

Title: Investigation of the abundance, distribution and composition of microplastics at coastal upwelling sites in the Atlantic Ocean

La Daana Kada Kanhai^{1*}, Rick Officer¹, Ian O'Connor¹, Richard C. Thompson²

¹Marine and Freshwater Research Centre, Galway Mayo Institute of Technology, Ireland

²School of Marine Science and Engineering, University of Plymouth, UK

Abstract: Microplastics are an issue of international concern due to the fact that these substances may potentially threaten biota by (i) causing physical harm, (ii) transporting persistent, bioaccumulating and toxic (PBT) substances and, (iii) leaching plastic additives. Within the world's oceans, areas which experience coastal upwelling are biota rich due to their high levels of primary productivity. The assessment of microplastic presence in areas which experience coastal upwelling is vital as it will indicate whether microplastics are an issue of concern in areas which support key biological resources. The null hypothesis of the present study is that microplastic abundance will be lower in areas where there is upwelling. As such, the present study aims to investigate whether microplastic abundance in upwelled areas in the Atlantic Ocean is significantly different from non-upwelled areas. Based on an opportunistic voyage aboard the RV Polarstern, microplastics will be sampled in sub-surface waters along a diverse latitudinal gradient in the Atlantic Ocean i.e. from Bremerhaven (Germany) to Cape Town (South Africa). Based on the proposed route, it will be possible to determine microplastic levels at two areas of coastal upwelling in the Atlantic Ocean (i) Canary Upwelling Ecosystem (CUE) and (ii) Benguela Upwelling Ecosystem (BUE). The results will then be analysed to determine whether there was a statistically significant difference between 'upwelled areas' and 'non-upwelled areas'.

*Email: ladaanakada@yahoo.com