





CRMS Website Training



April 2017

https://lacoast.gov/crms 703.648.4848 69619006#

Coastwide Reference Monitoring System – Wetlands Training Plan

Introduction

- Resources on website (https://lacoast.gov/crms) Library- pdf of this presentation will be posted Program subheading- descriptive documents, publications
- CWPPRA/CRMS background
- Charting
- Bulk Charting
- Data Download
- Mapping Viewer



Coastwide Reference Monitoring System – Wetlands CWPPRA Restoration Program



Restoration project types: diversions of freshwater and sediments, marsh creation, shoreline protection, sediment and nutrient trapping, hydrologic restoration, and vegetation planting

- CWPPRA was congressionally funded in 1990 and mandated 20 years of restoration project monitoring
- CWPPRA program uses multiple restoration techniques
 - size and types of projects vary
- Initially the program used paired project and reference sites
- difficult to find "uninfluenced" reference
- pre-construction vs. postconstruction time scales
- Inconsistent monitoring variables and collection frequencies across projects with short data records



Coastwide Reference Monitoring System – Wetlands Purpose



- To improve our ability to determine the effectiveness of individual coastal restoration projects.
- Provide information to evaluate coastal wetlands at the project, basin, and coastwide scales.
- To determine the ecological condition of coastal wetlands to ensure that the strategic coastal planning for Louisiana (Coast 2050, LCA, Louisiana Master Plan) is effective in recreating a sustainable coastal ecosystem.



Fresh

Brackish
 Saline

Coastwide Reference Monitoring System – Wetlands CRMS Design and Assessment



- Funded by CWPPRA in 2003 & State of LA
- CPRA/USGS Sponsors
- ~ 390 CRMS sites
- Long-term dataset
 (2006-2019)
- Sites inside & outside of CWPPRA projects
- Sites in swamp, fresh, intermediate, brackish, and salt marsh
- Barrier islands monitored through BICM, not CRMS
- Allows for multi-scale assessments through CRMS report cards
- Data used for future scenario modeling



Coastwide Reference Monitoring System – Wetlands CRMS Design and Assessment



Questions to address through CRMS:

Did the restoration program:

- reduce coastal wetland loss?
- sustain a diversity of vegetation types within basins?

Is the restoration program effective in reducing major stressors on wetlands (e.g., flooding regime, salinity, elevation change)?



Coastwide Reference Monitoring System – Wetlands Site Design

Non-spatial data collection Spatial data collection 200m 1km MARSH 200m 200 m 1km 200 m WATER 2m X 2m vegetation station - V01 Rod Surface Elevation Table (RSET) – E01 Accretion station – A01 Hydrologic datasonde – H01, W01 **Boardwalk**



Typical Marsh Site



Typical Swamp Site

CRMS sites contain numerous CRMS stations

See cheat sheet for details of the standardized naming conventions



CRMS DATA COLLECTION INFORMATION AND SCHEDULE

CRMS website: http://lacoast.gov/crms

Standard operating procedures: CRMS website-Program/Administration/Support Docs/Folse et al. 2014.

Download "raw" data from Coastal Information Management System (CIMS): CRMS website-Data/Tabular/CIMS Data Tool (http://cims.coastal.louisiana.gov/)

Hydrographic: Station number (H01): Continuous hourly salinity, temperature, and water level data are collected. At most sites the data sonde is in an open water body or bayou.

- Station number (W01): Continuous hourly salinity, temperature, and water level but the data sonde is in a well in the marsh instead of an open water body.
- Station number (M01): Marsh mat stations are established in floating marshes where the marsh mat rises and falls with water level.

CRMS sites with *realtime* hydro gages: CRMS0061, 0282, 0411, 0465, 0568, 0609, 0615, 0651, 2418, 5373 -- http://waterdata.usgs.gov/la/nwis/current/?type=flow

Soil Porewater Salinity: Station number (P01, P02, P03): Discrete collections near the CRMS boardwalks: 1) intermittently throughout the year during hydro data sonde servicing and 2) twice annually during spring and fall RSET/accretion sampling. Collected at each vegetation station (10 herbaceous vegetation stations per CRMS site) during vegetation sampling in the late summer/early fall.

- Herbaceous Vegetation: Station number (V01, V02, etc.): Species composition, percent cover, and dominant height once annually (late summer/early fall) at 10 stations per CRMS site. Plots are 2X2m.
- **Vertical Accretion** (Station number (A01, A02, etc.)) & **Surface Elevation** (Station number E01 or E02): Collected twice annually (spring and fall) using cryo-coring and rod-surface elevation tables.

Swamp Forest:

- Overstory Station number (F01, F02, etc.) (at least every 3 years): species composition and diameter at breast height (DBH) for woody shrubs and trees > 5 cm DBH in late summer/early fall. Canopy cover with a densiometer annually during herbaceous vegetation sampling. Plots are 20X20m.
- Understory Station number (F01UNW, UC, USE, etc.) (every 3 years): species composition, height, DBH, stem density of woody shrubs and trees < 5 cm DBH (late summer/ early fall). Plots are 6X6m.
- 3) Swamp Herbaceous Vegetation Station number (F01VNW, VC, VSE, etc.) (annually in the late summer/early fall): same as for herbaceous vegetation as described above but at 9 stations per swamp CRMS site. Plots are 2X2m.

Soil Properties: Station number (S01, S02, etc): Collected upon site establishment and every 10 years in marshes and 6 years in swamps.

• pH, salinity, bulk density, soil moisture, percent organic matter, wet/dry volume

Cheat Sheet: Provided via email (4/7/17) and available in the FAQ's on home page



Coastwide Reference Monitoring System – Wetlands Site Data Collection



1km² scale:

High resolution aerial photography based land:water analyses to investigate land change through time.



200m² scale: Field data collection using standardized data collection protocols and consistent sampling intervals





Coastwide Reference Monitoring System – Wetlands Site Layout









H01 - Installed in open water, this sonde captures hourly salinity, water surface elevation, and water temperature data.

M01 Floating System:

This monitoring system is deployed in thick marsh mats that can support instrument weight. The data sonde is suspended in the fluid ooze layer and records vertical mat movement, salinity, and water temperature.

M01 Static System:

An anchored pulley system is used to record vertical mat movement in thin marsh mats that cannot support the weight of the monitoring equipment. **P01, P02** - Water samples are extracted from 10 cm and 30 cm depths using a syringe. The salinity of the collected water is used to assess the salt exposure expereinced within the root zone of the marsh. E01 - This station uses a Rod Surface Elevation Table (RSET) instrument to measure surface elevation changes relative to a steel rod that is set deep (~100 ft) into the marsh subsurface. An RSET table connects to the rod using a permantly attached collar and measurements are taken by loweing 9 fiberglass pins to the marsh surface. Data is collected over time to measure changes in surface elevation. A01- Soil accretion, or land building, data is collected by measuring soil that accumulates above a feldspar marker horizon that has been previously placed on the marsh surface. A specialized cryogenic coring device is used to ensure accuate readings of the feldspar location within the core.



Coastwide Reference Monitoring System – Wetlands Site Data Collection

Data Type	Parameter	Method	Scale	Frequency
Land	Land:Water Ratio	Satellite Imagery	Hydrologic Basin	3 years
change	Land:Water Ratio	Digital Aerial Photography	CRMS Site (1 km ²)	3 years
	Emergent Vegetation	Braun Blanquet: % Cover, Species Richness, Height of Dominant Species	(10) 2m x 2m plots per marsh site or (9) plots per swamp sites	Annually during peak biomass
Vegetation	Forested Vegetation	DBH, Canopy Cover, Understory veg	(3) 20m x 20m Forested plots & (9) 6m X6m Understory plots per site	3 yrs during peak biomass
	Soil Characteristics	Core samples profiled into 4 cm increments to 24 cm. Bulk Density, OM%, Soil Salinity, pH, and Moisture.	3 cores, 18 archived samples per site	6 to 10 years
Soils	Vertical Accretion	Feldspar Plots/Cryogenic Cores	3 plots per site	Twice per year
	Marsh Elevation Change	Rod Surface Elevation Table (RSET)	4 directions per site	Twice per year
Hydrology	Soil Porewater	10 and 30 cm syringe sippers	3 samples per depth per site and at vegetation plots	Variable and annually
nyarology	Surface Water Salinity, Temp and Water Level	Submersible Data Logger	in available water within 200m of CRMS site or in a well	Hourly



A STANDARD OPERATING PROCEDURES MANUAL FOR THE COAST-WIDE REFERENCE MONITORING SYSTEM-WETLANDS:

Methods for Site Establishment, Data Collection, and Quality Assurance/Quality Control

Todd M. Folse, Jonathan L. West, Melissa K. Hymel, John P. Troutman, Leigh A. Sharp, Dona Weifenbach, Tommy E. McGinnis, Laurie B. Rodrigue, William M. Boshart, Danielle, C. Richardi, C. Mike Miller, and. W. Bernard Wood

The Louisiana Coastal Protection and Restoration Authority

- QA/QC procedure for each data type
- Field procedures
- Data entry
- Initial data review
- Automated review during submission into database buffer
- CPRA regional office review
- Final approval and acceptance into CIMS database-- data lag varies by data type



From Date (mm/dd/yyyy):

To Date (mm/dd/vvvv):

Coastwide Reference Monitoring System – Wetlands Database



alternate request option is available (see Other Data, below).

Accretion Data **Retrieve Accretion Data**

Accretion data can be downloaded either by project, CRMS (Coastwide Reference Monitoring System) site, or station number. These data are collected from specific locations within herbaceous marsh vegetation areas and forested swamp/bottomland hardwood vegetation areas, and are collected at 6 months and 12 months after monitoring station establishment. Accretion measurements show rates of soil accretion or soil erosion at a location.



Coastwide Reference Monitoring System – Wetlands Database



CRMS Data Records:

Continuous Hydro – 57.2 million Marsh Veg - 356K Surface Elevation - 277K Discrete Hydro - 221K Forested Veg - 53K Accretion - 43K Soils – 8K





- Federal and State Scientists
- Academics
- WARC's Advanced Applications Team
- Oversight by CWPPRA Monitoring Work Group



Coastwide Reference Monitoring System – Wetlands Analytical Teams







Wetland restoration efforts conducted in Louisiana require monitoring the effectiveness of individual projects as well as monitoring the cumulative effects of all projects in restoring, creating, enhancing, and protecting the coastal landscape. The effectiveness of the traditional paired-reference monitoring approach in Louisiana has been limited because of difficulty in finding comparable test sites. CRMS is a multiple reference approach that uses aspects of hydrogeomorphic functional assessments and probabilistic sampling.

This approach includes a suite of sites that encompass the range of ecological conditions for each stratum, with projects placed on a continuum of conditions found for that stratum. Trajectories in reference sites are then compared with project trajectories through time. The approach could serve as a model for evaluating wetland ecosystems.



- Web mapping viewer
- Summarize and visualize data at multiple scales
- On-the-fly user defined graphics and tools
- Simple queries and data downloads
- Develop multi-metric ecological indices
- Develop report card
- Continually evolving





Coastwide Reference Monitoring System - Wetlands Overview of Report Card Indices

Vegetation:

- Floristic Quality Index (FQI) used to determine wetland quality based on plant species composition.
- <u>Vegetation Volume Index (VVI)</u> quantifies the 3D vegetative structure irrespective of species.

Hydrology:

 <u>Hydrologic Index (HI)</u> assesses the suitability of average salinity and percent time flooded in maximizing vegetation primary productivity.

Soils:

• <u>Submergence Vulnerability Index</u> (SVI) assesses the vulnerability of a site to submergence based on it's elevation relative to ESLR.



Coastwide Reference Monitoring System (CRMS)

Site Level Report Card

Site: CRMS0672 Year: 2014



3/17/2015



- Developed using CRMS dataset
 - · 2006-2009
- Good (>75%), fair (25-50%), poor (<25%)
- Category thresholds vary by index
- SVI is a continuous scale without defined thresholds





https://lacoast.gov/crms



- Main menu with a series of submenus
- Largely self explanatory
 - Program Subheading- LOTS of documentation Support documents and publications Contact information-USGS/CPRA CRMS Leads
 - FAQs
- Best functionality in Google Chrome
- OPM dictated website security changes may result in slower functionality
- This presentation focuses on most used features



Hydro Basi Vegetation

Public Lands

MP 2012

Land Chan

Land/Water

HUC12

Coastwide Reference Monitoring System - Wetlands **Site Navigation**





MP 2012 Land Chan Land/Wate HUC12

Coastwide Reference Monitoring System – Wetlands Site Navigation





	Charting Bulk Chartin	ng Data Download	Reporting	
Coastwide Reference Monitoring Home Data Mapping Library Visua	• Hydro			
	 Vegetation 			
	> Soil			
	 Spatial 			
	Report Card Cha	rts	Coas CRMSI Mein Motty War Elwalon	twide Reference Monitoring System 3990 - Continuous Hydrographic Data Maai beeste 60008 — Mach Beester 600003 — Meer Norde Saley — Meer Poweite Saley Ton
ChartsLots of Ch Surface Elev % Organic / I 	arts ation/Accretion Bulk Density			Petruary 2006. April 2017 Data Source: Monthly Averages
Vegetation		Water Surface Elevation F	Range - CRMS0189-H01 2009	
 Forested Porewater Hydrographic Precipitation Report Card 	C (Salinity, Temp, Water Level)			ACCOMMENTATION ACCOMMENTATION Less 35 4 5 4 0000 Less 35 4 5 4 0000 Exert 15 1 4 0000 Pagenese monthers file Pagenese mo
		Oct Nov Dec Jan Feb Mar Apr N 2008 2008 2008 2009 2009 2 Data Source: Continuous Hour	fery Jun Jul Aug Sep oos 2009 2009 2009 2009 y Observations	Interesting without Nade Pro- Representation and Pro- Parama and Pro- team and Pro- team and Pro- Representation and Pro- Representation and Pro- Representation and Pro- Representation and Pro- Paramateria and Pro- Representation and Pro- Paramateria and Pro-

Download



- 1. Pick a Data Category Hydro
- 2. Pick a Parameter Salinity

Charting Bulk Charting Data Download	Reporting
- Hydro	
Water Level Range Hydro Completeness Salinity Water Level Temperature Flooding Continuous Site Hydro Index Soil Porewater Precipitation	Casci-mde Johnson Strantyrong Styden Meth. antien-Stearty June
Vegetation	
> Soil	
Spatial	
Report Card Charts	
Clear Charts	



- 1. Pick a Data Category Hydro
- 2. Pick a Parameter Salinity
- 3. Pick a Scale Station
- 4. Enter Start / End Dates 1/1/2001 12/31/2011 Apply Date Filter

Hydro	Water Year	is Oct	tober 1	- Se	ptemb	er 30		
Water Level Range Hydro Completeness Salinity Water Level Temperature Flooding	Scale: Sta Date Range 1/1/1992 - Min Date: [Max Date:	tion 4/5/20 01/01/ 12/31	• 017 /2001 /2011					
Continuous Site Hydro Index	Apply Dat	0	Dec		• 20:	11	۲	•
Soil Porewater Precipitation		Su	Мо	Tu	We	Th	Fr	Sa
Seasonal Precipitation						1	2	3
Interactive Hydro		4	5	6	7	8	9	10
Vegetation		11	12	20	21	15	23	17
vegetation		25	26	27	28	29	30	31
Soil								
Spatial								
Report Card Charts								
dear Charts								



- 1. Pick a Data Category Hydro
- 2. Pick a Parameter Salinity
- 3. Pick a Scale Station
- 4. Enter Start / End Dates 1/1/2001 12/31/2011 Apply Date Filter
- 5. Pick Station Submit Request

Charting	Bulk Charting	Data Download	Reporting
- Hydr	0		Water Year is October 1 - September 30
inyu			Scale: Station
Water	Level Range		State. Station
Hydro	Completeness		Date Range:
Salinit	y		1/1/1992 - 4/5/2017
Water	Level		Min Date: 01/01/2001
Tempe	erature ng		Max Date: 12/31/2011
Contin Site H	uous vdro Index		Apply Date Filter
Soil Po	orewater		
Precipi	itation		Mean annual salinity
Seasor	nal Precipitation		Mean growing season salinity
Intera	ctive Hydro		Selection
			CRMS0151-H01
Vege	etation		CRMS0153-H01
			CRMS0154-H01
Soil			CRMS0156-H01
			CRMS0157-H01
Spat	tial		CRMS0159-H01
			CRMS0161-H01
Popo	ort Card Charts		CRMS0162-H01
Керо	one cara charts		CRMS0163-H01
			CRM50164-H01
Clear Char	rtc		CRM50172-U01
crear crrar			CRM50172-H01
			CDMC0174 U01
			Include major weather\storm events Show Map Selector
			Submit Request



- 1. Pick a Data Category Hydro
- 2. Pick a Parameter Salinity
- 3. Pick a Scale Station
- 4. Enter Start / End Dates 1/1/2001 12/31/2011 Apply Date Filter
- 5. Pick Station Submit Request

✓ Hydro	Water Year is October 1 - September 30
Water Level Range Hydro Completeness Salinity Water Level Temperature Flooding Continuous Site Hydro Index Soil Porewater Precipitation Seasonal Precipitation	Date Range: 1/1/1992 - 4/5/2017 Min Date: 01/01/2001 Max Date: 12/31/2011 Apply Date Filter
Interactive Hydro	Selection
 Vegetation Soil 	CRMS0129-H01 CRMS0131-H01 CRMS0132-H01 CRMS0135-H01
 Spatial 	CRMS0136-H01 CRMS0139-H01 CRMS0146-H01
Report Card Charts Clear Charts	CRMS0147-H01 CRMS0148-H01 CRMS0151-H01 CRMS0153-H01 CRMS0154-H01 CRMS0156-H01
	Include major weather\storm event Show Map Selector Submit Bequest
All Control of Control	Sublitt Request



- 1. Pick a Data Category
 - 1. Hydro
- 2. Pick a Parameter
 - 1. Salinity
- 3. Pick a Scale
 - 1. Site
- 4. Enter Start / End Dates
 - 1. 1/1/2001
 - 2. 12/31/2011
 - 3. Apply Date Filter
- 5. Pick Site
- 6. View Chart
- 7. Save Chart Image



Search Google for "Home Data Mappi..."

Convert Selection to Adobe PDF Append Selection to Existing PDF

View Selection Source

Inspect Element with Firebug Adblock Plus: Block image...



- 1. Pick a Data Category Hydro
- 2. Pick a Parameter Salinity
- 3. Pick a Scale Station
- 4. Enter Start / End Dates 1/1/2001 12/31/2011 Apply Date Filter

Salinity (ppt)

Data Download

- 5. Pick Station
- 6. Save Chart Image
- 7. View Chart
- 8. Download Data (optional)

	Salinity
	Salinity CRMS0156-H01
June 2007 Sep 2008 June 2 Data	28 2007 - December 28 2011 Source: Monthly Averages
	Image: Second seco
	A B C D E F 1 Station_ID MonDate Salinity Water_Level Water_Temperature 2 CRMS0156-H01 1/1/2011 0:00 1.560417 1.8325 9.65125 3 CRMS0156-H01 1/2/2011 0:00 2.130833 1.62625 12.42083 4 CRMS0156-H01 1/3/2011 0:00 1.746667 1.434167 8.210417 5 CRMS0156-H01 1/3/2011 0:00 1.055833 1.344167 7.54125 7 CRMS0156-H01 1/6/2011 0:00 1.085833 1.344167 7.54125 7 CRMS0156-H01 1/6/2011 0:00 1.514583 1.237083 7.506667 9 CRMS0156-H01 1/7/2011 0:00 1.60125 1.127917 7.66375 10 CRMS0156-H01 1/9/2011 0:00 1.60125 1.127917 7.66375 10 CRMS0156-H01 1/9/2011 0:00 1.398333 1.907417 11.25458 11 CRMS0156-H01 1/10/2011 0:00 2.137083 1.528333



Multi-Station Charting- Plots data from multiple stations on the same chart

Pick a Data Category Hydro Pick a Parameter Water Level Pick a Scale Multi Station Enter Start / End Dates 1/1/2001 12/31/2011 Apply Date Filter Pick Stations

narting	Bulk Charting	Data Download	Reporting	
- Hydr	0		Water Year is October 1	- September 30
Water Hydro Salinit Water Tempe Floodir Contini Site Hy Soil Po Precipi Seasor	Level Range Completeness Y Level Irature 1g uous ydro Index orewater tation hal Precipitation		Scale: Multi Station V Date Range: 1/1/1992 - 4/5/2017 Min Date: 01/01/2001 Max Date: 12/31/2011 Apply Date Filter	Project: All Projects ✓ Selection limited to 10 items
Vege	tation		Options	Selection
Soil			CS20	CS20-03
Spat	ial		CS20-14R CS20-15R	CS20-07 CS20-09
Repo	ort Card Charts			CS20-17
Clear Char	ts			

Previous Selection

Submit Request



Multi-Station Water Level Chart



Data Download



"Map Selector" allows chart stations to be picked in a mapping interface.

Great if you have an area of interest, but don't know the station IDs.

- Hydro	Water Year is October 1 - September 30
	Scale: Multi Station 🔻
Water Level Range	
Salinity	1/1/1992 - 4/5/2017
Water Level	Min Date: 1/1/1992
Temperature	Max Date: 4/5/2017
Continuous	Apply Data Filter
Site Hydro Index	Apply Date Filter
Soil Porewater	
Seasonal Precipitation	Basin: All Basins V Project: All Projects V Selection
r	limited to
Interactive Hydro	10 items
Vegetation	Options Selection
vegetation	
 Soil 	AT04-01
e	AT04-02
> Spatial	AT04-03
Report Card Charts	AT04-04
	AT04-06
arma	BA01-01
Clear Charts	BA01-02
	BA01-03
	BA01-04
	Include major reather\storm events
	Show Map Selector







t Mode - Drag the Mouse inside the map to select	stations.	
RMS0541-H01		







The sites/stations that were selected on the map appear in the right side of the selection box.

October 1 - September 30 Station 5/2017 /1992 5/2017 Iter
Station
5/2017 /1992 5/2017 Iter
5/2017 /1992 5/2017 Iter ⁽¹⁾
/1992 5/2017 Iter 1
5/2017 Iter 1
lter 1
lter
asins v Project: All Projects v Selection
10 items
tions Selection
CRMS0498-H01
CRMS0499-H01
CRMS0504-H01
CRMS0520-H01
CRMS0522-W01
CRMS0522-W01 CRMS0523-H01
CRMS0522-W01 CRMS0523-H01 CRMS0524-W01
CRMS0522-W01 CRMS0523-H01 CRMS0524-W01 CRMS0529-H01


Filter the list by a Basin

Water Year is October 1 - September 30 Scale: Multi Station Date Range: 1/1/1992 - 11/30/2016 Min Date: 1/1/1992 Max Date: 11/30/2016 Apply Date Filter
Scale: Multi Station Date Range: 1/1/1992 - 11/30/2016 Min Date: 1/1/1992 Max Date: 11/30/2016 Apply Date Filter
Date Range: 1/1/1992 - 11/30/2016 Min Date: 1/1/1992 Max Date: 11/30/2016 Apply Date Filter
Date Range: 1/1/1992 - 11/30/2016 Min Date: 1/1/1992 Max Date: 11/30/2016 Apply Date Filter
1/1/1992 - 11/30/2016 Min Date: 1/1/1992 Max Date: 11/30/2016 Apply Date Filter 1
Min Date: 1/1/1992 Max Date: 11/30/2016 Apply Date Filter
Max Date: 11/30/2016 Apply Date Filter
Apply Date Filter
Basin: All Basins
All Basins
Selection
Barataria Barataria
Calcasieu/Sabine
AT04-0 NA
AT04-0 Mermentau
AT04-(Mississippi River Delta
AT04-(Pontchartrain Terrebonne
AT04-(Teche/Vermilion
BA01-01
BA01-02
BA01-03
BA01-04
Include major weather\storm every Show Map Select







Submit Request

Interactive Hydro Chart

Great for hydro **data exploration** without having to download data.

	Water Year is October 1 - September 30	
Hydro		
Water Level Range	Scale: Multi Station	
Hydro Completeness	Date Range:	
Salinity	1/1/1992 - 11/30/2016	
Temperature	Min Date: 01/01/2001	
Flooding	Max Date: 12/31/2005	
Continuous Cite Hudes Jadeu	Apply Date Filter	
Soil Porewater		
Precipitation		
	Basin: Calcasieu/Sabin V Project: All Projects	•
Interactive Hydro		
Interactive Hydro	Selection limited to 10 items	
Vegetation	Selection limited to 10 items CS20	
Vegetation Soil	CS20 CS20-106 CS20-03	
Vegetation Soil	Selection limited to 10 items CS20 CS20-106 CS20-03 CS20-14R CS20-07	
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Vegetation Soil Spatial	Selection limited to 10 items CS20 CS20-106 CS20-03 CS20-14R CS20-07 CS20-15R CS20-09 CS20-17	
Vegetation Soil Spatial Report Card Charts	Selection limited to 10 items CS20 CS20-106 CS20-03 CS20-14R CS20-07 CS20-15R CS20-09 CS20-17	
Vegetation Soil Spatial Report Card Charts	Selection limited to 10 items CS20 CS20-106 CS20-03 CS20-14R CS20-07 CS20-15R CS20-09 CS20-17	
Vegetation Soil Spatial Report Card Charts	Selection limited to 10 items CS20 CS20-106 CS20-03 CS20-14R CS20-07 CS20-15R CS20-09 CS20-17	
Vegetation Soil Spatial Report Card Charts	Selection limited to 10 items CS20 CS20-106 CS20-03 CS20-14R CS20-07 CS20-15R CS20-09 CS20-17	



Great for data discovery, fast manipulation, and comparison of sites without having to generate charts.

Coastwide I	Refer	ence Monitor	ing S	ystem	X	W. HTT	XXX	a CWPPRA funded projec	CRMS
Home	Data	Mapping	Libra	ry Visu	alization	Program			
Stations		Parameter		Color					
None	•	Choose One	•	Red	•				
None	•	Choose One	•	Blue	•				
None	•	Choose One	•	Orange	•				
Submit									



Same station with multiple parameters



NOTE: Water elevations prior to Oct. 1, 2013 are GEOID99 and GEOID12a thereafter



Coastwide Reference Monitoring System – Wetlands Using the Interactive Hydro Charting Interface

Frequency Type Same station with multiple parameters **Coastwide Reference Monitoring System** a CWPPRA funded project Home Data Mapping Library Visualization Program CRMS0489-H01 • Marsh Elevation Red Download type for .csv: Hourly CRMS0489-H01 ▼ Water Level • Blue . ۳ Water Temperature V None Orange V Submit Download Chart Download CSV CRMS0489-H01 Water Level (ft NAVD88) -0.43 CRMS0489-H01 Marsh Elevation (ft NAVD88) 1.09 | 00:00 January 18, 2014 2.50 1.50 0.5 -0\A -1.0 May 13 Jun 13 Jul 13 Aug 13 Sep 13 Oct 13 Dec 13 Nov 13 Jan 2015 2007 2008 2009 2010 2011 2012 2013 2014 2016 < >

Data availability time extent:

- Window can slide along time line
- Changing window size controls temporal accuracy of chart

7

MOVE CLOSE

Chart Data Source Determination

Period of record ≤ 6 months: Chart includes **Continuous Hourly** data. Period of record ≥ 6 months and ≤ 3 years: Chart includes **Daily Average** data. Period of record ≥ 3 years: Chart includes **Monthly Average** data.



Same station with multiple parameters



NOTE: Water elevations prior to Oct. 1, 2013 are GEOID99 and GEOID12a thereafter



Multiple stations with the same parameter





Downloading

- Set time frequency of data (i.e., hourly, daily, monthly)
- Data in CSV format

Home	Data	Mapping	Library	Visualization	Program				
CRMS0174-H01 None None Submit	¢ Ir ¢ W ¢ W	nundation Vater Level Vater Temperature	 Cr Blu Or 	een ¢ ne ¢ ange ¢			Downl	oad type for .csv:	✓ Hourly Daily Monthly t Download CSV
							• CRMS0174-H01	Inundation 0.31 00:00	December 28, 2014
006 V	2007	2008		2009	2010	2011	2012	2013	0.75 0.50 0.25 -0.00 -0.25
< 20	07	2008	200	09	2010	2011	2012	013 201	2



Downloaded CSV





you@email.com

Show Map Selector

Submit Request

Bulk Charting: creates multiple charts with the same parameter input

Great for creating figures for reports that all need to be uniformly designed.

Water Year is October 1 - Septe	ember 30
Scale: Station	
1/1/1992 - 11/30/2016 Min Date: 1/1/2001	
Max Date: 12/31/2005 Apply Date Filter	
Basin: Calcasieu/Sabin ▼ Pro	oject: All Projects 🔹
CS20 Select All	Deselect All
CS20-14R CS20-15R	CS20-03 CS20-07
	CS20-09
	CS20-17
	Water Year is October 1 - Septer Scale: Station V Date Range: 1/1/1992 - 11/30/2016 Min Date: 1/1/2001 Max Date: 12/31/2005 Apply Date Filter Basin: Calcasieu/Sabin V Pro CS20 Select All CS20-14R CS20-15R



Water Surface Elevation





Coastwide Reference Monitoring System – Wetlands Bulk Charting

Show Map Selector

Submit Request

 Charting
 Bulk Charting
 Data Download
 Reporting

 Bulk Charting
 Basin:
 All Basins

 • Hydro
 Basin:
 All Basins

 • Vegetation
 BA39-01
 BA39-01

 Forested
 BA39-02
 BA39-02

 Site Floristic Quality Index
 CRMS0002
 CRMS0002

 Warsh Class
 Volume Vegetation Index
 CRMS0008

 • Soil
 Cemeconage
 Cemeconage

- Spatial
- Report Card Charts

Select	All	
39-01	^	CRMS0647
\39-02		CRMS0655
39-03		CRMS0672
150002		
S0003		
MS0006		
MS0008	-	
MS0030	-	
oose Colors Cancel		
Spartina patens		
Phragmites australis		
Typha latifolia		
Typha domingensis		
Distichlis spicata		
Schoenoplectus robustu	s	
Paspalum vaginatum		
Amaranthus bigelovii		
Paspalum distichum		
Symphystrichum cubula	tum	

piazzas@usgs.gov

Site Floristic Quality Index:

User can define color ramp for species of interest in all charts generated by one request.

Great for looking at species presence/absence or tracking invasive species



Coastwide Reference Monitoring System – Wetlands Bulk Charting



Floristic Quality Index for Brackish Marsh, Site CRMS0672



Floristic Quality Index for Intermediate Marsh, Site CRMS0647



Ex: All Spartina patens are red as defined by user.



Coastwide Reference Monitoring System – Wetlands Site Navigation

				a CWPPRA funded p	project
Coastw	ide Ref	erence I	Monitori	ng System	CREMS Construide Reference Monitoring System
Home	Data	Mapping	Library V	isualization Program	
Map	Data	FAQ	Factsheet	Wetland restoration effor Louisiana require monitor of individual projects as w the cumulative effects of restoring, creating, enhan	ts conducted in ring the effectiveness well as monitoring all projects in ncing, and protecting
	_				
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or Program In fewords through on philosophy and the most		Wettern Jundent prosect	Coastwide Ref	erence Monitoring System	Coastwide Reference Monitoring System
			Previous	Charting Version	Home Data Mapping Library Visualization Program
			Data	Download	Bulk Charting Data Download Reporting
			Data or de	available through this website are calculated rived values based on the original data which wailable from the CIMS database (CIMS)	Vegetation
		a		Hudro	> Soil
					> Spatial
				regetation	
				Soil	Report Card Charts



Coastwide Reference Monitoring System – Wetlands **Bulk Data Download**



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 06 April 2017.





• CRMS bulk data download All values for selected years, for selected stations

(queue processes first come first serve)

 Hydro 	
Hudro Averages	
Hydro Index	
Bersent Fleeded	
Water Level Bange	
Water Level Range	
Shifted water Elevation Data	

Vegetation

Basal Area Floristic Quality Index Marsh Class Veg Percent Cover Vegetation Volume Index

Soil

Surface Elevation Change Rate Submergence Vulnerability Index Vertical Accretion Rates

Spatial

Percent Land 1km Land/Water

Same interface	e for data	selection	as charting
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Charting	Bulk Charting	Data Download	Reporting			
Data Dov Data avai	vnload lable through this w	ebsite are calculated	Water Ye Yearly	ear is October 1 - S	Septemb	er 30
or deriveo are availa	l values based on the ble from the CIMS	ne original data which database <u>(CIMS)</u>	Calenda	r Year		T
+ Hyd	ro		Year:	Select	<u>t All</u>	
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Vege	etation		2001			
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- Spat	tial					
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Select A	<u>All</u>		Deselect All
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BA20-08			
BA20-11			
BA20-20			
BA20-90R			
BA20-91R	-		

Show Map Selector

•

Deselect All

Email Address:

Submit Request



Coastwide Reference Monitoring System – Wetlands Site Navigation/Reporting

			a CWPPRA funded	project	
Coastwide F	leference M	Ionitoring	g System	CRMS Restricte Reference Monitoring State	
Home Data	Mapping	Library Visua	ilization Program		
Map D	ata FAQ	Factsheet	Wetland restoration effo Louisiana require monito of individual projects as the cumulative effects o restoring, creating, enha	rts conducted in pring the effectiveness well as monitoring f all projects in ancing, and protecting	
			restoring, creating, crine	incing, and protecting	
			Data/Repo	rting Charting	
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		Home Data	Mapping Library Visualization Program	Home Data Mapping Library Visualization Previous Charting Version	Program
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	an a sa an	Data availa or derived	ble through this website are calculated values based on the original data which	Hydro Vegetation	
				→ Soil	
		Hydri Veget	tation	> Spatial	
		 Hydr Veget Soil 	tation	Spatial Report Card Charts	



Charting Bulk Charting Data Download	Reporting
Generate Report Card	Year: 2011 •
Generate Report Card	CRMS0002 CRMS0003
<mark>Site Level Report</mark> Project Level Report Basin Level Report Coastwide Level Report	CRMS0006 CRMS0008 CRMS0030 CRMS0033 CRMS0034 CRMS0035
► OM&M	CRMS0038 CRMS0039 CRMS0046 CRMS0047

Submit Request

Report Card CRMS0003 2011



Coastwide Reference Monitoring System – Wetlands Report Cards

About the program

In 1990, the U.S. Congress emands the Coastal Wealands Planning, Peterssion and Resonation Act (CMVPPRA) in response to the ground parameters of Localizantia's link discussion for CMVPRA was the fort Adment. Latabach and the coastal wealands of Localizantia's link discidented exclusioniff to the short, and long-term restoration of the coastal wealands of Localizantia's link discidented exclusioniff to the short, and long-term restoration of the coastal wealands of Localizantia's links, the CMVPRA program has coastal weatand habitat including: diversion of fink-tanker and exclusioned to instruct, protect, and create coastal weatand habitat including: shoreline protection; seliment and nutrient trapping; Ifdrologic restoration through outfall, marsh, and dela management, barrier linked restoration; and wegataston printing protection.

Need for a Monitoring System



CRMS Approach and Design

The CRWS approach includes a suite of sites (391) that encompase a range of ecological conditions across the coast. The CRWS is locations were elected randomic throughout the coastal zone. Sites represent the entire range of ecological variability within a degraded coastal landcape. Sites are located within (project sites) and outside (reference sites) of coastal resoration projects. Trajectoise of changing conditions in reference sites are compared with trajectories of change within project sites through time. The CRWS design not only allows for monitoring and evaluating the effectiveness of each project to kuil site outpoort ongoing envaluation of the cumulatio effects of all CWPPRA projects throughout the coastal lacor/strem of Louisma. More information about the CRMs projects in provided within a USOS factomet (http://doc.more.org/outpoil.001016).



Through the Coastal Wetlands Planning, Protection, and Restantian Act (CMPPRA) is comprehensive, standardized monitoring and assessment program has been developed to evaluate coastal terostation projecto throughout the Louisiane coastal zone. The Coastakide Reference Monitoring Sfisterin (CRMS) collects monitoring data for numerous ecological variabiles. Using CRMS data, incless have been developed to assesse wateral fidefload(s), exeptation, and soits. This interactive report card provides surmary information and display 6 index scores for individual CRMS sites, restoration projectus, fidefloads basis, and the entire Louisiana coast.

Index Development

What is an Index?

An index combines and ∮nhesizes scientific data to help inform or assess a topic of interest. Each index helps explain the condition of a particular aspect of the coastal wetland eccofstem. B∫ comparing indices at various time and opstail scales we can understand the overall condition of coastal wetlands in Louisiana.

How were the indices developed?

CRMS Analytical Teams, made up of agend and exademic personnel, developed indices based on the suite of parameters available from the 2006 to 2009 CRMS dataset. Three indices have been developed: a floritisc quality (FCI), Hydnologi (HI), and availengeme vulnerability (SVI), and a landscope index is currently being refined. Wetland vegetation, Hydnologi, and avails are undenabily interconnected and form the basis for ecological process that ultimatel fruinces fuure land transpared to thongs and the suitability of costal habitats. Although these indices have been developed using 4 feast of baseline CRMS data, the indices will be refined to better define costogical relationships as the data set becomes more notwork overline.

Because no regulatory thereholds exist for the ecological parameters of internst, it was not possible to assess index score based on previously defined values that would indicate an accessible or unacceptable score. Therefore, for the FOI and the FII assessments were made relative to a baseline distribution of the index scores derived from 2005 to 2006 data at CRMs dise across the louisiner cost. Recause ideal thresholds were not available for the FOI and HI, scores were classified as 'good' (green) if thed, scored, because the 76h percentile of index scores calculated for all CRMs dises during the baseline period, poor (red) if the f did not scored the 20th percentile, or Tair (reflow) if thed y even itermediate to the 20th and 76h percentiles (Figure





ference Monite

Coastwide Reference Monitoring System (CRMS)

Site Level Report Card

Site: CRMS0003

Year: 2011



Dynamic documents

2

- Program and Index explanations
- Multi-scale assessments site, project, basin, coastwide



X 🖪 🕥 🖪 🥵

MP 2012

Coastwide Reference Monitoring System – Wetlands Site Navigation/Mapping Viewer

		a CWPPRA funded project		
Coastwide Refe	erence Monitor	ing System	CREMS Chernete Reference Monitoring Offer	
Home Data	Mapping Library	Visualization Program		
Map Data	FAQ FAQ Factsheet	Wetland restoration effore Louisiana require monitor of individual projects as the cumulative effects of restoring, creating, enha	orts conducted in pring the effectiveness well as monitoring of all projects in ancing, and protecting	
		Data	Charting	
Мар	Coastwide I Home	Reference Monitoring System	Coastwide Reference Monitoring System Home Data Mapping Library Visualization Prog	
Adam Pegam Single-Click the yellow symbolizing on the map to view CRMS Site Information.	Previo	arting Bulk Charting Data Download Reporting	Previous Charting Version Charting Bulk Charting Data Download Rep	
	D	ata Download ata available through this website are calculated derived values based on the original data which e available from the CIMS database (<u>CIMS</u>)	Hydro Vegetation	
		Hydro Vegetation	Soil Spatial Report Card Charts	
		Spatial	Clear Charts	



Coastwide Reference Monitoring System – Wetlands Mapping Viewer





Hides the CRMS Website banner and menu. Allows for more map viewing space.





Shows and hides the Layers Menu





Activate Tools Menu









To Full Extent



In & out





Coastwide Reference Monitoring System – Wetlands Save State Button

Used to create a save state on the map.

Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) Since the pellow symbols; or the map to year (2015) HC(21) Bealton since HC(21) Bealton since Bealton since Bealton since

Link created to save the current state of the map.

Email this link to someone so you are both looking at the same information on individual computers.



Used to create a screenshot in pdf format.





Used to create a screenshot in pdf format.







Coastwide Reference Monitoring System – Wetlands Create Map Screenshot Output











Expands CRMS layer menu



Download a KML file to used in Google Earth. Download a csv file of latitude and longitude.

Zooms to the site and shows the site information bubble.

Adds/removes the 1 km² buffer layer Aerial Photography Boundary

Adds/removes the 200 m² buffer layer Ecological Data Collection Area

Highlights realtime hydro sites in blue

Highlights floating marsh sites in red

Classify invokes the tools menu with the classification option selected.



Click a point for site level information bubble





Site Information Bubble



General information about the CRMS site including data availability, site photos, and survey reports.

Arrows allow user to scroll through data availability by year.



Site Information Bubble



The Water tab contains all hydrologic information for the selected site.

Salinity – Brief overview of salinity data for the site. Also charts most recent salinity data for the site.



 $- \times$

Site Information Bubble



The Water tab contains all hydrologic information for the selected site.

Hydro Index – All Hydro Index charts available for the site.

MOVE CLOSE

The Hydrologic Index (HI) jointly assesses the suitability of two critical aspects of wetland hydrology, average salinity and percent time flooded, in maximizing vegetation primary productivity for the 5 different marsh classifications in coastal Louisiana (swamp, fresh, intermediate, brackish, and saline). The index score ranges from 0 - 100, and the score corresponds to the percent of maximum vegetation productivity expected to occur if the separate effects of salinity and inundation on productivity interact in a multiplicative fashion, according to the following formula:

 $HI = fld \times sal$

where fld is the percent maximum productivity attributable to percent time flooded, and sal is the percent maximum productivity attributable to the average annual salinity. Relationships describing how percent maximum productivity varies with salinity and percent time flooded were taken from the Habitat Switching Module of the LCA ecosystem restoration study (U.S. Army Corps of Engineers 2004).

The HI is calculated for a given water year, which begins October 1 and ends the following September 30.




The Water tab contains all hydrologic information for the selected site.

Water Level Range – All water level range charts available for the current site.



Water Surface Elevation Range - CRMS5035-H01 2016







The Vegetation tab contains all vegetation information for the selected site.

Herbaceous – Species driven percent cover chart.

CRMS

MOVE CLOSE

Species composition data from the 1997 Chabreck and Linscombe vegetation survey were used by Visser et al. (1998, 1999, 2000) to assign marsh vegetation types (deltaic mixture, deltaic roseau cane, fresh bulltongue, fresh maidencane, fresh spikerush, mesohaline mixture, mesohaline wiregrass, oligohaline bulltongue, oligohaline mixture, oligohaline spikerush, oligohaline wiregrass, polyhaline oystergrass) to CRMS sites. Sites within forested wetlands were assigned as swamp based on swamp classifications from the 1998 Louisiana GAP analysis project.

Chabreck, R.H. and Linscombe G. 1997. Vegetation type map of the Louisiana coastal marshes. Louisiana Department of Wildlife and Fisheries, New Orleans, Louisiana.

Louisiana Gap Analysis Project. 1998. Land Cover Classification for the Louisiana GAP Analysis Project. U.S. Geological Survey, Biological Research Division, National Wetlands Research Center, Lafayette, Louisiana. <u>http://sabdata.cr.usgs.gov/sabnet_pub</u> /pub_sab_app.aspx?prodid=780





The Vegetation tab contains all vegetation information for the selected site.

Forested – Species driven basal area chart.





The Vegetation tab contains all vegetation information for the selected site.

Floristic Quality Index (FQI) chart showing vegetative species composition and FQI score annually.





The Vegetation tab contains all vegetation information for the selected site.

Marsh Classification – The chart displays marsh class by site over time.

Top bar is marsh class at the site level using annual on-the-ground vegetation survey data.

Bottom bar is marsh class at the site level using the helicopter survey data.



Info Water Vegetation Soil Spatial Report Card Tools Marsh Elevation: 0.64ft NAVD88 GEOID12A CRMS Measured Bulk Density: 0.180 g cm⁻³ NRCS Soil Type: Fausse clay, frequently floode Surface Elevation/Accretion/SVI Percent Organic Bulk Density Depth (cm) 12 - 16 16 - 20 20 - 24 8 -0 -4 -8 12 % Avg Organic Matter 36.98 32.68 43.39 36.96 30.66 32.56 ±6.13 ± 3.87 Error ±3.07 ± 7.07 ± 1.7 ±2.95 CRMSSIS nt Cores - % Cirganic Content DATE OF DATE 0 10 4 4 to 5 à to 12 12 to 18-Mean 15. Organis Corrent 10 to 20 2010/24 1.4

Organic Contant %

The Soil tab contains all soil information for the selected site.

Percent Organic – Soil profiles taken at site establishment.







The Soil tab contains all soil information for the selected site.

Surface

Elevation/Accretion – currently displays site level elevation change and accretion and gives rates for shallow subsidence.





	Site	Informatio	on Bul	bble						
7	Info Water Land/Water	Vegetation Soil <u>Maps</u>	Report Car <u>Aeria</u>	ard Tools				The Spatial tab contains all spatial information for the selected site.		
	Land/W	Vater 2012						ALL		
				[Acres	Percent		Land/Water with acreage breakdowns.	
					Land	199	80.24			
					Water	49	19.76		2015/2016 Land/Water	
				L	Flooded	U	U	and the	classification in progress.	
X	Lan	d 📃 Wa	nter					Section 19		
2										



pdf link

Site Information Bubble



The Spatial tab contains all spatial information for the selected site.

CRMS site land/water maps at the 1km² scale.





The Spatial tab contains all spatial information for the selected site.

Aerial Photography





The Report Card tab contains all report card information for the selected site.

Report Card- Generate site report cards for previous years in the bubble or look at summary graphics.

Click on thumbnails to expand graphics.





Report Card Summary Graphics- Allow you to visualize individual index scores through time for a particular site.





The Tools tab lets you do an Acreage Assessment on the selected site.

Acreage Assessment – Use the acreage assessment tool to determine acreage breakdowns of the available coastwide vegetation surveys or land/water data.







Coastwide Reference Monitoring System – Wetlands Stations Layer



Points on the map display a brief description of the station's information









Zoom to function zooms to the project and shows the information bubble for it.

Adds/removes the Constructed projects layer to the map.

Adds/removes the "planning" projects layer to the map.

Adds/removes the Project Infrastructure layer to the map and shows the legend



Project Information Bubble

Info Water Vegetation Report Card Tools

State ID: CS-20 Name: East Mud Lake Marsh Management Sponsors: NRCS and CPRA Type: Marsh Management Links:

CS-20 General Fact Sheet(2.46 MB)

<u>ECS-20 Comprehensive Monitoring Report</u>(2.77 MB)

<u>ECS-20 Operations, Maintenance, and Monitoring Report</u>(9.08 MB)

Objectives:

• Prevent wetland degradation in the project area by reducing vegetative stress, thereby improving the abundance of emergent and submergent vegetation. This will be achieved through hydrologic structural management to reduce water levels and salinities.

Stabilize shoreline of Mud Lake through vegetative plantings.

Goals:

- Decrease rate of marsh loss
- Increase vegetative cover along shoreline of East Mud Lake
- Increase coverage of emergent vegetation in shallow, open-water areas
- Increase abundance of vegetation in presently vegetated portions of project area

• Reduce water-level and salinity fluctuations to within target ranges for brackish vegetation. Target range for salinities is less than or equal to 15 ppt and 6 in. below marsh level to 2 in. above marsh level for water levels.

• Decrease duration and frequency of flooding over marsh.

The information bubble appears when a CWPPRA project is clicked. The Project Info tab is automatically chosen when the bubble pops up on the screen.



Info Water	Veget	ation Report	Card To	ols					
Summary Salinity		Water I	Water level Temperature		Water Le	evel Range			
_	∕ ⊳	Mean Annual Salinity	Salinity 10%	Salinity 90%	% Time Flooded	Tide Range (ft)			
CRMS0672-H	01	<70%	< 70 %	<70%	<70%				
Project Mea	n	N/A	N/A	N/A	N/A				
CS20-14R		<70%	<70%	<70%	<70%				
Reference N	lean	N/A	N/A	N/A	N/A				

The Water tab contains all hydrologic information for the selected project.

<70% - The available data covers less than seventy percent of the entire water year(Oct. 1 - Sept. 30).

Salinity 10%: 90% of all hourly salinity records for the given water year exceed the value for salinity 10%.

Salinity 90%: 10% of all hourly salinity records for the given water year exceed the value for salinity 90%.

70% threshold not reached yet this water year

Summary – Gives a brief overview of the hydro data available for the project.



	Info Water Veget	ation Report	Card To	ols	20146	
	Summary Salinity	<u>Water level</u> <u>Temperatu</u>		mperature	Water Level Range	
	2016	Mean Annual Salinity	Salinity Salinity 10% 90%		% Time Flooded	Tide Range (ft)
I	CRMS0672-H01	12.1	7.2	16.8	92.1	
I	Project Mean	12.1	7.2	16.8	92.1	
	CS20-14R	13.9	7.5	20.2	83.4	
	Reference Mean	13.9	7.5	20.2	83.4	

The Water tab contains all hydrologic information for the selected project.

<70% - The available data covers less than seventy percent of the entire water year(Oct. 1 - Sept. 30).

Salinity 10%: 90% of all hourly salinity records for the given water year exceed the value for salinity 10%.

Salinity 90%: 10% of all hourly salinity records for the given water year exceed the value for salinity 90%.

Summary – Gives a brief overview of the hydro data available for the project.





The Water tab contains all hydrologic information for the selected project.

Salinity – Charts most recent data for hydro stations located within the project.

NOTE: Only stations with data recorded in the previous two years are shown in the station list.





The Water tab contains all hydrologic information for the selected project.

Water Level Range – Charts water level range data for hydro stations located within the project.





The Vegetation tab contains all vegetation information for the selected project.

Marsh classification at project and reference stations over multiple years.





The Vegetation tab contains all vegetation information for the selected project.

Project/Ref FQI – Project Scale Floristic Quality Index Chart.





The Vegetation tab contains all vegetation information for the selected project.

Side by Side – Side by side comparison of Marsh Class using the raster image created from helicopter surveys.





The Report Card tab contains all report card information for the selected project.

Report Card-Summary of project scale information compiled into a report card.



Hydrologic basins as defined by CWPPRA





Basin Information Bubble



The Report Card tab contains all report card information for the selected basin.

Report Card – Summary of basin scale information compiled into a report card.



Vegetation classification based on helicopter surveys,

O'Neil 1949 through Sasser et al. 2013, 8 surveys

Coastwide Reference Monitoring System		a CWPPRA funded project
Home Data Mapping Library Msualization Prog		
CRMS Stations CWPPRA CWPPRA Vegetation Main Layer 2013 V Diff Layer None C Points Points		and the second
Fill: 100 Legend Assessment Soils MP 2012 Land Change Land Water		
HUC12 Base Layer		Vegetation Legend Saline Brackish Intermediate Fresh Swamp Water Other
Long: -91.716, Lat: 31.802 0 15 30mi		Earthstar Geographics





Main Year selects the primary polygon layer on the map.

Diff Year selects the secondary polygon layer on the map.

Adds/removes the vegetation data points.

- Adds/removes the vegetation polygons layer.
- The slider changes the transparency of the layer.

Assessment link invokes the acreage assessment tool menu for the currently selected year.





Points display the site specific vegetation data when clicked.



Vegetation Difference Layer Functionality



The "Vegetation Change" is shown when two different years are chosen for the Main Layer and Diff Layer.



Coastwide Reference Monitoring System – Wetlands Vegetation Layer

Vegetation Difference Layer Functionality





NRCS SSURGO data displayed

Coastwide Reference Monitoring System				a CWPPRA fur	aded project
Home Data Mapping Library Visua	alization Program				
	Single-c	click the colored layer to view soil type info	ormation.	AND CALLS AND INTERVIEW	Canada and
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		and the second			
Long: -89.559, Lat: 31.775					CRMS
0 15 30mi					Earthstar Geographics





The Soil Type information window pops up when a soil area is clicked.


Displays Federal (USFWS and NPS) and State (LDWF) land holdings.







The Public Lands information window pops up when a Public Lands polygon is clicked.



Master Plan project types and general project areas.

Additional visualizations of this information available through CIMS.







The Master Plan information window providing project information pops up when a symbology is clicked.



Coastwide Reference Monitoring System – Wetlands Land Area Change 1932 to 2010

Couvillion et al., 2011. Land Area Change in Coastal Louisiana from 1932 to 2010.

Displays land change (both loss and gain) broken down by time intervals.







Land/Water classifications from 1932 to 2010

18 classification dates based on satellite imagery, 30m resolution.





NRCS's Hydrologic Unit Code (HUC) Boundaries—12 digit subwatershed classification





Ability to visualize the base map layer as different years of aerial photography or world imagery.





Streets Base Layer





Coastwide Reference Monitoring System – Wetlands CRMS Classify Tool



Layers Menu		Tools Menu
🜌 🕨 🔵 CRMS		Classify
📄 Stations	V	
CWPPRA	~	Type:
Hydro Basins	~	Choose one •
Vegetation	V 2	Attribute:
Soils	1	Choose one •
🗆 🕨 🎇 Public Lands	~	Year:
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📄 🕨 🎆 Land Change 👘	~	
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HUC12		Assessment
🛛 🕨 🔤 Base Layer		



Classify Tool- allows all CRMS sites to be visualized based on user-selected parameters.

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

Vegetation

- FQI
- Vegetation Percent Cover
- Marsh Classification
- Hydro
 - Flooding
 - Hydro Index
 - Salinity
 - Water Level
- Soil
 - Cumulative Elevation Change (CEC)
 - Submergence Vulnerability Index (SVI)
 - Bulk Density (mean 0-16cm, 3 cores)
 - Percent Organic (mean 0-16cm, 3 cores)







User defines classification intervals and color ramp. For each CRMS index the defaults are red, yellow, green (as in the report card).





The tool will tally the classification categories by hydrologic basin.





Coastwide Reference Monitoring System – Wetlands CRMS Acreage Assessment Tool



Acreage Assessment Tool provides area estimates of a chosen layer given a defined polygon.

Layers: Coastwide Vegetation Land/Water

Area: CWPPRA Projects Hydro basins CRMS Sites (1km buffer)

Years:

Varies based on layer dataset



Coastwide Reference Monitoring System – Wetlands CRMS Acreage Assessment Tool

Acreage Assessment Tool



Questions? https://lacoast.gov/crms

Sarai Piazza piazzas@usgs.gov