WAPMERR - WORLD AGENCY OF PLANETARY MONITORING AND EARTHQUAKE RISK REDUCTION, GENEVA.

WHAT IS QLARM?

QLARM is a 2nd generation open source tool to esti-mate building damage and casualties in quakes (Fig. 1).

The properties of the building stock are defined by the European macroseismic scale (EMS98). Collapse rates and casualty matrices are based on the most recent publications on these topics.

The population is given by settlement for all countries of the world and is based on 2009 and 2010 data. For selected important cities, models considering data by district are included.

Different attenuation functions may be selected.

As input, earthquake source parameters or pre-calculated shakemaps may be used**.**

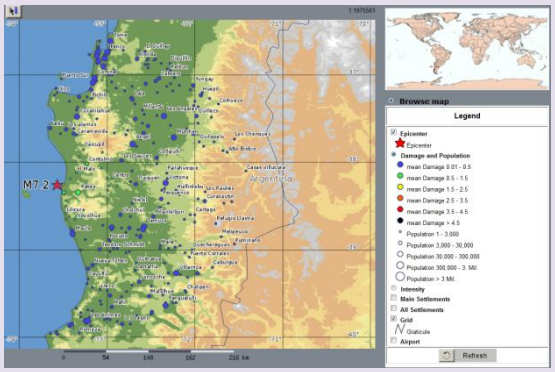

Figure 1: Map of mean damage estimated in real time by QLARM after the earthquake of 2011/01/02, Mw 7.1, Araucania, Chile. Building inventories are a function of settlement size.

WHAT IS QLARM'S OUTPUT?

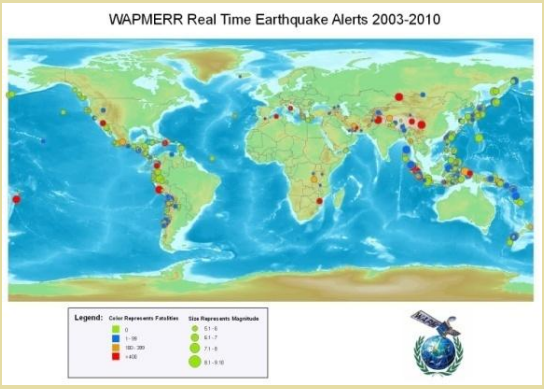

Figure 2: Epicenters of earthquakes for which WAPMERR has issued an alarm. Color and size of the symbols indicate severity and population size, respectively.

The output is in the form of a table that lists the following expected parameters for each settlement in the data base. 1) Intensity, 2) mean damage to each building type, 3) overall mean damage, 4) range of fatalities, and 5) range of injured. The sums of the fatalities and injured are the parameters on which the disaster level is judged.

Two types of maps are generated: A) Expected intensity at all settlements and B) expected mean damage for all settlements (Fig. 1).

Earthquake alerts are issued by WAPMERR within less than one hour for all major earthquakes worldwide that occur near populated areas (Fig. 2).

Anyone may sign up to receive this free service.

Experts who wish to estimate real time losses in their own countries are invited to use QLARM in collaboration with WAPMERR.

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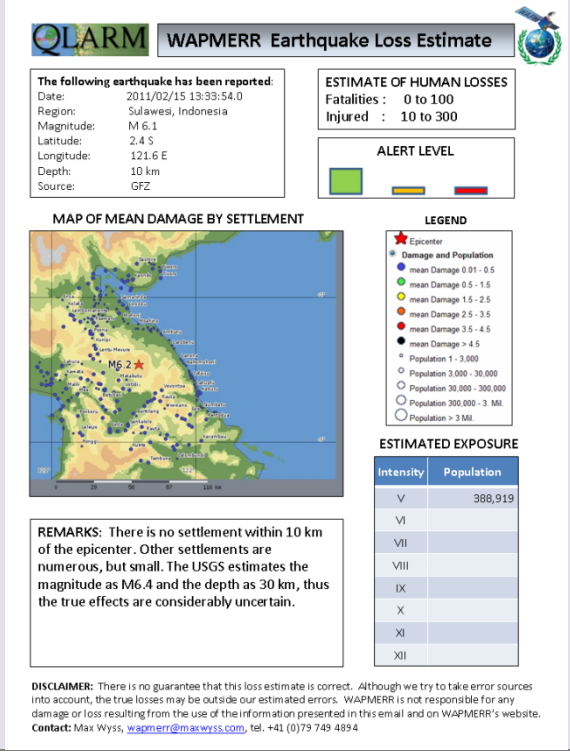
REAL TIME LOSS ESTIMATES WORLDWIDE

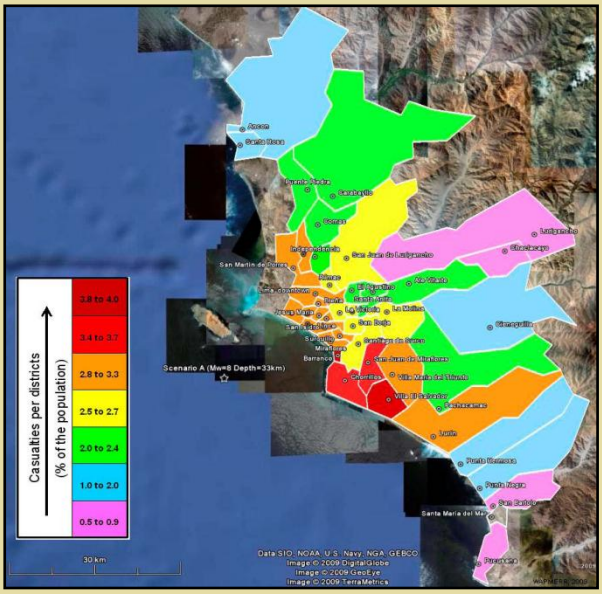
Alerts Distributed by WAPMERR

- **Alerts are distributed by email.**
- **All alerts are reviewed.**
- **Minimum magnitude threshold varies from 5.5 (Europe) to 7.5 (Pacific). On average Mmin=6.**
- **Median response time: 29 minutes.**
- **Number of alerts issued so far: 600.**
- **Number of settlements affected in alerts: 100 to 3,000.**
- **Intensity level considered: V to XII.**

The alerts aim to differentiate disastrous and inconsequential events. The largest uncertainties stem from errors in hypocenters and building properties.



SCENARIO LOSS ESTIMATES



The purpose is to estimate the order of magnitude of losses likely to be suffered in future earthquakes.

- **Cities are divided in administrative districts or neighborhoods of similar building inventory.**
- **Microzonation maps on amplification of seismic waves are used.**
- **The fate of the school population may be analyzed separately.**
- **The functionality of health facilities may be evaluated.**
- **Critical facilities and historic structures may be studied.**

PUBLICATIONS BY WAPMERR

Articles on the method, the results, on data, on error sources, on the casualty matrix on data sources may be downloaded from WAPMERR's web site: www.wapmerr.org

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