

Future Scenarios Presented in Water Plan Update 2005

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Introduction

The concept of scenario planning is like a decision tree analysis that outlines different actions or responses based on different plausible futures. Some actions would be common and implemented regardless of the scenario; other actions will be taken in response to specific conditions. Scenarios are neither positive nor negative.

Multiple future scenarios provide decision-makers, water managers, and planners much more information about what they might expect in the future and how different management actions might perform across a range of possible futures. The scenarios are created by varying important assumptions about water and other resource conditions in order to highlight important categories of uncertainties. This multiple scenario approach is a milestone departure from previous water plan updates, which had based planning assumptions on a single future condition.

The primary reason to use multiple scenarios is that different assumptions about the future can significantly affect the nature and outcome of various mixes of management strategies. Some management strategies may be effective and economical regardless of the future scenario. Other strategies may only be suited if specific conditions develop in the future.

Peter Schwartz, a pioneer in the field of scenario planning, explains:

In a scenario process, managers invent and then consider, in depth, several varied stories of equally plausible futures. The stories are carefully researched, full of relevant detail, oriented toward real-life decisions, and designed (one hopes) to bring forward surprises and unexpected leaps of understanding. Together, the scenarios comprise a tool for ordering one's perceptions. The point is not to "pick one preferred future," and hope for it to come to pass. Nor is the point to find the most probably future and adapt to it or "bet the company" on it. Rather, the point is to make strategic decisions that will be sound for all plausible futures. No matter what future takes place, you are much more likely to be ready for it—and influential in it—if you have thought seriously about scenarios.¹

¹ Schwartz, Peter, *The Art of the Long View*, Currency, 1991. p. xiiv-xiv

Water Plan Baseline Scenarios for 2030

For Water Plan Update 2005, DWR and the Advisory Committee developed three scenarios of plausible events that could shape future water use by 2030. The scenarios describe the plausible conditions that *could happen*. The scenarios concentrate on statewide implications of regional shifts.

The introduction of *scenarios* is the biggest difference between the approach used in previous updates and the new approach, which is to compare performance among possible management responses to expected change. Scenarios represent the baseline conditions that we could reasonably expect to face in the year 2030, based on what we know to be true today. Any attempt to forecast or predict what the water management system will be like 25 years from now is highly uncertain.

Recognizing how uncertain these attempts to describe the future are, DWR has decided to present multiple scenarios that are plausible, but might cause water managers to respond very differently. These scenarios are not meant to forecast an actual outcome, but rather provide clear and systematic basis for comparing possible management responses and, in particular, highlight those responses that perform best when compared across a wide array of baseline conditions that could occur in the future.

An important element of scenario planning for the Water Plan is that as the state continues to grow, the updates of the Water Plan will need to re-evaluate management strategies based on revised plausible futures that incorporate increased information about future conditions and changes in water policies.

Describing Expected Changes with Three Preliminary Scenarios of Baseline Conditions for 2030

While DWR has decided to use multiple future scenarios in the quantitative work for *The next Water Plan Update*, it has not yet developed the analytic tools to do so. To demonstrate how scenarios can be used to better understand the implications of future conditions on water management decisions, however, the Water Plan Update 2005 presents three baseline scenarios. The narrative descriptions of these scenarios were developed by water plan staff and the Advisory Committee. *These scenarios are referred to as baseline because they represent changes that are reasonably likely to occur without additional management intervention beyond those currently planned.*

Developing quantitative estimates of water demands and supplies for multiple future scenarios and management responses requires using available data and assumed relationships. The following are the three plausible scenarios; however, DWR and stakeholders may develop other scenarios as work on the next Water Plan Update progresses:

- Scenario 1—**Current Trends**: Recent trends continue for the following: population growth and development patterns, agricultural and industrial production, environmental water dedication, and naturally occurring conservation (like plumbing code changes, natural replacement, actions water users implement on their own, etc.).
- Scenario 2—**Less Resource Intensive**: Recent trends for population growth, higher agricultural and industrial production, more environmental water dedication, and higher naturally occurring

conservation than Current Trends (but less than full implementation of all cost-effective conservation measures currently available).

- Scenario 3—**More Resource Intensive**: Higher population growth rate, higher agricultural and industrial production, no additional environmental water dedication (year 2000 level), and lower naturally occurring conservation than Current Trends.

All three scenarios include assumptions for two kinds of water use efficiency actions: (1) those that water users take on their own (called naturally occurring conservation) and (2) those encouraged by water agency programs, policies, and requirements. Only naturally occurring conservation was varied among the scenarios; and all scenarios include the same continued implementation of cost-effective actions by water agencies.

Key Factors

DWR and stakeholders considered numerous factors that could vary in the future and developed three preliminary narrative future scenarios that can be used to begin the analysis for *The next Water Plan Update*. The following table (“Factors affecting regional and statewide water demands and supplies”) shows factors that may vary across scenarios. Each factor must be quantified. The availability and resolution of data varies widely. While key factors have been identified, much work remains before reaching agreement on the relationships between the factors and the methods that will be used to quantify them.

Factors affecting regional and statewide water demands and supplies

Table 4-1 Scenario factors affecting regional and statewide water demands and supplies

FACTOR ¹	SCENARIO 1 CURRENT TRENDS	SCENARIO 2 LESS RESOURCE INTENSIVE	SCENARIO 3 MORE RESOURCE INTENSIVE
Total Population	DOF	DOF	Higher than DOF
Population Density	DOF	Higher than DOF	Lower than DOF
Population Distribution	DOF	DOF	Higher Inland & Southern; Lower Coastal & Northern
Commercial Activity	Current Trend	Increase in Trend	Increase in Trend (Same as Scenario 2)
Commercial Activity Mix	Current Trend	Decrease in High Water Using Activities	Increase in High Water Using Activities
Total Industrial Activity	Current Trend	Increase in Trend	(Same as Scenario 2) Increase in Trend
Industrial Activity Mix	Current Trend	Decrease in High Water Using Activities	Increase in High Water Using Activities
Irrigated Crop Area (Includes Irrigated Land Area and Multi-cropped area)	Current Trend	Level Out at Current Crop Area	Level Out at Current Crop Area
Crop Unit Water Use	Current Trend	Decrease in Crop Unit Water Use	Increase in Crop Unit Water Use
Environmental Water-Flow Based	Current Trend	High Environmental Protection	Year 2000 Level of Use
Environmental Water-Land Based	Current Trend	High Environmental Protection	Year 2000 Level of Use
Naturally Occurring Conservation ²	NOC Trend in MOUs	Higher than NOC Trend in MOUs	Lower Than NOC Trend in MOUs
Urban Water Use Efficiency	All Cost Effective BMP's in Existing MOU's Implemented by Current Signatories (present commitments)		
Ag Water Use Efficiency	All Cost Effective EWMP's in Existing MOU's Implemented by Current Signatories (present commitments)		
Per Capita Income	Current Trends		
Ratio of Seasonal to Permanent Crop Mix	Current Trends		
Irrigated Land Retirement	Currently Planned		
Hydrology	Essentially a Repeat of History		
Climate Change	Essentially a Repeat of History		
Colorado River Supply	Equal to 4.4 Plan		
Existing Inter-Regional Import Projects	Current Conditions		
Flood Management	Current capacities, management practices and operations		
Energy Costs	As Projected From Current Trends		
Ambient Water Quality	Current Conditions		
Drinking Water Standards	Current and Planned		
Ag Discharge Requirements	Current and Planned		
Urban Runoff Mgmt.	Current Level of Use		
Recreation	Present Demand Trends Continued		
Desalting	Current Level + Permitted/Financed		
Recycled Water	Current Level + Permitted/Financed		
Water Transfers Within Regions	Currently Approved Transfers		
Water Transfers Between Regions	Currently Approved Transfers		
Integrated Ground & Surface Water Mgmt.	Current Level + Permitted/Financed		
Groundwater Storage	Current Level + Permitted/Financed		
Surface Water Storage	Current Level + Permitted/Financed		
Conveyance Facilities	Current Level + Permitted/Financed		
Rate Structure	Current Practices - pricing constrained to cost recovery		

(1) Factors should be considered as an initial list that will be modified, as needed, as analyses proceed for next Water Plan Update.

(2) Naturally Occurring Conservation is the amount of background conservation (changes in plumbing codes, etc.) occurring independently from the BMP and EWMP programs.

While all the factors in the table are needed to define the strategies, DWR has begun its analysis by varying only the factors in the upper portion. The factors defined below are primarily related to land and water use patterns over which the water community has little control. DWR may need to vary other factors in the table to gain insight into specific operations.

Key Factors Affecting Water Demand:

Total Population	The statewide total population projection regardless of geographical distribution.
Population Density	The average number of people per square mile for a planning area.
Per Capita Income	The average annual income from all sources per person for a planning area.
Total Commercial Activity	Total commercial activity refers to all activities in the service-producing sectors, which include farm services, transportation, public utilities, trade, finance, insurance, real estate, services, and government. This factor is a driver of (and indicator for) commercial water use (business offices) as well as institutional water use (government offices, schools, etc.).
Commercial Activity Mix	The mix of high and low water using commercial activity. Note that Commercial Activity is broken into two factors: Total Activity and Activity Mix. The latter factor allows designation of the type of commercial activity that is occurring.
Total Industrial Activity	Total industrial activity refers to all activities in good-producing sectors, which include farm production, mining, construction, and manufacturing. This factor is a driver of (and indicator for) industrial water use. Note that Industrial Activity is broken into two factors: Total Industrial Activity and Industrial Activity Mix. The latter factor allows designation of the type of industry that is occurring. This is necessary to account for the large variation in water demands by industry type.
Industrial Activity Mix	The mix of high and low water using industrial activity. Note that Industrial Activity is broken into two factors: Total industrial Activity and Industrial Activity Mix. The latter factor allows designation of the type of industry that is occurring. This is necessary to account for large variation in water demands by industry type.
Irrigated Land Area	The land area under irrigation in a study area.
Crop Acreage	The number of irrigated crop acres (by crop category) planted in a study area during a given year; this number includes multiple cropping.

Crop Unit Water Use	Changes in the volume of water used per acre of cropped area due to changes in crop type. This can be a function of evapotranspiration rates and cultural practices, but NOT use efficiency. Agricultural water use efficiency is captured under its own distinct factor.
Environmental Water – Flow Based	The amount of water dedicated to in stream uses and aquatic habitat. Flow based is estimated by (a) Delta outflow, (b) in stream flow requirements, (c) Wild and Scenic River flows (d) Environmental Water Account asset allocations, (e) Anadromous Fish Restoration Program flows, and (f) Ecosystem Restoration Program flow targets.
Environmental Water – Land Based	The amount of water used by managed wetlands and native vegetation. The amount should be estimated by the amount of water used by managed wetlands and native vegetation including riparian water use, however, native vegetation water use is not quantifiable at this time.
Naturally Occurring Conservation:	The amount of background conservation occurring independent of the BMP and EWMP programs.

Description of Preliminary Scenarios

This section describes key narrative assumptions made for each “no action” scenario by category of possible change.

Scenario 1: Current Trends

Population and Land Use

- Population in 2030 is what the California Department of Finance has projected – 48.1 million people.²
- Increasing population pressure in the valley and on the California coast. Most people are moving to cities with large populations and high percentages of growth in Fresno, Stockton, Modesto, Bakersfield and San Diego.
- Expanding metropolitan areas continue to affect the residents’ daily lives and agriculture.
- The cost of land in Southern California is growing—with shrinking availability.
- *Placeholder: add something on per capita income trends.*

Commercial and Industrial

- Industry has become more efficient in water use—driven to reduce costs in the face of competition. When possible, industries like concrete have moved to dry processing to eliminate water necessary to create its product—reducing costs.
- Businesses have been reducing water use over time because it is cost effective, primarily by replacing old or broken-down equipment with high efficiency machines.

² CA Department of Finance Demographic Research Unit, Population Projections by Race/Ethnicity for CA and Its Counties 2000-2050, May 2004.

Agriculture

- Irrigated agricultural land will be less than it is currently. Irrigated crop acreage, which includes multi-cropping, will also be less than current levels, but will be less of a change than the land acreage due to increases in multicropping.
- Farmers are increasingly using sprinklers and drip irrigation, moving away from flooding and furrows. Farmers are able to turn irrigation on and off at will and decide exactly where to irrigate. Improved water management is modestly increasing water efficiency over 2000 levels. Irrigation techniques improve the uniform distribution of water to all plants, which is also contributing to an increase in plant size. Farmers produce more “crop per drop” through a variety of means, including changes in irrigation methods away from inefficient approaches, though more improvement is possible.
- A significant amount of the reduction in irrigated agricultural land is land with high quality soils. Any new land coming into production would be of poorer quality soils, decreasing some efficiency gains in applied water and yield per acre for those soils.
- Concerns about impacts to the local area from loss of farmland due to urbanization will continue to be addressed by local governments.

Environment

- Environmental flows would reach half way to levels needed to meet the objectives of CALFED’s Ecosystem Restoration Program and the objectives in the Anadromous Fisheries Restoration Program. Water dedicated to wetlands would reach half way to the “Level 4” supplemental water supplies for National Wildlife Refuges cited in CVPIA Sections 3405 and 3406(b).
- Some increase in the extent of managed wetlands designed to use in cleansing wastewater due to projects which use floodplains/wetlands for high flow management and ecosystem restoration programs.
- In some areas, continued loss of functioning floodplains due to the direct encroachment of urban development (flash floods and fast runoff).
- In urban areas, where new development has ended, continued regional and local efforts to restore functioning channels and floodplains.
- Environmental restoration projects do not fully offset ongoing losses of habitat (with species effects) and other watershed impacts.

Groundwater

- Increase in groundwater remediation and aquifer quality protection.

Efficiency

- Urban Best Management Practices (BMPs) are commonplace in most water agencies, including residential indoor and outdoor water use surveys and improvements; commercial, industrial, and institutional water use audits and retrofits, landscape irrigation audits and upgrades; district water system leak detection and repair programs; metering, commercial washing machine rebate programs, conservation pricing, waste water reduction ordinances, and public information and education programs.
- Urban landscape irrigation has decreased, where irrigation does occur, fewer chemicals are applied.

- Existing efficiency standards affecting washing machines, toilets, spray valves in restaurants continue to be implemented.

Water Quality

- Water quality best management practices are limited to local affordability; limited public funding assistance is available.
- Current quality impairments continue in many waterways, particularly those which are not directly linked as urban drinking water sources.
- Urban stormwater runoff regulations are implemented, and point source controls continue to be implemented.
- Runoff from irrigated lands and lands used for grazing and timber harvest, nonpoint sources of water pollution, has moderately reduced.
- Some decrease in flexibility to meet Delta water quality standards, due to reduced surplus inflow and greater reuse of water upstream. Standards are assumed to be met.
- Substantial improvement in the effectiveness and affordability of water filtration technologies.

Water Demand

- Placeholder: Add in estimates for consumptive and applied water use for this scenario.

Considerations³

- Placeholder: CALFED ROD assumptions
- Funding for agricultural and urban water use efficiency programs.
- Implementation of agricultural and urban efficiency measures is part of overall management strategy, not just a response to drought conditions.
- Continued resistance by some water agencies to implement agricultural and urban water use efficiency best management practices.
- Urban sprawl has consumed valuable farmland, open space and other natural resources and contributed to water pollution, extinction of species, and increased competition for limited water resources.
- Construction of vast amount of impervious surfaces, such as roads and rooftops lead to degradation of water quality by increasing surface runoff, altering regular stream flow and watershed hydrology, reducing groundwater recharge, and increasing stream sedimentation.
- Sprawl in metropolitan areas, and negative economic impacts in some areas (where known) have environmental justice implications.
- Assumptions about the management of drainage impaired lands will affect irrigated agriculture and have implications for water supply and water quality.

³ Source: Resource management strategy narratives in Volume 2.

Scenario 2: Less Resource Intensive

Population and Land Use

- Population in 2030 is what the California Department of Finance has projected – 48.1 million people.⁴
- Citizens live in mixed use developments with native vegetation requiring little or no irrigation. An increase in population density means infill in existing urban areas and less new urban land being developed. This compact development has reduced the need for impervious surfaces benefiting open space, reduced runoff and other related issues.
- The cost of land in Southern California is growing—with shrinking availability.
- *Placeholder: add something on per capita income trends.*

Commercial and Industrial

- The industrial, commercial and agricultural sectors are strong, balanced with high environmental protection.
- Urban areas have a high degree of commercial and industrial productivity.
- California is a global leader in all types of recycling technology.
- California has emerged as a leading industrial producer of environmental products and continued as a force in producing hardware for the technology industry.
- Industry has shifted from water-intensive processing to dry product assembly, reducing water use. Businesses have dramatically reduced demand. They have received incentives accelerating the move to machines with high efficiency water use to accomplish standard tasks.

Agriculture

- Statewide irrigated crop acreage will remain at year 2000 levels.
- Even with increasing urban densities, there will still be urbanization of agricultural land. Any land acreage removed from agricultural must be replaced by a combination of new land coming into production or an increase in multi-cropping, to keep the crop acreage at the current level.
- A viable agricultural sector has sustained export levels and food production in keeping with market forces and trends.
- The social contract continues to keep food and fiber prices low.
- A healthy, efficient agricultural sector has no new irrigated acres, but is able to produce more per acre and decrease applied water per irrigated crop acre.
- Farmers use sprinklers and drip irrigation on nearly all appropriate crops and lands. Flooding and furrow irrigation are applied only where more efficient methods cannot be used. Farmers turn irrigation on and off at will and decide exactly where to irrigate based on accurate information on soil moisture and climate conditions. Improved water management is increasing water efficiency. Irrigation techniques improve the uniform distribution of water to all plants, which is also contributing to yields.

Environment

⁴ CA Department of Finance Demographic Research Unit, Population Projections by Race/Ethnicity for CA and Its Counties 2000-2050, May 2004.

- Instream flows are sufficient to meet the objectives of CALFED's Ecosystem Restoration Program and the Anadromous Fisheries Restoration Program.
- Environmental health regulations are fully enforced, especially for air and water quality.
- Projects are designed to achieve multiple benefits integrating ecosystem restoration with water supply reliability
- Water dedicated to wetlands would reach "level 4" supplemental water supplies for National Wildlife Refuges cited in the CVPIA sections 3405 and 3406(b).
- River floodplain protection and restoration is undertaken for high flow management, habitat benefits, groundwater recharge, and public recreation (where appropriate).
- New developments and infrastructure (such as roads) are designed to minimize impacts to the natural drainage patterns and water quality of watersheds and increase groundwater recharge using urban water retention measures.
- Management actions are oriented toward the sustainability, restoration and improvement of the natural infrastructure.
- Californians recognize the link between the environment and their economic health and personal well being. Wetlands and native vegetation flourish through high environmental protection. Water dedicated to in stream use and enhancing aquatic life is finally yielding increased populations. The sense of the State and its policy is to sustain a high degree of environmental protection.

Groundwater

- There is increased utilization of existing groundwater aquifers to meet water demand and for water storage due to local cooperative watershed and integrated resource plans.
- Groundwater basins have been remediated and aquifer quality protection is in place.

Economics and Water Pricing

- Water has a high degree of economic optimization (e.g. \$/drop) relative to existing economic activity types and water use efficiencies.
- Users are accustomed to paying more for water, especially in response to high levels of demand.
- The cost of investing in water use efficiency provides a return on investment.

Transfers and Conveyance

- Infrastructure is built to permit local and regional water transfers in order to balance water supplies (but not large inter-regional transfers, especially those that must pump through the Delta).

Public Trust

- Water managers recognize public trust responsibilities to protect waters of the state for environmental, recreational, and aesthetic values.

Efficiency

- Naturally occurring conservation (NOC) trend is higher in the agricultural and urban sectors than under Scenario 1. Business and agriculture have recognized the benefits of conservation and implemented efficiency measures that go far beyond best management practices in place in 2000.

- Many houses are dual plumbed, enabling residents to use recycled water for appropriate uses.
- Municipal and agricultural best management practices become comprehensive, encouraging more water use efficiency improvements and practices to be developed.
- Native vegetation and other innovative landscaping techniques have greatly reduced residential demand for landscape irrigation.

Water Quality

- Water quality best management practices have been fully implemented.
- Implementation of urban stormwater runoff regulations and point source controls have exceeded anticipated levels.
- Runoff from irrigated lands and lands used for grazing and timber harvest, nonpoint sources of water pollution, has significantly reduced.
- Water quality in currently impaired lakes and rivers is substantially improved and clean waters are protected from degradation.

Water Demand

- Placeholder: Add in estimates for consumptive and applied water use for this scenario.

Considerations

- Placeholder: CALFED ROD assumptions
- Cost of implementation is a factor.
- Impact of climate change on hydrologies.
- Funding for agricultural and urban water use efficiency programs.
- Implementation of efficiency measures is part of overall management strategy, not just a response to drought conditions.
- Continued resistance by some water agencies to implement urban water use efficiency best management practices.
- Compact, mixed use development reduces water demand (landscaping) and minimizes pollution of surface and groundwater. Impacts to habitat, watershed functions, and groundwater recharge areas are reduced.

Scenario 3: More Resource Intensive

Population and Land Use

- Population in 2030 is 52.3 million people, which is higher than the California Department of Finance's projection of about 48.1 million.⁵
- The population is dispersed regionally. Expanding urban areas are commonplace.
- Build-out for many cities and towns in Northern California and coastal regions has not been reached. More people live in the inland areas of the Central Valley and in the southern regions of California. Fresno, Stockton, Modesto, Bakersfield and San Diego have large populations and have experienced high percentages of growth.
- The population is more spread out resulting in more outdoor residential water use (e.g. larger residential lot size).
- The Central Valley is experiencing air and water quality problems due to the stress of the high population.
- People tend to drive individually long distances to the work place.
- Placeholder: add something on per capita income trends.

Commercial and Industrial

- The industrial, commercial and agricultural sectors are strong, balanced with existing environmental protection.
- Difficulty attracting clean, efficient industries has an impact on the state's attractiveness.
- California has become a global leader in recycling technology.
- California has emerged as a leading industrial producer of environmental products and continued as a force in producing hardware for the technology industry. California's leadership in high tech hardware places constraints on its water resources since this industry is a high water using industry that has not achieved advances in technology to limit its water use.
- Industry continues to rely on high water-using processes based on market conditions.

Agriculture

- Statewide irrigated crop acreage will remain at year 2000 levels.
- The healthy agricultural sector maintains past levels of food and fiber production. Low-density urban development expands onto prime farmland, but harvested acreage remains about the same due to increased multi-cropping and new lands coming into production.
- The annual volume of applied water per crop is high due to the changing nature of crops grown and the movement of agricultural production to lands with poor soil quality.
- There are no new long-term transfers of water from the agricultural sector to the cities.

Environment

- Instream flows are not meeting objectives of CALFED's Ecosystem Restoration Program and Anadromous Fisheries Restoration Program, but remain at year 2000 levels.
- Water dedicated to wetlands remains at year 2000 levels, and the "Level4" supplemental water supplies for National Wildlife Refuges cited in CVPIA sections 3405 and 3406(b) are not achieved.

⁵ CA Department of Finance Demographic Research Unit, Population Projections by Race/Ethnicity for CA and Its Counties 2000-2050, May 2004.

- Californians recognize the link between the environmental and their health and personal well being, but there is less water available to the environment.

Groundwater

- Although some groundwater basins have been remediated and recharge protection is in place, groundwater overdraft is prevalent in the state and land subsidence occurs.

Economics and Water Pricing

- Water is used with a low degree of economic optimization (e.g. \$/drop) relative to the economic activity types and efficiencies.

Efficiency

- Naturally occurring conservation in the agricultural and commercial and industrial sectors is lower than the current trends.

Quality

- Water quality best management practices have been fully implemented but not extended.
- Implementation of urban stormwater runoff regulations (NPDES) and point source controls have reached but not exceeded anticipated levels.
- Runoff from irrigated lands and lands used for grazing and timber harvest, nonpoint sources of water pollution, has significantly reduced.
- Improvements in water quality in impaired lakes from existing regulations are becoming more difficult to achieve.

Water Demand

- Water planners and decision makers have to contend with high water use in every sector.
- Water use is less efficient than in Scenario 2.
- Placeholder: Add in estimates for consumptive and applied water use for this scenario.

Considerations

- Placeholder: CALFED ROD assumptions.
- Water quality has become a major challenge due to the increased demands and expanding urban areas.
- Water conveyance requires a great deal of infrastructure improvement due to the dispersed population.
- Expanding urban areas have consumed valuable farmland, open space and other natural resources and contributed to water pollution, extinction of species, and increased competition for limited water resources.
- Construction of vast amount of surfaces, such as roads and rooftops lead to degradation of water quality by increasing surface runoff, altering regular stream flow and watershed hydrology, reducing groundwater recharge, and increasing stream sedimentation.
- Urban water availability is constrained by high water use and limited transfers from agriculture.
- Water prices are much higher as scarcity increases.