

Tailings dams can degrade the upstream variety and abundance of fish species

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Decrease



Increase



A well preserved stream affected by TSD. Credit: *Water Biology and Security* (2023). DOI: 10.1016/j.watbs.2023.100136

Streams are complex habitats that can be affected by changes further upstream or downstream. Even small dams and reservoirs can modify significant ecological processes, such as fish migration and colonization.

Tailings storage dams (TSDs) have been known to have an adverse effect on [water quality](#); however, their implications on upstream fish assemblages have yet to be determined.

A team of researchers, led by Gilberto Salvador from the Federal University of Pará, Biological Sciences Institute, postulate there are at least three aspects that need to be considered: life-cycle disruption, species intolerance or tolerance to lentic conditions, and [non-native species](#).

In their latest study conducted in the Rio Doce basin in Brazil, the researchers found that streams flowing into TSDs had fewer catfish species, including fewer armored catfish and fewer small predaceous catfish common to steep-slope [streams](#). The findings are published in *Water Biology and Security*.

To collect fish, the team used standard methods in 24 sites, half draining to TSDs (dammed) and half free from this impact (undammed). To identify differences between treatments, they used permutational multivariate analysis of variance, or PERMANOVA, to test both environmental variables and the assemblages of fish in each waterbody, and evaluated the biological metrics that most influenced assemblage composition change.

"Despite natural forest cover in most of the [catchment area](#) we observed a decrease in these species that rely on stream continuity and high-quality water," explained Salvador. "In comparison, two other widely tolerant species had increased in numbers along with one species commonly found in TSDs."

The team attributed this to re-colonization barriers created by TSDs, as well as colonization sources for tolerant species.

"Our findings underscore the need to consider downstream alterations caused by TSDs when assessing reference conditions for biomonitoring and bioassessment studies," concluded Salvador.

More information: Gilberto N. Salvador et al, Mine tailings storage dams modify upstream headwater fish assemblages, *Water Biology and Security* (2023). [DOI: 10.1016/j.watbs.2023.100136](https://doi.org/10.1016/j.watbs.2023.100136)

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