

Climate Change and Reclamations Hydrologic Hazard Assessment Approach

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Abstract. The Bureau of Reclamation puts its physical inventory through assessments of risk that include hydrologic loadings. Historically the data source for assessments is length of record antecedent annual peak flow information. The data are used through various methods (example: Bulletin 17-B) of calculating statistical distributions that result in flood frequency curves. There has long been recognized an assumption of stationarity included in this analysis. This assumption becomes additionally complex when a changing climate is considered. The Intergovernmental Panel on Climate Change (IPCC) in their Fourth Assessment Report (AR4) that there has been a change in extreme events, notably heavy precipitation in mid-latitudes in the past 50 years.

This project is focused on 1) assessment of whether any changes in flood frequency estimates can be detected using antecedent information and 2) evaluating whether downscaled General Circulation Model results for the twenty-first century run through rainfall-runoff models depict a different flood frequency curve picture than has previously been seen. For the antecedent condition flood frequency curves are calculated for over 100 unregulated USGS gages using a moving window using different multi-decadal windows to look for trends and steps. For the projection approach flood frequency curves are evaluated for the twenty-first century model results and compared to model results for a base twentieth-century case.