

**Best-practice for long-term observations of total suspended particulate matter in coastal marine environments**

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Total suspended matter concentration (SPMC) is a key parameter to assess the status of and impacts to marine environments. To capture its high variabilities over long time periods numerous observation platforms were being installed worldwide to identify and predict changes induced by e.g. human activities. They combine direct (samples) with indirect (optical and acoustic sensors) measurements of SPMC. The long-term operations are inherently associated with uncertainties along the whole operation chain from in situ calibration of the sensors, laboratory work, mostly unsupervised long-term deployments to final sensor output conversion. Knowledge of these uncertainties are needed to obtain validated time series that can be used for direct (e.g. trend lines, moving averages) or indirect predictions (e.g. validated numerical models) of the environmental status. Despite several years of practical experience with systems operating in highly dynamic and productive coastal ocean environments, proper comprehensive and agreed operational guidelines have not been formulated so far. International guidelines exist only for water sample data but not for the usage of indirect systems. To collect knowledge on potentials and limitations of present practice, more than 20 international experts gathered for a two-day workshop in February this year. As an outcome a number of recommendations were formulated that shall be published as a basis to acquire best quality-assured SPMC data sets obeying procedures put forward by the expert group. On the basis of examples we will illustrate main sources of uncertainties, present means to quantify and reduce their ranges, and a set of recommendations for suitable protocols.

**Keywords:** monitoring methodology, suspended particulate matter, turbidity, long-term time series

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