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SALINIZATION OF A DESERT RESERVOIR?: INFLOWS, SOLUTES AND MIXING IN LAKE AMISTAD

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Three rivers of very different physical and chemical nature (the Rio Grande/Rio Bravo, Pecos, and Devils) flow into the international reservoir Lake Amistad. This reservoir is a very valuable water supply for downstream and local agricultural and domestic interests, and has a huge upstream drainage (323,643 km²), which includes rivers draining both the western and eastern slopes of the southern Rockies, and a large proportion of the Chihuahuan Desert, including the Rio Conchos in Mexico. In 2004 a great deal of the volume of the reservoir, which had decreased dramatically since 1994 during an extended drought, has been recovered through high inflows. Because of increasing intensive agricultural use of irrigation waters upstream, projections have been made that the Rio Grande and L. Amistad waters will become more salty- to a point to that would significantly decrease the value of the water for downstream human uses. Our data (2004-2006) and historical sources suggests that there are a number of complex mechanisms, including the mixing of the rivers into the reservoir, seasonal inflow patterns, local groundwaters, chemical processes and reservoir releases which have ameliorated upstream salinization at Amistad.

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