

# Evaluation of suspended sediment in Slovenian rivers by using automatic turbidity sensor

MSc. Florjana Ulaga<sup>1</sup>

<sup>1</sup> Ministry of the environment and spatial planning, Slovenian Environment Agency,  
Vojkova 1b, Ljubljana, Slovenia.

Phone: +386-1-478-4081  
E-mail: florjana.ulaga@gov.si

**Introduction:** In complex of monitoring of suspended sediment, the Slovenian Environment Agency started with implementation of new technology. At the automatic gauging station on the Sora River, a torrential tributary of the Sava River, an optical turbidity sensor Solitax\_sc (Hach & Lange) was set up for trial operation. Suspended sediment concentration (SSC) can be estimated from the turbidity of water. The purpose of testing was to start implementing Solitax\_sc as automatic sensor for SSC determination also on other automatic gauging stations. The same sensor was set up also on automatic gauging stations on transboundary river Drava.

**Methods:** The turbidity sensor reflects dynamics of suspended solid according to expectations. From the aspect of monitoring of suspended material, the testing of the turbidity sensor proved that the sensor is suitable. The correlation that exists between turbidity and the SSC is evident from data. Nevertheless, relationship between two parameters needs to be tested and proved periodically for every hydrological station. Advantage noticed during the testing time was: high resolution sampling of SSC in water; SSC measurements in extreme hydrological conditions; semi-automation of monitoring procedures and higher data sampling rate results in better on-line data availability through network communication links.

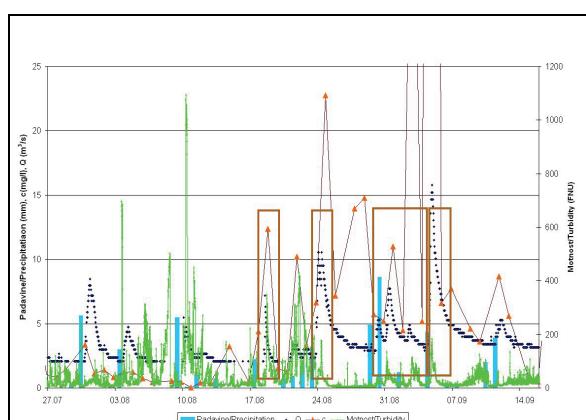


Fig. 1: The results of test measurements on river Sora – precipitation, discharge, SSC, turbidity.

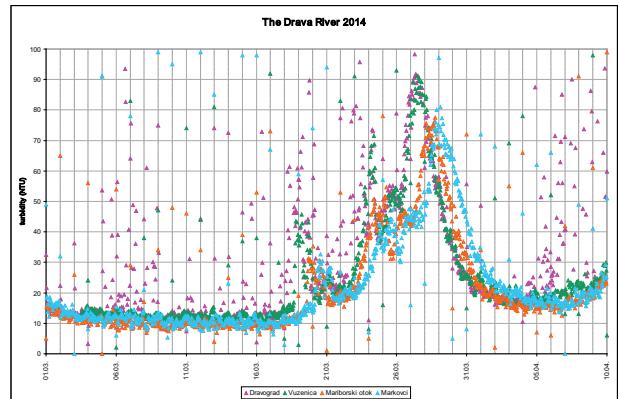


Fig. 2: Turbidity of transbounday river Drava in spring 2014.

**Results:** According to good experiences of recognizing relationship between turbidity, SSC and also water discharge on gauging stations, the implementation of automatic turbidity sensors is planning for evaluate of SSC on another eight water bodies in Slovenia. Good knowledge of the continuity of sediments is essential in particular for monitoring of biological and hydromorphological status of water in rivers with headwaters in the Alps, as well as in transboundary rivers. The implementation of sensors and evaluation of the results is part of the project BOBER - Better Observation for Better Environmental Response, which has come to the final part in 2015.

**References:** [1] EPA 180.1 *Turbidity measurement standard*; [2] Florjana Ulaga, Luka Ravnik (2014) *Testing of automatic turbidity sensor Solitax\_sc*; [3] Florjana Ulaga (2014) *Motnost Drave*.