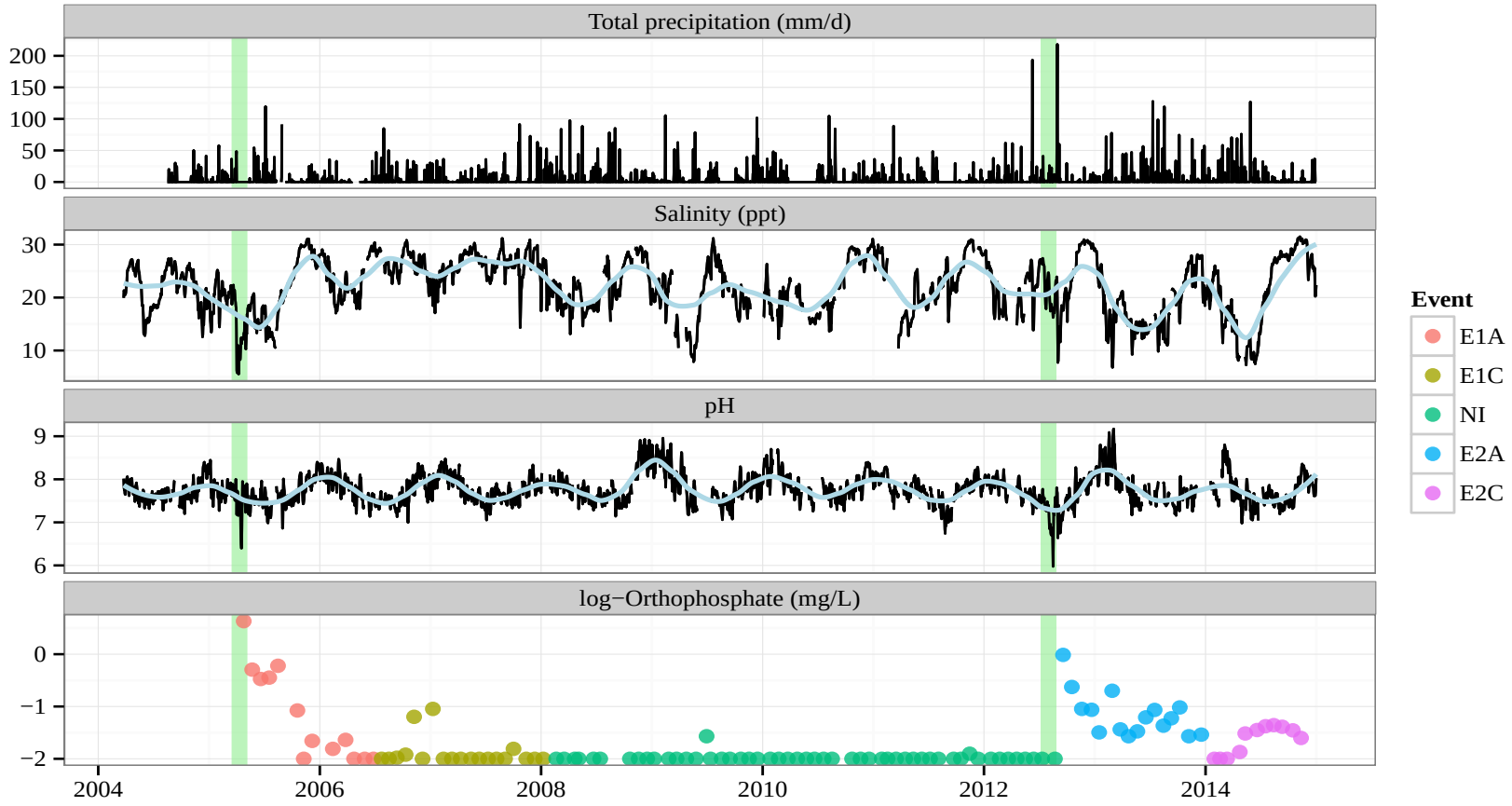

Figure 2: Time series of total precipitation, salinity, pH, and phosphate for Bangs Lake, Grand Bay reserve. All observations are daily averages, excluding phosphate which was sampled monthly. Vertical green bars indicate a heavy rain event in April 2005 and hurricane Isaac in August 2012. Salinity and 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.

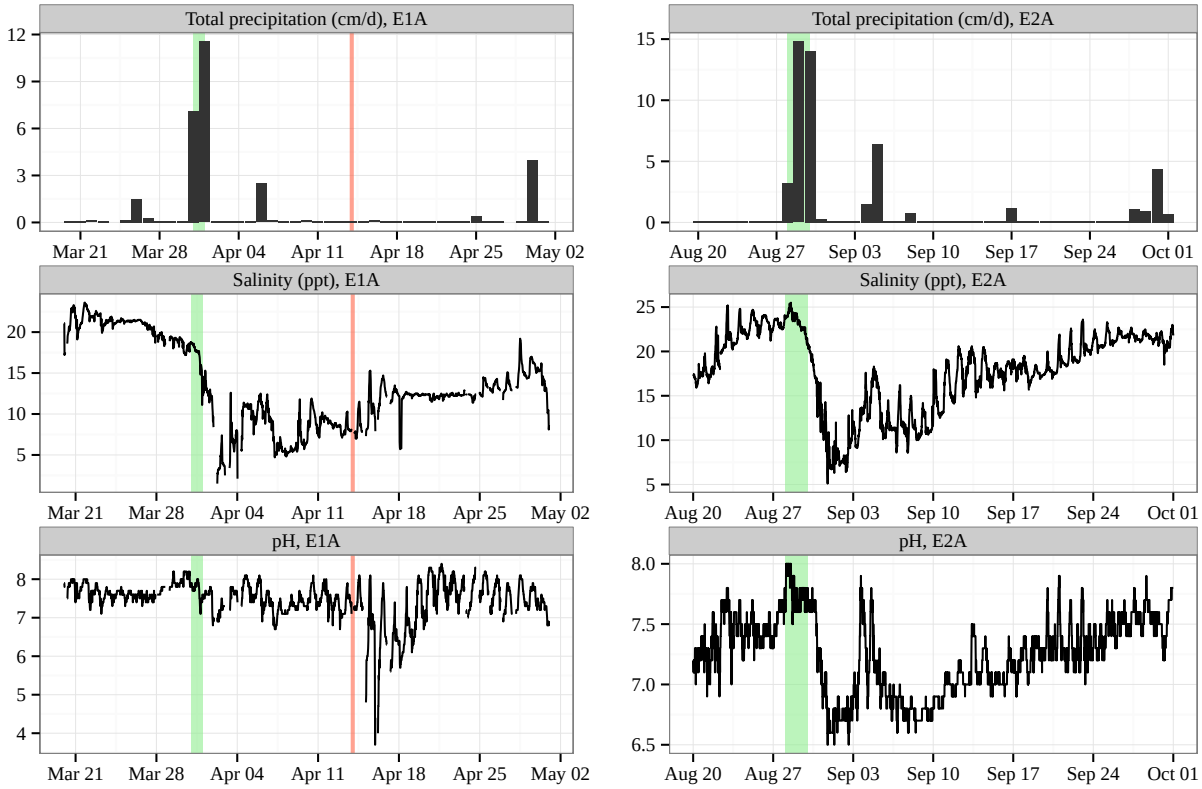

Figure 3: Time series of daily precipitation, salinity, and pH for Bangs Lake, Grand Bay reserve. Precipitation data represents daily totals from the Pascagoula International Airport. Salinity and pH data were collected at 15 minute time steps. Green shading indicates period of high precipitation for 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.

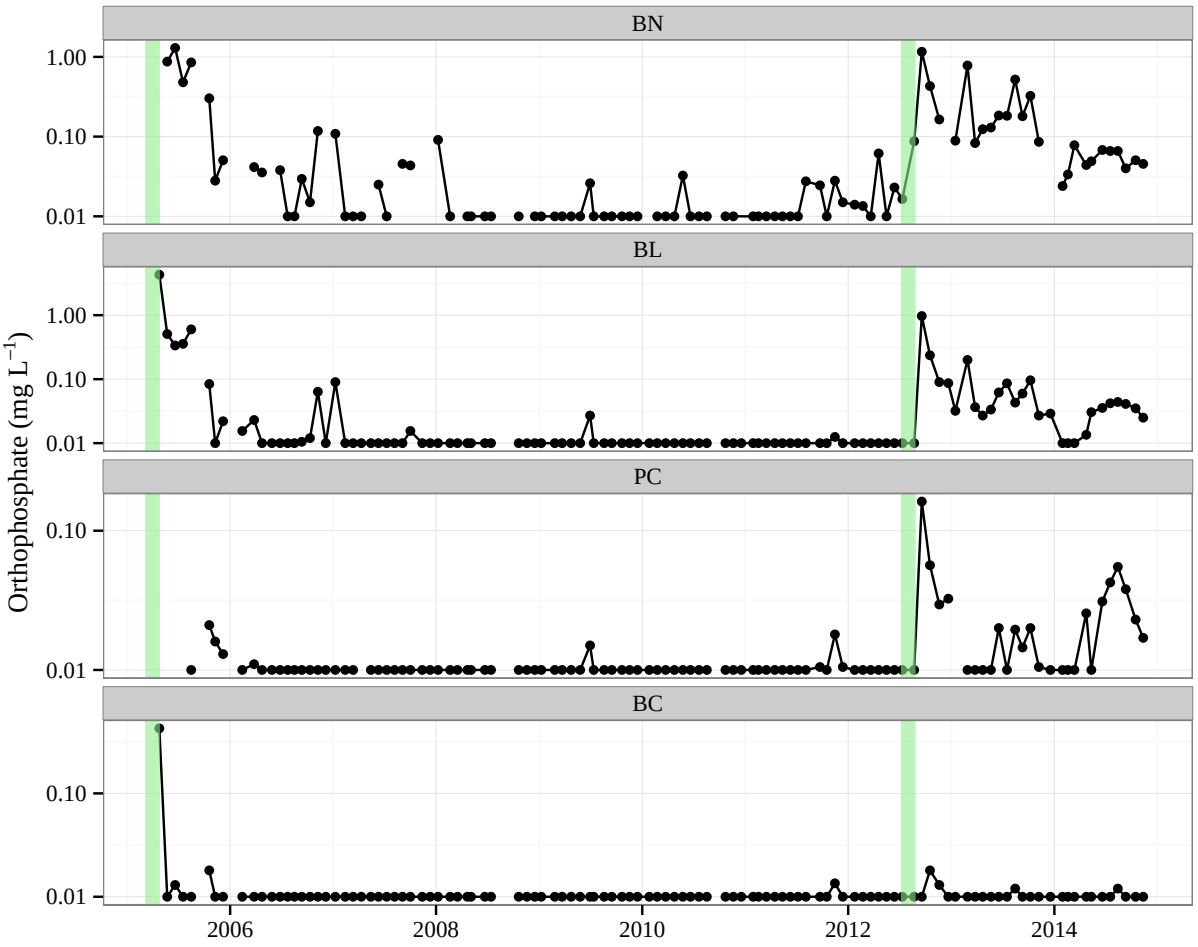

Figure 4: Monthly phosphate time series at Bangs North (BN), Bangs Lake (BL), Point aux Chenes (PC), and Bayou Cumbest (BC) sites at Grand Bay. Vertical green bars indicate a heavy rain event in April 2005 and hurricane Isaac in August 2012.

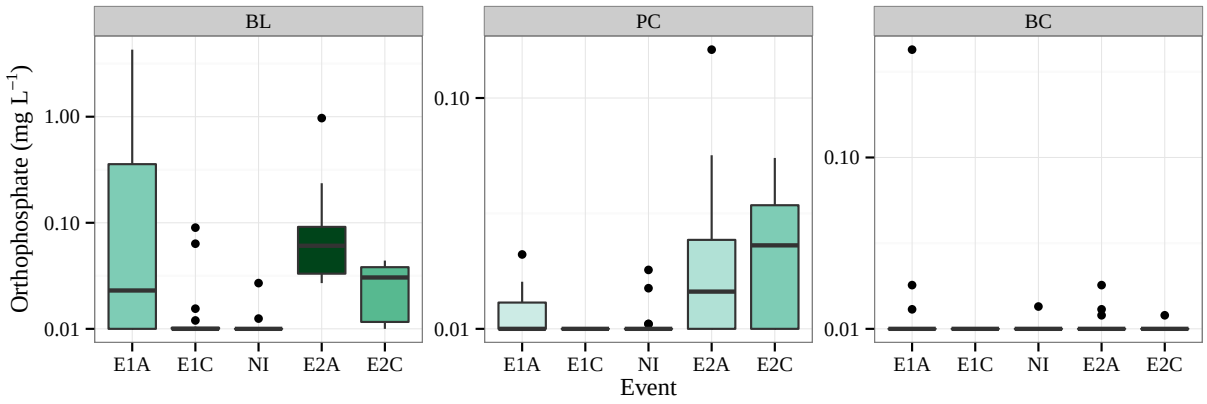

Figure 5: Boxplot summaries by event of monthly orthophosphate data at Bangs Lake (BL), and Point aux Chenes (PC), and Bayou Cumbest (BC) sites in Grand Bay. Boxes represent the interquartile range (IQR, 25$^{\text{th}}$ to 75$^{\text{th}}$ percentile) with the median as the middle horizonal line. Outliers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

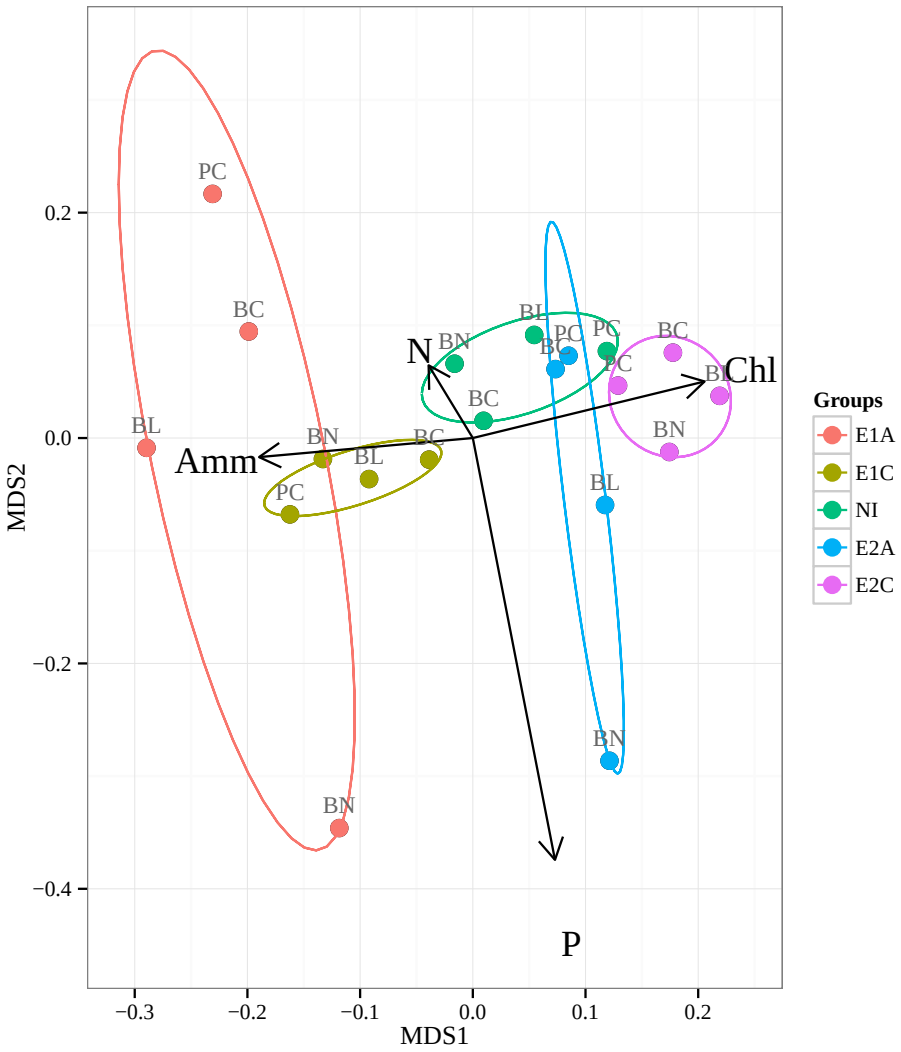

Figure 6: Ordination biplot of nutrient values (phosphorus, nitrogen, ammonium, and chlorophyll) by site and time frames. Monthly data were averaged by site and time frame prior to ordination. Site are Bangs Lake (BL), Point aux Chenes (PC), and Bayou Cumbest (BC). E1A: event 1 acute, E1C: event 1 chronic,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

Table 2: Within site comparisons of monthly orthophosphate data for each time frame at 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. P-values were adjusted using the sequential Bonferroni method to reduce the probability of Type I errors. Sites are BC: Bayou Cumbest, BL: Bangs Lake, and PC: Point aux Chenes. Time frames are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, and E2C: event 2 chronic.

Site	Result	n	Median	Min	Max
BL					
E1A	ab	13	0.02	0.01	4.29
E1C	c	19	0.01	0.01	0.09
NI	d	52	0.01	0.01	0.03
E2A	a	16	0.06	0.03	0.97
E2C	b	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

Table 3: Within time frame comparisons of monthly orthophosphate data at Grand Bay. Values are within-group summaries of sample size, median, and ranges for orthophosphate by time frame and station. Result letters indicate stations within each time frame that were not significantly different based on multiple comparisons with Mann-Whitney rank sum tests. P-values were adjusted using the sequential Bonferroni method to reduce the probability of Type I errors. Sites are BC: Bayou Cumbest, BL: Bangs Lake, and PC: Point aux Chenes. Time frames are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, and E2C: event 2 chronic.

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

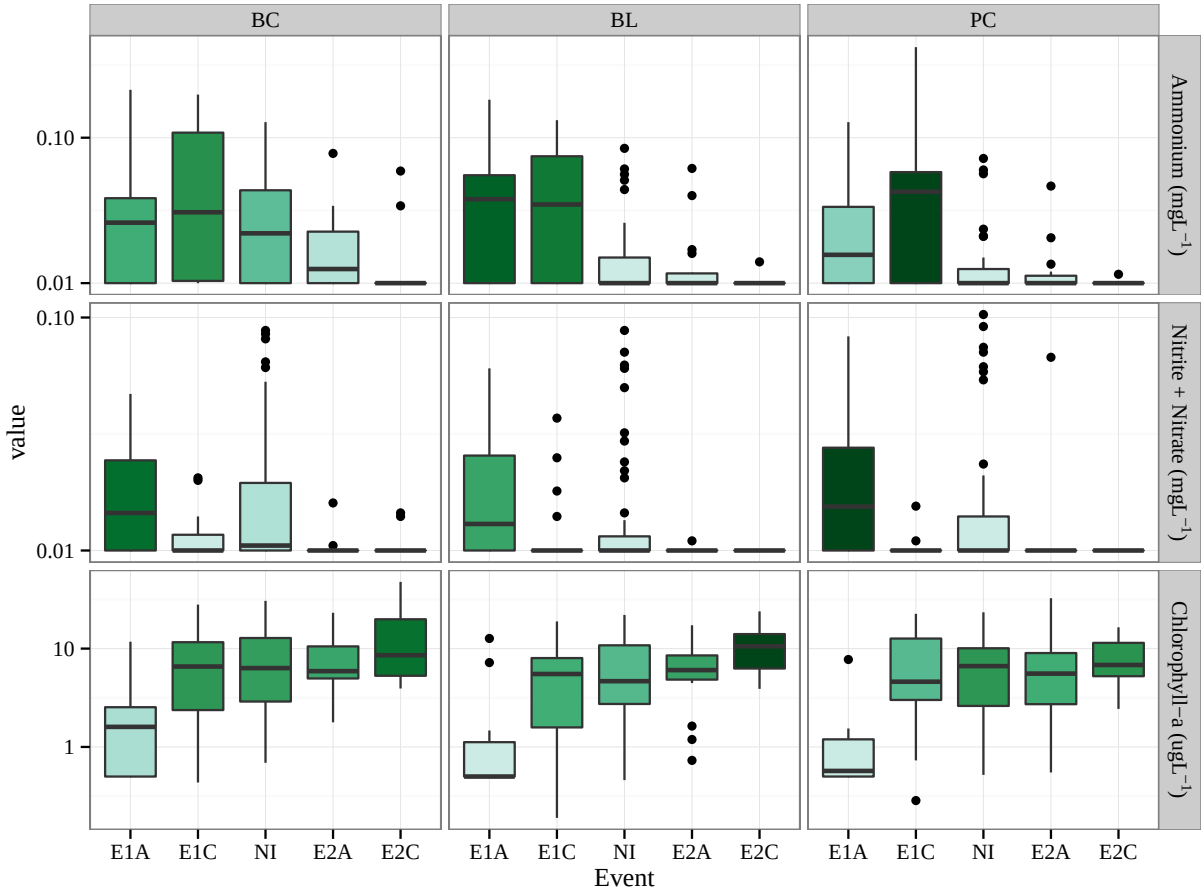

Figure S1: Boxplot summaries by event of nutrient data at Bayou Cumbest (BC), Bangs Lake (BL), and Point aux Chenes (PC) sites at Grand Bay. Boxes represent the interquartile range (IQR, 25^{th} to 75^{th} percentile) with the median as the middle horizonal line. Boxes are colored by relative median 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: Within site comparisons of monthly ammonium data for each time frame at Grand Bay. Values are within-group summaries of sample size, median, and ranges for ammonium 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. P-values were adjusted using the sequential Bonferroni method to reduce the probability of Type I errors. Sites are BC: Bayou Cumbest, BL: Bangs Lake, and PC: Point aux Chenes. Time frames are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, and E2C: event 2 chronic.

Site	Result	n	Median	Min	Max
BL					
E1A	ab	12	0.04	0.01	0.18
E1C	a	18	0.03	0.01	0.13
NI	bc	49	0.01	0.01	0.08
E2A	abc	16	0.01	0.01	0.06
E2C	c	11	0.01	0.01	0.01
PC					
E1A	ab	8	0.02	0.01	0.13
E1C	a	17	0.04	0.01	0.42
NI	b	49	0.01	0.01	0.07
E2A	b	16	0.01	0.01	0.05
E2C	b	11	0.01	0.01	0.01
BC					
E1A	a	12	0.03	0.01	0.21
E1C	a	18	0.03	0.01	0.20
NI	a	49	0.02	0.01	0.13
E2A	a	16	0.01	0.01	0.08
E2C	a	11	0.01	0.01	0.06

Table S2: Within site comparisons of monthly nitrogen (nitrate, nitrite) data for each time frame at Grand Bay. Values are within-group summaries of sample size, median, and ranges for nitrogen 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. P-values were adjusted using the sequential Bonferroni method to reduce the probability of Type I errors. Sites are BC: Bayou Cumbest, BL: Bangs Lake, and PC: Point aux Chenes. Time frames are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, and E2C: event 2 chronic.

Site	Result	n	Median	Min	Max
BL					
E1A	a	14	0.01	0.01	0.06
E1C	ab	19	0.01	0.01	0.04
NI	ab	53	0.01	0.01	0.09
E2A	b	15	0.01	0.01	0.01
E2C	b	11	0.01	0.01	0.01
PC					
E1A	a	10	0.02	0.01	0.08
E1C	b	18	0.01	0.01	0.02
NI	ab	53	0.01	0.01	0.10
E2A	ab	15	0.01	0.01	0.07
E2C	b	11	0.01	0.01	0.01
BC					
E1A	a	14	0.01	0.01	0.05
E1C	ab	19	0.01	0.01	0.02
NI	a	53	0.01	0.01	0.09
E2A	b	16	0.01	0.01	0.02
E2C	ab	11	0.01	0.01	0.01

Table S3: Within site comparisons of monthly chlorophyll data for each time frame at Grand Bay. Values are within-group summaries of sample size, median, and ranges for chlorophyll 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. P-values were adjusted using the sequential Bonferroni method to reduce the probability of Type I errors. Sites are BC: Bayou Cumbest, BL: Bangs Lake, and PC: Point aux Chenes. Time frames are E1A: event 1 acute, E1C: event 1 chronic, NI: non-impact, E2A: event 2 acute, and E2C: event 2 chronic.

Site	Result	n	Median	Min	Max
BL					
E1A	a	14	0.50	0.50	12.68
E1C	b	18	5.52	0.19	18.89
NI	b	54	4.66	0.46	21.99
E2A	b	16	6.05	0.73	17.28
E2C	b	11	10.56	3.90	23.89
PC					
E1A	a	10	0.57	0.50	7.74
E1C	b	17	4.61	0.29	22.56
NI	b	54	6.63	0.52	23.39
E2A	b	16	5.57	0.55	32.52
E2C	b	11	6.81	2.44	16.46
BC					
E1A	a	13	1.60	0.50	11.75
E1C	ab	18	6.61	0.44	28.02
NI	b	54	6.34	0.69	30.59
E2A	b	16	5.91	1.78	23.12
E2C	b	11	8.57	3.93	47.67