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Floodplains of large river systems - homogenous or heterogeneous deposition environments? Lessons learned from high-resolution XS210Pb analyses

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One of the questions in fluvial geomorphology of large river basins is the question of how sediment is distributed on floodplains. For large rivers different processes and conveyors like floodplain channels, crevasse splays and avulsions play a role in sediment delivery to the floodplains. But how efficient and homogenous is sediment transport to floodplains in large river systems? How dependent is overbank sedimentation on external factors like climate and land cover change? How stable are sediments in distal parts of the floodplain after deposition? And, have short-term processes implications on the use of floodplain profiles as long-term records?
Trying to answer some of these questions several landscape units along the Sacramento River floodplain between River Mile (RM) 175 and RM 195 have been analysed for infilling rates and processes using OSL and high-resolution XS210Pb profile analyses and dating. The landscape structure of this particular reach of the Sacramento River with large ephemeral floodplain channel systems, natural, large scale annual inundation of the floodplain and a high level of preservation of pristine fluvial environments is highly suited to answer the question of how different topographic units influence sediment deposition on a floodplain. Using high-resolution XS210Pb analyses it is possible not only to calculate infilling rates but also to identify different styles of infilling and erosion processes and their distribution over the floodplain of a large river system during the last century. Thus shedding light on the complexity of large river floodplains as sediment sinks. Using OSL and 14C dating as additional dating tools, this combined approach also enabled the comparison of last centuries' processes and rates with all-Holocene records testing how well modern sedimentation rates fit site specific long term evolution.