Economic and Environmental Sustainability
Energy, Water & Environmental Sustainability Council
February 15, 2013
Water Variability and Use

Yearly Total Delta Outflow
(Calendar Year)

Average annual runoff (land area)
- 66% (20%)
- 24% (20%)
- 9% (20%)
- 1% (10%)
- 0.1% (30%)

[Map of California with Average Annual Runoff shading]

[Bar chart showing yearly total delta outflow with data points from 1922 to 2003]
California's 21st century economic and ecological water needs are sustainably met. All had unintended consequences, and all are less reliable today.
Factors Contributing to Uncertain Water Supply

- Increasing population
- Aging infrastructure
- Groundwater overdraft
- Degraded ecosystems
- Increasing conflict
- Uncertainty due to climate change
An Unreliable Statewide Supply

- California currently meets 5-10% of its annual needs by overdrafting groundwater
- Deficit spending & uncertain supplies could lead to annual water deficit of 5 MAF
- Prolonged drought, flood or seismic event could make this worse
Change in Groundwater Storage for the Central Valley

Source:
RMC analysis of CZVSM historical simulation results, 2012.

Legend:
- Annual Storage Change
- Cumulative Storage Change
Groundwater Trends

Subsidence

- Area = Rhode Island & Connecticut
- 1 foot to over 30 feet
- Critical infrastructure and energy impacts
Current Conditions

- Environmental Decline
- Conflict
- Increased Variability
- Includes overdraft (deficit spending)
Chronic Underinvestment in Water Infrastructure

Much of CA’s water infrastructure is over 100 years old

- More than 1,300 local, state, and federal reservoirs
- 2 major water development systems
- SWP: 34 reservoirs, 25 dams, 20 pumping plants, 4 pumping-generating plants, 701 miles of canals and pipelines, 1,595 miles of levees
- CVP: 20 dams and reservoirs, 11 power plants, 500 miles of major canal as well as conduits, tunnels, and related facilities.

California has a $12 billion annual deficit in funding for critical water infrastructure.
Business Impacts of Water Unreliability

- Pay more, get less water
  - 20 percent more in dry years
- Increased risk
  - Risk and uncertainty from external factors
- Economic impacts
  - 2009 drought = $1.7 billion in higher energy costs, $300 million in lost income, 50% of population under water rationing
A Lesson From Australia

If a similar drought to Australia’s 10-year drought happened in California, what would that mean to the economy?

• $500 billion total negative economic impact
• 114,000 jobs lost per year at its peak
• 30 percent reduction in California’s agricultural output
Solving California’s Water Crisis

• No region’s water supply is self-sufficient
• Water management actions and issues are interconnected
• No single strategy can meet all needs
• Integrated, diverse strategies needed
California Water Foundation

Achieving sustainable water management through:

1. **Efficiency**: Make every drop of water count
2. **Groundwater**: Improve groundwater management
3. **Rivers**: Protect and restore river systems
4. **Integrated Management**: Promote regional solutions
Improve Water Use Efficiency

• Advance water use efficiency practices and technologies
  – Agricultural efficiency
  – Urban efficiency

• Promote new regional water supply opportunities
  – Recycled water
  – Stormwater capture
Water-Energy Nexus

- Water Use accounts for 19% of electricity use, 30% of natural gas, and 88 billion gallons of diesel fuel each year (CEC, 2005)

- Saving water saves energy
  - Southern California Edison Leak Detection Program (annual savings): nearly 83 million gallons of potable water and 81 metric tons of carbon dioxide emissions avoided (ACEEE, 2013)
  - Santa Clara Valley Water District water use efficiency and recycled water programs (1992-2009 savings): 527,000 ac-ft of water and 625,000 metric tons of CO2 (SCVWD, 2011)
  - By 2020, recycled water in the Santa Clara Valley Water District reduces CO2 eq by 2,280 metric tons (The Pacific Institute)
Improve Groundwater Management

• Improve regional management
• Eliminate overdraft
• Increase supplies
Restore River Systems

- Integrated flood management
- Reservoir reoperation
Advance Integrated Water Management

• Promote new and broad-based coalitions
• Develop long-term funding
• Support integrated resource planning
• Promote innovative technologies
Water Management Opportunities

- **Water Use Efficiency** – 5.0 MAF
  - Urban efficiency – 2.1 MAF
  - Agricultural efficiency – 0.6 MAF
  - Reuse and recycling – 1.5 MAF
  - Stormwater capture - 0.8 MAF

- **Conjunctive management and groundwater storage** – 1.0 MAF

**CWF solutions could provide California with an additional 6 MAF of water each year**
Sustainability

• Resilient ecosystems
• Diverse and adaptable water supply
• Meet current and future economic and ecosystem water needs