

# California's Flood Future

Recommendations for  
Managing the State's Flood Risk

BAFPAA Briefing  
February 21, 2013

# Overview

- Purpose
- Understanding the Situation
- The Problem
- Research Findings
- Recommendations





# California's Flood Future

- Unprecedented effort
  - Statewide coverage
  - Collaboration: DWR and USACE
    - DWR Executive and Divisions
    - USACE Division and 4 Districts
- In consultation with:
  - More than 140 agencies
  - County Engineers Association of California (CEAC)
  - FEMA



# Report Purpose

- Increase understanding of statewide flood problem
- Make recommendations for managing flood risk
- Inform decisions about:
  - Policies
  - Financial investments





# Understanding the Situation

# California experiences many types of flooding



# Flood risk is defined using these factors:



## Hazard

What causes harm?



## Performance

How will the system react?



## Exposure

Who and what can be harmed?



## Vulnerability

How susceptible to harm?



## Consequence

How much harm?

## Inundation Risk

Likelihood and severity  
of adverse  
consequences

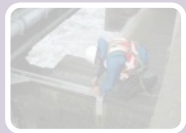


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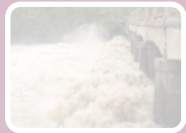
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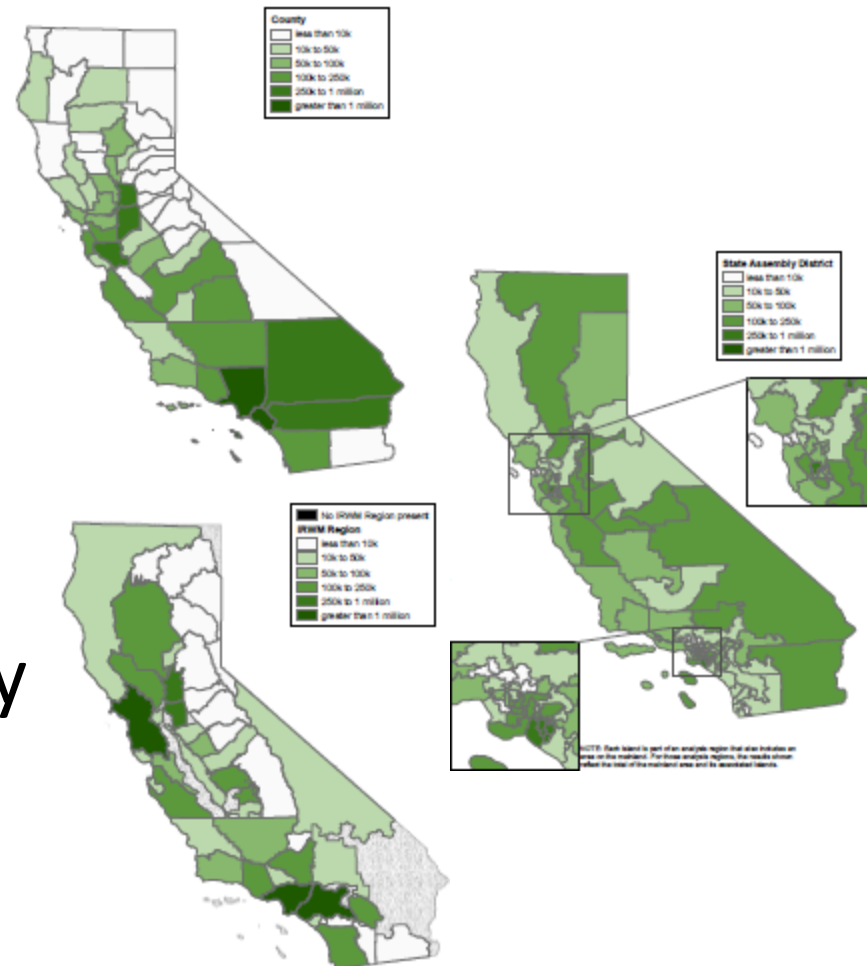
# Flood hazard exposure analysis

- Consistent, accurate, and reproducible
- Comparison of exposure within the state
- Appropriate for high level planning purposes



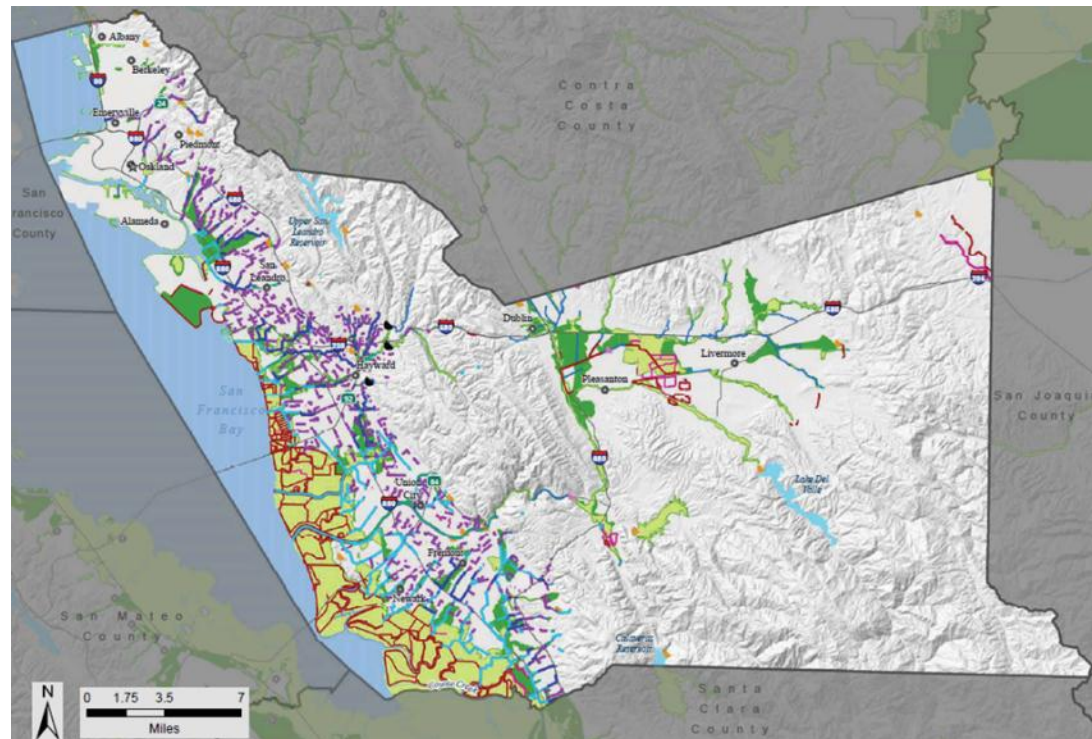
# Analysis Regions

- CWP hydrologic regions
- Primary and Secondary Delta Zones
- Counties
- US Congressional Districts
- State Senate and Assembly Districts
- IRWM Regions



# Typical County Map

- County statistics
- Exposure results
- Infrastructure  
(if provided in GIS format)
- Flood types
- Flood events
- Planned project totals
- Local agencies SFMP participants





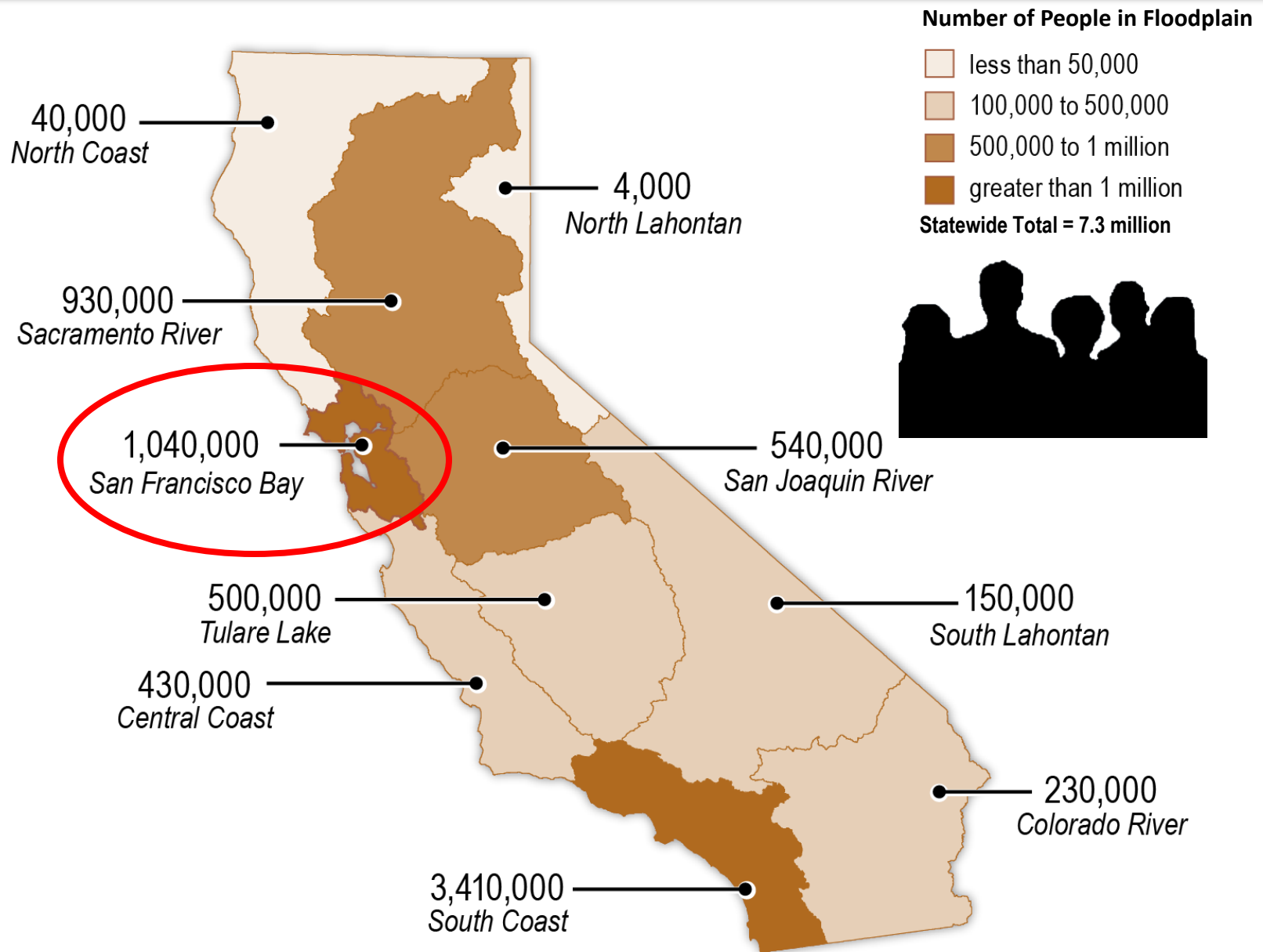
# The Problem

# California is at risk for catastrophic flooding

- 1 in 5 Californians are exposed to flood risk
- \$580B in assets are exposed to flood risk
- Every county is at risk for major flooding
- Flood insurance policyholders have tripled since 1982



# 7.3 million Californians live in floodplains



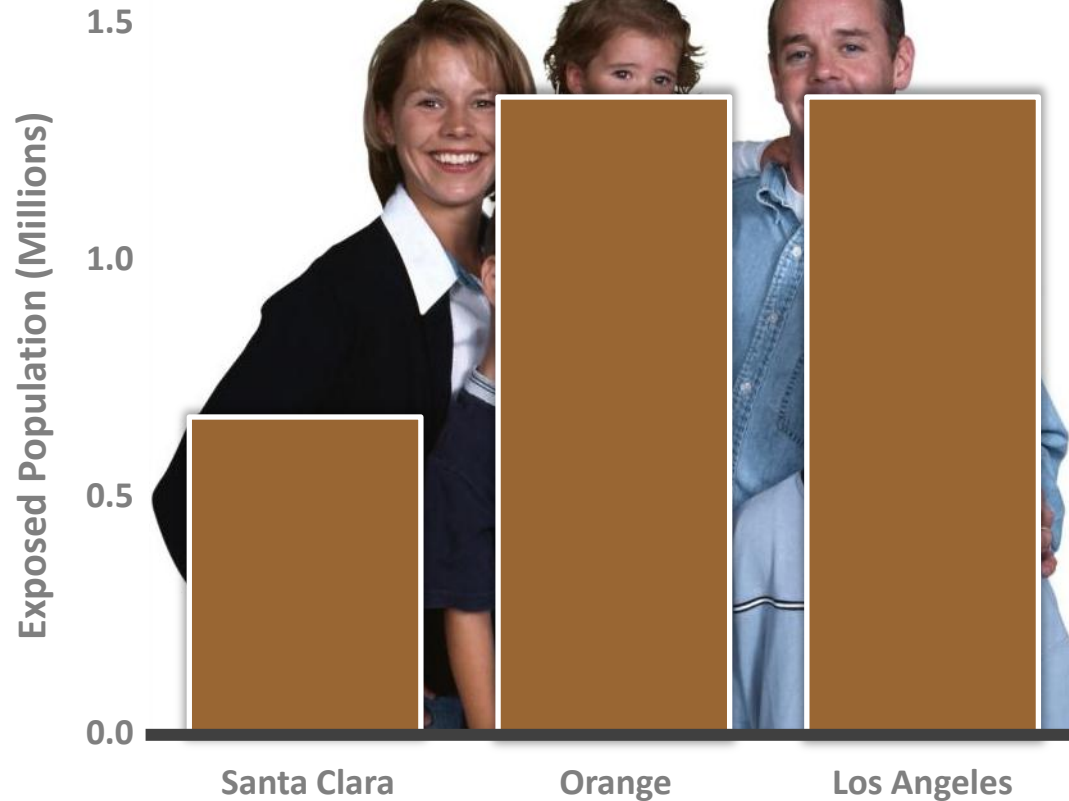


# 7.3 million Californians live in floodplains

## Number of People in Floodplain

- less than 50,000
- 100,000 to 500,000
- 500,000 to 1 million
- greater than 1 million

Statewide Total = 7.3 million



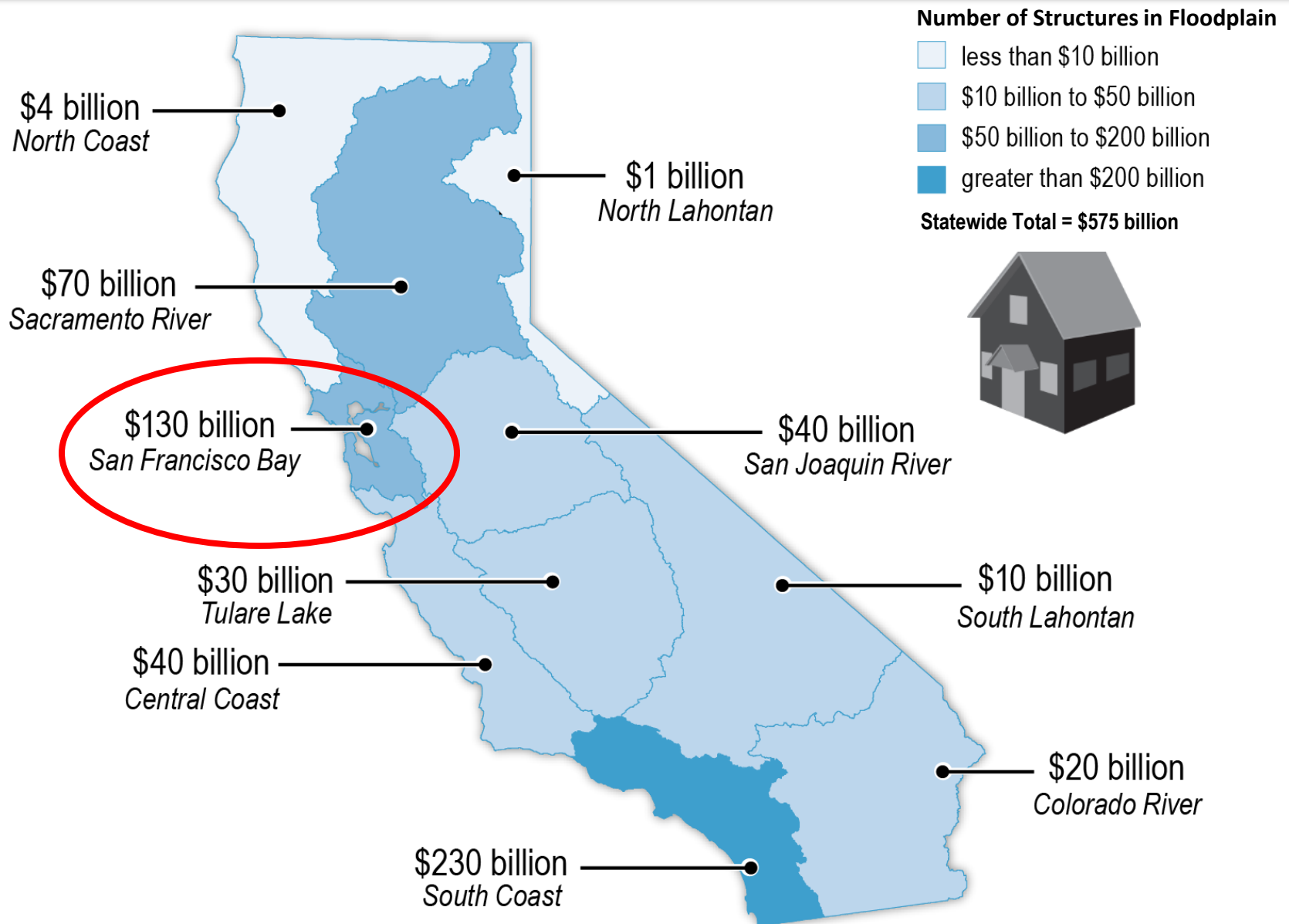
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n River

150,000  
South Lahontan

230,000  
Colorado River

South Coast

# \$575 billion in structures are at risk

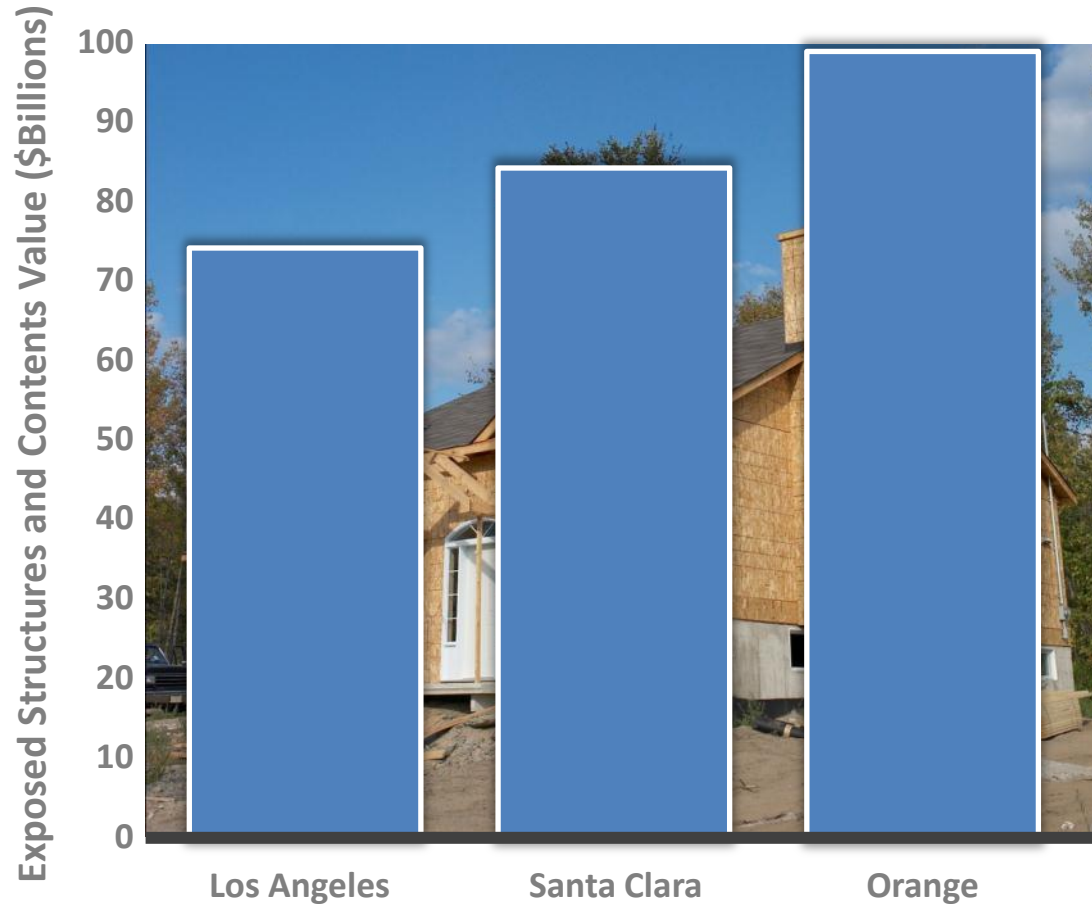


# \$575 billion in structures are at risk

## Number of Structures in Floodplain

- less than \$10 billion
- \$10 billion to \$50 billion
- \$50 billion to \$200 billion
- greater than \$200 billion

Statewide Total = \$575 billion



llion  
in River

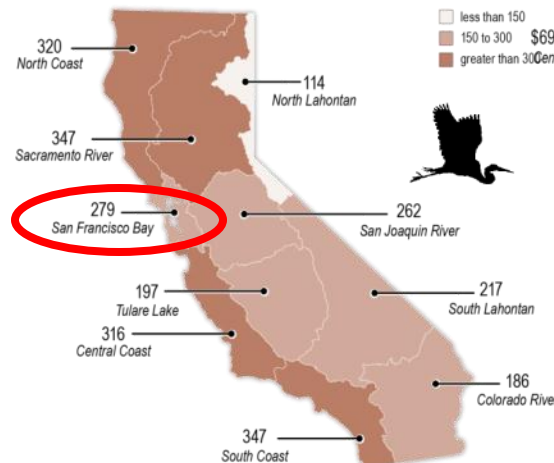
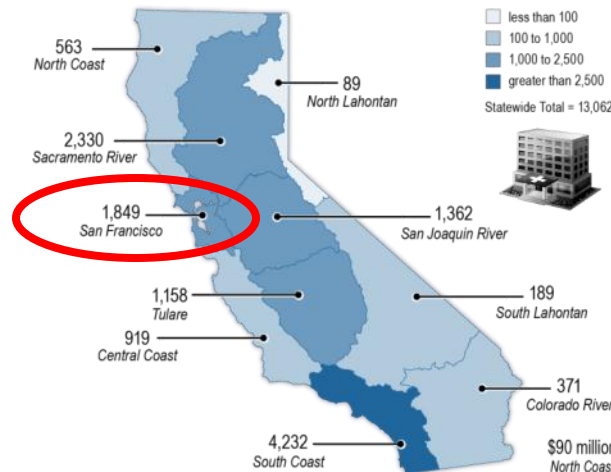
\$10 billion  
South Lahontan

\$20 billion  
Colorado River

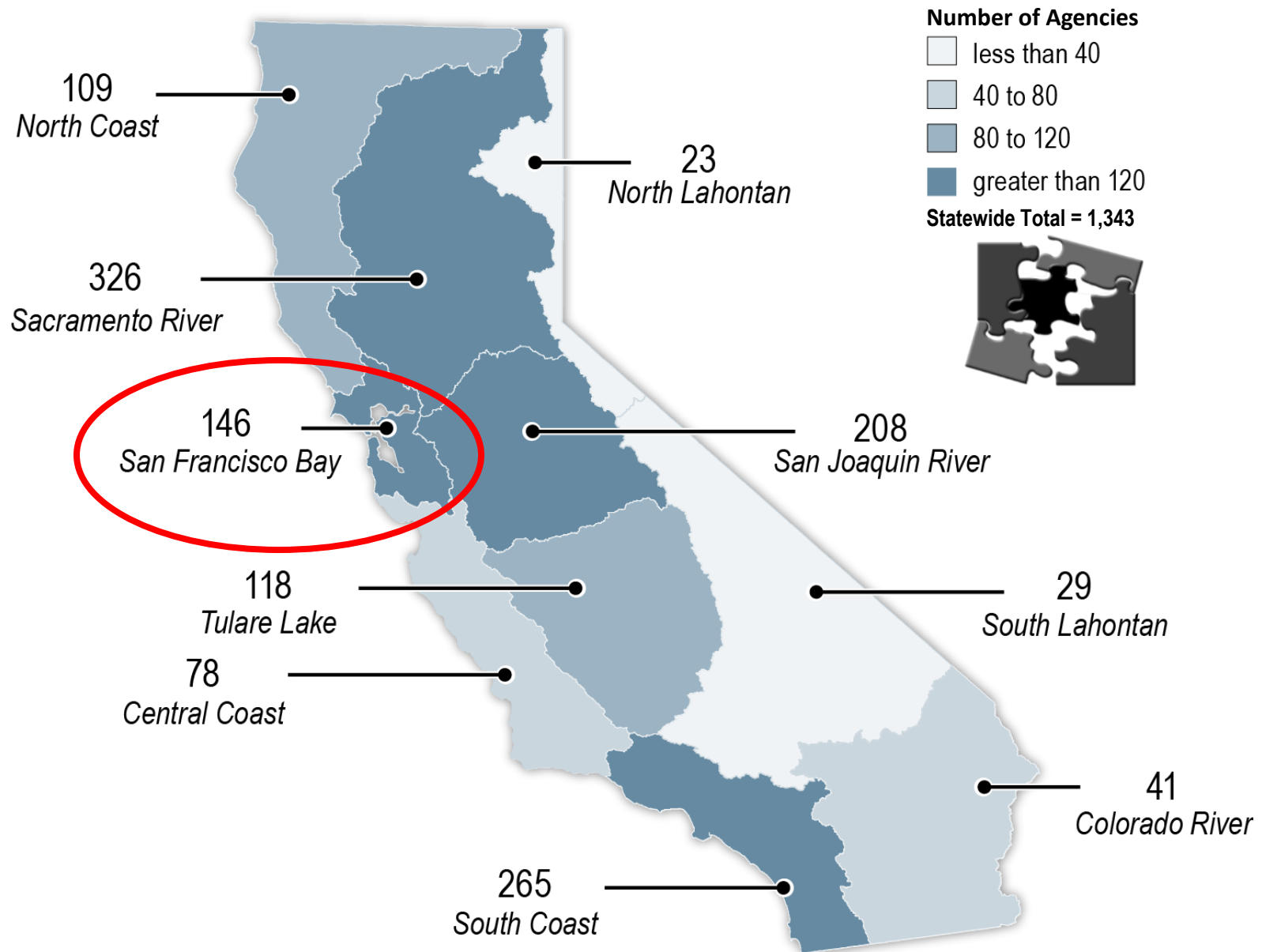


# Critical Facilities, Agricultural Crops, and Sensitive Species

- Over 13,000 Critical Facilities
- 7.5 Billion in agricultural crops
- Over 300 sensitive species
- Effects reach beyond the floodplain



# Flood management authority is complex and fragmented



# Local Agencies Speak Out

- Different risk methodologies and inadequate data
- Public understanding of risks is inadequate
- Limited emergency management funding
- Land use decisions may not protect public safety
- Projects are not prioritized
- Flood management responsibility is fragmented
- Permitting is a complex obstacle balancing public safety and environmental needs
- Sufficient and stable funding is needed

**NORTH BAY** • Humboldt County • Siskiyou County • City of Eureka • City of Arcata • City of Eureka • Mendocino County Water Agency • Siskiyou County • Town of McCloud • Sonoma County Water Agency • Trinity County Planning Department • Trinity County Department of Transportation • Trinity County Department of Public Works • **SACRAMENTO RIVER** • Butte County Public Works • City of Chico • M&T Ranch • El Dorado County • Glenn County Public Works • City of Orland • City of Willows • Glenn County Irrigation District • Yuba County Flood Control and Water Conservation District • Modoc County • City of Alturas • Central Modoc Resource Conservation District • Nevada County • Placer County Flood Control and Water Conservation District • Plumas County Flood Control and Water Conservation District • Sacramento County Department of Water Resources • American River Flood Control District • Sacramento River Flood Control Agency • **SAN FRANCISCO BAY** • Alameda County Flood Control and Water Conservation District • Alameda County Zone 7 • Contra Costa Flood Control and Water Conservation District • Bethel Island Municipal Improvement District • Marin County Flood Control and Water Conservation District • City of Corte Madera • City of Mill Valley • City of San Rafael • City of Sausalito • City of Tiburon • City of Novato • Napa County Public Works • San Francisco Department of Public Works • San Francisco County Flood Control Agency • San Francisco County Flood Control Agency • San Francisco County Flood Control Agency • San Francisco County Flood Control Agency • San Francisco County Flood Control Agency • **SOLANO COUNTY WATER AUTHORITY** • Reclamation District 2068 • **CENTRAL COAST** • Monterey County Water Resources Agency • San Joaquin Water District • San Joaquin County Flood Control and Water Conservation District • Santa Cruz Flood Control and Water Conservation District • Santa Cruz Flood Control and Water Conservation District • Santa Cruz Flood Control and Water Conservation District • **SAN JOAQUIN RIVER** • Amador County • Calaveras County • Calaveras County Flood Control and Water Conservation District • Colusa County Flood Control and Water Conservation District • Colusa County Flood Control and Water Conservation District • Colusa County Flood Control and Water Conservation District • **MARIPOSA COUNTY** • Merced County Public Works • Merced Irrigation District • San Joaquin Flood Control and Water Conservation District • San Joaquin Area Flood Control Agency • Stockton-East Water District • Stanislaus County Water Agency • Turlock Irrigation District • **CLACKAMAS COUNTY** • **SOUTH LAHONTAN** • Inyo County • **TULARE LAKE** • Fresno County Public Works • Fresno County Flood Control District • Fresno County Flood Control District • Kern County Water Authority • Kings County • Kings River Conservation District • Tulare County Flood Control District • **SOUTH COAST** • Los Angeles County Department of Public Works • City of Lancaster • City of Los Angeles • City of Palmdale • Orange County Public Works • Santa Ana River Flood Protection Agency • San Bernardino County Department of Public Works • San Diego County Flood Control District • City of Chula Vista • City of Coronado • City of El Cajon • City of Imperial Beach • City of Oceanside • City of San Diego • City of San Diego Storm Water Division • City of Vista • Ventura County Water Protection District • Ventura County Public Works • **COLORADO RIVER** • Imperial County • Imperial Irrigation District • Riverside County Flood Control and Water Conservation District • Coachella Valley Water District



# Environmental Stewardship Suffers from Competing Regulations and Processes.



# Flood infrastructure does not meet current and future needs

800+ projects identified statewide

- 20% do not have cost estimates
- \$30-\$50+ billion in improvements and projects
- Will not provide a 100-year level of protection statewide



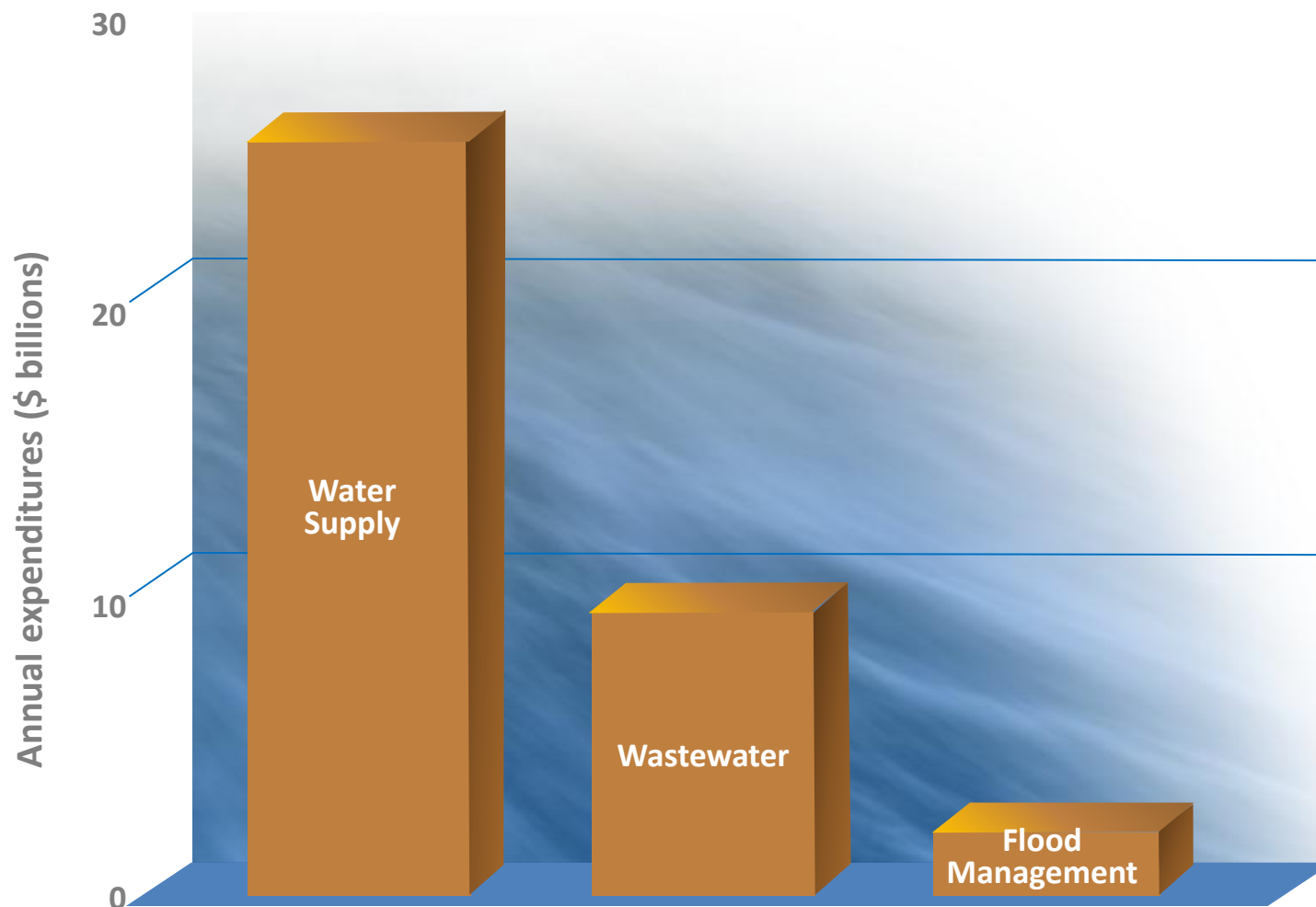
# Flood funding is limited and unreliable

- Inconsistent and insufficient funding
- Declining local resources
- Reduced Federal cost shares
- Challenging revenue structure
- Cost of flood management misunderstood by public and policy makers





# California's flood management expenditures are significantly lower than expenditures for water supply and wastewater treatment



*SOURCE: Water and the California Economy – Technical Appendix PPIC, 2012*

# Sufficient and stable investment in flood management must become a public policy priority

Capital investment in California Flood management projects in the last decade.



# Sufficient and stable investment in flood management must become a public policy priority

## Estimated capital investment needed for currently identified projects

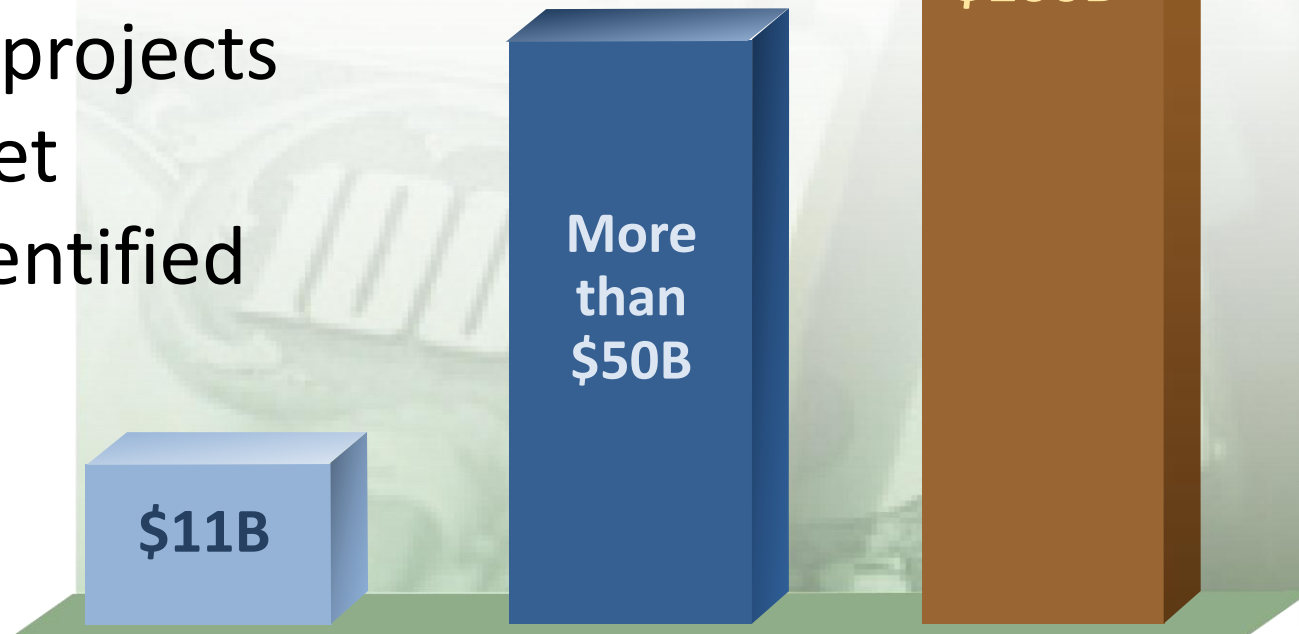
- USACE - \$6B
- CVFPP - \$14 - \$17B
- Delta - \$0.1 - \$17B
- Local - \$12B





# Sufficient and stable investment in flood management must become a public policy priority

Estimated additional capital investment needed for flood management projects that are not yet specifically identified



# The Solution



# Solutions must use an Integrated Water Management Approach

- Combines flood management, water supply, and ecosystem actions
- Regional and systemwide approach
- Collaboration and cooperation
- Array of funding sources





# Local agencies and IWM

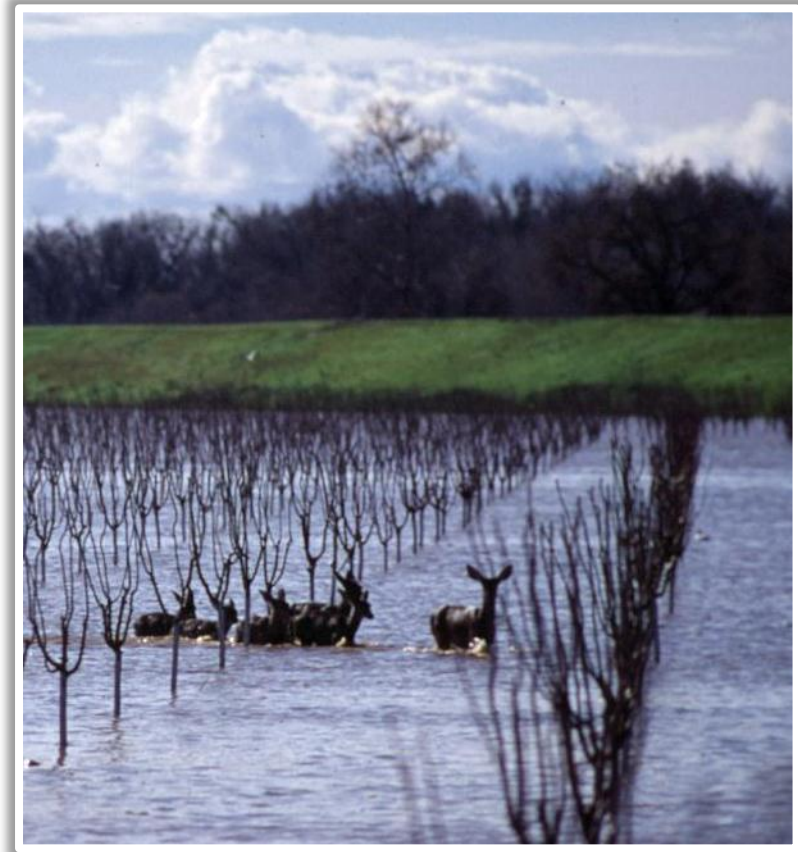
- IWM concepts are often in agency's mission statements but not always implemented
  - Large, urban agencies are more likely to implement IWM projects
  - Concerns exist about permitting costs and project operation and maintenance
- Flood management is often an afterthought in IRWM regions

# Recommendations

# 1 Conduct regional flood risk assessments to understand statewide flood risk

STOP

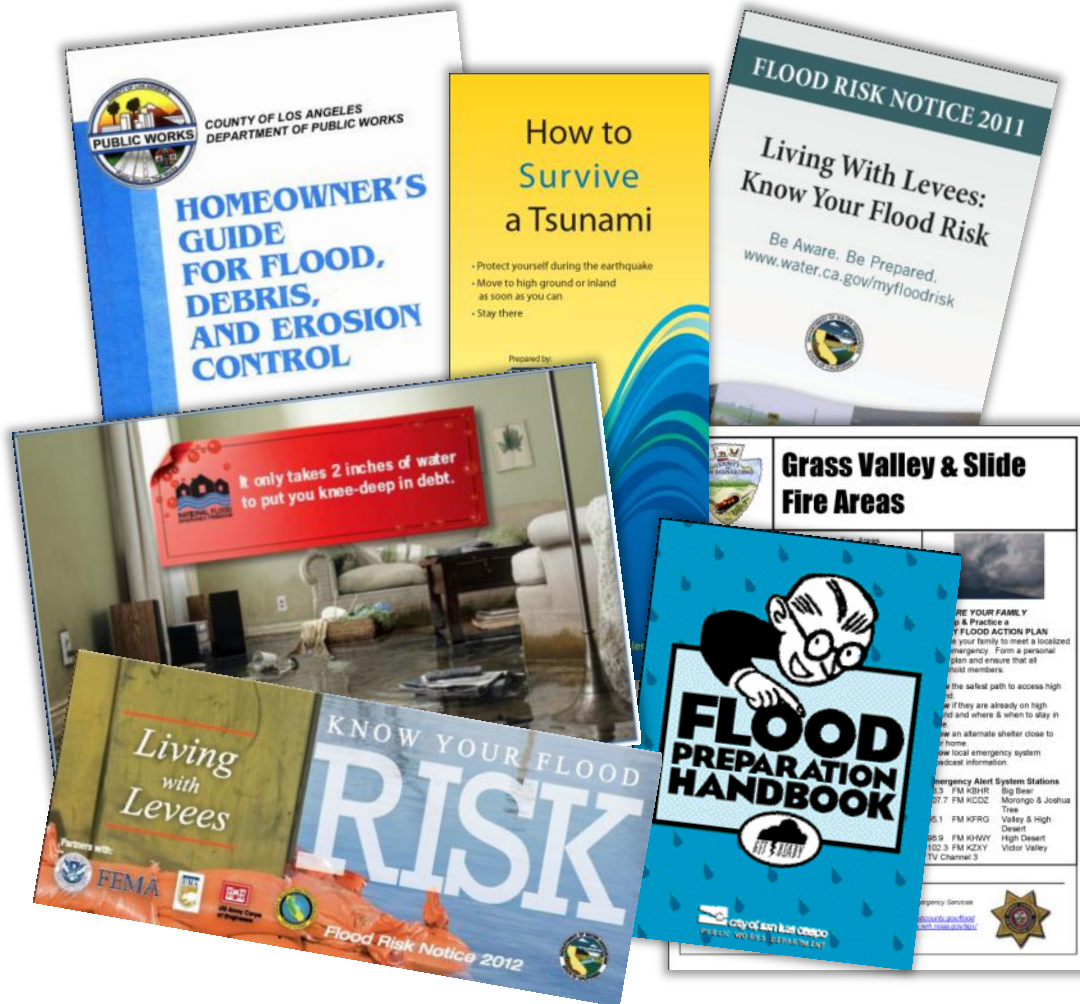
- Identify methods for and conduct regional flood risk
- Set regional flood risk reduction goals
- Identify opportunities to maintain natural systems
- Assess climate change and sea level rise impacts





# 2 Increase public and policymaker awareness about flood risks to facilitate informed decisions

- Develop consistent messaging
- Provide outreach materials
- Share data and information



# 3 Increase support for flood emergency preparedness, response, and recovery programs to reduce flood impacts

STOPS

- Provide increased flood readiness funding
- Develop or improve Flood Emergency Management Plans
- Conduct regular flood emergency exercises
- Identify data/forecasting needs





## 4

# Encourage land-use planning practices that reduce the consequences of flooding

## PLANS

- Develop planning principles for development in floodplains
- Facilitate coordination and alignment between planners and emergency managers
- Incentivize best management practices





## 5

# Implement flood management from regional, systemwide, and statewide perspectives to provide multiple benefits

## PLANS

- Identify regional flood planning areas
- Prioritize flood management projects
- Improve State and Federal Processes
- Coordinate regional water and flood management
- Link funding to an IWM approach



# 6 Increase collaboration among public agencies to improve flood management planning, policies, and investments

- Utilize regional working groups
  - *Permits*
  - *Plans*
  - *Implementation*
- Provide funding, grant, and in-kind credit programs
- Prioritize flood management investments



# 7 Establish sufficient and stable funding mechanisms to reduce flood risk

ACTIONS

- Assess potential funding sources and propose new options
- Facilitate access to funding sources
- Increase funding for priority flood management projects





# We Must Take Action. Now.

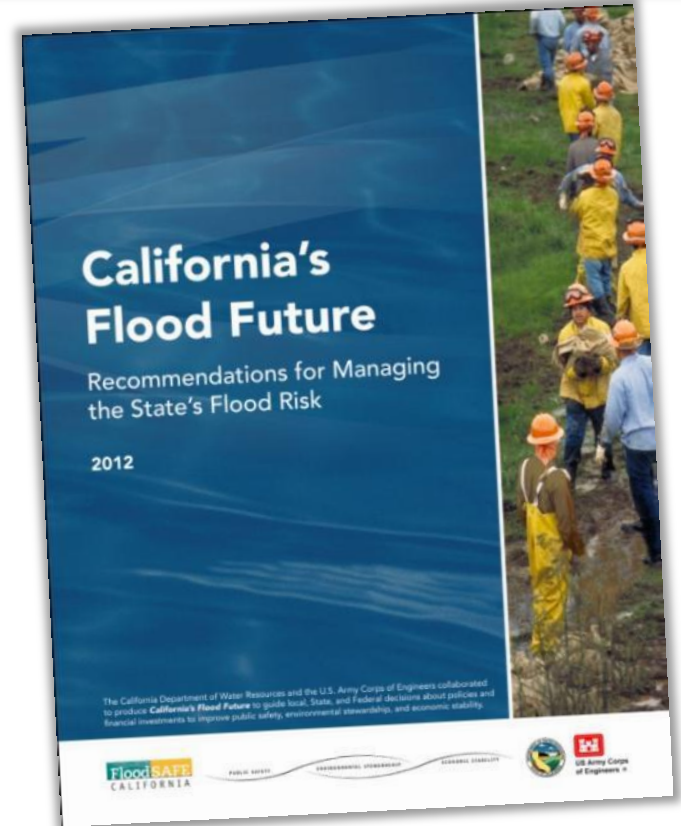
## California's future depends on:

- Local, State, and Federal agencies working together
- Implement policies and projects using an IWM approach
- Increase awareness of the cost and consequences of flooding
- Establish investment priorities and sufficient and stable funding
- Short term and long term actions and solutions

# California's Flood Future Schedule

- Preview draft
  - Highlights: November 2012
  - Main report, TMs: March 2013
- Public review draft: April 2013
  - Main report, TMs, Highlights
- Regional Workshops: April 2013
- Final report: June/July 2013

<http://www.water/ca/gov/SFMP>



# Questions



# For more information:

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