SSC Regression Analysis

09326500 Ferron Creek (Upper Station) near Ferron, Utah

Calculated Constituent: Suspended Sediment Concentration (SSC) in mg/L

Regression Model Number: 2.0

Surrogate: Turbidity (FNU)

Model Creation date: February 16, 2016.

Model Data Collection Period: Seasonal data collected WY 2014-2015

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RECORDS COLLECTED AT STATION.—Streamflow has been collected at this site from 1911-1923 and 1927 to present year. Turbidity data have been collected using a YSI 6920 with a YSI 6136 turbidity sensor seasonally at this site since 2014. Suspended sediment samples have also been collected seasonally since WY 2014. Daily non-isokinetic samples are collected using an ISCO auto-sampler. EDI or EWI isokinetic samples are collected semi-weekly during the spring runoff period.

TURBIDITY REGRESSION ANALYSIS.—The USGS developed MATLAB program SAID was used to develop an Ordinary Least Squares (OLS) regression model for SSC based on recorded turbidity values. For the current regression it was decided to base the analysis only on isokinetic samples that were collected using the EDI method. This includes 13 samples collected in WY 2014-2015. No significant trends were observed, including autocorrelation.

The regression Model 2.0 is a simple linear regression (SLR) model that used log10 transformed variables of turbidity and suspended sediment concentration. The regression model equation takes the form:

log10(SSC) = 0.787 + 0.923 * (log10(turbidity))

or as transformed from log10:

SSC = 6.1235 * turbidity^(0.923)

DATA ARCHIVE.—A copy of the regression model including input files can be found by contacting the U.S. Geological Survey Utah Water Science Center.