Session: C14 Poster: T27B

The Peruvian ocean observing system : A synthesis and challenges

Maria del Carmen Grados Quispe[†]; Alexis Chaigneau; Luis Vasquez; Noel Dominguez; Vincent Echevin; Alice Pietri; Pierre Testor; GÈrard Eldin; Marie Le Texier
[†] IMARPE, Peru
Leading author: cgrados@imarpe.gob.pe

We present the current state of the Peruvian Ocean Observing System as well as the main results obtained from various datasets. The aim of this study is to summarize the recent efforts that lead to a better understanding of the Northern Humboldt Current System (NHCS) from the large-scale to submesoscale dynamics. The long-term oceanographic observational program off Peru consider two networks of coastal multidisciplinary (1960 to present) and ocean-meteorological (2000 to present) stations at 9 selected sites along the Peruvian coast. These 2 networks are under the administration of the Marine Research Institute of Peru (IMARPE) and the Direction of Hydrography and Navigation (DHN), respectively. Long-term ship-based observations mainly consist of (i) three long-term (1992 to present) multidisciplinary cross-shore sections at 5oS, 7oS and 12oS, (ii) regularly scheduled research fishery assessment cruises covering the entire Peruvian coast (1960 to present), (iii) some dedicated surveys and (iv) an annual oceanographic cruise (1998 to present). The latter is part of the Southeastern Joint Oceanographic Research Survey, a regional initiative coordinated by the South Pacific Permanent Commission (CPPS). Fixed moorings (1999-2009) and new available technologies such as autonomous underwater vehicles (glider) were also deployed for short periods. Thus, a complete set of physical, biogeochemical, paleo-oceanography, biological and fishery hydroacoustic data has been collected by IMARPE at different spatio-temporal scales. These data are, for instance, currently used to prevent societal and economic impacts of extreme events such as El Niño Southern Oscillation events, a priority task for the Peruvian Government. Based on 50 year of in-situ data collected by IMARPE and the available NODC and ARGO profiles in the NHCS, we constructed a high-resolution (0.1ox0.1o in latitude-longitude) monthly climatology of hydrographic properties. This climatology allows describing the near-coastal properties of the NHCS and reveals interesting features such as distinct upwelling centers and frontal zones that are subject to a well-defined seasonal signal affecting both the water mass properties and the coastal circulation. At mesoscale, a composite analysis of the available ARGO profiles in the NHCS shows key differences in the thermohaline vertical structure between cyclonic and anticyclonic eddies and allows an estimate of the heat and salt cross-shore transports associated with these structures. Finally, at submesoscale, glider-based observations in the Pisco-San Juan upwelling region, revealed small-scale bio-physical coupling and suggested the presence of ageostrophic circulation cells forced by down-front winds. Challenges to establish sustained observation systems are discussed and future actions are presented.