
Microplastic research in Australia and New Zealand August 2019

Globally the issue of microplastic contamination in our marine environment has been of increasing concern and as such, it is an area of interest for Australian and New Zealand (NZ) researchers. The majority of research that has/is being undertaken focusses around determining the prevalence and type of plastics causing the concern, with only a small amount of work investigating the impact to human health. Below is a summary of the research that SafeFish is aware of to date:

Human health research relating to microplastics:

- A recent study by the Global Centre for Environmental Remediation at the University of Newcastle (UoN) determined that the global average of microplastic ingestion could be as high as 5 grams a week per person, and largely comes from consuming water containing fibres.¹ This research was the first in the world to derive a mass based dietary intake for microplastics, and will form the basis for a human health risk assessment. The outcomes of this report is in alignment with the recent WHO report '[Microplastics in drinking water](#)' released in August 2019 (For more information contact: [Thava Palanisami](#)).
- In 2016, the EFSA Panel for Contaminants² was asked to provide a statement on the risk of plastics in food with a particular focus on seafood. This report found that the risk of ingestion of microplastics by humans through eating contaminated seafood was low as in most cases the product is eaten cleaned (with the gastrointestinal (GI) track removed). There is a higher risk from mussels, oysters and animals eaten whole or with GI track still intact however after oral ingestion, the largest fraction (>90%) of the ingested micro- and nanoplastics will be excreted via faeces. The report did however indicate that further work was required to determine the impact to human health from co-locating chemicals absorbed by the microplastics from the marine environment.
- In 2019, The FAO released a report called 'microplastics in fisheries and aquaculture; what do we know? Should we be worried?'³ that also confirmed that the risk to human health from the consumption of fishery and aquaculture products was known to be negligible, however the toxicity of the monomers, polymers and additives present in these products still needs to be evaluated.

Research into prevalence, source and identification techniques relating to microplastics:

- In 2017, researchers from IMAS and the University of Tasmania identified the presence of microplastic contamination in the sediment along the coast of South Eastern Australia⁴.

¹ Senathiraja K, Palanisami T, 'No Plastic in Nature: Assessing Plastic Ingestion from Nature to People', The World Wide Fund for Nature (WWF), 14 (2019)

² [EFSA Statement on microplastic and nano plastic particles in food.](#)

³ [FAO Microplastics in Fisheries and Aquaculture: What do we know? Should we be worried?](#)

⁴ Ling, S D., Sinclair, M., Levi, C J., Reeves, S E., and Edgar, G J. (2017) Ubiquity of microplastics in costal seafloor sediments. Marine Pollution Bulletin, 121, 104-110.

- In 2018, the NZ Institute for Environmental Science and Research (ESR) initiated a 5 year project to determine the [impacts of microplastics on New Zealand bioheritage systems, environments and eco-services](#).
- The NZ [Sustainable Seas National Science Challenge](#) is currently undertaking work around physical oceanography and the transport and fate of plastics. This includes the development of a visualisation tool that will help to provide an understanding of the connectivity of coastal waters.
- In 2019, The University of Adelaide (UoA) and SafeFish began an 18 month project, to determine how widespread the presence of microplastics in the gastrointestinal tract of commercial species of Australian fish and molluscs and compare this to international data. (for more information contact: [Bronwyn Gillanders](#))
- The UoA are also currently completing work on detecting microplastics compounds in fish tissues, and are comparing levels of microplastics detected in Australian samples to those found in Fiji, Vanuatu and Sri Lanka. (for more information contact: [Bronwyn Gillanders](#))
- The University of Newcastle (UoN) has been undertaking research into microplastics since 2015 and their researchers and students are currently investigating and involved in the following activities (For more information contact: [Thava Palanisami](#)):
 - developing fundamental knowledge on the ageing and weathering of plastics and microplastics in the environment to improve the accuracy of ecological and human health risk assessments
 - developing chemical fingerprinting methods to determine the composition of the plastics and to look at the concentrations of chemicals adsorbed on them
 - In conjunction with Macquarie University, the UoN are involved with the [Australian Microplastic Assessment Project \(AUSMAP\)](#) a consortium of research, environmental, industry and government experts which aims to develop a standard method to assess and record microplastic pollution, standardise data collection, undertake research around microplastic contamination and engage with the community on the issue.
- Currently, the University of Wollongong (UoW) are investigating the sources of microplastics in Lake Illawarra (NSW) and whether bioremediation and/or sewage treatment plants (enzymes etc.) could potentially be a management option (for more information contact: [Karen Raubenheimer](#)).
- At the Australian Institute of Marine Sciences (AIMS), there is currently post doctorate research occurring around determining the incidence of microplastics in wild caught QLD seafood. In addition to this, they are investigating the routes of exposure of microplastics to humans through seafood by investigating if the contamination is from the marine environment, or is occurring through processing and airborne contact (For more information contact: [Amanda Dawson](#)).
- In June 2018, SafeFish compiled a [fact sheet on microplastics in Seafood](#). This provided an overview of the issue including looking at international research undertaken to date, investigated how Governments were managing the issue internationally, and outlined the risks and impacts for Australia.

Status of Microplastics in Australia

- In February 2019, Food Standards Australia, New Zealand published a statement around [Microplastics in Food](#), which indicated that based on the research to date^{5,6,7} plastic contamination of the food chain is unlikely to result in immediate health risks to consumers. As such, they have listed this issue as a watching brief.
- In February 2016, the Minister for Environment stated that the Federal Government would action a ban on plastic microbeads use in Australian products if the industry failed to implement a voluntary phase out of their use by July 2017. In late 2017, the Department commissioned an [independent assessment of microplastics](#) in personal care and cosmetic products sold in supermarkets and pharmacies and found that approximately 94% of products were plastic free. Given these results, the Department are confident that the voluntary phase-out process is working and have not yet initiated a formal ban. They have also implemented a [monitoring and assurance protocol](#), which will include a further independent assessment of microbeads in the retail market as well as research on plastics entering the marine environment.
- The Parliament of Australia referred the threat of marine plastic pollution to a Senate committee in April 2016. Recommendations included that future policies should be underpinned by sound, peer-reviewed research, and that the Government actively support research into the effects of marine plastic pollution.

Status of Microplastics in New Zealand

- On 7th June 2018, the NZ Ministry for the Environment introduced the [‘Waste Minimisation \(Microbeads\) Regulations 2017’](#) which bans the sale and manufacture of wash-off products that contain plastic microbeads.

Meetings of interest relating to microplastics:

- [Ocean Plastic Congress](#) (Melbourne) 2-6th December 2019: Session on ‘Plastics and Human Health – what do we know?’
- [Seafood Directions Conference](#) (Melbourne) 9-11th October 2019: Key topic ‘Plastics’.
- [World Seafood Congress](#) (Penang, Malaysia) 9-11th September 2019: Program Theme: Environmental Concerns; Session on ‘Microplastics and other high impact pollution in the oceans.’

⁵ [EFSA Statement on microplastic and nano plastic particles in food.](#)

⁶ [FAO Microplastics in Fisheries and Aquaculture: What do we know? Should we be worried?](#)

⁷ [FAO Microplastics in Fisheries and Aquaculture Technical paper 615.](#)