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Drought Dynamics in the Canadian River Basin, United States of America

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About 12,000 years ago(Ice Age), the climate of south-central plains of America alternately experienced wet and dry periods. The region later transformed itself into a desert plain grassland. Currently, the region is undergoing another megadrought that is predicted to last for centuries in future. From the lens of hydrological and meteorological drought conditions, these prolonged and extreme environmental events may have irreversible and adverse impacts on a perennial river system like Canadian river. Originating from the Sangre de Cristo Mountains along the Colorado-New Mexico border, the river travels eastward across many different climate regions, ecoregions, and cultural regions before emptying into the Arkansas River, later draining into the mighty Mississippi river. The river is dammed and diverted throughout the basin for multiple purposes: irrigation, recreation, industrial, municipal, and energy extraction. This situation has given rise to socio - economic drought conditions across the entire watershed. In addition, the river basin plays an increasing role in the region's energy needs, which is connected to its water sustainability. The interconnectedness between drought conditions, water quantity, population variability, and climate change complexities cannot be described by the simplistic explanation of cause and effect. These systems will reinforce one other through dynamic and multiple feedback mechanisms within factors ranging from irregularity in rainfall patterns to socio -economic conditions. The study aims to predict the connections between these factors of influence and the different types of droughts, both individually and in conjunction with one another, to foresee the faith of the river over time and space.

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