

ISGC 2010 media release
Thursday 11 March 2010
For immediate release

Asian scientists shake up earthquake research

Researchers from Taiwan have proposed a large-scale data network allowing the whole of the Asia-Pacific to share and analyse seismic data gathered on earthquakes, one of which struck Taiwan just seven days ago.

As recent events in Haiti, Chile and Turkey have demonstrated, earthquakes can have devastating effect. Those living in the Asia-Pacific are well aware of this. Lying on the so-called “Ring of Fire”, countries such as Taiwan are at high risk of natural disasters such as earthquakes, volcanoes, floods, and tsunamis. Today researchers at the International Symposium on Grid Computing, ISGC 2010, have gathered to share their experience of mitigating such disasters.

“Earthquake prediction is an unsolved problem. But using data gathered by seismometers we are able to predict ground motion and reduce the damage. Providing access to earthquake data will help the Asia-Pacific to be better prepared when an earthquake strikes - the more information we have, the better.” says Li Zhao from the Institute of Earth Sciences, Academia Sinica, Taipei.

“Our dream is to have an integrated regional data centre for the Asia-Pacific, which is accessible for scientists to study the earth nature.” says Wen-Tzong Liang also of the Institute of Earth Sciences. This could improve scientist's knowledge of earthquakes and the earth's interior, providing information for engineers to design and reinforce buildings appropriately as well as teaching citizens how to respond when an earthquake strikes.

In order for such a network to be successful, data needs to be gathered from countries across the Asia-Pacific, not just those that are prone to earthquakes. The team at Academia Sinica, led by Bor-Shouh Huang, have already started tackling this problem. In the last two years they have set up ten new stations along the Vietnamese coast, and are set to deploy even more in the Philippines.

These seismic stations will produce real-time data continuously for any local data centre to monitor earthquake activity in this region. Giving scientists wider access to the archived data can help them predict what will happen when an earthquake strikes and understand what the earth structure is below the surface.

“We use computers to simulate wave propagation so if there's an earthquake in Taiwan we can determine how much the earth will shake anywhere in the world.” says Li Zhao from the Institute of Earth Sciences, Academia Sinica. “Using archived data records we can investigate the structure inside the earth, and if we know this we can better predict the ground motion. For example Taipei lies in a basin – the ground is covered by a soft sedimentary layer. So if an earthquake happens, Taipei will experience a higher motion than the surrounding area, a process called amplification.”

To set up this network, researchers are hoping grid technologies can provide robust and reliable ways to transmit and store data. They have already turned to grid computing to help analyse the data itself.

“The most important ground motion is in the frequency of a few Hertz, so the higher the frequency the more realistic the prediction is. But doing calculations at very high frequency requires a lot of computing power. Grid technology gives any researcher with an internet connection a way to run simulations for any earthquake they wish to study.” says Zhao. Zhao demonstrated a new gateway

which gives scientists easy access to a grid-based simulator at an ISGC 2010 workshop earlier this week.

-ends-

For further information please contact:

Vicky Huang
Dissemination Team
Academia Sinica Grid Computing (ASGC)
Institute of Physics
Academia Sinica
vic@twgrid.org

Tel: +886-2-2789-8308

Fax: +886-2-2783-5434

Notes for editors:

About ISGC 2010:

ISGC 2010, one of the foremost international grid forums in Asia Pacific, runs from 5-12 March 2010 at Academia Sinica in Taipei, Taiwan. Organised by TWGrid, it aims to enhance the awareness of grid computing activities as well as foster e-Science applications in the Asia-Pacific region.

Topic covered at ISGC 2010 include Grid Operation & Management, Grid Middleware & Interoperability, Grid Security & Networking and Grid Computing & Cloud Computing; as well as the applications in different disciplines such as High Energy Physics, Biomedicine & Life Sciences, Earth Sciences, Environmental Monitoring & Disaster Mitigation, Humanities & Social Sciences, and Digital Library & Content Management.

<http://event.twgrid.org/isgc2010>

If you can't make it to the conference you can follow ISGC 2010 online on the conference blog, run by the GridTalk project:

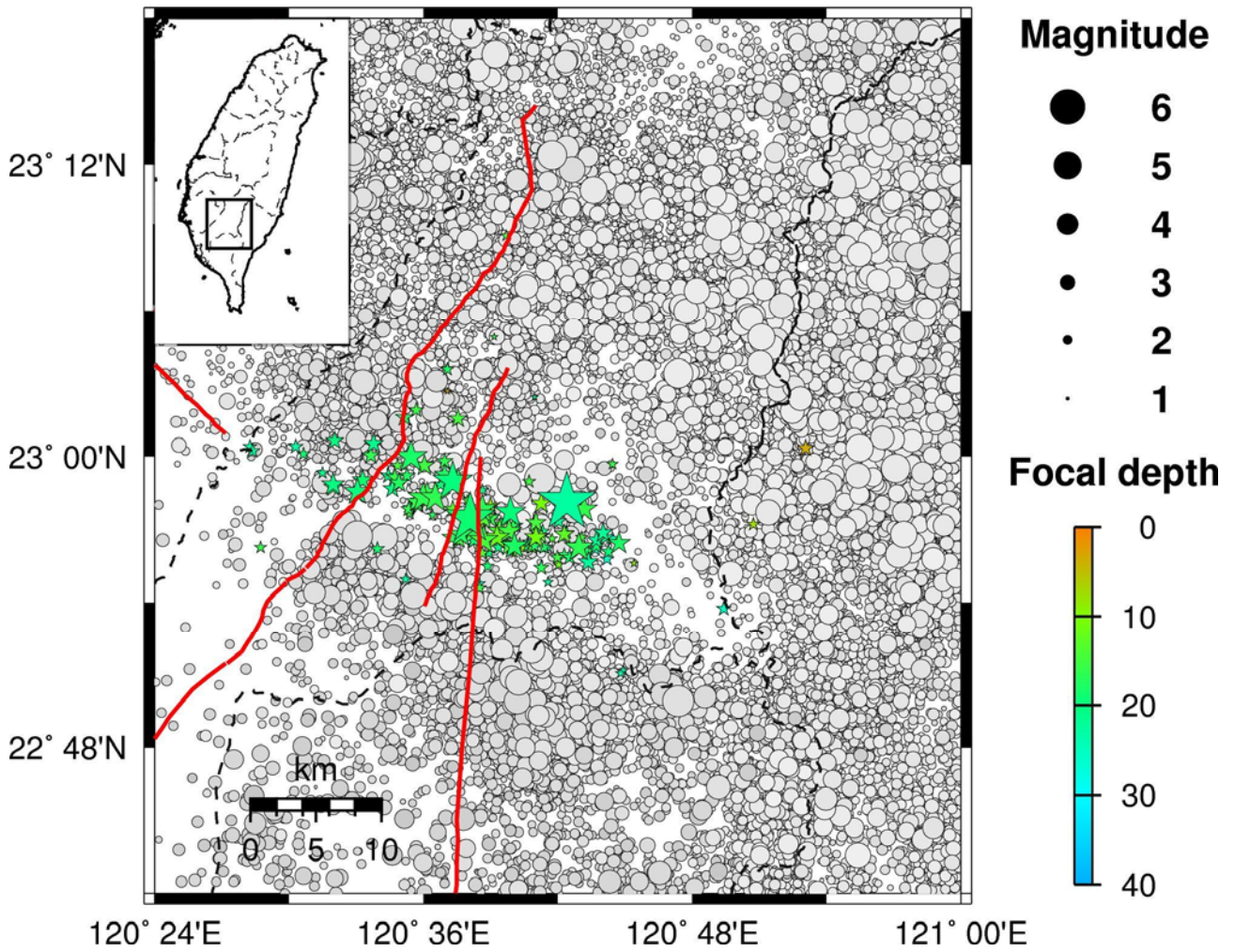
ISGC 2010 Blog - <http://gridtalk-project.blogspot.com>

About the Institute of Earth Sciences, Academia Sinica:

The Institute of Earth Sciences (IES), founded in 1982, is one of the thirty research institutes of Academia Sinica. The research programme is divided into two parts: basic research and applied research. Basic research is to improve our understanding of the earth system and applied research is to conduct natural hazard mitigation and resource management. Therefore, IES emphasises research domain in geochemistry, tectonophysics, mineral physics and seismology.

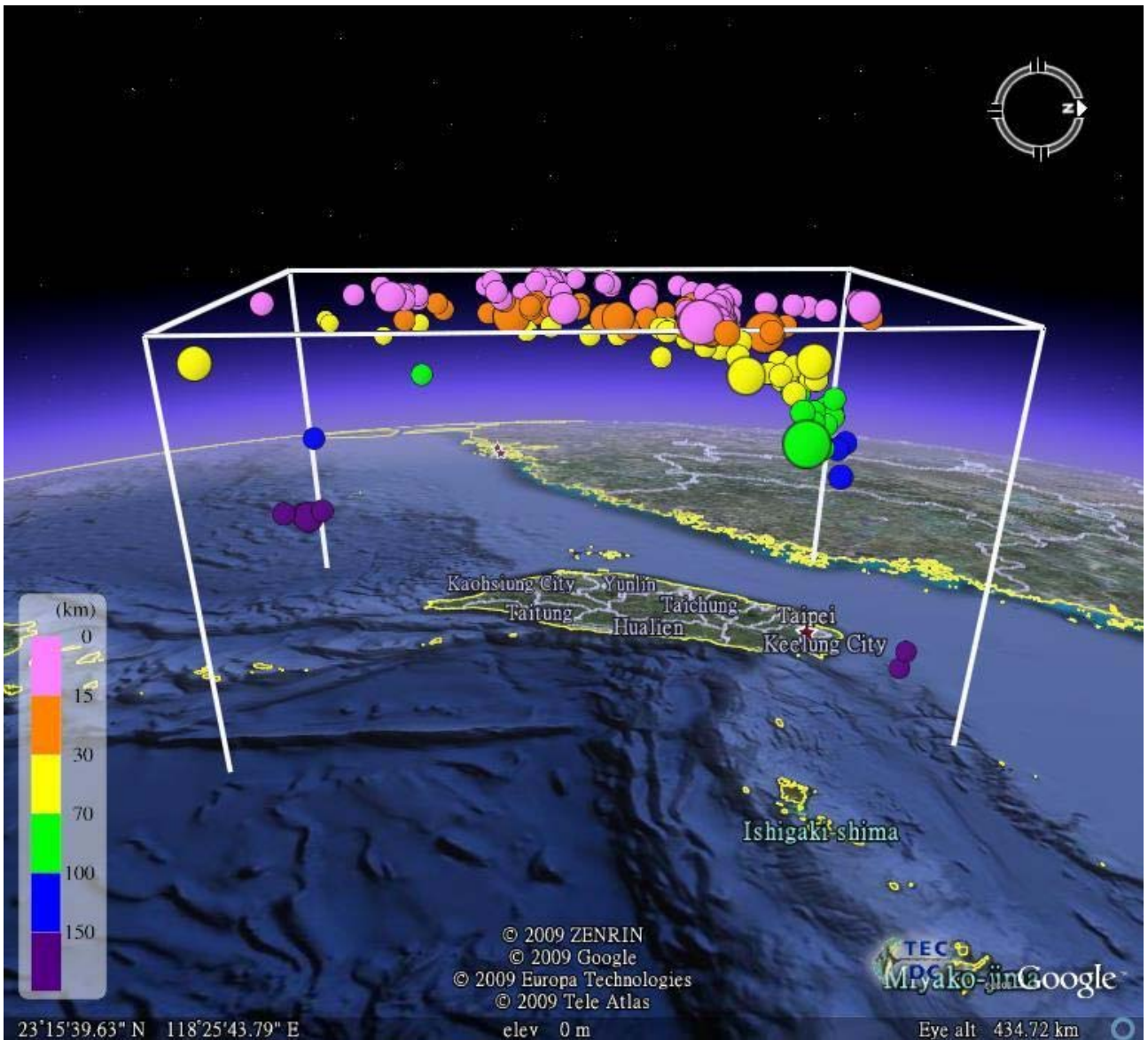
www.earth.sinica.edu.tw/en/

Images:



Caption: The main shock and after shock distribution for the 4 March 2010 Earthquake. Open circles indicate historical earthquakes detected in the region.

Image courtesy of Bor-Shouh Huang, Institute of Earth Sciences, Academia Sinica



Caption: Perspective of earthquake depth for major earthquakes in and around Taiwan.

Courtesy of Wen-Tzong Liang Institute of Earth Sciences Academia Sinica