EGU22-12401
https://doi.org/10.5194/egusphere-egu22-12401
EGU General Assembly 2022

A methodology to understand the wind-driven circulation in semi-enclosed bays and its connectivity with the open sea at the southern coast of France

Alejandro Caceres Euse, Natacha Bourg, and Anne Molcard
University of Toulon-France, Oceanography, Toulon, France (alejandro.caceres-euse@univ-tln.fr)

By applying an unsupervised neuronal network (NN) to sea velocity profiles and wind data, it was possible to determine the main wind-driven circulation patterns in the Toulon bay. In addition, the NN outputs were utilized to perform a conditional averaging to High-Frequency radar surface current data (HFR) and the atmospheric AROME model, in order to understand the connectivity between the inner Toulon bay circulation features and the offshore marine-atmospheric conditions. For instance, upwelling scenarios are observed under strong westerly winds, whereas the downwelling is present under easterly wind conditions. Additionally, a barotropic system is observed when weak-mid wind blows for long time periods, and first baroclinic modes occur under strong wind events. Up to date, few studies have presented a clear connectivity between semi-enclosed bays and the offshore conditions, particularly in the northwestern Mediterranean Sea. Thus, this methodology presents great advantages when trying to study the interaction between semi-enclosed bays and the open sea by means of a combination of several in situ meteo-marine information.