The impact of 2015-2017 El Niño on the Regional Ocean Variability off Peru: A case study

Regional Ocean Variability: Research CNR3070 VOCES- IAI

What is the regional coverage of observational climate data for research, and what are the gaps?

The relative ecosystem service of frontal areas in the South West Atlantic Large Marine Ecosystems

www.iai.int/?p=2608&lang=en#unique-identifier

Valla and Piola in 2015 showed the rate of sea surface temperature (SST) change and surface chlorophyll difference over 10 days perio during cooling events.

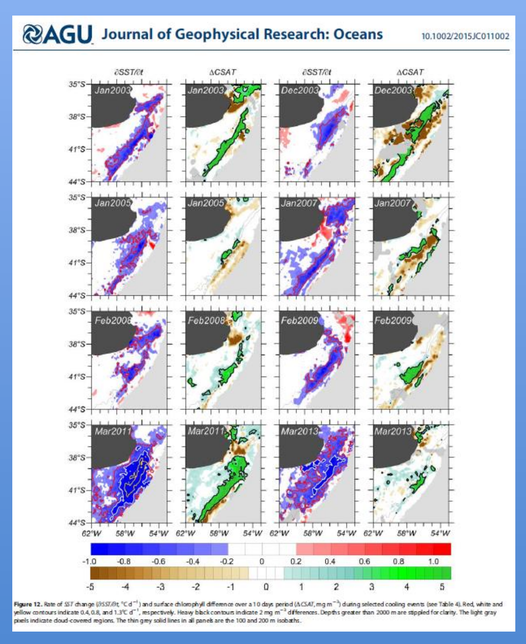


Figure 12. Rate of SST change ($\delta SST/\delta t$, °C d^{-1}) and surface chlorophyll difference over a 10 days period ($\Delta CSAT$, mg m^{-3}) during selected cooling events (see Table 4). Red, white and yellow contours indicate 0.4, 0.8, and 1.3°C d^{-1}, respectively. Heavy black contours indicate 2 mg m^{-3} differences. Depths greater than 2000 m are stippled for clarity. The light gray pixels indicate cloud-covered regions. The thin grey solid lines in all panels are the 100 and 200 m isobaths.

What scientific information on downscaling is available for provision of regional and national scale climate scenarios?

papers

in situ data, world ocean data base

List of some publications

[Acha et al.2015]Acha, E. M., Piola, A. R., Iribarne, O., and Mianzan, H. (2015). *Ecological Processes at Marine Fronts*. Springer International Publishing, Cham.

[Alemany et al.2014]Alemany, D., Acha, E. M., and Iribarne, O. (2014). Marine fronts are important fishing areas for demersal species at the argentine sea (southwest atlantic ocean). *Journal of Sea Research*, 87:56–67.

[Carreto et al.2016]Carreto, J. I., Montoya, N. G., Carignan, M. O., Akselman, R., Acha, E. M., and Derisio, C. (2016). Environmental and biological factors controlling the spring phytoplankton bloom at the patagonian shelf-break front – degraded fucoxanthin pigments and the importance of microzooplankton grazing. *Progress in Oceanography*, 146:1–21.

[Guerrero et al.2014]Guerrero, R. A., Piola, A. R., Fenco, H., Matano, R. P., Combes, V., Chao, Y., James, C., Palma, E. D., Saraceno, M., and Strub, P. T. (2014). The salinity signature of the cross-shelf exchanges in the southwestern atlantic ocean: Satellite observations. *Journal of Geophysical Research: Oceans*, 119(11):7794–7810.

[Marrari et al.2016]Marrari, M., Piola, A. R., Valla, D., and Wilding, J. G. (2016). Trends and variability in extended ocean color time series in the main reproductive area of the argentine hake, merluccius hubbsi (southwestern atlantic ocean). *Remote Sensing of Environment*, 177:1–12.

[Matano et al.2014]Matano, R. P., Combes, V., Piola, A. R., Guerrero, R. A., Palma, E. D., Strub, P. T., James, C., Fenco, H., Chao, Y., and Saraceno, M. (2014). The salinity signature of the cross-shelf exchanges in the southwestern atlantic ocean: Numerical simulations. *Journal of Geophysical Research: Oceans*, pages 7949–7968.

[Mianzan et al.2014]Mianzan, H., Quiñones, J., Palma, S., Schiariti, A., Acha, E. M., Robinson, K. L., and Graham, W. M. (2014). Chrysaora plocamia: A poorly understood jellyfish from south american waters. In Pitt, K. A. and Lucas, C. H., editors, *Jellyfish Blooms*, pages 219–236. Springer Netherlands.

[Quiñones et al.2015]Quiñones, J., Mianzan, H., Purca, S., Robinson, K. L., Adams, G. D., and Acha, E. M. (2015). Climate-driven population size fluctuations of jellyfish (chrysaora plocamia) off peru. 162(12):2339–2350.

[Valla and Piola2015]Valla, D. and Piola, A. R. (2015). Evidence of upwelling events at the northern patagonian shelf break. *Journal of Geophysical Research: Oceans*, 120(11):7635–7656.

2015-2017 El Niño impacts on Productivity and Peruvian fisheries

1. Climate scenarios

El Niño canonical

cold

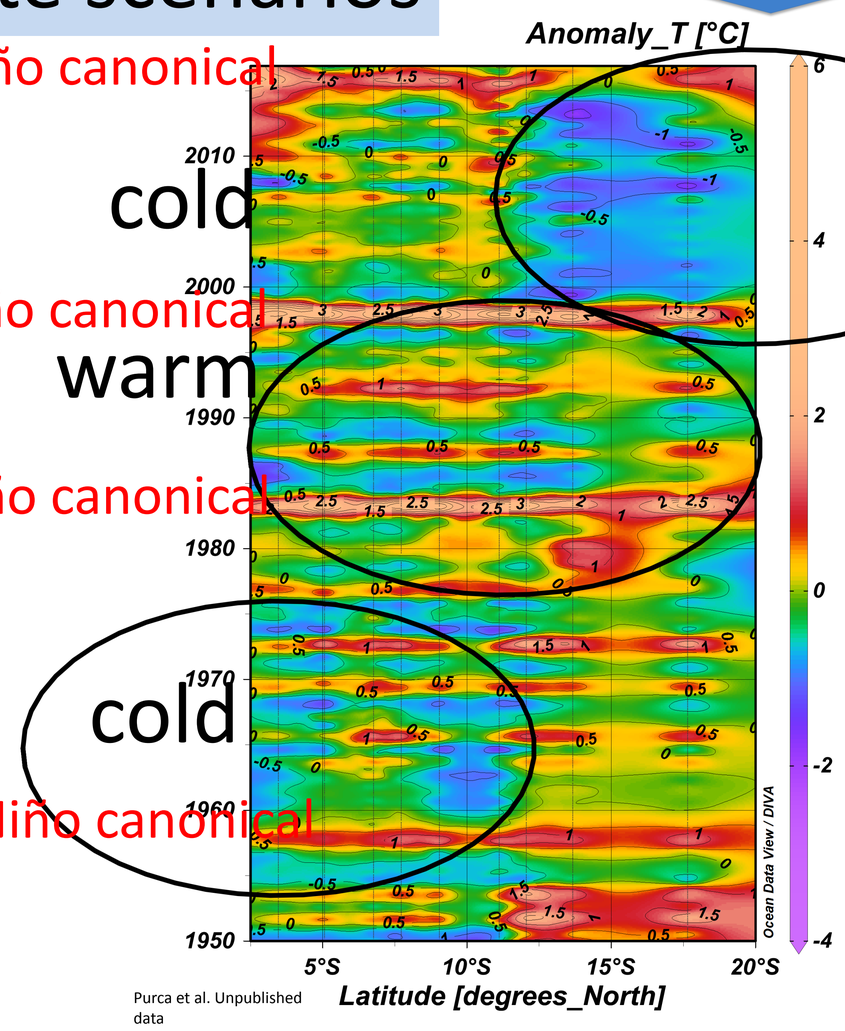
El Niño canonical

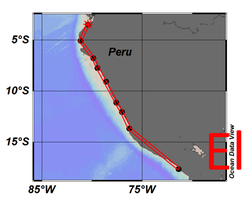
warm

El Niño canonical

cold

El Niño canonical





Purca et al. Unpublished data

2. Ecological and fisheries response

TIME SERIES OF JELLYFISH ABUNDANCES

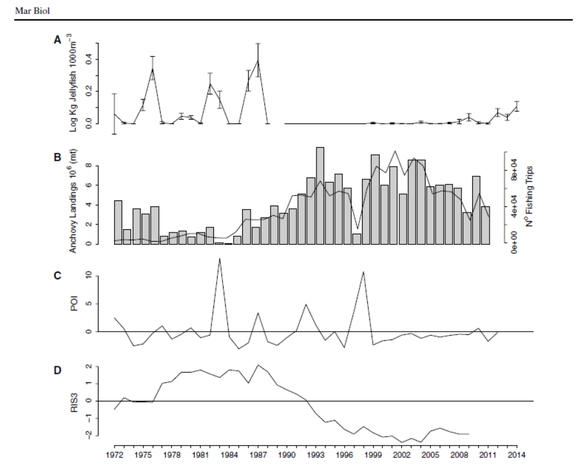
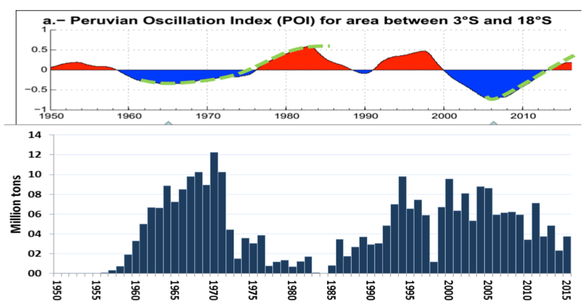


Fig. 2 Time series of jellyfish (*Chrysaora plocamia*) abundances for the period 1972–2013 expressed as kg jellyfish 1000 m^{-3}; abundances were log-transformed (a); Anchovy (*Engraulis ringens*) landings expressed in million tons, and number of fishing trips (1972–2011) (b); Peruvian Oscillation Index (POI) time series (1972–2012) (c) and Regime Indicator Series (RIS3) (1972–2009) (d)

Quiñones et al. 2017

LANDINGS OF ANCHOVETA



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