

WATER

more or less

Reflections about the
changing landscapes of
California's water in
story, art and policy
including diverse voices
of 20 top water leaders

**Rita Schmidt Sudman
Stephanie Taylor**



*California
Water*

Artist Interpretation shows:
 Rivers & Lakes
 Locally funded projects
 State Water Project (SWP)
 Federal & Central Valley
 Project (CVP)
 Wild & Scenic Rivers

Graphic inspired by DWR and Water Education Foundation maps

Water: More or Less

An intimate vision of the world of water as seen through the eyes of a water journalist, an artist, and through the diverse voices of water decision-makers.

20 Diverse Voices

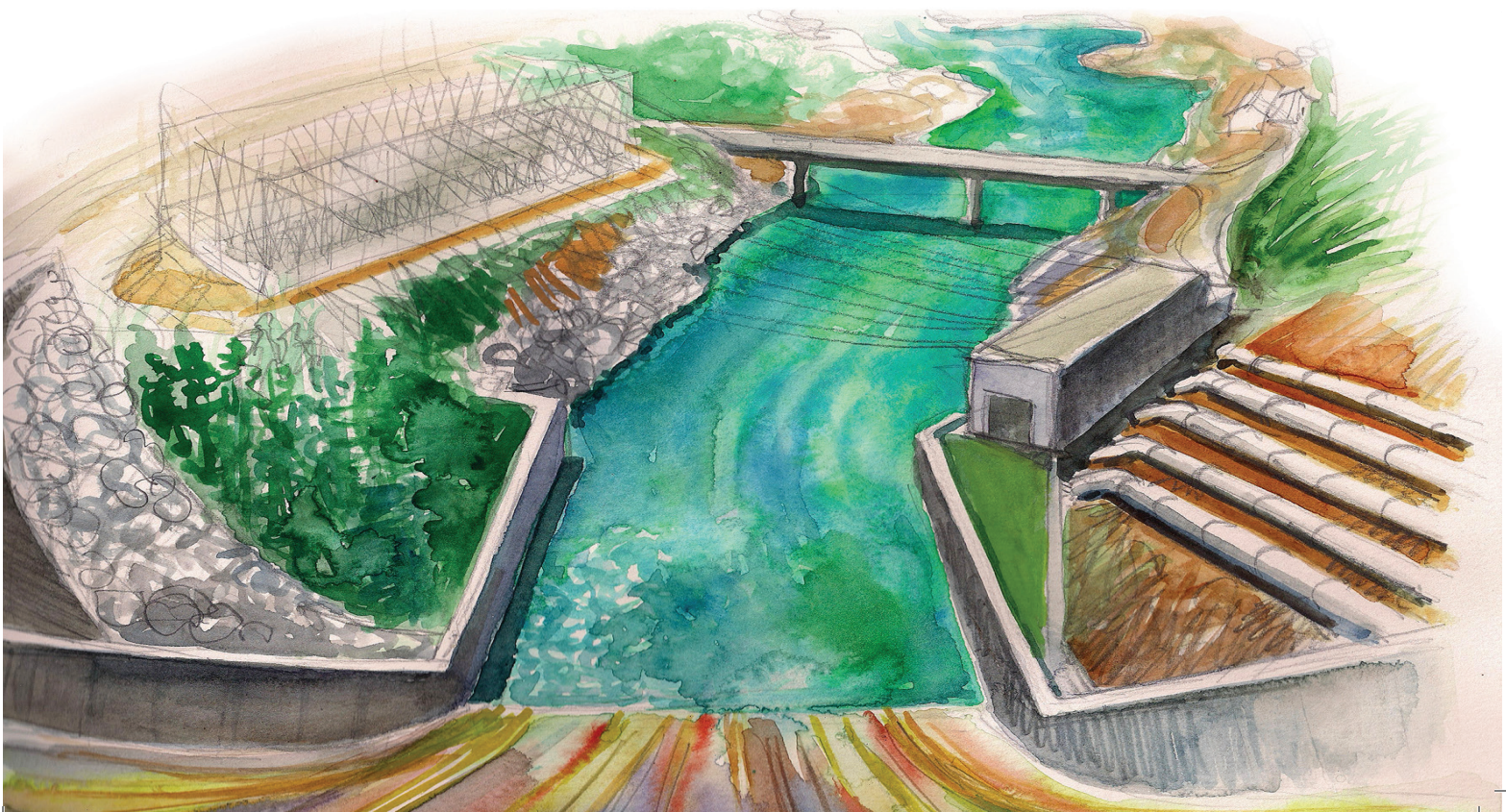
Diverse water policy decision-makers contribute personal essays for this book, bringing additional insight to options for the future of water, telling why they continue to have passion for this issue.

Rita Schmidt Sudman

Rita Schmidt Sudman, Emmy award winning journalist and former executive director of the Water Education Foundation, follows the history of water conflict in each geographic area from Mount Shasta to the Salton Sea. She examines many pressures that set the stage for disagreements and decisions that shaped water policy over decades. She provides context for the past, adds to an understanding of the present and suggests solutions for the future.

Stephanie Taylor

Stephanie Taylor has a dream career making paintings and sculpture for private and public collections all over the United States and in Paris. Combining her love of history and location, she's also a newspaper Opinion contributor. Her paintings, photography and lyrical essays capture images of people and places and describe a slice of the daily lives of fishermen, farmers, biologists and others. She invites the reader along as she hikes the land, traces the path of waterways and talks with those who rely on water for their livelihood. She has created the original art and most of the photography for this book.



Guest Authors

20 diverse voices

Tom Birmingham

General Manager, Westlands Water District

Jennifer Bowles

Executive Director, Water Education Foundation

Celeste Cantú

General Manager, Santa Ana Watershed Project Authority

Michael Cohen

Senior Associate, Pacific Institute

Kim Delfino

California Program Director, Defenders of Wildlife

Laurel Firestone

Co-Executive Director and Co-Founder, Community Water Center

David Guy

President, Northern California Water Association

Thomas Harter

Professor Cooperative Extension Specialist, Groundwater Hydrology,
University of California, Davis

Carl Hauge

Chief Hydrogeologist, California Department of Water Resources (retired)

Campbell Ingram

Executive Officer, Delta Conservancy

Kevin Kelley

General Manager, Imperial Irrigation District

Jeffrey Kightlinger

General Manager, Metropolitan Water District of Southern California

Sunne Wright McPeak

President, Delta Vision Foundation and CEO, California Emerging Technology Fund

David Orth

Member, California Water Commission and former General Manager,
Kings River Conservation District

Tim Quinn

Executive Director, Association of California Water Agencies

Tim Sloane

Executive Director, Pacific Coast Federation of Fishermen's Associations and
Institute for Fisheries Resources

Lester Snow

Executive Director, Water Foundation

Frances Spivy-Weber

Board Member, State Water Resources Control Board

Maureen Stapleton

General Manager, San Diego County Water Authority

Kevin Starr

State Librarian Emeritus and author of the *Americans and
the California Dream* series

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Sacramento Valley



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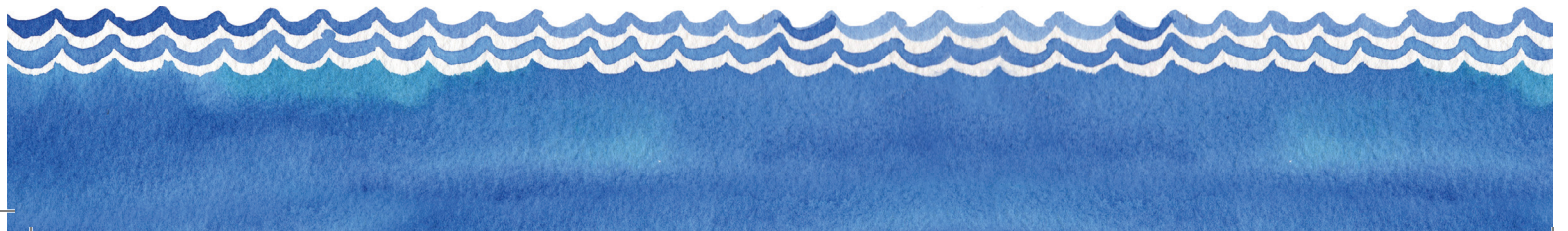
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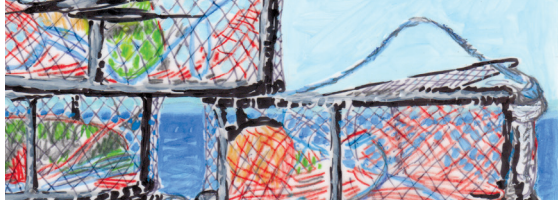
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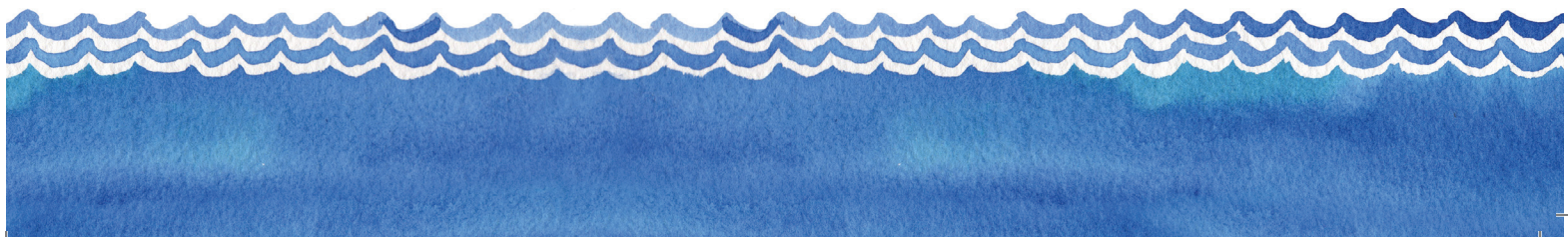
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San Joaquin Valley



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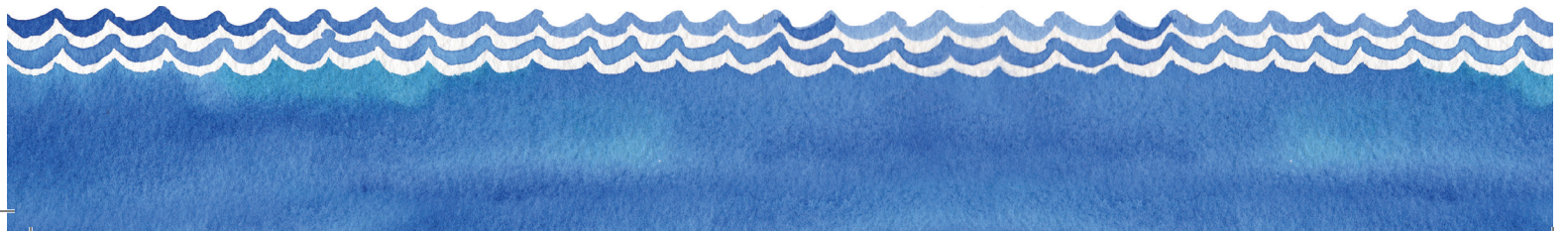
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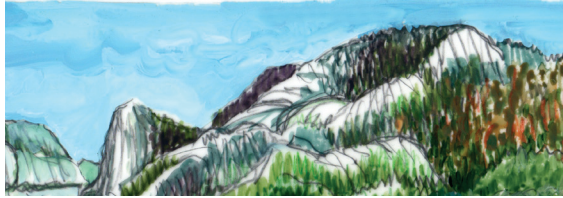
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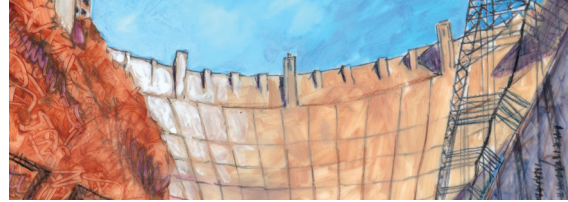
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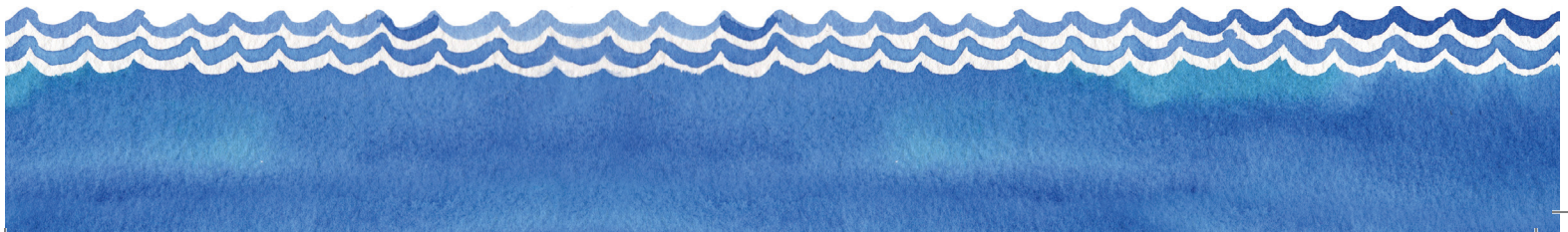
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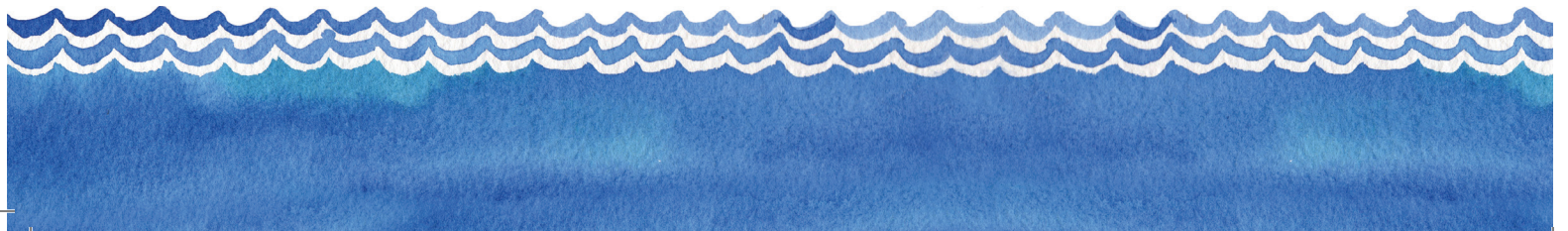
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The Delta

Chasing an Elusive Fix

Rita Schmidt Sudman

“The Delta is a microcosm – a world in miniature – of all California water issues.”

Spend any time on water issues and you will know that the California Delta is the heart of the state’s water system. In my water career of the last three decades, I have seen the emergence of two conflicting philosophies: one of protecting nature and one of subordinating it.

What is the Delta?

The Delta is an estuary where water from mountains and rivers mixes with ocean tidal water causing extreme fluctuations of fresh and salt water. Officially called the Sacramento – San Joaquin River Delta, it is the largest estuary on the West Coast and covers parts of five Counties. It’s no longer a natural system, but a 700-mile maze of sloughs and islands protected by over a thousand miles of levees. Within the levees, there are about 60 below-sea-level farm islands.

At the south end of the Delta, state and federal water projects extract water to serve 25 million people in the Bay Area, the San Joaquin Valley, parts of the Central Coast and urban Southern California. It supplies water to more than 3 million acres of farmland, mostly in the San Joaquin Valley.

The Delta’s aging levee system can be affected by tides, earthquakes, floods and sea level rise. Environmental problems include invasive species, export pumps pulling fish in the wrong direction, and degraded water quality. The Public Policy Institute of California (PPIC) says that within 50 years, it is highly likely that numerous Delta Islands will fail and flood permanently, pulling tidal salt water into the Delta, adversely affecting farming and jeopardizing much of the state’s drinking water.

The Delta is a land in crisis because we humans have changed it.

This situation didn’t develop overnight. The Spanish “discovered” the Delta in 1772, and explorers wrote about its abundance of fish, game and fowl. Trappers, including American Jedediah Smith, hunted plentiful beaver.



Photo: CA Department of Water Resources

After California became a state in 1850, the Delta landscape began to change.

The 1855 Swamp and Overflow Act allowed farmers to purchase marshland for \$1 an acre to “reclaim” it into farmland. To build the levees to hold back the rivers and floods, farmers used Chinese laborers. Once the mechanical dredge and gas pumps came on the scene, levee building began in earnest. By 1880, there were 100,000 reclaimed acres and by 1930, the entire Delta’s 450,000 acres were farmland.

The Delta is battleground zero for the opposing philosophies of protecting nature or subordinating it.

Today the Delta area is home to half a million people living in cities and towns. Its landscape includes highways, natural gas lines, high voltage transmission lines, railroads and two deep water shipping channels.

San Joaquin Valley

Drought

Arid

Oranges

Fallowed land

Environmental justice

Grapes

SWP

Farm profits

California Aqueduct

Almonds

CVP

Water in Food

Water Marketing



Groundwater

San Joaquin: Valley Views

Stephanie Taylor

“*At what was Tulare Lake, I try to imagine the thousands of white pelicans that used to nest here, stretching their 10-foot wing-spans in flight on the Pacific Flyway.*”

From the east side of the San Joaquin Valley, the Sierra foothills offer a dramatic view of changing terrain – from lush to parched. From citrus groves and almond orchards, the landscape shifts from a verdant Tuscan landscape to golden-brown along the Coast Range.

In Lemon Cove and Orange Cove, orchards of lemons and oranges and avocado creep into every fertile niche. Over gently rolling hillsides, patterns of mature orchards merge with new ones. Remnants of winter-harvested navel oranges lie abandoned in one orchard. An imaginary scent of citrus lingers in the air deep within the rows. Across a canal, another promises sweet summer Valencia oranges.

Farmers settled the east side of the San Joaquin Valley first, lured by abundant water from five major rivers and nutrient rich soils. Reservoirs and dams, built to control and capture torrential Sierra Nevada watershed rains, protect against devastating and periodic flooding, and also store water for summer use.

In contrast, on the west side of the Valley, some land is fallowed, some saved for only the most valuable crops like grapes, almonds and other nuts. Row after row of vines stretch endlessly in late afternoon sun, waiting for tiny buds. Fields and orchards near Tupman, for example, are barren, withered. Other towns look dusty, forlorn, graffitied walls crumbling, leaning.

Land was always cheaper on the west side. Until federal and state aqueducts brought water, farmers and communities depended on groundwater. With surface water deliveries reduced, wells had to penetrate deeper and deeper. As more and more water was pumped from the ground, the soil collapsed, subsided.

Subsidence in the Valley can be measured in feet- many feet, with visible damage to aqueducts and bridges. Near the San Joaquin River, a closer look under a bridge displays



On the west side of the Valley, pilings have pulled away from this bridge due to land subsidence caused by severe groundwater pumping

evidence of the impact of subsidence on infrastructure. Pilings no longer support the bridge. New pilings have been constructed to make the structure safe.

At one site near Mendota, land subsided about 30 feet between 1925 and 1977.

I look down at dry weeds and ground under my feet, and try to imagine what another 30 feet down might look like.

This flat land is graced with tumbleweeds, and I've often wondered where they come from. Turns out, they're an invasive species of thistle from Russia.

The Tulare Basin is the states most heavily subsided area. It was named for the famous Valley tules, as in Tule Fog. I see no tules now as the land was drained for farming long ago.

Areas of ground are white with evaporated salt. You can see a salt bathtub ring on Google Earth, from what used to be the shores of a 14,000 acre inland freshwater lake, drained, empty and dry.

*East side soil, granitic from the Sierra:
west side soil, salty from the sea.*

I try to imagine the thousands of white pelicans that used to nest here, stretching their 10-foot wing-spans in flight on the Pacific Flyway. In wet years, Chinook salmon arrived via the San Joaquin River.

The Southland

Drinking Water

Reliability

Colorado River

Mulholland

SWP

Conservation

Tap Water

Bottled Water

Recycled water

Hoover Dam

Imported Water

North vs. South



The Southland

Imagining Paradise

Stephanie Taylor

“Who ever brings the water brings the people.

William Mulholland

The Tehachapi Mountains, viewed from the ascending slash of the Golden State Freeway at 70 mph, is hardly my idea of a beautiful landscape. Rising from the agricultural abundance of the Central Valley, these bleak, brown, steep hillsides are a visual shock.

At the top of the Tehachapis, water pumped from the state's California Aqueduct descends into the Southland to meet the urban demands of millions of people. It splits into two branches. Surprisingly, most of the water flows east to dry desert communities, and only about a third makes its way west to Los Angeles and coastal areas south.

From the headwaters of the Sacramento River at Mount Shasta, through the Delta and the Central Valley, I've followed the water to the Southland. And now, the West Branch of the aqueduct has brought me to the San Fernando Valley -- hot, dense and dotted with thousands of swimming pools.

The original Los Angeles River starts here. Water inspired settlement by the original peoples, and with an advantageous climate, has since attracted millions more. Restrained for flood control, it winds through downtown Los Angeles and sometimes flows to the sea.

The Santa Monica Mountains repeat the Tehachapi vistas of drought tolerant plants, a contrast to what lies south in the greater Los Angeles Basin, my home for 18 years. Hollywood Hills, Santa Monica, Beverly Hills, downtown, UCLA and the beach, stunning areas boasting extravagant flowers and gardens, long avenues of trees and lavish lawns, golf courses, parks and ponds.

Fan palms, those ubiquitous icons of paradise, are native plants from ancient tropical times that survived on water seepage from faults.

Imperial Valley & the Salton Sea

Mexico

Water Transfer

Colorado River

Salinity

All-American Canal

Desert

Birds

Public ownership

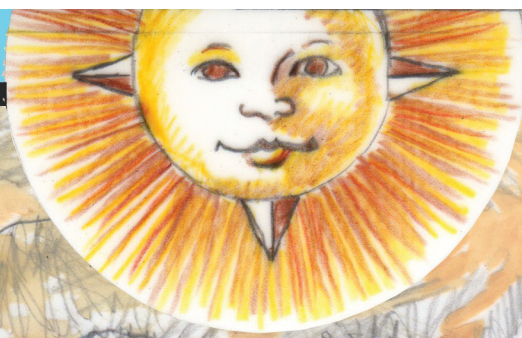
Irrigation

Salton Sea

Love Story

Farms

Great Flood



Palm Springs

Coachella Valley

Salton Sea

Imperial Valley

New River
Alamo River

River

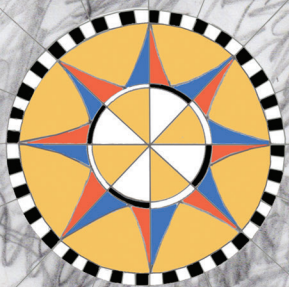
California

Mexico

Mexicali Valley

Colorado

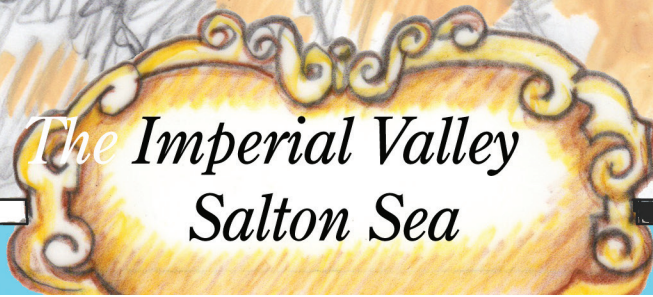
Arizona
Mexico



Salton Sea

and the
Colorado River Delta Watershed

Gulf of California



*The Imperial Valley
Salton Sea*

Some Solutions

Twelve Answers to California's Water Problems

Rita Schmidt Sudman

“California has thrived as an 'oasis civilization,' delivering abundant water to cities and farms. Now we must adapt to aridity, punctuated by floods.”

Lewis Carroll's Cheshire cat said to Alice in Wonderland, “If you don't know where you're going, any road will get you there.” The message is clear. The first step to getting where you want to go is knowing where you want to end up. Next, follow a plan to get there. In the case of solving California's water problems, a strategic road map can lead to some real answers.

The water leaders of earlier generations made mistakes, but they created enough successes to give us a prosperous state. The opportunity for us is now. Many agree we have not continued the investments made by earlier generations.

Water is a shared resource. When too many users stress the water resource, it's called the “tragedy of the commons.” Everyone loses. California has existed as an “oasis civilization,” delivering abundant water to cities and farms. Now we must learn more about aridity, punctured by periods of unexpected floods. After four years of drought, the sky did not fall. The state is resilient and a pioneering spirit remains. In 2014, California's economy grew 27% faster than the nation's economy. Of course, that doesn't mean that there have not been pockets of distress and pain. It is tragic to see wells going dry, especially in poor San Joaquin Valley communities now dependent on emergency water from the state.

We've had 10 droughts in California during the last century. Some experts are calling the latest one a once-in-a-1,200 year drought exacerbated by a changing climate. Californians have responded to the Governor's call for reduced water use and dramatically cut their water use by more than the requested 25%.

Californians need water security during and beyond the current water crisis. Let's make it happen by enacting a series of changes that will take us on the road to exactly where we want to be when the next drought hits.

On the following pages are 12 answers to California's water problems. They are not my original ideas and they are not new, but this is my summary of the best solutions.

