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Distribution and cycling of carbon in the Tana River basin (Kenya)

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The Tana river represents the largest river basin in Kenya (~120,000 km^2). We conducted a dry season survey in headwater streams and along the main river, analysing a wide suite of biogeochemical parameters (concentrations and stable isotope composition of POC, DOC, DIC, and O2, as well as general physico-chemical measurements, nutrients, methane, and pigments). Biogeochemical signatures in headwater streams were highly variable, with some organic carbon characteristics in the water column clearly correlated to those in surface soils. Along the middle and lower river course (>600 km), TSM concentrations increased almost 20-fold despite the absence of tributary inputs, indicating important resuspension of internally stored sediment. These inputs were characterized by a decreased and more 14C-depleted OC content, suggesting selective degradation of more recent material during sediment retention. Masinga Dam (a large reservoir on the upper river) showed a strong retention of nutrients and an uncoupling of DOC and POC: while DOC pools and d13C signatures were similar above, in and below Masinga, the POC pool in Masinga was drastically different, being dominated by 13C-depleted phytoplankton with a distinct pigment composition.