Spatial and temporal variability of suspended sediment yield in the Kamchatka Krai, Russian Federation

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Abstract Research into the spatial and temporal variability of suspended sediment flux (SSF, t year⁻¹) has been conducted for rivers in the Kamchatka Krai (in the far east of the Russian Federation). The study of long-term fluctuations in SSF was based on difference-integral curve analysis. Most of the rivers in the region are characterized by two relatively long-term trends in SSF; increases from the late 1970s to the early 1980s, followed by a subsequent decline. Kamchatka was divided into regions based on similar conditions of specific suspended sediment yield (SSSY, t km⁻² year⁻¹) followed by a determination of the various factors controlling it. New maps of suspended sediment concentration (SSC, mg L⁻¹) and SSSY for Kamchatka also were constructed and, based on this study, there currently appear to be 18 SSC and 13 SSSY regions, as opposed to 4 and 2 regions, respectively, as had been determined in the 1970s. The influence of volcanoes on SSF can be substantial, and can increase up to 5-fold after eruptions; SSC can reach 6⋅10⁵ mg L⁻¹ in rivers draining the flanks of volcanoes.

Key words suspended sediment concentration; volcanic eruptions; rainfall erosive factor; specific sediment yield; suspended sediment concentration; multiple regressions; Kamchatka Krai, Russia