

Discharge, sediment load and chemical flux from the Yukon River basin, Alaska

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The mechanisms of discharge, sediment load and chemical flux from the Yukon River basin, Alaska, are investigated by re-producing their time series with runoff analyses. The Yukon River discharge in summer consists of glacier-melt and rainfall runoffs, which are affected by spatial distributions of mountain glaciers (ca. 2.8% area in the basin) and spacious permafrost (ca. 90% area). The 1999 and 2006 observations revealed that temporal patterns of discharge are quite different from those of sediment load and SiO_2 flux. This results from different sources of sediment and SiO_2 , biasedly located in the basin; the former originates in the glacialized regions and the latter comes from the base flow from the permafrost regions. The sediment plume off the Yukon Delta was numerically simulated by using a 3D topographic model. A comparison between simulation and satellite images indicates that the advective diffusion of suspended sediment is relatively restricted to around the delta front, reflecting the surrounding weak ocean current.