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Use of turbidity measurements to monitor suspended sediment loads on the Congo River

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Recent mapping of sediment sources and erosion processes in the Congo basin show that sediment loads may be higher than previously estimated. Stark temporal changes in water turbidity in some of the tributaries observed by satellite images over the past 25 years indicate a need for closer monitoring of sediment load transported in the River. Turbidity sensors present an attractive option for sediment monitoring due to their ability to provide automated continuous time series data for estimation of suspended sediment concentration and suspended sediment fluxes in rivers; an attribute that is particularly important for remote rivers like the Congo. Continuous in-situ turbidity measurements were made using an OBS-501 turbidity sensor at the Kutu Moke monitoring site on the Kasai River, a major tributary of the Congo River between July 2018 and August 2019. The sensor infers turbidity by detecting the intensity of light scattered from suspended particles in water. We explore a field calibration of turbidity measurements with over 120 simultaneous suspended sediment concentration (SSC) measurements for the same period. Sediment loads estimated using high frequency turbidity data measurements (hourly) are then compared to loads estimated using classical sediment rating curves to establish if the turbidity provides a better representation of the suspended sediment load.