

Program overview

Marine microdebris is comprised of anthropogenic solid waste, including microplastics (plastics smaller than 5 mm in length), that has been inadvertently or intentionally disposed in marine environments. With global plastic production rising, microdebris contamination is predicted to increase.

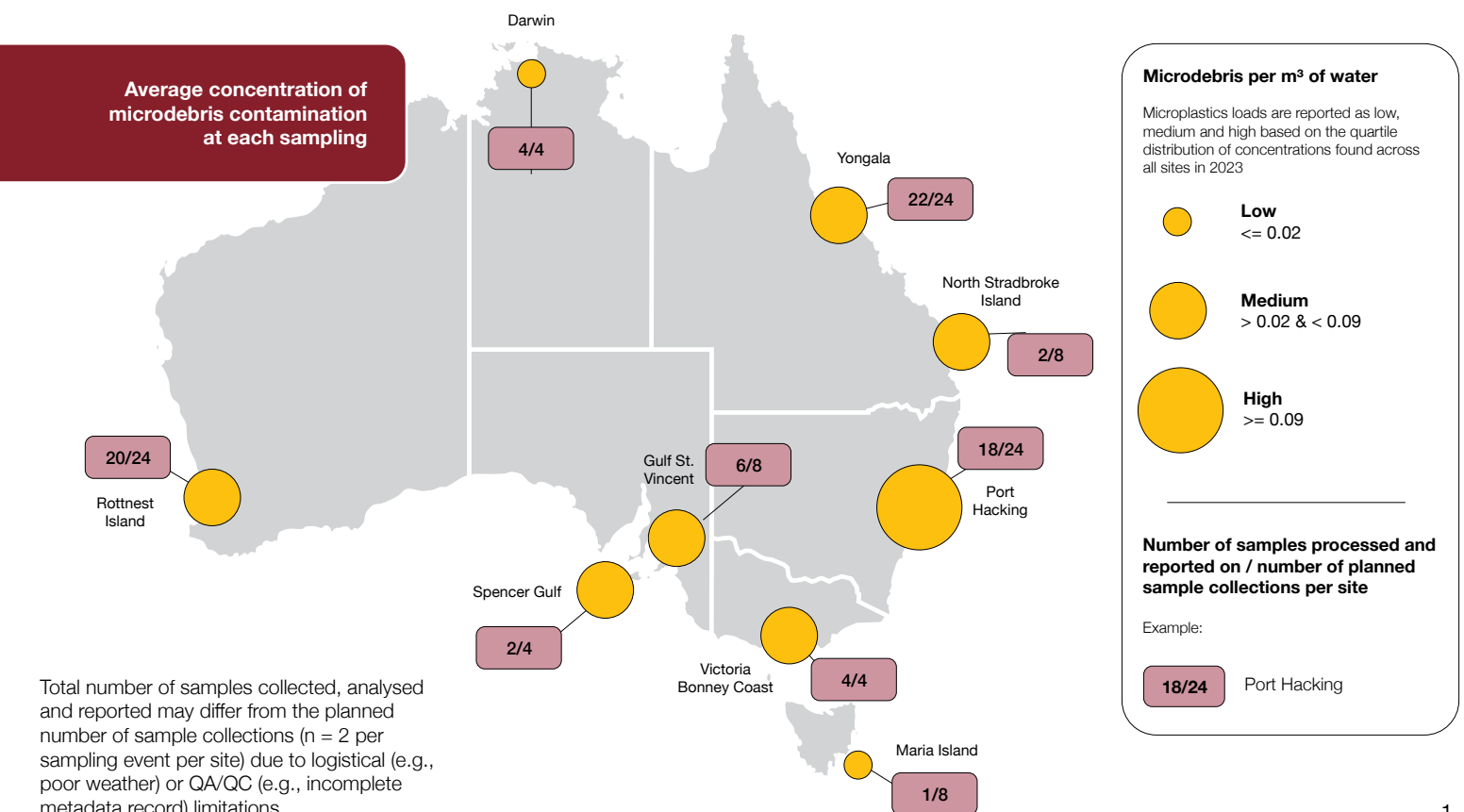
The IMOS Marine Microdebris Monitoring New Technology Proving project, established in 2021 to monitor temporal and spatial variations of microplastics in Australian waters and inform environmental management and policy, transitioned into an IMOS sub-Facility in 2023.

This series of report cards documents the extent of contamination at each sampling site and summarises trends in pollution levels – serving as a bridge between the two programs. This 2023 report provides a comprehensive annual summary for all monitored sites January to December 2023, offering an ongoing assessment against the baseline established in 2021. This, and future reports, leverages year-on-year comparable data to identify contamination hotspots, support pollution target-setting, and evaluate the effectiveness of local management practices.

Findings are reported as microdebris abundance per cubic metre of water (MPs m^{-3}), along with diagnostic physical and chemical characteristics — essential data for identifying sources, assessing ecological risks and informing policy decisions.



Microplastics recovered from a sample collected in Port Hacking, NSW

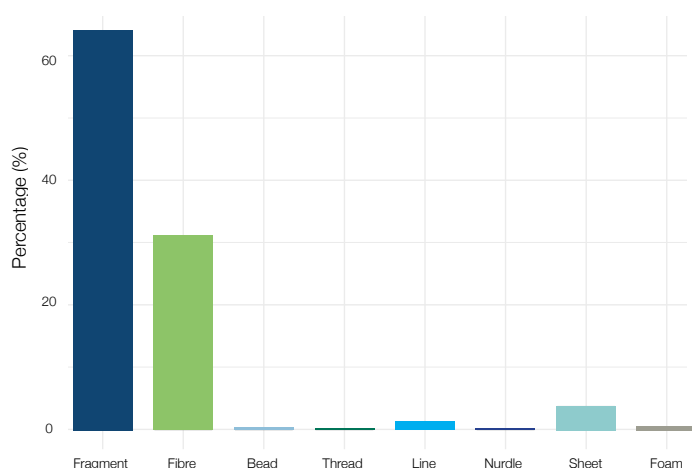


Microdebris up close: What it looks like

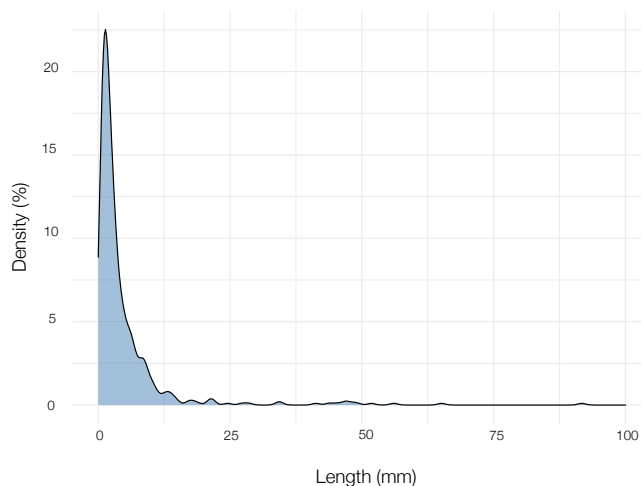
Shape, colour, size and chemical composition characteristics are presented for all microdebris found in 2023. This is a representation across all sites.

Refer to the site-specific graphs for the most common polymer types found at each site for the year.

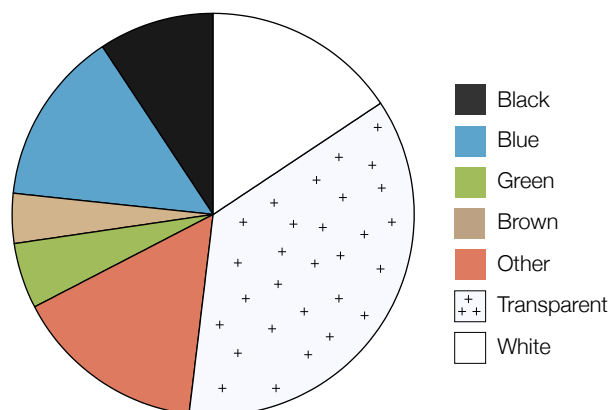
Shape %



Size %

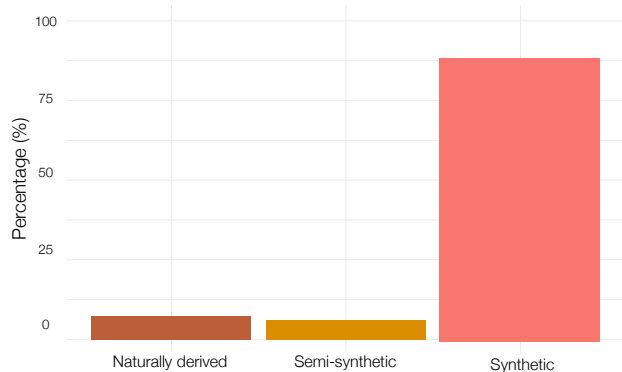


Colour %

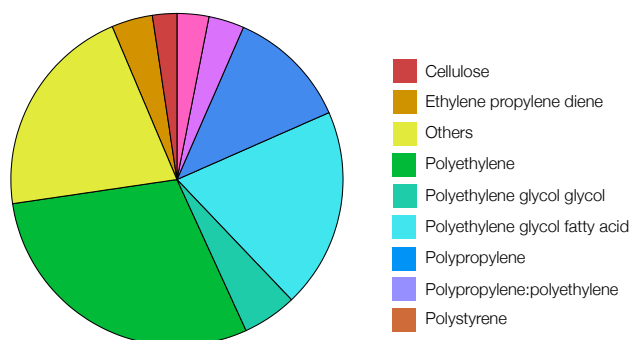


Chemical composition %

Percentage of polymer category



Polymer type distribution

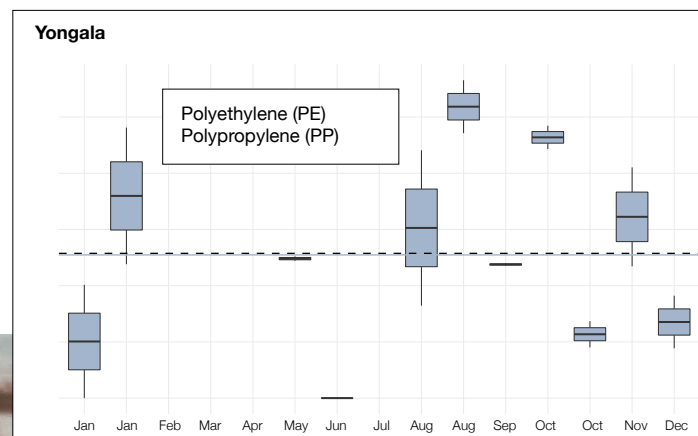
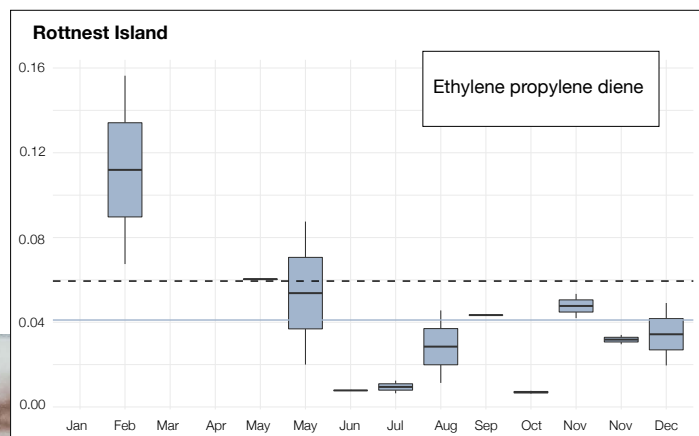
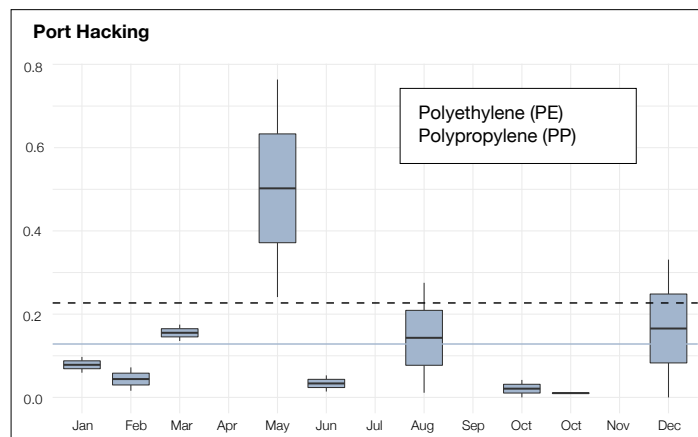
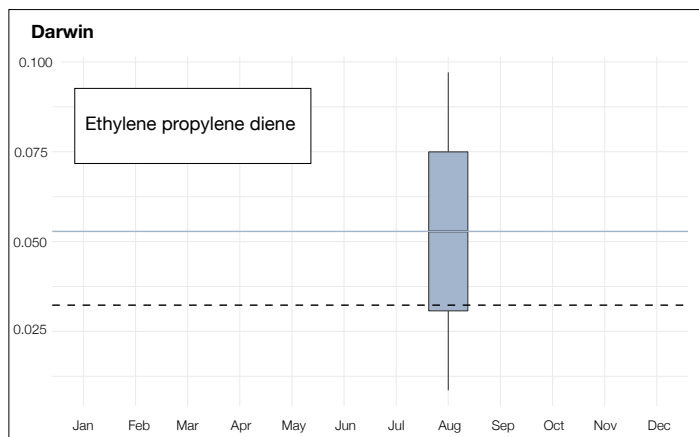


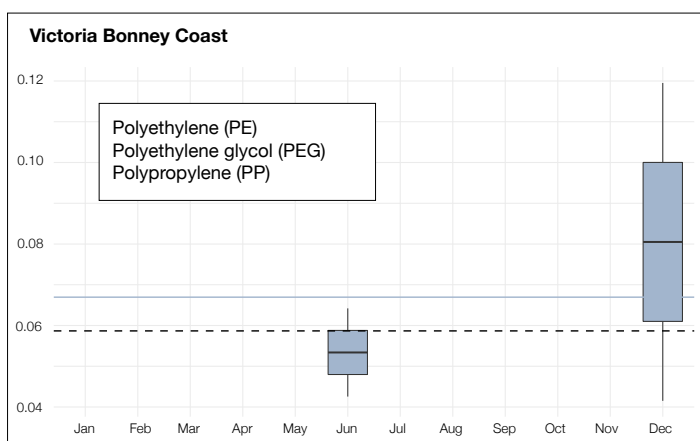
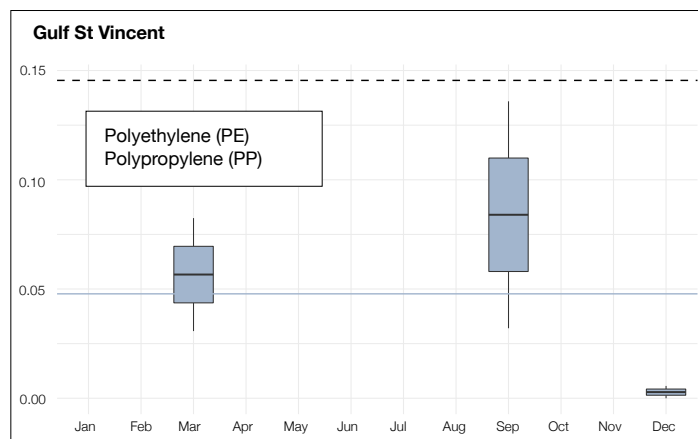
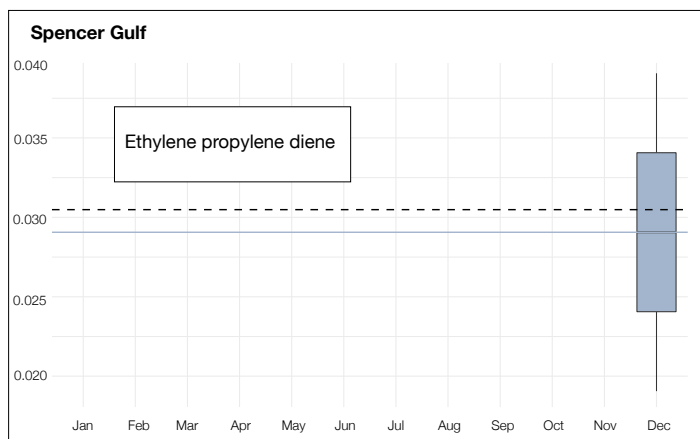
Where and when: Microdebris levels and characteristics across sites

2023

These graphs illustrate microdebris contamination levels (items per cubic meter of water, MP m^{-3}) recorded in 2023, categorised by month and sampling location. Because of logistical constraints, some months may feature multiple sampling events - these months are duplicated on the relevant graph. Months without any sampling events are left blank.

Plots are supplemented with additional data, including annual and cumulative averages of microdebris concentrations for 2023 (represented by a continuous line) and across the entire program timeline 2021 - 2023 (dashed line). Additionally, the most abundant polymer types identified at each site are provided.





Important Notes

- Each microdebris item was physically and chemically characterised using stereomicroscopy and Fourier transform infrared spectroscopy. Potential extraneous contamination (e.g., staff clothing fibres) were excluded following standardised procedures.
- Caution should be taken when comparing data as sampling frequency differs between sites (refer to the map).

[ACCESS THE DATA](#)



Understanding the impact: What the data tells us

The IMOS Marine Microplastics sub-Facility aims to provide insightful data for better understanding trends of microplastic contamination over time and across the different sampling locations.

This dataset complements other IMOS long-term ocean observation datasets (e.g., surface salinity, current, plankton and fish larvae) and will aid in identifying environmental factors that potentially influence the distribution of such contamination or its potential impacts.

The data contributes to determining potential sources, fate, and impacts of microplastics in Australian marine waters thereby informing environmental management at local and national scales.

The IMOS Marine Microplastics sub-Facility is operated by AIMS, in partnership with CSIRO, SARDI, NSW-DCCEEW and Deakin University.



Highlights from 2023

In 2023, the program was formally operationalised as an IMOS sub-Facility, with funding secured until 2027. This transition enabled an expansion in both spatial and temporal coverage, introducing new sampling sites at North Stradbroke Island, Maria Island, and Kangaroo Island.

Operations at Spencer Gulf site ceased due to persistent logistical issues. Where feasible, sampling frequency increased at each site, ensuring a minimum of four sampling events per year.

In 2023, data from 85 of the planned 108 sampling events across Australia was published, the lower sampling rate reflecting the delayed commencement at new sites - sampling commenced mid-2023.

Reporting enhancements included a broader range of microplastic shape descriptors, enhancing analytical precision. Moderate levels (average range 0.02 - 0.09 MPs m⁻³) of contamination were observed at most sites.

Access the data

For more information on the program's methodologies and to access the publicly available data, **visit the AODN website**.

Get in touch

If you have any questions, please email microplastic@aims.gov.au

