
Transboundary environmental flows to the Colorado River Delta: When the past matters and when it doesn't

Karl Flessa*¹

¹University of Arizona – University of Arizona Tucson AZ 85721 USA, United States

Abstract

In most years since 1960, the Colorado River has not reached its delta. Aqueducts in the U.S. and Mexico divert the river's water for agriculture and cities. No surveys of baseline conditions had been made of the delta. Mexican and U.S. scientists used historical accounts, catch records, rare floods and paleoecology to document past conditions. Most of the landscape had been converted to agriculture, native forests had been cut, the lack of spring floods and a declining water table inhibited revegetation by native trees and allowed the spread of non-natives, and the lack of river flow reduced estuarine nursery grounds and benthic productivity. Environmental groups used these studies to pressure both governments to restore the delta.

In March 2014, the first transboundary environmental flow was delivered to the delta, the result of a new binational agreement on water management. The five-year (2012-2017) agreement concerned sharing shortages and surpluses, storage of Mexico's water allocation in a U.S. reservoir, and an environmental flow. Studies of the flow demonstrated that restoration of parts of the riparian corridor was possible. An agreement now being negotiated adds estuarine restoration to existing goals. Target salinities for a restored estuary were established through analyses of oxygen isotopes in shells and otoliths from pre-diversion accumulations and archaeological sites.

As is likely often the case, science (including paleoecology) plays only a part in decisions about environmental policy. The case of the Colorado River delta illustrates the importance of good science, stubbornness, earthquakes, drought and luck.

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*Speaker