



Holocene flood plain sediment storage and hillslope erosion within the Rhine Catchment.

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The response of fluvial systems to land use and climate change is strongly dependent on the catchment size. While the forcing-response mechanisms of small catchments are reasonably well understood, the response of larger drainage basins is less clear. In particular, the impact of land use and climate change on the Rhine system is not well known due to the large size of the catchment (185 000 km²) and the long history of human cultivation, which started approx. 7500 years ago. A sediment budget was used to estimate the alluvial sediment that was deposited during the Holocene and to calculate long term soil erosion rates. The results suggest that $59 \pm 14 * 10^9$ t of Holocene alluvial sediment are stored in the non-alpine part of the Rhine catchment. While 50% of these sediments are deposited within the lower and upper Rhine, the rest is stored in the tributary catchments. Assuming a sediment delivery ratio of 10%, the stored alluvium corresponds to a mean Holocene erosion rate of 0.55 ± 0.14 t ha⁻¹yr⁻¹ or 38.5 ± 0.14 mm/kyr. This value is at the lower limit of mean long term erosion rates from other studies.