

Supporting Information for

Influence of iron, cobalt, and vitamin B₁₂ supply on phytoplankton growth in the tropical East Pacific during the 2015 El Niño event

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Table S1: Reference seawater Fe and Co results.

	SAFe S n=11	SAFe S consensus value	SAFe D1 n=13	SAFe D1 consensus value	SAFe D2 n=7	SAFe D2 consensus value
Fe	0.091±0.009	0.095±0.008	0.645±0.037	0.69±0.04	1.029±0.038	0.956±0.024
Co	0.005±0.001	0.005±0.001	0.048±0.003	0.046±0.005	0.048±0.003	0.047±0.003

Values represent mean ± standard deviation in nmol L⁻¹, n=number of measurements.

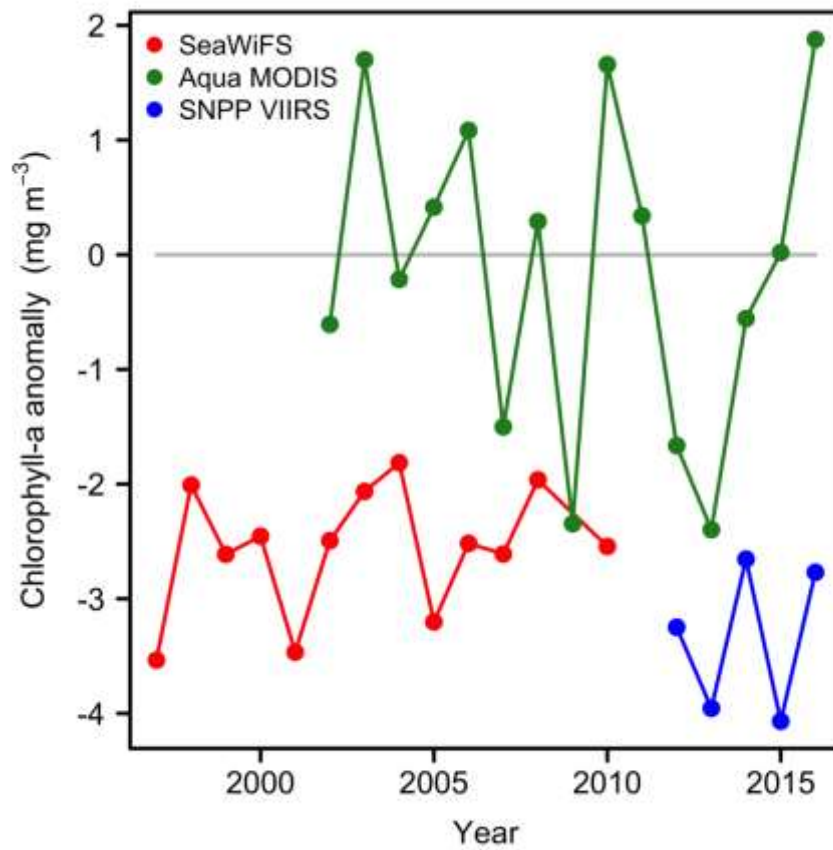


Figure S1. Time series of chlorophyll-a anomalies for the Peruvian Shelf derived from three satellite sensors. The geographic extent of averaging over the shelf is indicated in Figure 1d of the main manuscript. Anomalies are October monthly averages subtracted from the MODIS 2002–2016 October average.

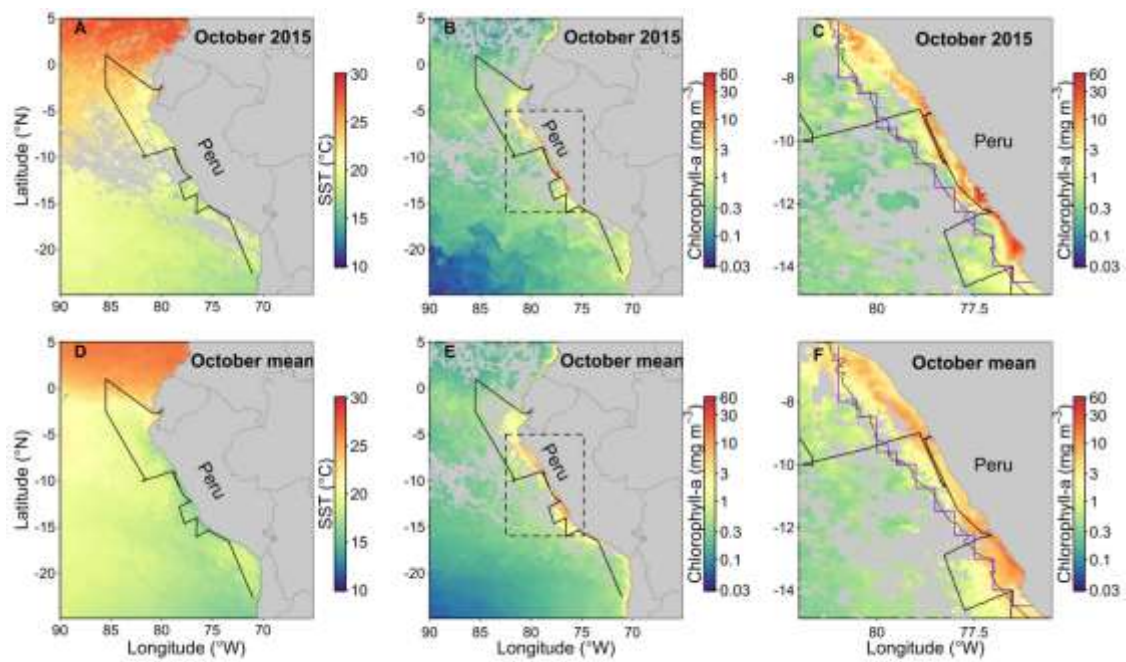


Figure S2. Sea surface temperature (SST) and chlorophyll-a distribution (all MODIS Aqua). (a–c) Satellite-derived October 2015 and SST and chlorophyll-a. (d–f) 2002–2016 October average SST and chlorophyll-a. These data were used to calculate the anomalies presented in Figure 1 of the main manuscript. Light grey pixels over ocean indicate no data. Boxed regions in ‘b’ and ‘e’ are enlarged in ‘c’ and ‘f’ to highlight chlorophyll-a over the Peruvian shelf. The black line indicates the SO243 cruise transect. In ‘c’ and ‘f’ the dark grey line is the 1 km depth contour and the purple line highlights the region used for calculating shelf-averaged chlorophyll-a anomalies discussed in the main manuscript text and shown in Figures S1 and S4.

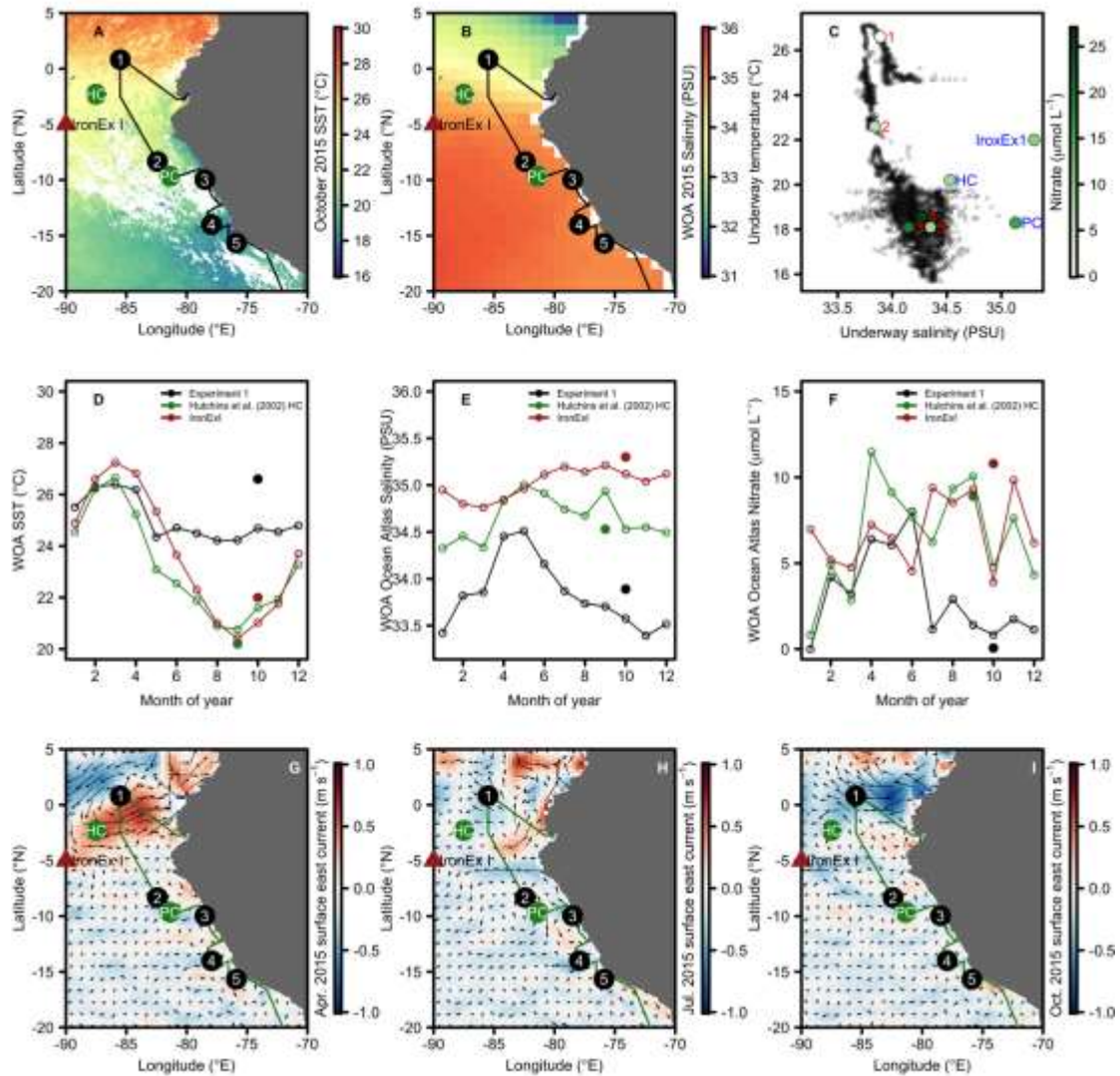


Figure S3: Hydrographic differences between the site of Experiment 1 (this study) and Fe enrichment experiments previously conducted nearby. HC: Humboldt Current bottle enrichment site in *Hutchins et al.* [2002], IronEx I: mesoscale iron enrichment experiment [*Martin et al.*, 1994]. Although in the vicinity of the two previously conducted sites, climatological data suggest the Experiment 1 site is bathed in warmer (a, c, d), fresher (b, c, e), lower nutrient (f) waters from July–December. During the October 2015 occupation of the Experiment 1 site, waters were 1.9 °C warmer than climatological average (d) and nitrate concentrations were 0.76 $\mu\text{mol L}^{-1}$ lower than the climatological average (f); filled symbols indicate cruise measurements from the three experimental sites. Near-surface current estimates from OSCAR (Ocean Surface Current Analysis Real-time; <https://podaac.jpl.nasa.gov/>) indicate the Experiment 1 site to be within a westerly flowing current originating from the North East in October (data October 6–10th 2015) in comparison to an easterly flowing current in April (data April 7–11th 2015) (g–i).

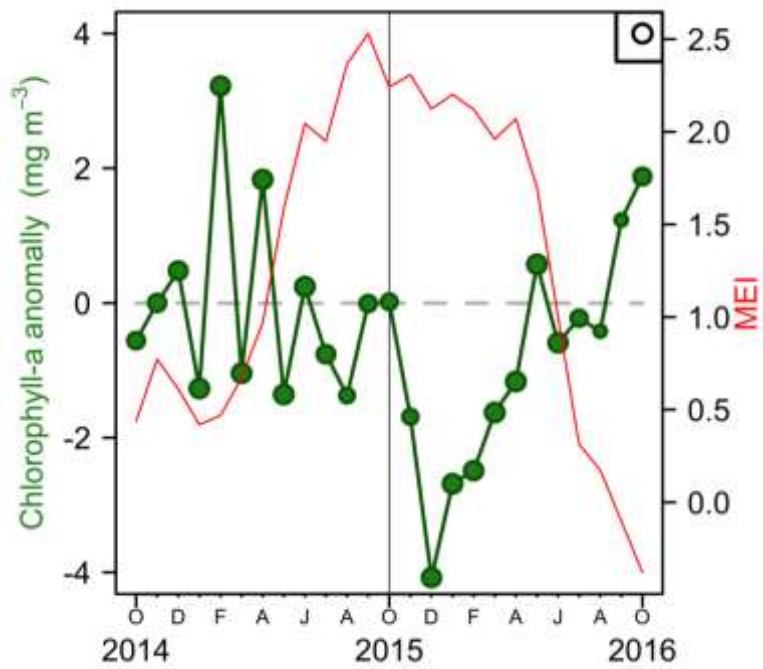


Figure S4. Monthly-resolved satellite-derived chlorophyll-a anomalies for the Peruvian Shelf. Chlorophyll-a anomalies (green) are from MODIS and were calculated by subtraction from the 2002–2016 MODIS October chlorophyll-a average (both averaged over the same region defined in Figure 1d in the main manuscript). The red line shows variability in the Multivariate ENSO Index (MEI) over the same time period and the full vertical line highlights the month of the SO243 research cruise (October 2015).

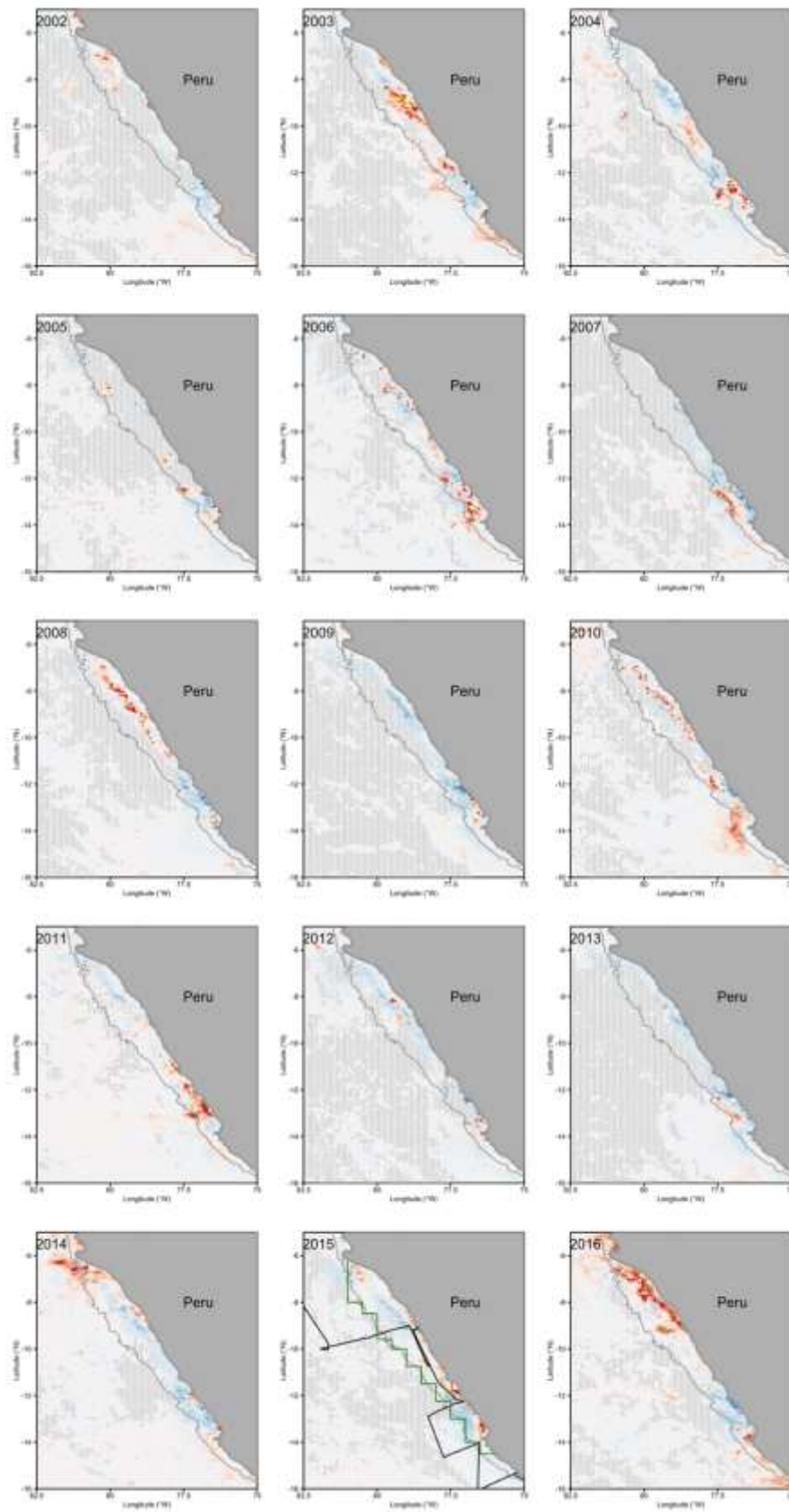


Figure S5. Interannual spatial variability in October chlorophyll-a anomalies over the Peruvian Shelf. As for Figure 1d in the main manuscript but for all years of the MODIS record (2002–2016).