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Monitoring microplastics and their associated chemicals in an Irish deep water Special Area of Conservation

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Although microplastic pollution is ubiquitous, accurate quantification is still required and plastic associated chemicals from environmental samples remain largely unexplored. Given the difficulties associated with deep water data acquisition (e.g. costly and opportunistic sampling, weather dependency and engineering restrictions), much of the research carried out on marine plastics to date are either restricted by low spatial or temporal resolution, are isolated studies or are subject-specific in nature due to a lack a multidisciplinary approach. Preliminary video data collected by a Remotely Operated Vehicle (ROV) from an earlier project led by the team previously showed that large plastic items are abundant, especially fishing items, in deep water Irish coral reefs from the Porcupine Bank Canyon and Moira Mounds, both currently listed as Special Areas of Conservation (SACs). This study expands on such previous knowledge of the area and focusses on microplastics by integrating a large spatial range, temporal resolution and novel methodologies. Microplastics and their associated chemicals are being analysed from samples collected by eight Benthic Lander systems and sediment traps deployed between 2019 to 2021. QA/QC techniques are given special importance to ensure the reliability of the analytical results produced. The main outcomes of this study are to (1) accurately quantify the abundance and fate of microplastics and their associated chemicals in deep sea Irish canyons, (2) the interactions and impacts to the health of cold-water corals present in Special Areas of Conservation (SACs) and (3) the potential cause for observed coral health variability throughout time.