The U.S. Geological Survey (USGS) National Earthquake Information Center (NEIC)

Gavin Hayes

U.S. Geological Survey, National Earthquake Information Center

NEIC Mission

NEIC - The People

24x7 Operations
1 Director
1 Supervisory Geophysicist
14 Geophysicists
1 Bulletin Editor

Research
6 Ph.D. Geophysicist
4-6 University Researchers
2-3 Summer Interns
3 Contractors

Web Development
4 Software Developers

Systems Engineering
4 Software Developers
1 Software Engineer

Field Operations
(GSN and Backbone)
1 Science-in-Charge
1 Director of Operations
~30 Engineers/Admin

Post-Earthquake Information Products

PAST

Mostly made by academic community

EQ ORIGIN TIME

HYPOCENTER

MAGNITUDE (Mw)

MECHANISM

SLIP MODEL

UPDATED SHAKEMAP

STRESS CHANGES

DAMAGE/LOSS ESTIMATES

MODIFIED PROBABILITIES

1hr | 1Day | 1We | 1Mo

PRESENT

EQ ORIGIN TIME

HYPOCENTER

FINAL SM, DAMAGE, LOSS

STRESS CHANGES

MODIFIED PROBABILITIES

All In-House

Post-Earthquake Information Products

PAST

EQ ORIGIN TIME

HYPOCENTER

MAGNITUDE (Mw)

MECHANISM

SLIP MODEL

UPDATED SHAKEMAP

STRESS CHANGES

DAMAGE/LOSS ESTIMATES

MODIFIED PROBABILITIES

1hr 1Day 1We 1Mo

PRESENT

EQ ORIGIN TIME, HYPOCENTER, FINAL SM, Mw, MECH., SLIP

STRESS CHANGES

DAMAGE, LOSS

MODIFIED PROBABILITIES

EMERGENCY RESPONSE →

NEWS/ MEDIA →

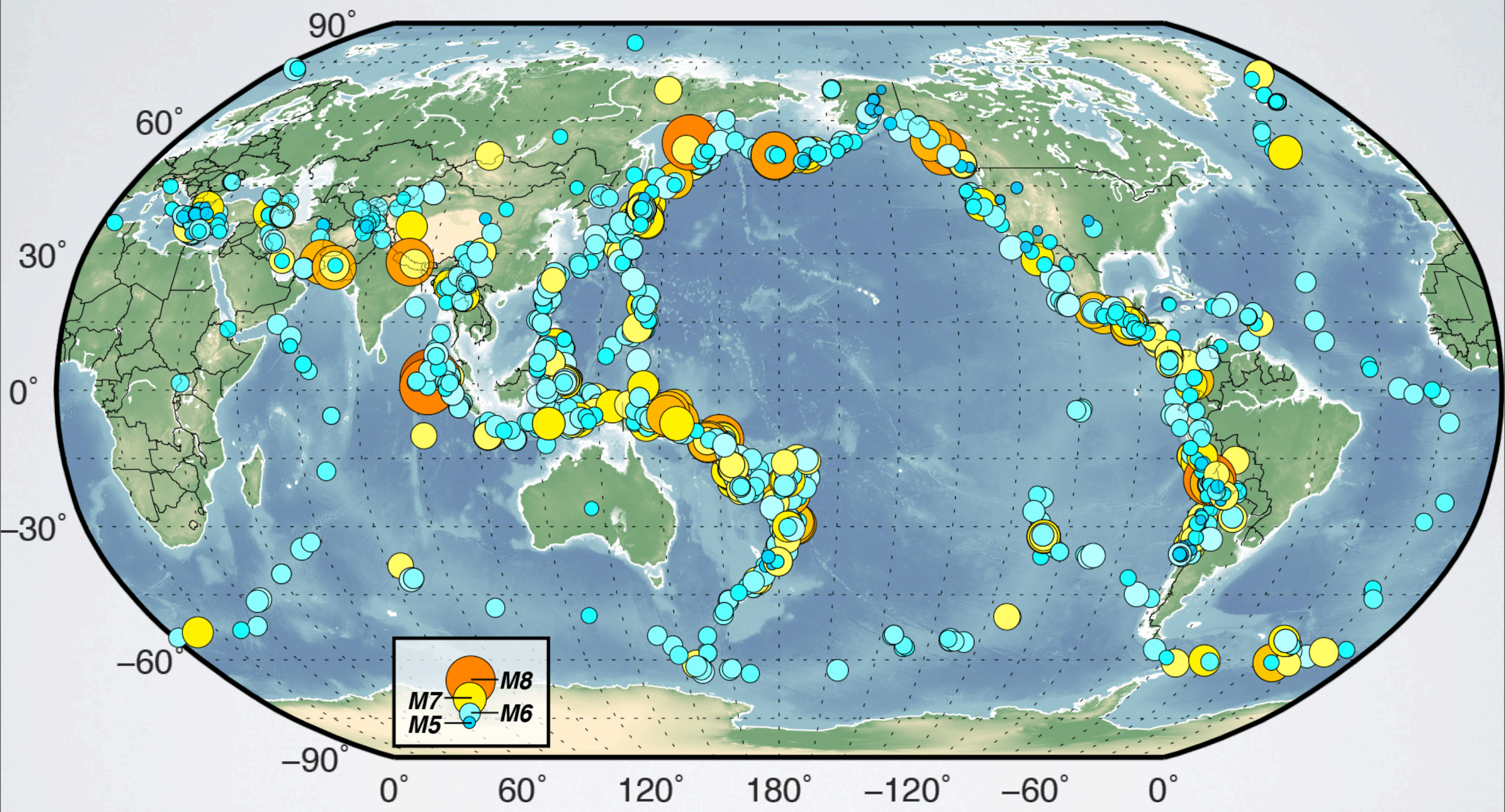
U.S. PERSONNEL & MILITARY EXPOSURE →

HUMANITARIAN AID →

NEIC Response Products

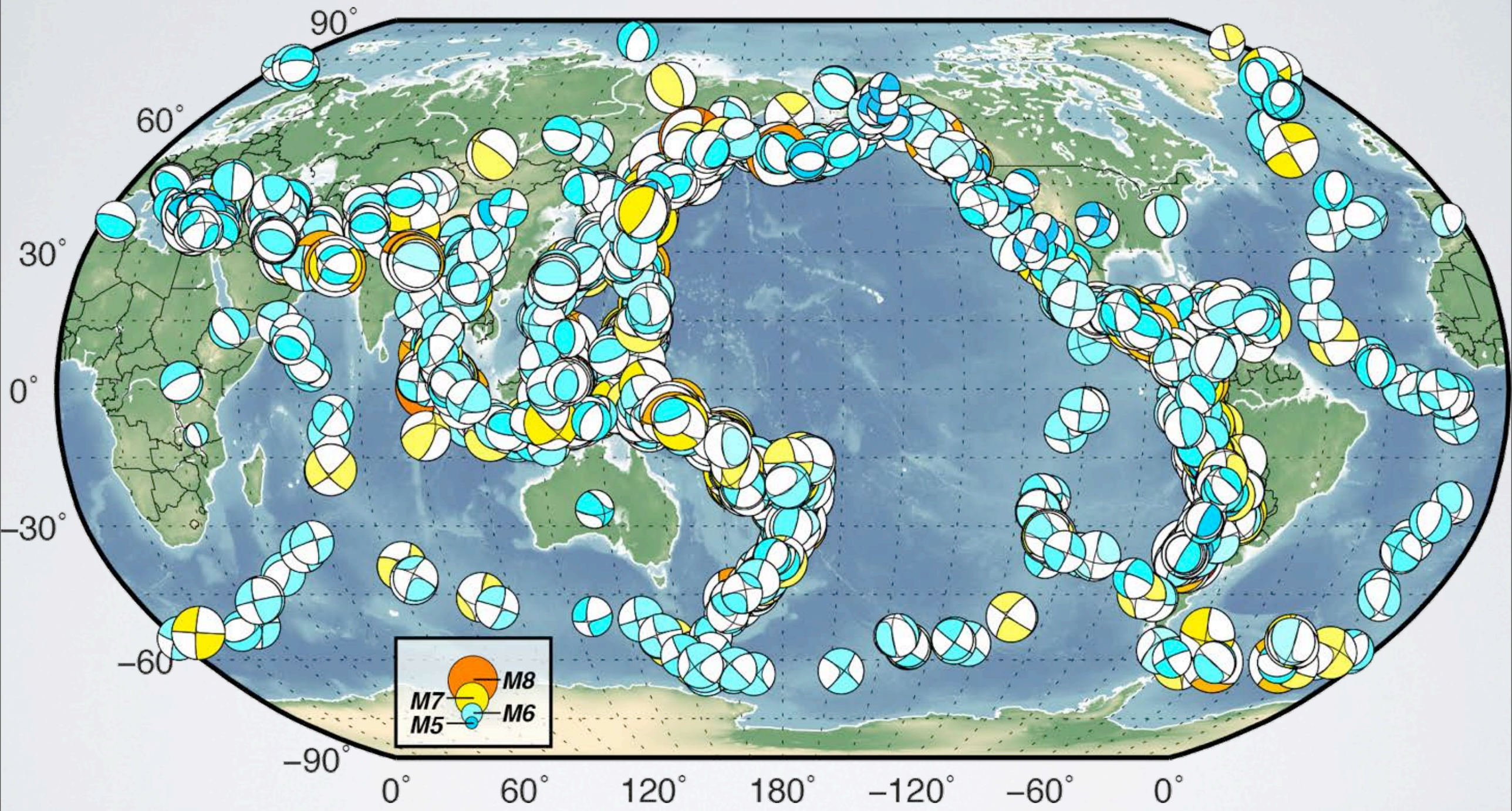
Response Goal: To release accurate & actionable information regarding an earthquake's location, size, and potential impact, as rapidly as possible.

Rapid Moment Tensors - W Phase



1920+ events published since July 2009.
Approximately complete above M6.
Authoritative NEIC magnitude for M6+ EQs in response, and for PDE.

Rapid Moment Tensors - W Phase



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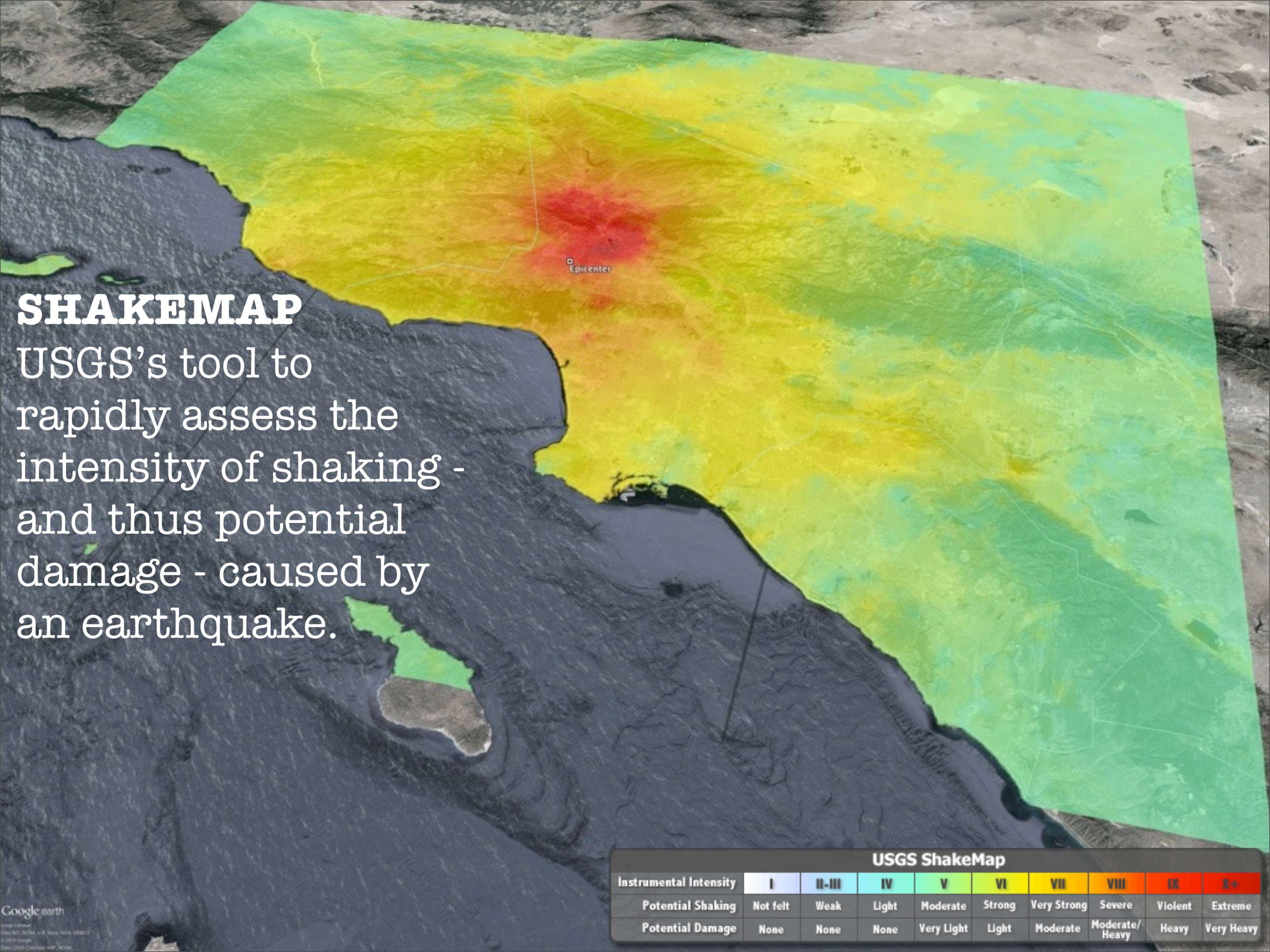


SHAKEMAP
USGS's tool to rapidly assess the intensity of shaking - and thus potential damage - caused by an earthquake.

USGS ShakeMap

Instrumental Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+
Potential 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

DYFI? is a way for community users - **YOU!** - to contribute to our earthquake response.

USGS "Did You Feel It?"

Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+
Shaking	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
Damage	None	None	None	Very Light	Light	Moderate	Moderate/ Heavy	Heavy	Very Heavy

M7.0 - 239km E of Enarotali, Indonesia

2013-04-06 04:42:36 UTC

PAGER - GREEN | ShakeMap - VII | DYFI? - III

Google Earth KML

Did You Feel It? Tell Us!

Contributed by USGS National Earthquake Information Center

Español

OMB No. 1028-0048
Expires 05/31/2015

Show/Hide Help Issues? Try the classic form

Your location when the earthquake occurred

Location Description : *required

Street address, ZIP/postal code, or other location (more information helps us make more accurate maps)

Choose Location

Your situation when the earthquake occurred

Did you feel it : *required

...or did it wake you?

○ Yes ○ No

Physical Situation :

What was your situation during the earthquake?

Please select...

Were you asleep :

Please select...

Did others nearby feel it :

Please select...

Your experience of the earthquake

Shaking Strength :

How would you best describe the shaking?

Please select...

Shaking Duration (seconds) :

About how many seconds did the shaking last?

How did you react :

Please select...

How did you respond :

Please select...

Stand or Walk :

Was it difficult to stand and/or walk?

Please select...

Earthquake Effects

Free-hanging objects :

Did you notice any swinging of doors or other free-hanging objects?

Please select...

Sounds :

Did you hear creaking or other noises?

Was there any damage to the building?

Check all that apply.

- ☐ No Damage
- ☐ Hairline cracks in walls
- ☐ A few large cracks in walls

Answers to these specific questions are very diagnostic of earthquake intensity.

Please select...

Stand or Walk :

Was it difficult to stand and/or walk?

Please select...

Earthquake Effects

Free-hanging objects :

Did you notice any swinging of doors or other free-hanging objects?

Please select...

Sounds :

Did you hear creaking or other noises?

Please select...

Shelved Objects :

Did objects rattle, topple over, or fall of shelves?

Please select...

Hanging Pictures :

Did pictures on walls move or get knocked askew?

Please select...

Furniture :

Did any furniture or appliances slide, topple over, or become displaced?

Please select...

Large Appliances :

Was a heavy appliance (refrigerator or range) affected?

Please select...

Walls/Fences :

Were free-standing walls or fences damaged?

Please select...

Was there any damage to the building?

Check all that apply.

- ☐ No Damage
- ☐ Hairline cracks in walls
- ☐ A few large cracks in walls
- ☐ Many large cracks in walls
- ☐ Ceiling tiles or lighting fixtures fell
- ☐ Cracks in chimney
- ☐ One or several cracked windows
- ☐ Many windows cracked or some broken out
- ☐ Masonry fell from block or brick wall(s)
- ☐ Old chimney, major damage or fell down
- ☐ Modern chimney, major damage or fell down
- ☐ Outside wall(s) tilted over or collapsed completely
- ☐ Separation of porch, balcony, or other addition from building
- ☐ Building permanently shifted over foundation

Contact Information (Optional)

Name :

Email :

Phone :

Additional Comments

You may use this box to clarify answers or to make observations that are not accommodated by other questions. You may also give first-person descriptions of how the earthquake affected you. USGS scientists may use some of the information that you enter in qualitative descriptions of shaking or damage in USGS publications. You would be identified as "an observer" and your location would be given in general terms. Parts of some first-person accounts may be reproduced as quotations in USGS publications.

Submit Report Reset Form

Scientific Background on the Did You Feel It? Process

Answers to these specific questions are very diagnostic of earthquake intensity.

USGS
science for a changing world

RESPONDING TO GLOBAL EARTHQUAKE HAZARDS

PAGER—Rapid Assessment of an Earthquake's Impact

Prompt **A**ssessment of **G**lobal **E**arthquakes for **R**esponse

The next step is to assess how many people experienced such shaking intensities...

USGS
science for a changing world

RESPONDING TO GI

PAGER—Rapid Assessm

Prompt Ass
Earthquak

USGS PAGER: Compares ShakeMap to population density to calculate how many people were exposed to each level of shaking.

USGS
science for a changing world

Earthquake Shaking Red Alert

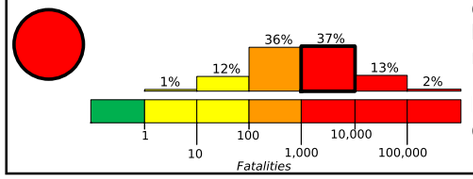
GSN ANSS USAID FROM THE AMERICAN PEOPLE

M 9.0, NEAR THE EAST COAST OF HONSHU, JAPAN

Origin Time: Fri 2011-03-11 05:46:23 UTC (14:46:23 local)
Location: 38.32°N 142.37°E Depth: 32 km
FOR TSUNAMI INFORMATION, SEE: tsunami.noaa.gov

PAGER
Version 12
Created: 2 weeks, 1 day after earthquake

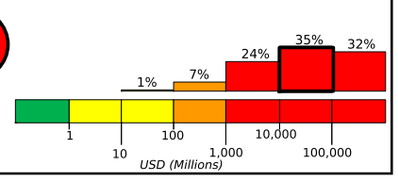
Estimated Fatalities



Red alert for shaking-related fatalities and economic losses. High casualties and extensive damage are probable and the disaster is likely widespread. Past red alerts have required a national or international response.

Estimated economic losses are 0-1% GDP of Japan.

Estimated Economic Losses



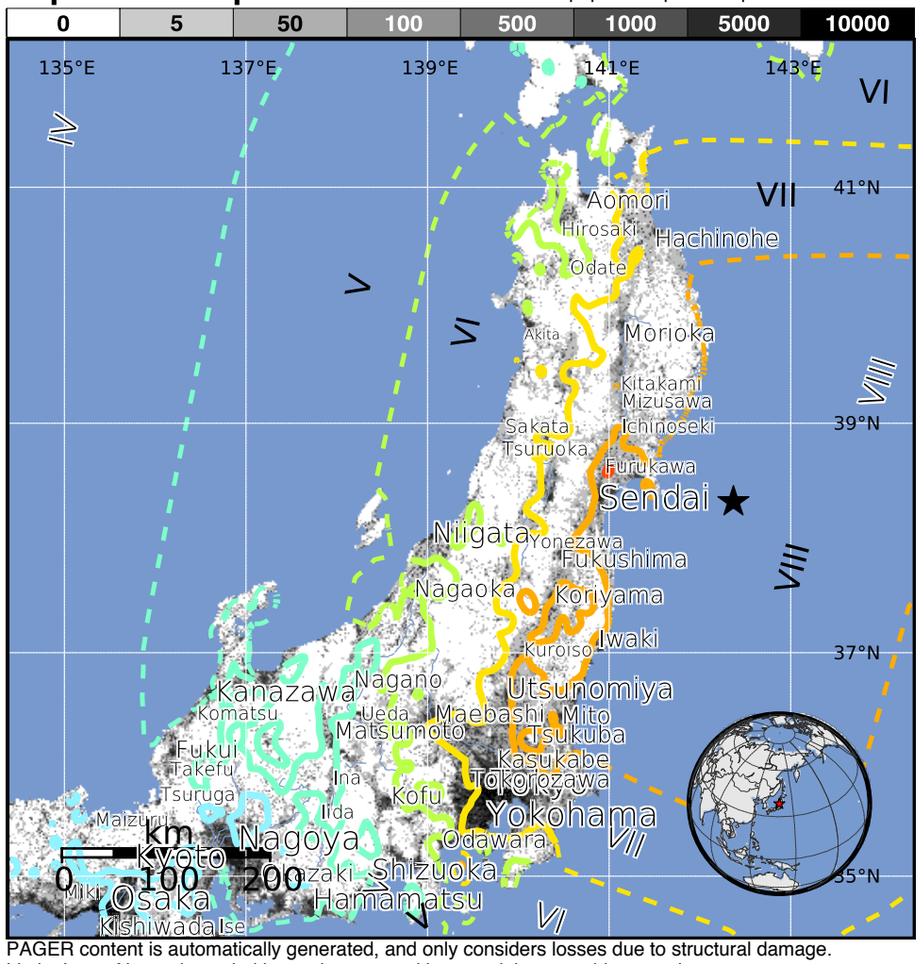
Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)		- -*	13,068k*	21,353k*	8,612k*	10,080k*	34,125k*	6,009k*	251k	0
ESTIMATED MODIFIED MERCALLI INTENSITY		I	II-III	IV	V	VI	VII	VIII	IX	X+
PERCEIVED SHAKING		Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

*Estimated exposure only includes population within the map area.

Population Exposure

population per ~1 sq. km from Landscan



Structures:
Overall, the population in this region resides in structures that are resistant to earthquake shaking, though some vulnerable structures exist. The predominant vulnerable building types are non-ductile reinforced concrete frame and heavy wood frame construction.

Historical Earthquakes (with MMI levels):

Date (UTC)	Dist. (km)	Mag.	Max MMI(#)	Shaking Deaths
1998-06-14	363	5.7	VII(428k)	0
1994-12-28	263	7.7	VII(132k)	3
1983-05-26	369	7.7	VII(174k)	104

Recent earthquakes in this area have caused secondary hazards such as tsunamis, landslides, and fires that might have contributed to losses.

Selected City Exposure

from GeoNames.org

MMI	City	Population
IX	**Furukawa**	**76k**
IX	Iwanuma	42k
IX	Hitachi	186k
IX	Kogota	20k
VIII	Shiogama	60k
VIII	Sukagawa	69k
VII	**Tokyo**	**8,337k**
VII	**Yokohama**	**3,574k**
IV	**Nagoya**	**2,191k**
III	**Osaka**	**2,592k**
III	Kobe	1,528k

bold cities appear on map (k = x1000)

PAGER content is automatically generated, and only considers losses due to structural damage. Limitations of input data, shaking estimates, and loss models may add uncertainty.
http://earthquake.usgs.gov/pager

Event ID: usc0001xgp

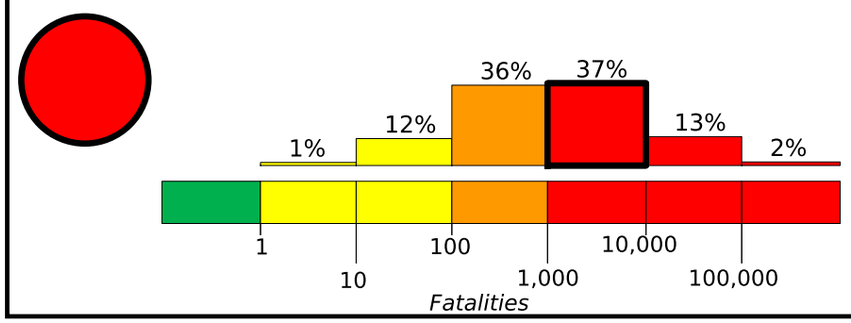
USGS
science for a changing world

RESPONDING TO GLOBAL EARTHQUAKE HAZARDS

PAGER—Rapid Assessment of an Earthquake's Impact

Prompt **A**ssessment of **G**lobal **E**arthquakes for **R**esponse

Estimated Fatalities



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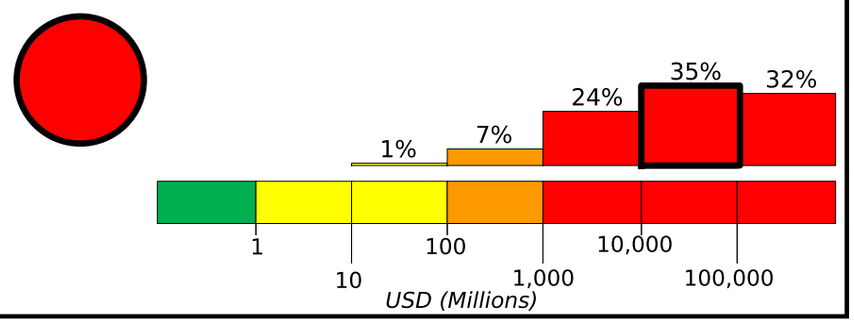
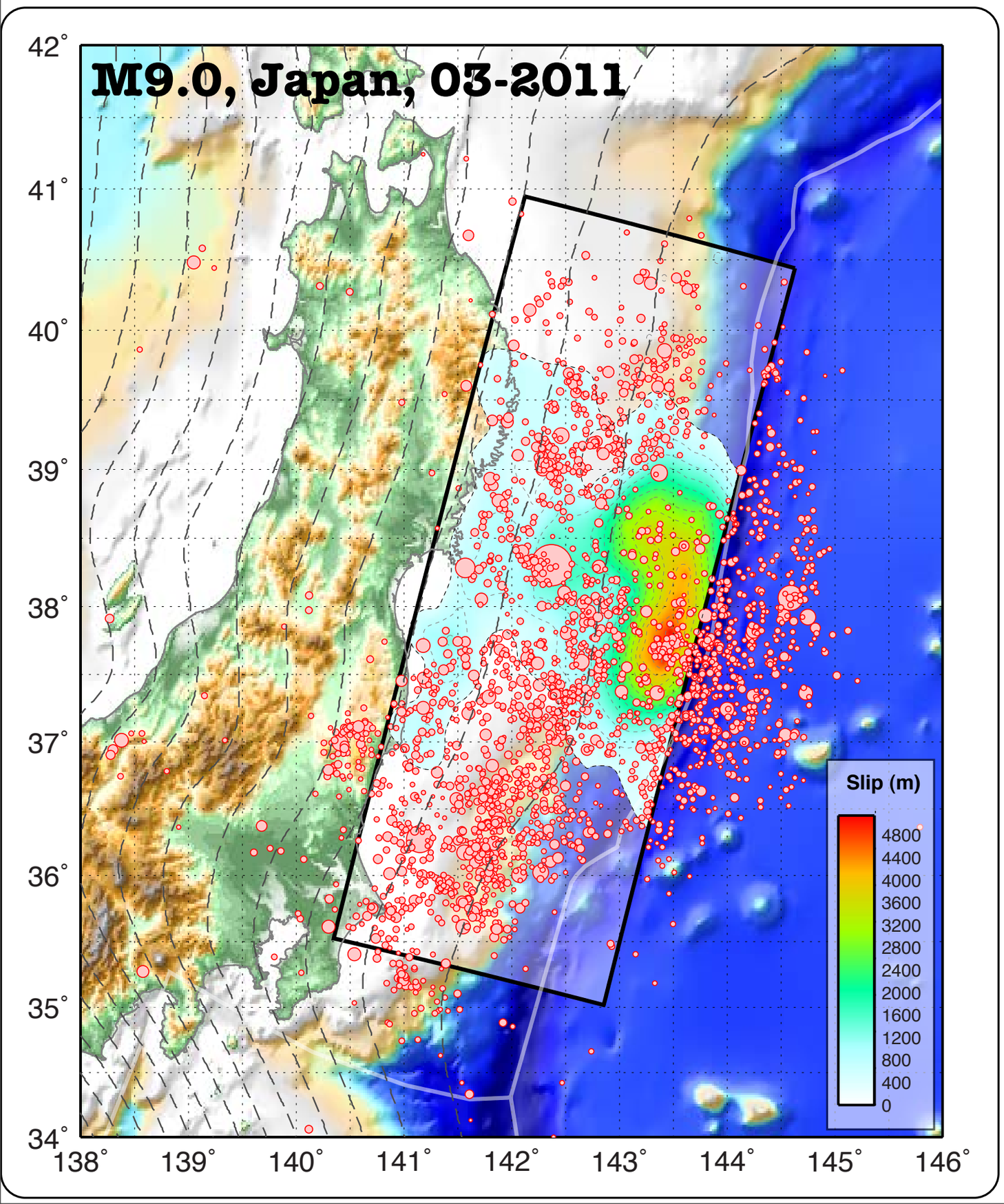


PAGER uses a color-coded "earthquake impact scale", communicating predicted impact and response needed after an event: **green (little or no impact)**, **yellow (regional impact and response)**, **orange (national-scale impact and response)**, **and red (international response)**.

Earthquakes Are Not Points!



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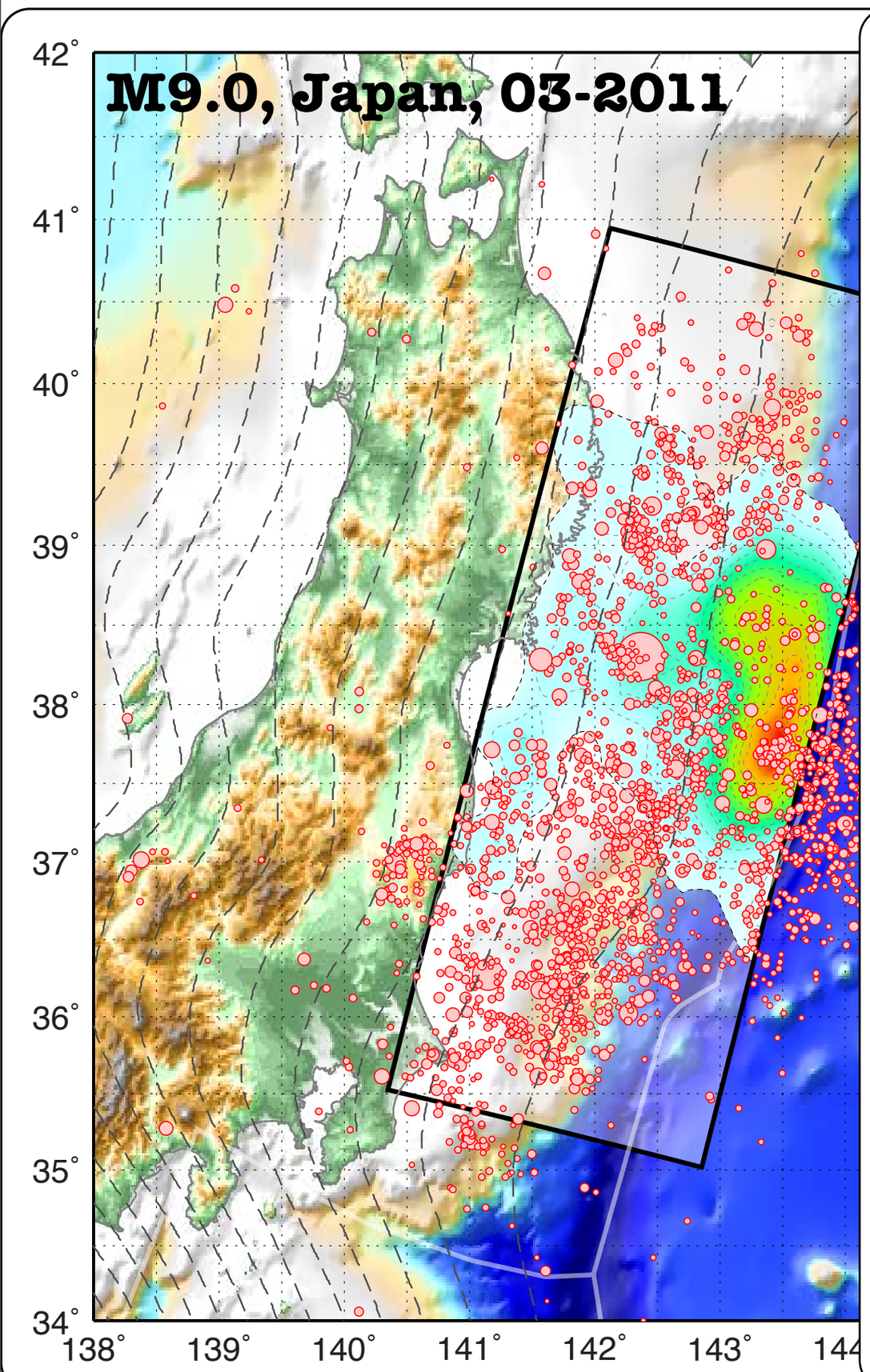

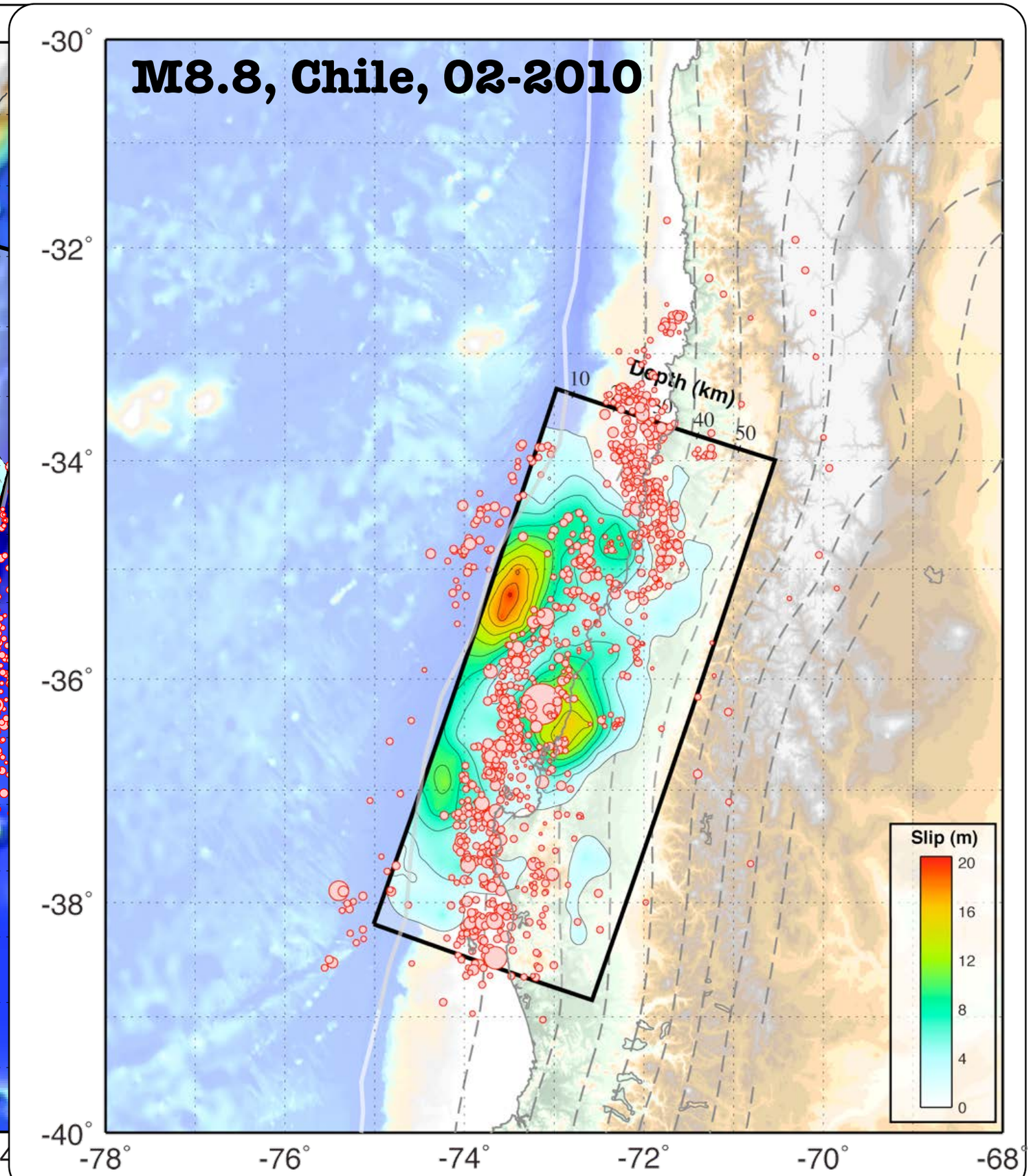

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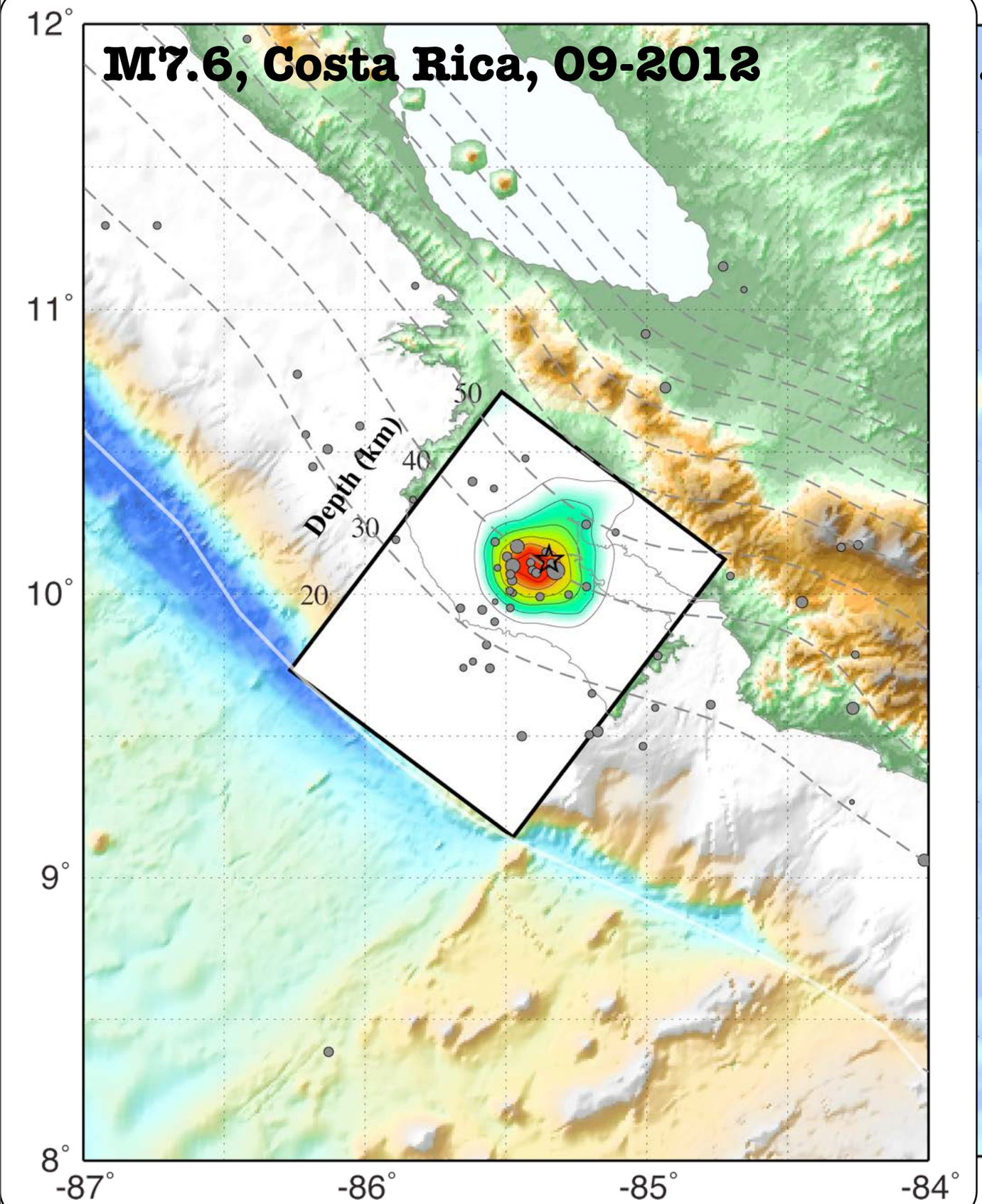

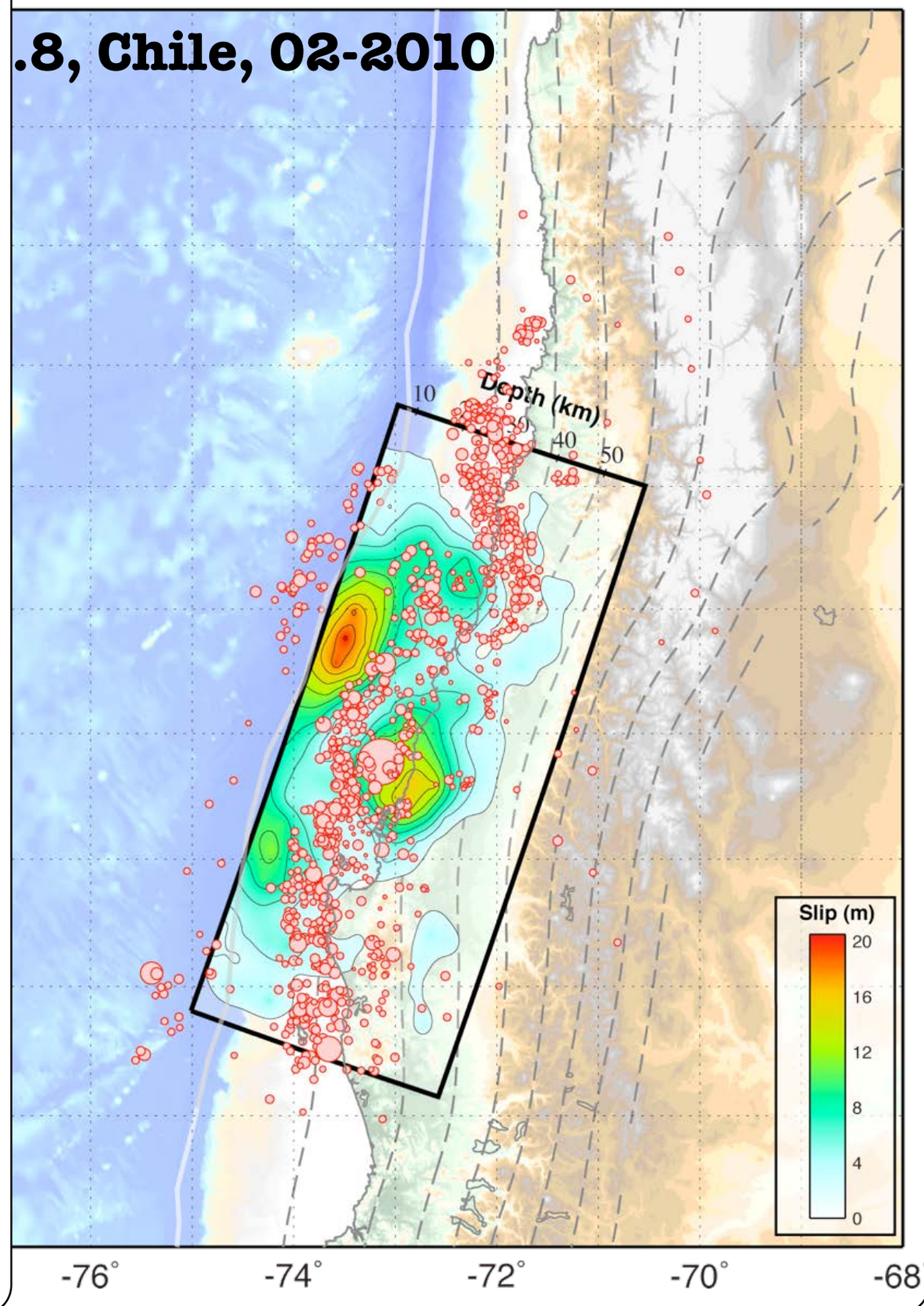

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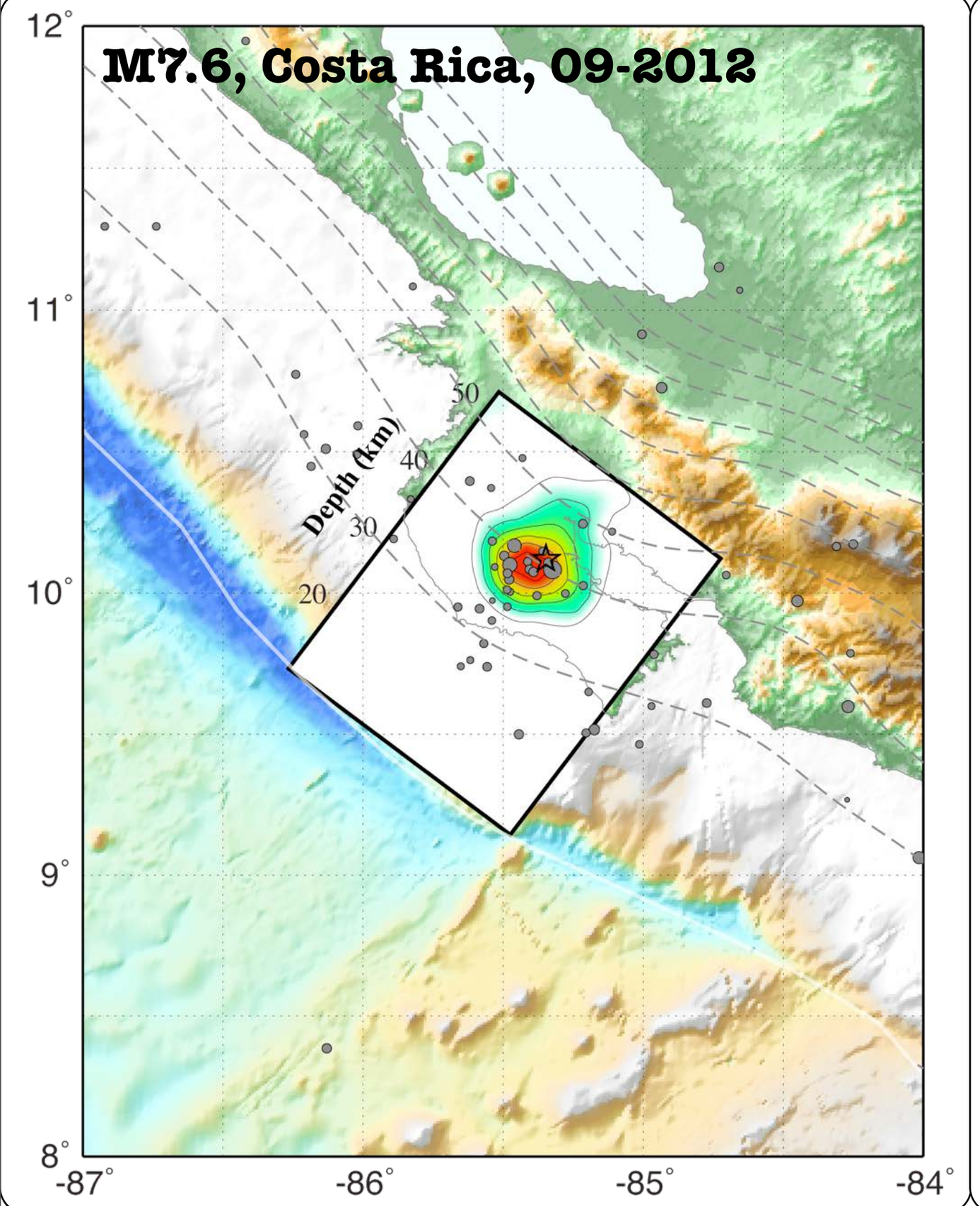
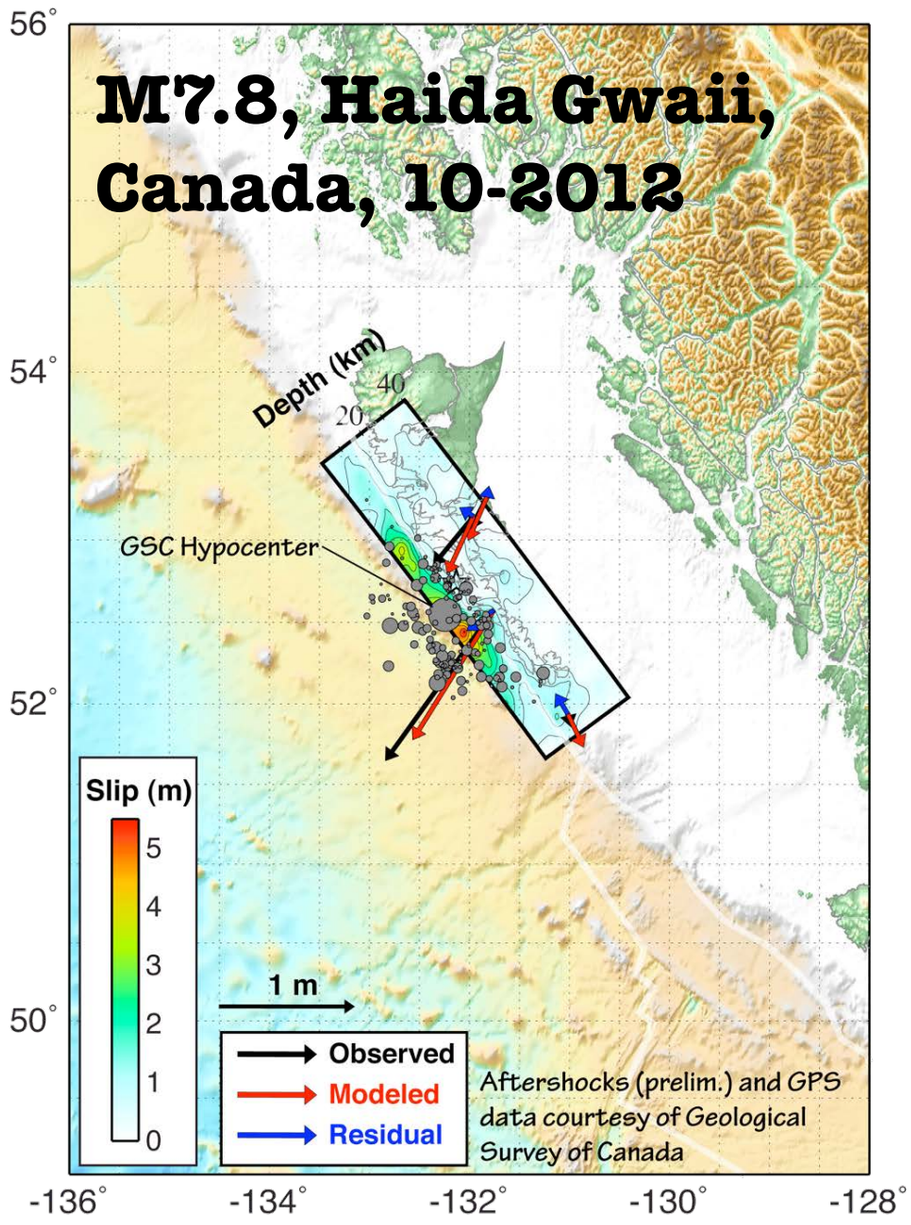
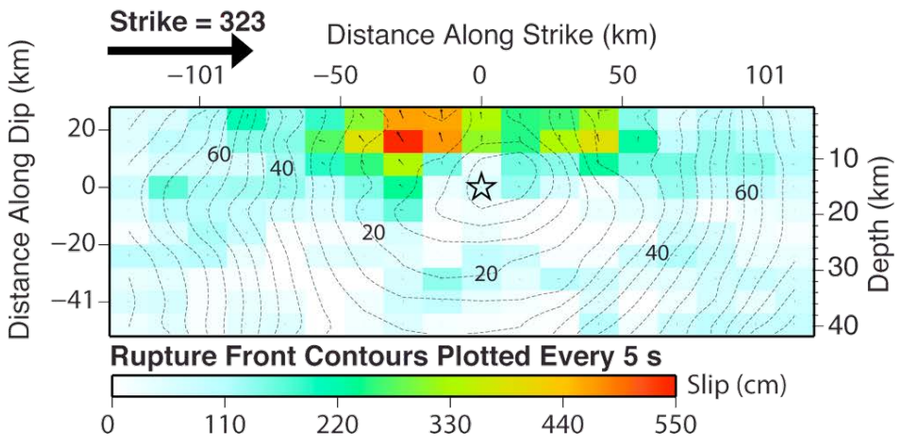
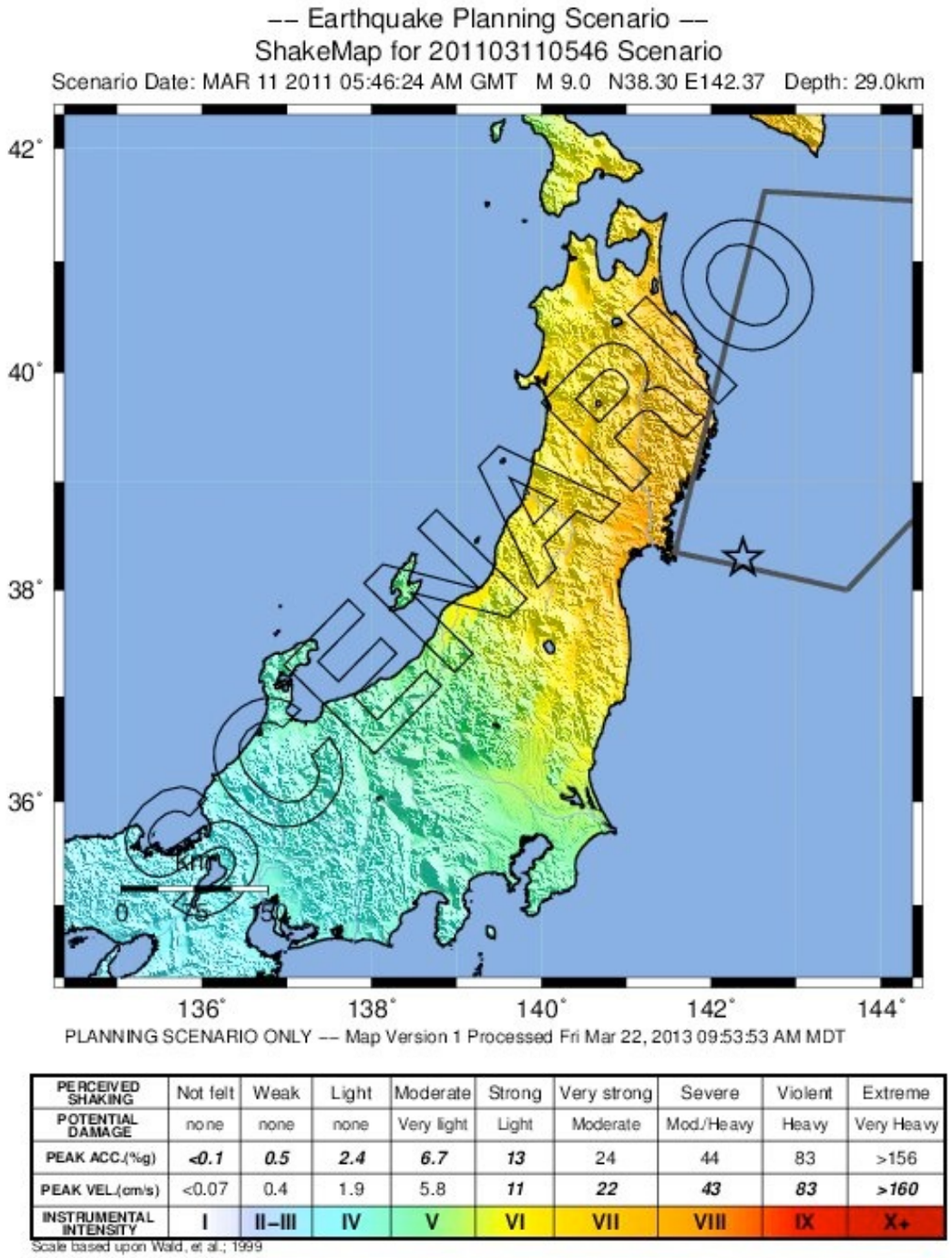




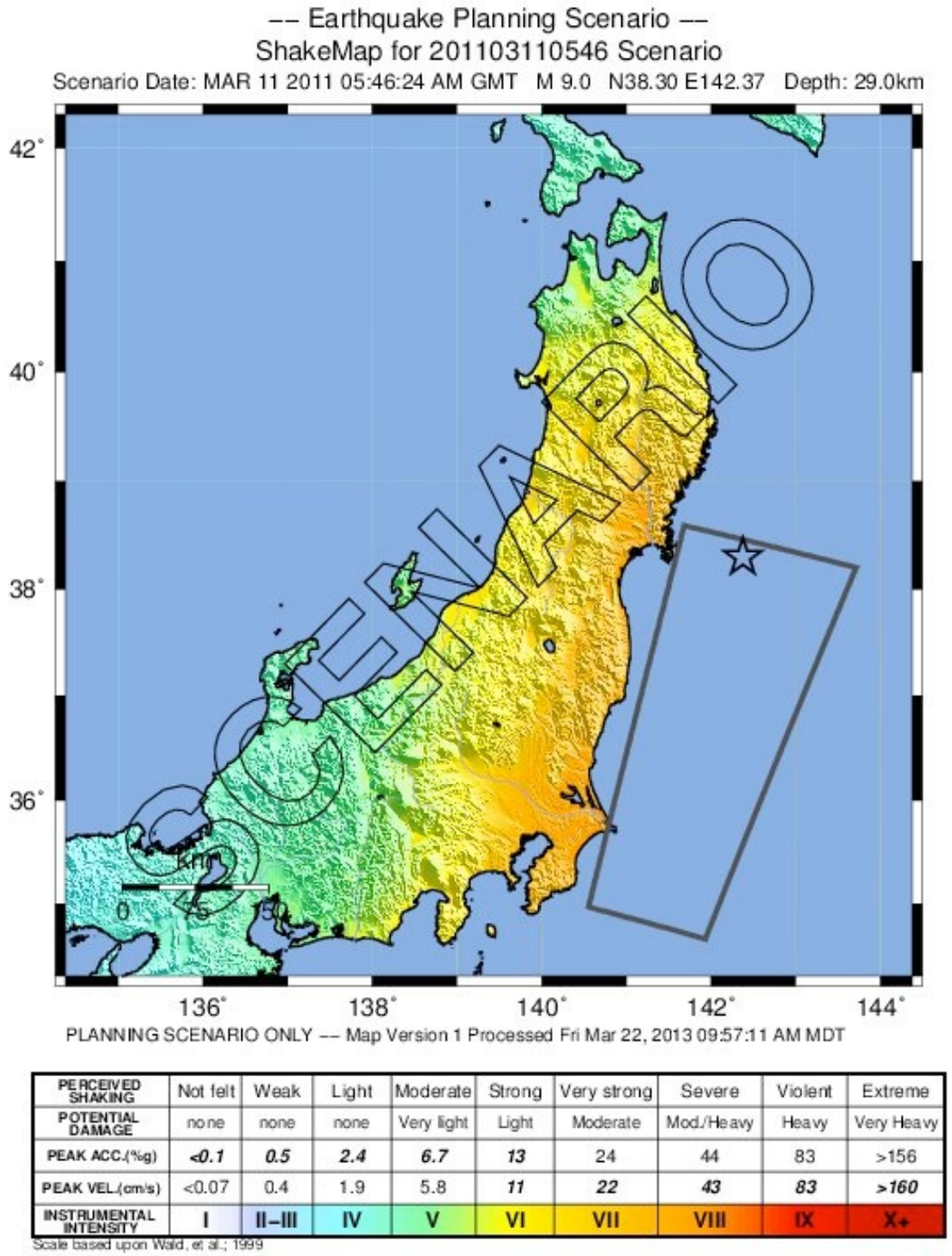


Rupture Models - Why Finiteness Matters



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<0.1*	*0.5*	*2.4*	*6.7*	*13*	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	*11*	*22*	*43*	*83*	*>160*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al.; 1999



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
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PEAK ACC.(%g)	*<0.1*	*0.5*	*2.4*	*6.7*	*13*	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	*11*	*22*	*43*	*83*	*>160*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald, et al.; 1999

Two scenarios shown for 2011 Tohoku earthquake; one with northward rupture, and one to the south. Shaking intensities much higher in Tokyo in southward rupture scenario.

Rupture Models - Why Finiteness Matters

USGS science for a changing world

Earthquake Shaking — Red Alert

USAID FROM THE AMERICAN PEOPLE

GSN ANSS

M 9.0, Tohoku-Oki, Japan

Origin Time: Fri 2011-03-11 05:46:24 UTC (14:46:24 local)

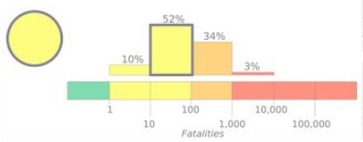
Location: 38.30 °N 142.37 °E Depth: 29 km

FOR TSUNAMI INFORMATION, SEE: tsunami.gov

PAGER Version 1

Created: 106 weeks, 0 days after earthquake

Estimated Fatalities



Red alert level for economic losses. Extensive damage is probable and the disaster is likely widespread. Estimated economic losses are less than 1% of GDP of Japan. Past events with this alert level have required a national or international level response.

Yellow alert level for shaking-related fatalities. Some casualties are possible.

Estimated Economic Losses

Estimated Population Exposed to Earthquake Shaking

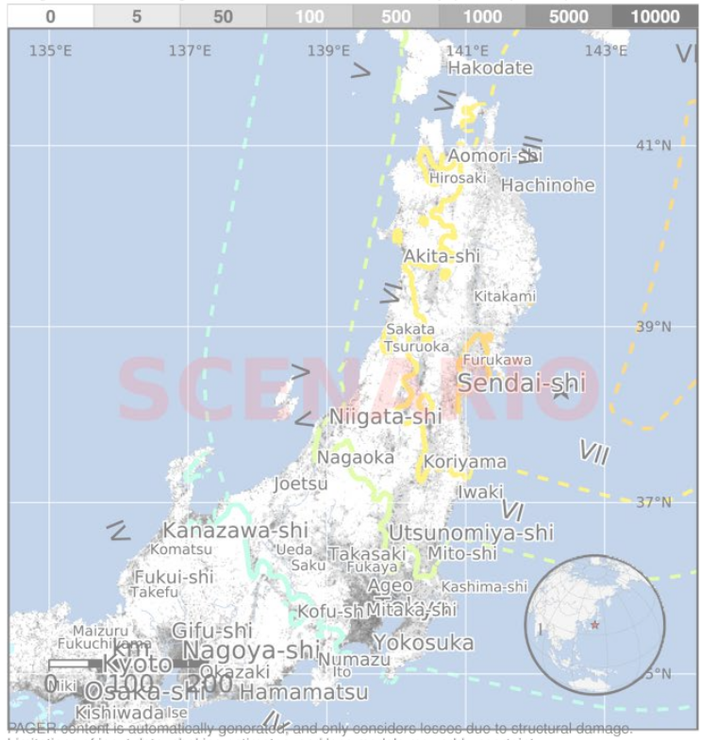
ESTIMATED POPULATION EXPOSURE (k = x1000)		- -*	38k*	37,237k*	42,933k*	5,949k*	6,644k*	1,338k	0	0
ESTIMATED MODIFIED MERCALLI INTENSITY		I	II-III	IV	V	VI	VII	VIII	IX	X+
PERCEIVED SHAKING		Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

*Estimated exposure only includes population within the map area

Population Exposure

population per 1 sq. km from Landscan

0 | 5 | 50 | 100 | 500 | 1000 | 5000 | 10000



PAGER content is automatically generated, and only considers losses due to structural damage.
Limitations of input data, shaking estimates, and loss models may add uncertainty.

Structures:
Overall, the population in this region resides in structures that are resistant to earthquake shaking, though some vulnerable structures exist. The predominant vulnerable building types are heavy wood frame and reinforced concrete frame construction.

Historical Earthquakes (with MMI levels):

Date (UTC)	Dist. (km)	Mag.	Max MMI(#)	Shaking Deaths
2003-07-25	118	6.0	VIII(57k)	0
1978-06-12	31	7.6	VIII(1,304k)	22
1983-05-26	371	7.7	VII(174k)	104

Recent earthquakes in this area have caused secondary hazards such as tsunamis, landslides, and fires that might have contributed to losses.

Selected City Exposure

from GeoNames.org

MMI	City	Population
VIII	Ishinomaki	117k
VIII	Yamoto	32k
VIII	**Furukawa**	**76k**
VIII	Wakuya	18k
VIII	Misawa	43k
VIII	Kamaishi	43k
V	**Tokyo**	**8,337k**
V	Yokohama-shi	3,574k
IV	**Nagoya-shi**	**2,191k**
IV	**Osaka-shi**	**2,592k**
IV	Kobe-shi	1,528k

bold cities appear on map (k = x1000)

http://earthquake.usgs.gov/pager

Event ID: us201103110546_se

USGS science for a changing world

Earthquake Shaking — Red Alert

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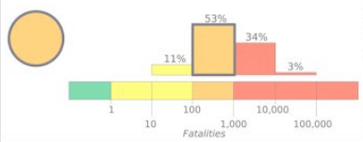
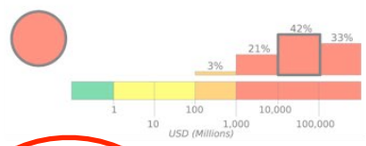


Red alert level for economic losses. Extensive damage is probable and the disaster is likely widespread. Estimated economic losses are 0-1% GDP of Japan. Past events with this alert level have required a national or international level response.

Orange alert level for shaking-related fatalities. Significant casualties are likely.

Estimated Economic Losses



Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)		- -*	- -*	13,946k*	23,755k*	10,045k*	33,564k*	12,828k	0	0
ESTIMATED MODIFIED MERCALLI INTENSITY		I	II-III	IV	V	VI	VII	VIII	IX	X+
PERCEIVED SHAKING		Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

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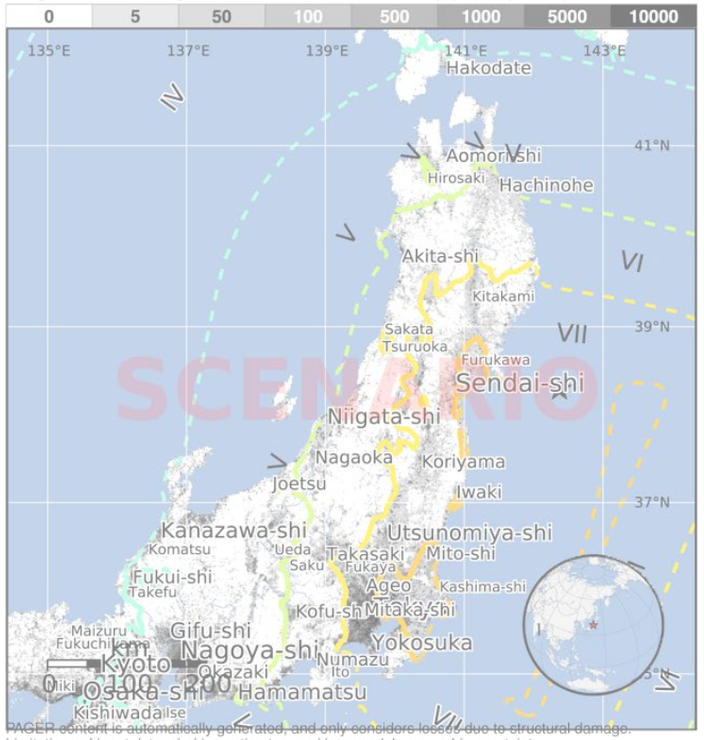
Population Exposure

population per 1 sq. km from Landscan

0 | 5 | 50 | 100 | 500 | 1000 | 5000 | 10000



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Date (UTC)	Dist. (km)	Mag.	Max MMI(#)	Shaking Deaths
2003-07-25	118	6.0	VIII(57k)	0
1978-06-12	31	7.6	VIII(1,304k)	22
1983-05-26	371	7.7	VII(174k)	104

Recent earthquakes in this area have caused secondary hazards such as tsunamis, landslides, and fires that might have contributed to losses.

Selected City Exposure

from GeoNames.org

MMI	City	Population
VIII	Asahi	42k
VIII	Ishinomaki	117k
VIII	Itako	26k
VIII	Yamoto	32k
VIII	Oarai	19k
VIII	Mobara	97k
VIII	**Tokyo**	**8,337k**
VII	Yokohama-shi	3,574k
V	**Nagoya-shi**	**2,191k**
IV	**Osaka-shi**	**2,592k**
IV	Kobe-shi	1,528k

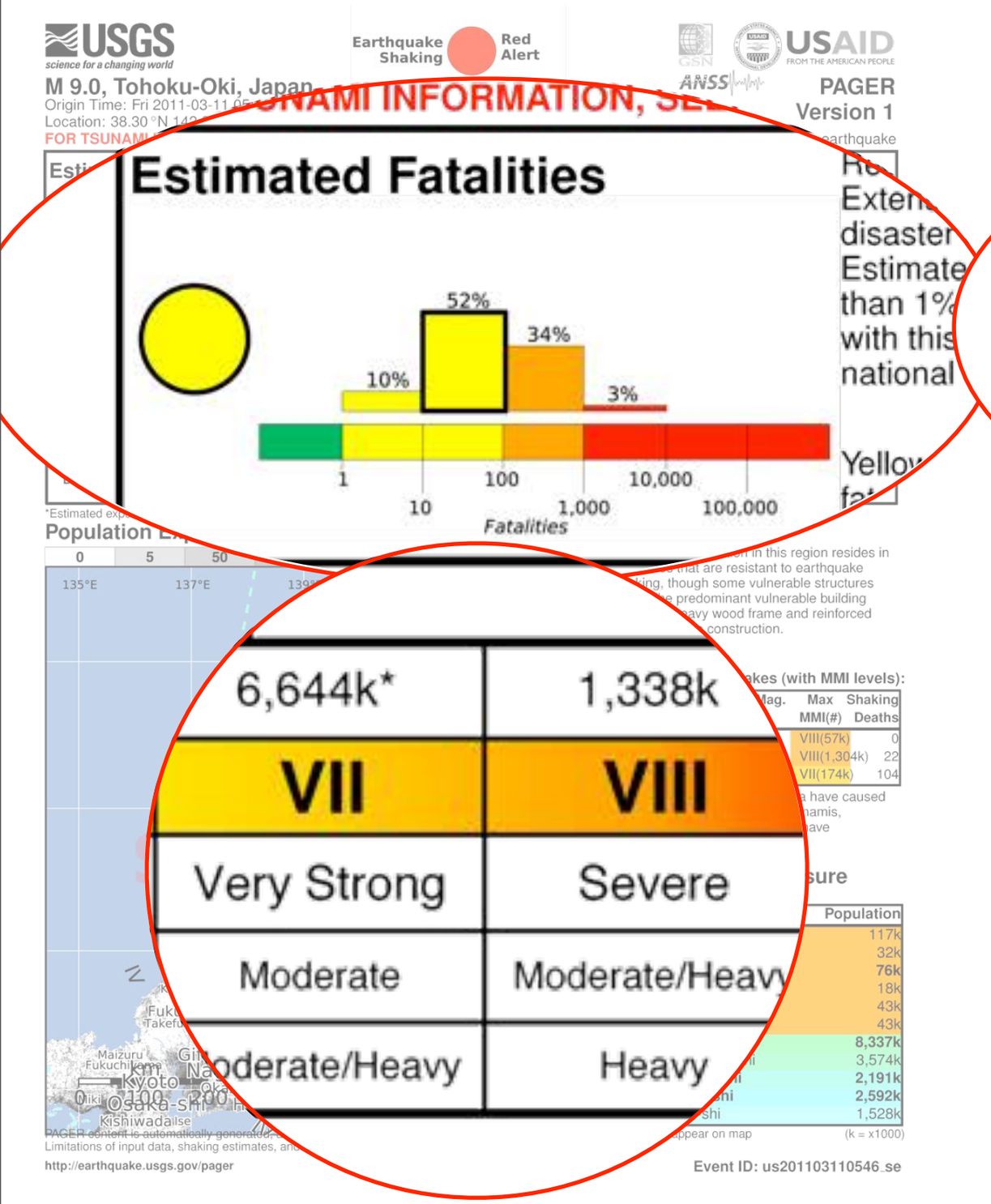
bold cities appear on map (k = x1000)

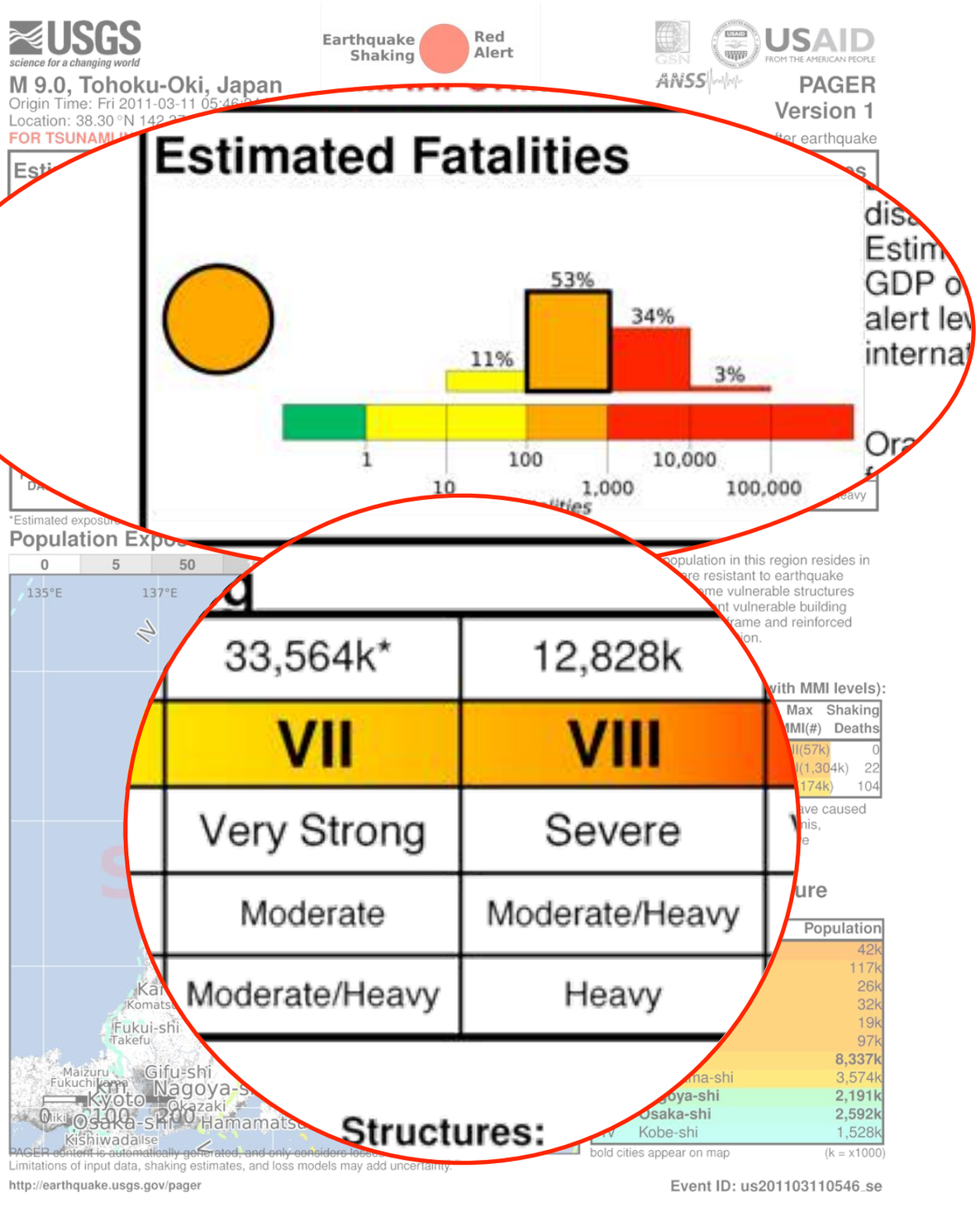
http://earthquake.usgs.gov/pager

Event ID: us201103110546_se

Thus, population exposures significantly increase for the southward scenario as well.

Rupture Models - Why Finiteness Matters





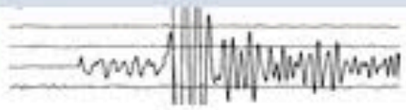
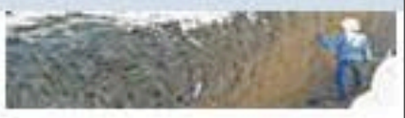
Thus, population exposures significantly increase for the southward scenario as well.

Communication

A response network is only as good as its ability to communicate

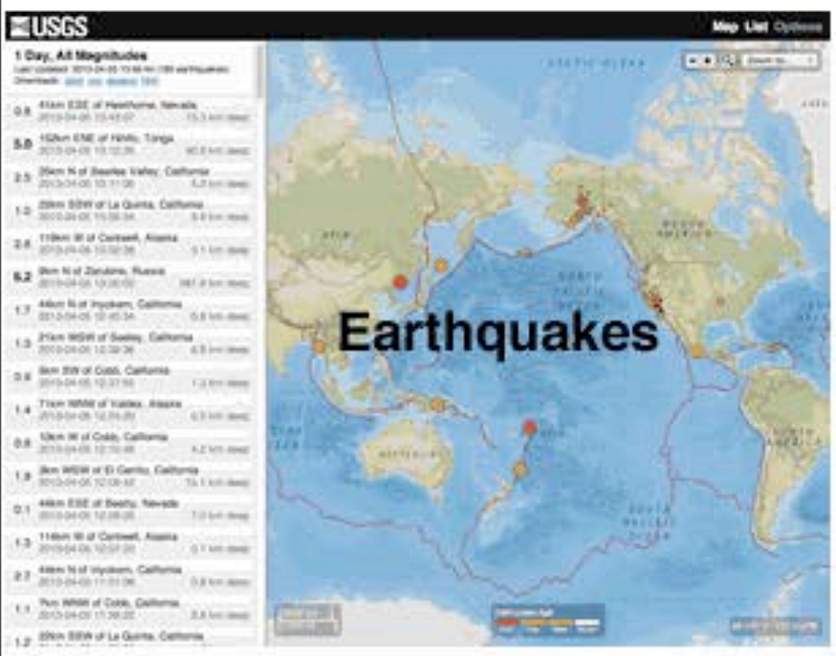




The USGS Earthquake Hazards Program is part of the National Earthquake Hazards Reduction Program (NEHRP), established by Congress in 1977. We monitor and report earthquakes, assess earthquake impacts and hazards, and research the causes and effects of earthquakes.

Latest Earthquakes



View recent events or search for past earthquakes. Optimized for mobile and desktop.

Which earthquakes are included on the map?

Real-time Feeds & Notifications

Get real-time earthquake notifications sent to

Significant Earthquakes

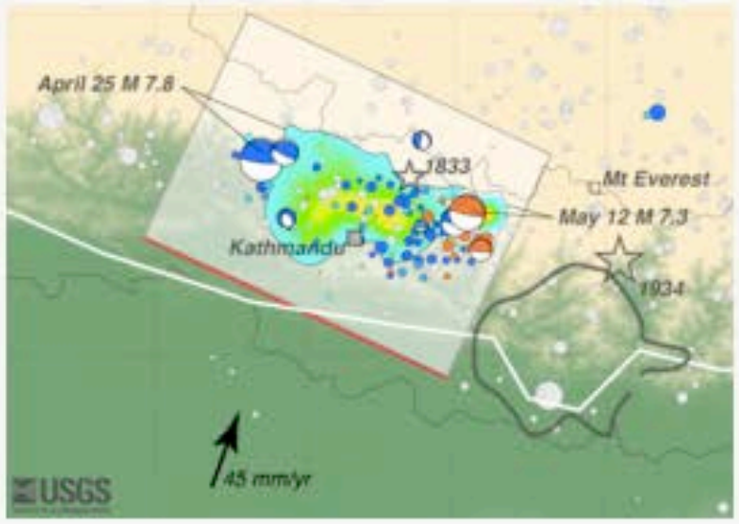
Past 30 Days

6.3	Southern Mid-Atlantic Ridge	
	2015-05-24 04:53:22 UTC	10.0 km deep
6.8	159km ESE of Kirakira, Solomon Islands	
	2015-05-22 23:59:33 UTC	10.0 km deep
6.9	204km ESE of Kirakira, Solomon Islands	
	2015-05-22 21:45:19 UTC	9.9 km deep
4.8	35km SSW of Caliente, Nevada	
	2015-05-22 18:47:42 UTC	4.0 km deep
4.1	10km ENE of Yountville, California	
	2015-05-22 02:53:00 UTC	13.0 km deep
6.8	184km W of Lata, Solomon Islands	
	2015-05-20 22:48:53 UTC	12.0 km deep
6.7	Pacific-Antarctic Ridge	
	2015-05-19 15:25:21 UTC	10.2 km deep
3.3	6km N of Irving, Texas	
	2015-05-18 18:14:29 UTC	5.0 km deep
5.7	24km N of Ramechhap, Nepal	
	2015-05-16 11:34:10 UTC	10.0 km deep

Featured Items

1 2 3

Nepal Earthquake Sequence Educational Slides



Download 17MB PDF presentation created by USGS scientists.

VIEW EARTHQUAKE

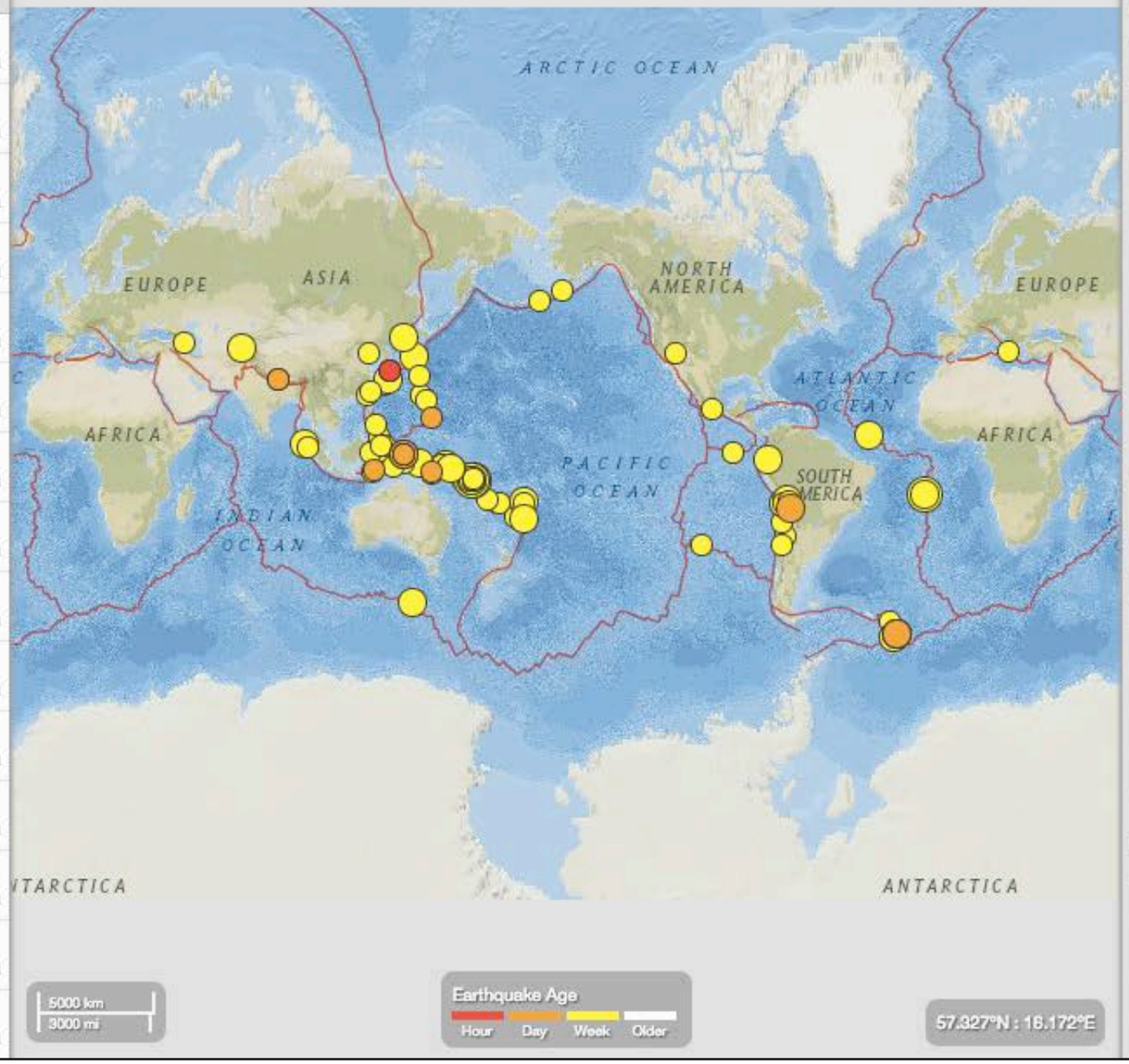
USGS

7 Days, Magnitude 4.5+ Worldwide

96 earthquakes - Download
Updated: 2015-05-27 02:29:07 UTC
Showing event times using UTC

96 earthquakes in map area

4.8	**10km ESE of Makurazaki, Japan** 2015-05-27 01:51:25 UTC	150.2 km
4.5	**166km E of Manokwari, Indonesia** 2015-05-27 01:07:00 UTC	42.6 km
5.4	**83km ENE of Bristol Island, South Sandwi...** 2015-05-26 23:51:30 UTC	35.0 km
5.3	**82km ENE of Bristol Island, South Sandwi...** 2015-05-26 23:41:40 UTC	35.0 km
5.4	**86km ENE of Bristol Island, South Sandwi...** 2015-05-26 23:26:58 UTC	32.0 km
4.6	**63km SSE of Wau, Papua New Guinea** 2015-05-26 22:17:35 UTC	10.0 km
4.8	**187km NE of Palue, Indonesia** 2015-05-26 20:56:22 UTC	580.9 km
4.5	**54km NNW of Kathmandu, Nepal** 2015-05-26 17:07:16 UTC	31.1 km
4.6	**194km ENE of Manokwari, Indonesia** 2015-05-26 16:57:36 UTC	39.0 km
5.3	**191km ENE of Manokwari, Indonesia** 2015-05-26 16:42:36 UTC	44.2 km
5.0	**176km ENE of Manokwari, Indonesia** 2015-05-26 16:38:32 UTC	49.8 km
4.8	**156km SE of JP Tinian Town pre-WW2, No...** 2015-05-26 14:15:43 UTC	43.7 km
5.7	**67km NE of Calama, Chile** 2015-05-26 10:32:01 UTC	115.1 km
4.6	**4km NNW of Aran, Azerbaijan** 2015-05-26 01:20:36 UTC	15.1 km
4.9	**68km SW of Yonakuni, Japan** 2015-05-26 00:56:54 UTC	18.1 km



MY SETTINGS

Bookmark to return to map/list with same settings.

Earthquakes

- [x] Auto Update

- ( ) 1 Day, Magnitude 2.5+ Worldwide
- ( ) 1 Day, All Magnitudes Worldwide
- (•) 7 Days, Magnitude 4.5+ Worldwide
- ( ) 7 Days, Magnitude 2.5+ Worldwide
- ( ) 7 Days, All Magnitudes Worldwide
- ( ) 30 Days, Significant Worldwide
- ( ) 30 Days, Magnitude 4.5+ Worldwide
- ( ) 30 Days, Magnitude 2.5+ Worldwide

Create new or edit existing search.
Search Earthquake Archives

List Format

- (•) Magnitude
- ( ) DYFI
- ( ) ShakeMap
- ( ) PAGER

List Sort Order

- (•) Newest first
- ( ) Oldest first
- ( ) Largest magnitude first
- ( ) Smallest magnitude first

ComCat (Combined Catalog) - A New Web Interface

Search Earthquake Archives

Search results are limited to 20,000 events. To get URL for a search, click the search button, then copy the URL from the browser address bar.

- Help
- About the ANSS Comprehensive Catalog and Important Caveats

Basic Options

Date & Time

Start (UTC)

2015-05-19 00:00:00

End (UTC)

2015-05-26 23:59:59

Magnitude

Minimum

6

Maximum

Depth (km)

Minimum

Maximum

Geographic Region

Currently searching entire world

Rectangle

Decimal degree coordinates. North must be greater than South. East must be greater than West.

Draw Rectangle on Map

North

West

East

South

Circle/ Donut

Specify an inner radius to perform a donut search.

Center Latitude

Center Longitude

Circle/ Donut

Specify an inner radius to perform a donut search.

Center Latitude

Center Longitude

Inner Radius (km) Optional

Outer Radius (km)

Advanced Options

Azimuthal Gap

Minimum

Maximum

Review Status

- (•) Any
- ( ) Automatic
- ( ) Reviewed

[+] Event Type

[+] Impact (PAGER, ShakeMap, DYFI)

[+] Catalog

[+] Contributor

[+] Product Type

Output Options

Format

- (•) Map & List
- ( ) CSV
- ( ) KML
- ( ) QuakeML
- ( ) GeoJSON

Order By

- (•) Time - Newest First
- ( ) Time - Oldest First
- ( ) Magnitude - Largest First
- ( ) Magnitude - Smallest First

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Advanc

Azimutha

Minimum

Review S

Any

Autom

Reviev

Output

Format

Map & List

CSV

KML

QuakeML

GeoJSON

− Impact (PAGER, ShakeMap, DYFI)

Significance

Minimum

Maximum

PAGER Alert Level

Any

Green

Yellow

Orange

Red

ShakeMap MMI

Decimal numbers

Minimum

Maximum

Did You Feel It CDI

Decimal numbers

Minimum

Maximum

Number of DYFI? Responses

Minimum

+ Event Type

+ Impact (PAGER, ShakeMap, DYFI)

+ Catalog

+ Contributor

+ Product Type

Order By

Time - Newest First

Time - Oldest First

Magnitude - Largest First

Magnitude - Smallest First

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Specify an inner radius to perform a donut search.

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Center Longitude

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Outer Radius (km)

Advanc

Azimuth

Minimum

Review S

Any

Auton

Revie

Output

Format

Map &

CSV

KML

Quak

GeoJSON

− Catalog

- Any
- AK - Alaska Earthquake Information Center
- AT - National Tsunami Warning Center
- Atlas
- Choy
- CI - California Institute of Technology
- Dr
- Duputel
- Gcmt
- HV - Hawaiian Volcano Observatory
- Is
- ISC-GEM
- LD - Lamont-Doherty Cooperative Seismographic Network
- MB - Montana Bureau of Mines and Geology
- NC - Northern California Seismic System
- Ne
- NM - St. Louis University
- NN - University of Nevada
- Official
- PR - Red Sismica de Puerto Rico
- PT - Pacific Tsunami Warning Center
- SE - Virginia Tech
- US - National Earthquake Information Center, PDE
- UU - University of Utah
- UW - University of Washington

+ Event Type

+ Impact (PAGER, ShakeMap, DYFI)

+ Catalog

+ Contributor

+ Product Type

Order By

- Time - Newest First
- Time - Oldest First
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Outer Radius (km)

Advanc

Azimuth

Minimum

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Output

Format

Map &

CSV

KML

Quak

GeoJSON

+ Event Type

+ Impact (PAGER, ShakeMap, DYFI)

+ Catalog

+ Contributor

+ Product Type

Order By

Time - Newest First

Time - Oldest First

Magnitude - Largest First

Magnitude - Smallest First

– Catalog

Any

AK - Alask

AT - Natio

Atlas

Choy

CI - Califo

Dr

Duputel

Gcmt

HV - Hawa

Is

ISC-GEM

LD - Lamo

MB - Mon

NC - North

Ne

NM - St. L

NN - Unive

Official

PR - Red S

PT - Pacifi

SE - Virgin

US - Natio

UU - Unive

UW - Univ

– Product Type

Any

Associate

CAP

Disassociate

DYFI?

Eq-location-map

Finite Fault

Focal Mechanism

General Link

General-text

GeoServe

Historical-moment-tensor-map

Historical-seismicity-map

Image

Impact Link

Impact Text

LossPAGER

Moment Tensor

Moreinformation

Nearby Cities

Origin

P-Wave Travel Times

Phase Data

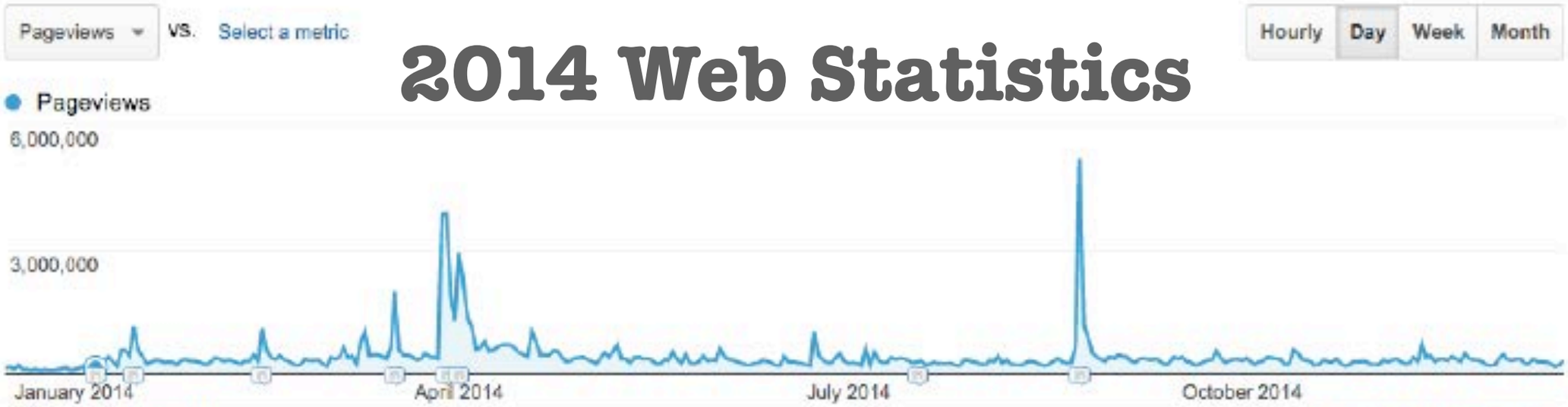
Scitech Link

ShakeMap

Significance

Tectonic Summary

2014 Web Statistics



Show: All | Starred

+ Create new annotation

	Jan 6, 2014	Tracking code (minified) added to more EQ pages		kitfullerusgs@gmail.com
☆	Jan 15, 2014	M4.4 Fontana, CA	edit	lisawald@gmail.com
☆	Feb 14, 2014	M4.1 South Carolina	edit	lisawald@gmail.com
☆	Mar 17, 2014	M4.4 Beverly Hills, CA	edit	lisawald@gmail.com
☆	Mar 29, 2014	M5.1 La Habra, CA	edit	lisawald@gmail.com
☆	Apr 1, 2014	M8.2 Iquique, Chile	edit	lisawald@gmail.com
☆	Jul 17, 2014	2014 NSHM released at 9am Eastern time	edit	lisawald@gmail.com
☆	Aug 24, 2014	M6.0 Napa, CA	edit	lisawald@gmail.com

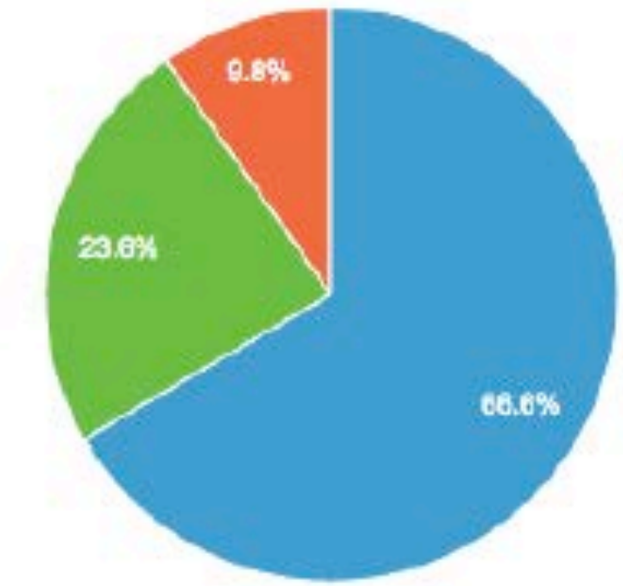
During the most recent 12-month period the website had just over 150 million **pageviews**, which is about 12.5 million pageviews per month, 3 million pageviews per week, or 0.5 million pageviews per day. Over half the total pageviews were of real-time data pages of some sort. Pageviews for the real-time feeds are not included in Google Analytics, but comparing the number of pageviews of the Latest EQ interface with the number of pageviews in the top 8 feeds using our Logaholic statistics for a 30-day period, we receive about 4 times more feed pageviews than all the other real-time pageviews on average.

Information On The Move

Devices

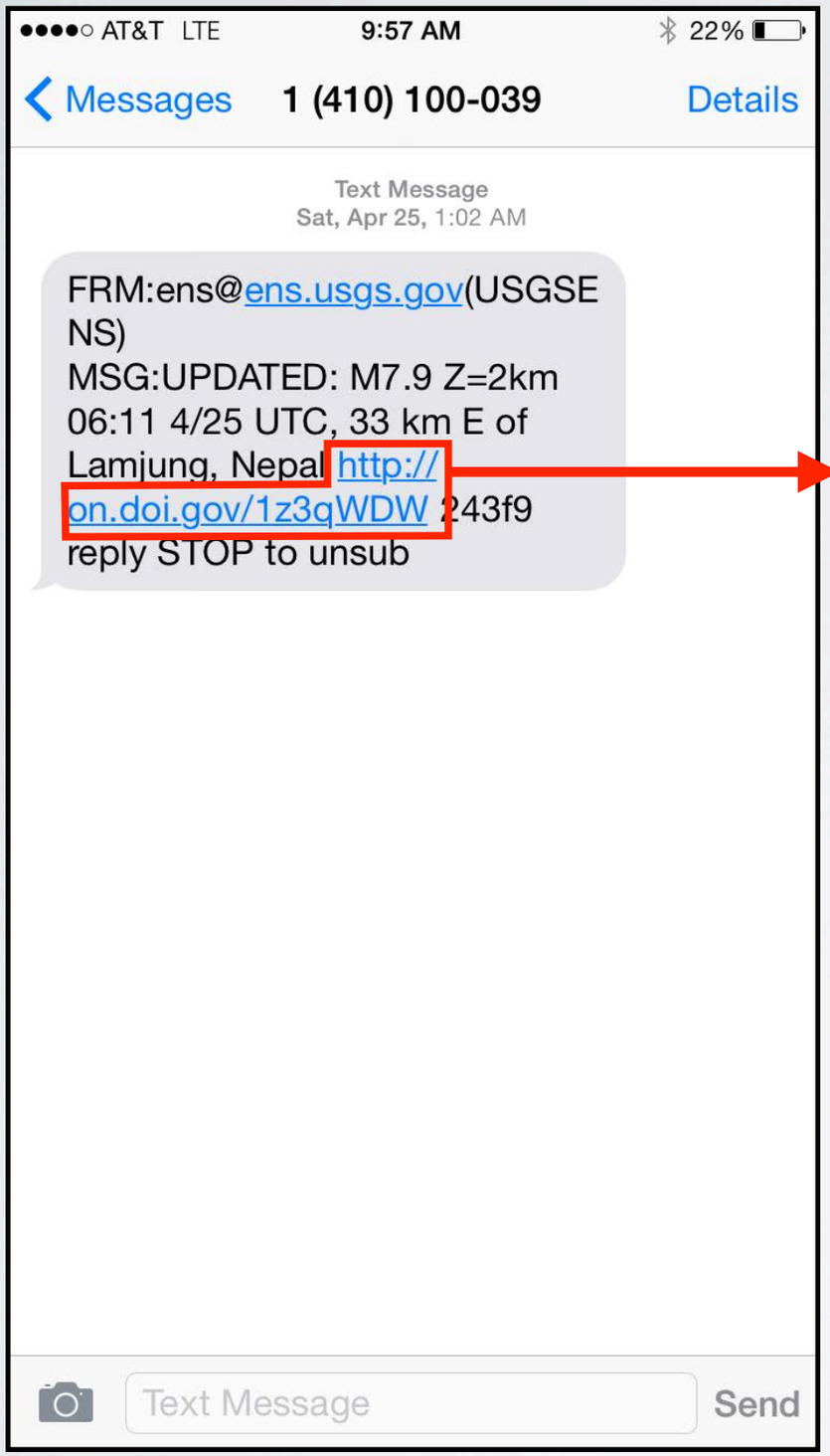
Device Category	Sessions	Sessions
	75,004,055 % of Total: 100.00% (75,004,055)	75,004,055 % of Total: 100.00% (75,004,055)
1. desktop	49,927,354	66.57%
2. mobile	17,725,873	23.63%
3. tablet	7,350,828	9.80%

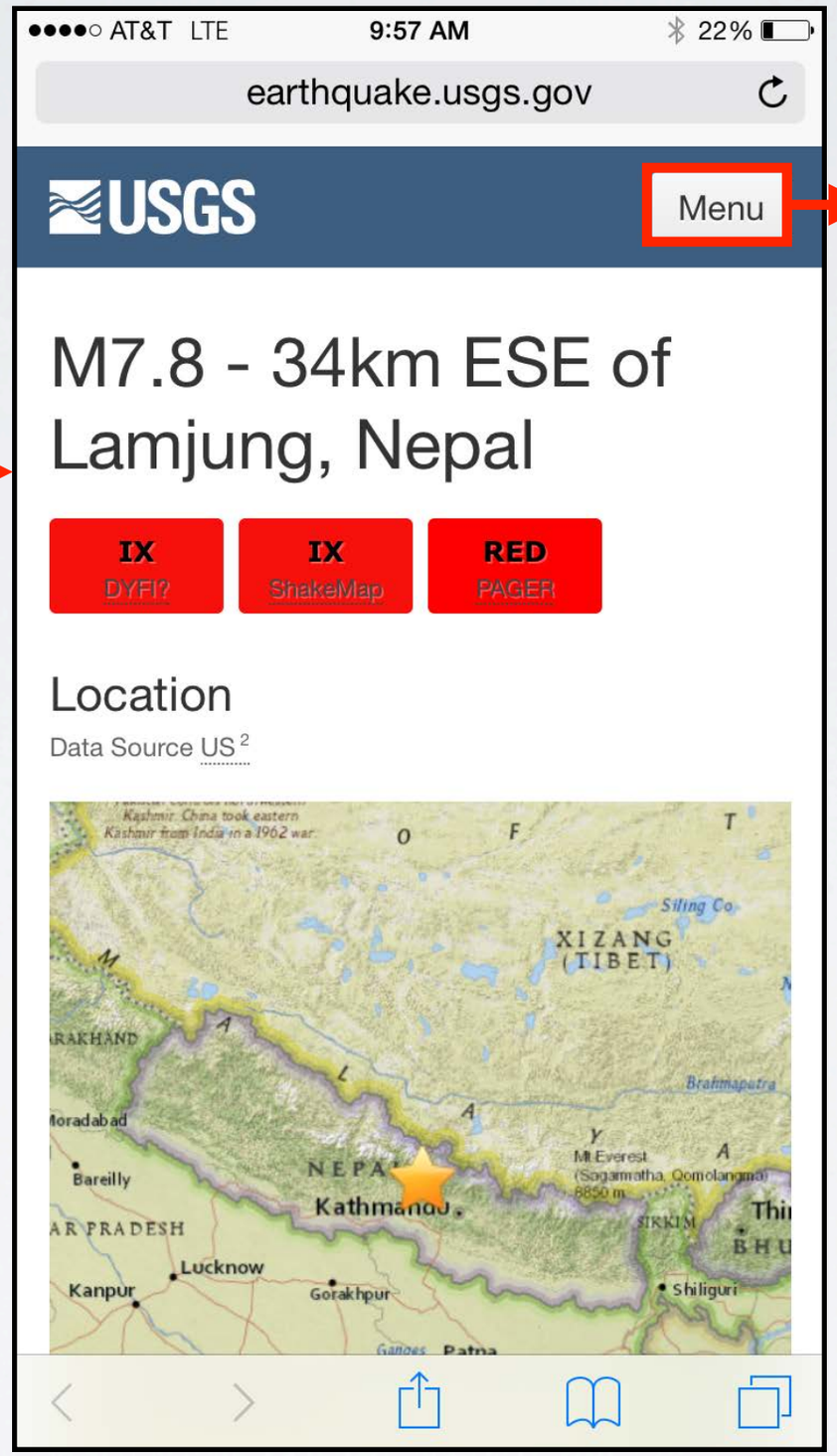
Contribution to total: Sessions

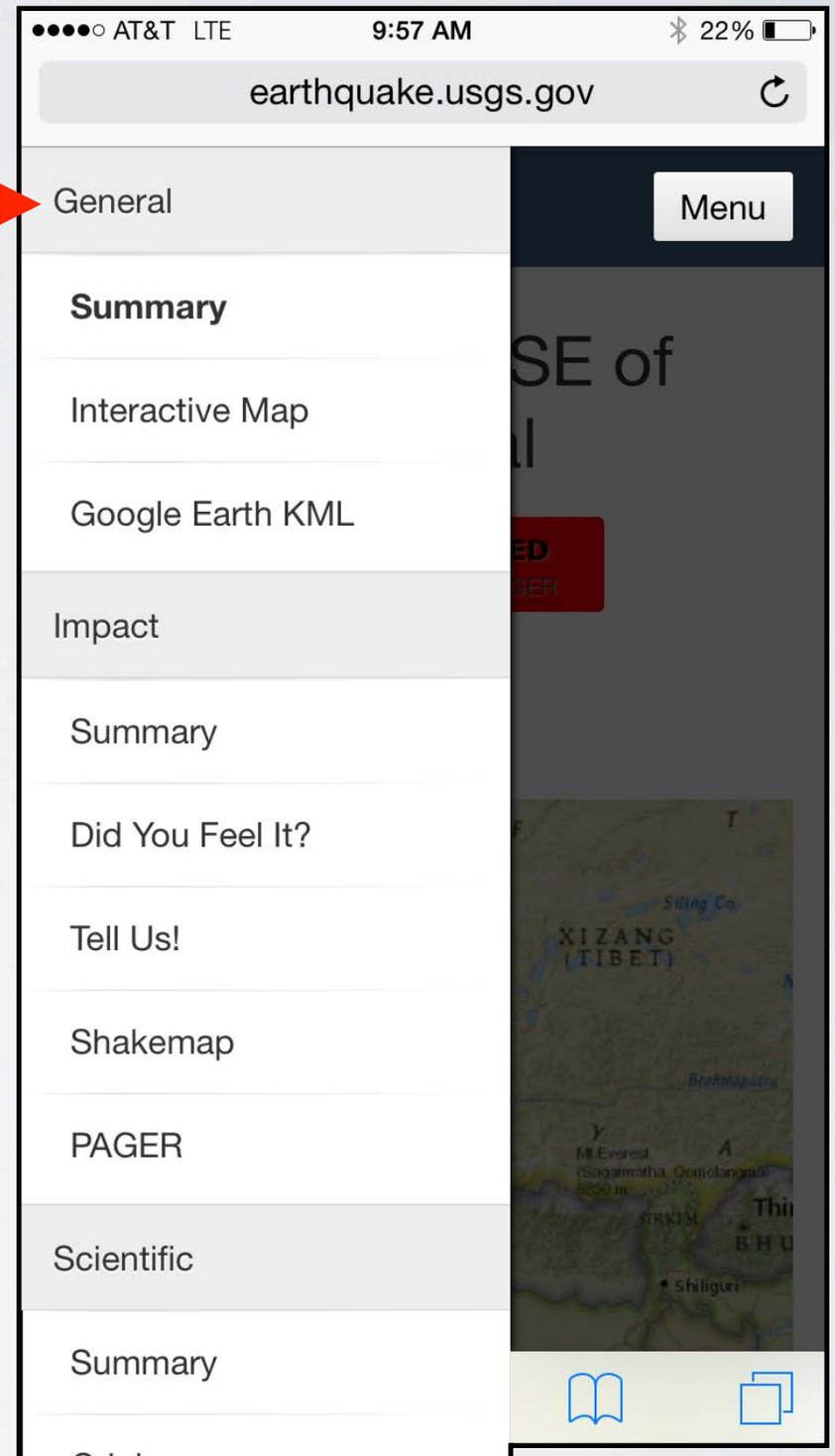


Two-thirds of our visitors are using their desktops to access the website, about ¼ are using a mobile device, and 10% are using a tablet.

Earthquake Notification Service





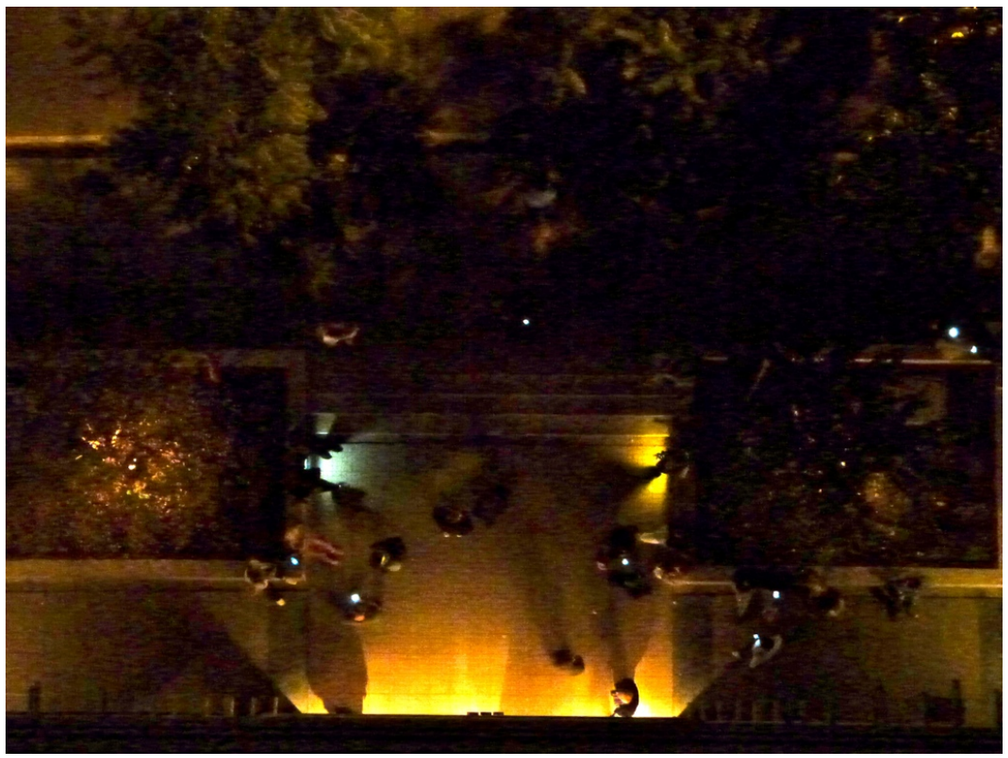


Event pages linked directly from text messages; instant access to all event-based info in new, phone-friendly web format.

Changes in Modern EQ Response

Rising Expectation from the Public, Media, State and Federal Agencies

- Increasingly the planet is becoming more wired. Citizens get upset if they don't get good information quickly.



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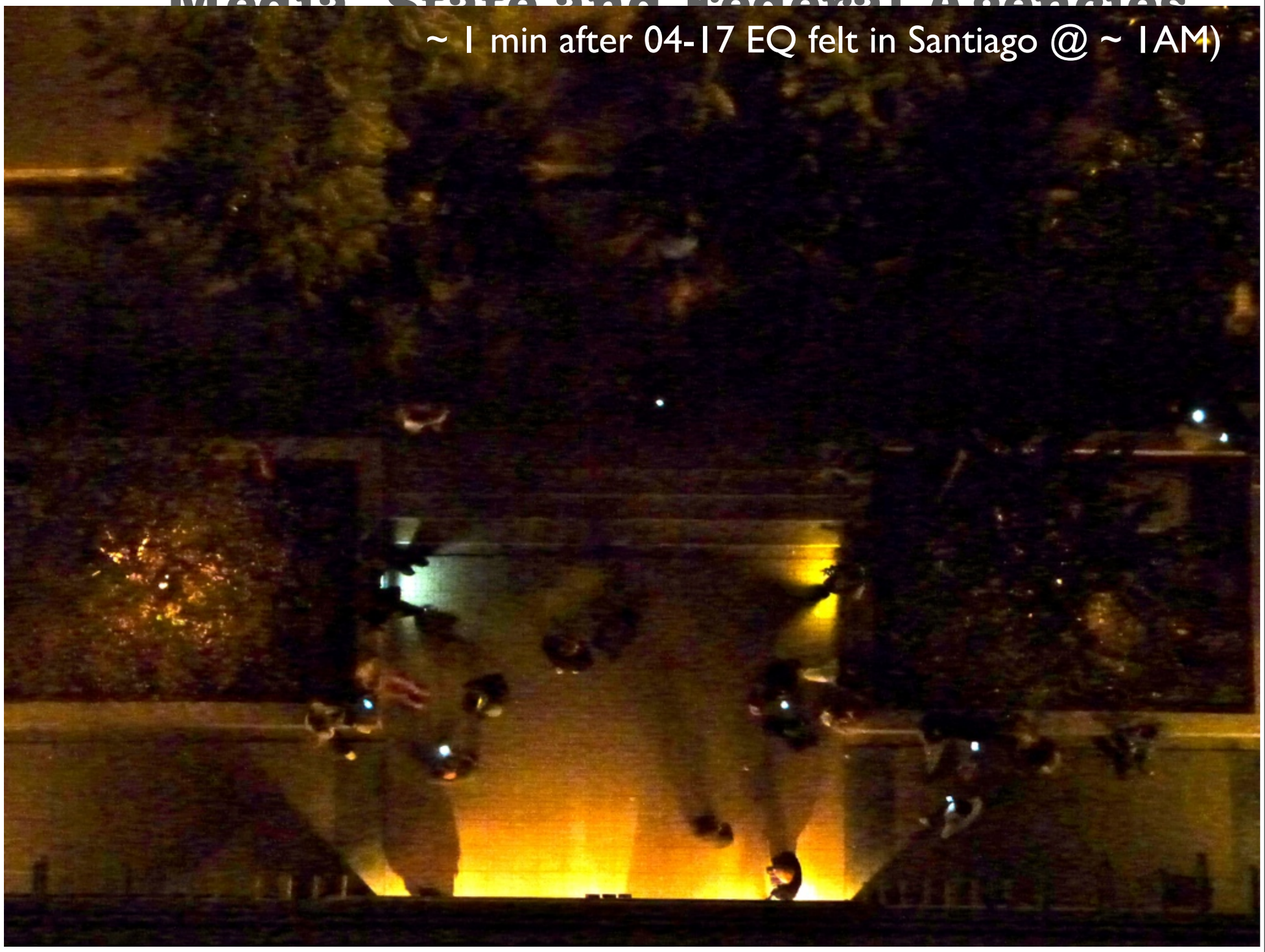

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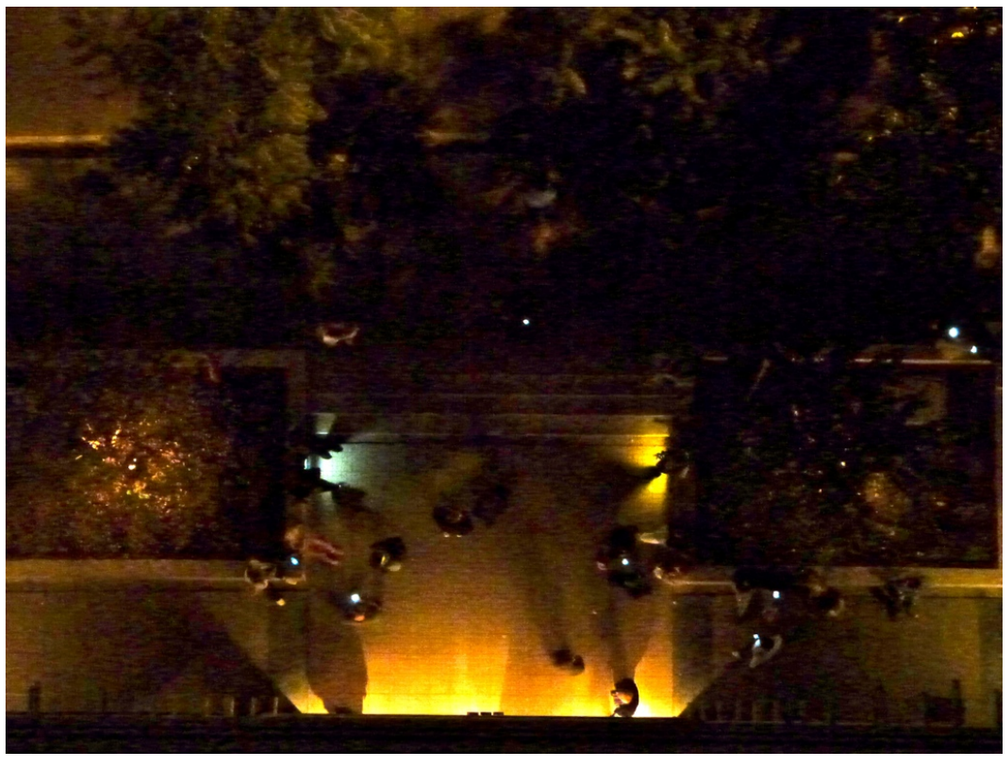


Changes in Modern EQ Response

EQ @ 03:50:16

2012/04/17 03:50:46
UL: Chile. Providencia.
GEO: -33.423, -70.612 (C)
Terremoto!!!!!!!!!!!!!!!

2012/04/17 03:50:46
UL: Chile, Santiago
GEO: -33.463, -70.648 (C)
temblor pesado

2012/04/17 03:50:46
UL: San Antonio, Chile
GEO: -33.587, -71.613 (C)
weno el temblor mierda

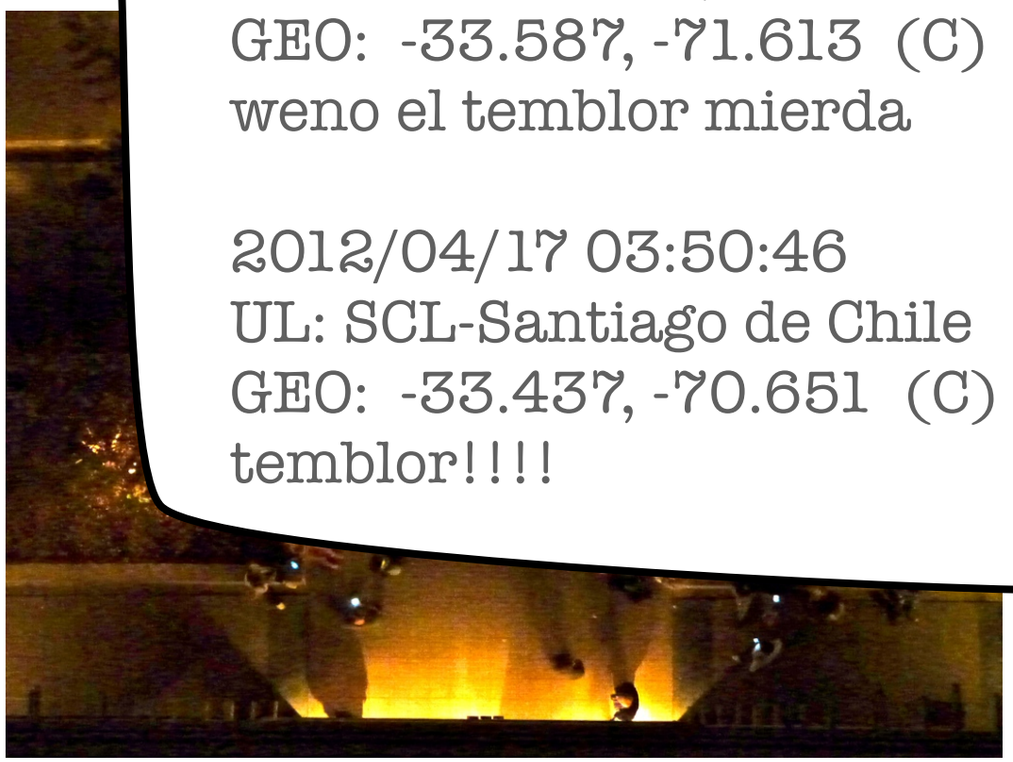
2012/04/17 03:50:46
UL: SCL-Santiago de Chile
GEO: -33.437, -70.651 (C)
temblor!!!!

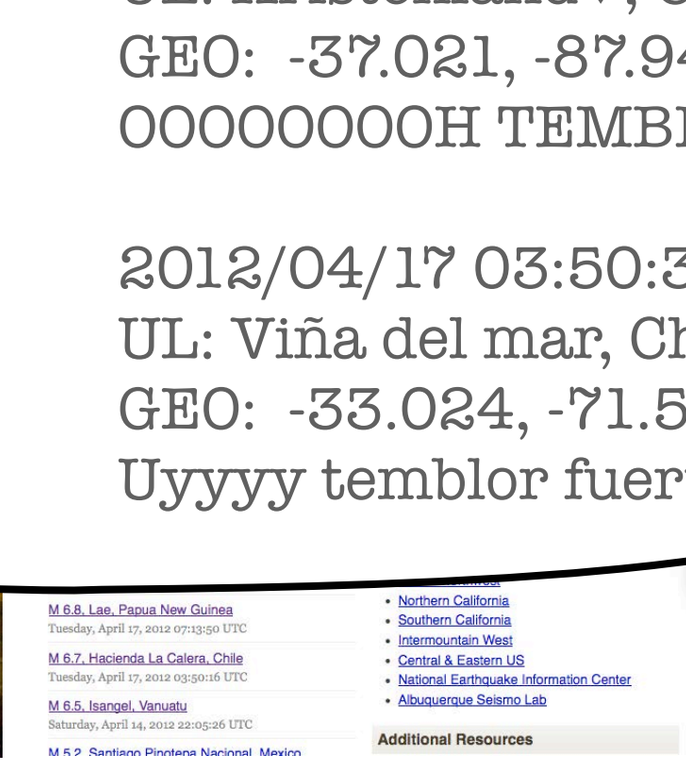
2012/04/17 03:50:46
UL: Santiago,Chile
GEO: -33.437, -70.651 (C)
Temblor

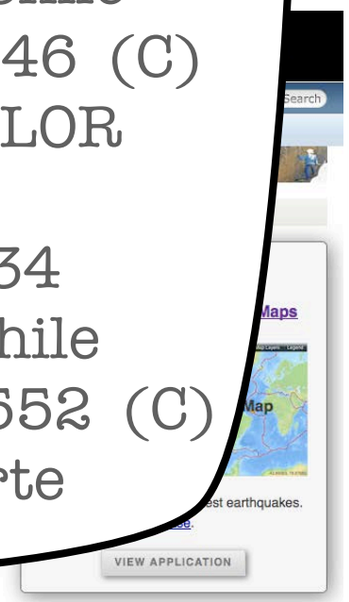
2012/04/17 03:50:45
UL: Viña del Mar, Chile.
GEO: -33.024, -71.552 (C)
Temblor

2012/04/17 03:50:34
UL: Kristenland♥, Chile
GEO: -37.021, -87.946 (C)
OOOOOOOOH TEMBLOR

2012/04/17 03:50:34
UL: Viña del mar, Chile
GEO: -33.024, -71.552 (C)
Uyyyy temblor fuerte







Twitter Alerts

@USGSted

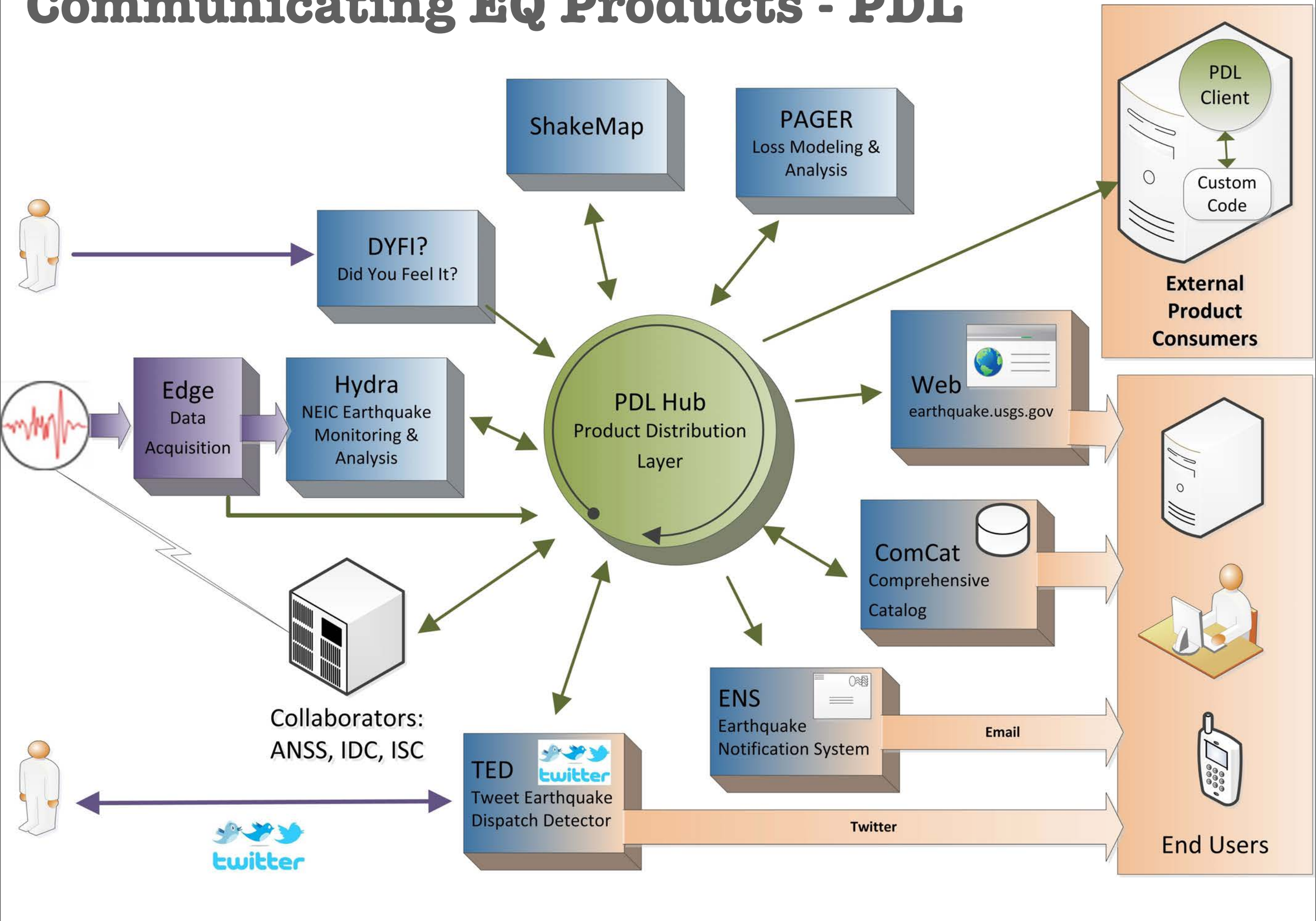
Twitter Earthquake Dispatch

~50,000 followers

Highly scaleable

Tweets alerts for M5.5+ EQs

Communicating EQ Products - PDL



The Next Generation of Data Flow at the USGS NEIC

M. Guy, J. Patton, D. Ketchum, J. Fee, E. Martinez, M. Hearne, H.M. Benz, P. Earle

Acquisition

Inputs

Regional & Global Collaborators Real Time and Late Arriving Products

Event Data

ANSS

Event Parametric Data

Hypocenters, Magnitudes

Phases

Moment Tensors

ShakeMaps

Vetted Catalogs

Tsunami Warnings

Waveforms

100 Networks
7,000 Channels

Instruments
Network Operators

Station Metadata

PDL Hub
Product Distribution Layer

QuakeML Converter

Edge

Acquires contributed data (both real time and delayed) waveform, station metdata and event parametric data then organizes it into standard formats for distribution

Processing

All Products:
- QuakeML: [Hypocenters, Magnitudes, Phases, Focal Mechanisms, Moment Tensors]
- ShakeMaps

Web

Public

XML Strong Motion Data

DYFI?
Did You Feel It?

ShakeMap

Finite Fault

NEIC Scientists

Waveforms

Waveforms

Hydra
NEIC Earthquake Monitoring & Analysis

PAGER
Loss Modeling & Analysis

Station Metadata

Client Interactive Displays

NEIC 24x7 Analyst Staff And Scientist

Waveforms

CWB

Continuous Waveform Buffer: Time series Waveform Data

Station Metadata

PDL Hub
Product Distribution Layer

Geodetic

Places Product

TED
Tweet Earthquake Dispatch Detector

ENS
ANSS Earthquake Notification System

Services

Tweets @USGSTed (~50,000 Followers)

Emails (~450,000 subscribers)

Realtime Products

Real-time Data Feeds: GeoJson, KML, ATOM

Realtime Subset of ComCat; All Event Centric Products

All Products via PDL Client: QuakeML, XML

ANSS ComCat

Java API Interface

Wrapper Libraries Python, Matlab, R

ANSS Comprehensive Catalog; All Event Centric Products

GIS

GIS Services

Feeds Website

Map Images, GIS Services, GIS Data

Web Service Interface

GeoServe

Web Service Interface

GeoNames
3rd Party Data Provider
www.geonames.org

Place Names: FE Regions, Cities, TZ

CWB

QueryMon Interface

EW Waveserver Interface

Winston Wavserver Interface

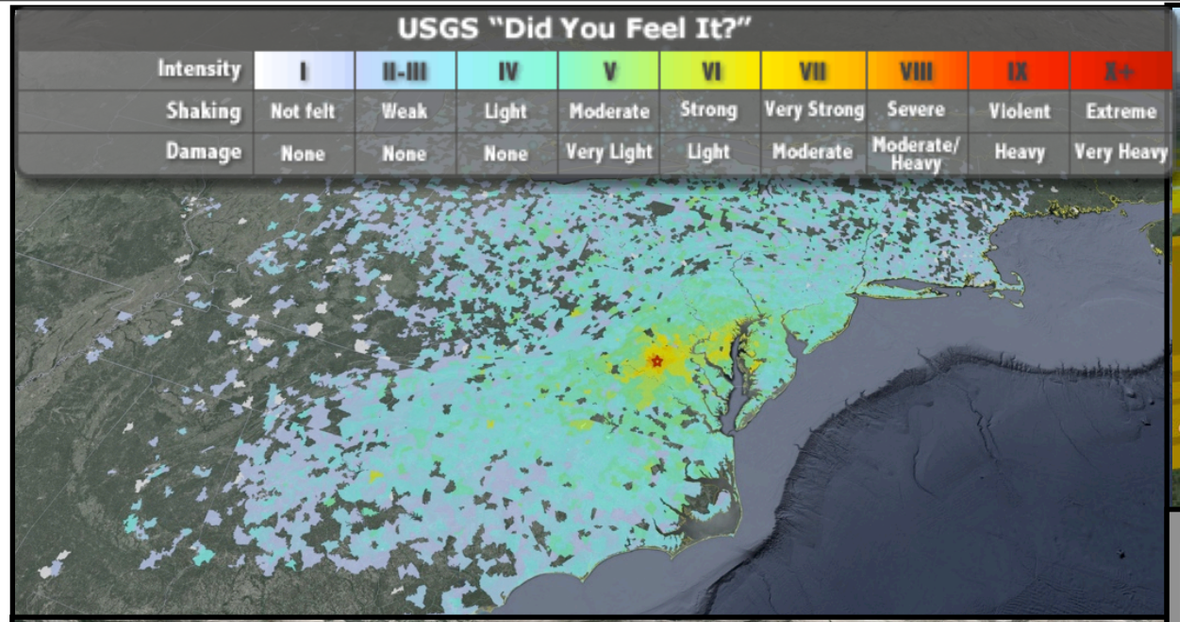
SeedLink

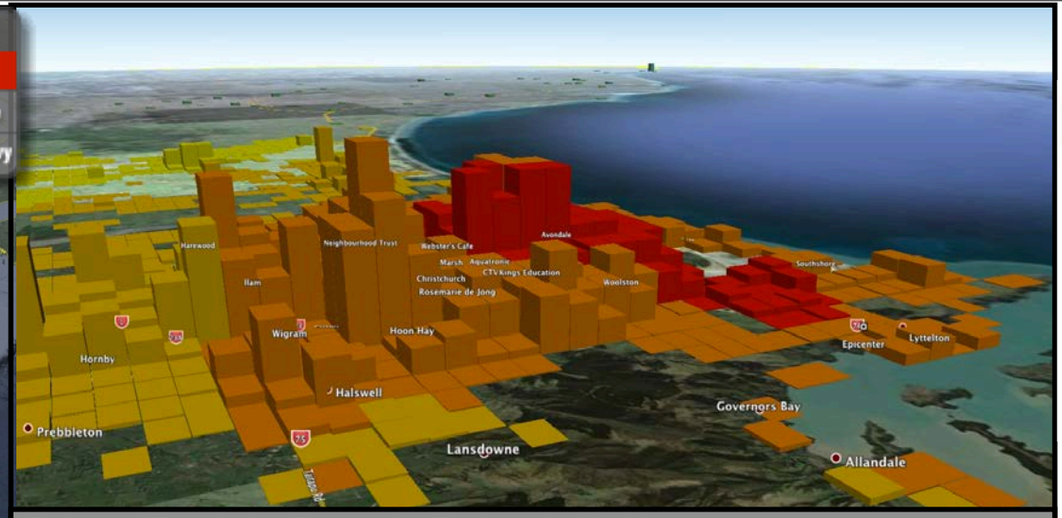
Continuous Waveform Buffer: Time series Waveform Data

MDS

MDGet via TCP/IP

24x7 Metadata Server: Station & Channel responses and coordinates

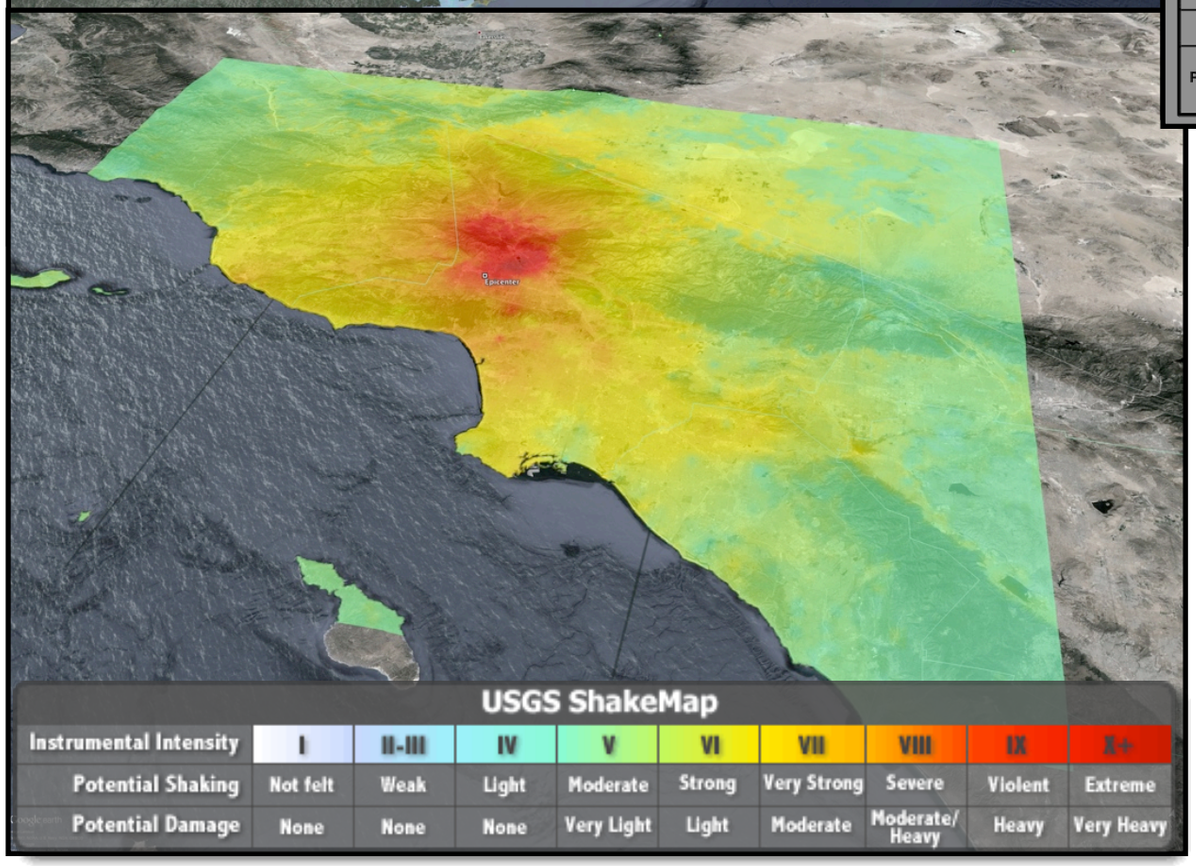


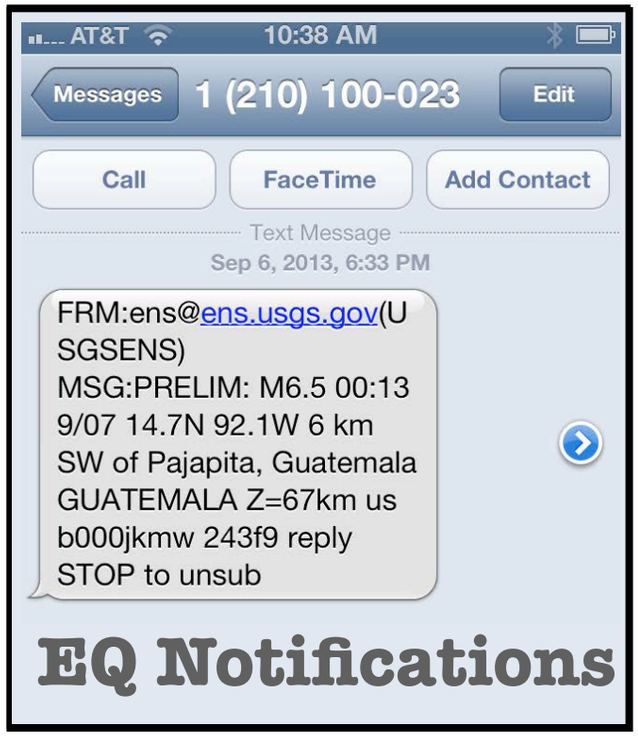


Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)		- -*	23*	46k*	91k	50k	63k	228k	92k	0
ESTIMATED MODIFIED MERCALLI INTENSITY		I	II-III	IV	V	VI	VII	VIII	IX	X+
PERCEIVED SHAKING		Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

twitter



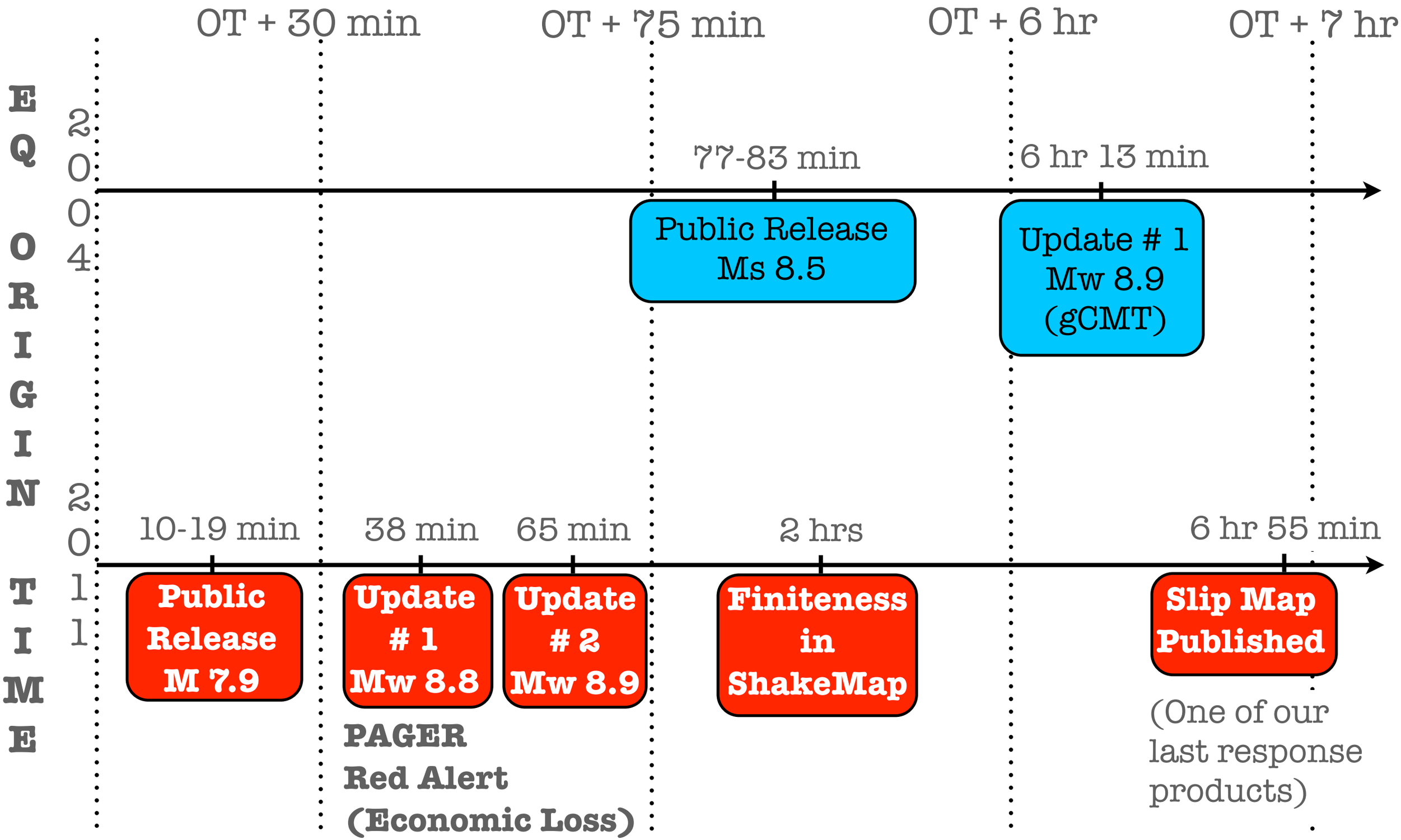


EQ Notifications

The products we serve - magnitude doesn't tell us how an earthquake affects people. New products have allowed us to both improve our rapid response, and serve more useful information.

Comparing EQ Response Response

2004 Sumatra EQ (M 9.1) vs 2011 Tohoku EQ (M 9.0)



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EARTHQUAKES HAZARDS LEARN PREPARE MONITORING RESEARCH

Questions?

Gavin P. Hayes (ghayes@usgs.gov)
USGS NEIC **(earthquake.usgs.gov)**

See the detailed earthquake response and educational material, etc., on our website!

EARTHQUAKES
- List/Map/Search
- Real-time Feeds & Notifications
- Did You Feel It?
- Significant EQ Archive
- Search EQ Archives
- "Top 10" Lists & Maps
- Info by Region
- US Seismicity Map
- World Seismicity Maps

HAZARDS
- Faults
- Hazard Maps & Data
- Seismic Design
- Hazard Analysis Tools
- EQ Scenarios

LEARN
- EQ Topics for Education
- FAQ
- EQ Glossary
- For Kids
- Google Earth/KML Files
- EQ Summary Posters
- Photos
- Publications

PREPARE
- How do I prepare?
- Great ShakeOut Drills
- Multi-Hazards Project

MONITORING
- NEIC
- ANSS – United States
- GSN – World
- Volunteer Monitoring
- ASL – Albuquerque
- Network Operations
- Seismogram Displays
- Buildings
- NSMP – Strong Motion
- Crustal Deformation
- Data

RESEARCH
- Projects
- Science Centers
- Data
- DYFI?
- PAGER
- ShakeMap
- Early Warning
- Software
- External Support