

Figure 2: Time series of total precipitation, salinity, pH, and phosphate for Bangs Lake, Grand Bay reserve. All observations are daily averages, excluding phosphate which was sampled monthly. Vertical green bars indicate a heavy rain event in April 2005 and hurricane Isaac in August 2012. Salinity and pH include a loess smooth to reduce variability. Orthophosphate is colored by event categories in relation to the vertical green bars. E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, E2C: event 2 chronic.

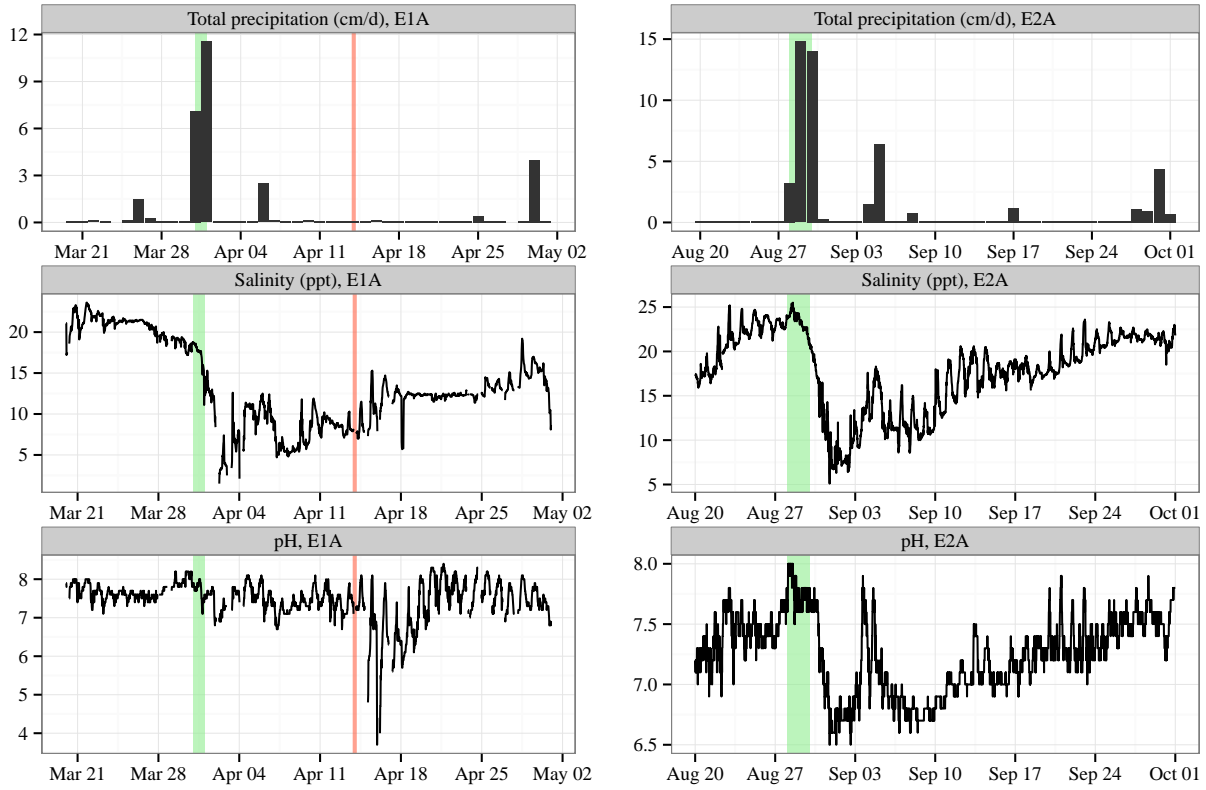


Figure 3: Time series of daily precipitation, salinity, and pH for Bangs Lake, Grand Bay reserve. Precipitation data represents daily totals from the Pascagoula International Airport. Salinity and pH data were collected at 15 minute time steps. Green shading indicates period of high precipitation for a heavy rain event in 2005 (left, March 31st to April 1st) and hurricane Isaac in 2012 (right, August 28th to 30th). Red shading for the first event indicates the date of documented phosphorus spill. E1A: event 1 acute, E2A: event 2 acute.

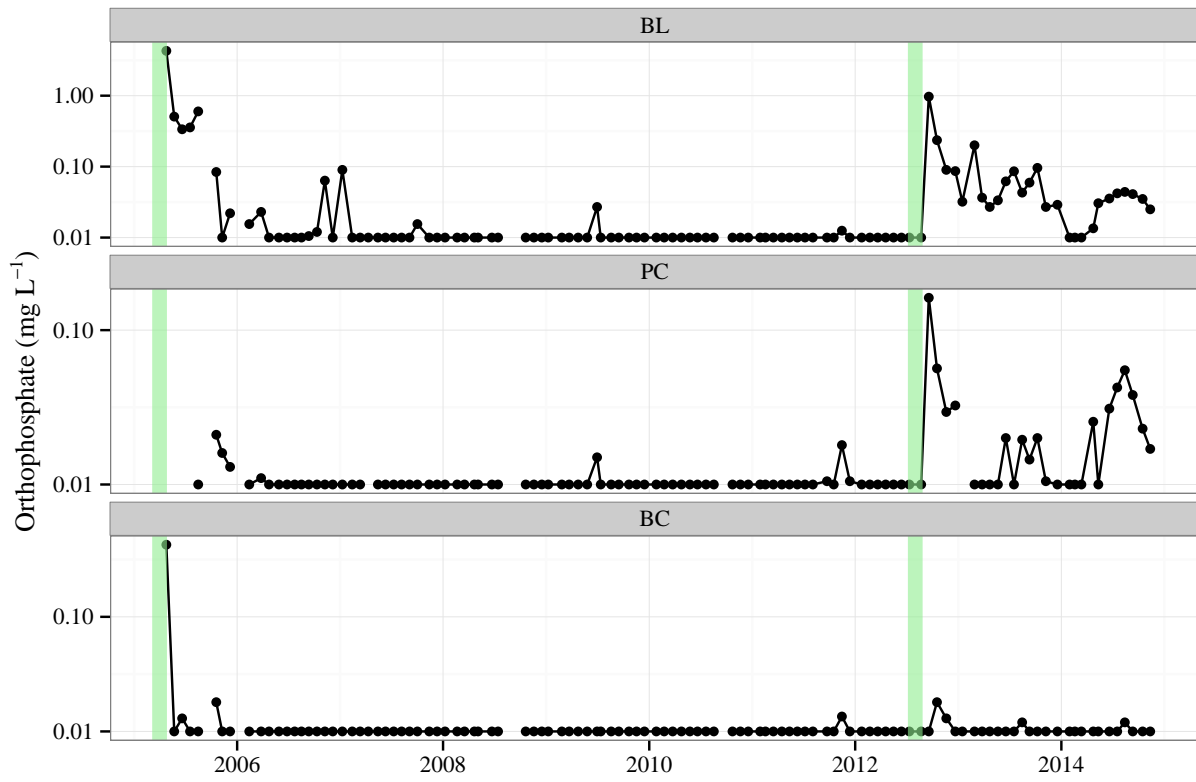


Figure 4: Monthly phosphate time series at Bangs Lake (BL), Point aux Chenes (PC), and Bayou Cumbest (BC) sites at Grand Bay. Vertical green bars indicate a heavy rain event in April 2005 and hurricane Isaac in August 2012.

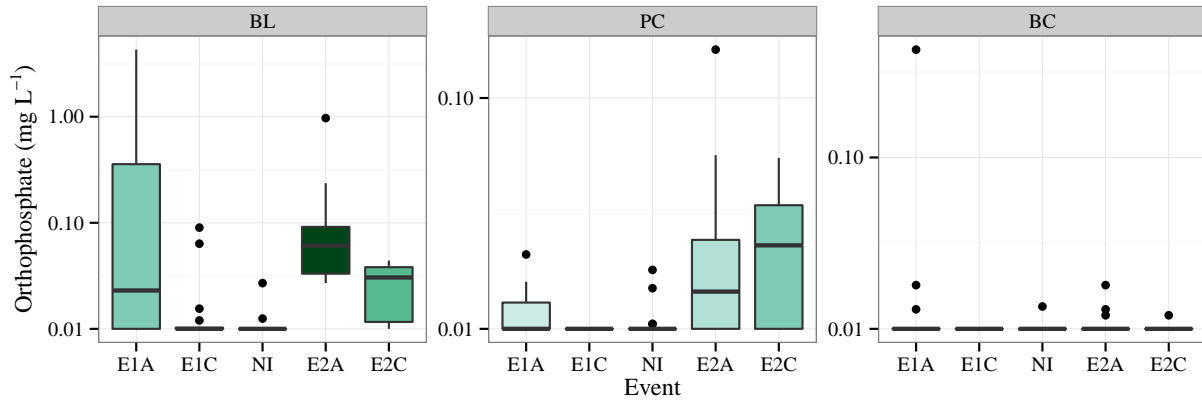


Figure 5: Boxplot summaries by event of monthly orthophosphate data at Bangs Lake (BL), and Point aux Chenes (PC), and Bayou Cumbest (BC) sites in Grand Bay. Boxes represent the interquartile range (IQR, 25th to 75th percentile) with the median as the middle horizontal line. Outliers are present beyond whiskers (1.5·IQR). Boxes are shaded by medians between sites. See table 2 for a numerical summary. E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, E2C: event 2 chronic.

Wisconsin double standardization Run 0 stress 0.1036975 Run 1 stress 0.1216213 Run 2 stress 0.1216212 Run 3 stress 0.1138584 Run 4 stress 0.1036975 ... New best solution ...
 procrustes: rmse 1.19793e-05 max resid 2.55159e-05 *** Solution reached

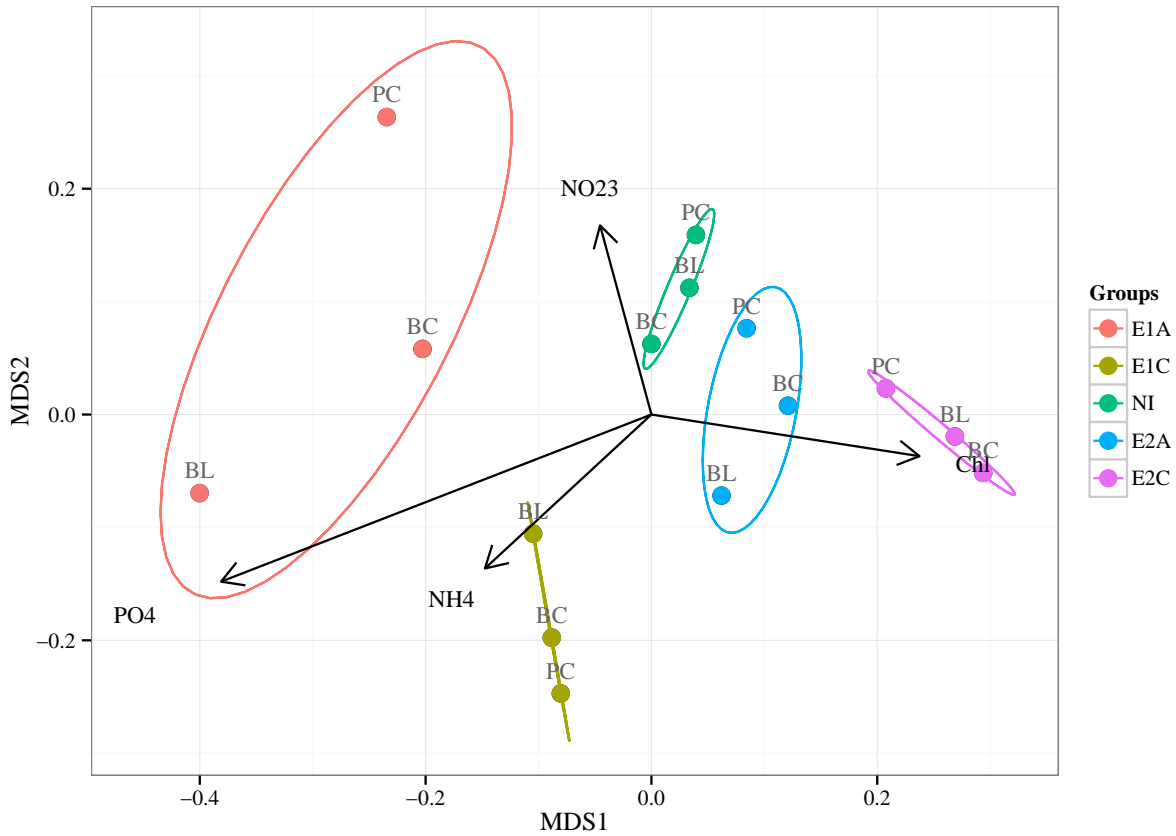


Figure 6: Ordination biplot of nutrient values by site and time frames. Monthly data were averaged by site and time frame prior to ordination. Site are Bangs Lake (BL), Point aux Chenes (PC), and Bayou Cumbest (BC). E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, E2C: event 2 chronic.

Table 2: Summaries by site and event of monthly orthophosphate data at Bayou Cumbest (BC), Bangs Lake (BL), and Point aux Chenes (PC) in Grand Bay. Values are within-group summaries of sample size, median, and ranges for orthophosphate by station and time frame. Result letters indicate time frames within each station that were not significantly different based on multiple comparisons with Mann-Whitney rank sum tests, with the alpha-level of each test corrected for the total number of comparisons at each site. Timeframes are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, E2C: event 2 chronic.

Site	Result	n	Median	Min	Max
BL					
E1A	a	13	0.02	0.01	4.29
E1C	bc	19	0.01	0.01	0.09
NI	b	52	0.01	0.01	0.03
E2A	a	16	0.06	0.03	0.97
E2C	ac	11	0.03	0.01	0.04
PC					
E1A	a	9	0.01	0.01	0.02
E1C	b	18	0.01	0.01	0.01
NI	b	52	0.01	0.01	0.02
E2A	a	15	0.01	0.01	0.16
E2C	a	11	0.02	0.01	0.06
BC					
E1A	a	13	0.01	0.01	0.43
E1C	ab	19	0.01	0.01	0.01
NI	b	52	0.01	0.01	0.01
E2A	ab	16	0.01	0.01	0.02
E2C	ab	11	0.01	0.01	0.01

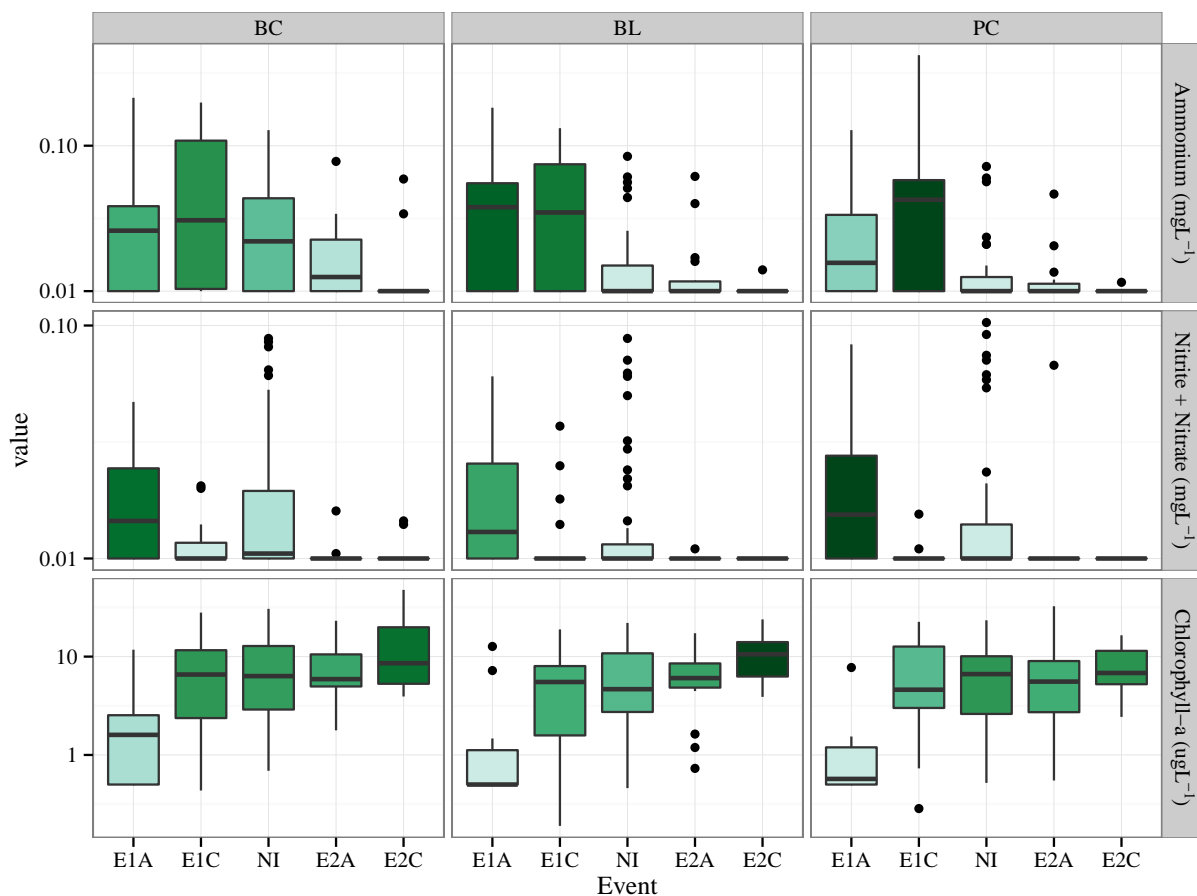


Figure S1: Boxplot summaries by event of nutrient data at Bayou Cumbest (BC), Bangs Lake (BL), and Point aux Chenes (PC) sites at Grand Bay. Boxes represent the interquartile range (IQR, 25th to 75th percentile) with the median as the middle horizontal line. Boxes are colored by relative median nutrients between sites. Outliers are present beyond whiskers (1.5·IQR). See tables S1 to S3 for numerical summaries. E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, E2C: event 2 chronic.

Table S1: Summaries by site and event of monthly ammonium data at Bayou Cumbest (BC), Bangs Lake (BL), and Point aux Chenes (PC) in Grand Bay. Values are within-group summaries of mean, standard deviation, sample size, and range for ammonium by station and time frame. Result letters indicate time frames within each station that were not significantly different based on Tukey multiple comparison analyses ($\alpha = 0.05$, corrected to reduce Type I error rates). Timeframes are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, E2C: event 2 chronic.

Site	Result	Mean	St. Dev.	n	Min	Max
BL						
E1A	a	0.03	2.72	12	0.01	0.18
E1C	a	0.03	2.64	18	0.01	0.13
NI	b	0.01	1.74	49	0.01	0.08
E2A	b	0.01	1.74	16	0.01	0.06
E2C	b	0.01	1.11	11	0.01	0.01
PC						
E1A	ab	0.02	2.52	8	0.01	0.13
E1C	a	0.04	3.06	17	0.01	0.42
NI	b	0.01	1.59	49	0.01	0.07
E2A	b	0.01	1.50	16	0.01	0.05
E2C	b	0.01	1.04	11	0.01	0.01
BC						
E1A	ab	0.03	2.63	12	0.01	0.21
E1C	a	0.04	3.13	18	0.01	0.20
NI	ab	0.02	2.15	49	0.01	0.13
E2A	b	0.02	1.79	16	0.01	0.08
E2C	b	0.01	1.86	11	0.01	0.06

Table S2: Summaries by site and event of monthly total nitrogen (nitrate, nitrite) data at Bayou Cumbest (BC), Bangs Lake (BL), and Point aux Chenes (PC) in Grand Bay. Values are within-group summaries of mean, standard deviation, sample size, and range for total nitrogen by station and time frame. Result letters indicate time frames within each station that were not significantly different based on Tukey multiple comparison analyses ($\alpha = 0.05$, corrected to reduce Type I error rates). Timeframes are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, E2C: event 2 chronic.

Site	Result	Mean	St. Dev.	n	Min	Max
BL						
E1A	a	0.02	1.86	14	0.01	0.06
E1C	ab	0.01	1.45	19	0.01	0.04
NI	ab	0.01	1.80	53	0.01	0.09
E2A	b	0.01	1.02	15	0.01	0.01
E2C	b	0.01	1.00	11	0.01	0.01
PC						
E1A	a	0.02	2.31	10	0.01	0.08
E1C	b	0.01	1.11	18	0.01	0.02
NI	ab	0.01	1.95	53	0.01	0.10
E2A	ab	0.01	1.64	15	0.01	0.07
E2C	b	0.01	1.00	11	0.01	0.01
BC						
E1A	a	0.02	1.79	14	0.01	0.05
E1C	ab	0.01	1.26	19	0.01	0.02
NI	a	0.02	1.94	53	0.01	0.09
E2A	ab	0.01	1.12	16	0.01	0.02
E2C	ab	0.01	1.15	11	0.01	0.01

Table S3: Summaries by site and event of monthly chlorophyll data at Bayou Cumbest (BC), Bangs Lake (BL), and Point aux Chenes (PC) in Grand Bay. Values are within-group summaries of mean, standard deviation, sample size, and range for chlorophyll by station and time frame. Result letters indicate time frames within each station that were not significantly different based on Tukey multiple comparison analyses ($\alpha = 0.05$, corrected to reduce Type I error rates). Timeframes are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, E2C: event 2 chronic.

Site	Result	Mean	St. Dev.	n	Min	Max
BL						
E1A	b	0.94	2.87	14	0.50	12.68
E1C	a	3.39	3.61	18	0.19	18.89
NI	a	4.60	2.58	54	0.46	21.99
E2A	a	5.35	2.39	16	0.73	17.28
E2C	a	9.44	1.84	11	3.90	23.89
PC						
E1A	b	0.87	2.41	10	0.50	7.74
E1C	a	4.85	3.26	17	0.29	22.56
NI	a	4.73	2.66	54	0.52	23.39
E2A	a	4.88	2.66	16	0.55	32.52
E2C	a	7.48	1.79	11	2.44	16.46
BC						
E1A	b	1.52	3.02	13	0.50	11.75
E1C	a	4.64	3.55	18	0.44	28.02
NI	a	5.58	2.78	54	0.69	30.59
E2A	a	6.29	2.15	16	1.78	23.12
E2C	a	10.49	2.34	11	3.93	47.67