

AEES NEWSLETTER



June 2012

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President's Report

Sharon and Russell have done a fantastic job organising the upcoming annual conference at Tweed Heads, Queensland on 7-9 December 2012. Sharon has circulated the first call for abstracts. The theme of this year's conference is 'Historical beginnings, current status, recent advances and future directions'. A number of keynote speakers have been invited to give presentations along this theme. Dr. Will Twycross will talk about the life of his great uncle, Prof. John Milne, and the history of seismology, including the formation of the world's first seismological society, the first seismological journal, and the first university chair in seismology. Prof. Ikuo Towhata from the University of Tokyo and Associate Prof. Stefano Pampanin from the University of Canterbury will talk about the recent powerful earthquake and tsunami in Japan and the Christchurch earthquake, respectively.



Like many of the previous annual conferences, the 2012 annual conference will be a great event not to be missed by any member, or in fact, by anybody in Australia interested in seismology and earthquake engineering.

By the 1st of June, the 15WCEE organizing committee has received 3704 full papers from 83 countries, out of about 6000 abstracts. There are only 13 papers from Australia, compared to 66 from New Zealand, 118

from Canada, and 696 from Japan. This low submission rate from Australia might affect our chance of bidding to host the next world conference at Melbourne. Nonetheless, the preparation of bidding has been progressing smoothly. We have secured supports from vice chancellors of a few universities in Australia, from Engineers Australia, City of Melbourne and the Melbourne Convention and Visitor's Bureau. We will submit an expression of interests before the end of July and prepare to bid in September during the World Conference in Lisbon.

Climate change is one of the important issues heavily debated in Australia owing to the impacts of the recent tropical cyclones and severe storms. Nuclear power has been discussed as an alternative energy source, besides solar, wind and wave energy, to reduce greenhouse emission in Australia. The safety of nuclear power plants and nuclear waste is always a major concern. This concern has been greatly intensified after the Fukushima nuclear disaster in Japan. Perhaps we should be more active in such discussions in relation to earthquake risk in Australia. It seems that the general public are often fed with misleading facts which lead them to believe that Australia is either free of earthquake threat or the threat is equally significant as that in Japan. Incorrect or incomplete information from journalists, politicians, and self-interest groups may result in incorrect decisions on this important issue, which will surely affect the environment and likely the economy of Australia.

Hong Hao

President AEES

New Centre at University of Canterbury NZ

From: Bruce Deam <bruce@kxl.co.nz>

The University of Canterbury is establishing the UC Quake Centre, a new centre focussed on industry and university engagement in the area of earthquake engineering. They are seeking to appoint an Industry Liaison Engineer as the first of a number of new positions in the Centre. Further details can be found at https://ucvacancies.canterbury.ac.nz/psp/ps/EMPL_OYEE/HRMS/c/HRS_HRAM.HRS_CE.GBL

For further information about the role please contact Prof. Roger Nokes. (roger.nokes@canterbury.ac.nz)

More on the trial of Italian seismologists

Earthquake Experts Finally Testify in Their Manslaughter Trial Abstracted from Science Insider by Edwin Cartlidge on 31 May 2012

Even as Italians were coping with a destructive earthquake near the city of Modena, killing at least 17 people, the seven indicted scientists finally took the witness stand for the first time.

The prosecution argues that an assessment of seismic risk carried out by them at a meeting of Italy's National Commission for the Forecast and Prevention of Major Risks, was superficial and led to people remaining indoors and perishing in the early hours of 6 April 2009 instead of leaving their homes following tremors earlier in the night. A swarm of tremors had shaken the area over the previous 4 months.

An interview was given before the meeting by Bernardo De Bernardinis, then deputy chief of Italy's Civil Protection Department who told a television journalist that the tremors posed "no danger" and that "the scientific community continues to confirm to me that in fact it is a favourable situation, that is to say a continuous discharge of energy."

De Bernardinis, who is an expert on floods, yesterday told the court that he used the word "favourable" because he believed that the "swarm" had neither increased nor decreased the probability of a major quake striking the region in the near future. He came to this conclusion, he said, after having read two articles written by another of the indicted, Giulio Selvaggi of Italy's National Institute of Geophysics and Volcanology (INGV), and three stories published by the ANSA news agency. He said that his impression of "normal" seismicity was reinforced by what he heard during the 31 March meeting, including the statement that more powerful tremors were improbable. "If they had said to me that the risk had increased I would have called Bertolaso straight away," he said, referring to his then boss, Guido Bertolaso.

Testifying first yesterday, before De Bernardinis, was Enzo Boschi, who at the time of the quake was president of the INGV. He said that swarms could not be considered precursors of earthquakes, saying that "a seismic sequence, whether consisting of big or small tremors, cannot tell us if a major earthquake is on the way." He ruled out the idea that a discharge of energy might reduce the chances of a major quake. "It is neither favourable nor unfavourable," he said, explaining that scientists cannot know how much energy there is to discharge.

Defendant Claudio Eva, a geophysicist at the University of Genoa, agreed that swarms cannot predict the occurrence of major earthquakes, pointing out that the L'Aquila quake was the only strong tremor in Italy in the past 50 years to be preceded by a swarm. Eva, however, revealed at the time of the 31

March meeting, he didn't realize the area around L'Aquila was subject to a swarm, and he also testified that he didn't know that two major historical quakes in the region, in the 15th and 18th centuries, were also preceded by swarms.

When the prosecution made its case to indict the seven now on trial, it contended that the commission members' discussions at the meeting contained little real evaluation of the ongoing swarm, describing their analysis as "approximate, generic, and ineffective." During yesterday's testimony, Boschi told the court that he went to L'Aquila expecting the discussion to be "more thorough" and "much longer" than the 45 to 60 minutes that it turned out to be. "Afterwards, I understood why it was shorter," he says. "The fundamental point was to understand whether or not one can predict earthquakes, so things ended there."

Boschi's comments in court yesterday follow the release of a recording of a phone conversation on the Web site of the newspaper La Repubblica in January, in which Bertolaso is heard telling a regional civil protection officer on 30 March 2009 that the meeting was being set up "not because we are frightened and worried" by the swarm but because "we want to reassure the public." In that recording, Bertolaso said that he wanted to "shut up any imbecile," which is thought to be a reference to Gioacchino Giuliani, a technician at the National Institute of Nuclear Physics near L'Aquila whose claim to have predicted the earthquake was widely derided by earthquake specialists. While not among the seven currently on trial, Bertolaso is now also being investigated by L'Aquila prosecutors.

The main trial, meanwhile, which started in September last year, now breaks for the summer and will resume this September when the prosecution and then the defence are due to present their final arguments to the judge, who is expected to give his verdict before the end of October.

New Zealand Earthquake Engineering Conference

The New Zealand Society for Earthquake Engineering annual conference was held at Canterbury University in Christchurch, 13th - 15th April 2012. The theme 'Implementing lessons learnt', and the scope of presented papers reflected the wide range of disciplines contributing to societies need for protection from earthquakes.

Members, Professor Nawawi Chouh and Kevin McCue, inspect fatigue (vibration) problems after the NZSEE meeting.

Keynote speakers included Roger Sutton, chair of the Canterbury Earthquake Recovery Authority who urged engineers not to be too conservative in their recommendations for the rebuilding program.



On Saturday morning Professor David Alexander gave an entertaining and comprehensive discourse on seismic risk mitigation. The introduction of time-dependent earthquake hazard was a big change from past practice and the general consensus that 'low risk does not equal no risk', the title of one of the oral presentations, was interesting (and noted prominently in AS2121-1979). Several speakers suggested we build base-isolated structures everywhere, even where the risk is low but the consequences of collapse may be great. A good example of how well base-isolated buildings respond was the Christchurch hospital, subjected to strong ground motion, but suffering little

damage. The extra cost computed by several speakers was in the range 10 to 20% with potential extra cost savings on insurance.

The AGM was held as the Friday night. This year there were so many speakers that Saturday afternoon was devoted to oral presentations, a trend AEES might have to adopt.

The Saturday night buffet dinner was excellent, even with a Super15 Rugby match next door. The mayor entertained us with colourful stories about his life experiences followed by presentations of life membership and awards to members, and the big announcement that Professor Stefano Pampanin had been elected by the incoming committee as President of the Society for the year.

There were at least nine members of AEES at the meeting including immediate past President John Wilson who invited all present to join us at Tweed heads for this years AEES conference.

The conference ended with an extended plenary session that had some useful messages though we had to leave before it finished to make our flight home. Every session suffered from time overruns due to late starts or speakers/chairs running overtime.

Congratulations to Professor Pampanin, newly elected President of NZSEE and a big thanks to the new immediate-past President Peter Wood for a very difficult job well done, the recovery of Christchurch an ongoing task.



A shake of former-Presidents at NZSEE2012 left to right: Mark Stirling, Kevin McCue and Peter Wood.

Kevin McCue.

IAEE Matters

Invitation Message by the IAEE President

Greetings! I am pleased to invite all members of the world community of earthquake engineers to attend the Fifteenth World Conference on Earthquake Engineering that will next be hosted by the Portuguese Society for Earthquake Engineering. Our definition for an earthquake engineer is much broader than might be implied by the word "engineer." From their inception in 1956, the World Conferences have served as an authoritative platform of information exchange among diverse professionals who deal with earthquake loss mitigation. These include practitioners and researchers among engineers (civil, structural, mechanical, and geotechnical), architects and urban planners, earth scientists (geologists, seismologists), public officials, and social scientists. IAEE pursues its objectives with an international emphasis: the promotion of international cooperation in earthquake engineering through global interchange of knowledge, ideas, results of research and practical experience.

We are reminded constantly by recurring earthquakes in many countries of the importance of our mission. The human misery and loss caused by ground shaking and its cascading effects can be reduced only through the focused cooperation of professionals who perform their responsibilities in the light of knowledge that has been generated worldwide.

Our Portuguese colleagues have prepared a wonderful conference in one of the most attractive cities of the world, itself the victim of a terrible earthquake in 1755. The scientific program, side activities and opportunities to enjoy what Lisbon has to offer its guests will make the conference a memorable event. I look forward to seeing you all there.

Polat Gülkan, President IAEE

Conferences

19-24 Aug 2012 33rd General Assembly of the European Seismological Commission to be held in Moscow, Russia.

The official language of the Assembly is English.

ON-LINE REGISTRATION is now available on the official website www.esc2012-moscow.org

Please address questions to the Technical Secretariat:

Ms. Anastasiya Devochkina

Tel./Fax: +7 (495) 726-5135

E-mail: esc2012@onlinereg.ru

24-28 Sep 2012 15th World Conference on Earthquake Engineering. Lisbon Portugal.

<http://15wcee.com/>

History - Lisbon 1755

(Extracted from the *Hobart Mercury* 4 August 1883, page 2).

The most terrible earthquake of which there is any record is that which occurred at Lisbon in 1755. On that occasion no less than 60,000 people perished. This disaster was totally unexpected. For many centuries the city had suffered from such disturbances of more or less violence, but these had been nearly forgotten, when on the 1st November, 1755, it was reduced almost in an instant to a heap of ruins.

The buildings which were not destroyed by being shaken from their foundations were consumed in the fire which immediately broke out.

The area affected on this occasion was very extensive. The shock was felt on the one side as far as the southern shores of Finland, and on the other it reached beyond the St. Lawrence in Canada, and was observed in some of the West India islands-an area of no less than 7,500,000 square miles.

The influence of this earth wave is sometimes communicated to the sea. The sea swells and slightly retires from the beach, and then a great wave rolls in upon the shore. At the great Lisbon earthquake this wave rose to a height of 60 feet at Cadiz, carrying with it sea-spoil far beyond the ordinary reach of the sea.

NZCS: Damage Control Design

Conceptual Design & Practical Implementation Seminar - Christchurch, Wednesday 20 June 2012

The Christchurch earthquakes sequence in 2010 - 2011 has critically highlighted the mismatch between societal expectations over the reality of seismic performance of modern buildings.

This half-day seminar discussed motivations, issues and cost-effective engineering solutions to design reinforced concrete buildings capable of sustaining low-levels of damage and thus limited business interruption after a moderate to severe event. The presentations, based on real NZ applications and extensive research & development of such building technologies, covered conceptual design and detailing, including constructability and architectural aspects. The material covered will provide essential practical information around the appropriate design and consenting of these structures.

For more information please contact us

Allan Bluett

email concrete@bluepacificevents.com

NZCS - New Zealand Concrete Society

PO Box 12, Beachlands, Auckland 2147

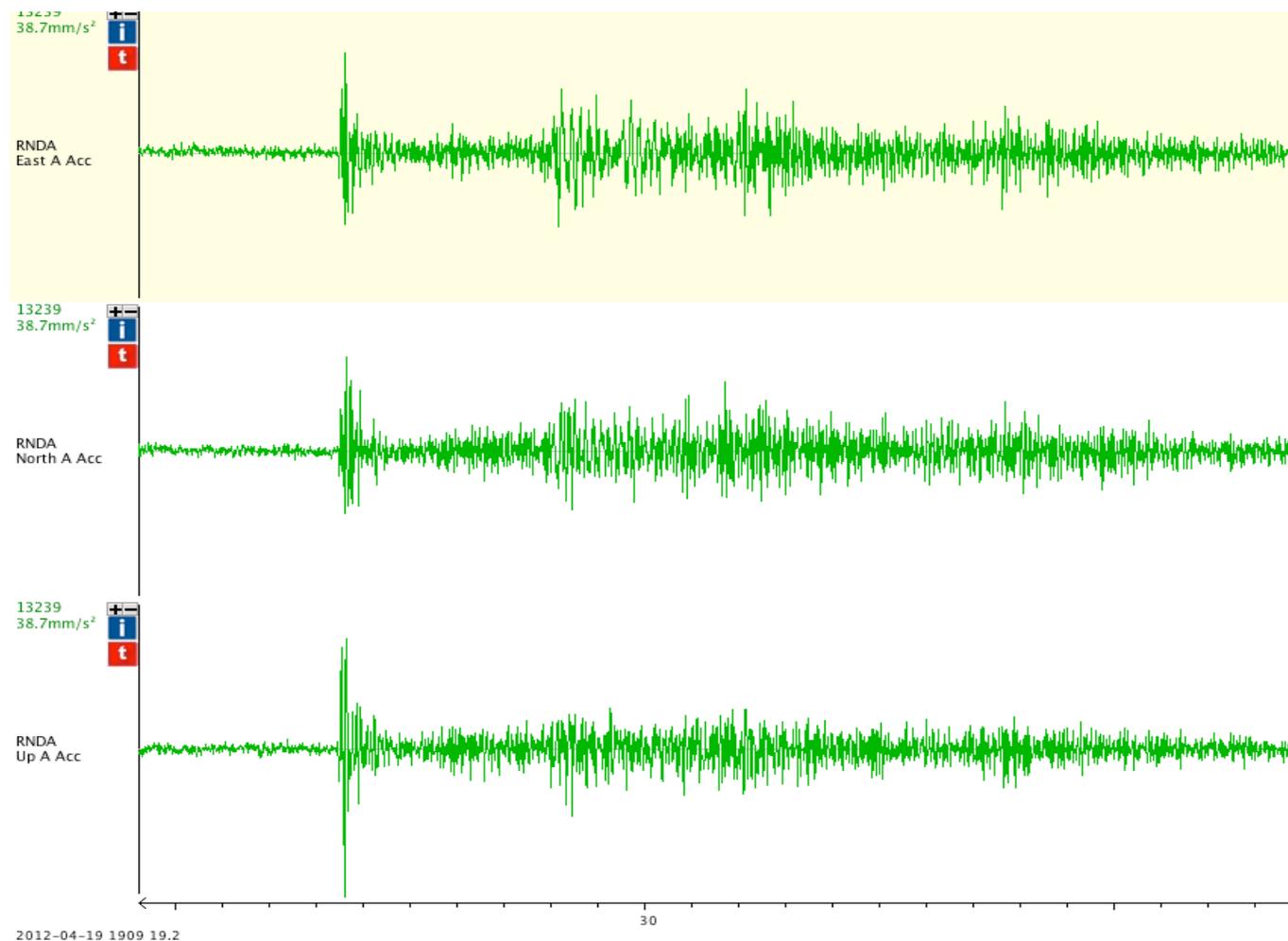
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Fax: +64 9 536 5442

Website: www.bluepacificevents.com

Canberra shaken

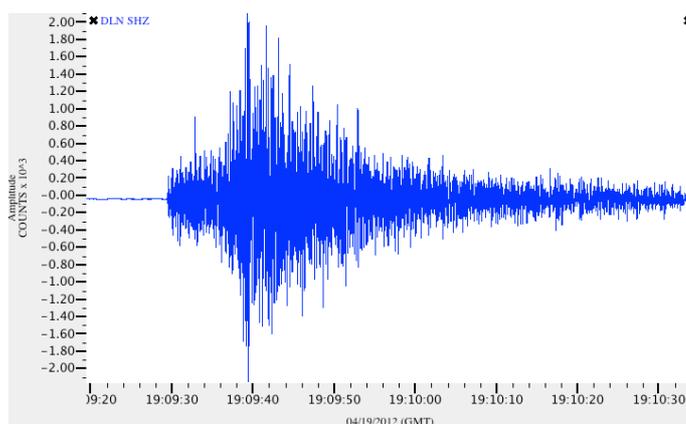
At 9 minutes past 5am on 19th April, many residents of the National Capital (apart from the author, absent overnight) were awakened or nearly lost their early-morning latte as the city shook for several seconds.



ACT Police were inundated with phone calls but there was no damage.

The epicentre of this magnitude 4 earthquake was about 40 km west of Canberra in the Brindabella Mountains south of Wee Jasper (see table page 9).

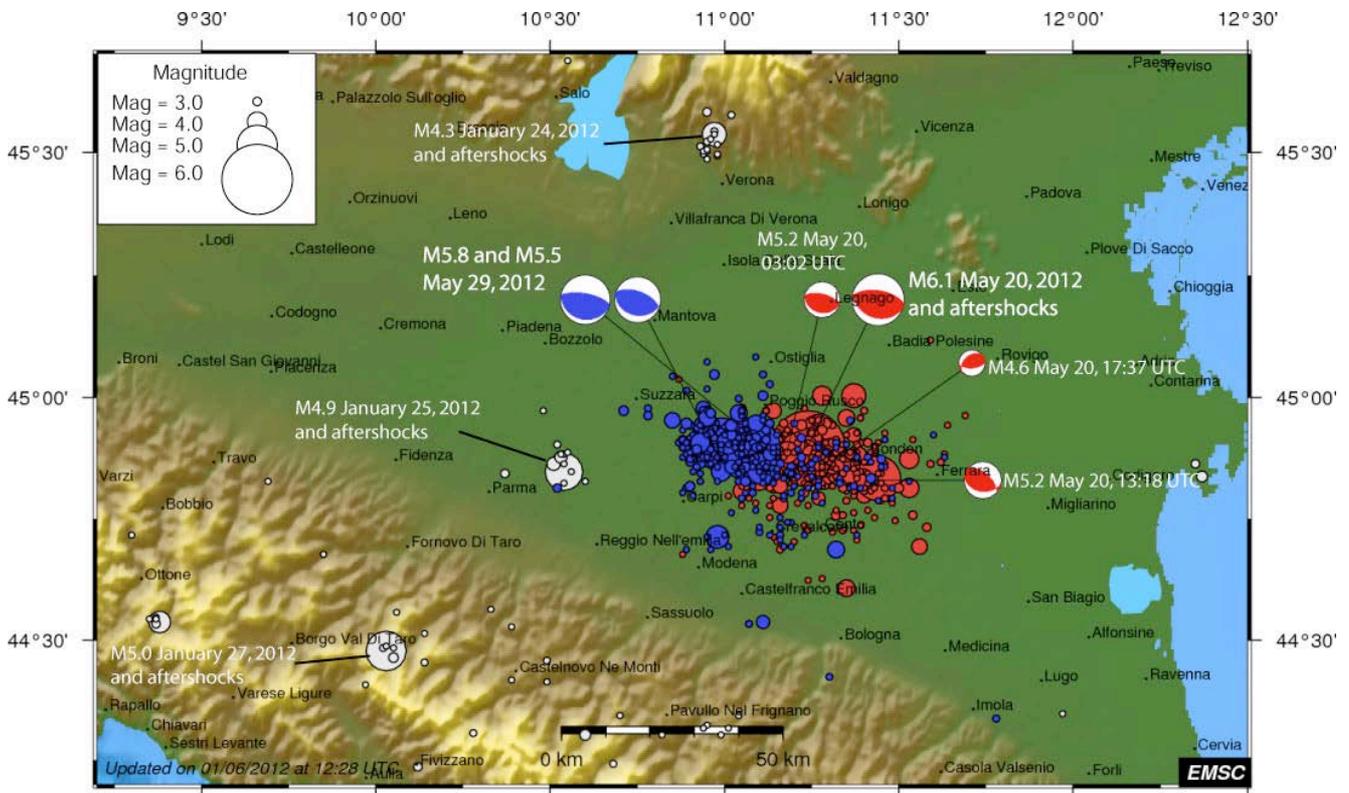
On the author's Aranda accelerograph (RND A shown above, 37km from the epicentre), the peak ground motion was about 40 mm/s^2 , on the vertical component (lower trace) of the 'P' wave. A similar high vertical shaking was observed in the recent Christchurch earthquake at some stations. The spectral amplitude peak on the RND A 'S' wave was at about 5Hz corresponding to the natural frequency of a 2-storey building. The vertical component accelerogram at GA's Dalton accelerograph (blue below), at a different azimuth, looks very different, more 'normal', the pga about 8 mm/s^2 at 76km distance (thanks to Jonathan Bathgate and Clive Collins).



Some 10 accelerograms may have been recorded for this earthquake on equipment owned by ACTEW, GA, Snowy Hydro and Sydney Water but most of this data is not publicly available.

Earthquakes in Northern Italy

Shallow thrust-type earthquakes of magnitude 6.1 and 5.8 hit northern Italy, on May 20th (red dots) and 29th (blue dots) 2012. They caused 30 deaths and several hundred injuries and the evacuation of several cities. The shaking was felt throughout Northern Italy. Serious damage occurred in the cities of Finale Emilia, Ferrara and Modena, where significant cultural heritage buildings have been affected. Recorded accelerograms would be near-field design earthquakes for Australia and the expected consequences not dissimilar given the amount of un-reinforced masonry in both places.



The sequence follows a series of moderate to strong earthquakes that occurred in Northern Italy in January 2012 in the vicinity of Ferrara.

<http://www.guardian.co.uk/world/2012/may/20/italy-earthquake-kills-five-history>

Hundreds were injured in the earthquake which toppled centuries-old churches and clock towers. Three thousand people bedded down in tents or temporary accommodation in northern Italy after the earthquake in the early hours.

Aftershocks in the Emilia-Romagna region continued to bring down damaged buildings during the day, injuring a firefighter, as emergency services scrambled to find temporary shelter for residents afraid to return home.



The last serious earthquake to strike Italy was the Ms 6.3 shock at L'Aquila in 2009 which killed nearly 300.

<http://www.guardian.co.uk/world/2009/apr/07/italy-earthquake-cultural-damage>



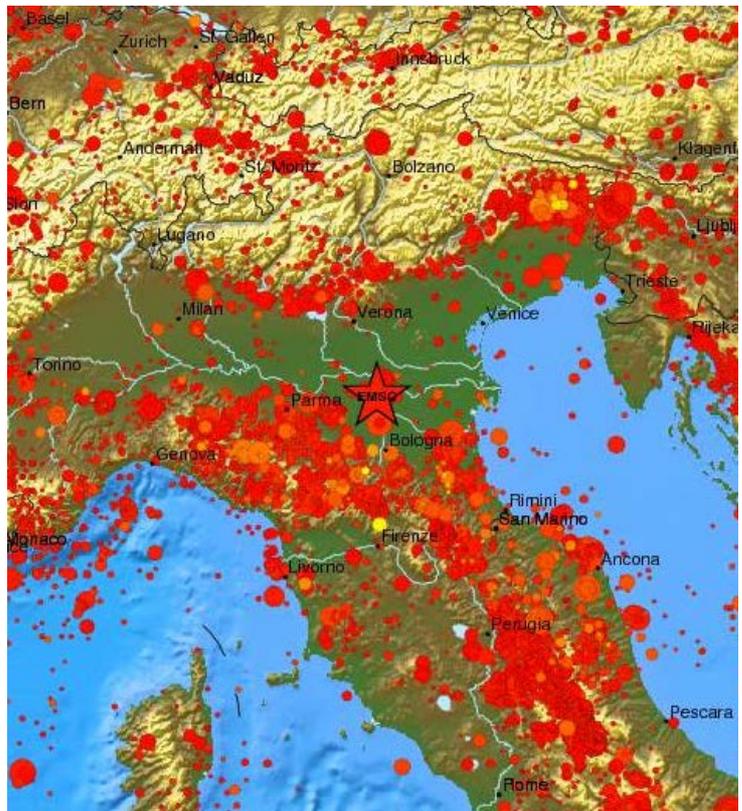
The earthquake left major towns such as Bologna unscathed but wrought havoc in small towns and villages dotting the countryside between Bologna, Ferrara and Modena. In San Felice sul Panaro, the tops of several towers of a 14th-century castle collapsed while fresco-filled churches in the town were seriously damaged. In Finale Emilia, the historic Palazzo dei Veneziani partly collapsed and 11 residents survived after knocking down a wall to escape.

The Castello delle Rocche in the town was also damaged while a clock tower was split down the middle, with one side disintegrating into rubble before the remaining side collapsed during an aftershock (adjacent photo).

In the tiny hamlet of Buoncompra, 700 residents were evacuated to a makeshift emergency centre on the outskirts of town, overlooking the destroyed church of San Martino.

Four night shift workers were killed at three different factories which collapsed, including a 45-year-old aluminium car parts maker factory. Two of the other fatalities were workers at a nearby ceramics factory. A fourth man died when he was hit by a falling beam at a plastics factory in Ponte Rodoni di Bondeno. A woman aged 106 was also killed in her bed at her rural house by a falling beam.

Cheese producers said 300,000 wheels of grana and parmesan cheese had been lost as warehouses collapsed, while farmers were fighting to save livestock trapped in collapsed barns.



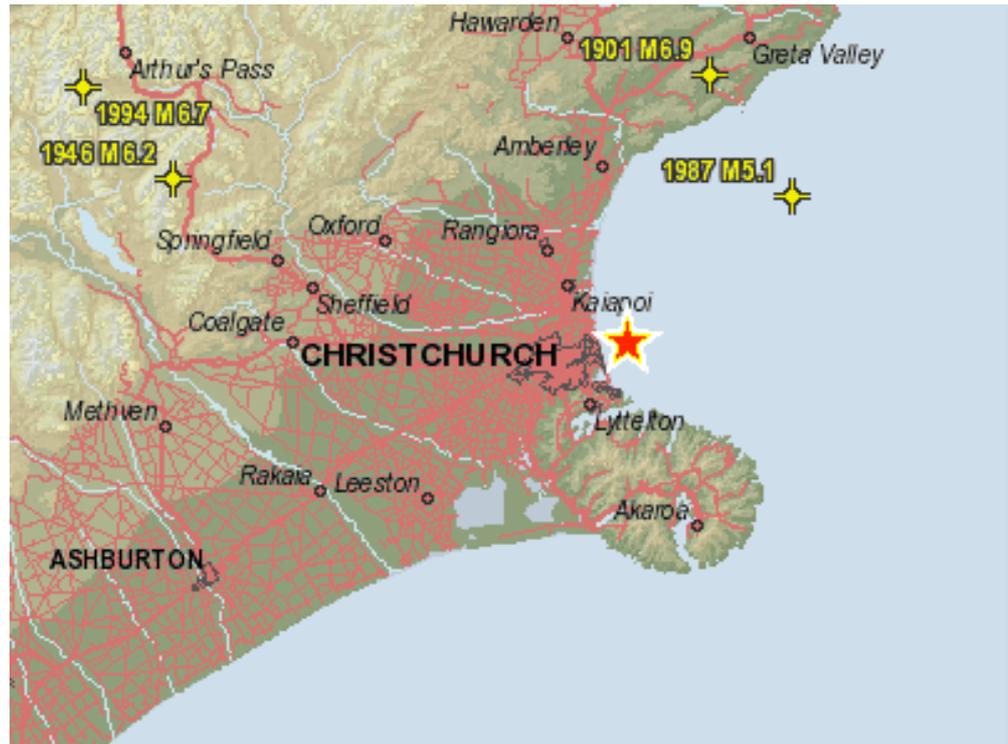
The epicentre of the May 2012 earthquake (star) and historical earthquake epicentres, from EMSC the European and Mediterranean Seismological Centre.

Aftershocks continue to rattle New Zealand

A magnitude 5.2 earthquake rattled the south island of New Zealand on 25 May at 2:44pm local time. The epicentre was computed to have been 10 km east of Christchurch and the maximum intensity observed in suburban Christchurch was MM6.

New Zealand insurers are confident Christchurch's latest shake will not impact on the rebuild.

Finance Minister Bill English told TV3's The Nation programme on Saturday it was possible that Friday's 5.2 magnitude quake could delay the rebuild of the city and affect the confidence of insurance companies.



"I mean there would not be a lot of physical damage from it, but a critical issue in Christchurch has been the confidence of the insurance companies," English said.

However, IAG, which owns NZI, AMI and State Insurance, said the shake did not alter its confidence in the Canterbury region, but did reinforce the need for a cautious approach. An IAG spokesman said while Friday's quake was unsettling, it was of the scale that could be expected. He said the quake did not alter the company's underwriting stance.

IAG started offering new insurance in Ashburton and Hurunui at the start of this year, but it was still not in a position to offer insurance to new customers in Christchurch, Selwyn and Waimakariri. English told The Nation the latest earthquake was a reminder it wasn't just a matter of policy or process to get the rebuild going. "There is the ongoing concern that there can be further earthquakes, and each one of them has some effect on confidence."

The Government was trying to work with the insurance companies. "From the Government's point of view we just want to push on as far as we can," he said.

GNS Learning from earthquakes

The wealth of data from over a year and a half of seismic records from the Canterbury earthquakes is allowing GNS Science to both test some current models of ground shaking and also to create more refined models of aftershock behaviour.

To aid in the Canterbury reconstruction process, GNS have been testing the accuracy of a number of Ground Motion Prediction Equations (GMPEs) against what pre-Darfield models would have predicted. The GMPEs have been based on data that included very few measurements within the first 15km of large earthquakes. Much of the damage resulting from the Christchurch earthquakes has fallen into this 'near-field' range from the earthquake's rupture zone. The data GeoNet is collecting are therefore unprecedented in their coverage of the near-field and will lead to more accurate global hazard assessments in areas that, like Christchurch, can have very infrequent but damaging earthquakes.

The data are also providing insights into the physical mechanisms of the larger events in the sequence. The relationship of smaller aftershocks to the mainshocks, casts light on the physical conditions during the earthquake that gave rise to the dramatic shaking.

Extracted from GeoNet News - Issue 16, April 2012

Australian Earthquakes, Mar-May 2012

The table below shows earthquakes in the Australian region, magnitude 3.0 or greater, located by Geoscience Australia, PIRSA, ES&S, and ASC. The implied accuracy in epicentral coordinates is rarely better than 3km (.03°) horizontally and 5 km vertically. The largest earthquake, Mw 5.4, occurred in north-central South Australia and caused surface faulting (see last Newsletter 2012/01), but no damage. The Tasman Sea epicentre location used some New Zealand data, GNS rated the magnitude as 5.1, ES&S 4.7 and GA 4.8.

UTC Date	Time	Latitude	Longitude	D (km)	ML/Mw	Location
2012-03-05	17:20:52	-16.82	120.616	33	3.1	NW Broome, WA.
2012-03-09	06:16:26	-30.41	117.84	8	3.4	Beacon, WA.
2012-03-09	06:59:47	-30.397	117.822	9	3.3	Beacon, WA.
2012-03-13	20:26:01	-34.134	117.186	15	3	S Kojonup, WA.
2012-03-16	11:24:36	-26.174	131.824	15	4.3	Musgrave Ranges, SA.
2012-03-16	13:04:01	-27.009	113.952	5	3	N of Kalbarri, WA.
2012-03-20	03:25:23	-26.144	132.287	10	3.8	Musgrave Ranges, SA.
2012-03-21	17:07:09	-28.231	136.001	0	3.9	SE of Oodnadatta, SA.
2012-03-23	09:25:14	-26.163	131.955	7	5.7/5.4	Near Ernabella, SA [‡]
2012-03-24	05:06	-38.4	145.8	10	3.4	Korumburra, Vic
2012-03-25	16:57:41	-30.405	117.843	10	3.4	Beacon, WA.
2012-03-25	20:53:20	-30.324	136.821	0	3.9	Near Andamooka, SA.
2012-03-29	05:05:21	-29.031	114.224	3	3.4	SW Geraldton, WA.
2012-03-30	06:27:09	-26.209	132.186	10	3.6	Near Ernabella, SA.
2012-04-08	11:56:06	-26.09	131.901	0	3.7	Near Ernabella, SA.
2012-04-12	06:50:58	-25.937	132.917	10	3.6	W Kulgera, NT.
2012-04-19	19:09:17	-35.27	148.67	10	4.0	South of Wee Jasper, NSW*
2012-04-19	21:03:46	-25.917	132.892	0	3.6	Near Kulgera, NT.
2012-04-21	01:33:15	-31.222	118.203	11	3	N Merredin, WA.
2012-05-24	19:06:31	-31.297	141.732	12	3.1	NE Broken Hill, NSW.
2012-05-27	092709.5	-40.72	155.97	15	4.8	Tasman Sea E Bass Strait

* Felt throughout Canberra, recorded on ~10 accelerographs ‡ Associated with surface faulting

Epicentres of earthquakes in Australia, 01 March to 31 May 2012 (from Geoscience Australia and Google Earth, epicentres not in the GA database or off-shore may not be plotted)

