Sedimentation missing from pollution priorities, says researcher

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Credit: Griffith University

Sediment runoff from land use change and unsustainable development is missing from global priorities despite being one of the greatest threats facing freshwater and marine ecosystems, Griffith University researcher

reveals.

Published in *Science*, Dr. Caitlin Kuempel from the Australian Rivers Institute outlines how the Kunming-Montreal Global Biodiversity Framework (GBF), targeted to halt biodiversity loss and restore natural ecosystems by 2030 overlooks sediment runoff, a key driver of poor water quality that threatens freshwater and marine ecosystems.

While the GBF includes four goals and 23 targets to halt biodiversity loss and restore natural ecosystems, including goals to reduce pollution from sources such as plastics and nutrients, none relate to the enormous loads of sediment being washed into waterways.

"To conserve aquatic environments, the global community must prioritize explicit indicators and commitments to reduce excess sediment," Dr. Kuempel said.

Excess sediment is caused by land-use change and unsustainable development including logging, agriculture, and construction.

"When that sediment enters rivers, lakes, and coastal waters, it can smother nonmobile organisms, such as plants and corals," Dr. Kuempel said.

"The cloud of sediment settling out of the water column shades out the available light that is essential for many species to grow, feed, and reproduce."

For this reason, excess sediment in waterways can have real consequences for ecosystem health and function and crucially reduce the resilience of freshwater and marine ecosystems to climate change.

Globally, more than 40% of coral reefs are at risk from sediment export,

and in the southern hemisphere sediment run-off from land use change has increased by more than 40% since 1984.

"Governments and industry need to work together with scientists to monitor and mitigate anthropogenic sediment impacts on freshwater and marine systems," Dr. Kuempel said.

"Water quality and erosion metrics are relatively easy to measure using traditional and remote sensing methods and can be used to identify high sediment levels."

In addition to systematic land restoration and protection to combat land conversion, mitigating the negative effects of sediment requires erosion and sediment control, including maximizing covered ground, management of overland water flow, and sediment trapping, particularly in areas with high erosion risk like steep slopes.

"On the other side of the coin, we also need to take into account that infrastructure like dams can prohibit the sediment flow that is needed downstream," Dr. Kuempel said.

"The Australian government has committed to sediment reduction regulations in catchments near the Great Barrier Reef, but policies to reduced sediment loads must be incorporated into global conservation commitments."

"Managing sediment pollution would help to achieve global goals by facilitating habitat and species conservation, promoting sustainable food production and responsible urbanization, and improving natural resource management, while at the same time increasing the resilience of freshwater and marine ecosystem to climate change."

More information: Caitlin D. Kuempel, Sedimentation sifted out of

pollution priorities, *Science* (2023). DOI: 10.1126/science.adh2147