



Research News

Study shows coastal flooding will disproportionately impact river delta populations

31 million people living in river deltas are at high risk of flooding



An aerial view of Belem, Brazil, a city situated along the Amazon Delta in northeastern Brazil.

[Credit and Larger Version \(/discoveries/disc_images.jsp?cntn_id=301423&org=NSF\)](#)

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Thirty-one million people living in river deltas are at high risk of flooding and other impacts from tropical cyclones and climate change, according to a [study \(/cgi-bin/good-bye?https://www.nature.com/articles/s41467-020-18531-4\)](#) by [Indiana University \(/cgi-bin/good-bye?https://eri.iu.edu/news-and-events/_news/archive/2020/20200930-iu-study-shows-coastal-flooding-will-disproportionately-impact-river-delta-populations.html\)](#) researchers.

"To date, no one has successfully quantified the global population living on river deltas and assessed the cumulative impacts from climate change," said Douglas Edmonds, lead author of the study. "Since river deltas have long been recognized as hotspots of population growth, and with increasing impacts from climate change, we realized we needed to quantify what the cumulative risks are in river deltas."

The team's analysis shows that river deltas occupy 0.5% of Earth's land surface, yet they contain 4.5% of the global population: 339 million people. River deltas form at or below sea level, so they are prone to storm surges, expected to occur more frequently because of sea level rise and coastal flooding fueled by climate change.

The [U.S. National Science Foundation <https://www.nsf.gov/awardsearch/showAward?AWD_ID=1812019&HistoricalAwards=false>](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1812019&HistoricalAwards=false) -funded research analyzed geographic regions that included New Orleans, Bangkok and Shanghai, using a new global dataset to determine how many people live on river deltas and how many are vulnerable to a 100-year storm surge event (an event whose likelihood is one in 100 years). The researchers also looked at the ability of deltas to naturally mitigate impacts of climate change.

In addition to the threat of flooding, many of the residents in river deltas experience water, soil, and air pollution, and have inadequate housing infrastructure and limited access to public services. According to the study, of the 339 million people living on deltas throughout the world, 31 million are in 100-year storm surge floodplains.

"The basic science conducted by this team could lead to improved risk assessments in these vulnerable coastal areas," says Justin Lawrence, a program director in NSF's Division of Earth Sciences. "This information could inform future management decisions and improve the well-being of the public."

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