Cristina Garcia Fernandez
University of Vigo
Nationality: Spanish
Date doctoral degree: 01/12/2021

Orientation: Sustainable Use of Marine Resources
Specialization Area: Management and Use of Resources
Research Area: 2.3 Assessment of fish and shellfish resources

PhD project: **Ecology of recruitment in European hake: interaction between maternal effects, environment and fisheries**

Supervisors: Dr. Francisco Saborido Rey (IIM-CSIC)
Dr. Rosario Domínguez Petit (IEO-CSIC)

Summary: European hake (*Merluccius merluccius*) is an important fishery resource and a key species in the demersal marine ecosystems of the temperate regions of the NE Atlantic Ocean, where it has been intensively exploited. Based on its importance, it is essential to understand the recruitment dynamics. European hake is characterized by its high plasticity and adaptive capacity, which allows to modulate its vital traits according to changes in energy availability, environmental conditions and fishing pressure. The present study focuses on the southern stock, on the Galician shelf, where it has a protracted spawning period with three spawning seasons and great inter-annual variability. In this context, the different contribution of each spawning season to annual recruitment has never been studied, despite the relevant impact it may have on productivity and population dynamics. If these three spawning seasons correspond to one or several spawning sub-populations within the same stock was unknown. This PhD addressed the study of the factors influencing stock recruitment also taking into account spawning seasonality and from different approaches: the analysis of spawning dynamics, maternal effects and reproductive potential of the stock, environmental dynamics in the spawning area and the analysis of the factors driving recruitment over the last 35 years. Combining all the results, an overall picture of the dynamics of European hake recruitment and the main factors affecting it was obtained. Both the environment and fisheries play a relevant role in changes in recruitment levels as they affect the productivity of the stock. Furthermore, results suggest that the spawning stock is composed by different spawning sub-components, spawning in different seasons with different reproductive potential and, therefore, relative contribution to annual recruitment. Differences in the specific characteristics of each spawning component, such as oocyte dynamics, maternal effects on offspring or spawning intensity, would be the result of the adaptive capacity of this species. If the existence of distinct and isolated temporal components of spawning is confirmed, the inclusion of this temporal variability in fishery assessment models would reduce uncertainty and improve the predictive capacity of such models.