Búsqueda de candidat@s para tesis doctoral

DATOS GENERALES

Organización: AZTI Fundazioa (www.azti.es)
Ubicación: Herrera Kaia, Portualdea z/g 20110 - Pasaia (Gipuzkoa)
Supervisores: Maite Louzao mlouzao@azti.es, Guillemo Boyra gboyra@azti.es
Fecha límite: 21 de junio de 2018

DESCRIPCION DE LA BECA

Título: ***Understanding the 3D links between forage fish and top predators to advance ecosystem-based monitoring***

Descripción corta de la Beca:

The following PhD proposal will focus in understanding the links between forage fish and top predators to advance ecosystem-based monitoring in the Bay of Biscay. This PhD will be divided in four different chapters:

Chapter 1. Applying machine learning algorithms to identify small pelagic fish schools

Acoustic techniques are necessary for stock assessments and behavioural studies of many fish species, providing high sampling resolution in both vertical and spatial domains. However, acoustic techniques need to be combined with trawl fishing and trained experts to identify fish species, aided by additional criteria such as school depth range and behavioural patterns, which is highly time consuming. By applying machine learning algorithms (e.g. support vector machines; Robotham et al., 2010) to identify small pelagic fish schools, we will assess the advantage of the automatic analysis of echograms to identify small pelagic fish schools in the BoB based on different acoustic characteristics such as morphology, depth range, bathymetry, acoustic energy and geographical coordinates.

Chapter 2. 3D charaterisation of pelagic fish schools in temperate pelagic ecosystems

Pelagic fish school dynamics depends not only depends on internal factors (e.g. species, number of fish, physiological status) but also on external factors (e.g. oceanography). In addition, the presence of predators could also influence the fish schooling behavior. Within this framework, fish school characteristics (morphology, depth range, bathymetry, acoustic energy and geographical coordinates) will be analysed jointly with 3D oceanographic data and predator abundance to characterise their 3D pelagic habitat in a productive ecosystem of temperate latitudes.

Chapter 3. 3D connection between forage fish and top predators

Accounting for spatial overlap between species is crucial in developing ecosystem based fisheries management to secure both prey and predator population viability. One of the main advantages of multidisciplinary oceanographic surveys is the possibility of considering not only the spatial dimension but also the vertical dimension of pelagic species. Prey availability depends on abundance, predictability, degree of aggregation, accessibility and depth range. Here, we will develop a multivariate analysis to analyse the 3D connections between forage fish and top predators based on the JUVENA multidisciplinary surveys, which covers both shelf, slope and oceanic ecosystems. We hypothetise that different species could use resources from different habitats generating significant links across systems.

Chapter 4. Are forage fish schools driving the spatial abundance patterns of top predators?
Most studies assessing the oceanographic habitats of marine predators have been based on surface oceanographic conditions, and recent studies have suggested the importance of depth distribution of prey and sub-surface oceanographic processes in understanding predator distribution patterns. Therefore, preyscape and oceanographic descriptors developed to characterise the vertical dimension could be of vital importance. In addition, defining biologically meaningful depth ranges (e.g. considering prey accessibility) to describe preyscape and oceanography can be a critical step in understanding predator abundance pattern. We will develop Generalized Additive Models to disentangle the effect of the 3D prey environment and the 3D ocean dynamic environment at different depth ranges, as well as static variables, on driving the spatial abundance of marine predators.

In order to advance conservation and management efforts, the European Union has adopted the Marine Strategy Framework Directive (MSFD, Directive 2008/56/EC) with the objective of achieving or maintaining Good Environmental Status (GES) of European waters by 2020. In order to help Member States assess and achieve GES in their waters, the European Commission has provided descriptors, criteria and methodological standards (2008/56/EC, COM Dec; 2010/477/EU). The JUVENA (and potentially BIOMAN) multidisciplinary survey series will constitute the main data sources for the project. The main objective of both projects is to characterise the functioning of the pelagic ecosystem in the Bay of Biscay, using multidisciplinary tools that allow information on the spatial distribution and abundance of phytoplankton, zooplankton, small pelagic fishes and marine top predators, as well as different oceanographic variables important for the characterising the pelagic realm to be collected simultaneously.

Requisitos:

Para ello se busca un perfil que cumpla con los siguientes requisitos:

- Titulación y Especialidad: Licenciatura en Ciencias del Mar, Biología, C.C. Ambientales, Geografía, Matemáticas, Física o similar.
- Nota media superior a 7.5.
- Idiomas: alto nivel de inglés.
- Estar empadronada en un municipio de la Comunidad Autónoma del País Vasco en el momento de la solicitud y, al menos, desde el 1 de enero de 2018. Para más detalles

específicos consultar las bases de la convocatoria http://www.euskadi.eus/informacion/ayudas-al-personal-investigador-programa-predoctoral/web01-a3predoc/es/

- Se valorará:

1. Se valorará que el contenido del Máster incluya formación en aspectos de ecología de peces pelágicos, depredadores, técnicas acústicas, modelización espacial, gestión pesquera y se haya desarrollado un proyecto Fin de Máster en la misma temática.

2. Además se valorarán:

    - Conocimientos y experiencia en Sistemas de Información Geográfica (ArcGIS o Quantum GIS)
    - Programación y análisis estadístico en R.
    - Gestión y administración de bases de datos.
    - Participación o colaboración en proyecto o iniciativas relacionados con aspectos de la conservación y gestión del medio marino.

- Otros

El candidato/a deberá tener disponibilidad para viajar a congresos/ reuniones regionales/nacionales/internacionales para presentar los resultados obtenidos en el desarrollo de la presente Tesis.