Taking advantage of the high resolution hydrodynamic model, a particle tracking model was applied to study the connectivity of deep-sea sponges aggregations, a vulnerable marine ecosystem (VME). Considering the scarce data about deep-sea sponges' biology, different scenarios were tested, including different pelagic larval durations, and seasonal spawning, in order to study the connectivity between known sponge aggregations location in the Azores. Furthermore, these results are complemented with biogeochemical model results, providing additional and relevant data to study this connectivity. These biogeochemical model results reduce the current gap on deep-sea understanding, providing valuable information to study not only the hydrodynamic and bathymetric barriers, but also the biotic patterns in the bottom layers. The applied methodology and the first results are presented. This model integration approach provides a better understanding of ecosystem connectivity and deep-sea dynamics in the Azores region, helping to improve the understanding about VME connectivity in the deep-sea, providing new information to support conservation and management plans.

Special session 1e# Pollutants and debris.pdf – Mestre

- First Report of Deep-Sea Litter from the Southwest Atlantic
  Flávia Masumoto, Amanda Gomes, Rayane França, Marcelo Melo

Marine litter is defined as any persistent, manufactured or processed man-made solid material that has been discarded or abandoned directly in marine environments (sea based) or into rivers or near to the coastline and transported from land to the sea by rivers, sewage or wind (land based). The debris can be long-distance transported by marine currents both before and after sinking, making its precise source identification exceedingly difficult. The first reports of marine litter date back to the 1960's in shallow waters but, nowadays, it is becoming a general problem to all marine environments. In the deep-sea, the reports are still relatively scarce and more focused to the Mediterranean Sea, North Pacific and North Atlantic, which may be an artefact caused by the amount of scientific investment to those areas. In this contribution, we make the first report of deepsea litter from the Southwest Atlantic. Collections were made onboard the R/V Alpha Crucis using a semi-balloon otter trawl with 23 meters in the lower hope and mesh size of 100 mm in the wings and main body and 25 mm in the cod-end. Sixteen hauls were conducted on continental slope off Southeastern Brazil, in depths from 400 to 1,500 m. The items were sorted, dried, counted and weighted. The litters were collected in 81% of the stations, totalling 392 items and about 10 kg, and categorized into five classes: plastic (56%), metal (21%), textile (16%), fishing gear (5%), glass (3%) and miscellaneous (19%). Plastic was the most common, and the only item present in all samples, and glass was the heaviest composing 26% of the total weight. The most frequent items include plastic bags (58%) and food or beverage cans (35%).

- Plastic Ingestion by Pelagic and Benthic Crustaceans at the Charlie Gibbs Fracture Zone of the Mid-Atlantic Ridge
  Daniella Milanese, Michael Vecchione, Tracy Sutton, Tamara Frank

Plastic debris is a widespread pollutant found in all marine environments and it is known to have detrimental effects both on the environment and on a variety of organisms. Research over the past decade has documented plastic ingestion in pelagic fish species, however there are few studies examining plastic ingestion in deep-sea crustaceans. We quantified plastic ingestion in deep-sea decapod crustacean species with respect to habitat (pelagic vs. benthic), geography, and hydrography of the Charlie-Gibbs Fracture Zone (CGFZ) of the Mid-Atlantic Ridge (MAR). Pelagic specimens were captured at four discrete depths from 0-2900 m depth, benthic samples were obtained along the seafloor at depths between 1900m-3500m, from stations north and south of the CGFZ. Plastics were extracted from the digestive tract and gills and categorized by size as mesoplastics, microplastics, or mini-microplastics, and by type as fiber, film, fragment, and pellet. Plastic ingestion in benthic species was similar in samples collected both north and south of the CGFZ. While all types of plastics were present, the highest percentage was in the fiber category. Plastics ingestion in pelagic species was higher in samples collected north of the CGFZ vs. the southern samples. The only plastic type present in the pelagic species from either region was fibers. This study is the first to compare plastic contamination in deep-sea benthic vs. pelagic species collected from the same area at the same time.

- Occurrence of marine litter along abyssal areas of the Gloria Fracture Zone (NE Atlantic)
  Sofia P. Ramalho, C. Ferreira, Christian Hensen, Pedro Terrinha, Mark Schmidt, Thomas Müller, Kasia Sroczynska, Helena Adão

Marine litter pollution is a recognized form of anthropogenic disturbance that affects widely the marine environment, particularly near the continental margins, although also present at abyssal and bathyal depths. This study reports the occurrence of marine litter distribution and abundance in four abyssal basins along the Gloria fracture zone in the NE Atlantic. Litter items occurrences were analysed using TV-CTD video surveys carried out during the multidisciplinary activities of the R/V Meteor M162 cruise. The surveys reached depths between 3500-4500m and covered 16 km of seafloor, between the Terceira ridge and the Madeira-Tore Rise. Litter items were annotated and categorized by type (i.e., plastic, fishing gear, metal, glass, other unknown items). Results revealed that litter was exclusively found on soft sediment habitats across all areas, i.e. depositional areas, with the overwhelming dominance of plastics items (71%), such as plastic containers, cups and bag fragments. Although less common (6-8%), metal, glass and lost fishing gear were also observed. Litter density was on average 9 times higher in the easternmost area near the Madeira-Tore ridge, when compared to the other areas. Higher litter densities are likely explained due to the proximity to the Madeira-Tore seamount complex targeted by the fishing industry and nearimportant corridors of marine traffic between various Atlantic and Mediterranean locations. The observations