

Comments from R.A. Halliday

8.2.2 first sentence doesn't quite jive with the IJC direction, which speaks of “all potentially affected sectors”. It also sells the chapter a little short as 8.6.2 does cover the affected sectors briefly.

While we did not evaluate the direct impacts of multi-lake regulation (i.e., the net costs and benefits in monetary terms or other metric) for the reasons outlined, we used extreme water level conditions defined as the simulated historic water level range to represent water levels that would adversely affect key interest groups. Also, as the reviewer notes, we did discuss the impacts on different sectors briefly and in general terms in section 8.6.2. The first paragraph of 8.2.2 has been modified to make this clearer.

Page 5, last sentence. “Selected” seems a little strong in view of the discussion in 8.3.3. Perhaps say “identified”.

The text was modified, as suggested.

Page 8, last para, line 4.1 and figure 8-3. How does the simulated historical range compare to the actual historical range? Can the difference between actual and simulated historic water levels be used as a performance indicator for the simulations?

The simulated historical range cannot be compared to the actual historical range because the simulated range represents what water levels would have been over the past 109 years if conditions were the same throughout this time period as they are currently (i.e., lake Ontario and Superior regulated with the existing regulation plans, conveyance capacities of the connecting channels constant, diversions maintained at current rates, etc.) Since we cannot identify all changes that have occurred in the past and when they occurred, we cannot simulate actual historical water levels precisely. Also, since interest groups and stakeholders adapt to changing water levels, it is more appropriate to use the simulated historical range based on current conditions as the performance metric for evaluations of multi-lake regulation.

Page 17, last para of 8.4.4. Would it be fair to say that the four point plans, because it is able to maintain appropriate Lake Erie levels, would not require re-regulating structures in the lower St. Lawrence? A mention here may aid the subsequent discussion in 8.6.3.

No, this would not be accurate. Maintaining appropriate Lake Erie levels under the four-point plans would require changing the outflow from Lake Erie, which is also the inflow to Lake Ontario. By modifying the Lake Ontario inflow, the outflow from Lake Ontario to

the St. Lawrence River would also require adjustment in an attempt to maintain the level of that lake within its desired range (as shown in Figure 8-7, while this was possible for Lake Erie, it was not possible for Lake Ontario). The outflow from Lake Ontario, being controlled by structures in the upper St. Lawrence River, would therefore require modifications to the regulation of these structures in the upper St. Lawrence, resulting in modified outflows to the lower St. Lawrence and requiring additional mitigation measures (i.e., structures and excavation) here, as discussed in section 8.6.3. The key point is that regulation at any point in the system will result in modifications to flows and levels downstream, which could result in adverse impacts downstream unless appropriate mitigative measures are taken.

Page 23, section 8.6.1. It may be instructive in this section to consider a scenario with two-point regulation scheme. Since this would represent the current structures, this could demonstrate to the reader, the extent to which perfect knowledge could improve the current regulation scheme. Depending on the outcome of this analysis, a key point relating to perfect forecasts under the present infrastructure could be in order.

The reviewer's suggestion is interesting. Though the Study did not consider this scenario (i.e., two-point regulation with a perfect forecast) in the multi-lake regulation evaluation presented in Chapter 8, we did investigate whether forecasting could be used to improve Lake Superior regulation alone, and as discussed in Chapter 9 of our report on the "Role of Adaptive Management", it was found that forecasting can be used to improve regulation of this lake. In Chapter 9 it is also suggested that as forecasting abilities improve over time, an adaptive management approach (such as the plan described in Chapter 9 of the report) would review this new knowledge and possibly incorporate it into a revised regulation plan if it were to prove beneficial. It should also be noted, however, that as described in Chapter 6 of the IUGLS final report, Lake Superior regulation is limited in its ability to affect water levels downstream, and therefore even with perfect forecasts, it is unlikely that the existing two regulation structures could be used to provide significant benefits to all lakes, especially lakes Michigan-Huron and Erie, downstream of Lake Superior.

Comments from Dr. P. A. Johnson

The figures are not very readable and will need to be improved. Many are too small, fuzzy, etc.

The figures will be published in a higher resolution format for the final report, which should rectify this problem.