

# Problems Associated with Comparing *In Situ* Water Quality Measurements to Pollution Model Output for Geographical Analyses

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## Abstract:

We are using data to quantify and assess the significance of sediment, nitrogen, phosphorus, and other nutrient output from the Agricultural Non-Point Source (AGNPS) pollution model in relation to hydrologic field data from the Little River watershed in Georgia. In an effort to quantify the effects of resolution on model results, we attempt to establish measures of accuracy for each of the 51 output values relative to a corresponding *in situ* water-quality measurement. Efforts to quantify the significance of input spatial resolution on the physical, chemical, and hydrologic model output values are problematic because of convoluted matching of these values to the collected *in situ* measurements. Curves representing the accuracy of the results were created using mathematical means such as cubic splines and logistic regression. We intend to quantify a spatial resolution threshold by examining this curve through which any increasing resolution does not provide increasing accuracy of the model output. Obstacles to achieving this are the difficulty of assembling the *in situ* data from wide and disparate sets of data sources such as information in published literature and on websites, files on archived media, and tables in documents. Of 51 output parameters, we have matched only 2 measured parameters directly, and an additional 6 values indirectly. Overcoming these problems and quantifying this spatial threshold relative to AGNPS will provide insight to the contribution of geospatial resolution to the variance of output values from AGNPS and, thus, insight on the analyses of water-quality investigations.