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CLIMsystems Applications and Methods for Extreme Rainfall Analysis

Applications	Baseline and total seasonal and monthly changes in slow onset for water resources planning	Extreme changes, changes in return period, IDF*, or DDF* for water infrastructure design	Extreme changes in short duration (hourly), changes in return period, IDF, or DDF for urban water infrastructure design	Water resources, flooding, inundation modelling	Extreme changes in short duration (hourly), changes in return period, IDF, or DDF for urban water infrastructure design
Precipitation related climate change analysis type	Annual or monthly mean	Daily precipitation extremes	Subdaily to multiple Intensity Duration Function(IDF), or Density Duration Function (DDF)	Hydrological model input data	Very high resolution RCM precipitation changes for urban water systems
Recommended methodology	Change factor approach (Percentage change per degree, or percentage in different scenarios)	Generalized Extreme Value analysis, multiple distributions fitting testing.	Generalized Extreme Value analysis and IDF curve fitting, multiple distributions fitting testing.	Bias correction statistical downscaled with climate change projection	1-3 km resolution convection permitting RCM simulations
Historical data required	Observation based Monthly historical data	Daily observation time series	Subdaily observation data	Subdaily or daily observation	Sub-hourly precipitation observation
GCM/RCM data required	Multiple GCM and RCM monthly mean ensemble results	Multiple GCM daily precipitation based extreme value change patterns	Multiple GCM** 3 hourly precipitation output extreme value change patterns	Multiple sources: subdaily or daily GCM or RCM**	RCM sub-hourly data
CLIMsystems tool	SimCLIM monthly pattern scenario generator	SimCLIM GEV tool and in-house tools	Subdaily extreme event analysis in-house tool	Multiple GCM daily BCSD*** dataset	WRF specific domain case by case
Potential linkage to other models	WEAP,DSSAT	Related infrastructure design models	Related infrastructure design models	SWAT, DHI, EWater, HECS, SWMM, Flood Modeller	SWAT, DHI, EWater, HECS, SWMM, other Related infrastructure design models

*IDF and DDF = Intensity Duration Frequency and Depth Duration Frequency commonly used for water drainage system design.

**GCM = General Circulation Model; RCM= Regional Climate Model

***BCSD = Bias Correction Spatial Disaggregation