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What's that Floating in my Soup? Characterisation and Handling of Floating Debris in the Great Pacific Garbage Patch

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There is extensive documentation of plastic debris in the marine environment [1]. Citizen science programs and tracking apps have been used more recently in the collection of data on plastics in marine settings [1]. These programs, however, are focussed on debris collected from beach cleanups and coastal environments. Large debris currently afloat in ocean garbage patches, which contribute significantly to marine plastic pollution, are less well-characterised. Buoyant plastics accumulate offshore in the five ocean gyres, the largest of which is the Great Pacific Garbage Patch (GPGP) in the North Pacific Ocean. There, they are seen floating in a loosely concentrated 'soup'. Over time they degrade in saltwater, under UV radiation, with the help of wind and wave action. They also serve as substrates for trace metal and organic pollutant adsorption, as well as the growth of microbial consortia and larger potentially invasive organisms. There is currently limited data collection on sources of large floating plastics in ocean gyres. Majority of data collected on plastics in the garbage patches is based on trawled sampling techniques that exclude objects larger than 0.5m [2]. Large debris are important for elucidation of the overall mass of plastic in the patches. We know that 8% of the GPGP is comprised of microplastics and thus larger objects constitute the greater fraction of the total plastic mass [2], which we know little about. It is important to understand what types of debris accumulate in the patches, their land-/marine-based origins and the locations from which they enter the ocean. Where the debris is produced and what practices (commercial, cultural, industrial) contribute to their accumulation in the garbage patches is also pivotal data that needs to be collected. This information, coupled to data on how long the plastics persist and how well they persevere in the marine environment, is necessary for creating effective and efficient mitigation strategies.

References

[1] Jambeck, J. R. & Johnsen, K. Citizen-Based Litter and Marine Debris Data Collection and Mapping. *Computing in Science & Engineering*, **17**, 20-26 (2015).

[2] Lebreton, L. et al. 2018. Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic. *Scientific Reports*, **8**, 4666 (2018).