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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Projected intensification of sub-daily and daily rainfall extremes in convection-permitting climate model simulations over North America: Implications for future Intensity–Duration–Frequency curves" *by* Alex J. Cannon and Silvia Innocenti

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Below we present replies (Reply) to the reviewer comments (Comment) below.

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Comment: 1 minor typo correction: Line 25 on page 23: add "is" between "it" and "difficult".

Reply: This typo will be fixed in the revised manuscript.

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Comment: 1 question: The authors mentioned the difference between their GEVSS and conventional (e.g. ECCC) methodology for IDF curves, are the IDF curves from this study ready for engineers to use for their infrastructure designing and planning? Do the authors see any challenges to persuade engineers to use their new IDF curves from this study, instead of those based on conventional method, which have been used for ages, if not longer?

Reply: The GEVSS model allows for nonzero shape parameter, but constrains all quantile curves to share the same slope. This reduces the number of parameters relative to the official ECCC IDF curves, while keeping the main characteristics of the conventional approach, but also allowing some flexibility in terms of the ability to model heavy tailed distributions. Figures 7 and 8 compare model performance statistics between GEVSS estimates of IDF curves relative to the official ECCC IDF v2.30 values. Systematic and unsystematic errors are, in general, very low, which suggests that the two methodologies provide similar quantile estimates. While it beyond the scope of the paper to make recommendations about the use of alternative methods operationally, the revised manuscript will include some additional discussion on potential advantages/disadvantages of the GEVSS model relative to the conventional ECCC approach.

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