

PREDICTIVE INSIGHTS FOR PRECIPITATION EXTREMES UNDER NON-STATIONARY CLIMATE

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We have explored two different approaches for descriptive and predictive modeling of precipitation extremes. First, we analyzed precipitation extremes and their trends using a statistical framework of extreme value theory. These and related methods can be applied to observed and model-simulated data to develop predictive insights on precipitation extremes attributes. Second, we developed a data-guided approach to extract information content about precipitation extremes from related atmospheric variables. This method can be complemented with process-oriented approaches for improved understanding of the atmospheric processes that may cause precipitation extremes as well as lead to enhanced predictive insights. In addition to assessing the state of the art and recent progress in these areas, we will present ongoing research and open challenges. We will discuss how a combination of the two types of approaches can strengthen our understanding of probable maximum precipitation in the context of impacts on natural and built infrastructures.