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:	Paradigm Shift in Downscaling Climate Model Projections: Building Models and
	Tools to Advance Climate Change Research in Cold Regions
Our major accomplishments to date are:	
Database comprising CMIP6 simulations for precipitation, average minimum and maximum	
temperature at monthly and daily scales.	
Database of gridded and station observations.	
Evaluated CMIP6 simulations for Canada	
 Bias-corrected climate model maximum and minimum temperature simulations using EMDNA dataset for Canada. A total of 652 simulations each (maximum and minimum temperature) are bias-corrected at daily scale for the time period 2021-2100 at 0.1° × 0.1° spatial resolution. 	
 Projected changes in average, maximum and minimum temperature over Canada and for different climate regions in Canada are evaluated. Both Spatial and temporal changes (till 2100) for different Shared Socio-economic Pathways (SSPs) are calculated. Evaluated changes in the risk of extreme temperatures in terms of ETCCDI, heat and cold wave indices in the 11 major Canadian cities and 199 megacities worldwide. 	
Our current activities are:	
 Bias-correcting climate model precipitation simulations using EMDNA dataset for Canada. The Semi-Parametric Quantile Mapping (SPQM) method is developed to bias-correct the simulations at daily scale for the time period 2021-2100 and tested for a couple of grids across Canada. A total of 759 simulations are used for bias-correcting. Obtaining projected changes in precipitation over Canada and for different climate regions in Canada is under process. Both Spatial and temporal changes (till 2100) for different Shared Socio-economic Pathways (SSPs) will be evaluated. 	
The main accomplishments expected by the end of the project are:	
 A databas temperati A novel m any temport 	e of climate model simulations for precipitation, average minimum and maximum ure at monthly and daily scales, and several observation datasets. ethod, Semi-Parametric Quantile Mapping, for bias-correcting the simulations at oral scale.
 A suite of and maxir 	bias-corrected fine resolution climate model simulations for precipitation, minimum num temperature at daily scale for Canada.
 Projected of magnite waves. 	changes in the extreme precipitation and temperature and associated risks in terms ude, frequency and duration of extreme events such as droughts, heat and cold
 Projected temperation 	changes in the compound extremes considering both precipitation and ure.



Historical and projected mean temperature of Canada (left column) under different Shared Socioeconomic Pathways (SSPs) and temporal changes (right column) in the empirical cumulative distribution function for historical (1979-2014), near (2030-2065) and far (2065-2100) future. A total of 178, 147, 153 and 174 simulations are considered for SSP1-2.6, SSP2-4.5, SSP3-7.0 and SSP5-8.5 respectively.