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## Measuring in-channel sediment balance by river changes

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A case study located in the middle plain of the Po river (Italy) is presented that is related to the results enlightened from measures of bank landward movements during 33 years (1955-1988).

The landward movements describe erosive and sedimentary processes in the fluvial dynamics and characterise the balance of lateral sediment erosion and in-channel deposition.

A Po river reach, 100 km long, showing a single channel threat 200 m wide (meandering), was observed by multitemporal documentation: aerial photographs, topographic surveys of the river channel, maps of topographic support.

Morphometric analyses were carried out to obtain measures on the landward erosion and related bedform accretions, both measuring their area and elevation changes. Volumes of mobilised sediment were calculated with accuracy of the cartographic elaboration scale (1:25.000) on the planform measures and with accuracy of the topographic survey on the elevation measures.

The results on mobilised sediment in 55 bank erosion sites showed a cumulate volume of  $64x10^6$  m<sup>3</sup>having a distribution site by site following the landward migration rate. These volumes were considered an important sediment supply to the sediment transport in the observed channel reach.

As far as the sediment balance is concerned, the cumulate volumes of the bed accretion showed a loss of  $18 \times 10^6$  m<sup>3</sup>: the loss of sediments in the balance was assumed as total sediment yield at the end of the reach during 33 years.

The in-channel sediment balance measured by morphometric analyses could improve the sediment transport assessment in large bed rivers without direct measures.