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SIMULATION OF IMPACTS OF WATER AVAILABILITY AND WEATHER CONDITIONS ON MANAGEMENT PLAN FOR AMISTAD RESERVOIR

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The Rio Grande is the fifth longest river in North America. Amistad Reservoir plays an important role for the development of sustainable water in the Rio Grande drainage basin. Reservoir management is a complex process involving not only the hydrological state of the reservoir, water quality in/downstream of the reservoir, and demands from downstream users, but also judgment weighing the risk of flood versus drought and the political positions of the two countries. This study simulates water quality in Amistad Reservoir using a two-dimensional reservoir model under various hydrological and water demand scenarios and projects water quality in the reservoir under different future climate scenarios due to potential global climatic warming. Different inflow and outflow scenarios and the initial reservoir storage condition can result in different water quality conditions in the reservoir which impact reservoir management plans. Drought in Rio Grande basin and increasing of water demand upstream and downstream of Amistad Reservoir can result in low reservoir storage. Simulations of water quality in Amistad Reservoir under different water availability and weather conditions can assist us in developing different alternative reservoir management plans. Unfavorable water quality conditions in the reservoir pose environmental and ecological concerns for the reservoir and communities downstream of the reservoir.

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