Title: A Canadian River Ice Database from National Hydrometric Program Archives

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General Comments:

The manuscript introduces the newly developed Canadian River Ice Database (CRID). Such a database is very welcomed in the river ice science and practitioner community and will promote studies to address a variety of research questions and practical issues. It is tremendous efforts to go through the large amount of historical data and collect the variables related to specific key ice events. Several of these variables can be very challenging to identify and require extensive expertise in river ice engineering, which is offered by the author team. The team's experience and expertise are also reflected in the selection of the variables, detailed description of their physical importance, quality control of the ice data, and uncertainty assessment. In this regard, the manuscript provides an important reference document for the use of the CRID. I will definitely be using the database and would like to see it being updated regularly as new information becomes available.

Specific comments:

Line 87: select to selected

Line 115-126: It seems that with minimum 20-year record, no minimum drainage area and including both north of 0deg isotherm and southern temperate zone would result in much more than 196 stations. Am I missing any additional selection criteria used here?

Line 135: foci to forcing

Line 139: listing to list

Line 191: There are actually more than 15 variables as several of the ones listed in Table 2 include both water level and discharge and they probably should be counted as 2 variables.

Figure 3: I am not sure if this figure is based on actual gauge record or purely conceptual. It may worth to show a water level hydrograph where the key ice events are less obvious (less "spiky") and explain how the different variables are identified.

Table 2: does the wording "data accuracy" best represent what this indicator really means? It may lead reader/user to think the published data is accurate while it is less likely in case of ice affected discharge data.

Section 3.3 What are the methods used to compute discharges under ice conditions? Can the authors briefly describe some common ones? This is important information for users of the published discharge data. Additionally, my understanding is that different methods and techniques have been used when deciding when to start and end the B symbol. Maybe the authors can provide some information on this as well?

Line 278: repetitive quotation marks

Page 12: Section goes from 3.3 to 3.4.1, missing 3.4

Line 345-348: It may not be accurate to say the initial ice cover progression past a gauge is always a spike in the water level chart. In many cases, the “stage up” caused by an ice cover approaching from downstream and passing a gauge is a gradual water level increase. How is HF decided in a case like this?

Line 483: maybe add “approximately” before 0.92 as ice density can be affected by many factors.

Line 501 Fig. 10 should be Fig. 11

Line 517-518: this statement about the spike on the water level hydrograph indicating the onset of breakup seems to be conflicting with line 539-541. In the case of thermal breakup, how is HB determined?

Line 529-531: ice jams can form at morphologically conducive locations even without intact ice cover stopping the ice run.

Line 534-535: Jams formed upstream of a gauge may also choke the flow. It also depends on its vicinity to the gauge.

Line 545 chuck -> chunk

Line 553-556: I wouldn’t say the last B date is always used as a surrogate/index, and less accurate than the CRID data to analyze spring breakup timing. They just represent different stage of the breakup.

Line 573-575: how can one calculate the water level using rating curve when instrumentation is damaged or not functioning?

Line 603-607 unclear to me how the percentage error are calculated.

Line 635 Fig 12 should be Fig. 13