



Triaging Healthcare Facilities for Emergency Operations

*California Office of Statewide Health
Planning & Development*

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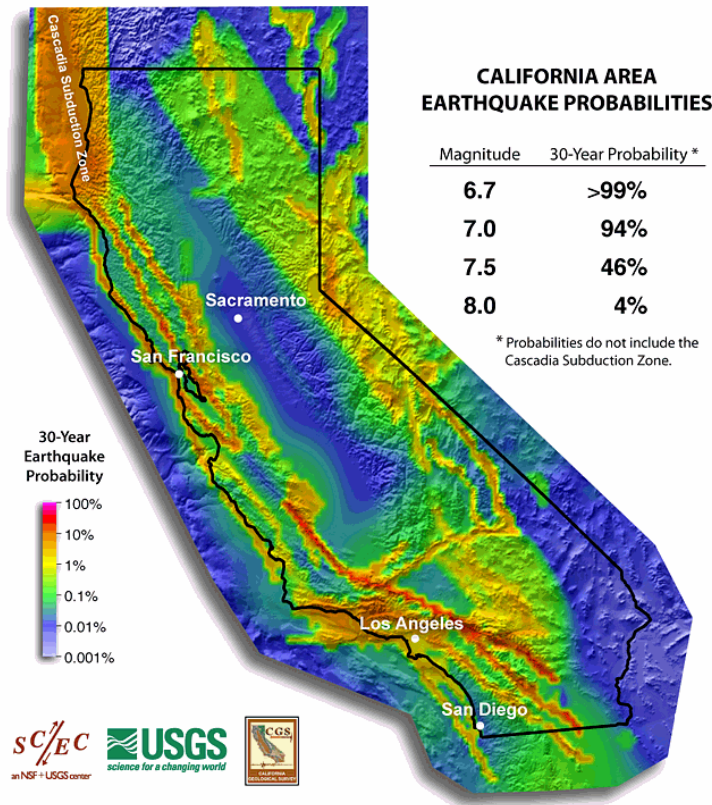


1979 – Imperial County Services Building



When? - Not if.

UCERF: Map of California Area Earthquake Probabilities

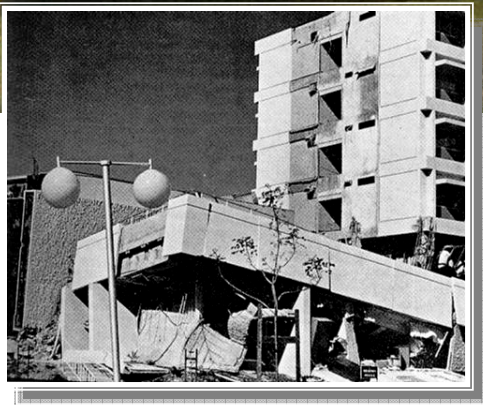


- **>99%** probability of M6.7+ in CA within 30yrs¹
- **62%** probability of M6.7+ in SF Bay region within 30yrs²

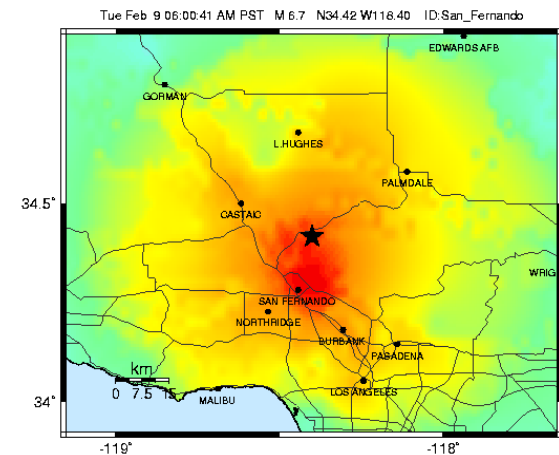


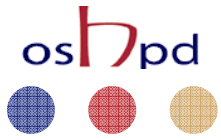
1971 “Sylmar” Earthquake

(San Fernando Fault Zone)

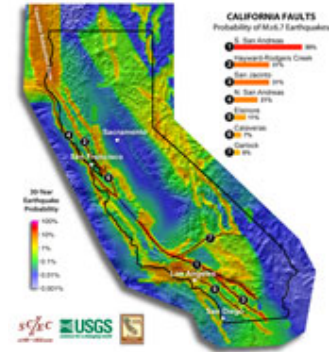


- Magnitude M_w 6.6
- Avg Displacement 3 ft.
- 65 dead
 - Most in V.A. Hospital
- \$500M damages





Responsibility - OSHPD

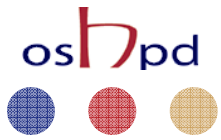


- Facilities Development Division (FDD)
- To respond to all significant *earthquakes* & verify hospital and skilled nursing facility building safety after an earthquake event.
 - Not 1st responder.
 - See [Health & Safety Code](#), Section 130025.
 - Inspect buildings for safety & tag red, yellow, green.
- Staff inspect buildings regularly for permitting.

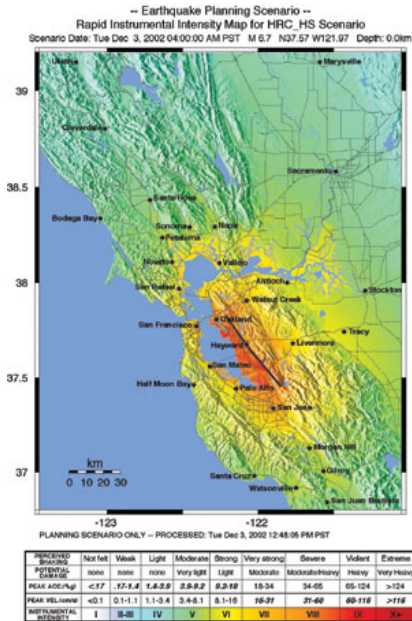
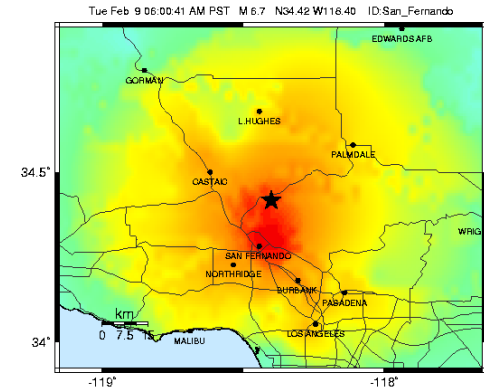


EOC Information System, background

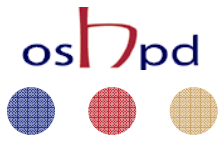
- **How do you triage the facilities??**
- Extended existing CA Healthcare Atlas
 - Browser-based .NET web application
 - Proof of concept (of EOC functionality)
 - Small budget
 - Short development time
 - Cross-references facilities ↔ events
- Target User → OSHPD Emergency Staff



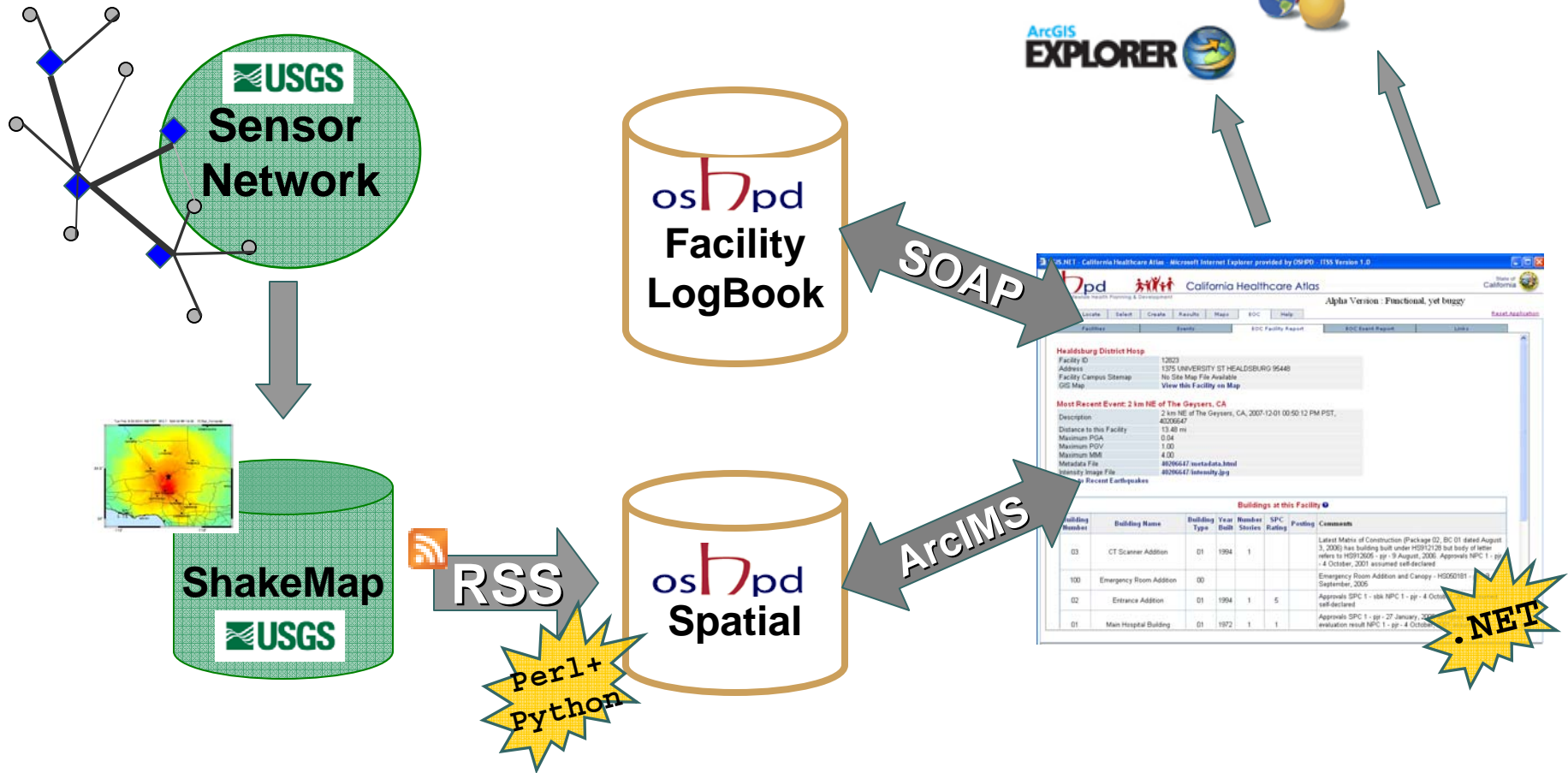
Typical Event Scenario

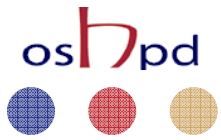


- Earthquake Happens
- USGS Data Consumed (automatically)
- E.O.C. Team Activated (or not)
- Triage & Investigate
 - Atlas-EOC web application
 - ArcGIS Desktop
 - Other non-GIS applications
- Manage the Event



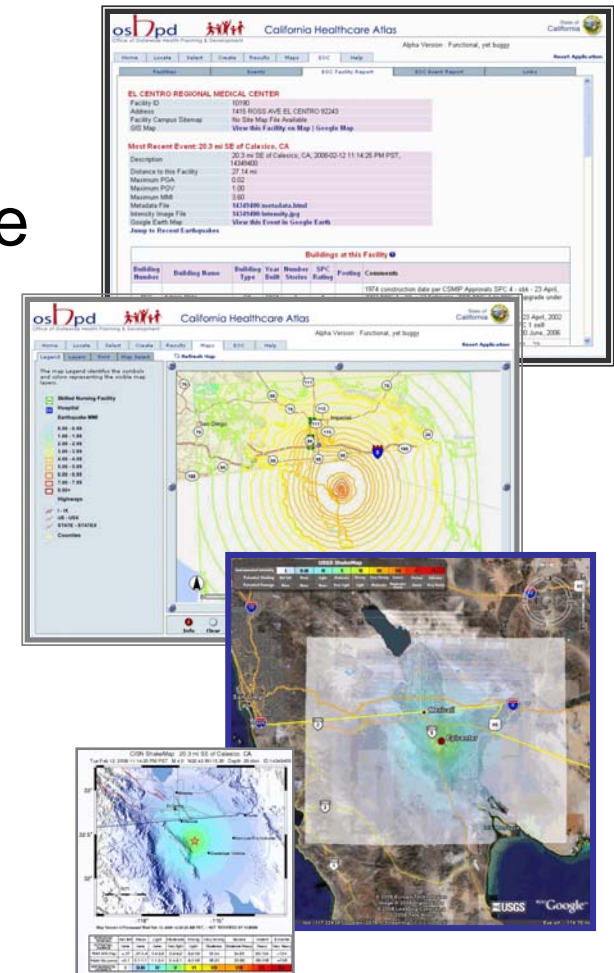
System Overview





Live Demonstration

- **All Facilities** Perspective
- **All Events** Perspective
- **Single Facility** Report
 - Critical Buildings
- **Single Event** Report
- Reference Links





All Facility Report Tab

Facilities Receiving an MMI of 4 or greater within the Last 48 hrs

Facility ID	Crit	Facility Name	Facility Type	MMI	PGA	PGV	#Events	Links
10190	📍	EL CENTRO REGIONAL MEDICAL CENTER	H	5.00	0.08	2.0	1	📄 🗺
20195		VALLEY CONVALESCENT CENTER - EL CENTRO	SNF	4.80	0.04	2.0	1	📄 🗺
20194		IMPERIAL MANOR	SNF	4.60	0.04	2.0	1	📄 🗺

Facilities within Select a Distance of any epicenter within the last 30 days.

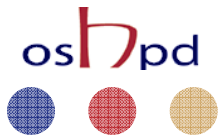
Facilities Receiving an MMI of 3 or greater within the Last 30 days

Facility ID	Crit	Facility Name	Facility Type	MMI	PGA	PGV	#Events	Links
10190	📍	EL CENTRO REGIONAL MEDICAL CENTER	H	5.20	0.08	4.0	7	📄 🗺
10192	📍	PIONEERS MEMORIAL HOSPITAL	H	4.00	0.04	2.0	3	📄 🗺
20195		VALLEY CONVALESCENT CENTER - EL CENTRO	SNF	4.80	0.04	2.0	7	📄 🗺
20194		IMPERIAL MANOR	SNF	4.60	0.04	2.0	5	📄 🗺
20193		ROYAL CONVALESCENT HOSPITAL	SNF	3.80	0.02	2.0	3	📄 🗺

Facilities within 50 miles of any epicenter within the last 30 days.

Facility ID	Crit	Facility Name	Facility Type	MMI	PGA	PGV	#Events	Links
10190	📍	EL CENTRO REGIONAL MEDICAL CENTER	H	5.20	0.08	4.0	7	📄 🗺
10192	📍	PIONEERS MEMORIAL HOSPITAL	H	4.00	0.04	2.0	7	📄 🗺
11001	📍	SHASTA REGIONAL MEDICAL CENTER	H	2.00	0.02	1.0	2	📄 🗺
11002	📍	MERCY MEDICAL CENTER	H	2.00	0.02	1.0	2	📄 🗺
11125	📍	TRINITY HOSPITAL	H	1.80	0.02	1.0	2	📄 🗺
20195		VALLEY CONVALESCENT CENTER - EL CENTRO	SNF	4.80	0.04	2.0	7	📄 🗺

- Facilities impacted w/in time period & shaking threshold
- Summary Stats
- Critical Buildings
- Links
 - Single facility report
 - Maps



Single Facility Report Tab

EL CENTRO REGIONAL MEDICAL CENTER

Facility ID: 10190
 Address: 1415 ROSS AVE EL CENTRO 92243
 Facility Campus Sitemap: No Site Map File Available
 GIS Map: [View this Facility on Map | Google Map](#)

Most Recent Event: 20.3 mi SE of Calexico, CA
 Description: 20.3 mi SE of Calexico, CA, 2008-02-12 11:14:25 PM PST, 14349400
 Distance to this Facility: 27.14 mi
 Maximum PGA: 0.02
 Maximum PGV: 1.00
 Maximum MMI: 3.60
 Metadata File: [14349400/metadata.html](#)
 Intensity Image File: [14349400/intensity.jpg](#)
 Google Earth Map: [View this Event in Google Earth](#)
[Jump to Recent Earthquakes](#)

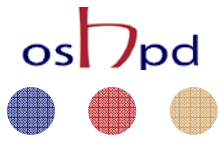
Buildings at this Facility

Building Number	Building Name	Building Type	Year Built	Number Stories	SPC Rating	Posting	Comments
B07	Admin Bldg	04	1974	1	4		1974 construction date per CSMP Approvals SPC 4 - sbk - 23 April, 2003 NPC 1 - DL - 23 February, 2005 NPC 1 to NPC 2 upgrade under CAN - pjr - 30 June, 2006
B07A	Admin Bldg Addition	03	1978	1	4		Not listed in Evaluation Report Approvals SPC 4 - sbk - 23 April, 2002 NPC 1 - DL - 23 February, 2005 accepted assumed NPC 1 self-declaration NPC 1 to NPC 2 upgrade under CAN - pjr - 30 June, 2006
B03A	West Addition		13	1963	1	1	Changed as part of Package 01E, Back Check 02 to SPC 1 NPC 1 self-certified - pjr - 1 December, 2004 Approvals SPC 1 - pjr - 1 December, 2004 NPC 1 - pjr - 1 December, 2004 NPC 1 to NPC 2 upgrade under CAN - pjr - 30 June, 2006

Events Impacting this Facility During the Last 7 days

Event Description	Event Time	Magnitude	Max PGA	Max PGV	Max MMI
20.3 mi SE of Calexico, CA, 2008-02-12 11:14:25 PM PST, 14349400	2/12/2008 11:14:25 PM	4.00	0.18	3.0	5.10
17.9 mi SE of Calexico, CA, 2008-02-12 01:27:19 AM PST, 14348840	2/12/2008 1:27:19 AM	4.40	0.22	3.0	4.90
18.9 mi SE of Calexico, CA, 2008-02-12 01:20:11 AM PST, 14348824	2/12/2008 1:20:11 AM	4.20	0.18	3.0	4.90
19.9 mi SE of Calexico, CA, 2008-02-11 08:40:46 PM PST, 14348592	2/11/2008 8:40:46 PM	4.00	0.18	3.0	5.10
18.4 mi SE of Calexico, CA, 2008-02-11 08:32:39 PM PST, 14348588	2/11/2008 8:32:39 PM	5.00	0.68	19.0	6.70
27.4 mi SSE of Calexico, CA, 2008-02-11 10:29:30 AM PST, 14348196	2/11/2008 10:29:30 AM	5.10	0.58	17.0	6.70
21.6 mi SSE of Calexico, CA, 2008-02-08 11:12:06 PM PST, 14346868	2/8/2008 11:12:06 PM	5.10	0.66	21.0	6.90

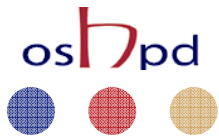
- Recent Event Summary
- Buildings Summary
- Critical Buildings
- Metadata (event's)
- Google Earth/Map links
- Cross-Reference to other events w/in time period



All Events Report Tab

Event Description	Event Time	Magnitude	Max MMI	Max PGA	Max PGV
20.3 mi SE of Calexico, CA, 2008-02-12 11:14:25 PM PST, 14349400	2/12/2008 11:14:25 PM	4.00	5.10	0.10	3.0
17.9 mi SE of Calexico, CA, 2008-02-12 01:27:19 AM PST, 14348840	2/12/2008 1:27:19 AM	4.40	4.90	0.22	3.0
18.9 mi SE of Calexico, CA, 2008-02-12 01:20:11 AM PST, 14348824	2/12/2008 1:20:11 AM	4.20	4.90	0.10	3.0
19.9 mi SE of Calexico, CA, 2008-02-11 08:40:46 PM PST, 14348592	2/11/2008 8:40:46 PM	4.00	5.10	0.18	3.0
18.4 mi SE of Calexico, CA, 2008-02-11 08:32:39 PM PST, 14348588	2/11/2008 8:32:39 PM	5.00	6.70	0.50	19.0
27.4 mi SSE of Calexico, CA, 2008-02-11 10:29:30 AM PST, 14348196	2/11/2008 10:29:30 AM	5.10	6.70	0.58	17.0
21.6 mi SSE of Calexico, CA, 2008-02-08 11:12:06 PM PST, 14346868	2/8/2008 11:12:06 PM	5.10	6.90	0.66	21.0

- List all events w/in selectable time period
- Summary Statistics
- Links
 - Single event report
 - Maps



Single Event Report Tab

osbpd California Healthcare Atlas
Office of Statewide Health Planning & Development

Alpha Version : Functional, yet buggy

Home Locate Select Create Results Maps EOC Help

Facilities Events EOC Facility Report EOC Event Report Links

This Event: 18.4 mi SE of Calexico, CA

Description: 18.4 mi SE of Calexico, CA, 2008-02-11 08:32:39 PM PST, 14348588

Maximum PGA: 0.58
Maximum PGV: 19.00
Maximum MMI: 6.70
Facility Most Impacted: EL CENTRO REGIONAL MEDICAL CENTER (5.00 MMI)
Metadata File: 14348588/metadata.html
Intensity Image File: 14348588/intensity.jpg
Google Earth Map: [View this Event in Google Earth](#)

Facilities Impacted by an MMI of 4 or Greater from this Event.

Facility ID	Crit	Facility Name	Facility Type	MMI	PGA	PGV
10190	📍	EL CENTRO REGIONAL MEDICAL CENTER	H	5.00	0.08	2.0
20195		VALLEY CONVALESCENT CENTER - EL CENTRO	SNF	4.80	0.04	2.0
20194		IMPERIAL MANOR				

- List Facility Impacts above shaking threshold
- Summary Statistics
- Links
 - Metadata
 - USGS Graphic
 - Google Earth

Advanced National Seismic System (ANSS), ShakeMap, California Regional Earthquake Data Center
Maps of ground shaking and intensity for event 14349400, 20.3 mi SE of Calexico, CA

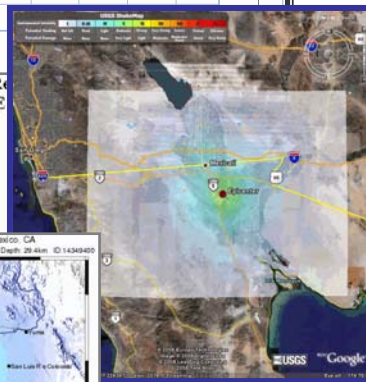
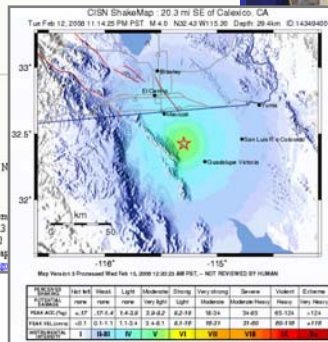
Metadata also available as - [Browsable text](#) - [XML](#)

Metadata:

- [Identification Information](#)
- [Data Quality Information](#)
- [Spatial Reference Information](#)
- [Entity and Attribute Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)

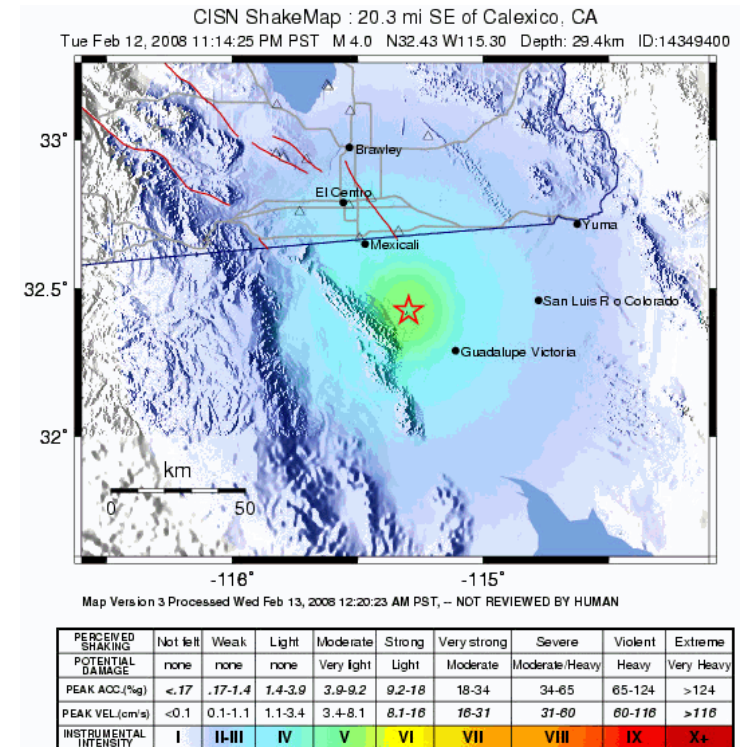
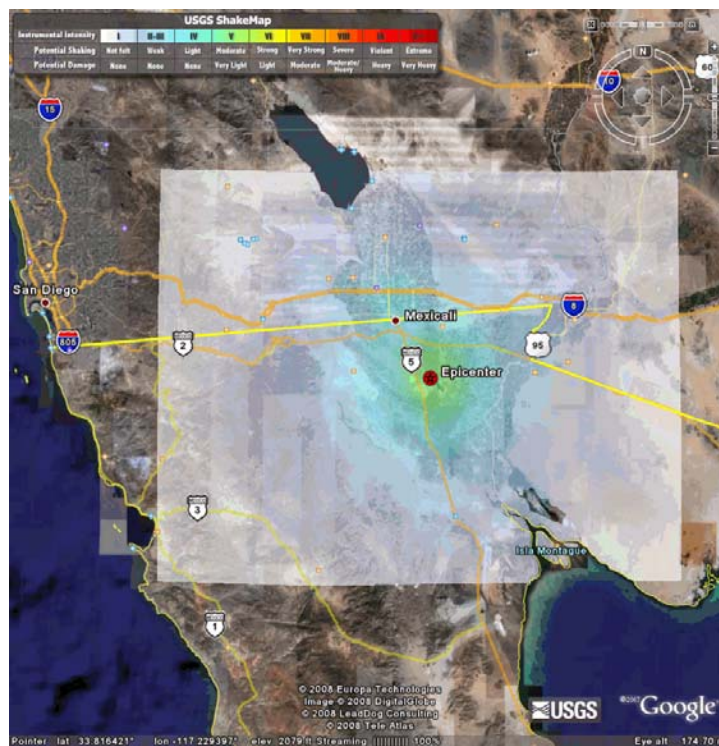
Identification Information:

Citation:
 Citation Information:
 Originator: The California Integrated Seismic Network
 Publication Date: 20080213
 Publication Time: 07:42:53 OMT
 Title: Advanced National Seismic System intensity for event 14349400, 20.3
 Edition: Map Version 3, Code Version 3.2
 Geospatial Data Presentation Form: Map
 Online Linkage: <http://earthquake.usgs.gov>



Google Earth Link

✓ *Any KML source can now be integrated*





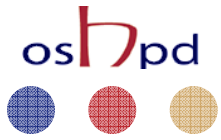
Status & What's Next?

- Proof-of-Concept → Production
- ArcGIS Server
- Add Event Types
 - Fire
 - Flood
- Real-time Field Staff Updates of building safety status as tagged.
- Facilities Division is re-engineering their business process.



Acknowledgements

- OSHPD Staff
 - Michael Byrne (Project Manager)
 - Michael O'Neill (Application Architect)
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 - Brian Hoefer (Project Manager)
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- U.S.G.S.
 - Kuowan "Wan" Lin (ShakeMap/ShakeCast Dev. Lead)
- ESRI
 - Scott Christman (former GIS Coordinator)



Questions ?

Michael O'Neill & Michael Byrne

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