Spatio-temporal variability of surface water pCO2 and nutrients in the tropical Pacific from 1981 to 2015

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We present a synthesis of surface water partial pressure of CO_2 (pCO_2) and nutrient observations in the tropical Pacific from 1981 to 2015. The e-folding scale for interannual variability of pCO_2 is estimated to be 6˚ in latitude, 13˚ in longitude, and 2 months with a signal-to-noise ratio of 4. When El Niño occurs, pCO_2 along the equator is reduced due to weakening of the easterly wind and reduced upwelling of CO_2 rich subsurface water. The surface seawater pCO_2 trend is positive in all regions with an area average of 1.8 ±0.1 μatm/yr. However, along the equator the trend is > 2 μatm/yr linked to the Pacific Decadal Oscillation forcing. Surface nutrient concentrations in the central to eastern tropics along the equator decreased during El Niño periods, but there are not enough data to characterize the trends of nutrients in the tropical Pacific.

