The following supplement accompanies the article

Celestial patterns in marine soundscapes

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Marine Ecology Progress Series 508: 17–32 (2014)

Supplement 1. Additional data from a time-series analysis of soundscapes and environmental conditions on two coral reefs in Florida. Tables S1 & S2 provide results from an ANCOVA used to examine the role of offshore wind, season, moonphase, and site on the acoustic conditions of the reefs. Figs. S1-S7 depict the environmental data in the time domain and frequency domain, and Fig. S8 further examines the role of wind by comparing a series of predicted and actual sound pressure levels at the two reefs. Finally, one exemplary wav file from each site is included (Supplements 2 & 3 at www.int-res.com/articles/suppl/m508p017_supp/. These recordings were made at dusk during a new moon of the wet season (July 1, 2011), and a visual representation of each sound file is shown in Fig. 8 in the main article.

Table S1. Results from an ANCOVA with low band level as the dependent variable, and offshore wind, season, moon phase, and site as independent variables. Interactions are depicted with a *. After accounting for wind, there were significant differences between site, season, and moon phase, and significant interactions between site and season, as well as site and moon phase

Source	**df**	**SS**	**MS**	***F***	**p**
Offshore	1	91831	91831	4696.1	<0.001
Season	1	5840	5840	298.6	<0.001
Moonphase	2	12838	6419	328.3	<0.001
Site	1	5467	5467	279.5	<0.001
Offshore*season	1	3784	3784	193.5	<0.001
Offshore*moonphase	2	694	347	17.7	<0.001
Offshore*site	1	1638	1638	83.8	<0.001
Offshore*season*moonphase	2	83	41	2.1	0.12
Offshore*season*site	1	270	270	13.8	<0.001
Offshore*moonphase*site	2	314	157	8.03	<0.001
Offshore*season*moonphase*site	2	3	1	0.07	0.94
Residuals	19585	382980	20		

Table S2. Results from an ANCOVA with high band level as the dependent variable, and offshore wind, season, moon phase and site as independent variables. Interactions are depicted with a *. After accounting for the wind, there was a significant effect of season, moon phase, and site. However, there were no interactions between site and moon phase or site and season

Source	**dF**	**SS**	**MS**	**F**	**p**
Offshore	1	435	435	210.8	<0.001
Season	1	8492	8492	4117.9	<0.001
Moonphase	2	486	243	117.7	<0.001
Site	1	4138	4138	2006.7	<0.001
Offshore*season	1	76	76	36.8	<0.001
Offshore*moonphase	2	91	46	22.1	<0.001
Offshore*site	1	98	98	47.6	<0.001
Offshore*season*moonphase	2	15	8	3.71	0.03
Offshore*season*site	1	1	1	0.67	.41
Offshore*moonphase*site	2	7	3	1.6	0.20
Offshore*season*moonphase*site	2	4	2	0.92	0.40
residuals	19763	40757	2		

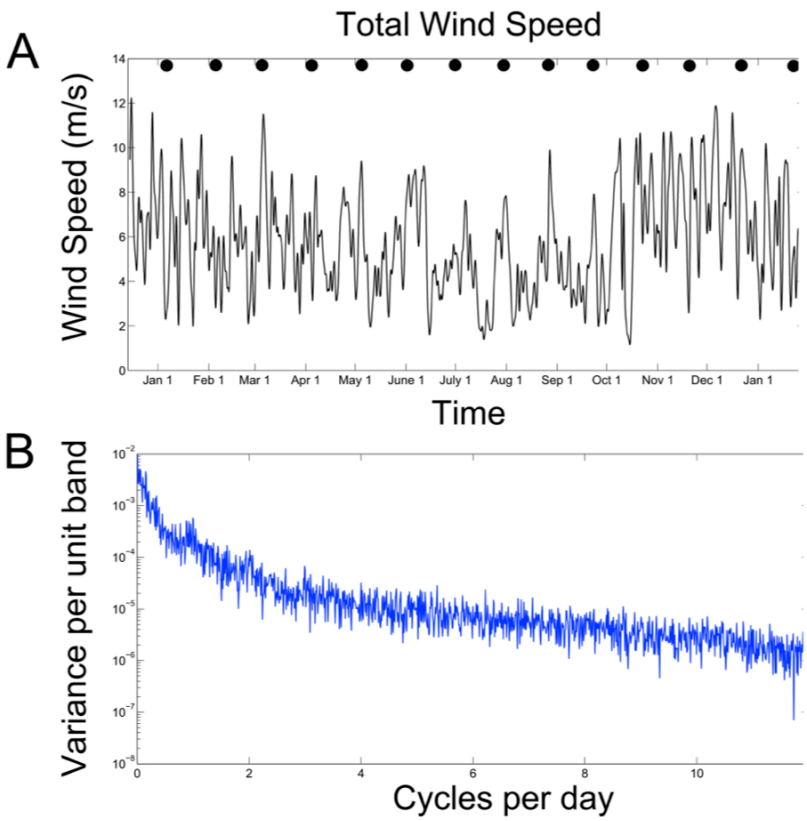

Fig. S1. Total wind speed in (A) the time domain, smoothed with a 50-pt Hanna filter, and (B) the frequency domain. The power spectrum (B) shows a small peak at once/day

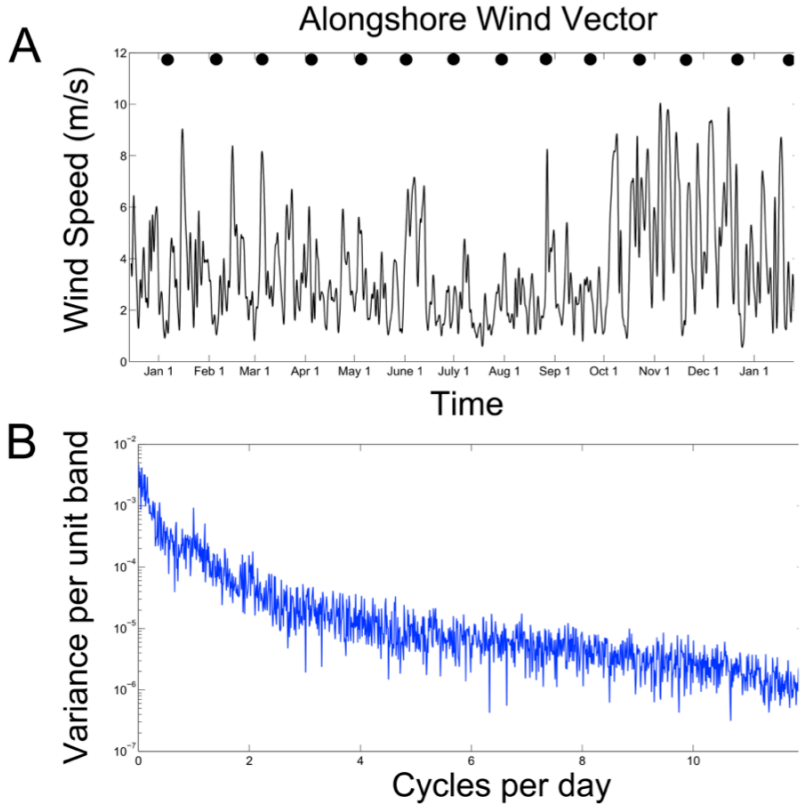

Fig. S2. Alongshore wind vector in (A) the time domain, smoothed with a 50-pt Hanna filter, and (B) the frequency domain. There was a small peak at once/day in the power spectrum

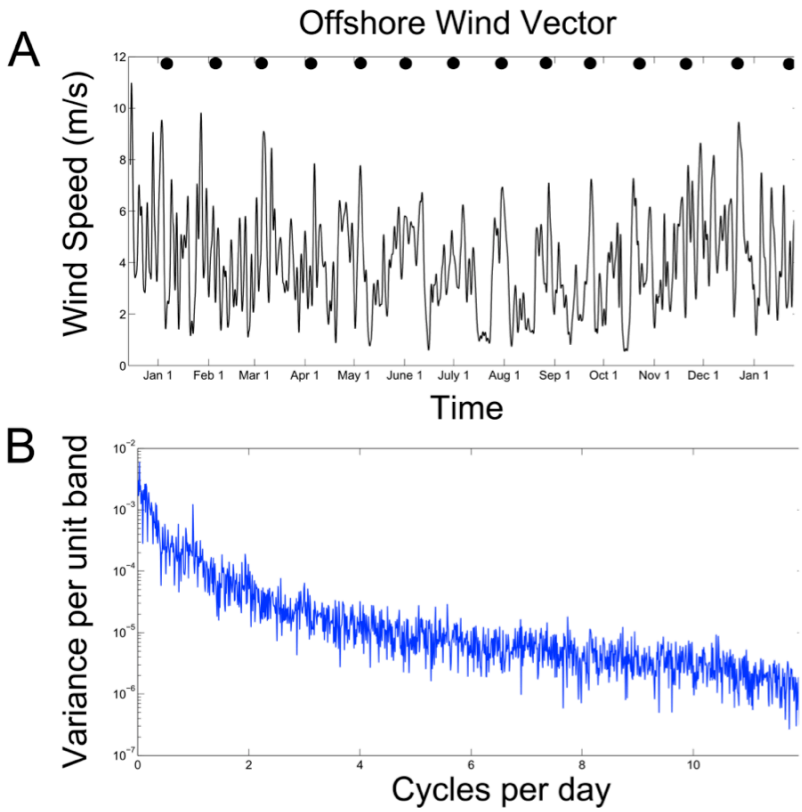

Fig. S3. Offshore wind vector in (A) the time domain, smoothed with a 50-pt Hanna filter, and (B) the frequency domain. Peaks at once/sidereal month (27.32 days) and once/solar day are evident in the power spectrum

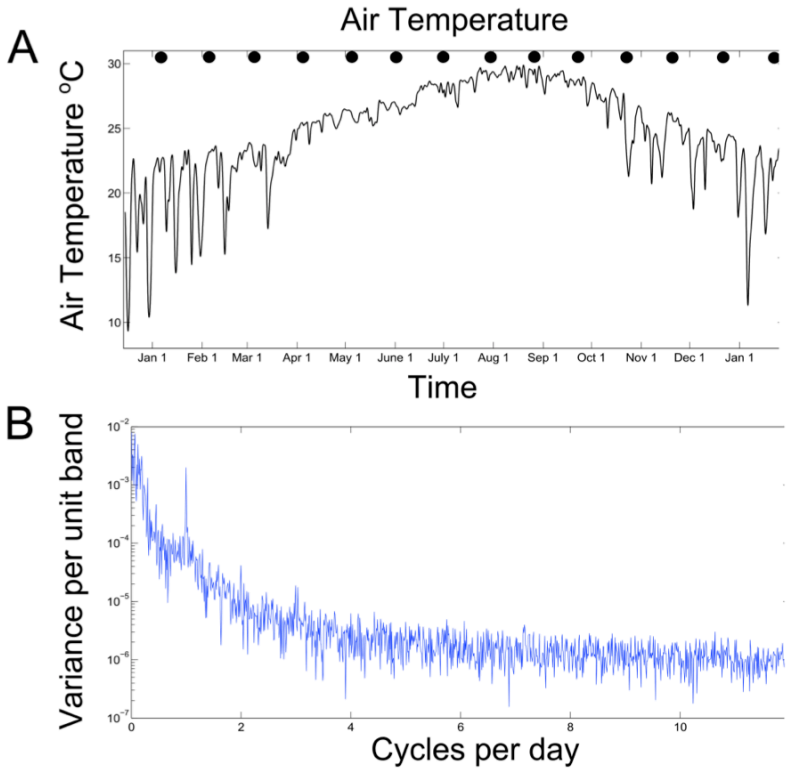

Fig. S4. Air temperature in (A) the time domain, smoothed with a 50-pt Hanna filter, and (B) frequency domain. There was a clear seasonal change in air temperature, as well as a once/day peak as seen in the power spectrum

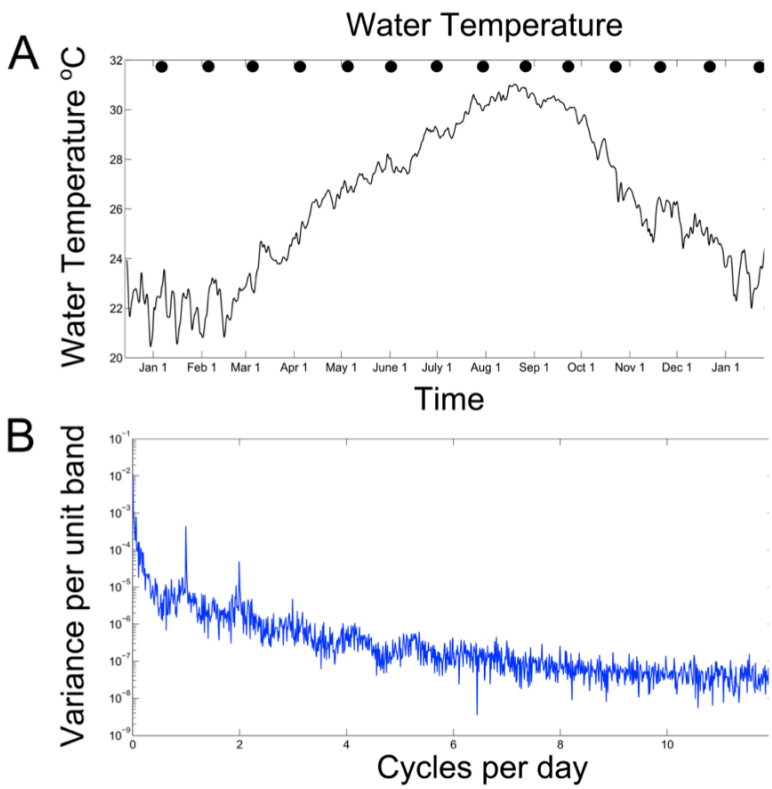

Fig. S5. Water temperature in (A) the time domain, smoothed with a 50-pt Hanna filter, and (B) the frequency domain. In addition to a seasonal trend in the water temperature, there was also a peak at once and twice per lunar day, corresponding to tidal flow

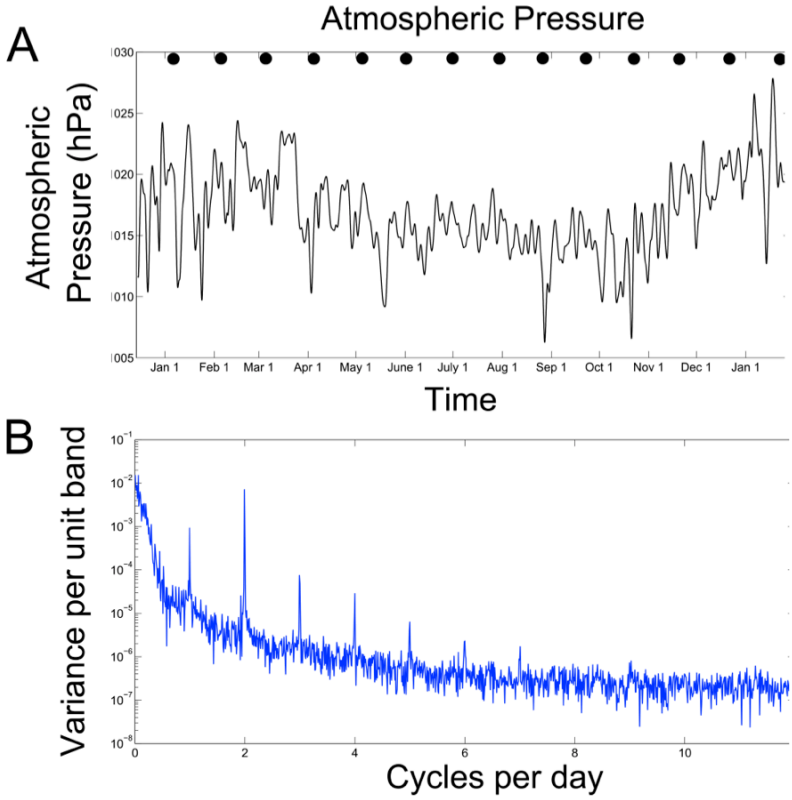

Fig. S6. Atmospheric pressure in (A) the time domain, smoothed with a 50-pt Hannah filter, and (B) the frequency domain. There were large peaks at once and twice per day, with harmonics extending into higher frequencies

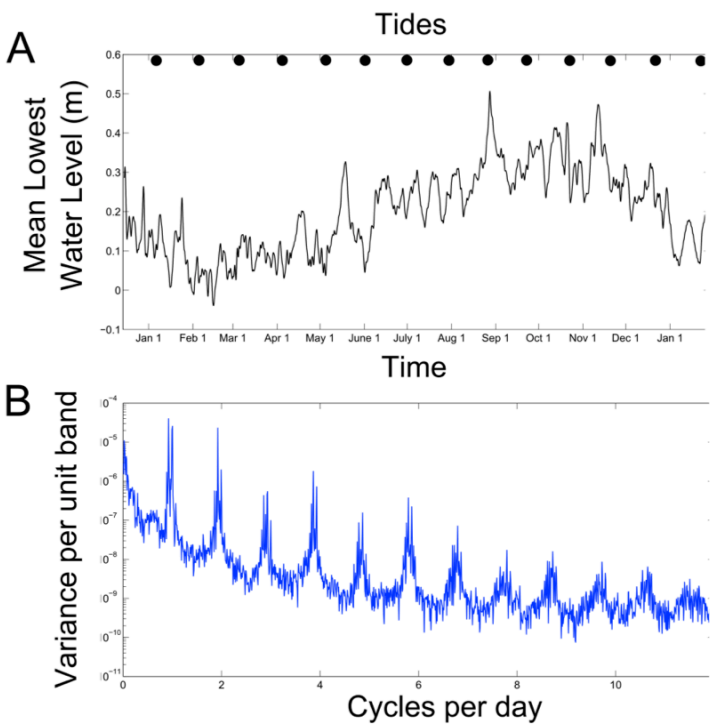

Fig. S7. Tides (mean lowest water level, in m) in (A) the time domain, smoothed with a 50-pt Hannah filter, and (B) the frequency domain. There are many frequency components to tides, which is evident in the power spectrum, but the primary peaks occurred at once and twice per lunar day

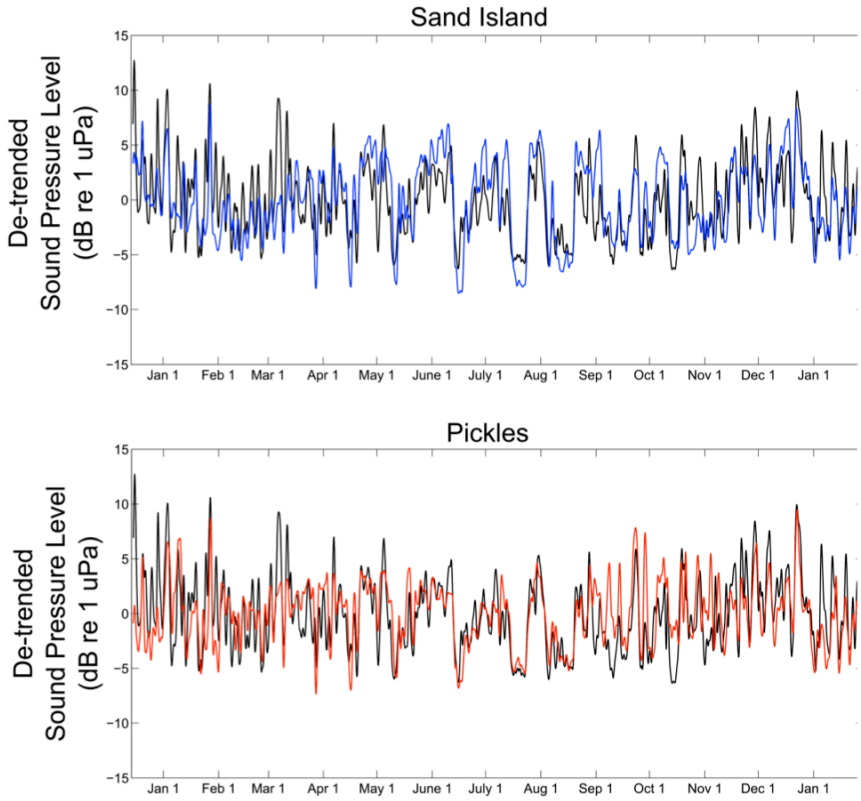

Fig. S8. A time series of predicted root mean square (RMS) level (black line), based on measured wind speeds (using relationship in Knudsen 1944), with actual RMS level for Sand Island and Pickles (blue and red line, respectively). All data was de-trended before the calculations and plots were made. While both sites had fairly close agreement with predicted sound pressure levels, at Sand Island there was a discrepancy between the predicted and actual values in the wet season, which indicates that there was an additional sound source (i.e. biophony) with a similar period