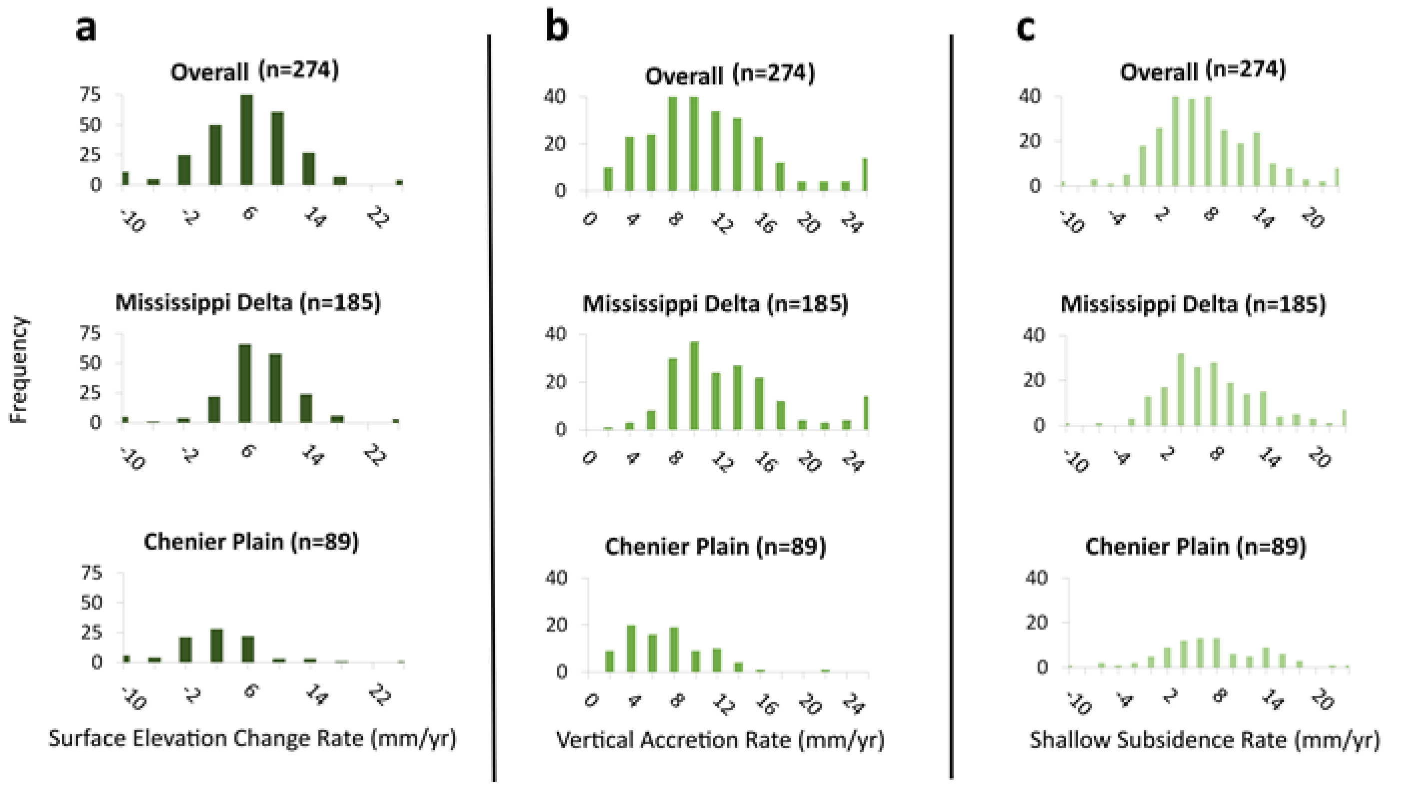
Supplementary Table 1. **Size of previously published rod-surface elevation table data sets.** The list below includes the number of rod-surface elevation tables (RSETs) used in 63 previously published studies. Our data set (n = 274) is an order of magnitude larger than the largest regionally contiguous RSET data set[20]. Supplementary Table 1 is an extension of previously published RSET data compilations[64,65].

Study/Reference #	**Number of RSETs**	**Location**
		United States
1	6	California
2	unspecified	California
3	8	California
4	2	Chesapeake Bay
5	179	East Coast (and parts of Europe)
6	16	Florida and the Carribbean
7	unspecified	Florida
8	unspecified	Florida
9	9	Florida
10	9	Florida
11	2	Louisiana
12	18	Louisiana
13	6	Louisiana
14	9	Louisiana
11	10	Louisiana
15	20	Louisiana
16	3	Louisiana
17	6	Maine
18	6	Maryland
19	12	Maryland
20	25	Maryland
21	14	Massachusetts, New Jersey, and Virginia
22	1	Mississippi Delta Region
23	12	Mississippi Delta Region
24	6	Mississippi Delta Region
25	4	Mississippi Delta Region
26	14	New Hampshire and Massachusetts
27	unspecified	New York
28	3	North Carolina
29	2	Oregon
30	3	South Carolina
31	4	Southern Region
32	22	Southern Region and Caribbean
33	15	Texas and Louisiana

34	12	Texas
35	10	Washington DC
36	unspecified	Washington
		Oceania
37	69	Australia
38	9	Australia
39	9	Australia
40	24	Australia
41	12	Australia
42	12	Australia (Brisbane)
43	6	Australia (Minnamurra River)
44	9	Australia (Queensland)
45	18	Micronesia
46	12	New Zealand
47	153	Indo-Pacific Region
		North and Central America
48	16	Canada (Bay of Fundy)
49	3	Canada (Bay of Fundy)
50	5	Canada (Bay of Fundy)
51	9	Belize
52	18	Honduras
		Europe
53	2	France (Rhone Delta)
54	20	Italy (Venice Lagoon)
55	10	Italy (Venice Lagoon)
56	4	Italy (Venice Lagoon)
57	6	Spain (Ebro Delta)
58	4	Spain (Ebro Delta)
59	55	Spain, France, Italy
60	13	The Netherlands
61	10	United Kingdom
62	8	United Kingdom
63	11	United Kingdom

Supplementary Table 2. **Rates of surface-elevation change, vertical accretion, and shallow subsidence by wetland type.**

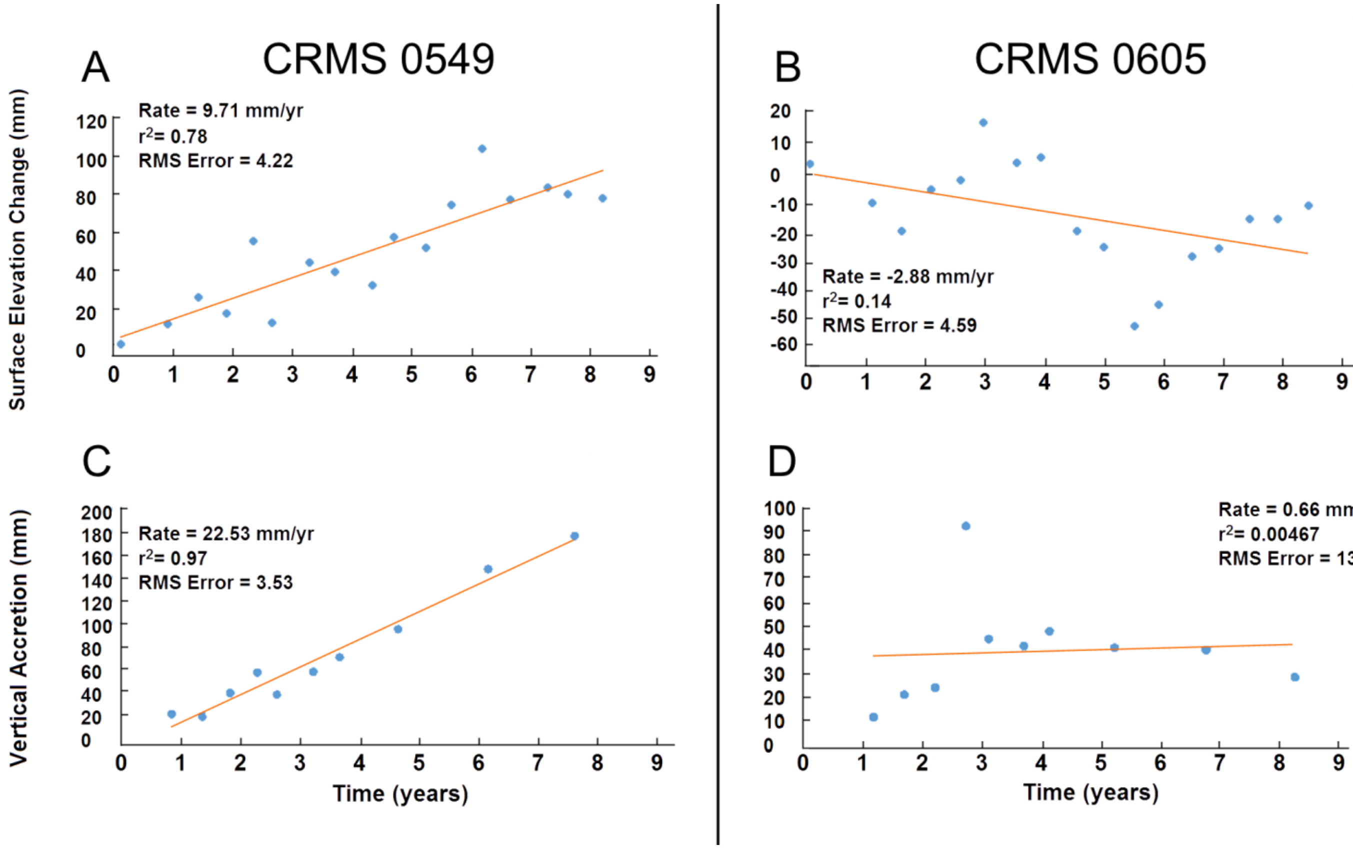
	Surface-elevation change rate (mm/yr)			**Vertical accretion rate (mm/yr)**			**Shallow subsidence rate (mm/yr)**				
	Mean	**Median**	**s.d.**	**Mean**	**Median**	**s.d.**	**Mean**	**Median**	**s.d.**	**n**	**% of Total**
Total	3.8	4.1	7.4	10.7	9.5	7.8	6.9	6.0	7.9	274	100%
Fresh marsh	4.4	4.7	10.7	12.2	10.3	7.6	7.8	8.7	10.7	31	11%
Intermediate marsh	2.5	2.0	7.5	9.9	9.5	6.3	7.4	7.1	5.8	83	30%
Brackish marsh	3.0	3.5	5.4	8.7	8.6	4.5	5.7	5.3	4.8	74	27%
Saline marsh	6.3	7.7	8.4	13.6	10.0	12.5	7.3	3.4	12.3	57	21%
Swamp	4.1	3.9	3.4	10.5	9.5	4.7	6.4	6.1	4.9	29	11%
Mississippi Delta	5.7	5.8	7.2	12.8	11.3	8.4	7.1	6.0	8.7	185	100%
Fresh marsh	8.1	7.0	10.5	14.8	15.0	7.8	6.7	8.7	12.7	19	10%
Intermediate marsh	5.4	5.1	7.2	13.7	12.7	6.2	8.2	8.0	4.8	42	23%
Brackish marsh	4.6	4.4	4.8	10.6	10.3	4.1	5.9	5.5	4.3	45	24%
Saline marsh	6.9	8.1	8.8	14.5	11.6	13.0	7.6	3.4	13.0	50	27%
Swamp	4.1	3.9	3.4	10.5	9.5	4.7	6.4	6.1	4.9	29	16%
Chenier Plain	-0.2	-0.5	6.3	6.3	5.9	3.7	6.5	5.8	6.3	89	100%
Fresh marsh	-1.6	-3.0	8.4	8.0	7.5	5.0	9.6	9.8	6.7	12	13%
Intermediate marsh	-0.6	-1.0	6.7	6.0	6.0	3.6	6.6	6.2	6.7	41	46%
Brackish marsh	0.5	1.5	5.4	5.8	4.5	11.6	5.3	5.1	5.6	29	29%
Saline marsh	1.7	1.3	2.8	7.0	6.3	3.5	5.3	3.7	4.1	7	8%
Swamp	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0%



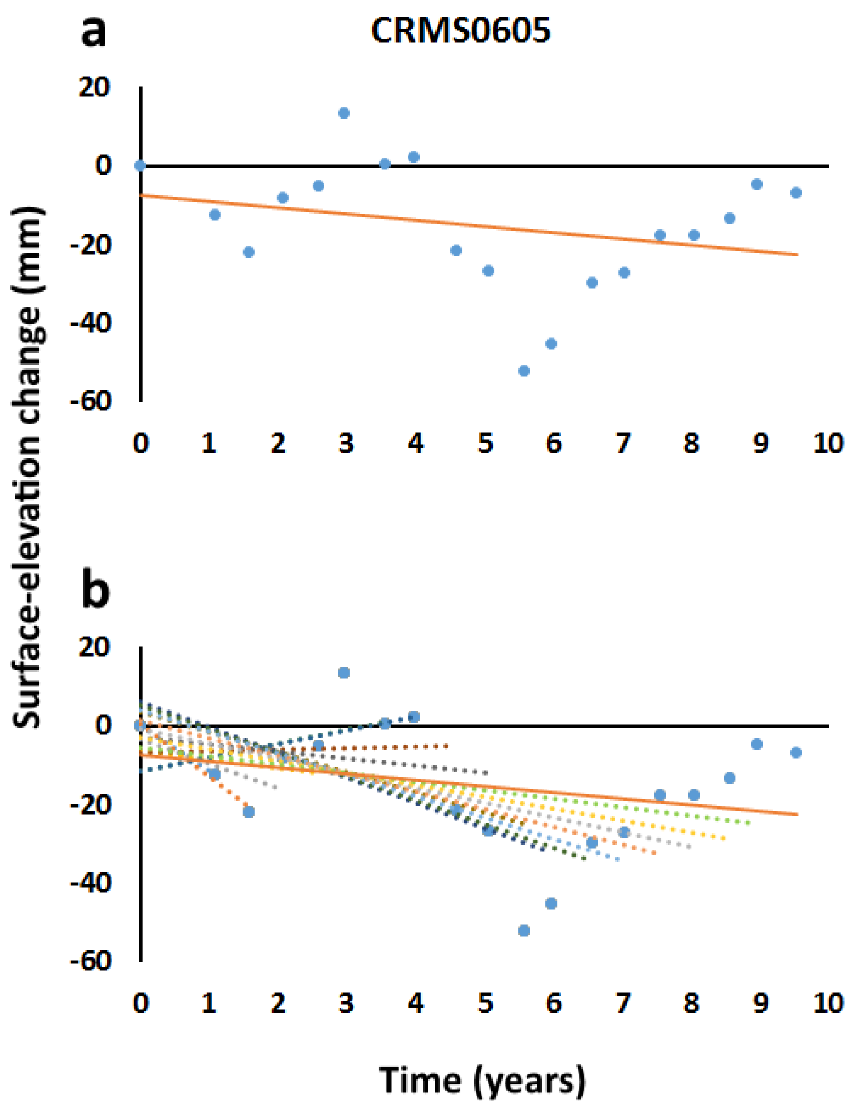
Supplementary Figure 1. **Frequency histograms with rates of (a) surface-elevation change, (b) vertical accretion, and (c) shallow subsidence.**

Supplementary Table 3. **GPS-measured and predicted deep subsidence rates in the Mississippi Delta.** Vertical velocity data were obtained from 13 GPS stations (data from Karegar et al., 2015) within the Mississippi Delta that were used to create a linear model (Fig. 4) of deep subsidence rates. Predicted vertical velocity is obtained by solving this linear equation as a function of latitude. Only GPS sites within the Mississippi Delta with ≥5 years of observation were included.

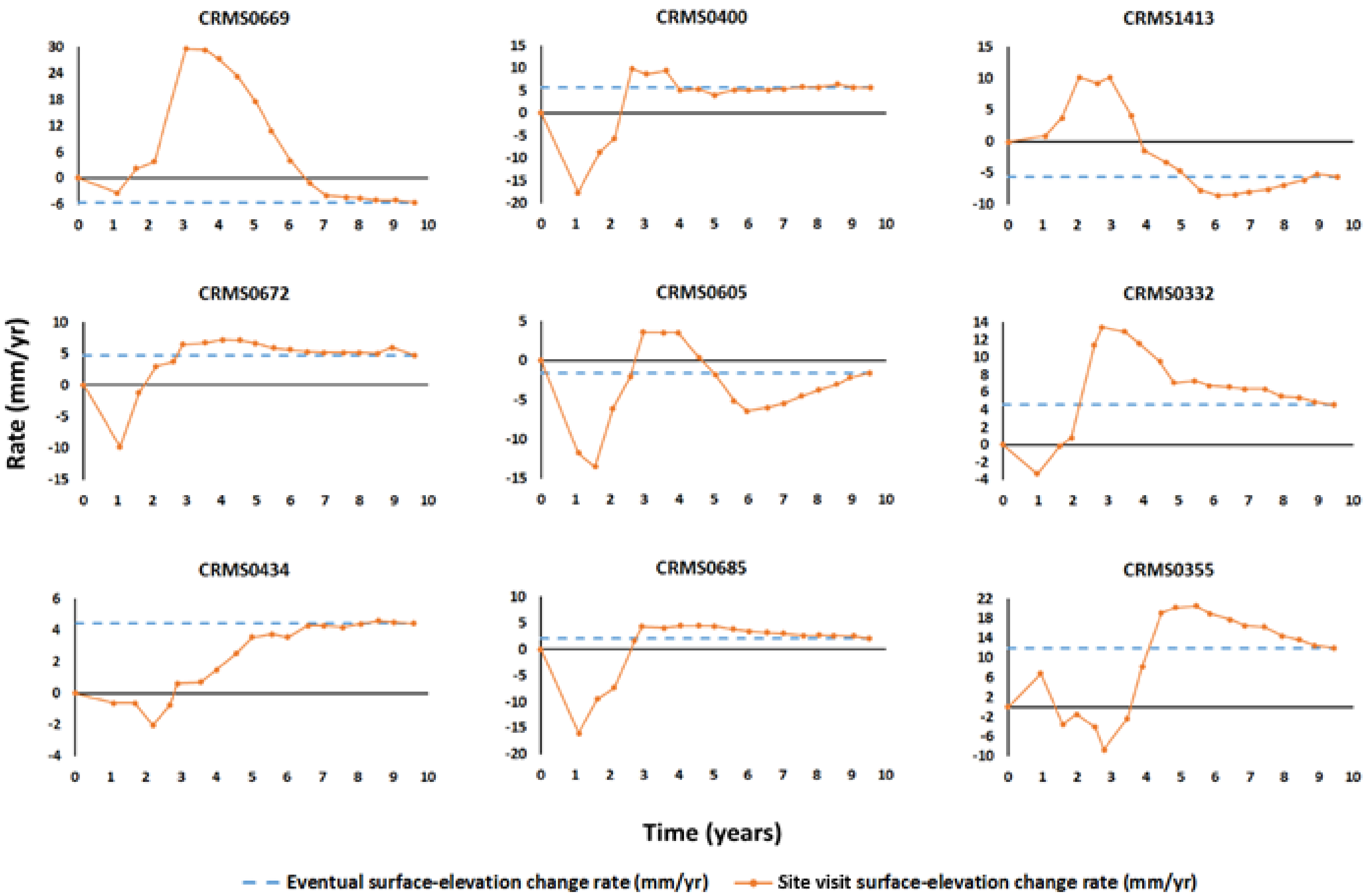
GPS Station	Latitude	Longitude	Length of observation (yr)	GPS foundation depth (m)	GPS measured vertical velocity (mm/yr)	Predicted vertical velocity (mm/yr)	Difference between GPS-measured vs predicted vertical velocity (mm/yr)
BVHS	-89.41	29.34	11.93	>20	-5.7	-5.27	0.43
COVG	-90.10	30.48	10.02	>15	-0.8	-1.04	-0.24
DSTR	-90.38	29.96	8.38	unknown	-2.0	-2.97	-0.97
ENG1	-89.94	29.8	18.54	~3	-2.3	-3.26	-0.96
GRIS	-89.96	29.27	8.89	unknown	-5.6	-5.53	0.07
HAMM	-90.47	30.51	13.45	>15	-1.0	-0.92	0.08
HOUM	-90.72	29.59	10.67	>15	-3.9	-4.34	-0.44
LMCN	-90.66	29.25	11.26	36.5	-6.5	-5.61	0.89
LWES	-90.35	29.90	6.67	unknown	-2.7	-3.19	-0.49
MSSC	-89.61	30.38	9.23	unknown	-1.5	-1.41	0.09
NDBC	-89.61	30.36	13.18	unknown	-1.3	-1.48	-0.18
SJB1	-91.11	30.40	5.36	unknown	-1.5	-1.33	0.17
1LSU	-91.18	30.41	11.21	<15	-2.9	-1.30	1.60



Supplementary Figure 2. **Methodology to determine rates of surface-elevation change and vertical accretion.** Following each site visit, individual measurements are averaged and plotted vs. time. A linear regression is carried out to determine the rate of surface-elevation change (a, c) and vertical accretion (b, d). For both SEC and VA records, mean site visit (i.e., static) measurements are indicated by the blue dots and the orange line indicates a linear regression analysis of the record which yields the eventual (i.e., long-term) SEC or VA rate. Short-term perturbations in the accretion history at individual CRMS sites contribute to within-site variability. It is important to note that due to the MH methodology, individual events that deviate from the overall trend of accretion at a CRMS site are necessarily time-averaged between site visits, and so the relative importance of individual events is dependent on the frequency of sampling.



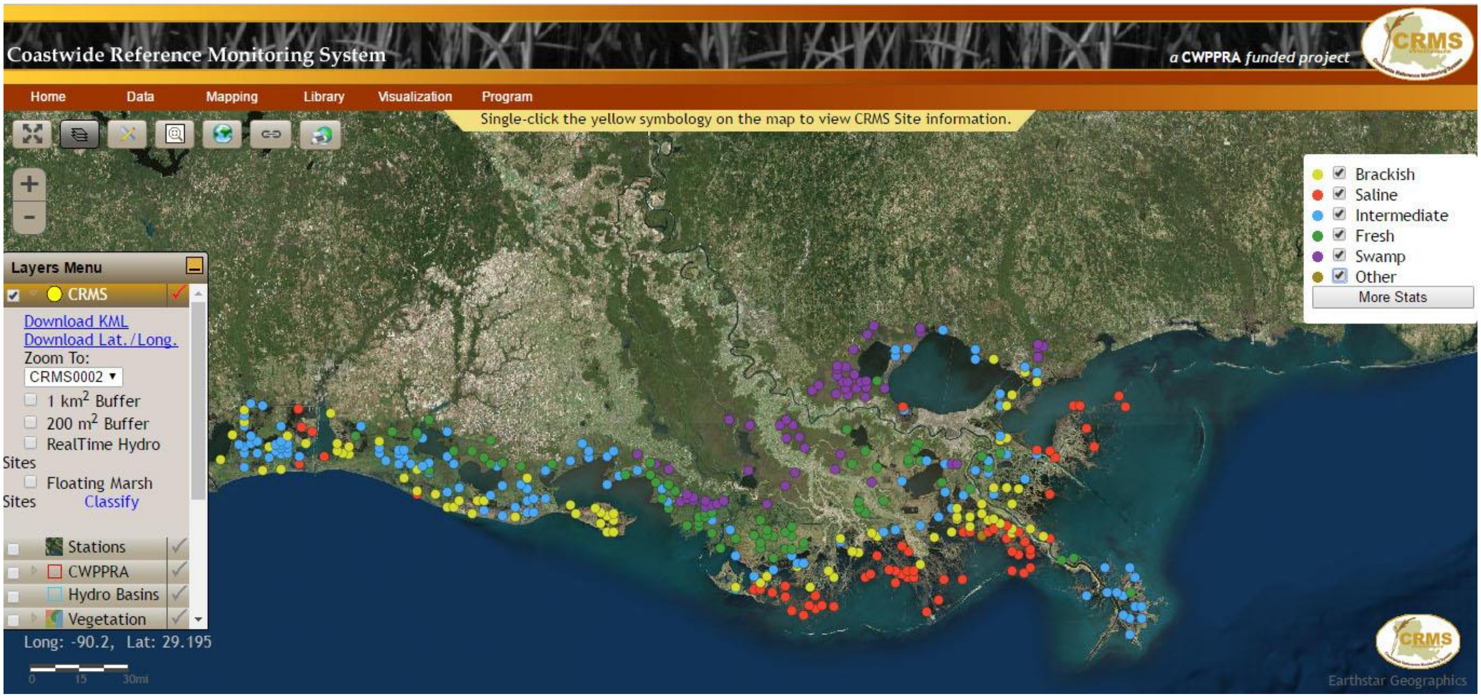
Supplementary Figure 3. **Comparison of eventual and site visit surface-elevation change linear regression analyses for site 0605.** The step-wise establishment of CRMS sites has resulted in variable durations of observation among sites. We determined the eventual (i.e., long-term) surface-elevation change rate for site 0605 with blue dots indicating site visit surface elevation measurements and the solid orange line indicating the linear regression (i.e., the eventual SEC rate) for this record (a), i.e., similar to Supplementary Fig. 2c. We then determined linear regressions for site visit SEC rates at each time step (i.e., approximately every six months through the duration of observation) with each of the dotted lines representing a site visit SEC rate of different length and the solid orange line representing the eventual SEC rate (b). Short-term site visit SEC rates (≤4 years of observation) produce highly variable campaign SEC rates that may deviate significantly from the eventual SEC rate. Longer-term site visit SEC rates (≥5 years of observation) approximate the eventual SEC rate.



Supplementary Figure 4. **Comparison of eventual and site visit surface-elevation change for the 9 longest records.** The difference between each site visit SEC rate (orange line) and the eventual SEC rate (dashed blue line) is plotted for the 9 sites with the longest duration of observation. The difference at each time step is tracked over the full duration of observation for each of the 9 selected sites. We find that in most cases, the difference between the site visit SEC rate and the eventual SEC rate approaches its minimum after 5 years of observation (and sometimes earlier). All sites included in this analyses have been monitored for 6 years or more. It is important to note that this analysis fundamentally assumes that SEC rates at a given site approach a "true" value over time and that these rates are appropriately represented by a linear relationship as time progresses. While this is not necessarily correct, it constitutes a more stringent assessment of required length of observation record than what has commonly been used[47].

Supplementary Table 4. **Effect of removing noisy surface-elevation change and vertical accretion records.** Descriptive statistics for rates of surface-elevation change and vertical accretion and for the Mississippi Delta and Chenier Plain sub-regions were calculated using the full data set as well as a smaller, reduced error data set. We compare the descriptive statistics of these two data sets to evaluate the effect that noisy data may have on the results. In the reduced error data set, sites with a root mean squared (RMS) error in the 90th percentile (i.e., the noisiest records) for surface-elevation change and/or vertical accretion were removed. Removal of high RMS error records generally removed exceptionally low minimum and/or high maximum values and lowered the standard deviation.

	Full data set n=274	**Reduced error data set n=227**	**Full data set n=274**	**Reduced error data set n=227**
Overall				
	Surface-elevation change rate (mm/yr)		*Vertical accretion rate (mm/yr)*	
Mean	3.8	3.7	10.7	10.5
Median	4.1	4.1	9.5	9.5
Standard deviation	7.4	6.0	7.8	7.8
Minimum	-41.0	-18.0	0.2	0.9
Maximum	46.0	31.9	83.7	83.7
Mississippi Delta				
	Surface-elevation change rate (mm/yr)		*Vertical accretion rate (mm/yr)*	
Mean	5.7	5.6	12.8	12.6
Median	5.8	5.8	11.3	11.2
Standard deviation	7.2	5.1	8.4	8.5
Minimum	-41.0	-18.9	1.6	2.0
Maximum	46.0	31.9	83.7	83.7
Chenier Plain				
	Surface-elevation change rate (mm/yr)		*Vertical accretion rate (mm/yr)*	
Mean	-0.2	-0.9	6.3	6.1
Median	-0.5	-0.6	5.9	5.5
Standard deviation	6.3	5.1	3.7	3.4
Minimum	-17.3	-17.3	0.2	0.9
Maximum	22.5	12.2	20.6	14.7



Supplementary Figure 5. **Distribution of wetland types in coastal Louisiana.** Data are taken from the Coastwide Reference Monitoring System[66] and wetland types are based upon an established classification system[67]. Here all 391 CRMS sites (including the 274 sites used in this study) are represented.

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