

# Study reveals flood mud burden on Moreton Bay

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Satellite image of the Brisbane River flood plume entering Moreton Bay in early 2022. Credit: University of Queensland

University of Queensland sampling during and after the February 2022 Brisbane River flood has sounded a warning about the future of Moreton Bay with climate change predicted to bring more extreme weather.

Dr. Alistair Grinham from the School of Civil Engineering said recent floods deposited mud across 98% of the Bay, compromising its remaining areas of clean sand and hastening the growth of a muddy "dead zone."

"In 1970 Moreton Bay had about 400 square kilometers of clean sand and now it has just 30 square kilometers," Dr. Grinham said.

"Clean sand is defined as having less than one percent of mud content so some areas may look lovely and white, but the [flood](#) sediment is insidiously changing the nature of the seabed and affecting [water chemistry](#)."

"While sand is inert, flood sediment contains clay, [organic matter](#) and nutrients from rural and suburban areas which microbes break down to release nitrogen."

"This process is a background stressor across the whole Bay contributing more and more nutrients to the water."

Dr. Grinham said the levels of nitrogen measured in the water during the study indicated Moreton Bay already had a big problem.

"We estimate the amount of ammonium the sediment is contributing to the Bay's water to be equivalent to 180 years of sewage plant discharges," he said.

"When you load a system with nutrients and mud like this, phytoplankton thrive and block sunlight reaching the seabed which is already being smothered by mud and these factors changes what can live there.

"It is a process already underway in Moreton Bay."

The study collected and analyzed sediment from 47 sites around Moreton Bay three days after the flood peak and then at more than 200 sites throughout 2022.

Core samples of mud pulled from the seabed across the Bay were also collected and the results compared to previous studies done in 1970, 2015 and 2019. The findings are [published](#) in the journal *Science of The Total Environment*.

"Over the past 50 years, 300 million cubic meters of mud has been washed into Moreton Bay—that's enough to fill 300 Suncorp stadiums," Dr. Grinham said.

"A lot of the mud has collected in the central Bay where the water is deeper and wind and tidal currents can't disperse it.

"This is where a big mud zone is growing and puts at risk the great habitat wealth of Moreton Bay.

"With [climate change](#) meaning we will see more [extreme weather events](#) and floods in the future; we desperately need [restoration work](#) along the Brisbane River catchment and especially in the Lockyer Valley and

Bremer River sub-catchments that flow into the Bay.

"Without restoration work, eventually Moreton Bay will not be able to bounce back from a flood event," Dr. Grinham said.

The research is part of a long-term collaboration between UQ, Urban Utilities and the Port of Brisbane.

**More information:** Alistair Grinham et al, Nitrogen loading resulting from major floods and sediment resuspension to a large coastal embayment, *Science of The Total Environment* (2024). [DOI: 10.1016/j.scitotenv.2024.170646](https://doi.org/10.1016/j.scitotenv.2024.170646)

Provided by University of Queensland

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