New research provides global analysis of storm surge footprints

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New research provides a global analysis of the footprint of storm surges, providing a first step toward helping decision-makers coordinate flood management and emergency response plans across borders.

When Category 4 Hurricane Laura made landfall, the biggest cause of alarm was a projected 'un-survivable' 20-foot storm surge. A storm surge is the sudden rise in sea level generated by a storm that can produce powerful currents, flood roads and destroy infrastructure.

Hurricane Laura's storm surge wound up being just half as high as feared, but storm-associated coastal flooding is expected to become more frequent with sea level rise. Better understanding storm surges and their spatial distribution can help coastal communities prepare for these dangerous flooding events.

New research in AGU's *Journal of Geophysical Research: Oceans* suggests the footprints of storm surges are more dependent on storm track direction than the intensity of the storm, and that both contiguous and unconnected stretches of coast can be simultaneously impacted by the same event. To reach their conclusion, the authors statistically analyzed both observed surge data from tide gauges and simulated storm surge data to understand how storm surges would simultaneously impact different coastline stretches around the world.

The authors provide a new framework to identify the patterns of coastal hazards. They demonstrate that simulated storm surge data can broadly reproduce the spatial footprints of storm surges obtained from observations, allowing them to analyze storm surge footprints in areas with limited tide gauge data and produce a global picture of storm surge footprints.

This information can be used to improve global coastal risk analysis, emergency plans and adaptation measures, according to the authors. They also conclude that their results, which show that storm surges can impact coastlines across state and national boundaries, highlight the importance of inter-state and international collaboration for disaster preparedness and response plans.

More information: Alejandra R. Enríquez et al, Spatial footprints of storm surges along the global coastlines, *Journal of Geophysical Research: Oceans* (2020). DOI: 10.1029/2020JC016367

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