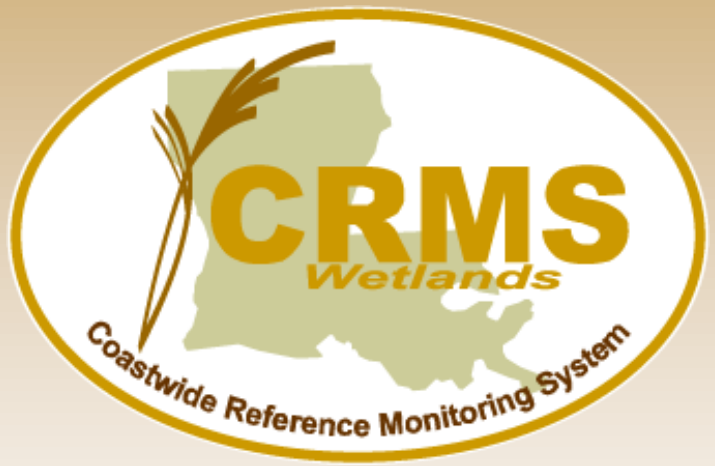
CRMS Website Roadshow



Spring 2015

NRCS-5/8/15, NMFS-5/11/15, USFWS-5/18/15, USACE-5/21/15, EPA-6/11/15

CRMS

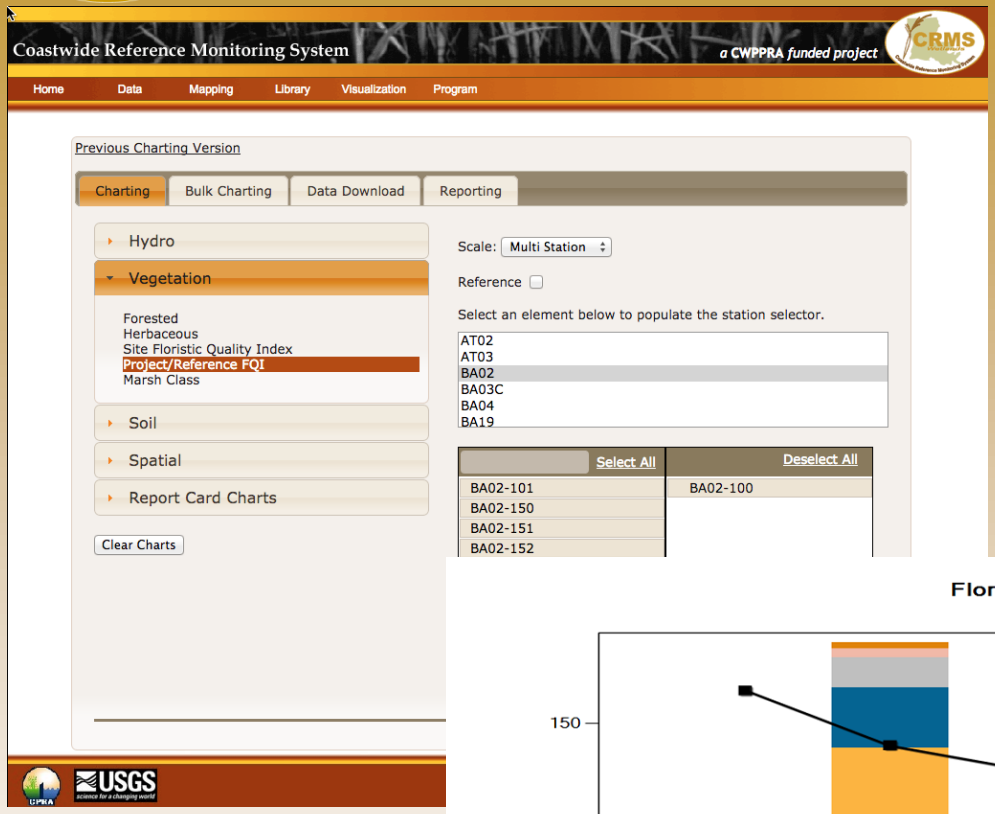
lacoast.gov/crms

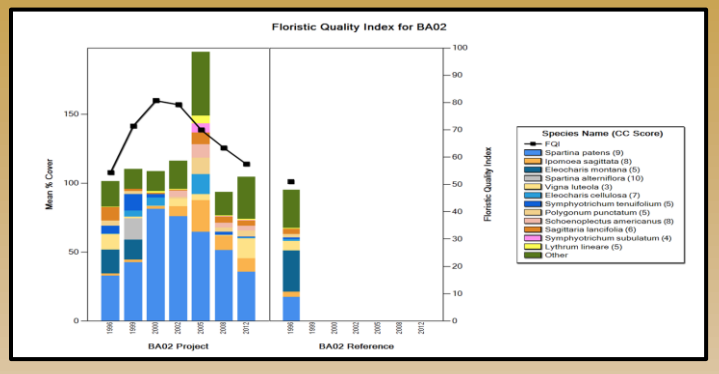
CIMS

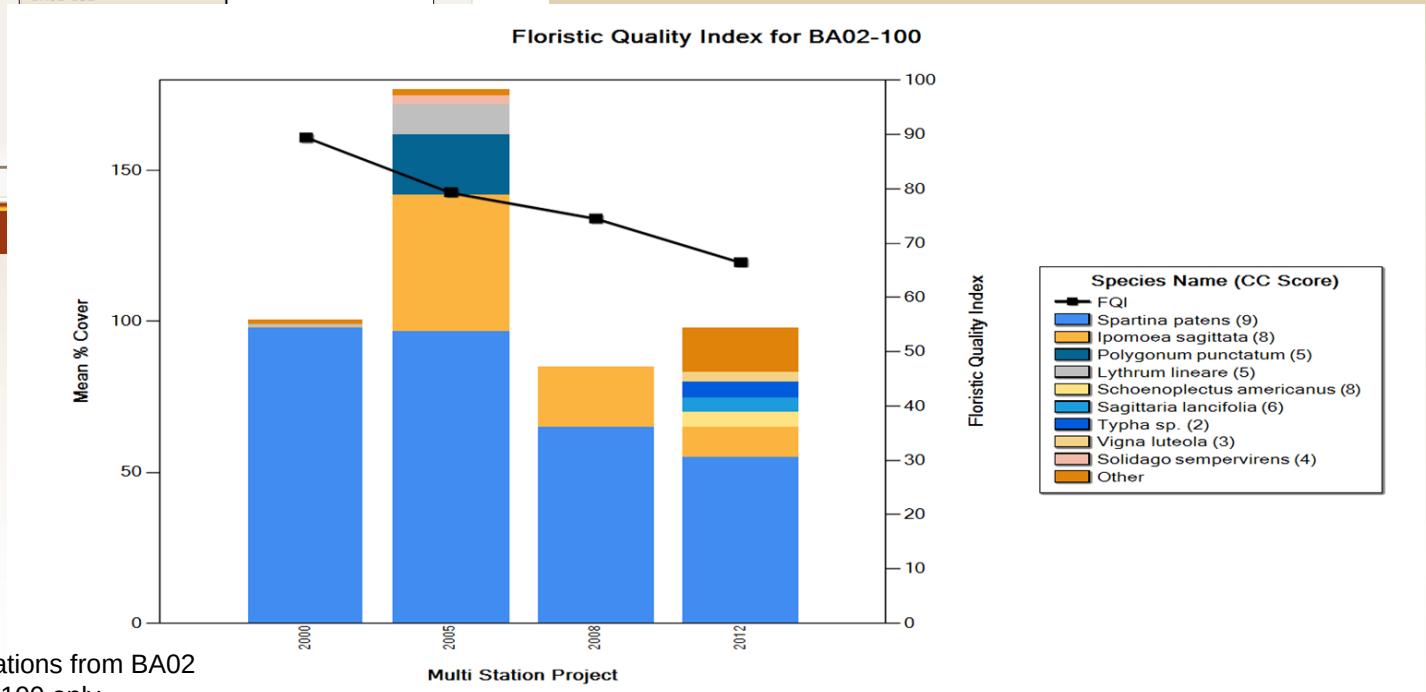
cims.coastal.louisiana.gov

Released on the Website

Only one station on the project/ref chart instead of site FQI



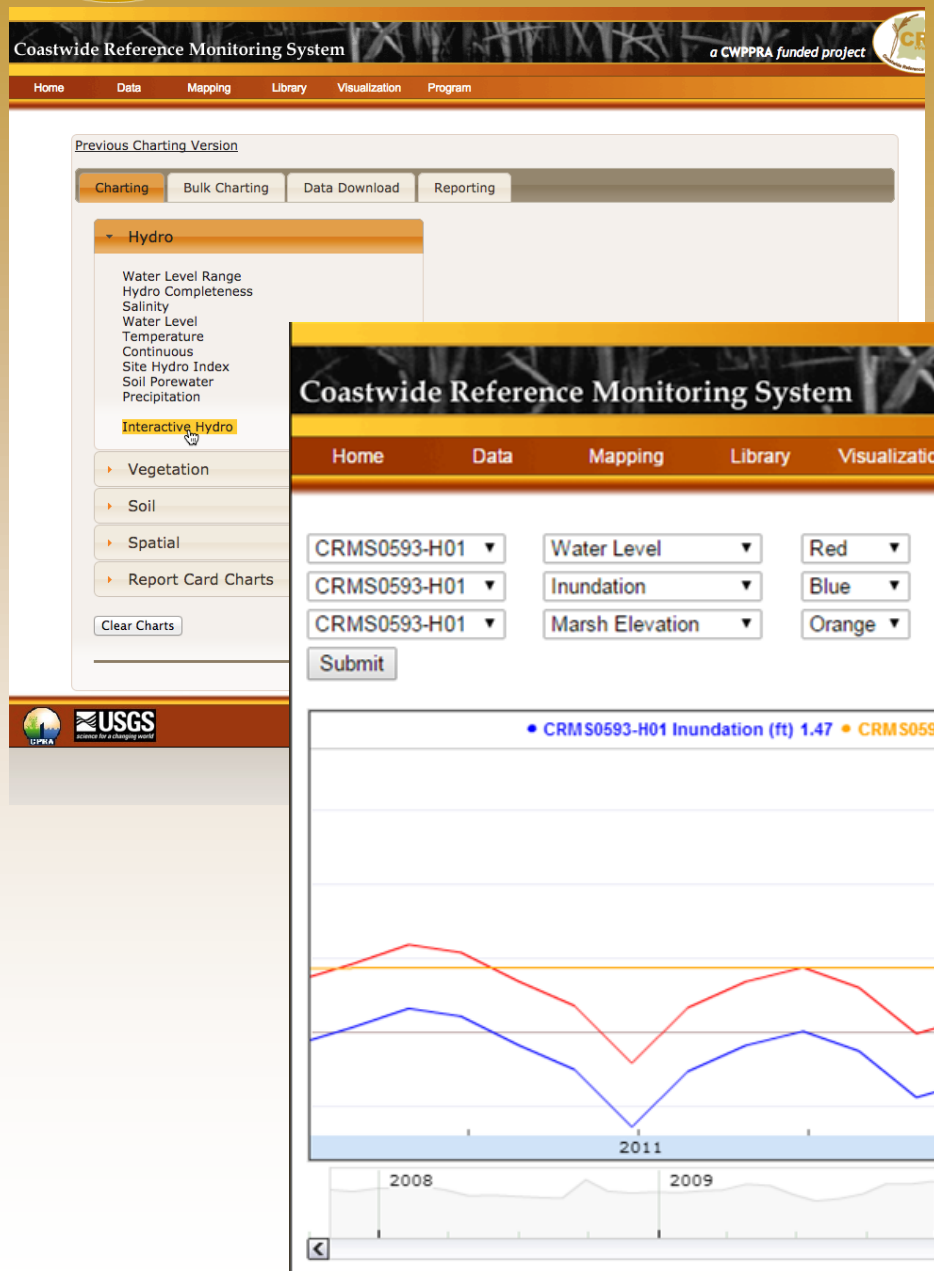




Small image: FQI includes all veg stations from BA02
Large image: FQI is based on BA02-100 only

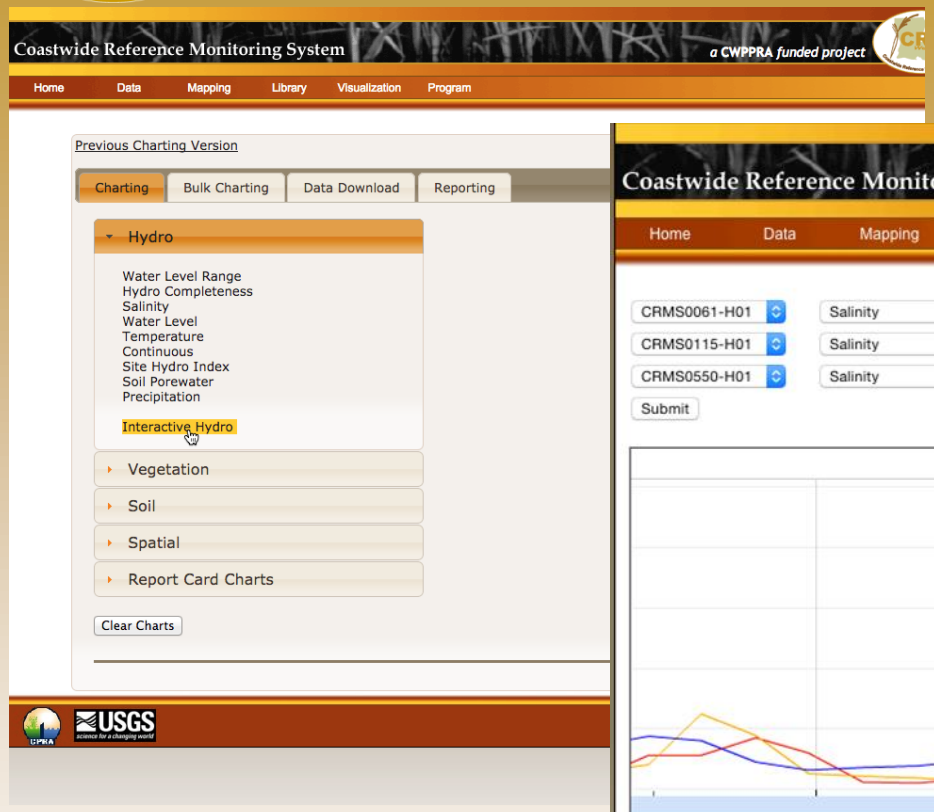
Released on the Website

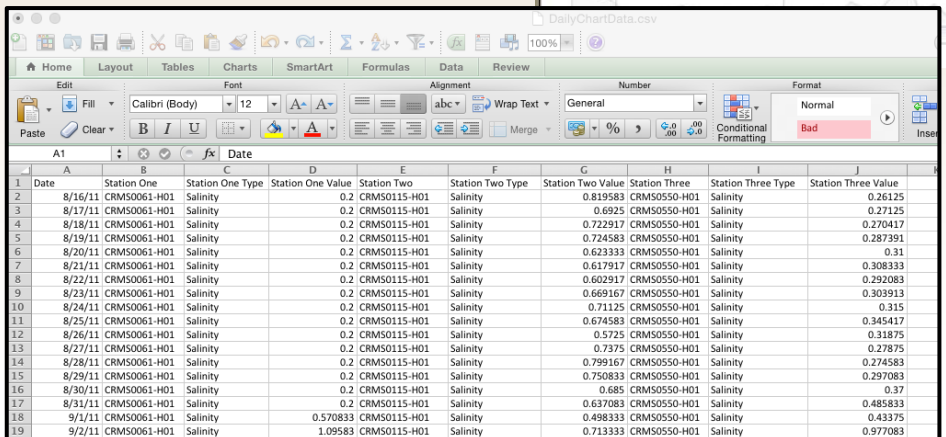
Inundation (water relative to marsh) as a parameter within interactive charting



Released on the Website

Data download feature within interactive charting



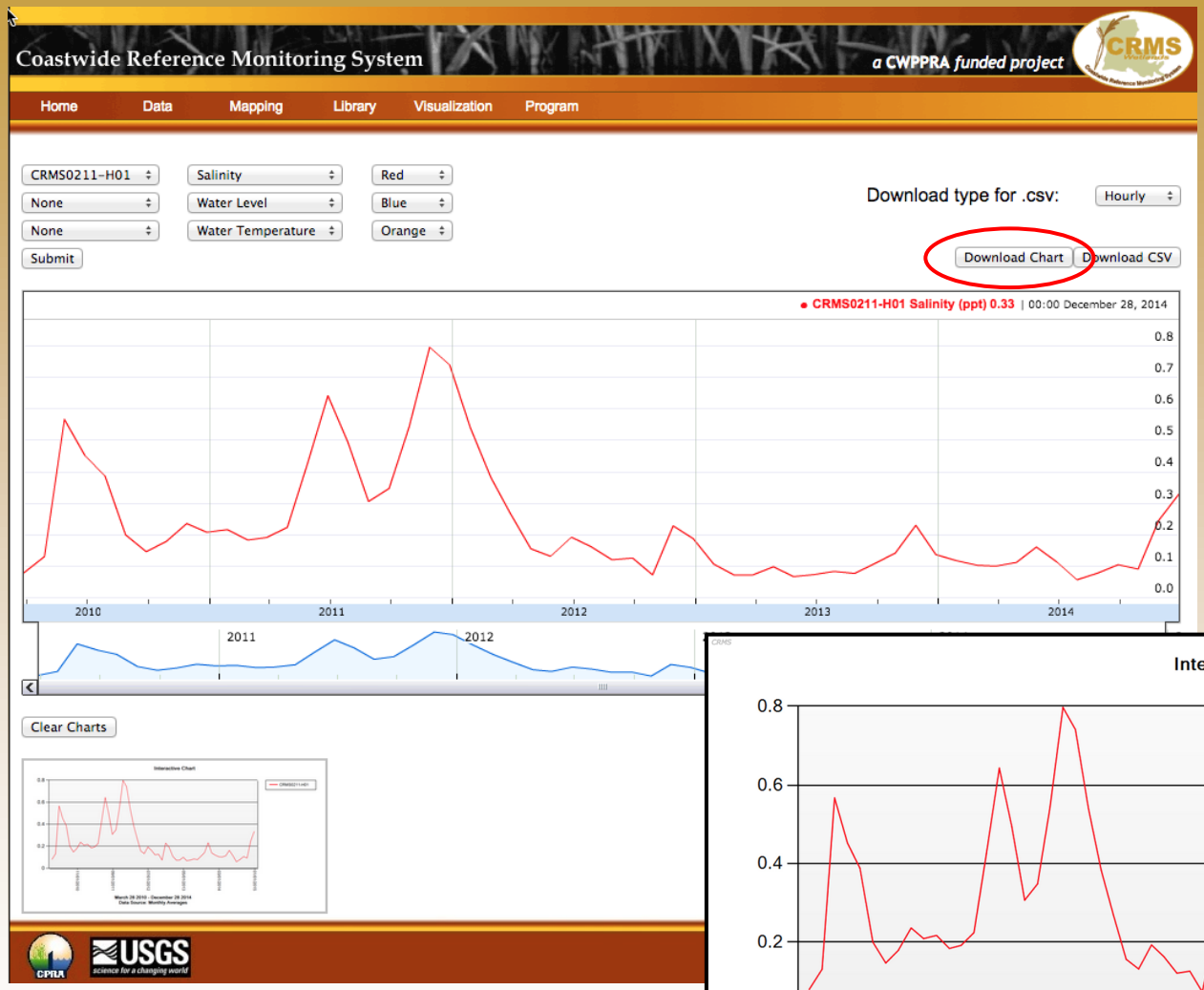


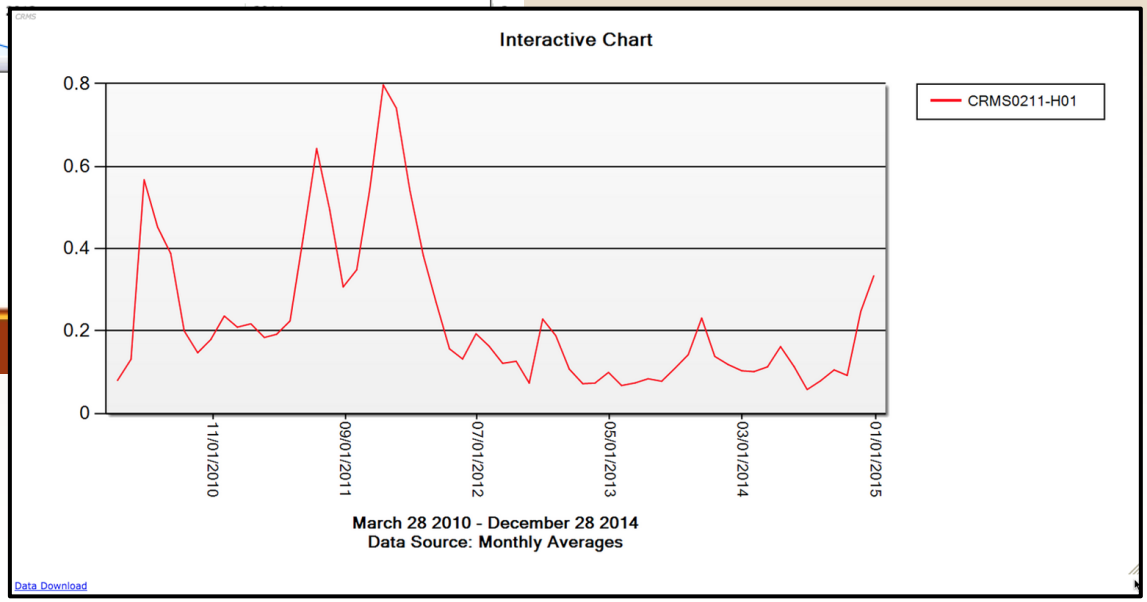
DailyChartData.csv

Date	Station One	Station One Type	Station One Value	Station Two	Station Two Type	Station Two Value	Station Three	Station Three Type	Station Three Value
8/16/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.819583	CRMS0550-H01	Salinity	0.26125
8/17/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.6925	CRMS0550-H01	Salinity	0.27125
8/18/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.722917	CRMS0550-H01	Salinity	0.270417
8/19/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.724583	CRMS0550-H01	Salinity	0.287391
8/20/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.623333	CRMS0550-H01	Salinity	0.31
8/21/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.617917	CRMS0550-H01	Salinity	0.308333
8/22/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.602917	CRMS0550-H01	Salinity	0.292083
8/23/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.669167	CRMS0550-H01	Salinity	0.303913
8/24/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.71125	CRMS0550-H01	Salinity	0.315
8/25/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.674583	CRMS0550-H01	Salinity	0.345417
8/26/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.5725	CRMS0550-H01	Salinity	0.31875
8/27/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.7375	CRMS0550-H01	Salinity	0.27875
8/28/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.799167	CRMS0550-H01	Salinity	0.274583
8/29/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.750833	CRMS0550-H01	Salinity	0.297083
8/30/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.685	CRMS0550-H01	Salinity	0.37
8/31/11	CRMS0061-H01	Salinity	0.2	CRMS0115-H01	Salinity	0.637083	CRMS0550-H01	Salinity	0.485833
9/1/11	CRMS0061-H01	Salinity	0.570833	CRMS0115-H01	Salinity	0.498333	CRMS0550-H01	Salinity	0.43375
9/2/11	CRMS0061-H01	Salinity	1.09583	CRMS0115-H01	Salinity	0.713333	CRMS0550-H01	Salinity	0.977083

Released on the Website

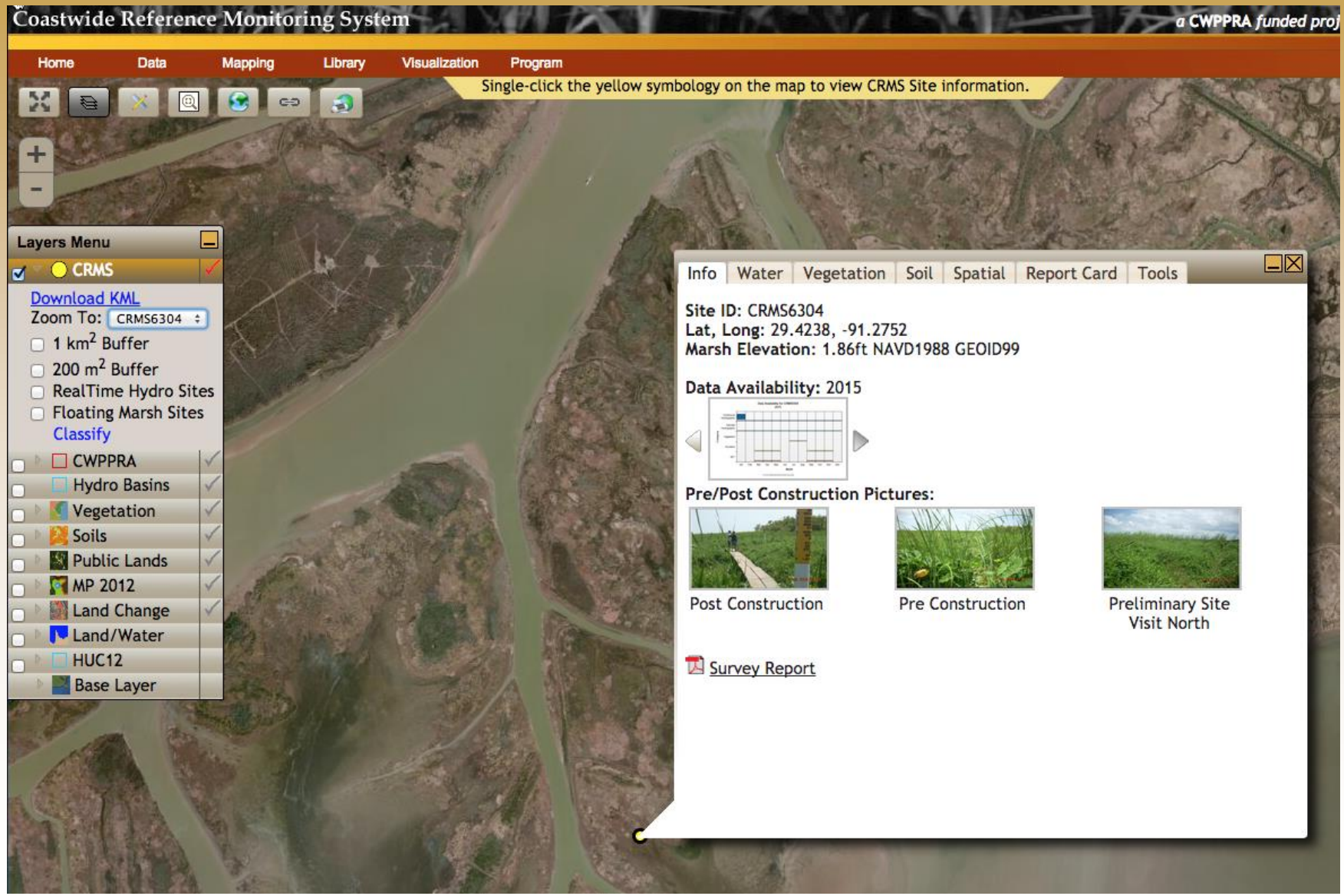
Generate static hydro chart from within the interactive charting interface.





Released on the Website

Updated the site photos in the viewer's information bubble



Released on the Website

% Land and Water for each year was added for download in the data download

Previous Charting Version

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
- Soil
- Spatial

Percent Land

1km Land/Water

Year:

Select All | Deselect All

1993	2008
2000	2012
2001	
2002	
2003	
2004	
2005	
2007	
2014	

Submit

Basin: All Basins Project: All Projects

Select All | Deselect All

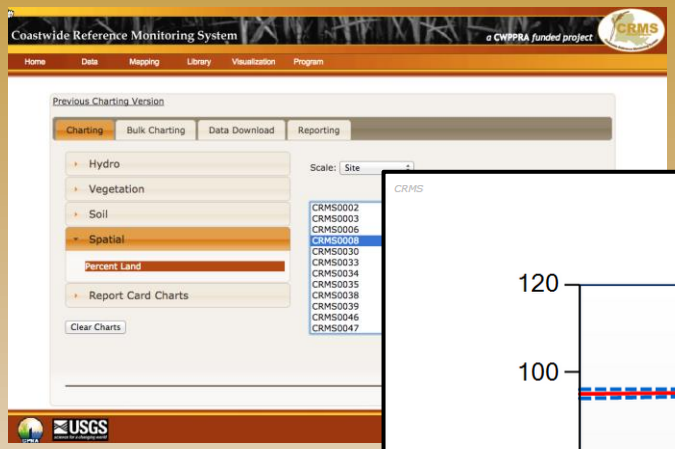
CRMS0003	CRMS0002
CRMS0008	CRMS0006
CRMS0033	CRMS0030
CRMS0035	CRMS0034
CRMS0038	
CRMS0039	
CRMS0046	
CRMS0047	
CRMS0056	

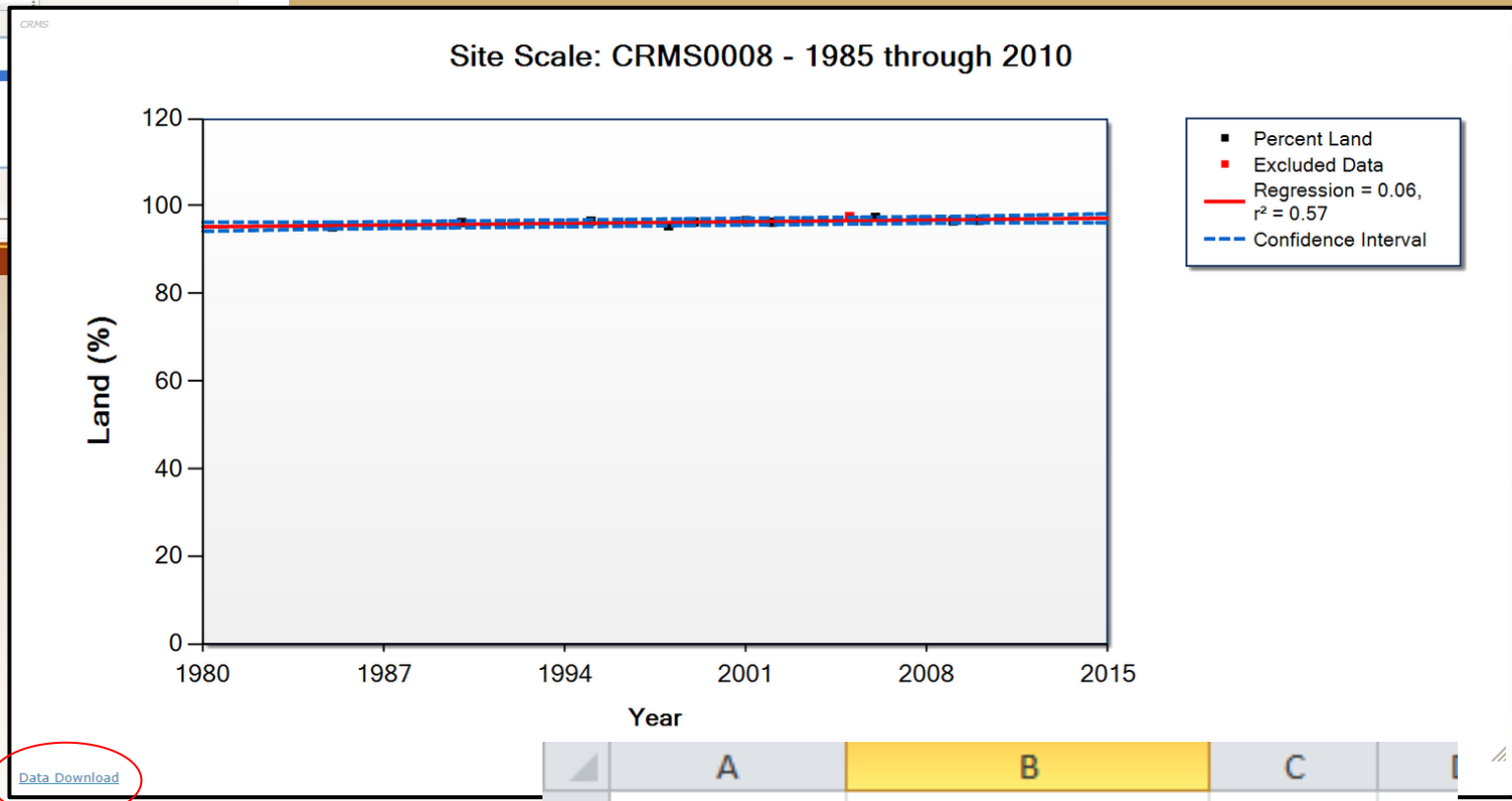
Show Map Selector Email Address:

	A	B	C	D	E	F
1	crms_site	map_year	land_acres	water_acres	flooded_acres	
2	CRMS0002	2008	130	118	0	
3	CRMS0006	2008	114	134	0	
4	CRMS0030	2008	206	42	0	
5	CRMS0034	2008	217	31	0	
6	CRMS0002	2012	125	123	0	
7	CRMS0030	2012	208	40	0	
8	CRMS0034	2012	219	29	0	
9	CRMS0006	2012	117	131	0	
10						
11						
12						

Released on the Website

Data Download includes a csv that contains the regression slope and r^2



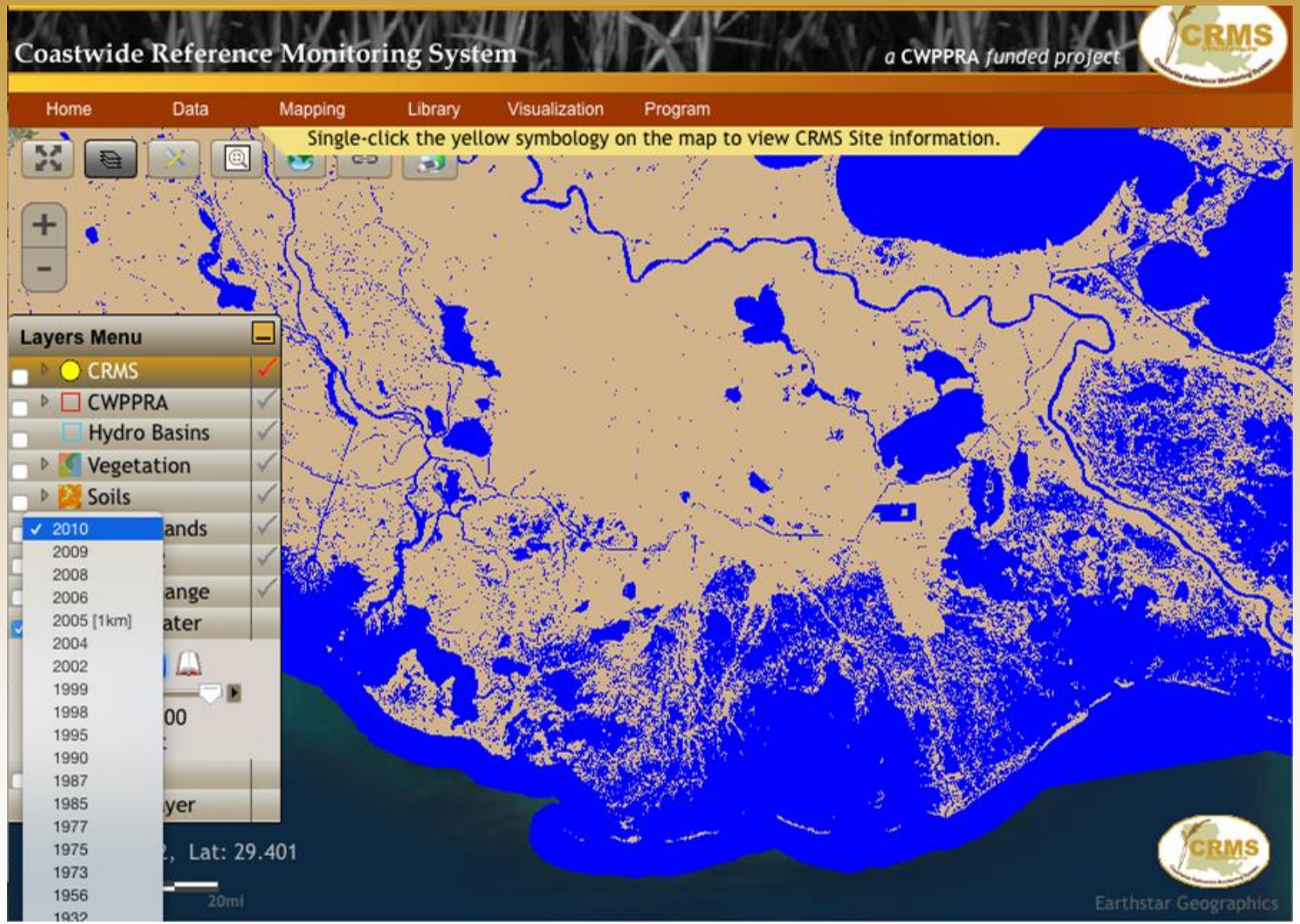


	A	B	C
1	Station_ID	Regression_Slope	r^2
2	CRMS0008	0.06	0.57
3			
4			

Released on the Website

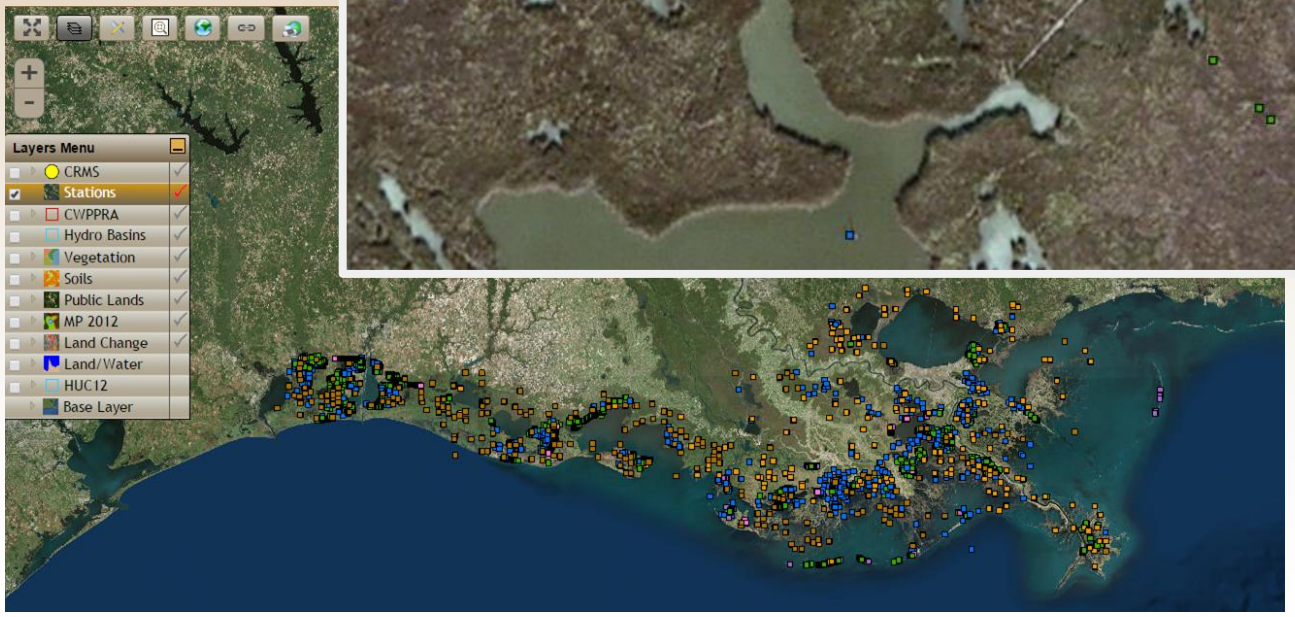
More Land/Water Years

Couvillion, B.R., Barras, J.A., Steyer, G.D., Sleavin, William, Fischer, Michelle, Beck, Holly, Trahan, Nadine, Griffin, Brad, and Heckman, David, 2011, Land area change in coastal Louisiana from 1932 to 2010: U.S. Geological Survey Scientific Investigations Map 3164, scale 1:265,000, 12 p. pamphlet.



Released on the Website

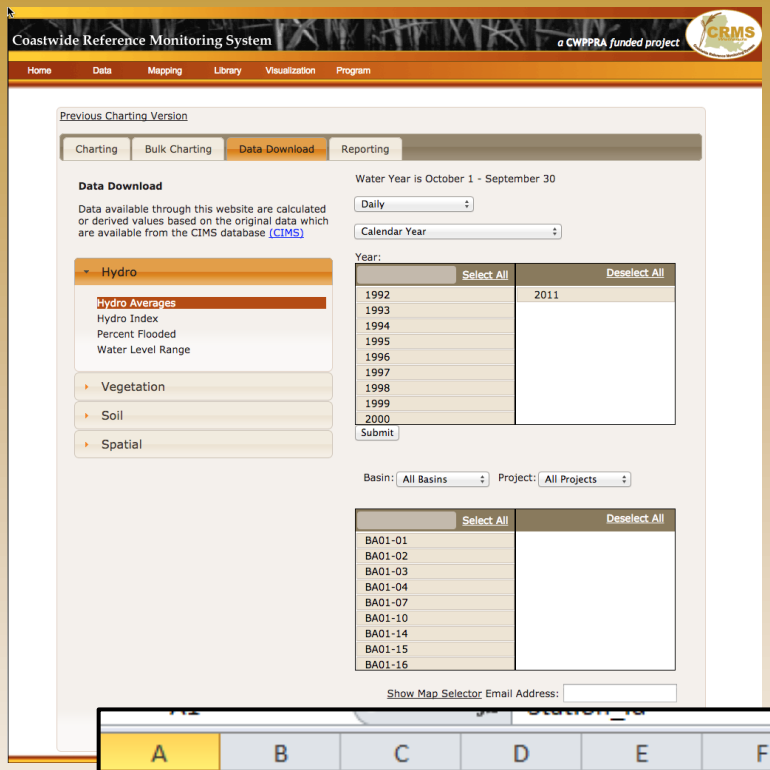
CRMS station layer added to the map



NOTE:
Station coordinates coming

Released on the Website

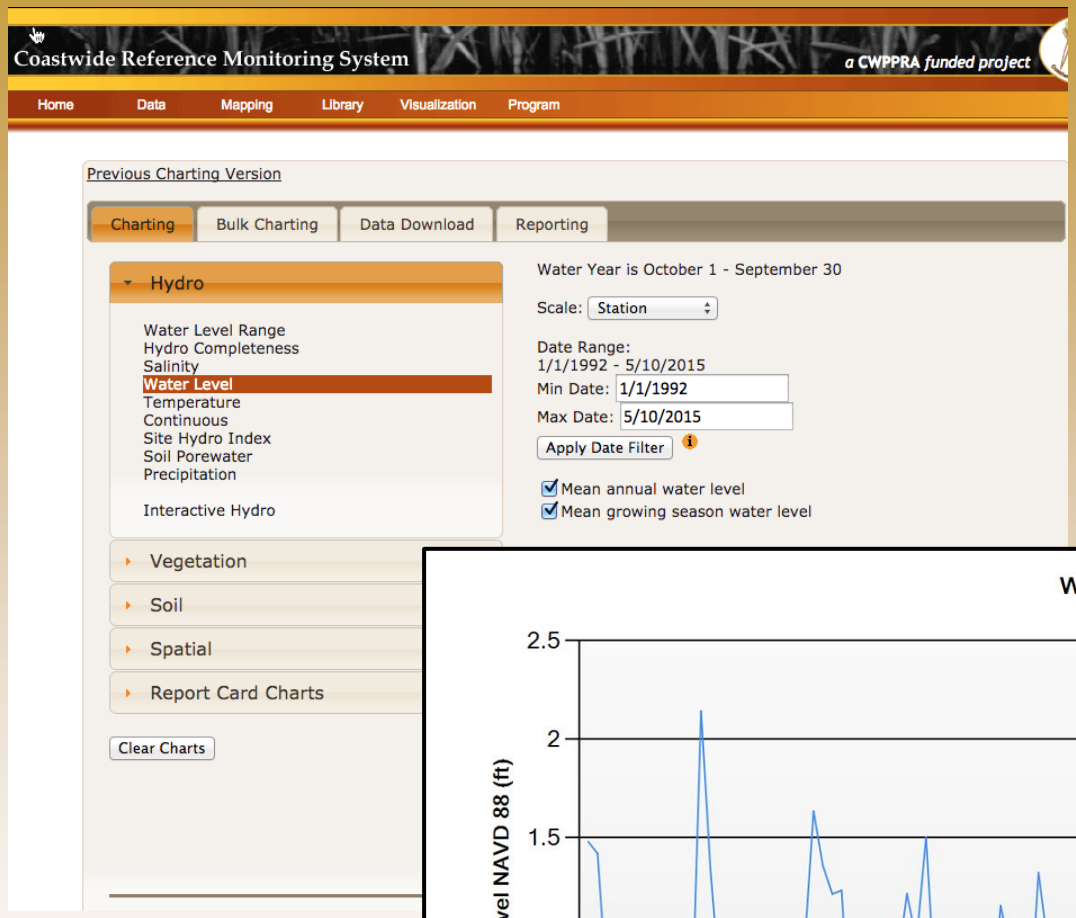
Added daily mean flooding column to the hydro averages download table (avg_water_level_to_marsh) .

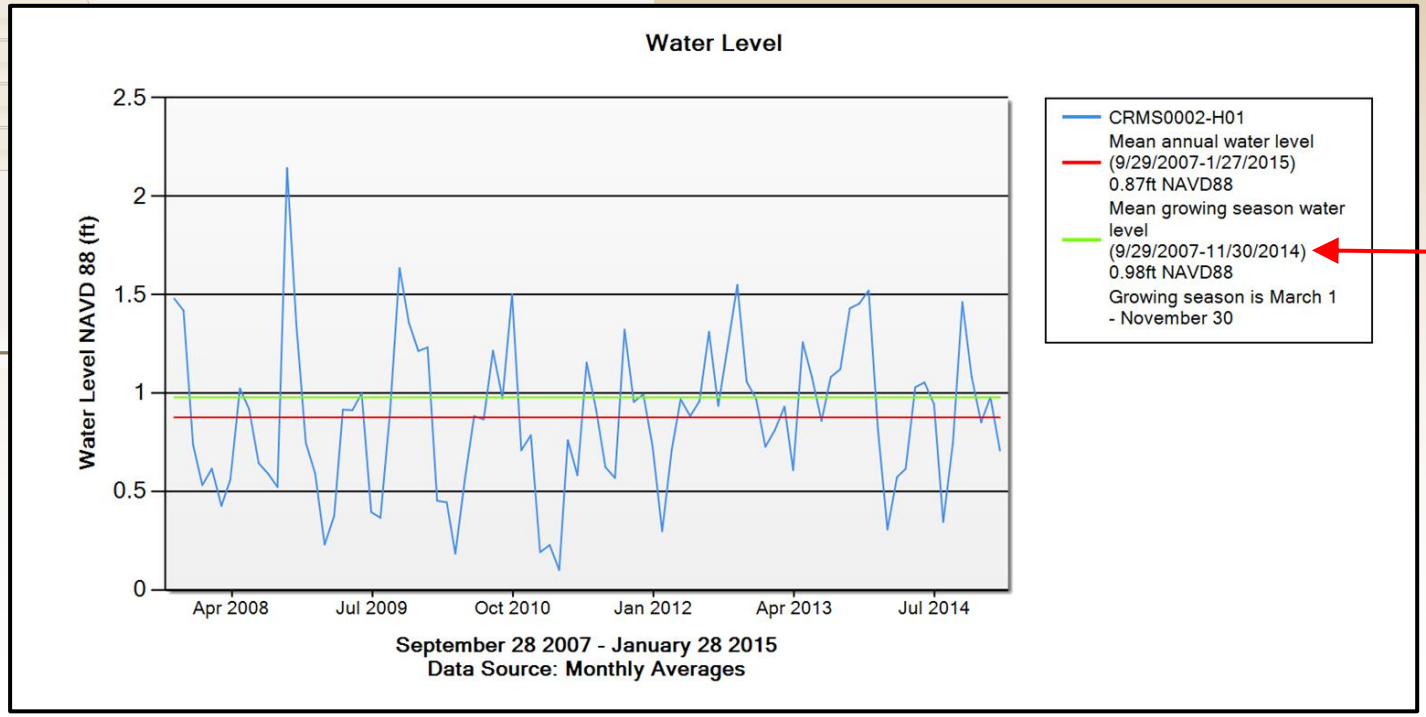


A	B	C	D	E	F	G	H	I	J	K	L	M
Station_id	date	avg_salini	min_salin	max_salin	avg_wate	min_wate	max_wate	avg_water_level_to_marsh	avg_temp	min_temp	max_temperature	
CRMS0002	1/1/2011	12.16	9.92	14.03	1.017917	0.84	1.22	0.574583327	13.77	11.58	16.13	
CRMS0002	1/2/2011	9.539583	9.09	10.56	0.67	0.24	1.1	0.227499999	10.395	6.77	14.49	
CRMS0002	1/3/2011	8.77	8.35	9.16	0.41875	0.14	0.67	-0.022916668	7.94	4.17	11.75	
CRMS0002	1/4/2011	7.722917	7.31	8.36	0.367917	0.1	0.7	-0.074166667	11.77708	9.38	14.84	
CRMS0002	1/5/2011	7.176667	6.96	7.61	0.289583	-0.01	0.56	-0.154583333	14.535	11.89	17.72	
CRMS0002	1/6/2011	6.517917	6.11	7.07	0.18875	-0.09	0.54	-0.254166667	13.3475	9.77	16.85	
CRMS0002	1/7/2011	6.137143	5.44	6.53	-0.18217	-0.53	0.12	-0.625217396	12.33182	10.93	14.66	
CRMS0002	1/8/2011	5.281667	4.88	5.55	-0.425	-0.51	-0.26	-0.867499992	9.8275	8.08	11.25	
CRMS0002	1/9/2011	5.182609	4.68	7.49	0.320417	-0.44	1.86	-0.123333334	9.18375	8.16	10.13	
CRMS0002	#########	7.484167	6.26	9.12	1.457083	0.97	2.02	1.014999998	9.317083	8.62	10.25	
CRMS0002	#########	8.0325	6.71	9.18	0.6375	0.22	1.07	0.195833335	8.164583	4.24	11.61	

Released on the Website

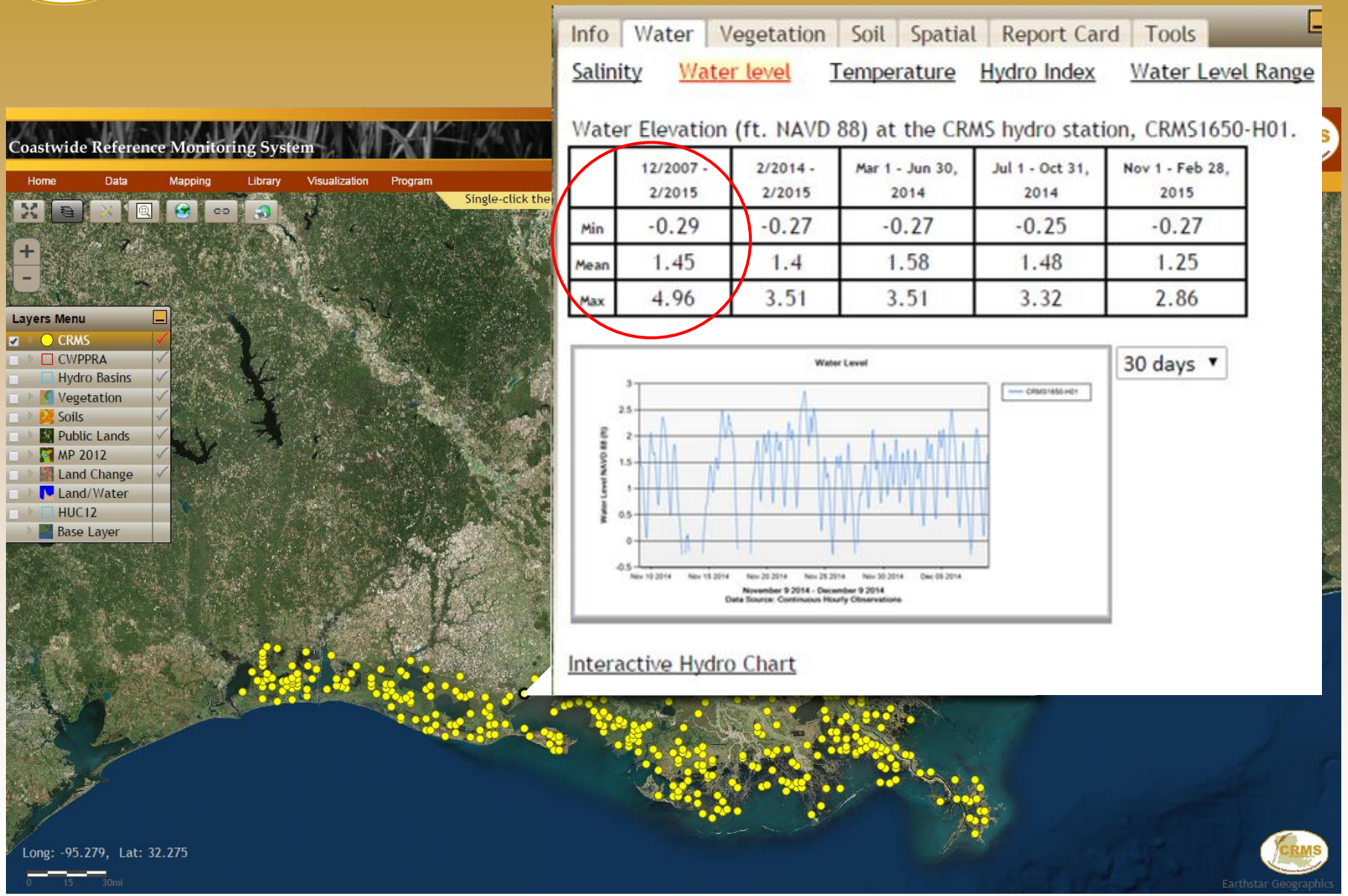
Added “Mean growing season water level” line





Released on the Website

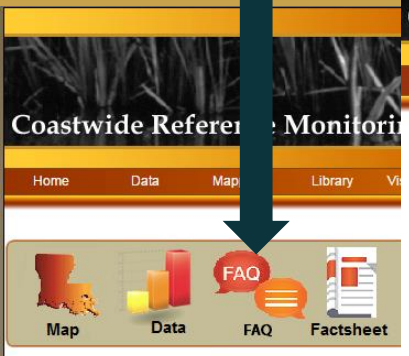
Show statistics for the entire dataset (along with the previously available year and various seasons).



NOTE: Applies to salinity and temperature too.

Released on the Website

FAQ



a CWPPRA funded project

Coastwide Reference Monitoring System

Home | Data | Mapping | Library | Visualization | Program

What parameters are measured through CRMS, how and when are they measured?

Data Type	Parameter	Method	Scale	Frequency
Land change	Land:Water Ratio	Satellite Imagery	Hydrologic Basin	3 years
	Land:Water Ratio	Digital Aerial Photography	CRMS Site (1 km²)	3 years
Vegetation	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
	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
Soils	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
	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
	Surface Water Salinity, Temp and Water Level	Submersible Data Logger	in available water within 200m of CRMS site or in a well	Hourly

How do I interpret the CRMS station naming convention (ex., CRMS0002-V01 CRMS0002-A13, etc)?

CRMS **site** names are indicated by CRMSXXXX, where XXXX is a four digit number. CR **station** names begin with the CRMS site number, followed by a hyphen, and the stati number (ex., CRMS0002-A01). There are many stations within a CRMS site. For additi details of station naming conventions and general CRMS data collection schedule, click here

How do I download data?

Use cims.coastal.louisiana.gov if you are looking for raw data for a specific data type (

a CWPPRA funded project

Coastwide Reference Monitoring System

Home | Data | Mapping | Library | Visualization | Program

CRMS Data Collection Information and Schedule

Download "raw" data from CIMS or the CRMS website homepage by clicking on Data/Tabular/CIMS

Hydrographic:

- Station number (H01): Continuous hourly salinity, temperature, and water level data are collected. At most sites the data recorder is in an open water body or bayou.
- Station number (W01): Continuous hourly salinity, temperature, and water level data but the data recorder 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 -- Data

Soil Properties:

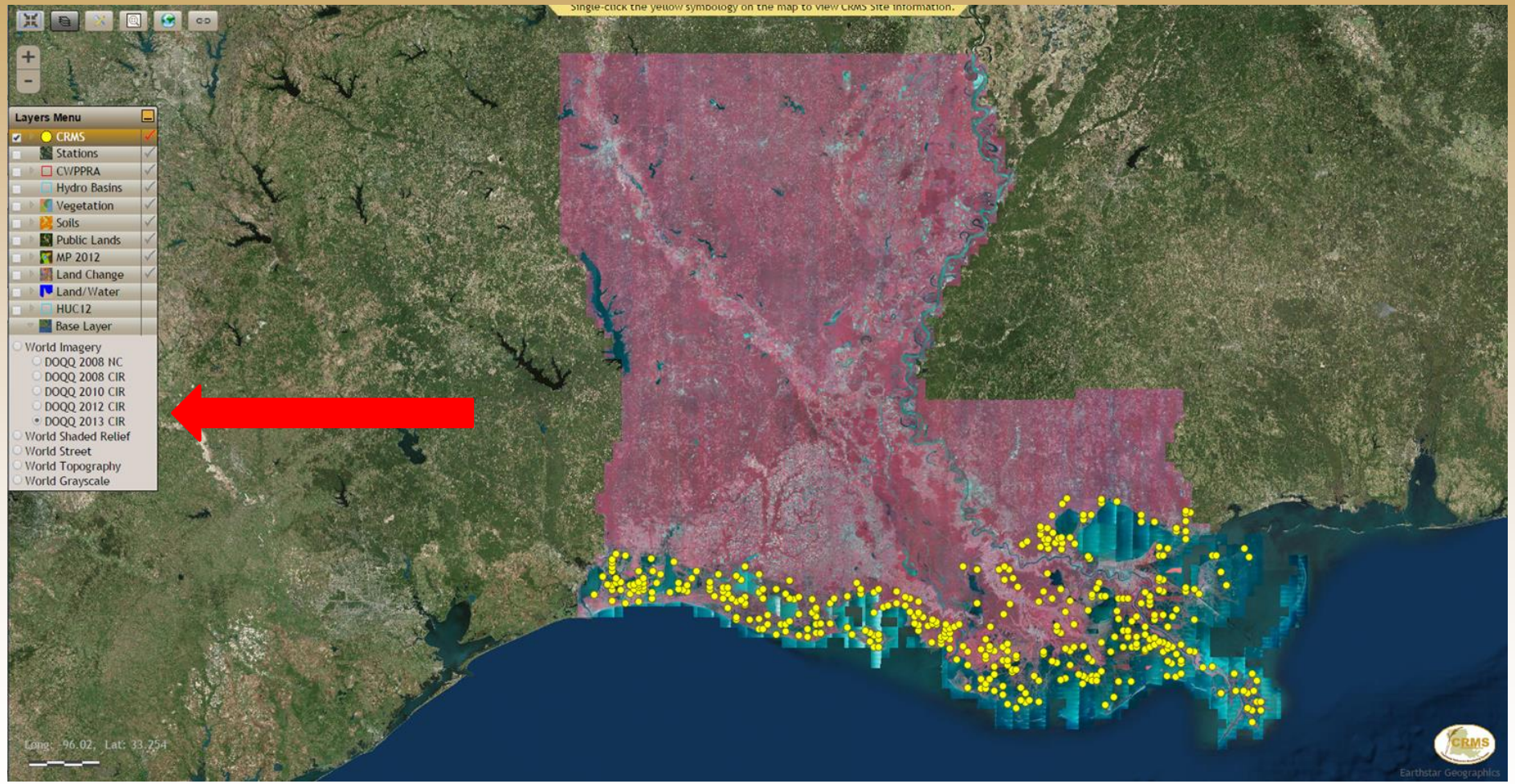
Station number (S01, S02, etc): Collected upon site establishment and approximately 10 years thereafter. Soil: pH, salinity, bulk density, soil moisture, percent organic matter, wet/dry volume

Soil Porewater Salinity:

Station number (P01, P02, P03): Discrete collections occur near the CRMS boardwalks: 1) intermittently throughout the year when the boardwalk is accessed, 2) twice annually during spring and fall RSET/accretion sampling, and 3) collected at each vegetation station

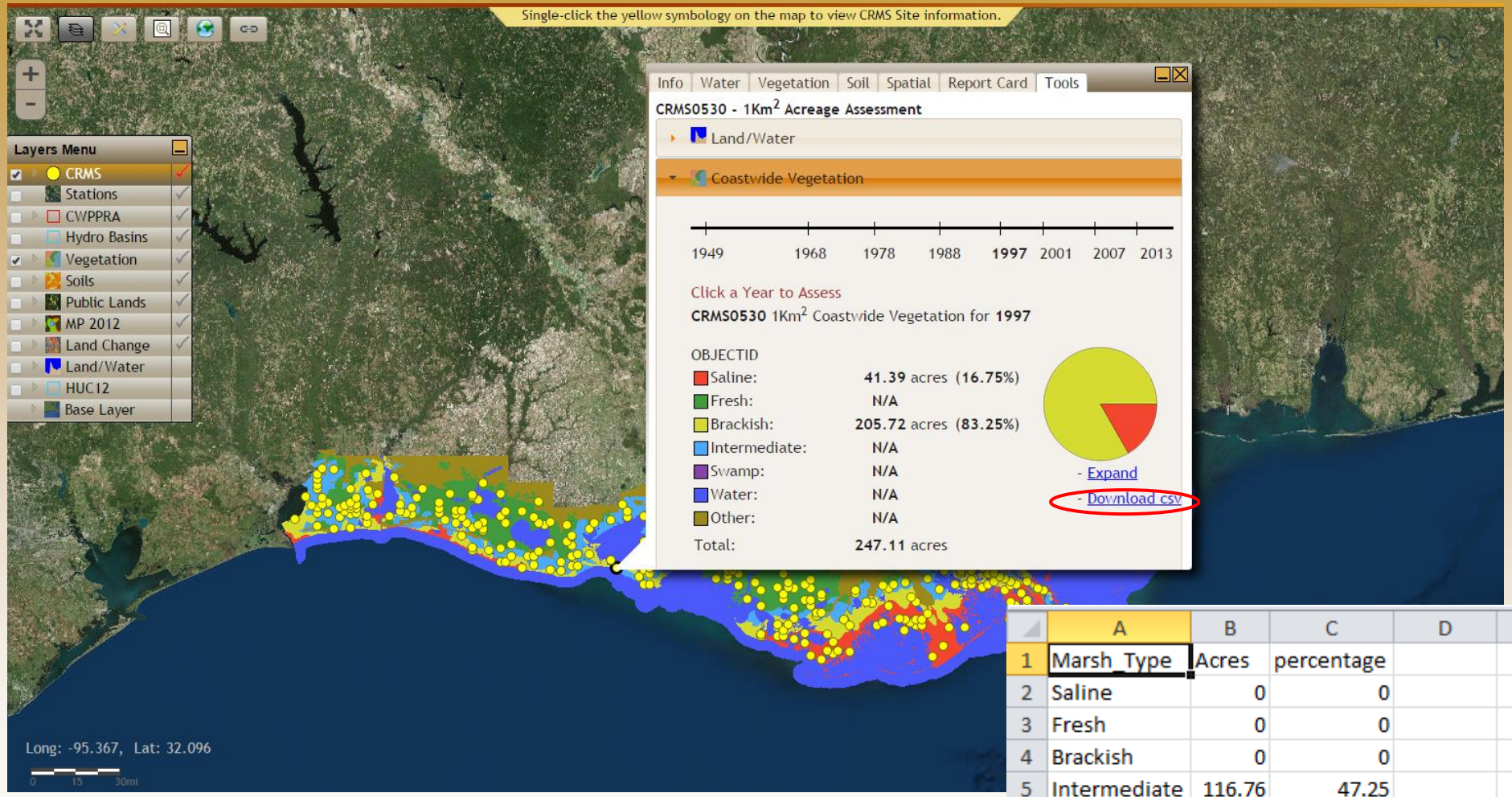
Released on the Website

2013 Color Infrared Imagery



Released on the Website

Add a link to download the vegetation acreage assessment



	A	B	C	D
1	Marsh_Type	Acres	percentage	
2	Saline	0	0	
3	Fresh	0	0	
4	Brackish	0	0	
5	Intermediate	116.76	47.25	
6	Swamp	0	0	
7	Water	130.35	52.75	
8	Other	0	0	
9				
10				
11				

Coming Soon

Coming Soon

Create charts for sites that are “CRMS like” but have different naming convention

Previous Charting Version

Charting | Bulk Charting | Data Download | Reporting

- Hydro
  - Water Level Range
  - Hydro Completeness
  - Salinity
  - Water Level
  - Temperature
  - Continuous
  - Site Hydro Index
  - Soil Porewater
  - Precipitation
  - Interactive Hydro
- Vegetation
- Soil
- Spatial
- Report Card Charts

Water Year is October 1 - September 30

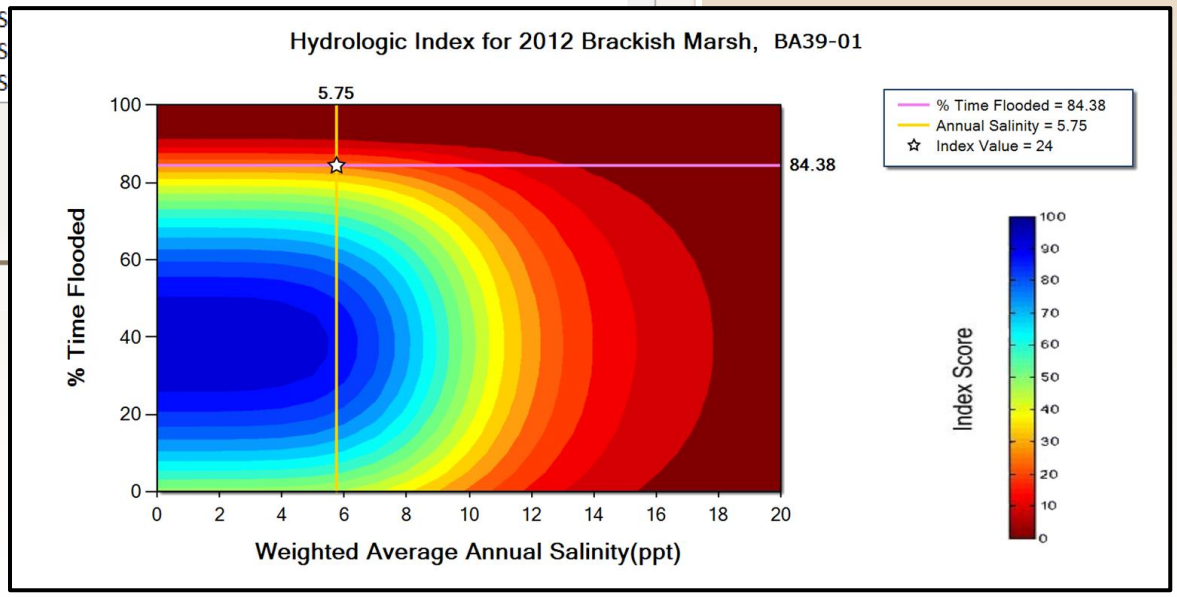
More Info on Chart

Scale: Site

Year: 2012

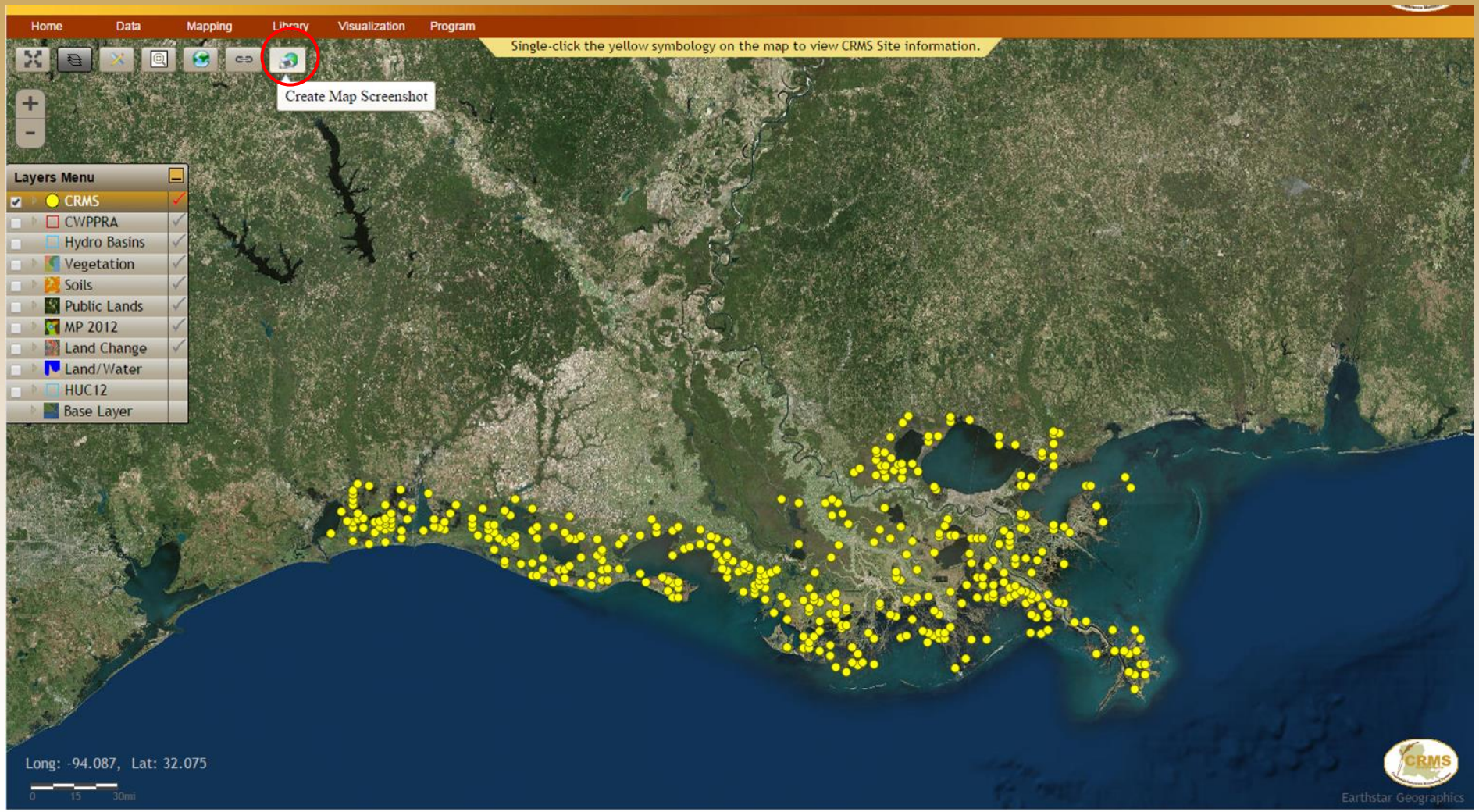
BA39-01
BA39-02
BA39-03
CRMS0002
CRMS0003
CRMS0006
CRMS0030
CRMS
CRMS
CRMS

Clear Charts



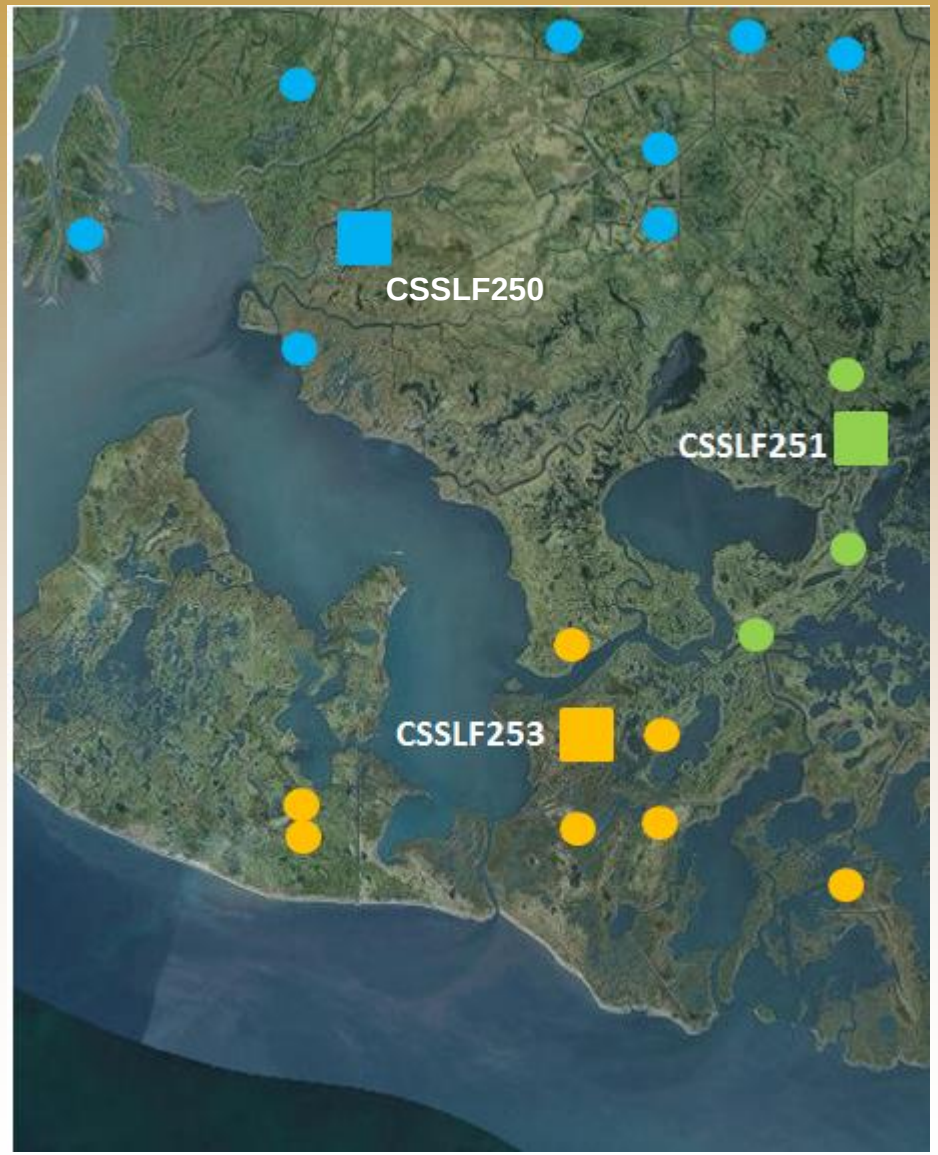
Coming Soon

Print of your map.



Coming Soon

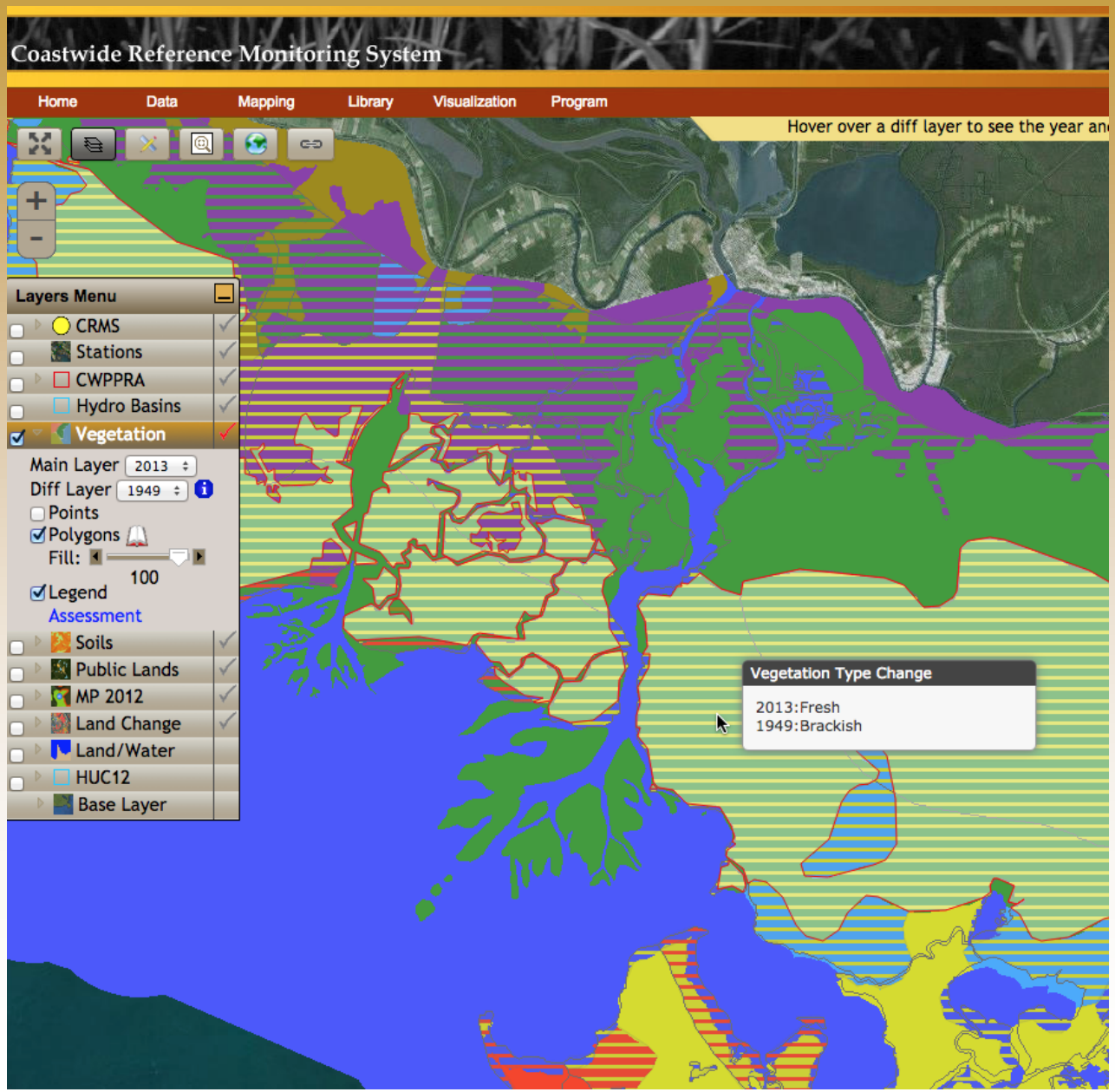
Display elevation survey benchmark network and associated CRMS sites



Coming Soon

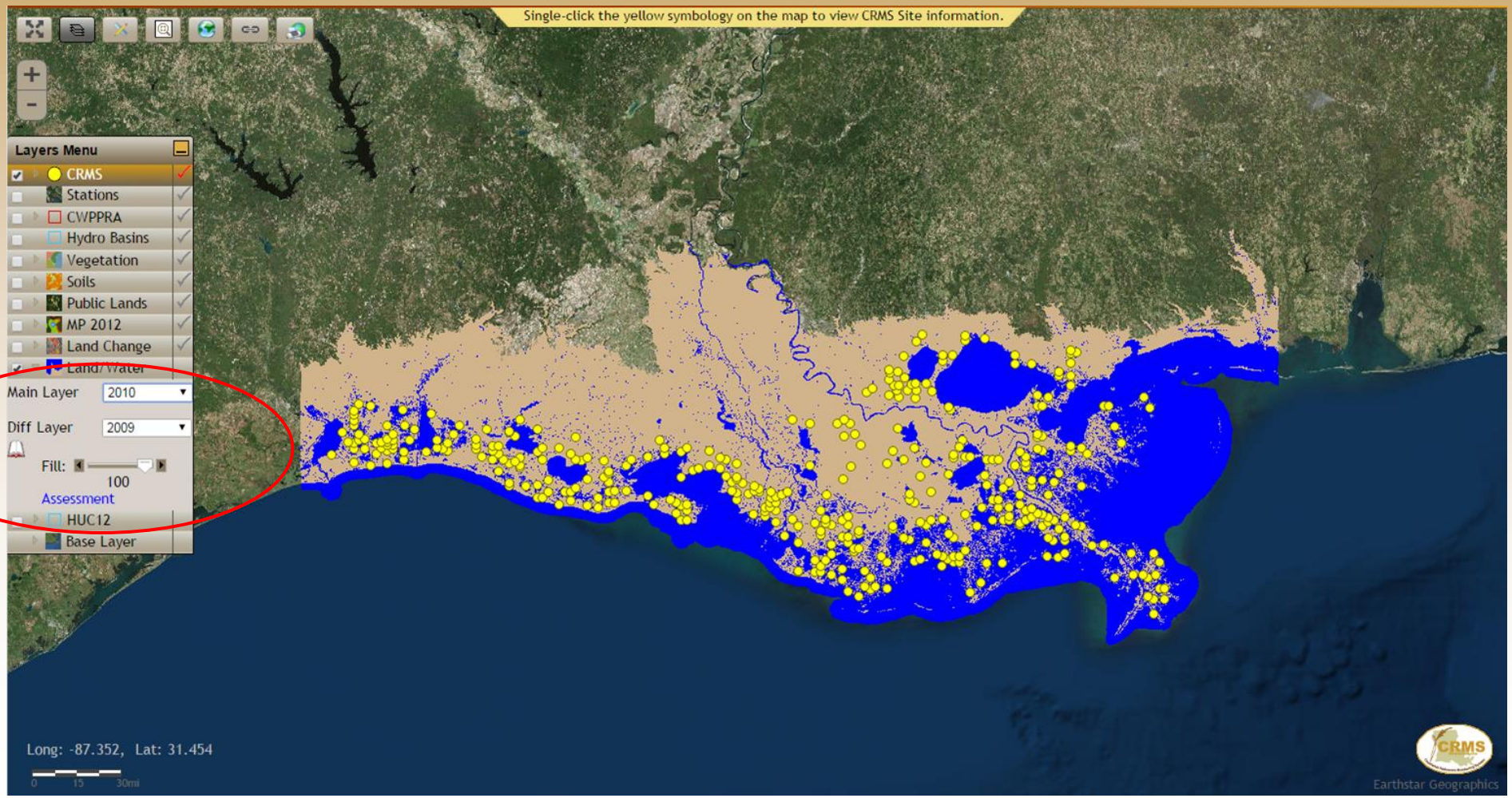
Add a difference layer to the land/water layer

NOTE: Context of the new land/water too



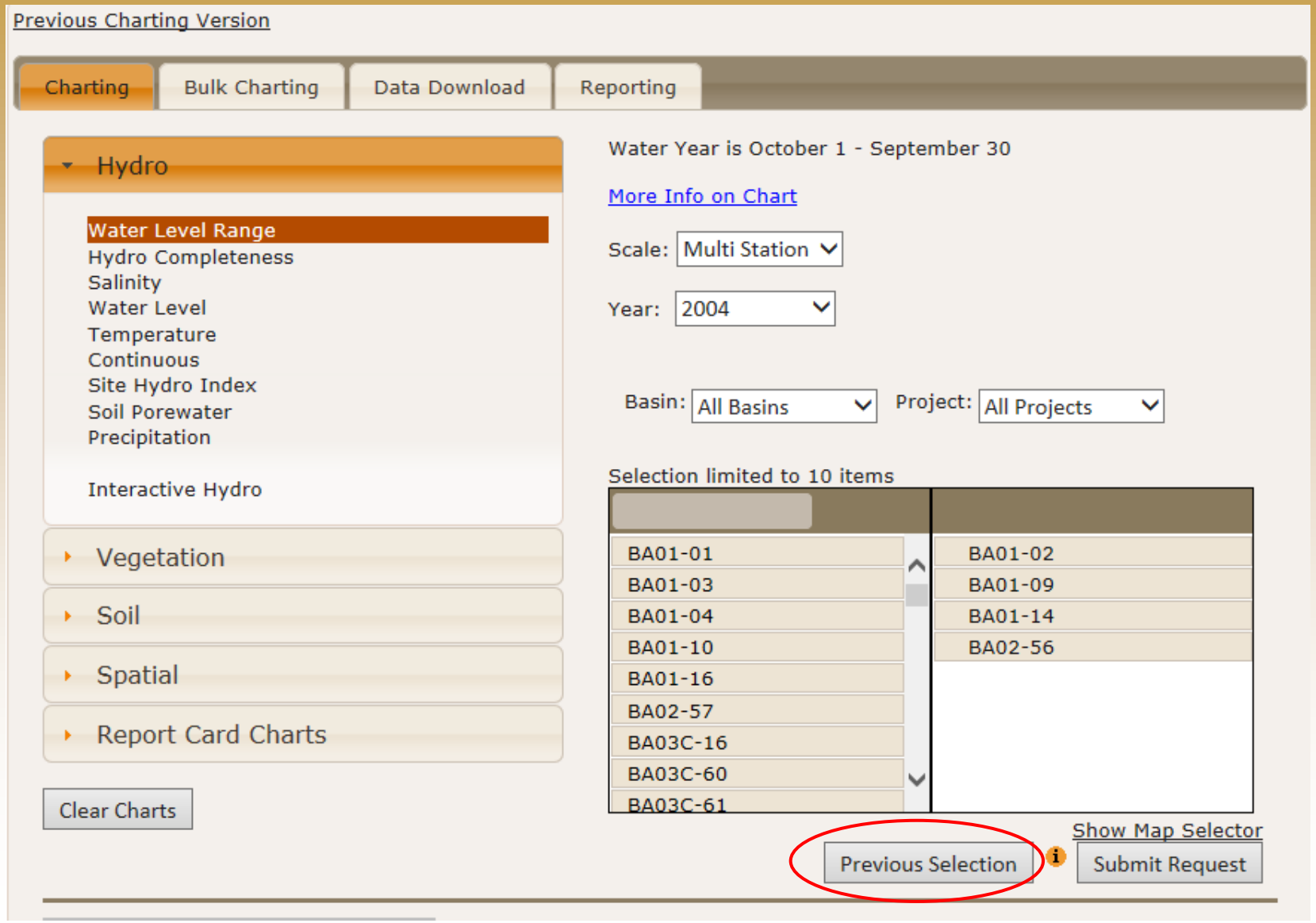
Coming Soon

Add a difference layer to the land/water layer



Coming Soon

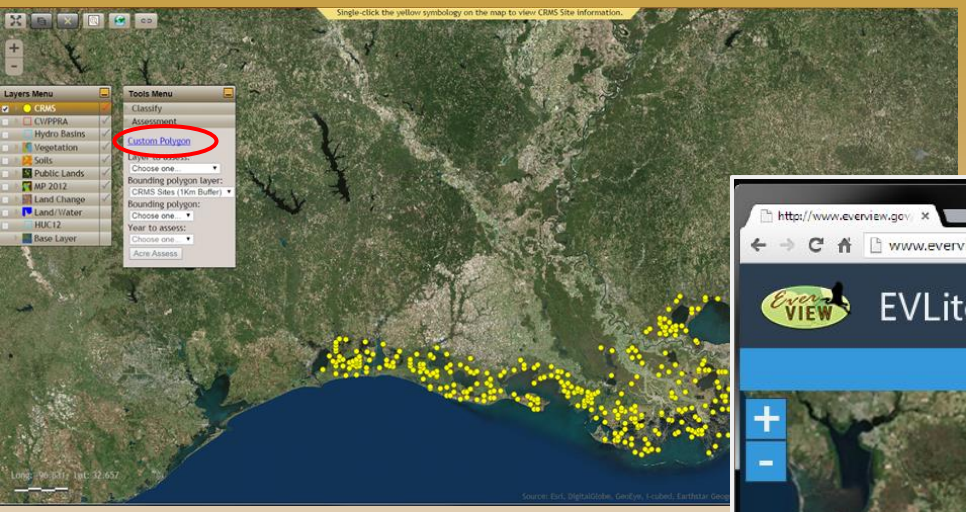
Save a previous selection list for chart creation

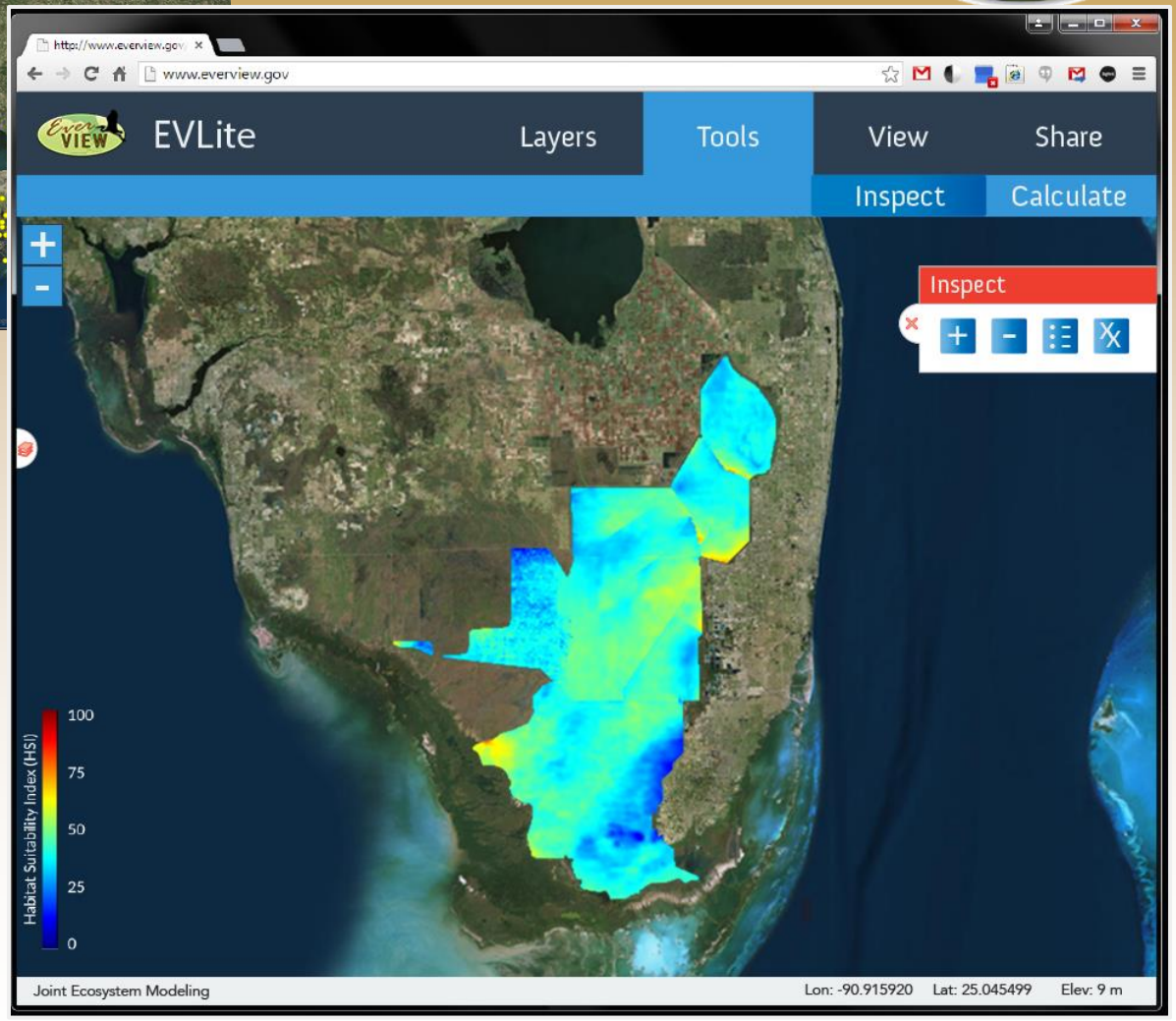


Ideas...

Ideas!

Add “MY” shapefile to the CRMS map
(Leveraging work on the EverVIEW project)





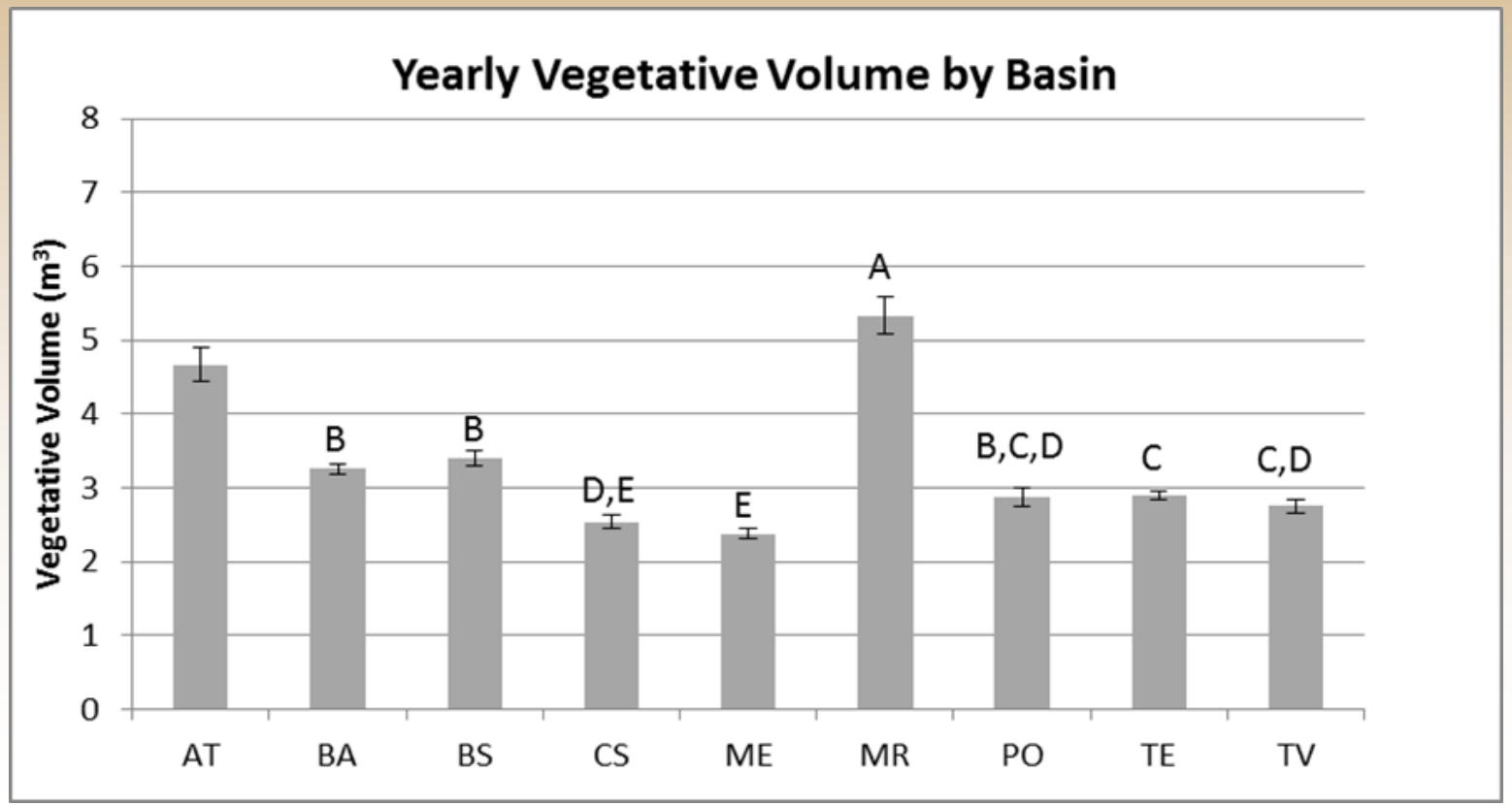
CRMS Analytical Team Updates

Forested Floristic Quality Index (FFQI)

- USGS Open-File Report completed peer review
- Uses basal area by tree species to assess quality and quantity of overstory & incorporates information about the herb layer
- Station level scores are aggregated to site level FFQI values
- By using basal area, percent tree canopy cover and information about the herbaceous layer enables differentiation between sites in different successional states, e.g. emerging or deteriorating forests

Vegetation Volume Index (VVI)

- USGS Open-File Report completed peer review
- Quantifies the volume of vegetation at a site (m^3) by incorporating cover AND height for each vegetation layer.
- Proxy for vegetation production, quantifying 3d structure.
- The VV values are indexed into VVI scores by marsh type.
- Developed to be paired with the FQI.



Landscape Index (LI)

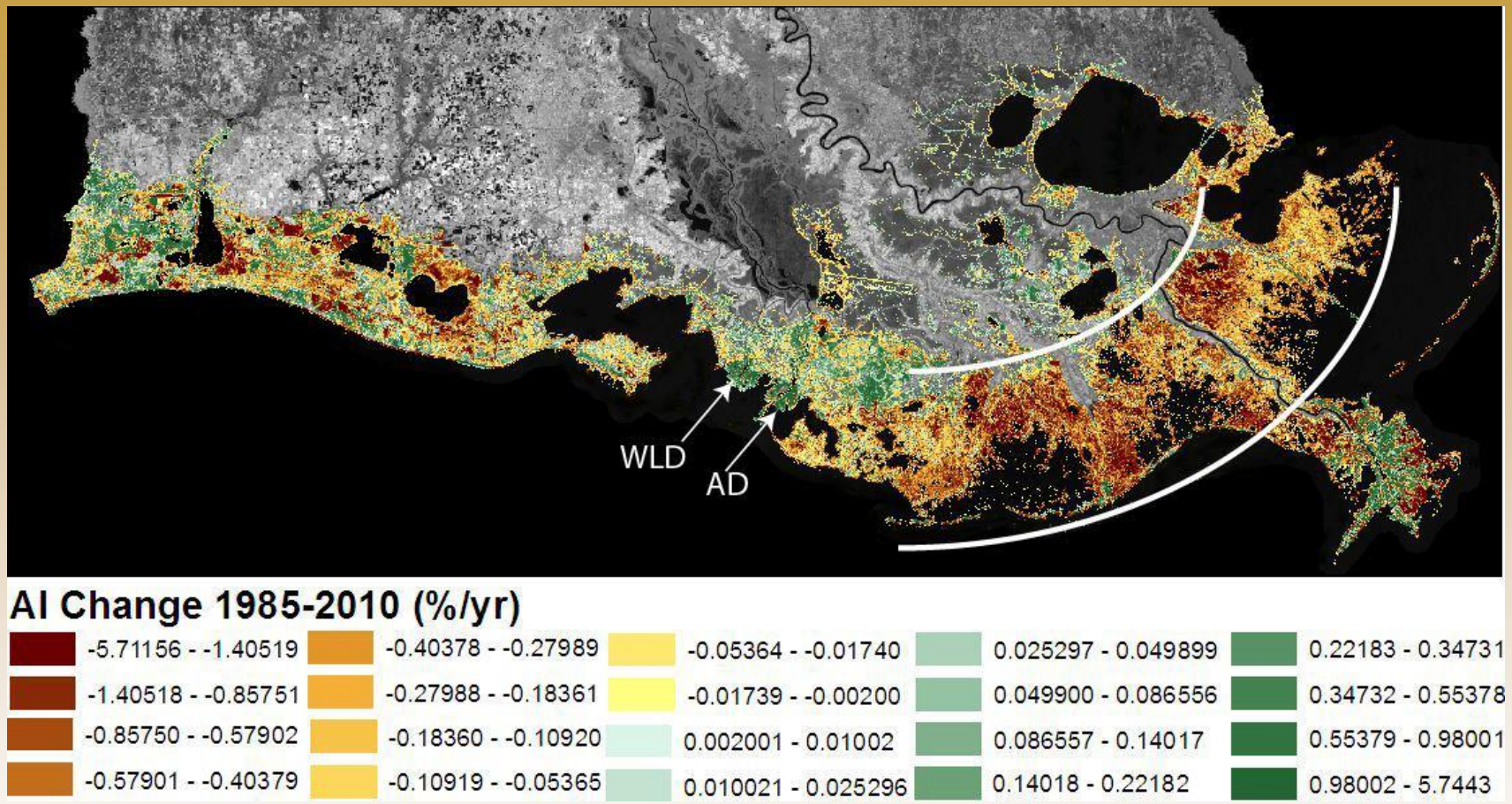
Landscape Index

- Manuscript completed USGS review, submitted for journal review.
- Wetland loss, mosaic of wetlands and open water patches
- Examined the spatial and temporal variability of landscape configuration and the relation of those patterns to the trajectories of wetland loss
- Spatial configuration was quantified using multi-temporal satellite imagery and an Aggregation Index (AI)
- AI uses land/water datasets to compute a percentage based on the ratio of possible vs. observed land for each pixel
- AI has a range of 0-100
- AI can be compiled at various spatial scales

Fully disaggregated
AI=0

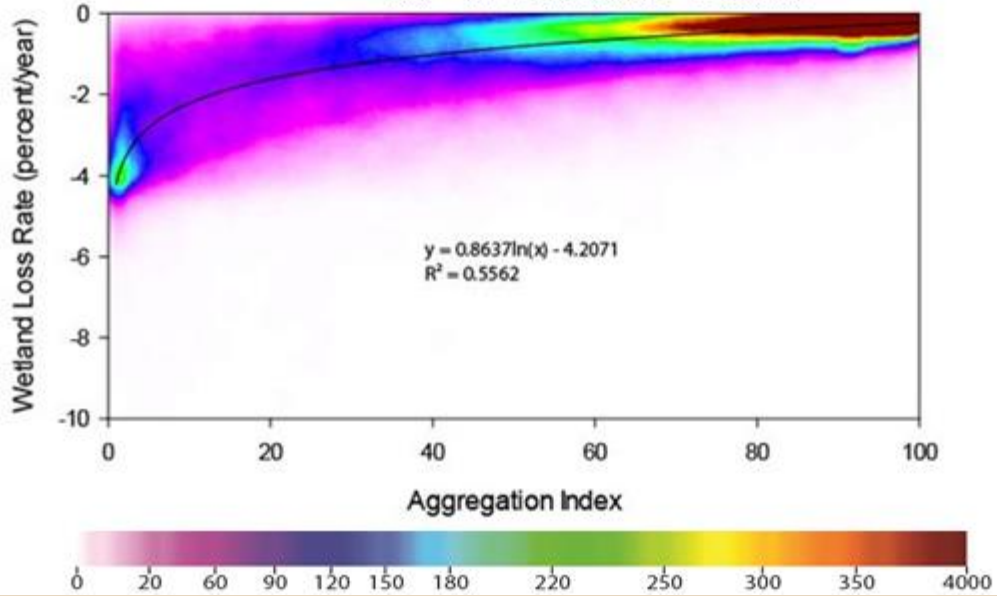
Fully aggregated
AI=100

Coastwide and Basin Scale Analyses



- **Fragmentation is only one factor influencing wetland loss.**
- **Areas of greatest negative AI change are potentially more susceptible to future wetland loss.**

Link between Spatial Configuration and Susceptibility to Wetland Loss

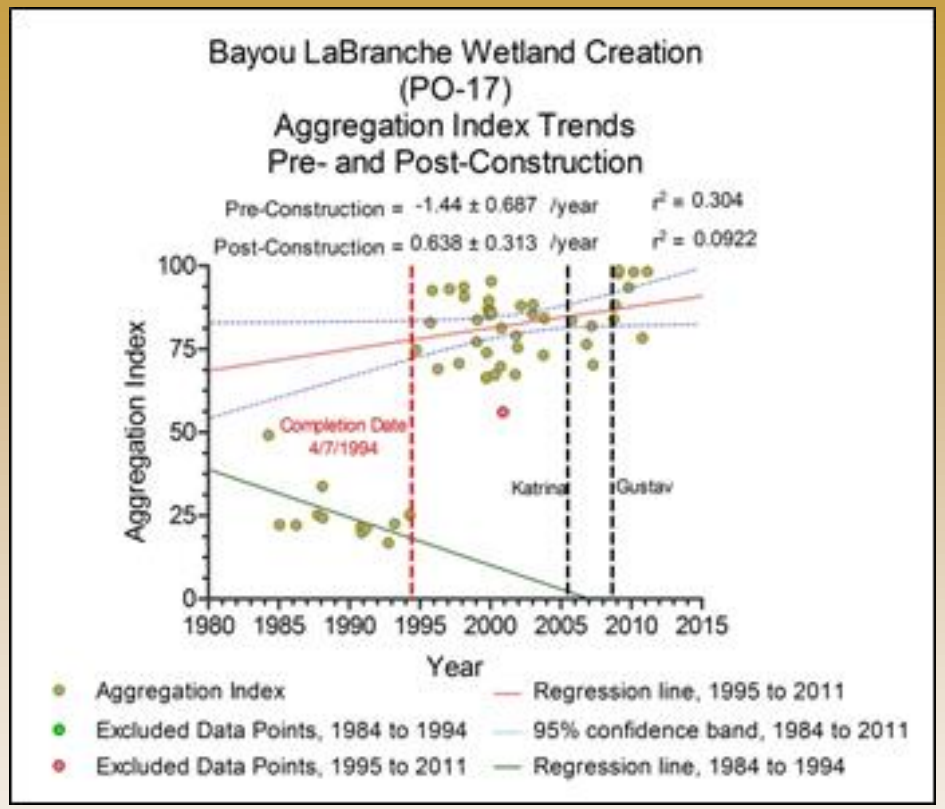


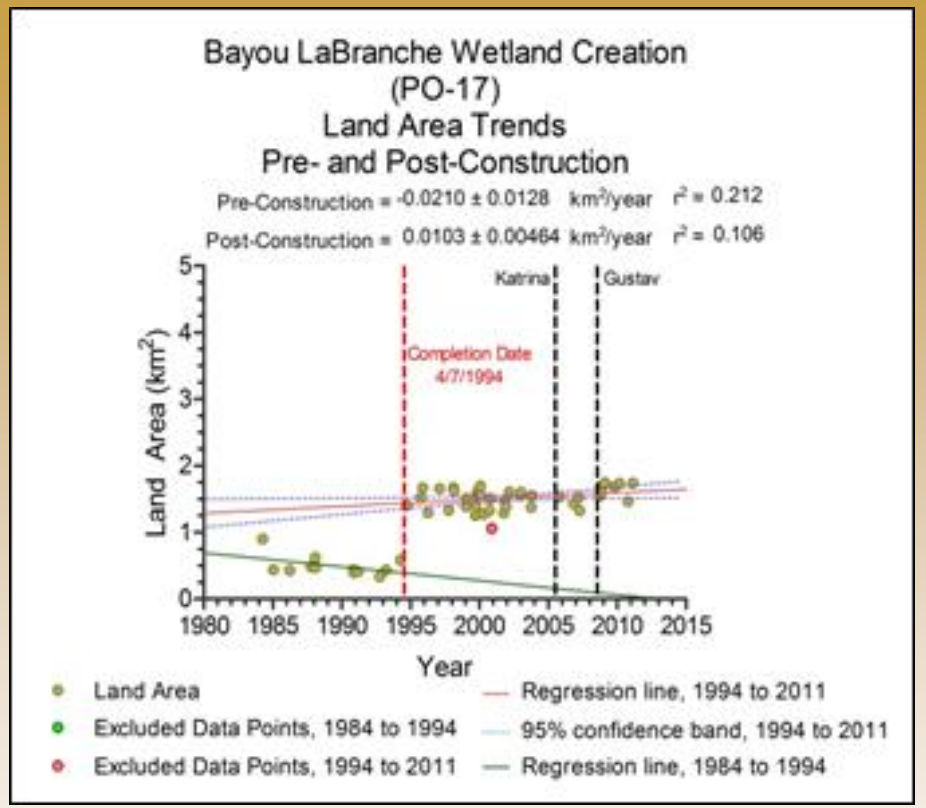
- Known that wetland loss contributes to fragmentation, and it is suspected that fragmentation contributes to wetland loss, few studies have actually tested that hypothesis at large scales over a large period of record.

- AI and wetland change rate for the subsequent period are correlated.

- Results suggest while various causal mechanisms of wetland loss may lead to the **initial fragmentation** of wetlands, the fragmentation itself then **contributes to increased exposure and vulnerability** of wetland landscapes, thereby **increasing the probability** of furthered **wetland loss**.

Restoration Project Scale Analysis



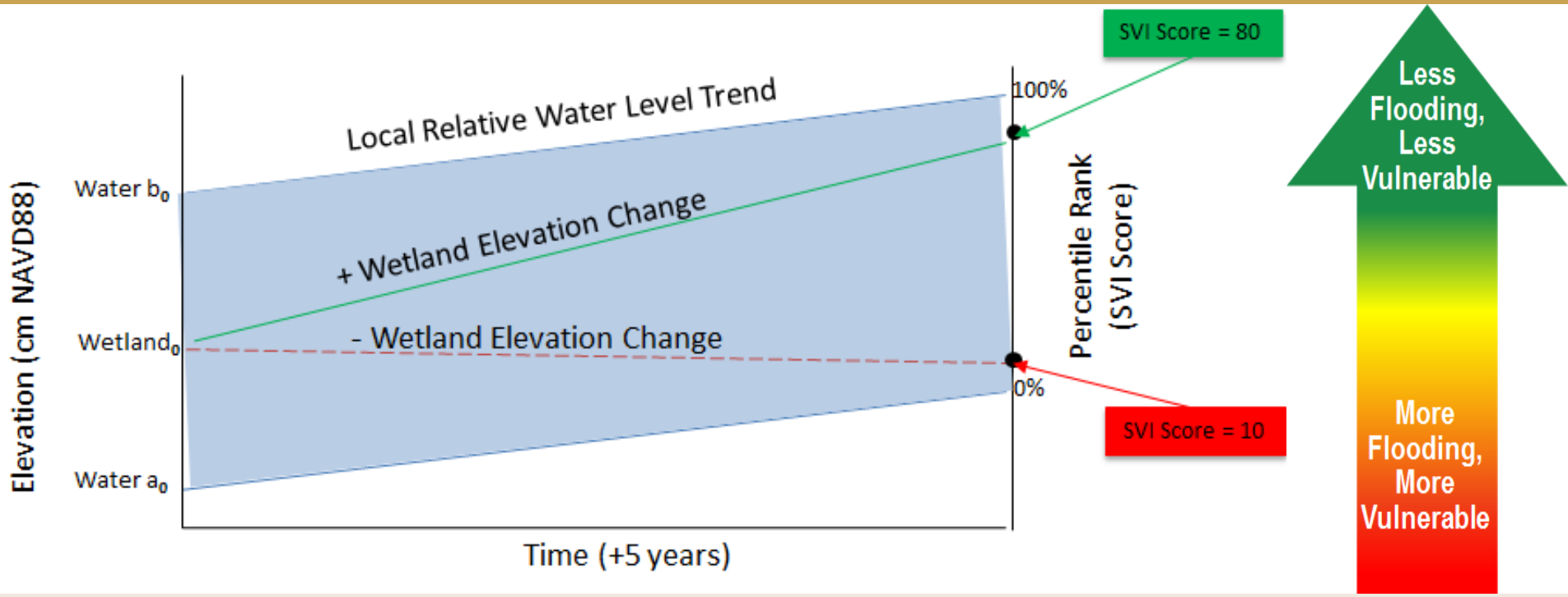


- **PO-17, marsh creation, constructed in 1994.**
- **Increased aggregation and land area acres following construction.**
- **Implied the project area is not only maintaining itself, but is also more stable.**
- **Fluctuations in AI & land area due to water level**

Submergence Vulnerability Index (SVI)

SVI Revisions: Initial Model

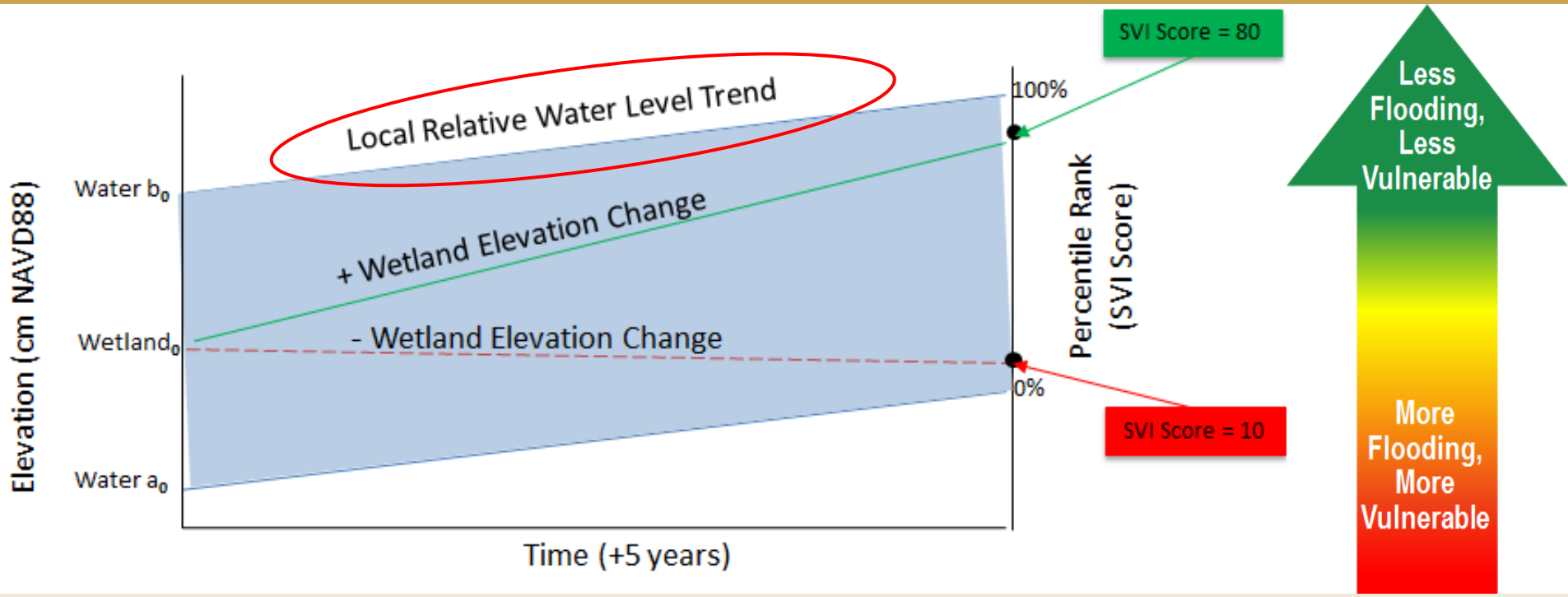
2013



- **Compares site specific water level data & surface elevation data.**
- **Water level and surface elevation are projected 5 years.**
- **Intersection of water and marsh surface are ranked.**
- **Predicted percent time flooded is calculated.**
- **SVI score is the inverse of predicted % time flooded.**
- **Ex: SVI = 80, would be flooded 20% of time.**

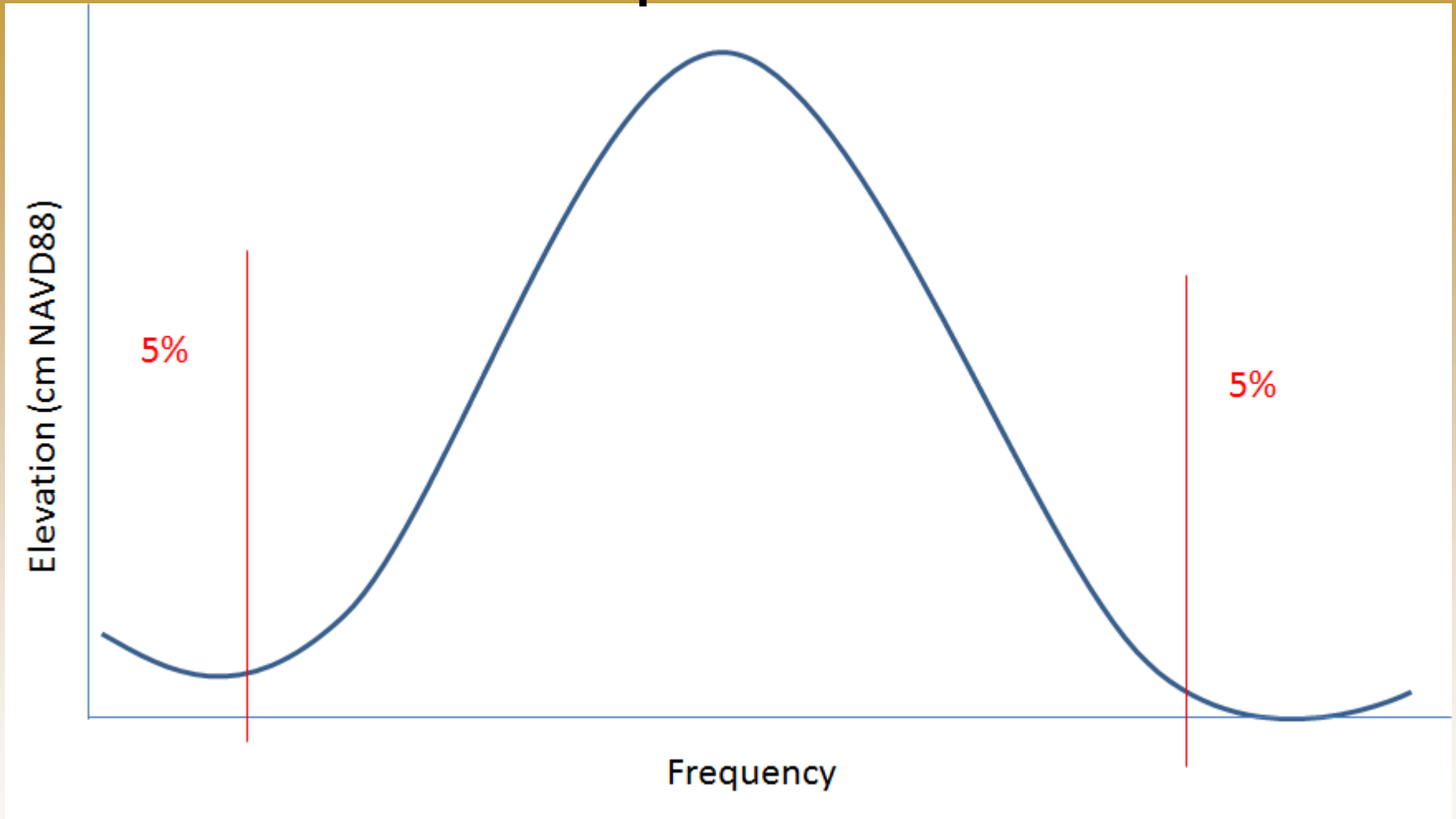
SVI Revisions: Initial Model

2013



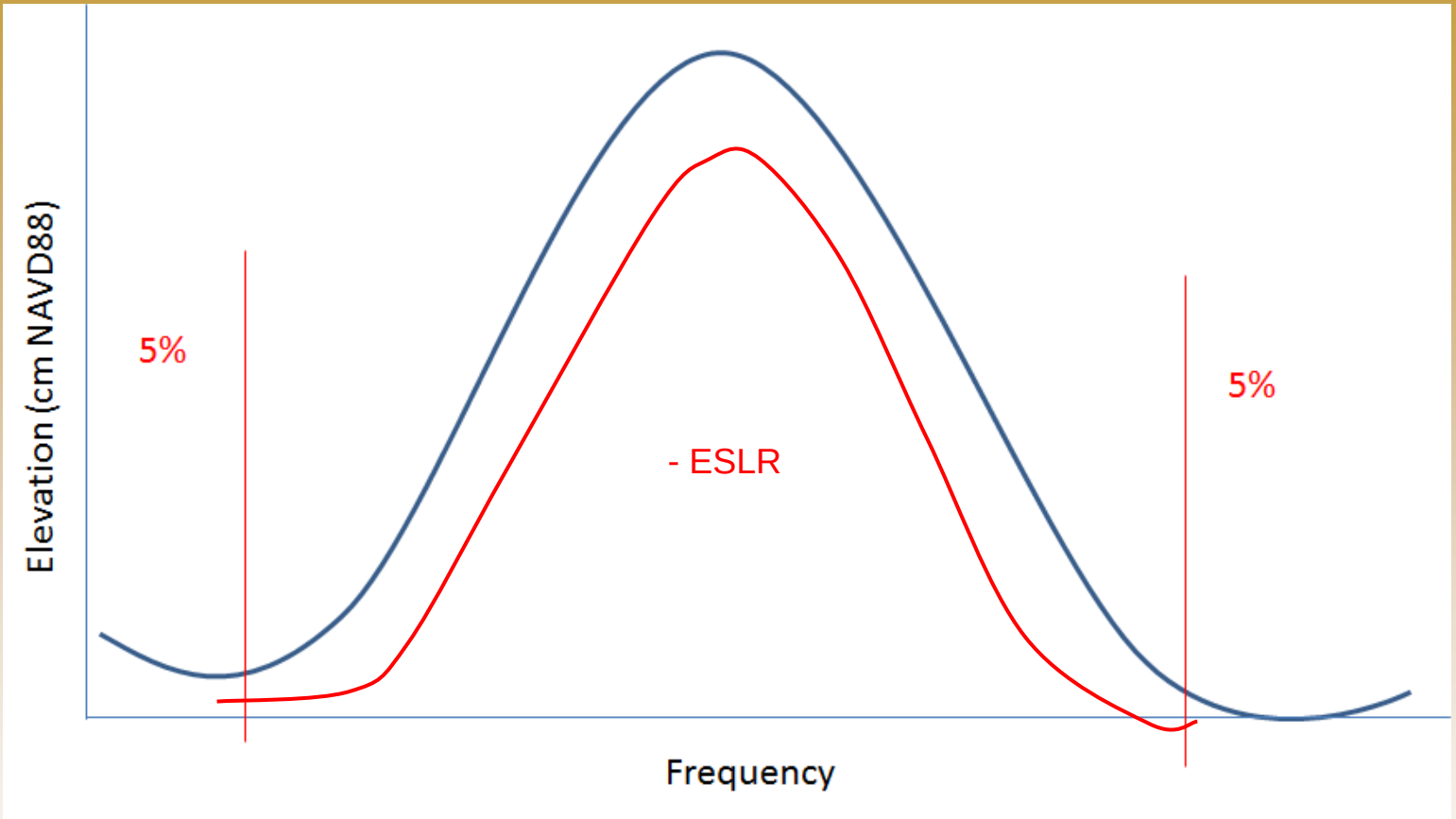
- **Original model used Local Relative Water Level Trend which incorporated ESLR and shallow subsidence.**
- **The model used surface elevation change data also, so it accounted for shallow subsidence twice.**
- **Removed shallow subsidence from water level constant.**

Hydrologic Data: Remove Episodic Events



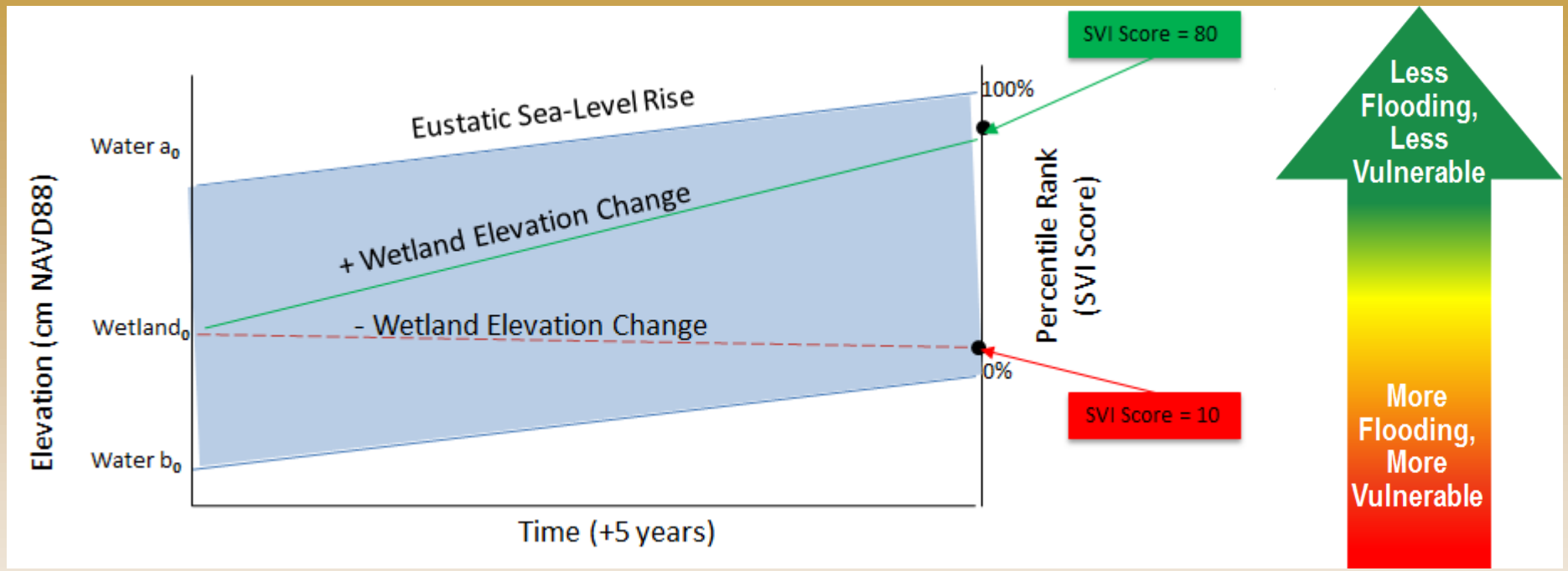
- SVI scores were overly conservative due to influence of storm events on water elevation distribution
- Removed 5% on either end of distribution to remove episodic influences that artificially raise/lower local water elevations

Hydrologic Data: De-trended ESLR



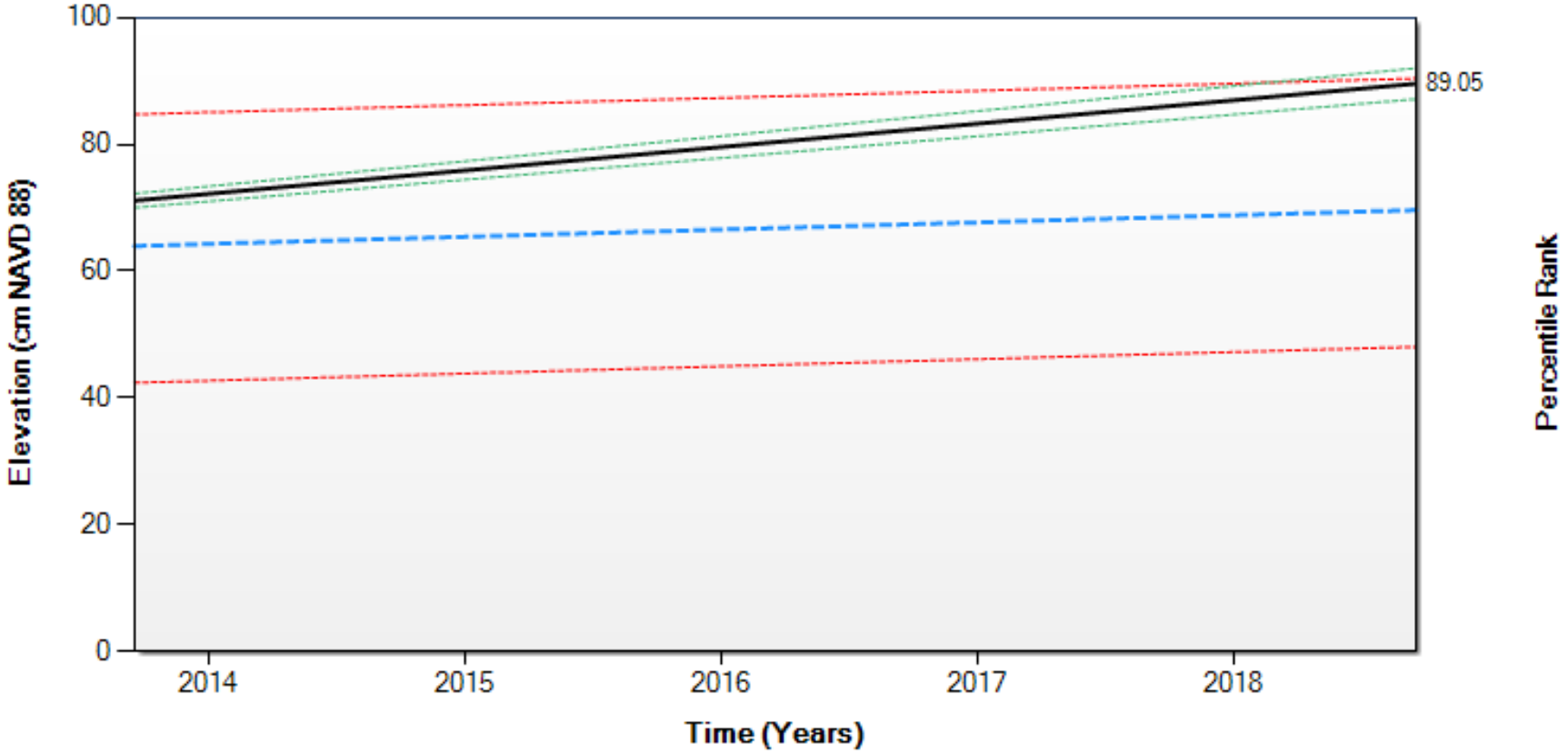
- **Water level data from tide gages inherently incorporates ESLR.**
- **De-trended ESLR from water level data set before projecting into the future.**

Revised SVI Model



- **The SVI model assesses the submergence vulnerability of a site based on the 5-year projection of it's relative position within the hydrologic prism.**
- **Wetland elevation is projected 5 years into the future by a regression of the SET data over time.**
- **The future hydrologic prism is calculated using a linear model with a slope equal to eustatic sea level rise.**

CRMS0156
SVI score = 89.05
Data Period: 6/27/2007 - 9/17/2013

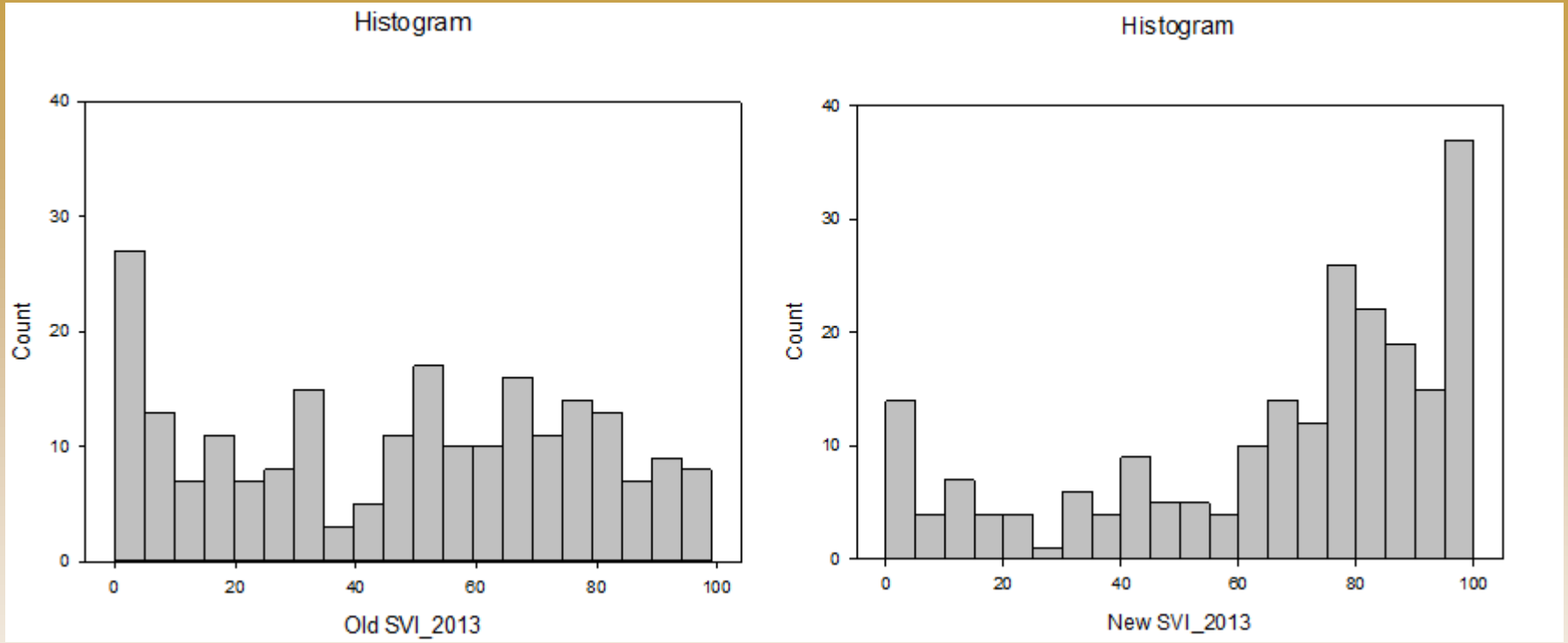


Initial Marsh Elevation = 51.82 (cm)
Wetland Elevation Change(CEC) = 3.69 (cm y^{-1})
Accretion = 4.52 (cm y^{-1})
Shallow Subsidence* = 0.82 (cm y^{-1})
ESLR = 0.31 (cm y^{-1})
Site Relative Water Level Trend = 1.13 (cm y^{-1})
SVI Score = 89.05

*SVI shallow subsidence rates are calculated using short-term accretion rates.

- 90% Hydrological Datum
- 10% Hydrological Datum
- Mean Water Level
- 95% Prediction Band
- Wetland Elevation Change (cm y^{-1})

Implications of Revisions



- **Overall increase in SVI scores because ESLR is likely less than actual RSLR.**
- **Site specific rates of RSLR would be optimal, but need at least one epoch (18 yrs) of water level data to estimate local rates of RSLR that are accurate.**

SVI Open File Report available:

http://pubs.er.usgs.gov/publication/

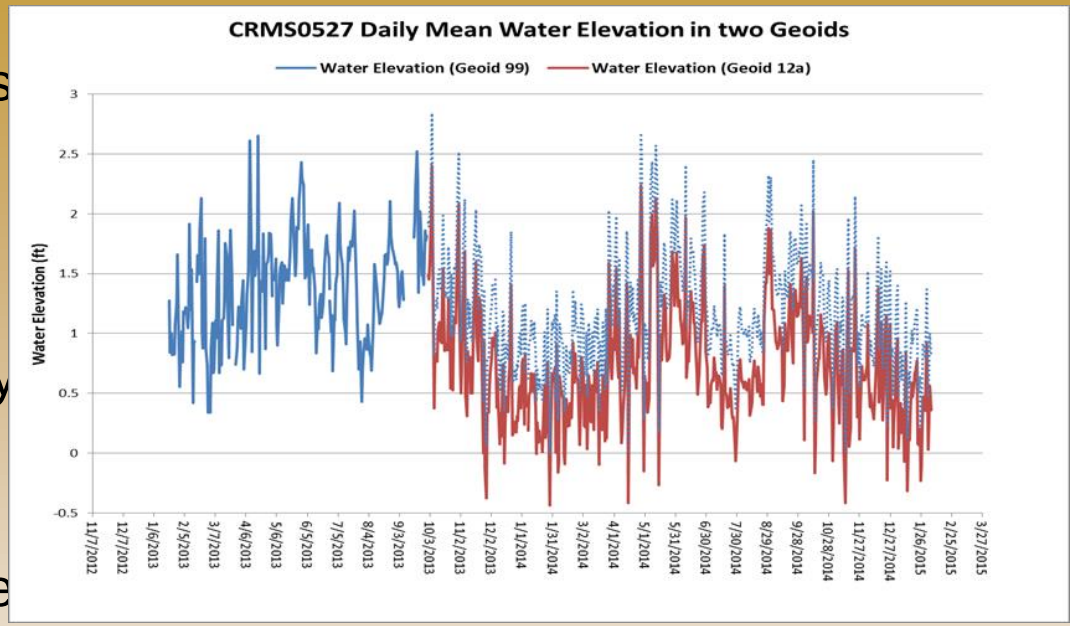
Coming soon:
Document revision addressing the modifications

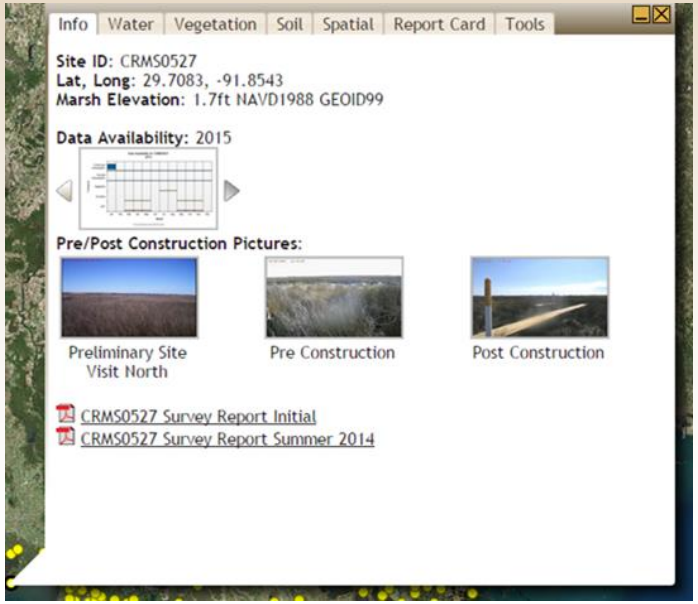
Coastwide Elevation Survey Update

- Sites were surveyed at the beginning of the program over several years and data were reported in NAVD88 Geoid99
- Spring/Summer 2014 all sites were surveyed in Geoid12a
- Elevations will be stored in the database with their Geoid information
- Will begin serving the Geoid12a elevations starting with October 1, 2013. Coincides with water year
- New average marsh elevations were calculated for each CRMS site

Coastwide Elevation Survey Update

- Contractor adjusting staff gages now
- Data shift will be visible due to resurveying
- Geoid will be identified for every elevation
- Both survey reports are available in the site level bubble
- Revising visualizations to reflect new elevations (water elevation, marsh elevation, flooding, etc.)
- Working on potential data shift to be applied to “old” data





Questions, Data Requests, Ideas????

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