

EERI: Learning From Earthquakes

Earthquake early warning in Mexico City



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Mexico City visit: October 2nd-6th, 2017

Talked with CIRES (EEW alert generator), C5 (warning sirens), UNAM seismologists business owners, private warning companies, and members of the public



Earthquake early warning in Mexico City



SASMEX: Mexico's EEW system

Goal: Issue alert for all earthquakes that might be felt in Mexico City



EEW alerts in Mexico City



12,000 sirens across Mexico City



Dedicated radio receivers and sirens – few hundred



Modified NOAA weather radios – tens of thousands?



September 2017 – busy month

Sep 6th ??pm **Technician triggered sirens across Mexico City**

Sep 7th 11:50pm **M8.1 over 700 km from Mexico City**
~2 minutes of warning
Shaking widely felt, little damage

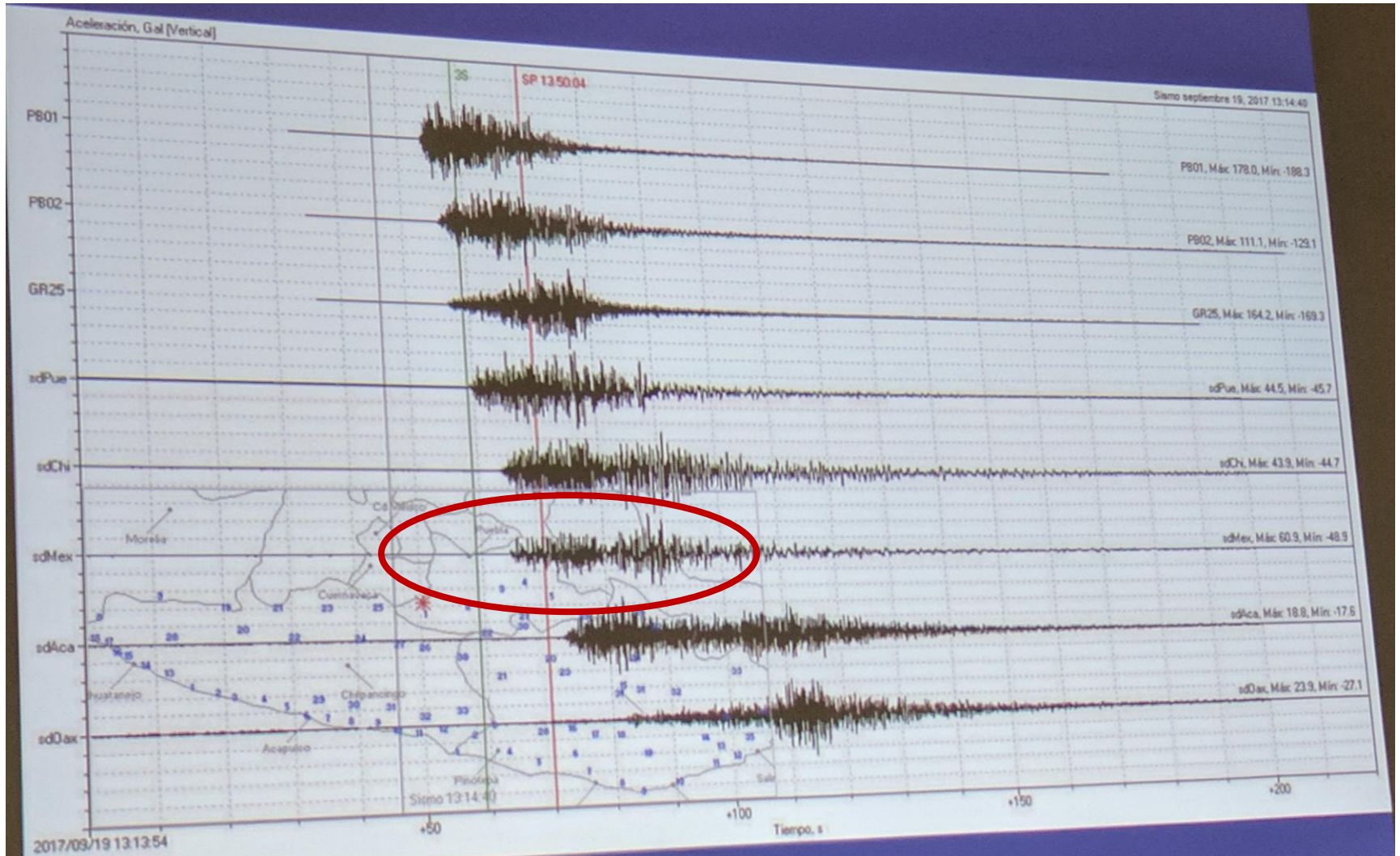


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Sirens sound few seconds *after* shaking felt
Damaged and collapsed building across the city



September 19th 2017 – M7.1



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Very few felt shaking



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Five alerts:

Main event: Alert few seconds after shaking felt

Two alerts with *little damage and little shaking*

One false + one drill



So what do people think of EEW?

The system is **“valuable”**

People do gripe:

- Have to “go outside in the rain when the alert sounds”
- “evacuated in the night but did not feel shaking”
- “the alert sounded after they started to feel shaking”

But go on to say

the system is **“valuable” “necessary”**
even **“stupendous”**

They recognize there are technical limitations
...and accept them



“False” alerts

Public definition: an alert but no earthquake

...the earthquake does not have to be felt by an individual

and “false alerts are just drills”

CFO of “BBB” based in headquarters:

“Could have a drill/alert every couple of months”

**“Would loose about 30 min work time
but improve awareness and response”**

This means there is a

greater tolerance

for false events than missed events



The right message

Earthquake!

More complex message cannot be comprehended
...and are technically more challenging

magnitude vs. intensity – public does not understand

time-till-shaking

– may delay or confuse response

– may be wrong, e.g. strong P-wave shaking

Multiple types and sources of alerts only amplifies confusion



The right message

Earthquake!

...immediately followed by additional information

People want to know what happened...



“there was an earthquake even though I did not feel it”

...mitigates potential frustration about “false” alerts



Seismic culture – EEW helps

EEW increases earthquake awareness



People ...think about earthquakes
...think about impacts
...think about response
...think about preparedness



Design matters



**must use social media
...modern webpages**

**must be *seen* to innovate
(while also being innovative)**



Five recommendations for EEW around the world

1. EEW is seen as being valuable

...despite technical limitation, non-perfect performance
and mixed messages about protective actions

Gives us confidence about accelerated deployment elsewhere

2. Initial alert should be as simple as possible: “earthquake” to prompt immediate protective actions

3. Follow-up information critical in the seconds/minutes after alert social media is a key channel for communicating this information

4. Warning information from all sources should be consistent to prevent confusion

5. EEW is only as good as the likelihood that effective action is taken EEW development must be paired with disaster preparedness research, education, planning and policy

