

# Microplastics and Soil Processes

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Global production of plastics has exponentially increased. Figure 1 presents the annual production of plastic on a global scale (Crawford and Quinn, 2017). In 1950, the annual global production of plastics amounted to around 1.5 million tonnes. By 2015, the world consumption of plastic materials was almost 300 million tonnes. This suggests, only over the period of 65 years, the production increased nearly 200-fold (Crawford and Quinn, 2017).

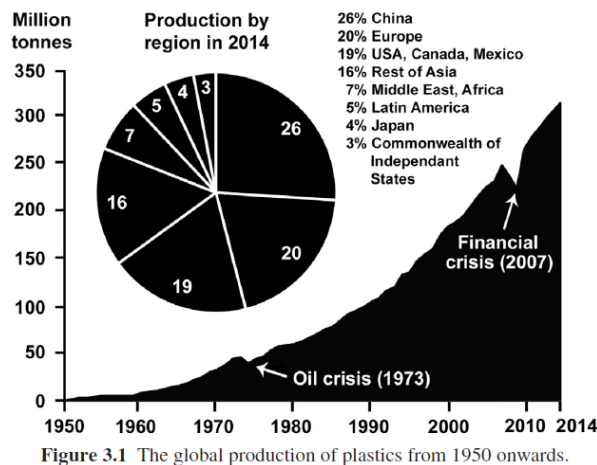


Figure 3.1 The global production of plastics from 1950 onwards.

**Figure 1.** Annual production of plastics on the global scale since 1950 (from Crawford and Quinn, 2017).

The widespread inclusion and use of plastics in many industrial applications and processes led to their presence in the environment. Unfortunately, the majority of plastics products are discarded into the environment which can be fragmented and turned into smaller-sized litter. The term Microplastics (MPs) generally refers to any piece of plastic smaller than 5 mm in size (but larger than 1 micron). MPs could come from different primary and secondary sources including but not limited to plastic pellets, personal care products containing microbeads, paint, sewage sludge, washing wastewater, vehicle tire wear, municipal debris such as plastic bags and bottles, farming film, fishing wastes, and ropes.

Although the effects of the presence of MPs in marine environment have been investigated extensively, much less is known about how exactly MPs influence fluid flow and transport processes in soil. The presence of MPs could modify some key characteristics of the soil such as wettability, structure and permeability. These changes could potentially modify multiphase flow and transport processes in the vadose zone. Motivated by the crucial importance of soil physical and chemical properties on controlling a wide range of processes occurring in soil such as water evaporation, infiltration, contaminant transport or vegetation, the specific objectives of this project are to understand how the presence of MPs influences some of these processes at different scales. Both experimental and theoretical tools will be used in this project. The project will be conducted at the Institute of Geo-Hydroinformatics at TUHH.

If you are interested in this project, please feel free to contact Dr. Milad Aminzadeh ([milad.aminzadeh@tuhh.de](mailto:milad.aminzadeh@tuhh.de)) for further details.

## References

Crawford, C.B., Quinn, B. (2017). *Microplastic Pollutants*, Elsevier, ISBN 978-0-12-809406-8, <https://doi.org/10.1016/C2015-0-04315-5>.