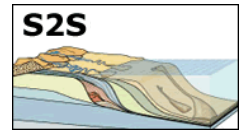


Geomorphodynamic Modulation of Biogeochemical Fluxes and Basin Stratigraphy of the Fly River



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The focus of this recently awarded project is a multidisciplinary investigation of the processes responsible for the transport and sequestration of organic carbon by the Fly River and the associated floodplain. Our research team will investigate the role that sediment exchange processes between channels and floodplains play in modulating biogeochemical fluxes and how these processes affect the composition, source, age and stability of organic matter. Additionally, we will study how partial and full channel avulsions govern sediment and carbon accumulation across the distal floodplain and hence the infill of these lowland alluvial basins. To explore these processes, we will (1) quantify the character, concentration, and fluxes of organic matter and biogeochemically reactive particles; (2) document migration rates and cross-meander-apex profiles of topography and biogeochemical properties; and (3) survey and core the distal floodplain at several reaches where early avulsion processes appear to be delivering large quantities of sediment and burying organic rich floodbasins. We will combine these field surveys of sediment/biogeochemical transport and depositional processes with numerical modeling, image analysis, and monitoring at established gauging stations to determine (i) the fluxes, exchanges, and sinks for fine particles, and (ii) the related fluxes and net changes in the quantities, characteristics, and turnover times of associated organic carbon. This research will provide critical insight into the strength, timing, and controls on the "source" term for water, sediment, and biogeochemical fluxes within this NSF Margins Source-to-Sink study area, enhancing prior research conducted downstream (e.g., Aalto et al., 2008; Alin et al., 2008; Goni et al., 2008, Lauer et al., 2008).

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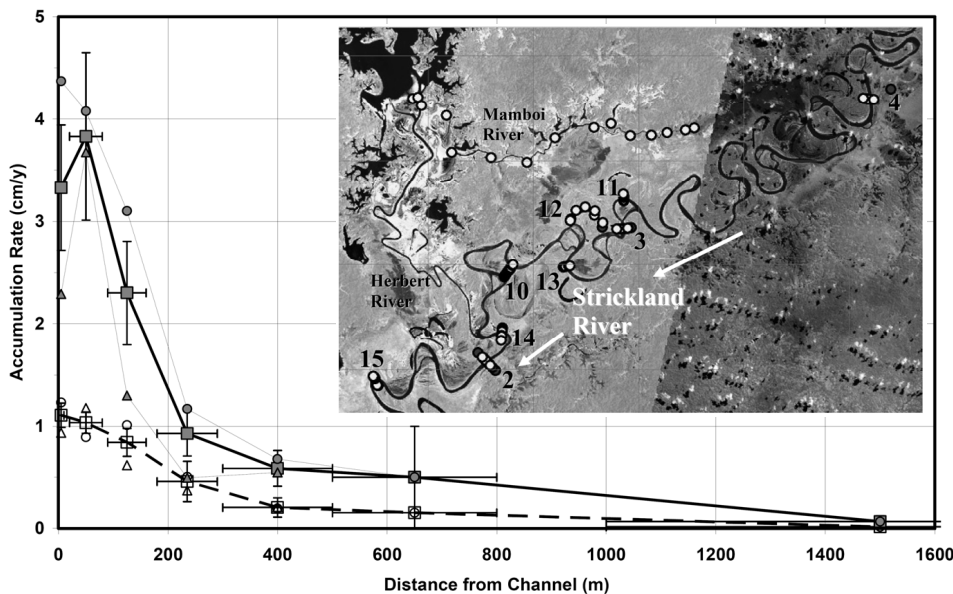


Figure 1. Measured sediment accumulation rates across the flood plain of the middle Strickland River (Aalto, et al., 2008). The insert map shows the sample locations along the Strickland River within Papua New Guinea.

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