

TEXAS WATER JOURNAL

Volume 7 Number 1
2016



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Volume 7, Number 1

2016

ISSN 2160-5319

texaswaterjournal.org

THE TEXAS WATER JOURNAL is an online, peer-reviewed journal devoted to the timely consideration of Texas water resources management, research, and policy issues. The journal provides in-depth analysis of Texas water resources management and policies from a multidisciplinary perspective that integrates science, engineering, law, planning, and other disciplines. It also provides updates on key state legislation and policy changes by Texas administrative agencies.

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The Texas Water Journal is published in cooperation with the Texas Water Resources Institute, part of Texas A&M AgriLife Research, the Texas A&M AgriLife Extension Service, and the College of Agriculture and Life Sciences at Texas A&M University.



Book review:
Bitter Waters: The Struggles of the Pecos River

Dearen, P. 2016. *Bitter Waters: The Struggles of the Pecos River*. Norman (Oklahoma): University of Oklahoma Press. ISBN: 9780806152011. 256 p. \$17.97.

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The most basic assumption about a river is that it will dilute salts and carry them away to sea. The Pecos River of West Texas has never lived up to such expectations, despite what the land speculators and politicians say.

As it cuts across the Chihuahuan Desert, the twisting river is lined with 4 centuries of stories describing decade-long droughts and water so salty it kills livestock and sterilizes farmlands.

The looming river has become a popular setting for Western novels and films. Now someone has taken on the stranger than fiction story of the river itself.

In his book, *Bitter Waters: the Struggles of the Pecos River*, Western novelist Patrick Dearen walks readers through the geology, hydrology, climate, history, and politics that make the Pecos one of the most misunderstood and mistreated rivers in the Lone Star State.

The legal battles of the Pecos were well documented in 2002 by G. Emlen Hall in *High and Dry: The Texas-New Mexico Struggle for the Pecos River*, but Dearen is the first to tackle the entire story from a West Texas perspective.

He writes about the Pecos' headwaters in the 13,000-foot-high Sangre de Cristo Mountains, where climate change and a century of fire suppression have left dwindling snow packs and catastrophic-fire-prone forests of dying pine trees. He writes about how underground nuclear explosions are suspected in altering and enhancing the pathways of the salty springs that have always been the bane of anyone looking to get a drink from the Pecos. He writes about how the increasing salt load of the river is presenting a threat to everything downstream, including the Rio Grande Valley.

None of these subjects are new. In the first chapter, he includes a quote attributed to a 1942 report by the National Resources Planning Board: "For its' size, the basin of the Pecos River probably presents a greater aggregation of problems associated with land and water use than any other irrigated basin in the Western U.S."

The strength of Dearen's work is the perspective he brings to a subject that is usually dominated by lawyers, scientists, academics, and bureaucrats.

Dearen's expertise lies with the particular personality and character of the West. His previous work includes being a reporter at local newspapers, collecting the oral histories of cowboys, and trying his hand at science fiction writing. He was born in West Texas in 1951 and has spent his career there. He has a flare for introducing each chapter's subject—invasive plants, water compacts, endangered species—as if they were characters walking into a dusty saloon and sparking an unexpected plot twist.

"Again, the long struggle between states seemed over, but now the river offered up new threats to plague the very waters that would come Texas' way," he writes to introduce golden

alga, the latest and possibly most horrific result of the outdated water policy of the Pecos.

With this twist, Dearen introduces a creature stranger than science fiction that is perpetuated by the classic western theme of neighbors not getting along to the detriment of all.

The single-cell organism made its first appearance in the Western Hemisphere on the Pecos in the 1980s. It's a mystery how golden alga got there or what triggers its sudden random exponential growths in population, but the results are not.

The blooms of alga are thick and turn the water a golden color. They also dissolve the cells of fishes' gills and internal organs, causing them to slowly die. The blooms can be controlled, or at least drastically reduced, by freshwater inflows. But on the Pecos in Texas, freshwater flows are rare. It is now common to see tens of thousands of dead fish floating on any reach of the Pecos, all the way to the confluence with the Rio Grande.

The stronghold for this invasive foreigner is Red Bluff Reservoir, which was created by a federally subsidized dam in 1936.

The water of the shallow and leaky reservoir is controlled by the Red Bluff Water Power Control District. Its authority was granted by federal and state governments that were desperate to create jobs during the Great Depression and when little was known about the flows of the Pecos.

Although the nearby fields of cotton, alfalfa, and melons were already switching to wells when the dam was built and often cannot use the water held by the reservoir, the district resists change. The power plants have been abandoned. There was rarely enough water for them to operate.

With the aid of the desert sun, the water in the reservoir becomes ever saltier and warmer, enabling the golden alga to multiply ever faster. The lake is now so hostile to fish that the state of Texas has given up stocking it or even conducting fish surveys. When the water is released downstream, it can spark fish kills all the way to the confluence with the Rio Grande.

It would seem that such a menace to the Texas reach of the Pecos would be enough to spur a unifying movement to find a way to stop the alga. But that would be the naive reaction of someone who does not understand the history of the Pecos and the deep divisions and pride that keep people from working together.

Dearen, on the other hand, knows who to interview. He boils the story down to its most basic elements with quotes from those who actually live and work with the river.

"We may be obsolete someday," conceded Robin Prewit, a longtime employee of Red Bluff District. "Maybe this isn't the best use of the water... But at least give some credit for what it is and how it came to be and what it means to some people."

Dearen's book was commissioned by the Pecos River Resolution Corporation, which was founded by oilman P. Lourcey Sams and dedicated to recording the facts of the river that will lead to a "comprehensive understanding of the best overall use

of the Pecos River and what would be involved in accomplishing this mission,” according to the corporation’s website.

The project was made possible by the underwriting of the Nita Stewart Haley Memorial Library in Midland, Texas, and by contributions from oil and gas companies and foundations, including the Apache Corporation, Concho Resources, and the Permian Basin Area Foundation.

While this backing may have limited Dearen’s scrutiny of the oil and gas industry, it did not stop him from a telling a history that needs to be shared.

His book is not the complete story of the Pecos. No book ever could be. But it is a start to understanding why the Pecos is such a great place for a Western novel and lousy place to be a fish.