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Climate Change and the Rio Grande: Throwing Gasoline on a Fire
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SUMMARY

The Rio Grande is a perfect laboratory to study the effects of drought in a region characterized by traditional western water management. Drought response can be used as a proxy for how a region might respond to climate change, although the physical effects of the two will not necessarily be identical.

There are two points of agreement among scientists concerning water management that I would note. The first is an increasing sense among hydrologists that the future will not resemble the past. Perhaps this insight is overdue, not just as a result of global climate change, but as longer records of data are brought to light, and more attention paid to climate variability. Politicians and public officials often express a felt entitlement to the return of precipitation to “normal”. It is difficult for ski basin operators, river companies, water managers and ordinary citizens to accept that “averages” are not “normal” and that the West has had long periods of drought. My personal dilemma is expressed by asking, “should I hold onto my skis, canoe, and kayak in the hopes of better years, or sell them now?”

The second point is that the lack of predictability in nature is compounded by the new challenges of ecosystem management, in which we are attempting to manage for biological results. With several years of adaptive management to draw on, we are now aware of how difficult it is to restore species or ecosystems. The salmon efforts in the Pacific Northwest do not point to any clear path to recover those species, but the experimentation has been necessary to develop appropriate alternatives. We must persuade the public and policymakers that natural systems are not mechanistic. The policy implication is that the commitment to ecosystem management, or species recovery, is a long term one and will not have the quantitative certainty that legal systems often demand.

II. Drought

A. Endangered Species

The Rio Grande Silvery Minnow, a small nondescript fish native to the Rio Grande, has found itself in the midst of a national debate over whether species can be protected during times of drought. The dramatic announcement of the 10th Circuit decision is galvanizing political debate, with the water establishment arrayed against the minnow. At this moment, it is difficult to predict either the legal or biological outcome on the Rio Grande.

But, I will step back a bit from the immediate fray, and offer a few observations about the fate of nonhuman species in light of water stresses.

U.S. citizens will adapt much more smoothly to climate change than will other species. In physical terms, it may be more difficult to continue irrigated agriculture in light of global warming, but society is accustomed to massive agricultural subsidies. Not so for species, which depend almost entirely on the embattled Endangered Species Act for their chance of survival.

The Rio Grande Silvery Minnow may be on the brink of extinction. Tellingly, it survived the drought of late 1500s and other periods when precipitation was significantly reduced. The threat comes not from the drought, but from anthropogenic changes to the river in a basin where the hydrology has been totally altered by dams and diversions.

But for both the species and for agriculture, and for that matter for city dwellers, life is going to have to change under prolonged drought. It is possible that the dominant species will decide irrigated agriculture is too costly a luxury to maintain in the west. It is more likely that some will conclude that native aquatic species are too much of a luxury.

The water establishment has clear choices to make in the face of the drought, including the following:

- 1) Water might be procured for instream purposes through a combination of leasing, forbearance, and conservation programs. Habitat changes will be made to improve the minnows' chance of survival. Federal funds will help aid the transition. (At present, however, no arrangements have been made for forbearance (leasing of water during water short years) in the Middle Rio Grande Conservancy District, so that farmers and suburban homeowners will continue to use water as long as it is present in the ditches. Despite a willingness to pay, this water is not subject to the preferences of Albuquerque city dwellers who would prefer to see a balance between instream water and agricultural uses.)
- 2) State leaders can amend the Endangered Species Act, as they are now threatening to do, to avoid the necessity of statutory compliance.
- 3) The State may invoke the God Squad and attempt to persuade it that extinction is the best course.
- 4) The minnow may go extinct by inaction of the key actors, because the water provided for it in the current biological opinion proves inadequate for its survival.

Although the environmental community has brought the minnow what water it has through litigation, the ultimate decision makers are those who own and manage water. Despite my hopes, I would not hazard a guess as to what the future holds for the minnow and the river.

B. Border water needs and conflicts

The Rio Grande/Rio Bravo is the source of both drinking and agricultural water. The Rio Grande has now ceased to flow to the Gulf because of the drought and excessive withdrawals. Mexico is in default on its Treaty Obligations, leaving Texas farmers seething. The drought is equally severe in Mexico, hurting farmers on both side of the river.

The entire basin relies on groundwater for much of its water. El Paso, which is in a critical water situation, but also aggressively moving to respond to it, uses about 41,000 AF per year of the Rio Grande (about 1/3 of its total use). Las Cruces is beginning agricultural to municipal transfers.

Elephant Butte holds the supply for NM's obligations to Texas and the US's obligations to Mexico. It has moved to center stage this year, as the state considered the untoward effects of losing about 180,000 feet/year of water from EB through evaporation, and arranged to hold water in upstream reservoirs.

Litigation is threatened by Texas against New Mexico. Its basis may be quality of water delivered to Texas, or perhaps the use of groundwater below Elephant Butte.

Ciudad Juarez illustrates the stresses that drought, and possibly climate change, bring to the region. The city relies on the Hueco Bolson, which is nearing the end of its usable life. Juarez may turn to other aquifers for new water supplies. There are no agreements among nations, or states, about these shared aquifers. Also, it may use surface water allotment under treaty that is now used by agriculture.

The response to drought thus far has been one of angry words exchanged across borders. One could argue that the basin has more joining it than separating it, and that political borders are a great part of the problem. Migration across borders, shared economies, and shared cultures may point to eventual cooperation, if the attention of the relevant decision makers can be constructively focused.

C. Political and Institutional Response

Drought may be an opportunity for better water management, but the evidence in New Mexico is equally strong that it is an opportunity to promise constituents rescue from the hard facts of life in a desert. New Mexico is witnessing a rush to oversell the benefits of water production from tamarisk removal and logging. Other technologies for stretching water supplies deserve research. Ultimately, however, low value irrigation water often will be the most cost effective source of new water.

D. Policy options

I would agree with the many authors who have suggested that versatility is the single most important component of water management in times of drought. The relevant

discipline may be economics, not engineering. There are public interests (communities, the environment, recreational users, and other stakeholders) that play a legitimate role in all water transactions.

Speakers in conferences devoted to societal responses to climate change often seem to assume that society should protect current users from the effects of these changes. For example, there is much attention to changes in precipitation timing, and how that might “necessitate” building additional storage to capture early season flows. Equally plausibly, however, policymakers might decide to determine where these investments should be made. Continuing the patterns of water infrastructure made in 1902 and thereafter may not serve the needs of contemporary western society.

Sitting in Colorado, I would note that ski basin owners and those who depend on the winter tourist industry are a greater part of the economy and far more imperiled by climate change. We do not, however, seem to assume that society can, or should, attempt to protect that industry from the effects of decreased snow and warmer soil temperatures, even though the consequences to the industry are dire.

Where society should invest its resources in responding to climate change deserves the benefit of our democratic processes. These processes will be far more open than they were when the first major round of infrastructure funding occurred in 1902.