

South Australian Historical Earthquakes in the Pre-Instrumental Period 1837-1963: A Comprehensive Chronicle and Analysis of Available Intensity Data

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Abstract

Macroseismic data in the form of felt reports of earthquake shaking is vital to seismic hazard assessment, especially in view of the relatively short period of instrumental recording in many countries. During the early 1990s, a very detailed examination of historical earthquake records held in the State Government archives and the Public Library of South Australia was carried out by myself. This original work resulted in the compilation of a list of just over 460 earthquakes in the period prior to seismic network recording, which commenced in 1963. The majority of these events had escaped mention in any previous publication on South Australian seismicity and seismic risk. This historical earthquake research, including the production of a large number of isoseismal maps to enable earthquake quantification in terms of magnitude and location, appears to have been the only study of its kind in South Australia performed so comprehensively, and resulted in the most extensive list available. After 20 years, it still stands as the definitive list of historical earthquake events in the state. The incorporation of these additional historical events into the South Australian Earthquake Catalogue maintained by the SA Department of Primary Industries and Resources had the potential to raise the previous listing of just 49 pre-instrumental events to 511 earthquakes, and to extend it back another 46 years to 1837. Some of the major events have been formally included in the South Australian Earthquake Catalogue. However, for many events, there was insufficient information and/or time to finalise the source parameters due to the onerous task of manually trawling through historical records and newspapers for felt reports.

With the advent of the information age, researching historical newspapers and records is now a feasible undertaking. As an example, I recovered reports of an additional 110 previously unrecognised events during the first 50 years of colonisation from digitised South Australian newspapers, recently made available on the National Library of Australia's website called TROVE. This was done in a relatively short period of time and now the South Australian Historical Earthquake List incorporating these events comprises some 679 entries.

This thesis builds upon and consolidates the work that was commenced 20 years ago. By doing so, it proposes the establishment of flexible and convenient computerized processes to maintain well into the future an increasingly accurate record of historical earthquakes in South Australia. This work may also provide a model for the ongoing development of historical earthquake records in other states and territories of Australia.

Contents

Statement of Originality	i
Acknowledgements	i
Abstract	ii
Tables	iv
Figures	iv
Chapter 1 Introduction: The Importance of Historical Earthquake Research.....	1
1.1 International perspective	1
1.2 South Australian perspective	3
1.3 Early attempts to establish an earthquake record.....	5
1.4 Thesis objectives and overview.....	6
Chapter 2 Undertaking Historical Earthquake Research: Expanding the List	8
2.1 Historical earthquake records	8
2.2 Archival lists and records	9
2.3 South Australia’s newspaper heritage	13
2.4 Newspaper research before the digital age	15
2.5 TROVE: Newspaper research in the digital era	17
2.6 Newspapers, earthquakes and population: The issue of ‘completeness’	18
Chapter 3 Defining Historical Earthquakes: Estimating Size and Location	21
3.1 Local to Universal Time	21
3.2 Isoseismal maps	21
3.3 Estimating earthquake magnitude.....	24
Chapter 4 Historical Earthquakes in South Australia	26
4.1 Quantity over quality	26
4.2 Key to the sources of information.....	27
Chapter 5 Conclusions and Future Directions	217
5.1 An index of historical earthquakes.....	217
5.2 The issue of completeness	218
5.3 Historical earthquake research going forward.....	220
References	222
Appendix A List of Pre-Seismic Network Newspapers in South Australia	227
Appendix B Index of Historical Earthquakes in South Australia	234

Tables

Table 1.1.	The top 10 largest, most damaging and deadliest earthquakes on record, ranked by date	2
Table 3.1.	The Modified Mercalli Intensity scale	23
Table 3.2.	Magnitude-intensity relationships	24
Table 5.1.	Predictions of magnitude ML in South Australia for representative return periods	220

Figures

Figure 1.1.	Global Seismographic Network stations (triangles) are shown against a backdrop of large earthquakes from 2000-2010 (circles=magnitude 6-6.9, squares=magnitude 7 and above).....	2
Figure 1.2.	Earthquake epicentres in South Australia 1841-2000 and recent fault scarps	4
Figure 1.3.	Minutes from the October 1860 meeting of the Adelaide Philosophical Society	5
Figure 2.1.	The first report of an earthquake in a South Australian newspaper, 1837	8
Figure 2.2.	Cartoon published in the <i>Advertiser</i> , 6 March 1954, after the Adelaide earthquake	11
Figure 2.3.	Coverage of earthquake reporting from the 1830s to the 1960s in South Australia	12
Figure 2.4.	The first South Australian newspaper printed in London in 1836	13
Figure 2.5.	Locations of newspaper publication in South Australia in the 1880s and 1920s	14
Figure 2.6.	An estimation of newspaper coverage by region in South Australia.....	15
Figure 2.7.	Relationship between population, newspapers and earthquakes over time	19
Figure 5.1.	Number of earthquakes in South Australia recorded during the instrumental period compared to the relative proportion of events recorded in the historical period	219
Figure 5.2.	Magnitude against its probability of exceedance P	219