Spatio-temporal monitoring of coastal marine plastics

Montserrat Compa ∗ 1, Carme Alomar 1, Salud Deudero 1

1 Instituto Español de Oceanografía - Centro Oceanográfico de Baleares – Spain

Coastal ecosystems are continuously affected by anthropogenic impacts such as urbanization, maritime activities, recreational and commercial activities, all of which have been prominent sources of plastic marine litter. Plastics are continually entering the marine environment and overtime degrade posing a potential threat to marine wildlife. Currently in the Mediterranean Sea, the concentration of plastic particles is between 0.116 – 0.40 items/m2 weighing an estimated 671.91-2020 g/km2.The current study aims to quantify and identify the spatial distribution of marine plastics over time in coastal ecosystems of the Island of Mallorca in the archipelago of the Balearic Islands located in the Western Mediterranean Sea. Sea surface samples were collected during summer months in 2017 (July, August and September) at seven locations across the island within 500 meters of the coastline. Three samples at each location were collected for posterior quantification of floating plastics at the laboratory to assess autocorrelation within sampling locations. Plastic items was observed in all collected samples of varying sizes, ranging from macro- (> 25 mm), meso- (5-25 mm) and micro-plastics (< 5 mm), composed principally of fragments, films and filaments. Despite initial results show plastics were present in the sea surface at all sampling locations surrounding the island, no significant differences were seen between locations (KW, $p > 0.05$). These preliminary results indicate the coastal marine plastic concentrations are similar to those found offshore in the Western Mediterranean Sea.

Keywords: microplastics, marine debris, neuston nets, coastal

∗*Speaker*

From coastal to oceanic micro-meso and macroplastics in the SE Bay of Biscay

Oihane C. Basurko ∗ 1, Beatriz Beldarrain 1, Joana Larreta 1, Deniz Kukul 1, Anna Rubio 1, Irene Ruiz 1, Igor Granado 1, Andrés Cózar 2, Matteo Galli 3, Inma Martin 1, Ainhize Uriarte 1, Maite Louzao 1, Xabier Dávila 1, Ingrid Puillat 4

1 AZTI – Marine Research, Herrera Kaia, Portualdea z/g, 20110 Pasaia, Spain, Spain 2 ´ Area de Ecología, Facultad de Ciencias del Mar y Ambientales, Universidad de Cádiz – Campus deExcelencia Internacional del Mar, E-11510 Puerto Real, Spain, Spain 3 Department of Physical Sciences, Earth and Environment, University of Siena – Via P.A. Mattioli 4, 53100, Siena, Italy, Italy 4 IFREMER – Ifremer, Brest – Laboratoire d'Océanographie Physique et Spatiale, UMR

6523 CNRS-IFREMER-IRD-UBO, ZI Pointe du Diable, CS10070, 29280 Plouzané, France

Several numerical models predict that the SE Bay of Biscay is a critical area for oceanic litter accumulation because of its geography and metocean conditions; and yet, the knowledge of marine litter is limited in the region. This has led local authorities to seek scientific ad- vice to manage this new challenge. Here we show the results of 3 oceanographic surveys that cover different oceanic regions of the Bay of Biscay: BIOMAN (May 2017), ETOILE (August 2017) and LEMA (Sept-Nov 2017 and May-Sept 2018), where 210 water surface samples were taken with a 500 im mesh-size neuston net. Results map the spatio-temporal distribution of micro-mesoplastic abundance, from coastal to oceanic waters. Micro-mesoplastic abundance in general follows an expected gradient from coastal to oceanic waters, but also shows high variabil- ity within the same water mass. Some coastal water samples contained high abundance levels with almost 1500·103 items km-2 in coastal waters in contrast to low levels (16·103 items km-2) in deeper waters, while no plastic was found in others. Such variability highlights the importance of understanding how the meso and small-scale ocean features (e.g. eddies, fronts), which are frequent on coastal waters, may influence and help to predict micro-mesoplastic accumulation hotspots for management purposes. Micro-mesoplastic abundance and characterisation results are completed with macro-litter mapping obtained for the same region by: (i) fishing vessels devoted to collect marine litter from coastal waters (May-September 2018); and (ii) visual de- tection of macro-litter (JUVENA and BIOMAN ecosystemic surveys). We anticipate that our results have started to provide data of marine litter abundance and sources, and that they are currently being used as a baseline to work with relevant authorities, sectors and industries (such as the fishing sector) regarding their responsibility in the prevention and the development of management strategies to deal with marine litter locally.

Keywords: Microplastic, Mesoplastics, Macroplastic, SE Bay of Biscay, management strategies,

∗Speaker

Microplastics in the Sea Surface Microlayer in Southampton Water, UK

Jessica Stead ∗ 1, Andrew Cundy 1, Malcolm Hudson 2, Charlie Thompson 1, Ian Williams 2, Andrea Russell 2

1 School of Ocean and Earth Science [Southampton] – National Oceanography Centre Southampton, European Way, Southampton SO 14 3ZH, United Kingdom 2 University of Southampton [Southampton] – University Road Southampton SO17 1BJ, United Kingdom

Microplastics (MP) are detected in sediments and surface waters globally. They are consid- ered