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Microplastics

From River Weser to the North Sea

PLAWES investigates microplastics contamination across ecosystems

[20. September 2017] **Around the globe, the pollution of rivers, lakes and seas with plastic litter is on the rise. A new project jointly coordinated by the University of Bayreuth and the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) is the first to approach the problem from a holistic perspective. In the model region Weser - Wadden Sea National Park the participating researchers will use e.g. empirical and model-assisted analyses to discover how minute plastic particles (microplastics) make their way from land to sea, which input and transport routes are involved (and to which extent), and what risks this contamination poses for various ecosystems.**



Joint Press Release from the University of Bayreuth and the Alfred Wegener Institute

To do so, they will investigate microplastics from a diverse range of sources, including sewage treatment plants and the atmosphere. The outcomes of the PLAWES project will then provide the basis for strategy recommendations for the government, industry and civil society, and for effective nature conservation and health protection measures, but also for new environmental education concepts. Germany's Federal Ministry of Education and Research (BMBF) will support the project with ca. 2.9 million euros of funding over the next three years as part of its framework programme FONA (Research for Sustainable Development).

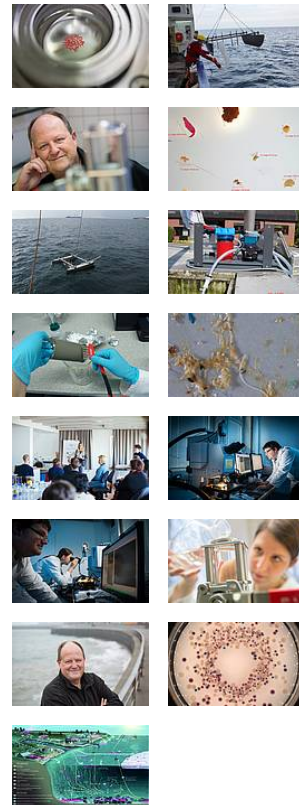
"Microplastics Contamination in the Model System Weser - Wadden Sea National Park: A Cross-Ecosystem Approach" - or "PLAWES" for short - is the name of the new research initiative. In addition to the University of



AWI research on microplastics (Photo: Gunnar Gerdts)

Bayreuth and the AWI Helgoland, the Goethe University Frankfurt, University of Oldenburg, Forschungszentrum Jülich, Thünen Institute in Braunschweig,

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and the Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency on Norderney will all contribute their specific expertise.

“At both the national and international level, PLAWES is the first research project to assess microplastics contamination - from a river’s headwaters to the coast, where it flows into the ocean - from a cross-ecosystem, interdisciplinary and long-term perspective. At the same time, it will be the first wide-scale microplastic project to directly integrate its findings into new informational and educational concepts,” explains Prof Christian Laforsch, Chair of Animal Ecology at the University of Bayreuth and one of the project’s coordinators. “Most of the previous microplastic studies essentially offered snapshots, and the various methods used and outcomes couldn’t really be compared with one another. By pursuing a holistic approach, we hope to close a number of significant gaps in our knowledge,” adds Laforsch, who has been intensively researching microplastic contamination for years.



Dr Gunnar Gerdts, microbiologist at the Alfred Wegener Institute (Photo: Tristan Vankann)

As Dr Gunnar Gerdts from the Alfred Wegener Institute’s Helgoland facilities relates, “For example, we still know far too little about the roles of wind and weather, soil erosion, sewer systems and sewage treatment plants in the creation and distribution of

microplastic. Further, we need reliable data that offers a clear picture of plastic accumulation in various ecosystems - and we want to more precisely and extensively analyse the interactions between plastic contaminants and fauna than has been done in the past.”

The researchers are convinced that the Weser - Wadden Sea region offers the optimal conditions for their work: it encompasses both urban and agricultural areas, allowing the respective levels of plastic pollution to be independently assessed and compared. In addition, the estuary of the Weser is located in the vulnerable Lower Saxony Wadden Sea National Park, which has been designated as a UNESCO World Heritage Site.

From the outset, the PLAWES project was intended to yield insights and develop concepts for the pilot region Weser - Wadden Sea that could subsequently be applied to similar river and coastal regions in other parts of the globe. The results will lay the groundwork for national and international strategies that take plastic-litter-related risks into account in the sustainable preservation of aquatic ecosystems. Here, the goal is ultimately to (also) avoid risks to human health. Accordingly, one of the key questions explored in the project is whether the spread of pathogenic microorganisms and the rise in antibiotic resistance are exacerbated by environmental microplastic pollution. Given the fact that microplastic can also find its way into food chains, small animals living in freshwater settings and in the North Sea will be examined for potential harmful effects.

An additional focus will be on environmental education. Biology education experts

School lab OPENSEA on the island of Helgoland (Photo: Jens Quasten)

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The Institute



The Alfred Wegener Institute pursues

research in the polar regions and the oceans of mid and high latitudes. As one of the 19 centres of the Helmholtz Association it coordinates polar research in Germany and provides ships like the research icebreaker Polarstern and stations for the international scientific community.

from Bayreuth and Oldenburg will gather data on attitudes toward, knowledge of, and ability to judge plastic litter among schoolchildren and their teachers.



Together with the AWI School Laboratory on

Helgoland, educational materials on microplastic will be prepared and tested. Further, a multi-language internet portal operated by Bayreuth's Department of Biology Education will provide findings from PLAWES and the latest expert opinions, so as to increase the project's international visibility and reach.

In addition to the universities and research institutes that have joined forces in the FONA project PLAWES, the following stakeholders will also be involved in the research work: Germany's Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety; Environmental Protection Agency (UBA); Bremen's Senator for the Environment, Construction and Transport; Hessian Agency for Nature Conservation, Environment and Geology; State Agency for Nature, Environment and Consumer Protection NRW (LANUV); Thuringian State Institute for Environment and Geology (TLUG); Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency; Flussgebietsgemeinschaft Weser; Helmholtz Centre for Materials and Coastal Research in Geesthacht; Chamber of Agriculture NRW; National Park Administration, Lower Saxony Wadden Sea National Park; One Earth - One Ocean e.V.; and PlasticsEurope.



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