YSI Environmental

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Tech Note

Reconciling 6026 and 6136 Turbidity Data

Introduction

The agreement between *in situ* turbidity measurements and measurements made by commonly accepted laboratory technology has been a source of concern for investigators responsible for gathering turbidity data, especially for compliance and enforcement applications.

Extensive empirical field and lab tests performed by YSI as well as by independent agencies in Alpha and Beta studies, document close agreement between *in situ* measurements made with the YSI 6136 turbidity sensor and data from the Hach 2100AN: a laboratory instrument recognized as the standard for turbidity measurement. This is one of the reasons that the YSI 6136 turbidity probe has become the YSI turbidity sensor of choice.

For users that have a database of turbidity measurements using the YSI 6026 turbidity probe, they may want to correlate it with readings from a new YSI 6136 turbidity probe. This document describes a method for such correlation.

Although there is no guarantee that readings from the two sensors can be normalized exactly, it is possible to bring the two types of turbidity data into close agreement. Several methods can be used depending on the accuracy required for the normalization. The first involves the simple multiplication of the previously obtained 6026 readings by a linear factor. For example, for the YSI Southwest Ohio Rivers Study, if the 6026 readings are multiplied by the empirically-derived average factor of 0.6486, the agreement of the two sensors will be within 10% or 2 NTU, whichever is greater, for most data points.

The second, more accurate normalization method, involves a fit of the observed turbidity readings to a third order polynomial. For data obtained during the YSI Southwest Ohio River Study, this method has produced agreement between the two sensors within 5% or 2 NTU, whichever is greater, for most data points. This method can be readily carried out in Microsoft® Excel. The following equations were developed from 98 measurements made at varying locations and during widely varying turbidities during the YSI SW Ohio Rivers Study. These equations are offered as examples and guides for developing equations best suited to your data, and not as universal conversion equations.

6026 Data to 6136 Data

Simple equation to convert 6026 data to 6136 data format:

$$f(x) = 0.6486x$$

Data correction algorithm to convert 6026 data to 6136 data format:

$$f(x) = -10^{-7}x^3 - 2*10^{-5}x^2 + 0.6981x$$

6136 Data to 6026 Data

Simple equation to convert 6136 data to 6025 data format:

$$f(x) = 1.54x$$

Data correction algorithm to convert 6136 data to 6026 data format:

$$f(x) = 2*10^{-6}x^3 - 4*10^{-4}x^2 + 1.4754x$$

Additional Information

Following the YSI contact information is an excerpt of an older document, explaining the steps necessary to organize data for graphical analysis using a spreadsheet program like Microsoft® Excel.

For additional information please contact
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