

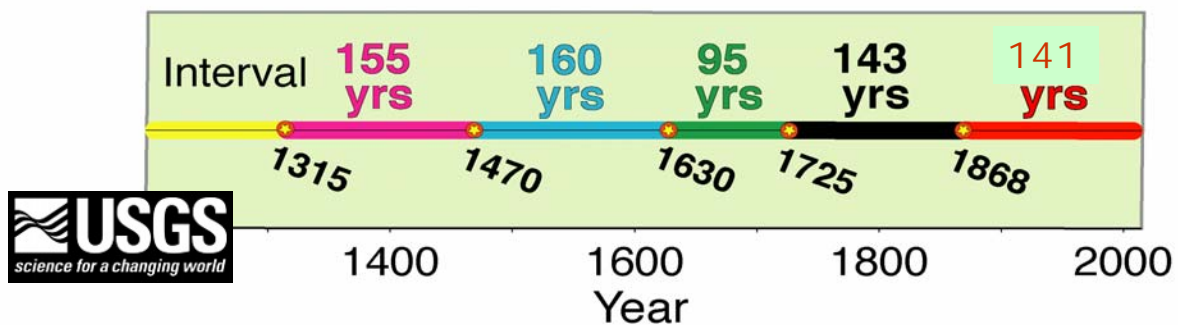


# **Bay Area Earthquakes and Sewer Issues**

*JEANNE PERKINS*

*ABAG Earthquake and Hazards  
Program Consultant*

## The Last Five Hayward Fault Earthquakes Have Been 140 Years Apart on Average



**The Hayward fault is overdue for a major earthquake. Other faults are also a threat.**

# Earthquake Impacts

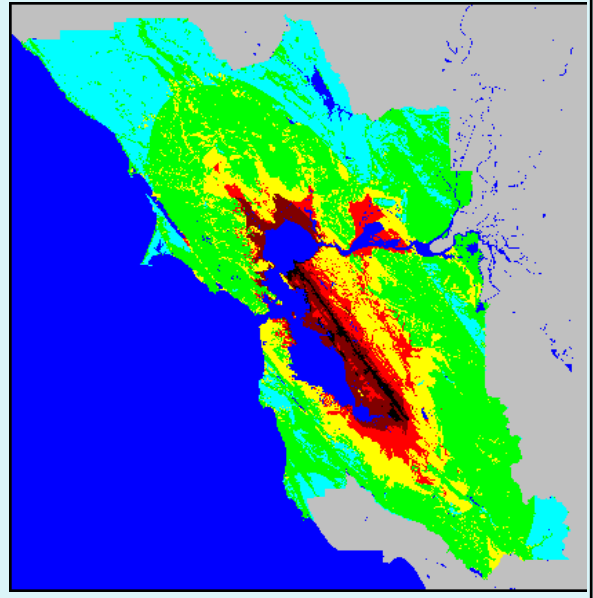
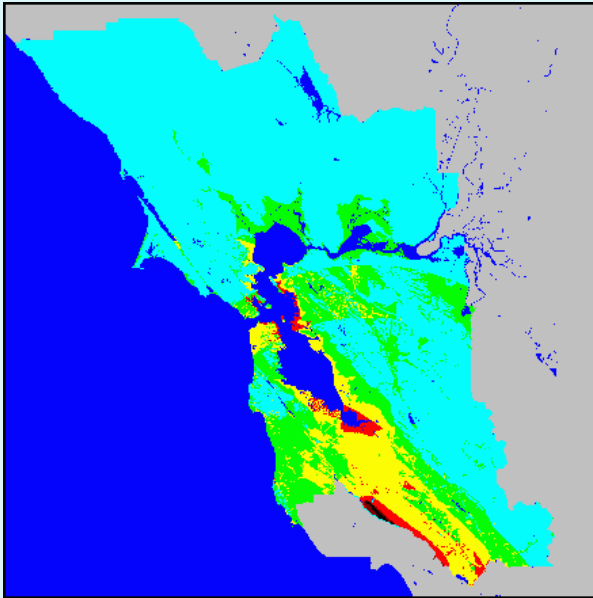
## DIRECT

- Ground Shaking
- Fault Rupture
- Liquefaction
- Landslides

## INDIRECT

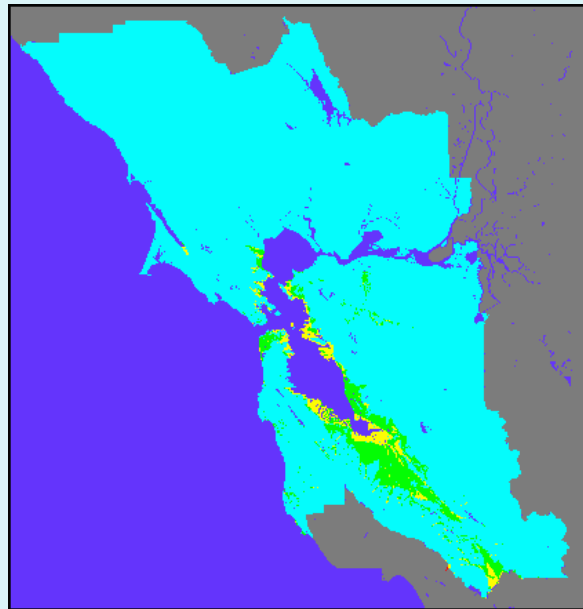
- Water system
- Transportation
- Power & communications
- Housing

## Shaking Hazard - Loma Prieta Versus Entire Hayward

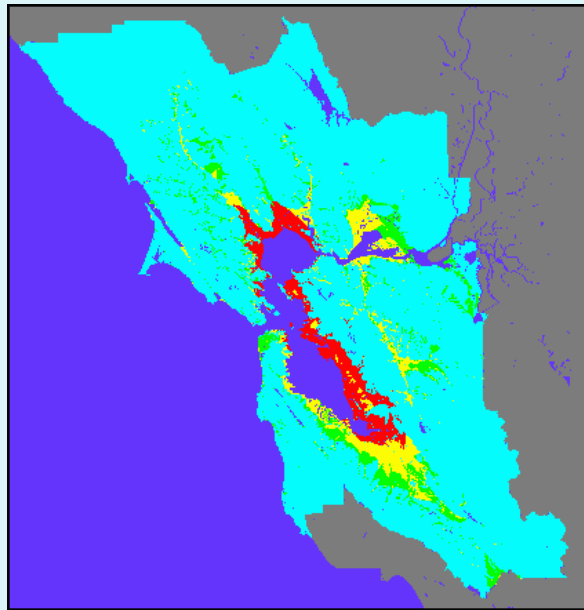
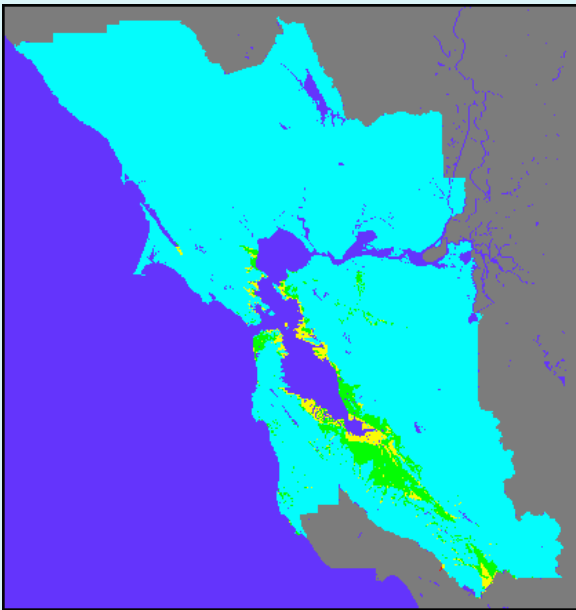


## What Happened in the “Very High” Liquefaction Areas in Similar Shaking Intensities - Loma Prieta Quake

- **Water** – 4-5 times more breaks
- **Natural Gas** – 3 - 11 times more breaks
- **Roads** – 1.3 times more surface, but 25 times more costly
- **SEWERS** – NO DATA!



## Liquefaction Hazard - Loma Prieta Versus Entire Hayward



# Pipeline System Impacts

## WATER SYSTEMS:

- 507 documented water pipeline leaks/ruptures in Loma Prieta

## BUT IN A HAYWARD QUAKE:

- 5,500 leaks/ ruptures due to shaking
- PLUS 100 or more due to landslides
- PLUS 500 due to faulting
- PLUS 1,000-2,000 ? due to liquefaction

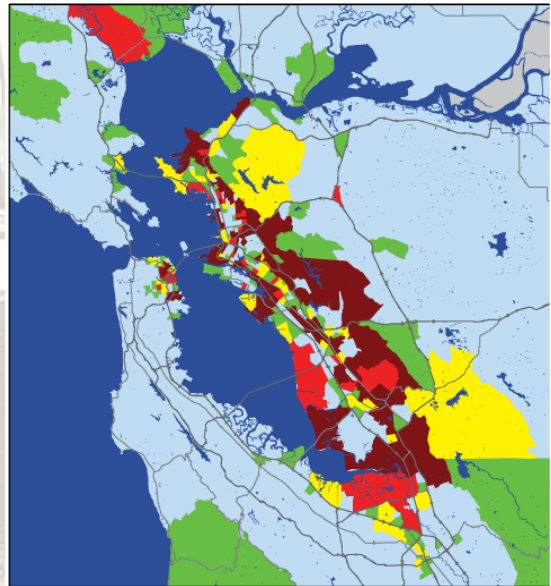
## SEWER SYSTEMS:

- WORSE – but unknown extent



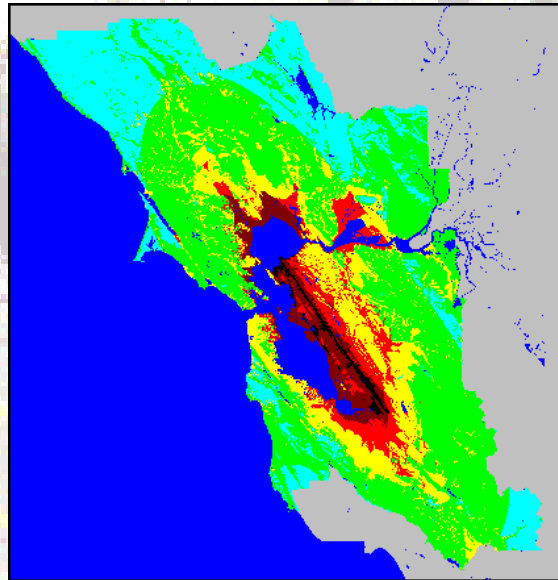
## Transportation Impacts

- **LOMA PRIETA** –  
**142** road closures
- **NORTHRIDGE** –  
**140** road closures
- **NEXT TIME** – about  
**1,700** road closures –  
closer to Kobe or  
Katrina



## Housing Impacts

- **LOMA PRIETA** –  
**16,000** uninhabitable
- **NORTHRIDGE** –  
**46,000** uninhabitable
- **NEXT TIME** – about  
**155,700** uninhabitable  
– about half of 300,000  
of Katrina



# Disaster Planning Cycle



# Public Preparedness

- Sewer Smart Brochure



## **Mitigation Priorities =**

- Wastewater treatment plants
- Pumps and connections to pipelines
- Sewer lines, particularly old brittle ones

## One Source of \$\$\$\$ = FEMA Hazard Mitigation Grants

- Pre-Disaster Mitigation Grants
- Post-Disaster Grants (Hazard Mitigation Grant Program)
- **BONUS** - State also covers local match for post-disaster "Public Assistance"

## Good Intentions Are NOT Enough

- Is your sewer agency covered? See handout!
- If yes - See Danielle Hutchings for contact if you have not yet been asked about what you want to see.
- If no - See Danielle Hutchings on how to get covered! You need to act NOW.

## **Disaster Recovery**

- **KEY = Money to repair**
- **MOST IMPORTANT THING TO DO NOW = Document "Existing Conditions" to ensure maximum FEMA Public Assistance Funds**



**ABAG information:**

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