

Frequency, Duration and Risk Assessment of Drought in the Upper Green River Basin, Wyoming

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Abstract. The limited length of available instrumental streamflow data impacts the true magnitude of natural interdecadal variability of water delivered from the Upper Green River Basin, Wyoming. This limited period of instrumental record can be extended by utilizing proxy records (reconstructed streamflow) derived from tree rings (dendrochronology). The use of dendrochronology to create reconstructed streamflow records can improve stochastic estimates of streamflow variations by extending the available period of record and number of recorded events. The reconstructed period of record contains drought events that well surpass any events that would be part of the instrumental record, in terms of magnitude and duration. If a purely instrumental record is used to calculate average water year volume, the mean may be falsely elevated due to wet periods in the early 20th century. Water planners and interested parties can incorporate frequency, intensity and duration calculations for planning and establishing a level of acceptable risk.

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