

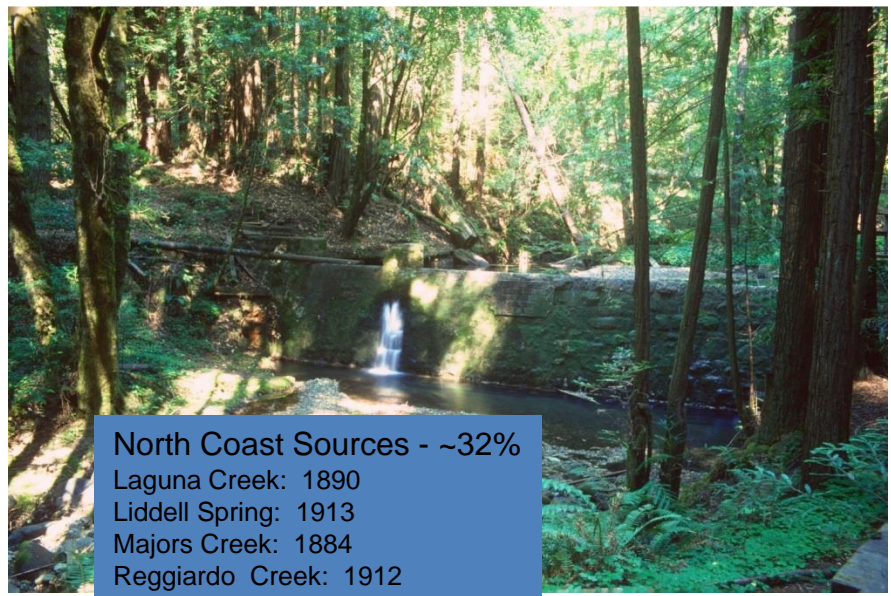
City of Santa Cruz Water Supply Planning

Saturday, April 27, 2019, 10:00am
League of Women Voters - Capitola Council Chambers

Our Water, Our Future

Presentation Objectives

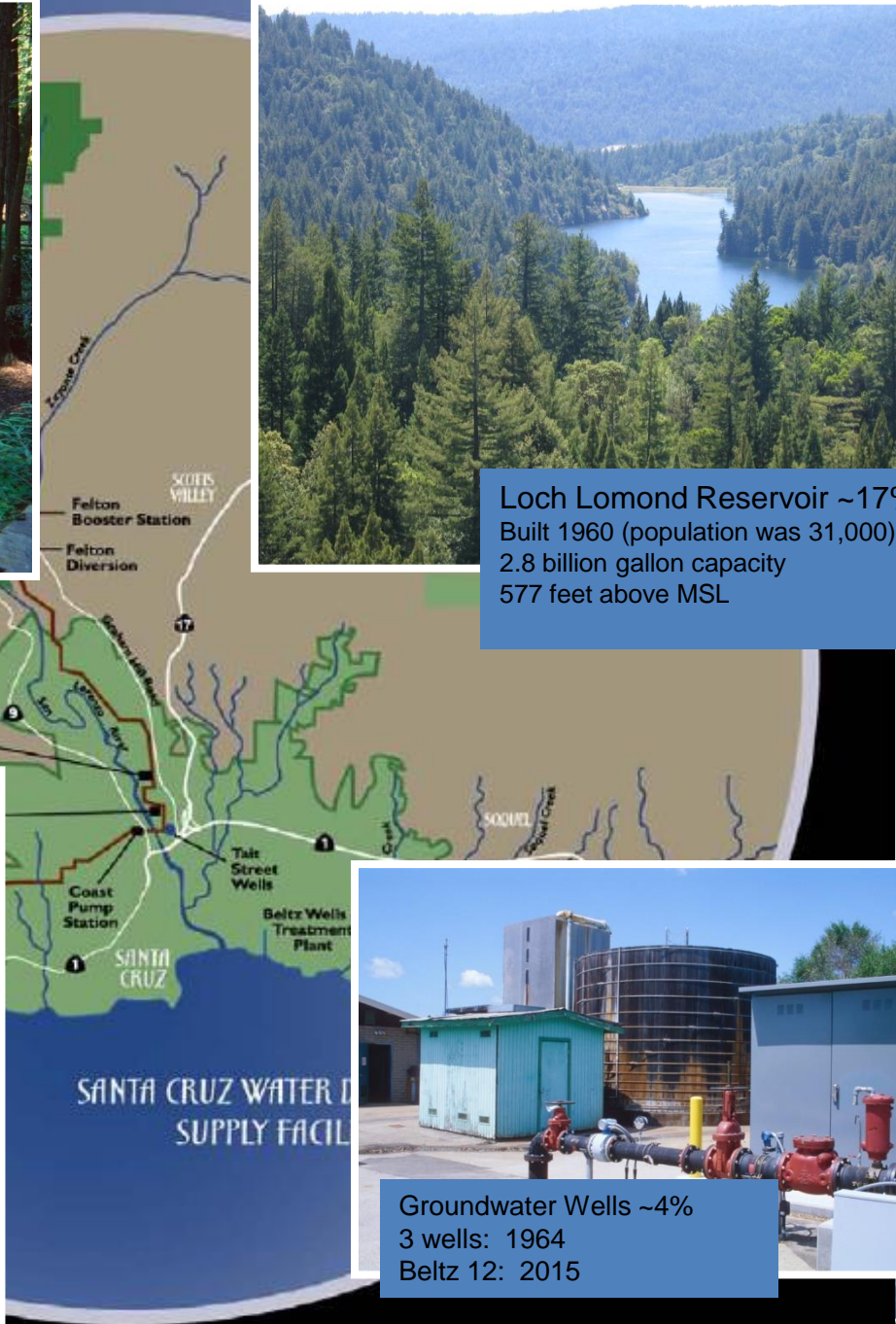
- Introduction to the City of Santa Cruz Water Department
- Our Water Challenges
- Approaches to Addressing these Challenges



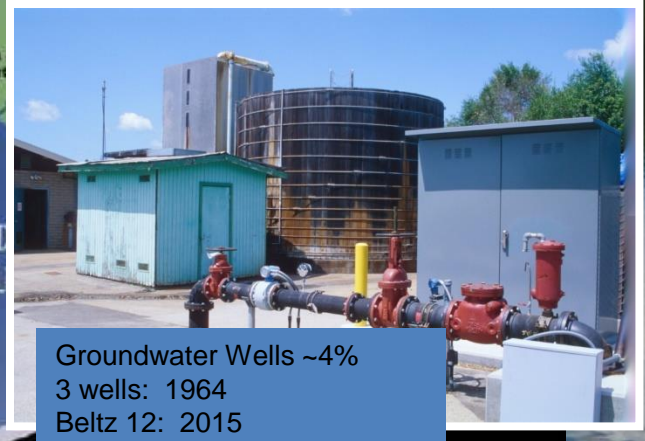
North Coast Sources - ~32%
 Laguna Creek: 1890
 Liddell Spring: 1913
 Majors Creek: 1884
 Reggiardo Creek: 1912



Loch Lomond Reservoir ~17%
 Built 1960 (population was 31,000)
 2.8 billion gallon capacity
 577 feet above MSL



San Lorenzo River ~47%
 Tait St Intake: 1924
 Felton Diversion: 1976

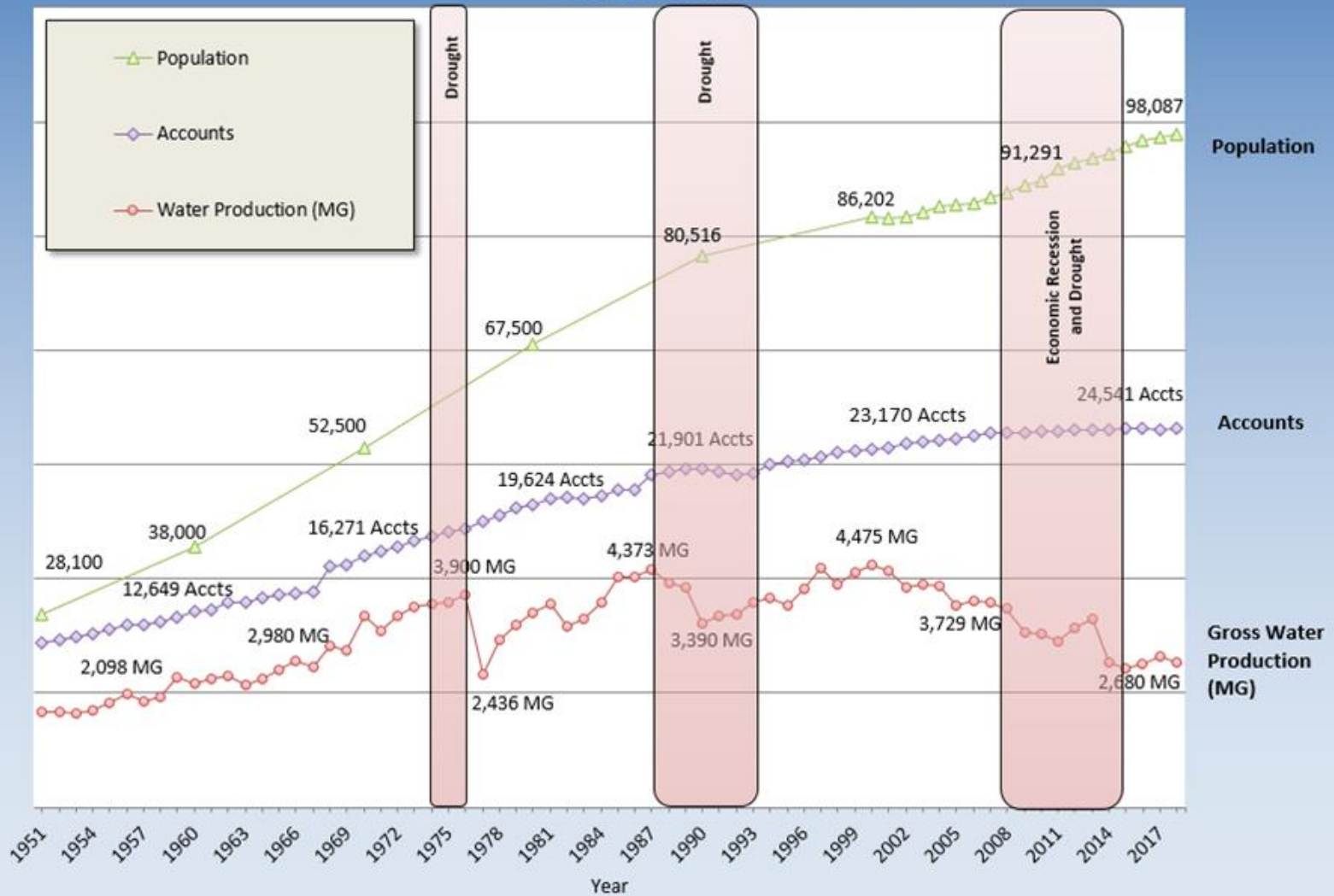


Groundwater Wells ~4%
 3 wells: 1964
 Beltz 12: 2015

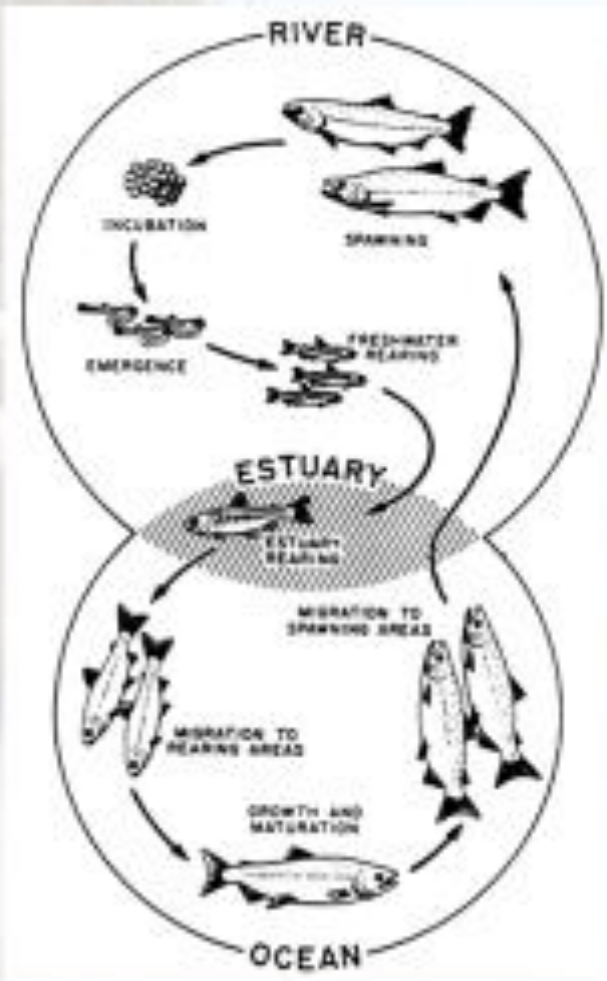
Our Challenges

- Population
- Aging Infrastructure (1884 -)
- Unsustainable Groundwater Pumping
- Endangered Species/Environmental Needs
- Climate Change

Population, Accounts, Water Production, and Rainfall 1951-2018 City of Santa Cruz

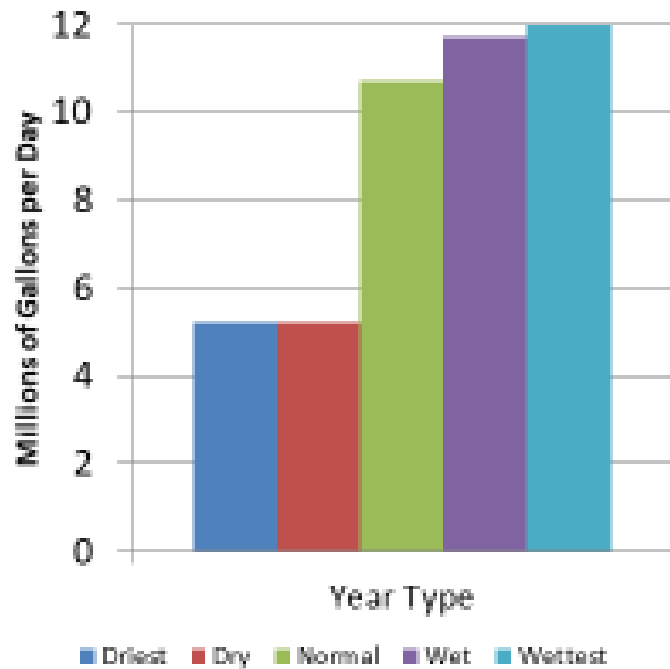


Fish Flow Commitments

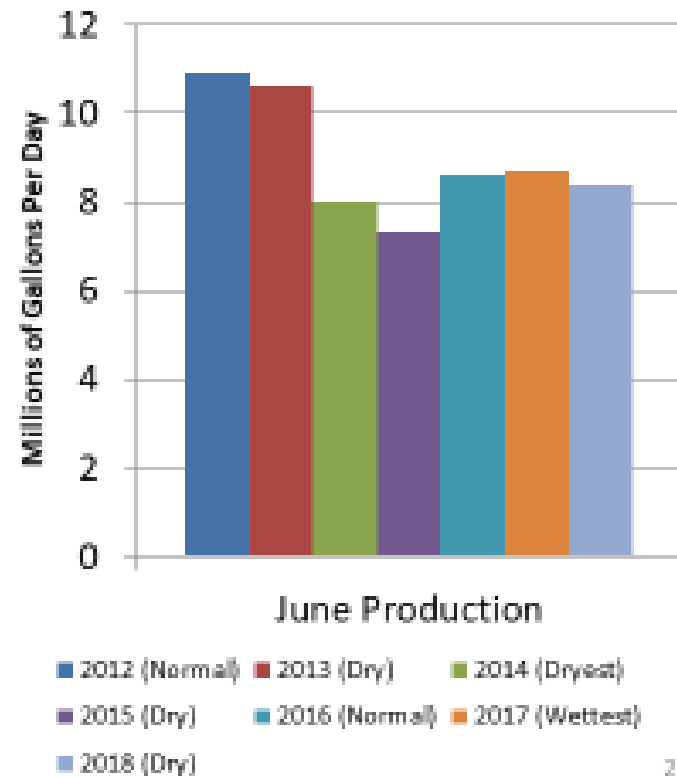


Putting the City's Summer Fish Flow Commitments in Context

June Fish Flow Releases

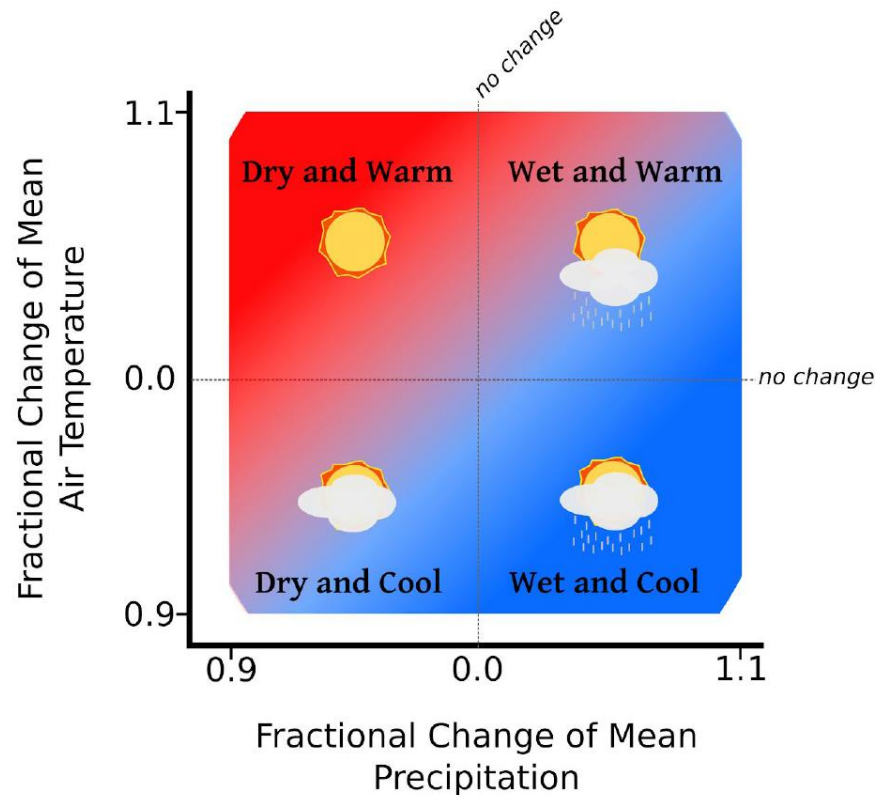


June Water System Production



Climate Change

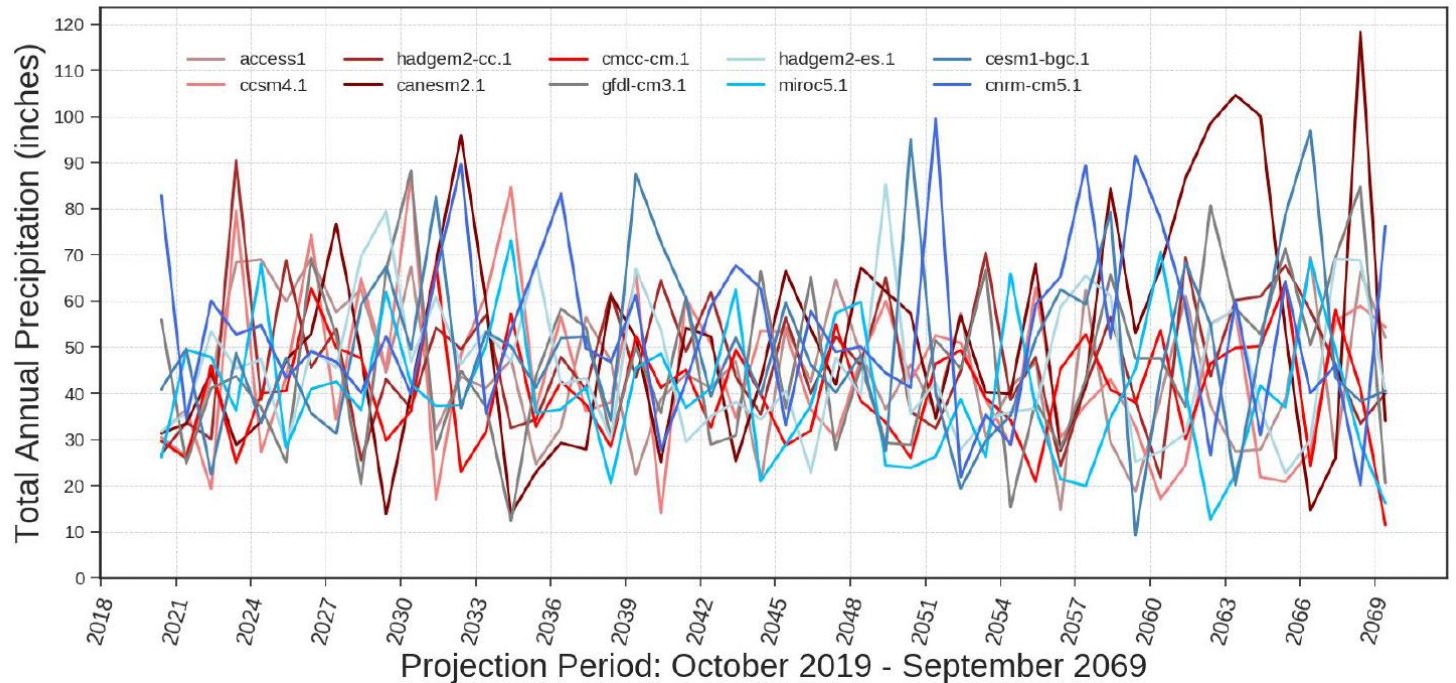
Where Are We Headed by the 22nd Century?



PROJECTED CLIMATE

What do climate projections suggest in terms of the S.C. climate over next 50 years?

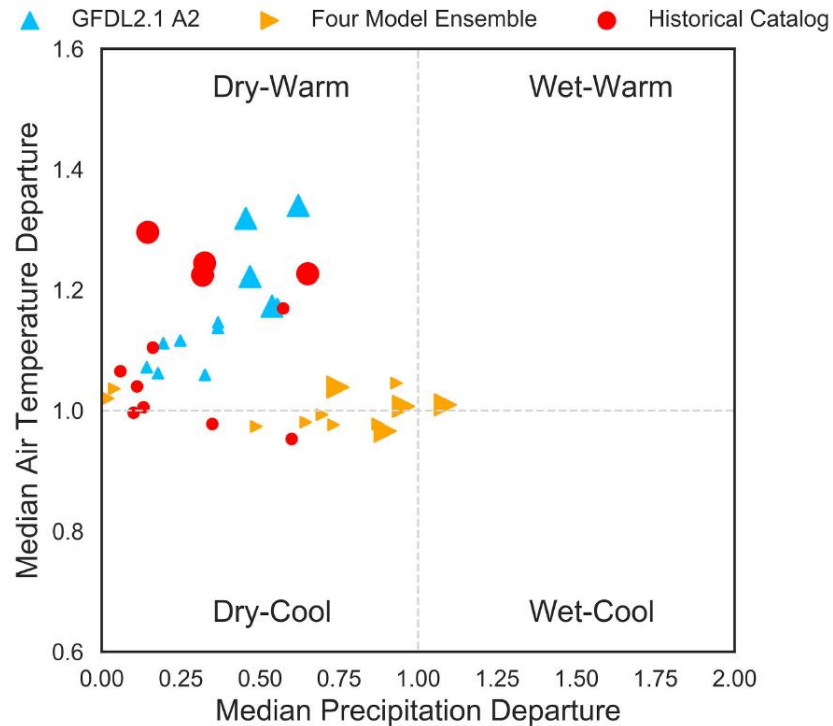
Projected Annual Precipitation for 10 Downscaled GCMs RCP 8.5



PROJECTED CLIMATE

What do climate projections suggest in terms of the S.C. climate over next 50 years?

Monthly Departure for Climate Change Projections from Maurer et al. (2002) used for Santa Cruz Water Supply Planning



INTRODUCTION

What do climate science and scientists expect for California in the future?



Wetter, Drier, or Both?

INCREASING PRECIPITATION EXTREMES IN CALIFORNIA

California's climate has always featured wide swings between drought and flood. But in a warming world, precipitation will likely become even more volatile — with large increases in the frequency of extreme wet events, extreme dry events, and rapid transitions between them. These changes will pose major challenges for water, fire, and emergency management in 21st-century California.

Extreme Dry Years

Low November–March precipitation totals for these years resemble 2013–14 or 1976–77, the driest year in modern California history.

FREQUENCY 1895–2017 **1/100 YEARS**

FUTURE RISK BY 2100



KEY IMPACT WATER SCARCITY

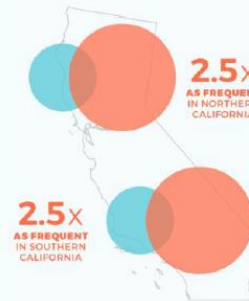
Available surface water may not meet human demands, leading to water shortages or unsustainable use of groundwater. Ecosystems also suffer, as low river flows can harm fish and drought-stressed vegetation can fuel wildfires.

Extreme Wet Years

In these years, the November–March period is as wet as in 2016–17, when statewide precipitation was 54% greater than average.

FREQUENCY 1895–2017 **4/100 YEARS**

FUTURE RISK BY 2100



KEY IMPACT INFRASTRUCTURE STRESS

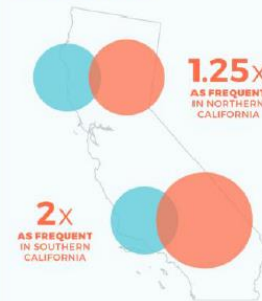
Runoff from heavy rains can stress levees, dams, and other flood control structures. Warmer temperatures amplify this effect by causing more precipitation to fall as rain, which immediately flows into rivers and streams, instead of snow.

Dry-to-Wet Whiplash

This scenario represents the transition from a very dry year to a very wet one, as occurred between 2015–16 and 2016–17.

FREQUENCY 1895–2017 **4/100 YEARS**

FUTURE RISK BY 2100



KEY IMPACT MUDSLIDES

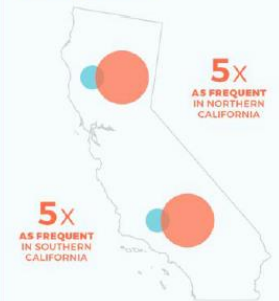
Although a very wet year following a drought can boost water supplies, a sudden transition from dry to wet conditions can cause its own problems. For example, heavy rains can result in mudslides and debris flows, especially near recent wildfire burn scars.

Severe Storm Sequence

In this scenario, 40-day precipitation totals are similar to those during California's "Great Flood of 1862."

FREQUENCY 1895–2017 **1/200 YEARS**

FUTURE RISK BY 2100



KEY IMPACT CATASTROPHIC FLOODING

Such an event would cause inundation of a magnitude not experienced in modern California. The Great Flood of 1862 flooded much of the Central Valley and swaths of Los Angeles and Orange Counties now home to millions of people.



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Find more on this project: www.ioes.ucla.edu/project/future-extreme-precipitation-california

Source: <https://www.ioes.ucla.edu/article/study-forecasts-a-severe-climate-future-for-california/>

Our Approach to Water Supply Reliability

14 Citizens of Santa
Cruz and Live Oak

Appointed by Council

Representing the
Chamber, Desal Alts,
Sierra Club, Surfrider,
Sustainable Water
Coalition, the Water
Commission and 3
community-at-large
members.

*The Water Supply Advisory Committee
2014 - 2015*



Not Pictured Peter Beckman and Charlie
Keutmann

WSAC's Problem Statement

July 2015

- Limited Storage
- Fish Flow Requirements & Potential climate change impacts
- Resulting peak-season gap: 1.2 billion gallons worst case
- Water conservation alone is not enough

Our Approach To Water Reliability

Conservation



Water Transfers

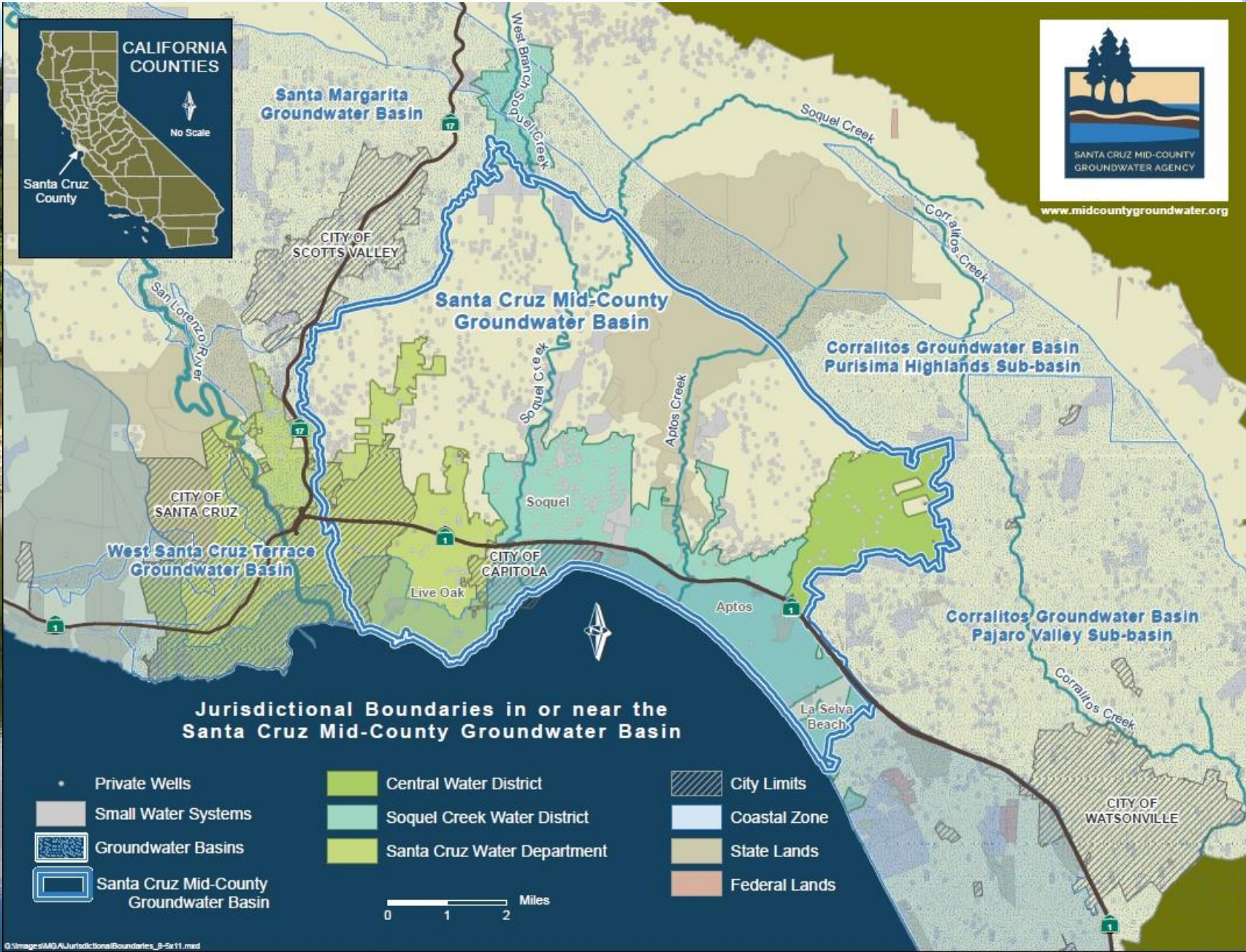


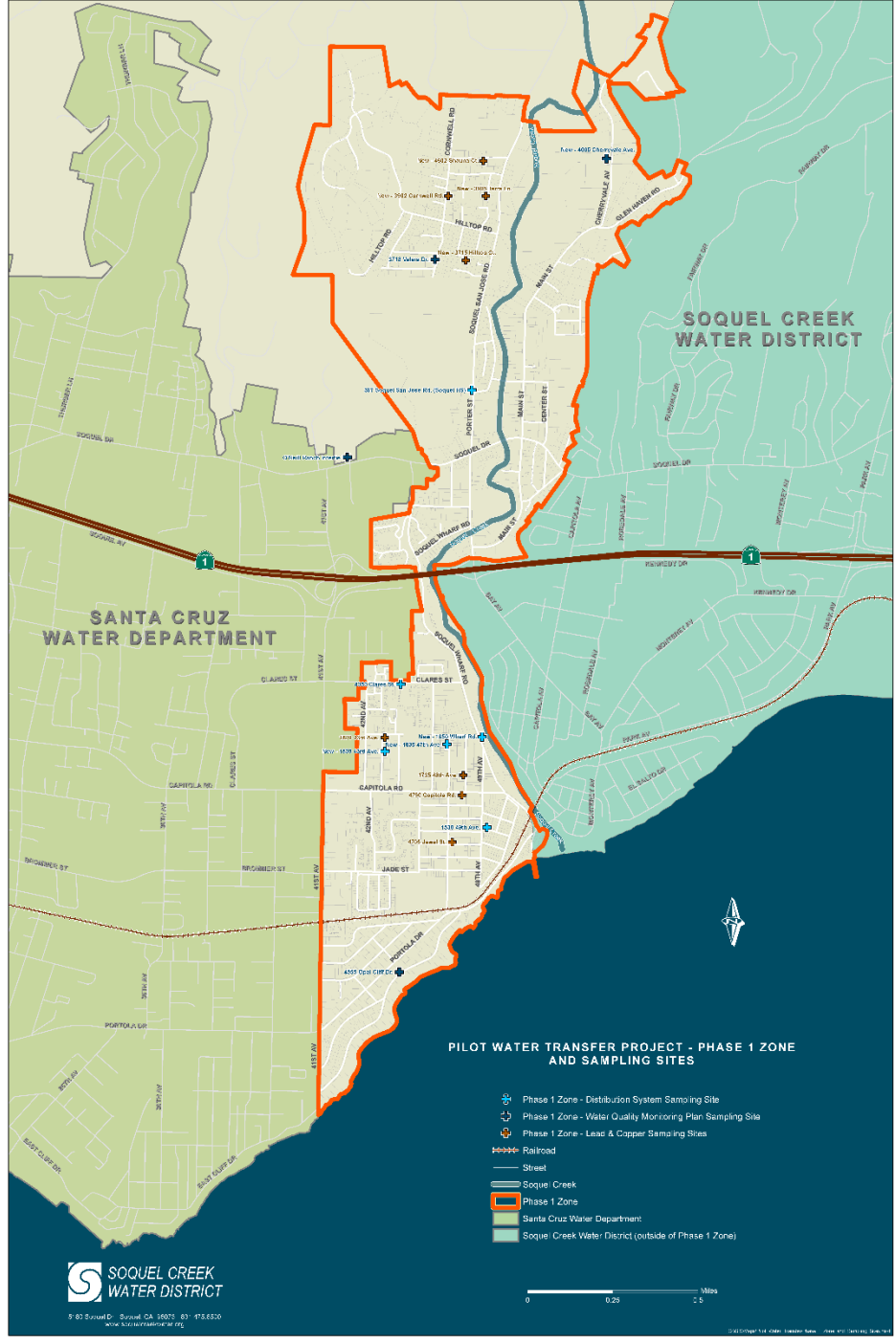
Aquifer Storage & Recovery



Recycled Water/Desalination

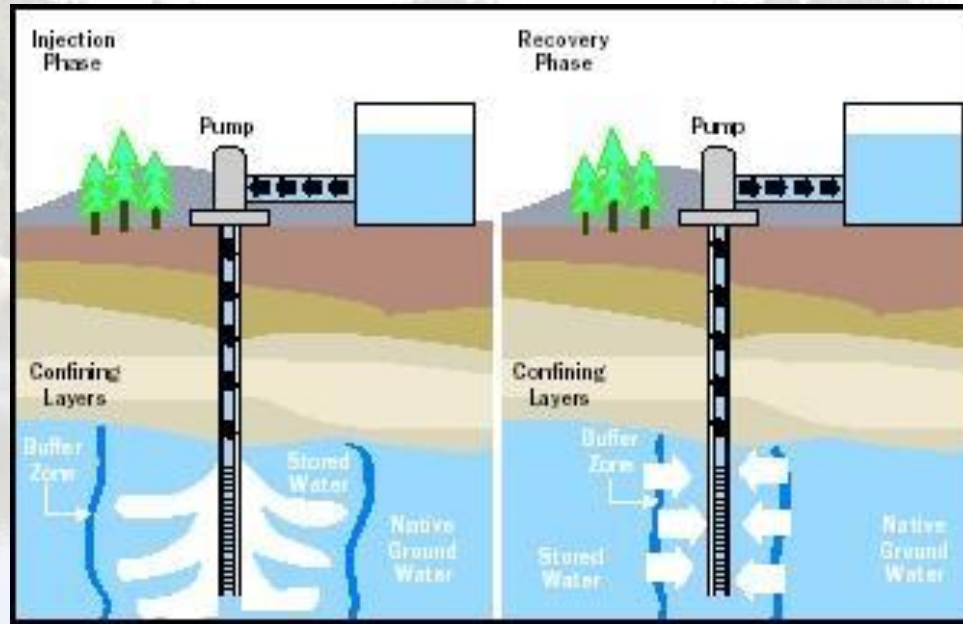






Water Transfers Pilot Phase 1

Aquifer Storage and Recovery



Evaluate the feasibility of storing water in regional aquifers for future use during drought.

Key Milestones

Implement Conservation Programs Ongoing
→

Pilot Test Water Transfers with Neighboring Agencies 2015 - 2020
→

Pilot Test Aquifer Storage & Recovery 2019 - 2021
→

Develop Full Scale Project(s) 2021 - 2023
→



Thank You!

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Our Water, Our Future



