

Study suggests that mangrove forests provide cause for conservation optimism (Update)

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Credit: Daniel Friess / National University of Singapore

More than a decade ago, academics warned that mangrove forests were being lost faster than almost any other ecosystem, including coral reefs and tropical rainforests. But things are looking better.

An international team of 22 researchers from 24 institutes led by Associate Professor Daniel Friess and Dr. Erik Yando from NUS

Geography have found that there is now cause for optimism, with the global loss rate of mangrove forests now less alarming than previously suggested. (Please refer to the Annex for the full list of contributing institutions).

After studying various earlier presented works, the team found that globally, mangrove loss rates have reduced by almost an order of magnitude between the late 20th and early 21st century—from what was previously estimated at one to three percent per year, to about 0.3 to 0.6 percent per year, thanks in large part to successful mangrove conservation efforts. This heightens conservation optimism amongst broader projections of environmental decline.

"The team deduced that the reduction in mangrove global loss rates has resulted from improved monitoring and data access, changing industrial practices, expanded management and protection, increased focus on rehabilitation, and stronger recognition of the ecosystem services provided by mangroves," explained Assoc Prof Friess.

A commentary summarising the team's findings was published in the scientific journal *Current Biology* on 24 February 2020. This international effort was the result of the Fifth International Mangrove Macrobenthos and Management conference (MMM5), the world's largest mangrove conference which was held for the first time in Singapore last year.

Positive change in mangrove conservation

Mangrove forests occur along the shorelines of more than 100 countries and are incredibly important as they provide a number of critical benefits to people, including protection from coastal erosion and storm as well as cyclone damage, natural filters for pollution and sediment, carbon sequestration which helps to mitigate climate change, and

provide millions of people with products such as fuelwood, construction materials and fisheries resources, since mangroves act as nursing grounds for many coastal fishes.

"There is strong evidence that positive conservation change is occurring. Mangrove conservation has gained substantial momentum, with greater public and government awareness leading to investment and on-the-ground action. However, despite recent mangrove conservation successes, tempered optimism is necessary, as conservation gains are not evenly spread, nor guaranteed into the future," cautioned Assoc Prof Friess.

Mangroves under threat in emerging deforestation frontiers

The team gathered that mangroves continue to be threatened by aquaculture, agriculture and urban development across the world, particularly for new deforestation frontiers that are emerging throughout parts of Southeast Asia and West Africa. Southeast Asia is a traditional hot spot of mangrove deforestation as mangroves are cut down to make space for aquaculture ponds, cleared for rice paddy cultivation, and reclaimed for industrial and port development.

"Emerging deforestation frontiers need to be addressed early. Improved environmental governance and increased public intervention can help secure positive conservation outcomes in these locations. We need to take decisive steps to improve the success and scale of mangrove rehabilitation, and increase the resilience of mangroves to sea-level rise to maintain the current progress in mangrove conservation," commented Dr. Candy Feller, Senior Scientist at the Smithsonian Environmental Research Center, who is one of the contributors to the study.

Maintaining current progress in mangrove conservation

The team also noted that while mangrove rehabilitation is lauded as a method to offset historical as well as ongoing losses and can yield long-term ecosystem service provision, successful rehabilitation is still a challenge to achieve at scale.

Current mangrove rehabilitation projects around the world can fail because key ecological thresholds and rehabilitation best practices are ignored—for instance, planting in low-intertidal locations that are not suitable for mangrove growth and using non-native species that can quickly become invasive, which gives rise to myriad ecological impacts on the intertidal zone.

Another contributor, marine ecologist Professor Karen Diele of Edinburgh Napier University added, "The challenge of mangrove rehabilitation is to ensure that the best practices are executed correctly, including monitoring of rehabilitation projects, both in terms of flora and fauna, to learn from failure and successes. Work is required to overcome key socio-political hurdles. These include lack of training, unclear land tenure, and national governments or NGO targets that incentivise rehabilitation efforts in unsuitable coastal locations. These are not insurmountable challenges and can be addressed through engagement with policy makers and stakeholders."

"Ensuring that mangrove conservation gains are not short-lived will require continued research, policy attention, and renewed efforts to improve the success of mangrove rehabilitation at a scale that will be ecologically impactful," said Dr. Yando, Research Fellow at NUS Geography.

Meanwhile, Assoc Prof Friess and his team will continue to monitor mangrove deforestation and conduct studies to assess the benefits and values of mangroves in Southeast Asia.

More information: Daniel A. Friess et al. Mangroves give cause for conservation optimism, for now, *Current Biology* (2020). [DOI: 10.1016/j.cub.2019.12.054](https://doi.org/10.1016/j.cub.2019.12.054)

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