

# A satellite study of coastal Kelvin waves off the South American coast-biological implications

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## *INTRODUCTION*

We investigate the propagation of coastal Kelvin waves and the biological implications of the induced isopycnal displacement using coastal tide gauge data and remote observations of sea surface temperature (SST) and chlorophyll concentration. We use simple physical reasoning to quantify the vertical displacement of isopycnals and of the nutricline associated with wave propagation, the potential of these waves to lower water column stability (Richardson number) and to enhance vertical mixing, as well as the wave-associated transport for case studies at different locations. Expected changes in nutrient supply due to deformations of the nutricline are compared with satellite ocean color observations.

## *PROPERTIES OF KELVIN WAVES AND CLIMATOLOGY*

A climatology of observed waves from tide gauge data is obtained for the period 1984-1999 to understand their wavelength, speed, physical structure, and the frequency of their occurrence. We then quantify the role of Kelvin waves in the observed variability of phytoplankton concentration and the expected implications down the food chain (i.e. fish).