

Monitoring of suspended sediment in South Tyrol

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In the context of the EU Water Framework Directive (WFD), which aims to achieve a good status of European water bodies, the Hydrographic Office of the Autonomous Province of Bolzano (Italy) extended in 2014 its institutional activities including the monitoring of suspended sediment in the river channel network. Currently, the only active monitoring station is on the Adige River at the gauging station of Ponte Adige near Bolzano (drainage area 2705 km²). The applied monitoring strategy and the data analysis concept are both based on the guidelines issued by the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW).

The results indicates that the temporal variability strongly differs during the investigated period (2014-2015). In addition to the analysis of precipitation and water discharge, temperature and lightning activity were also included to better understand the sediment transport dynamics observed at the station. In summer 2015, the combination of constantly high daily temperature throughout the Adige basin (which drove intense glacier melting in the headwaters) with a high frequency of convective rainfall events (90% more than in 2014, obtained through lightning detection), led to an annual mass of transported suspended sediment of 260000 t. Interestingly, this value is similar to the one estimated for 2014 (300000 t), which was characterized by very different meteorological conditions (colder and wetter summer), but with the occurrence of an important flood in August, which transported half of the annual amount.

Finally, we can conclude that the adopted monitoring strategy is applicable for institutional aims in terms of costs as well as in terms of time effort. During the next years, other stations for suspended sediment monitoring are planned to be installed in the Province to cover the most important river segments.