AEES NEWSLETTER

October 2007

President's Report

Welcome and greetings to all our members to the third edition of the newsletter for 2007.

The annual conference in Wollongong is shaping very well with over 60 papers received and invited speakers presenting on US earthquake engineering developments, seismic networks, blast damage, tsunami warning systems, earthquake insurance issues and emergency response management. We are anticipating around 100 delegates to the weekend conference and hope you can join us for both the technical and social discussions; it will be a great event. The annual conference is our flagship event and provides a great opportunity for sharing and discussing the latest developments in seismology, earthquake engineering and related fields such as blast engineering, USAR, insurance and emergency response management. Further details regarding registration are contained in this newsletter and on the AEES website. A special thanks to our Wollongong AEES member Geoffrey Pryke for all the local organization, to Nelson Lam as lead editor of the Conference and to Sharon Anderson for all the secretarial support.

The updated Earthquake Loading Standard AS1170.4 (2007) has now been published by Standards Australia, which is very welcome news for the committee who worked very hard and patiently over many years. I made a presentation at the recent ABCB annual conference and we are hopeful that the Standard will be 'called up' in the BCA as part of the Building Regulations for 2008. Work is now needed to complete the accompanying Commentary to the Standard.

The Melbourne Executive Committee were appointed to manage AEES for the period 2005-07 and we are still seeking expressions of interest from other regions to take over the running following the AGM in November. Please give this serious consideration and members of the Melbourne committee are happy to discuss further. We have had a pretty busy three years with a great deal of the effort invested in organizing the annual conferences, improving the AEES web site, assisting with USAR Engineering training and publishing the new AS1170.4 Earthquake Actions loading standard. Work on the following 3 special initiatives raised at the 2006 AGM in Canberra involving; a) development of a concept proposal for a strong motion seismograph network, b) post earthquake reconnaissance study team and c) raising earthquake awareness in Australia are all progressing slowly.

We look forward to seeing you in Wollongong, 23-25 November.

John Wilson
AEES President

Farewell to our Treasurer

Dee Ninis, who has acted voluntarily as the AEES Treasurer leaves us to take up a scholarship in New Zealand in the New Year (after a well deserved holiday!) Thank you Dee for all your hard work!

Amy Brown, in addition to her current role as AEES Secretary, will assume the position of Treasurer until the AGM in November. Thank you Amy for taking on this additional role!

The Committee

President:	John Wilson
Secretary:	Amy Brown
Acting Treasurer:	Amy Brown
Technical Editor-Publ.:	Nelson Lam
Webmaster:	Adam Pascale
Secretariat/Newsletter:	Sharon Anderson

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New South Wales	Colin Gurley
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ACT	Mark Edwards
South Australia	David Love
Western Australia	Hong Hao

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Dr Takuji Kobori

Hirokazu Iemura, the Secretary General of IAEE passed on the sad news that Dr. Takuji Kobori passed away on 5 September from cancer at the age of 86. Dr Kobori was a National Delegate from Japan from 1980 to 1984; and an Executive Committee Member of IAEE from 1988 to 1996. He then became an honorary member.

Dr Kobori was involved in many innovative works in Earthquake Engineering. It was his unique proposal to have a special theme session at 8 WCEE held in Japan. He had recently implemented his theories to structural response control. It is a big loss to lose such a pioneer and innovator in Earthquake Engineering.

News from S.A. (David Love)

Earthquake near Wilpena Pound

On September 17th at the very civilized hour of 8:48 am a significant earthquake occurred in the Flinders Ranges. First notification came from our operator at Hawker. One seismologist found himself very busy trying to locate the event, answer phone calls and plan an aftershock survey. The location was done jointly with Geoscience Australia. Station data came from telemetered sites, dial-up sites and faxed copies from analogue sites. The first reasonable calculations produced an hypocentre slightly north of Wilpena Pound and 32km deep, with a magnitude of 4.8.

An aftershock survey was mobilised, with the party arriving at Hawker in the late evening. Accommodation was tight as it was peak tourist season. The following day 4 temporary instruments were deployed, and the existing station checked. A fifth instrument was installed the next day, and the party returned to Adelaide in the late afternoon.

The nearest seismograph was a temporary dial-up site near Wilpena Pound (seismogram fig 1) that had a P to S time of 4.4 seconds, or 37km. A careful viewing of the first break on the record (fig 2) shows that it is possible to estimate a direction, and a dip for the arriving P wave. The orientation of the seismometer was found to be 317 degrees during the aftershock survey. Comparison with other events suggests that the arriving ray is probably closer to an emergent angle of 30 degrees than the 60 degrees indicated in the first break. This allows one to calculate a 'one station location', with the hypocentre being about 30km away, in a direction slightly west of north, and about 20km deep.

The earthquake was a useful exercise. Rapid exchange of information between agencies needs practice. Given the uneven distribution of seismographs this location was not easy. Aftershock surveys require practice, and having spare instruments running on the bench helps enormously. One station locations can sometimes be quite useful, but need orientation information, and also need practice. No aftershocks have yet been recorded.

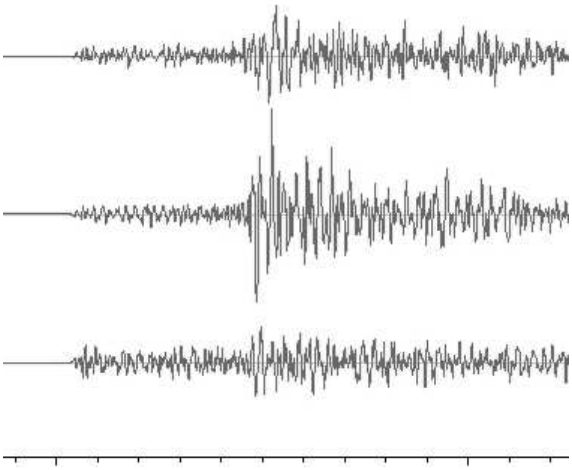

Figure 1 Wilpena Pound seismogram. Channels from top are East, North and vertical. Scale is seconds.

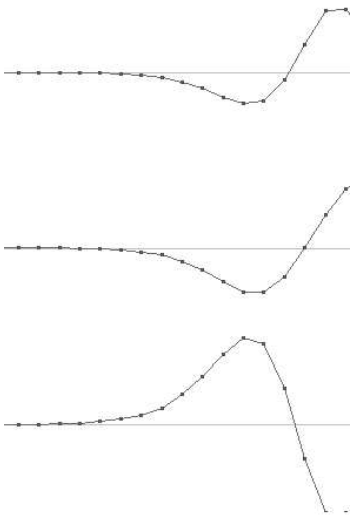

Figure 2 First break of seismogram. Channels east, north and up. Points are 0.01 seconds apart. First direction of motion of compressional wave is west, south and up.

Something new on the South Australian Emergency Management scene

The first Business Continuity Management Course conducted in South Australia by the Emergency Management Australia Institute (Mt Macedon) was recently held in Adelaide.

Course attendees included numerous key personnel from Local Government, as well as representatives from Police, SA Water, SES, MFS, Dept for Families and Communities and Dept of Treasury and Finance (Supply).

This course aims to build resilience to devastating impacts that jeopardise the delivery of public safety measures, threaten economic viability and challenge the survival of agencies.

Sound business continuity planning embraces an all-encompassing view of possible threats, which of course includes earthquake impacts.

The popularity and appropriateness of the course for the emergency management sector will ensure that further courses of this type will be repeated in South Australia.

Allan McDougall
State Emergency Management Training Officer
SA State Emergency Service

Recent Publications

Natural Disaster Occurrence & Impact - the CRED CRUNCH. Newsletter, issue 10, Sept 2

An interesting and sobering article listed on the attached web site courtesy of E/Prof Paul Grundy.

"During the last three months the world, once again, has been heavily affected by major natural disasters. The exceptional floods, particularly devastating fires and hurricanes in July and August are still fresh in our minds.

The 2007 first semester figures show a decrease in terms of impacts and disaster occurrence in comparison to the first semester averages of the past ten years. However, during this period, 102 natural disasters were reported, killing over 2000 people, affecting more than 4 million and causing more than 7.5US$ billion in economic damages.

Floods and windstorms remained the major disasters in terms of occurrence and impacts.

Unfortunately, these somewhat optimistic trends in the figures have to be nuanced with regards to recent major events (Flood in China, India, UK, Africa) which by our first estimates show a complete reversal of the first six month tendency."

Dr Debarati Guha-Sapir

For full article and figures go to:
http://www.emdat.be/Documents/CredCrunch/Cred%20Crunch%2010.pdf

Treatise on Geophysics
Gerald Schubert (Editor-in-Chief)
University of California, Los Angeles, U.S.A.
Go to:
http://books.elsevier.com/uk//earthscience/uk/subindex.asp?maintarget=&isbn=9780444519283&\country=United+Kingdom&srccode=90900&ref=&subcode=&head=&pdf=&basiccode=&txtSearch=&\SearchField=&operator=&order=&community=earthscience

The **Treatise on Geophysics** is the only comprehensive, state-of-the-art, and integrated summary of the present state of geophysics. Offering an array of articles from some of the top scientists around the world, this 11-volume work deals with all major parts of Solid-Earth Geophysics, including a volume on the terrestrial planets and moons in our solar system. This major reference work will aid researchers, advanced undergrad and graduate students, as well as professionals in cutting-edge research that can be conducted easily, with all the relevant information that they need right at their fingertips.

DATE	TIME UTC	LAT	LON	DEPTH	MAG	COMMENTS
June						
11	2137	19.85	133.94	15	2.9	SW of Tennant Creek NT.
12	1405	34.50	139.33	26	2.5	Gawler SA.
19	0525	20.04	116.48	13	2.8	N Dampier Archipelago WA
22	0840	19.72	133.93	8	2.5	W of Tennant Creek NT.
28	1602	28.74	112.92	15	3.2	W of Geraldton WA.
30	1406	30.77	117.16	8	3.8	E of Cadoux WA.
July						
1	1357	22.98	128.66	0	3.9	S of Lake Mackay WA.
4	1025	23.13	128.70	0	2.7	S of Lake Mackay WA.
6*	1847	35.29	138.47	10	2.8	Victor Harbour SA.
8	1817	35.61	138.11	10	2.8	Victor Harbour SA.
8	2035	32.99	138.42	10	3.1	Port Pirie SA.
9	0849	37.79	139.93	10	3.2	Millicent SA.
17	1031	25.54	113.32	0	2.6	Shark Bay WA.
August						
3	1537	33.86	139.04	0	2.7	SE of Burra SA.
5	0712	33.19	117.65	16	3.5	Dumbleyung WA.
9	0304	34.50	148.61	1	3.0	SW of Boorowa NSW
13	1904	19.80	133.90	10	2.6	SW Tennant Ck, NT
18	0344	34.37	150.37	9	2.6	Hilltop NSW
18	0357	34.38	150.38	18	3.2	Hilltop NSW
21	0305	37.89	146.12	12	3.0	Mt Baw Baw Vic
22	1024	34.09	150.25	7	3.0	Yerranderie NSW
24	0609	16.66	128.67	0	2.8	S of Kununurra WA
24	1347	32.35	148.57	0	2.8	S of Dubbo NSW
25	0606	26.50	151.43	4	4.0	Durong Qld
26	0034	22.15	115.37	6	3.2	SE of Onslow WA
28*	1533	35.43	115.94	18	**4.6**	SE of Augusta WA
31	1904	19.80	133.90	10	2.6	SW Tennant Ck NT
September						
4	1954	11.97	124.51	23	2.8	Offshore W of Darwin NT
5	1702	35.71	143.65	9	2.3	NW of Kerang Vic
6	0045	42.06	145.56	N	2.6	Queenstown Tas
8	1029	40.5	145.09	10	3.8	N of Smithton, Tasmania
10	0320	15.34	130.37	9	2.9	North of Timber Creek NT
13	0829	19.75	133.88	10	3.1	W of Tennant Creek NT
13	1103	34.76	149.00	10	2.5	NE of Yass NSW
14	0906	29.85	148.63	10	3.4	E of Walgett NSW
14	1745	19.88	134.09	19	2.7	S of Tennant Creek NT
16	1143	38.35	145.18	26	2.6	NE of Somers Vic
16*	2318	31.39	138.52	33	**4.8**	Wilpena SA
18	0753	35.60	155.02	11	2.7	E of Batemans Bay NSW
18	1704	15.16	139.63	9	2.8	Gulf of Carpentaria N of Mornington Island Qld

The number of earthquakes of magnitude 3 or more in the Australian region in August and September has increased over the first 5 months of the year, especially in SA. The Wilpena earthquake on 16 September was widely felt but not strongly in the epicentre supporting the greater than normal computed depth. No damage was observed but several events, marked with an * were reported felt. The list was compiled using GA, ES&S, PIRSA, CQU and USGS data.

From our Members (Edward Cranswick)

US nuclear dump plan in danger after seismic shock

This article comes to us from Edward Cranswick (via Kevin McCue) who investigated the magnitude 5.2 Little Skull Earthquake near Yucca Mountain in 1992.

*Fred Attewill
Tuesday September 25, 2007
Guardian Unlimited
http://www.guardian.co.uk/>*

The most expensive public works project in the US was today in disarray after it emerged that a planned giant nuclear dump would be located on a faultline.

Rock samples from deep within Yucca Mountain, in Nevada, showed that the fault runs directly beneath the site where the US federal government planned to store 70,000 tonnes of highly radioactive waste.

More than $8bn (£4bn) has already been spent on the $58bn project, which had been due to open in 2017, but the proposals - approved by George Bush in 2002 - may now have to be redrawn.

Samples taken from 76 metres below the surface of the mountains, which are around 90 miles north-west of Las Vegas, revealed that the Bow Ridge fault passes hundreds of metres to the east of where scientists believed it lay.

The measurements were backed up by US Geological Survey maps and a letter, the Las Vegas Review-Journal reported yesterday.

The fault is now thought to run beneath a storage pad where spent radioactive fuel canisters would be cooled before being sealed in a maze of tunnels inside the mountain.

Bob Loux, the executive director of the Nevada Agency for Nuclear Projects, expressed amazement that the US Department of Energy had only just carried out the "11th hour" drilling tests.

"It certainly looks like DoE has encountered a surprise out there, and it certainly speaks to the fact they haven't done the technical work they should have done years ago," he told the paper.

"It's going to have to cause some change of the design in the final analysis. It's going to impact the safety case."

The state of Nevada - the third most seismically unstable in the US - has long opposed the project on the grounds that earthquake activity makes the site unsafe.

Since 1976, there have been 621 seismic events of magnitude greater than 2.5 on the Richter scale within a 50-mile radius of Yucca Mountain.

The Department of Energy refused to comment on the claims, but project officials said they were continuing to develop repository design, construction and operating plans in preparation for applying next year for a licence from the Nuclear Regulatory Commission.

Guardian Unlimited © Guardian News and Media Limited 2007

From our Members (Col Lynam)

The Secret Life of a GEMOC Geodynamic Modeller – Dr Craig O'Neill

During the day, Dr Craig O'Neill from GEMOC is a mild-mannered geodynamic modeller, conducting simulations of how the Earth's surface and interior have evolved over millions of years. Away from the office however, O'Neill is 'Extreme Man', with a penchant for wrestling man-eating alligators.

Like all brave action heroes, of course, O'Neill is blasé about these dangerous creatures.

"Alligators look terrifying but they are actually just like big puppy dogs," he says. "I saw the funniest thing in Louisiana – there was one across a footpath which must have been about 12 feet long and a friend and I stopped and wondered how we would get around it when this guy walking his dog came past. The dog just walked around the front of it and the guy stepped over it and just kept walking.

I've spent a bit of time out in the swamps photographing alligators and I've handled gators of various sizes. I've also swum with freshwater crocs in Queensland and the Northern Territory, trekked through Mexican swamps looking for American crocs, and fed salties, but I'm not game enough to get in the water with them!"

What was your first job?

Delivering pizzas to stoners in the sticks on the Central Coast.

What do you like most about Macquarie?

The people number one and the position second. And the ambience on campus is very nice, oh and the Uni is pretty close to the beach.

What is the best advice you've ever been given?

An old Judo Sensei of mine used to say "Craig, stop thinking too much. It's all just rat cunning".

Who inspires you?

Carl Sagan, the great science communicator. Up until a month before his death from cancer he was still attending meetings, giving interviews and generally spreading the word. He never let anything slow him down.

What are you addicted to?

Endorphins. I tend to get very grumpy if I don't run or go to the gym for a couple of days.

What is your ideal way of relaxing?

A camping/fishing/surfing trip on the North Coast.

What do you do best?

I'm great at taking the reigns in pub trivia and I have a reputation for my instant recall of Simpsons quotes and cultural references.

What's a good Sunday?

A sleep-in followed by a big brekkie then hanging out at the beach with a beer and a BBQ.

What would people be surprised to learn about you?

That I have a lop-eared bunny named Booflet. I really wanted a dog called Boof but I live in a unit so I had to compromise. Because it's a female my wife wouldn't let me name it Boof, so Booflet it became.

Is there life after Macquarie?

Life after Macquarie is hopefully a long, long way off. It's a bit like thinking about whether there is life after death!

This interview appeared in Macquarie University News: http://www.pr.mq.edu.au/macnews/

Some interesting abstracts of articles going to print at Elsevier's journals. Also some colateral data on mining accidents/fatalities in Qld.

Q'ld Govt Mining Journal, Sept 07, Issue 1228 pp54-56

Review of Fatal Accidents
(Rob O'Sullivan)
(see also ref report:
http://www.nrw.qld.gov.au/mines/publications/pdf/annual_report0506.pdf)

Data assimilation: From photon counts to Earth System forecasts
Pierre-Philippe Mathieu
& Alan O'Neill
doi:10.1016/j.rse.2007.02.040

Geological storage of carbon dioxide by residual gas and solubility trapping
Tetsuya Suekane, Tomohisa Nobuso, Shuichiro Hirai, Masanori Kiyota
doi:10.1016/S1750-5836(07)00096-5

Analysis for preliminary design of a class of torsionally coupled buildings with horizontal setbacks
Dhiman Basu & N. Gopalakrishnan
doi:10.1016/j.engstruct.2007.07.013

Two Abstracts regarding interesting research topics are:

The tilting continent: A new constraint on the dynamic topographic field from Australia
Mike Sandiford
School of Earth Sciences
University of Melbourne
Victoria

Abstract

A pronounced latitudinal asymmetry in the present-day morphology of the Australian continental shelf is reflected in Neogene stratigraphic relationships. The northern Australian margin has a broad shelf, typically 200–500 km wide and a Neogene record of stratal onlap. Relative to the continent, sea levels are currently as high as at any stage during the Neogene. In contrast, the southern shelf is typically less than 100 km wide and shows a record of progressive offlap with Neogene palaeo-shorelines commonly many hundreds of kilometres inland, at elevations up to 250 m above present-day sea level.

This continental-scale 'reciprocal' stratigraphy implies 250–300 m N-down, SSW-up apparent vertical motion with respect to sea level since the mid-Miocene. The apparent vertical motion can be attributed to variations in dynamic topography and the geoid along Australia's NNE plate circuit; specifically, the movement of the southern margin off the dynamic topography low, geoid low presently centred on the Australian–Antarctic discordance, and the northern margin towards a dynamic topography low, geoid high associated with the subduction realm to the north. Variations in the geoid appear to account for about 10% of the total apparent motion, depending on assumptions about how the geoid field has evolved during Australia's northward motion. This inferred Neogene, continental-scale dynamic N–S tilting rate of 15–20 m/myr provides a compelling new constraint on the nature of the Earth's dynamic topographic field.

Earth and Planetary Science Letters
Volume 261, Issues 1-2, 15 Sept 2007, Pages 152-163

Defining the source region of the Indian Ocean Tsunami from GPS, altimeters, tide gauges and tsunami models

Pietrzak, Anne Socquet, David Ham, Wim Simons, Christophe Vigny, Robert Jan Labeur, Ernst Schrama, Guus Stelling & Deepak Vatvani

Abstract

To understand the role of the co-seismic moment magnitude, M_w, 9.1–9.3 Sumatra–Andaman Earthquake rupture mechanism on the severity of the Indian Ocean Tsunami, we used permanent Global Positioning System (GPS) data and carried out an analysis of co-seismic displacement and tsunami models. Tsunami modelling, validated against independent Jason-1 altimetry data and tsunami arrival time data as determined from tide gauges, was used to analyse the results of five co-seismic slip inversions, using GPS, seismicity and/or uplift data. In this way we determined the most likely slip distribution characterized by slip maxima of 20 m in the South and 20 m in the North. We used both the distribution and temporal evolution of the co-seismic slip as derived from the GPS data. We show that the 9 min propagation time of the rupture led to constructive interference of waves radiating first from the South and minutes later from the North, strengthening the tsunami in Southern India, Sri Lanka and Thailand. We conclude that the incorporation of permanent real-time GPS stations would represent a valuable component of future tsunami warning systems.

Earth and Planetary Science Letters
Volume 261, Issues 1-2, 15 Sept 2007, Pages 49-64

Spatial predictions of geological rock mass properties based on in-situ interpretations of multi-dimensional seismic data
C.D. Klose, S. Loew, R. Giese, and G. Borm

As mining and traffic tunnels are on the increase in Australia, I thought this paper may be of interest.

This technique seems a very sophisticated way of relating in-situ seismics to geological properties.

I don't think the author "Klose" is the same as the "Newcastle paper" one. Col.

Abstract

The article presents a statistical approach to characterize and predict engineering geological conditions in the up to 2000 m deep Faido tunnel and Gotthard base tunnel in Switzerland. Seismic investigations were conducted to improve the technology of interpreting seismic tomographic images. Overall, the goal of this study was to predict spacial maps of geological rock mass properties, such as, uniaxial compressive strength or total fracture spacing, by using up to six seismic features in combination, e.g., compression-wave and shear-wave velocities and dynamic Poisson's ratio. Self-Organizing Mapping (SOM), an artificial intelligent method, was used for the purposes of interpreting multi-dimensional geophysical attributes derived from seismic profiles of tomographic images along tunnel sidewalls. The SOM-method was applied in the Faido tunnel to delineate complex physical relations between the geological and seismic parameters. Then, the method was applied to predict geological properties around a segment of the Gotthard base tunnel with unknown geological–geotechnical conditions. The results illuminate that correlation analyses (pairwise parameter classification) are substantially less powerful than the SOM-method (multi-parameter classification) in order to interpret geological features from seismic in-situ data. Moreover, predicted spatial distributions of the total fracture spacing and the uniaxial compressive strength, for example, corresponded well with drill core and tunnel mapping results. The SOM-approach was a helpful tool for practitioners in predicting zones of instabilities and geological complexity during underground excavation processes of the Gotthard base tunnel.

It is suggested to use such an interpretation method as decision support for purposes of sub/surface exploration and long-term geophysical monitoring of large-scale geoengineering projects, such as, disposals of nuclear waste and greenhouse gases or geopower plants for renewable energy (geothermal, biosoils).

Computer model to track storm surges

The Qld Govt is helping fund a research initiative to assess the impact on climate change on Qld' coastline and develop a computer model to predict and track storm surges and coastal erosion.

The Qld Premier announced the initiative at the Commencement Day address of the University of Sth Carolina campus, USA, in May.

Griffith University has been awarded a $973,000 grant from the Qld Govt's Smart State Innovation Fund to conduct the research. When all other partner funding is included, the total project involves an overall investment of $3.8M.

Further info
Qld climate ChangeCentre of Excellence
julie.wissmann@nrw.qld.gov.au

New interactive data on coastal website
2 Aug 2007 cited on http://www.ga.gov.au/news/

Scientists, natural resources manager's and community members can now access the largest central source of coastal information and data in Australia, the OzCoast and OzEstuaries website.

Previously called OzEstuaries, and used in more than 70 countries, the website now provides access to more coastal and estuary data and information.

The new data and information can be used to improve natural resource management and for the conservation of Australia's coastal zone, estuaries and near-shore environments.

The latest version of the website includes a new Geology and Geomorphology (the study of landforms) module with 3D models and case studies, an Environmental Management module and new and updated fact sheets (Indicators module).

The Environmental Management module (derived from the Coastal CRC product OzCoast) shows how data, planning and participation processes can be used in developing, implementing and reviewing catchment and coastal plans.

Maps, images, reports and data can be downloaded to assist scientists, natural resources manager's and policy organisations with estuary and coastal management. You can now even build your own conceptual model.

For the wider community, there are fact sheets about the science underpinning estuary and coastal indicators and issues.

Sitting under the Geoscience Australia banner, the website was designed with input from more than 40 agencies including government, universities and the National Estuaries Network. The former Cooperative Research Centre for Coastal Zone, Estuary & Waterway Management and National Land and Water Resources Audit team coordinated communication between agencies.

New York Times Article

August 5, 2007
Editorial
A Bridge Collapses

The nation's physical foundations seem to be crumbling beneath us. Last week, a 40-year-old interstate highway bridge collapsed in Minneapolis, plunging rush-hour traffic into the Mississippi River 60 feet below. Two weeks earlier, an 83-year-old steam pipe under the streets of Manhattan exploded in a volcano-like blast, showering asbestos-laden debris. And two years before that, substandard levees gave way in New Orleans, opening the way for the floodwaters of Hurricane Katrina.

These are some of the most dramatic signs of the nation's failure to maintain and enhance its aging physical structures at a time when demands on roads, transit systems, sewage treatment plants and other vital facilities are rising. In the event of a catastrophic failure, many lives can be lost. But even the slower deterioration undermines our quality of life and retards economic growth. Traffic jams waste gasoline, pollute the air and exhaust drivers' patience. Disabled trains and subways strand commuters. Gridlocked airports disrupt travel plans. And power failures plunge millions into darkness.

At a time of ballooning deficits, and in the midst of a hugely expensive war, most politicians will be tempted by the quick and inexpensive fix. But that is exactly how the country got into this problem.

How large a challenge the country is facing can be seen in a report by the American Society of Civil Engineers, grading the nation's infrastructure.

The latest report, issued in 2005, assigned a cumulative grade of D, down from D+ four years earlier. Near-failing grades of D- applied to drinking water, sewage treatment and navigable waterways. The highest grade, C+, went for landfills and the recycling of solid waste.

In between were unsafe dams, whose number was rising faster than they could be repaired; overstressed power lines, whose maintenance budgets had decreased for a decade; public parks and beaches that were falling into disrepair; and deteriorating schools that seemed unlikely to accommodate rising enrolments or allow smaller classes.

Bridges actually scored relatively well, earning a straight C, mostly because the percentage of the nation's 590,000 bridges that were rated structurally deficient or functionally obsolete had dropped slightly, to 27 percent. The deficiency rating does not mean a bridge is in danger of collapse, but it does reflect the need for repairs, close monitoring and perhaps weight restrictions.

No one yet knows what caused the Minneapolis bridge, one of those deemed structurally deficient, to fall apart. Theories include undetected cracks or metal fatigue, vibrations from a resurfacing project on the roadway, or possibly soil erosion around the underwater supports.

The design of the structure was almost certainly an element. The 1,900-foot span lacked much redundancy for its critical supports, which could allow a single failure of a crucial structural part to bring down the whole edifice. The notion that critical parts ought to have backup systems seems so basic to current engineering practice that it is shocking to learn that some 756 bridges of similar design around the country also lack redundancy. They will need to be inspected and monitored with great care.

Unfortunately, the adequacy of current inspections is also in question. It is disturbing that the pipe that burst in Manhattan had just been inspected and declared sound by a utility crew, that the levees in New Orleans had been regularly inspected by the Army Corps of Engineers, and that the Minneapolis bridge had been inspected annually.

In these and other failures it will be important to establish whether the inspectors failed to do a diligent job or whether the real problem is that inspections are inherently limited in what they can detect. Perhaps inspectors need to be given much better sensing equipment to detect hidden flaws.

The larger problem of crumbling roads, bridges and levees and crashing electrical grids can almost always be traced to a lack of investment. When budgets are tight, elected officials find it convenient to cut back on maintenance and leave some future administration to deal with the consequences. When Congress appropriates money for public works, the legislators typically prefer shiny new projects that will enhance their reputations, not mere maintenance on a bridge named after someone else. The federal government has particularly lagged in paying for infrastructure projects, leaving state and local governments to assume the dominant role.

Congress is now scrambling to provide extra money to help Minnesota replace its stricken bridge and is planning hearings on broader infrastructure needs. One sensible bill that ought to be quickly passed would set up a commission to assess the state of the nation's infrastructure, set priorities, and recommend financing approaches. Another bill is proposing a new national bank to leverage both public and private investment for repair and new construction projects. Each time there is one of these tragedies, politicians briefly declaim the need for a major and sustained investment in the nation's aging infrastructure. But that enthusiasm quickly flags. The collapse of Minneapolis's Bridge No. 9340 is a reminder that such long-postponed investments can no longer be neglected.

cited on 5/8/2007 at
http://www.infoplease.com/ipa/A0197840.html

Number of Earthquakes Worldwide & Mortality Figures

2004–2007

Magnitude	2004	2005	2006	2007[1]
8.0–9.9	2	1	1	2
7.0–7.9	14	10	10	2
6.0–6.9	141	141	132	70
5.0–5.9	1,515	1,697	1,483	678
4.0–4.9	10,888	13,918	13,069	4,556
3.0–3.9	7,932	9,189	9,953	3,239
2.0–2.9	6,316	4,636	4,016	1,153
1.0–1.9	1,344	26	19	17
0.1–0.9	103	0	2	0
No magnitude	2,939	865	849	784
Total	31,194	30,483	29,534	10,501
Estimated deaths	**284,010**	**82,364**	**6,605**	**136**

1. As of May 29, 2007.

Source: National Earthquake Information Center, U.S. Geological Survey. Web: neic.usgs.gov/neis/eqlists/eqstats.html

1996–1999

Magnitude	1996	1997	1998	1999
8.0–9.9	1	0	2	0
7.0–7.9	21	20	14	23
6.0–6.9	160	125	113	123
5.0–5.9	1,223	1,118	979	1,106
4.0–4.9	8,794	7,938	7,303	7,042
3.0–3.9	4,869	4,467	5,945	5,521
2.0–2.9	2,388	2,397	4,091	4,201
1.0–1.9	295	388	805	715
0.1–0.9	1	4	10	5
No magnitude	2,186	3,415	2,426	2,096
Total	19,938	19,872	21,688	20,832
Estimated deaths	**419**	**2,907**	**8,928**	**22,711**

Source: National Earthquake Information Center, U.S. Geological Survey. Web: neic.usgs.gov/neis/eqlists/eqstats.html

Other Abstracts of Interest

Historical seismometry database project: A comprehensive relational database for historical seismic records
Andrea Bono
Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V7D-4KFMMC3-4&_user=10&_coverDate=01%2F31%2F2007&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=7a70cc8404b0d226ce5bbd9026729fe4#implicit0

Geomechanical modeling of the nucleation process of Australia's 1989 M5.6 Newcastle earthquake
Christian D. Klose

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4N2072J-1&_user=10&_coverDate=04%2F30%2F2007&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=de7000aaba73685d55a40db3befbddb4#implicit0

Deep upper-mantle melting beneath the Tasman and Coral Seas detected with multiple ScS reverberations
Anna M. Courtier & Justin Revenaugh

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4NN0WDX-2&_user=10&_coverDate=07%2F15%2F2007&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=d37be5638823eedfcae57a830691cd79#implicit0

Intraplate termination of transform faulting within the Antarctic continent
F. Storti, F. Salvini, F. Rossetti and J. Phipps Morgan

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V61-4NTBFM8-5&_user=10&_coverDate=08%2F15%2F2007&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=35caf2f6bd39c5576d166ce2c92150bd#aff1

A scenario-based procedure for seismic risk analysis
U. Klügel, L. Mualchin & G.F. Panza

ITIC Tsunami Bulletin Board

The ITIC Tsunami Newsletter (Jan - Mar 2007) 20 page electronic edition is available at:

http://ioc3.unesco.org/itic/categories.php?category_no=331

Also, ITIC invites you to submit tsunami articles on meetings, conferences, projects, events, activities, etc., for inclusion in the ITIC Newsletter. The written article can be a few paragraphs in length, with accompanying captioned photos or graphics. Send articles to Brian.Yanagi@noaa.gov Linda.Sjogren@noaa.gov.

Tsunami Event - September 12, 2007
Indonesia

See link: http://nctr.pmel.noaa.gov/index.html

Fraudulent Article
ITIC Tsunami Bulletin Board
Tsunami Bulletin Board:

Fauzi from Indonesia's Meteorological and Geophysical Agency brought to our attention the following article: Indonesia/Bali's tsunami warning system does not work, at all, and never will posted at http://www.balibs.org/news-update/bali-tsunami-system-fails.shtml.
We are erroneously listed as the authors of this article. We wish to inform all of you that we had nothing to do with this article and have made no statements

publicly or privately about Indonesia's warning system and flatly disagree with the contents of this web site. We commend Indonesian efforts to establish a viable tsunami warning system and outreach program.

We are concerned that others in the tsunami community may have been similarly defrauded by unscrupulous journalists and encourage everyone in our community to bring questionable web postings or other materials to the attention of the purported authors and the tsunami community.

Thank you

Phil Liu and Lori Dengler
Professor and Chair
Geology Department
Humboldt State University
California lad1@humboldt.edu

From our Members (Kevin McCue)

The following article is an extract of an article published in Eos Vol 88 Number 30, 24 July 2007
by Kiyoshi Suyehiro, Japan Agency for Marine-Earth Science and Technology, Yokosuka;

Major Earthquake Strikes Japan

On 16 July 2007 at 10:13 A.M. local time (0113 UTC) an earthquake of magnitude M_j 6.8 struck Niigata Prefecture on the west coast of Japan's Honshu Island, its focus approximately 17 km underground at 37.5°N, 138.6°E, according to the Japan Meteorological Agency.

The epicenter was less than 10 km from shore, close to Kashiwazaki, a city with a population of approximately 100,000. The death toll as of 19 July is 10; all fatalities were people more than 70 years old, most of whom were buried under collapsed buildings, the majority of which were old wooden houses. More than 1300 were injured.

The Kariha nuclear power plant situated close to or immediately above the fault plane, was automatically shut down; a fire broke out in one of the plant's electric transformers, and slightly radioactive water leakage occurred. However, because the ground acceleration exceeded the design pga of the power plant, a careful governmental review of all plants' building codes will be hastened, in light of the fact that about 30% of Japan's electricity is supplied from nuclear power.

Reported earthquake mechanisms point to a reverse faulting with northwest-southeast compression in accord with the mechanisms of past large events, recognized active faults, and the regional tectonic stress direction. Aftershock distribution in the days following the earthquake seemed to favour the southeast dipping fault plane with about 40° dip angle. The fault of the main shock probably occurred on a previously unidentified fault. Maximum registered acceleration exceeded 1000 cm/s^2 (1g) at nearby stations of the Japanese strong- motion seismograph network, corresponding to seismic intensity as high as IX on the Modified Mercalli Scale. A rough estimate of the energy released by the earthquake is 10^{19} joules, given initial conditions of up to 1 meter of maximum slip on a fault size of about 40 km long by 20 km wide.

A scientific land-sea seismological observation will be carried out by Japanese research institutions and universities in several weeks' time.

This shallow crustal earthquake was followed 13 hours later by a deep focus magnitude 6.8 quake roughly 330 km to the west, 350 km below the Sea of Japan. The two earthquakes were generated by different mechanisms.

The National Seismic Hazard Maps for Japan were revised in March of this year (see http://www.jishin.go.jp); data from this recent earthquake will require another revision. Additional information about the earthquake can be found at http://www.gsi.go.jp and http://www.bosai.go.jp and http://earthquake.usgs.gov/eqcenter/eqinthenews/2007/us2007ewac/#summary

Note several things: (1) recorded pga exceeded 1g (2) the causative fault had not been mapped (3) the majority of collapsed buildings were old wooden houses (4) this is not the first nuclear power plant closed down or damaged in an earthquake and (5) the hazard map will be revised as a result of this earthquake.

Kevin McCue

Upcoming Conferences

4th International Seminar on Deep & High Stress Mining, 2007

This is an event organised by the Australian Centre for Geomechanics, W.A.

Date:	7-9 November, 2007
Venue:	Novotel Langley Hotel Perth, W.A.
Website:	www.deepmining07.com
Email:	christin@acg.uwa.edu.au

Link to the updated programme/registration brochure:
http://www.acg.uwa.edu.au/__data/page/2168/DHS11.pdf

AEES AGM & Conference

As our President mentioned in his opening, the AEES Conference is being held this year in Wollongong from 23-25 November. All members should have received the conference brochure and we hope to see as many members as possible in Wollongong.

If you would like to register to attend our conference please mail or email your completed registration form to Sharon Anderson at srj@bigpond.net.au or PO Box 4014, McKinnon P.O., Vic 3204 (remember Earlybird registration closes on 23 October) as soon as possible. If you require any further information on the conference please do not hesitate to contact Sharon via email or telephone 0414 492 210 or visit our website.

8th Pacific Conference on Earthquake Engineering

Date: 5-7 December 2007
Venue: Singapore

Conference flyer (680K PDF)

Full details of the conference are to be found at the conference website:
http://www.ntu.edu.sg/cee/8PCEE/

International Conference on Modern Design, Construction & Maintenance of Structures (MDCMS 2007)

This event is jointly organised by the Department of Civil & Environmental Engineering, The University of Melbourne and Institute of Building Science and Technology (IBST), Vietnam. Papers on engineering for natural hazards including earthquake engineering, structural engineering, protective technology, structural dynamics, health monitoring of infrastructure, mechanics, materials and construction technology are all welcome.

Date: 10-11 December, 2007
Venue: Institute for Building Science & Technology (IBST) Hanoi, Vietnam
Email: t.ngo@civenv.unimelb.edu.au

Abstracts and enquiries should be directed to: t.ngo@civenv.unimelb.edu.au or info@mdcms2007.org. Although the submission of abstracts is overdue, late submissions will be considered.

AGU Fall Meeting

Date: December 2007
Venue: San Francisco

AGU is celebrating it's 40th consecutive Fall Meeting in San Francisco this December.

The Program Committee has assembled an exciting program this year with about 550 preplanned sessions. If you cannot locate a session that fits your interest, then you can submit to a General Contributions session in the appropriate discipline.

Consider registering now for the meeting and making your hotel bookings. Details can be found at http://www.agu.org/meetings/fm07/.

Australasian Structural Engineering Conference 2008

Date: 26 – 27 June 2008
Venue: The Sebel Albert Park, Melb.
Website: www.asec2008.com
Email: asec2008@meetingplanners.com.au

Conference Themes:

- Turning theory into practice
- The practice of structural engineering
- Sustainable structural engineering
- Lessons from failures

The 14th World Conference of Earthquake Engineering, 2008

Date: 12-17 October, 2008
Venue: Beijing
Website: www.14wcee.org
Email: asec2008@meetingplanners.com.au

This is an event of the International Association of Earthquake Engineering (IAEE) For further details please visit their website.