

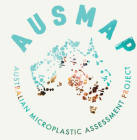


Manly Cove

Sydney
Microplastic
Pollution
Hotspot

November 2024

The Issue



The Microplastic Dilemma

Plastics have made their way into almost all aspects of our lives, with an estimated 400 million tonnes of plastic waste produced each year globally. The proliferation of single-use plastics, coupled with inadequate waste management, has led to widespread pollution, detrimentally impacting ecosystems, marine life, and human health.

When a piece of plastic is acted upon by natural forces such as sunlight, over time, the chemical bonds are partially broken resulting in an indefinite process of breakup into smaller pieces of **microplastic**.

These minuscule plastic fragments, measuring less than five millimetres in size, infiltrate water bodies, soil, and even the air. Microplastics pose a severe ecological threat as they are ingested by aquatic organisms, entering the food chain and causing detrimental effects on marine life and, subsequently, human populations.



Approximately

90%

of plastic
pollution comes
from a land-
base source

AUSMAP



Our Mission

Total Environment Centre (TEC), established in 1972, is a charity with a long-track record of tackling major environmental issues. Within Australia, TEC has a key role in developing policies, undertaking public education and promoting solutions to plastic pollution.

The expertise of the TEC led to the development of the Australian Microplastic Assessment Project (AUSMAP) in 2018.

AUSMAP is a nationwide microplastic program using citizen science to document microplastic pollution around Australia. It is Australia's leading microplastic program, and a global first, that provides a fully immersive experience in microplastic collection and analysis. The program educates, engages and empowers citizens of all ages to identify microplastic hotspots, and find effective remediation strategies. AUSMAP builds ambassadors for behaviour change and through this capacity building approach ensuring the sustainability of the project into the future.

Australian Microplastic Assessment Project

The AUSMAP methodology identifies the types and concentrations of plastics measuring between 1–5mm (microplastics) found along recent strand lines of beaches, rivers, lakes or mangroves. Using the data collected by citizen scientists, AUSMAP has identified numerous plastic pollution hotspots, in and around our cities and major urban areas.

For AUSMAP to understand where this litter might be originating, a number of strategies are used. With more data comes more knowledge and the opportunity for understanding how to reduce microplastic inputs. This work enables communities and governments to implement behaviour change, regulate industry, and develop better waste management systems.

6 Years of the AUSMAP Program



Over **350+**
locations
sampled



3.7 Million
microplastics
collected



10,000+
volunteers
engaged



850+
Samples
collected



Over **45**
microplastic
hotspots
identified

Manly Cove



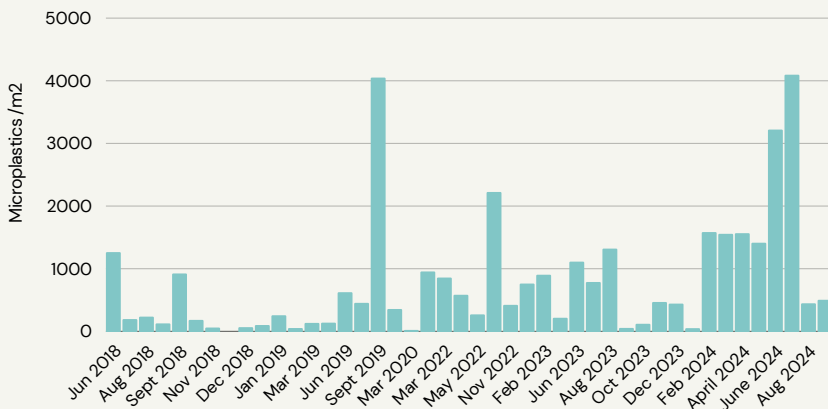
A Sydney Microplastic Hotspot

2018–2024

AUSMAP's ongoing monitoring at Manly Cove, a popular beach in Sydney's northern beaches, has revealed consistently high levels of microplastic pollution, marking it one of Australia's significant hotspots. Since mid-2018, AUSMAP researchers and community members have collected over 60 samples from Manly Cove, building one of the most comprehensive datasets on microplastic pollution in Australia, and potentially worldwide. This data reveals concerning trends that highlight the severity and persistence of microplastic contamination at this site.

The microplastic levels at Manly Cove frequently fall into the "High" (251–1,000 microplastics/m²) or "Very High" (1,001–10,000 microplastics/m²) categories on AUSMAP's pollution scale, with a peak concentration recorded at 4,097 microplastics/m² in July 2024. This consistently elevated pollution suggests that Manly Cove is experiencing ongoing contamination from plastic debris.

Change in microplastic loads at Manly Cove (2018–2024)



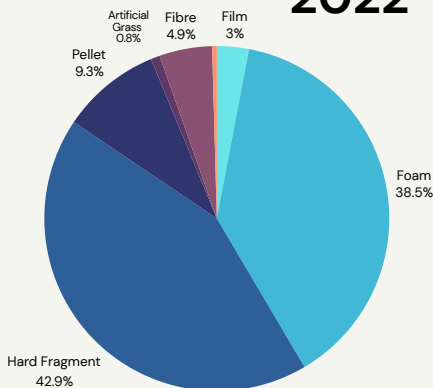
Microplastic Types



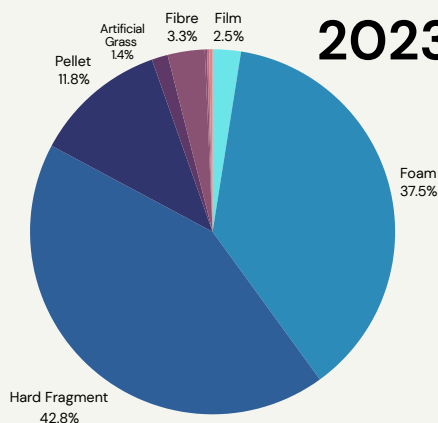
AUSMAP microplastic samples are analysed by classification of the type of microplastics found. Microplastic type identification allows understanding of potential sources of microplastic pollution.

AUSMAP defines microplastic types as “Hard Fragments”, “Foam”, “Fibre”, “Pellet”, “Film”, “Synthetic Grass” and “other”. The categorisation of such types are determined through a manual, visual identification process.

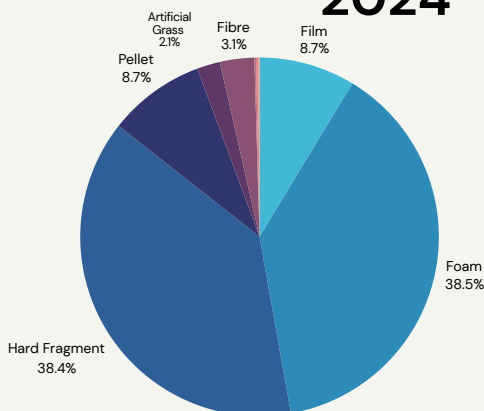
2022



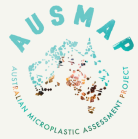
2023



2024



Microplastic Trends



Manly Cove

Hard plastic fragments and polystyrene foam pieces remain the dominant types of microplastics found at Manly Cove, together comprising approximately 80% (~ 8,000 pieces) of the total microplastics identified in 2024. These proportions have remained consistent over previous years, highlighting a persistent and ongoing pollution issue from land-based sources entering Manly Cove and surrounding areas through open stormwater outlets.

Plastic industrial resin pellets, or nurdles, have also been found in significant quantities during surveys at Manly Cove, often comprising up to 10% of the recorded microplastics. Resembling fish eggs, nurdles are easily ingested by aquatic

animals and their recurring presence highlights the urgent need for stricter regulations and improved practices for handling and transporting these materials.

Another concerning trend at Manly Cove is the increased prevalence of artificial grass fragments, which accounted for 2.1% of the microplastics collected in 2024, up from previous years. Artificial turf particles have been identified in nearly every survey this year, likely reflecting the rise in artificial grass installations across Sydney's suburban areas. These fragments pose emerging environmental challenges, as they degrade into microplastics that may impact aquatic ecosystems and human health.



Calling for Urgent Action



AUSMAP's data on Manly Cove exemplifies the wider issue of plastic pollution and underscores the need for targeted actions and policies to address the root causes of microplastic pollution. Once microplastics enter the ocean, they are exceedingly difficult to remove, making prevention at the source the most effective solution. Stronger regulatory actions, coupled with efforts to reduce plastic use and improve waste handling, are essential to protect marine ecosystems and mitigate the long-term impacts of plastic pollution.



AUSMAP is calling for:

- **Support to sustain continued microplastic monitoring of Manly Cove beach – the longest running microplastic dataset**
- **Implementation of source identification and reduction methodologies to stop microplastic pollution at the source**
- **support to increase education resources and outreach within the region with stakeholders and community to raise awareness of the growing treat of microplastic pollution both at a local and global scale.**



Microplastic characterisation of a single quadrat from July 2024 Manly Cove showing higher than baseline percentage of hard fragments, fibres and film; (top) AUSMAP Research Director Dr Scott Wilson and community volunteer Karen Martin sampling microplastics at Manly Cove
Photos: Natasha Franklin, AUSMAP Science Officer

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can be made following the QR code:



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