

Mapping and Monitoring Resources for Florida Coastal Wetlands

Table 1. Selected land cover and vegetation classification schemes for mangroves and salt marshes.

Name	Affiliation	Region	Coastal Wetland Classification Scheme	Reference
Florida Land Use and Cover Classification System (FLUCCS)	Florida Department of Transportation (FDOT)	Florida	Wetlands Wetland hardwood forests Mangrove swamp Vegetated nonforested wetlands Saltwater marshes Cordgrass Needlerush	FDOT 1999
Guide to the Natural Communities of Florida	Florida Natural Areas Inventory (FNAI)	Florida	Marine and estuarine vegetated wetlands Salt marsh Salt flat Mangrove swamp Buttonwood forest Keys tidal rock barren	FNAI 2010
Descriptions of Vegetation and Land Cover Types Mapped Using Landsat Imagery	Florida Fish and Wildlife Conservation Commission (FWC)	Florida	Marine and estuarine Salt marsh Mangrove swamp Scrub mangrove (Keys only)	Gilbert and Stys 2004
Florida Land Cover Classification System	FWC	Florida	Estuarine, intertidal Exposed limestone Vegetated Keys tidal rock barren Tidal marsh Tidal marsh barren Saltwater marshes Cordgrass Needlerush Tidal swamp Mangrove	Kawula 2009
Vegetation Classification for South Florida Natural Areas	University of Georgia, U.S. National Park Service, South Florida Water Management District	Everglades	Forest Mangrove forest Woodland Mangrove woodland Shrubland Mangrove shrubland Scrub Mangrove scrub Marsh Salt marsh (partial list, further subdivisions available)	Rutchev et al. 2006

NatureServe Terrestrial Ecological Classifications	NatureServe, Landfire, The Nature Conservancy	Southeastern United States	Woody wetlands and riparian Caribbean coastal wetland systems South Florida mangrove swamp Southwest Florida perched barriers tidal swamp and lagoon Herbaceous wetlands Gulf and Atlantic coastal plain tidal marsh systems Atlantic coastal plain Indian River Lagoon tidal marsh Central Atlantic coastal plain salt and brackish tidal marsh Florida Big Bend salt and brackish tidal marsh	NatureServe 2007
Classification of Wetlands and Deepwater Habitat of the United States	U.S. Fish and Wildlife Service (USFWS)	National	Estuarine, intertidal Emergent wetland Persistent Scrub-shrub wetland Broad-leaved evergreen Forested wetland Broad-leaved evergreen	Cowardin et al. 1979
National Vegetation Classification Standard, v. 2	Federal Geographic Data Committee	National	Forest and woodland Tropical moist forest Mangrove Shrubland and grassland Temperate and boreal shrubland and grassland Temperate and boreal salt marsh (partial list, further subdivisions available)	FGDC 2008
National Land Cover Data (NLCD)	USGS	National	Wetlands Woody wetlands Emergent herbaceous wetlands	www.mrlc.gov Vogelmann et al. 1998
Coastal Change Analysis Program (C- CAP) Classification System	National Oceanic and Atmospheric Administration	National	Wetland Marine/estuarine emergent wetland Haline (salt marsh) Mixohaline (brackish marsh) Estuarine woody wetland Evergreen Forest Scrub-shrub Dead	Klemas et al. 1993, Dobson et al. 1995

Table 2. Selected large-scale providers of coastal wetland land cover data in Florida

Program	Affiliation, region of map extent	Data origin, most recent data	Classification scheme	Reference
National Wetlands Inventory (NWI)	USFWS, national	Composite of multiple data and aerial image sources, 1970s to 2000s	Cowardin et al. 1979	USFWS 2010 www.fws.gov/wetlands
National Gap Analysis Program (GAP)	USGS, national	Southeast Gap Analysis Project, 1999–2001	NatureServe 2007, FGDC 2008	gapanalysis.usgs.gov/
Southeast Gap Analysis Project	USGS & North Carolina State Univ., southeastern U.S.	Landsat ETM+ and DEM models used to model vegetation classes, 1999–2001	NatureServe 2007, FGDC 2008	www.basic.ncsu.edu/segap/index.html
Wetland Status and Trends	USFWS, national	Remote imagery and randomized sample plots, 2009	Cowardin et al. 1979	Dahl 2005, 2011 www.fws.gov/wetlands/Status-and-Trends/
Coastal Change Analysis Program (C-CAP)	NOAA, national coastline	Landsat 5 TM satellite imagery, 2010	Dobson et al. 1995	coast.noaa.gov/ccapftp/#/
2003 Florida Vegetation and Land Cover	FWC, Florida	Landsat ETM+ satellite imagery, 2003	Gilbert and Stys 2004	Stys et al. 2004, Kautz et al. 2007 ocean.floridamarine.org/mrgis/
Florida Water Management Districts (WMD) Land Use Land Cover (LULC) maps	NFWFMD	Color infrared or true color aerial photography, 2012–2013	FDOT 1999	www.fgdl.org/metadatexplorer/explorer.jsp
	SRWMD	Color infrared or true color aerial photography, 2010–2011	FDOT 1999	www.srwmd.state.fl.us/index.aspx?NID=319
	SFWWMD	Color infrared aerial photography, 2011	FDOT 1999	www.swfwmd.state.fl.us/data/gis/
	SFWMD	Composite of multiple data sources (see SFWMD 2005 for full listing), 2008–2009 (limited extent available for 2011–2013)	FDOT 1999, SFWMD 2009	my.swfwmd.gov/gisapps/sfwmdxwebdc/
	SJRWMD	Color infrared aerial photography, 2009	FDOT 1999, SJRWMD 2009	floridaswater.com/gisdevelopment/docs/themes.html
FWC compilation of WMD mangroves and salt marshes	FWC, Florida	Compilation of WMD data, 1999–2011	FDOT 1999	geodata.myfwc.com/
Gulf of Mexico Data Atlas	NOAA, Gulf of Mexico coast and all of Florida	Mangrove data from FWC compilation of WMD data, wetlands data from NWI, 2000–2005	Mangrove data: FDOT 1999, NWI data: Cowardin et al. 1979	gulfatlas.noaa.gov/

Cooperative Land Cover (CLC) map	FNAI and FWC, Florida	Compiled from FWC 2003 land cover (Stys et al. 2004), WMD, aerial photography, and local data collections, 2003–2011	FNAI 1990, FDOT 1999, Gilbert and Stys 2004, Kawula 2009.	Knight et al. 2010 www.fnai.org/LandCover.cfm
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Table 3. Examples of monitoring procedures used for coastal wetlands in Florida.

Name	Association, Region	Focus	Reference
Wetland Assessment Procedure (WAP)	SWFWMD and Tampa Bay Water (TBW), Florida	Monitoring isolated wetlands for management considerations	SWFWMD and TBW 2005
Wetland Rapid Assessment Procedure (WRAP)	SFWMD, Florida	Rating index for monitoring temporal changes in altered wetlands	Miller and Gunsalus 1997
Monitoring and Assessment Plan (MAP)	Comprehensive Everglades Restoration Plan (CERP), South Florida	MAP is used as a tool to assess CERP	CERP 2004
Uniform Mitigation Assessment Method (UMAM)	Florida Department of Environmental Protection (FDEP), Florida	Methods for assessing mitigated habitats in Florida	FDEP 2012
South Florida/Caribbean Network (SFCN) Vital Signs Monitoring Plan	National Park Service (NPS) SFCN, South Florida	Monitor vital signs of national park ecosystems in SFCN, including coastal wetlands	Patterson et al. 2008
Vital Signs Monitoring in the Southeast Coast Inventory & Monitoring Network (SECN I&M)	NPS SECN I&M, Northeast Florida	Monitor vital signs of national park ecosystems in SECN, including coastal wetlands	DeVivo et al. 2008
Nutrient Criteria Technical Guidance Manual: Wetlands	U.S. Environmental Protection Agency (EPA), national	Assessing nutrient status and developing nutrient criteria for wetlands	USEPA 2008
Hydrogeomorphic Methodology (HGM)	U.S. Army Corps of Engineers, EPA, Federal Highway Administration, Natural Resources Conservation Service, and U.S. Fish and Wildlife Service, national	Evaluates wetland functionality and predicts impacts of future changes	USACE 2010
NERRS System-Wide Monitoring Program (SWMP) Vegetation Monitoring Protocol	National Estuarine Research Reserve System (NERRS), national with 3 reserves in Florida	Long-term estuarine and coastal wetland vegetation monitoring	Moore 2013
Coastal Blue Carbon	The Blue Carbon Initiative, international	Methods for assessing carbon stocks and emissions of coastal wetlands and seagrass	Howard et al. 2014
Ecological Mangrove Rehabilitation: A field manual for practitioners	Mangrove Restoration, international	Practical international guide for mangrove rehabilitation and monitoring	Lewis and Brown 2014

Methods for Studying Mangrove Structure	UNESCO Scientific Committee on Ocean Research, international	Field methods for quantifying mangrove structure	Cintron and Novelli 1984
Remote sensing procedures (general)	Varied	Use of satellite data, aerial photographs, and LiDAR to monitor wetlands	Kasischke and Bourgeau-Chavez 1997, Ozesmi and Bauer 2002, Dahl 2006, Klemas 2011

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