

## **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: Options for Restoring Lake Michigan-Huron Water Levels: An Exploratory Analysis**

**Author(s):** IUGLS Study Team

**Name of Reviewer:** Eric D. Loucks, PE

1. Are the objectives of the work clearly stated? 1 2 3 4 5
2. Are the methods employed valid, appropriate and sufficient to address the questions, hypotheses or the problem? 1 2 3 4 5
3. Are the observations, conclusions and recommendations supported by the material presented in the manuscript (e.g., data, model and analyses)? 1 2 3 4 5
4. Are the assumptions used valid and are the mathematics presented correct? 1 2 3 4 5
5. Is the manuscript well organized, material precise and to the point, and clearly written using correct grammar and syntax? 1 2 3 4 5
6. Are all of the figures and tables useful, clear, and necessary? 1 2 3 4 5
7. What is the quality of the overall work? 1 2 3 4 5

**Recommendation** (please circle your response)

A - acceptable

**B** - acceptable with suggestions for revision

C - acceptable if adequately revised

D - unacceptable

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

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

100 90 80 70 60 50 40 30 20 10 0

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?

Generally does a good job of quantifying the impacts of the scenarios in specific quantified terms

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

The environmental analysis is key and quite well done.

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

From the italicized statement on page 6 that both structural and non structural measures were to be considered. No non-structural measures are presented and the structural measures are weak. The structural concepts date from the 30's and early 70's and none achieves the 40 or 50 cm targets. Far too much detail is presented on the nature and dimensions of these structures which neither meet the objectives and lack environmental viability. Some ideas that could have been considered include terminating the Chicago Diversion, diverting water from a north-flowing watershed into Lake M-H, increasing Lake SUP outflow or direct mitigation for parties harmed by M-H lowering. Would like to see what a measure that achieves 50 cm would look like.

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?

Could use a clearer statement of objectives. I'm not sure if what I found on Page 6 was really it. I was confused by the Executive summary which mentions analysis of four options but then says the structures evaluated only went up to 25 cm. Once I read the whole report, then I understood.

I think too much is made of the adjustment period, which ultimately clouds the results. I think there should be an assessment of the staged and instantaneous transient impacts and then the long term effects should be based on a system in equilibrium. For example, the negative impacts to Niagara Hydropower are only during the transition.

May be worthwhile to add a discussion on adaptation. Have adaptive strategies to recent low water already begun? If we raise water levels, will coastal riparians adapt to higher water levels thus ameliorating some of the adverse impacts noted in this report?

Signature: Eric D. Loucks Date: May 2, 2011

## 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.

Figure 3-1 and others – I presume these will be reformatted. The label “ER” should be removed and consistent number formats applied to all axes. Time series plots in section three number the years on the x-axis from 1 to 109 in varying increments (by 5 here, but 4 in Fig 3-3). The time series plots in section 4 appear use the year from which the underlying NBS was obtained. I prefer the latter. Either approach is confusing to some readers. Changing methods part way through the report is confusing to all readers.

Table 3-1 – I don’t approve of the use of the term ymSC as if it were a universally understood term. Also it appears two ways here.

Figure 3-2 – what is the cause of the significant downward trend toward the end of the time series? Is this the 2000-2006 period of low NBS? Is the 50 cm scenario more sensitive to low NBS than the others? By 2100, this low water episode could have high impacts due to adaptation.

Figure 3-3 – perhaps better to show the long-term max/min some other way.

P. 47 – Second sentence is very long route to a relatively simple point. This is repeated on the following page. Isn’t it sufficient to say that the small error in stage is negligible given the huge flow and total head. It sounds like an excuse is being made for a big assumption.

P. 50 – second line impede rather than impeded. This sentence is an awkward double negative.

P. 53 – second sentence of second paragraph. Says three reaches but sounds like two.

Figure 4-20 – The boat launch score seems inconsistent with the boat slip data. The data implies that adverse effects kick in when the lake falls below its median level.

P. 76 – What’s the point of saying “statistically small?” The reader will understand if you say small or limited.

P. 78 – option 4 – the words “other more desirable” made me think there must be something undesirable about inflatable flap gates. If not, then just say alternative.

P 79 – Reference to Figure 3.1 should be 5.1

Figure 6-1 – is unreadable but I assume this is being addressed

Figure 6-3 – Eventually I figured out all the abbreviations except WAYP

P. 131 – “show stopper” is probably an inappropriate colloquialism in the report.

Throughout sections 6, 7 and 8 the discussion is heavily slanted toward saying the project is essentially dead due to the impact on the Lake Sturgeon habitat. This almost crosses the line in terms of making a recommendation. I think a reasonable person can see that the cost and environmental consequences are difficult for cash strapped governments to justify.

P 154 – Section 8.3.1, this is one of many times that the reader is told that the list of structures considered is not exhaustive. In fact, this is an exaggeration as the structures considered were limited to three that were previously proposed and a couple ideas provided in the directive. Perhaps it would be worthwhile to do a quasi-exhaustive enumeration of possibilities and rate their feasibility on a broad scale

