

ESSAI

Volume 6

2008

Article 32

Don't Drink the Last Drop

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Don't Drink the Last Drop

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(English 1102)

Could the American Southwest be down to their very last drop? Of water, that is. Fresh water shortages are more prevalent than ever and are greatly affecting the Southwest. Many factors contribute to the fresh water shortages and lowering water levels. The global temperature increase due to global warming is largely at fault for these significant water shortages. In addition to the changing climate, the population in the Southwest is continuing to grow rapidly; consequently the area's water supply cannot support the surplus population. Due to explosive population growth and ancient water laws, Las Vegas, Nevada is subject to the most severe water shortages. This is not an issue of the future, but something that is happening right now. Most of what has already been lost cannot be restored; however, there are many steps that can be taken to prevent the water shortages from becoming disastrous.

Having a basic knowledge of water history in the Southwest is important to understanding this problem. Much of the Southwest's water is supplied by the Colorado River. On the 1,450 mile long Colorado River, that stretches from northern Colorado to the Gulf of California in Mexico, 20 dams have been built. The Hoover Dam, the largest and most influential dam in the United States, stands 726.4 feet tall (Davidson 425-426). The construction of the Hoover Dam developed from the Colorado River Compact of 1922, which was created to divvy up the Colorado River's water between seven Southwestern States: Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. This compact was the first time in American history that states settled an issue between themselves, independently from the federal government (Davidson 426-430).

When the allotment of water was first decided, the states based it off of the irrigable land in each state. Later, they realized it would make more sense to divide themselves into the Lower Basin and Upper Basin and assign a specific maf amount [million acre-feet; acre-feet is a term used in water measurement, equal to about 325,851 liquid gallons (Davenport)] to each. The Lower Basin consists of California, Arizona, and Nevada, and the Upper Basin consists of Wyoming, Colorado, Utah, and New Mexico. They decided to assign a specific maf amount to the Lower and Upper Basins over a 10 year period of time. This was intended to balance out any natural climatic changes such as years of drought or flooding. However, this plan was difficult to carry out because the river flow fluctuated so much over time. As the population of California and Arizona increased, they realized that allotting a specific amount of water was unpractical. Therefore, they decided to designate a percentage of the Colorado River to each state instead of a specific maf amount (Davidson 429-431). The current problem with this arrangement is the percentage allotted to each state has remained the same over the years, but the population in the many Southwestern states is continuing to grow.

There are several factors that all work together to create the Southwestern water shortages. Global warming, which is effectively making the planet warmer, contributes to this growing problem. The first problem that comes to mind with global warming is the rising sea levels destroying coastal cities around the world; however, the warmer climate will also have huge effects on the world's fresh water supply (Gertner 1). There has been "a catastrophic reduction in the flow of the Colorado River –which mostly consists of snowmelt from the Rocky Mountains" (Gertner 1). Due to the temperature increase, there has been a significant decrease in mountain snowpack. When the amount of snowpack decreases, the less snowmelt runs into the rivers. Therefore, the rivers will

remain low and continue to drop.

It is widely accepted by climatologists that global warming suggests a wetter world (Gertner 6). This statement seems to contradict the water problems being faced in the Southwest. Scientist Richard Seager, from Columbia University's Lamont Doherty Earth Observatory, shed some light on this. Seager recently published a study on the Southwest and determined that the poles will experience more precipitation while regions near the equator will become drier. In this study, Seager focused on the effects of climate changes on the Southwest. His studies show that the American Southwest will experience dramatic changes in both atmosphere and weather (Gertner 6). "When I asked if the drought in his models would be permanent, he pondered the question for a moment, then replied: 'You can't call it a drought anymore, because it's going over to a drier climate. No one says the Sahara is in drought'" (Gertner 6). This is not a temporary drought; this is a drastic change in climate. The severe water shortages that will arise in such a dry climate have already started to take place.

New studies based on tree rings suggest that this climate change is something that has happened throughout the course of Earth's history. Lee's Ferry, in northern Arizona, is the place on the Colorado River where the water is measured to determine how it will be divvied up. The water level at Lee's Ferry is the lowest that it has ever been recorded since the river started being measured 85 years ago. In tree ring studies, scientists study samples from old Ponderosa Pines or Douglas firs to determine ancient moisture levels. These studies give insight into the history of Earth's climate and tell us that such droughts and climate changes have precedence. In the 1920's, when the first measurements at Lee's Ferry began, the area was going through an overly wet period. Therefore, the Colorado River was unfortunately thought to have an average flow of 17 maf per year, when in reality it averages way less. Tree ring studies also revealed a very significant drought that occurred in the 1150's (Gertner 5). "They think that's when the Anasazi Indians were forced out. We see drought cycles here that can go up to 60 years of below average precipitation" says Peter Binney, water manager in Aurora, Colorado (Gertner 5). If a drought like this were to happen today, a choice would have to be made between agriculture and people. This would lead to political debates and severe economic problems. Humans have very short life spans relative to geological time and therefore have a very narrow view of our changing world. When we discover ways to study the climate of our ancient world, we start to see how much the world actually changes itself over time.

Aside from global warming and our earth's ever changing climate, the population boom in the Southwest attributes to the immense water shortages. According to the 2000 Census, the population in Las Vegas exceeded 478,000 and was the country's fastest growing city. "Las Vegas is almost certainly more vulnerable to water shortages than any metro area in the country. Partly that's a result of the city's explosive growth" (Gertner 7). The population growth is not the only factor to blame. "But the state of Nevada has the historical misfortune of receiving a smaller share of the Colorado River (about 300,000 acre-feet annually) than the other six states with which it signed the water-sharing compact in the 1920's" (Gertner 7). Their share of the water is held in Lake Mead, the large reservoir adjacent to the Hoover Dam. Lake Mead, the largest reservoir in the United States, is 110 miles long and, when filled completely contains 28 million acre-feet of water (Gertner 7). Currently, Lake Mead is about 49% full. According to a lecture by Dr. Mike Cordonnier, an Earth Science professor at the College of Dupage, he believes in the most optimistic view of this situation, Lake Mead will never be filled higher than it is right now. On the flip side, Cordonnier says, from a very pessimistic viewpoint, that the lake will be dry in the next fifteen years. Whether we remain optimistic or pessimistic, the future is grim. However, something has to be done before this problem gets even more out of hand.

Several solutions have been proposed to combat the struggle over water. Pat Mulroy, the Manager of the Southern Nevada Water Authority, projected that the water levels in Lake Mead will probably drop below the levels of the intake pipes. Mulroy, says they have plans to build lower

intake pipes by 2012 (Gertner 8). These pipes will at least allow for the water at the bottom of the lake to be used and not go to waste.

“One catchphrase of the water trade is that water flows uphill toward money, which is another way of saying that a city with ample funds can, at least theoretically augment its supplies indefinitely” (Gertner 8). This line indicates that where ever there is money, there will be water. Money is no issue for the greater metropolitan area of Las Vegas, with a population exceeding 1.5 million and growing. The Water Authority of Southern Nevada wants to pay for desalination on the Pacific coast in exchange for their portion of the Colorado River (Gertner 8). Water will arrive wherever the money is flowing.

An extremely innovative solution to the water shortages of the West has been proposed in Aurora, Colorado. With a population of 310,000, Aurora is the sixtieth largest city in the United States and is continuing to grow. The new and fast growing city is facing severe water shortages. In the West, water rights are granted to whoever got to the water first. In this case, Denver, Colorado gets access to the water before Aurora gets anything (Gertner 3). “Over the course of a century, the city had established a reasonable water supply. About a quarter of its water is piped in from the Colorado River basin about 70 miles away, another quarter is taken from reservoirs in the Arkansas River basin far to the south. The rest comes from the South Platte, a lazy meandering river that runs north through Aurora on its way toward Nebraska” (Gertner 4). Peter Binney experienced Aurora's worst drought his first year on the job, back in 2002, when Aurora's reservoirs dropped 26% (Gertner 4). Due to the high chance of severe droughts, Binney feels that cities like his need at least five years of water on reserve. New sources of water and ways to get to it have to be found in order to make this possible.

Binney came up with a great plan. “We have to find a new way of meeting the needs of all this population that's turning up and still satisfy all of our recreation and environmental demands,” says Binney (Gertner 2). His idea was derived from a technique often used in Europe. Binney wants to drill wells on the edge of the South Plate River and draw water up from the ground, using the gravel as a natural filter (Gertner 4). This works the same way it works when you dig a hole in the sand near the ocean and it fills up from underneath. Since Aurora and several other cities in the Denver Metropolitan Area, put their treated waste water right back into the South Plate, the River has a very dependable flow (Gertner 4). Binney wants to buy agricultural land 20 or 30 miles downstream and drill wells where he can take back his city's own waste water. This system would create a cycle where water from the South Plate River would be used, treated, then sent back into the river. When the water is later recovered from the wells, the cycle continues.

Reusing waste water has been done in other places, like the water from the Mississippi River. “But as far as Binney knew, no municipality in the United States had built the kind of closed loop that Aurora envisioned” (Gertner 5). As far as Binney can see, his plan will be the “blueprint” for water projects in many other Southwestern states such as California, Arizona and Nevada (Gertner 5).

Water conservation is very important in preventing further water shortage. There are several different ways to conserve water. Burning less fossil fuel is a good place to start. People need to stop burning so much fossil fuel because it is contributing to the global temperature increase. Cities such as Las Vegas are making huge strides in conservation efforts. An important one of these efforts is the installation of low-flow home appliances as they need less water to run. For example, a water conserving toilet uses about 1.5 gallons per flush, while a regular toilet uses anywhere from 3.5 to 7 gallons per flush (“Water Use Facts”).

People can also conserve water at home. These conservation efforts include several tactics that can be done in and outside of the home. Using more water friendly irrigation systems is another way to help out the water conservation effort (Gertner 11-12). According to the city of Henderson (a city southeast of Las Vegas) website, people should water their lawns early in the day to avoid evaporation during the heat of the summer days. It is also important to make sure the sprinklers are

working properly to avoid leakage and water loss. Instead of having green grass lawns, planting native grasses and plants that require little water to survive are a very good idea in desert regions. This type of landscaping is known as xeriscaping (“What You Can Do”). Keeping up with water conservation outside the house is essential to fighting the water shortages.

Other efforts can be made inside the home to prevent these water shortages from continuing to be a problem. People need to take shorter showers instead of baths and turn off the water while applying soap. Also, when brushing teeth, the water should be shut off. When cleaning the house, make sure to only run loads of laundry and dishes that are full. Also, in the kitchen, make sure to use minimal water. Leave a pitcher of water in the refrigerator to avoid running the tap for cold water. Finally, do not allow the water to run as vegetables sit in the sink (“What You Can Do”). Household water usage can range from 50 to 300 gallons per person per day (“Water Use Facts”). It takes 36 gallons of water to run a bath and 9 to 12 just to shower (“Water Use Facts”). Indoor conservation may seem like a simple solution but if everyone were to take time for these few extra steps, think about how much water that would save.

Water shortages in the Southwest are a problem being faced right now. Due to our warming world this problem seems to be getting worse. Population growth is also at fault for the overuse of the water supply in the Southwest. Because of this, Las Vegas is one of the cities that will be extremely affected by this problem in the near future. Cities in Southern Nevada and the rest of the Southwest need to realize there is a problem and they need to work to correct it. Many efforts are being made to conserve water that will help put an end to this frightening problem. Something needs to be done before the Southwest drinks their last drop.

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