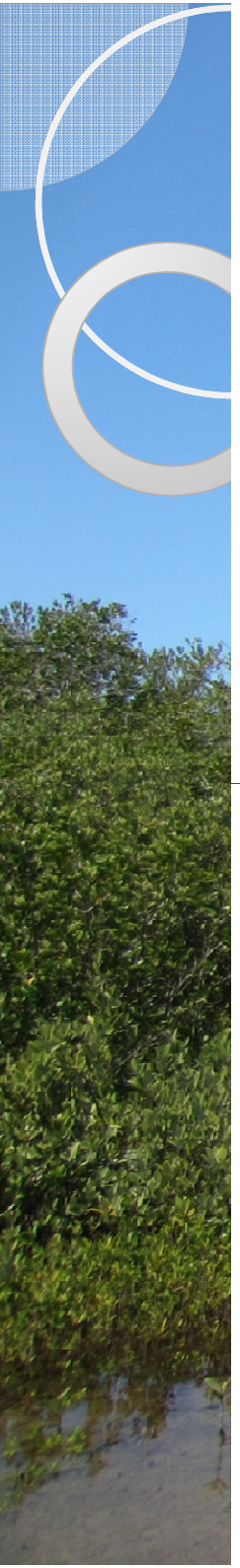
National Wetlands Inventory (2009)



National Gap Analysis Program (1999-2001)



Cooperative Land Cover (CLC) maps are based upon WMD maps and so are similar



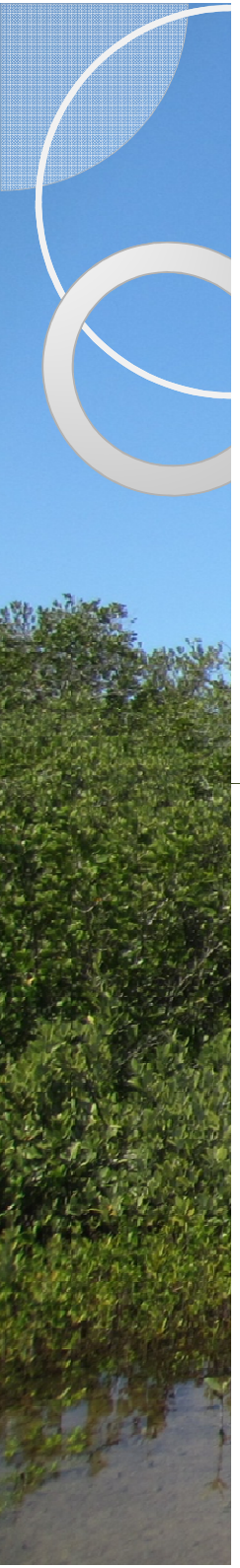
Suggestions for Regional Chapter Contents

- Mangrove/salt marsh map of region
- Local assessment of status
- Summary of regional mapping and monitoring programs and data availability.
- Additional data (author's choice)
- Regional recommendations for protection, management, restoration
- Report card?

SIMM Report card example

Seagrass Status Indicators	Status	Trend	Assessment, Causes
Seagrass cover		Declining	Losses, hypoxia
Seagrass meadow texture		Poor growth	Mortality, stunted, sparse
Seagrass species composition		Little change	Salinity changes, high sulfide levels
Overall seagrass trends		Declining	Salinity changes, high sulfide levels
Seagrass Stressors	**Intensity**	**Impact**	**Explanation**
Water clarity		Some improvement	Poor in some areas
Nutrients		Good	Low levels, little runoff
Phytoplankton		Good	Low levels

- **Green**—Healthy, improving, stable conditions
- **Yellow**—Declining, some stress present, some threats to ecosystem health
- **Orange**—Measureable declines, moderate stressors or declines in seagrass cover
- **Red**—Large negative changes in seagrass health and stressors, either acutely over a short period of time, or chronically over a period of years.



CHIMMP report card ideas

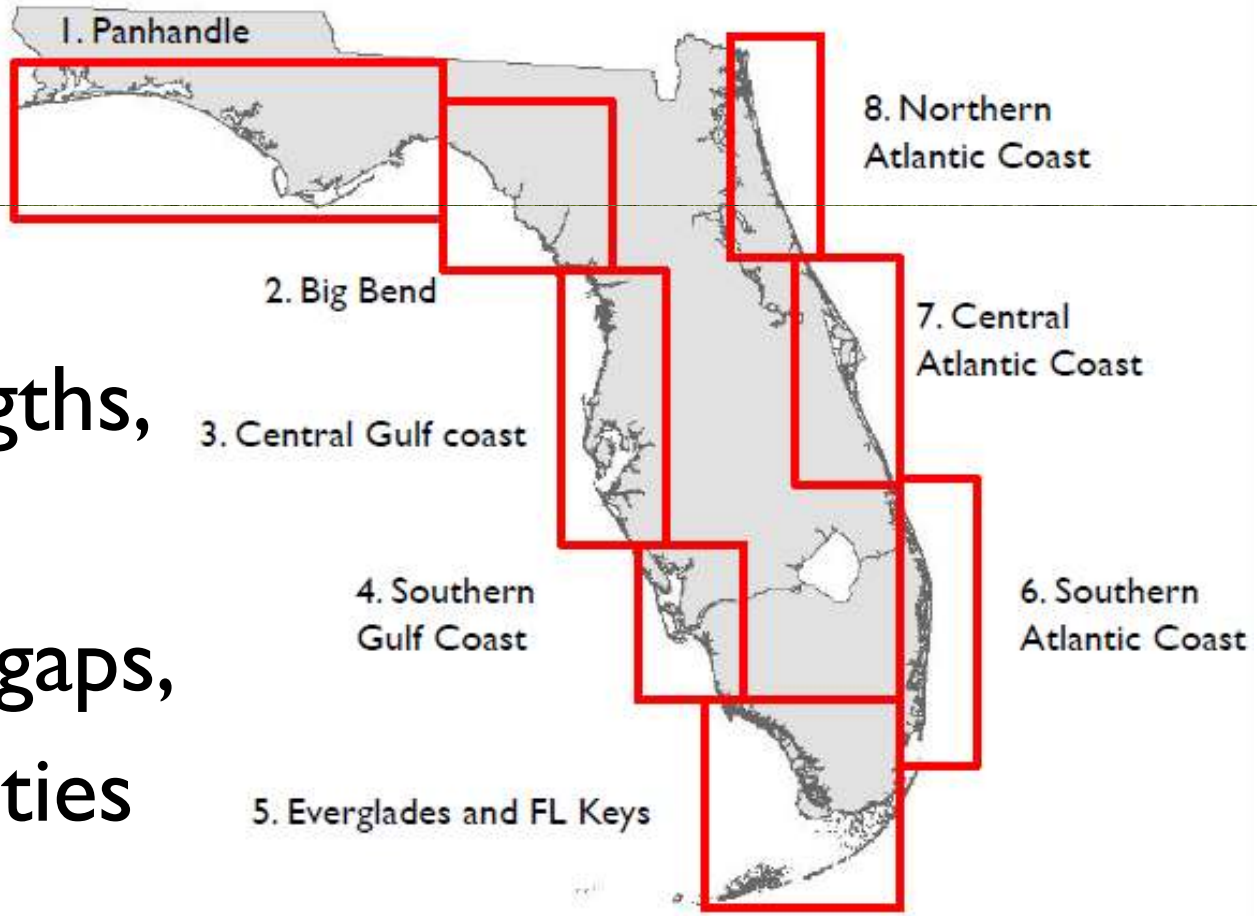
- **Possible CHIMMP report card criteria:**
  - Total area or % coverage of coastal wetlands
  - % change in coastal wetland extent
  - Human population growth within watershed
  - Room for inland migration

- **Report card criteria must be documented/traceable** (not anecdotal)

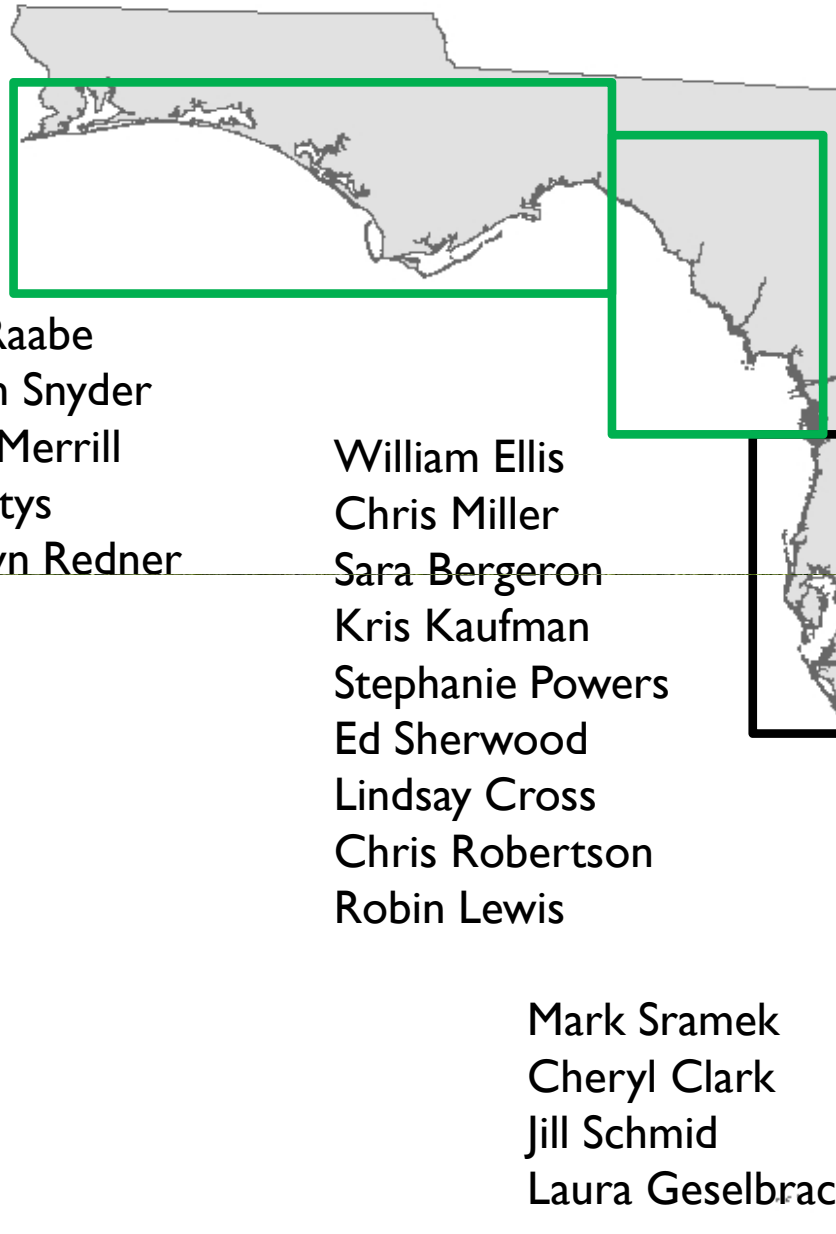
Comments & ideas for report card?

Regional breakout 1

- Discuss regional boundaries, redraw or split regions (if necessary)



- Identify regional strengths, weaknesses, partnerships, gaps, and opportunities



Ellen Raabe
Caitlyn Snyder
Maria Merrill
Beth Stys
Jennylyn Redner

William Ellis
Chris Miller
Sara Bergeron
Kris Kaufman
Stephanie Powers
Ed Sherwood
Lindsay Cross
Chris Robertson
Robin Lewis

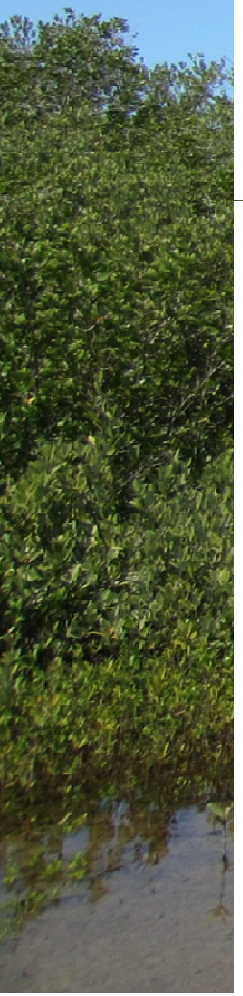
Mark Sramek
Cheryl Clark
Jill Schmid
Laura Geselbracht

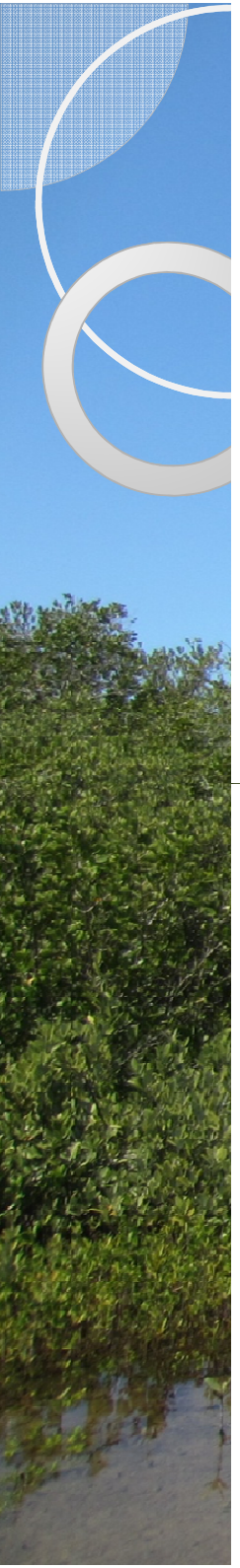
Ron Brockmeyer
Nikki Dix
Andrea Small
J Cho

Jeff Beal
Pamela Sweeney
Eric Anderson

Regional breakout II

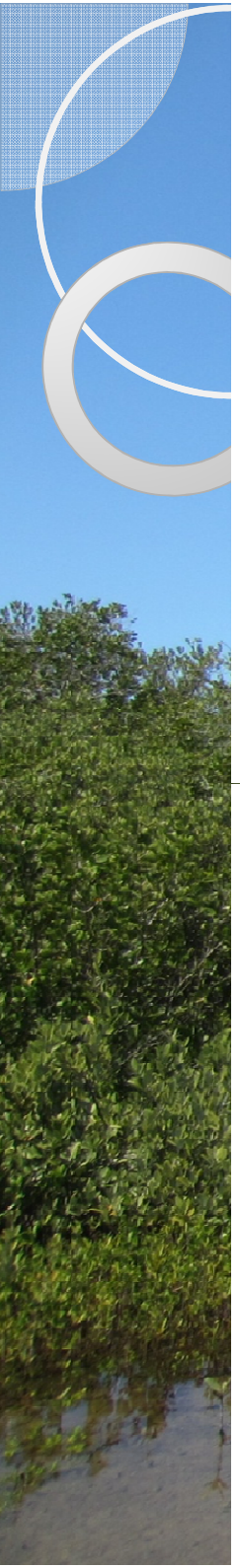
- Identify regional leader and co-authors
- Who's not here?
- Suggestions for the future?





Conclusions

- Thank you for all your input!
- Please email with comments, suggestions of datasets or collaborators, offers to contribute expertise
- Summary table (region specific) rather than report card



Workshop Conclusion