

## HCS072 - A Lagrangian study of the PCUC source waters

Marie Croquette, Gérard Eldin

LEGOS (Laboratoire d'Etudes en Géophysique et Océanographie Spatiales), 14 avenue Edouard Belin, 31400 Toulouse [tel : +33 5 61 33 30 56, e-mail : marie.croquette@notos.cst.cnes.fr], [tel : +33 5 61 33 28 72, e-mail : gerard.eldin@cnes.fr]

Key words: Lagrangian, undercurrent, upwelling, model, source water

The ROMS (Regional Ocean Modeling System) sigma-coordinate model was run in a configuration from 5°N to 35°S, including both Peru and Chile basins to 99°W, to study the origins of the PCUC (Peru-Chile UnderCurrent) and coastal upwelling waters. To allow computation on that large spatial domain, resolution was limited to 1/6° and time period to 2000 - 2004. The model was forced with daily QuikSCAT winds and boundary conditions prescribed by ECCO (Estimating the Circulation and Climate of the Ocean) model results.

To compute trajectories, an offline algorithm allowing backward calculation [Blanke and Raynaud, 1997] was used on the mean state and climatology derived from that interannual simulation. Particles were initially located along the Peru and Chile coasts in the core of the PCUC and at the surface. A backward integration then permitted to evaluate the particles origins. 3 sources were identified: the SSCC (South Subsurface Counter Current or Tsuchiya jet), the lower part of the EUC (Equatorial Under-Current) below 100 meters, and a subsurface current coming from the south of the region. This current is probably part of the south-east gyre return branch and is characterized by an extremely low salinity. This water mass has the properties of the Eastern South Pacific Intermediate Water (ESPIW) [Schneider et al, 2003]. Transport was computed to quantify the relative contribution of each source. The EUC brings about 1.8 Sv of water which mainly upwells along the Peru coast. The Southern branch brings around 0.4 Sv; only along the Chilean coast at about 30°S. The SSCC is the main source of water with more than 3 Sv. Part of this water upwells along the Peru coast but another part (0.7 Sv) flows south of 18°S in the Peru Chile undercurrent. Moreover, 2 distinct cores were identified in the SSCC, (around 4°S and 8°S at the western boundary of the model) in agreement with previous observations [Rowe et al 1999]. The first core (4°S) mainly feeds the Peru upwelling whereas the second (8°S) also feeds the Chile undercurrents and upwelling.

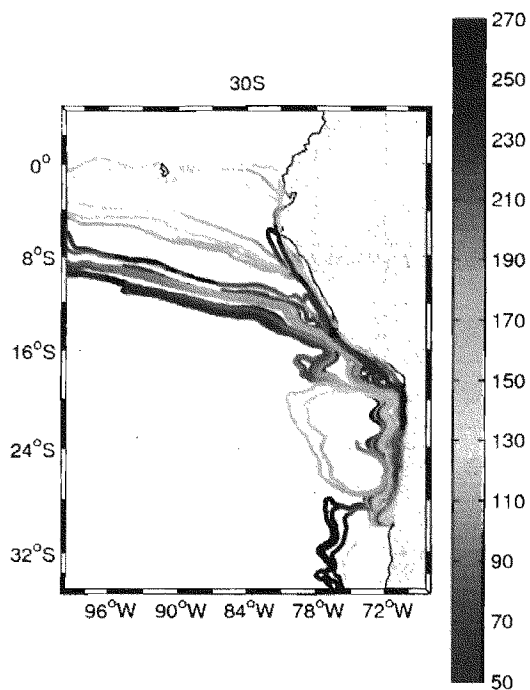


Figure 1: Backward trajectories of particles initially positioned in the PCUC core at 30°S. Colours represent depth.

## HCS095 - Statistical study of mesoscale characteristics in the Eastern-South Pacific. A review based on different approaches

Alexis Chaigneau<sup>1</sup>, Carmen Grados<sup>2</sup>, Oscar Pizarro<sup>2</sup>, Boris Dewitte<sup>2,3</sup>, Luis Vasquez<sup>2</sup>

<sup>1</sup>IRD, IPSL-LOCEAN, UMR CNRS / Université P. et M. Curie / IRD / MNHN, 75005 Paris, France. [e-mail: alexis.chaigneau@ird.fr]

<sup>2</sup>IMARPE Esquina Gamarra y General Valle S/N Chuchito Callao Peru

<sup>3</sup>IRD Teruel 357 Miraflores Lima-Peru

Keywords: Eastern South Pacific; Mesoscale characteristics; Satellite altimetry; Lagrangian drifters; Spatio-temporal variability.

Croquette M., Eldin Gérard. (2006)

A Lagrangian study of the PCUC source waters

In : *Climate ocean dynamics, ecosystem processes and fisheries : the Humbolt current system : book of extended abstracts*

La Paz (BOL) ; La Paz : IMARPE ; IRD, p. 41

International Conference on The Humboldt Current System : Climate, Ocean Dynamics, Ecosystem Processes and Fisheries, Lima (PER), 27/11/2006-01/12/2006.