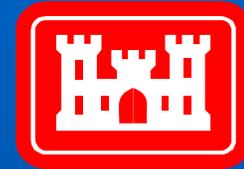
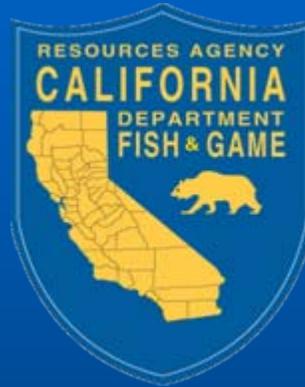


Delta Risk Management Strategy



**US Army Corps
of Engineers**

Sacramento District

DRMS PUBLIC MEETING
JUNE 26, 2007

Delta-Suisun Marsh Branch
Department of Water Resources

Delta Risk Management Strategy

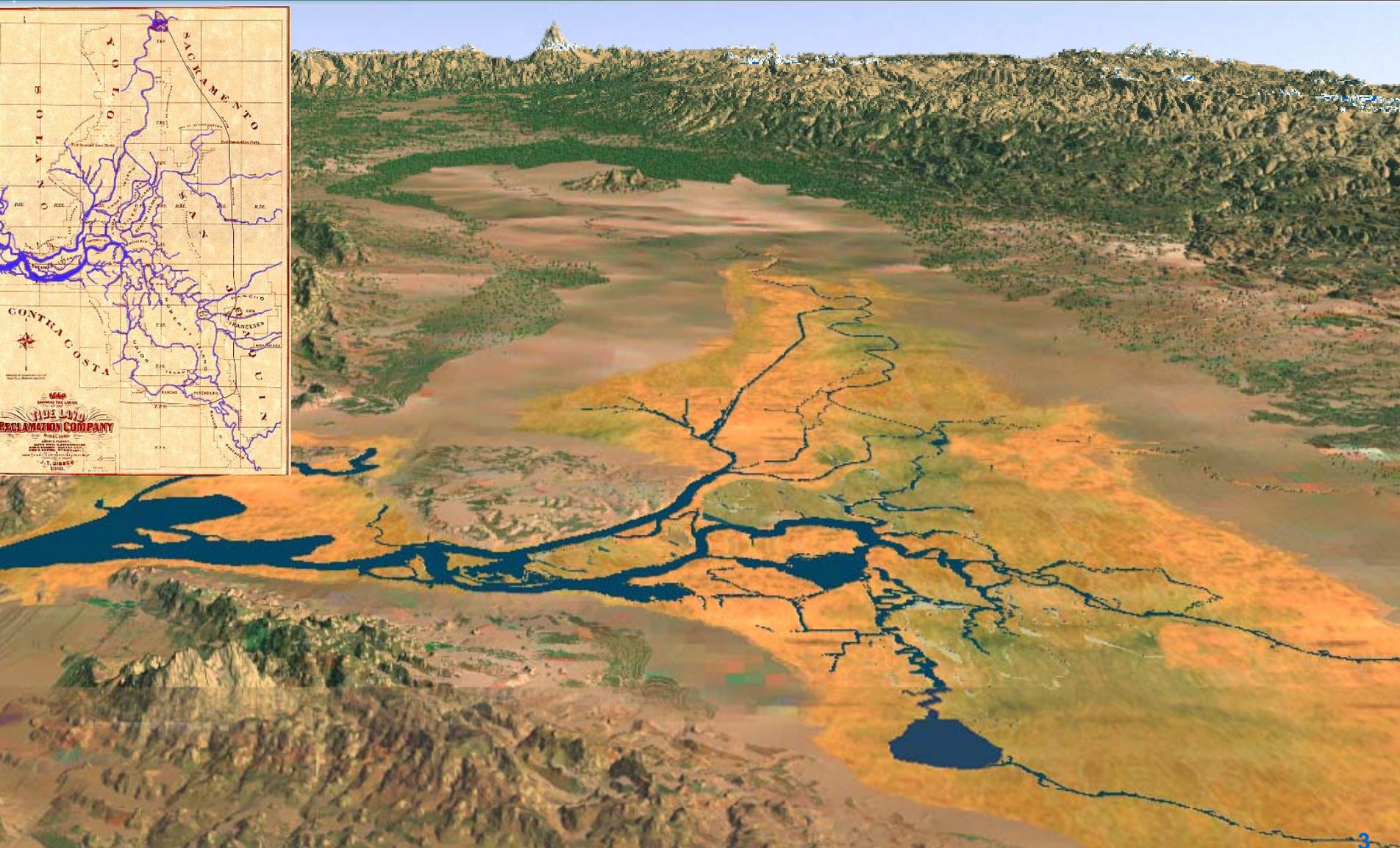
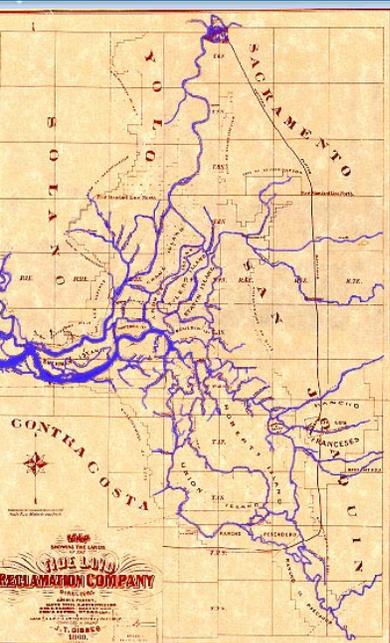
- Evaluate current and future risk
- Identify consequences
- Identify risk reduction measures, including levee upgrades and land use changes
- Evaluate alternative strategies to reduce risk

Phase 1: Evaluation of Risks

Phase 2: Evaluation of Alternative Strategies to Reduce Risk



Sacramento-San Joaquin Delta



Design and Construction History



What Could We Lose?

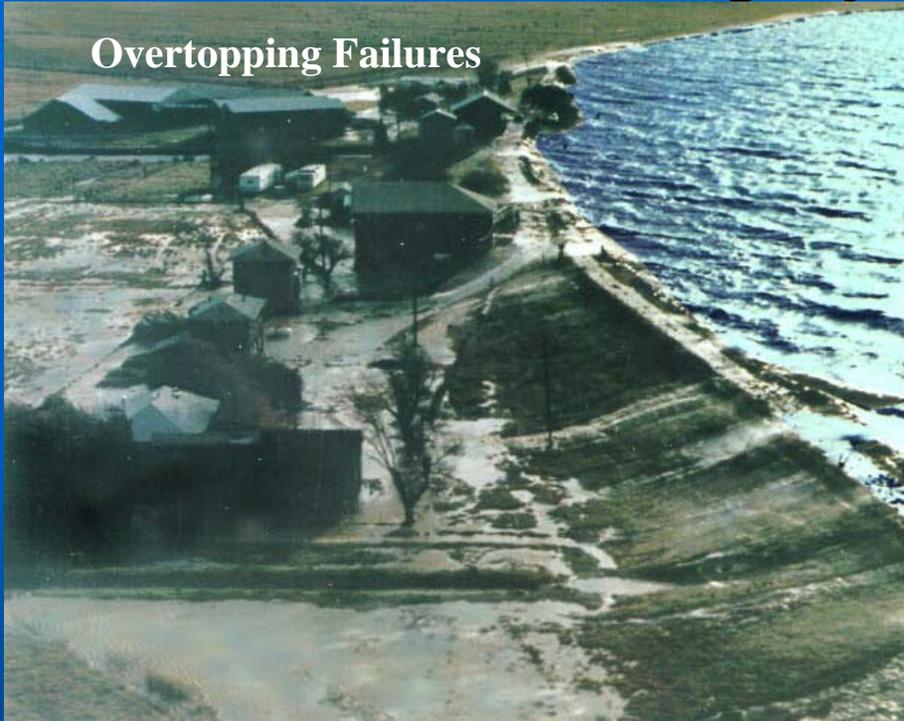


- Supplies water to more than 22 million Californians, industry and agriculture
- Water supply supports \$400 billion state economy
- Home for more than 400,000 people
- Habitat for 500 species
- Highways, pipelines, power distribution, railroads, and deep water ports

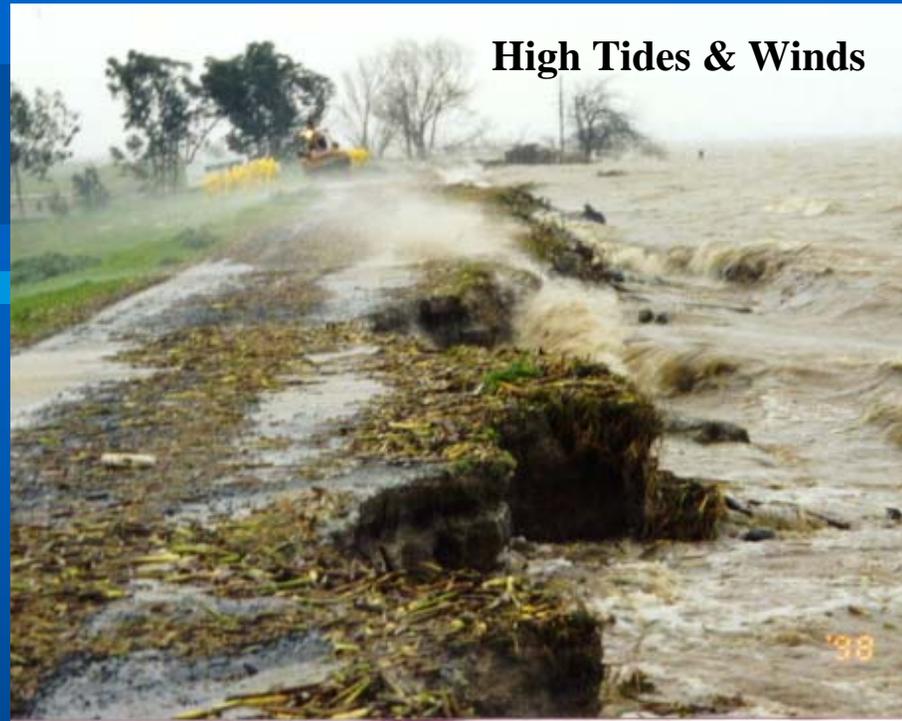


Risks to Levee Integrity

Overtopping Failures



High Tides & Winds



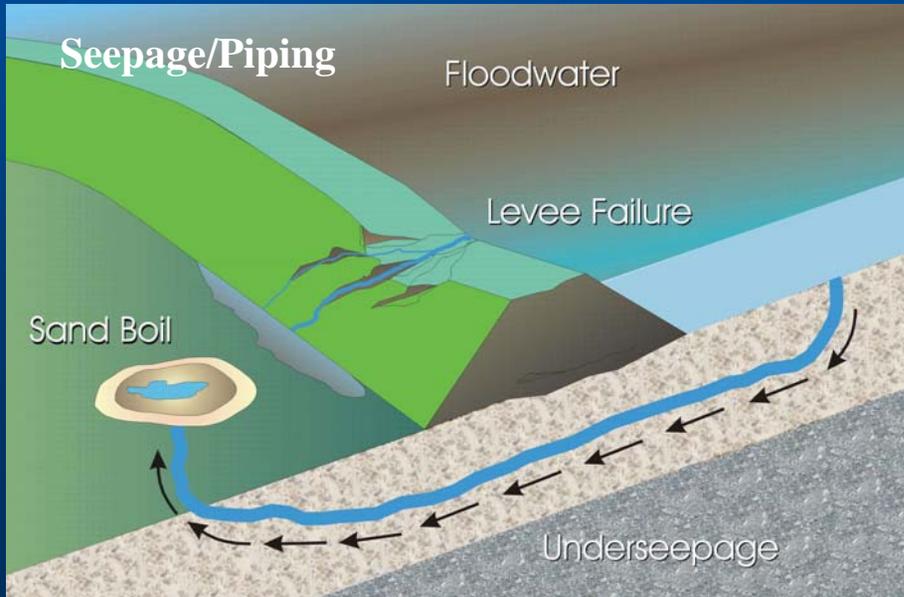
Seepage/Piping

Floodwater

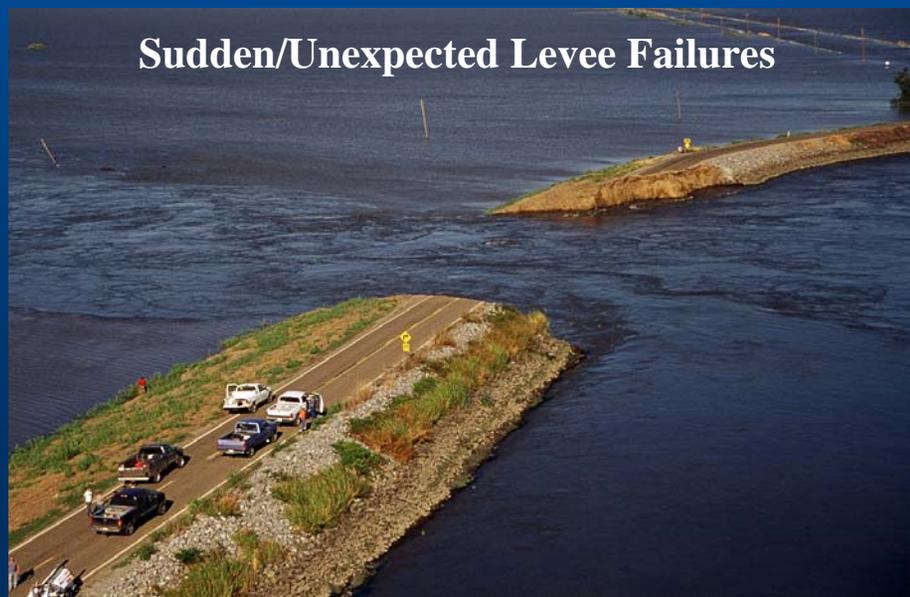
Levee Failure

Sand Boil

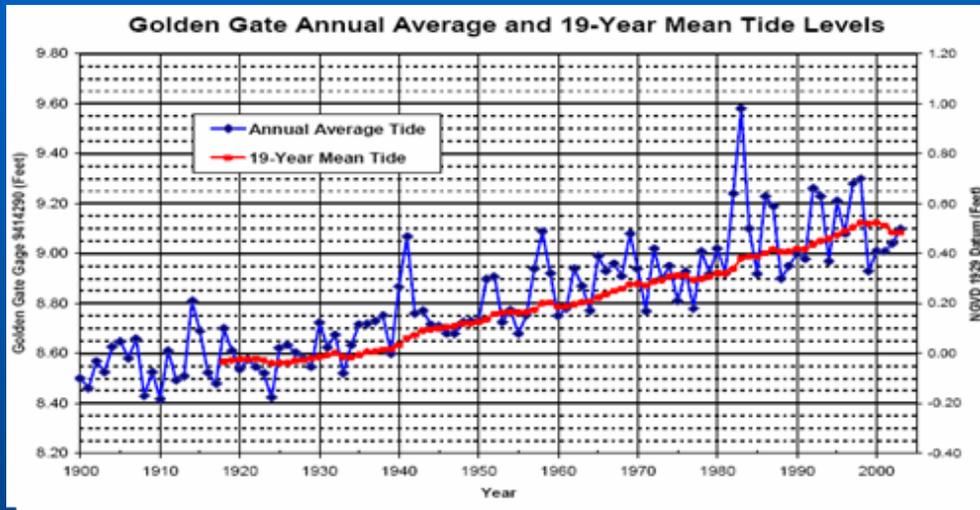
Underseepage



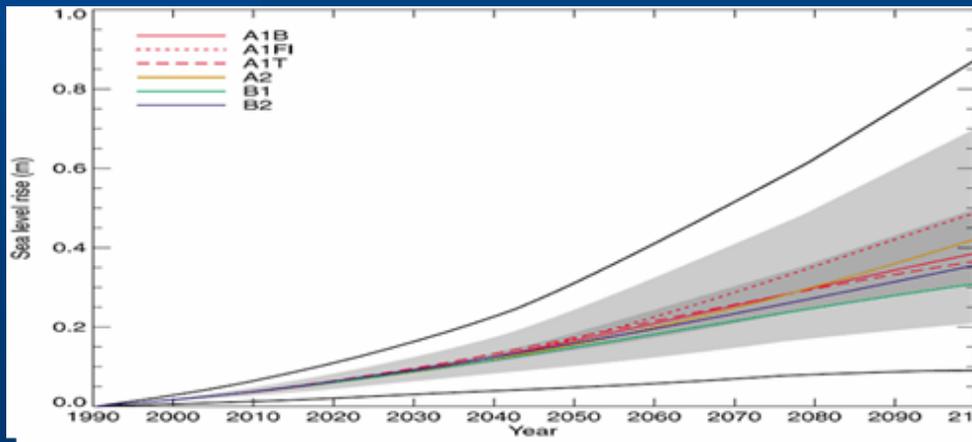
Sudden/Unexpected Levee Failures



Climate Change: Sea Level Rise

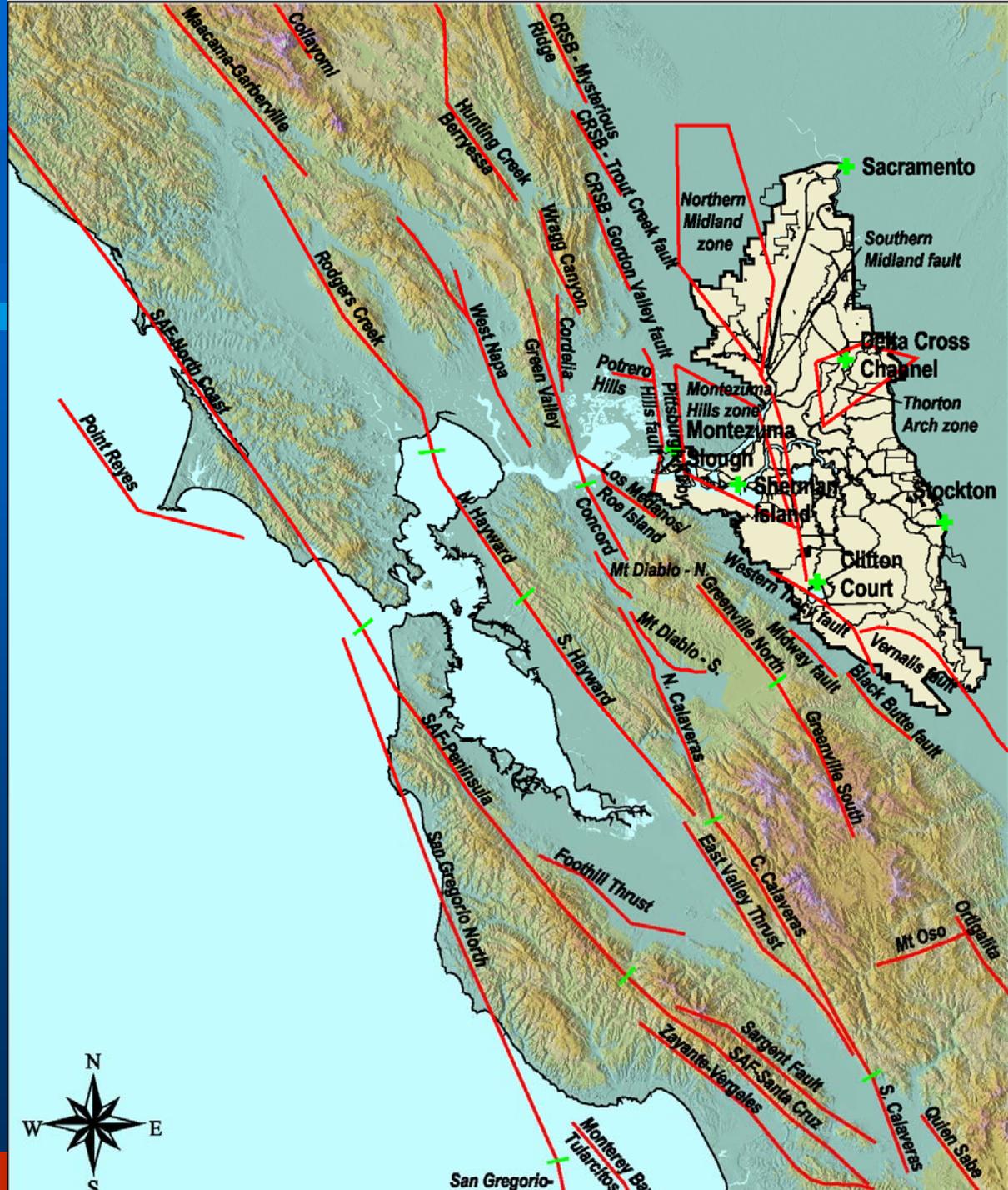


Past (1900 – 2000)
+ 15 cm sea level rise



Future (2000 – 2100)
15 to 60 cm sea level rise

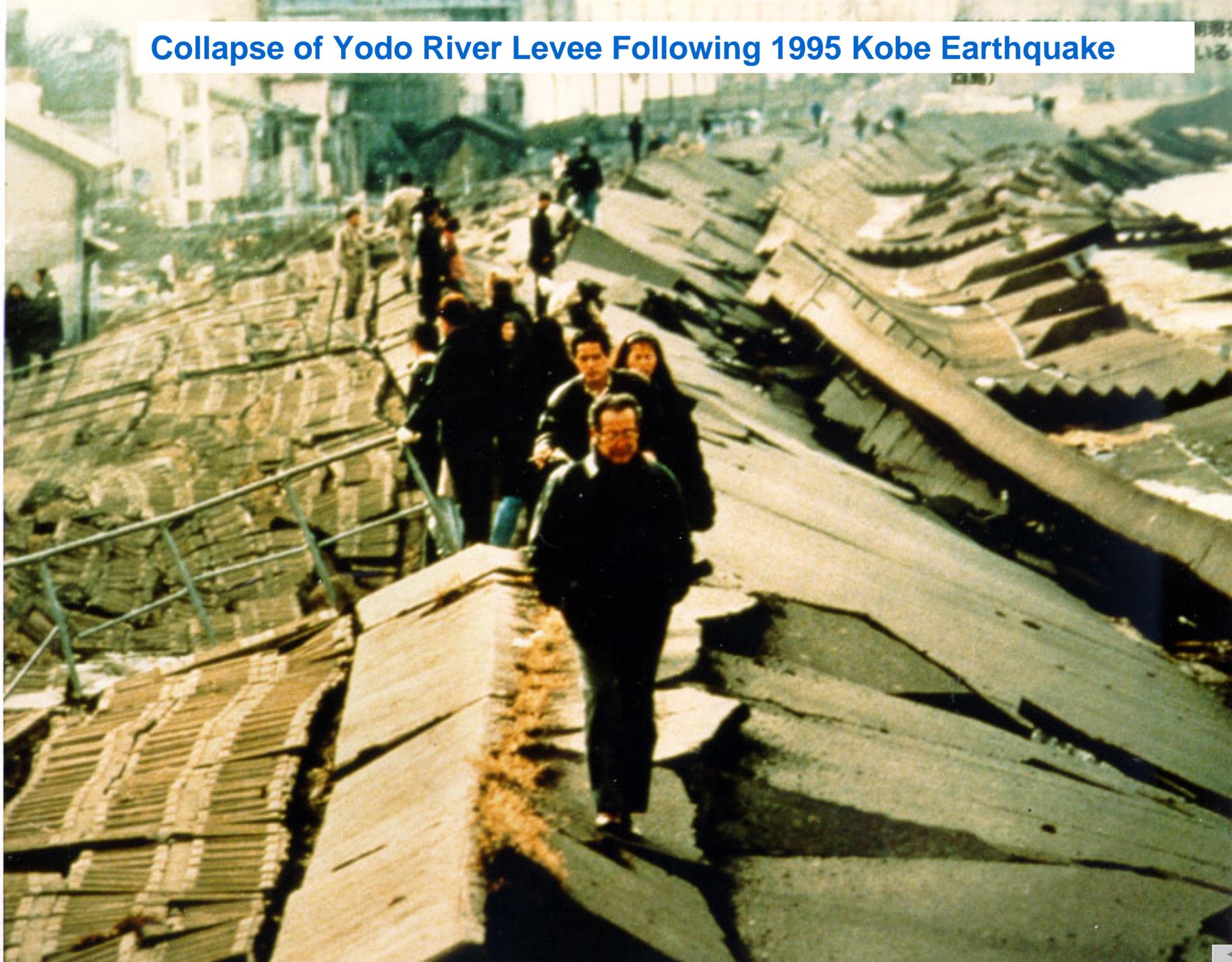
Bay Area Fault Map



Moderate Damage to Yodo River Levee Following 1995 Kobe Earthquake



Collapse of Yodo River Levee Following 1995 Kobe Earthquake



Upper Jones Tract



June 3, 2004

Floodwaters enters island

Collapse of Moss Landing Marsh Levee Following 1989 Loma Prieta Earthquake



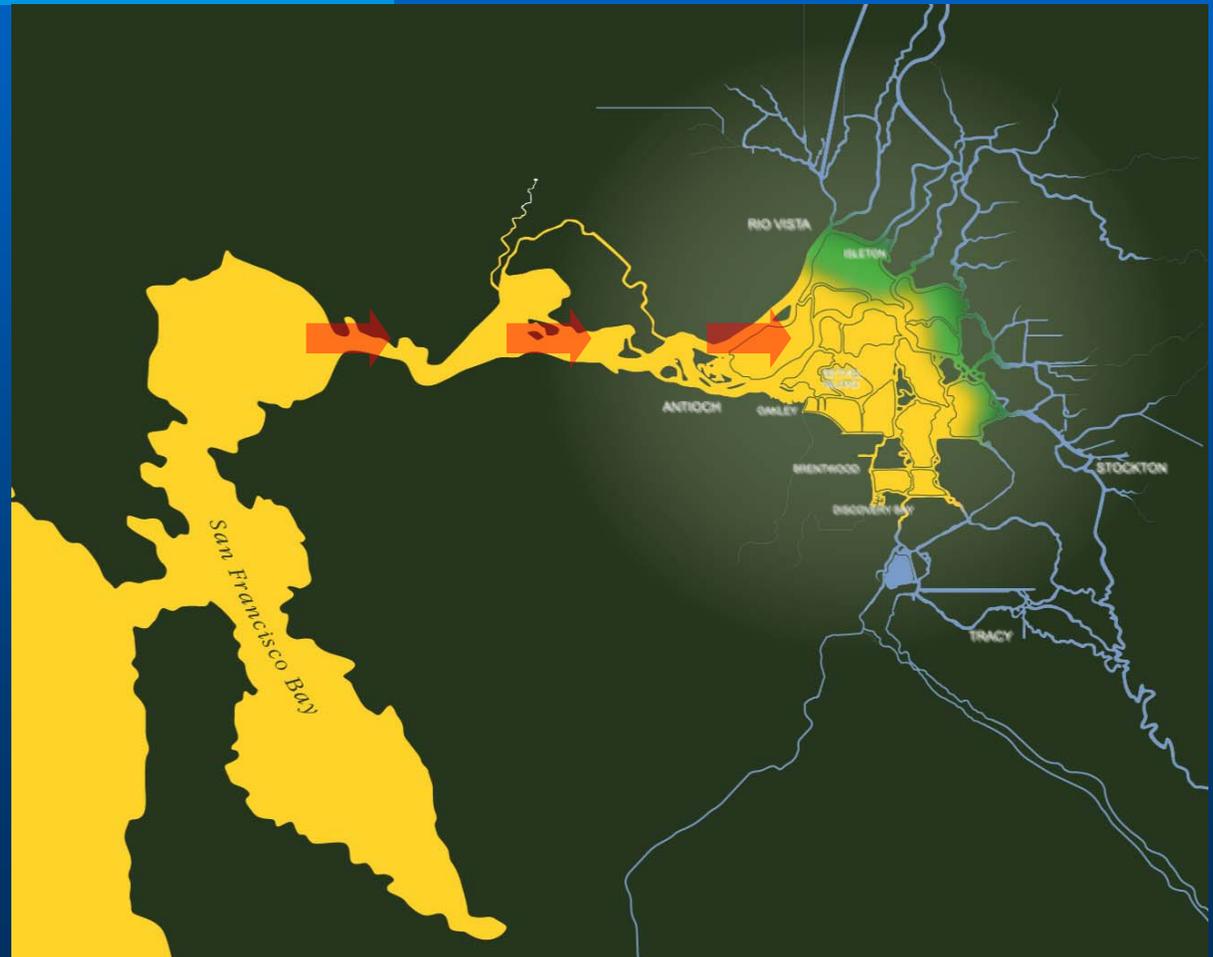
Magnitude 6.5 Earthquake Scenario



Magnitude 6.5 Earthquake Scenario

When the Delta Levees Fail

- 300 billion gallons of salt water flow into the Delta in first few days



Delta Risk Management Strategy

Phase 1 Risk Evaluation

- Development of a Risk Analysis to Evaluate the Impact to Delta Levees from:
 - Floods
 - Earthquakes
 - Unexpected Failures
 - Subsidence
 - Climate Change
- Determine Consequences to Economy & Eco-System based on Risks Found

DRMS – Project Activities-Phase 1



Notes:

R/L: Costs of Repair & Loss of Revenue/Resources

L-T: Long Term

Delta Risk Management Strategy

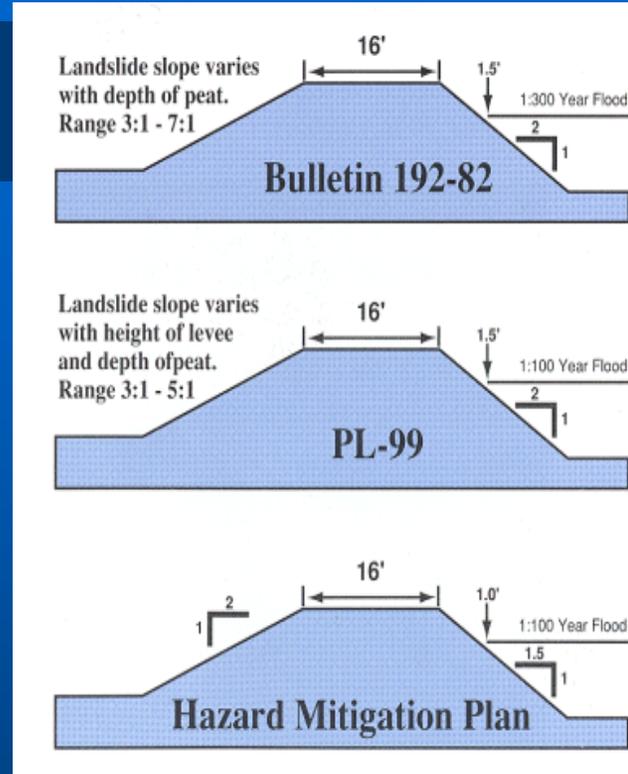
Phase 2: Development and Evaluation of Risk Reduction Strategies

- Develop a menu of risk reduction measures that could reduce risk – *“building blocks”*
- Package the measures into different combinations -> *“trial scenarios”*
- Use Risk Model to evaluate potential risk reductions
- Evaluate benefits and costs of risk reduction measures

Delta Risk Management Strategy

Potential Risk Reduction Building Blocks:

- Improved Levee Maintenance
- Upgraded Delta Levees
- Enhanced Emergency Preparedness/Response
- Pre-Flooding of Selected Western Islands
- Land Use Changes to Reduce Subsidence
- Armored Through Delta "Pathway" Conveyance
- Isolated Conveyance
- Elevation of State Highways on Piers
- Armored Infrastructure Corridor
- Suisun Marsh Restoration
- Cache Slough Restoration
- Fish Screens
- Reduced Water Exports



DRMS Phase II

Trial Scenarios Being Proposed

- Improved Levees
- Armored Pathway
- Isolated Conveyance

Key Question ...

- ✓ **Delta Vision – What changes (landscape, ecology, water conveyance and governance) need to occur to keep the Delta and its uses sustainable?**

... and Products

- ✓ **Vision Report – most likely scenarios for additional consideration - December 2007**
- ✓ **Implementation Strategy – Recommended scenario and plan for implementation - October 2008**

Delta Vision Blue Ribbon Task Force Members

- Phillip Isenberg, Chair
- Monica Florian
- Richard M. Frank
- Thomas V. McKernan
- Sunne Wright McPeak
- William K. Reilly
- Raymond Seed

Delta Stakeholders Group

41 members represent diversity of interests who live, work, play and depend on the Delta:

- Local government / land use
- Business and labor
- Agriculture and Delta landowners
- Flood risk and levee management
- Recreation, tourism and commercial fishing

Thank You