Geophysical Research Abstracts
Vol. 13, EGU2011-4934, 2011
EGU General Assembly 2011

A review of all Australian Damaging Earthquakes and their contribution to knowledge of earthquake risk in Australia.

James Daniell (1,2,3) and Gary Gibson (4,5)

(1) General Sir John Monash Scholar, The General Sir John Monash Foundation, Level 5, 30 Collins Street, Melbourne, Victoria, Australia 3000.(j.e.daniell@gmail.com), (2) Center for Disaster Management and Risk Reduction Technology (CEDIM), Hertzstrasse 16, 76187, Karlsruhe, Germany., (3) Geophysical Institute, Karlsruhe Institute of Technology, Hertzstrasse 16, 76187, Karlsruhe, Germany., (4) Environmental Systems and Services, 8 River St., Richmond, Victoria, Australia 3122., (5) School of Geosciences, Building 28, Room 124, Monash University, Clayton, Victoria, Australia 3800.

By using the newly formed CATDAT Damaging Earthquakes database, the socio-economic damage data collected for historic Australian earthquakes and rockbursts are presented. Although the total Australian statistics, just under $5 billion USD (2011 HNDECI adjusted dollars) and 16 earthquake deaths and 5 rockburst deaths, are dominated by the 1989 Newcastle Earthquake, many other historic earthquakes have recorded significant losses to regional finance and infrastructure and a repeat earthquake could cause significant damage with the now increased exposure. Most Australian buildings are built of URM with a reasonably low seismic code by world standards.

The effects of over 90 damaging earthquakes have been recorded in Australia since the beginning of its European history. Given the small return period of European Australian history (approx. 220 years), there exists a large gap in the historical damaging earthquake record compared to some other parts of the world, with increased uncertainty of the effects of large earthquakes expected along major faults through urban centres (particularly Adelaide and Perth – both cities of over 1 million people).

Comparatively, on a global scale, Australia has had very few social losses as a result of earthquakes. Only 6 fatal earthquakes and rock-bursts have been recorded on Australian soil; however, 10 more have caused injuries. 21 deaths, over 275 injured and over 1500 homeless have been recorded.

This complete list of Australian damaging earthquake socio-economic losses in CATDAT, sourced from many locations, includes estimates, trends and figures of these earthquakes based on historical Australian building type, economy and social data. Details as to damaging earthquake secondary effects are also presented. In addition, a normalisation procedure has been used to look at potential economic losses from a reoccurrence of these earthquakes. It has been seen that a reoccurrence of the 1989 Newcastle earthquake would not change the economic loss considerably, due to the increase of seismically built and retrofitted infrastructure; however, some earthquakes such as Adelaide 1954 could be in excess of $500 million USD direct economic loss, with much more expected from indirect economic losses.

This work furthers the need for systematic risk assessments for all urban centres in Australia. This data should help to standardise the differences seen in literature and historic earthquake databases in values of historic Australian damaging earthquakes and will also aid earthquake loss estimation damage-loss conversion ratios.