ASCOBANS Common Dolphin Group

Spanish activities – IIM CSIC

Ongoing projects, etc., at IIM CSIC (Spain)

- SEACHANGES Marie Curie network – Marie Petitguyot PhD (year 2)
- TRANSITION (Spanish Plan Nacional Project) – contaminant flows
- Paula Gutierrez PhD – dolphin distribution (almost finished)
- Alberto Hernandez PhD – dolphin diet (almost finished)
- Andrea Fariñas PhD – Threats to dolphins (linked to TRANSITION) (started)
- CetAMBICion – proposal on Cetacean bycatch monitoring and mitigation

TRansfers of Anthropogenic and Natural Stressors Involving Trophic Interactions of Ocean Nekton (TRANSITION) (2019-2021)

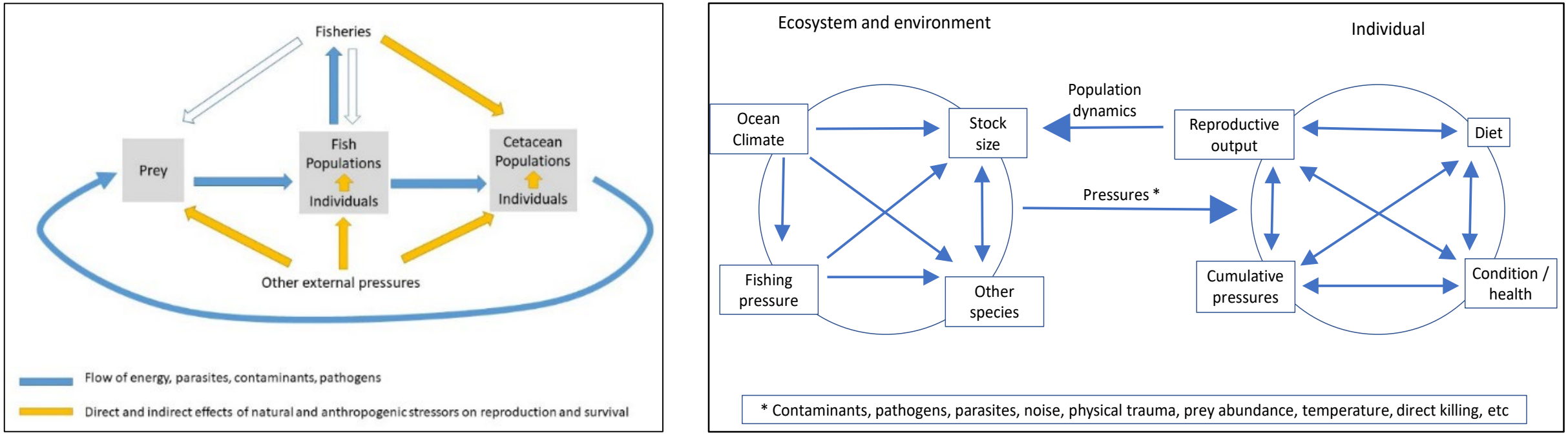
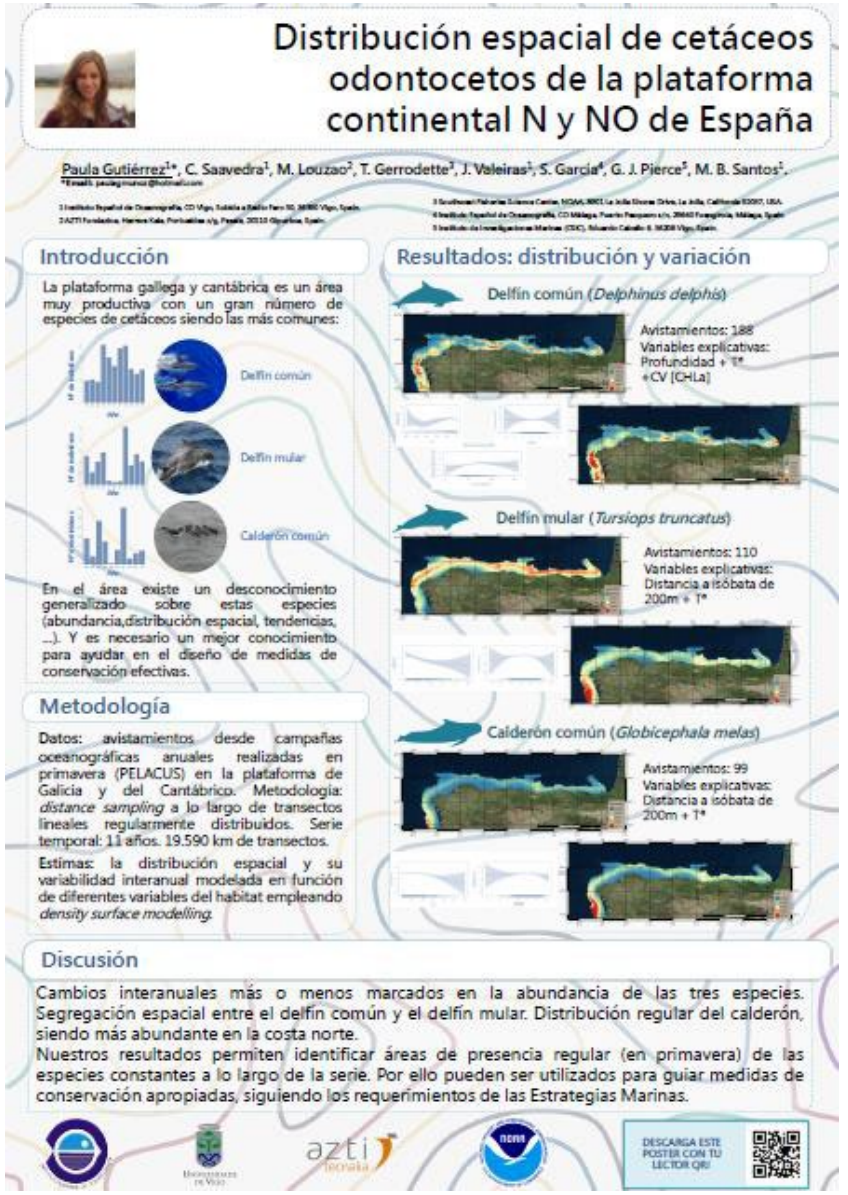


Figure 1. Conceptual views of a Model of Intermediate Complexity for Ecosystem Assessment (MICE) in which trophic links transfer not only energy but also parasites, contaminants and pathogens; a model which explicitly considers stressor effects on individuals and populations: (left) the main compartments and (right) parameters and relationships within compartments, including relationships with the biotic and physical environment.

Paula Gutierrez PhD

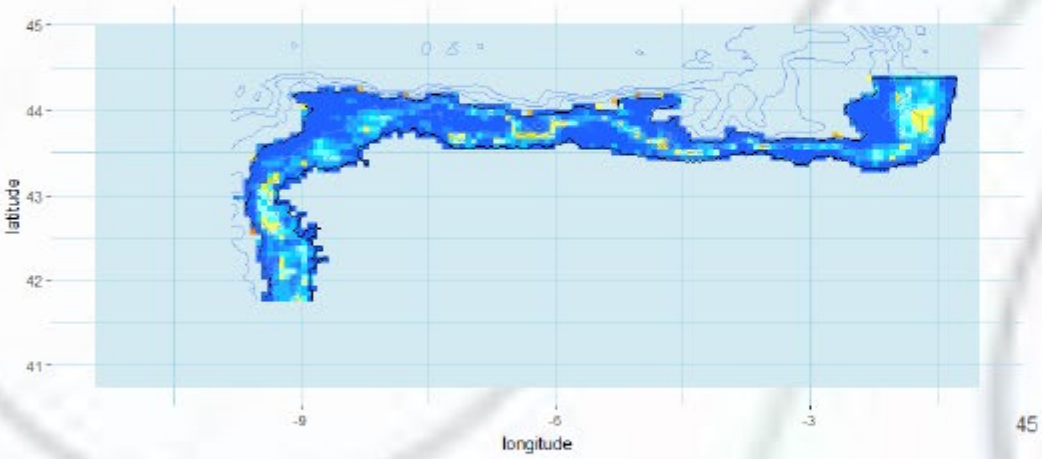
MODELLING DISTRIBUTION AND HABITAT USE OF CETACEAN SPECIES OF CONTINENTAL SHELF WATERS OF THE NORTHEAST ATLANTIC

Nº	CHAPTER	DATA USED	METHODOLOGY
1	Introduction	Bibliography	Literature review
2	Habitat and abundance modelling. Cetaceans N & NW Spain	Survey PELACUS	Distance Sampling
3	Analysis of coastal cetacean sightings data	sea watch FOUNDATION	GAMs, Mixed Models & GEEs
4	Analysis of coastal cetacean sightings data of Scotland	WDC WHALE AND DOLPHIN CONSERVATION	GAMs, Mixed Models
5	Study of the relationship between fin whale presence and their preys	SCANS-III & CODA	GAMs / MaxEnt
6	Analysis of opportunistic cetacean and birds sightings data in the North Sea	NORTH SEA BIRD CLUB NSBC	MaxEnt
7	Discussion		

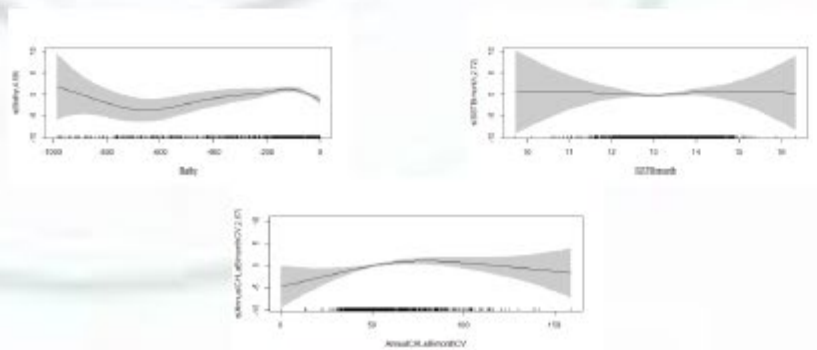


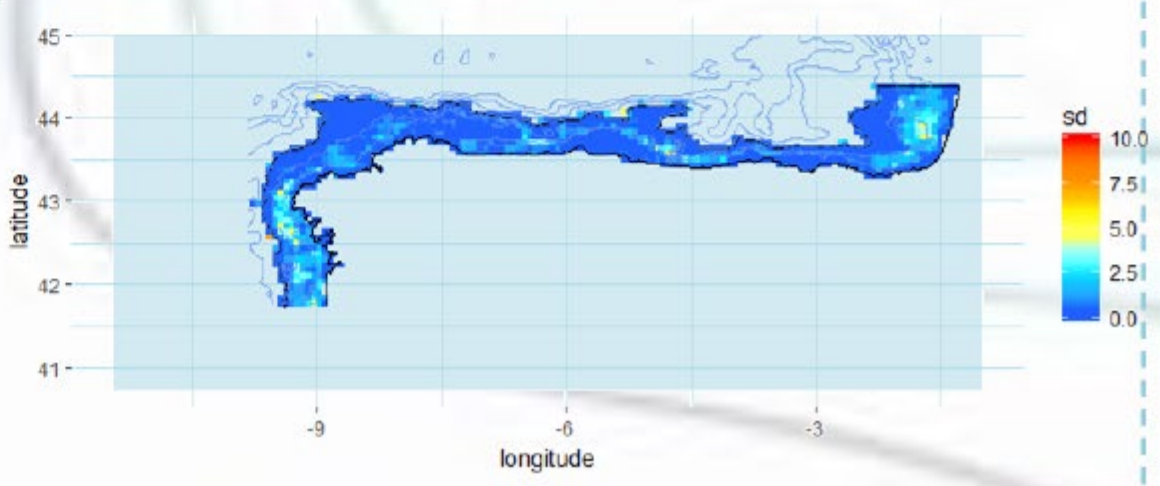
Resultados: distribución y variación

Delfín común (*Delphinus delphis*)



Avistamientos: 188
Variables explicativas:
Profundidad + T^{a}
+CV [CHLa]





Alberto Hernandez PhD

1. **Performed and unperformed tasks in each PhD chapter**
   - Allometric regressions
   - Harbour porpoise (*Phocoena phocoena*) diet
   - Striped dolphin (*Stenella coeruleoalba*) diet
   - Bottlenose dolphin (*Tursiops truncatus*) diet
   - Common dolphin (*Delphinus delphis*) diet
   - Micro and Macroplastics

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Microplastics in the stomach contents of common dolphin (*Delphinus delphis*) stranded on the Galician coasts (NW Spain, 2005–2010)

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ABSTRACT

Plastic debris is currently recognised as one of the major global threats to marine life. However, few data exist on the presence and abundance of microplastics (plastics < 5 mm in size) in marine mammals. This is the first record of the presence of microplastics in the digestive tracts of marine mammals from the Iberian Peninsula. This study made use of 35 samples of common dolphin stomach contents. Microplastics were identified in all the samples analysed, an average of 12 items per stomach although abundance varied widely from one stomach to another. Most plastic items were small fibres although some fragments and a bead were also found. Excluding the smallest fibres as possible airborne contamination, the estimated occurrence of microplastics could drop to as low as 94%. Although factors affecting accumulation of microplastics and their effect on common dolphins are unknown, the fact that all stomachs analysed contained microplastics is a cause for concern.

1. Introduction

In number, plastics have been reported to constitute between 60% and 80% of debris in the marine environment (Derraik, 2002), and they are currently considered as one of the greatest threats to marine biodiversity (UNEP, 2011), believed by Halpern et al. (2008) to be above other environmental threats such as resource overexploitation, other types of pollution, invasive species or climate change.

Every year it is estimated that between 5 and 13 million tonnes of plastic end up in the ocean, mainly as a result of poor waste management (Jambeck et al., 2015). Due to the physical and chemical characteristics of plastics, which make them very resistant to heat, oxidative damage and microbial degradation (Thompson et al., 2009), very long time-periods are necessary for these materials to become fragmented and decomposed (Cole et al., 2011; Vroom et al., 2017). In addition, plastics are easily transported by rivers, winds and ocean currents, accumulating along coastlines and within mid-ocean gyres (see Van Sebille et al., 2015). For all these reasons, plastics have a ubiquitous distribution in the marine environment (Cole et al., 2011).

Plastics can provoke negative effects on marine organisms, e.g. by causing external physical injuries like strangulation, movement restriction or even amputations (e.g. Williams et al., 2011; Baulch and Perry, 2014; Sigler, 2014); or internal injuries and starvation by totally or partially blocking the digestive tract (e.g. Gall and Thompson, 2015), sometimes causing the death of the individual (De Stephanis et al., 2013).

Microplastics (*MPs*), defined as "small plastic pieces less than 5 millimetres long" (GESAMP, 2015), can float, be neutrally buoyant or sink depending on their composition, density and shape. Consequently, *MPs* can be found in the whole water column and even as part of sea floor sediments (see review in Cole et al., 2011). *MPs* have also been found in the digestive tracts of a large number of marine species such as zooplankton (Sun et al., 2017), crustaceans (Goldstein and Goodwin, 2013), fish (Lusher et al., 2013), sea turtles (Santos et al., 2015), seabirds (Van Franeker and Law, 2015) and marine mammals (e.g. Besseling et al., 2015; Lusher et al., 2015a). Because *MPs* have a large surface-volume ratio, they can adsorb on their surface Persistent Organic Pollutants (*POPs*) or heavy metals from the surrounding water (Cole et al., 2011; Fossi et al., 2014) and, consequently, ingestion of small pieces of plastics might contribute to incorporation of pollutants into the tissues (Tanaka et al., 2013). Besides, as noted by Alonso et al. (2014), once *POPs* are incorporated into the food chain they can

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Chapter 5: Common dolphins diet

- Work done

Gathering diet data of all bottlenose dolphins previously analysed (**n = 517**, 1991 - 2008) from different sources (IEO and CEMMA databases)

Cleaning, sorting, separation and identification of all prey items from **179** stomach contents samples, from 2005 to 2018

Measurements of prey ítems from stomach contents samples (**n = 66**, 2005 - 2018)

- Work stopped

Laboratory activities

- Work to do (approximate dates: June – September 2020; and January – March 2021)

Cleaning, sorting, separation and identification of all prey items from **70** stomach contents samples left stored at IEO, from 2005 to 2018

Measurements of prey ítems from stomach content samples I have analysed (**n ≈ 182**, 202002-200202)

Diet analysis (**n = 766**, 1991 – 2018)

Article draft

CetAMBICion proposal

CALL FOR PROPOSALS "DG ENV/MSFD 2020" *MARINE STRATEGY FRAMEWORK DIRECTIVE: SUPPORT TO THE PREPARATION OF THE NEXT 6-YEAR CYCLE OF IMPLEMENTATION*

COORDINATED CETACEAN ASSESSMENT MONITORING AND MANAGEMENT STRATEGY IN THE BAY OF BISCAY AND IBERIAN COAST SUB-REGION

WP1
Review 2018 MSFD report for D1 (CETACEANS) in FR, ES & PT

WP2
Coordinated sub-regional CETACEAN assessment, GES determination + monitoring strategy (D1C2, D1C3, D1C4, D1C5)

WP3
Coordinated sub-regional CETACEAN BYCATCH assessment, GES determination and monitoring strategy

WP4
Coordinated measures to address CETACEAN BYCATCH

WP5
Communication, stakeholders, capacity-building, legacy

WP6
Coordination

ANTHROPOGENIC THREATS

- CLIMATE CHANGE
- DISTURBANCE
- FISHERY BYCATCH
- HABITAT DEGRADATION AND PREY DEPLETION
- OIL + GAS DEVELOPMENT
- POLLUTION
- SHIP STRIKES
- UNDERWATER NOISE