

More Frequent River Avulsions on Deltas Due to Sea-level Rise

Chadwick, A. J., Lamb, M. P., & Ganti, V. (2020). Accelerated river avulsion frequency on lowland deltas due to sea-level rise. *Proceedings of the National Academy of Sciences*, 117(30), 17584-17590. <https://doi.org/10.1073/pnas.1912351117>

Scientific Achievement

- We showed modern rates of relative sea-level rise on deltas should cause coastal rivers to naturally divert their course, or avulse, more frequently.

Significance and Impact

- Results provide a framework to predict delta response to future sea-level rise, which is valuable for planning engineered diversions to nourish deltaic ecosystems and prevent catastrophic flood hazards in coastal megacities.

Technical Details

- We developed a new numerical model that couples the physics of river flow, sediment transport, riverbed deposition and erosion, and river avulsion processes.
- Model predictions agree with global historical river data.



Satellite view of a river avulsion, whereby the river abruptly and catastrophically changed its course to the ocean. This delta is found in East Aceh, Sumatra.

Credit: Base image courtesy of Sentinel 2, Vamsi Ganti, and Sam Brooke.