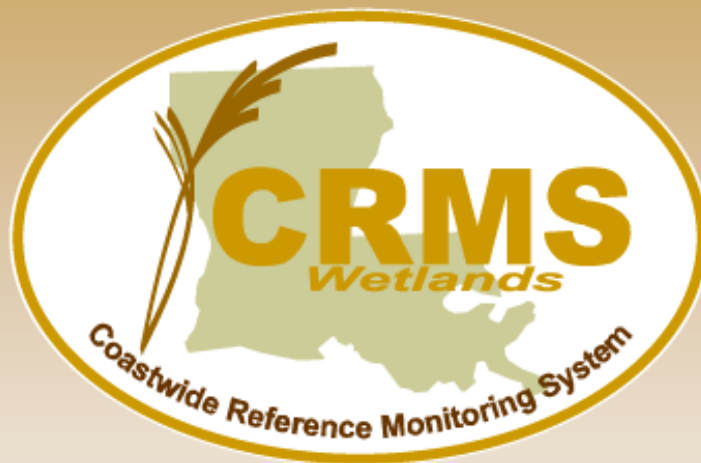




# CRMS Website Roadshow



**Summer 2017**  
**USFWS, NRCS, EPA-6/5/17, USACE-6/9/17,**  
**NOAA-6/16/17**

**1**

**Website releases – per partner requests**

**2**

**Upcoming website functionality**

**3**

**Website survey**

**4**

**Analytical team updates**



### Coastwide Reference Monitoring System

Home Data Mapping Library Visualization Program

#### CRMS Publications

Administration

Support Docs

Contacts

Publications

Data Descriptions

Privacy

Accessibility

FOIA

Disclaimer

Data Citation

Atazadeh, I., M.B. Edlund, B. Van der Vijver, K. Mills, S.A. Spaulding, P.A. Gell, S.S. Lee, K.E.L. Smith, P. Newall, and M. Potapova. 2014. [Morphology, ecology, and biogeography of \*Stauroneis pachycephala\* P.T. Cleve \(Bacillariophyta\) and its transfer to the genus \*Envekeadea\*](#). *Diatom Research* 29:4: 455-464.

### Coastwide Reference Monitoring System

Library Visualization Program

Vijver, K. Mills, S.A. Spaulding, P.A. Gell, S. Crawford, A.F. Barton, M. Potapova. 2014. [Morphology, ecology, and biogeography of \*Stauroneis pachycephala\* P.T. Cleve \(Bacillariophyta\) and its transfer to the genus \*Envekeadea\*](#). *Diatom Research* 29:4: 455-464.

100+ pubs mention CRMS  
or use CRMS data

- no abstracts included
- not an exhaustive list
- submissions-email Sarai

Blanchette, T.A., Liu, K.B., Qiang, Y. and Lam, N.S.N., 2015. [Wetland Accretion Rates Along Coastal Louisiana: Spatial and Temporal Variability in Light of Hurricane Isaac's Impacts](#). *Water*, 8(1), p.1.

Brien, L.F., 2015. [Modeling eutrophication vulnerability in coastal Louisiana wetlands impacted by freshwater diversion: A remote sensing approach](#)(Doctoral dissertation, Kansas State University).

Burleson, D.W., Rifai, H.S., Proft, J.K., Dawson, C.N. and Bedient, P.B., 2015. [Vulnerability of an industrial corridor in Texas to storm surge](#). *Natural Hazards*, 77(2), pp.1183-1203.

Byrnes, M., & Berlinghoff, J. (2012). [Gulf Regional Sediment Management Master Plan: Case Study Compilation](#). *Journal of Coastal Research*, 72-124. Retrieved from <http://www.jstor.org/stable/41508594>

Cahoon, D.R., 2015. [Estimating relative sea-level rise and submergence potential at a coastal wetland](#). *Estuaries and Coasts*, 38(3), pp.1077-1084.

Carle, M., Sasser, C., & Roberts, H. (2015). [Accretion and Vegetation Community Change in the Wax Lake Delta Following the Historic 2011 Mississippi River Flood](#). *Journal of Coastal Research*, 31(3), 569-587. Retrieved from <http://www.jstor.org/stable/43385533>

Carle, M.V. and Sasser, C.E., 2016. [Productivity and Resilience: Long-Term Trends and Storm-Driven Fluctuations in the Plant Community of the Accreting Wax Lake Delta](#). *Estuaries and Coasts*, pp.1-17.

Carle, M.V., Wang, L. and Sasser, C.E., 2014. [Mapping freshwater marsh species distributions using WorldView-2 high-resolution multispectral satellite imagery](#). *International Journal of Remote Sensing*, 35(13), pp.4698-4716.

Couvillion, B.R. and H. Beck. 2013. [Marsh Collapse Thresholds for Coastal Louisiana Estimated Using Elevation and Vegetation Index Data](#). *Journal of Coastal Research* 63:58-67

Couvillion, B., M. Fischer, H. Beck, and W. Sleavin. 2016. [Spatial configuration trends in coastal Louisiana from 1985 to 2010](#). *Wetlands*. 10.1007/s13157-016-0744-9.

Couvillion, B.R., Steyer, G.D., Wang, H., Beck, H.J. and Rybczyk, J.M., 2013. [Forecasting the effects of coastal protection and restoration projects on wetland morphology in coastal Louisiana under multiple environmental uncertainty scenarios](#). *Journal of Coastal Research*, 67(sp1), pp.29-50.



Coastwide Reference Monitoring System

a CWPRA funded project



Home

Data

Mapping

Library

Visualization

Program

Charting

Bulk Charting

Data Download

Reporting

▼ Hydro

Water Level Range

Hydro Completeness

Salinity

Water Level

Temperature

Flooding

Continuous

Site Hydro Index

Soil Porewater

Precipitation

Seasonal Precipitation

Interactive Hydro

▶ Vegetation

▶ Soil

▶ Spatial

▶ Report Card Charts

Clear Charts

**Suggested Data Citation:**  
Coastal Protection and Restoration Authority (CPRA) of Louisiana. 2017. Coastwide Reference Monitoring System-Wetlands Monitoring Data. Retrieved from Coastal Information Management System (CIMS) database. <http://cims.coastal.louisiana.gov>. Accessed 02 May 2017.

CPRA

USGS  
science for a changing world



Charting

Bulk Charting

Data Download

Reporting

Hydro

Water Level Range  
Hydro Completeness  
Salinity  
Water Level  
Temperature  
Flooding  
Continuous  
Site Hydro Index  
Soil Porewater  
Precipitation  
**Seasonal Precipitation**

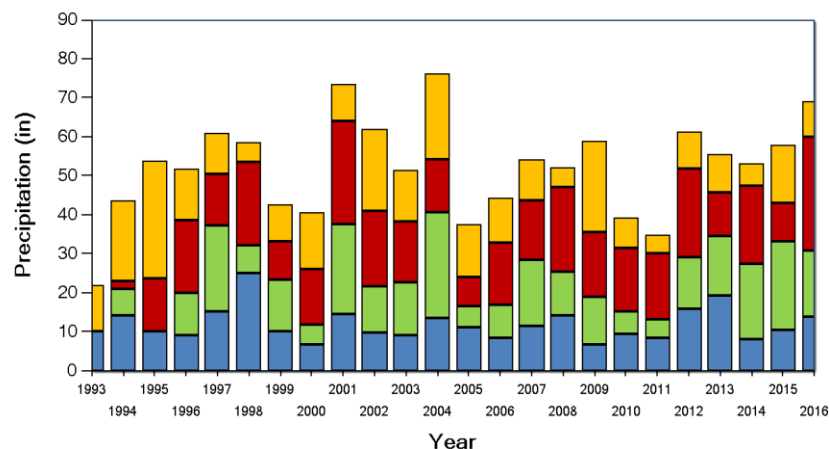
Interactive Hydro

Selection

Lake Charles Airport (LCH)  
New Orleans Armstrong Intl Airport (MSY)  
Slidell Airport (ASD)  
Lafayette Airport (LFT)  
Boothville (ASOS)  
Gulfport-Biloxi Airport (GPT)  
Port Arthur Airport (BPT)

- Equinox based seasons
- Annual data feed
- 1993-2016

Seasonal Precipitation for Lafayette Regional Airport (KLFT)



Name	Type	Compressed size	Passv
readme.txt	Text Document	1 KB	No
SeasonalPrecipitationChart_101920...	PNG image	39 KB	No
SeasonalPrecipitationChart_101920...	Microsoft Excel Comma S...	1 KB	No
SeasonalPrecipitationChart_101920...	PNG image	26 KB	No

readme.txt - Notepad

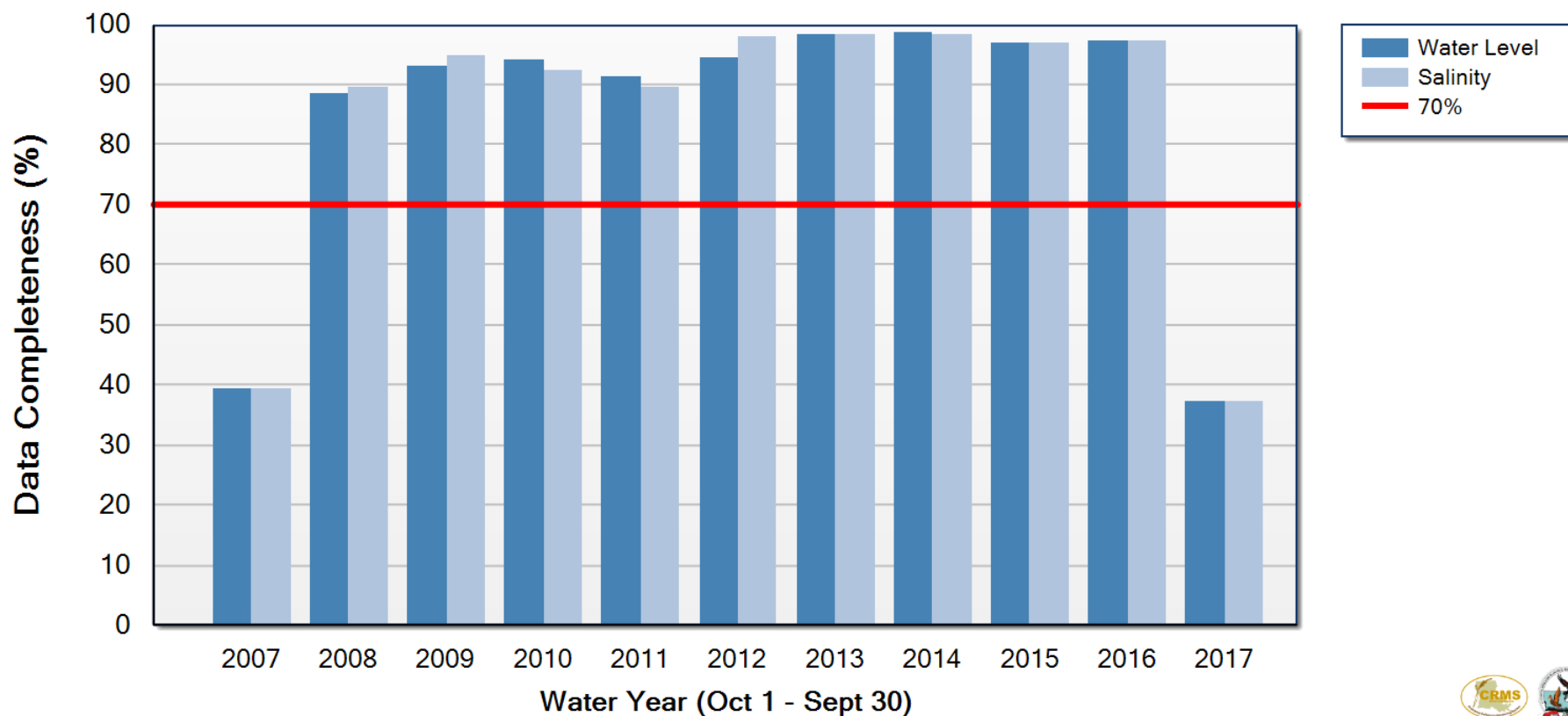
File Edit Format View Help

Seasonal Date Ranges:

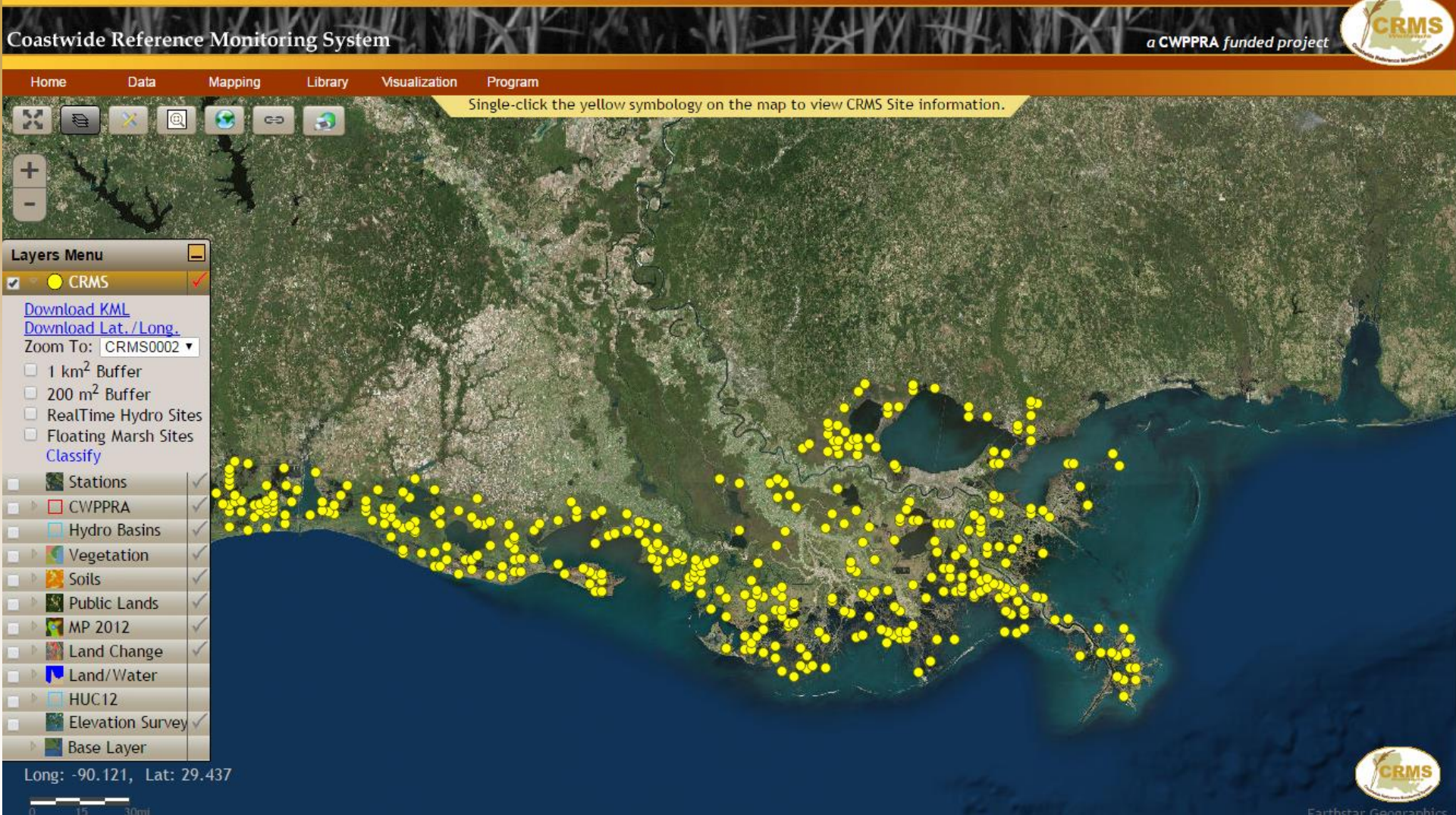
winter -- December 21 (of year prior) thru March 19 (of current year)  
Spring -- March 20 thru June 19  
Summer -- June 20 thru September 21  
Fall -- September 22 thru December 20



### CRMS0034 Hydro Data Completeness









## Classify Tool-

A Type, Attribute, and Year must be chosen to Classify the CRMS sites.

### Vegetation

- FQI
- Total Percent Cover
- Marsh Classification

### Hydro

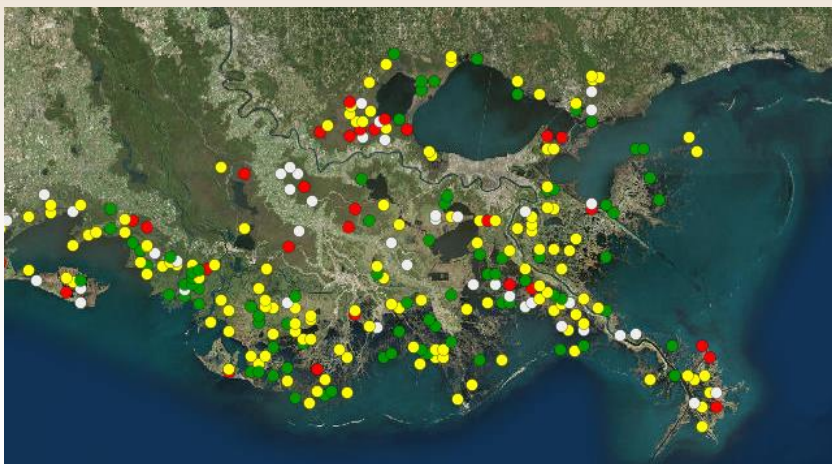
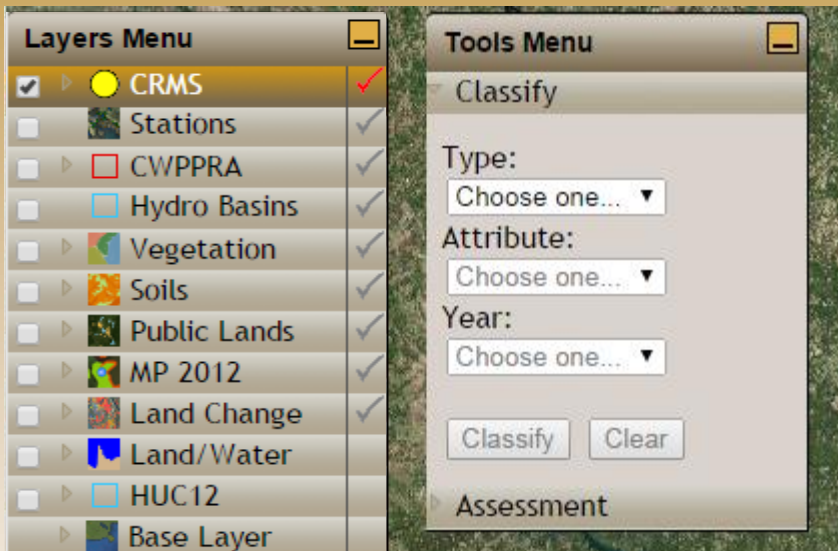
- Flooding
- Hydro Index
- Salinity
- Water Level

### Soil

- Surface Elevation Change Rate
- Submergence Vulnerability Index (SVI)
- Bulk Density (mean 0-16cm, 3 cores)
- % Organic (mean 0-16cm, 3 cores)

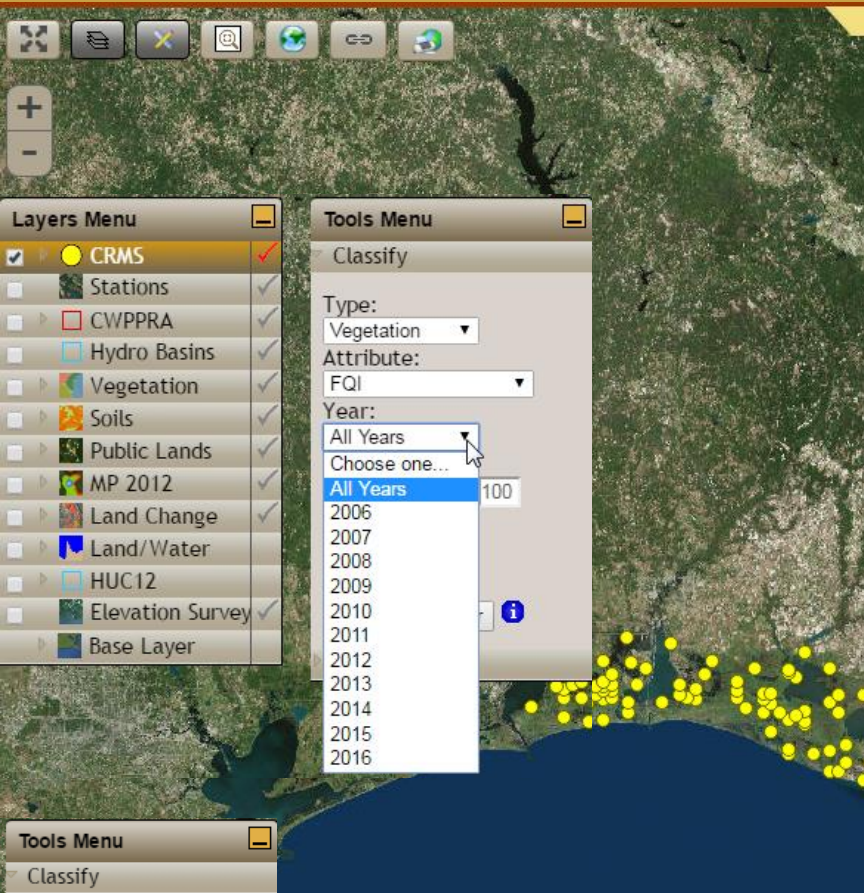
### Spatial

- Land Acres
- Percent Land





Single-click the yellow symbology on the map to view CRMS Site information.



2006

Range	AT	BA	BS	CS	ME	MR	PO	TE	TV	Total
0 - 33.33	2	0	2	15	29	1	1	2	8	60
33.33 - 66.67	3	9	2	7	8	2	1	27	14	73
66.67 - 100	0	23	3	5	4	0	0	24	2	61
Unknown	15	33	13	19	12	10	56	22	16	196

2007

Range	AT	BA	BS	CS	ME	MR	PO	TE	TV	Total
0 - 33.33	6	3	0	6	16	0	12	7	12	62
33.33 - 66.67	13	14	12	29	27	12	19	32	23	181
66.67 - 100	0	39	7	8	7	0	21	33	4	119
Unknown	1	9	1	3	3	1	6	3	1	28

2008

Range	AT	BA	BS	CS	ME	MR	PO	TE	TV	Total
0 - 33.33	7	11	4	6	9	4	13	10	3	67
33.33 - 66.67	12	14	13	25	35	8	25	28	33	193
66.67 - 100	0	37	3	13	8	0	19	37	4	121

**Summaries reflect the intervals chosen by the user.**

**Implementation for all types and attributes in progress.**





For credentials, email [piazzas@usgs.gov](mailto:piazzas@usgs.gov)

## Coastwide Reference Monitoring System

Home Data Mapping Library Visualization Program

Single-click the yellow symbology on the map to view CRMS Site information.



**Layers Menu**

- ☒ CRMS
- ☐ Stations
- ☐ CWPPRA
- ☐ Hydro Basins
- ☐ Vegetation
- ☐ Soils
- ☐ Public Lands
- ☐ MP 2012
- ☐ Land Change
- ☐ Land/Water
- ☐ HUC12
- ☐ Elevation Survey
- ☐ Base Layer

**Tools Menu**

- Classify
- Assessment
- Custom Polygon

Layer to assess:  
Choose one...

Bounding polygon layer:  
CRMS Sites (1Km Buffer)

Bounding polygon:  
Choose one...

Year to assess:  
Choose one...

Acre Assess

☐ Criminal, administrative, or other adverse action. Unauthorized or illegal use may subject you to prosecution.

**Account Information**

Username:

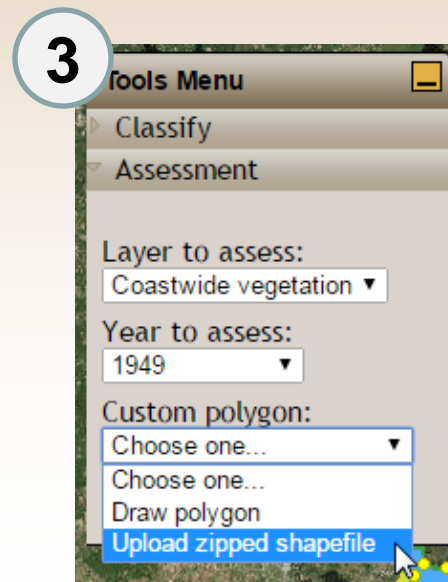
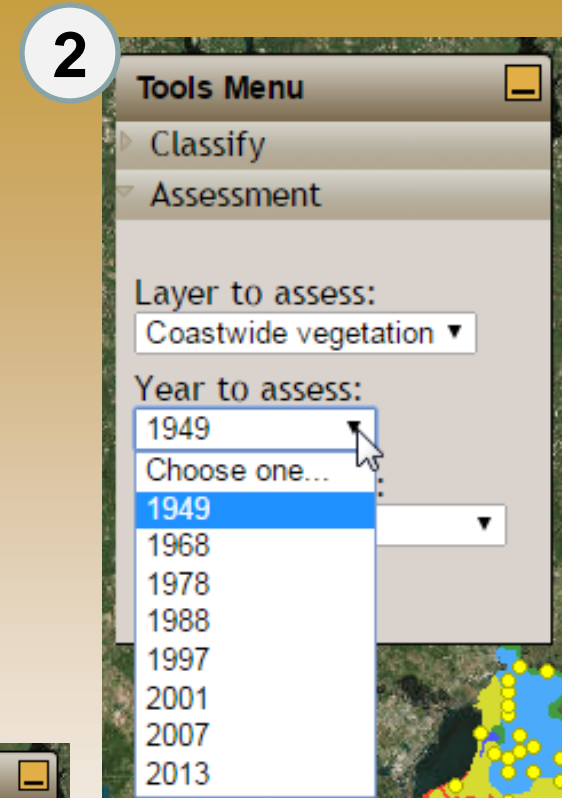
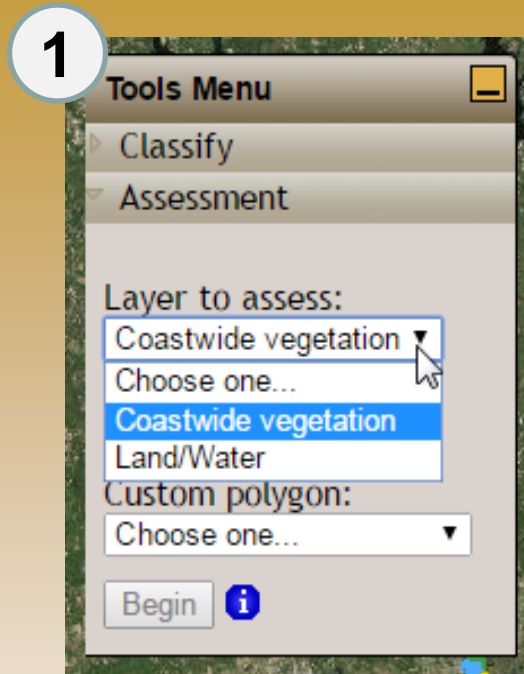
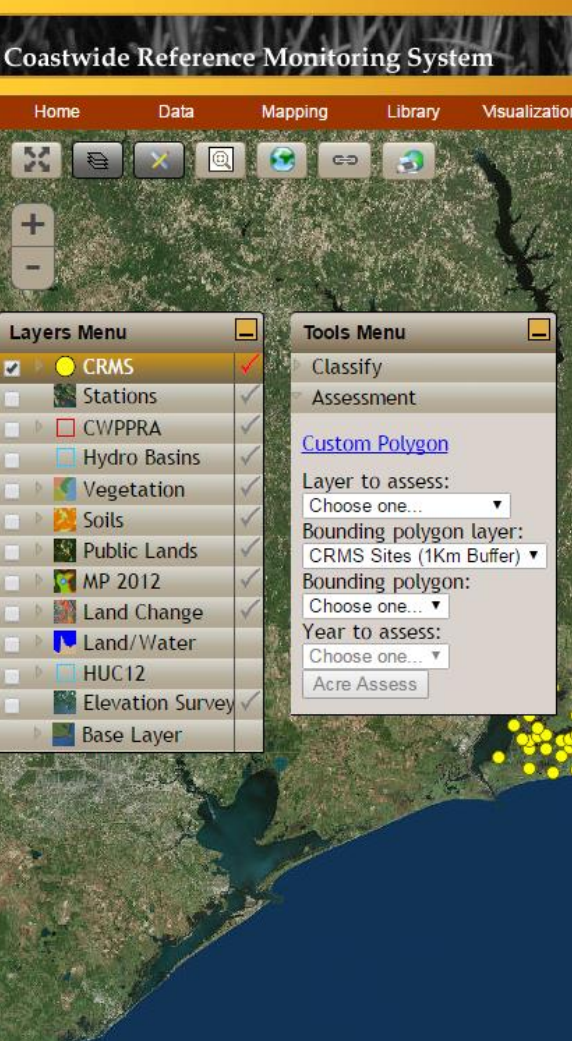
Password:

Log In



# Released on the Website

Tools: Acreage Assessment with Imported Shapefile







# Released on the Website

Tools: Acreage Assessment with Imported Shapefile

**Tools Menu**

Classify

Assessment

Layer to assess:  
Coastwide vegetation

Year to assess:  
1949

Custom polygon:  
Choose one...  
Choose one...  
Draw polygon  
Upload zipped shapefile

**Tools Menu**

Classify

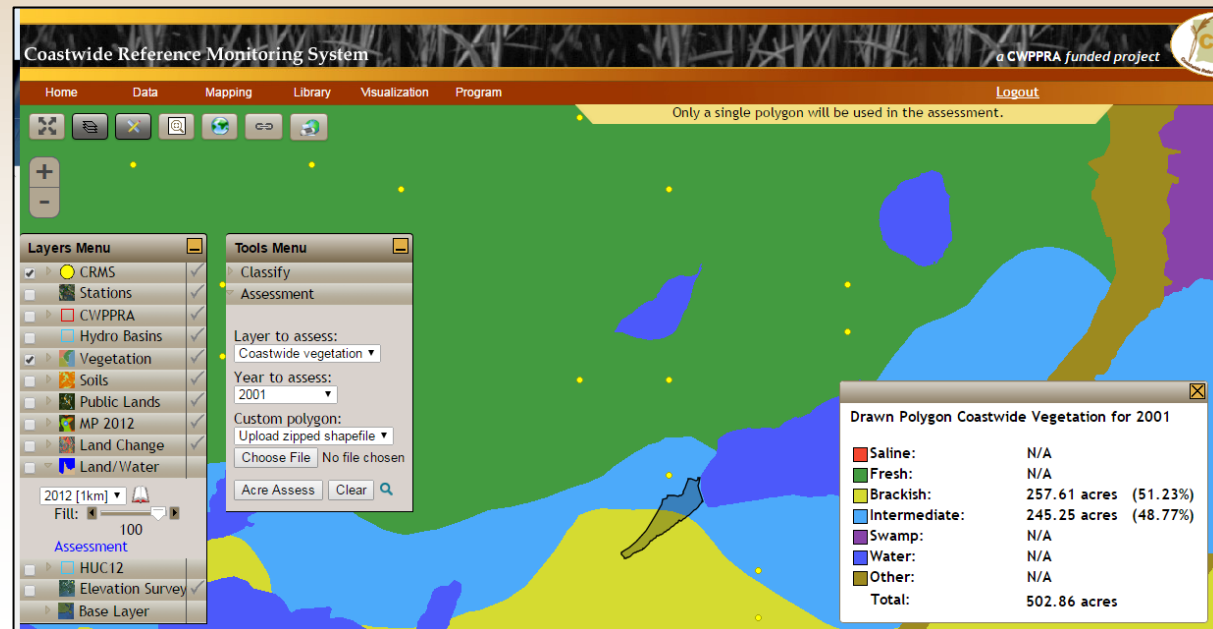
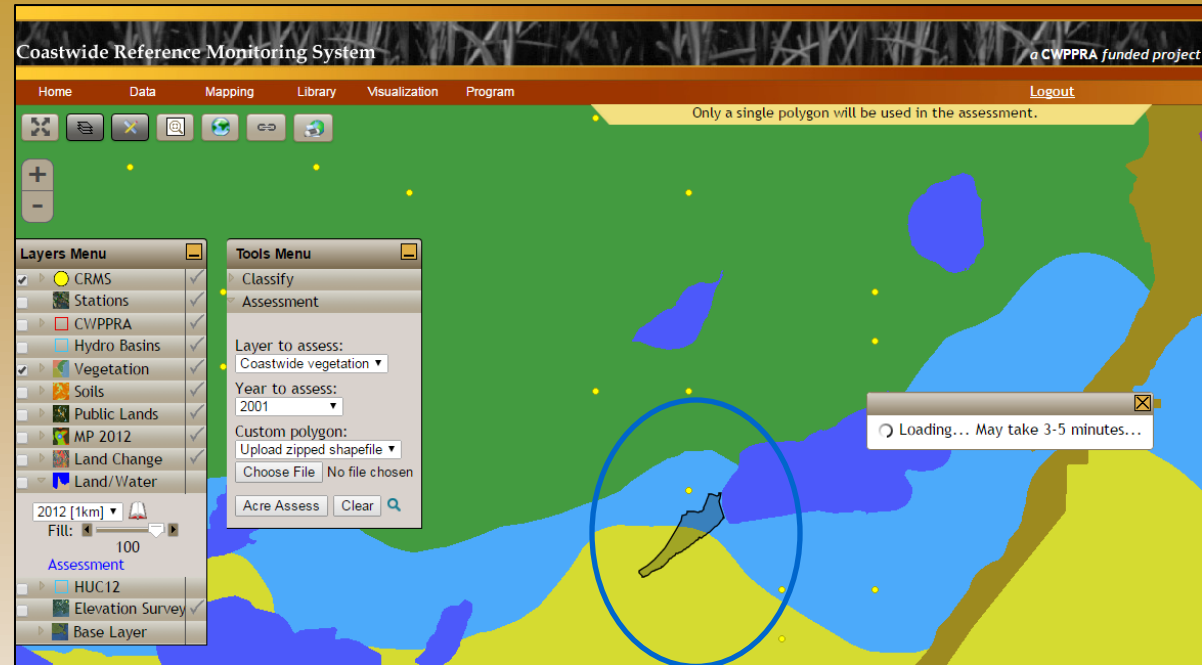
Assessment

Layer to assess:  
Coastwide vegetation

Year to assess:  
2013

Custom polygon:  
Upload zipped shapefile  
Choose File bayou\_...4.zip  
Importing shapefile...

Acre Assess Clear





# Released on the Website

Tools: Acreage Assessment with Imported Shapefile

Tools Menu

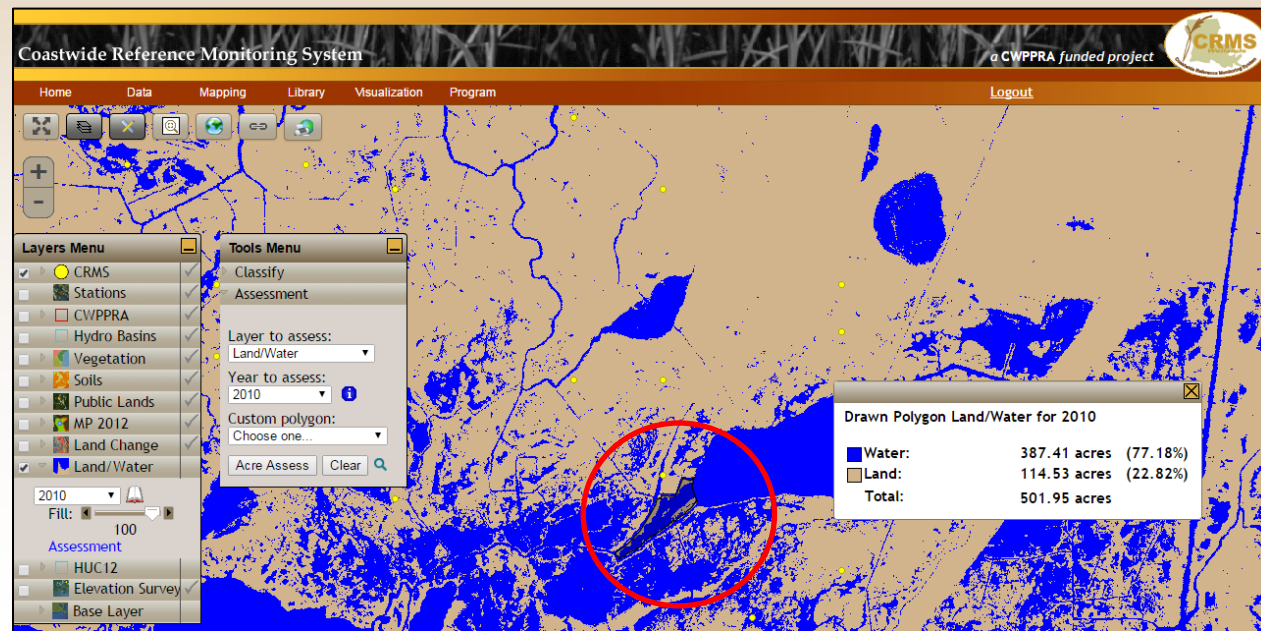
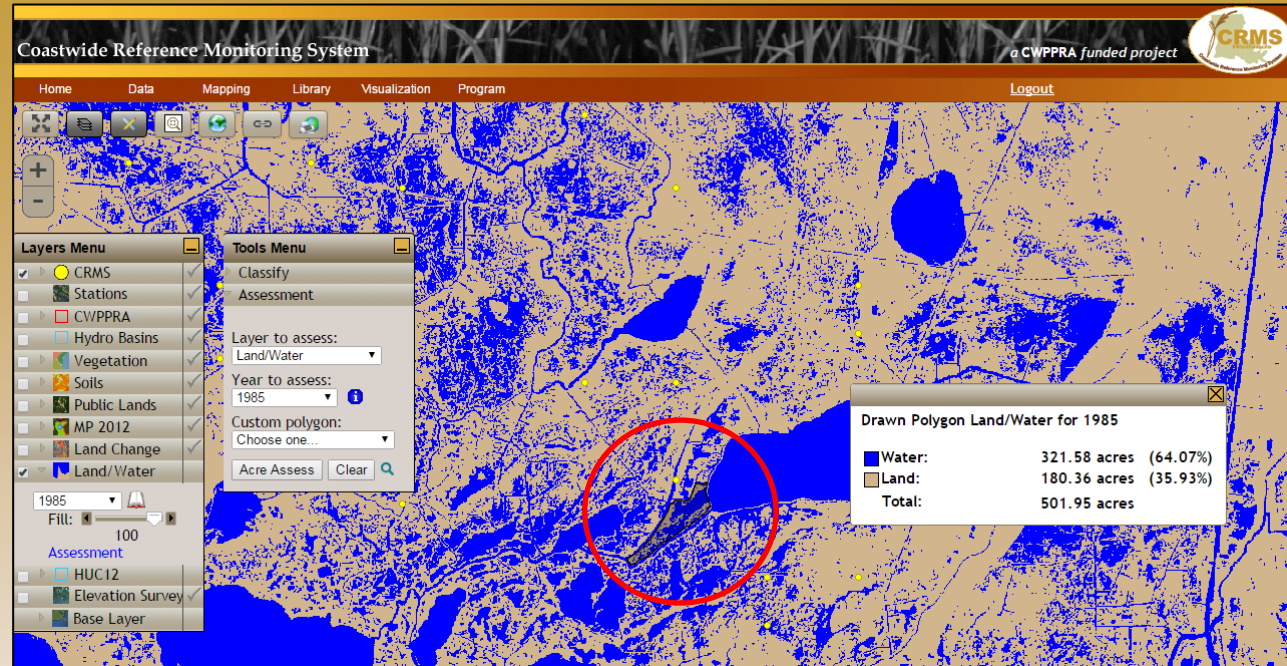
Classify

Assessment

Layer to assess:  
Land/Water

Year to assess:  
Choose one...  
Choose one...  
1985  
1987  
1990  
1995  
1998  
1999  
2002  
2004  
2006  
2008  
2009  
2010

Custom polygon:  
Upload zipped shapefile  
Choose one...  
Draw polygon  
Upload zipped shapefile







Single-click in a red polygon on the map to view CWPPRA Project information.

**Layers Menu**

- CRMS
- Stations
- CWPPRA**
- Hydro Basins
- Vegetation
- Soils
- Public Lands
- MP 2012
- Land Change
- Land/Water
- HUC12
- Elevation Survey
- Base Layer

**Tools Menu**

- Classify
- Assessment
- [Custom Polygon](#)
- Layer to assess: Coastwide vegetation
- Bounding polygon layer: CWPPRA Projects
- Bounding polygon: TV-04
- Year to assess: 2013
- [Acre Assess](#)

**TV-04 CWPPRA Project Acreage Assessment**

Land/Water

Coastwide Vegetation

1949 1968 1978 1988 1997 2001 2007 2013

Click a Year to Assess

**TV-04 Coastwide Vegetation for 2013**

OBJECTID		
Saline:	N/A	
Fresh:	26,066.53 acres	(84.29%)
Brackish:	N/A	
Intermediate:	3,712.14 acres	(12.00%)
Swamp:	944.56 acres	(3.05%)
Water:	201.39 acres	(0.65%)
Other:	1.85 acres	(0.01%)
Total:	30,926.47 acres	

[Expand](#)

[Data Download](#)

TV-04 VegAssessment_2013 (1)			
Ready			
	A	B	C
1	Marsh_Type	Acres	percentage
2	Saline	0	0
3	Fresh	26066.53	84.29
4	Brackish	0	0
5	Intermediate	3712.14	12
6	Swamp	944.56	3.05
7	Water	201.39	0.65
8	Other	1.85	0.01
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			



# Released on the Website

Data Download: Vegetation Species Search

**Search database for specific observations by vegetation species.**

**Scale:**

- 1) Station
- 2) Site

**Years:**

Any data in CIMS including pre-CRMS

**Options:**

All vegetation species in the database, text recognition to sort options

Charting

Bulk Charting

Data Download

Reporting

**Data Download**

Data available through this website are calculated or derived values based on the original data which are available from the CIMS database ([CIMS](#))

▶ Hydro

▼ Vegetation

Basal Area

Floristic Quality Index

Marsh Class

Veg Percent Cover

**Veg Species**

Vegetation Volume Index

▶ Soil

▶ Spatial

Scale: Station

Year

Selection

Select All	Deselect All
1994	1992
1995	2013
1996	2014
1997	2015
1998	2016
1999	
2000	
2001	
2002	

Submit

Options



Selection

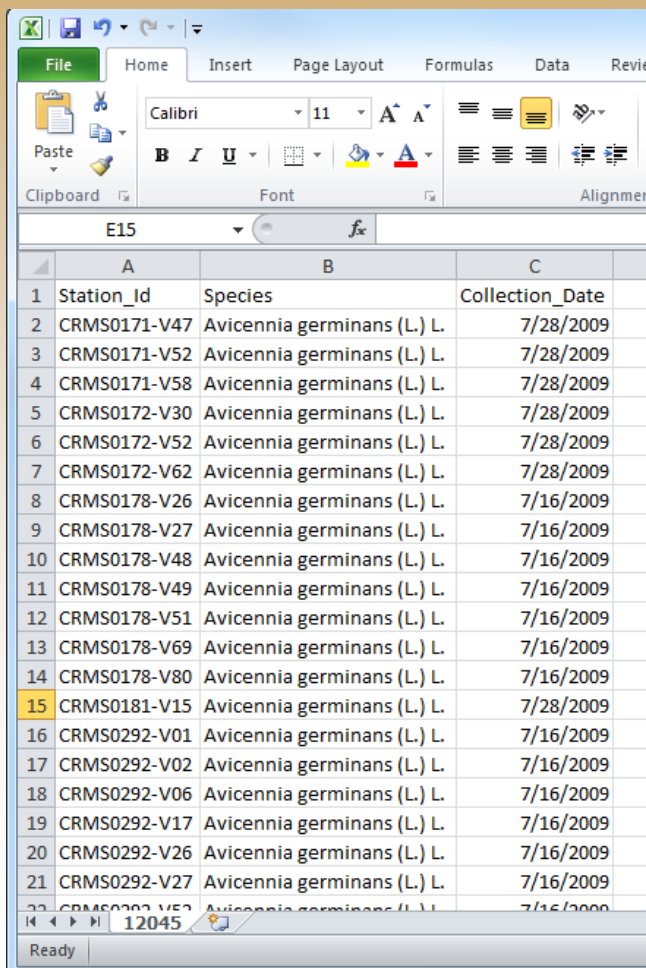
Select All	Deselect All
Acer negundo L.	Avicennia germinans (L.) L.
Acer rubrum L.	
Acmella oppositifolia (Lam.) R.K. Jansen	
Aeschynomene indica L.	
Aeschynomene L.	
Agalinis fasciculata (Elliott) Raf.	
Agalinis heterophylla (Nutt.) Small ex Britton	

Show Map Selector

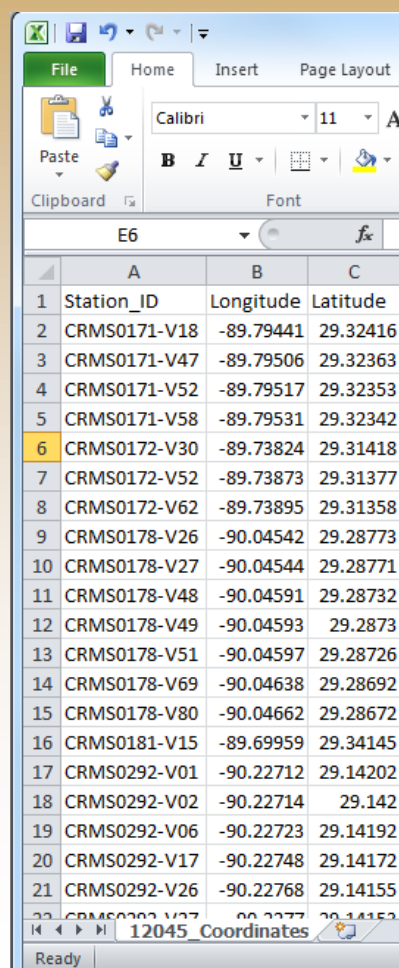
Email Address:

Submit Request

Name	Type	Compressed size	Password ...	Size	Ratio
 12045.csv	Microsoft Excel Comma S...	1 KB	No	5 KB	92%
 12045_Coordinates.csv	Microsoft Excel Comma S...	1 KB	No	2 KB	75%



E15		
A	B	C
Station_Id	Species	Collection_Date
1	CRMS0171-V47	Avicennia germinans (L.) L. 7/28/2009
2	CRMS0171-V52	Avicennia germinans (L.) L. 7/28/2009
3	CRMS0171-V58	Avicennia germinans (L.) L. 7/28/2009
4	CRMS0172-V30	Avicennia germinans (L.) L. 7/28/2009
5	CRMS0172-V52	Avicennia germinans (L.) L. 7/28/2009
6	CRMS0172-V62	Avicennia germinans (L.) L. 7/28/2009
7	CRMS0178-V26	Avicennia germinans (L.) L. 7/16/2009
8	CRMS0178-V27	Avicennia germinans (L.) L. 7/16/2009
9	CRMS0178-V48	Avicennia germinans (L.) L. 7/16/2009
10	CRMS0178-V49	Avicennia germinans (L.) L. 7/16/2009
11	CRMS0178-V51	Avicennia germinans (L.) L. 7/16/2009
12	CRMS0178-V69	Avicennia germinans (L.) L. 7/16/2009
13	CRMS0178-V80	Avicennia germinans (L.) L. 7/16/2009
14	CRMS0181-V15	Avicennia germinans (L.) L. 7/28/2009
15	CRMS0292-V01	Avicennia germinans (L.) L. 7/16/2009
16	CRMS0292-V02	Avicennia germinans (L.) L. 7/16/2009
17	CRMS0292-V06	Avicennia germinans (L.) L. 7/16/2009
18	CRMS0292-V17	Avicennia germinans (L.) L. 7/16/2009
19	CRMS0292-V26	Avicennia germinans (L.) L. 7/16/2009
20	CRMS0292-V27	Avicennia germinans (L.) L. 7/16/2009
21	CRMS0292-V52	Avicennia germinans (L.) L. 7/16/2009
22	CRMS0292-V53	Avicennia germinans (L.) L. 7/16/2009



E6		
A	B	C
Station_ID	Longitude	Latitude
1	CRMS0171-V18	-89.79441 29.32416
2	CRMS0171-V47	-89.79506 29.32363
3	CRMS0171-V52	-89.79517 29.32353
4	CRMS0171-V58	-89.79531 29.32342
5	CRMS0172-V30	-89.73824 29.31418
6	CRMS0172-V52	-89.73873 29.31377
7	CRMS0172-V62	-89.73895 29.31358
8	CRMS0178-V26	-90.04542 29.28773
9	CRMS0178-V27	-90.04544 29.28771
10	CRMS0178-V48	-90.04591 29.28732
11	CRMS0178-V49	-90.04593 29.2873
12	CRMS0178-V51	-90.04597 29.28726
13	CRMS0178-V69	-90.04638 29.28692
14	CRMS0178-V80	-90.04662 29.28672
15	CRMS0181-V15	-89.69959 29.34145
16	CRMS0292-V01	-90.22712 29.14202
17	CRMS0292-V02	-90.22714 29.142
18	CRMS0292-V06	-90.22723 29.14192
19	CRMS0292-V17	-90.22748 29.14172
20	CRMS0292-V26	-90.22768 29.14155
21	CRMS0292-V27	-90.22777 29.14153
22	CRMS0292-V52	-90.22777 29.14153
23	CRMS0292-V53	-90.22777 29.14153

## Zip file via email

- 1) Data file
- 2) Coordinates of relevant sites/stations



Charting

Bulk Charting

Data Download

Reporting

**Generate Report Card**

Year: 2015

## ▼ Generate Report Card

Site Level Report

Project Level Report

Basin Level Report

Coastwide Level Report

▶ OM&amp;M

Clear Reports

Report Card CRMS3985 2015

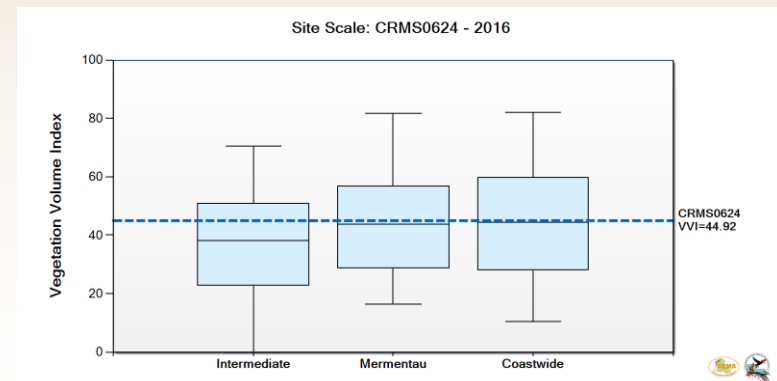
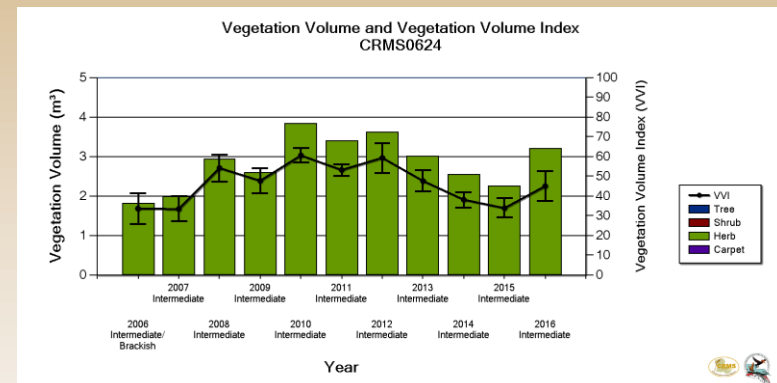
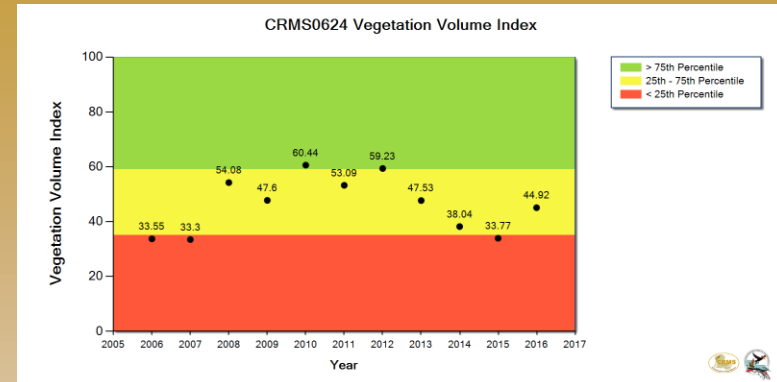
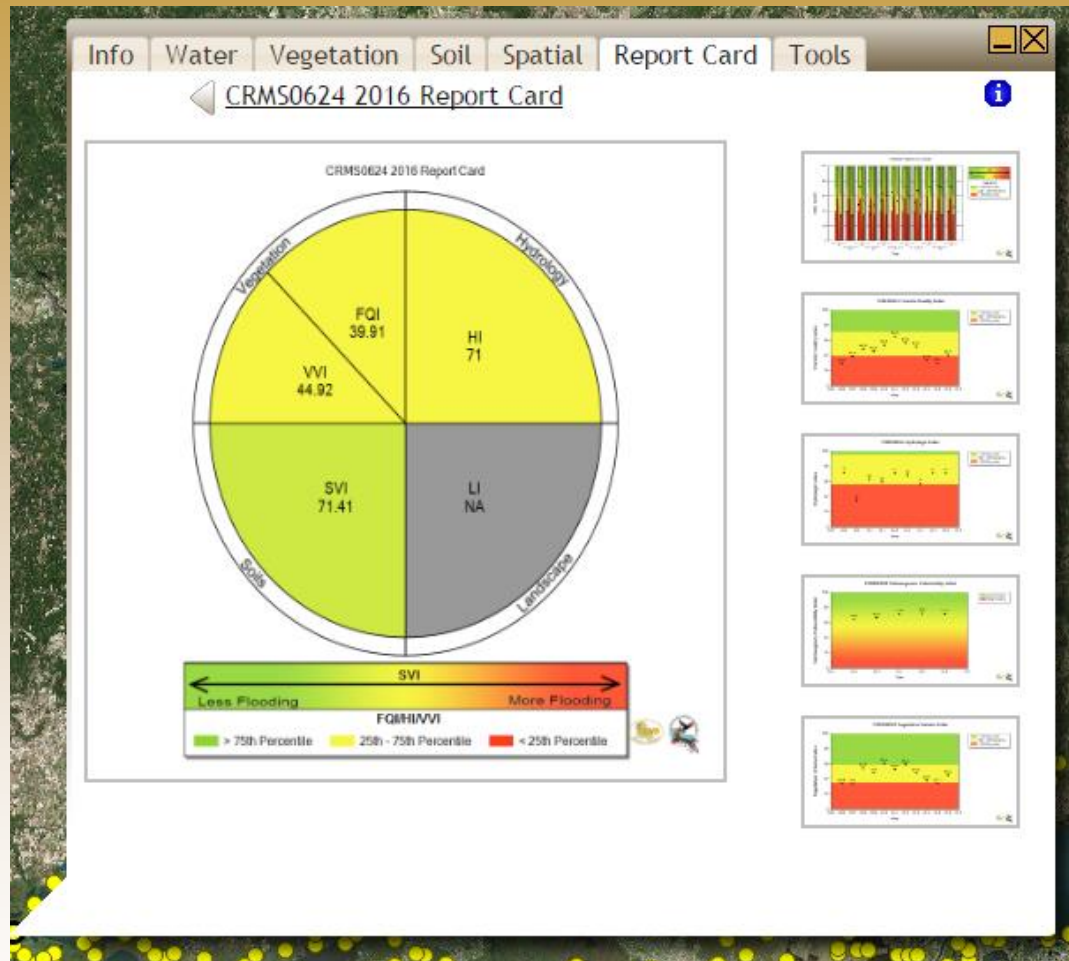
CRMS3617  
CRMS3626  
CRMS3639  
CRMS3641  
CRMS3650  
CRMS3664  
CRMS3667  
CRMS3680  
CRMS3784  
CRMS3800  
CRMS3913  
CRMS3985

**The Vegetation Volume Index (VVI)**

The Vegetation Volume Index (VVI) is a measure of the amount of three-dimensional vegetative structure present irrespective of observed vegetation species. The VVI was developed using CRMS data from coastal Louisiana but could be employed in other marsh or shrub scrub ecosystems. It was developed using the area of total vegetation cover (m<sup>2</sup>) multiplied by vegetation layer height (m) of each of four vegetation layers; carpet, herbaceous, shrub, and tree. This methodology does not distinguish between early and late successional stage vegetation species. As a result, early stage annual species can score similarly or higher than late stage perennial species as vigor and robust growth forms outweigh vegetation community stability in some dynamic environments. CRMS sites are comprised of 10 sampling stations that are sampled annually. The VVI scores range from 0 to 100 and are calculated for each sampling station based on the vegetation volume of the combined layers and marsh type of each sampling station. Individual station level VVI scores are averaged to obtain an annual CRMS site VVI score. For more detailed information regarding the development of the VVI see: <https://pubs.er.usgs.gov/publication/ofr20151206> and Wood et al. 2015.



VVI incorporated throughout website and report card tab







Charting

Bulk Charting

Data Download

Reporting

Hydro

Vegetation

Forested

Herbaceous

Site Floristic Quality Index

Project/Reference FQI

Marsh Class

Vegetation Volume Index

Soil

Spatial

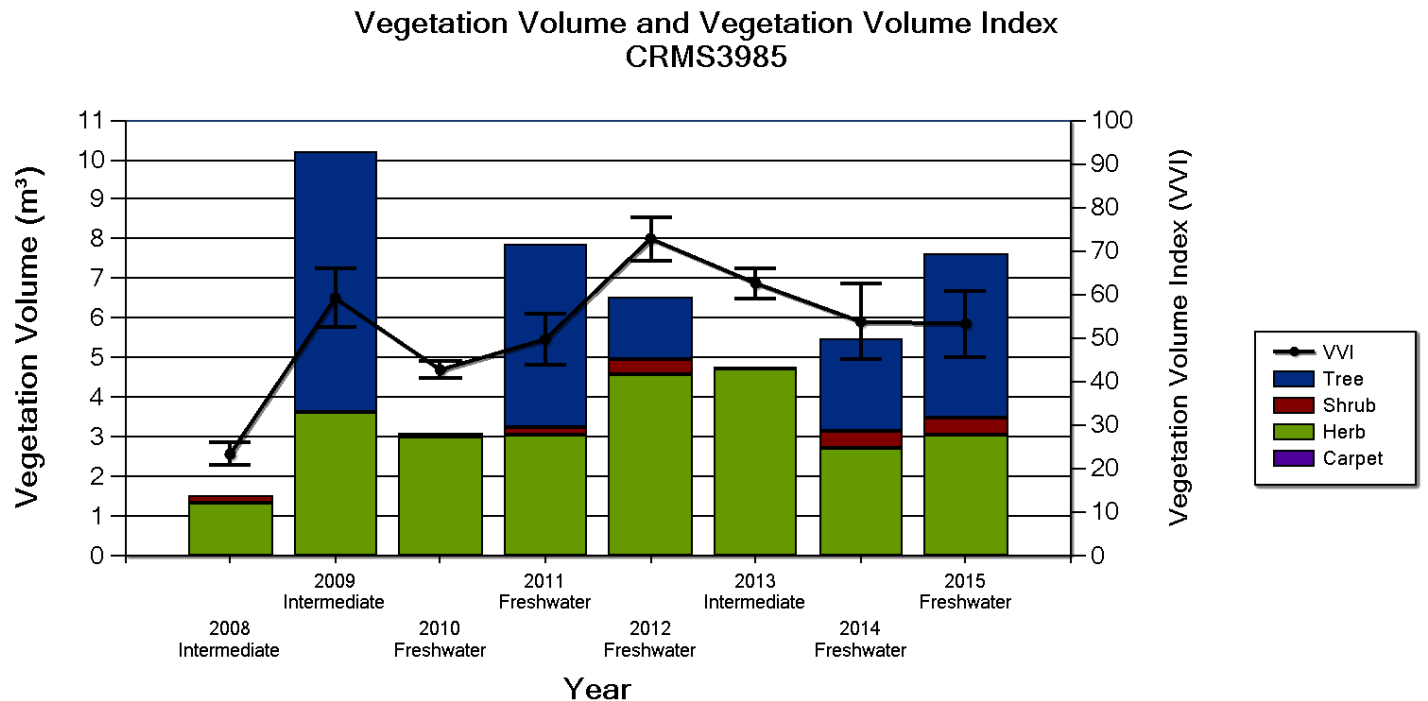
Report Card Charts

Scale: 

Select a scale

Vegetation Volume and Vegetation Volume Index

CRMS1024





## Reminder: Released on the Website

Data Download: 2014 Coastwide CRMS elevation survey

Charting

Bulk Charting

Data Download

Reporting

### Data Download

Data available through this website are calculated or derived values based on the original data which are available from the CIMS database ([CIMS](#))

#### ▼ Hydro

Hydro Averages

Hydro Index

Percent Flooded

Water Level Range

Shifted Water Elevation Data

Scale:

Select Value

Select Value

Correction factor (from GEOID99 to GEOID12A)

Shifted Water Elevation (GEOID12A)



CRMS

MOVE CLOSE

The Station specific value used to shift the water elevation data from GEOID99 to GEOID12A.

$\text{GEOID12A} = \text{GEOID99} + \text{Correction Factor}$ .

**Correction Factor :** The value that is used to shift the elevation data from GEOID99 to GEOID12A.

**Shifted water elevation (12A):** Water elevation values collected in GEOID99 with the station specific correction factors applied to provide GEOID12A water elevation values. These shifted water elevations were used in the computation of the Submergence Vulnerability Index.



# Reminder: Released on the Website

Data Download: Shifted Water Elevation

Charting

Bulk Charting

Data Download

Reporting

## Data Download

Data available through this website are calculated or derived values based on the original data which are available from the CIMS database ([CIMS](#))

### Hydro

Hydro Averages

Hydro Index

Percent Flooded

Water Level Range

Shifted Water Elevation Data

### Vegetation

### Soil

### Spatial

Scale: Shifted Water Elevation (GEOID12A)

Year:

Select All	Deselect All
2006	2012
2007	
2008	
2009	
2010	
2011	
2013	
2014	
2015	

Submit

Select All	Deselect All
CRMS0002	CRMS0147
CRMS0003	
CRMS0006	
CRMS0008	
CRMS0030	
CRMS0033	
CRMS0034	
CRMS0035	
CRMS0036	

[Show Map Selector](#)

Email Address:

Submit Request



## Reminder: Released on the Website

Data Download: Shifted Water Elevation

Name	Date Modified	Type	Size
3193_ShiftedWaterElevationData.zip	6/14/2016 3:40 PM	WinZip File	42 KB

Name	Type	Compressed size	Password ...	Size	Ratio	Date modified
3193.csv	Microsoft Excel Comma S...	41 KB	No	501 KB	92%	6/14/2016 3:40 PM
3193_Coordinates.csv	Microsoft Excel Comma S...	1 KB	No	1 KB	18%	6/14/2016 3:40 PM
DISCLAIMER.txt	Text Document	1 KB	No	1 KB	37%	6/14/2016 3:40 PM

	A	B	C	D	
1	Station_ID	MonDateTime	Water_Elev_Datum (ft NAVD88)	GEOID	
2	CRMS0147-H01	11/6/2012 21:00	0.11	GEOID12A	
3	CRMS0147-H01	11/6/2012 22:00	0.35	GEOID12A	
4	CRMS0147-H01	11/6/2012 23:00	0.46	GEOID12A	
5	CRMS0147-H01	11/7/2012 0:00	0.49	GEOID12A	
6	CRMS0147-H01	11/7/2012 1:00	0.47	GEOID12A	
7	CRMS0147-H01	11/7/2012 2:00	0.48	GEOID12A	
8	CRMS0147-H01	11/7/2012 3:00	0.44	GEOID12A	
9	CRMS0147-H01	11/7/2012 4:00	0.37	GEOID12A	
10	CRMS0147-H01	11/7/2012 5:00	0.33	GEOID12A	
11	CRMS0147-H01	11/7/2012 6:00	0.18	GEOID12A	
12	CRMS0147-H01	11/7/2012 7:00	0.05	GEOID12A	
13	CRMS0147-H01	11/7/2012 8:00	-0.09	GEOID12A	
14	CRMS0147-H01				
15	CRMS0147-H01				
16	CRMS0147-H01				
17	CRMS0147-H01				
18	CRMS0147-H01				
19	CRMS0147-H01				

### Disclaimer:

These water elevation data have been shifted from the GEOID in which they were observed (GEOID99) into the most recent GEOID (GEOID12A).

Stations were surveyed relative to GEOID12A in water year 2014. Uncertainty increases with time as values are shifted prior to water year 2014.

Corrections for subsidence have not been identified or applied.



## Reminder: Released on the Website

Data download: CRMS site specific correction factors

Charting


Bulk Charting

Data Download

Reporting

### Data Download

Data available through this website are calculated or derived values based on the original data which are available from the CIMS database ([CIMS](#))

Scale:  

Select All	Deselect All
CRMS0131	CRMS0147
CRMS0132	
CRMS0135	
CRMS0136	
CRMS0139	
CRMS0146	
CRMS0148	
CRMS0153	
CRMS0154	

#### ▼ Hydro

Hydro Averages

Hydro Index

Percent Flooded

Water Level Range

Shifted Water Elevation Data




#### ▶ Vegetation

#### ▶ Soil

#### ▶ Spatial

[Show Map Selector](#)

Email Address:

 3194\_Coordinates.csv  
 DISCLAIMER.txt  
 GEOID99\_TO\_GEOID12A.csv



A	B	C	D
Station ID	Correction_Factor (ft NAVD88)		
CRMS0147-H01	-0.6		





- **FFQI and LI implementation throughout website**
- **Land area change 1932-2015 layer**
- **Map vegetation species search results**
- **Vegetation species search by parish**
- **Basin level percent inundation graphic**
- **Updated site photos**

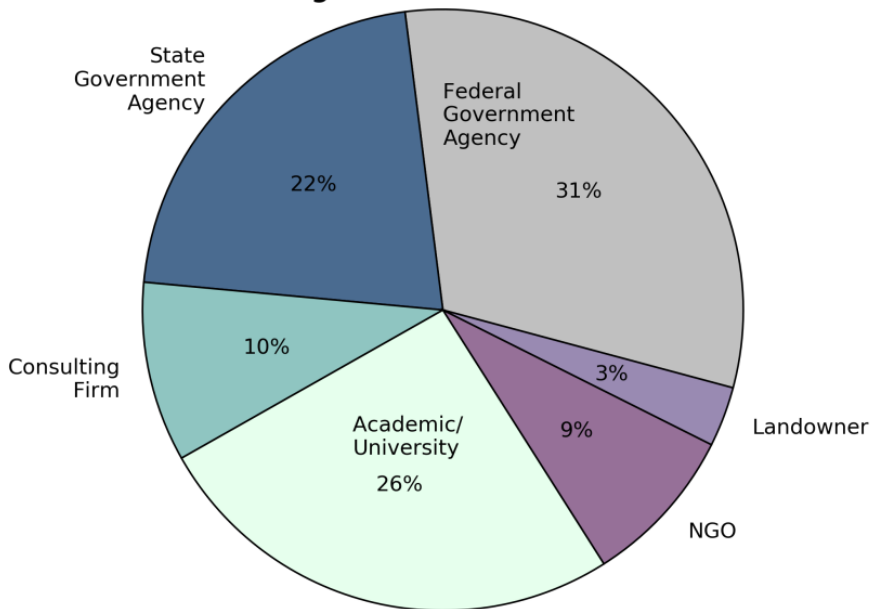


# Website Survey Results

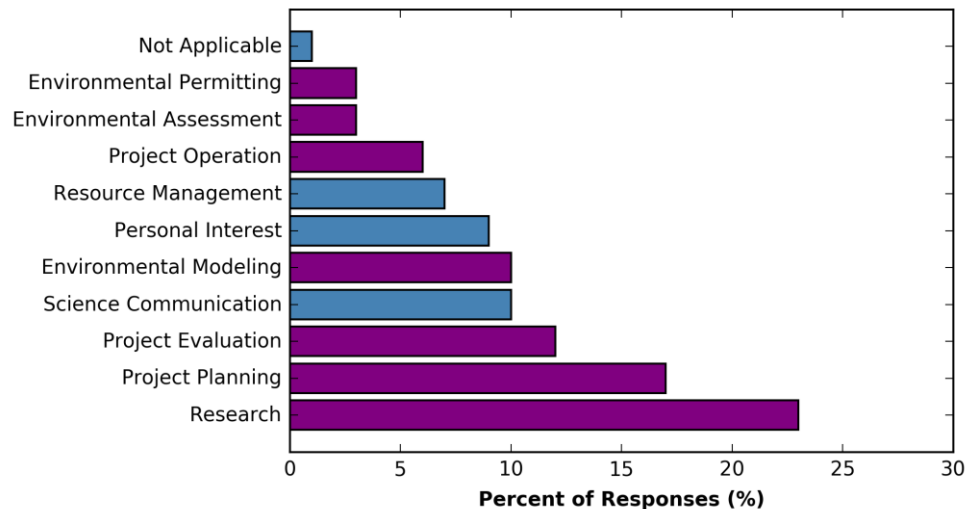


# Website Usage Survey Results

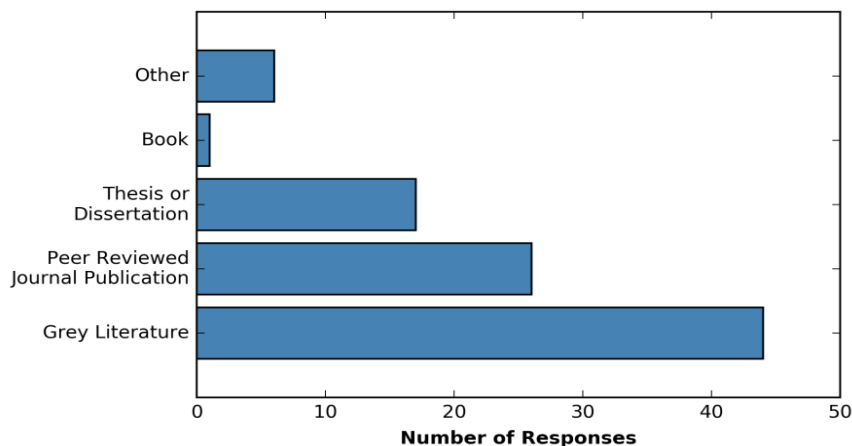
**Organization Affiliation**



**How did you use the CRMS data?**



**Have you used the CRMS data in reports or publications?**

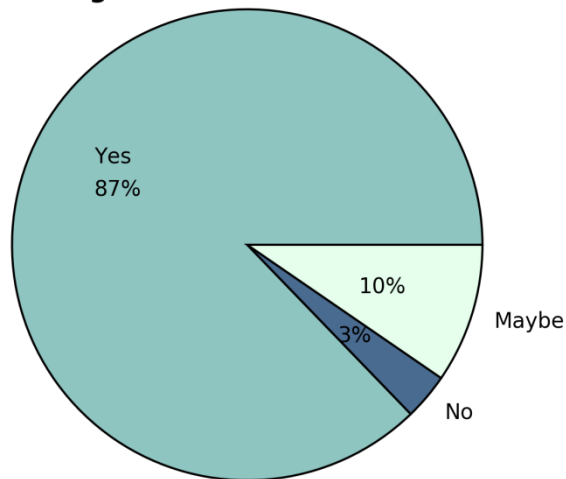


- Sent surveys to known website users
- Approx. 100 responses
- CWPPRA community 63% of responses
- Much of the data used for planning & evaluation process
- Most respondents used data for grey literature (agency reports, contract deliverables, OM&M, EIS, etc.)

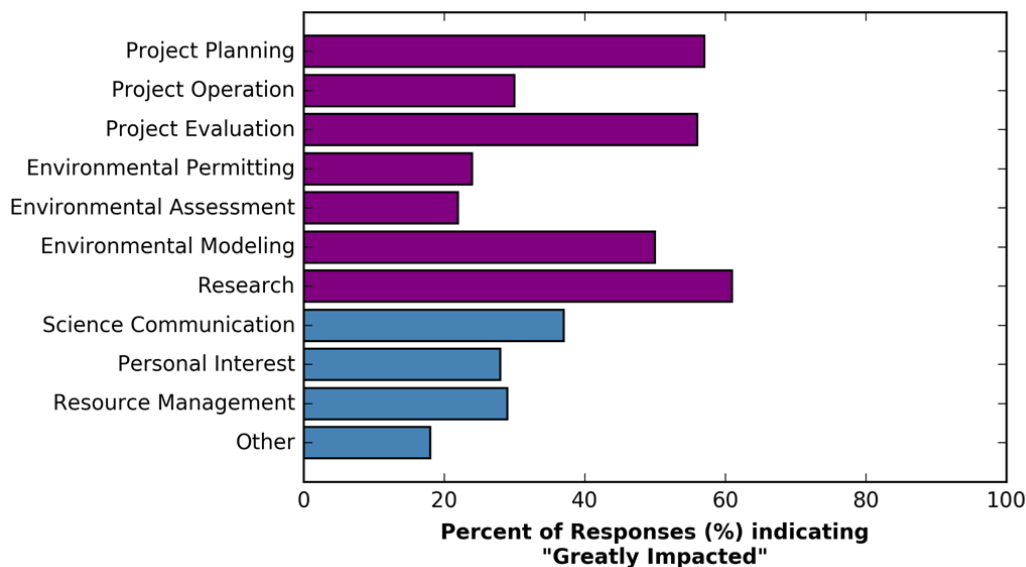


# Website Usage Survey Results

**Are you planning to use the CRMS data in the future?**



**If CRMS data were not available, how would your FUTURE planned work, communication, or recreation be impacted?**

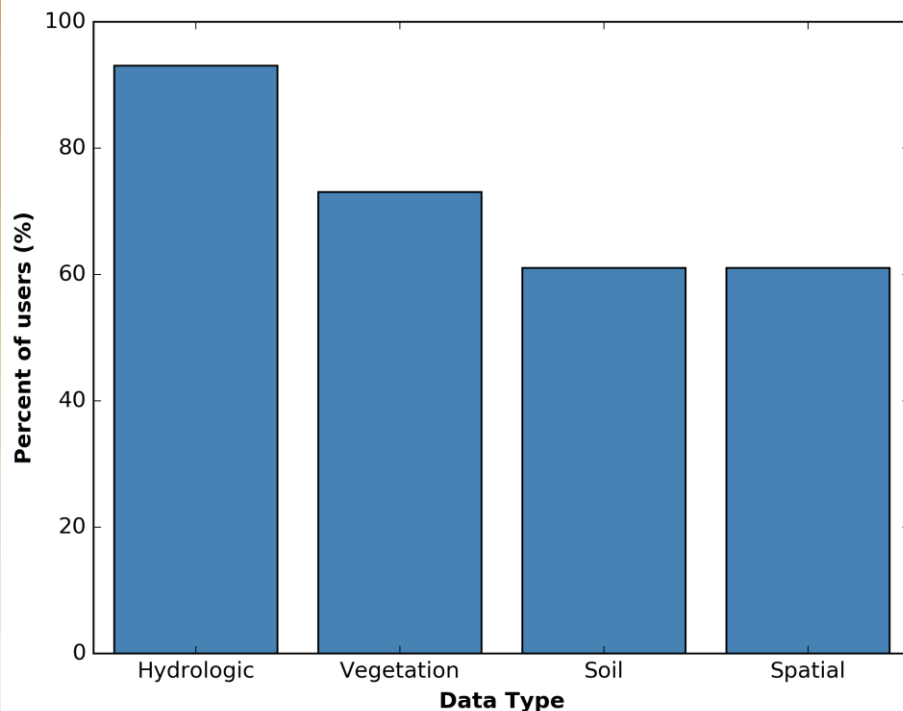


- Vast majority of respondents plan to use CRMS data in the future
- Users identified many CWPPRA activities that would be “Greatly Impacted” without CRMS

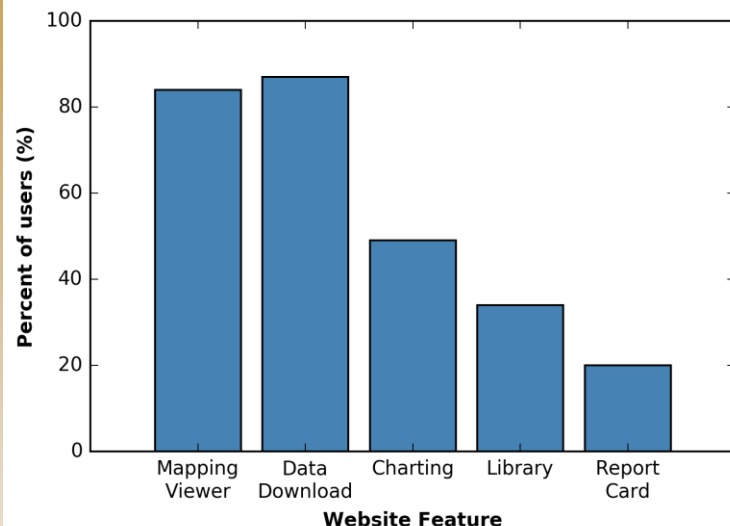


# Website Usage Survey Results

**Percent of users who ranked CRMS website data types as 'Very Important'**



**Percent of users who ranked CRMS website features as 'Very Important'**



**User input confirms website statistics:**

- Hydro most used data type
- Users rely most on the map, data, and charting





# **CRMS Analytical Team Updates**

# RSET Rod Extensions

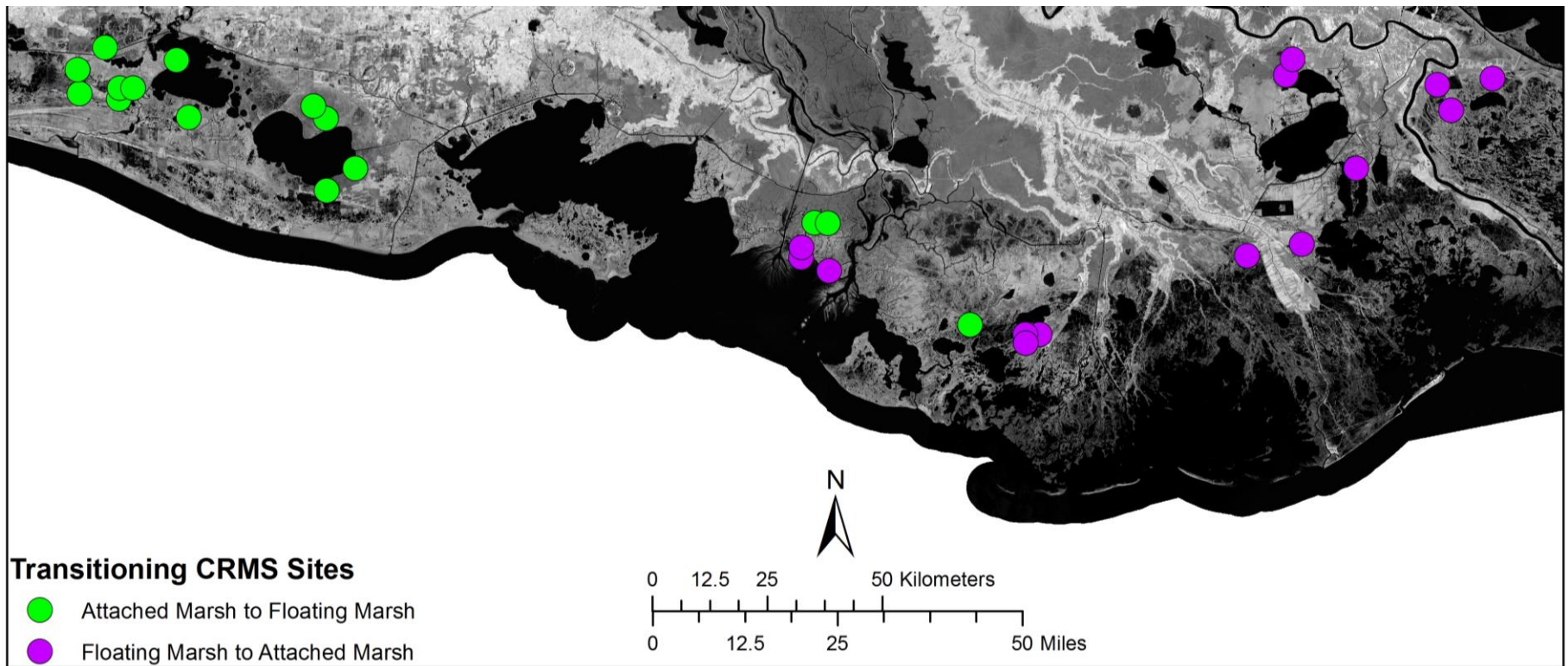
- Recently developed a method for extending RSET rods that were about to be buried. Deployed at 4 sites in the MR and 1 in BA.





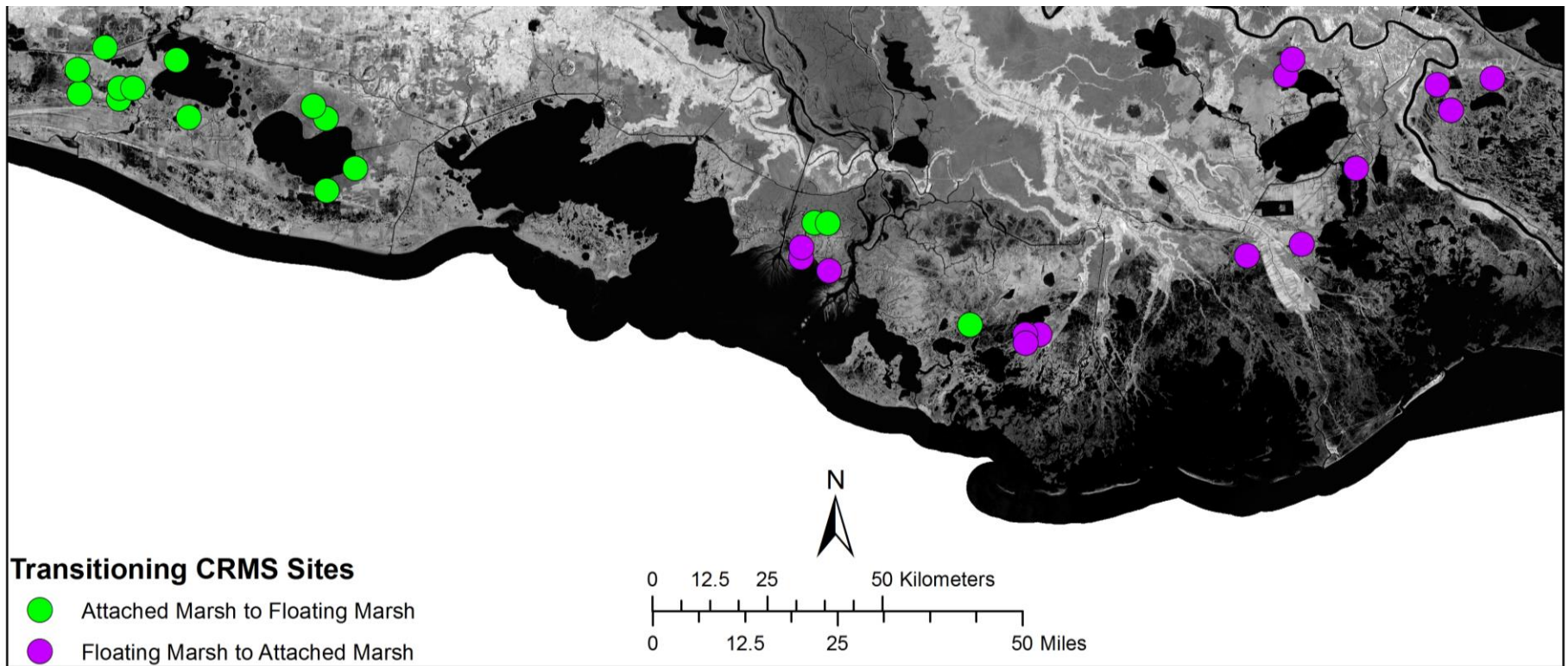
# Floating Marshes now Attached

- We are currently verifying that information and, if found to be attached, we will drive RSET rods, add accretion plots, remove the marsh mat recorder and establish marsh elevation for flooding calculation.
- Elevation change and accretion measurements will begin in Spring 2018.



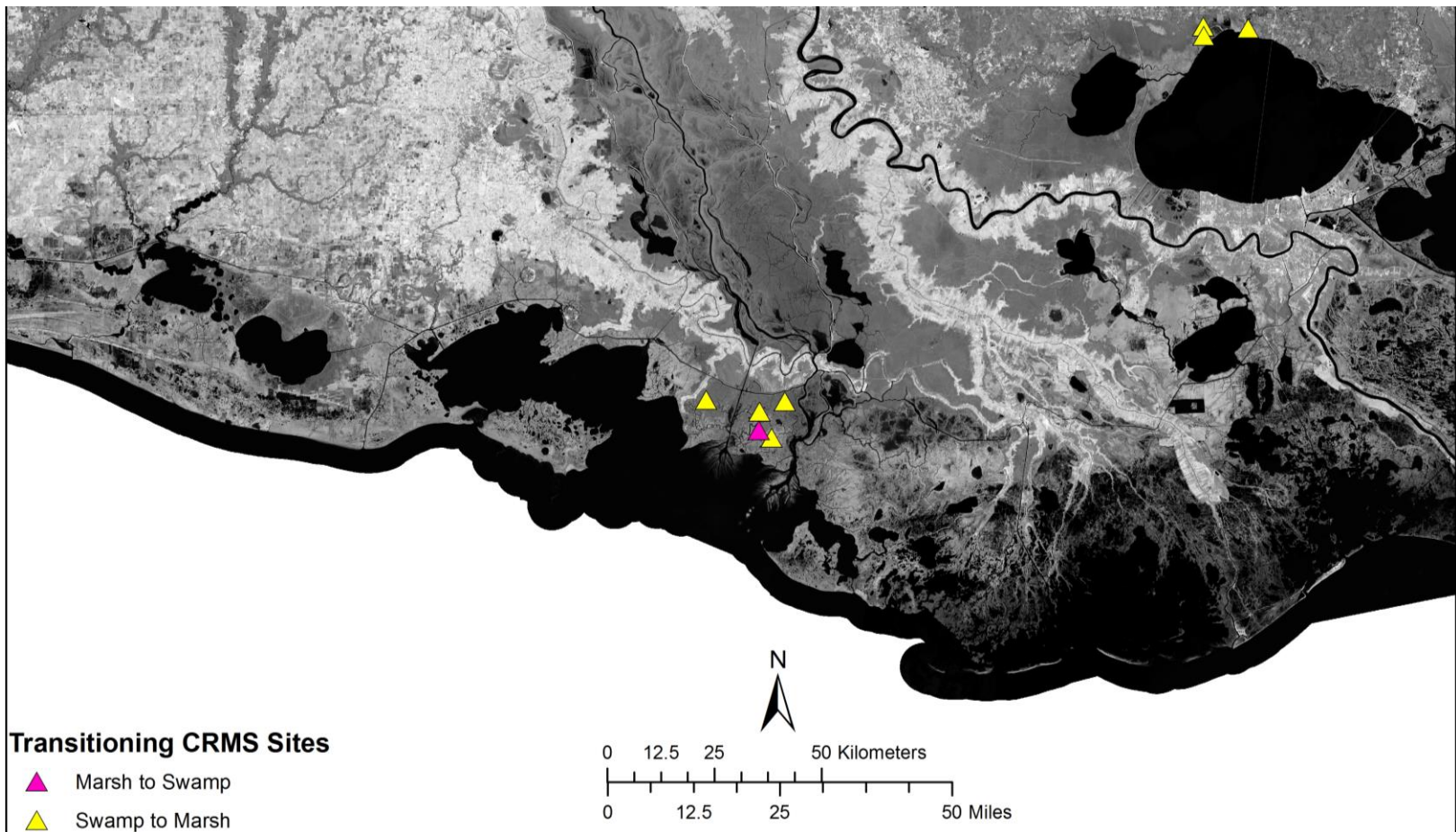
# Attached Marshes now Floating

- We will continue monitoring as attached and will use the RSET and Accretion data to assess if and when they re-attach.



# Fresh Marsh now Swamps

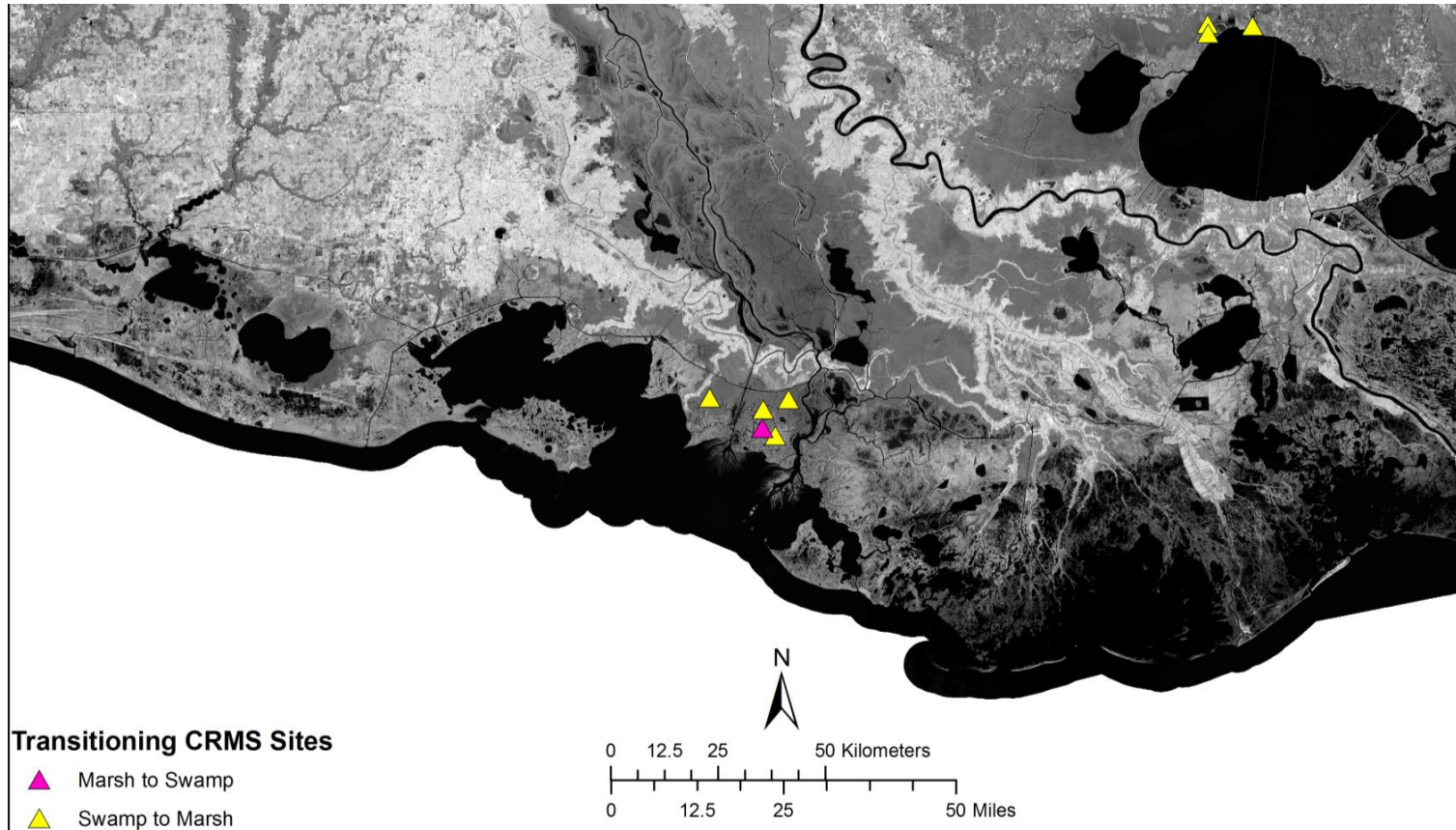
- Established as fresh marsh, now trees with dbh sufficient to consider measuring forested vegetation.
- We are assessing the sites and will add forest plots in the 2018 Forested Vegetation campaign if necessary.





# Swamps now Fresh Marsh

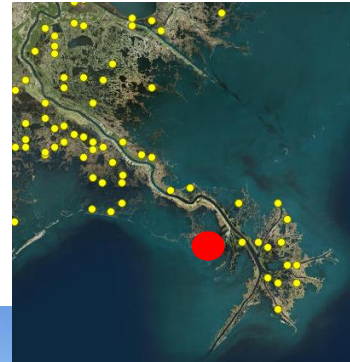
- ▲ 7 CRMS sites that were established as forested swamps have few trees and would now be considered marsh.
- We are assessing the sites and will cease forested data collection if necessary.
  - Sites would retain their low FFQI scores if the trees are gone.





# Phragmites Scale

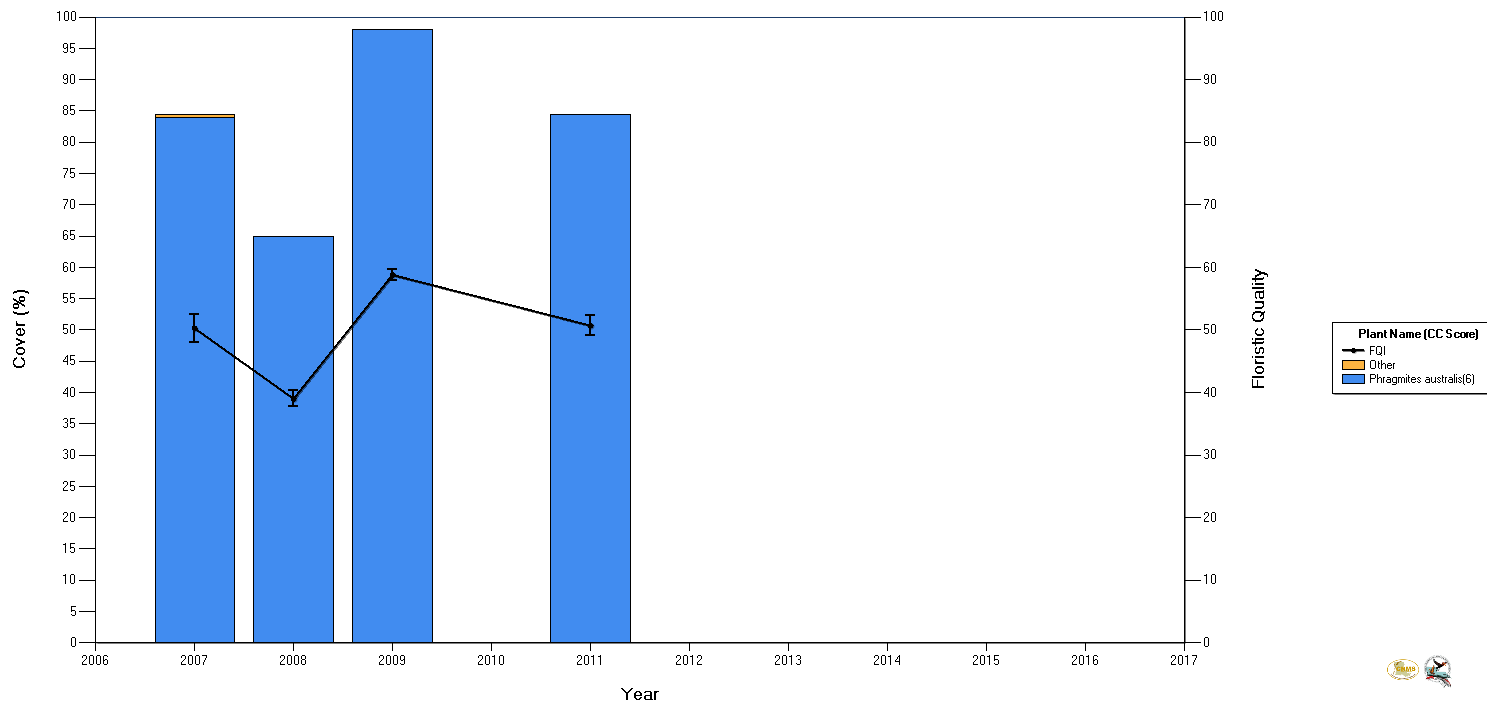
- We are aware of the Phrag Scale down in the MR delta. Field crews are on the lookout and will note the presence of scale during data collection.
  - Specific data will be captured if scale is found at CRMS vegetation stations or at boardwalks.
  - Preliminary investigation showed only CRMS0163 influenced
  - Destruction *en route* to a sites will be documented.



# Phragmites Estimation

- We estimated Phrag at difficult to reach locations from 2012 to 2016. Many estimates were 100% cover which is high compared to Phrag sites where cover was not estimated.
- We adjusted the CIMS database to address estimated data and are re-assessing after this veg season.
- Charts currently do not show data for estimated years.

Floristic Quality Index for Intermediate Marsh, Site CRMS0161



# First Basin scale report is in draft and will be available for review soon.



State of Louisiana

Coastal Protection and Restoration Authority  
(CPRA)

## 2016 Basin Summary Report

for

### Mermentau Basin

June 2016  
Cameron/Vermilion Parishes

Prepared by:  
Mark Mouldous and Bernard Wood

Operations Division  
Lafayette Regional Office  
635 Cajundome Boulevard  
Lafayette, LA 70506





# Land Area Change in Coastal Louisiana (1932 to 2015)



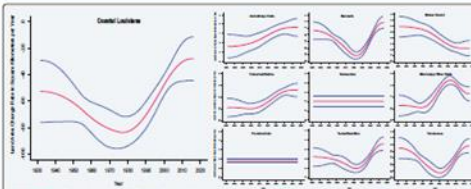
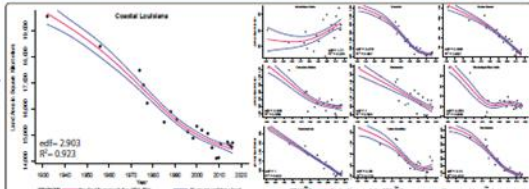
DRAFT

U.S. Department of the Interior  
U.S. Geological Survey

## Land Area Change in Coastal Louisiana (1932 to 2015)

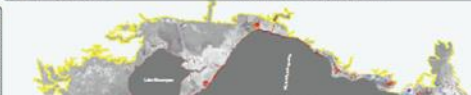
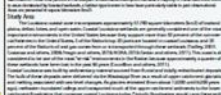
By Brady K. Couvillion, Holly Beck, Donald Schoellhamer, and Michelle Fischer

**Abstract**  
Coastal Louisiana is a dynamic environment with a long history of land area change. The U.S. Geological Survey (USGS) has been monitoring land area change in coastal Louisiana since 1932 using aerial photography and satellite imagery. This report presents the results of a comprehensive analysis of land area change in coastal Louisiana from 1932 to 2015. The analysis shows that land area has decreased by approximately 1,000 square miles (2,600 square kilometers) during this period. The largest losses have occurred in the Terrebonne and Calcasieu-Sabine Basins, which have lost approximately 400 and 300 square miles, respectively. The Teche-Vermilion Basin has lost approximately 200 square miles, and the Atchafalaya Delta Basin has lost approximately 100 square miles. The Barataria and Breton Sound Basins have lost approximately 50 square miles each. The Pontchartrain Basin has lost approximately 20 square miles. The Mississippi River Delta Basin has lost approximately 10 square miles. The analysis also shows that land area has increased by approximately 100 square miles in the Lake Charles and Lake de Cade Basins. The results of this analysis are presented in a series of maps and tables. The maps show the distribution of land area change across the state, and the tables provide detailed information on the amount of land area lost or gained in each basin. The analysis highlights the need for continued monitoring and management of coastal Louisiana to prevent further land area loss.

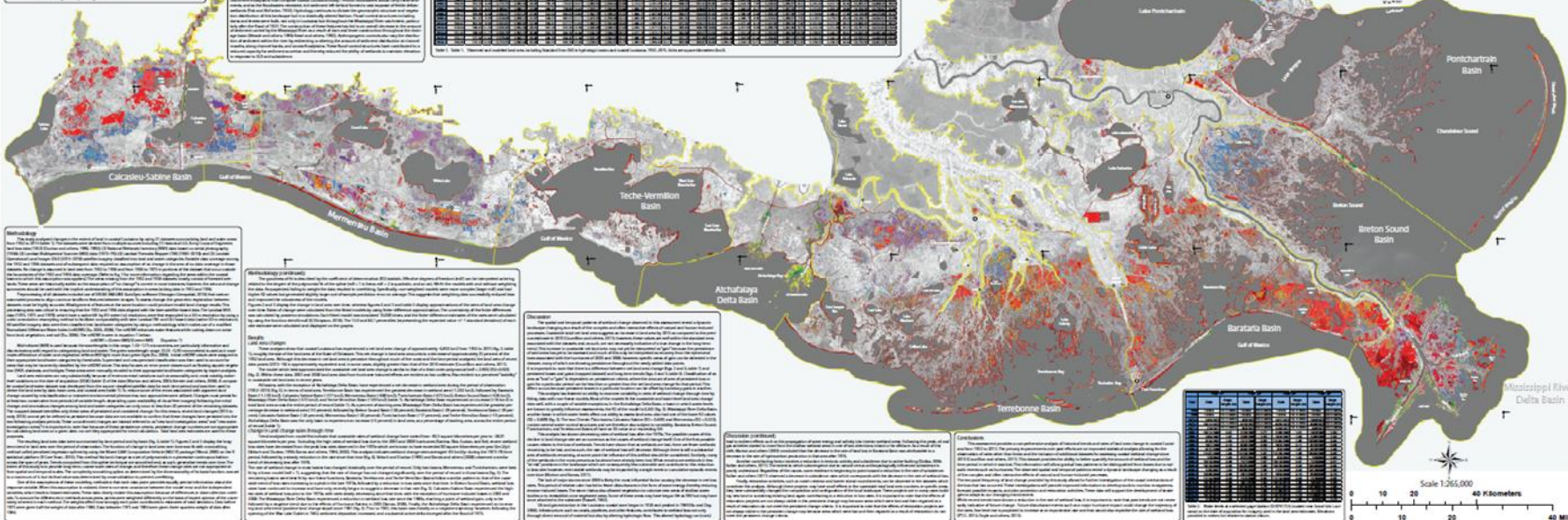


Basin	1932-1940	1940-1950	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000	2000-2010	2010-2015	Total
Calcasieu-Sabine Basin	-100	-100	-100	-100	-100	-100	-100	-100	-100	-1000
Terrebonne Basin	-100	-100	-100	-100	-100	-100	-100	-100	-100	-1000
Teche-Vermilion Basin	-50	-50	-50	-50	-50	-50	-50	-50	-50	-500
Atchafalaya Delta Basin	-20	-20	-20	-20	-20	-20	-20	-20	-20	-200
Barataria Basin	-10	-10	-10	-10	-10	-10	-10	-10	-10	-100
Breton Sound Basin	-10	-10	-10	-10	-10	-10	-10	-10	-10	-100
Pontchartrain Basin	-5	-5	-5	-5	-5	-5	-5	-5	-5	-50
Mississippi River Delta Basin	-2	-2	-2	-2	-2	-2	-2	-2	-2	-20
Lake Charles Basin	10	10	10	10	10	10	10	10	10	100
Lake de Cade Basin	10	10	10	10	10	10	10	10	10	100

**Introduction**  
Coastal Louisiana is a dynamic environment with a long history of land area change. The U.S. Geological Survey (USGS) has been monitoring land area change in coastal Louisiana since 1932 using aerial photography and satellite imagery. This report presents the results of a comprehensive analysis of land area change in coastal Louisiana from 1932 to 2015. The analysis shows that land area has decreased by approximately 1,000 square miles (2,600 square kilometers) during this period. The largest losses have occurred in the Terrebonne and Calcasieu-Sabine Basins, which have lost approximately 400 and 300 square miles, respectively. The Teche-Vermilion Basin has lost approximately 200 square miles, and the Atchafalaya Delta Basin has lost approximately 100 square miles. The Barataria and Breton Sound Basins have lost approximately 50 square miles each. The Pontchartrain Basin has lost approximately 20 square miles. The Mississippi River Delta Basin has lost approximately 10 square miles. The analysis also shows that land area has increased by approximately 100 square miles in the Lake Charles and Lake de Cade Basins. The results of this analysis are presented in a series of maps and tables. The maps show the distribution of land area change across the state, and the tables provide detailed information on the amount of land area lost or gained in each basin. The analysis highlights the need for continued monitoring and management of coastal Louisiana to prevent further land area loss.

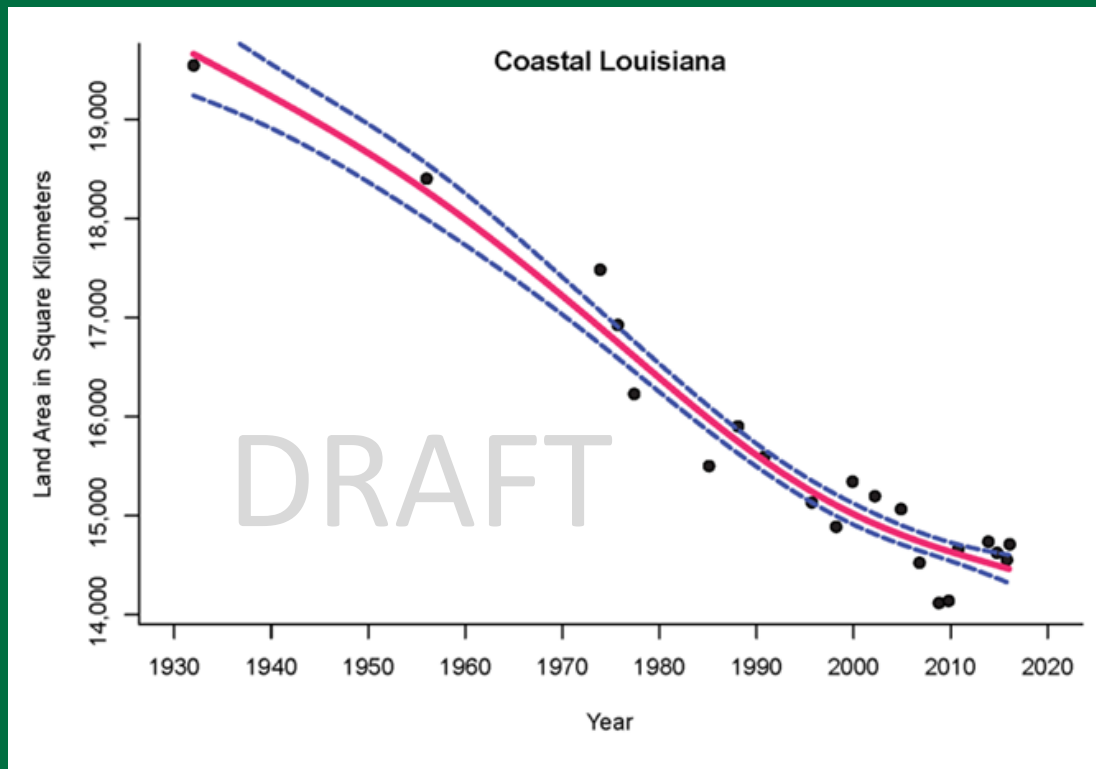


Basin	1932-1940	1940-1950	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000	2000-2010	2010-2015	Total
Calcasieu-Sabine Basin	-100	-100	-100	-100	-100	-100	-100	-100	-100	-1000
Terrebonne Basin	-100	-100	-100	-100	-100	-100	-100	-100	-100	-1000
Teche-Vermilion Basin	-50	-50	-50	-50	-50	-50	-50	-50	-50	-500
Atchafalaya Delta Basin	-20	-20	-20	-20	-20	-20	-20	-20	-20	-200
Barataria Basin	-10	-10	-10	-10	-10	-10	-10	-10	-10	-100
Breton Sound Basin	-10	-10	-10	-10	-10	-10	-10	-10	-10	-100
Pontchartrain Basin	-5	-5	-5	-5	-5	-5	-5	-5	-5	-50
Mississippi River Delta Basin	-2	-2	-2	-2	-2	-2	-2	-2	-2	-20
Lake Charles Basin	10	10	10	10	10	10	10	10	10	100
Lake de Cade Basin	10	10	10	10	10	10	10	10	10	100



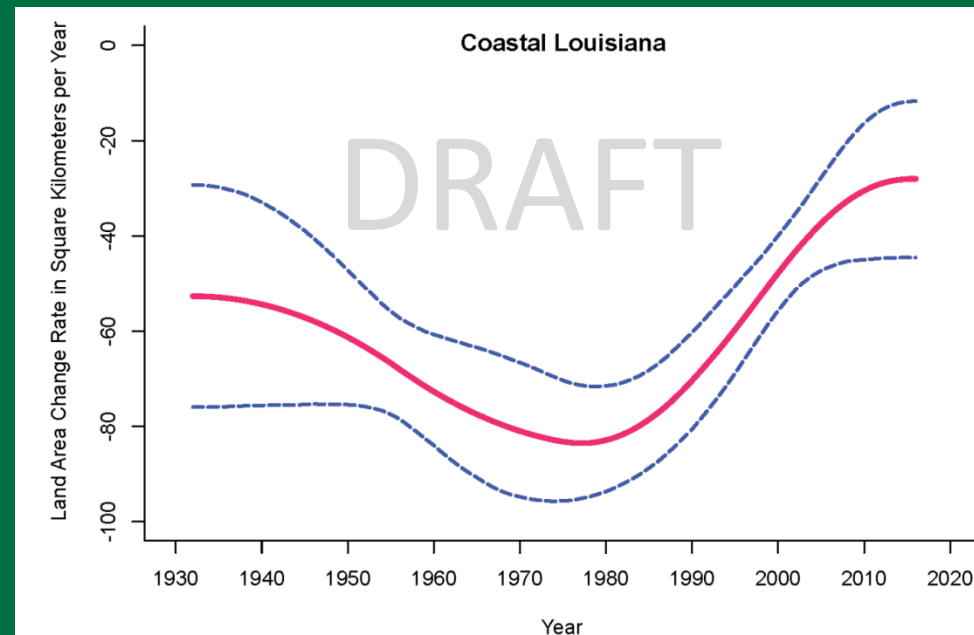
**EXPLANATION**  
1932-1940: Land area change from 1932 to 1940  
1940-1950: Land area change from 1940 to 1950  
1950-1960: Land area change from 1950 to 1960  
1960-1970: Land area change from 1960 to 1970  
1970-1980: Land area change from 1970 to 1980  
1980-1990: Land area change from 1980 to 1990  
1990-2000: Land area change from 1990 to 2000  
2000-2010: Land area change from 2000 to 2010  
2010-2015: Land area change from 2010 to 2015  
Total: Total land area change from 1932 to 2015  
Scale: 1:265,000  
North Arrow

- Change in land area over time was fit with penalized regression splines vs. prior work that was fit with a linear regression
- To account for differences in methods across years, points were weighted differently. The weight affects how strongly each point contributes to estimates of total deviation.
  - Prior to 1973: 1/2 the weight of data after 1984.
  - Between 1973 and 1984:  $\frac{3}{4}$  weight of data after 1984.



- Net change in land area of -4,833 km<sup>2</sup> from 1932-2015.
- Decrease of 25% of 1932 land area
- All basins experiencing net loss over study period except AT

- Land loss rate was greatest in the 1970's
- Variability in rates of change
- Decrease in loss rate
  - No major storms recently
  - Less land available for loss
  - Changes in subsidence rates
  - Land that is remaining is in less vulnerable position in the landscape
  - Changes in coastal development
  - Vegetation expansion







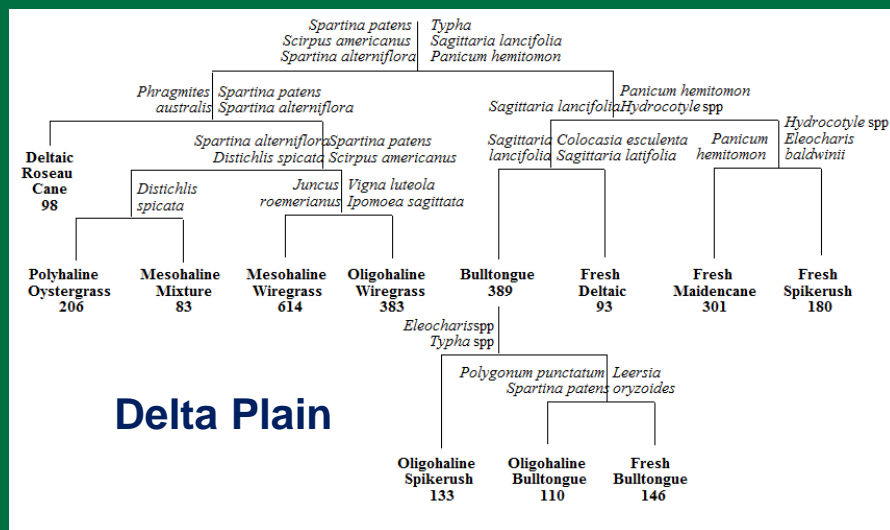
# Using Artificial Neural Networks For Classifying Marsh Vegetation Communities in Louisiana

Gregg A. Snedden  
USGS Wetland and Aquatic Research Center

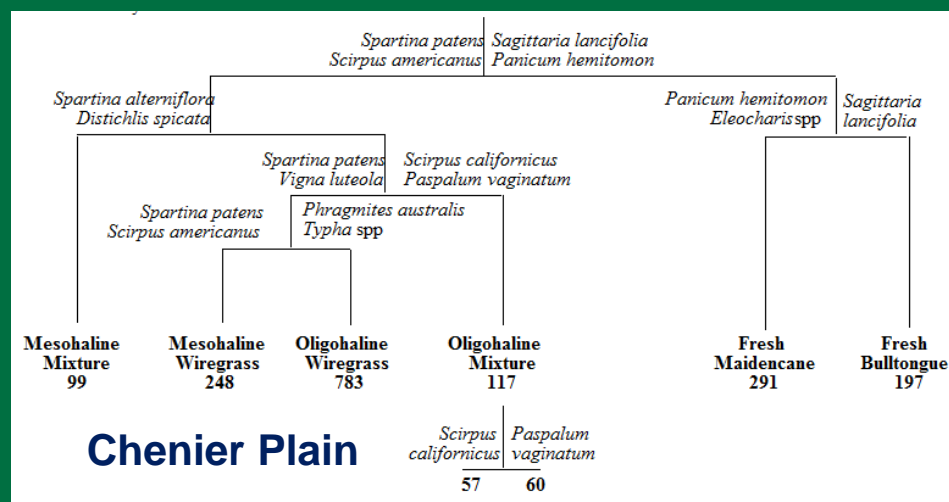
# Benefits

- Eliminates issues with spatial comparisons

Visser et al. 1998

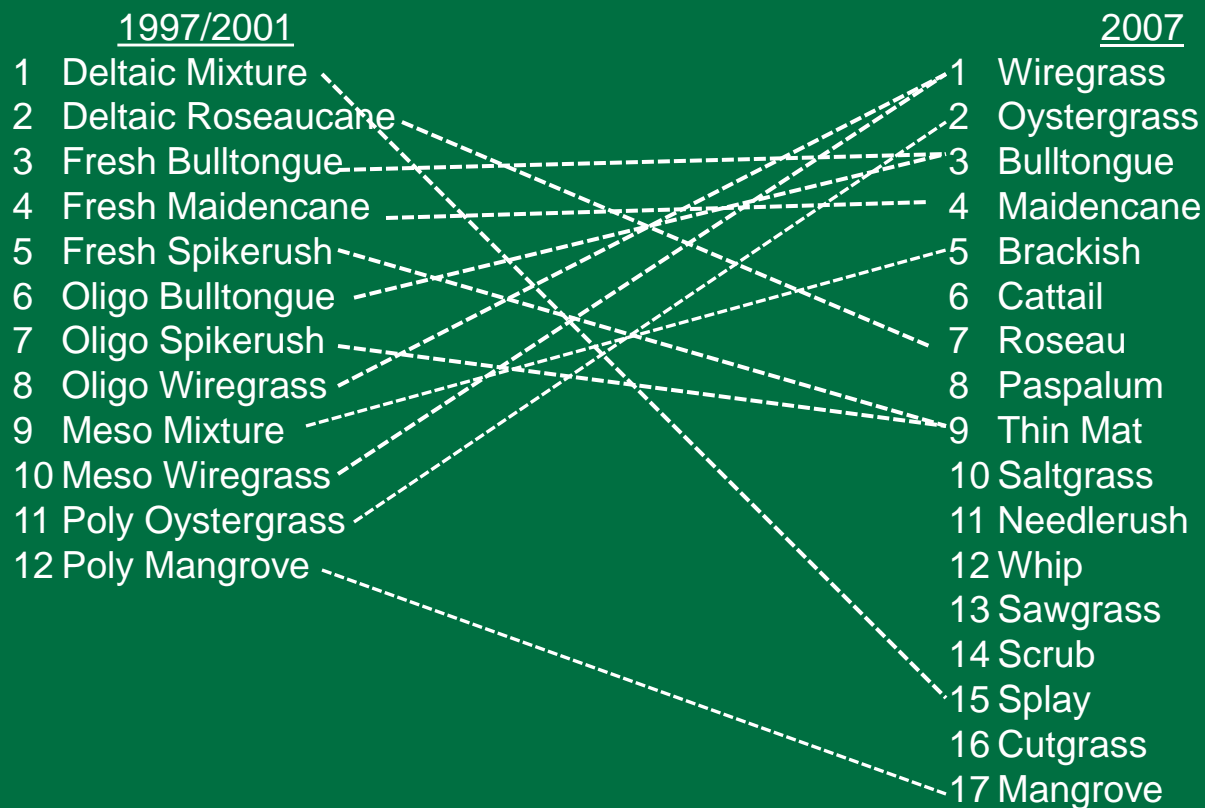


Visser et al. 2000



# Benefits

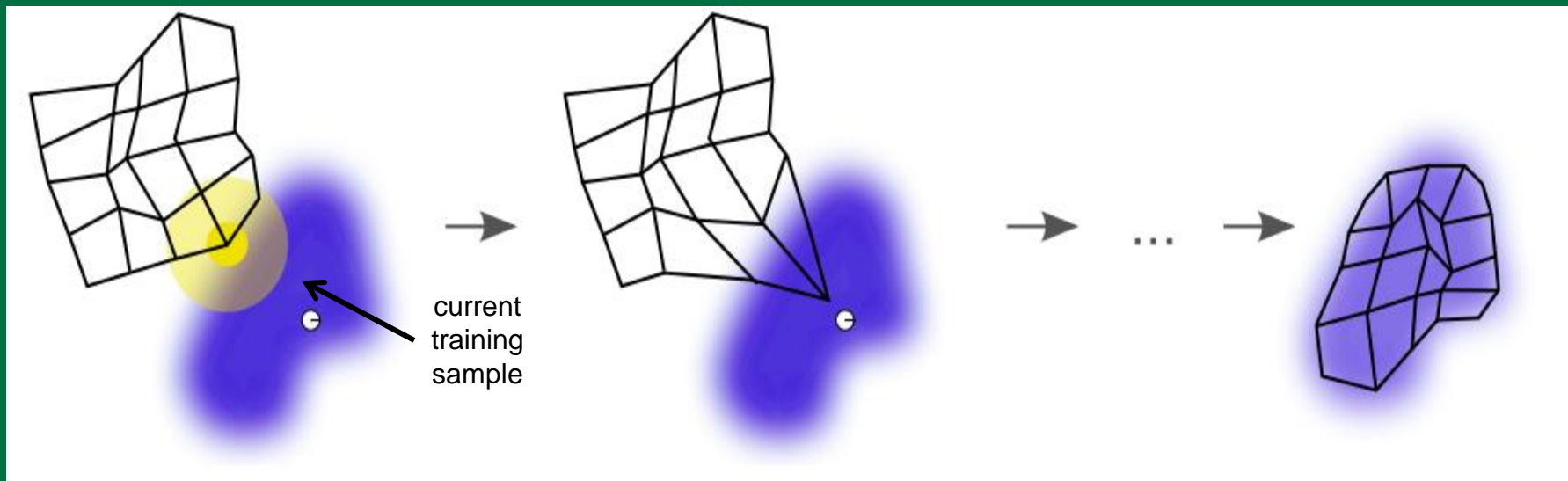
- **Eliminates issues with temporal comparisons**



- **Static classifier built with robust dataset**

# Creating a self-organized map (SOM)

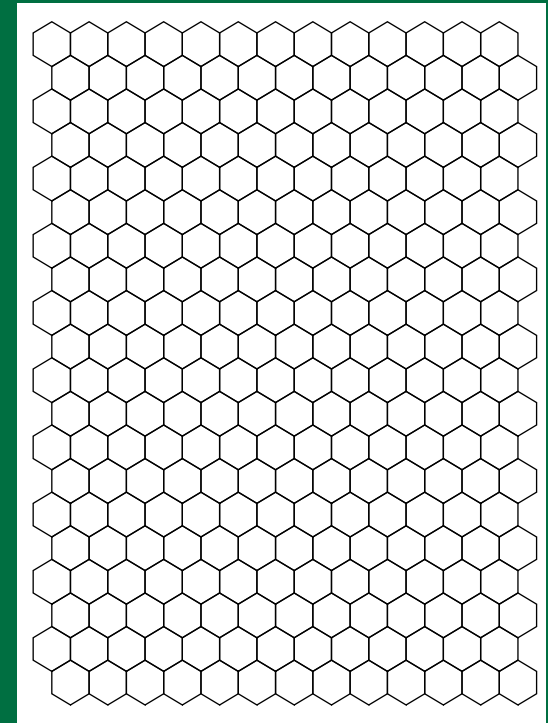
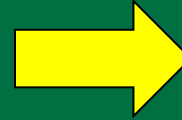
- Blue represents distribution of training data in multivariate space
- Each node initially has a random species composition
- Then nodes are added to represent similar species composition in neighboring nodes
- After repeating the process with all samples in training dataset the network approximates multivariate distribution of the training dataset





# Trained with CRMS Vegetation Survey data

Species					
	Sp <sub>1</sub>	Sp <sub>2</sub>	Sp <sub>3</sub>	...	Sp <sub>559</sub>
Sample <sub>1</sub>	85	0	5	...	0
Sample <sub>2</sub>	0	42	30	...	4
⋮	...	...	...	...	
Sample <sub>2526</sub>	2	76	20	...	0



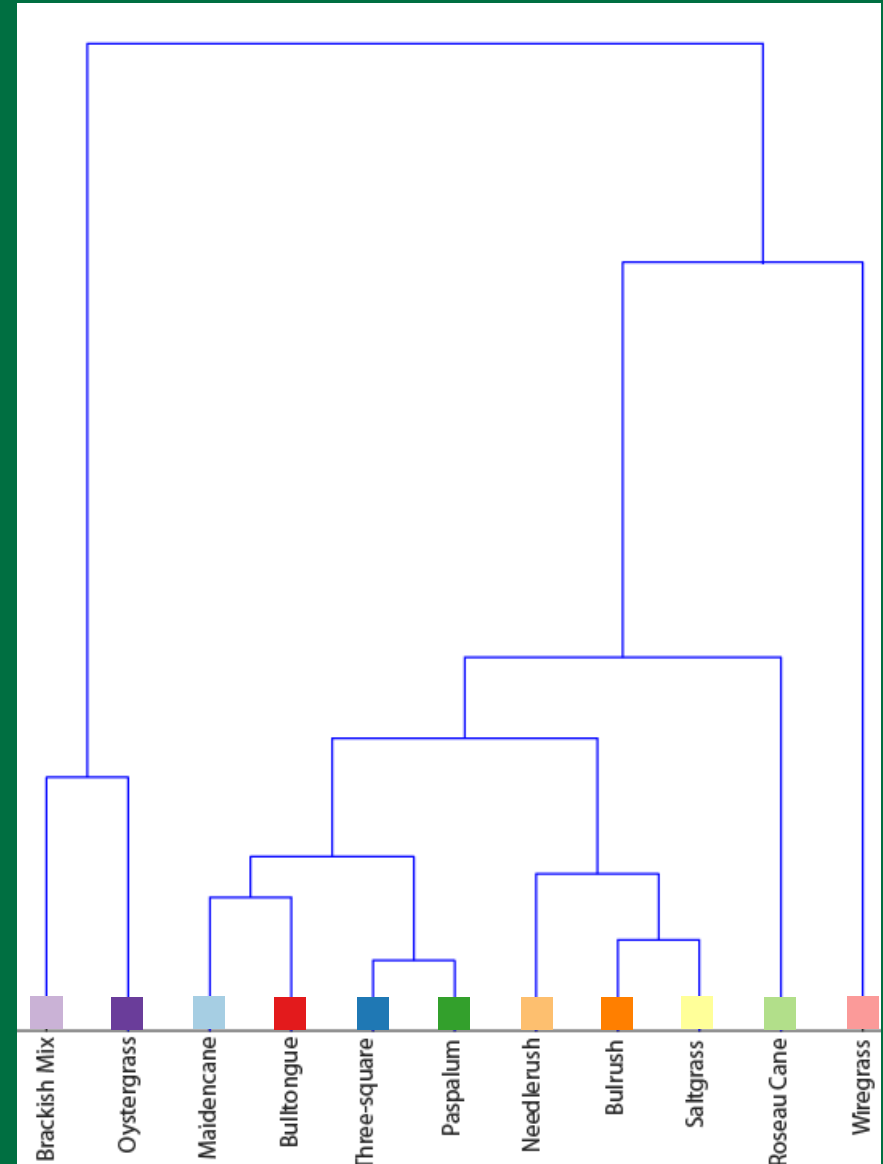
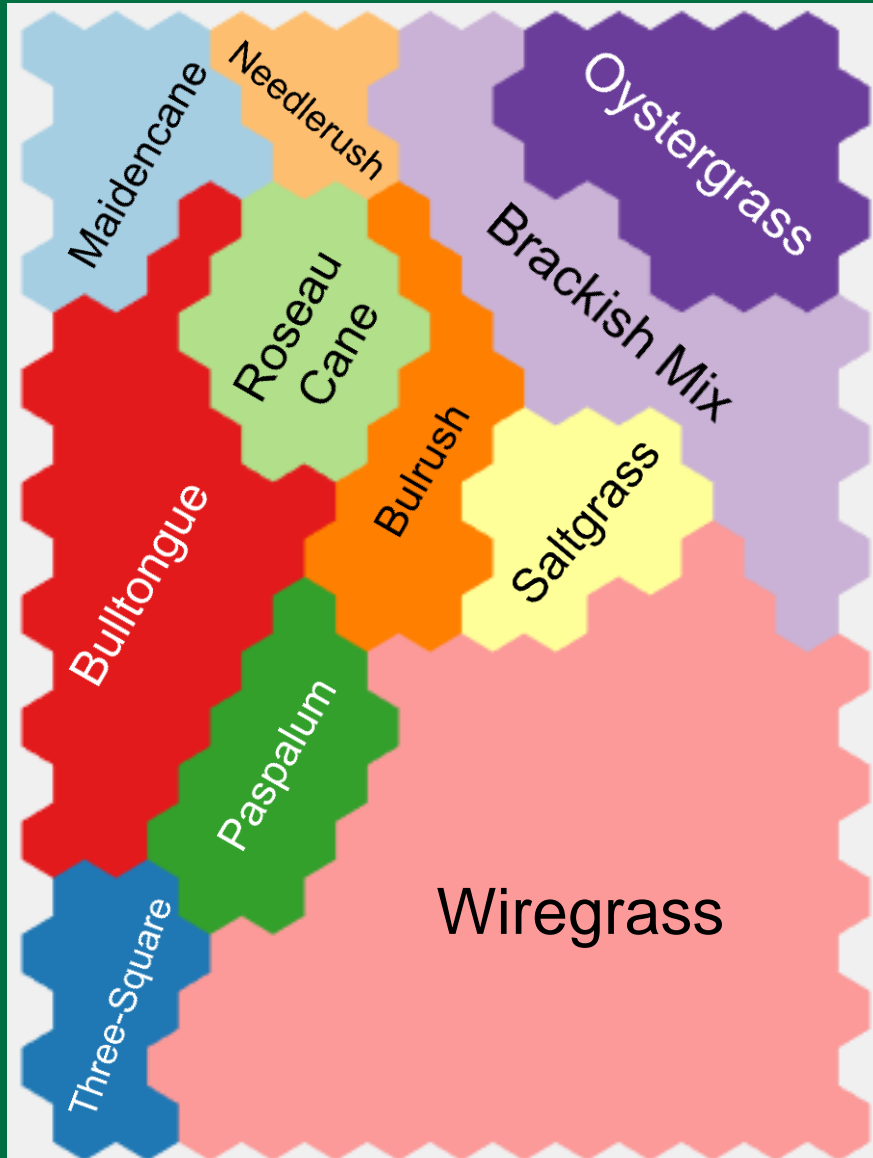
20 x 13 (260 cells)

$$\#cells = 5\sqrt{\#samples}$$

Multivariate distribution in 2D

- Surveys from 2006-2014
- 343 sites
- Swamp sites (56) removed
- 559 species included
- 2526 samples in training dataset (300ish sites, 7-9 years)

- Quantitatively determined the number and positions of dendrogram breaks
- 11 groups, named after dominant vegetation species



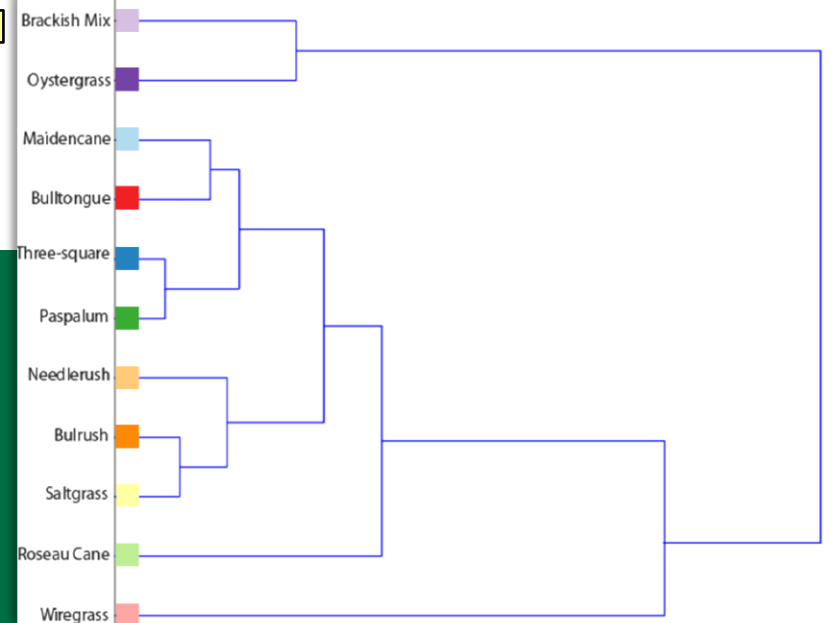
# Dominant Species



Maidencane		Three-square		Roseau Cane		Paspalum	
<i>Panicum hemitomon</i>	34	<i>Schoenoplectus americanus</i>	27	<i>Phragmites australis</i>	71	<i>Paspalum vaginatum</i>	24
<i>Leersia hexandria</i>	11	<i>Spartina patens</i>	19	<i>Spartina patens</i>	5	<i>Schoenoplectus californicus</i>	13
<i>Sagittaria lancifolia</i>	10	<i>Sagittaria lancifolia</i>	6	<i>Alternanthera philoxeroides</i>	4	<i>Spartina patens</i>	11
<i>Eleocharis</i>	7	<i>Lythrum lineare</i>	5	<i>Spartina alterniflora</i>	3	<i>Typha latifolia</i>	10
<i>Thelypteris palustris</i>	5	<i>Cladium mariscus</i>	4	<i>Typha domingensis</i>	2	<i>Ipomoea sagittata</i>	6
<i>Alternanthera philoxeroides</i>	4	<i>Eleocharis macrostachya</i>	4	<i>Zizaniopsis miliacea</i>	2	<i>Distichlis spicata</i>	3
<i>Typha</i>	4	<i>Distichlis spicata</i>	4	<i>Polygonum punctatum</i>	2	<i>Echinochloa walteri</i>	3

Wiregrass		Bulltongue		Neederush		Bulrush	
<i>Spartina patens</i>	65	<i>Sagittaria lancifolia</i>	16	<i>Juncus roemerianus</i>	54	<i>Schoenoplectus robustus</i>	24
<i>Distichlis spicata</i>	7	<i>Polygonum punctatum</i>	11	<i>Spartina alterniflora</i>	15	<i>Distichlis spicata</i>	16
<i>Schoenoplectus americanus</i>	5	<i>Alternanthera philoxeroides</i>	7	<i>Spartina patens</i>	8	<i>Spartina patens</i>	13
<i>Schoenoplectus robustus</i>	3	<i>Ludwigia grandiflora</i>	4	<i>Distichlis spicata</i>	8	<i>Spartina cynosuroides</i>	8
<i>Ipomoea sagittata</i>	2	<i>Typha</i>	4	<i>Lythrum lineare</i>	2	<i>Spartina alterniflora</i>	7
<i>Lythrum lineare</i>	2	<i>Colocasia esculenta</i>	3	<i>Phragmites australis</i>	2	<i>Paspalum distichum</i>	5
<i>Spartina alterniflora</i>	2	<i>Sacciolepis striata</i>	3	<i>Schoenoplectus robustus</i>	2	<i>Juncus roemerianus</i>	5

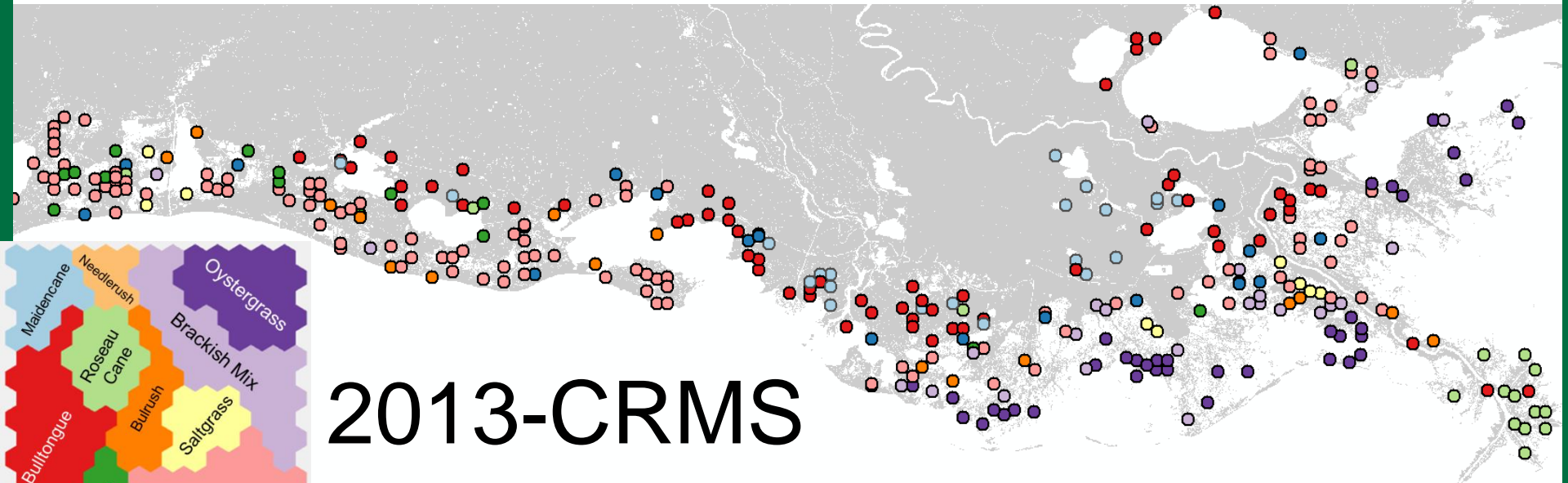
Brackish Mix		Oystergrass		Saltgrass	
<i>Spartina alterniflora</i>	53	<i>Spartina alterniflora</i>	93	<i>Distichlis spicata</i>	49
<i>Spartina patens</i>	20	<i>Juncus roemerianus</i>	4	<i>Spartina patens</i>	21
<i>Juncus roemerianus</i>	10	<i>Spartina patens</i>	1	<i>Spartina alterniflora</i>	15
<i>Distichlis spicata</i>	7	<i>Distichlis spicata</i>	1	<i>Schoenoplectus robustus</i>	6
<i>Schoenoplectus robustus</i>	3	<i>Batis maritima</i>	<1	<i>Schoenoplectus americanus</i>	2
<i>Avicennia germinans</i>	3	<i>Schoenoplectus robustus</i>	<1	<i>Iva frutescens</i>	1
<i>Iva frutescens</i>	2	<i>Avicennia germinans</i>	<1	<i>Juncus roemerianus</i>	1





A map showing the distribution of 2009-CRMS data points across a coastal region. The points are represented by small colored circles in various colors including red, blue, green, orange, yellow, and purple, scattered across the landmasses.

# 2009-CRMS



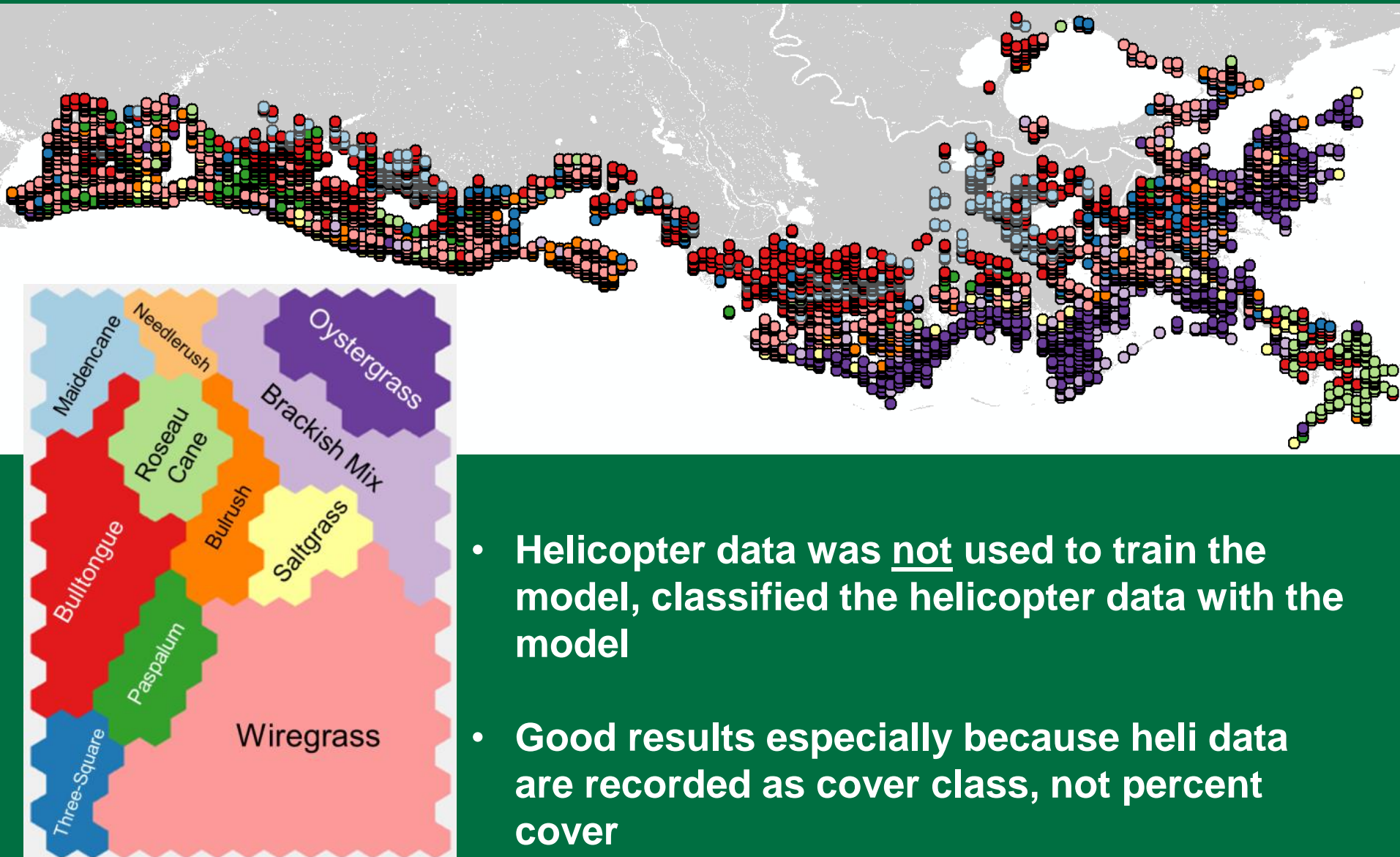
A map showing the distribution of 2013-CRMS data points across the same coastal region as the 2009 map. The points are represented by small colored circles in various colors including red, blue, green, orange, yellow, and purple, scattered across the landmasses.

# 2013-CRMS





# 2007 Helicopter survey data classified



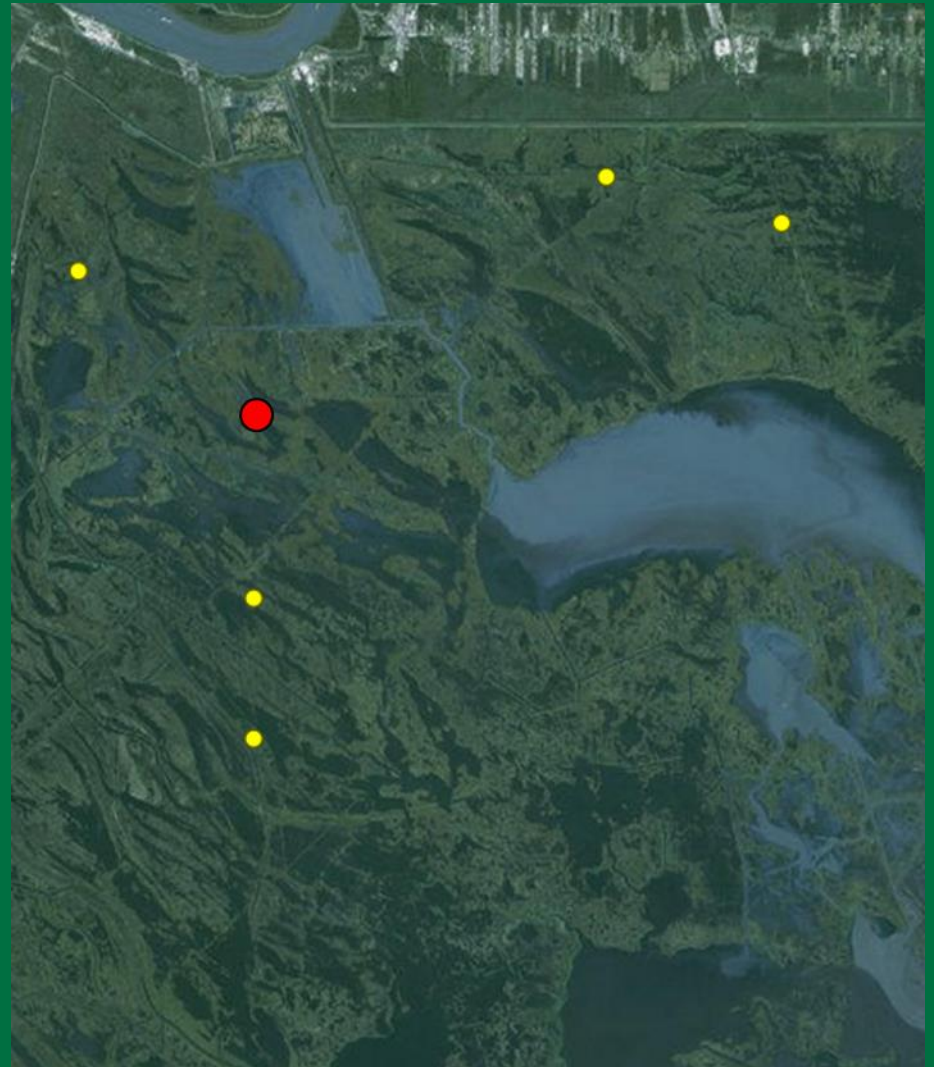
# Environmental Conditions



Type	Average annual salinity	Percent time flooded	tidal amplitude	bulk density	organic matter	organic density
Needlerush	8.70	30.04%	17.68	0.37	22.1%	0.08
Brackish mix	11.09	37.62%	16.02	0.32	27.9%	0.09
Three-square	2.32	38.87%	8.80	0.19	42.2%	0.08
Maidencane	0.24	40.17%	8.46	0.18	44.5%	0.08
Wiregrass	5.34	42.51%	6.09	0.20	38.6%	0.08
Oystergrass	15.14	43.62%	21.23	0.36	21.7%	0.08
Saltgrass	9.28	44.09%	7.46	0.32	29.2%	0.09
Roseau cane	3.04	46.99%	7.97	0.34	31.0%	0.10
Bulltongue	1.03	49.88%	8.95	0.29	36.7%	0.11
Bulrush	7.07	50.41%	9.32	0.34	29.5%	0.10
Paspalum	2.50	68.00%	1.93	0.14	52.3%	0.07

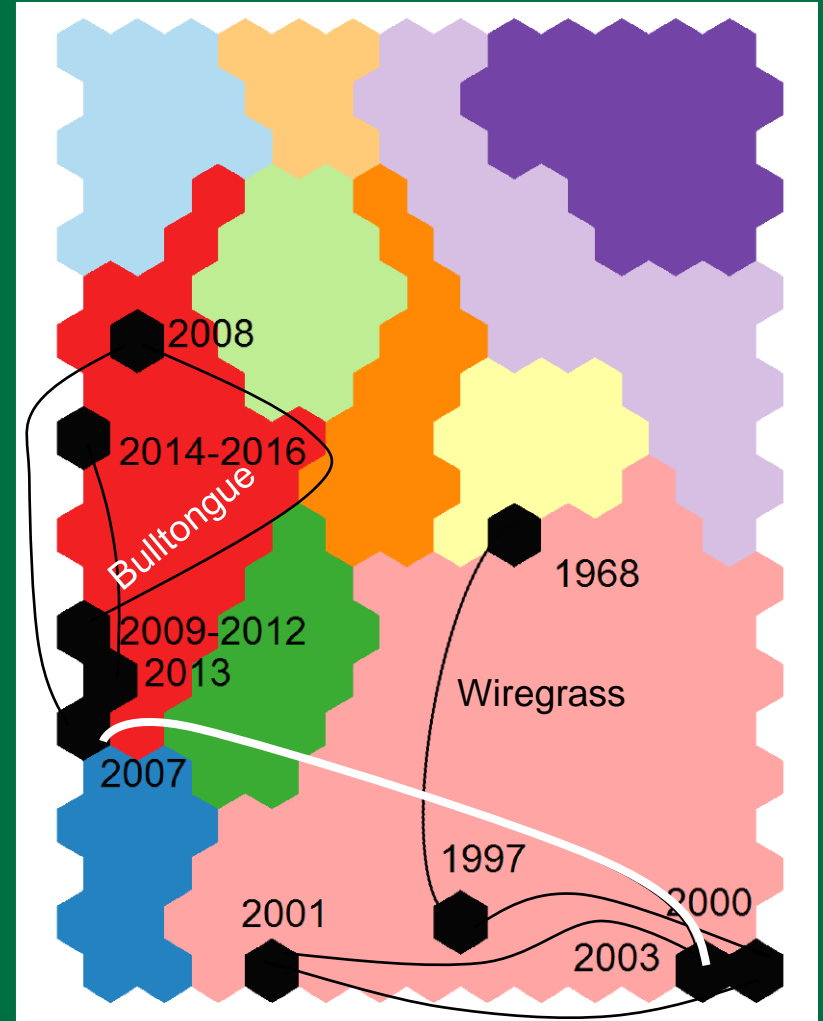
# Application: SOM Tracking Community Change in Upper BS, 1968 – 2016, CRMS0117

- Brackish salinity regime prior to Caernarvon operations wiregrass plant community present (pre-1991; Lane et al. 1999)
- Wiregrass community persisted through the years leading up to Katrina
- Vegetation community transitioned to bulltongue between 2003 and 2007, possibly disturbance-related
- Improved community change trajectory visualization possible



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# Questions?

Data requests,  
ideas,  
specialized  
website training



*Website survey response:*

*".....Without CRMS, project development & evaluation would be set back by decades."*

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