State’s highly variable climate was on display this year

- 5-year drought ended, but had some lasting impacts
  - Lowered groundwater levels, stressed freshwater species

- Near record precipitation
  - Stressed dams, levees
  - Added more fuel to fire-prone landscapes

Oroville Dam spillway failure
A road map of water priorities for California

- Ensure clean and reliable water supplies
  - State must improve capacity to store water, manage demands, provide safe drinking water to underserved communities

- Enhance the environment
  - Health crisis in freshwater ecosystems and headwater forests highlights need for new approaches

- Tackle problems in key watersheds
  - Big decisions lie ahead on supply, environment for Colorado River and Sacramento–San Joaquin Delta
Outline

- Ensure clean and reliable water supplies
- Enhance the natural environment
- Tackle problems in key watersheds
Changing climate will affect snowpack, floods, drought

- State’s dams designed, operated for past climate patterns
- Systems inadequate for recharging aquifers in wet years

Folsom reservoir in drought

Oroville Dam spillway, 2017
California needs forward-looking storage management

- Manage surface and groundwater together
- Remove barriers to groundwater recharge
- Evaluate, modernize dams to adapt to changing climate

Rising temperatures will shrink Sierra snowpack

Source: Cayan et al. 2016
Managing demand can improve supply reliability

- Plan ahead for urban supply shortages
  - Balance short-term conservation and long-term efficiency

- Manage agricultural demand
  - Reducing groundwater overdraft will require better accounting, basin-scale approaches

- Make it easier to trade water
  - Process is too complex, especially for short-term drought-related trades
All Californians deserve safe drinking water

- Several hundred small systems unable to provide safe drinking water
  - Improve estimates of population at risk
  - Prioritize support for underserved communities
  - Protect and mitigate dry wells during droughts

East Porterville gets safe drinking water
Ensure clean and reliable water supplies
Enhance the natural environment
Tackle problems in key watersheds
Headwater forests are overly dense, in poor health

- More small trees, fewer large ones
- Latest drought effects:
  - 15 million more dead trees per year, most from beetle outbreak
  - Two of largest wildfires in state history
- Forest benefits at risk

Recent tree die-off in Sierra headwaters
Forest health should be a top priority for management

- Expand pace and scale of treatments (managed fire, mechanical thinning)
- Improve accounting of at-risk forests, treatments used
- Offset costs by bundling harvest with other treatments
- Use new collaborative tools
Troubled freshwater ecosystems need more reliable protection, better water management

- Promote projects that benefit people and nature
- Develop watershed-scale plans to build ecosystem health
- Adopt ecosystem water budgets for key watersheds
- Create more reliable sources of funding
Outline

- Ensure clean and reliable water supplies
- Enhance the natural environment
- Tackle problems in key watersheds
Difficult decisions lie ahead for two key watersheds

- Over-allocation, drought affects Colorado River basin—a major water supply for Southern California
- Reliability of Delta water supply at risk from climate change, levee failures
- Complex environmental problems affect both basins
Collaboration is key to Colorado River solutions

- Work with other states to foster flexible solutions, avoid mandatory water cuts
- Support implementation of agreement with Mexico
- Build momentum for addressing health and environment concerns at Salton Sea

Hoover Dam in drought
The Delta is a complex, enduring water challenge

- It’s time to decide: what is the future of Delta water supply?
- With or without tunnels project, priorities include:
  - Changing focus from species to ecosystems
  - Adopting comprehensive plan for Delta levees
Thank you!
About these slides

These slides were created to accompany a presentation. They do not include full documentation of sources, data samples, methods, and interpretations. To avoid misinterpretations, please contact:

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Thank you for your interest in this work.