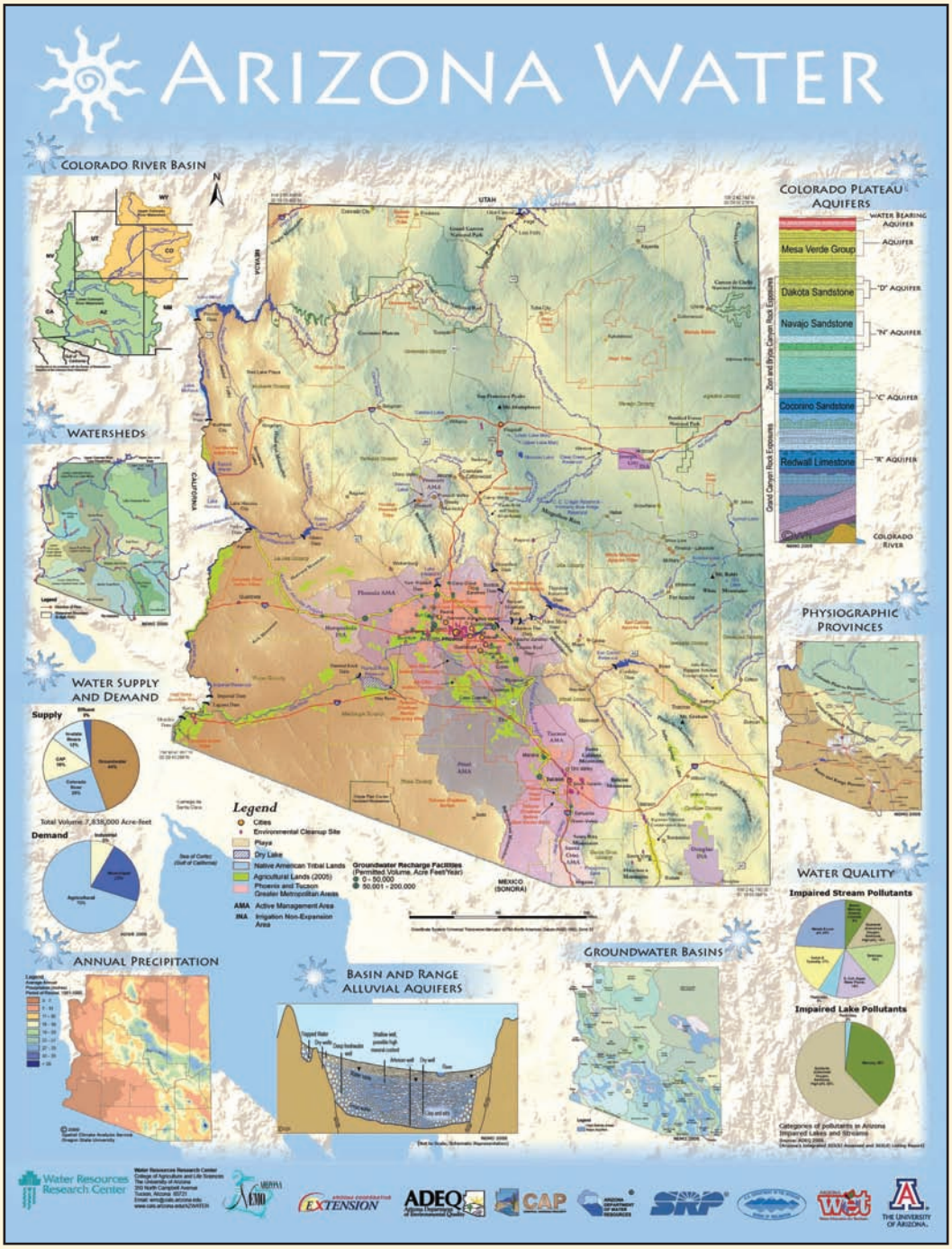
Announcing: Arizona Water Map Poster and Educators' Curriculum Guide

The University of Arizona's Water Resources Research Center (WRRC) promotes understanding of critical water resource issues through community outreach and public education. As part of this mission, WRRC first published the Arizona Water Map in 1994, with an update published in 2002. Both map editions focused on Arizona's surface and groundwater resources, riparian areas, water conservation, and water infrastructure with photos and text. In preparing a new 2010 Water Map update, a committee of water education stakeholders from the Arizona Department of Environmental Quality (ADEQ), the Arizona Department of Water Resources (ADWR), the Salt River Project (SRP), and the Central Arizona Project (CAP) contributed resources to the map publication.



The 2010 version of the Arizona Water Map has expanded on the focus of the earlier maps by including stunning graphics showing groundwater aquifers, physiographic provinces, and watersheds, each important to understanding where water is and how water moves through our environment. A Curriculum Guide accompanies the map with text to explain each graphic element. In addition, the updated central map of the poster now includes Native American Tribal lands, Riparian Conservation Areas, National Parks, mountain ranges, environmental clean-up sites, and agricultural lands.

The Arizona Water Map Curriculum Guide is published to enable educators to use the Map for classroom instruction, and to replace the lengthy text sidebars of the earlier editions. Designed to bring relevant Arizona-specific content into the classroom for middle and high school students,

the Guide includes expository text that describes each map or graphic, and suggests Arizona Project WET lessons that relate to the content along with learning extensions. Digital copies of the Guide and each of the graphics on the Arizona Water Map are on a CD for projection in the classroom.

ARIZONA WATER

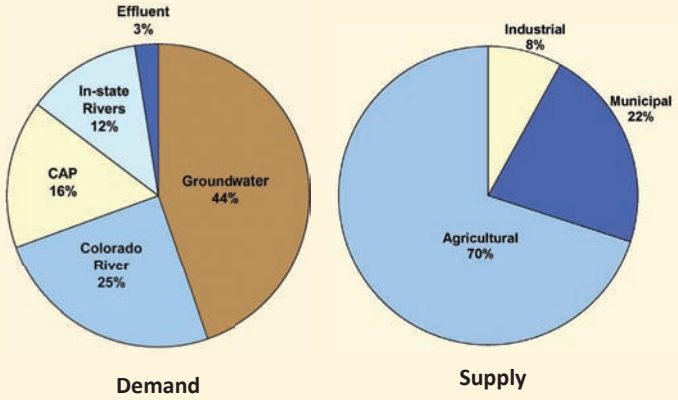
On the map, low elevations are delineated in brown moving to forest green for the highest elevations. The reservoirs on the Colorado River and the six reservoirs around the Phoenix metro area, part of the Salt River Project water supply, account for most of the surface water used in the state.

The withdrawal, use, and transportation of groundwater in the state are highly regulated in five designated active management areas (AMAs), where management goals and conservation are mandated. On the Arizona Water Map, these areas are shown in shades of purple and include the Phoenix, Pinal, Prescott, Santa Cruz and Tucson AMA's. In areas designated as irrigation non-expansion areas (INAs), irrigation acreage expansion is prohibited and metering and reporting requirements apply to certain groundwater withdrawals. There are three INAs: the Douglas INA, Joseph City INA and Harquahala INA, also shown in shades of purple on the map.

Arizona currently uses its entire allocation of Colorado River water by storing some of the CAP water in the ground. This is done by allowing CAP water to flow to recharge basins where it can percolate into permeable ground. Groundwater recharge facilities are designated with green bulls-eye symbols.

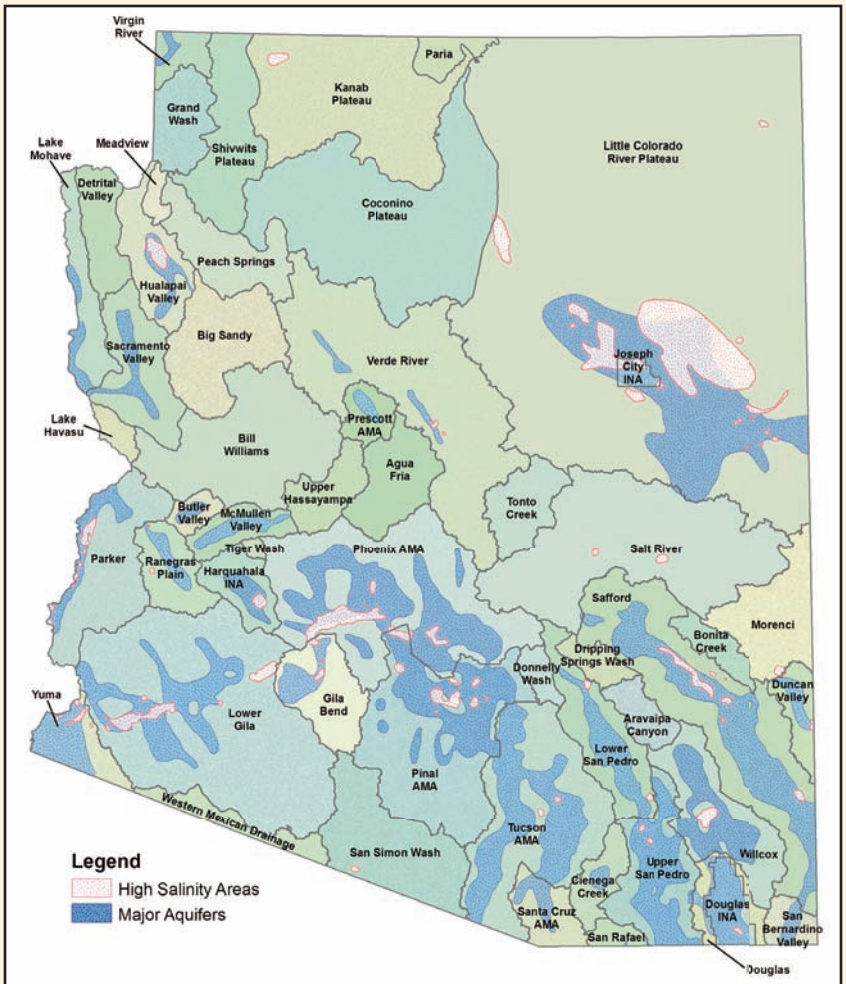
WATER SUPPLY AND DEMAND

Most of Arizona's water supply is surface water from the Colorado River and from in-state rivers such as the Gila, Salt and Verde. Of course, Central Arizona Project (CAP) water is surface water too. The Central Arizona Project is designed to bring 1.5 million acre-feet of Colorado River water per year to Pima, Pinal and Maricopa counties, and is shown on the central map in yellow. CAP carries water from Lake Havasu near Parker to the southern boundary of the San Xavier Indian Reservation southwest of Tucson. It is a 336-mile long system of aqueducts, tunnels, pumping plants and pipelines and is the largest single resource of renewable water supplies in the state of Arizona.



Total Volume approximately 7,838,000 Acre-feet

Water demand is expected to increase as Arizona's population grows. Arizona is the second fastest growing state, having increased from 3.6 million to 5.1 million inhabitants between 1990 and 2000, an increase of 40 percent. Rapid population growth impacts water supplies and infrastruc-



ADWR Groundwater Basins and Areas of High Salinity

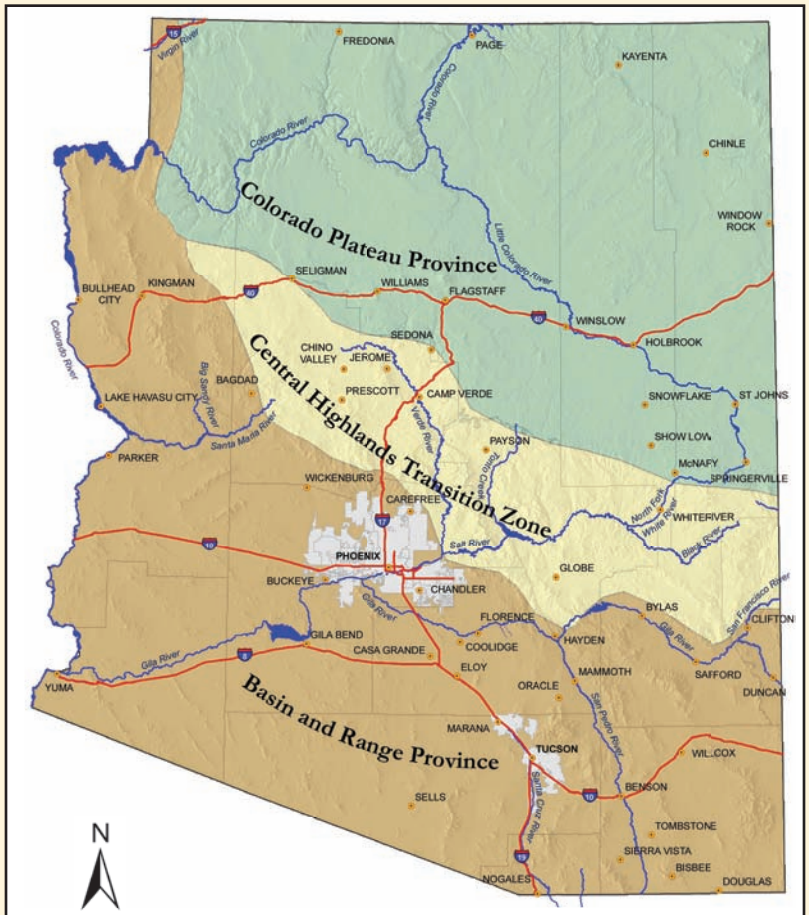
ture in some areas of the state. Arizona's population is expected to exceed 11 million by 2050.

GROUNDWATER BASINS

In the 1940's, Arizona began large scale pumping of groundwater. In most cases, the water stored in these underground reservoirs has been in place for thousands of years. Throughout this century, groundwater has been pumped out more rapidly than it is being replenished, creating a condition called overdraft. Though a large amount of water remains stored in Arizona's aquifers, its availability is limited by location, depth and quality.

Groundwater basins are delineated based on similar aquifer characteristics. On the map, hatched areas delineate high-volume producing aquifers.

The withdrawal, use, and transportation of groundwater in the state are regulated under the Arizona Groundwater Code. The Code's goals are: 1) to control groundwater overdraft in certain parts of the state; 2) to provide a means to allocate groundwater to meet state needs; and 3) to augment groundwater supplies through the development of new water supplies. The Code contains regulatory provisions applicable statewide, such as well drilling requirements and restrictions on groundwater transport.

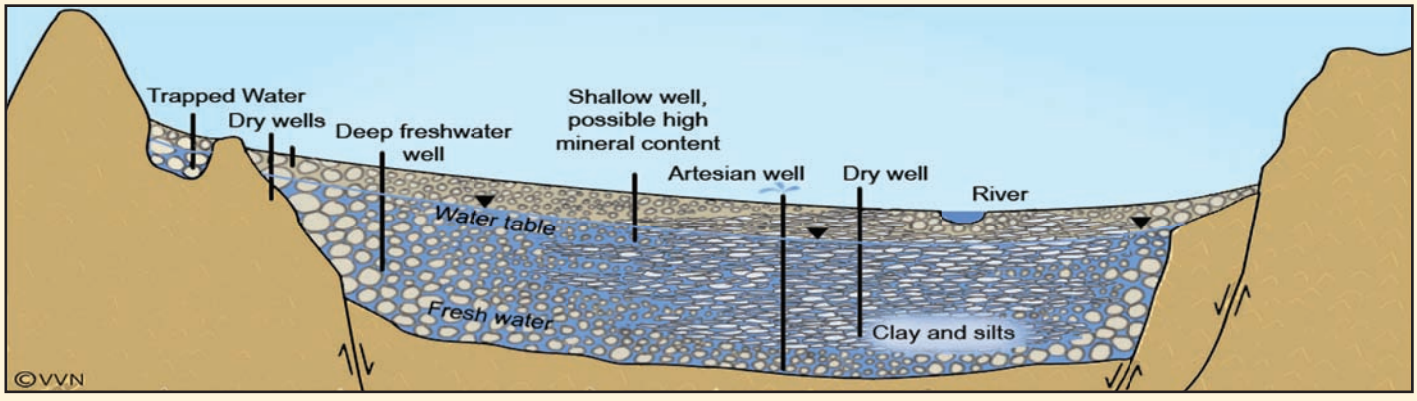


Physiographic Provinces of Arizona

PHYSIOGRAPHIC PROVINCES

Geographers view Arizona in terms of three major physiographic regions or provinces: the Colorado Plateau, the Central Highlands Transition Zone, and the Basin and Range Province. These regions have distinct topography and geologic origins. The Colorado Plateau in northern and eastern Arizona ranges from 4,000 to 9,000 feet above sea level –its rock formations and deep canyons are known around the world; the Grand Canyon is one of them. The Mogollon Rim forms the edge of the Colorado Plateau in Arizona.

The Basin and Range Province includes the south and western portions of the state and is recognized by successive mountain ranges, so called "sky islands" isolated from each other by broad basins. Many sky islands (like the Santa Catalinas, Pinalenos and Huachucas) exceed an elevation of 9,000 feet above sea level.

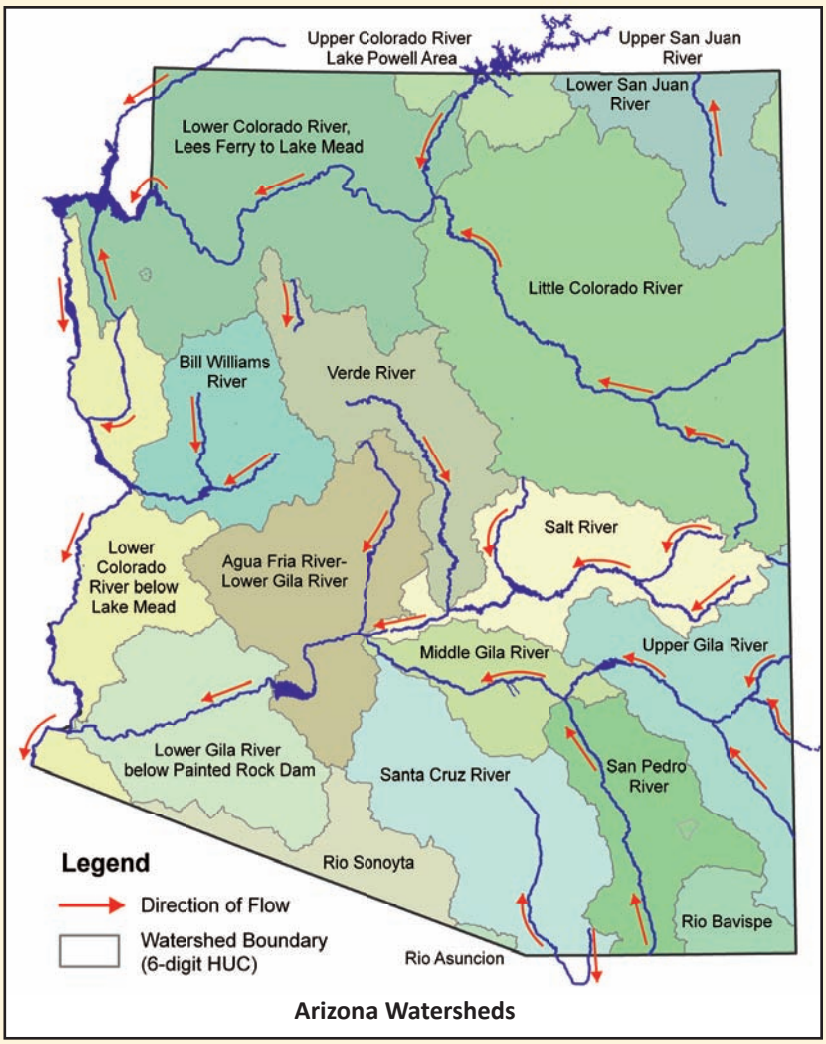


Basin and Range Alluvial Aquifer

ALLUVIAL AQUIFER

The Basin and Range Province is characterized by broad, gently sloping alluvial basins separated by north to northwest trending fault block mountains. Around 15 to 18 million years ago, the mountain ranges we see today in this province developed and the valleys between them began to fill up with sediment. Stream alluvial deposits and sediment basin fill originating from the bordering mountains are the principal water bearing material in these basins. They are characterized by small to moderate amounts of mountain-front recharge, stream-flow infiltration, and significant underflow in and out of basins.

The Basin and Range Province contains deep alluvial aquifers and significant volumes of water in storage. However, since aquifer recharge rates are relatively low and pumping volumes have been large, many aquifers are in an overdraft condition. Overdraft is a condition where groundwater is pumped in excess of recharge.



Arizona Watersheds

WATERSHEDS

A watershed is the land area that drains water to a particular stream, river or lake. Watersheds are named after the river that drains the land. The high points or ridges form the boundary of the watershed. A drop of water falling on one side of the ridge flows to one watershed and a drop of water falling on the other side flows to another watershed. Streams often start near the ridge tops and flow to the lowest point, driven by gravity. As the tributaries flow they join other small streams, growing larger and more powerful and eventually join the main stem. The rivers in southern Arizona flow north and west into the Gila. The Salt, Verde and Agua Fria also flow to the Gila from the north. The Little Colorado River, with it's headwaters at Mount Baldy in the White Mountains, drains a vast area of the Colorado Plateau. They all flow to the Colorado River.

The Water Map Poster and Educators' Curriculum Guide are for sale at the Water Resources Research Center
http://cals.arizona.edu/azwater/

The Arizona Project WET (APW) program is recognized as Arizona's premier water education program for teachers and students at all grade levels. APW receives grant funds from federal, state, county, and city government agencies, public and private companies and Foundations to deliver quality professional development workshops for teachers and educators.

In partnership with and funded by the Arizona Department of Environmental Quality (ADEQ), NEMO is also supported by the University of Arizona, Technology and Research Initiative Fund (TRIF), Water Sustainability Program through the Water Resources Research Center, and is a program of Arizona Cooperative Extension.

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