AUSMAP Microplastic Summary Report
Georges River Catchment
Sampling Period: November 2024 – February 2025

Prepared for

Georges Riverkeeper, NSW

15th April 2025

Summary

As part of Georges Riverkeeper's (GRK) ongoing efforts to monitor waterway health and assess microplastic pollution, staff trained in AUSMAP's methodology conducted sampling across 11 sites within the Georges River and Botany Bay estuaries from Nov 2024 - Feb 2025.

Microplastic abundance ranged from 22 to 2,495 particles per square metre, revealing significant spatial variation in microplastic pollution across the region, highlighting both areas of ongoing or emerging concern as well as sites with relatively low microplastic pollution levels. This new dataset builds on previous GRK sampling efforts dating back to 2018, providing valuable continuity in tracking trends over time. Notably high levels of pellets and hard fragments at several sites suggest ongoing inputs from urban and industrial sources. The detection of artificial grass at multiple locations points to an emerging issue linked to the breakdown of artificial turf in recreational and residential areas, particularly those near stormwater drains.

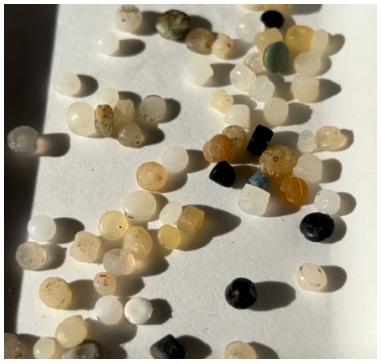
Sampling Methodology

Trained ambassadors from GRK collected sediment samples using the AUSMAP methodology on 26th Nov 2024 (Eora Beach - known as Cutler, Tower Beach, Lady Robinson Beach), 27th Nov 2024 (Taren Point Beach, Silver Beach, Dolls Point Beach) and 10th Dec 2024 (Kelso Beach, Simmos Beach, Mickeys Point Beach), and 11th Feb 2025 (Towra Day Beach). All samples were collected under dry weather conditions, with no recorded rainfall in the 72 hours prior to sampling. Microplastics (plastics 1-5 mm in size) were analysed from three to five shoreline quadrats within a 50 m transect at each site using the AUSMAP standardised methodology.

Sample were sent to Total Environment Centre for characterisation by AUSMAP staff;

- Microplastics were sorted by type (e.g. pellets, foam, hard fragment, fibre, artificial grass, rubber crumb, Table 1), colour, size and shape.
- Microplastic loads are categorised in particles per square metre (MP/m^2), and any field site > 250 particles per m^2 are considered to be a microplastic hotspot.
- All microplastic data was added to the publicly available AUSMAP Hotspot Map and included in the National database.

Table 1. Microplastic types reported in AUSMAP samples

Microplastic Type	Example Image Identification	Microplastic Type	Example Image Identification
Pellets/ Nurdle		Foam	
Hard Fragment		Fibre	
Soft Film		Artificial Grass/ Rubber Crumb	

Microplastic Results: Key Observations

Microplastic pollution was found at all surveyed sites (Fig. 1) but varied widely between locations, reflecting a complex pattern of pollution pressures within the Georges River and Botany Bay catchment.

- The highest microplastic pollution level was recorded at **Eora Beach** (formerly named Cutler Beach due to the closest street), with an average of **2,495 microplastics per square metre** and categorised as ***Very High*** according to the AUSMAP pollution scale. This concentration indicates a significant local source or accumulation hotspot, warranting further investigation and targeted management action.
- ***High*** microplastic levels were also observed at several other sites, suggesting persistent or upstream pollution inputs: **Lady Robinson Beach** (899 MP/m²); **Tower Beach** (896 MP/m²); and **Mickeys Point Beach** (313 MP/m²).
- ***Moderate*** microplastic levels were detected at: **Taren Point Beach** (161 MP/m²); **Kelso Beach** (59 MP/m²); **Towra Day Beach** (91 MP/m²); and **Dolls Point Beach** (53 MP/m²).
- ***Low*** microplastic levels were found at **Silver Beach** (42 MP/m²) and **Simmos Beach** (22 MP/m²).

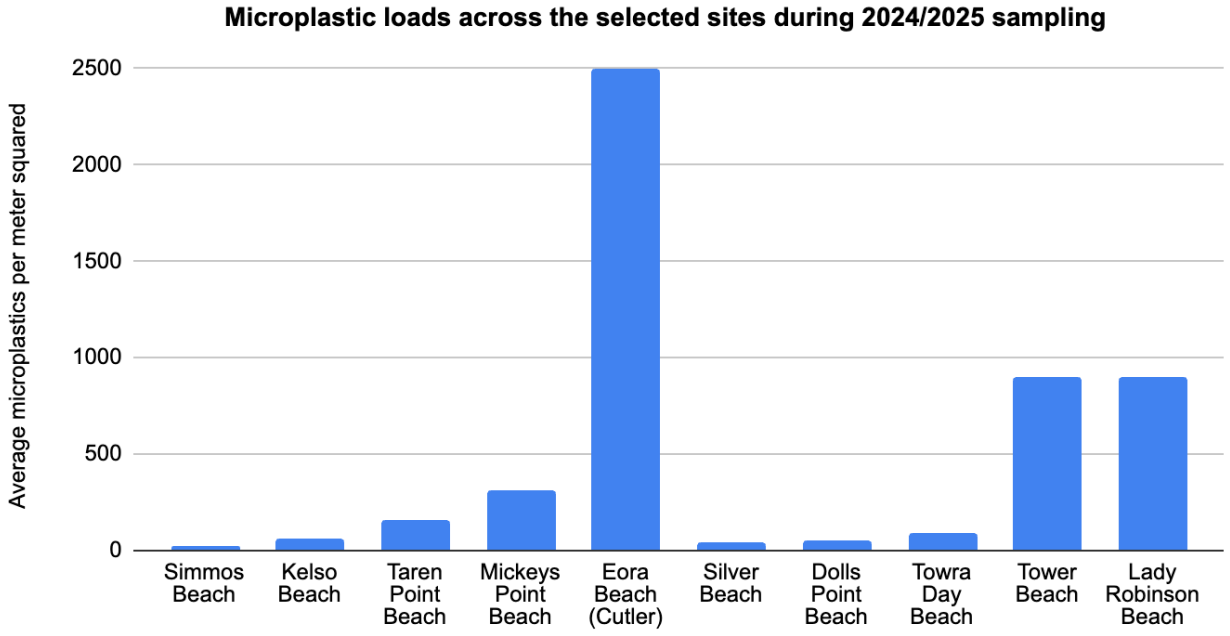


Figure 1. Average microplastic loads across the selected sites during the 2024/2025 monitoring

Microplastic Type Distribution and Trends:

Table 2 presents the relative composition of microplastic types recorded at 11 sites across the Georges River and Botany Bay catchment. The data highlight considerable variation in microplastic composition across sites, pointing to different local sources and usage patterns.

- Hard fragments were the most common plastic type overall, dominating samples at Silver Beach (77%), Taren Point Beach (63%), and Dolls Point Beach (65%), suggesting ongoing degradation of rigid plastics from urban runoff or legacy litter.
- Pellets were notably high at Lady Robinson Beach (53%), Mickeys Point Beach (47%), Towra Day Beach (50%), Kelso (41%) and Eora Beach (35%), likely reflecting upstream industrial input or stormwater pathways transporting these raw plastic materials.
- Foam plastics were present in elevated levels at Kelso Beach (28%), Mickeys Point Beach (21%), and Dolls Point Beach (18%), possibly from packaging or insulation materials breaking down.
- Plastic films accounted for the highest proportions at Tower Beach (29%) and Simmos Beach (19%) which may be associated with food wrappers, bags, and other soft plastics entering the environment.
- Microplastic fibres were present in low proportions at all sites, with the highest recorded at Taren Point Beach (10%). These are likely derived from synthetic sources such as rope, fishing line, or outdoor materials, rather than clothing fibres which are typically too small to be collected using the AUSMAP method.
- Artificial grass fragments were detected at four sites, with particularly high levels at Simmos Beach (11%), Tower Beach (10%), and Taren Point Beach (7%). Though a smaller proportion of the total plastic load, this material represents an emerging pollution source, possibly linked to nearby synthetic turf playing fields or landscaping runoff.

Table 2. Microplastic type distribution as a percent of the total recorded across 11 sampled sites

Microplastic type	% Film	% Foam	% Hard Fragment	% Pellet	% Fibre	% Artificial grass
Simmos Beach	19	15	52	0	0	11
Kelso Beach	0	28	30	41	1	0
Taren Point Beach	12	7	63	0	10	7
Mickeys Point Beach	1	21	30	47	0	0.02
Eora Beach (Cutler)	7	17	37	35	3	0.03
Silver Beach	2	4	77	15	2	0
Dolls Point Beach	5	18	65	8	2	0
Towra Day Beach	0	0	47	50	3	0
Tower Beach	29	3	47	4	4	10
Lady Robinson Beach	0	1	45	53	1	0.02

Analysis of colour data revealed that opaque particles were the most dominant across most sites, particularly at high-load locations such as Lady Robinson and Eora Beaches, aligning with the prevalence of similarly coloured pellets. Several other sites, including Simmos Beach, Taren Point Beach, Silver Beach, and Tower Beach, contained notable proportions of green particles, primarily consisting of irregular hard fragment shavings. Further details on microplastic colour, size and shape are provided in an accompanying summary spreadsheet and can be seen on the AUSMAP Hotspot Map (See Figure 2 as an example).

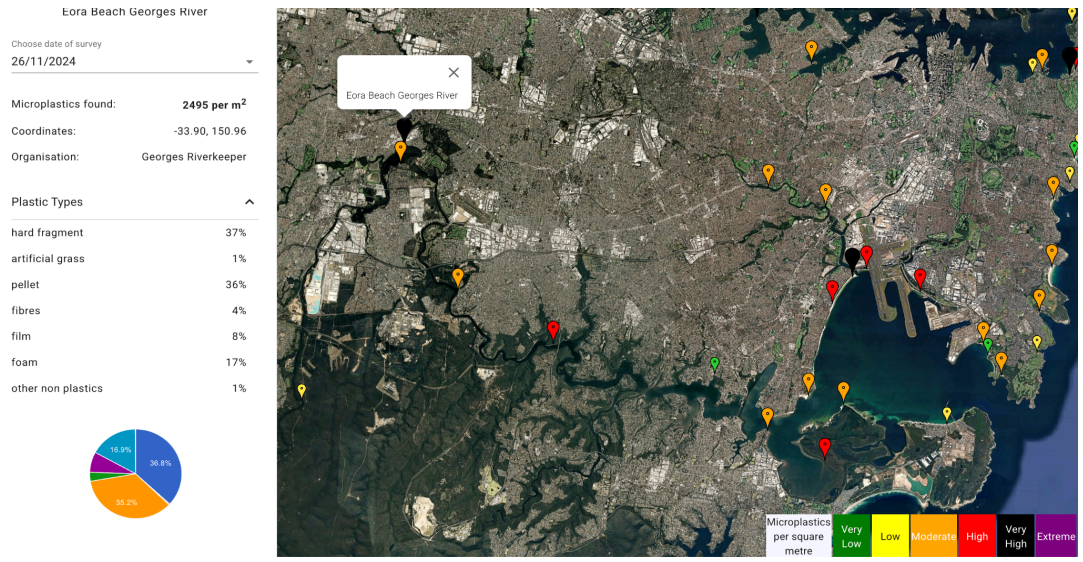


Figure 2: AUSMAP National Microplastic Hotspot Map showing data Georges Riverkeeper dataset

Comparison with Legacy Microplastic Surveys from GRK

The following table presents microplastic monitoring results collected by GRK from 2018 through to early 2025. This legacy dataset provides valuable insights into long-term trends, variability, and site-specific pollution patterns across the Georges River catchment.

Recent sampling has shown a resurgence of high microplastic concentrations at historically impacted sites, including Eora Beach, Lady Robinsons Beach, and Tower Beach, confirming ongoing or renewed pollution pressures in these locations. In contrast, sites such as Simmos Beach, Silver Beach, and Dolls Point Beach have remained relatively stable over time, typically recording low microplastic loads under 50 mp/m², likely due to reduced local inputs or effective catchment management strategies. Sites like Mickeys Point and Towra Day Beach continue to show episodic spikes, highlighting the influence of seasonal or event-driven pollution. These long-term findings reinforce the importance of sustained monitoring and targeted interventions at high-risk locations.

Table 3. *Summary of all microplastic sampling activities by GRK from 2018 - 2024. Microplastics measured in mp/m^2(Green = Very Low; Yellow = Low; Orange = Moderate; Red = High; **Black** = Very High).*

GRK Site and Microplastic level							
	2018	2019	2020	2021	2022	2023	2024
Simmos Beach	(Nov) 3	(Apr) 4 (Dec) 3	-	-	-	(Jun) 0	(Dec) 22
Kelso Beach	(Nov) 84	(Apr) 73 (Dec) 155	-	-	-	(Jun) 19	(Dec) 59
Taren Point Beach	(Dec) 4	(Dec) 265	(Apr) 215	-	-	(Jul) 0	(Dec) 161
Mickeys Point Beach	(Nov) 8	(Dec) 265	(Apr) 1	-	-	(Jun) 11	(Dec) 313
Eora Beach (Cutler)	(Nov) 79	(Apr) 1011 (Dec) 1707	-	-	-	(Jun) 316	(Nov) 2495
Silver Beach	(Dec) 3	(Dec) 25	(Apr) 29	-	-	(Jun) 19	(Nov) 42
Dolls Point Beach	(Nov) 1	(Apr) 83 (Dec) 52	-	-	-	(Jul) 23	(Nov) 53
Towra Day Beach	(Nov) 8	(Dec) 331	(Apr) 856	-	-	(Jul) 1	(Feb 25) 91
Tower Beach	(Nov) 28	(Dec) 2859	(Apr) 540	-		(Jul) 183	(Nov) 896
Lady Robinson Beach	(Dec) 4	(Apr) 189 (Dec) 143	-	-	-	-	(Nov) 899

Conclusions

The recent round of AUSMAP surveys highlights several microplastic pollution hotspots within the Georges River and Botany Bay catchment, notably Eora Beach, Lady Robinson Beach, Mickeys Point Beach, and Tower Beach. The dominance of hard plastic fragments and industrial pellets at these locations points to ongoing inputs from urban and industrial sources. Additionally, the detection of artificial grass fragments at several sites (Simmos Beach, Tower Beach,and Taren Point Beach) suggests an emerging source of microplastics linked to recreational spaces or possible residential landscaping, likely where stormwater drainage is nearby.

AUSMAP commends Georges Riverkeeper for their ongoing leadership in understanding and addressing microplastic pollution. By continuing to monitor microplastic loads and building on previous data, Georges Riverkeeper is well positioned to track trends over time, inform community education, and implement targeted, site-specific source reduction strategies to reduce microplastic pollution.