

WATER FACTS

Phoenix, Arizona: Identifying and Becoming More Resilient to Impacts of Climate Change





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Cities across the United States should anticipate significant water-related vulnerabilities based on current carbon emission trends because of climate change, ranging from water shortages to more intense storms and floods to sea level rise. To help cities become more resilient to the rising threats of climate change, NRDC reviewed more than 75 scientific studies and other reports to summarize the water-related vulnerabilities in 12 cities—including Phoenix. Although there may still be some uncertainty about what particular impacts threaten cities and how quickly or severely they might occur, action at the local level is the most effective method of reducing, mitigating, and preventing the negative effects of water-related climate change outlined in this fact sheet. NRDC urges cities to prepare for coming challenges relating to water resources. Fortunately, there are steps cities are already taking to become more resilient.

Situated at the northeastern region of the Sonoran Desert, Phoenix, Arizona has a subtropical arid climate with limited yearly rainfall. Because of Phoenix's limited water resources, increased temperatures and decreased rainfall are very likely to impact the availability of freshwater to homes, businesses, farms, and institutions in Phoenix over the course of this century.

Summary of water-related climate changes and impacts in Phoenix throughout the 21st century

	Water supply challenges due to increased droughts
	Decreased annual precipitation

 Highly likely  Likely  Possible

Source: NRDC



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INCREASED TEMPERATURE

Average temperatures are already on the rise in Phoenix. According to the Southwest Climate Change Network, “The Southwest is projected to warm faster than the world as a whole in the coming decades, with summer temperatures rising even faster than winter ones. Average annual temperatures in many parts of the region could be 5 to 8 degrees F [2.8 to 4.4 C] higher than they were even during the hot quarter-century that began in the 1970’s.”

PRECIPITATION AND DROUGHTS

Precipitation is projected to decline in southern Arizona by 5 to 10 percent by 2100. Although summer monsoons can bring significant rainfall, high temperatures cause much of that moisture to immediately evaporate. Winter snowfalls, which are crucial to the management of the city’s water supply, may be decreasing. These factors indicate increased drought for the region.

WATER SUPPLY CHALLENGES

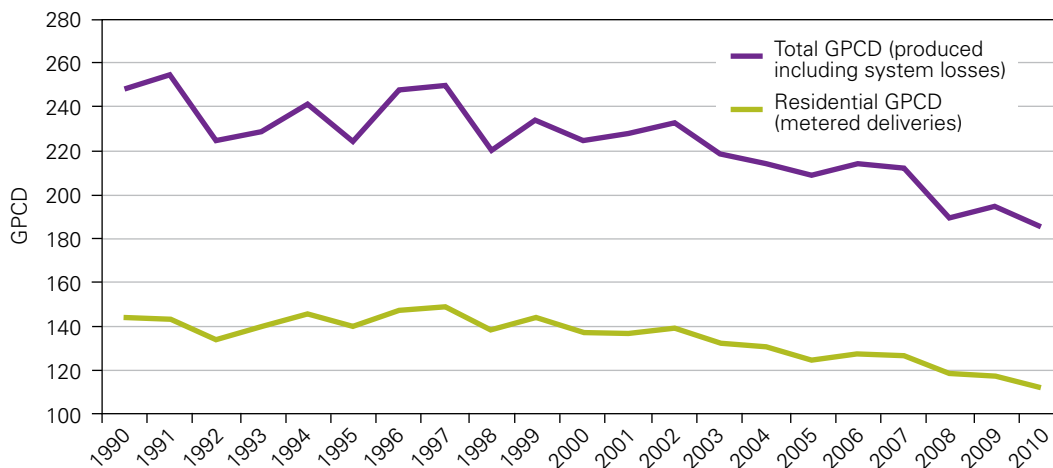
Higher temperatures and decreased precipitation are expected to reduce water supplies. Based on the average of climate scenarios, runoff into the Salt and Verde watersheds—from where Phoenix gets much of its water supply—could decrease by 23 percent. Water imported from the Colorado River system through the Central Arizona Project (CAP) helps to alleviate the impact of droughts, but has been below capacity due to drought conditions and over-allocation.

During prolonged or severe drought conditions, the city may not be able to count on water from CAP. Reduced surface water supplies necessitate groundwater withdrawals to meet demand, but overuse of groundwater can cause land subsidence and reduced water quality. Another factor affecting future water availability in Phoenix is population growth. Expanding population could result in demand exceeding supply by 2030, and higher temperatures combined with drought conditions would increase annual household water use even further because of increased evapotranspiration.

ACTION

Phoenix’s efforts to adapt to climate change are centered on water resource management. Given its arid climate, the city had already developed strategies to address potential deficit conditions between water supply and demand before climate change became a dominant factor. For instance, through water demand management, the city has been able to decrease per capita water consumption despite recent population growth. Though current climate research has not yet yielded data sufficient to be directly incorporated into the decision process, the city is planning for a variety of future water supply shortage scenarios. For instance, Phoenix currently stores excess surface water supplies in underground aquifers through the Granite Reef Underground Storage Project; and it uses more than 90 percent of the water treated by the city’s three wastewater treatment facilities for crop irrigation, golf course watering, habitat restoration, and industrial cooling.

City of Phoenix per-capita water consumption



Source: Adapted from City of Phoenix