

Rural Water Initiative Workshop

Flagstaff, July 2007



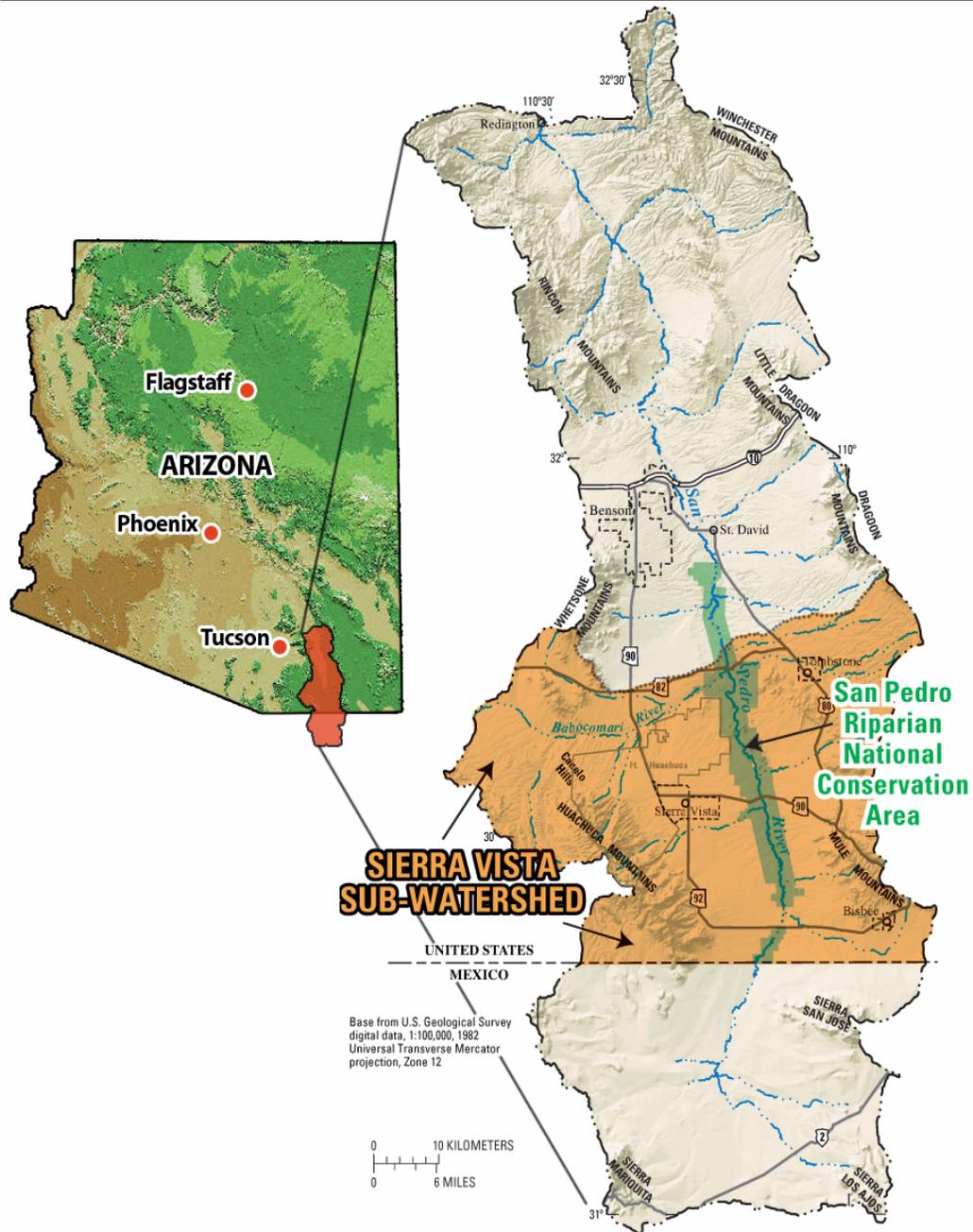
Sustainability = Goal

“...to ensure water of sufficient quantity and quality is available for the subwatershed’s social, economic, and environmental needs.”

2004 321 Report

Save the River, Save the Fort

Save the Fort, Save the River



San Pedro Riparian National Conservation Area

SIERRA VISTA SUB-WATERSHED

Base from U.S. Geological Survey digital data, 1:100,000, 1982 Universal Transverse Mercator projection, Zone 12

0 10 KILOMETERS
0 6 MILES

SPRNCA: Hemispheric Importance

- One of largest & most critical avian migratory corridors in western US
- 58,000 acre San Pedro Riparian National Conservation Area
- First RNCA. Established by Congress Nov. 18, 1988
 - 100 species of breeding birds 250 species of migratory & wintering birds Over 80 species of mammals 40 of reptiles & amphibians*
- 250 recorded pre-historic & historic sites (Clovis Culture 9000-6000 BC)
- 140 miles long, San Pedro River = one of last free-flowing North-South rivers in US

Fort Huachuca: \$2 billion economic impact

Missions: Military Intelligence, Communications, Unmanned Aircraft Systems Training Battalion, Electronic Testing, Intelligence School for Entire US Military, Premier test range for U.S. military, Protected airspace supports training missions of Davis-Monthan, Arizona's Air Guard and Luke AFB

Contribution: Recession proof, employs 7,000 Arizonans plus military, "Clean" industry, Highly trained, skilled workforce, Oldest active installation in Arizona

Water "problem" is on DoD radar

If reality & perception don't change, Fort may lose more positions and not be considered for backfill missions

Using science for better projects

- Partnership organization
- Resource constraints (Budgets)
- Role of verification, monitoring
- Augmentation
- Getting to Goal

Organization

21 member agencies – 25 individual members

3 committees: PAC, Excom, Tech

Monthly meetings

USPP Strategic Goals

1. Verify, monitor and report on conditions within the SV Subwatershed using the best available science and adaptive management techniques.

Funding

- **Administrative Budget:** Cochise County, Sierra Vista, Ft. Huachuca, TNC, Vanderbilt Farms
 - Staff, meetings, communications
- **Project Budget:** Federal Funds, State Funds, Member agencies
 - Planning tools, verification & monitoring, studies, early stage project development, wet water projects

FY07 Project Budget

Science, Reporting (\$14K)

321, monitoring, GW model runs

Wholesale Projects (\$1M)

Huachuca City, Bisbee

Retail Projects & Education (\$130K)

Water Wise audits, Ft. Huachuca & ICI grants, SV Toilet Rebates

Other (\$300K)

Fort Huachuca dry well pilot, TDRs, Mansker Estates, Golden Acres, County Flood Control

FY08 & FY09 Funding Priorities

1. Maintain ***verification & monitoring*** programs
2. Fund preparation of annual ***321 Report***
3. Establish budget for ***groundwater model runs***
4. Provide ***DSS training*** and support
5. Secure funds for ***BOR feasibility study***
6. Secure funds for new ***project development***
7. Maintain ***conservation grant & rebate*** programs

FY 08 Request

	<u>Requested</u>	<u>Probable</u>
USGS	\$750,000	\$300-400K
ARS	\$750,000	\$?
BOR	\$850,000	\$?
BLM	\$252,000	\$0
USPP	\$1,000,000	\$0
Total	\$3,602,000	

Defining Progress: Water Budget

The traditional way of measuring

Groundwater Budget 2002

Inflow: 18,000 acre ft.

Natural recharge 15,000

Underflow from Mexico 3,000

Outflow: 27,900 acre ft.

SPR base flow 3,250

Net GW withdrawals 16,500

Riparian, ET 7,700

GW underflow 440

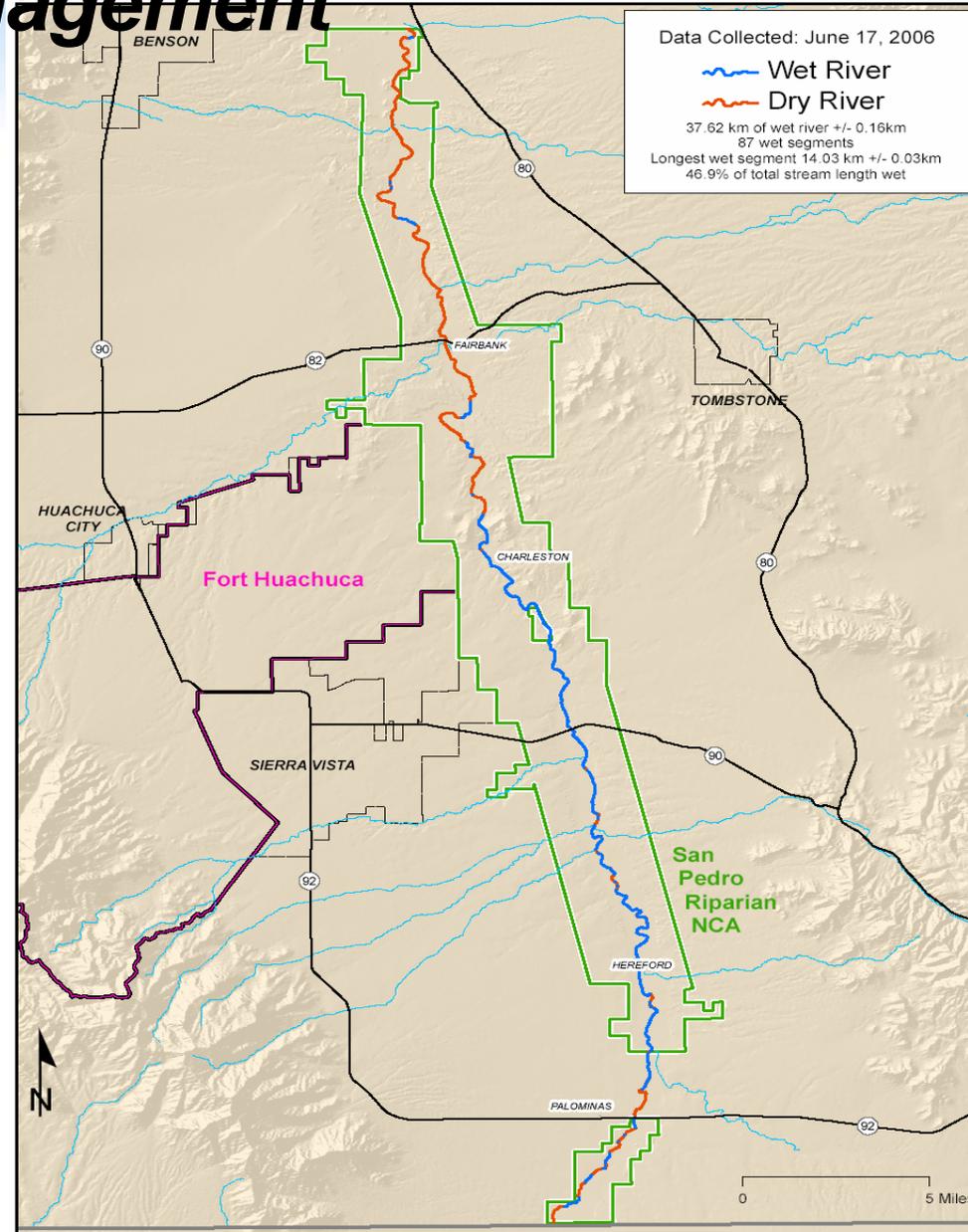
Net Deficit 9,900 acre ft.

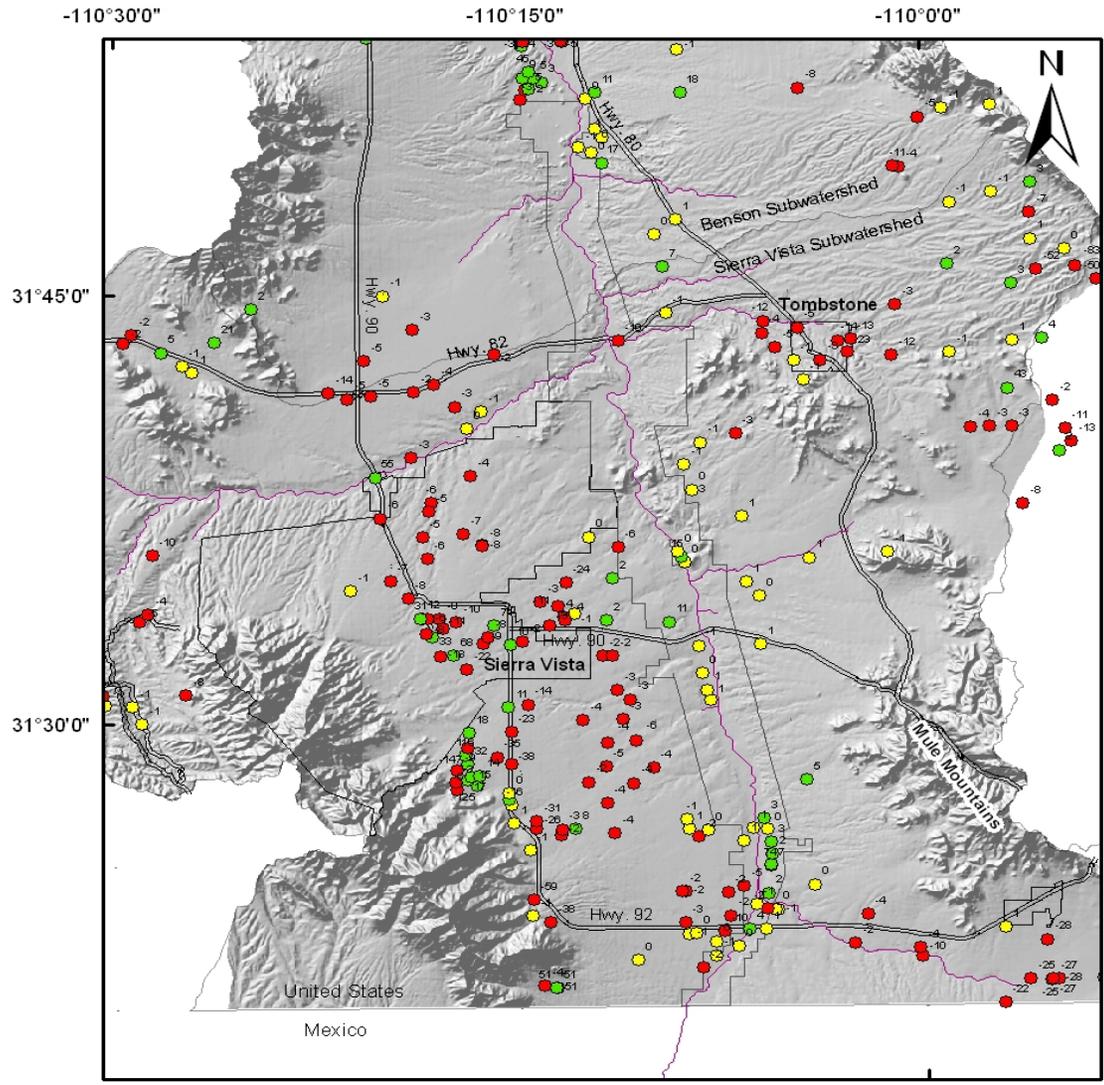
If no action is taken, annual aquifer storage deficit will increase to 12,000 acre ft. by 2011

Temporal & Spatial Management

Mapping the Water Deficit – Mid June 2006

<u>Date</u>	<u>% of total river wet</u>
6/99	52%
6/01	76%
6/04	46%
6/06	47%





EXPLANATION

Ground-water level change - annotations in ft
1990 to 2001

- decline
- decline
- less than 1-ft change
- rise



-110°0'0"

6 Water Management of the Regional Aquifer in the Sierra Vista Subwatershed, Arizona—2005 Report to Congress

Table 2. Planned annual yields and estimates of actual annual yields for 2002 through 2011 of measures planned by Partnership members to reduce aquifer overdraft

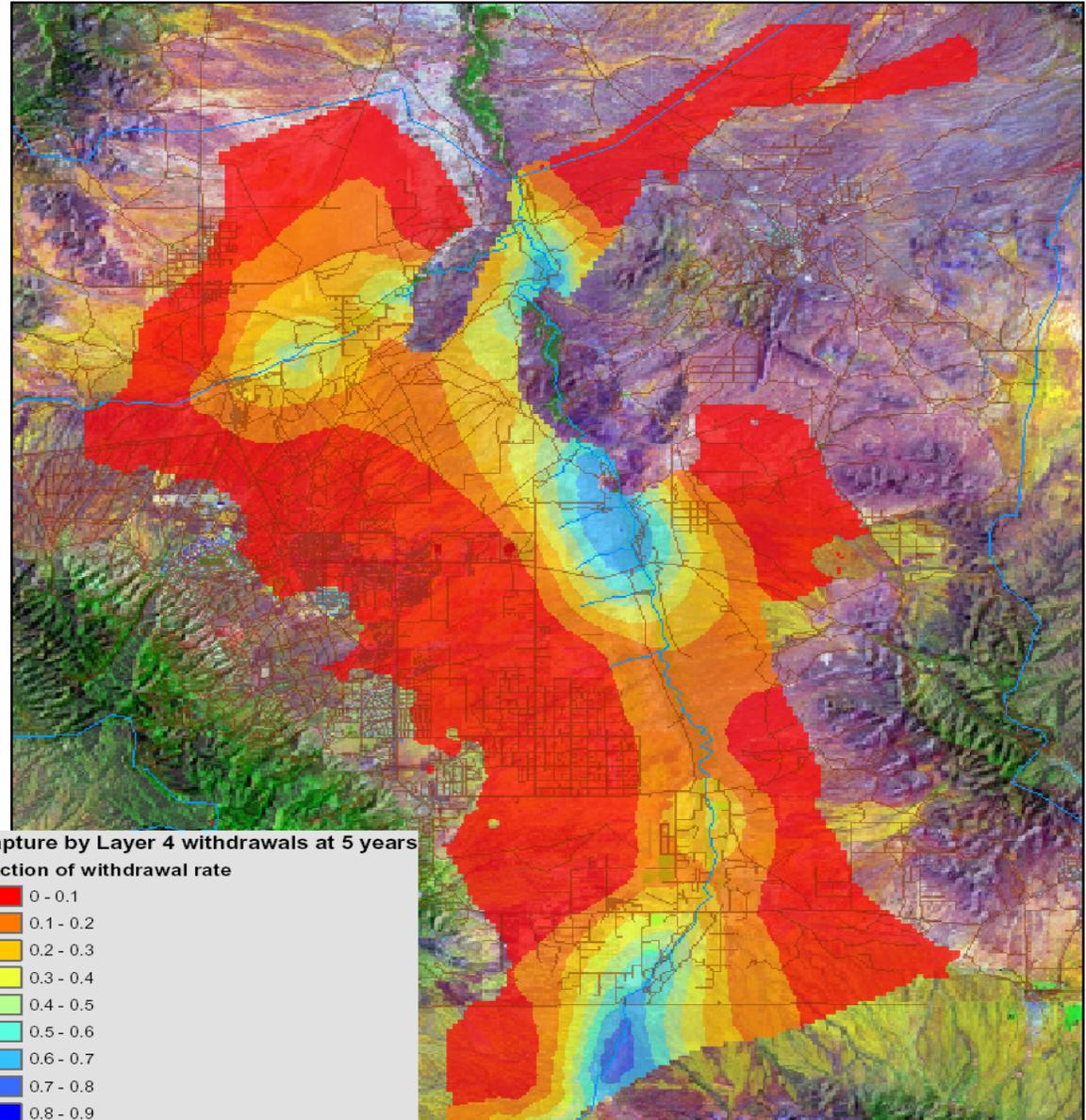
[Yields are in acre-feet/year; ---, indicates no yield in year; Numbers compiled in May – June, 2005; Conservation yields in each year are relative to a zero yield in the baseline year of 2002; Recharge yields are total values and are relative to a baseline of zero acre feet]

Description	Measure type	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
		Yield Actual	Yield Actual	Yield Actual	Yield Planned						
Fort Huachuca											
Conservation measures ¹	Conservation	---	-60	150	200	280	330	220	270	320	340
Reduced ground-water pumping through effluent reuse ¹	Conservation	---	-25	-90	54	54	54	54	54	54	54
Effluent recharge ²	Recharge	190	290	440	610	575	540	505	470	435	435
Stormwater detention basins ³	Recharge	60	30	25	370	370	370	370	430	490	580
Cochise County											
Conservation measures ¹	Conservation	---	---	10	60	110	170	220	270	320	380
Sierra Vista											
Conservation measures ¹	Conservation	---	50	100	290	290	300	300	310	310	320
Effluent recharge ⁴	Recharge	930	1,750	1,870	1,970	2,090	2,150	2,220	2,280	2,350	2,420
Stormwater detention basins ³	Recharge	140	180	290	150	150	180	180	180	180	180
The Nature Conservancy and Fort Huachuca											
Retirement of agricultural pumping ⁵	Conservation	---	---	---	---	250	250	500	1,000	1,500	2,000
Bisbee											
Conservation measures ¹	Conservation	---	---	---	---	10	20	30	40	50	60
Reduced ground-water pumping through effluent reuse	Conservation	---	---	---	---	420	420	420	420	420	420
Effluent recharge	Recharge	---	---	---	---	170	180	180	180	190	190
Huachuca City											
Conservation measures ¹	Conservation	---	---	---	---	5	5	10	10	10	20
Effluent recharged at Fort Huachuca	Recharge	---	---	---	---	---	170	180	180	180	180
Tombstone											
Conservation measures ¹	Conservation	---	---	---	---	5	5	10	10	10	20
Bureau of Land Management											
Mesquite reduction ⁷ , and retirement of agricultural ground-water pumping ⁸	Conservation	475	475	475	490	580	660	750	830	920	1,000
Urban enhanced ephemeral-stream channel stormwater recharge											
Increase in stormwater recharge in ephemeral channels by urbanization ⁹	Recharge	3,100	3,100	3,100	2,300	2,300	2,300	2,300	2,300	2,300	2,300
Total yields											
Total yield ⁹		4,900	5,800	6,400	6,500	7,700	8,100	8,400	9,200	10,000	11,000
Total yield projected in original 321 report ¹⁰		6,400	6,800	7,700	8,300	9,100	10,500	11,200	12,300	13,100	13,900

See footnotes on following page.

Spatial Water Management

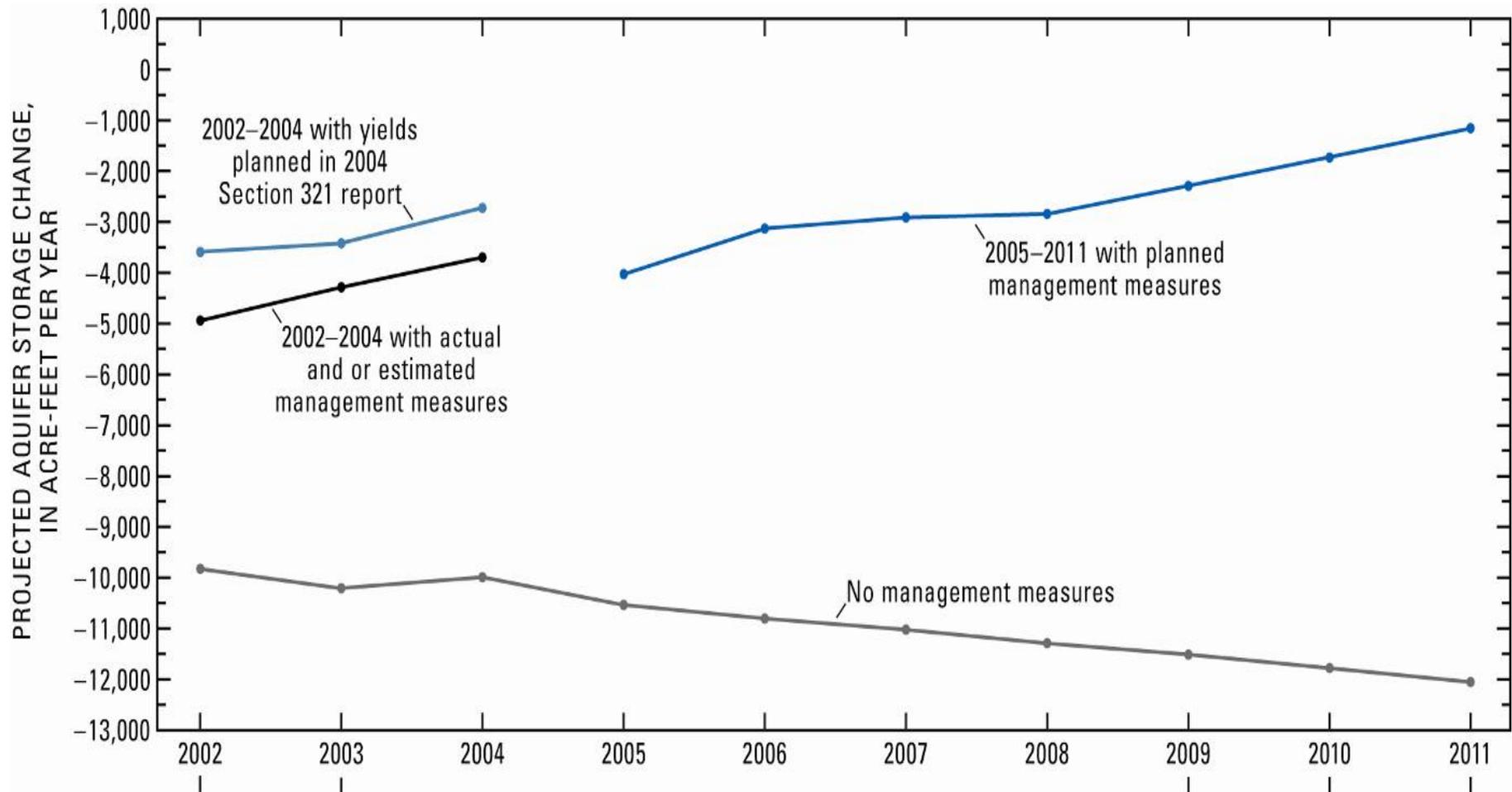
Effects of 5 years of pumping or recharge on the sub-watershed



Source: USGS 2006

0 1.25 2.5 5 7.5 10 12.5 Miles

Projected annual aquifer storage change with/out management measures



Alternatives for Feasibility Study

Urban stormwater runoff & recharge: Collect, treat, store, recharge runoff

Capital Cost: \$52 million **Yield:** 1800 afy

Dewatering the Copper Queen Mine: Treat & transport excess mine water, recharge at SPRNCA

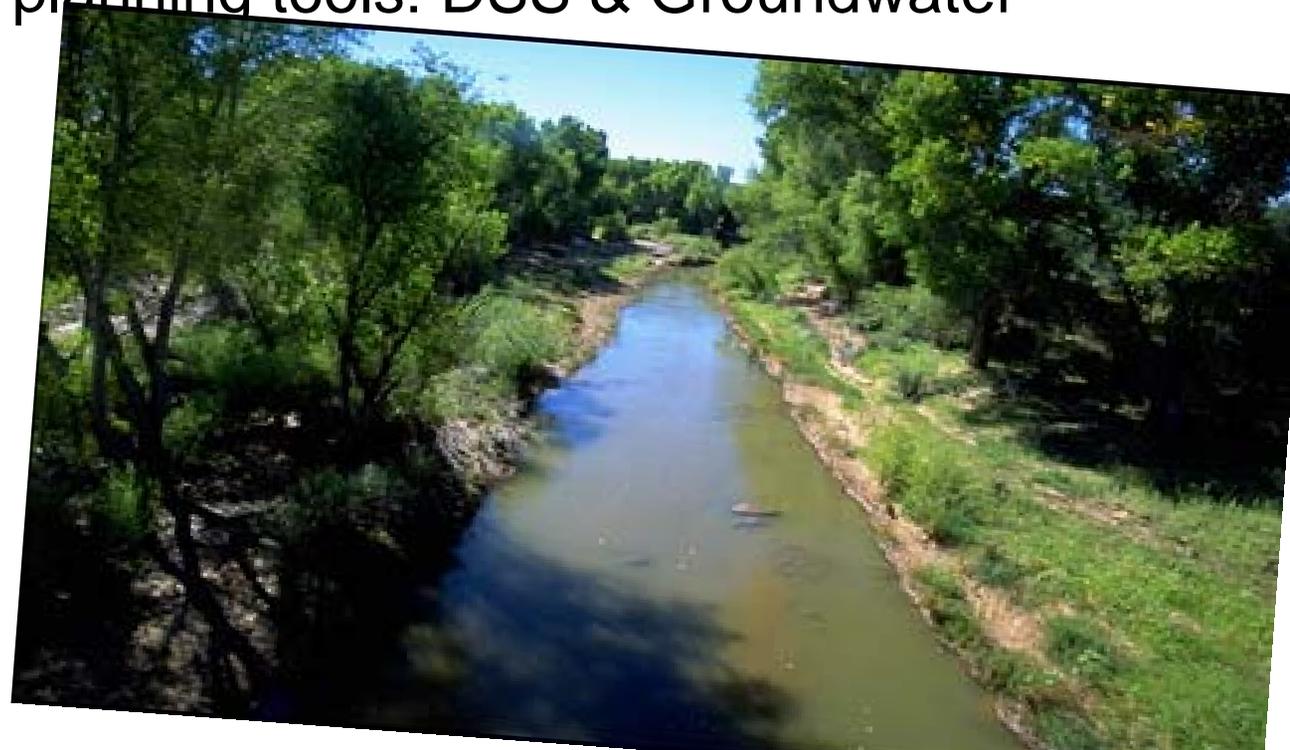
Capital Cost: NA **Yield:** 1800-2600 afy \$

Colorado River Allocation: Pipeline from Tucson terminus, recharge at SPRNCA

Capital Cost: \$160M-\$295M **Yield:** 20-40,000afy

Augmentation Next Steps

- Congressional authorization for BOR feasibility study
- Secure study funding
- Address pre-feasibility issues and engage neighboring communities
- Use Partnership planning tools: DSS & Groundwater Model



Summary

HOW BIG IS THE PROBLEM?

- 10,000 afy by 2011 if we do nothing
- 26,000 afy by 2050 if we do nothing

WHAT TOOLS DO WE HAVE?

- Conservation
- Education
- Reduce groundwater pumping through offsets
- Recharge effluent and other sources into aquifer
- Augment water supplies

CAN WE CONSERVE OUR WAY TO SUSTAINABILITY?

- Needs of the riparian system must be addressed
- Drought effects exacerbate the problem
- We need more than what can be conserved.

Summary

WHAT IS THE PARTNERSHIP DOING?

- Management measures
- County Water Overlay & Conservation Districts
- City/County, USPP (Fort funded) grant & rebate programs residential, commercial
- Groundwater model & DSS
- Bisbee effluent transfer
- Huachuca City effluent reuse
- Retirement of irrigated agriculture
- Acres of conservation easements
- Augmentation alternatives

WILL WE GET THERE?

- We will get close.