



## **Quasi-continuous and non-continuous archives in a floodplain setting. Detection, spatial distribution, and preservation potential.**

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Fluvial deposition and erosion within a floodplain setting is heterogeneous in respect to its temporal and spatial distribution. Especially larger river systems with topographically heterogeneous floodplains show a large variability of influences on the transport and subsequent deposition sediment. But (depending on time scale) floodplains might still be able to tell a continuous story of (extreme) flooding events.

This presentation discusses the potential of different topographic units as archives for fluvial processes in a floodplain setting along the Sacramento River floodplain (River Mile 175 - RM 195). This floodplain reach of the Sacramento River shows a large variety of topographic features, e.g. large ephemeral floodplain channels, elevated floodplains, channel scars, oxbow lakes, scour scars, large-scale annual inundation of the floodplain, and limited anthropogenic surface alterations. Therefore this setting provides an excellent opportunity to research the distribution of sedimentation processes on a floodplain.

To decipher the distribution of quasi-continuous and non-continuous archives in this setting, high-resolution XS 210Pb profile analyses, and dating has been applied to approximately 80 shallow cores (~1m) within several landscape units to reconstruct deposition or erosion processes, rates, and frequency. With these high-resolution clay normalised adsorbed excess 210Pb (CNAXS) profiles it is not only possible calculate sedimentation rates, but also to detect and date relatively small (>3cm) deposition events with high precision (error  $\pm 4$  to  $\pm 10$  a) within the last century. Thus gaining insights on the potential of river floodplains as archives for extreme events.

The analysis of the XS 210Pb profiles indicates that there are three categories of archives in the floodplain of the research area. (1) The majority of the sampling locations represent archives that are not suitable as for flood reconstructions, due to low sedimentation rates, frequent reworking or anthropogenic influences. Especially the anthropogenic use of a landscape has a negative influence on the preservation and detection potential of individual events and thus the suitability of floodplains as archives. (2) Floodplain profiles that show one to several individual dateable deposition events, but non-continuous records. When several of these individual profiles are combined a quasi-continuous record of deposition events can be established. (3) Oxbow lakes and channel scars that represent quasi-continuous archives of (extreme) flooding events.