

Irrigation, Water Management, & The Colorado River

By Tara Seely

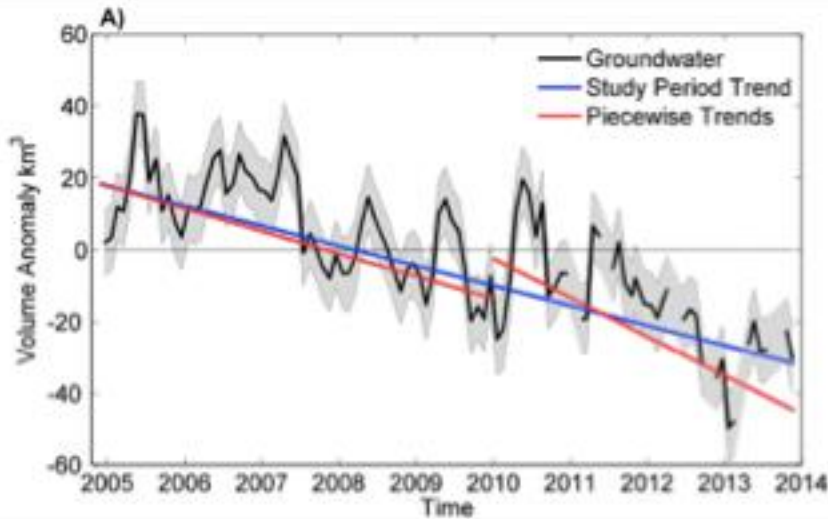
Have you ever wondered how food is grown in places that get very little rainfall? Farmers have spent millennia developing ways to grow food in dry environments. More recently, even scientists have begun to chime in. But for the people living in the southwest United States, there is a short, simple answer to that question: the Colorado River. The Colorado River supplies water to 7 western U.S. states and northern Mexico, a region that is often classified as arid, or very dry. People living in these places rely on the Colorado River to supply water to their households, industries, and, of course, farms. Farmers in the western United States depend on water from the river for irrigation, which is the suite of methods used to deliver water to agricultural fields so crops can grow and cattle can thrive. In areas like the Southwest, where a multitude of farmers all rely on one river, an even more important question to address is how to best allocate the limited amount of water that is actually available.

Alyssa Devincentis is a PhD student at UC Davis who studies how farmers use and manage water. She recently spoke to students in UC Davis' Grand Canyon class about the ways water from the Colorado River is used to grow food and support cattle in the southwest United States and northern Mexico. Alyssa taught the class about a few different methods of irrigation commonly used, including sprinklers (similar to the ones you likely played in during childhood summers), furrows (canals that use gravity to carry water through crop rows), and drip (a pipe stretched across a field with strategically placed holes that drip water directly at the roots of the plants.)



Types of Irrigation: Sprinkler, Furrow, and Drip (left to right)

In addition to irrigation methods, the class learned about the role farms and pasturelands have in stretching the Colorado River's water supply a little too thin. Currently, 70% of the water in the Colorado River is used for irrigation. In times of drought, farmers will often pump water from the ground, called groundwater, to make up for the water they can't get from the river during dry conditions. Over the years, the amount of groundwater near the Colorado River has been gradually decreasing, which indicates there hasn't been enough water to go around. In order to restore groundwater to its natural level and ensure that there will be enough water to grow food in the future, farmers and government agencies have to work together to design better water management plans.



This graph demonstrates an overall decrease in the amount of groundwater near the Colorado River since 2005. Image courtesy of the UC Center for Hydrologic Modeling at UC Irvine

The Colorado River has over 100 dams that regulate the flow of water and provide people access to this important resource. Despite these river modifications, there is a lot of conflicting information about the amount of water needed by farms in the region that relies on the Colorado River. Multiple agencies, including the United States Geological Survey and the United States Department of Agriculture have estimated of the amount of land area in different states requiring irrigation (up to 900,000+ acres in Colorado and Arizona), and the types of crops grown (corn, wheat, cotton, alfalfa, and a large portion for cattle forage.) However, the estimates vary widely, and agencies rarely agree on the numbers and information.

Better information is needed. If agencies can gather accurate information about the acreage and types of crops grown around the Colorado River, it will help them design a plan to allocate water to everyone who needs it. A management plan based on facts can divide water resources evenly and help farmers know when to implement water-saving strategies, so that everyone will have reliable access to water in the future.

One strategy farmers can use to reduce the amount of water used for irrigation is a technique called deficit irrigation. Deficit irrigation involves providing less water to crops than they ideally need. The plants undergoing deficit irrigation have natural biological strategies that allow them to grow despite the limited amount of water they receive. If implemented correctly, deficit irrigation enables farmers to produce enough of their crop to earn a reasonable profit, while simultaneously using less water.

Another way farmers can save water is by changing the type of crops they grow. Some crops such as cotton and alfalfa require more water to grow than other types of crops like wheat and sorghum. If farmers can switch to growing crops that need less water, more water can be saved. Both deficit irrigation and water-saving crops can help farmers in the southwest reduce the demand that is currently putting a strain on the Colorado River's water resources.

Water management in an arid area dominated by farmland is a complex, multifaceted issue. But with the right information, water-saving strategies, and management plans, there is hope for a future with thriving farms and enough water to go around.