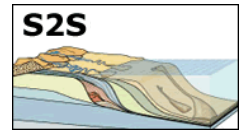


# Self organization of tidal deltas



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We developed a numerical model to simulate the formation of channels networks in tidal deltas. Model results show that the distributaries of the Kikori delta, in the Gulf of Papua, self-organize to uniformly redistribute the tidal prism (and therefore discharge) across the entire delta system. The specific tidal prism in the delta is clustered around a narrow band, whereas other possible geometries of the delta (without the fine structure of the network or with the tidal loops disconnected) are less effective in distributing the total discharge. The two opposite mechanisms of channel formation by avulsion and channel abandonment drive the entire delta towards a critical state at which every channel is near the silting threshold. Under these conditions the delta reaches self-organized criticality, with changes of its planimetric channel distribution occurring at all possible scales

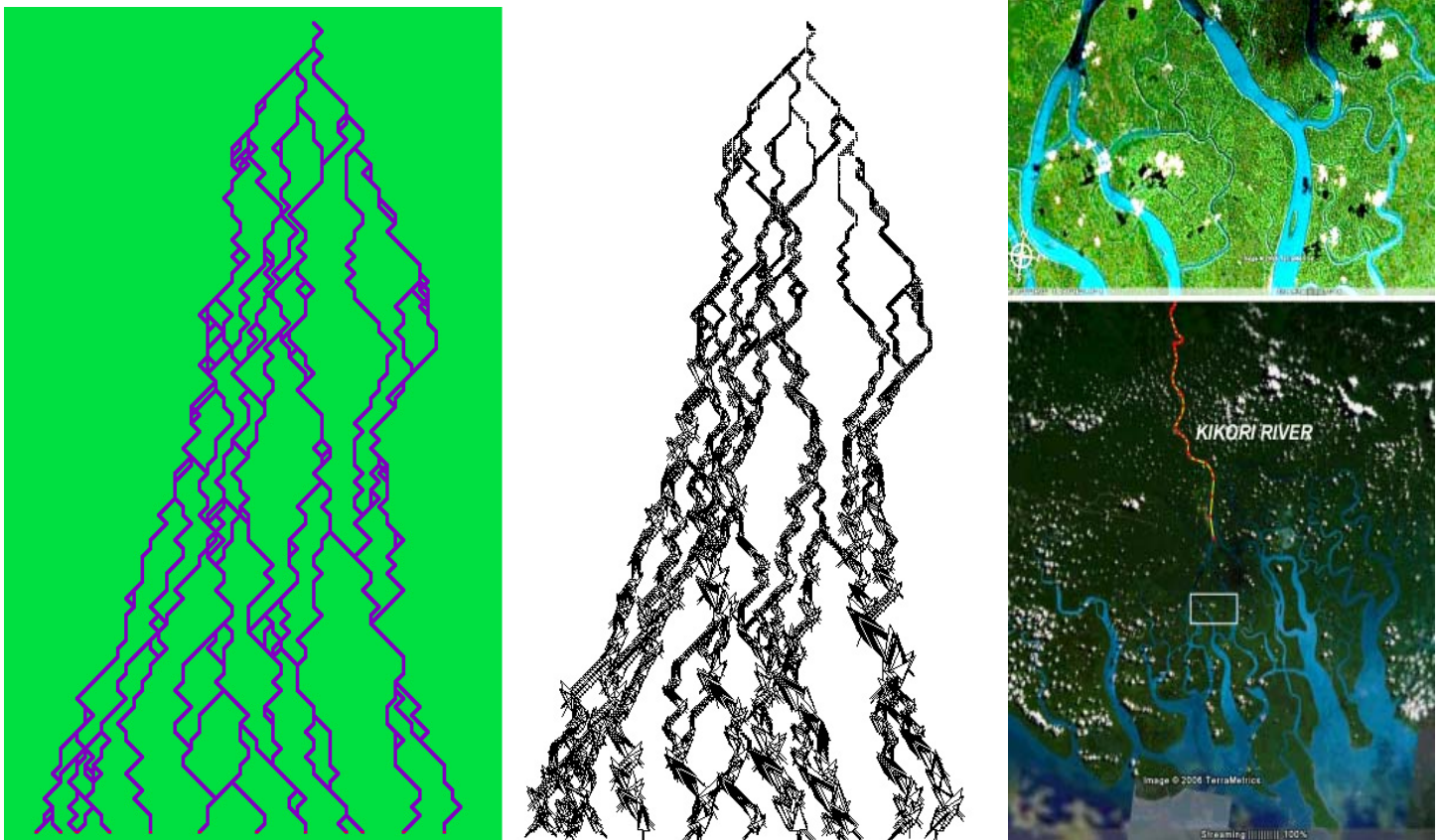


Figure: Modeling the formation of distributary channels in a tidal delta (left) model results; (middle) tidal discharge; (right) example, the Kikori river, PNG