



PROCESSING OF SENSOR-RECORDED WATER TURBIDITY BY MMEA PLATFORM

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ABSTRACT

The vision here is to integrate different water quality data of the Finnish Environment Institute (SYKE) through a computer platform so that a researcher can request reliable, continuous total phosphorus (TP) and suspended solids (TSS) concentration datasets of a certain area from the system. In the developed MMEA platform, the quality of the data recorded by water quality sensors at automatic measurement stations will be ensured by:

- 1) comparisons with water sample data and utilization of hydrological and meteorological data
- 2) on-site quality assurance methods (regular cleaning and maintenance)
- 3) carrying out quality assurance tests to detect missing observations, sudden unexpected changes in data, exceedances of limit values, outliers, etc.

The system provides information on how the data is processed and indicators of data quality (error variance, contribution of different error sources, etc.). Functionally, the system is divided into five phases:

- 1) Continuous turbidity measurements, data transmission (by mobile phone network) and storage
- 2) Collection, laboratory analyses and storage of water samples
- 3) Quality control of the observed data
- 4) Formulation and updating of the calibration and conversion equations
- 5) Responding to the end-user requests

Under SYKE's management there are many automatic measurement stations, which record continuously turbidity. In the MMEA Platform, the quality-assured "raw" sensor data is calibrated according to linear regression equation between water samples and simultaneous sensor recordings. Moreover, a conversion equation is formed according to the relationship between water sample -based turbidity and TP and TSS concentrations. With all of this information, the end-user inquiries regarding the TP and TSS concentrations in a certain area



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will be responded. The MMEA platform will use data quality assurance procedures also in the final step so that the end-user can evaluate the reliability and, on the other hand, uncertainty of the processed data in a user-friendly form.