(FTIR) spectroscopy. Statistical analyses were employed to evaluate similarities and differences among species. Microplastics were found in nearly all specimens, with a total of 105 particles recorded across the species sampled. Filaments and fragments were the most common shapes, and particles were primarily composed of polyethylene, polypropylene and polyethylene terephthalate. Regression analyses revealed a significant positive correlation between organism weight and microplastic abundance in Echinodermata, suggesting that larger individuals accumulate more particles. Cluster analysis revealed that contamination patterns were more closely aligned with ecological behaviours, such as feeding strategy, than with taxonomic relationships.
These findings provide the first evidence of microplastic contamination in multiple deep-sea invertebrate species from the Gulf of Orosei. The results emphasise the importance of species-specific ecological characteristics in shaping microplastic exposure and accumulation in deep-sea environments.

4.11.P-We345 Plastic Meets Climate: Nitokra spinipes in the Face of Dual Challenge
Juliette Grandjean[1]*, Jana Asselman*[2] *and Ana Isabel Catarino*[1]*, (1)Flanders Marine Institute (VLIZ), Belgium, (2)Blue Growth Research Lab (BGRL), Ghent University, Belgium*

In estuarine waters, organisms are subject to multiple stressors in the environment, including contaminants of emerging concern, such as microplastics, and fluctuating physicochemical parameters due to tidal and freshwater inputs. However, due to global change, physicochemical parameters are predicted to be shifted towards new extremes in estuaries. Additionally, estuaries are considered reservoirs of increasing plastic pollution, but the assessment of the combined effects of these stressors on primary benthic consumers is lacking. Therefore, the goal of this work is to assess the combined effects of multiple stressors (temperature, salinity, microplastics) on benthic primary consumers, on both the larval and adult stages. First, the stressors (salinity, temperature, microplastics) will be tested alone through acute toxicity tests on both stages, following standard protocols, to estimate the median lethal dose (LD50). The microplastic experiments will focus on the particle's effects. Effects of the leaching chemicals from the polymer matrix will be excluded by using a dialysis test with adult animals. Based on effect data for each stressor, three carefully selected combinations (from a fractional factorial experiment) will represent a best-case, an intermediate, and a worst-case scenario, with overall toxicity levels approaching half of the LD50. These combinations will be tested over single life stages but also across multiple generations (three generations) to obtain information not only on their toxicity but also on their sub-lethal effects (e.g., oxygen consumption rate, reproduction rate and success). Overall, this study will provide a comprehensive assessment of how multiple stressors interact to affect benthic primary consumers throughout their life cycle, thereby contributing to a better understanding of their vulnerability and resilience.

4.11.P-We346 Assessing Marine Ecotoxicity of Hazardous Constituents in Oilfield Produced Water
Sarah Daflon, Alyne Moraes Costa, Marllon Robert dos Santos Valentim and ***Juacyara Carbonelli Campos****, School of Chemistry - UFRJ, Brazil*

Produced water (PW) is the primary wastewater generated during oil and gas exploration, and many of its constituents can damage the aquatic environment. This study evaluated various substances found in PW by assessing acute toxicity using Vibrio fischeri and chronic toxicity with two species of sea urchins collected in Brazil, Arbacia lixula and Echinometra lucunter. The inorganic substances assessed included nitrogen, ammonia, and several metals, such as zinc, cadmium, copper, lead, iron, and manganese. The organic substances evaluated were ethylbenzene, o-xylene, phenol, o-cresol, p-cresol, and some carboxylic acids, including cyclohexane carboxylic acid, methyl pentanoic acid, cyclohexane pentanoic acid, cyclohexane acetic acid, and pentane carboxylic acid. The acute and chronic toxicity assessments were conducted in accordance with Brazilian standards, specifically ABNT 15411:2021 and ABNT 15350:2020, respectively. Ammonia nitrogen exhibited high chronic toxicity, particularly to E. lucunter, with a no-observed-effect concentration (NOEC) of 0.08 mg NH3/L. This substance is a significant contributor to PW toxicity due to its generally high concentrations. The most toxic metals evaluated for all organisms tested (with NOEC values equal to or less than 1 mg/L) were iron and zinc, which are commonly found at elevated levels in produced water compared to seawater. Copper was also highly toxic to marine organisms despite its low PW concentration (<0.005 mg/L). All organic substances tested were highly toxic to the evaluated organisms; however, chronic toxicity assessments with sea urchins indicated greater sensitivity for most organic compounds than acute toxicity evaluations. Among the carboxylic acids, methyl pentanoic acid was the least toxic to V. fischeri (EC20 of 783.5 mg/L), but it was one of the most toxic to both sea urchin species, with a NOEC of 0.05 mg/L. Conversely, cyclohexane pentanoic acid was found to be more toxic to V. fischeri (EC20 of 0.787 mg/L) than to A. lixula (NOEC of 25 mg/L) and E. lucunter (NOEC of 3.12 mg/L). Naphthenic acids are considered one of the most toxic components of PW, and their hazardous presence, along with other components such as nitrogen,