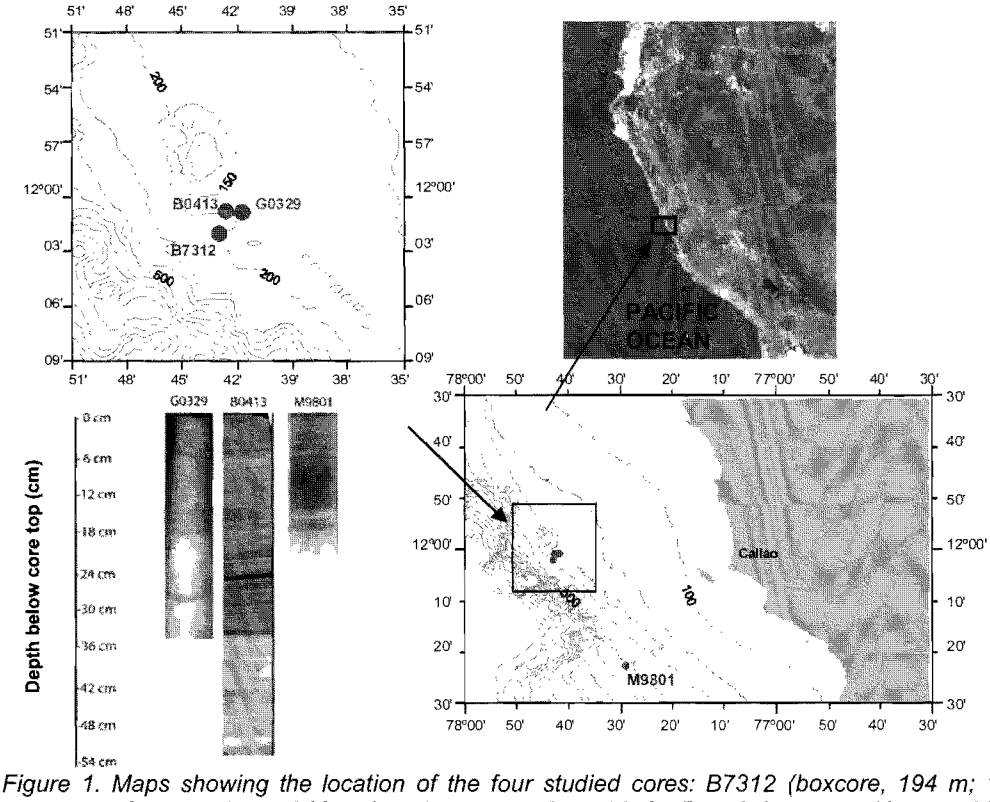

Figure 1. Maps showing the location of the four studied cores: B7312 (boxcore, 194 m; 1973), M9801 (multicore, 305 m; 1998), G0329 (gravity core, 179 m; 2003), B0413 (boxcore, 184 m; 2004), and X-ray radiographies of three of them.

HCS195 - Is long-term warming off the coast of Peru similar to that of the North Pacific?

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Keywords: Sea Surface Temperature, winds, warming, trend, Puerto Chicama

The Humboldt Current Ecosystem (HCE) is affected by large-scale climate forcing on multiple timescales. Although large decadal changes in the HCE have been observed in instrumental records, the nature of decadal-scale variability and the relative influence of the warming trend are unclear.
We examine the relative roles of decadal variability and the secular trend in Sea Surface Temperature (SST) and wind stress records from both coastal shore stations and oceanic data from International Comprehensive Oceanic and Atmospheric Database (ICOADS) off the coast of Peru. The longest coastal SST series comes from Puerto Chicama, Peru (8°S), spanning 1925- 2005, while other coastal monthly time series are from 1950-2005. Both interpolated ICOADS data products and the non-interpolated historical observations are examined from 1900-2005. These series are then compared with other SST series from the central and North Pacific. Measured SST variability is also placed in perspective of longer term variability with historical records from corals and marine sediments.
Decadal-scale variability in SST off Peru shows a similar correlation with the Pacific Decadal Oscillation (PDO) as other regions of the North Pacific. However, ICOADS SST data off Peru show a more clear secular warming trend and correlation with the PDO than coastal SST stations. We discuss the possibility that the lack of a trend in coastal SST stations may result from a concurrent increase in alongshore winds as well as the possibility that changes in data observation quality and interpolations have biased the trends in SST and alongshore winds. In contrast to the dominant interannual variability off the coast of Peru, SST records in the California Current have both a relatively greater proportion of variability associated with the PDO and a more coherent secular warming trend between coastal SST stations and COADS based data.
Paleoceanographic records from the California Current and tropical Pacific indicate that the warming since the mid-1970s is unlike prior decadal and centennial-scale variations and is best explained by the accumulation of greenhouse gasses in the atmosphere. This warming in the California Current occurs

despite an apparent increase in alongshore wind stress. A trend towards increasing wind stress and upwelling off California and Peru may be related to the increased atmospheric pressure gradients associated with 20th century warming. However, the relative influences of wind-induced upwelling and ocean-atmosphere heat exchange differ between the regions.

HCS053 - Interannual Variability of the Humboldt Peru/Chile Current System in 1997-98: a Modeling Study Using ROMS.

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Keywords: ENSO, Humboldt, Interannual Variability, Lagrangian Diagnostics, Mesoscale Processes, Numerical Modeling.

The Humboldt Peru/Chile Current System, flowing along the South American West Coast (SAWC) is the most productive eastern boundary current system. It is also the only upwelling region in direct connection with the equatorial ocean. A high resolution regional model (ROMS, 7km) encompassing the whole SAWC and its equatorial surroundings is used to investigate the mean circulation and mesoscale activity with a special focus on near-shore dynamics (i.e., within 300km from the shore). We assess the interannual variability by carrying out a downscaling experiment where boundary conditions are provided by a lower resolution basin-scale model of the Pacific. This framework allows us to investigate how low-frequency equatorial signal affect the SACW through poleward propagation of Kelvin-wave like anomalies. We focus on the 1997/98 El Niño event because it had an unambiguous signature and was well sampled both with in-situ and satellite measurements. The model captures well the strong double-peak signal of this ENSO event and reveals significant changes in the ocean state and dynamics.
We discuss the implication of this Niño event with a focus on near-shore mesoscale activity. In particular, the changes in dispersion, retention and advection are determined with the help of LaGrange diagnostics.

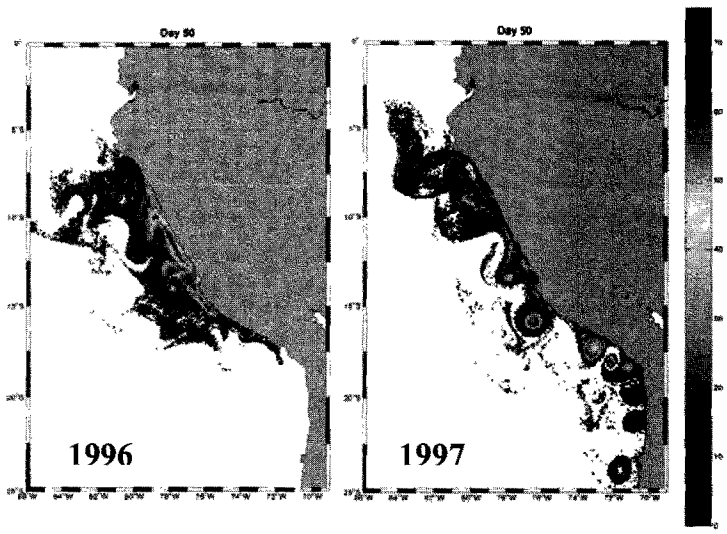

Figure1: 100000 LaGrange particles initially released over the Peruvian shelf and advected by the numerical model during 50 days. Release in May 1996 (left panel) and May 1997 (right panel). Colorscale is for particles concentration (per model grid cell).

HCS092 - Understanding the coupled dynamical/biogeochemical processes at seasonal time scale in the Humboldt Current System: comparison of model results to recent IMARPE data.

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The Humboldt Current System thrives one of the richest ecosystems in the world. Located in an upwelling region where vertical velocity brings nutrient rich waters to the enlighted surface layers, primary productivity is very high and a large amount of organic matter is generated and exported to the deep ocean. In subsurface layers, a zone of suboxic to anoxic waters appears in part due to the local intense remineralisation of organic matter and to the low rate of ventilation. However, the processes that control the spatial and temporal variations of this high productivity are not well known.

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