

Sediment Transport in the Lower Snake and Clearwater River Basins

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The U.S. Army Corps of Engineers estimates that, since completion of the Lower Granite Dam, about 75 million cubic yards of sediment have been deposited in Lower Granite Reservoir. In 2008, the U.S. Geological Survey began field data-collection activities designed to quantify relative sediment transport in the lower Snake and Clearwater River Basins and subsequent deposition in Lower Granite Reservoir. Data-collection activities included stream discharge measurement and suspended and bedload sediment sampling at 12 locations. Of the 12 stations sampled, the Palouse River (100 mg/L) and the Salmon River (94 mg/L) had the highest median concentrations of suspended sediment. The highest measured concentrations of suspended sediment were collected from the Palouse (1,400 mg/L) and Potlatch (3,320 mg/L) Rivers during a rain-on-snow event in January of 2011. For each of the stations in the sampling network, the load of total suspended sediment was highest during water year 2011 and lowest during water year 2010. Combined, the Snake and Clearwater Rivers discharged about 10 million tons of suspended sediment to Lower Granite Reservoir during water years 2009-2011. Of this total, the Salmon River Basin accounted for about 50 percent of the total suspended sediment, 56 percent of the suspended sand, and 44 percent of the suspended fines delivered to Lower Granite Reservoir. Agricultural river basins, including the Palouse, Potlatch, and Grande Ronde, had high percentages of suspended sediment (mean of greater than 80 percent) as fine-grained material smaller than 62.5 micrometers. Conversely, predominantly forested river basins, including the Salmon, Selway, and Lochsa, had relatively low percentages (mean of less than 55 percent) of fine-grained material. The mean annual basin yield of suspended sediment during 2009-2011 ranged from about 36 tons per square mile per year (t/mi²/yr) from the Lochsa River Basin to 156 t/mi²/yr in the Potlatch River Basin.