

Devastating Drought Seems Inevitable in American West

The southwestern U.S. looks a lot like Australia before its nine-year dry spell

By Peter H. Gleick and Matthew Heberger, Scientific American, January 12, 2012

Australia experienced the worst and most consistent dry period in its recorded history over much of the past decade. The Murray River failed to reach the sea for the first time ever in 2002. Fires swept much of the country, and dust storms blanketed major cities for days. Australia's sheep population dropped by 50 percent, and rice and cotton production collapsed in some years. Tens of thousands of farm families gave up their livelihoods. The drought ended in 2010 with torrential rains and flooding.

Australia's Millennium Drought is a wake-up call for residents of the drought-plagued southwestern U.S. and for all of us. What happened in Australia could happen in the U.S., with devastating consequences to the region and to the nation. We can avert the worst, however, if we pay attention to Australia's experience and learn the right lessons.

The southwestern U.S. bears some resemblance to parts of Australia before the drought. Both include arid regions where thirsty cities and irrigated agriculture are straining water supplies and damaging ecosystems. The Colorado River no longer flows to the sea in most years. Water levels in major reservoirs have steadily declined over the past decade; some analysts project that the largest may never refill. The U.S. and Australia also share a changing global climate that is increasing the risk of drought.

Evidence is mounting that climate change is playing a role in Australia's water woes. Since 1950 average rainfall has decreased 15 percent, and researchers found average temperatures over southeastern Australia from 1995 to 2006 were 0.3 to 0.6 degree Celsius higher than the long-term average. The combination of higher evaporation and lower precipitation depletes soil moisture and reduces runoff, making droughts more intense and more frequent. Australian scientists forecast a 35 to 50 percent decline in water availability in the Murray-Darling river basin and a drop in flows near the mouth of the Murray by up to 70 percent by 2030.

The Millennium Drought did have one benefit: it got people's attention. Australians responded to these extremes with a wide range of technical, economic, regulatory and educational policies. Urban water managers in Australia have been forced to put in place aggressive strategies to curb water use and to expand sources of new and unconventional supplies. They have subsidized efficient appliances and fixtures such as dual-flush toilets, launched public educational campaigns to save water, and more. Between 2002 and 2008 per capita urban water use—already low compared with the western U.S.—declined by 37 percent.

Other efforts focus on tapping unconventional supplies, such as systems that reuse gray water, cisterns to harvest rooftop runoff, and sewage treatment and reuse. The country's five largest cities are spending \$13.2 billion to double the capacity of desalination, enough to meet 30 percent of current urban water needs.

Even in the midst of the drought, Australia moved forward with plans to restore water to severely degraded aquatic ecosystems. The government has continued with plans to restore rivers and wetlands



Figure 1: DRYING OUT IN THE U.S.: The falling water level of Lake Mead near Las Vegas has left behind a white ring of mineral deposits Image: Christopher J. Morris/Redux Pictures

by cutting withdrawals from the Murray-Darling river basin by 22 to 29 percent. It has committed \$3 billion to purchase water from irrigators to restore ecosystems. Regulators introduced water markets in the hope of making farms more water-efficient and reducing waste. Despite efforts to phase out subsidies, the government announced more than \$6 billion in aid to improve irrigation infrastructure and make it more productive.

The southwestern U.S. states would do well to push for these kinds of reforms before a similar disaster strikes. They need to tackle difficult policy issues, such as development of water markets and pricing, expansion of water efficiency and productivity programs, elimination of government subsidies that encourage inefficient or unproductive water use by cities and farms, and agricultural reform. As the climate continues to change, smart water planning may help ease the impacts of unexpected and severe shocks that now appear inevitable.