

River predisposition to ice jams: a simplified geospatial model

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Iteration: Minor Revision

All requested minor corrections have been done.

Line 9: The word “breakup” is usually accepted and should be consistent in the paper whereas “freezeup” or “freeze-up” are both acceptable. **Done**

Line 9: predicting “the timing of” river ice breakup ... **Done**

Line 16: Results show “that” 77% ... **Done**

Line 32: Remove “some” **Done**

Figure 1: This Figure is much better than the previous one. Please adjust the orientation of the North arrow

Line 36: , “all tributaries of the St. Lawrence” River. **Done**

Line 45: in resisting forces to ice transport, including impeded ice runs pushing against an intact ice cover. **Done**

Line 46: use “resisting” **Done**

Line 46: “directly and indirectly” governed by **Done**

Line 50: Excellent

Line 52: “and will likely present a thicker, more resistant ice cover at breakup” **Done**

Line 54: remove “bottom” **Done**

Line 55: which represents an additional resistance to lifting and mobilization when the discharge increases. **Done**

Paragraph 43-65: Consider splitting this into two or more smaller paragraphs. **Done**

Remove line 72-73 as this is included in your list and explained earlier. **Done**

Move paragraph Line 74-77 above your selected or summary list. **Done**

Line 78: “will” should be “should” **Done**

Line 83: “will” should be “are” **Done**

Line 83: Last sentence should be: “This is a reasonable assumption since the presence of a thick ice cover can be linked to morphological indicators, as proposed by river ice conceptual models (e.g., Turcotte and Morse, 2013).” **Done**

Line 96: “but it would be...” should be “and could be implemented in a subsequent version of the model” **Done**

Lines 96 to 107: You mention the number of sections at the beginning and then mention the spatial limitation to finally present the length for each river. From my point of view, this could be better organized. **Done**

Lines 120-121: “release of pressure when the ice run and some water is deflected into a secondary channel” **Done**

Line 128: Remove the sentence that starts with “And” **Done**

Line 130: “when a bridge is crossing...” should be “at bridges would give them an adequate weight in the final...” **Done**

Line 135: “run off” should be “runoff” **Done**

Line 138: “the ice run can stop at the confluence to form an ice jam that could subsequently intercept subsequent ice runs from the main channel to form a larger ice jam” **Done**

Line 155: “does not” **Done**

Line 156: “which could be the case in reality.” **Done**

Lines 163-164: use “is” instead of “was” to be consistent with the preceding sentence. **Done**

Line 174: Merge the two sentences **Done**

Line 178: “at the end” should be “at their foot” **Done**

Line 178: “force” could be “manually impose” to sections with “known” rapids **Done**

Section 3.2.1: Comment: I don’t see a problem regarding using as much information as possible about confirmed ice jam locations in order to calibrate the model independently for any river. This would mean that the weight would be river, reach or morphology specific. I would make it more robust and reliable. The authors should consider this when applying the model to multiple rivers. **ok**

Line 254: I believe that “so” could be replaced by a more appropriate “therefore”, “as a result”, “in this case” etc. Also, throughout this section, there is some redundancy and this (lines 247-255) could be more efficiently expressed. **Done**

Line 256: “Table 4 finally shows that 32 sections (7%) where classified with a high predisposition...” **Done**

Line 258: Merge the two sentences **Done**

Line 264: remove “the” **Done**

Line 277: “a closer look at some false-negative errors that are important in terms of public safety because of adjacent vulnerability.” **Rephrased**

Line 280: From my point of view, these are more “bars” than “islands”. **Done**

Line 292: “not directly considered by the model” **Done**

Line 292: Two sentences starting with “again”. This should be merged. **Done**

Line 318: merge two sentences with “since” **Done**

Line 332: Merge two sentences with “and” **Done**

Line 336: would become available **Done**

Line 354: “new version of the model” **Done**

The reviewer also suggested, in very general terms, that the paper should be shared with colleagues in order to improve the efficiency of some sections and maximize the impact of the paper. We think that the specific submission/public reviewing process of NHSS is sufficient to achieve this goal.