Talk of the Town: Temporary drought or aridification: Will we thrive?

In this July 16, 2014, file photo, what was once a marina sits high and dry due to Lake Mead receding in the Lake Mead National Recreation Area in Arizona. (John Locher/AP, File)

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The Arizona State Climate Office reports, “Arizona is currently in our 21st year of a long-term drought.” Growing evidence suggests that the Southwest is in an extended drier and warmer climate — aridification. If so, an eventual crisis of ever-increasing well failure and insufficient water supply threatens our economy and lifestyle in the Prescott Active Management Area (PrAMA — which includes the municipalities of Prescott, Prescott Valley, Chino Valley, and Dewey-Humboldt).

Winter storms are essential in recharging northern Arizona aquifers. As documented by the Arizona Department of Water Resources (ADWR) beginning in 1985, five winters with substantial winter storms from 1985 through 1995 enabled groundwater recharge in the PrAMA to exceed the amount of groundwater pumped from the aquifer in those five years. Nevertheless, during that 11-year period total groundwater pumped exceeded the total recharge. By the end of 1995 the overdraft averaged about 2,600 acre-feet per year (af/y; an acre-foot can provide a year’s

water for three homes). The total loss of groundwater from the PrAMA aquifer was approximately 29,000 acre-feet or about 0.6 to 1 percent of the estimated volume of groundwater stored in the aquifer.

Then the weather changed (or was it the climate?). From 1996 through 2012, there were only two winters, 2004-05 and 2010, in which substantial storms caused recharge to exceed the amount of groundwater pumped in the PrAMA. For those 17 years, the average annual overdraft was about 13,000 af/y — five times the average annual overdraft for 1985 through 1995. ADWR has estimated that cumulative overdraft at that time, 1985 through 2012, was about 253,000 acre-feet, or about 5 to 8 percent of the estimated groundwater stored in the aquifer.

Determinations for 2013 through 2018 are not yet available, but the continued scarcity of large winter storms suggests that the vigorous overdraft continues. The inevitable consequence, if this pattern continues over the long term, is increasing numbers of failed wells and ever-increasing need to haul water for domestic use.

Are we in a temporary drought or in the early years of a multi-decadal or multi-century aridification that will ever more severely reduce our groundwater supply? If the former, we can't undo the accumulated overdraft, but we must stop its growth.

However, it is likely that we are experiencing long-term aridification. Will the Prescott region be a thriving home for our grandchildren and great grandchildren? If so, customs and some laws must evolve as we work to maintain our essential groundwater supply. Maximum efficiency in our use of water must be achieved. Major capture of runoff from rooftops, roadways and parking lots for return to the aquifer will be essential, and eventual more stringent management of water demand may be inevitable. It's time for serious planning.

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