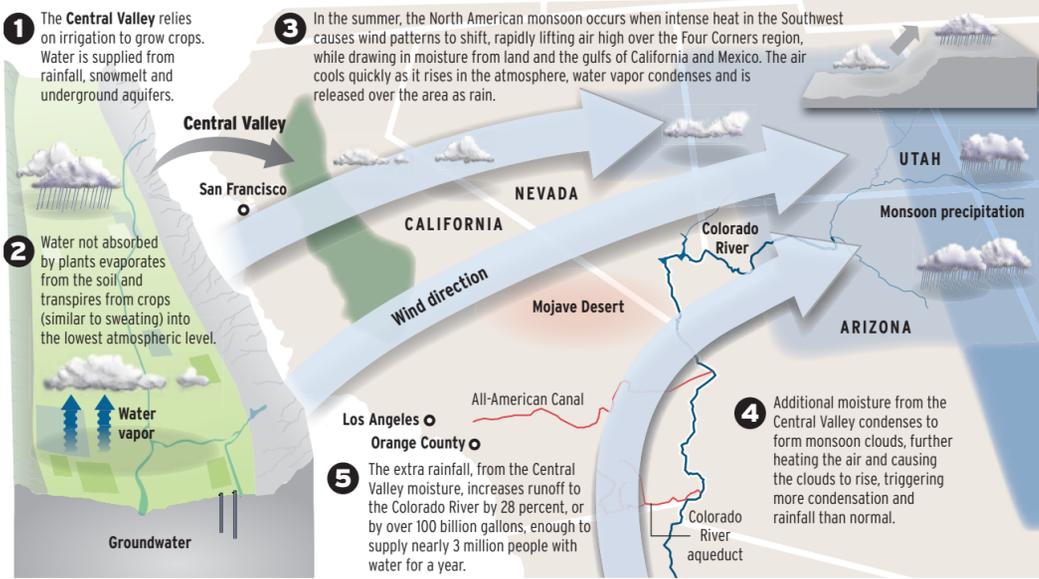


Flowing water: California to the Colorado

Water that irrigates Central Valley farmland ends up swelling the Colorado River, according to a new study. Researchers used a simulation of the world's climate systems to track this cause and effect of water from the West Coast to the Southwest.



Sources: "Irrigation in California's Central Valley Strengthens the Southwestern U.S. Water Cycle," Min-Hui Lo and James S. Famiglietti; "Groundwater Availability of the Central Valley Aquifer," U.S. Geological Survey; National Weather Service; "Central Valley Project," U.S. Bureau of Reclamation; American Meteorological Society; U.S. Census Bureau
Sonya Quick and Maxwell Henderson / The Register

California farms fuel Southwest monsoons, UCI study finds

Moisture rising from the farms of California's Central Valley powers big storms in the desert Southwest - providing fuel for massive and dramatic summer monsoons as far away as Arizona and New Mexico, a new study shows.



PAT BRENNAN
REGISTER WRITER

And when the water returns as rain, it can increase flow into the Colorado River by nearly 30 percent. Some of that water loops its way back to Cali-

fornia as part of our imported water supply.

The previously unknown connection between agricultural evaporation in California and monsoons in the Southwest is revealed in a paper published last week by a UC Irvine Earth System Science professor.

While global climate change driven by human activity more often makes headlines, the new paper reveals a more rarely seen effect: human activity driving climate change on a regional scale.

"We say it accelerates the water cycle," said Jay Famiglietti, the senior author on the study. "In the Southwestern U.S., water vapor is a powerful greenhouse gas. There is a lot of energy associated with that. It's like throwing fuel on a fire."

The finding also could be a warning sign, he said. If agriculture diminishes in the Central Valley because of excessive drawdown of groundwater, the effects could be dire, spanning a vast section of the West.

"The take-home message from the study is that what we do with water management can impact regional climate," Famiglietti said. "As we start to run out of water in California, then

"As we start to run out of water in California, then the monsoon will lose that vapor source. We could very well see more drought, less precipitation, and less stream flow as a result."

JAY FAMILIETTI,
EARTH SYSTEM
SCIENCE PROFESSOR AT
UC IRVINE

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Famiglietti and the paper's lead author, Min-Hui Lo, used a computer model of global climate to try to pin down the regional effects. Plugging climate data for the region into the model, they ran two simulations to spool time 90 years into the future. One factored in delivery of surface water and withdrawal of groundwater to and from the Central Valley. The other left out those effects.

The differences between the model runs revealed which climate effects could be attributed solely to irrigation. And those effects were dramatic. They showed a spike in evaporation over the Central Valley in the summer.

But little of that moisture remained over the Central Valley. Instead, prevailing atmospheric patterns pushed much of the moisture to the east and south.

That resulted in a 15 percent increase in summer rainfall over the Southwest, boosting river runoff across a four-state region by 56 percent, 28 percent over the Colorado River basin.

It amounts to an out-sized, human-driven alteration in the regional rainfall cycle.

"The water evaporates, and the prevailing wind direction is from west to east," Famiglietti said. "It gets transported to the east, hits the next big, active system, which is this big monsoon system. You amp up the convection happening over there."

The paper, "Irrigation in California's Central Valley Strengthens the Southwestern U.S. Water Cycle," appears in Geophysical Research Letters.

CALIFORNIA'S GOLD

A GOLDEN LEGACY:
Celebrating the
CALIFORNIA'S GOLD COLLECTION
and
SCHOLARSHIP FUND
and the
HUELL HOWSER ARCHIVE
at Chapman University

FRIDAY, FEBRUARY 8.

COME SHARE YOUR MEMORIES OF FAVORITE "CALIFORNIA'S GOLD" EPISODES, visit with *amazing* people featured in "California's Gold" programs, and view artwork and memorabilia from Huell Howser's extraordinary life and work.

2 p.m. **Gather at Memorial Hall** to enjoy highlights of "California's Gold," hear from the first recipient of the California's Gold Scholarship, and watch rare footage of Huell Howser.

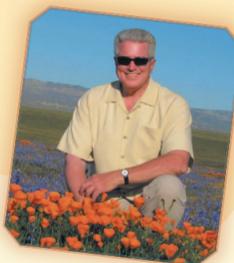
2:30 - 5 p.m. **Mingle in Chapman's Attallah Piazza** with some of the folks made famous in more than two decades of "California's Gold" programs.

Enjoy exhibits featuring Huell Howser's memorabilia and personal artwork. A re-creation of his office/editing room will also be on display.

4:30 - 6 p.m. **View some of the most beloved "California's Gold" episodes** in Memorial Hall.

For more information
www.Chapman.edu/events/Huell-Howser
This event is FREE, but seating and parking are limited.

"The adventure continues..."



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