

# Scientists find link between tropical storms and decline of river deltas

October 19 2016

---



Fishing in the Mekong river. Credit: University of Southampton

Research by the University of Southampton shows that a change in the patterns of tropical storms is threatening the future of the Mekong River delta in Vietnam, indicating a similar risk to other deltas around the world.

The study, funded by the UK Natural Environment Research Council (NERC) and undertaken in collaboration with the universities of Exeter (UK), Hull (UK), Illinois (USA) and Aalto University (Finland), found that changes in the behaviour of cyclones mean less sediment is running into rivers upstream of the Mekong delta, starving it of material vital for guarding against flooding. The findings are published in the journal *Nature*.

Deltas are landforms made from sediment washed into rivers and carried downstream. The sediment builds up where the river meets slow moving or still water, such as seas or lakes. Deltas naturally subside under their own weight, so a constant flow of new deposits is vital to offset these changes and prevent flooding which could be disastrous to agriculture and the environment.

Lead researcher Professor Stephen Darby of the University of Southampton said: "Our study is the first to show the significant role [tropical storms](#) play in delivering sediment to large river deltas. We show that although human impacts affect the amount of sediment in a river - cyclonic activity is also a very important contributing factor."



Professor Stephen Darby on fieldwork. Credit: University of Southampton

The Mekong is the world's third largest river delta at 39,000 square kilometres. It's home to 20 million people and has a large agricultural area which is dominated by rice and is vital to the economy of Vietnam.

The international team behind this latest research developed a new method of analysing archived measurements of water discharge into the Mekong River to detect sediment concentration dating back over two decades (1981-2005). Then, by modelling the water flows through the Mekong's channels, they were able to isolate the impact of changes in tropical storms on the river's sediment load. Their data shows that of all the sediment transported to the delta, one third is due to [tropical cyclones](#). It also shows that the Mekong's sediment load has declined markedly in recent years—largely due to changes in the location and



intensity of storms tracking across the upstream rivers that feed the delta.

Co-Investigator at Southampton Dr Julian Leyland added: "Climate models predict that, even though tropical cyclones may intensify as our climate warms, the locations of their tracks may well move further away from the Mekong's catchment in the future."



Researchers on Mekong River Commission boat. Credit: University of Southampton

Professor Darby commented: "These results are very significant because the Mekong's [sediment load](#) is already declining as a result of upstream damming and other human impacts such as sand mining. Understanding

the role played by changes in tropical cyclone climatology gives us a broader knowledge of the threats facing this delta and others like it around the world."

The research has implications globally because other major rivers such as the Ganges (India/Bangladesh), Yangtze (China) and Mississippi (USA) have catchments that are regularly struck by tropical storms. Some 500 million people live and work in the world's major river deltas. This study indicates that changes in storm climatology, even in the river catchments far upstream of the deltas themselves, must also be considered when evaluating their future vulnerability to sea-level rise.

**More information:** Stephen E. Darby et al, Fluvial sediment supply to a mega-delta reduced by shifting tropical-cyclone activity, *Nature* (2016). [DOI: 10.1038/nature19809](https://doi.org/10.1038/nature19809)

Provided by University of Southampton

Citation: Scientists find link between tropical storms and decline of river deltas (2016, October 19) retrieved 10 April 2024 from <https://phys.org/news/2016-10-scientists-link-tropical-storms-decline.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--