

Figure S1
Study species *Globoconella puncticulata* (a) and *Truncorotalia crassaformis* (b).
The scale bars represent 100 μm .

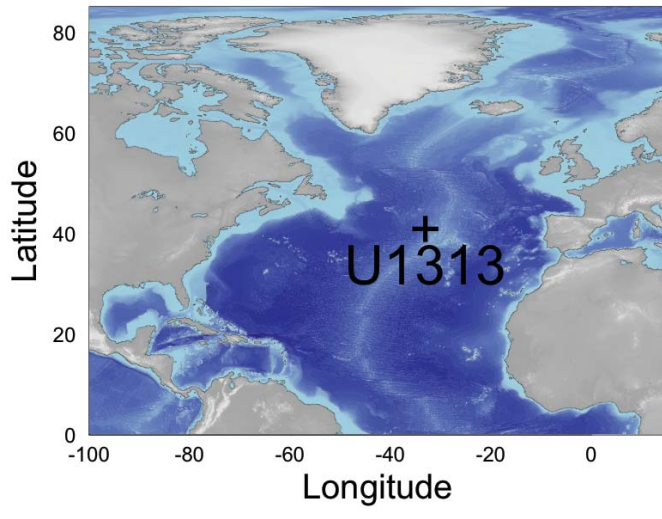


Figure S2
Map of study site IODP Site U1313 in the North Atlantic

G. puncticulata

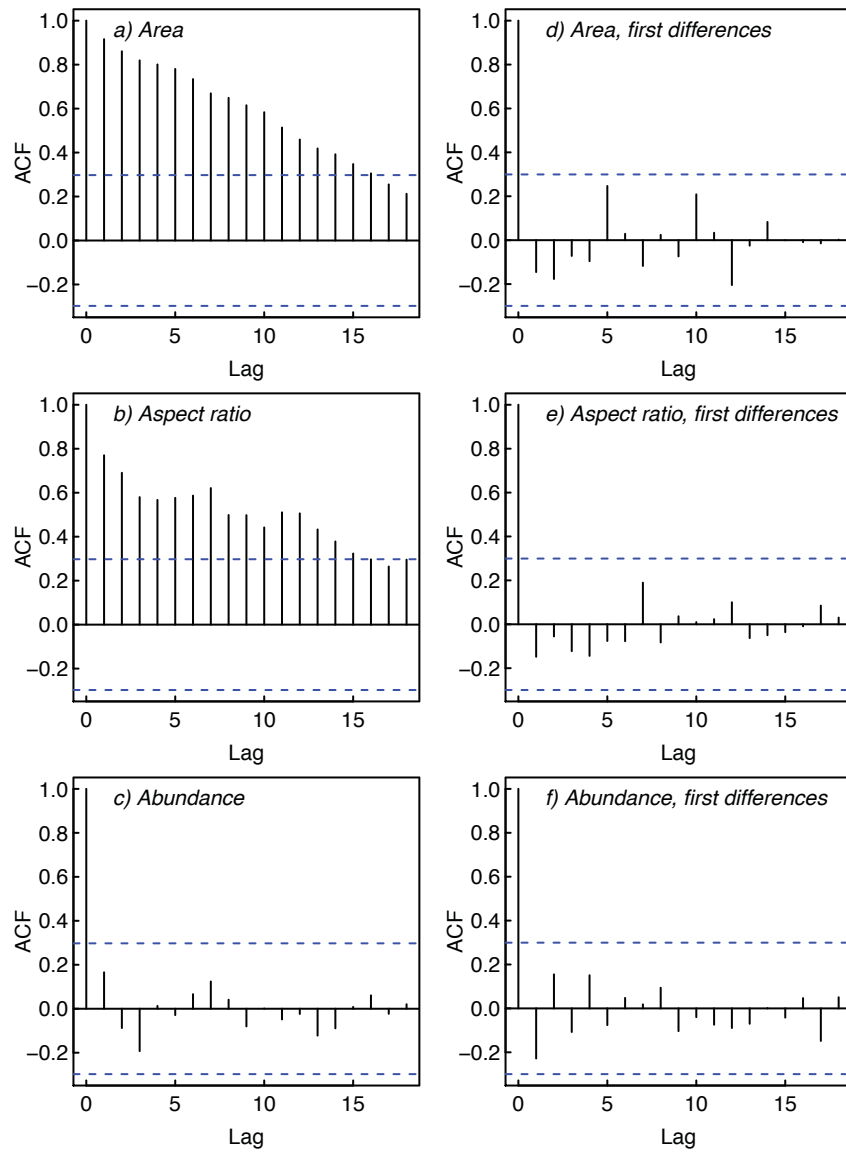


Figure S3

Autocorrelation plots for traits of *Globoconella puncticulata* showing autocorrelation in the original time series (a-c) but not in the first differences (d-f)

T. crassaformis

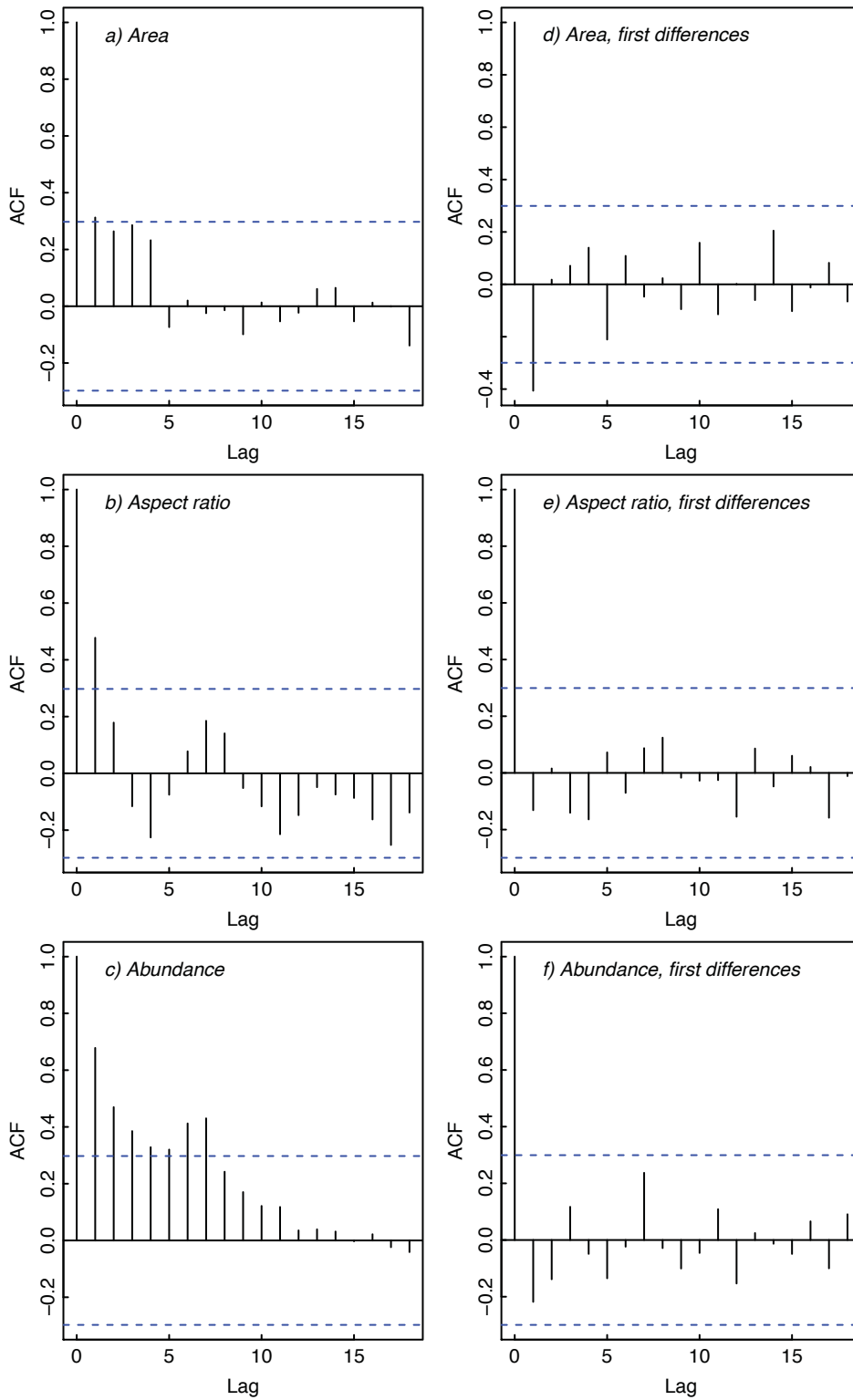


Figure S4

Autocorrelation plots for traits of *Truncorotalia crassaformis* showing autocorrelation in the original time series (a-c) but not in the first differences (d-f). Only area in *T. crassaformis* still contained a small amount of autocorrelation in the first differences time series. However, comparison of two Generalized Least Squares models with and without autocorrelation (by setting the continuous auto-correlation parameter $\phi=0.3$ and $\phi=0.1$, which converges to 0 under maximum likelihood, respectively) show lower AIC values for the model without autocorrelation, implying that the model with temporal autocorrelation is actually a poorer fit to the data than that without.

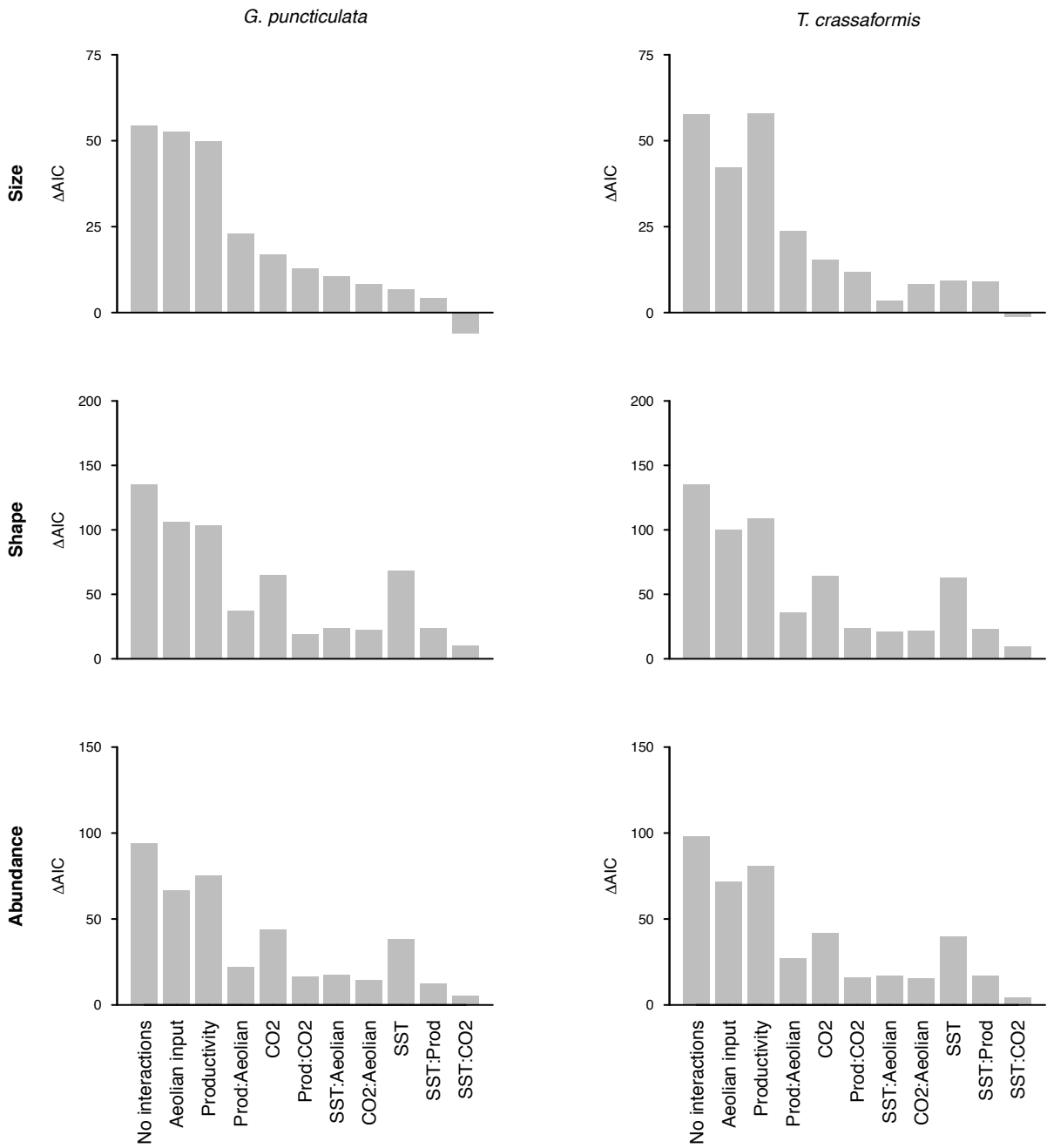


Figure S5

ΔAIC values showing the added relative importance of each environmental parameter or combination of parameters to the total model