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## **Downstream fining of bar sediments in a meandering river: variations and influence of lateral inputs in the upper Odra River**

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From a general point of view, river sediment is gradually fining the downstream direction, which is mainly a product of abrasion and selective transport. Downstream fining is not constant, and certain disturbances, such as sediment supply from tributaries or erosion connected with lateral and vertical shifts in the channel, can abruptly change sediment size. The main goal of this case study is to analyse discontinuities in the downstream fining of sediment size and link these variations with possible sources, i.e., lateral inputs. We focussed on the 75-km-long Odra (Oder) River reach in Czechia. The Odra is a relatively preserved meandering river with dominant gravel sediments. The supply of sediments is realised from two contrast geologically distinct mountain ranges, namely the Nízký Jeseník Mts. (generally offals and slates) in the Bohemian Massif and the Moravskoslezské Beskydy Mts. (flysch-based) in the Outer Western Carpathians. Analysis of the surface layer of 15 gravel bars was performed by the Wolman method, by which we randomly measured 100 clasts on each gravel bar. Additionally, we collected subsurface samples for sieving analysis. In the composition of the subsurface samples, there were dominant gravels and sandy gravels. Only four sites were muddy sandy gravels, which may be caused by the predominant slow flow in that part of the Odra River reach. The data of the coarse-grained material ( $\geq 2$  mm) from the surface layer showed downstream fining only in the approx. first third of the river reach (27 km). The downstream part of the reach did not show significant fining, but rather a gradual increase in grain size of the surface bar layers. The most apparent fluctuation in grain size showed the 25th and 75th percentiles (14 - 29 mm and 25 - 42 mm, respectively), while the median indicated lesser variations. The discontinuity in fining can generally be linked to the influence of tributaries that carry coarse gravel from mountainous areas, but in this case the samples near tributaries do not show abrupt changes in sediment calibre. It is reasonable to assume that the coarse sediment was supplied to the river by lateral erosion of alluvial deposits in active meander bends, as indicated by the presence of coarse gravels in the architecture of the eroded alluvium.