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Abstract title
Recent climate change forcings on coastal upwellings and artisanal fishery of *Sardinella aurita* in Venezuela

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**Abstract**

The southern Caribbean Sea comprises a unique wind-driven upwelling system, located near the equator (10-12° N) and zonally oriented, encompassing primarily the coasts of the Bolivarian Republic of Venezuela and, to a lesser extent, the Caribbean coasts of Colombia and Trinidad island. The most important small pelagic in this upwelling system is the Spanish sardine, *Sardinella aurita*, which inhabits the colder and plankton rich waters typical of the upwellings, mainly in the northeast Venezuela. Since 2005 the populations of this ecologically and fishery important forage fish have seriously declined. In this work we assembled several time series of sea surface temperature (SST) and wind field in the southern Caribbean to achieve an oceanological framework to explain these changes. Data were obtained from daily resolution observations-based products (NOAA OISST, NOAA Coral Reef Watch-SST, and NOAA NCEI Blended Seawinds), as well as reanalysis (ECMWF ERA5). Decomposition of additive time series analyses were performed in R. We have found a decreasing trend (-0.006 to -0.01 m.s-1 per year) in surface wind speed since 1987, drastically accentuated after 2022. Since 2000 there is also a clear increase trend on SST (0,012 to 0,27 °C per year), with historical maximum recorded in 2024. Furthermore, the spatial distribution of upwelling plumes with SST <25 °C has been drastically reduced. Altogether, these oceanological forcings fueled by climate change have affected the dynamics of coastal planktonic and small pelagic communities. Since 2022, there is an on-going national research program to *in situ* study the changes in the plankton and *S. aurita* dynamics, with the aim of establishing an adequate framework for its fishery management. This law-protected artisanal fishery is a very valuable source of high-quality, low-cost protein and its decline highlights the severe climate change impacts on Venezuelan coastal communities.

**Keywords**

“Coastal Upwellings”, “wind stilling”, “sea surface temperature”, “*Sardinella aurita*”.

**Biography** **(150 words limit):**

Dr. Alexis Bellorin, PhD in Sciences (São Paulo University-Brazil), researcher of the National Center of Research on Fishery and Aquaculture (CENIPA) of Fishery and Aquaculture Ministry - Venezuela. Main fields: marine biology and seaweed aquaculture.

Dr. Luis Manuel Hernández-Ramos, Dr in Sciences (Central University of Venezuela), researcher of the Scientific Computing Center, Faculty of Sciences, UCV. Main fields: Scientific Computing and Numerical Optimization.

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