



Protecting the Verde River

Prescott/Prescott Valley's

Big Chino Ranch

Groundwater Pumping & Pipeline

Outline

- Prescott/Prescott Valley purchased the Big Chino Ranch (formerly JWK Ranch) in the Big Chino Valley for the sole purpose of pumping and transporting groundwater
- Hydrologic connection exists between the Big Chino Valley aquifer and the surface flows of the Verde River
- Endangered species rely on the Verde River for survival

Outline

- Verde River's future impacts downstream users, recreationists, and wildlife
- Center for Biological Diversity filed Notice of Intent to Sue the cities for Endangered Species Act Section 9 violations
- Where we're at and next steps
- Title II

Big Chino Ranch Purchase

- Plan to pump 8,717 acre-feet/year plus water rights to retired irrigated lands, approx. 3,000 acre-feet/year
- Transport via pipeline planned for 12,400 acre-feet/year capacity
- Authorized by ARS 45-555; does not authorize destruction of the Verde River, its habitat or endangered or threatened species
- Despite more than a year of “mitigation” meetings, no formal mitigation plan or Habitat Conservation Plan has been produced

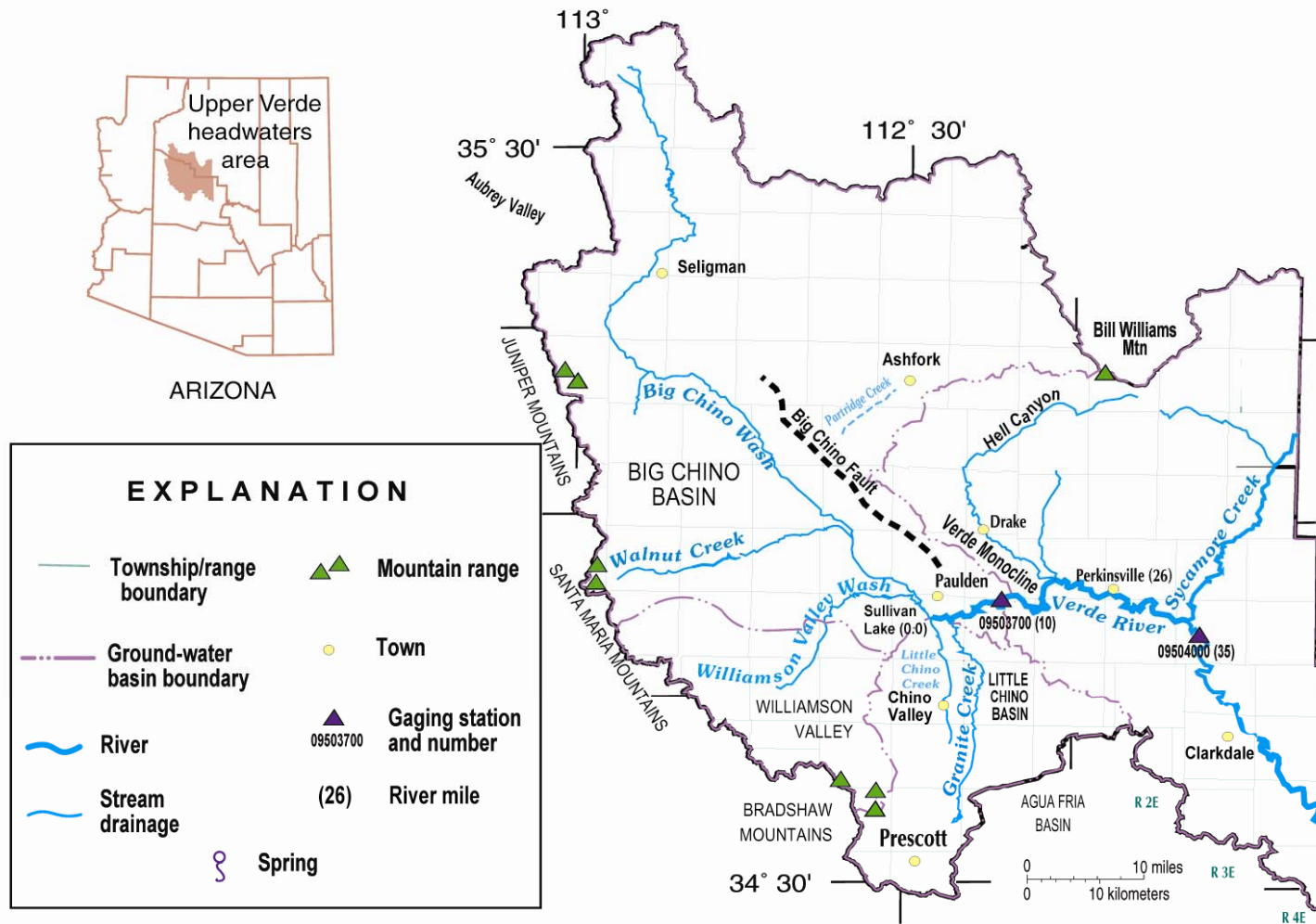


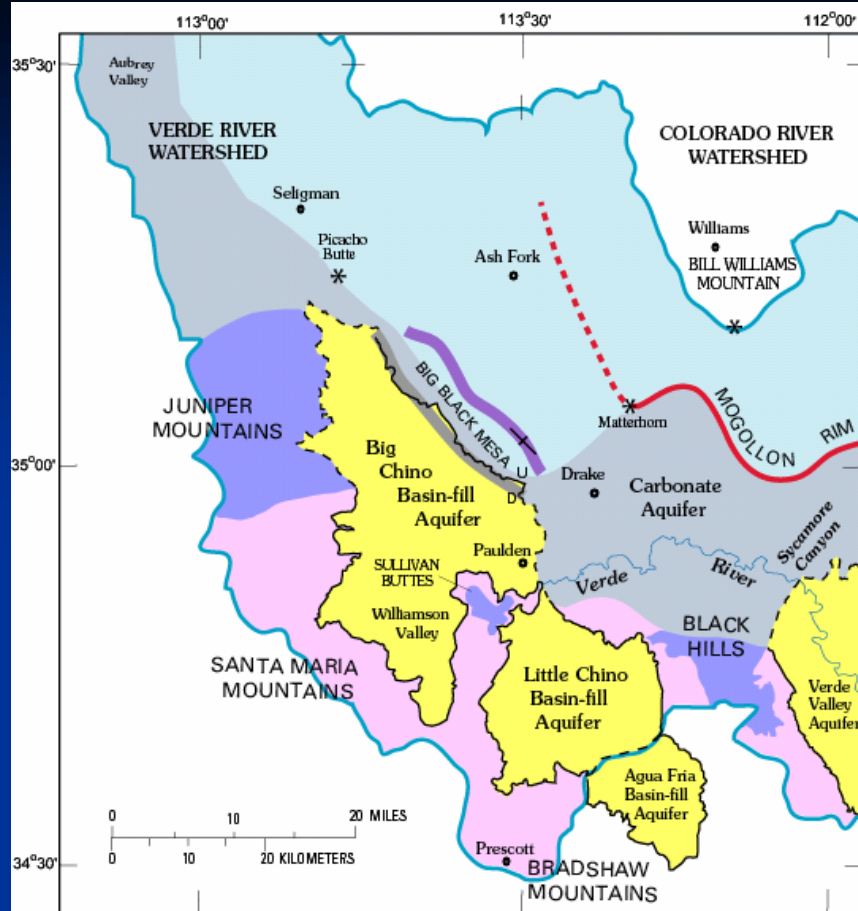
Figure 1. Major geographical features of the Verde River headwaters area.

Hydrologic Connection

- Scientific corroboration that the Big Chino aquifer is the primary source of Upper Verde River base flows contributing more than 80%
- Direct correlation between the decrease in past agricultural irrigation pumping and increased Verde River base flows
- Proposed pumping will decrease the base flows of the Verde River

Upper Verde Watershed

- Big Chino Aquifer provides 80%-86% of the Upper Verde River base flow
- Little Chino Aquifer supplies about 14% to base flow
- BBM/Carbonate Aquifer contributes less than 6% of the base flow



EXPLANATION

- Carbonate aquifer; moderate to high permeability; beneath Colorado Plateau
- Carbonate aquifer; moderate to high permeability; Transition Zone; connected to Colorado Plateau
- Carbonate remnant; moderate to high permeability; Transition Zone; disconnected from Colorado Plateau
- Igneous and metamorphic rocks; low permeability
- Basin-fill aquifer, moderate to high permeability; Transition Zone, boundary dashed where likely interconnected with adjacent aquifer
- Verde River watershed boundary
- Big Chino Fault; U, upthrown side; D, downthrown side
- Limestone Canyon monocline, symbol indicates vertical dip of beds

Sources of Verde River Baseflows

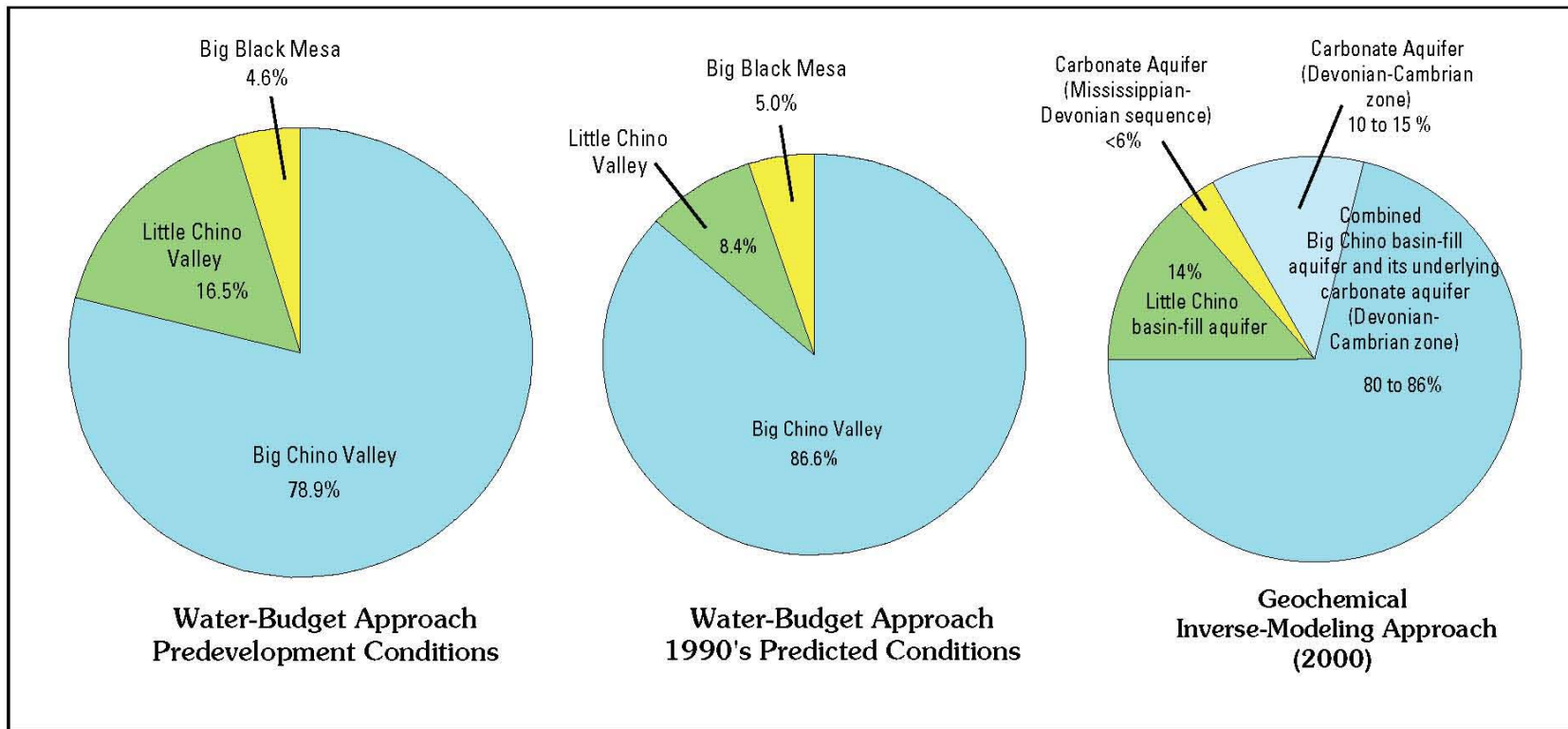
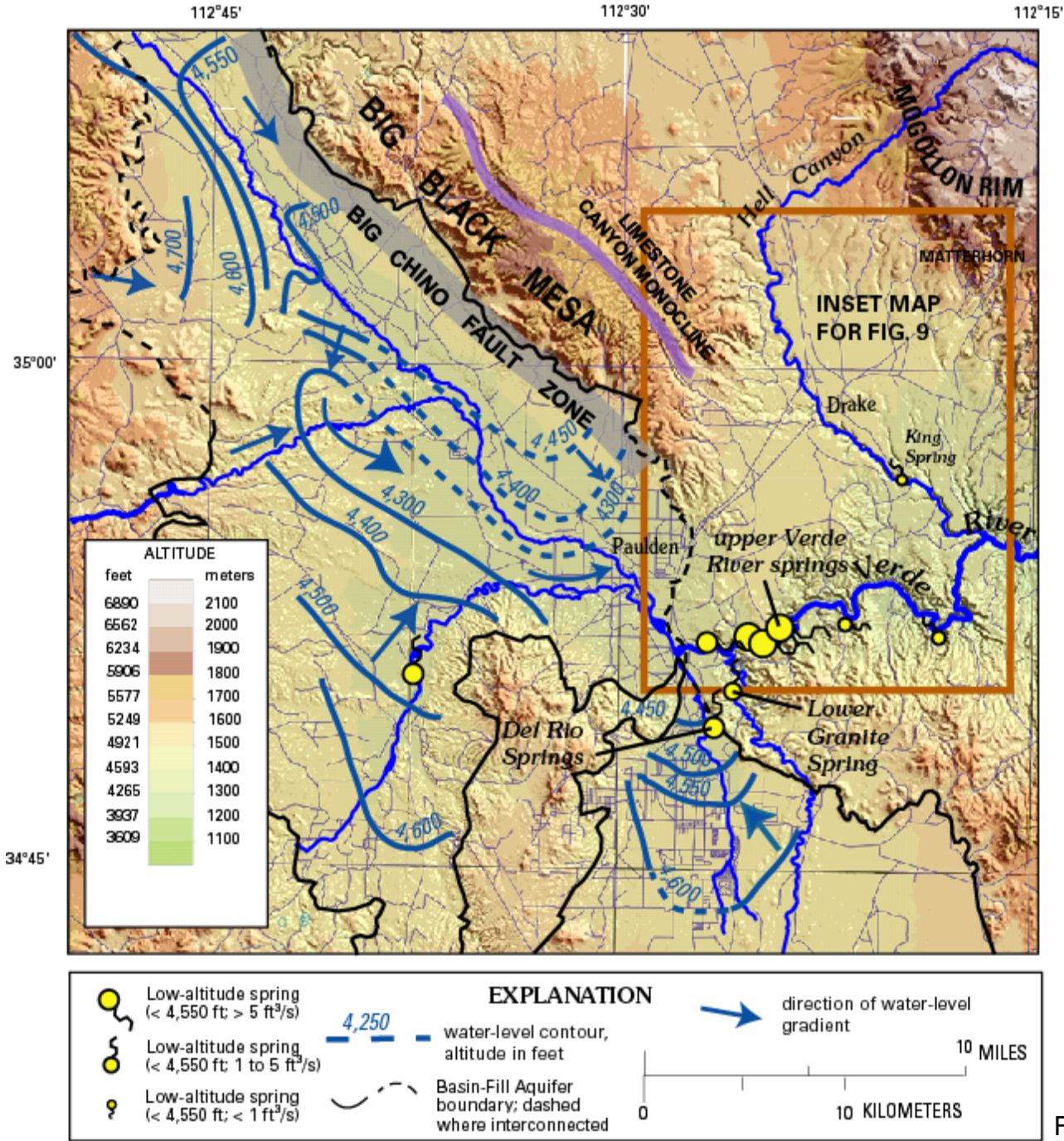


Figure G1. Pie charts showing sources of base flow to the upper Verde River, comparing water-budget estimates with those based on inverse modeling using geochemistry and tracer-study data. Data from previous studies is provided in table A4 and figure A16 (Chapter A, this volume). Note that the predevelopment pie diagram on the left is proportionately larger than those on the center and right.

Water-level contour map



Water level gradient shows groundwater of the Big Chino Aquifer moves toward the Upper Verde River Springs

From USGS Open-File Report 2004-1439

Playa Deposit

The orange-dashed line around blue-green area is the approximate extent of the playa deposit. It may extend as far NW as Partridge Creek.

According to 2005 USGS report:

“...the productive part of the aquifer northwest of the playa could be substantially smaller than the area proposed in a recent ground-water model by Southwest Ground-water Consultants (2004).”

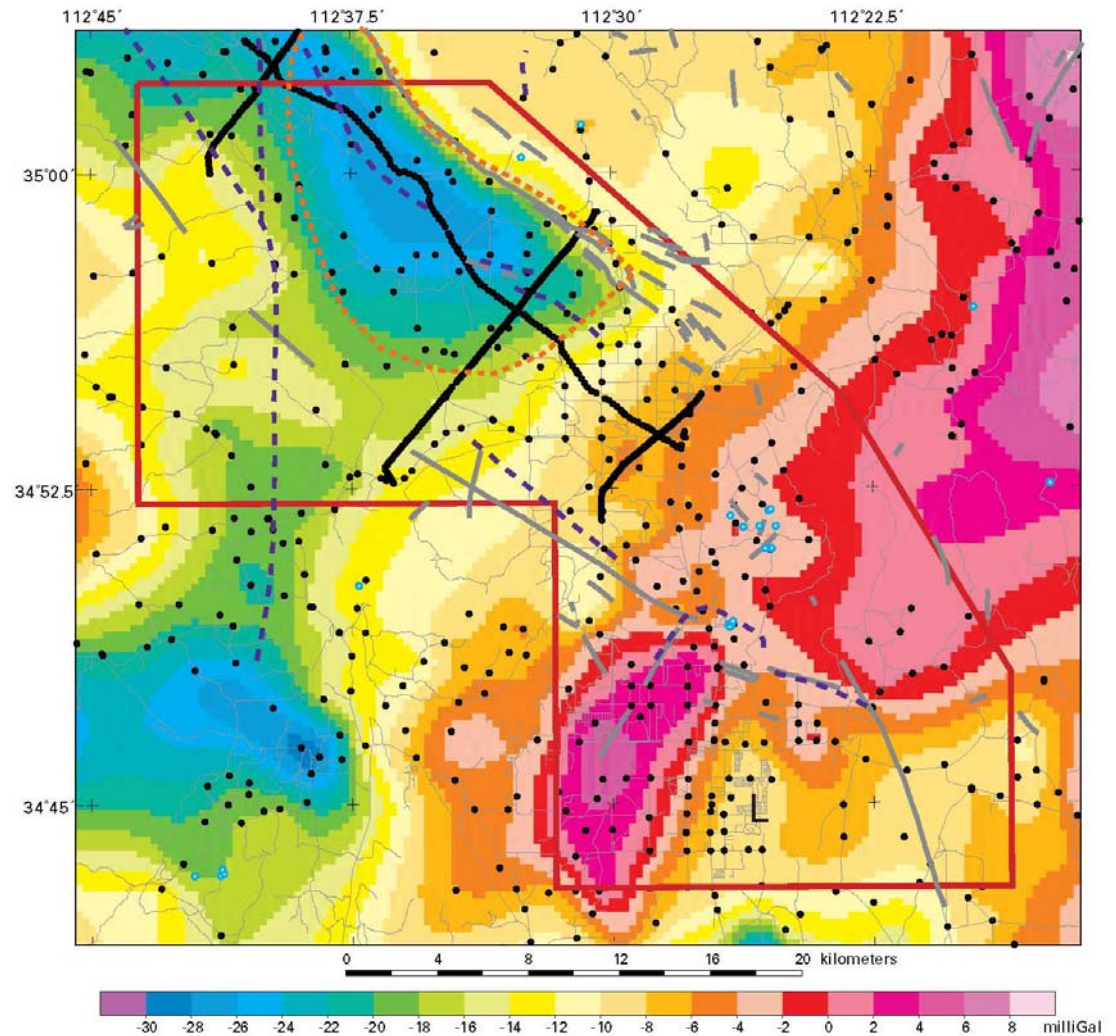


Figure C3. Isostatic gravity map. Black circles are gravity stations. Thick red line marks extent of aeromagnetic survey. Dashed orange line is approximate extent of the playa deposit that was interpreted as a clay deposit by Schwab (1995). Dark gray lines are faults determined in this study (Chapter B); dashed purple lines, faults from Ostenaar and others (1993). Blue circles are springs. “L” is small gravity low west of Granite Creek.

Upper Verde River springs

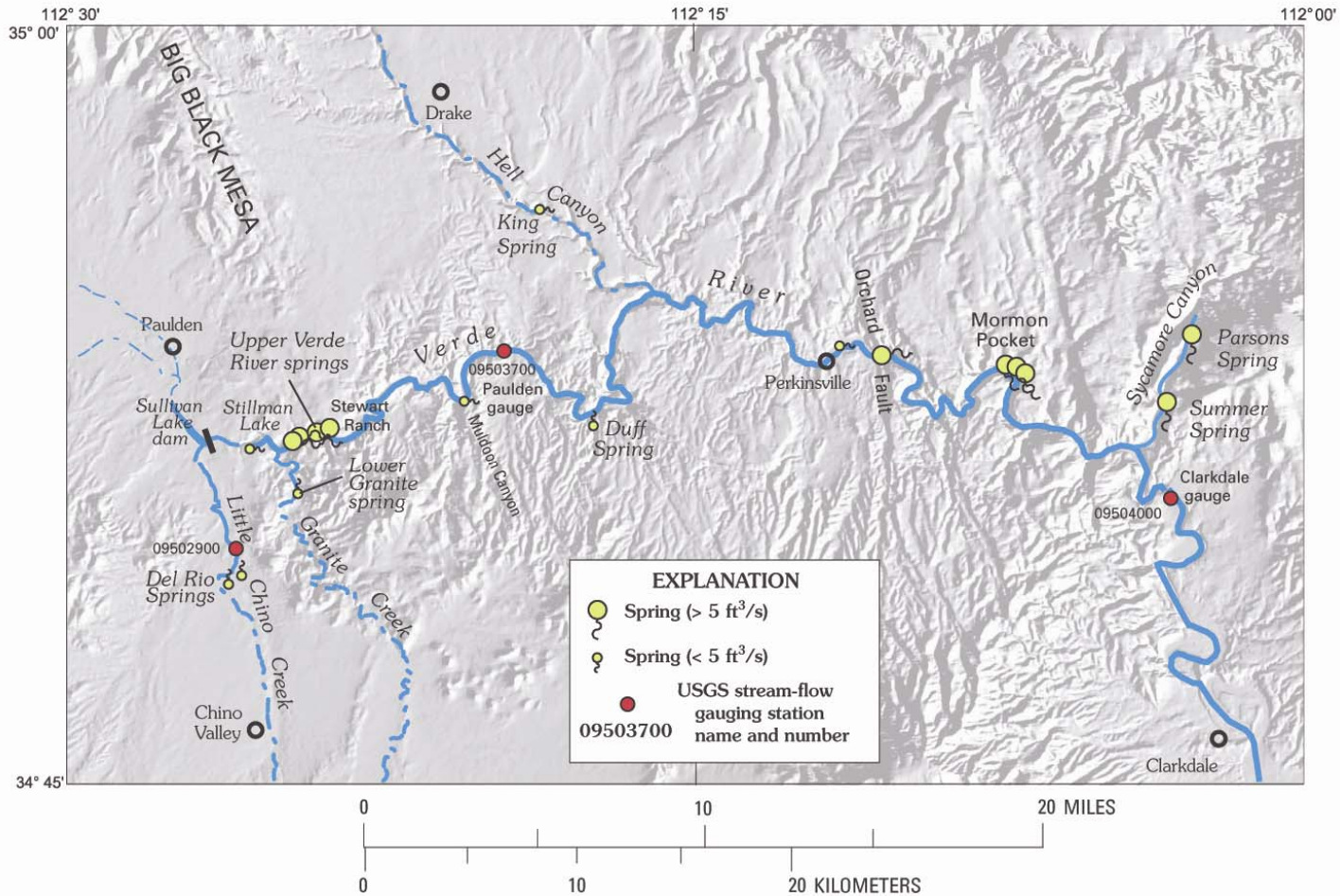
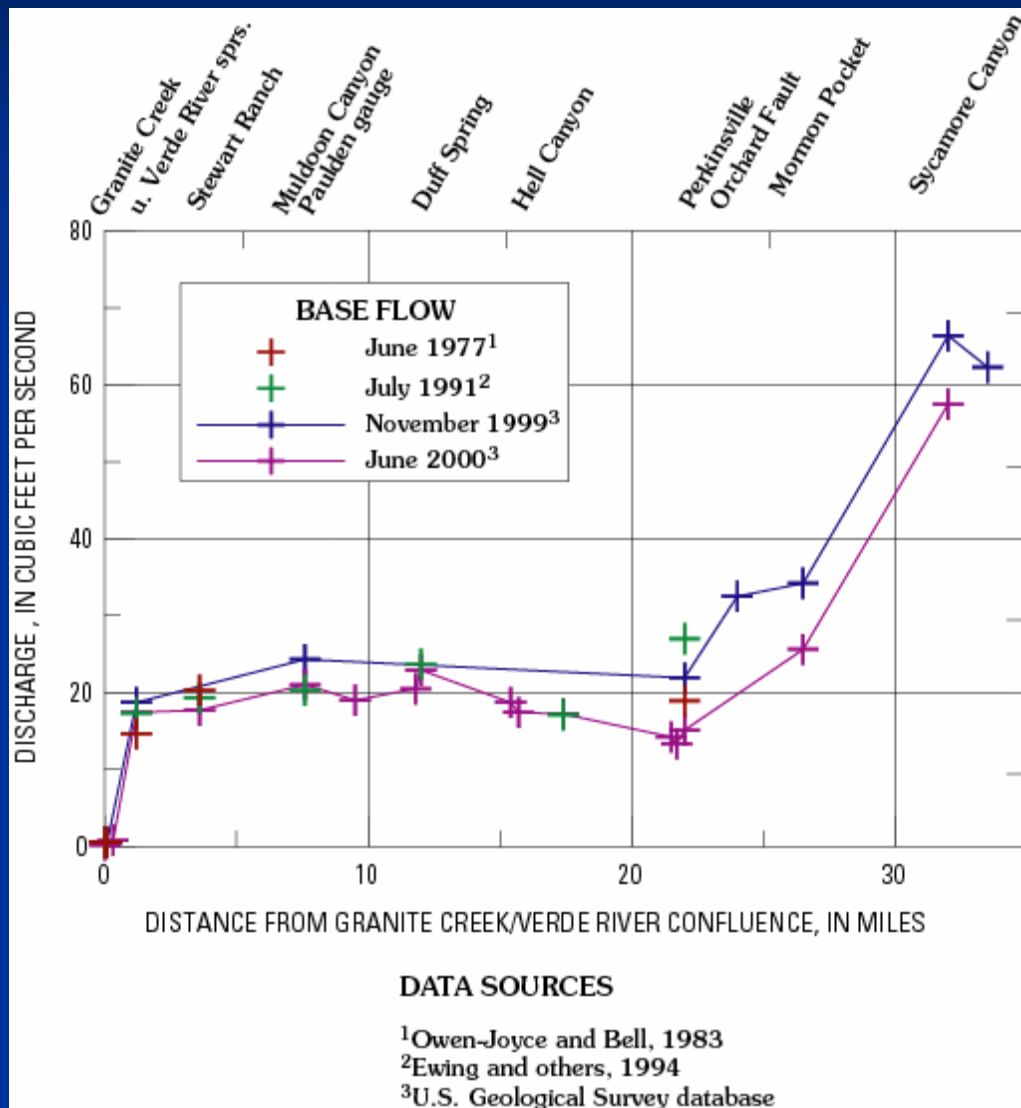


Figure 2. Locations of known springs along the upper Verde River from Sullivan Lake to Sycamore Creek. Base is from U.S. Geological Survey digital data 1:100,000; sun angle elevation is 45 degrees from southeast; azimuth is 120 degrees.

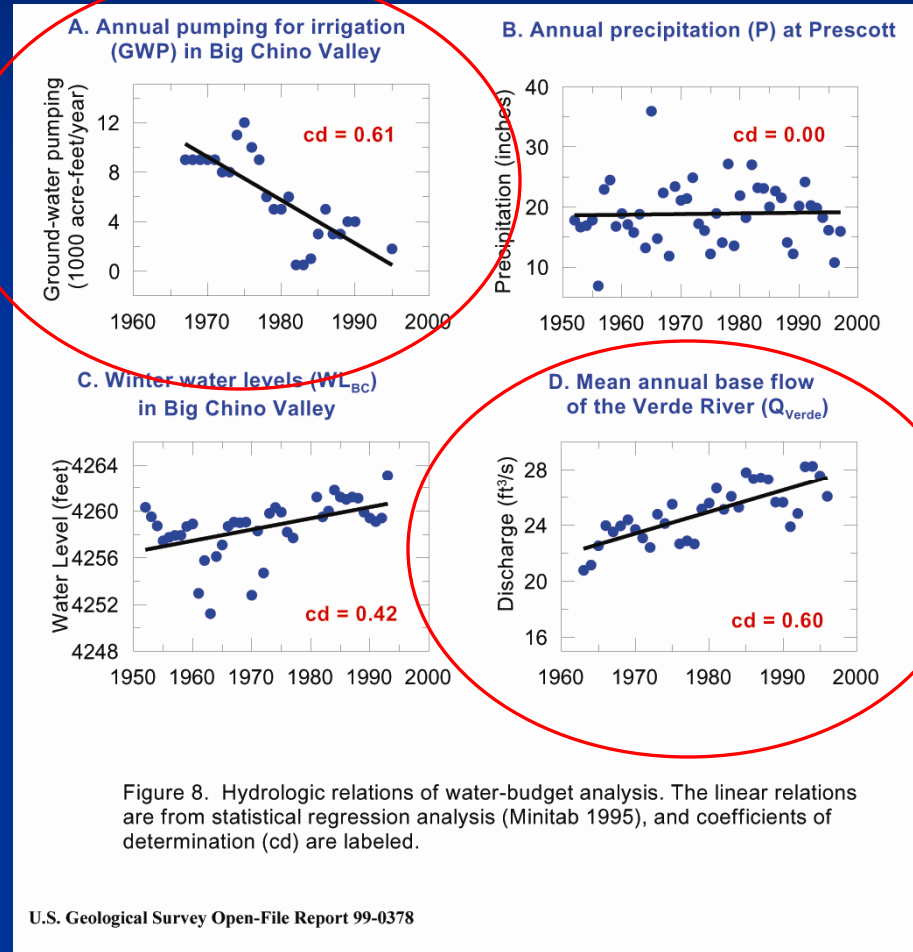
From USGS Open-File Report 2004-1439

Upper Verde base flow



- Upper Verde springs source of base flow during driest times of the year. Flows at the Paulden gauge normally between 22-26 cfs.

USGS graphs irrigation decline and Verde River base flow increase



T&E Species

LISTED

- Bald Eagle
- Southwestern Willow Flycatcher
- Razorback Sucker
- Loach Minnow
- Spikedace
- Gila Chub



Photo by Robin Silver

CANDIDATE

OR PROPOSED FOR LISTING

- Yellow-billed Cuckoo
- Roundtail Chub

Other Reasons to 'Keep it Flowing'

- Recreation
- Downstream communities: Clarkdale, Cottonwood, Jerome, Camp Verde, Sedona, Yavapai-Apache Nation
- Non-listed fish & wildlife
- Wild & Scenic River designation below Camp Verde
- SRP serving Phoenix area

ESA Section 9

- Federally-listed endangered/threatened species present in or dependent upon the Verde River
- Action will reduce base flows and impact riparian habitat
- Prescott/Prescott Valley guilty of “future take” of listed species in violation of Section 9 of ESA
- Center filed notice of intent to sue cities 12/8/04

Next steps

- Center lawsuit

OR

- Mitigation plan/Habitat Conservation Plan? An HCP is a formal agreement between a party and the Federal government; public process, must meet legal requirements and open to public challenge

“Mitigation” concerns

- Retiring historically irrigated property – only retiring currently irrigated property makes sense
- Pumping Big Chino water into the river to make up the difference is a Ponzi scheme
- Effluent – still requires pumping and unsafe

Effluent as mitigation?

Headline from Arizona Daily Star, December 11, 2005:

“Effluent Alters Sexuality of Fish”

“...studies, in the United States and Europe, have found similar gene-switching among male and female fish exposed to treated wastewater.

“In the UA-USGS study, the fish gene-switching appears to come from compounds created by the breakdown of detergents and by plasticizers — chemical additives that make plastics more flexible and durable. They go down people's drains into the sewer system...

“... So far, fish have been kept in tanks with no more than two-thirds wastewater...

“The new study's findings raise concerns, Walker said, about whether people who drink treated wastewater could suffer the same genetic switching that could make breeding for the bonytails impossible.”

Last Words... Title II

- Northern Arizona Land Exchange and Verde River Partnership Act of 2005: Yavapai Ranch land exchange bill created a multi-stakeholder partnership to work out water issues
- Based on Upper San Pedro Partnership
- Tasked with coming up with strategies to reach basin sustainability -- NO real authority to implement them or otherwise adequately protect the river

For more information...

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