

Comments (limit responses to one paragraph for each question; reference pages, charts, and data. Please distinguish if responses are of major or minor concerns.)

A. What is the best/most unique part of the analysis?

The authors did a very good job of explaining most of the statistical methods and processes and presenting the results. The use of the inverse modeling was very interesting.

The authors appreciate the complimentary remark.

B. What is the most critical aspect of the study/analysis? Why?

The friction slope, S_f , was approximated by the water surface slope, S_w . It is not clear that this assumption was tested and I wonder how it might affect the results given the strong correlation between slope and resistance.

The friction slope differs from the water-surface slope as a function of a contraction (0.1) or expansion (0.3) coefficient times the difference between average hydraulic heads between reaches, adjusted for the respective velocity weighting coefficients (eqn. 4, p. 9 of the report (<http://pubs.usgs.gov/sir/2009/5080/pdf/SIR20095080.pdf>)). Given the relatively uniform flow of the St. Clair River, the differences between the two slope characterizations are expected to generally be small. Thus, the authors agree with the reviewer's comment that there is a "strong correlation between water-surface slope and friction slope," which implies that the small differences would not be expected to substantially change the interpretation of the results. It was not possible to rigorously test the assumption without information on temporal changes in conveyance, which was being tested.

C. Which aspect of the analysis/modeling is weakest? Why? How can it be improved?

Table 7 presents the effective roughness along with the percent relative difference (PRD). PRD's were based on $n = 0.015$ and 0.04 . It was not clear why these values were selected or just how the PRD was calculated. In addition, I had a difficult time understanding how the PRD added value to the analysis or how the authors intended to use it.

The rationale for using Manning's " n " values of 0.015 and 0.040 is discussed on page 11, within the last paragraph on the right hand side of the report (<http://pubs.usgs.gov/sir/2009/5080/pdf/SIR20095080.pdf>). In particular, "In the first set, effective channel-roughness values for all reaches were initialized at a value of 0.015 , which is relatively low compared with the expected roughness characteristic of the channel. ... In the second set, effective channel-roughness values were initialized at a relatively high value of 0.040 ." Thus, low initial parameter estimates were expected to increase and high initial parameter estimates were expected to decrease to approximately the same value to consider that the parameters had uniquely converged. Equation (9) on page 12 of the report shows how the PRD was calculated. The use (and value) of the PRD is described at the top of page 12, first paragraph under equation (9) as, "If the PRD between converged parameter estimates were less than 3 percent for all reaches, parameters were considered to have converged uniquely for that year. If the PRD for only one reach exceeded 3 percent, parameters were considered to have converged uniquely for the year

except for the identified reach. If the PRD exceeded 3 percent for more than one reach, parameters were not considered uniquely converged for that year." If the parameter estimates did not converge uniquely, the utility of the parameter estimates, and associated conveyance characterization, was discounted.

D. Are there any other suggestions that are related to how this analysis may be used more effectively or the results explicated in a more understandable manner?

The authors did a good job of setting the objectives for the study, conducting the analysis, and drawing appropriate conclusions. The authors stated the results without making any judgments on their significance, meaning, or implications. Although not directly part of the objectives, it would have been helpful at the end of the study to include some implications and significance of the results. The report leaves the reader hanging with information for which the application is not obvious.

Consistent with the objectives of the report and USGS publication policy, the authors intentionally avoiding making any judgments, subjective interpretations of the results, or recommendations for future actions. This consistency is not thought to degrade the effectiveness or clarity of the report.