PRIORITIES FOR CLIMATE ADAPTATION

DEIRDRE DESJARDINS / CALIFORNIA WATER RESEARCH
Water Resilience Portfolio Climate vulnerabilities

South Coast Region Vulnerability Indicators

- Drinking Water Threats: 3
- Water Scarcity: 2
- Unsafe Beach Conditions: 2
- Impaired Water Quality: 3
- Flood Risks: 2
- Limited Drought Readiness: 1
- Threats to Ecosystem Vitality: 2
- Challenges to Sustainable Groundwater Management: 2
- Sea Level Rise Vulnerability: 4
- Affordability Challenges: 3
- Threats to Agricultural Sustainability: 2
- Aging Infrastructure of Statewide Significance: 2
POPULATION GROWTH

- Draft Water Resilience Portfolio
  California is projected to add another 10 million residents by 2050. This growth could increase water demand in communities in that period by one to six million acre-feet, according to state estimates.

- Department of Finance (2020-21 Budget)
  The net annual population increase is expected to fall to less than 100,000 by 2045, and close to zero net growth by 2060. Fewer births lead to fewer adults, which compounds the slowing growth over time. The current projections series reach a total population of 45 million by 2060, rather than 50 million in the previous iteration.
Annual Population Change: California 1990-2060

Components of Change (Thousands)

Estimates | Projections

1990 | 2000 | 2010 | 2020 | 2030 | 2040 | 2050 | 2060

Net Migration | Births | Deaths | Net

DOF Population Change projections (2020)
STATE RESILIENCY PRINCIPLES

- Adopted by the State of California’s Integrated Climate Adaptation and Resiliency Program (OPR.)

- First principle:

- Prioritize integrated climate actions, those that both reduce greenhouse gas emissions and build resilience to climate impacts, as well as actions that provide multiple benefits.
Energy Intensity of Selected Water Supply Sources in Southern California

Source: Dr. Robert Wilkinson
RECYCLED WATER

- Draft Water Resilience Portfolio
- Goal: recycle or reuse 2.5 million acre-feet by 2030
In the past few decades, California has added nearly 6 million acre-feet of new water storage capacity, with the biggest gains being realized from groundwater storage projects.

“The idea that surface storage is a silver bullet for the state's water problems is a myth founded on the erroneous notion that large, unregulated amounts of water are available to fill new storage at a reasonable cost. It persists because most people do not recognize the technical limitations and because a few local interests stand to gain from state subsidies for new facilities...Surface storage is a costly way to expand water supplies in part because most favorable reservoir locations already have large dams.”

—ELLEN HANAK ET AL., CALIFORNIA WATER MYTHS, PUBLIC POLICY INSTITUTE OF CALIFORNIA, 2009
Aris Georgakakos, 2012

... the current policy, which is tuned to the historical hydrologic regime, is unable to cope effectively with the more variable future climate. As a result, the water supply, energy, and environmental water uses cannot be effectively satisfied during future droughts, exposing the system to higher vulnerabilities and risks.

Francis Chung, 2009

We recommend that DWR develop a reoperation strategy for the CVP and SWP that includes modified operations scenarios to mitigate the effects of dead storage during climate change conditions prior to release of any studies (either these or BDCP) that include climate change.
US Geological Survey


Dynamic modeling integrating the effects of SLR, tides, waves, storms, and coastal change (i.e. beach erosion and cliff retreat)

Estimated over $150 billion of property equating to more than 6% of the state’s GDP and 600,000 people could be impacted by dynamic flooding by 2100
# Sea Level Rise at Santa Monica (Feet)

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North Delta Intakes

Delta Conveyance Design and Construction Authority has decided to keep intakes in same location as twin tunnels project.

For the twin tunnels project, only one analysis of performance of intakes with high sea level rise was done in 2010 (55 inches.) The simulation did not consider potential levee failure or island flooding in the North Delta.
MODEL GRID FOR 2010 SIMULATION OF PERFORMANCE WITH SEA LEVEL RISE AND ISLAND FLOODING
ADAPTATION CONSIDERATIONS

- “Resilient” tunnel is a hard adaptation that will start to be affected by salinity intrusion with high sea level rise.
- Degradation likely to be experienced between 1.5-2 m of sea level rise.
- Coastal flooding will become a major issue at the same point in time.
- Could overwhelm capacity to adapt for some areas.
CONCLUSION

- For long term sea level rise, only truly “resilient” investments are local supplies
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