

Basin-scale land use impacts on world deltas: Human vs natural forcings

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Abstract

A new global database of 86 deltas and river basins was analyzed to investigate the relative importance of deforestation and land use changes versus natural forcings in determining long-term total delta size. Results show that mean river flow and shelf slope were the most important variables, whereas population density and sediment load had a much lower importance. Deforestation and other variables related to land-use generally had a very small effect, but were more influential in a subset comprising Mediterranean and Black Sea deltas. As most deltas have developed over thousands of years, the much shorter-lived anthropogenic signals from deforestation and other landscape perturbations have had only secondary impact on the total area of deltas. Also, delta progradation is strongly influenced on sand deposition, whereas anthropogenic impacts on sediment load have more often impacted mostly the finer sediment being deposited offshore (prodelta deposits) or in the deltaic plain. These data disproves the hypothesis that delta size and growth is strongly influenced by human forcings, particularly for larger deltas, since Holocene delta building is mainly determined by natural forces. However, humans are influencing the geomorphology of deltas, particularly over the last century when the Anthropocene nature of deltas has become manifest. A more precise terminology is proposed to clarify concepts such as “human-made”, “human-engineered” or “human-influenced” deltas.

Read the full article in [Global and Planetary Change](#) [1].

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