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Net primary productivity, upwelling and coastal currents in the Gulf of Ulloa, Baja California, Mexico

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The Gulf of Ulloa, a highly productive area off the western coast of the Baja California Peninsula, is examined for five successive years (2003–2007) by using satellite data and seasonal net primary productivity (NPP) estimates obtained from a vertical generalised production model. The results identify that northwestern winds blow parallel to the coast throughout the year. However, highest NPP occurs from March to June. During this period, an equatorward coastal current transports water from neighbouring upwelling areas to the northern Gulf of Ulloa and in combination with local upwelling, which injects nutrients into the euphotic zone, produce the observed increase in NPP. The opposite situation occurs in late summer when a warm poleward current of tropical characteristics arrives and inhibits the productivity in the whole region and generates the yearly lowest NPP levels. Our findings reveal the importance of lateral advection in the modulation of the primary productivity in this subtropical upwelling region.

Palabras clave: Phytoplankton, California Current, Remote sensing