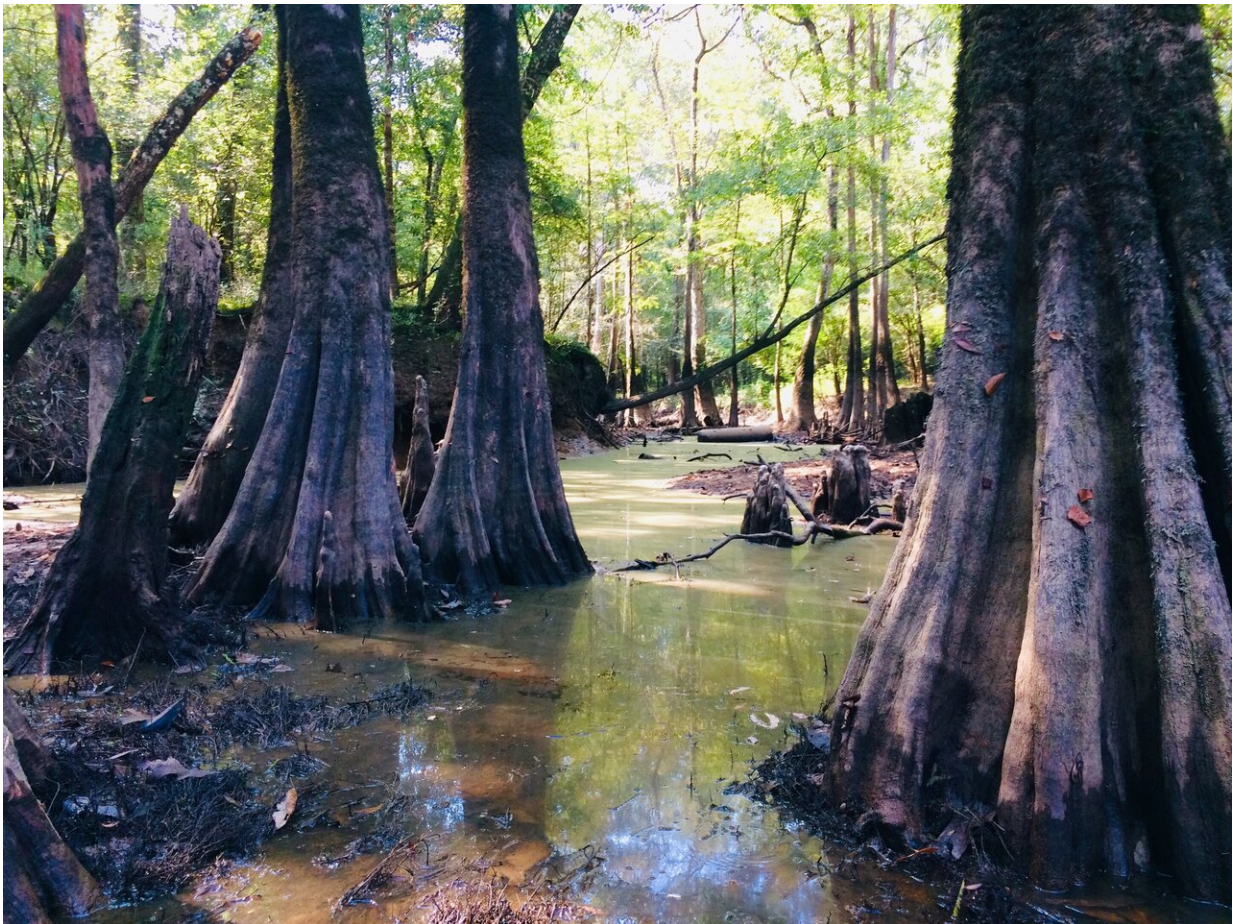


Study find delta helps to decrease the impact of river flooding

March 4 2020



A ground-level view of the Tombigbee-Alabama Delta. Credit: Steve Dykstra, Dauphin Island Sea Lab

Most coastal cities and ports face a double threat from storm surge and river flooding. Infrastructure development along waterways and sea-level rise increase vulnerability for these communities. In a recent publication, *The Propagation of Fluvial Flood Waves Through a Backwater-Estuarine Environment*, historical data is examined to determine how to reduce the risk of coastal river flooding to communities.

Usually, in rivers, large flooding events move from upstream to downstream faster than small events. This study identified a different model by tracking flooding events as moved from the river to the coastal ocean. The [river delta](#), which is common in many [natural systems](#), turned out to be very important for understanding when and where flooding is likely to happen.

Using years of observations (in some cases 9 decades of data), this study found that the Tombigbee-Alabama Delta (also known as the Mobile-Tensaw Delta) delays and reduces flooding for cities along the [delta](#) and bay. Amazingly, this effect is largely caused by the vegetation that naturally occurs in the delta.

Most of the delta is a densely packed tupelo-bald cypress swamp, supporting the most biodiverse location in temperate North America. For large events, the delta swamp acts like a sponge quickly absorbing the initial floodwaters, and then slowly releases the water back to the main rivers. This gives communities more time to prepare and reduces the risk of river flooding overlapping with a storm surge during a hurricane. The slower release of water from the delta also slows the impact on the bay, delaying the initial flushing while also keeping the salinity low for a longer period of time. In contrast, smaller flooding events moved downstream faster. This occurs because smaller flooding events remain in the confines of the river channel, where they are not impacted by the swamps of the delta.

These findings indicate the intensity of coastal flooding can be decreased and provide more time to prepare by allowing inland regions of rivers to flood and/or by managing vegetation type, both of which reduce the downstream height of water.

More information: S. L. Dykstra et al, The Propagation of Fluvial Flood Waves Through a Backwater-Estuarine Environment, *Water Resources Research* (2019). [DOI: 10.1029/2019WR025743](https://doi.org/10.1029/2019WR025743)

Provided by Dauphin Island Sea Lab

Citation: Study find delta helps to decrease the impact of river flooding (2020, March 4)
retrieved 27 April 2024 from <https://phys.org/news/2020-03-delta-decrease-impact-river.html>

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.