lack of holistic, baseline investigations of pollutants and their impact.
Therefore, in this project, we will perform an integrated pollution and risk assessment for Dronning Maud land and its biota, based on a three-month sampling campaign of the sea-ice of Atka Bay. Using innovative passive sampling techniques, we will investigate the current status of POP pollution in different environmental matrixes ranging from sea ice to (deceased) penguin tissue.
Starting at the onset of the melt season and extending into austral summer, we will follow up on the release of pollutants from the ice into the seawater and their putative uptake into ice alga and further into kill feeding on them. By determining pollutant body burdens, we will assess pollutants bioaccumulation and further biomagnification in Antarctic key species. Furthermore, in evaluating this in a recurring sample collection, we will learn about the seasonality of POP pollution.
As a significant counterpart to chemical analytics, we will complement the screening for POPs with a biological impact assessment. For this, we will investigate the biomarker response in krill to employing cellular and subcellular biomarkers of detoxification, oxidative stress, and regeneration. Again, the seasonal, stationary, sampling approach will enhance our knowledge of the variability of these physiological and potentially pathological responses. This will facilitate the interpretation of future sampling campaigns and forecast biomarker behavior. Involving other research stations in developing this concept, we aim to expand the current boundaries of pollution research and contribute to establishing future comprehensive and coordinated pollution and effect assessments in Antarctica.

Disclaimer/Disclosure: The project is funded by the German Research Foundation (DFG) as part of the DFG priority programme 1158 Antarctic Research, project number WI1410/13-1.

3.19.P-We266 PLASTFLOW - How Much Plastic Flows Into the Sea? Quantifying Plastic Fluxes and Identifying Plastic Hotspots in the Scheldt Estuary in Belgium

Nelle Siele Meyers[1]*, Ana I. Catarino*[2]*, Jana Asselman*[3]*, Ronny Blust*[4]*, Raewyn M. Town*[5]*, Hanne Diels*[6]*, Erik Toorman*[7]*, Nithin Achutha Shettigar*[7]*, Boudewijn Decrop*[8]*, Theofano Koutrouveli*[8]*, Els Knaeps*[9]*, Lisa Inès Devriese*[10]*, Silke De Buyser*[2]*, Jelle Rondelez*[2]*, Marie Robberecht*[2]*, Charlotte Dhondt*[2] *and Claudia Meneses*[2]*, (1)Ocean and Human Health, Flanders Marine Institute (VLIZ), Oostende, Belgium, (2)Flanders Marine Institute (VLIZ), Belgium, (3)Ghent University, Belgium, (4)University of Antwerp, Belgium, (5)University of Antwerpen, Belgium, (6)Unversity of Antwerpen, Belgium, (7)KU Leuven, Belgium, (8)IMDC, Belgium, (9)Flemish Institute for Technological Research (VITO), Belgium, (10)Ocean & Human Health, Flanders Marine Institute (VLIZ), Belgium*

Within the PLASTFLOW project, we aim to update the assessment of litter levels and plastic fluxes in the Scheldt estuary, Belgium, focusing on changes since the 2020-2021 baseline study. Through follow-up measurements during 2024-2025, the project focuses on quantifying seasonal variations, refining computational models of plastic fluxes, and providing clear insights into the amount of plastic flowing into the sea for policy development.
Sampling occurs at six locations along the Scheldt River, covering water and sediment across various depths to account for the behaviours and fluxes of different polymer types and densities. Surface water is sampled using net-based methods, while pollution in the water column is assessed with suspension and bedload samplers. Sediment is collected from the riverbed using a Van Veen grab, and riverbank samples are taken via quadrant-based approaches along transects, complemented by drone analysis. The combinations of these innovative methods provide a representative snapshot of macro-, meso-, and microlitter distribution.
During the planned campaigns within PLASTFLOW, three types of follow-up measurements are being acquired, each time during spring, summer, autumn, and winter: tidal cycle measurements, to assess and quantify the tidal movement of plastic particles along the Scheldt River; spot sampling measurements; and hotspot measurements, to assess long-term trends in microplastic deposition and identify key environmental parameters of plastic retention and accumulation.
Initial results point out Antwerp as a hotspot for microplastics in both water and sediment (286-615 plastics/m^3), pellets (2822-6611 pellets/m^3), mesoplastics (56-1238 plastics/m^3), and macroplastics (23-181 plastics/m^3). While areas further upstream appear to be hotspots for microplastics as well (151-778 plastics/m^3 at Wintam and 275 plastics/m^3 at Temse), meso- and macroplastic as well as pellet abundance on the riverbanks in both these areas was low (0-90 pellets/m^3, 1-20 mesoplastics/m^3, and 2-7 macroplastics/m^3).
All acquired samples will be used to produce computational models that will be applied to determine the

transport of plastic particles along the Scheldt estuary, and to validate those models. By integrating these results into computational models, the project will enhance predictions of plastic fluxes and accumulation, supporting updates to monitoring frameworks and aligning with the EU Green Deal's Zero Pollution Action Plan.

Disclaimer/Disclosure: This study was conducted within the scope of the Cmartlife project LIFE19 IPE/BE/000008, action D2 Monitoring the plastic flux. The Cmartlife project has received funding from the LIFE Programme of the European Union. More info about the project on: https://vlaco.be/kenniscentrum/onderzoeksprojecten/cmartlife

3.19.P-We267 Factors Influencing Regulated Pollutants in the Air of Admiralty Bay, Antarctic Peninsula

Amanda Câmara de Souza[1], *Tatiane Combi*[2], *Cesar de Castro Martins*[1] *and Rafael Andre Lourenco*[1], *(1)Oceanographic Institute, University of São Paulo, Brazil, Brazil, (2)Center for Marine Studies, Federal University of Parana, Brazil*

Antarctic is an important sink for pollutants due to its low sea surface temperatures, long periods without solar radiation, and well-defined seasonality, enhancing pollutant deposition and limiting degradation. However, climate change challenges this role, as rising temperatures accelerate re-volatilization of persistent organic pollutants (POPs) and polycyclic aromatic hydrocarbons (PAHs) from soil and snow. This study aimed to investigate POPs and PAHs in the atmosphere of Admiralty Bay, Antarctic Peninsula, using semi-permeable membrane devices (SPMD) to understand the factors influencing their presence in the air. The sampling devices were deployed at two locations in the austral summer of 2023, spring of 2023, and summer of 2024. Identification and quantification of target analytes were performed using an Agilent Model 7890B gas chromatograph coupled to an Agilent Model 7010B triple quadrupole TQMS operating in multiple reaction monitoring mode. The detection of high concentrations of low-chlorinated PCBs and HCB being the most prevalent pollutant - both restricted under the Stockholm Convention - suggests that long-range atmospheric transport (LRAT) is the main pathway for POPs. Trajectory models indicate that air masses often originate from the Southern Ocean, South America, and the Antarctic Peninsula and act as potential sources of contamination. Higher PAH concentrations near local activities indicate an influence from research stations and tourism emissions. The predominance of HCBs over PAHs may indicate a significant role in degradation processes. Higher levels of contaminants during the austral summer and at coastal sites may indicate potential re-volatilization from water, soil, and snow reservoirs. In summary, the distribution of POPs and PAHs in Admiralty Bay results from multiple factors, including LRAT, local emissions, physicochemical properties, secondary sources, meteorological conditions, and air mass dynamics. This study demonstrates the feasibility of using SPMDs in Antarctica, providing a practical and efficient method for continuous monitoring in remote and challenging conditions. It also contributes to understanding pollutant dynamics in the Antarctic environment, highlighting the need for global emission controls and continuous monitoring of this vulnerable region.

Disclaimer/Disclosure: The work was supported by the Antarctic Brazilian Program (PROANTAR), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, 442692/2018-8; 440884/2023-3). A.C. Souza would like to thank Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP; grant no. 2020/15701-8 and grant no. 2024/05324-3). Finally, this work is part of the CARBMET project (The multiple faces of organic CARBon and METals in the Antarctica ecosystem) sponsored by CNPq, CAPES and Brazilian Ministry of Science, Technology, and Innovation.

3.19.P-We268 Emerging Per- and Polyfluoroalkyl Substances (PFAS) Induced Intestinal Barrier Dysfunction in Marine Medaka (*Oryzias melastigma*)

Naiyu XIE, *Yuefei Ruan and Qi Wang, City University of Hong Kong, Hong Kong (Greater China)*

Perfluoroethylcyclohexane sulfonate (PFECHS) and 6:2 chlorinated polyfluoroalkyl ether sulfonate (6:2 Cl-PFESA) are emerging per- and polyfluoroalkyl substances (PFAS) and are considered as alternatives to perfluorooctane sulfonate due to their similarity in chemical structure and physicochemical properties. However, their adverse effects on marine organisms are not fully understood, particularly concerning intestinal health. In this study, newly fertilized marine medaka (*Oryzias melastigma*) was exposed to 6:2 Cl-PFESA and PFECHS at environmentally relevant concentrations (nominal: 0.1, 0.3, and 1.0??g/L) for 90 days to investigate their potential digestive toxicity. Results showed that 6:2 Cl-PFESA exhibited a higher bioaccumulation potential compared to PFECHS, and both emerging PFAS preferred to accumulate in the liver rather than the intestines. Physiological analysis demonstrated that PFECHS exposure