

Projecting global delta area under relative sea-level rise scenarios

Department: Physical Geography

Research group: Geographical hydrology, Global change geomorphology

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Project description

Coastal river deltas are low-lying environments vulnerable to changes in land elevation and sea level, which is concerning given relative sea-level rise (RSLR) projections for the coming decades and the hundreds of millions of people that currently live and rely on coastal deltas. Recent work ([Nienhuis and van de Wal 2021](#)) has modelled delta land area change over the 21st century under scenarios of RSLR, and here we will take the work further by combining their model with projections of fluvial sediment delivery ([Dunn et al. 2019](#)). Sediment deposition and retention is the primary driver of land elevation gain in deltas, and therefore the key counterbalance to subsidence and global sea-level rise. The proposed methodology allows for the inclusion of varying influences of dams and other human activities on sediment delivery to deltas, and therefore analysis of the effect of these drivers on delta land area change.

The assistant will undertake the modelling with advice from the supervisors, using existing available code and datasets. The analysis will focus on a selection of deltas based both on the best modelled data and processes, and broader academic and practical interest. The direction of the research may also be determined considering the assistant's interests. For example, the assistant can make a webpage showcasing land area projections of future deltas, or be involved in writing a publication based on the modelling work and analysis. As all research activities for this project are computer based, there should be no disruption to the work in case of further homeworking advice. Fortnightly meetings with the supervisors can be online or in person.

Job requirements

Experience with Matlab or Python and working with spatial data would be advantageous, as would knowledge of coastal river delta geomorphology.