California Water 2020
A Sustainable Vision

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PACIFIC INSTITUTE
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About the Pacific Institute

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The Institute has three broad goals: (1) to conduct policy-relevant research on the connections among environmental change, economic development, and international conflict; (2) to encourage and participate in similar research efforts by other organizations and individuals; and (3) to inform and learn from policy makers, activists, and the general public regarding the nature of these problems and the possible long-term strategies for mitigating them.

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CALIFORNIA WATER 2020: A SUSTAINABLE VISION

Executive Summary

California's water future depends on choices that are being made now or must be made within the next few years. It is increasingly obvious that the water policies that helped the state to become the agricultural and economic giant it is today are not up to the challenges of the 21st century. Yet those responsible for managing and protecting the state's freshwater resources continue to plan on the basis of outdated and inappropriate assumptions.

This report — the result of a year-long investigation into California's water future — presents a unique vision of a truly sustainable water future and discusses ways to realize such a vision.

The Problem

California's current water use is unsustainable.

In many areas, ground water is being used at a rate that exceeds the rate of natural replenishment. This is causing land to subside and threatening some aquifers with possible collapse. The use of ground water is almost entirely unmonitored and uncontrolled, hindering rational management. Urban water use is inefficient and poorly managed. Agricultural policies encourage the production of water-intensive, low-valued crops. Environmental water needs are poorly understood and rarely met. Fish and wildlife species are being driven toward extinction and habitats are being destroyed by withdrawal of water, as well as by development.

According to official projections, these and related problems will continue indefinitely.

The California Department of Water Resources, which produces the "California Water Plan," operates on the assumption that in the year 2020:

- California will grow the same kinds of crops, on about the same amount of land, as it does now;
- Rapidly growing urban populations will continue to waste large amounts of water on inefficient toilets and sinks, and on watering household and municipal lawns;
- Many aquifers will continue to be pumped more rapidly than they are replenished;
- Millions of acre-feet of treated wastewater will continue to be dumped into the oceans rather than being recycled and reused;
- Water needed to maintain California ecosystems and aquatic species will come and go with the rains and with human demands; and
- Droughts and floods will have ever greater effects on society and the natural environment.

In short, official projections are that water demand will exceed available supplies by several million acre feet — a gap projected in every official "California Water Plan" produced since 1957.

We believe that state water planners have been planning for a future that is increasingly unlikely and undesirable.

Traditional water planning assumes that the basic conditions affecting supply and demand will remain the same as they are today. They do not allow for the fact that social structures, values, and desires will change — as they are already changing. Even ignoring the difficulty of projecting future populations and levels of economic activities, this conventional approach to water resources planning has many limitations. Perhaps the strongest evidence of the inadequacy of this approach is the fact that it routinely produces scenarios with unsustainable conclusions, such as water demand exceeding supply and water withdrawals unconstrained by environmental or ecological limits. The costs to the state of such a future will include:

- lost industrial competitiveness and revenue;
- destroyed natural resources;
- continuing uncertainty about long-term water supplies; and
- further ill will among urban, agricultural, and environmental interests.

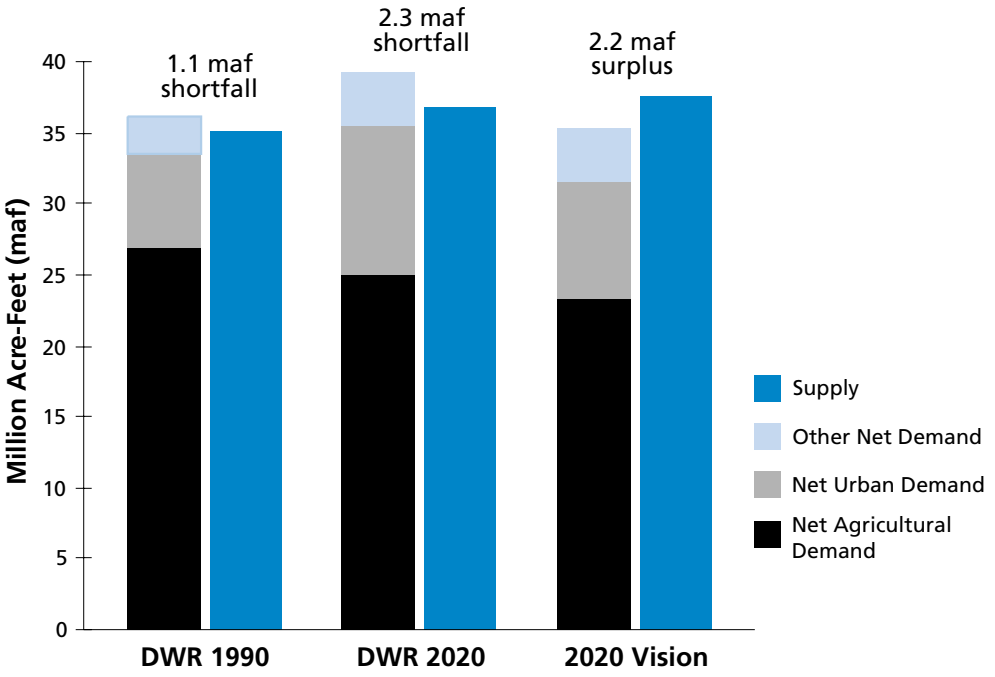
These costs can be avoided. Trend is not destiny, and official projections are not inevitable outcomes. It is time to develop new tools and approaches to California's water problems.

California Water 2020: A Sustainable Vision

A prosperous, healthy California is possible by 2020, with enough water for urban dwellers, a vibrant farm sector, and a robust environment. Without severely impacting any particular sector, groundwater overdraft can be eliminated, urban and agricultural water use can be made more efficient and productive, and California's natural ecosystems can be protected and restored. Figure ES-1 compares the state's future water supply and demand as estimated in this report and as projected by the official California Water Plan. In 2020, urban water demand per person could be far lower than it is today, helping to meet the demands of nearly 50 million residents, if current population projections are accurate. Agricultural production can shift away from today's emphasis on low-valued, water-intensive crops, increasing farm revenue while decreasing farm water needs. Groundwater overdraft can be completely eliminated. And the environment can benefit from more comprehensive and flexible water management.

This sustainable vision for the year 2020 would produce a more stable business environment, reduce uncertainty over water supplies, and increase the state's economic vitality and competitiveness. At the same time, the process of planning and managing the state's water resources can be made more democratic and open, bringing in whole segments of the population that have not previously been included.

Figure ES-1
Comparison of Water Supply and Demand: DWR 1990, DWR 2020, and 2020 Vision



Source: See Table 23.

What is Sustainable Water Use?

There has been plenty of rhetoric recently around the terms "sustainability" and "sustainable development." What is sustainability in the context of freshwater resources and why do we use the term here?

We define sustainable water use as:

> "*the use of water that supports the ability of human society to endure and flourish into the indefinite future without undermining the integrity of the hydrological cycle or the ecological systems that depend on it.*"

California's water resources should be managed so that today's human and environmental needs are met and so that the resource base is maintained for the future. Current water management practices are *unsustainable* because they produce groundwater overdraft, water-supply contamination by chemicals, loss of aquatic species and unique habitats, and other problems that directly diminish the state's natural resources. *To continue these practices is to squander an inherited fortune, leaving nothing for our children.*

Is sustainability a scientific concept? Not exactly. It is a social goal, much like equity, liberty, or justice. It implies an ethic. Public value judgments must be made about which needs and wants should be satisfied today — and what changes must be made to ensure a legacy for the future.

In this study we present a set of sustainability criteria for water. They were developed over the past year in discussions among people with a wide range of interests, and they embody these value judgments: that humans and natural environments should have access to the minimum amount of water necessary for survival, that the renewable characteristics of water resources should not be impaired, and that the process of water planning and management should be democratic, fair, and open.

An ethic of sustainability will require a fundamental change in how we think about water. Rather than trying to find the water to meet some projection of future desires, we must plan to meet present and future human and ecological needs with water that is available. This is an essential change in thinking, and it will require consideration at the highest levels. Such a shift does not mean we must diminish our quality of life. On the contrary, by securing a sustainable future, a prosperous, healthy California is possible by 2020.

How Do We Get There?

To realize this positive vision *no significant new supply infrastructures need be built, nor are any drastic advances in technology necessary. No "heroic" or extraordinary actions are required of any individual or sector.* The changes necessary to achieve a sustainable water future for California can be brought about by encouraging and guiding positive trends that are already under way. They can be accomplished by applying technological innovations gradually and incrementally at this time of continuing evolution in personal values and culture. These are already common characteristics of California society.

California's water policies can and must be substantially reshaped over the next quarter-century. In many cases the job has already begun and we need only nurture existing trends. Providing safe, clean water in the arid West has always required financial, institutional, and human investments, and some agencies, individuals, and organizations are likely to resist the short-term costs of any new approaches. It is imperative, therefore, that the long-term costs of *not* taking these actions — measured by the costs of new infrastructure construction, adverse impacts on human and environmental health, and the political costs of endless social conflict over water — also be brought into the equation.

A sustainable future *can* be achieved. Whether it *will* be achieved depends on the public and their elected officials.

Major Conclusions

California's current water use is unsustainable. Current water planning fails to address the water problems of the 21st century.

Continuing down the current path will lead to worsening social, economic, and environmental conflicts over water.

- Current policies reduce future flexibility and increase the risk of economic instability due to disruptions in water supply;
- Current policies produce uncertainty and a risk of future unreliability during periods of drought and shortage;
- Traditional planning leads to a large gap between water supply and expected demand, encouraging construction of new supply infrastructure.

California can achieve a more sustainable pattern of water use by 2020 without severe negative impacts on any particular sector.

The urban sector can become far more efficient and save millions of acre-feet of water.

- Average residential water use in 2020 could be 46 percent lower than the current 137 gallons per person per day, using only existing technology;
- Use of reclaimed water can increase from 0.4 million acre feet in the mid-1990s to 2 million acre-feet in 2020 and satisfy many urban demands;
- Industrial water-use efficiency could increase 20 percent over today's efficiency.

Modest re-organization of California's agricultural sector can save millions of acre-feet of water.

- The agricultural sector can be more efficient, with lower total water demand and higher agricultural revenues.
- Groundwater overdraft can be eliminated with modest changes in cropping patterns.
- By 2020, with modest shifts in cropping patterns, agricultural net water demand could decline by 3.5 million acre-feet while farm income rises by $1.5 billion (1988 dollars).

Innovative water management is necessary to protect California's natural resources.

- By 2020, more than 2 million acre-feet of water can be reallocated from urban and agricultural uses to a wide range of environmental needs.
- High mountain streams can be restored to drinkable conditions.
- Innovative agricultural policies can actually support both food production and wildlife habitat.

A major effort is needed to improve our understanding of water supply and use. Major gaps in water data make it difficult to develop and implement rational water plans.

- No one knows for sure how much ground water is used, by whom, and for what. This particular lack of data hampers efforts to control overdraft and impedes the development of rational statewide water planning.
- Residential, commercial, industrial, and municipal data on water use are spotty, at best. A comprehensive statewide water-use survey is needed.
- On-farm water use is rarely measured directly. Statewide data are needed on how much water is actually applied, evaporated from crops, returned to groundwater, and so on, as a function of crop, irrigation method, climate, and soil type.
- The water requirements for restoring and maintaining different ecosystems are poorly understood. This complicates attempts at rational joint management of water for farms, cities, and environmental needs. More information is needed on flow, timing, and water quality requirements.

Major Recommendations

The final section of the report offers a wide range of recommendations for improving California's long-term water policy and planning. Among the most important are to:

Expand efforts to promote the use of water-efficient technologies and practices.

- Current federal and state water efficiency programs should be implemented and expanded.
- Comprehensive agricultural, residential, industrial, commercial, and institutional efficiency programs are needed. These programs can include regulatory, economic, and educational components.
- Water rates for all sectors should be designed to encourage efficient water use.

Eliminate pricing policies that subsidize inefficient use of water at taxpayer expense.

- Gradually reduce, then eliminate, most federal and state water subsidies.
- Gradually reduce, then eliminate Federal crop subsidies for growing low-value, water-intensive crops.
- Adjust urban and agricultural water rates to reflect the cost of service, including non-market costs.

End the non-renewable use of groundwater in California.

- The state should establish a comprehensive groundwater monitoring program and database with open access.
- Implement institutional mechanisms for managing groundwater use at the local level in accordance with standards set by the state.

Reorganize California water-planning institutions to prepare for the 21st century.

- Make California water planning more equitable and democratic by bringing in groups that have been excluded from the process.
- Separate statewide water planning and data activities from current water project operations.
- Create an independent planning organization by streamlining existing water planning groups.

Environmental water needs should be better understood and met.

- Identify and preserve critical wetlands, together with the water supply needed to maintain them. Restore degraded wetlands.
- Set water flow and quality standards on a flexible seasonal basis, to be regularly reviewed.
- Monitor biological resources in a comprehensive, ongoing process.
- Honor state and federal agreements to protect the Bay-Delta region and California's Wild and Scenic Rivers.
- Allocate water to protect and restore native anadromous fish runs.
- Pursue the integrated management of agriculture and seasonal wetlands.

Support water transfers that improve water efficiency, enhance California's natural environment, and promote the overall well being of rural communities.

- Develop fair standards for water transfers that do not harm the environment or rural communities.
- Establish a fund, supported by fees on water transfers, to mitigate adverse impacts of transfers on rural economies, communities, and the environment.

Encourage the far greater use of reclaimed water in California through economic and regulatory incentives.

Create a statewide system of water data monitoring and exchange.

- Water data must be much more widely collected and distributed.
- Create an organization that collects, maintains, and freely distributes state water resources data.

Lifeline water allocations and rates should be implemented for the residential sector.

Integrate land-use planning and water-use planning.

- All new urban developments must demonstrate a secure, permanent supply of water before permits are approved.
- Protection of prime agricultural land and the water required to support these lands should be studied.