

# Water Quality Drivers in 11 Gulf of Mexico Estuaries

## Supplementary Materials

**Table S1.** Time Series Weekly Results.

	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	Y	Y	Y	N	N	N	N	N	0.111	0.001	530	None	N/A
BTB	Y	N	Y	N	N	N	N	N	0.084	0.001	561	None	N/A
CCB	Y	Y	N	N	Y	N	N	N	0.132	0.001	653	None	N/A
CH	Y	Y	N	N	Y	Y	N	N	0.085	0.001	734	None	N/A
GB	Y	Y	Y	N	N	N	N	N	0.154	0.001	570	None	N/A
MB	Y	Y	N	Y	Y	N	N	N	0.364	0.001	549	None	N/A
MGB	Y	Y	Y	N	N	Y	Y	N	0.095	0.001	678	None	N/A
SAB	Y	N	Y	N	Y	N	N	N	0.100	0.001	673	None	N/A
SB	Y	N	N	N	N	N	N	N	0.008	0.013	736	None	N/A
TBB	Y	N	N	N	N	N	N	N	0.100	0.001	564	None	N/A
TB	Y	N	Y	N	Y	N	N	N	0.045	0.001	815	None	N/A

**Table S2.** Time series monthly results.

	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	Y	N	N	N	N	N	N	N	0.130	0.001	169	None	N/A
BTB	Y	N	N	N	N	N	N	N	0.168	0.001	153	None	N/A
CCB	Y	N	N	N	N	N	N	Y	0.221	0.001	178	None	N/A
CH	N	Y	N	N	Y	Y	N	N	0.167	0.001	179	None	N/A
GB	Y	N	N	N	N	N	Y	N	0.152	0.001	135	None	N/A
MB	Y	N	N	N	Y	Y	N	N	0.586	0.001	132	None	N/A
MGB	Y	N	N	N	N	N	N	N	0.119	0.001	179	None	N/A
SAB	Y	N	N	N	Y	N	N	N	0.172	0.001	179	None	N/A
SB	N	N	N	N	Y	N	N	N	0.024	0.069	182	None	N/A
TBB	Y	N	N	N	N	N	N	N	0.101	0.001	154	None	N/A
TB	N	Y	N	N	N	Y	N	Y	0.170	0.001	191	None	N/A

**Table S3.** Time series seasonal results (bold MB row is plotted in Figure 3).

	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	Y	N	N	N	N	N	N	N	0.199	0.001	61	None	N/A
BTB	Y	N	N	N	N	N	N	N	0.361	0.001	54	None	N/A
CCB	N	N	Y	N	Y	N	N	N	0.283	0.001	62	None	N/A
CH	N	N	N	N	Y	N	N	N	0.195	0.001	62	None	N/A
GB	Y	N	N	N	N	N	N	N	0.109	0.001	33	None	N/A
<b>MB</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>Y</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>0.570</b>	<b>0.001</b>	<b>46</b>	<b>None</b>	<b>N/A</b>
MGB	Y	N	N	N	Y	N	N	N	0.280	0.001	62	None	N/A
SAB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
SB	N	N	N	N	Y	N	N	N	0.038	0.064	62	None	N/A
TBB	Y	N	N	N	N	N	N	N	0.061	0.061	45	None	N/A
TB	N	N	N	N	N	N	N	Y	0.218	0.001	64	None	N/A

**Table S4.** Time series annual results.

\	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	N	Y	N	N	N	N	N	N	0.304	0.04	16	None	N/A
BTB	Y	N	N	N	N	N	N	N	0.461	0.001	15	None	N/A
CCB	N	N	N	N	Y	N	Y	N	0.647	0.001	16	ENSO/Discharge	0.734
CH	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
GB	Y	N	N	N	N	N	N	N	0.324	0.076	11	None	N/A
MB	Y	Y	N	N	Y	N	N	N	0.931	0.001	12	None	N/A
MGB	N	N	N	N	Y	N	N	N	0.402	0.001	16	None	N/A
SAB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
SB	N	N	N	Y	N	N	N	N	0.156	0.156	16	None	N/A
TBB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
TB	N	N	N	N	N	N	N	Y	0.372	0.001	16	None	N/A

**Table S5.** XE<sub>90</sub> weekly results.

	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	N/A	None
BTB	N	N	N	N	N	N	Y	N	0.119	0.001	56	N/A	None
CCB	N	Y	N	N	N	N	N	N	0.031	0.112	65	N/A	None
CH	N	N	Y	N	N	N	N	N	0.028	0.144	73	N/A	None
GB	Y	N	N	N	N	N	N	N	0.053	0.076	57	Wind Speed/V	0.830
MB	N	N	N	N	Y	N	N	N	0.125	0.001	55	N/A	None
MGB	N	N	N	Y	N	N	N	N	0.048	0.023	68	N/A	None
SAB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	N/A	None
SB	Y	N	N	N	N	N	N	N	0.017	0.096	74	<u>Water Level/Wind Speed</u>	0.880
												<u>Wind Speed/V</u>	0.895
TBB	Y	N	N	N	N	N	N	N	0.113	0.001	56	<u>Wind Speed/Water Level</u>	0.867
TB	Y	N	N	N	N	N	N	N	0.092	0.001	82	<u>Wind Speed/Water Level</u>	0.895

**Table S6.** XE<sub>90</sub> monthly results.

	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	Y	N	N	N	N	N	N	N	0.187	0.021	17	None	N/A
BTB	N	N	N	N	N	N	N	Y	0.235	0.027	15	None	N/A
CCB	N	N	N	N	N	N	N	Y	0.290	0.025	18	None	N/A
CH	N	Y	N	N	N	N	Y	N	0.512	0.001	18	None	N/A
GB	N	N	N	N	N	N	N	Y	0.250	0.115	14	None	N/A
MB	N	N	Y	N	N	N	N	N	0.461	0.039	13	None	N/A
MGB	N	Y	N	N	N	N	N	N	0.394	0.001	18	None	N/A
SAB	N	N	N	N	N	Y	N	N	0.094	0.162	18	None	N/A
												<u>Discharge/ Precipitation</u>	0.895
SB	Y	N	N	Y	N	N	N	N	0.325	0.001	18	<u>Water Level/ Wind Speed</u>	0.742
TBB	Y	N	N	N	N	N	N	N	0.415	0.001	15	<u>None</u>	N/A
TB	Y	N	N	N	N	N	N	N	0.123	0.102	19	<u>Water Level/ Wind Speed</u>	0.895

**Table S7.** XE<sub>90</sub> seasonal results (bold TB row is plotted in Figure 4).

	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	N	N	N	N	N	N	N	Y	0.585	0.001	6	None	N/A
BTB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
CCB	N	N	N	N	N	N	N	Y	0.735	0.022	6	None	N/A
CH	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
GB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
MB	Y	N	N	N	N	N	N	Y	0.998	0.001	5	None	N/A
MGB	N	N	N	N	Y	N	N	N	0.796	0.001	6	None	N/A
SAB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
SB	N	N	N	N	N	N	N	Y	0.882	0.001	6	None	N/A
TBB	N	N	N	N	Y	N	N	N	0.811	0.035	5	None	N/A
<b>TB</b>	<b>Y</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>0.707</b>	<b>0.001</b>	<b>6</b>	<b>Water Level/Wind Speed</b>	<b>0.961</b>

**Table S8.** XE<sub>95</sub> weekly results (bold BTB row is plotted in Figure 5).

	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
<b>BTB</b>	<b>N</b>	<b>N</b>	<b>Y</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>0.355</b>	<b>0.001</b>	<b>28</b>	<b>None</b>	<b>N/A</b>
CCB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
CH	N	Y	N	N	N	N	N	N	0.111	0.031	37	None	N/A
GB	Y	N	N	N	N	N	N	N	0.115	0.091	29	None	N/A
MB	N	Y	N	N	N	N	N	N	0.076	0.152	27	None	N/A
MGB	N	N	Y	N	N	N	N	N	0.063	0.001	34	None	N/A
SAB	N	N	Y	N	N	N	N	N	0.100	0.078	34	None	N/A
SB	N	N	N	Y	N	N	N	N	0.039	0.115	37	Discharge/ Precipitation	0.804
TBB	N	N	N	N	Y	N	N	N	0.057	0.150	28	Discharge/V	0.895
TB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A

**Table S9.** XE<sub>95</sub> monthly results.

	Wind Speed	U	V	Precipitation	Discharge	Water Level	NAO	ENSO	R2adj	p	n	Correlated variables	Correlation Coefficient
ARB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
BTB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
CCB	N	N	Y	N	N	N	N	N	0.684	0.001	9	ENSO/V	0.755
CH	N	Y	N	N	N	N	N	N	0.428	0.001	9	None	N/A
GB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
MB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
MGB	Y	N	N	N	N	N	N	N	0.498	0.076	9	Water Level/Wind Speed	0.933
SAB	N	N	N	N	N	Y	N	N	0.414	0.001	9	None	N/A
SB	Y	N	N	N	N	N	N	N	0.398	0.042	9	Water Level/Wind Speed	0.953
TBB	N	N	N	N	N	N	N	N	N/A	N/A	N/A	None	N/A
TB	N	Y	N	N	N	N	N	N	0.248	0.096	10	None	N/A