6.09.P-Mo511 Exploring How AI Can Fill Data Gaps for Better Decision Making on Plastics Governance

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The omnipresence of plastics has led to policy makers asking questions about the environmental and health impacts of plastic use. These questions can be difficult to address as the specific composition of plastic products, packaging, and products containing plastics by different polymers is highly varied. Further, the volumes of plastics and their composition by polymers can differ across countries due to variations in economic sectors across countries. There is therefore a strong need for country-specific studies tracing the volumes of plastics from production through to end-of-life by economic sector for informed decision making. Mapping the flow and stocks of plastics through an economy can be challenging, however, due to data gaps. Possible data gaps include the composition of products by plastics, the composition of plastics by polymers, and on the lifetime of products and plastic components. In addition, trade data is not fit-for-purpose for country-specific mapping of plastic flows; the standardization of product groups across countries requires manual work to tailor the creation of groups that accurately reflect products traded in a specific economy. Here, we quantified the material flows and stocks of plastic polymers in the Norwegian economic sector using a static probabilistic material flow analysis (MFA). The data used in the model are a combination of trade statistics and data generated by Open AI's generative AI model Chat GPT-3.5 turbo (using a few-shot approach with fine tuning) where data gaps occurred. Specifically, AI generated estimates were used to estimate the compositions of product groups containing plastics by different polymers, the composition of packaging by polymers, and product group lifetimes. To test the robustness of these estimates, these were compared to data from random small samples of waste and national waste statistics. In this study, we found estimates provided from generative AI were broadly accurate and allowed for a more complete model of how plastics flow through the Norwegian economy. This study demonstrates that emergent AI technologies can allow us to fill data gaps to a certain extent for the creation of models tailored to specific contexts for more informed decision making.

6.09.P-Mo512 Paving the Way with a Holist Approach Combining Technologies and Actions to Reduce Litter in European Rivers

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The transport of litter, including macro-, meso- and microplastics, from rivers to the coast and ocean is of particular concern due to the potential ecological impacts of plastic litter in both freshwater and marine environments. The Innovative Solutions for Plastic Free European Rivers (INSPIRE) Horizon Europe project main goal is to significantly contribute to the reduction of litter through a holistic approach, that will enable the detection, collection and prevention of litter in river systems. To achieve this, our project will empower research and innovation, together with stakeholder and citizen participation, and blue investments. Through INSPIRE, we have enlisted collaborative efforts and know-how in disrupting plastic pollution, bringing together 20 technologies and actions in a consortium of 26 partners across Europe and Thailand. The project solutions include the implementation of strategies to i) collect litter from rivers (water, sediments, and riverbanks) using different technologies but also through organised cleanups with local citizens, ii) prevent litter by collecting and eliminating it from its waste streams before it reaches rivers and estuaries, and iii) develop alternatives for currently non-degradable polluting products (e.g., films used in agriculture and plastic packaging). Their technical feasibility and optimisation will be supported by cost-benefit and sustainability analyses and will include the development of business cases, strategic blueprints for scaling up and replication, and comprehensive mapping and modelling. A strategy will be in place for community engagement and dynamic communication, leveraged on multiple channels and tools to increase awareness locally and internationally. These elements converge to create a master plan to address the litter pollution related challenges at the European level and to contribute to the objectives of Mission 'Restore our Ocean and Waters' (European Commission). In this work, we share the INSPIRE innovative and collaborative approach by showcasing the six European rivers study cases where we are developing, deploying/installing, and testing innovative solutions. The complementarity of the technologic and behaviour-based solutions is explored, as well as how this concerted framework seeks to elucidate on litter pathways from rivers to the sea, paving the way for informed and evidence-based policy-making and mitigation strategies with the ambition to obtain plastic free European rivers.

6.09.P-Mo513 Mapping inland plastic flows in Santa Cruz, Galapagos

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Plastic demand is growing rapidly. Mapping of sources of plastic pollution is needed to inform intervention strategies. A major gap in such data exists for remote yet ecologically important locations such as the Galapagos archipelago. This study focuses