

Notes from the 19th Meeting of the International Upper Great Lakes Study Board

Embassy Suites Hotel, Washington, DC

11-12 April 2011

Day 1 -

1. Welcome/ Attendance:

Study Board: Gene Stakhiv, Ted Yuzyk, Jim Bruce, Dave Powers, John Boland, Don Burn, Allan Chow, Jonathan Bulkley, Jim Bredin, Jon Gee

Study Managers: Tony Eberhardt, Syed Moin

TWG Reps: Bill Werick, David Fay, Jacob Bruxer, Wendy Leger, Casey Brown, Jen Read, Al Pietroniro (Day 2), Joel Schlagel (Day 2), Bryan Tolson (Day 1 by phone).

Communications & Administration: John Nevin, Tara Buchanan

Agenda was approved and is Attachment 1.

Action Items are displayed as **bold** and summarized in Attachment 2.

2. Restoration Findings (Syed Moin):

a. Details provided from the Restoration report which was sent to the IPR Group

b. Highlights:

- i. Implies permanent increase in M-H levels.
- ii. Estimates what levels on Lakes M-H and Erie would have been without dredging.
- iii. Examined four previously studied structures, plus two additional structures (in-river turbines and inflatable weirs).
- iv. Evaluated more gradual restoration.
- v. Determined positive and negative impacts:
 1. Positive and negative ecological benefits
 2. Mixed economic benefits and losses
 3. First nation issues – sturgeon. Wording will be revised to indicate the sacred nature of sturgeon to First Nations.
- vi. Climate change aspects not considered.
- vii. Glacial Isostatic Adjustments considered; for Georgian Bay, the lower levels of restoration may be similar in magnitude to the GIA uplift, resulting in little net gain – **Board members will propose better wording to describe this result. Another chart will be prepared for comparison purposes, showing restoration-GIA impact at Chicago and GBA to 2050 (Syed Moin).**
- viii. With 50 cm restoration, levels above the historic record would be about 16 times in a 100-year period on Lake M-H.
- ix. **In summary table (8-1), add “Construction” in “Overall Cost” column and more details on hydropower pricing in footnotes (Syed Moin).**
- x. All comments must be in (externally and internally) by May 8th.
- xi. Report will not be given to PIAG at their April 13-14 meeting.

- c. Summer presentations and final report should present results in a neutral way. Board members will provide comments and proposed language to correct for perceived bias.

Sierra Club April 8th meeting in Port Huron notes from Kay Felt displayed for Board and described by Syed Moin, noting presentations by Roger Gauthier, Pat Chow-Fraser, Dennis Albert, Bill Biakowski and Karl Schiefer. Board will discuss these notes at the PIAG (April 13-14 meeting). Jim Bruce mentioned his Toronto meeting with GBA mentioning that they are considering studying low water socio-economic impacts. Tony Eberhardt provided information electronically to Chris Baines regarding low water studies being conducted by the Study in the Georgian Bay area of which Chris was not aware.

3. Risk Evaluation (Casey Brown):

- a. Range of zones for each sector (except ecosystems) for each lake displayed.
- b. Coastal and boat launches are most restrictive coping zones.
- b. Percent change in mean annual NBS vs. percent change annual NBS standard deviation displayed.
- c. Histograms also displayed – lower NBS give more low zone C occurrences and higher NBS give more high zone C occurrences. If the future is 10% drier, there's an unacceptably high risk of Cs at almost any level of variability.
- d. Plan 77A does well, except under very low lows.
- e. Need to determine which plans keep us out of zone C the most time weighed by plausibility.
- f. Consider what can be done to prepare communities for the risk of future high and low levels (adaptive management).
- g. Need to think about how all this (fairly technical information) can be presented to the public in understandable terms.

4. Lake Superior Regulation Options and Evaluations (Bill Werick):

- a. New Plans (David Fay):
 - i. Table provided describing plan alternatives.
 - ii. Each formulator ran five sets of NBS, (historical and four stochastic sets) each 109 years long, through their regulation rules.
 - iii. Results were standardized where necessary by re-running the plans in a coordinated model.
- b. SVM (Bill Werick):
 - i. Model set so that plans can be compared for any of the five NBS sequences (historic, high Superior, low Superior, high Michigan, and low Michigan) against the evaluative criteria.
 - ii. Focused on economics for Soo hydropower and commercial navigation, IERM results (number of zone C occurrences compared to 77A) and range compression.
 - iii. Worst plan: Plan S4S (Superior for Superior); second worst Plan 77C, both bad for economics and for ecosystem.
 - iv. Better plans: Watkins' plan has good hydropower results, but poor navigation results and matches or improves upon 77A; however, it's based on a perfect forecast.
 - v. Plan Bal 20 provides fairly good economic results and matches 77A very well.

- vi. Plan 128 is almost always better than Plan 77A.
- vii. Best Plan: 77B – positive economic results and no ecosystem losses with all criteria weighted equally. However, if (for example) lower Lake Superior highs are weighted highest, best plan is Watkins'. But 77B still ranks fifth (out of eighteen alternatives).
- viii. Decision items for discussion:
 - 1. Are PIs suitable?
 - 2. Are NBS sequences suitable?
 - 3. Is decision model internally consistent and are weights reasonable?
 - 4. What's missing?
- ix. Board assignments to address confidence in the IERM (6 key PIs); in hydropower PIs; and, in net basin supply values. John Boland is also involved to address confidence in the Board's decision.

5. Multi-lake Regulation (Bryan Tolson by phone):

- a. Considers two current control structures (St. Marys and St. Lawrence) and two new ones in the St. Clair and Niagara Rivers.
- b. Frequency-based objective function – keep levels within the historic range throughout the Great Lakes-St. Lawrence River system.
- c. Eight stochastic NBS sets tested (from LOSLR Study 50,000-year set).
- d. Across all scenarios, extremes on average are reduced by 68%. Additional work should include runs with (1) current control structures only (base case), (2) current control structures plus St. Clair River structure (another form of restoration), (3) current control structures plus a Niagara River structure (to assess efficacy of St. Clair control in a multi-lake context), and (4) all four control structures.
- e. Attempts to improve conditions at Montreal downgrades conditions upstream of Montreal (results still being refined).
- f. Results show very large improvements across the board for all scenarios and lakes, but not always possible to control lake levels within their historic extremes.
- g. Will consider a second objective to minimize highest structural change cost.
- h. Solutions with acceptable frequency based objective function cost more than \$30B. These estimates do not include the costs of structures at Montreal.
- i. May want to consider measures other than building structures in the connecting channels to address hydrologic extreme conditions.
- j. Institutional Issues (Wendy Leger):
 - i. Impact analyses.
 - ii. Creation of control boards.
 - iii. Authorized legislation.

6. Drafting a Board decision on further study of multi-lake regulation

- a. No economic driver or strong need so there is no need to pursue further.
- b. May be many other measures, including those related to adaptive management.
- c. Need to describe (in more detail) what would be required, physical terms – extent of dredging, structures, etc.
- d. John Boland and Don Burn will draft wording for the final report.
- e. Improvement is possible, but extremely costly and there are additional negative factors.

- f. **Additional runs will be included for a very dry climate change scenario. Also for Niagara River and St. Clair River structures only, no dredging. Differences from work already performed will be compared with this new data (Bryan Tolson). Additional work will be completed after the peer review report, by the SVAT meeting in May.**
- g. Chapter will be written by Study Team.

7. Communications (John Nevin):

- a. PIAG meeting on April 13-14.
- b. Meeting with US House and Senate on April 14-15 on Capitol Hill – Gene Stakhiv, Kay Felt and John Nevin to prepare briefings.
- c. Webinar for government on restoration report planned for June 9th – may have to modify June Board meeting agenda to do this.
- d. Proposed “Circles of Influence” in Collingwood on June 10th – public meeting possibly there on June 9th.
- e. Full-day workshop in Collingwood in early August proposed, but requires additional discussion.
- f. Development of 4-page insert for newspapers – **Jeff Kart will draft for Board and PIAG consideration for next meeting.**

8. Recap of previous day and additional discussion (All):

- a. Board assignments and responsibilities will be reviewed at the end of the day, with names of people that can provide assistance. **Need to identify TWG responsibilities (Syed Moin and Tony Eberhardt).**
- b. **To provide familiarity with SVM, a webinar will be set up at the end of May for Board and members and TWG Co-Leads. Make it “recordable” so that it can be used by those that can’t participate (Bill Werick).**

9. Peer Review document on IERM and environmental issues (Bill Werick/Jim Bredin):

- a. Best professional judgment was used within the report.
- b. Still need some clarification on how conditions transition from zone A to C and back. Need to consider the time element of this transition. **TWG is requested to provide an answer to the Board; Bill Werick and Jim Bredin to clarify validity of Doug Wilcox’s PI.**
- c. Need to be careful in the statements that are made in the report. Some regarding “no evidence of impacts of present regulation” need to be better defined.

10. Peer Review document on Climate Change and plain spoken narrative (Jim Bruce):

- a. **Seasonality within climate models addressed (Casey Brown) and need to be included in the IERM.**
- b. The route of lake effect snow could be better defined.
- c. Simulation/ forecasting of residual NBS (Vincent Fortin) results to 6-months is encouraging.
- d. Next hydroclimate meeting is scheduled for May for Ottawa to address/ finalize consideration of results and story line.
- e. Need to mention the caveat on these models in that they’re experimental.
- f. Assessment of Taha Ouarda’s & Laura Fagherazzi’s models (Don Burn):

- i. Shifting mean concept – shifts mean at same time for each lake; some shifts of which were observed.
- ii. Fairly high correlation observed on an annual basis between lakes.
- iii. Similar models but difference in causal indicators – compounding uncertainty.
- iv. Seidou and Ouarda’s ENSO & NCEP predictors match observed NBS fairly well.
- v. Taha’s and Laura’s results are fairly comparable.
- vi. Need a lot more information to define the methodology.
- vii. Seidou and Ouarda’s climate change runs are useful since they provide some very dry sequences that could occur and can be used to test alternatives.

11. Adaptive Management (Wendy Leger):

- a. The more confidence we have in climate predictors, the better we’ll be able to suggest adaptive measures – triggers.
- b. Priorities for monitoring and modelling – precipitation and evaporation; tributary and channel flows.
- c. Reduce uncertainty in change in storage.
- d. Jacob Bruxer is taking the lead in scoping out further work related to FIRM.
- e. Continuing support to the Lake Superior Control Board:
 - i. Expanded role of Coordinating Committee – subgroups (Hydroclimatic & PFEG).
 - ii. Bi-national AM Committee.
- f. Funding of after-IUGLS support will be extremely difficult – support is more likely to come if it could be linked to multiple purposes:
 - i. Adaptive management should be linked to the new Great Lakes Water Quality Agreement.
 - ii. Trust fund option.
- g. IJC should play a pivotal role in linking IUGLS AM efforts with other agencies.
 - i. Questionnaire sent to agencies – all respondents (14) were in favor of it and would support it, but their funding is already stressed.
 - ii. Many indicated IJC endorsement would help.
 - iii. Need a long-term champion.
 - iv. Business case has been written.
- h. Board agreed that they would recommend limiting the adaptive management effort to hydroclimate information distribution part (info out and communication strategy) – level 1 – which should move forward. Coordinating Committee could report to a new Secretariat housed at the IJC Windsor office. **Wendy will prepare a framework/ strategy to implement level 1.** This will be conveyed to PIAG at their April meeting.

12. Response to IJC Letter (Gene Stakhiv & Ted Yuzyk):

- a. Board has already commented on this response.
- b. Additional points on AM have just been covered.

13. 2010 St. Clair Bathymetric Findings (Jacob Bruxer):

- a. Algonac to Black River (main stem of the river) collected by Detroit District.
- b. Delta data (collected by Gourdie-Fraser under contract with Detroit District).

- c. Comparing 2010 to 2007 data.
- d. Data collection was not in areas where possible restoration structures would be placed.
- e. No substantial changes, but a more detailed review needs to take place.
- f. Dave Bennion (USGS) proposed digitizing the data as a further investigation of differences in the river and delta comparing 2000 and 2007 by June 1st for \$27,000. The Board approved this proposal.

14. Information Management Policy and Data Ring Project (Joel Schlagel):

- a. Data Ring project is moving forward.
- b. Metadata structure is set – data will be archived on the IJC server to facilitate info out which could be part of the AM process.
- c. Data Ring:
 - i. Four sites around the Great Lakes (four for flooding and three for low water – Chicago (flooding only), Duluth, Georgian Bay and Macomb and Wayne Counties (Lake St. Clair).
 - ii. May be of interest to Georgian Bay residents and be a possible topic at meeting there this summer.

15. Board Phase II Final Report/ Review Assignments (All):

- a. Length of chapters is arbitrary.
- b. Suggestion made to make Chapter 3 – Key Interests and Chapter 4 – Great Lakes Hydrology & Climate Variability/ Change.
- c. Board assignments for review:
 - i. Ch. 1 – Gene Stakhiv,
 - ii. Ch. 2 – Allan Chow,
 - iii. Ch. 3 – Don Burn & Jim Bruce,
 - iv. Ch. 4 – Dave Powers,
 - v. Ch. 5 – Jim Bredin,
 - vi. Ch. 6 – John Boland,
 - vii. Ch. 7 – Jon Gee & Jonathan Bulkley,
 - viii. Ch. 8 – Don Burn,
 - ix. Ch. 9 – Dave Powers & Jim Bruce,
 - x. Ch. 10 – all

16. Final Review of the IJC Presentation (All): Presentation was shown and comments by all incorporated.

17. High priority project management issues (All):

- a. June Meeting: Niagara Falls Marriott, June 7-9.
- b. Executive Meeting of the Study Team and PIAG Co-Leads: June 13, 14 or 15.
- c. September Meeting: Chicago, Sept. 19-22.

Points raised at IJC Appearance (April 13th):

- Summer public meetings should provide information on plan alternatives, multi-lake regulation and restoration as clearly as possible. Employing a specialist in preparing the visuals to encourage easy understanding may be warranted.

- Suggestion made that the draft presentation be reviewed by the Board prior to the summer meetings.
- Endorsement of adaptive management strategy. It should be developed along the lines of that outlined in the Study Board response to the February 2011 IJC letter.

IUGLS Board Meeting # 19
Monday, April 11, 2011 – Tuesday, April 12, 2011
Embassy Suites Hotel, Wine Room, Washington, DC 20036

Meeting Objectives (from Strategy):

1. Agree on a final set of **restoration** findings that can be presented to the IJC this week
2. Decide which candidate **Lake Superior regulation plans** to present to the IJC this week as representative of the range of plans that the Board might select from
3. Agree on a presentation to the IJC of **the risks water level control does not address** and the Board's intention and direction for recommending a non-control **AM solution**
4. Agree on specific issues to be addressed through **multi-lake regulation** analysis and to begin discussion of the likely range of recommendations
5. Determine what adjustments, if any, are required to complete the Board's work on **time** and within **budget**

AGENDA**Day 1 – Monday April 11th – Restoration and Regulation**

| Item | Time | Topic | Lead |
|-------------|------|---|---|
| 0 | 0830 | Arrivals | |
| 1 | 9000 | Welcome/ Review & Approve Agenda | Stakhiv/Yuzyk |
| 2 | 0915 | Restoration findings | Moin |
| 3 | 0945 | Communication strategy on restoration findings | Nevin/Kart |
| 1015 - 1030 | | Health Break | |
| 4 | 1030 | Risk Evaluation | C. Brown |
| 1130 - 1230 | | Lunch | |
| 5 | 1230 | Lake Superior Regulation Options and Evaluations, multiple water supply scenarios | Werick, Burn, Assigned Board Members ¹ |
| 1430 - 1445 | | Health Break | |
| 6 | 1445 | Multi-lake Regulation – technical presentation and policy/institutional issues | Moin/Leger |
| 7 | 1530 | Drafting a Board decision on further study of multi-lake regulation | Burn/Boland |
| 8 | 1630 | Peer Review Status and Issues | Moin |
| 1730 | | End of Day 1 | |

Day 2 – Tuesday, April 12, 2011

| Item | Time | Topic | Lead |
|------|------|---|---------------|
| 9 | 0830 | Recap of previous day and overview of today's agenda | Stakhiv/Yuzyk |
| 10 | 0845 | Peer Review document on IERM and environmental issues | Werick/Bredin |

¹ Jim Bruce, John Boland, Jim Bredin, Jonathan Bulkley

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|-------------|------|--|--------------------------------|
| | | under various supply scenarios | |
| 11 | 0915 | Peer Review document on Climate Change and plain spoken narrative | Bruce |
| 1000 - 1015 | | Health Break | |
| 12 | 1015 | Adaptive Management <ul style="list-style-type: none"> • Recap of issues raised in letter from IJC • AM for Superior Regulation <ul style="list-style-type: none"> ○ FIRM Business Case • AM beyond Superior Regulation • IM and AM • Questions/Issues • Board member opinions • Path Forward | Leger/Read (Gee/Bredin) |
| 1145 - 1245 | | Lunch | |
| 13 | 1245 | Response to IJC Letter | Stakhiv/Yuzyk |
| 14 | 1330 | 2010 St. Clair Soundings findings | Eberhardt/Moin |
| 15 | 1345 | IUGLS Information Management Policy and Framework <ul style="list-style-type: none"> • Data Ring | Schlagel |
| 1430 - 1445 | | Health Break | |
| 16 | 1445 | Board Phase II Final Report/Review Assignments | Stakhiv/Yuzyk |
| 17 | 1515 | Final review of IUGLS Appearance before the IJC | Stakhiv/Yuzyk |
| 18 | 1630 | High priority project management issues | Eberhardt/Moin |
| 1700 | | End of Board Meeting | |

Wednesday, April 13, 2011

| Time | Topic | Lead |
|-------------|---|---------------|
| 1045 | Study Board briefing & next steps from the IJC appearance | Stakhiv/Yuzyk |
| 1145 | End of Brief | |

Action Items from 19th Study Board Meeting – Washington, DC

| No. | Description of Action Item: | Action Lead: | Due by: |
|-----|---|---|---|
| 1 | Regarding changes to the Report on Restoration: <ul style="list-style-type: none"> • Another chart showing restoration-GIA impact at Chicago and GBA to 2050. • In summary table (8-1), add “Construction” in “Overall Cost” column and more details on hydropower pricing in footnotes. • Comments to be provided on the document | Syed Moin Board members | After document is received from IPR Group and prior to next Board meeting |
| 2 | Regarding the Multi-lake Analysis: <ul style="list-style-type: none"> • Perform runs without St. Clair River structures for final report and also only with St. Clair structure (another form of restoration). • Additional runs will be included for climate change (very dry). Also for Niagara River and St. Clair River structures only. Differences from work already performed will be compared with this new data. | Bryan Tolson | May 2, 2011 |
| 3 | Communications: A four-page insert will be written describing alternative plan development, multi-lake regulation and restoration as a newspaper insert. | Jeff Kart | May 15, 2011 |
| 4 | TWG Assistance: Need to identify TWG representatives that can assist the Board through the summer meetings and possible to Study completion. | Syed Moin and Tony Eberhardt | May 15, 2011 |
| 5 | SVM: Webinar for Board on using the model. | Bill Werick | Prior to the June Board meeting |
| 6 | IERM: <ul style="list-style-type: none"> • TWG to provide a narrative explaining transition between zones – Doug Wilcox’s PI. • Seasonality within climate models needs to be addressed | Bill Werick and Jim Bredin to pursue. Casey Brown to address seasonality item. | Prior to the June Board meeting |
| 7 | Adaptive Management: Framework/ strategy to implement level 1 – info out. | Wendy Leger | Prior to the June Board meeting |