

Countywide DFIRM Update in Conjunction with a HAZUS[®]MH Essential Facilities Risk Assessment for Southern California Studies

October 10, 2007

2007 ESRI Health GIS Conference



FEMA

MAP IX-Mainland

Meeting Agenda

- Vision & Purpose
- Community Participation
- Results So Far...



Emergency Management Philosophy

- Today's challenges in emergency management require pro-active planning, risk assessment and information sharing.
- We need to leverage innovative technologies and public-private partnerships to better address disaster planning and management.
- The first step is to assess vulnerabilities and the population at risk before we can mitigate and manage the risk.
- Government (Federal, State & Local) and Community participation is essential.

Project Goal

- FEMA Region IX selected three communities for a multi-hazard HAZUS-Map Mod Risk Assessment
 - Orange County
 - Riverside County
 - San Bernardino County
- Conjunction with DFIRM update provides us with an excellent opportunity to demonstrate the synergies between FEMA's Map Modernization (Map Mod) Project and FEMA's HAZUS® natural hazard loss estimation software, with products useful to emergency preparedness and hazard mitigation planning.

Hazard Mitigation Plans

- Importance of having a Hazard Mitigation Plan
 - Disaster Relief Funding
 - Mitigation Funding
- 5 year update
- Status of three communities
 - Riverside: Current plan for 90% of communities
 - San Bernardino: Current plan for 90% of communities
 - Orange: Current plan for 30% of communities

Funding Impacted by the HMP

Individual Assistance

After a disaster, Federal funds are provided to qualified individuals to facilitate recovery. Assistance comes in the form of low interest loans*, housing assistance, cash grants etc.



Not impacted by plan

Public Assistance

Categories A & B: Emergency measures and debris removal



Not impacted by plan

Categories C-G: Reconstruction of public facilities and infrastructure to current codes and standards.

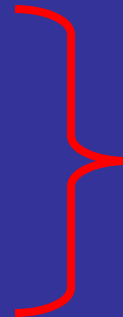


An approved State or Tribal plan is required in order to receive funding.

Mitigation

Hazard Mitigation Grant Program (HMGP): A portion of the total disaster grants (disaster operations cost less administrative costs) may be awarded by FEMA to the impacted State to implement long-term hazard mitigation measures after a major disaster declaration.

Pre-Disaster Mitigation Program (PDM-C): An annual competitive grant not tied to a disaster.



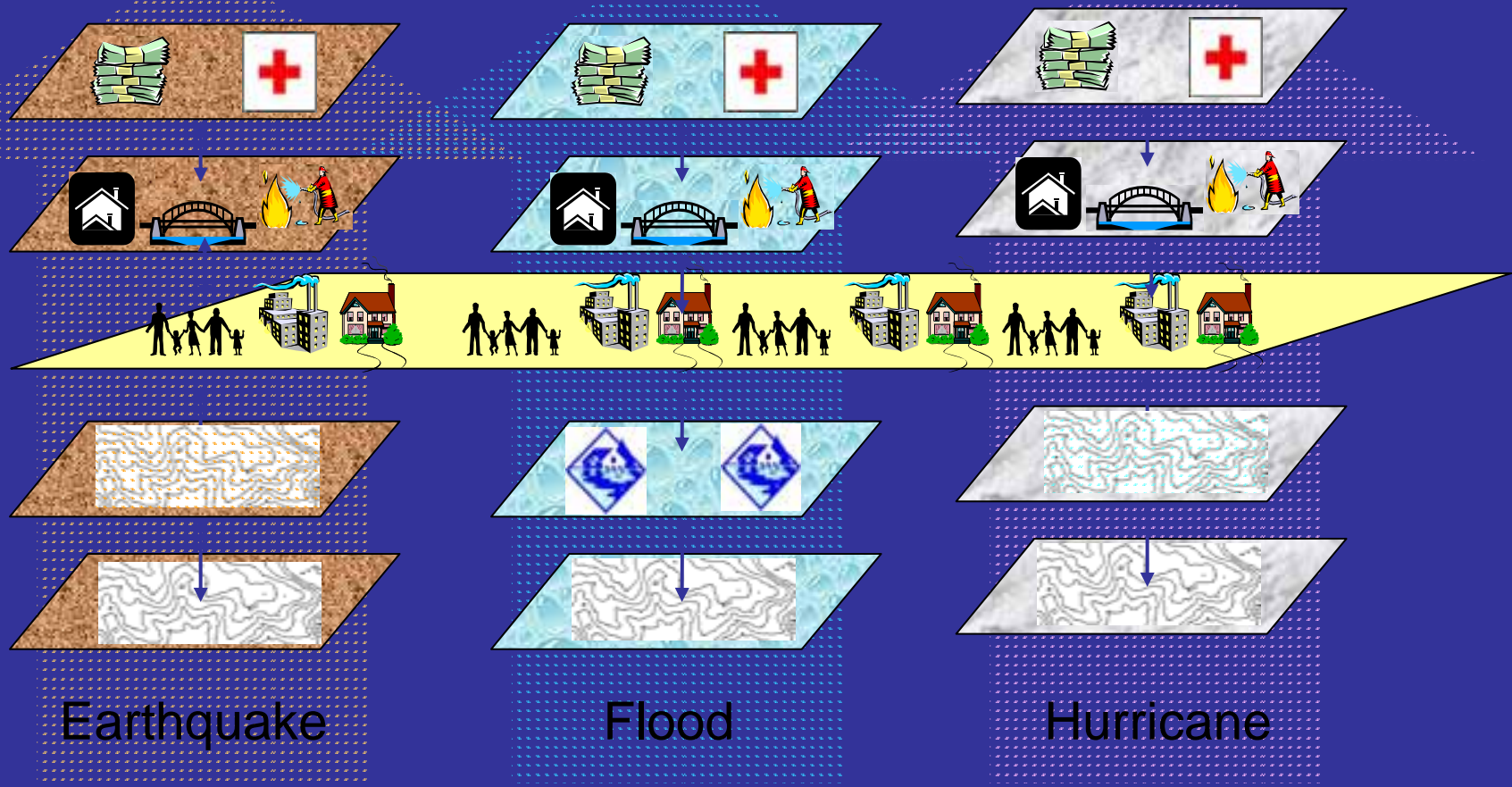
An approved State or Tribal and Local, Multi-jurisdictional or Local Tribal plan is required in order to receive funding for projects. Funding support for planning remains available only at the local level.



Project Overview

- Each project guided by a **Community Executive Committee (CEC)**
- Essential Facilities Data Collection and HAZUS Incorporation
- Incorporation of County Assessor's data.
- Earthquake Hazard Scenario Selection (2) and Risk Assessment
- Incorporation of DFIRM data into HAZUS
- Flood Risk Assessment (Two 100 yr events, w/ & w/out levees & one 500 yr event)
- Risk Assessment Report
- One year schedule per community all roughly ending December 2008

HAZUS-MH Loss Estimation Methodology



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How does HAZUS estimate losses?

- Predicts damage and estimates dollar losses for:
 - Buildings
 - Lifelines
 - Regional economy
- Answers 'what if' questions
 - Building code modifications
 - Levee or flow regulation structure
 - And much more...

Epicenter Location
and Magnitude

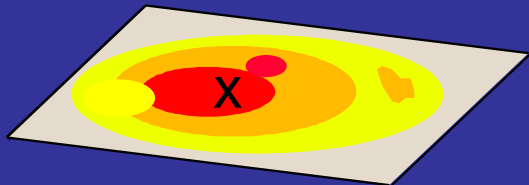


GIS Based
Attenuation
Model

EARTHQUAKE LOSS ESTIMATION USING HAZUS

(Courtesy S. McAfee, CA OES)

Soil Maps

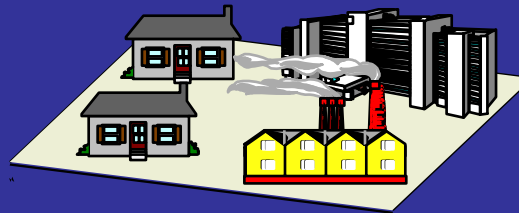


Ground Shaking
Maps



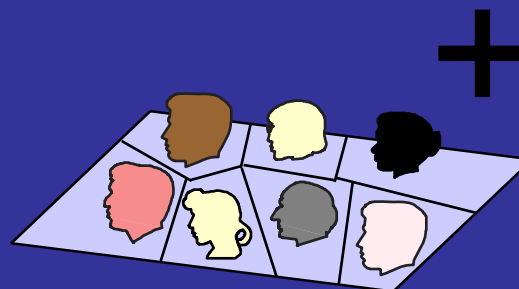
FEMA

Building Inventory Maps



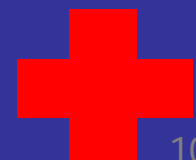
Model

Direct and
Indirect
Losses



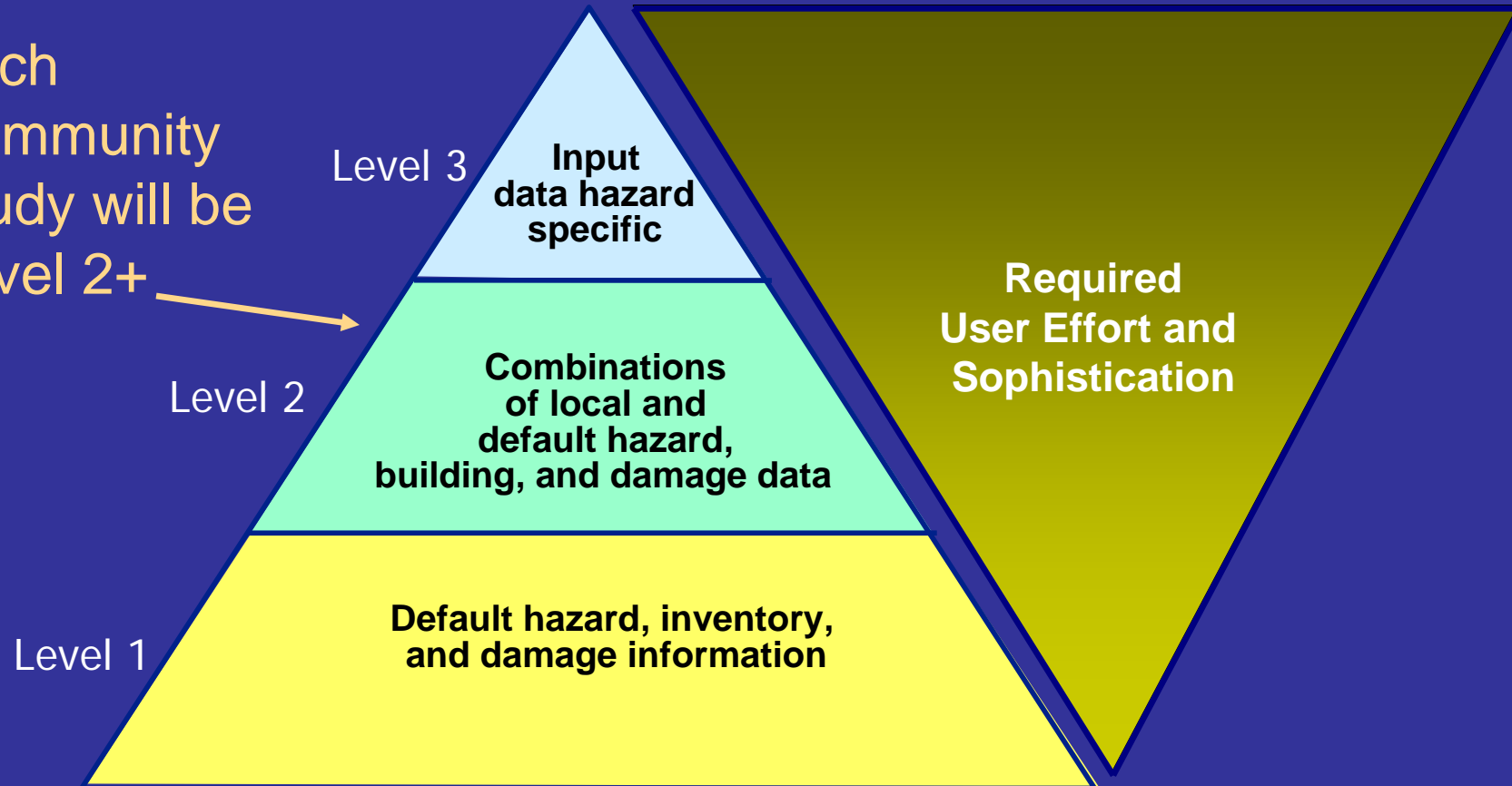
Demographic Maps

Casualties/
Shelter
Needs
Estimation



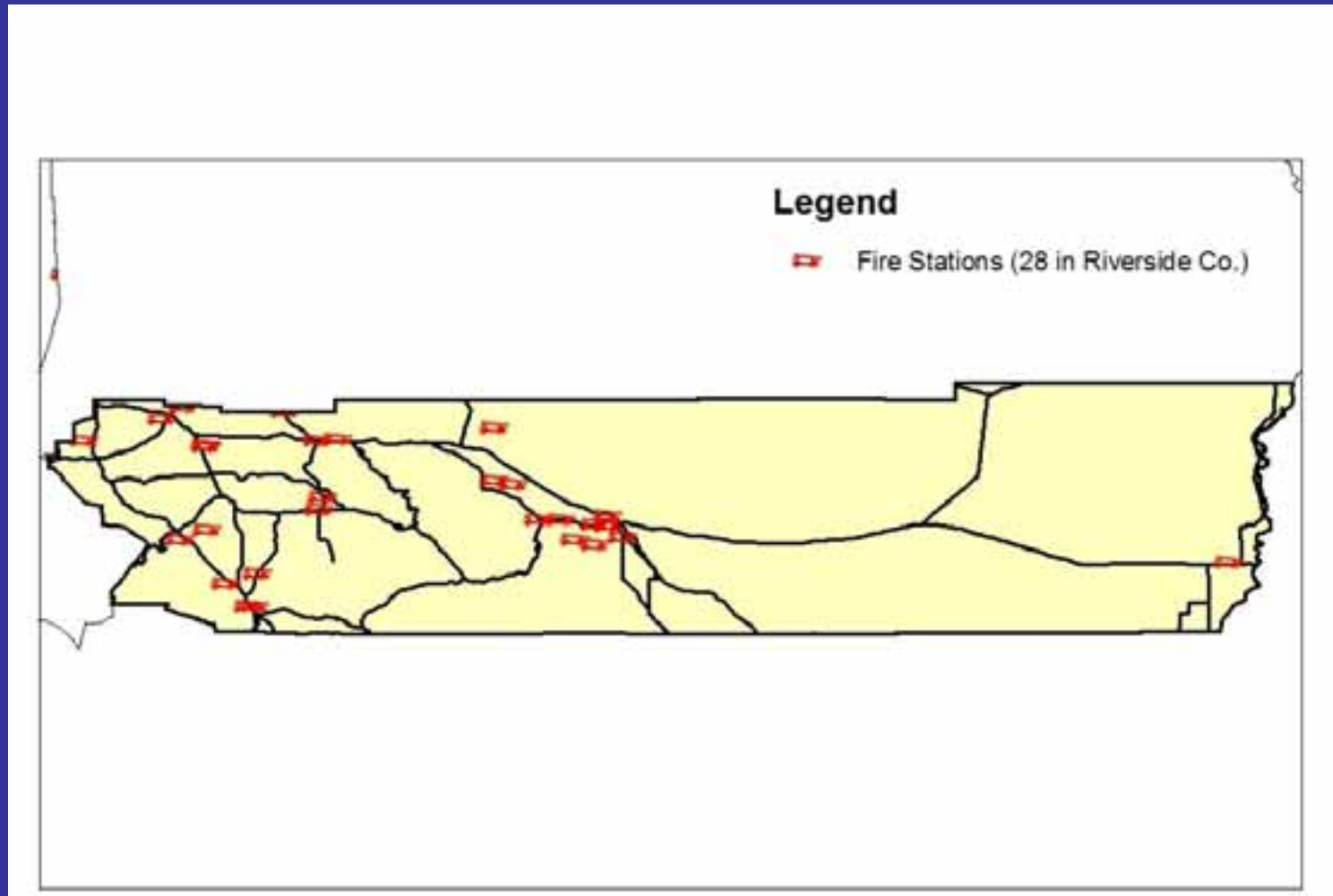
Levels of Analysis

Each
Community
Study will be
Level 2+



HAZUS Default data for Fire Facilities

Riverside
County
FD/CDF
has 95
stations,
plus City
FDs...



Detailed School Data Compared to HAZUS Default

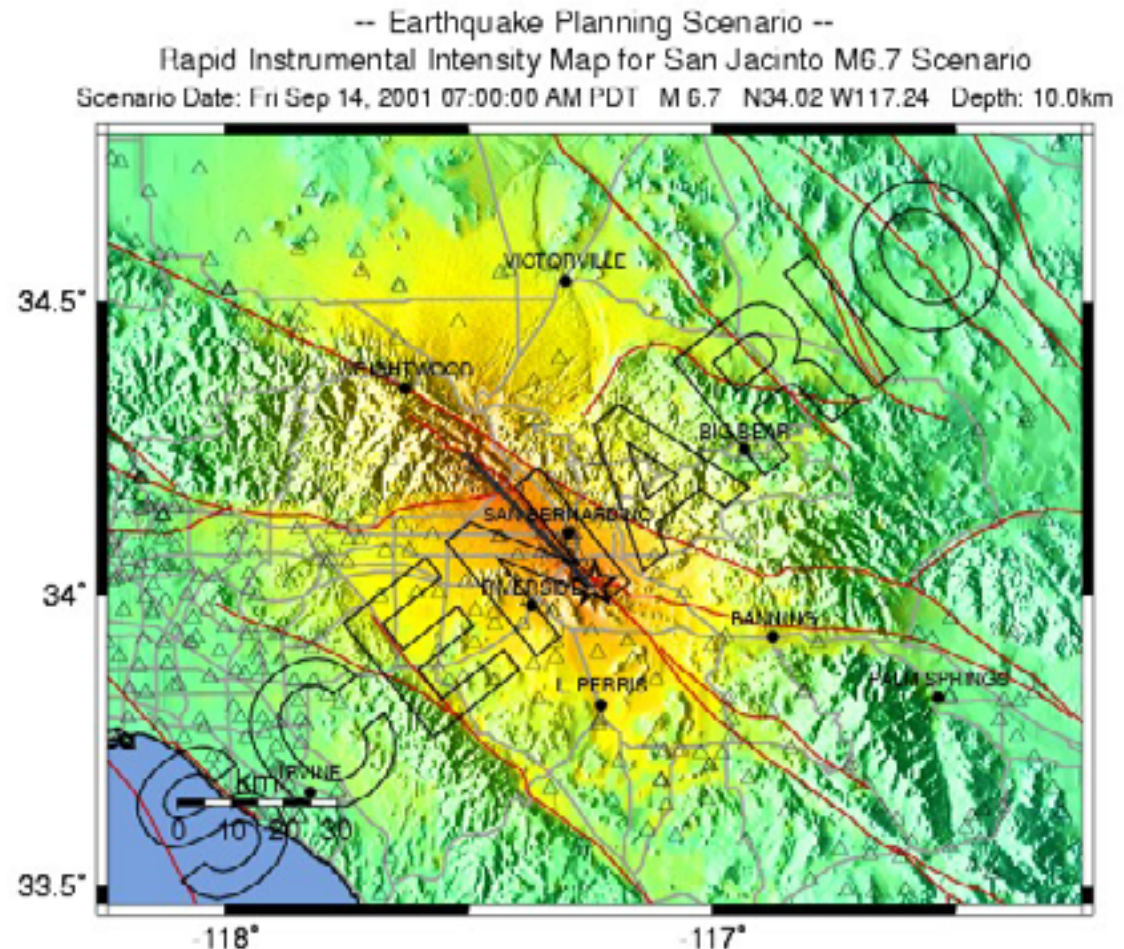
	Detailed Data from School District	HAZUS Default
# School Sites	57	50
# Buildings	1109	Individual building data not included (<i>Each school campus treated as a single "building"</i>)
Building Area (sq ft)	4.45 Million	No Data
Building Value	\$626.9 Million	\$29.5 Million
Contents Value	\$83.6 Million	Not included
Enrollment	57,346 (OCDE)	57,994
Year Built	1932 – 2006 Median = 1991	No Data
# Portable Buildings	706 (64%) Typ. 960 SF, \$72,000 bldg	No Data



GROUND SHAKING MAPS & DATA

ShakeMaps
available for So.
Cal. From the
USGS –

**SCENARIO
EARTHQUAKES**



PLANNING SCENARIO ONLY -- Processed: Mon Jan 23, 2000 05:00:42 PM PST

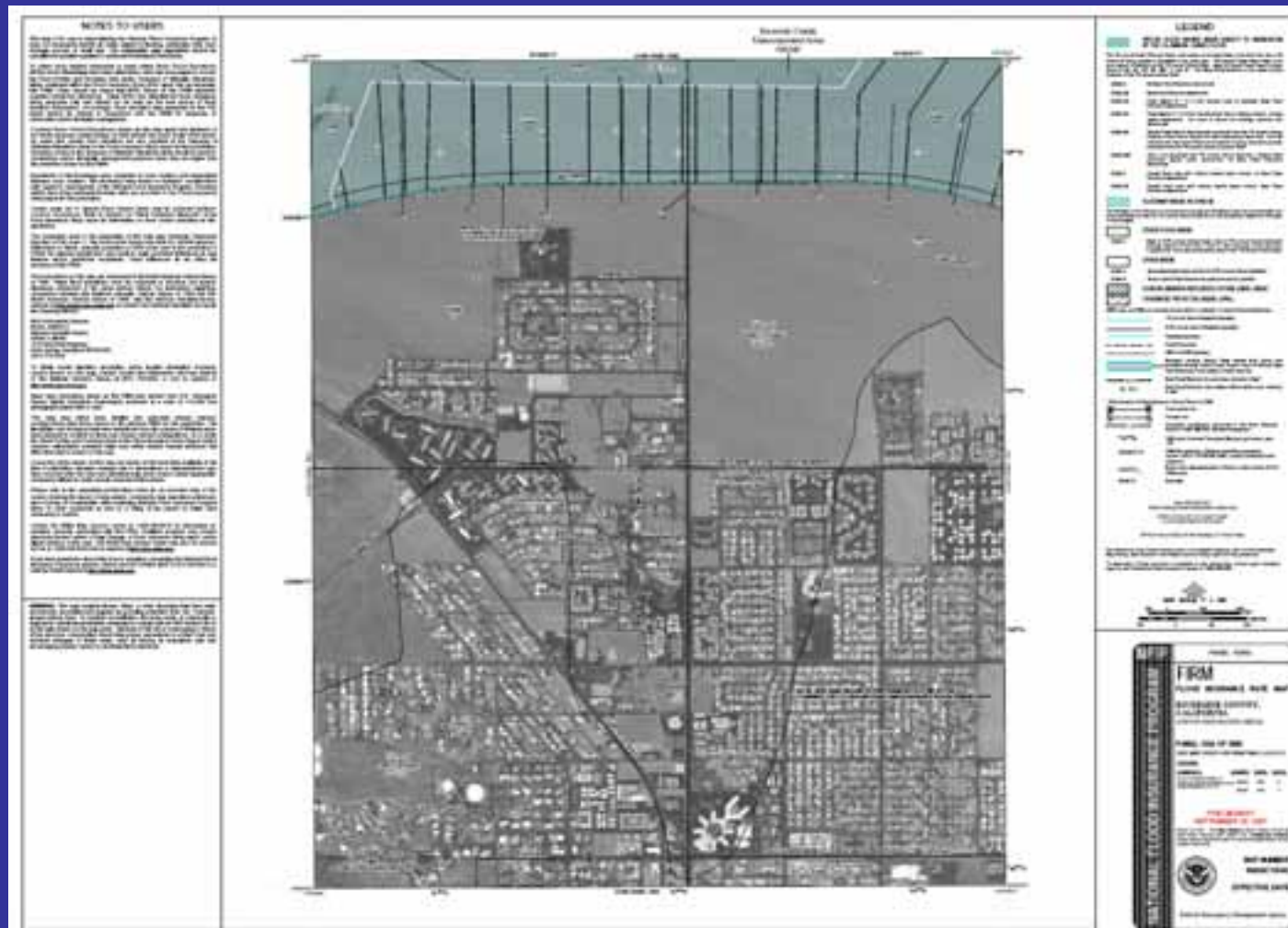
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (mm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



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<http://www.cisn.org/shakemap/sc/shake/>

Current FIRM



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Examine Essential Facilities in HAZUS



- FEMA HAZUS Projects begun in Orange, Riverside, and San Bernardino counties
- Map shows Hospitals in relation to the location of Earthquake fault lines
- Other essential facilities included:
 - Schools
 - Transportation lifelines
 - Emergency shelters

Project Phases

- 4 Phases:
 - 1 – Initial Coordination, Establishment of Community Exec. Committee, Identify points of contact
 - 2 - Data Collection & Review (*CEC meeting upon completion)
 - 3 - HAZUS Analyses - EQ & Flood (*CEC meeting upon completion)
 - 4 - Risk Assessment Report (*Community Roll-Out upon completion)

CEC Members

Orange	Riverside	San Bernardino
<ul style="list-style-type: none"> •Chairperson: County Fire Authority •County Health Care •Sheriff •Dept of Education •Hospital Association •Congressman Rohrabacher's Office •CA OES •County Flood Control •City Newport Beach •City San Clemente 	<ul style="list-style-type: none"> •No Chairperson •County Fire Department •County Flood Control •Sheriff •Hospital Association •Morongo Indians •City of Riverside •City of Indio •City of Moreno Valley •City of Corona •City of Murrieta •City of Palm Springs •City of Beaumont 	<ul style="list-style-type: none"> •Chairperson: Fire Department –Office of Emergency Services •County's invitation only to participate in CEC



What Value Are the Results?

- Risk Assessment results feed directly into Hazard Mitigation Planning
- Establishes a Community Executive Committee knowledgeable about the process, results, and future directions.
- Centralized GIS Data to be shared with community partners:
 - Essential Facilities
 - Enhanced Regional Building Inventory, if developed
 - Risk Assessment Report for Flood and Earthquake
 - DFIRM data layers

Project Web Sites



Contact Information

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See: www.map9-m.com for project documents, etc.