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The 100-year flowrate is an important design criterion for emergency spillways of high hazard dams. With change in climate, there is the potential for these events to vary in frequency and magnitude. This work quantified how changes in the 100-year flowrate may affect emergency spillway activation. Peakflow data were used to analyze changes in the 100-year flowrate. Reservoir routing was used at a high hazard dam under potential future flow scenarios (-7%, +6%, +12%, +20%, and +30%). The spillway of the dam was predicted to be reached by approximately a 12% increase in 100-year flow, which was matched and exceeded by historical increases in 100-year flow from unregulated gages of up to 19%. These results suggest that emergency spillway designs need to consider potential changes in 100-year flow. This research was supported by the NASA WVSGC Graduate Research Fellowship.