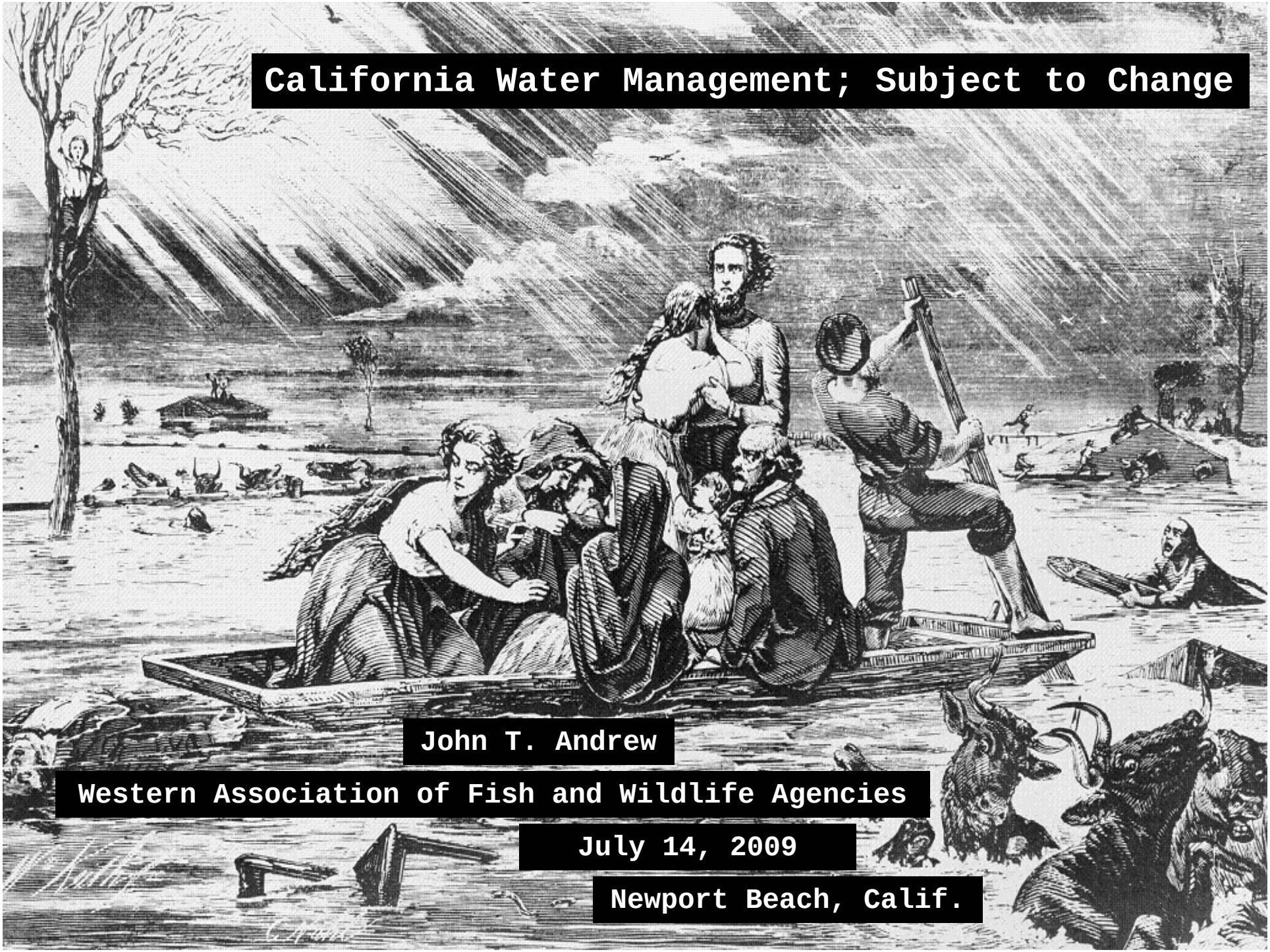
California Water Management; Subject to Change

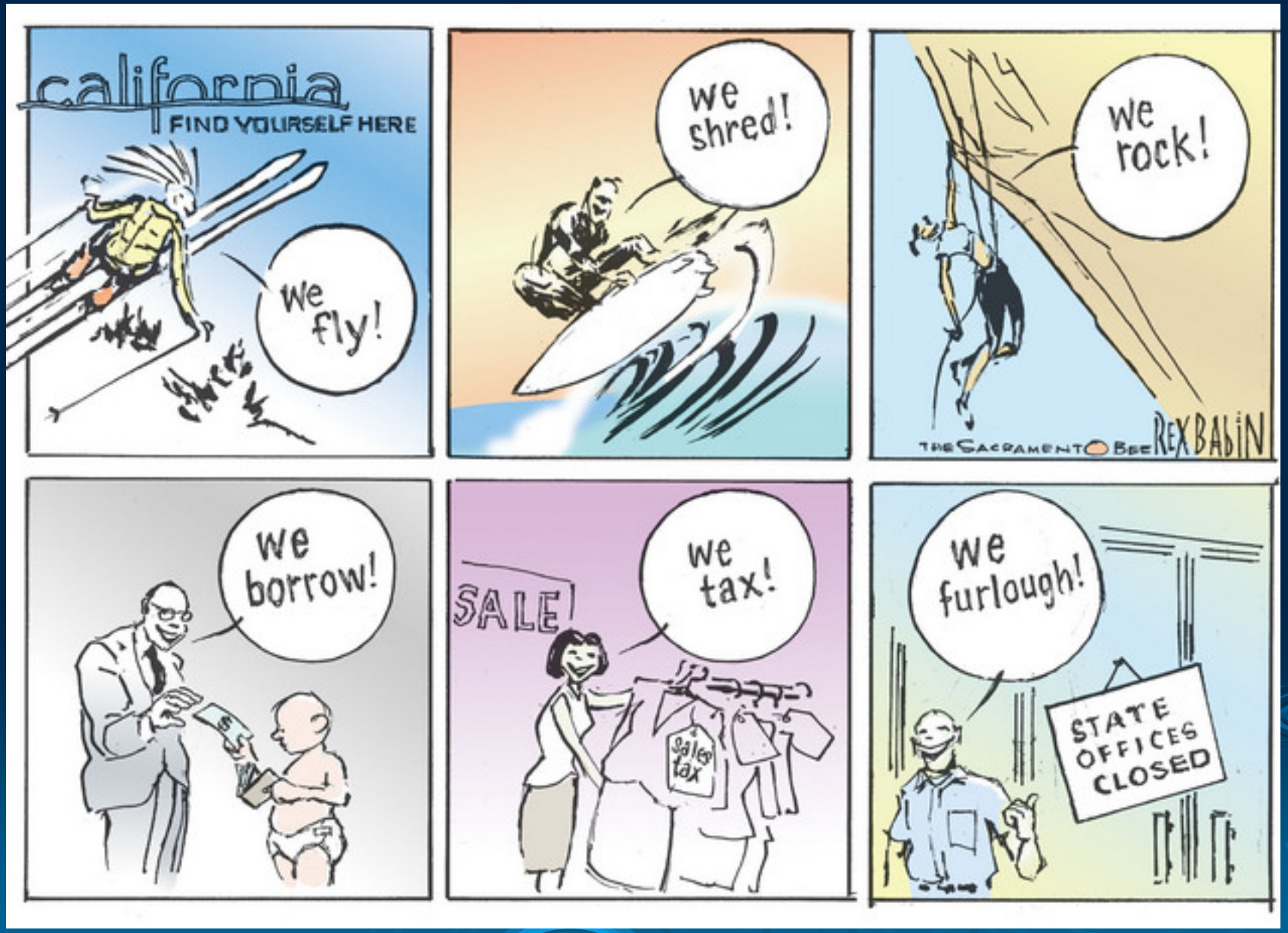


John T. Andrew

Western Association of Fish and Wildlife Agencies

July 14, 2009

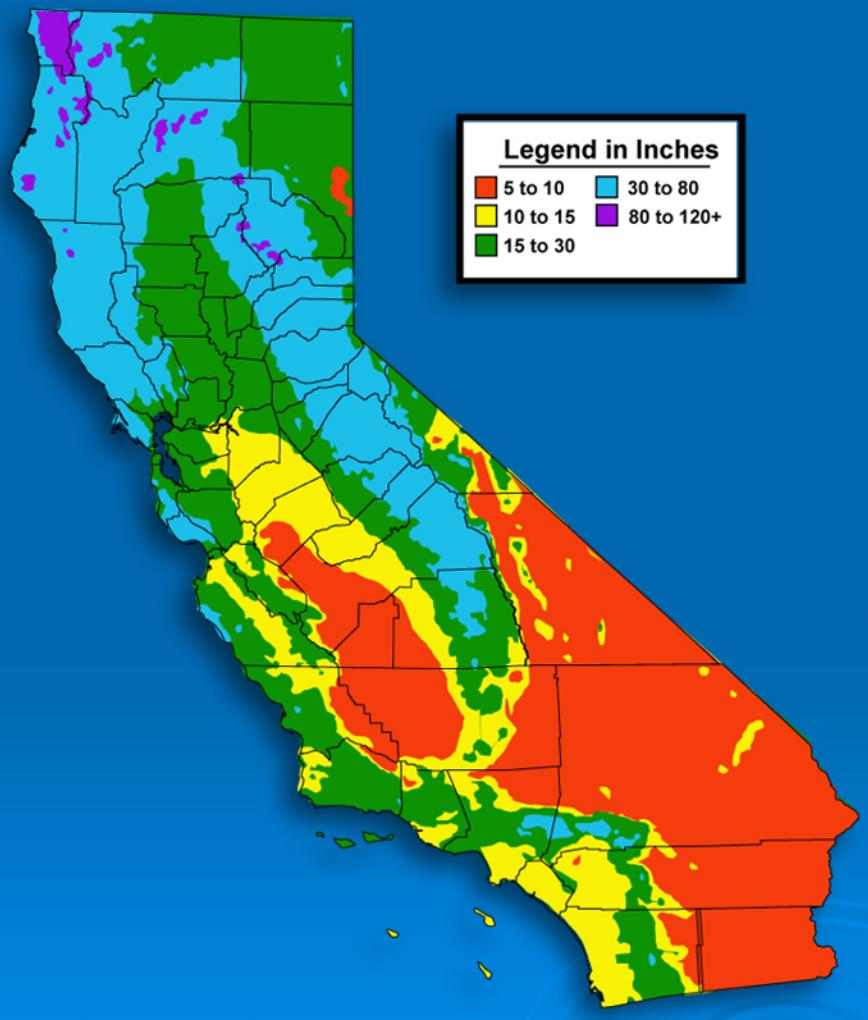
Newport Beach, Calif.


california
FIND YOURSELF HERE
we fly!
we shred!
we rock!
THE SACRAMENTO BEE REX BABIN
we borrow!
SALE
we tax!
sales tax
we furlough!
STATE OFFICES CLOSED

Today's Topics

- Background on California water
- Historical indications of climate change
- Projected impacts to water resources from climate change
- Responding to climate change

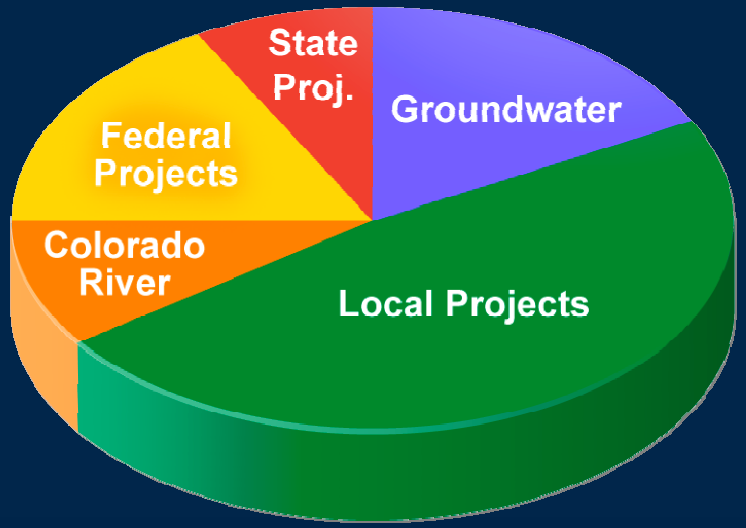
California Water Background



- Population:
  - 2005 36 million
  - 2030 48 million
- Irrigated Acreage: 9.5 million
- About 2/3 of the State's surface water runoff occurs north of Sacramento
- About 2/3 of the State's water needs occur south of Sacramento

California's Major River Systems

Statewide Water Management Systems



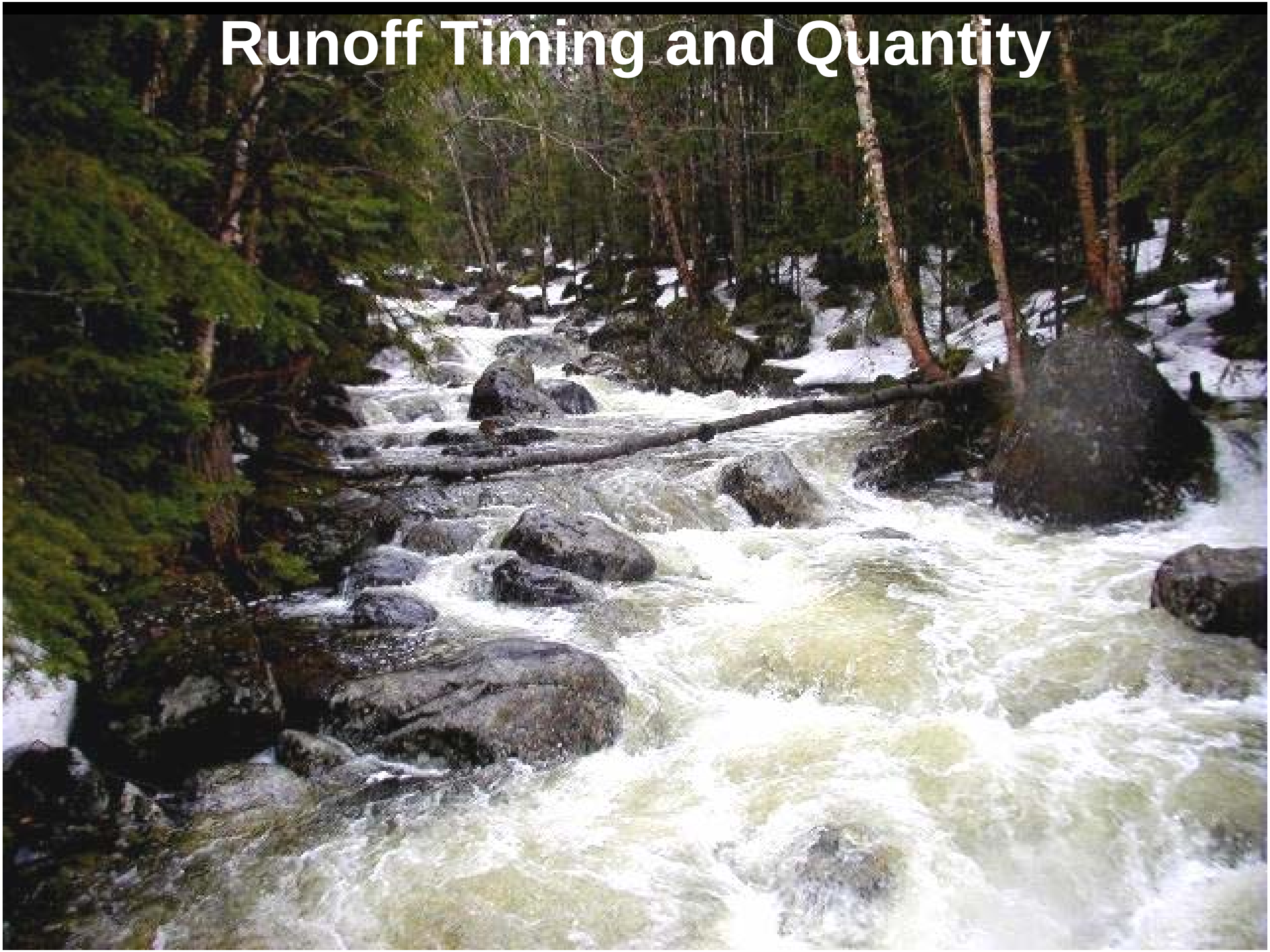
- Local – 20.6 maf
- Colorado – 5.3 maf
- Federal – 7.5 maf
- State – 3.6 maf
- Groundwater – 7.8 maf

Year 2000 data. Does not include re-use. Quantities vary by year.

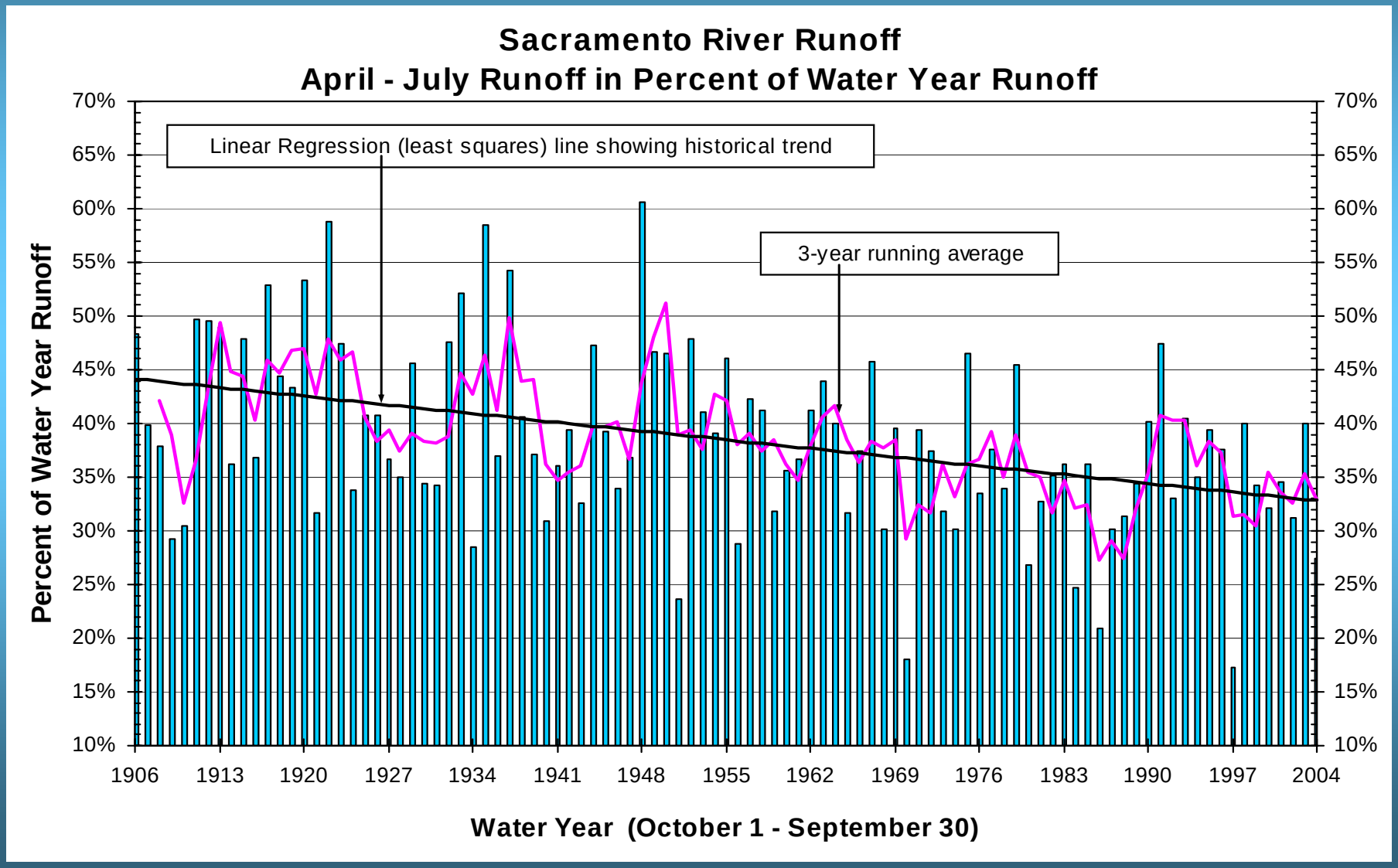
Climate Change Impacts on California's Water Resources

- Reduced snowpack, impacting water supply and hydropower
- Earlier snowmelt results in increased flood control demand on reservoir space
- Higher water temperatures impacts ecosystem
- Sea level rise impacts the Delta, threatens levees and increases salinity
- Increased demand in all sectors

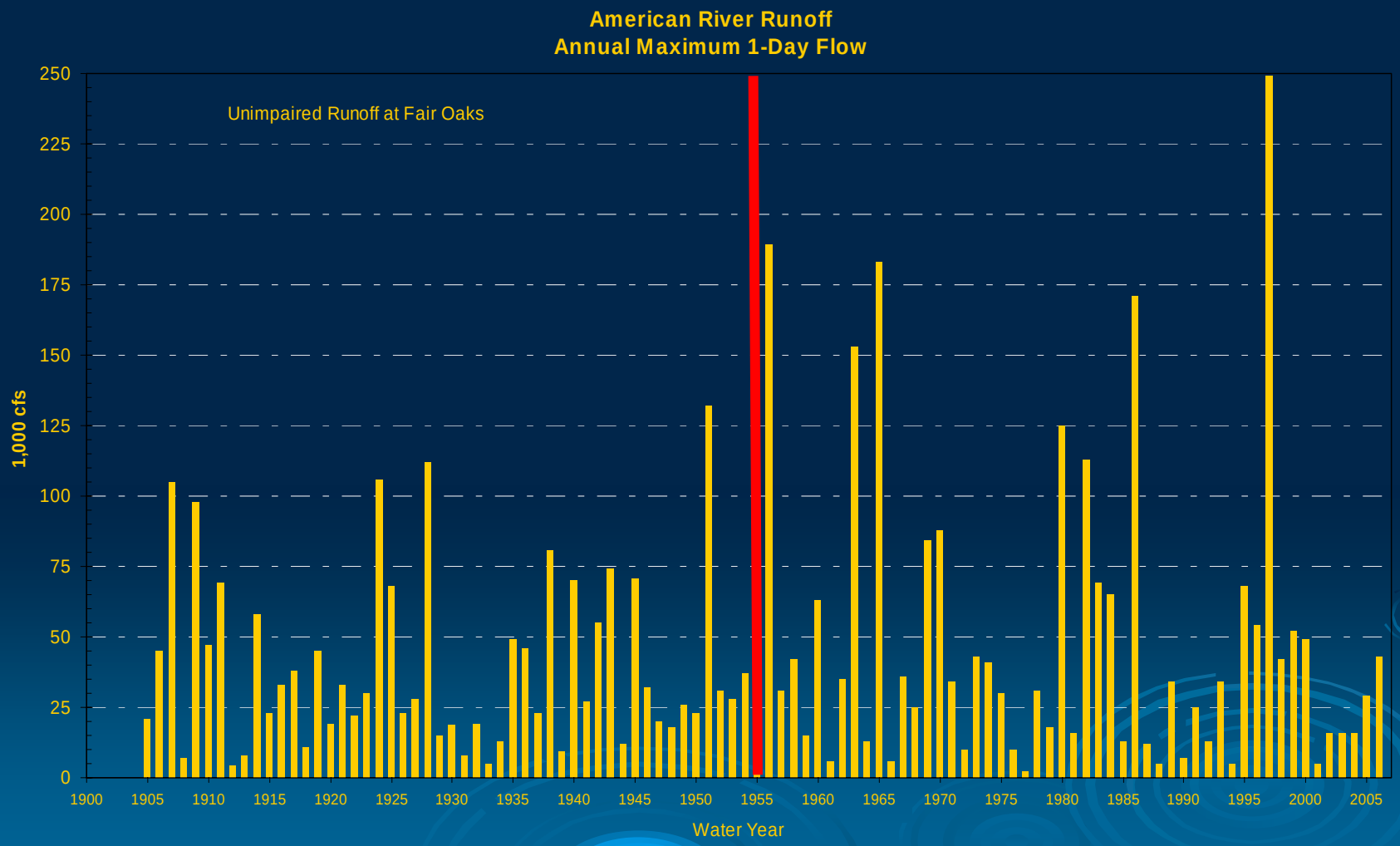
Runoff Timing and Quantity



Changes in Runoff Timing



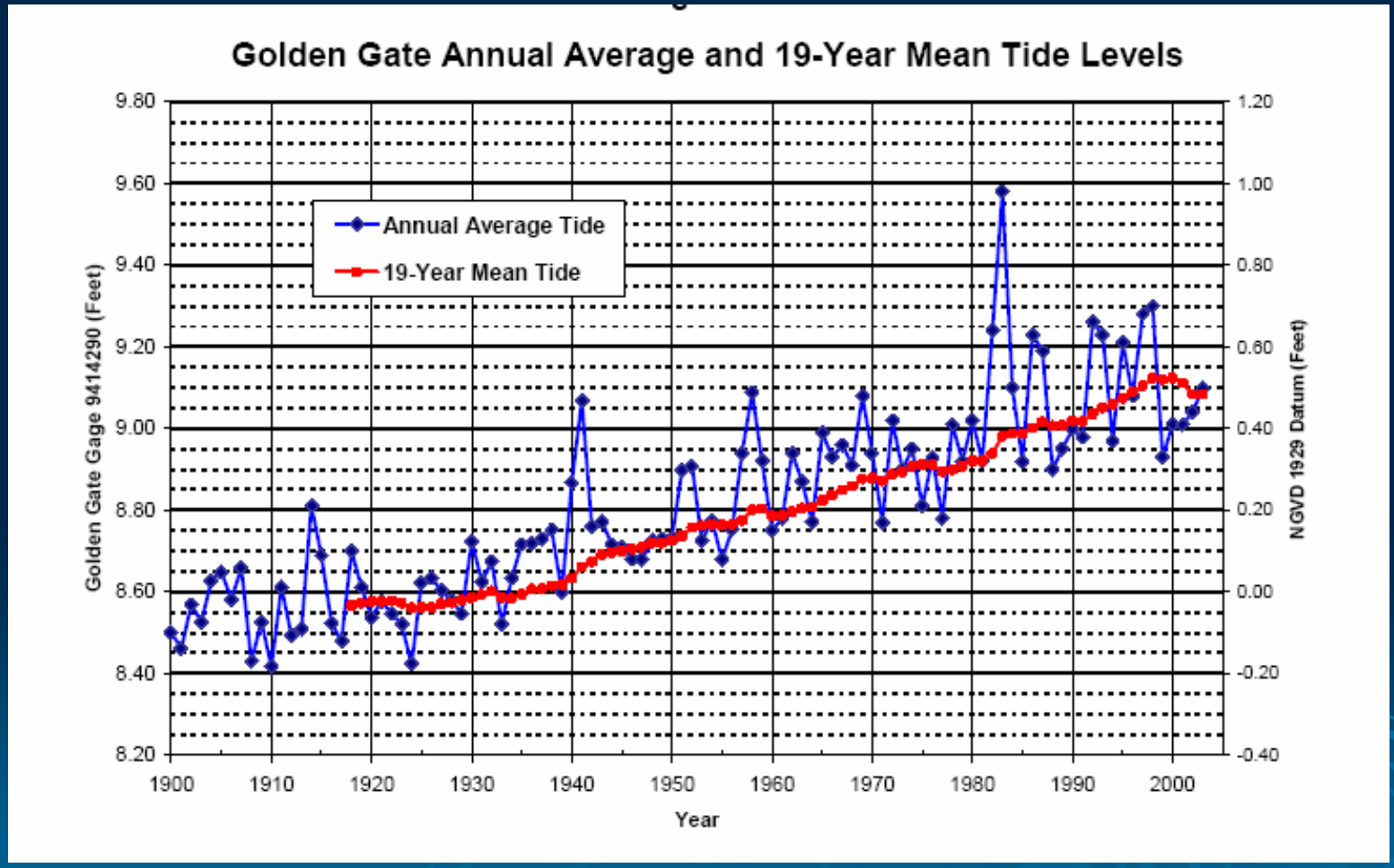
Changes in Peak Flows
American River



Red Line = Construction of Folsom Dam

Sea Level Rise

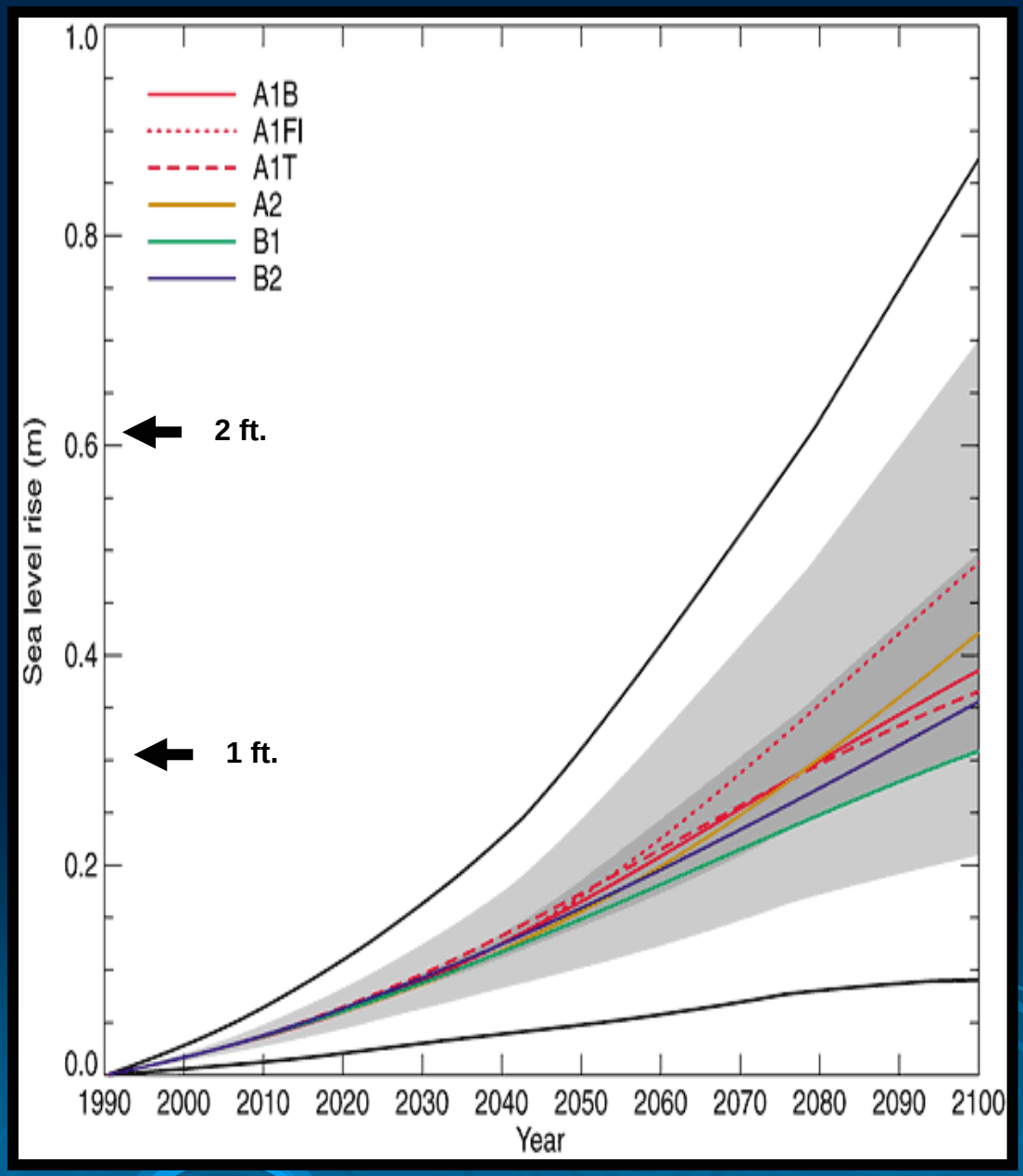
Sea Level Rise



Source: Roos 2003

Sea Level Rise

Projections



Source: IPCC, 2001

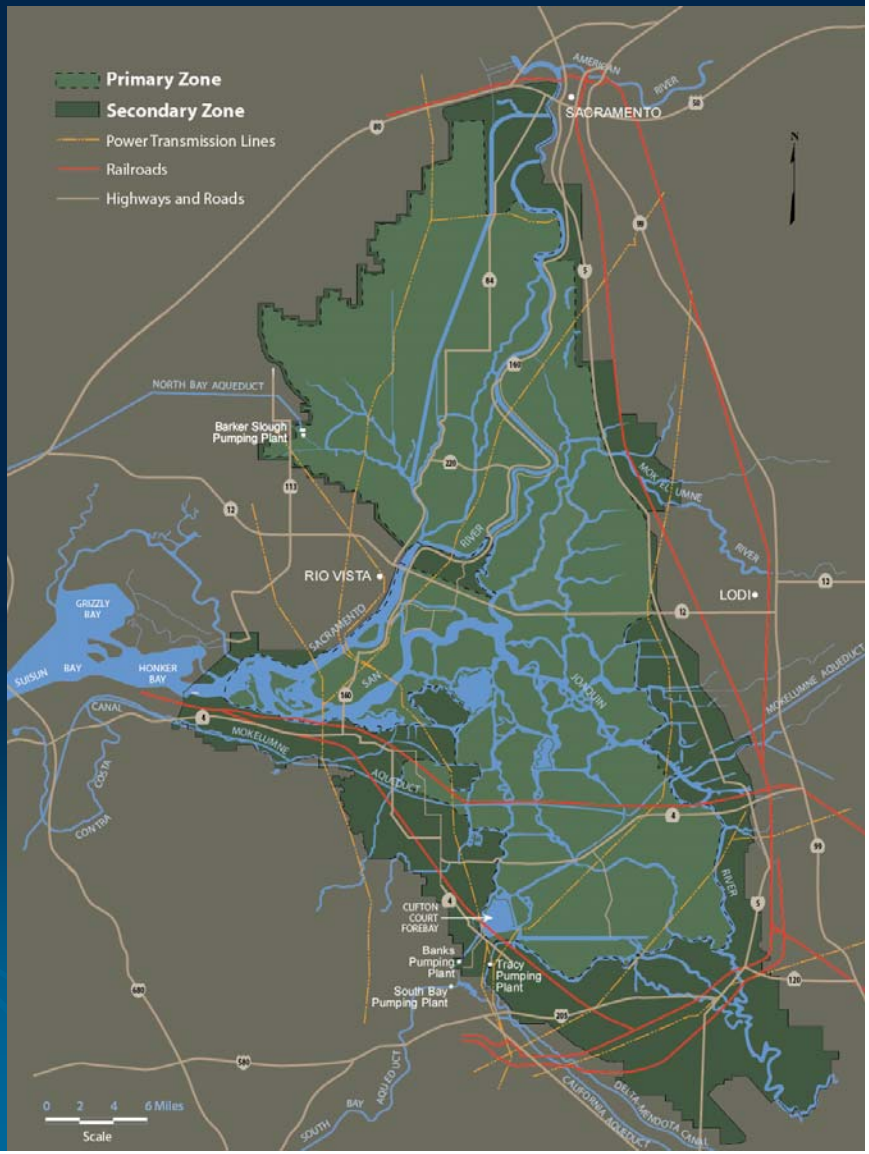
What Could Happen to Bay-Delta Estuary?

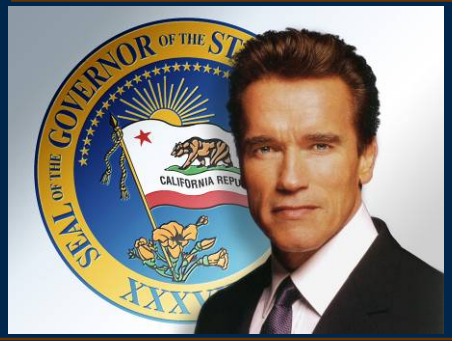
The "**Hinge Pin**" for much of California's water supply…

Bay-Delta detail image from CALFED

Implications of Sea Level Rise in the Delta

- Salinity intrusion degrades water quality, requires additional releases
- Habitat changes, losses
- Levee failure
- Inundation
- Interruption of water supplies



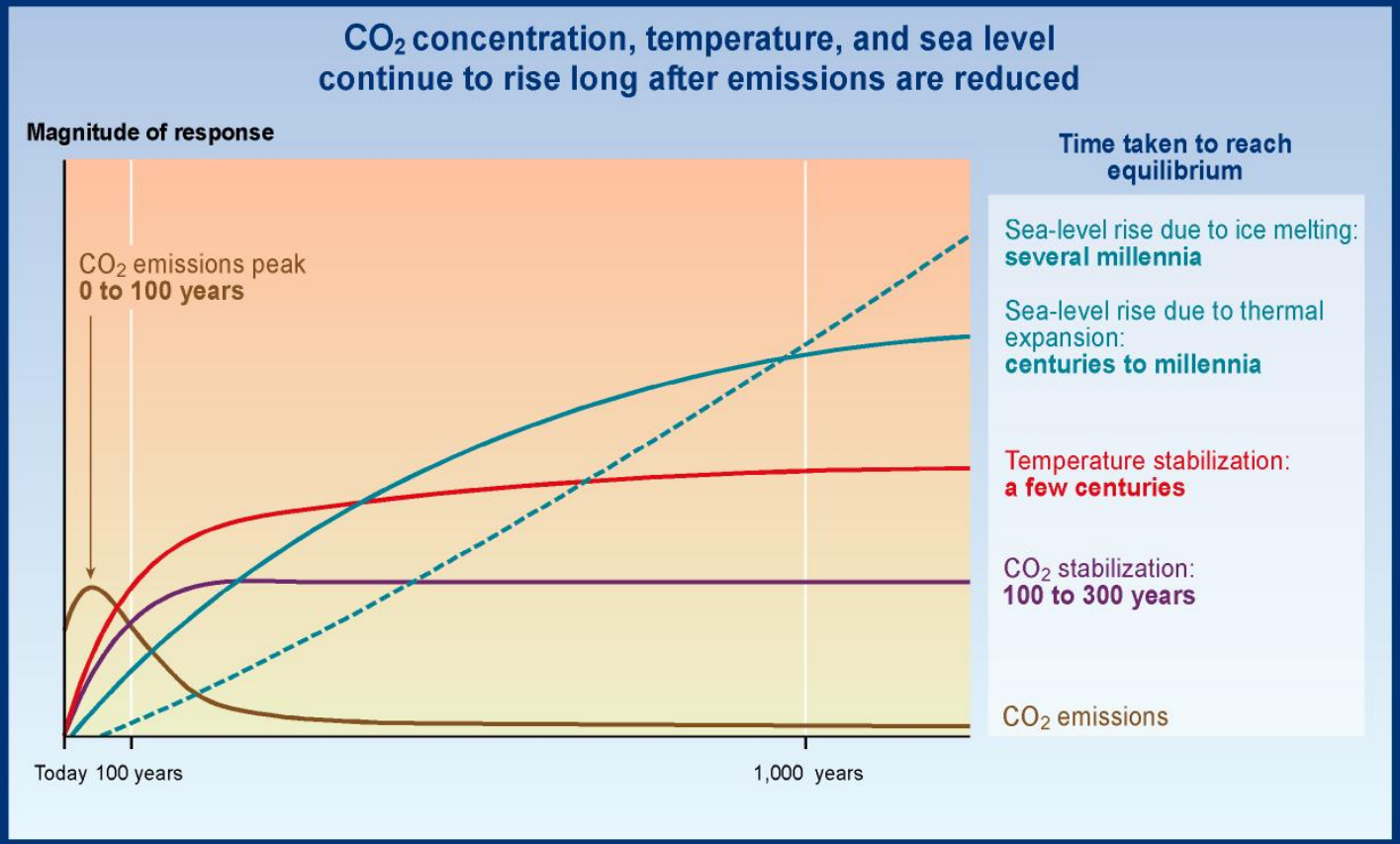


EXECUTIVE ORDER S-3-05

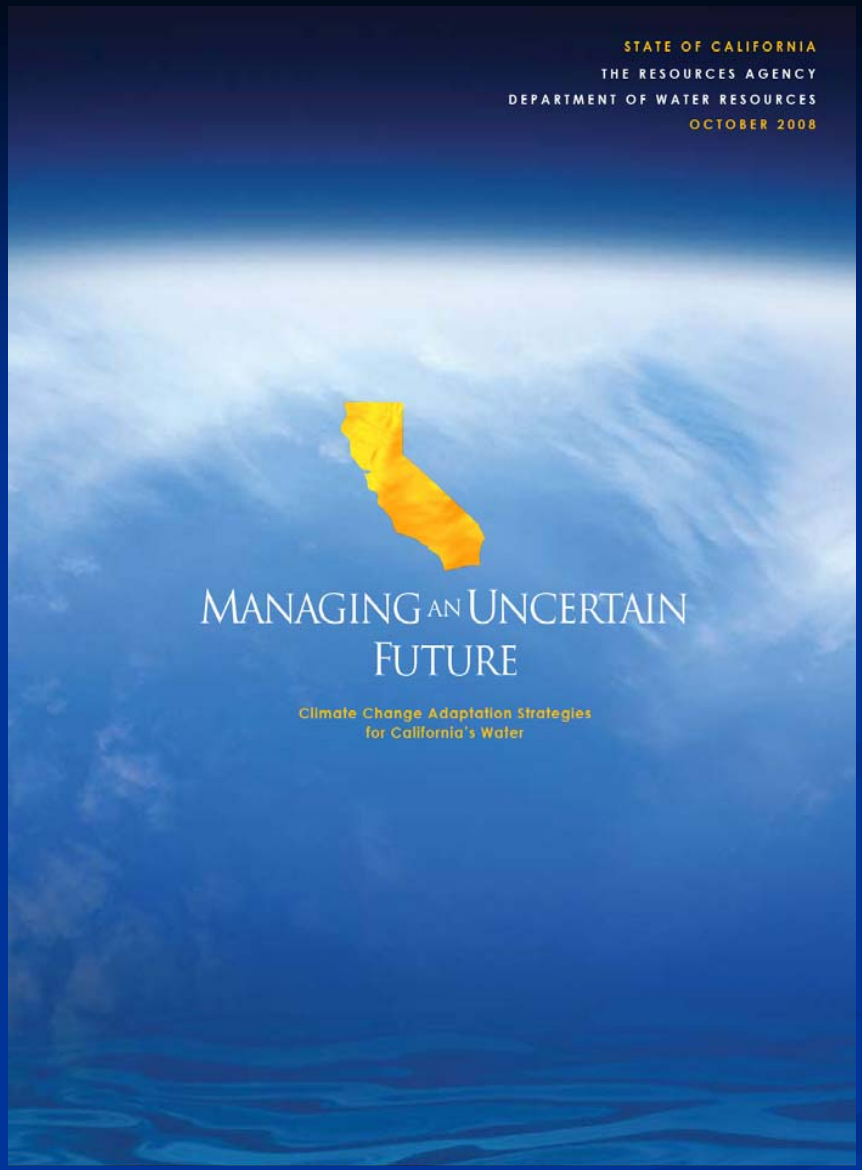
June 1, 2005

- Recognizes global climate change and its impacts on California.
- Establishes aggressive greenhouse gas emission reduction targets for the State.
- Requires biennial assessments of climate change impacts and the development of impact mitigation/adaptation plans.
- Requires the formation of an interagency team to implement the Governor's Order.

Adaptation is a Necessity



SYR - FIGURE 5-2



Climate Change Water Adaptation White Paper

www.climatechange.water.ca.gov

DEPARTMENT OF
WATER RESOURCES

Comprehensive Strategy for Adaptation

- **Regional Strategies**
  - Fully implement Integrated Regional Water Management (IRWM)
  - Aggressively increase water use efficiency

DEPARTMENT OF WATER RESOURCES

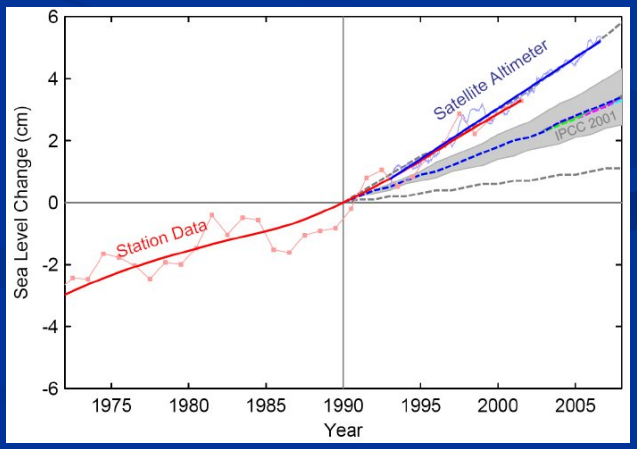
Comprehensive Strategy for Adaptation

- **Statewide Strategies**
  - Practice and promote integrated flood management
  - Enhance and sustain ecosystems
  - Advance and expand conjunctive management of surface and groundwater resources
  - Fix the Delta

DEPARTMENT OF WATER RESOURCES

Comprehensive Strategy for Adaptation

- **Improving Management and Decision-Making Capacity**
  - Preserve, upgrade, and increase monitoring and data analysis and management
  - Plan for and adapt to sea level rise
  - Identify and fund focused climate change impacts and adaptation research and analysis



DEPARTMENT OF
WATER RESOURCES

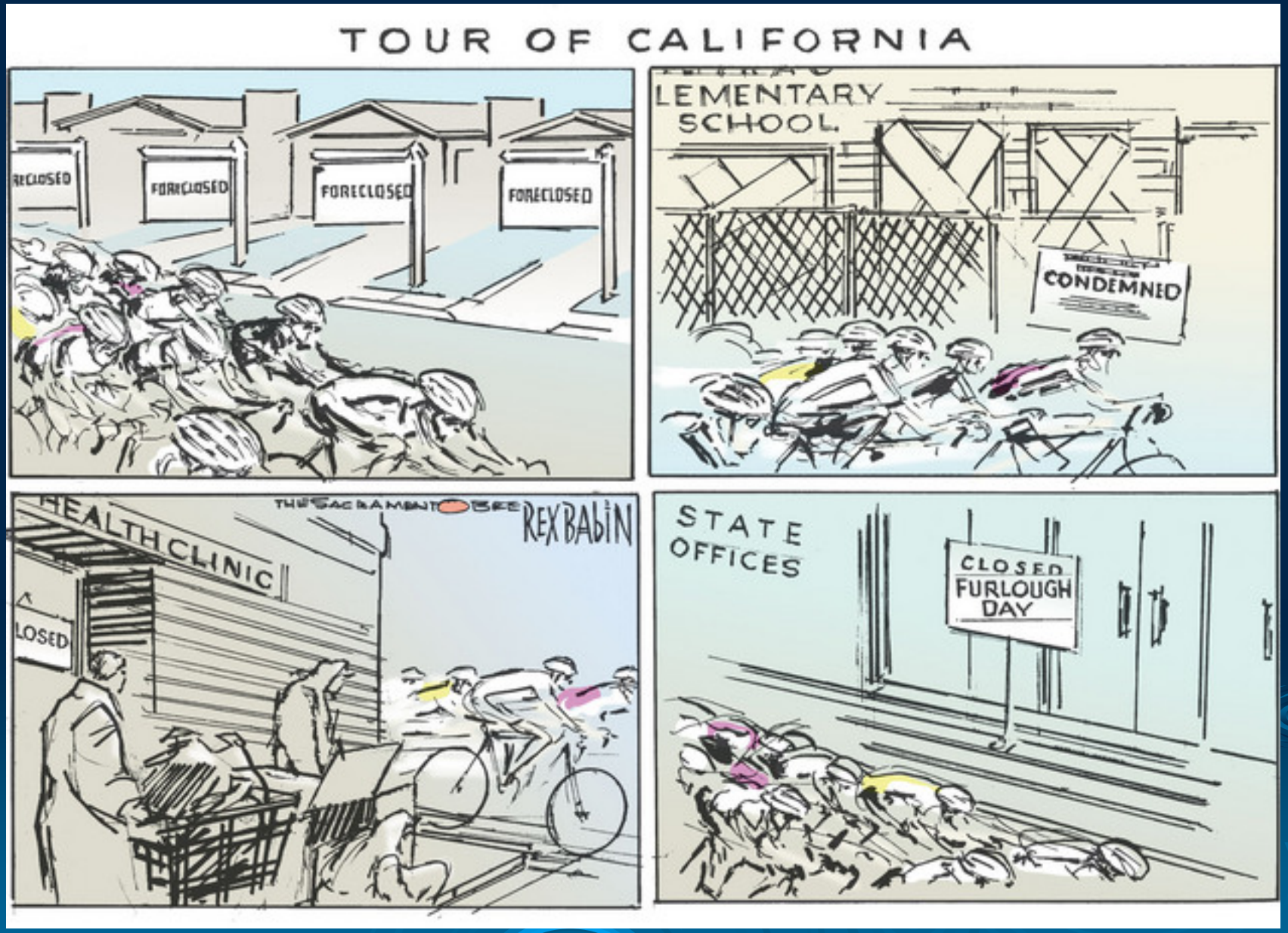
Comprehensive Strategy for Adaptation

Investment Strategies

- Provide sustainable funding for statewide and integrated regional water management

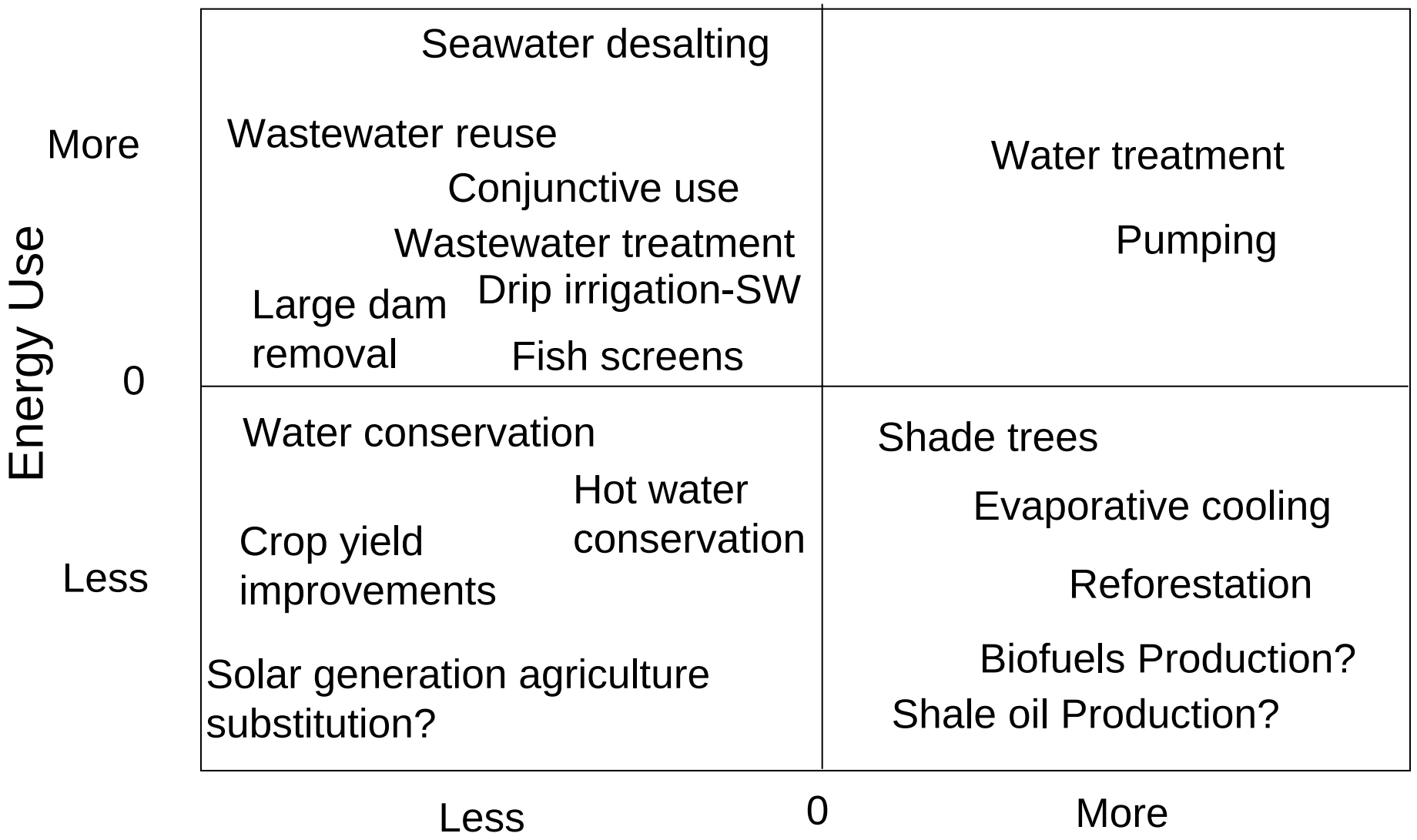
California Water Management and Climate Change

- Climate change presents significant challenges for the management of California's water resources.
- California water managers must focus on mitigation and especially adaptation.
- Climate change responses must be thoughtfully integrated with water supply reliability, environmental protection, public safety, and public health actions.
- We must embrace an entirely new way of thinking about water resources planning and management.


TOUR OF CALIFORNIA
RECLOSED
FORECLOSED
FORECLOSED
FORECLOSED
LEMENTARY SCHOOL
CONDEMNED
HEALTH CLINIC
LOSED
THE SACRAMENTO BEE
REX BABIN
STATE OFFICES
CLOSED
FURLOUGH DAY

John T. Andrew, P.E.
Assistant Deputy Director
Department of Water Resources
(916) 651-9657
jandrew@water.ca.gov

Common Energy-Water Tradeoffs



Jay Lund, UCD