**Subject:** Changes to Manuscript HESS-2023-150 Requiring Editor Approval

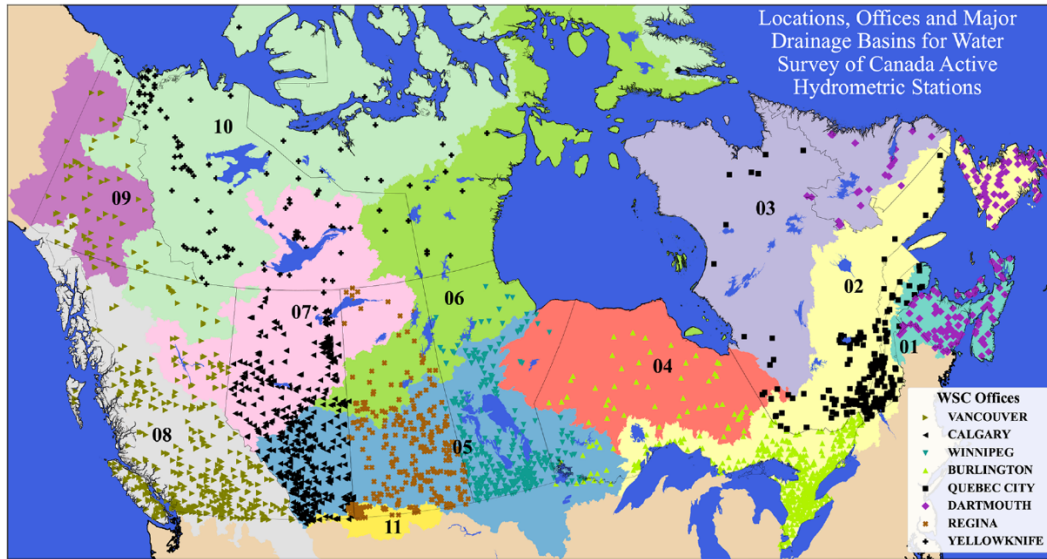
Dear Editor,
Dear Copernicus Publications Team,

In the following pages, I have outlined changes that may require editor approval. I hope these revisions can be accepted at this stage. The changes do not alter the core narrative of the manuscript but are primarily intended for clarification, elaboration, and maintaining consistency throughout.

Thank you in advance,

With kind regards,
Shervan Gharari

**Figure 1-** The original figure shows ~2800 active station that include 400 stations that are operated by Water Survey of Canada's (WSC) partners, which is not in the WSC operational database, and additional stations for lakes and reservoirs water level measurements. The new figure is limited to only 1800 stations that is strictly operated by Water Survey of Canada and accessible via API which was the basis of our work. We change this figure to be consistent with the numbers in the text and appendix and Figure-10. As an example, Quebec stations are removed as they are operated by Quebec authorities outside WSC system.

Old:

New:

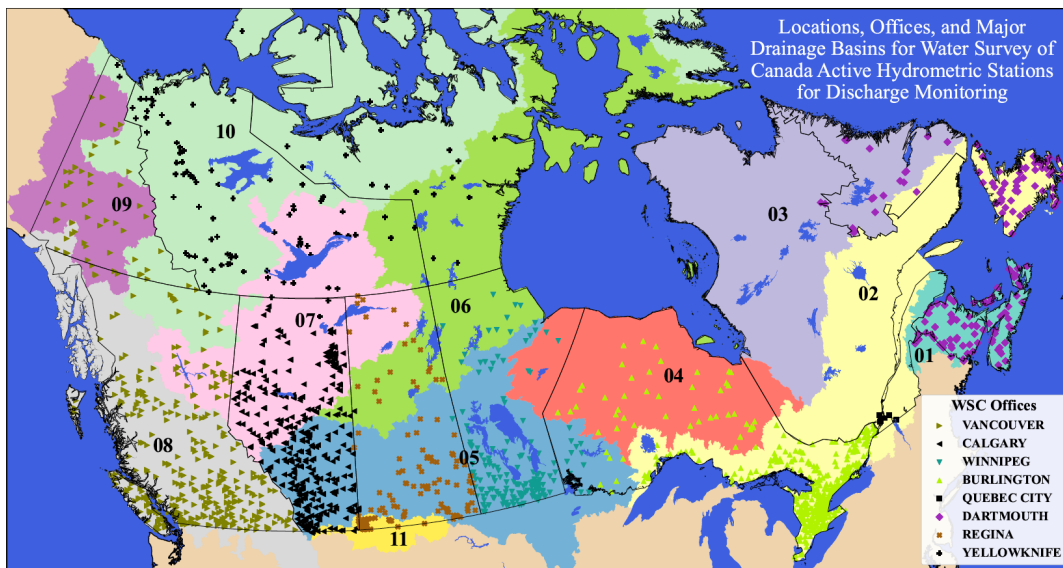
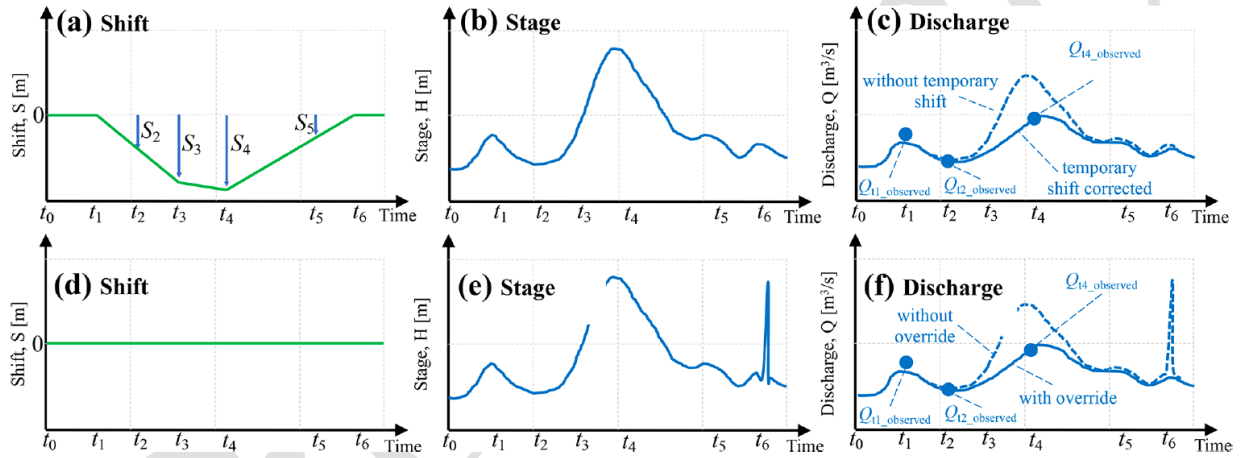



**Figure 4** – The shift in the axis and panel number should be actually "Temporary Shift" not to be confused with the "shift" as they are two different concepts (as explained in the text). Observed is also simplified to "o" subscript explained in the caption (refer to observational, measured or gauging points).

Old:

New:

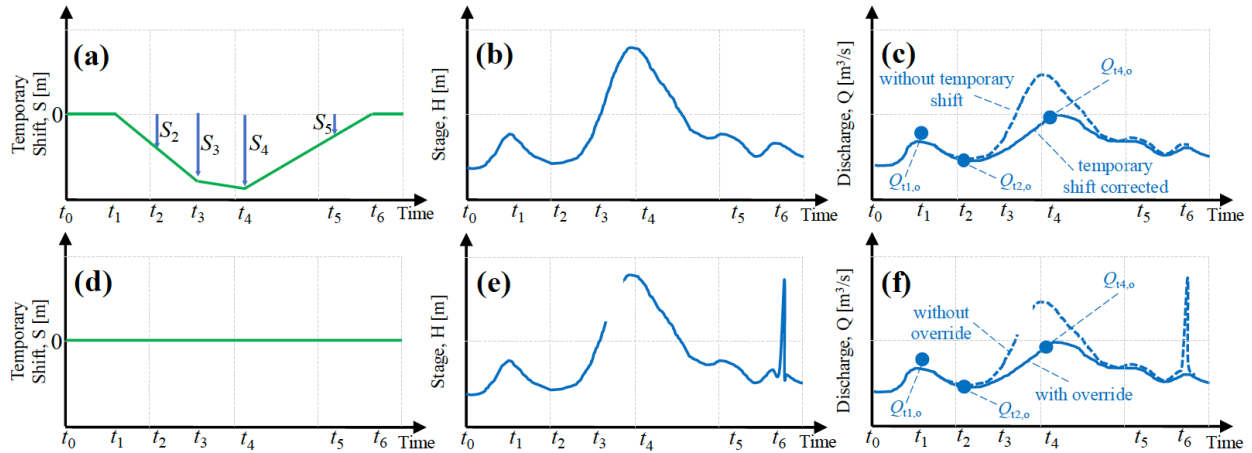
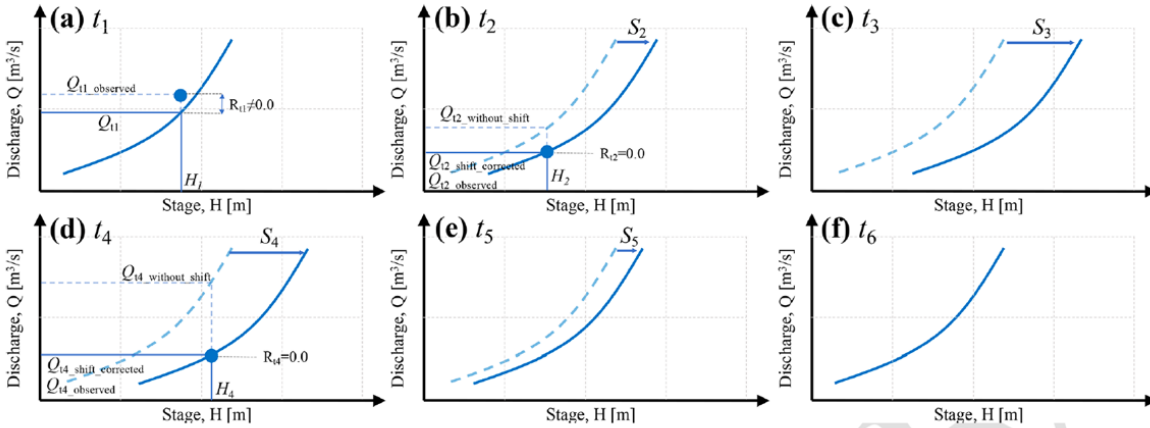



**Figure 5-** lengthy text is removed from the figure, and the more stage to discharge example are added for panel c, e, and f. subscripts are explained in the caption. wts, mean without temporary shift, tsc means temporary shift corrected, o is observational, gauging or measured discharge.

Old:

New:

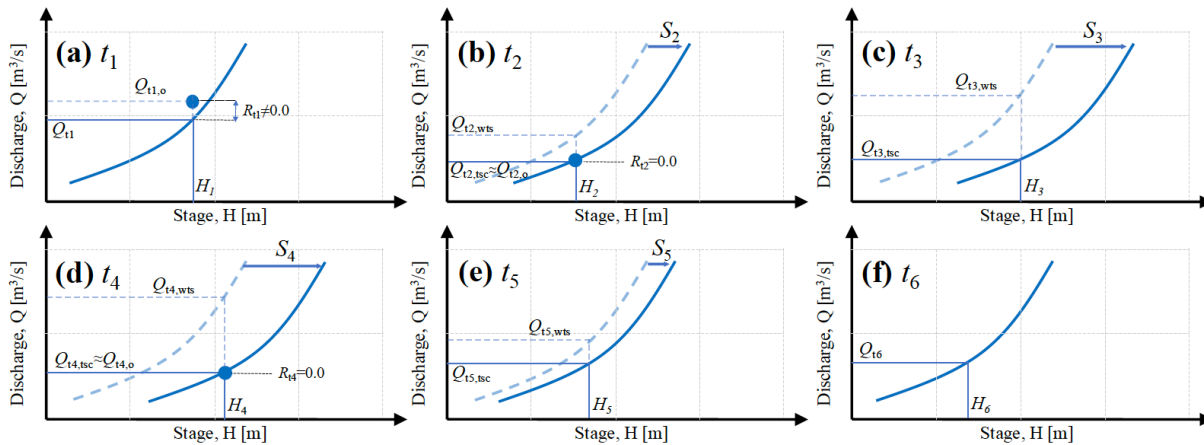
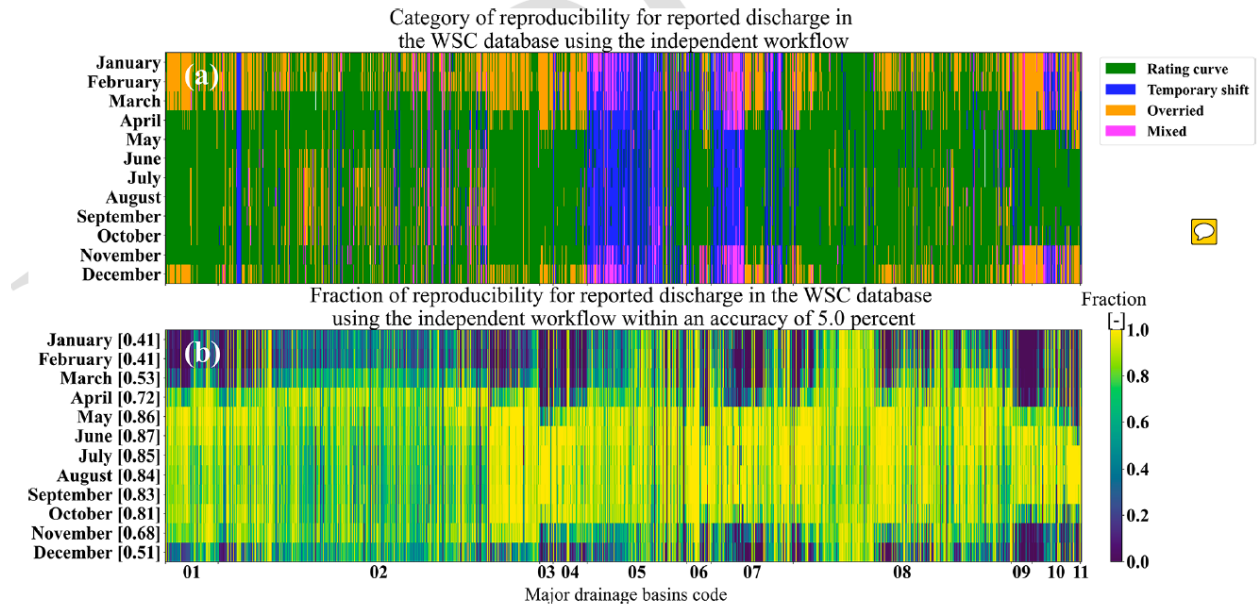
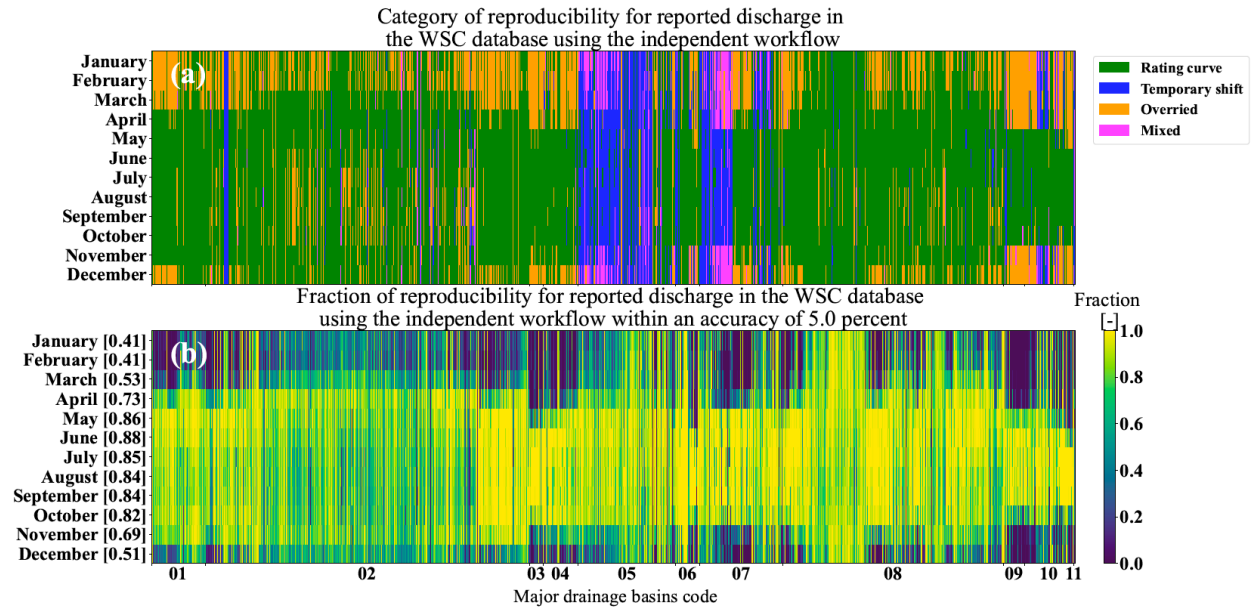



**Figure 15** – In creation of the figure, less than 10 stations that were seasonal were not removed in the code checks, these resulting in empty strips in the figure (if zoomed in). The new figure is strictly non-seasonal stations. They are almost identical looking with normal zoom.

Old:

New:

**Conclusion:** To clarify reproducibility and repeatability, more text was added to one of the points in the Conclusions.

Old:

"Given the knowledge of discharge estimation processes the reported discharge values in Aquarius can be produced for a fraction of 0.69 (withing 5% accuracy). The other 0.31 non-reproducible fraction cab be heavily attributed to the override."

New:

"Given the knowledge of discharge estimation processes the reported discharge values in Aquarius can be produced for a fraction of 0.69 (withing 5% accuracy). The other 0.31 non-reproducible fraction cab be heavily attributed to the override. The reader should note that the reproducibility statistic is based on the independent Python workflow provided in this study, and the reproducibility of the discharge estimation methods to the extent possible. However, repeatability by trained and experienced WSC hydrographers may result in a much higher level of agreement than what is presented in this work."

**Appendix:** To clarify the number of stations, there is added text to the first row of table A1 referring to active stations.

Old:
"These are the stations that are currently in operation and that collect data (in contrast to discontinued stations)."

New:
"These are the stations that are currently in operation and that collect data (in contrast to discontinued stations). At the time of preparing this work, for the discharge monitoring network, the Water Survey of Canada (WSC) operates ~1800 stations (~2200 stations with its partners). The total number of active stations, which also includes monitoring of lakes and reservoir water levels, is ~2800."