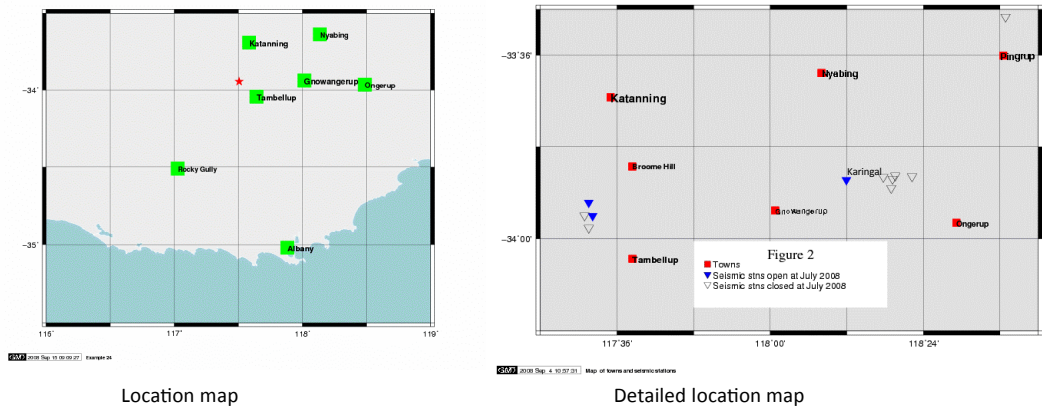




Improved hypocentral locations for two recent seismic events in southwest Western Australia

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Two felt earthquakes in late 2007, in southern Western Australia

- 1) 9 Oct 2007 “Katanning” event, Mag 4.8, caused significant damage to nearby farmhouse (felt intensities of perhaps MM VIII)
- 2) 20 Nov 2007, “Gnowangerup” event, Mag 2.3 (60 km ENE of “Katanning” event) – followed by perhaps thousands of smaller felt events, and some local damage

For the “Katanning” event – deformation was also detected by satellite imagery – possibly the smallest earthquake in the world so far to be detected by this method (Dawson et al, 2008). Investigation on the ground has confirmed its existence and location

Initial location of “Katanning” event relatively distant (~ 3 km) from site of most damage (Newlands Farmhouse). It is important to know correct location to estimate attenuation, & probability of damage from similar earthquakes in similar circumstances.

The Gnowangerup event might be better described as part of a “swarm” (nearby Mag 2.0 event on previous day). This is not the case for the Katanning event (largest aftershock Mag 2.0)

The initial instrumental locations used relatively distant stations of regional seismic network (closest station RKGY, ~80 km to southwest), and estimated uncertainties ~ 20 km in lat & long

Deployment of temporary networks

1) ML 4.8 “Katanning” earthquake

3 recorders taken to the area by Geoscience Australia, in days following, and deployed at a number of sites around probable epicentre. Equipment problems have meant that monitoring was incomplete, but enough data was obtained to enable a more accurate estimate of the focus of activity.

In the 3 days following the installation, a large number of small aftershocks were recorded, showing a high degree of consistency in S-P intervals at each seismograph location. The two largest aftershocks were both located at a position approx 0.5 km SW of the farmhouse

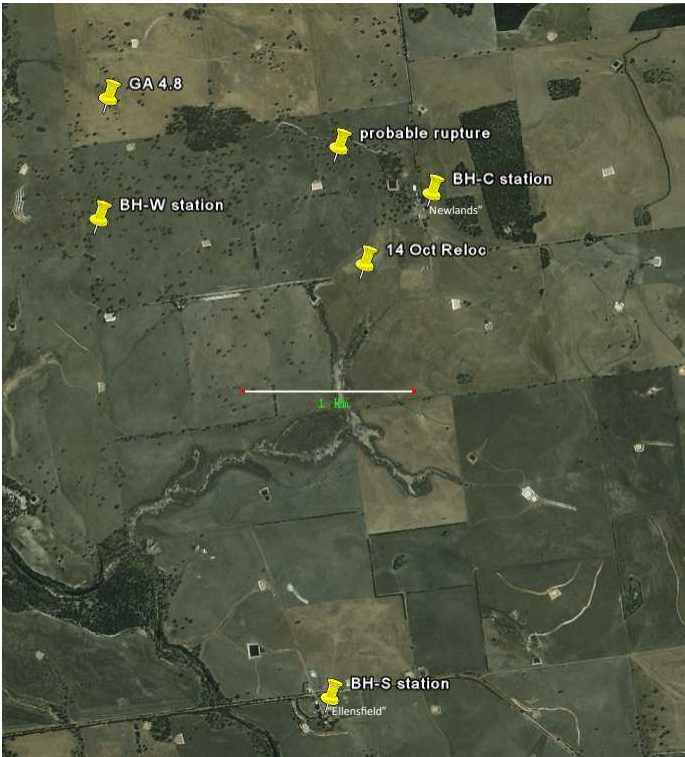
2) ML 2.3 “Gnowangerup” earthquake

A low cost “PSN” recorder installed at “Karingal” in late Jan 2008, ~ 2 months after activity started. Over 20 small events were recorded in the following 7 months, with a fairly consistent S-P interval, indicating a maximum distance of 2.5 km from the station.

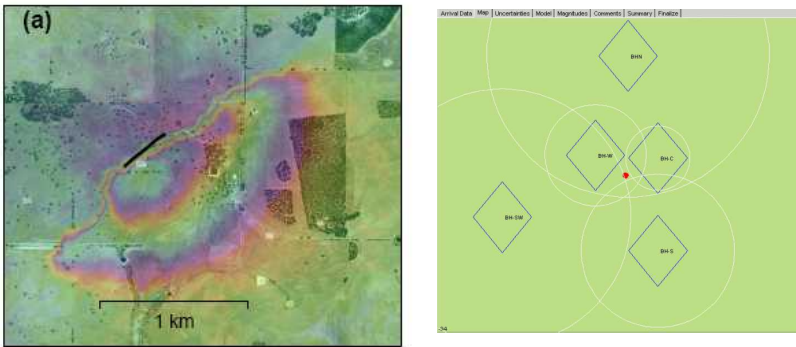
Conclusions

- 1) Aftershock activity, and probably the main shock, were closer to the farmhouse than initial estimates, and south of a probable surface deformation. No felt events have been reported more recently than a week after the main event.
- 2) At Gnowangerup, the continuing occurrence of very minor (ML < 1) felt events, in a probably very small source zone, has been confirmed.
- 3) Events were shallow (2 km or less).

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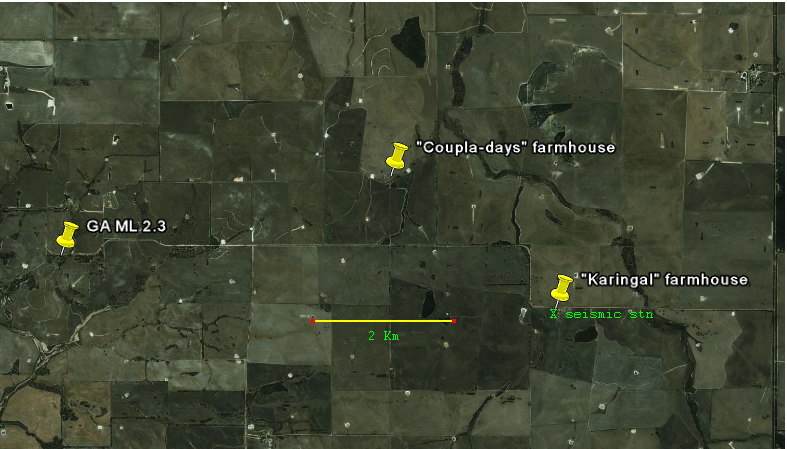


Map of epicentral region of Katanning event, showing temp station deployments



INSAR image of region of “Katanning” epicentre, from Dawson et al(2008)

Location of 14 Oct Katanning event based on S-P data from field stns



Epicentral region of “Gnowangerup” earthquake

DATE	GMT	Lat (S)	Long (E)	Region	ML	Stns used	Estimated uncertainty	Revised lat	Revised long	Estimated uncertainty	comments
09 Oct 2007	2358	33.946	117.505	Katanning	4.8	9	+/- 20 km	33.957	117.529		Based on location of 14 Oct event (below)
14 Oct 2007	1802	33.957	117.501	Katanning	2.0	6	+/- 30 km	33.957	117.529	+/- 1 km	Solution using temp station data
20 Nov07	1411	33.868	118.11	Gnowangerup	2.3	4	+/- 30 km	33.873	118.200	+/- 2 km	Assumed within 2 km radius of “Karingal”

Table showing initial and preferred locations