Excel Macro for Continuous Instream Monitor (CIM) Data Correction[1]

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Abstract: Continuous water-quality monitoring has become an essential part of gauging the current conditions of surface water. Sondes, a popular choice for continuous monitoring, can be deployed in bodies of water to record data for as long as the batteries will last. Drawbacks of this method are that as the sonde sits in the water, it can collect sediment or biological material on the sensors. As a result, the data can show evidence of fouling error. Another factor that can introduce error into sonde readings is calibration drift. Drift and fouling error can be corrected based on readings from the sonde at the end of the deployment period when the sonde is cleaned and the calibration is checked. Sonde data that is not corrected for these types of fouling and drift errors can be inaccurate. Therefore, the objective of this project was to develop a free and user-friendly Visual Basic for Applications (VBA) macro that performs fouling and calibration corrections on sonde data. The VBA macro was developed based on the United States Geological Survey (USGS) protocol for continuous instream monitoring data correction, which assumes that fouling and drift occurs linearly and can be corrected from the initial to final data points. The accuracy of the VBA macro in correcting sonde data was tested by deploying sondes for approximately seven weeks at locations where significant fouling was expected. Each week, a second clean and well calibrated field meter was used to collect water quality data next to the deployed sondes. At the end of the deployment period, the differences between the sonde data and well calibrated field meter measurements were compared. The data was in good agreement with the field meter measurements; however, additional work is underway to determine if assumptions for linear drift and fouling are valid and the best option for correcting sonde data.

Additional Key Words: Macro, Sonde, Fouling.

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