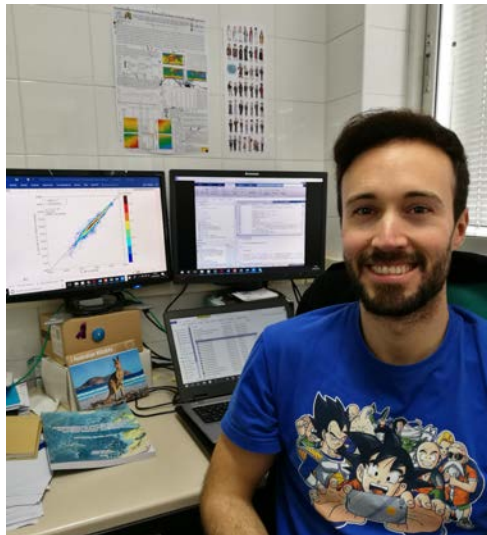


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 Research Area: 1.2 Chemical Oceanography



## PhD project: **The carbon cycle in the Iberian Upwelling Ecosystem**

Supervisors: Dr. Fiz Fernández Pérez (Marine Research Institute-CSIC)

**Summary:** The marine carbon cycle is a key elemental cycle of the ocean and, by virtue of its interaction with the atmospheric carbon dioxide, of fundamental significance for the Earth's climate.

This thesis aims to contribute to improving knowledge about the inorganic carbon chemistry in the ocean. In a first stage, global climatologies of the variables that describe this cycle (total alkalinity, total inorganic dissolved carbon, pH and pCO<sub>2</sub>) were designed through a neural network approach. The vertical and horizontal resolution of 102 depth levels in a 1°x1° grid will lead to a global assessment in detail. Furthermore, the use of these climatologies as initial conditions and validation sets in ocean biogeochemical models could reduce the uncertainties in the evaluations related to the climate change.

In a second stage, a physical ocean model (ROMS) will be coupled with a biogeochemical ocean model (PISCES) to evaluate the processes related to the inorganic chemistry in the Iberian Upwelling Ecosystem. Due to the complexity of the upwelling systems, this study will be conducted from large to small approach, that is, modelling the: 1<sup>o</sup>) Basin scale, 2<sup>a</sup>) Continental shelf scale and 3<sup>o</sup>) Estuary ("Ría") scale.

With the completion of the thesis, it is expected to offer a global and robust product that could be widely used by the scientific community. On the other hand, it is expected to improve the knowledge of the complex and dynamic upwelling systems.

