Global Water Futures 2021 Operations Team Meeting – Project Reporting Template

Instructions: All GWF projects are asked to provide a summary update on their activities and accomplishments in preparation for the upcoming Operations Team meeting. **Please submit these by email to chris.debeer@usask.ca by no later than December 2.** These will be used to help guide discussions and breakout synthesis activities and will be made generally accessible on our website in advance of the meeting.

Project Name:	GWF Pillar 1: Short-duration extreme precipitation in future climate

Our major accomplishments to date are:

- FZ: Compared intra-annual and long-term trend scaling of extreme precipitation with temperature in a large-ensemble regional climate simulation. (**Sun, Q., F.W. Zwiers, X. Zhang** and G. Li, 2020: A comparison of intra-annual and long-term trend scaling of extreme precipitation with temperature in a large-ensemble regional climate simulation. *Journal of Climate*, 33, 9233-9245, doi:10.1175/JCLI-D-19-0920.1)
- FZ: Analyzed the of changes in extreme precipitation at global, continental and regional scale. (**Sun, Q**., **X. Zhang**, **F.W. Zwiers**, S. Westra and L.V. Alexander, 2021: A global, continental and regional analysis of changes in extreme precipitation. *Journal of Climate*, 34, 243-258, doi:10.1175/JCLI-D-19-0892.1)
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- YL: Applied the object-based tracking of precipitation systems in western Canada and discovered the importance of temporal resolution of source data in determining the statistics characteristics of the MCSs. (**Lintao Li, Yanping Li*, Zhenhua Li**, 2020: Object-based tracking of precipitation systems in western Canada: the importance of temporal resolution of source data. *Climate Dynamics*, DOI:10.1007/ s00382-020-05388-y)
- YL: Assessment and projection of water budget over western Canada using convection permitting WRF simulations. (**Sopan Kurkute, Zhenhua Li, Yanping Li*, Fei Huo**, 2020: Assessment and Projection of Water Budget over Western Canada using Convection Permitting WRF Simulations *Hydrol. Earth Syst. Sci.* 3677–3697, 2020)
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Our current activities are:

- FZ: Quantify the human influence on the intensity of extreme 1- and 5-day precipitation amounts at global, continental, and regional scales. (**Sun, Q**., **F.W. Zwiers**, **X. Zhang**, J. Yan, 2021: Quantifying the human influence on the intensity of extreme 1- and 5-day precipitation amounts at global, continental, and regional scales. Submitted, *Journal of Climate)*

- YL: Examine the impacts of changing winter warm spells on snow ablation in the mountains of western North America (**Lucia Scaff**, Sebastian Krogh and **Yanping Li**, 2020: Impacts of changing winter warm spells on snow ablation in the mountains of western North America, 2020 AGU Fall Meeting, online, December 14, 2020)
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The main accomplishments expected by the end of the project are:

- YL: examine the change of extreme precipitation events and atmospheric circulation under current and future climate for the Canadian Prairies.
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Here is a key visual from the project (figure, photo, table, graph, etc.)

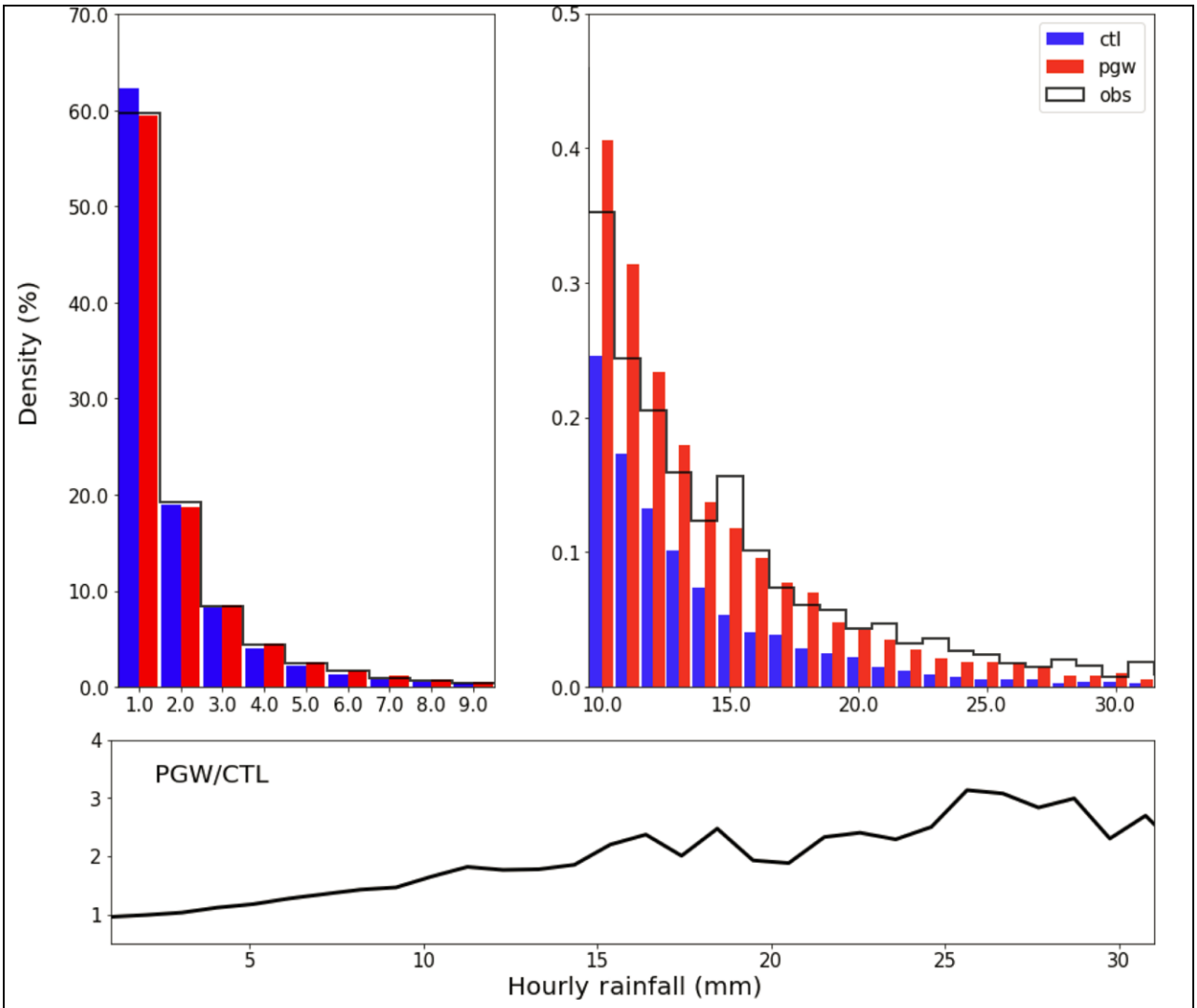

Figure 14. Hourly extreme precipitation frequency density over western Canada from station observation, WRF-CTL and PGW. The bottom panel shows the ratio between PGW and CTL for events with different intensities.
Source: **Yanping Li***, Zhenhua Li, Zhe Zhang, Liang Chen, Sopan Kurkute, Lucia Scaff, and Xicai Pan, 2019: High-Resolution Regional Climate Modeling and Projection over Western Canada using a Weather Research Forecasting Model with a Pseudo-Global Warming Approach, *Hydrol. Earth Syst. Sci.* 23, 4635–4659