

Challenges & Partnerships: Water Management

Adaptation Strategies & Information Needs in Response to Extreme Events

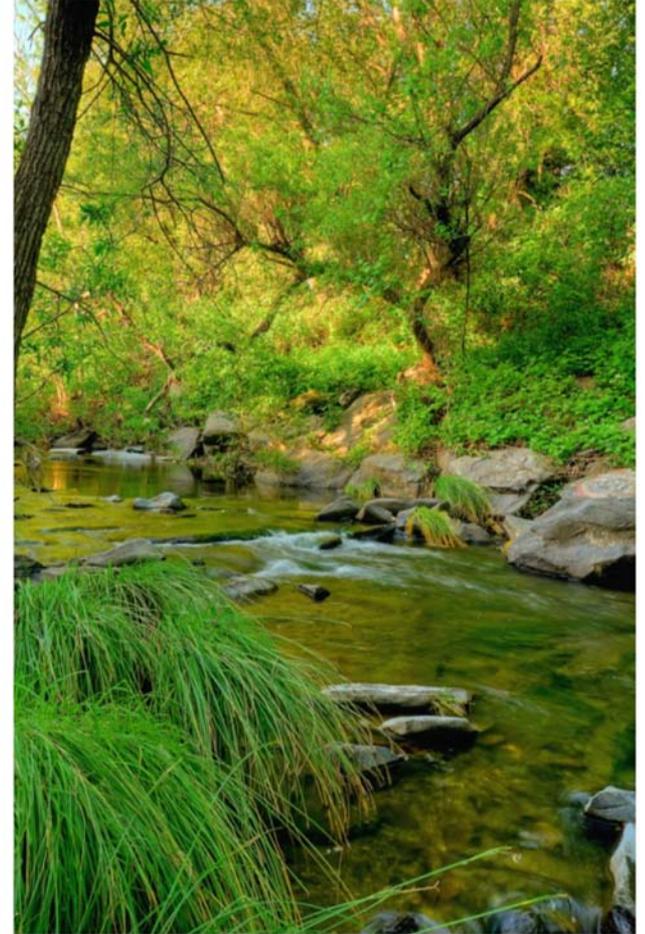
March 13, 2012

Jay Jasperse, P.E.
Chief Engineer



Overview

- Sonoma Co. Water Agency
- Russian River Project
- Water Management Challenges & Partnerships
 - Flood Control
 - Water Supply
 - Wastewater Services

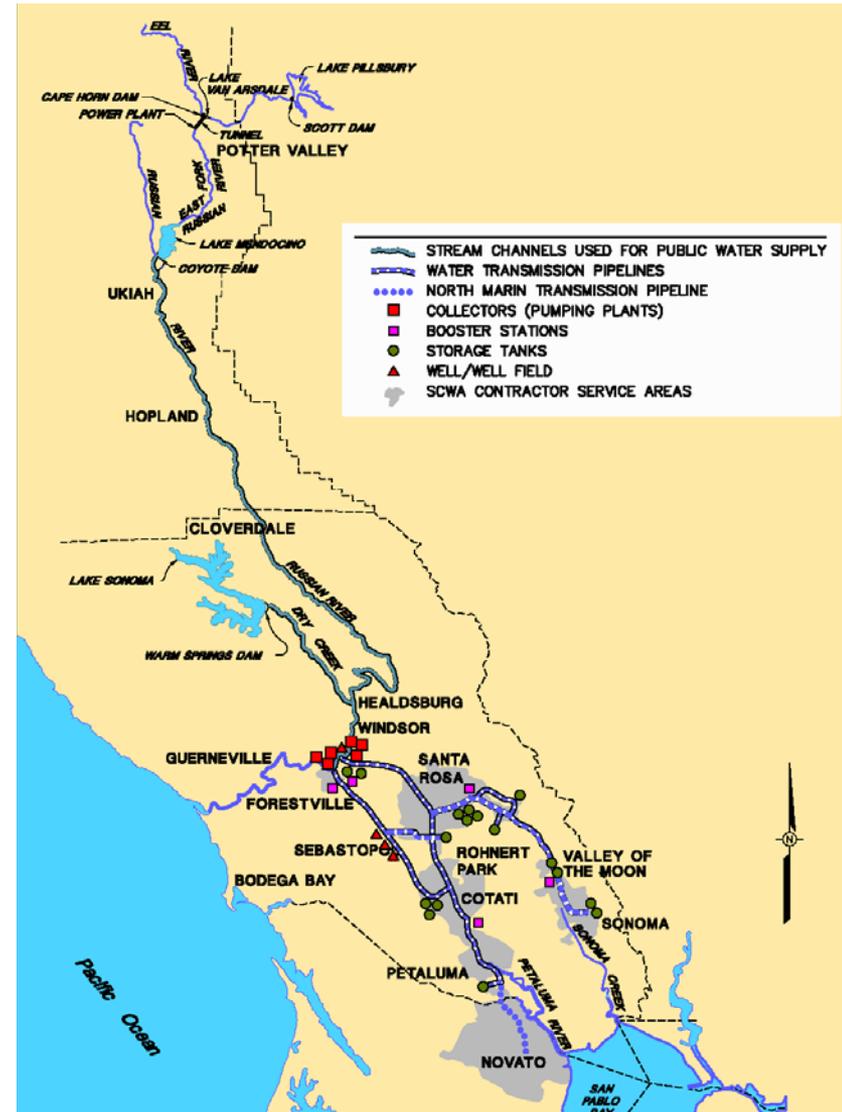


Sonoma County Water Agency

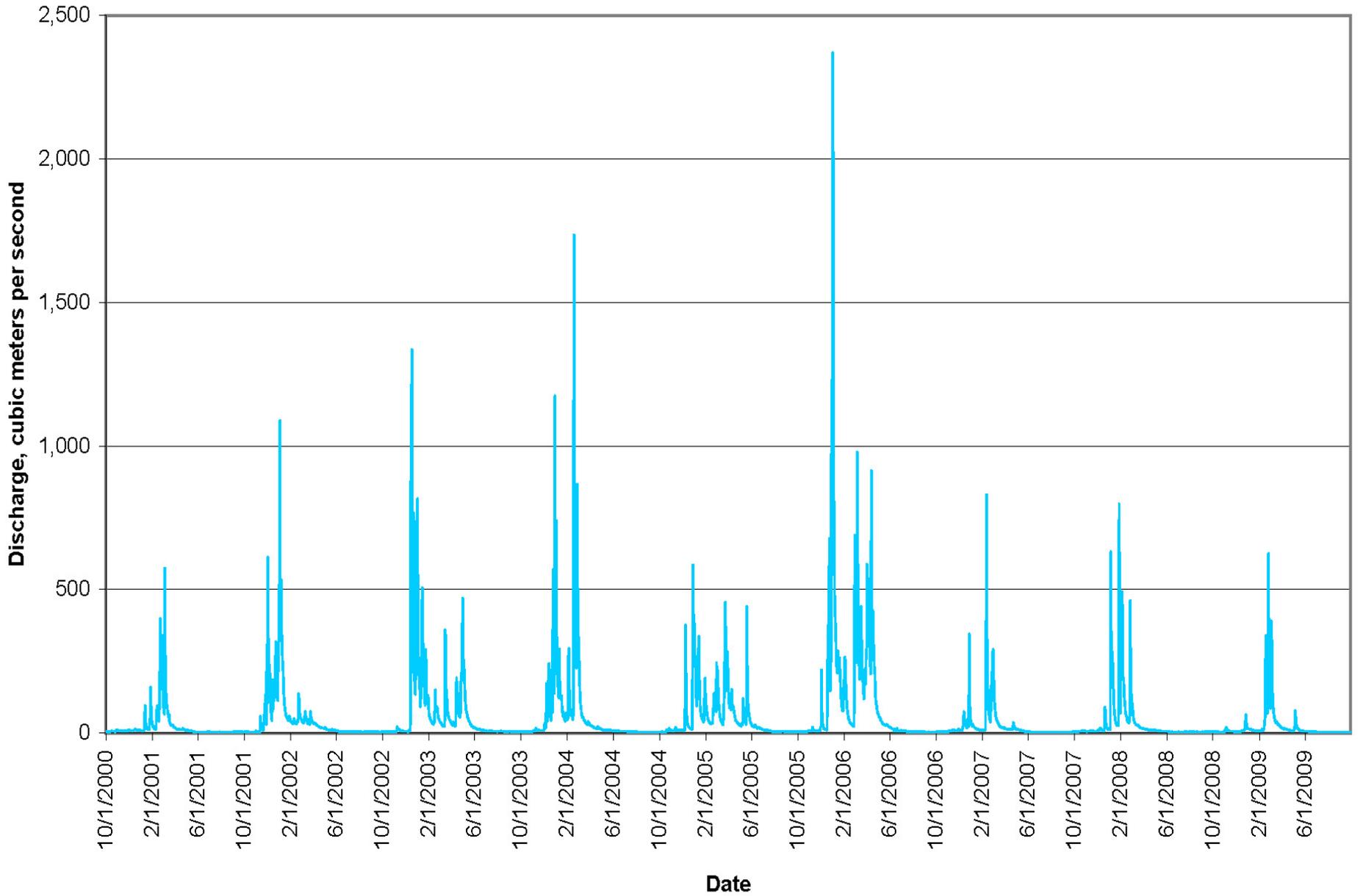
- Special District formed in 1949
- Wholesale water supplier ~600,000 people - Sonoma & Marin Counties
- Primary water supply source is Russian River with supplemental groundwater
- Also provide sanitation & flood control services - Sonoma Co.
- Authority for power generation
- Integrated resource management

Russian River Watershed

- Russian River ~100 miles long
 - Originates Mendocino Co.
 - Terminates at Pacific Ocean in Jenner (Sonoma Co.)
- Russian River Watershed ~ 1,480 sq. miles
- Rainfall dominated watershed - no significant snowpack
- ~93% of runoff occurs November to April
- “Flashy” hydrology: Rapid hydrologic response to storm events



Hydrograph - Russian River at Hacienda Bridge, Guerneville California



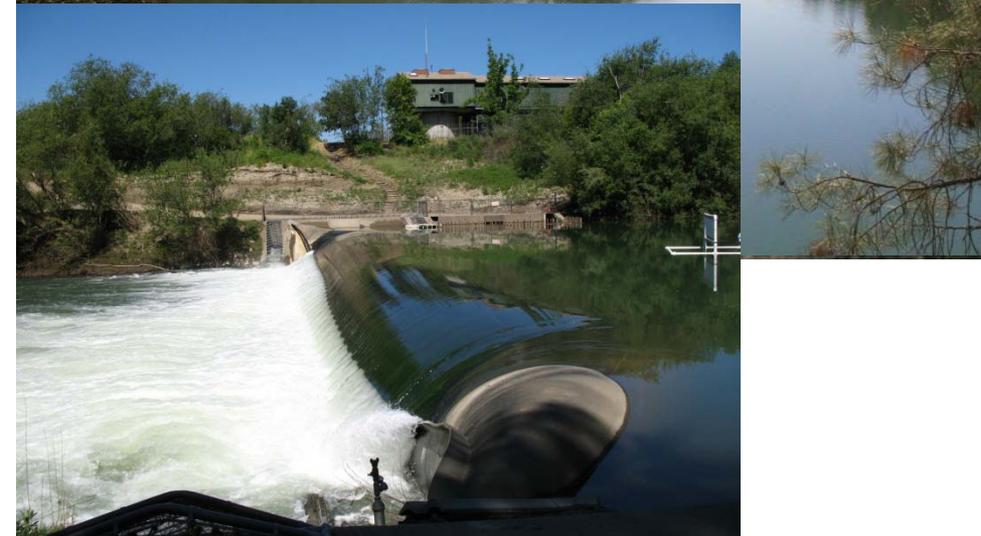
Russian River Project

Two Reservoirs Co-Operated by COE & SCWA

- **Coyote Valley Dam (1959): Lk. Mendocino**
 - Authorized flood control, water supply (agriculture & M&I), hydropower & recreation
 - Total storage 122,400 af, water supply pool 68,400 af
 - Total drainage area ~ 105 sq. miles
- **Warm Springs Dam (1983): Lk. Sonoma**
 - Authorized for flood control, water supply (M&I), hydropower, & recreation
 - Total storage 380,600 af, water supply pool 245,000 af
 - Total drainage area ~130 sq. miles

Russian River Watershed

- Lake Pillsbury / Donner / Mirabel



Water Management: Flood Control

- Corps of Engineers - Warm Springs & Coyote Valley Dams
- Sonoma County Water Agency - Other designated areas of Sonoma Co.

Flood Control: Russian River

- Warm Springs Dam (WSD) flood control operations normally independent of Coyote Valley Dam (CVD)
- CVD - Corps attempts to prevent flows East Fork Russian contributing overbank flooding
- WSD - Flood control operation goals:
 - Reduce peak flood discharges on Dry Ck. & river below Healdsburg
 - Restrict Guerneville river flows to < 35,000 cfs
- Estimated to reduce flood by 4 feet at Guerneville (1986 flood)







Flood Control: Sonoma Co. Water Agency

Central Sonoma Watershed Project

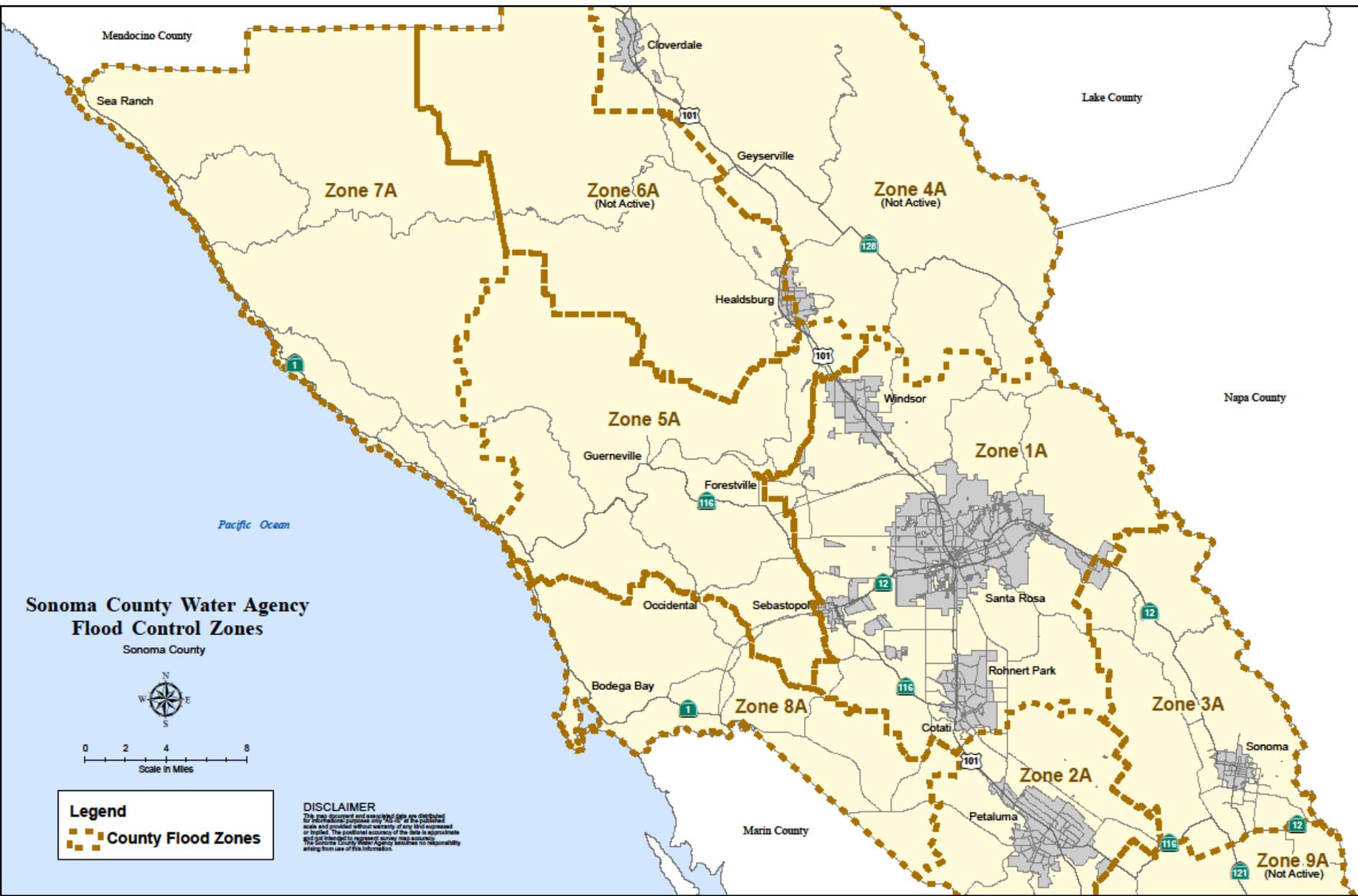
- Flood reduction Santa Rosa Ck watershed
- Initiated 1958, facilities built over 25 years
- 5 reservoirs
- Channelization projects & stabilization natural channels

Stream Maintenance Program (>75 miles eng. channels)

- Sediment management
- Bank stabilization
- Vegetation management
- Debris removal

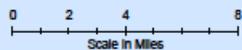
Flood control zones

- Established 1958 based on major watersheds to finance projects



**Sonoma County Water Agency
Flood Control Zones**

Sonoma County



Legend
 County Flood Zones

DISCLAIMER
 This map document and associated data are distributed for informational purposes only "AS IS" at the published scale and provided without warranty of any kind expressed or implied. The positional accuracy of the data is approximate and not intended to represent survey data accuracy. The Sonoma County Water Agency assumes no responsibility arising from use of this information.

Stream Maintenance Program

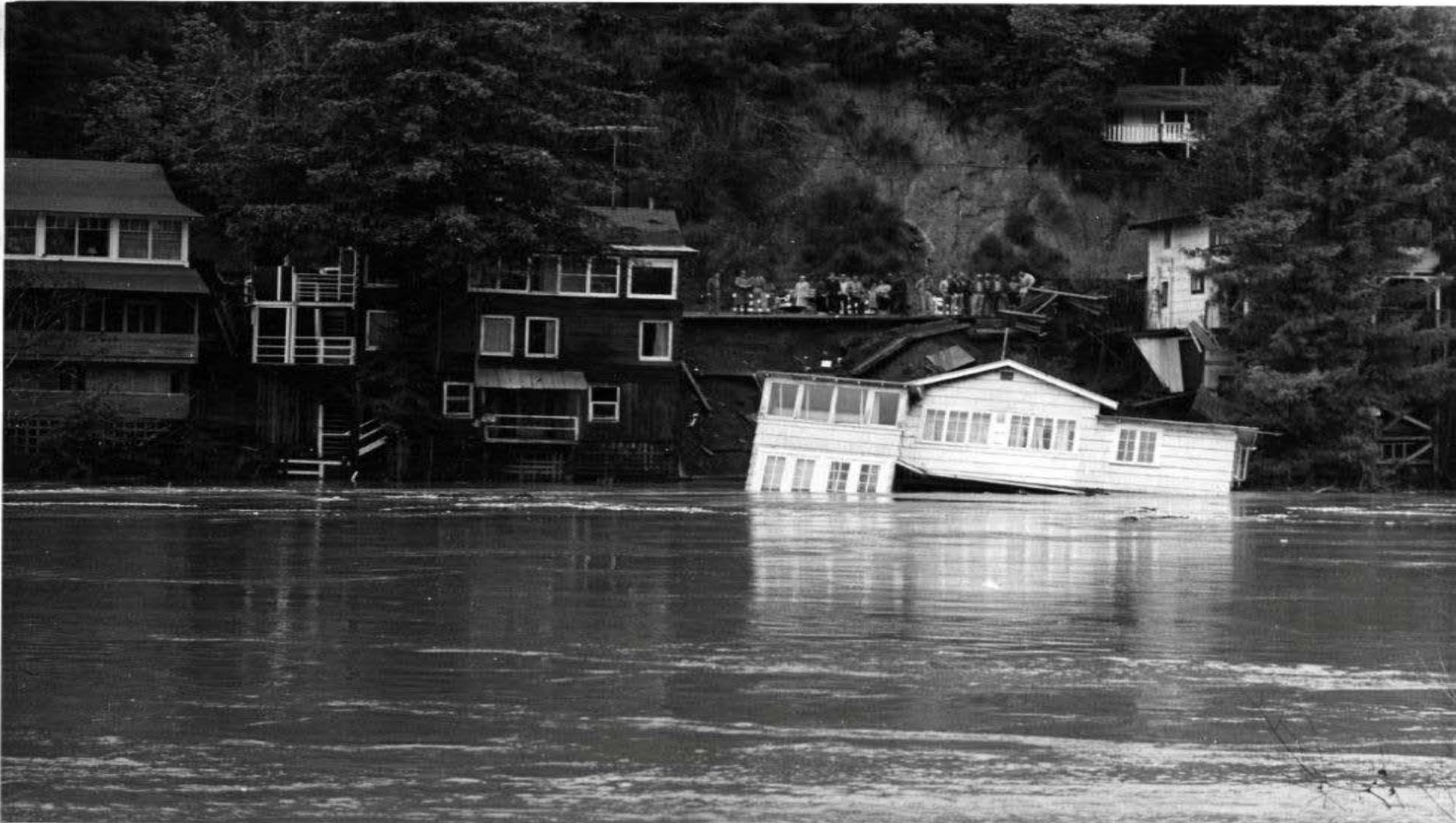
- Locally managed programmatic approach
- Reduces flood risk but maximizes riparian habitat
- Utilizes existing processes-geomorphology, succession, groundwater-surface water interactions, natural recruitment



- Develops partnerships for restoration and environmental education
 - Partner county agencies
 - Cities
 - Non-Profits
 - Schools
 - Summer Youth Ecology Corps
 - Conservation Corps
 - Public Volunteers



Flood Damage



Flood Control – Risk & Damage

Flooding Most Frequent Natural Hazard Sonoma Co.

- Russian River
- Petaluma River
- Sonoma Creek
- Santa Rosa Plain – Laguna de Santa Rosa
- Lower Russian River (Guerneville) three 100-yr & two 50-yr events from 1955-2009

Damages:

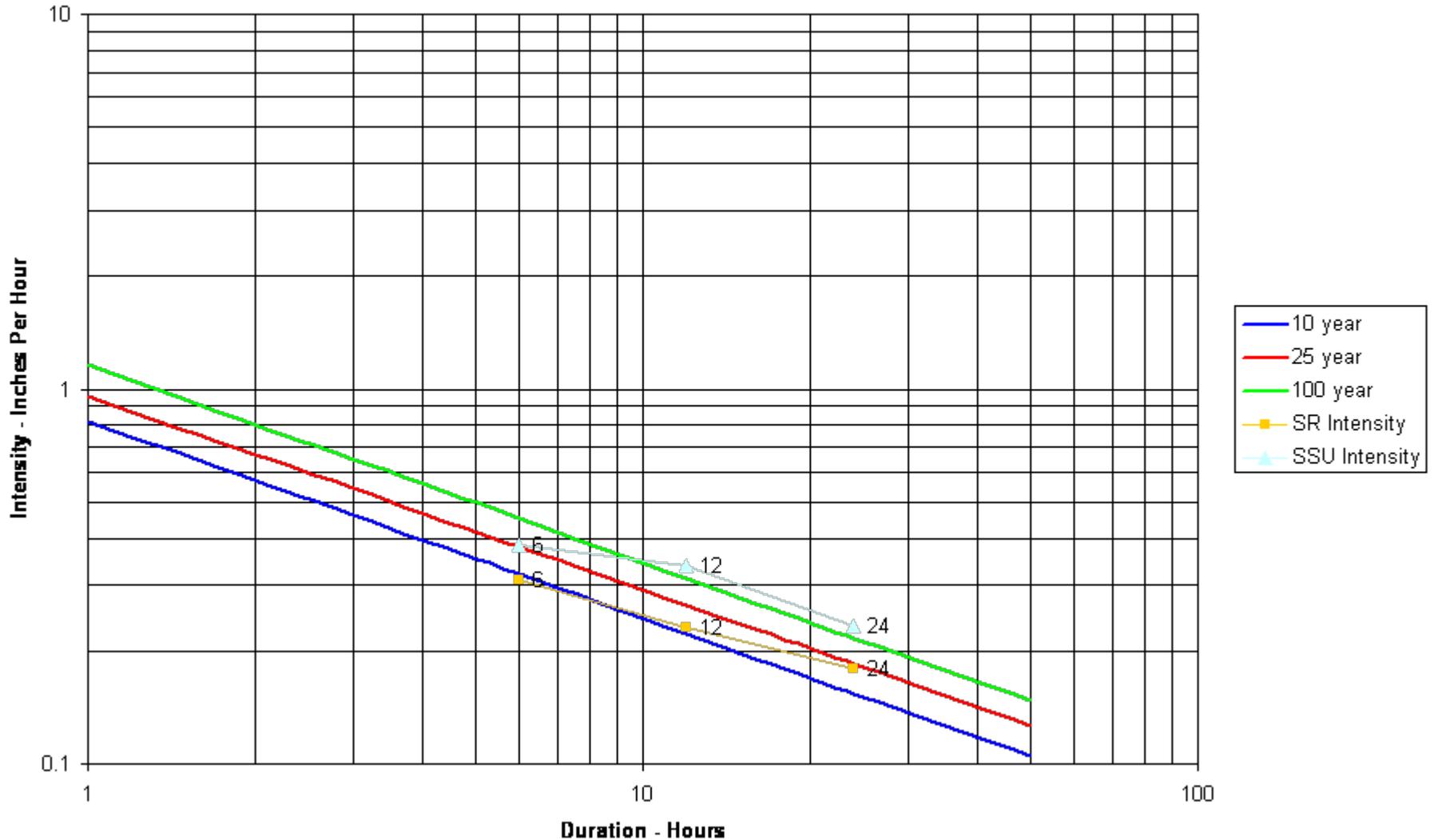
- FEMA estimated flood related damages 1995-2005 Sonoma Co. ~\$200M
- Son. Co. highest repetitive loss damages (\$60.86M) comprising ~32% of state's repetitive losses



New Year's Eve Storm 2005

CLASSIFICATION OF 12/31/05 EVENT

Rainfall Intensity vs Duration











Stano Road at Laguna de Santa Rosa, Dec 31, 2005 11 a.m.

Flood Control Challenges

Examples of Data Collection & Analysis Activities Where We Need Help:

- Weather forecasting - Uncertainty
- Lack of flow monitoring data
- Flood plain mapping - Inaccuracies & uncertainties
- Watershed level hydrologic & hydraulic analysis

Flood Control Challenges

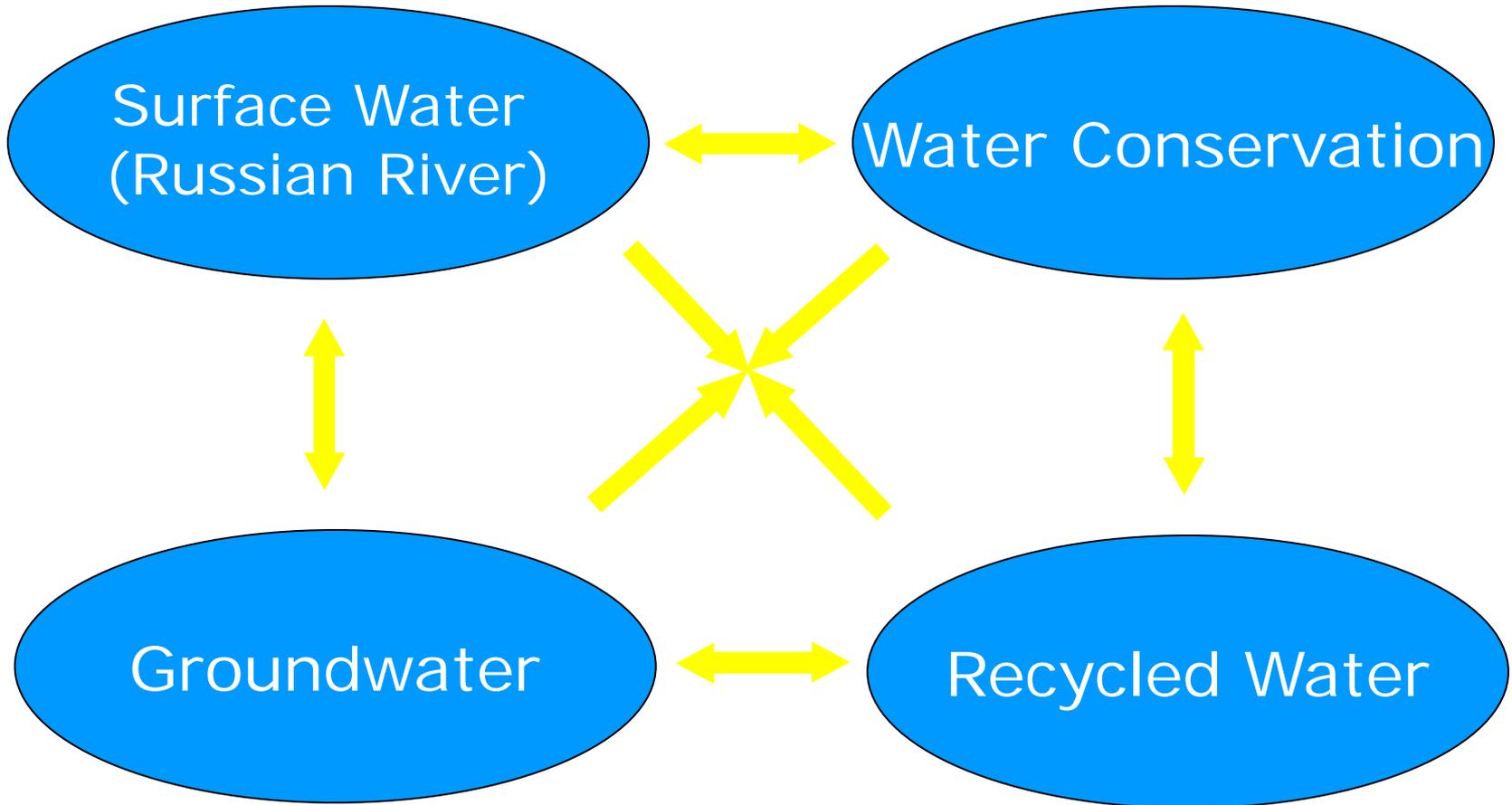
Management Challenges:

- Habitat vs. flood control (A balancing act)
- Public perception of management activities
- Sediment management from extreme events
- Water quality impacts due to flooding - urban debris from areas not designed to flood
- Land use:
 - Increased “flashiness” - impervious services
 - Development in natural flood zones

Water Management: Water Supply



Water Supply Management: 4 Ways to Meet Water Demands

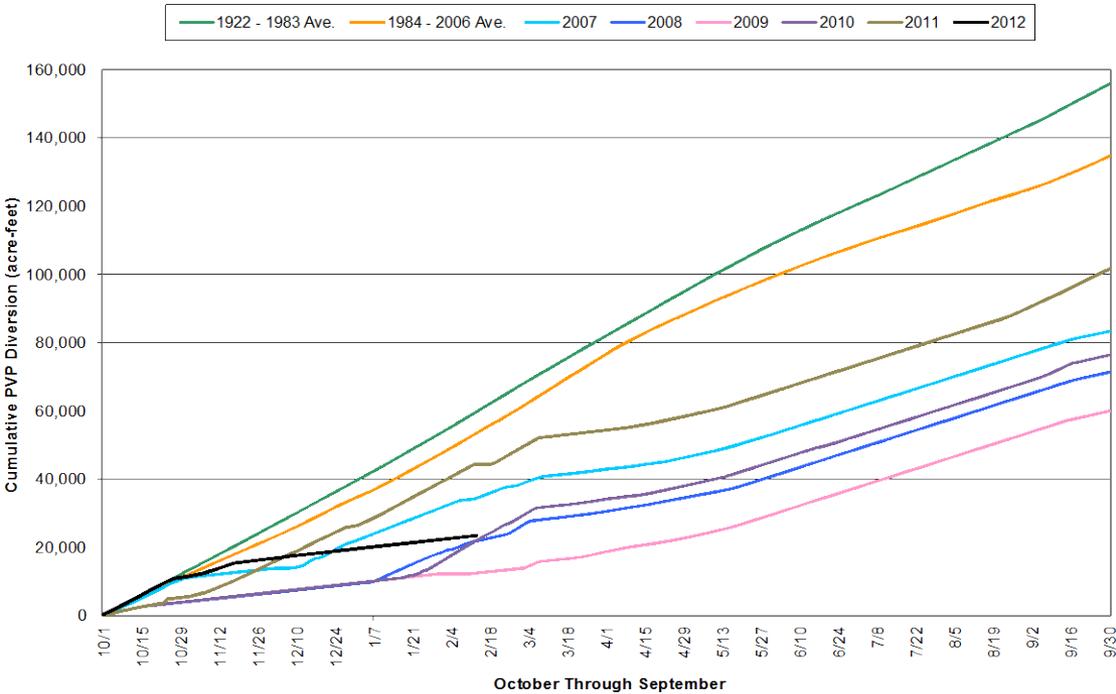


Water Supply Challenges

- Russian River supply most directly affected by extreme events
- Riverbank filtration system & use of river as a conveyance system - affected by extreme events
- Climate change
- Balancing environmental & human water needs
- Decreased Potter Valley diversions to Russian River system - increase vulnerability

Russian River Watershed – Potter Valley Diversion Reductions

Cumulative Diversion To Potter Valley Project By Water Year



Water Supply Challenges

Examples of Areas Where We Need Help:

- Weather forecasting
- Analysis of surface water - groundwater interactions
- Demand management (coordination & conservation) - including non urban areas
- Developing a coordinated & integrated portfolio approach

Lake Mendocino - 2009



Lake Mendocino - 2009



Wastewater Services



Wastewater Systems - Sonoma Co.

- Several POTWs varying in size, age, types of treatment, & discharge/reuse
- Capacities range from 0.027 mgd to 21.34 mgd ADWF
- Secondary & tertiary level treatment
- Surface water discharge & reuse
- Reuse: agriculture, urban landscape, & geysers geothermal
- Septic systems - significant issues, especially along Russian River





Wastewater: Challenges

- Aging infrastructure
- Sanitary sewer overflows
- Increasingly stringent regulatory requirements (treatment, source control, collection, & discharge/reuse)
- Ratepayer pressures (Prop. 218). Some smaller systems have among highest rates in state
- Can smaller systems continue to operate & meet increasing requirements?

Summary: Water Management Challenges

- Variable/uncertain weather
- Climate change
- Aging infrastructure
- Increasing regulations & new mandates
- Other natural hazards - e.g., seismic
- Financial - Poor economy, rate pressures
- Population growth, increased development
- "Organization fragmentation"

Summary: Water Management

- Extreme events pose specific challenges that managers must address while simultaneously grappling with a wide array of other challenges
- Managers must identify opportunities to respond to multiple challenges through integrated programs
- Developing partnerships is a key strategy
 - Leverage resources & coordinate activities
 - Overcome organizational fragmentation

Examples of SCWA Partnerships

- Water Advisory Committee
- Sonoma-Marín Saving Water Partnership
- Russian-Eel River Commission
- Sonoma Valley Groundwater Basin Advisory Panel
- Santa Rosa Plain Groundwater Basin Advisory Panel
- Regional Climate Protection Authority
- Russian River Watershed Protection Assoc.
- North Bay Watershed Assoc.
- North Bay Water Reuse Authority
- Integrated Regional Water Management Plans - North Coast & Bay Area
- BA Flood Prot. Agencies Assoc.
- Flood Control Zones Advisory Committees
- U.S. Army Corps of Engineers (Russian River, Santa Rosa Creek watershed)
- IWRSS - NOAA, USGS, COE
- RCDs & NGOs
- Local Community/Creek Groups - Creek Stewardship Program
- Youth Ecology Corps
- Santa Rosa Sub-regional System

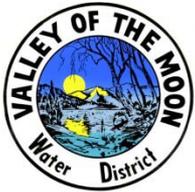
You Can't Do It Alone!



**US Army Corps
of Engineers**®
San Francisco District



**MARIN MUNICIPAL
WATER DISTRICT**



MENDOCINO COUNTY



**RESOURCE
CONSERVATION DISTRICT**



**RESOURCE
CONSERVATION
DISTRICT**

