International Upper Great Lakes Study – Sub-Product Reviews, Synthesis Product Reviews, and Draft Final Study Report Reviews Template

Peer Review of Manuscripts

This manuscript has been submitted for independent peer review to the Co-Chairs of the Independent Peer Review Group (IRG) as identified in the Independent Review Plan (IRP) of the International Upper Great Lakes Study (IUGLS).

The evaluation and acceptance of the technical report (documentation) will include, as part of the review criteria, how effectively the goals of the work have been accomplished within the limits as described in the "background and context statement in Article 9.3.1.2.

Manuscripts shall be evaluated on the extent to which the authors' efforts have been covered/documented and the extent to which the reviewers can answer the review questions:
- ➢ Are the methods employed by the authors sufficient to answer the questions;
- ➢ are they being used correctly;
- ➢ are the analyses and tests appropriate for the problem at hand; and
- ➢ are the derived conclusions supportable by the model and analyses?
- ➢ Are there any other comparable methods or approaches that may/ought to be considered, which would provide more insight for the specific task under review?

Checklist for the Reviewer

Your review is:
- To provide the authors with directions as to how they could improve their analysis and technical report. Please provide clear instructions and comment objectively, remembering the efforts that they have made to prepare the manuscripts. On a separate sheet, you may provide comments for the editor that you feel are necessary. These separate comments will not be provided to the authors.

Some additional points are:
- Please document statements adequately so that authors may fully understand your concerns. You may do this using additional sheets and cross-referencing your additional comments to the specific questions below.
- Some of the questions follow a scale of 1 through 5, with 1 be the highest rank (yes -- always or excellent) and 5 being the lowest (no -- never or very poor). Please encircle your responses.

Manuscript: _St. Clair River Hydrodynamic Modelling Using RMA2___

Author(s): _Jacob Bruxer and Aaron Thompson_

Name of Reviewer: Brian Barkdoll

1. Are the objectives of the work clearly stated?   1

2. Are the methods employed valid, appropriate and sufficient to address
   the questions, hypotheses or the problem?   2

3. Are the observations, conclusions and recommendations supported by the
   material presented in the manuscript (e.g., data, model and analyses)?   1

4. Are the assumptions used valid and are the mathematics presented correct?   2

5. Is the manuscript well organized, material precise and to the point, and
   clearly written using correct grammar and syntax?   2

6. Are all of the figures and tables useful, clear, and necessary?   1

7. What is the quality of the overall work?   1

Recommendation (please circle your response)

B - acceptable with suggestions for revision

If you have selected **C**, do you wish to receive the revised manuscript for
further review?   no

Rating (Circle the rating you would like to give this manuscript. Unacceptable work
   should be given a score of 40 or less.)

90

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?

Thorough and analyzed from many angles.

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

Lack of data and data locations coupled with uncertainty make this a challenging study.

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

Justification of assumptions and lack of finer grid simulation capabilities have large effects on results. Need more computational resources.

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?

This study focused on conveyance, but it is not made clear how it was defined and how it would answer the question if dredging caused lower water levels.

Please indicate any confidential comments to the Co-Chair(s) of the Independent Peer Review Group in the space below. Comments for transmission to the author(s) should be on a separate sheet attached.

Signature: _Brian Barkdoll_____ Date: __4/29/09_____

Comments for Transmission to Authors

It would be useful to have both general comments and specific comments for major and minor revision. Please use additional sheets should they be required.

This is a modeling study of the St. Clair River using RMA2.

General comments:

1. Tie all 3 phases together into one coherent report. The reader has no way of knowing that there are 3 phases and what to expect.
2. In Fig. 3-2, please explain what the orange arrows and numbers represent.
3. In Section 3.4, in the following statement: "Specifically, when mesh density was increased the model underestimated both the observed water levels and the water levels simulated by the original, lower density model." Did the model underestimate from observed values or from the lower-density-mesh simulation?

4. Ideally, the simulations should be repeated on a computer that is capable of a finer mesh.
5. In Fig. 3-4, please explain what the thick red lines are and how they show the mismatch between boundaries and bathymetry data.
6. Justify the use of RMA2 and not other 2D models.
7. Justify the use of linear interpolation for various mesh sizes as described in Table 4-1.
8. In Fig. 5-5, please tell how the difference is calculated. The reader does not know what a positive and negative value means.
9. Please show with discrete symbols where the simulations results are. The continuous lines shown suggest that it is a continuous function.
10. Define "conveyance" at its first use and tell how you can induce its trend by water levels and discharge, in the appropriate locations in the report.
11. Provide a schematic diagram to visually explain why the following was done: "Since shoreline data was not available for any years, it was assumed that the shoreline elevation was equal to the low water datum elevation minus one metre."
12. Define the equations used for each kind of error reported.
13. Justify the number of trials used for the Monte Carlo simulation described in Table 3-3. How do you know the number of trials was sufficient?
14. Please give changes in water level, discharge and conveyance relative to the change in bed elevation from dredging operations. It seems counter-intuitive to say that water levels dropped but discharge increased. For fixed bed levels the opposite is true. Some discussion on this point is in order.
15. Define what "value" is on the vertical axis in the variograms.
16. Modify the statement" Lastly, Figure 6-3 shows the same type of comparison, only the start year period ranges from 1996-2005." To read "Lastly, Figure 6-4 shows the same type of comparison, only the start year period ranges from 1996-2005."
17. The following statement is unclear: "This likely reflects the fact that the simulated water levels were found to be least sensitive to changes in this roughness coefficient of this zone than the other zones."