Supplementary Materials for
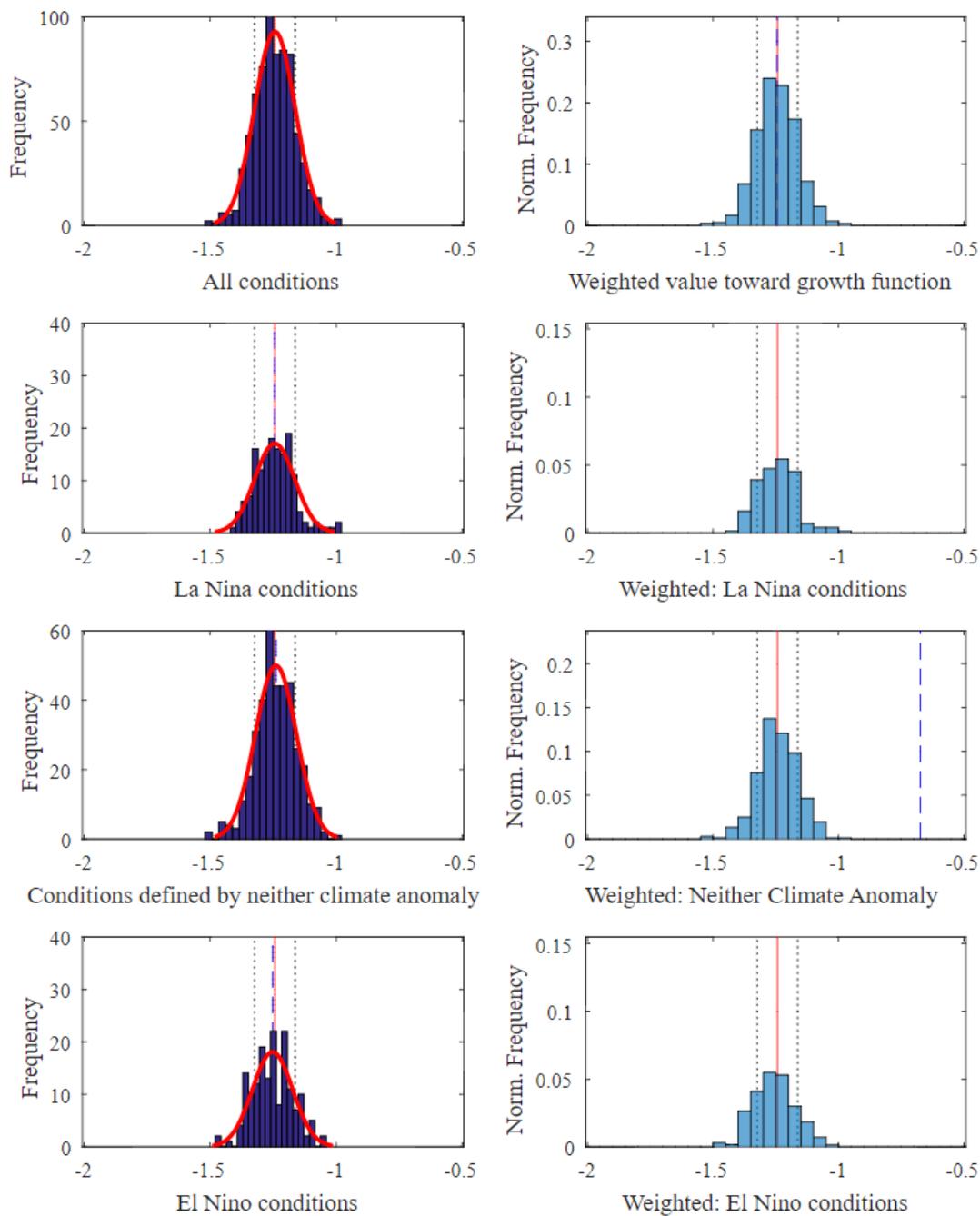
On the validity of foraminifera-based ENSO reconstructions

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This PDF file includes:

Figs. S1 to S5

Fig. S1.

Calculated oxygen isotope values for a single latitudinal and longitudinal grid-point. Left column is the absolute frequency (n = 696 months), right is the weighted frequency, based upon summing using the contribution of each individual month to the total growth rate. Values in V-PDB in per mil (‰).
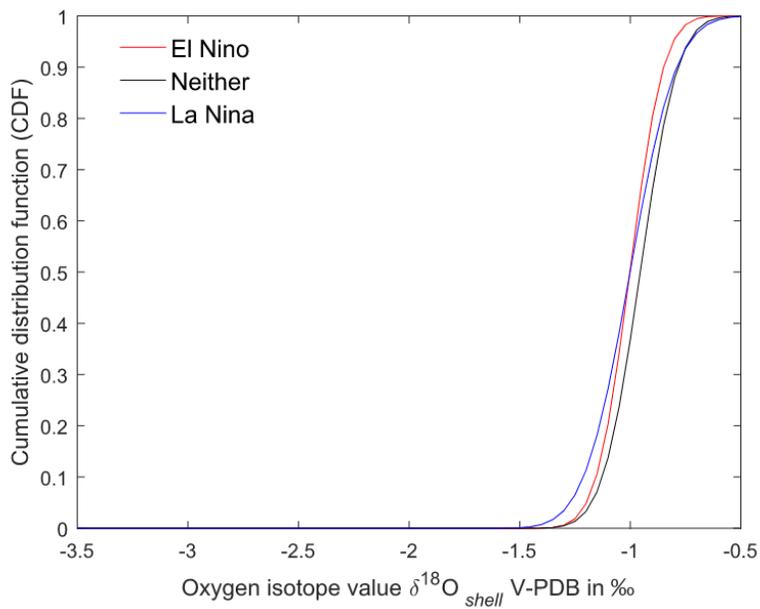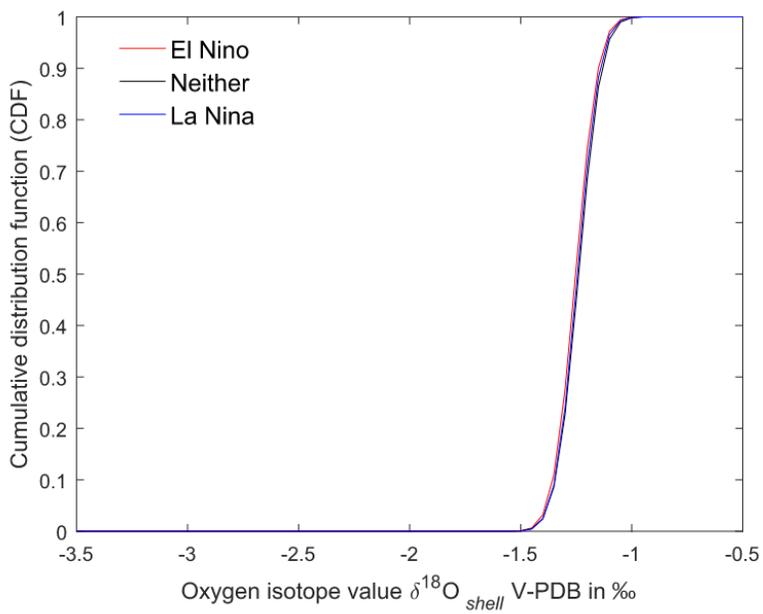
Fig. S2.
Example of the cumulative distribution function output for a latitudinal and longitudinal grid point that fails to reject the H_0 and another that accepts the H_1 hypothesis. The three curves represent the CDF for El Niño; Neutral and La Niña conditions, plotted against the $\delta^{18}O$. Values in V-PDB in per mil (‰).
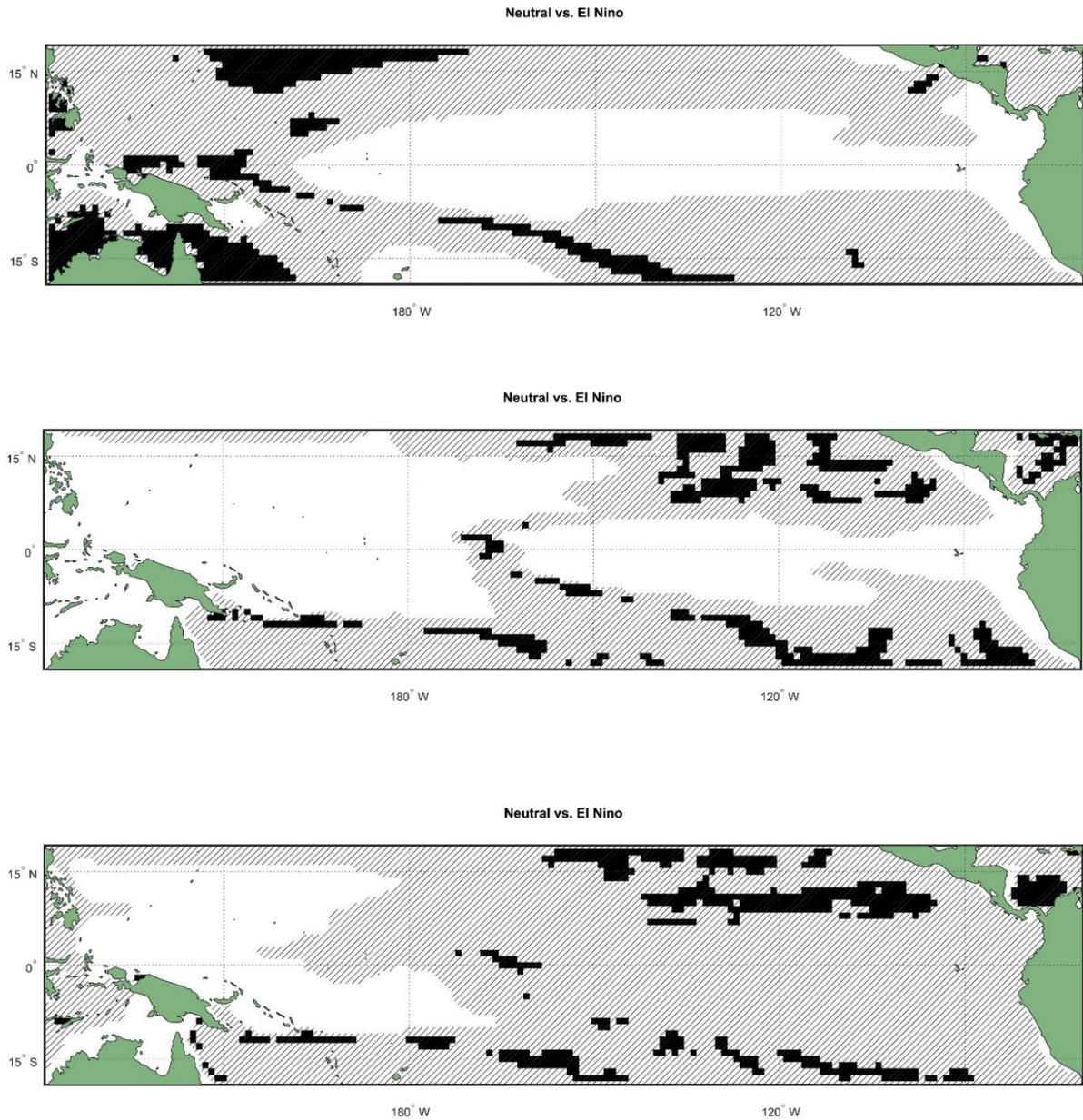
Fig. S3.

Results of an Anderson-Darling test between El Nino and Neutral climate conditions for the computed $\delta^{18}O_{eq}$: Fixed depth. White represents where the H_1 hypothesis is accepted, therefore the distributions can be said to be unique, black that the null hypothesis cannot be rejected and hatching represents those locations where the difference between the means of both populations is less than 0.1 ‰. Each panel represents a single depth (5, 150 and 250 m) sampled equally through time. Values in V-PDB in per mil (‰).
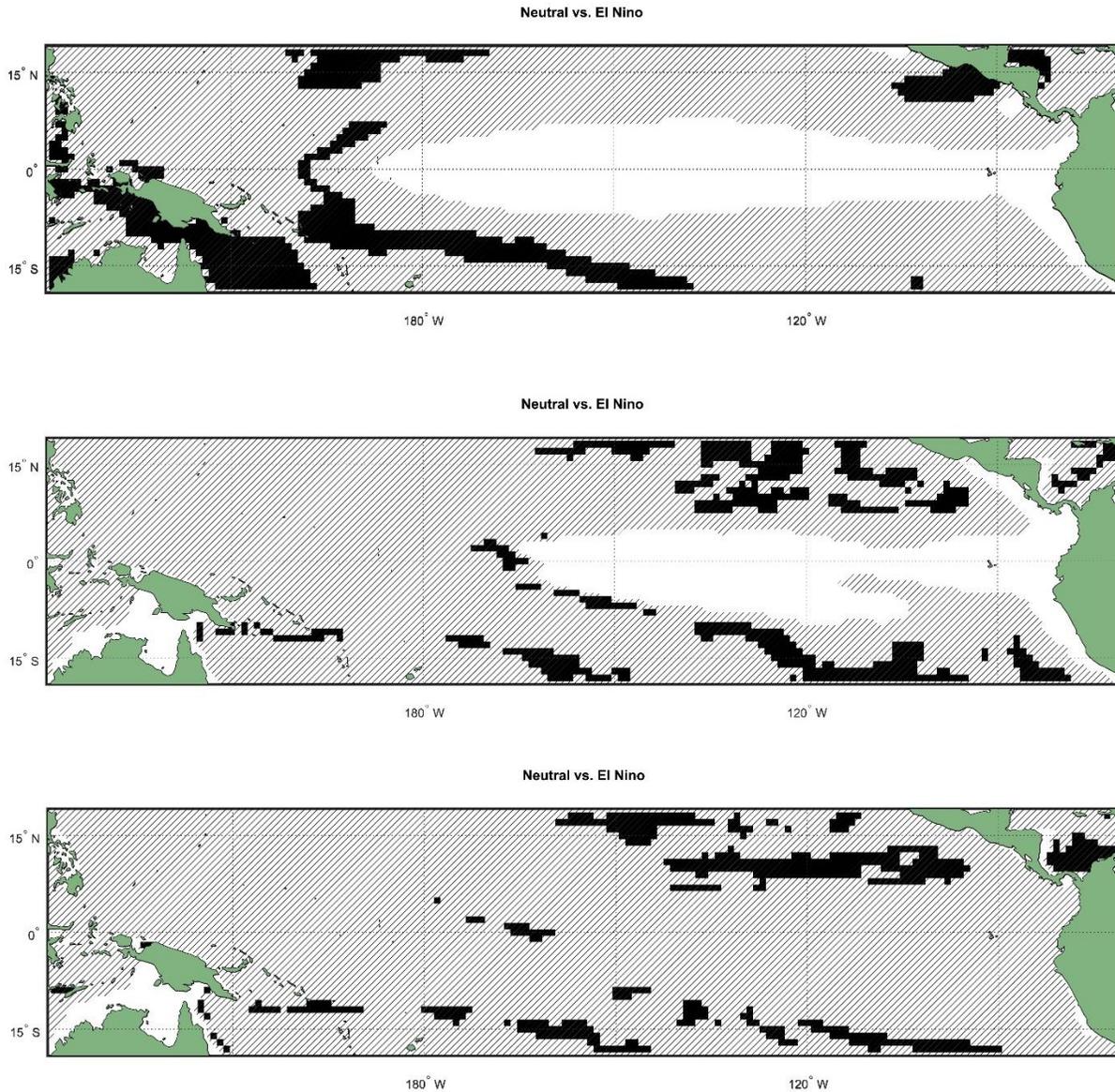
Fig. S4.

Results of an Anderson-Darling test between El Nino and Neutral climate conditions based upon the Temperature input data: Fixed depth. White represents where the H_1 hypothesis is accepted, therefore the distributions can be said to be unique, black that the null hypothesis cannot be rejected, and hatching represents those locations where the difference between the means of both populations is less than 0.5°C. Each panel represents a single depth (5, 150 and 250 m) sampled equally through time. This figure differs from Supplementary Figure S3 in that the <0.5°C is not based on an absolute value (i.e. sign removed), therefore cooling is also hatched.
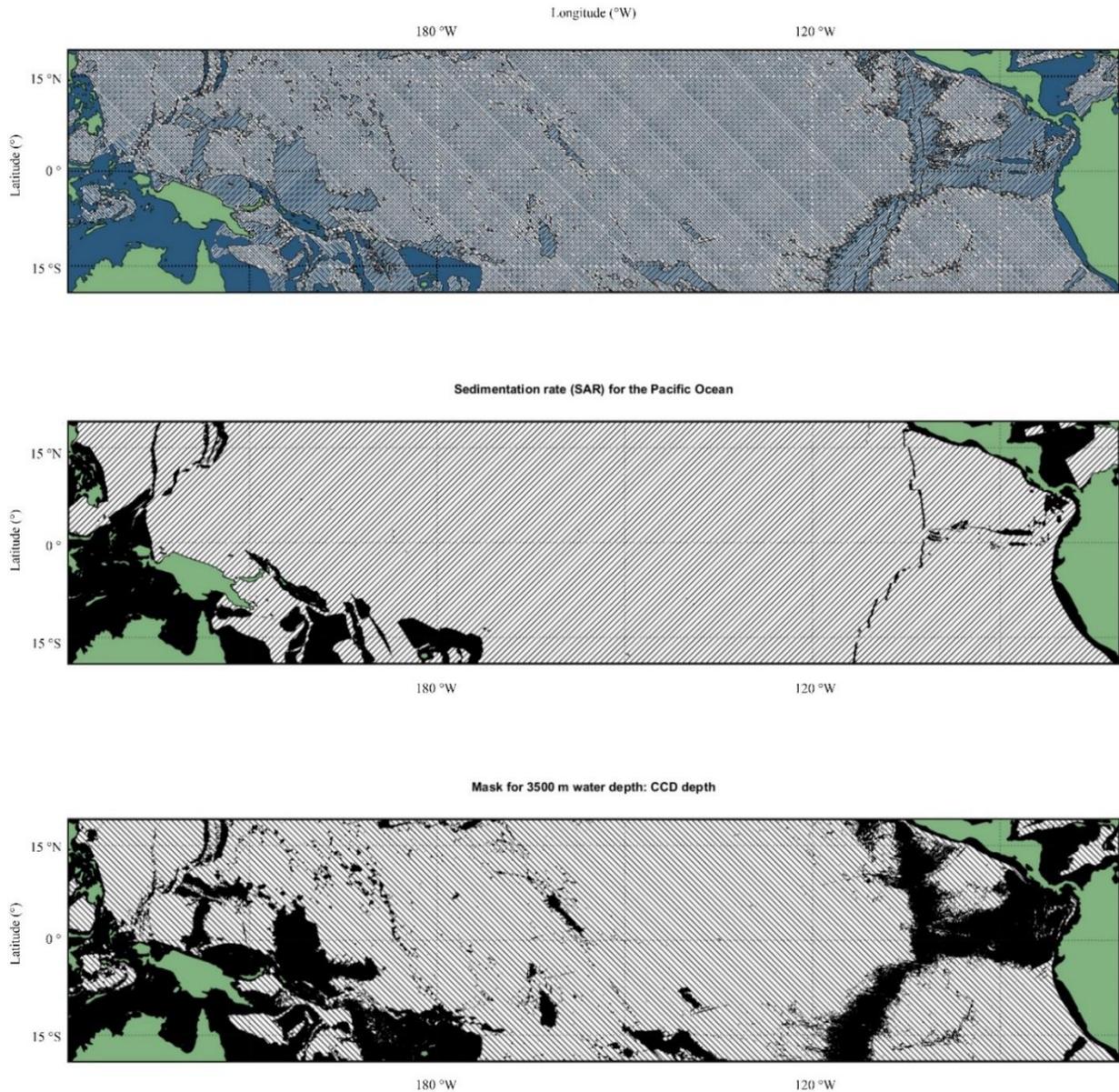
Fig. S5.

Sedimentology of the Pacific Ocean. (Top) Composite of (Middle) the sedimentation rate (SAR) for the Pacific Ocean, hatching represents < 4.9 cm^{-1}/ka^{-1} and black area > 5.0 cm^{-1}/ka^{-1}, and (Bottom) the bathymetry of the Pacific Ocean, hatching represents > 3500 m water depth (w.d.) and black area < 3500 m w.d., the cross hatching (in Top) represents areas where both SAR and W.D. meet the criteria for a poor-sedimentological record.