



National Environmental Science Programme



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

Unknown risk from contaminants flying under the radar on Great Barrier Reef and Torres Strait

Scientists have identified critical knowledge gaps for a number of contaminants entering into the waters of Great Barrier Reef and Torres Strait.

These contaminants originate from a wide range of sources from the land and on the water, including urban, industrial and shipping activities.

The contaminants, known as 'contaminants of emerging concern', include:

- antifouling paint, (used to prevent biofouling on ship's hull)
- heavy metals and metalloids, (from both natural and man-made sources)
- pharmaceuticals and personal care products, (such as medicines, perfumes and sunscreens)
- coal dust and particles,
- marine debris, (such as microplastics from broken down plastic products) and,
- hydrocarbons (such as oil-based fuels and lubricants).

Marine ecologist and lead author on the study, [Dr Frederieke Kroon](#) of the Australian Institute of Marine Science (AIMS) said while these contaminants are known to be in the marine environment, little is known about their effect on the Reef's ecosystem.

"Currently, water quality management focusses on the excess nutrients, sediments and pesticides entering the inshore Great Barrier Reef from the land. However it's also important we account for other contaminants flying under the radar of current monitoring," Dr Kroon said.

The study, funded by the [Australian Government's National Environmental Science Program's Tropical Water Quality Hub](#) and AIMS, used all available water quality monitoring data and research from the region to inform future ecological risk assessments of these contaminants.

"We found we have sufficient information to understand what contaminants are likely to be present in the region, and in some cases where they come from. Now, we need to better understand the potential risk they pose to the marine ecosystem so they can be effectively managed."

The risk posed by a contaminant to an ecosystem is determined by two major factors – the concentrations of the contaminant in the environment, and comparing these to the levels they begin to affect key marine organisms.

“For most of these contaminants, we do not know the concentrations found in the marine environment, nor the levels that are hazardous to tropical marine plants and animals. The next step would be to focus further monitoring and research on a short-list of potential high-risk contaminants based our study.”

The Great Barrier Reef catchment, a major source of these contaminants, is home to more than 1.2 million people, and supports urban, industrial and agricultural activities. Shipping is also a major contaminant source, as the marine environment is exposed to intense shipping activities from small recreational boats to large commercial vessels.

As Queensland’s population grows, the sources of the contaminants will also increase.

“To inform future management of these contaminants, it is important to implement targeted monitoring of potential high-risk contaminants, establish a baseline in the region and ensure any future increases are detected in time,” Dr Kroon said.

Dr Kroon said that good water quality was at the heart of healthy and resilient reef ecosystems.

“Tropical marine ecosystems are facing serious challenges ahead, particularly ongoing warming as a result of climate change.

“Global challenges need to be managed over the medium-to-long term, but regional and local issues such as water quality can be managed effectively in a relatively short time frame and will help the Reef be more resilient.”

The study, *‘Sources, presence and potential effects of contaminants of emerging concern in the marine environments of the Great Barrier Reef and Torres Strait, Australia,’* is published in [Science of the Total Environment](#).

Learn more about this research on the [Tropical Water Quality Hub](#) website.