

A comparison of spring coastal upwelling off central Chile at the extremes of the 1996-1997 ENSO cycle

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Southerly wind pulses are repeatedly observed in connection with upwelling off Point Curaumilla (33°S), around 20km south of Valparaíso. The remote forcing of coastal upwelling associated with intraseasonal coastal-trapped waves and the local, wind-driven upwelling forcing, are characterised there in terms of sea level, meteorological observations, surface weather charts and satellite-derived SST and chlorophyll a, from observations taken in late austral springs of 1996 (La Niña) and 1997 (El Niño). Warm and cold coastal SST periods lasting from 15 to 20 days are associated with intraseasonal (30-50-day periods) coastal-trapped waves which are detected in time series of adjusted sea level. These waves produce shoaling/deepening cycles in the thermocline depth and hence a modulation of the local wind-driven upwelling efficiency in bringing cold, nutrient-rich waters to the surface. The atmospheric forcing of the wind-driven upwelling pulses is closely related to atmospheric coastal-trap