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Sedimentation processes in backwaters of the Upper Mississippi River, USA

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The upper Mississippi River (UMR) from St. Louis, Missouri to St. Paul, Minnesota has since 1940 been regulated for navigation by 26 low-head dams. Old floodplains have been partially to completely inundated and these "backwaters" have been perceived as a huge sediment sink and for this reason, removal of the dams has been suggested. However, these earlier backwater studies are deeply flawed because they've depended on radiocarbon dating which can measure deposition but can't measure erosion.. Precise surveys in 2001, based on precise floodplain surveys in 1933 before inundation, suggest that as much erosion and deposition has occurred in Pool 8 near La Crosse, Wisconsin. Processes in the shallow backwaters are much more fluvial than lacustrine. That is, rather than being a mordant sink zone, these backwaters are dynamic with new landforms such as channels and natural levees being built and changed over time. The significance of this work transcends the UMR. The hypothesis is that since inundation suppresses woody vegetation, the floodplain is made hydraulically smoother so that flood velocities are greater. At the same time that tractive force is greater, the resistance to erosion is less, so more erosion and dynamic sedimentation processes will occur. Thus, while reservoirs are usually perceived as sediment traps, they may actually enhance fluvial processes on shallow, inundated floodplains.