



Coastal Wetland Elevation Monitoring Annual Report

Cape Romain NWR, Sites CRM002 and CRM008

The Coastal Wetland Elevation Monitoring Project (ServCat Link: <https://ecos.fws.gov/ServCat/Reference/Profile/34452>) is a network of monitoring sites designed to assess how wetland habitats in coastal National Wildlife Refuges are changing in response to sea level rise along the Atlantic and Gulf coasts. These changes can lead to wetland loss, habitat conversion, saltwater intrusion, and inland migration of marsh and forested ecosystems. Long-term monitoring of rod surface elevation tables (rSETs), marker horizon plots, and porewater salinity is needed to answer the following questions:

1. What is the overall rate of vertical accretion and elevation change?
2. Is the rate of elevation change less than or equal to local sea level rise?
3. Is the rate of elevation change the same as the rate of surface accretion?
4. Is the rate of accretion or elevation change the same across different Refuges?
5. Is the relationship between elevation change and surface accretion the same across different Refuges?

Data is being collected with common protocols and archived in a national database which will allow us to analyze changes at both the Refuge and regional scale. Ultimately the project will identify what different management options are available to enhance a wetland's sustainability in the face of sea level rise.

Cape Romain Monitoring

On May 3, 2010, two stations (CRM002 and CRM008, Figure 1) were established on Cape Romain NWR by Dr. Zoe Hughes as part of her dissertation research. Although these sites are not officially part of the CWEM network, they have collected data over a time period that coincides with the CWEM project and results from this study can be used to better understand coastal wetland change on NWRs in the SALCC.



Credit USFWS

Latitude, Longitude, and Elevation of stations on Cape Romain NWR, Horsehead Key

Name	Latitude	Longitude	Established	Elevation, m
CRM0002A	33.053917	-79.395300	5/3/2010	0.518
CRM0002B	33.053783	-79.390300	5/3/2010	0.553
CRM0002C	33.078600	-79.408600	5/3/2010	0.620

Latitude, Longitude, and Elevation of stations on Cape Romain NWR, Raccoon Key

Name	Latitude	Longitude	Established	Elevation, m
CRM008A	33.029450	-79.428700	5/3/2010	0.551
CRM008B	33.028750	-79.429500	5/3/2010	0.547

These sites could officially be added to the CWEM network, if the decision is made to start sampling the sites using CWEM protocols. Currently, data and reports from Zoe Hughes' project have been archived in the USFWS SET database and ServCat (<https://ecos.fws.gov/ServCat/Reference/Profile/97742>). At both Horsehead Key (CRM002) and Raccoon Key (CRM008), the vegetation surveys were conducted by USFWS

in 2016 and sites were classified to the *Sporobolus alterniflora* Carolinian Zone Herbaceous Vegetation association. These tidal marshes occur on regularly flooded low marshes with moderate salinity levels. There is typically very little species diversity within these sites, and often *Sporobolus alterniflora* occurs in nearly monospecific stands.

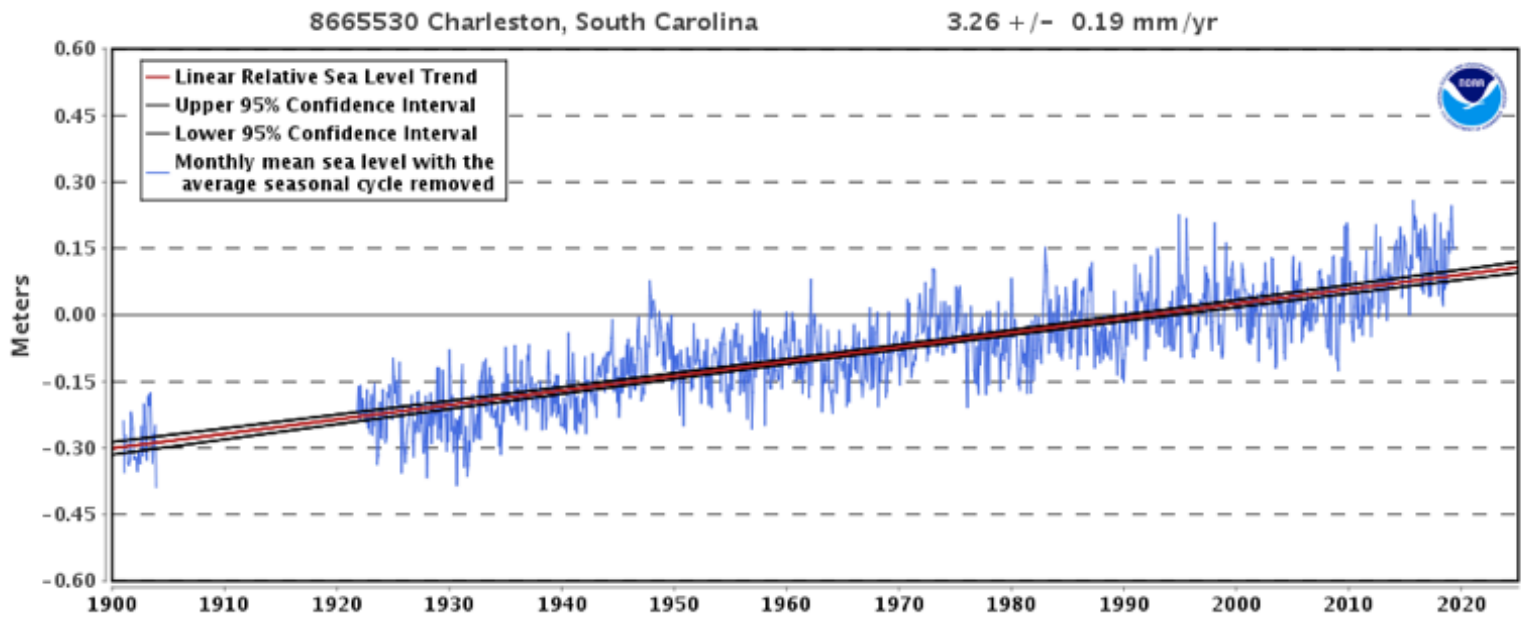
2010	1*			
2011	3*	2*		
2012	3*	1*		
2013	3*			
2014	1*			
2016	2*			1**

2010	1*			
2011	3*	2*		
2012	3*	1*		
2013	3*			
2014	1*			
2016	2*			1

*Sampled by Zoe Hughes, University of Houston

**Sampled by USFWS

+Missing a measurement for CRM002C



The closest NOAA water level station reporting a sea level rise trend to Cape Romain NWR is Station 866530, Charleston, Cooper River Entrance, SC. This station is ~ 36 miles from Site CRM008, and ~33 miles from CRM002. The relative sea level trend is increasing at 3.26 millimeters/year with a 95% confidence interval of +/- 0.19 mm/yr based on monthly mean sea level data from 1901 to 2018. This is equivalent to a change of 1.07 feet in 100 years. The plotted values are relative to the most recent Mean Sea Level datum.



Location of SET stations on Cape Romain NWR

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