

Sonoma Valley Water Supply Conditions & Water Management Programs



**State of Sonoma
Valley Water
Supply**

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Chief Engineer
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About the Sonoma County Water Agency

Core Business Functions Align with Integrated Management:

- Wholesale water supplier to over 600,000 people - Sonoma & Marin Counties
- Flood Control
- Sanitation - including Sonoma Valley County Sanitation District

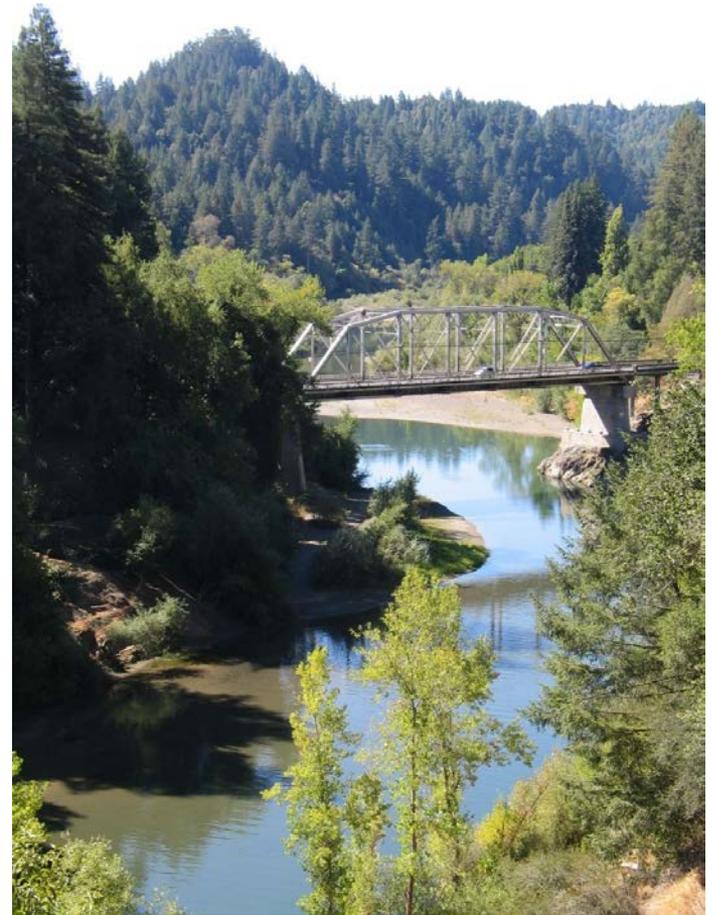
Our Approach to Business:

- Integrated Resource Management
- Partnerships
- Innovation

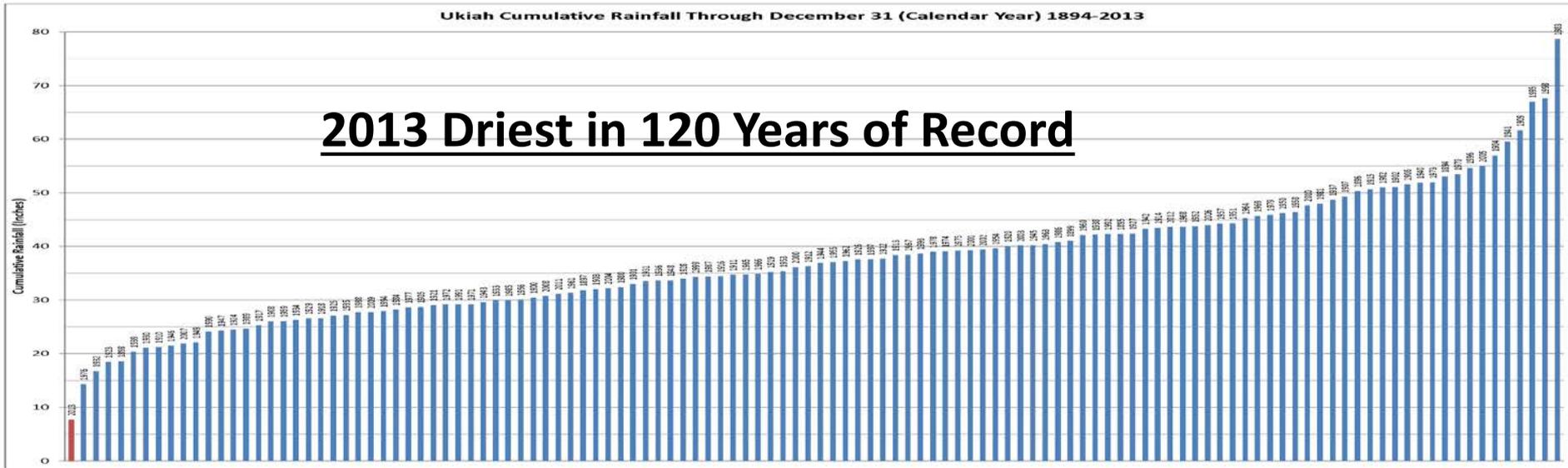


Topics

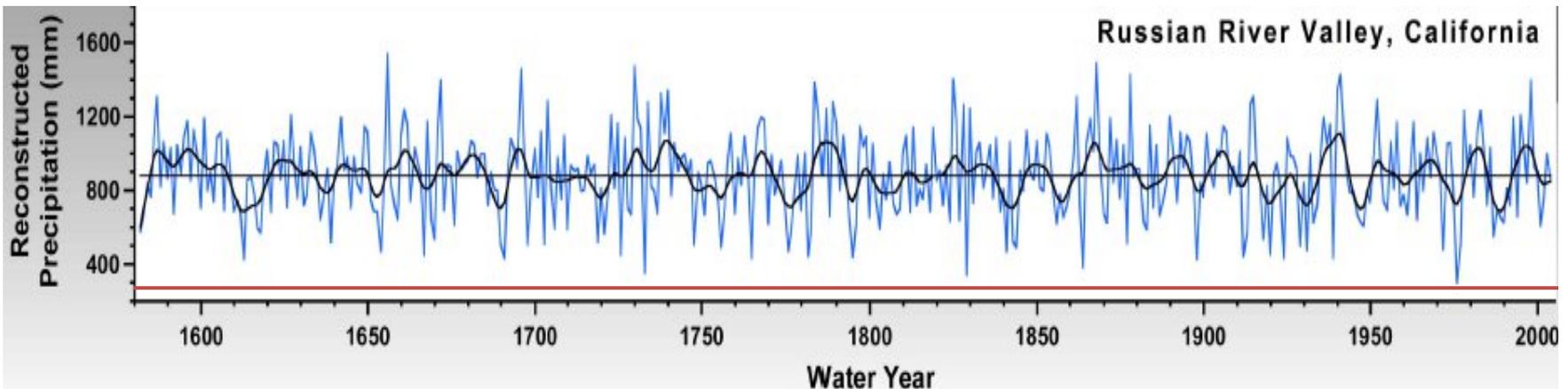
- Regional Context: 2012-2014 Drought - Russian River System
 - U.S. Drought Monitor: “Extreme Drought Conditions” - Sonoma Co.
- Building Resiliency Through Integrated Water Resource Management
- Sonoma Valley Water Supply Issues & Water Management Programs



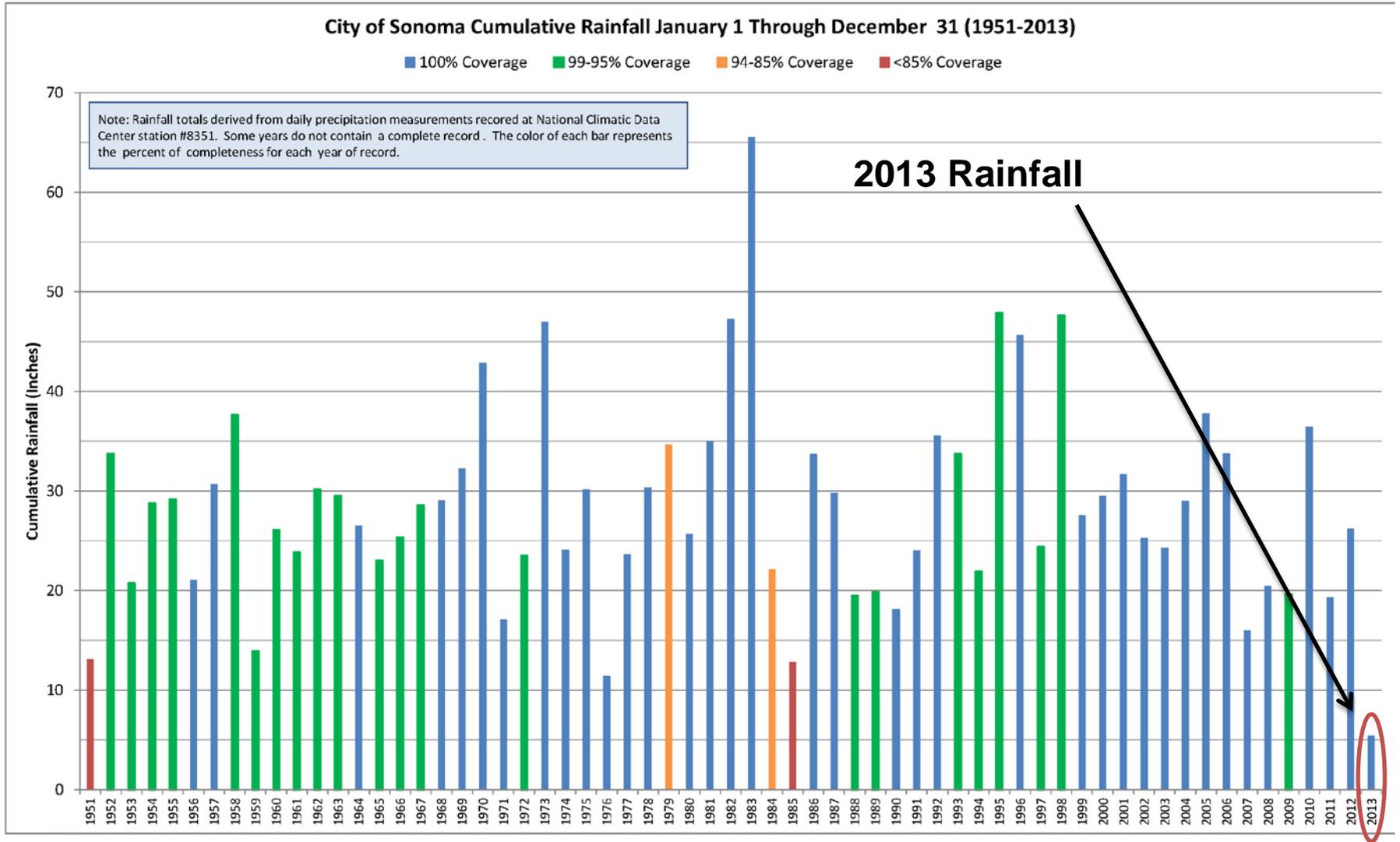
2013 A Year of Historical Dry Conditions



According to reconstructed precipitation study by University of Arizona:
2013 rainfall (red line) would be historical low over past 400+ years

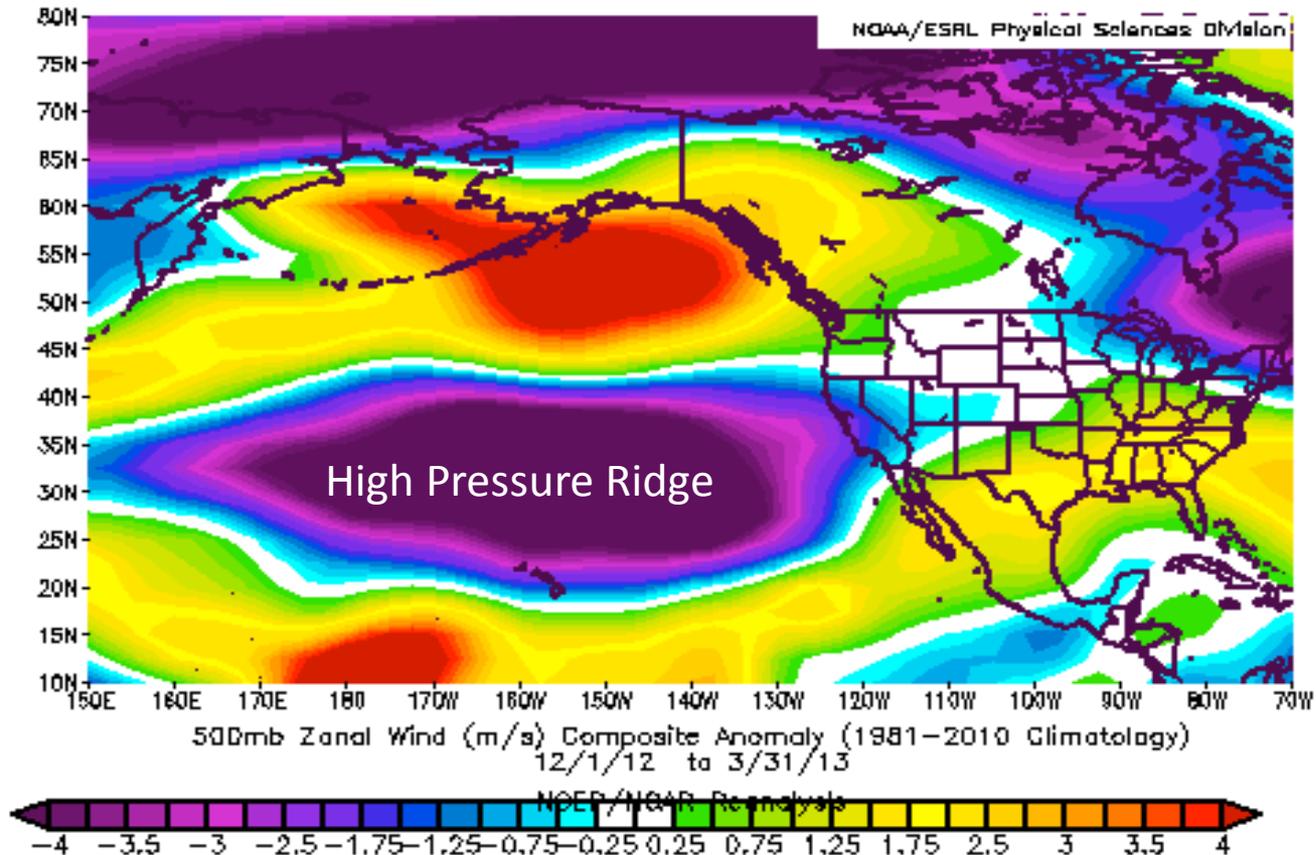


Sonoma Valley Hit Hard by Drought



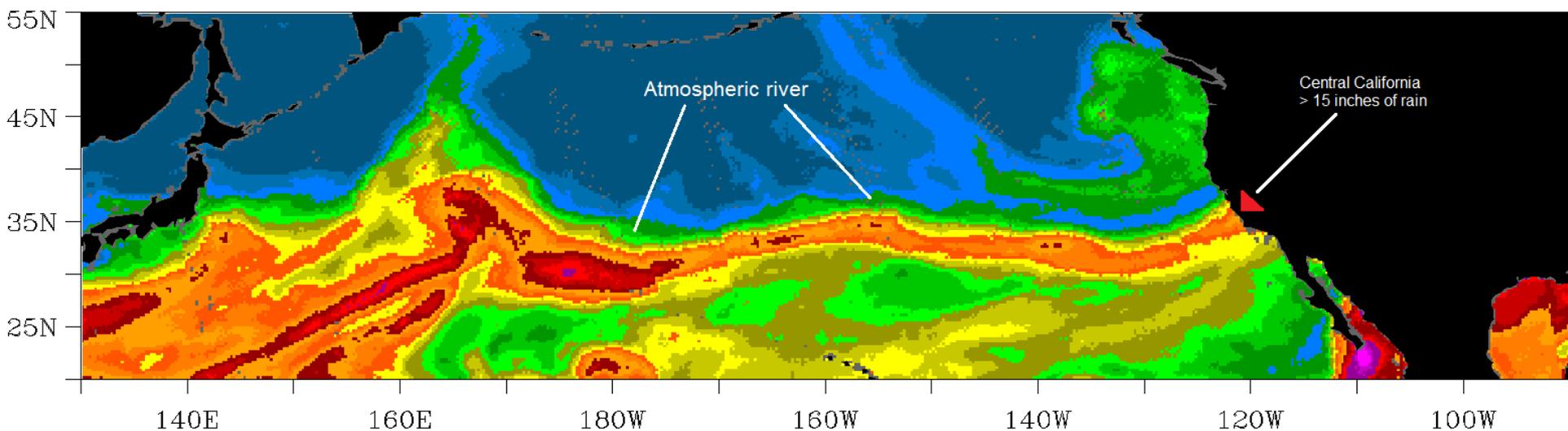
The Culprit!

Eastern Pacific High Pressure Ridge



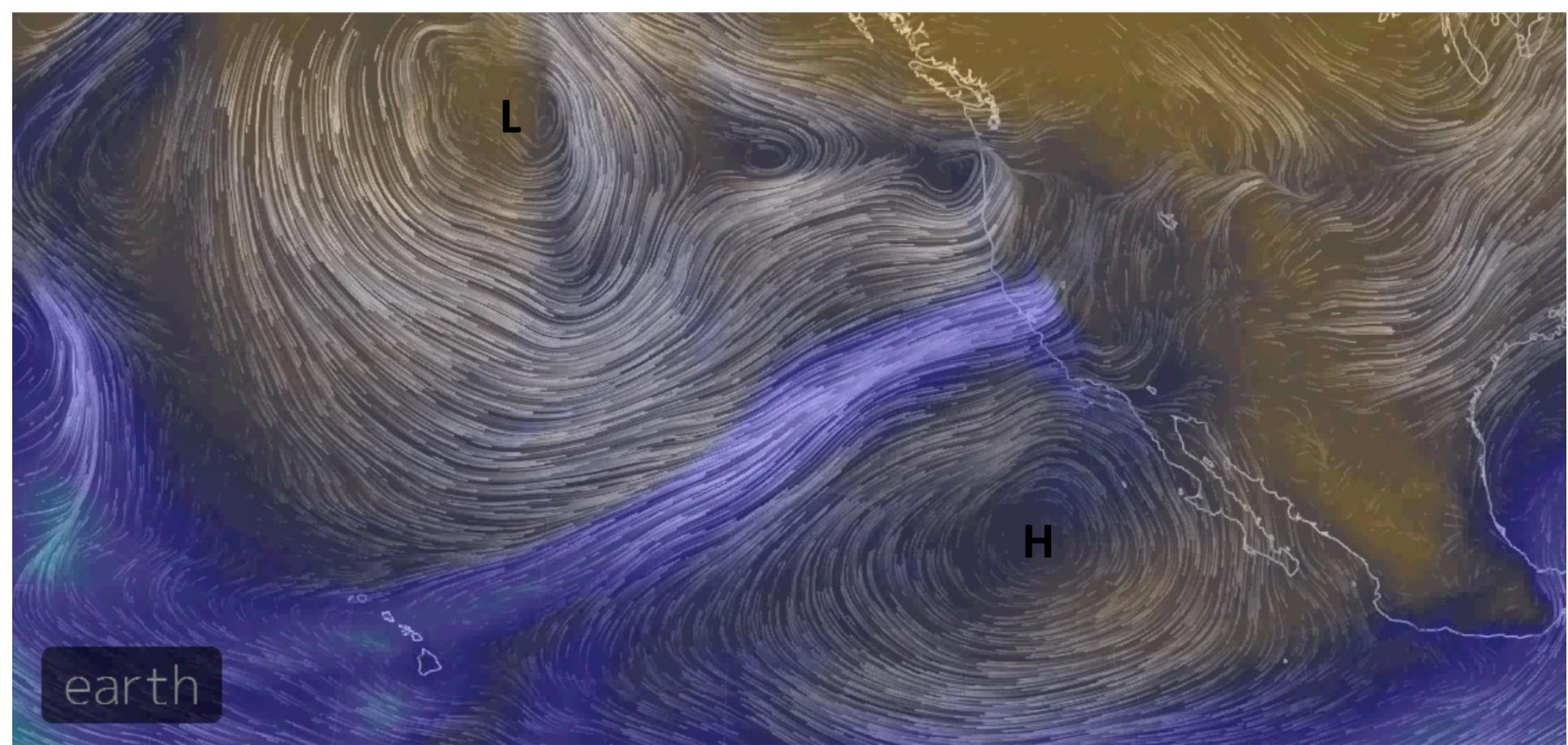
Is There Hope?

Atmospheric Rivers: Drought Busters & Flood Producers



**A fire hose from the equator!
(It's hit or miss)**

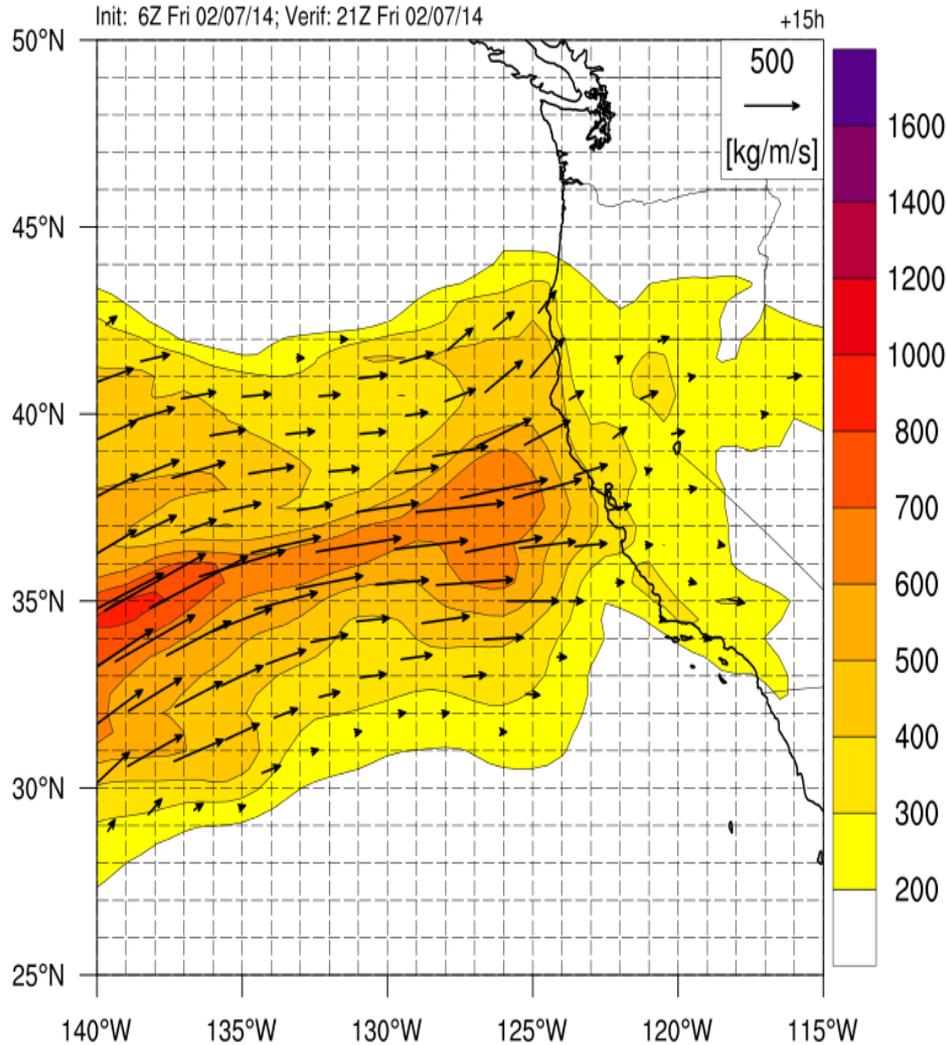
February 8, 2014 Atmospheric River – (First AR ~ 14 Months)



Over 6 Inches of Rainfall in Sonoma Valley

Atmospheric River Research: “Hurricane Hunters”

NCEP GFS IVT and Vector

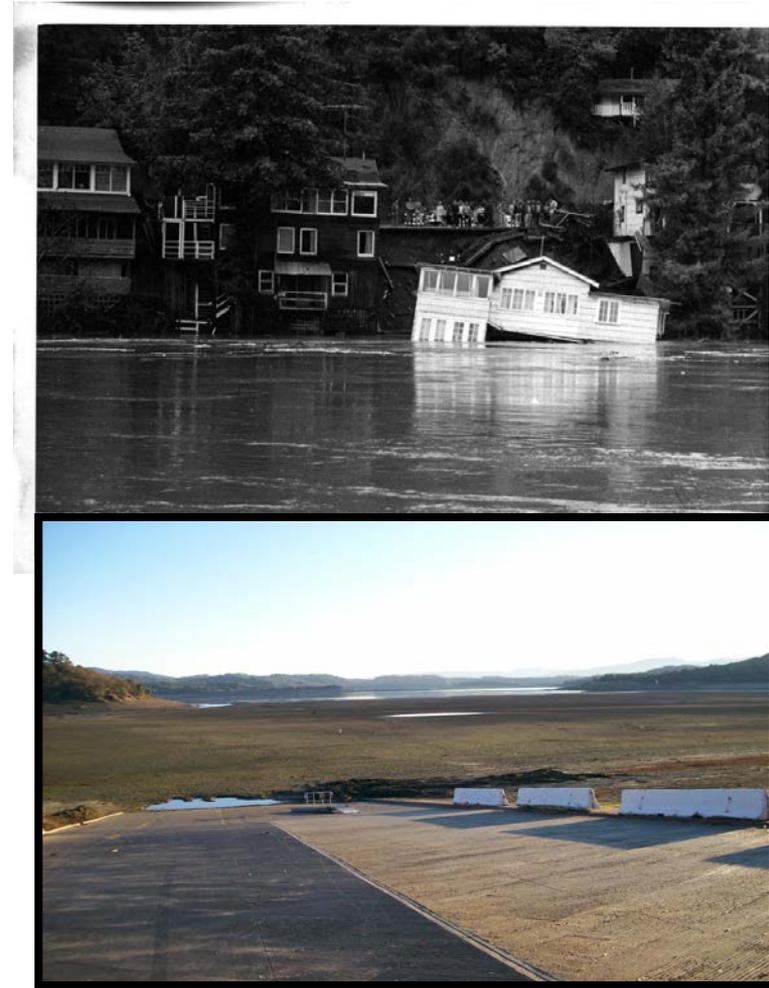


Goals: Improved Forecasting Skill of Location of Storm Landfall & Intensity



What Does the Future Look Like?

- Non-Stationarity: The past is not likely a predictor of the future
- SCWA and USGS partnership assess range of possibilities by looking at multiple scenarios



USGS-SCWA Climate Change Study

➤ Downscale 4 future climate change scenarios

- Spatially - 270 m
- Temporally - 1 day timestep

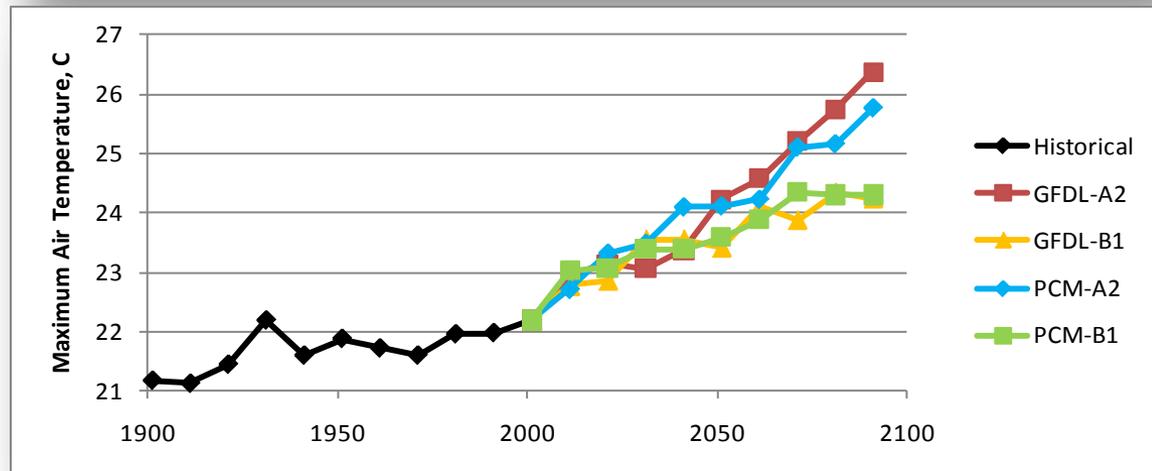
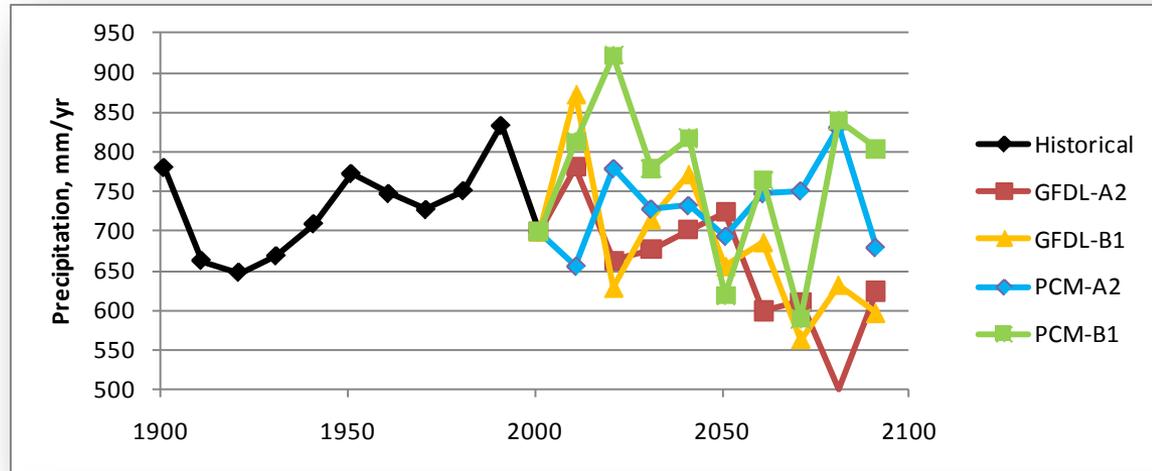
➤ 2 Global Climate Models

1. Parallel Climate Model
2. NOAA GFDL

➤ 2 Emission Scenarios

1. A2 - medium high emissions
2. B1 - low emissions

➤ Updating to 18 scenarios

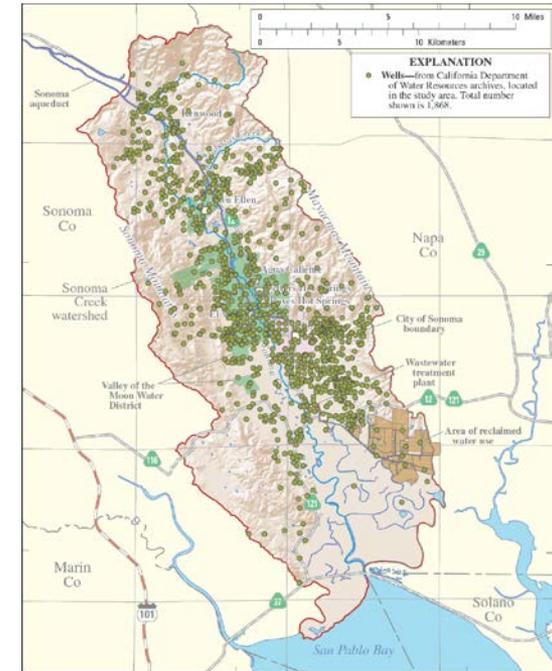
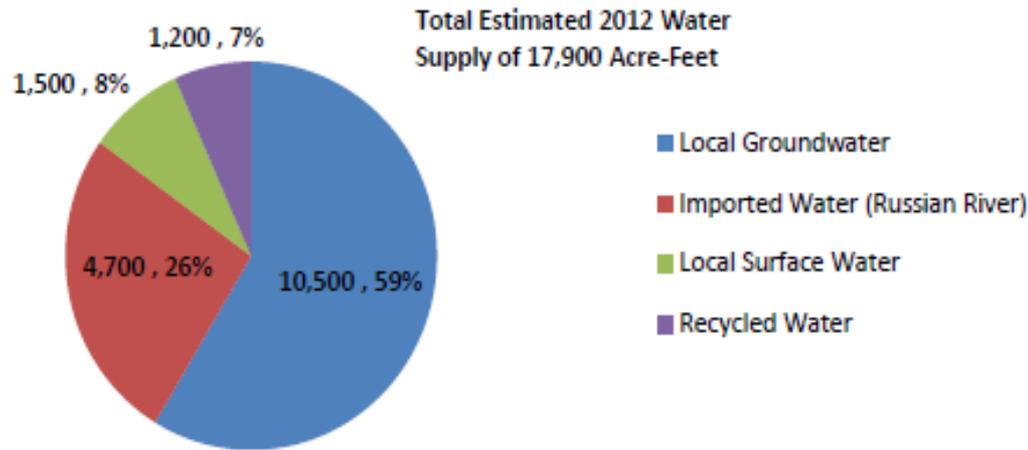


Anticipated Climate Change Impacts

- Increased temperature = Increased water demand (Human, Agricultural, Environmental) - Even in wet years
- Drier soils mean lower groundwater recharge
- Increased variability - Droughts & floods will be more extreme
- Even “wet” years likely to exhibit compressed winters
- Sea-level rise impact to infrastructure & saline intrusion
- Increased wildfire threat: Water quality & flood impacts

Sonoma Valley Water Use – Imported Water (26%) & Groundwater (59%) Play a Big Role

2012 Water Demands by Supply Sources (Acre-Feet)

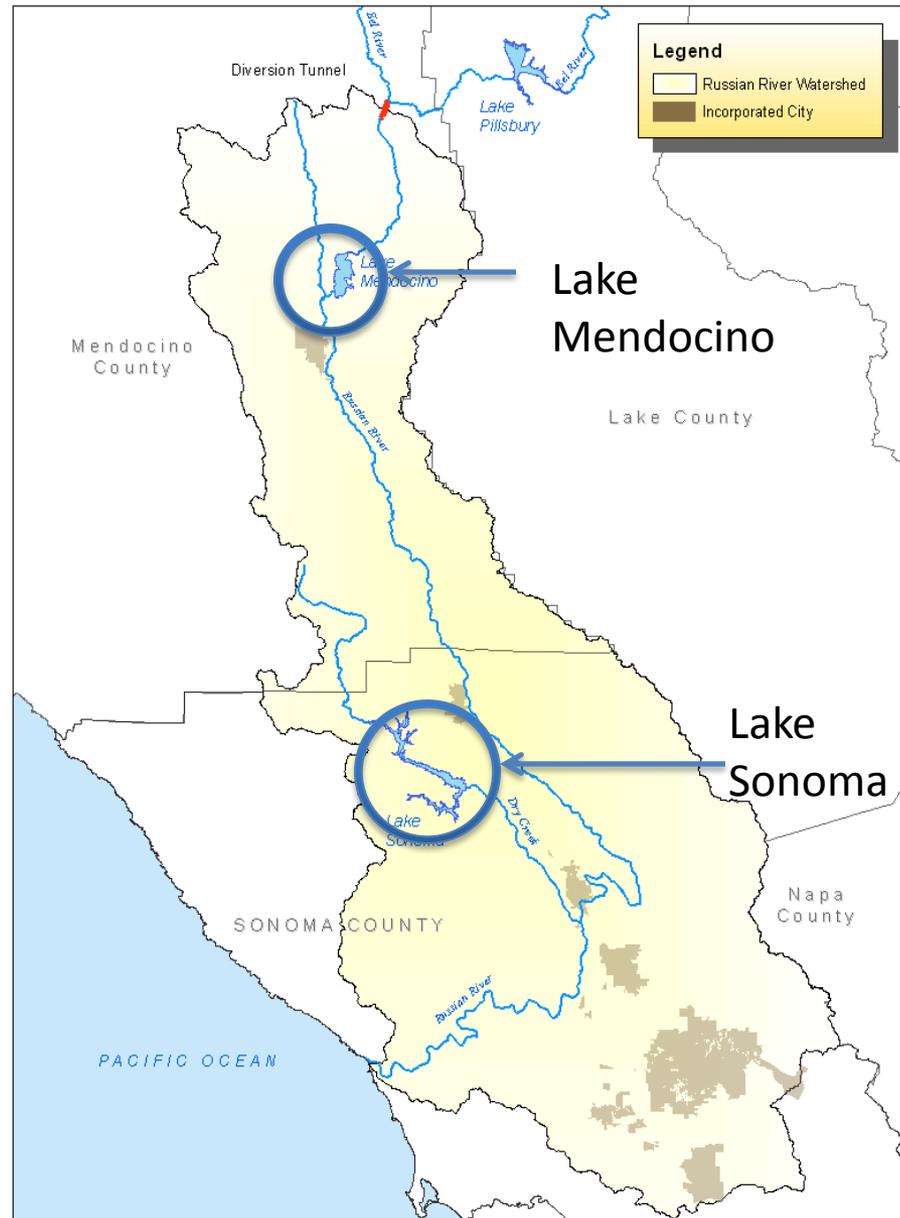


- Urban demand primarily met through imported Russian River water
- At least 2,200 permitted groundwater wells
- Recycled water (7%) & local surface water (8%)

Sonoma Valley Relies on Water Imported From the Russian River

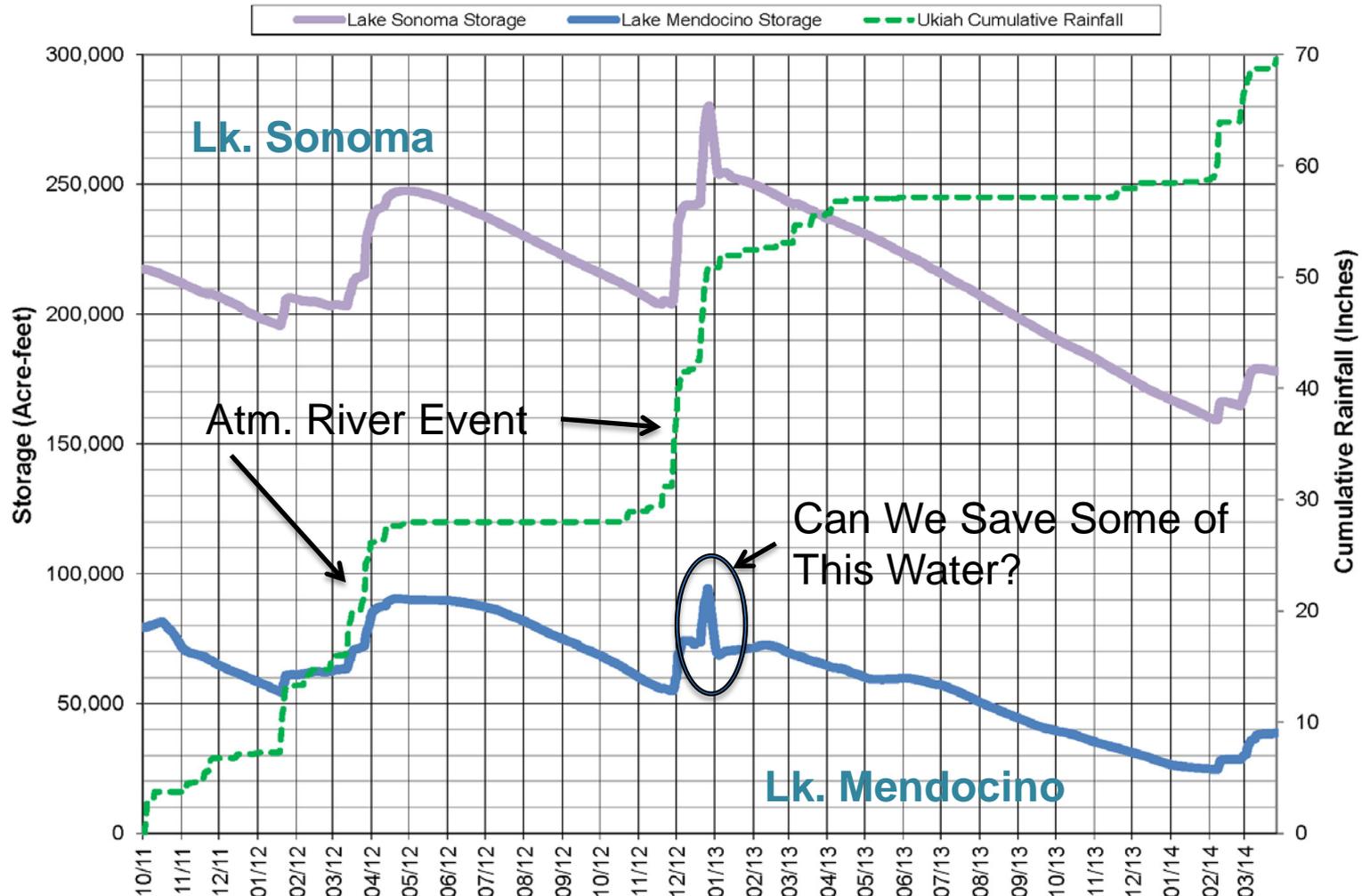


Lake Mendocino Dec. 2013



2 Reservoirs - 2 Pictures of Resiliency

Lake Sonoma and Lake Mendocino Storage
Water Years 2012 - 2014



Droughts Affect Fish & Ecosystems Too - Endangered Species Act Compliance

- **Biological Opinion per ESA**
 - 3 salmonid species
- **Timeline:** 15 years to implement
- **Major findings:**
 - Summer flow releases too high, jeopardize coho salmon & steelhead
- **Impact to Sonoma Valley**
 - Requires reduction summer flow releases
- **Cost:** Estimated \$125M or more from 2008-2023



A Tricky Task - Balancing Russian River Water Supply: People-Agriculture-Fish

- May & Dec 2013 petitions change reservoir management
- Cities, water districts, fishery resource agencies & agriculture:
 - Conservation measures
 - Shortage contingency plans
- Evaluate forecast based reservoir operations



The Bottom Line ...

Sonoma Valley Water Supply is More Vulnerable Than Most Areas of Sonoma County

Why?

- Long Distance from Russian River Supplies
- Small Rate Payer Base to Support Infrastructure
- Pipelines Vulnerable to Natural Hazards
- Aquifer Has Relatively Low Productivity & Areas of Significant Water-Level Decline
- Saline Water at Southern Boundary
- Increased Water Use Over Time

The Solution: Building Resilience Through ...

Integrated Water Resource Management

- Increase Water Supply Portfolio
- Maximize Recycled Water & Conservation
- Balance Surface Water (Russian River & Stormwater) With Groundwater Supplies
- Science-Based Management & Policies
- Partnerships are Key to Leverage Resources
 - Federal/State/Regional/Local Agencies
 - Community Constituencies: Agriculture, Municipal, Business, Rural Residential, Environmental

What's Being Done to Improve Water Supply Conditions in the Sonoma Valley?

Goal: Increase Resiliency of Water Resources to Enhance Supply & Ecosystems

- Groundwater Management – Climate Adaptation Strategies
- Conservation
- Recycled Water
- Coordinated Management of Surface & Groundwater

Surface Water

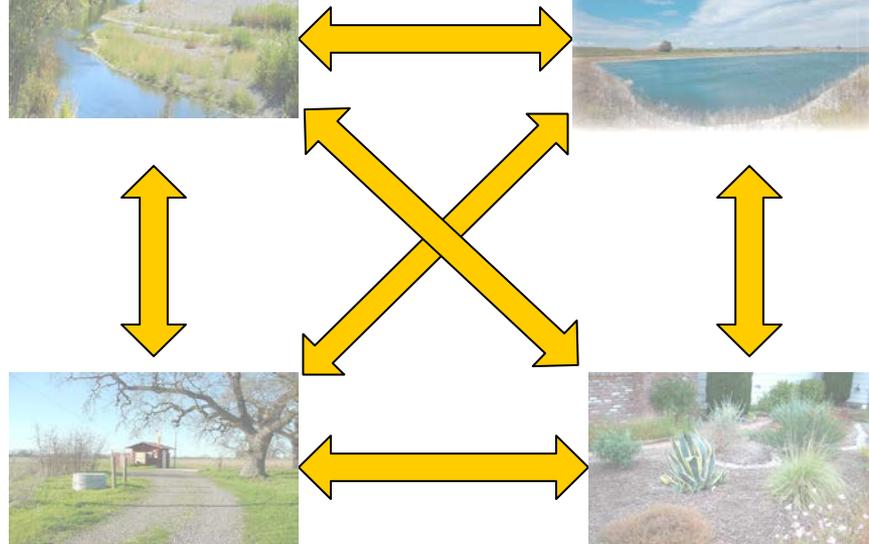


Recycled Water

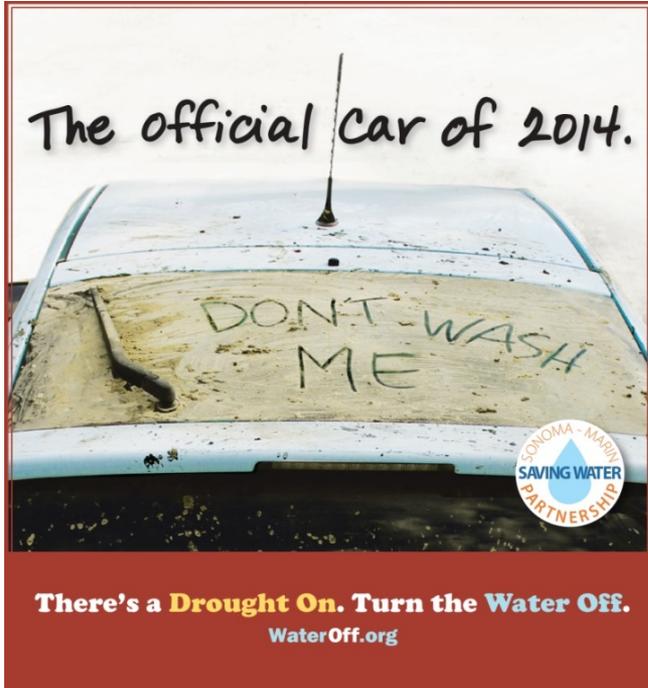


Groundwater

Conservation



Building Water Supply Resilience: Conservation



Sonoma-Marin Saving Water Partnership

- Regional Programs
- Includes City and VOMWD
- Regional Marketing Campaigns
- Garden Sense
- Drought Drive-Up on April 23

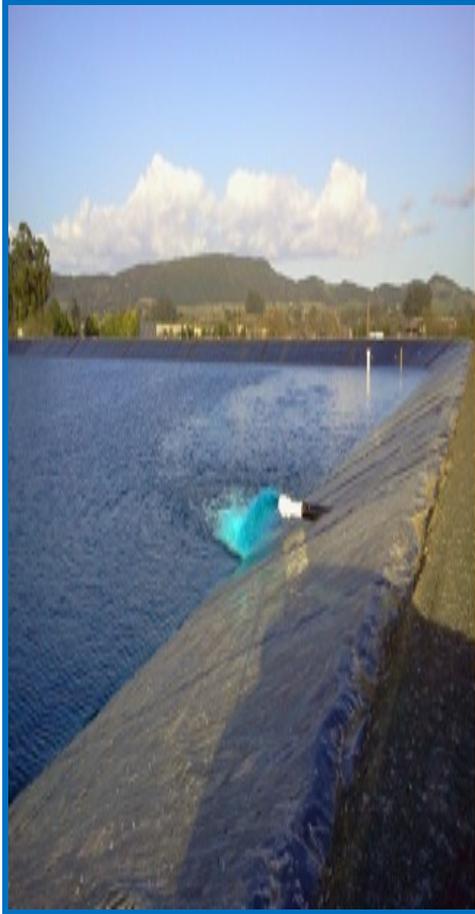


Water Agency

- Coordinate with local partners leverage funding
- Pursue grant funding program expansion to rural users



Building Water Supply Resilience: Recycled Water



Offset Groundwater Pumping Since 1990's in Sonoma Valley

Federal, State & Local Funding for Several Sonoma Valley Projects

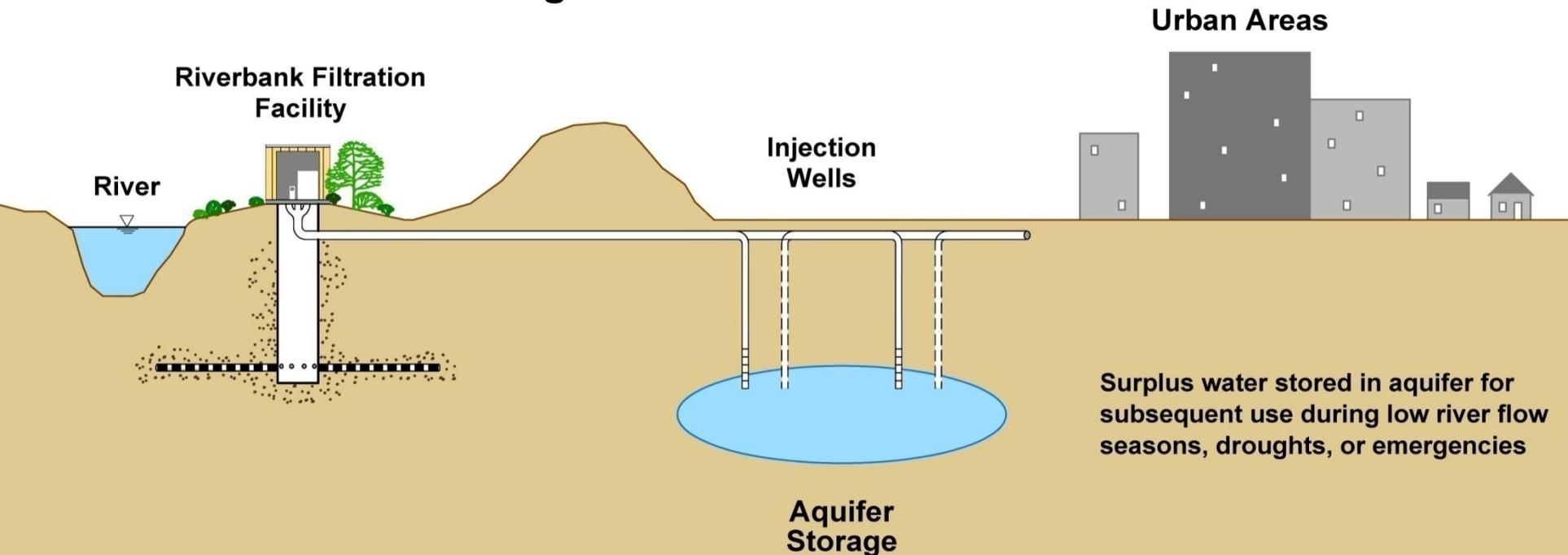
Key Adaptation Strategy for State & Region

Conceptual Groundwater Banking Schematic

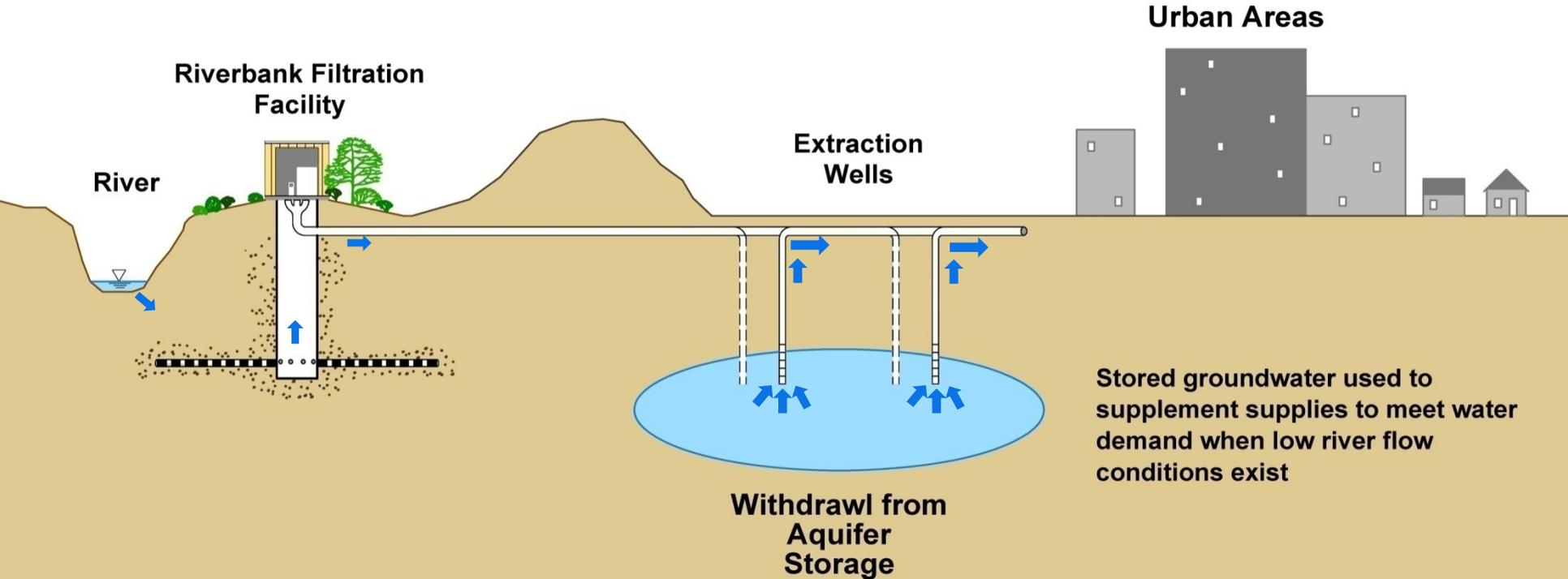
Aquifer Storage and Recovery

- Proceeding with Aquifer Storage and Recovery Concepts
- Geochemical compatibility assessment
 - Groundwater quality sampling and geochemical modeling
- Developing Work Plans for Pilot-Scale Demonstration Project(s)
- Explore funding options

High River Flow Conditions



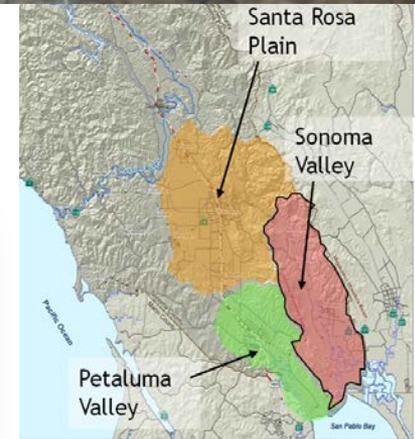
Low River Flow Conditions



Coordinating Stormwater Management & Groundwater Recharge - Green Infrastructure

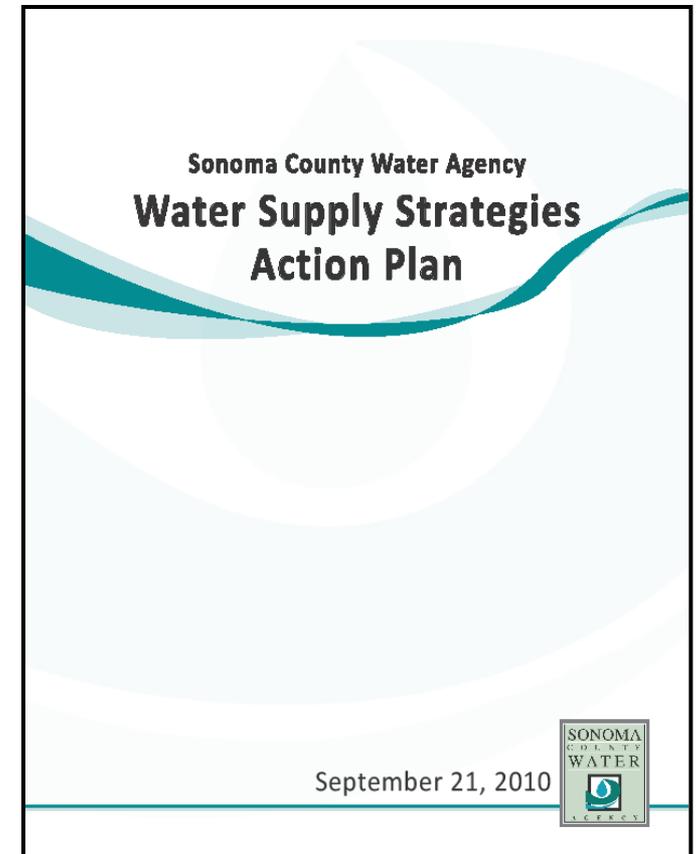
Prioritized in State Policies, Legislation & Funding

- Stakeholder process 3 Watersheds
- Improve ecosystems, water supply/quality & flood protection
- Climate adaptation strategy
- Grant funding
- Implemented throughout state



SCWA Water Supply Strategy Action Plan

- Framework for integrated water management
- Plan adopted September 2010
- Dozens of meetings, hundreds of comments
- 16 months outreach
- Updated 2011 & 2013



Challenges & Solutions

- **Sonoma Valley's water supply & ecosystems are vulnerable**
- **Exacerbated – but not created - by drought**
- **Regional & local water issues are inter-related**
- **Future climate will likely increase vulnerability**
- **New solutions are needed to build resiliency & protect ecosystems**
 - Increase water “portfolio”
 - Multi-benefit projects & adaptation strategies
- **Community involvement is essential – Issues beyond single organization**
 - Groundwater “alternatives analysis”