



www.csiro.au

Natural Hazards: from Risk to Opportunity Science-Society Partnership

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Centre of Australian Weather and Climate Research
A partnership of the Bureau of Meteorology and CSIRO

29 June 2011



International Union of Geodesy & Geophysics IUGG

- IUGG was founded in 1919 (89 years ago)
- One of the 12 Founding Partners of IYPE
- Composed of 8 International Associations



- IAG Geodesy - LANDSLIDES
- IAGA Geomagnetism and Aeronomy – SPACE WEATHER
- IAHS Hydrology – FLOODS AND DROUGHTS
- IAMAS Meteorology and Atmospheric Sciences – STORMS AND BUSHFIRES
- IAPSO Physical Sciences of the Oceans - TSUNAMI
- IASPEI Seismology and Physics of the Earth's Interior - EARTHQUAKE
- IAVCEI Volcanology and Chemistry of the Earth's Interior - VOLCANIC ERUPTION
- IACS Cryospheric Sciences - AVALANCHE



New Zealand IYPE Weather Stamps

Australia IYPE Coins



International Year of Planet Earth
2008 Six Coin Proof Set

The theme of 'Planet Earth in our hands' is close to the hearts of Australians and has considerable impact on our economic, environmental and social health and well-being, making the International Year of Planet Earth a fitting choice for the 2008 Year Set. The \$1 coin in this set depicts the powerful impact of climate change on all forms of life. The proof quality coins are struck from highly polished dies resulting in exceptional sharpness of detail and a brilliant, mirror-like surface.

The International Year of Planet Earth in 2008 is the biggest ever international effort to promote the Earth Sciences. Its theme, Earth sciences for society reflects the United Nations' desire to encourage responsible stewardship of our planet. The Year will see the funding of research and outreach activities designed to benefit all living beings on the surface of the Earth.

The work of geoscientists has revealed how our planet works and, by conveying this science in an approachable way, the Year will highlight the importance of our responsibility for our planet. Fitting the subjects explored will be water, hazards of the Earth, Earth and health, climate change, sustainable use of resources, building safer cities, deep Earth, oceans, soil and the origins of biological diversity.

Nominal Specifications

	1000 pieces	500 pieces	250 pieces	100 pieces	50 pieces	25 pieces
Denomination	\$1	\$2	\$5	\$10	\$20	\$50
Mass (g)	2.83	5.65	11.30	15.55	21.00	6.60
Diameter (mm)	19.41	23.66	26.52	31.53	21.00	20.92



Vince Neall
Chair, New Zealand National Committee
for the International Year of Planet Earth




Hazards Science Theme

Hazards - *minimising risk, maximising awareness*

Earth sciences for society



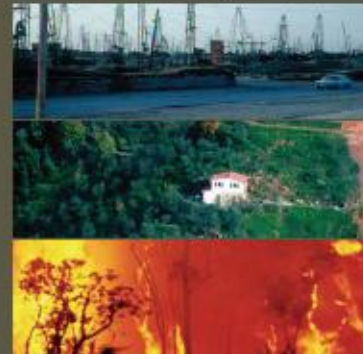
www.esfs.org

Prospectus for a key theme of the International Year of Planet Earth

3

Desastres naturais *minimizar o risco, maximizar a consciencialização*

Ciências da Terra para a Sociedade



www.yearofplanetearth.org

Prospectus relativo a um tema-chave do Ano Internacional da Física Terra 2007-2009

3

GEO-FIFIKA Földtudományi ismeretterjesztő



www.foldev.hu



3.
Természeti veszélyforrások
A kockázat csökkentése
a tudatosság növelése

Hungary



Australian red mud

In Western Australia

Worsley Alumina

Alcoa Wagerup Refinery



In Australia there have been noxious air emissions

Illnesses are well-documented.
Micrometeorological plume studies demonstrate that the plume causes them.

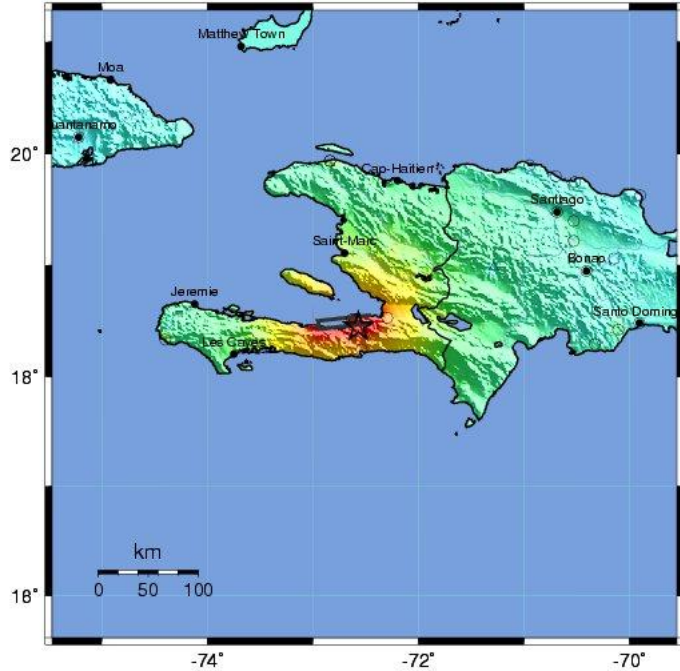
The chemical is still unknown.



Haiti

USGS ShakeMap : HAITI REGION

Tue Jan 12, 2010 21:53:10 GMT M 7.0 N18.45 W72.57 Depth: 13.0km ID:2010rja6



Map Version 10 Processed Thu Mar 4, 2010 04:10:14 PM MST - NOT REVIEWED BY HUMAN

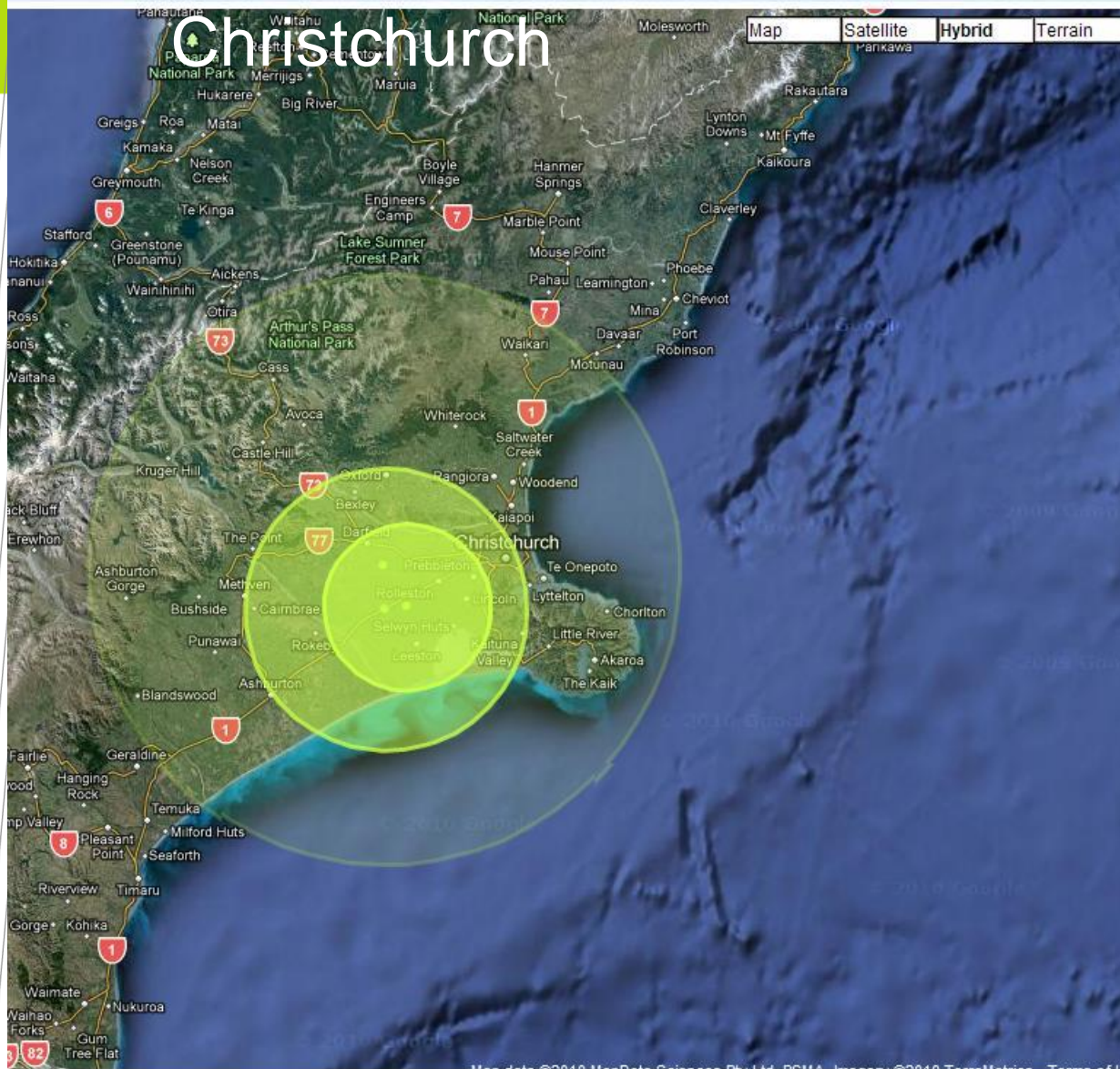
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-18	18-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



>200,000 deaths

Christchurch Quake Map

[FAQs / Help »](#) [About this s](#)



Sat Sep 4 2010 04:16 NZST

Jump to: last [3](#) / [6](#) / [9](#) / [12](#) / [24](#) hours

Show day: ▾

Sticky Dots

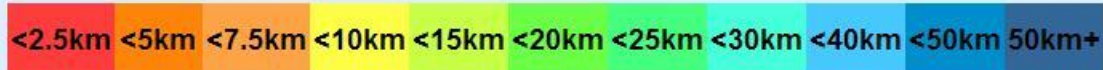
3 of 98 quakes (1550 total):

4.7M, depth: 10km 4/9/2010 05:06

5.6M, depth: 10km 4/9/2010 04:56

7.1M, depth: 11km 4/9/2010 04:35

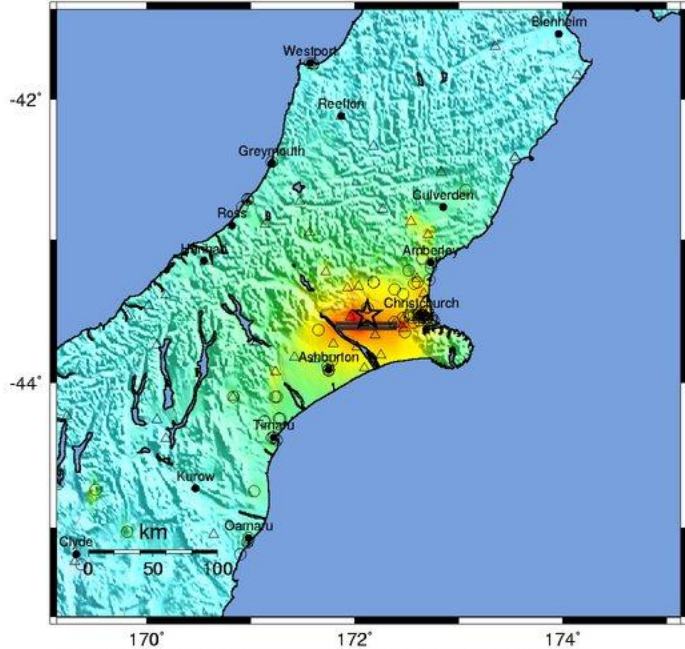
**Quake
depth:**



Christchurch



USGS ShakeMap : SOUTH ISLAND OF NEW ZEALAND
 Fri Sep 3, 2010 16:35:46 GMT M 7.0 S43.53 E172.12 Depth: 5.0km ID:2010atbj



Map Version 9 Processed Wed Sep 8, 2010 08:02:40 AM MDT - NOT REVIEWED BY HUMAN

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy	>124
PEAK ACC.(%g)	<.17	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+



0 deaths
US\$3.86 Billion damage

What can we deduce?

- **Developing Countries**

- Fatalities dominate



Explosive eruption at Stromboli



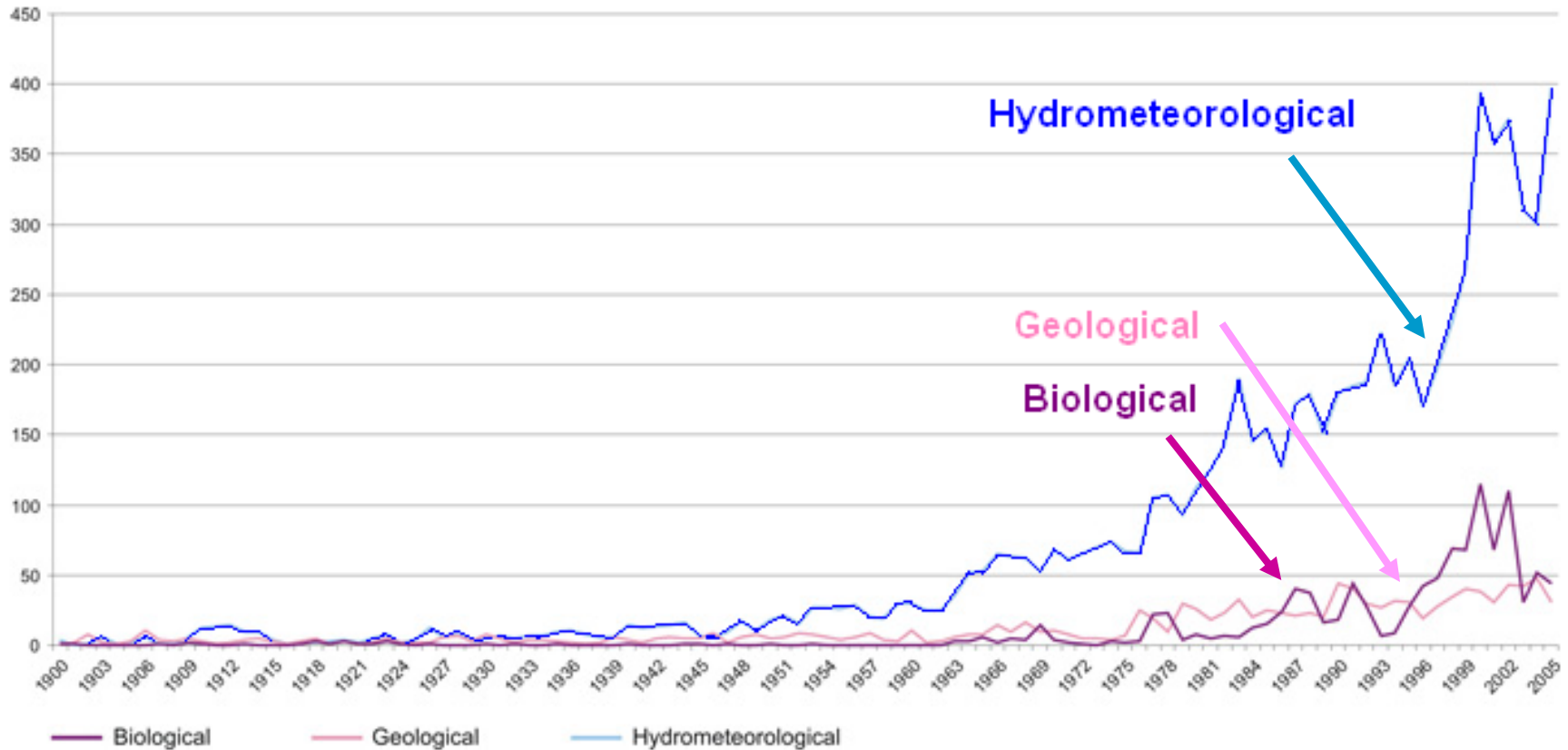
- **Developed Countries**

- Infrastructure and property losses dominate



Things are likely to get worse

Number of natural disasters registered in EMDAT
1900 - 2005





... fire-prone vegetation: the Australian eucalypt.



Black Saturday – 7 February 2009

170 deaths



Beer, T. A.M. Gill & P.H.R. Moore (1988)
Australian bushfire danger under changing climate regimes,
in Greenhouse, ed. G. Pearman (CSIRO), pp421-427.



Integrated Research on Disaster Risk



Geophysical Hazards

Minimizing Risk, Maximizing Awareness

Tom Beer (Ed.)



A Science Plan for Integrated Research on Disaster Risk
Addressing the challenge of natural and human-induced environmental hazards





IUGG

Melbourne AUSTRALIA 2011

XXV IUGG General Assembly

EARTH ON THE EDGE:
SCIENCE FOR A SUSTAINABLE PLANET
27 June – 8 July 2011

One Venue, One City, One Conference

www.iugg2011.com