MICROPLASTICS
RESEARCH

RMIT researchers are actively engaged in finding sustainable solutions to the microplastics problem by investigating critical aspects of the microplastic cycle including their sources, distribution, environmental impacts, potential health risks and their removal.

RMIT research aims to better understand the presence of microplastics in the environment, including aquatic systems, soil, and even air. RMIT's multidisciplinary approach facilitates comprehensive insights into the complex issue of microplastic pollution involving collaboration among various disciplines, including environmental science, chemistry, biology, engineering, and social sciences.

Specific examples include:

- Developing techniques for monitoring and analysing microplastics in different environments
  This could include using advanced imaging and spectroscopy methods to identify and quantify microplastics in samples.
- Understanding the ecological and human health impacts of microplastics
  This involves studying how microplastics are ingested by aquatic organisms, potentially entering the food chain, and investigating the associated consequences.
- Technologies for removing microplastics from water sources
- Exploring eco-friendly alternatives to conventional plastics

RMIT also engages in educational initiatives and public outreach campaigns to raise awareness about microplastic pollution among students, the community, and policymakers. This can contribute to a greater understanding of the issue and foster behavioural changes that reduce plastic consumption.

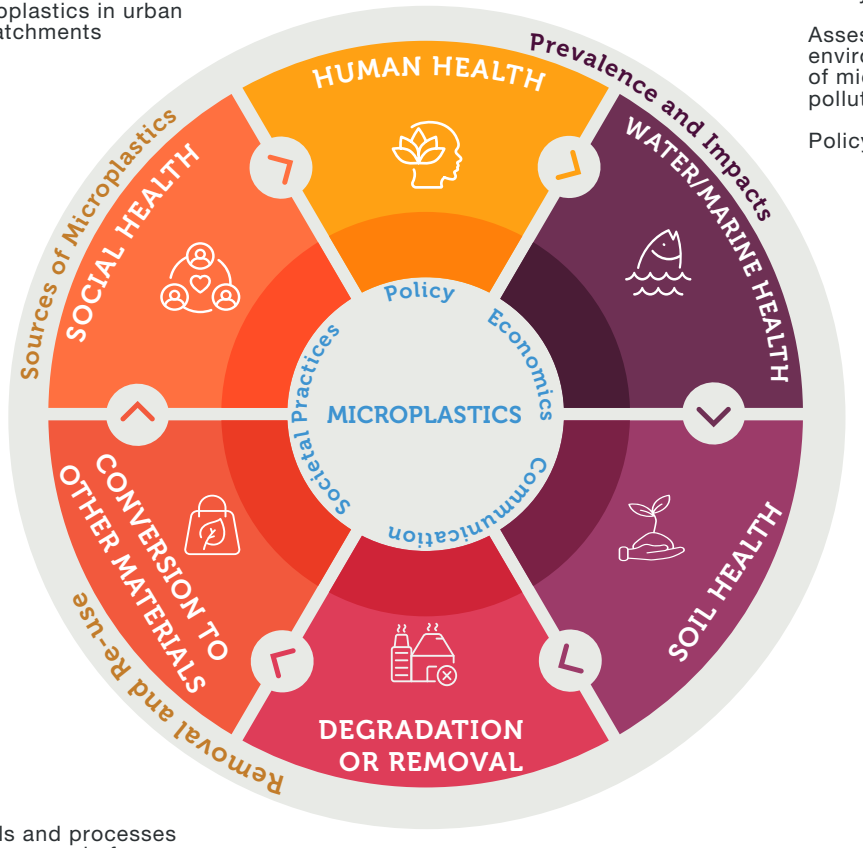
RMIT UNIVERSITY Enabling Impact Platforms

Identifying and mapping sources and concentrations of microplastics

Practices and policy approaches that reduce production of microplastics, including from textile shedding and food packaging

Development of biodegradable plastics

Treatment of microplastics in urban stormwater and catchments



Advanced materials and processes for degredation or removal of microplastics and nanoparticles from the environment

Transforming microplastics to new products or materials such as waxes, lubrication oils, fuels and gases.

Mapping and assessing the prevalence and concentration of microplastics and nanoplastics in waterways, marine environments and on land

Assessing the impact of microplastics and nanoplastics on human health, marine and plant life, including flow-on effects within ecosystems

Assessing the economic, environmental and health costs of microplastic and nanoplastic pollution

Policy and behavioural interventions

RMIT's Enabling Impact Platforms are the University's unique mechanism to assemble researchers and industry experts to rapidly respond to large-scale, complex issues in society.

RMIT UNIVERSITY Enabling Impact Platforms

Microplastics Research Community

Communication	Conversion to Other Materials	Degradation or Removal	Human Health	Policy and Economics	Prevalence and Impact	Societal Practices	Soil Health	Sources of Materials	Water/Marine Health
Leah Li	Derek Hao Hamid Arandiyan Kalpit Shah Namita Choudhury Nasir Mahmood Nicky Eshtiaghi Shadi Houshyar	Benu Adhikari Biplob Pramanik Briony Wood- Ingram Daniel Lester Derek Hao Joseph Jacob Richardson Linhua Fan Michelle Spencer Muhammad Waqas Khan Namita Choudhury Nasir Mahmood Nicky Eshtiaghi Rebecca Van Amber Shadi Houshyar Tien Huynh	Briony Wood-Ingram Celine Valery Leah Li Magdalena Plebanski Nasir Mahmood Oliver Jones Paul Wright	Briony Wood-Ingram Zsuzsanna Csereklyei	Dayanthi Nugegoda	Bhavna Middha	Joseph Jacob Richardson Linhua Fan Nasir Mahmood Nicky Eshtiaghi Oliver Jones Simon Jones Zsuzsanna Csereklyei	Benu Adhikari Bhavna Middha Muhammed Bhuiyan Olga Troynikov Rebecca Van Amber Vincent Pettigrove	Briony Wood-Ingram Joseph Jacob Richardson Jeff Shimeta Linhua Fan Mariela Soto- Berelov Namita Choudhury Nasir Mahmood Nicky Eshtiaghi Oliver Jones Simon Jones Vin Pettigrove

Key capabilities

Prevalence and Impacts

Antartica sampling (HB voyage)
Assessing effects of chemicals associated with microplastics
Accumulation of nanoplastics in biological systems
Biochemical assessment of effects of exposure
Capability to sequence organisms growing on plastics
Flow on impacts across the ecosystem
Locations and mechanisms of accumulation
Mapping of microplastics
Measurement/assessment of impacts and prevalence
Nanoplastics and microplastics interaction with the body
Quantifying the cost to economy,mortality and morbidity rates
Satellite observation of plastics

Sources of Microplastics

Acceptance and implementation of new products and services
Catchment sources
Detachment from plastics
Food packaging as a major source of microplastics, directly (through food) and through soil and water contamination
Green Lab - Better Wet lab practices
Mapping of sources and seasonal variations in micro-plastic input
Measurement/assessment of prevalence
Societal demand and impacts of plastic
Solutions to textile shedding
Tackling plastics at source-biodegradable plastics
Urban stormwater treatment

Removal and Re-use

Conversion microplastics to waxes, lubrication oils, fuels and gases
Convert textile to micro particles for various applications
Degredation and removal solutions
Designing materials to absorb nanoparticles
Microplastics to functional materials
Removal of microplastics using conventional and advanced processes
Materials for microplastics removal
Removal of nanoplastics
Re-use solutions

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Enabling Impact Platforms

Media and publications

Ozwater'23 Best Poster: Fate and Transport of Microplastics in Three Water Recycling Plants of South East Water
02 August 2023, Australian Water Association

The research demonstrated the potential of low-energy and low-cost lagoon/pond wastewater treatment systems for effective control of microplastics.

We consume a credit card worth of plastic each week. What is it doing to our health?
1 April 2023, The Sydney Morning Herald

A report published in March found there are more than 170 trillion microplastics floating on top of the world's oceans.

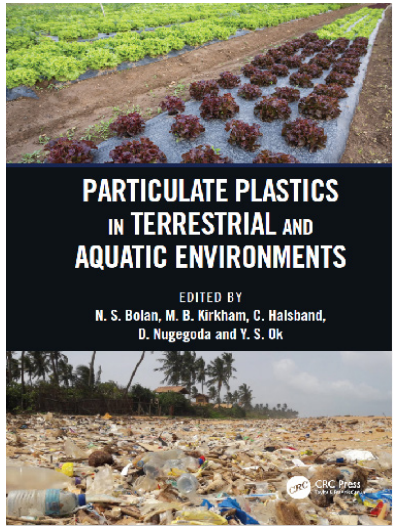
Magnetic material mops up microplastics in water
30 November 2022, RMIT News

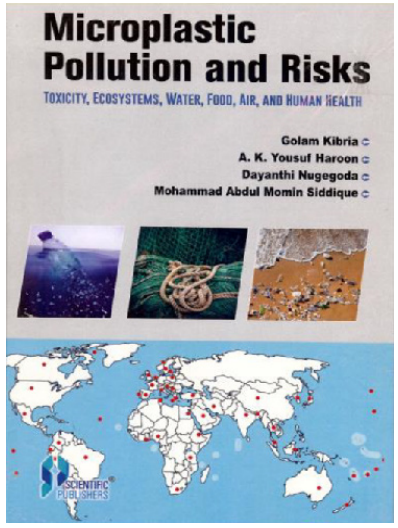
Researchers at RMIT University have found an innovative way to rapidly remove hazardous microplastics from water using magnets.

Satellites and light reflections help spot coastal plastic waste
02 February 2022, RMIT News

Geospatial scientists have found a way to detect plastic waste on remote beaches that are not visible in conventional satellite images, bringing us closer to global monitoring options.

Publications by Prof Dayanthi Nugegoda, an ecotoxicologist who has investigated the effects of toxicants and anthropogenic activities and resulting pollution, on native species, and ecosystems, for over 25 years





2024

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