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Geoinformation and disaster management

Menno-Jan Kraak

vice president of the International Cartographic Association

Geoinformation and disaster management

- Joint Board of Geospatial Information Societies
- Maps
- International Cartographic Association
- Commission on Cartography in Early Warning and Crisis Management

Joint Board of Geospatial Information Societies

JBGIS
Joint Board of Geospatial Information Societies

http://www.fig.net/jbgis/

- The Joint Board of Geospatial Information Societies (JB GIS) is a coalition of leading international geospatial societies which can speak on behalf of the geospatial profession at international level, especially to the United Nations and other global stakeholders. Its second goal is to coordinate activities within the geospatial society and organisations

- Global voice, Research, Knowledge transfer, Standards, Quality, Education, Outreach

Members of the Joint Board of Geospatial Information Societies

- Global Spatial Data Infrastructure (GSDI) Association
- IEEE Geoscience and Remote Sensing Society (IEEE-GRSS)
- International Association of Geodesy (IAG)
- International Cartographic Association (ICA)
- International Federation of Surveyors (FIG)
- International Geographic Union (IGU)
- International Hydrographic Organization (IHO)
- International Map Trade Association (IMTA)
- International Society of Photogrammetry and Remote Sensing (ISPRS)
- International Steering Committee for Global Mapping (ISCGM)

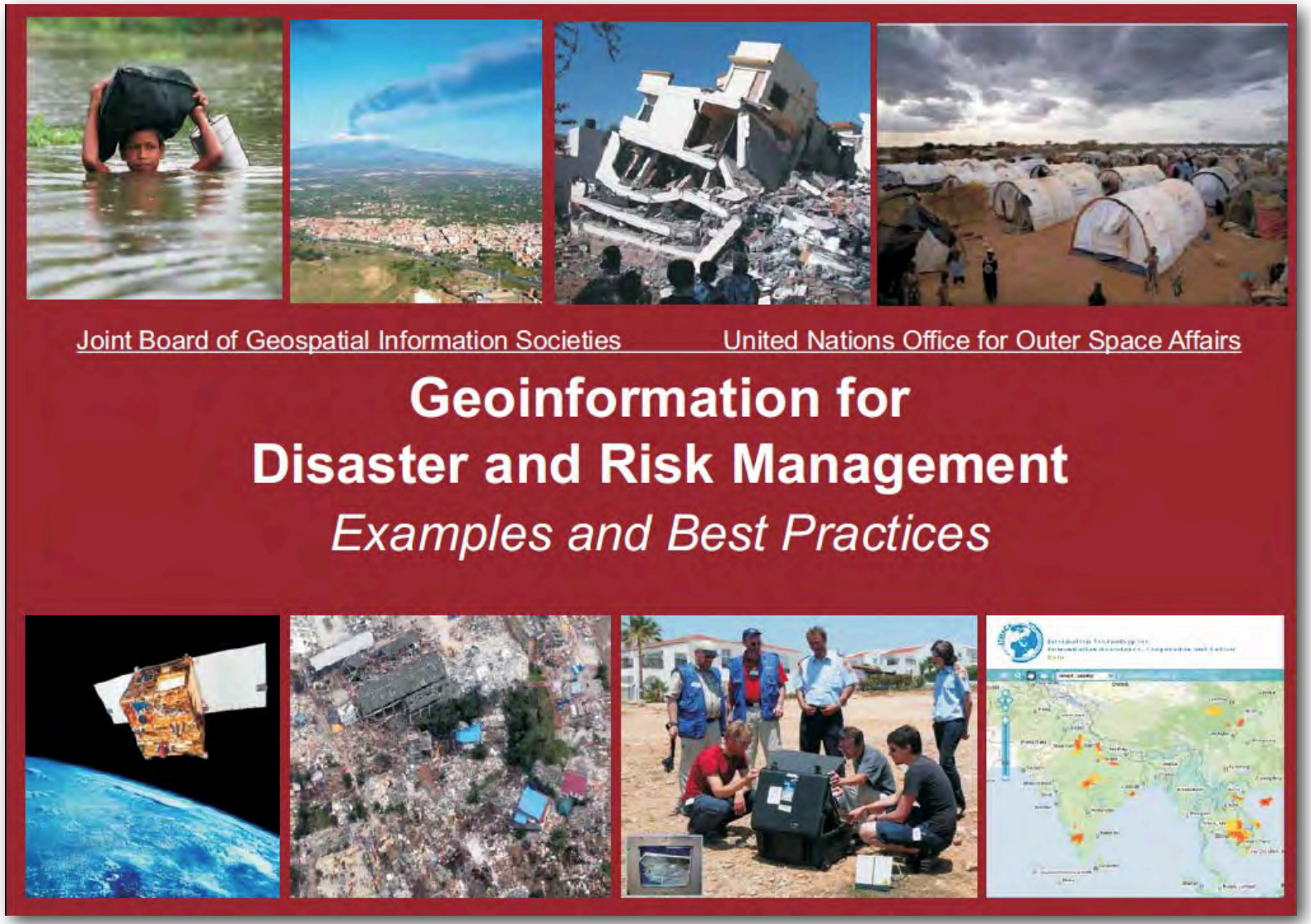
JBGIS in action

Committed to supporting society and governments through

Collaborative facilitation of initiatives and programmes to

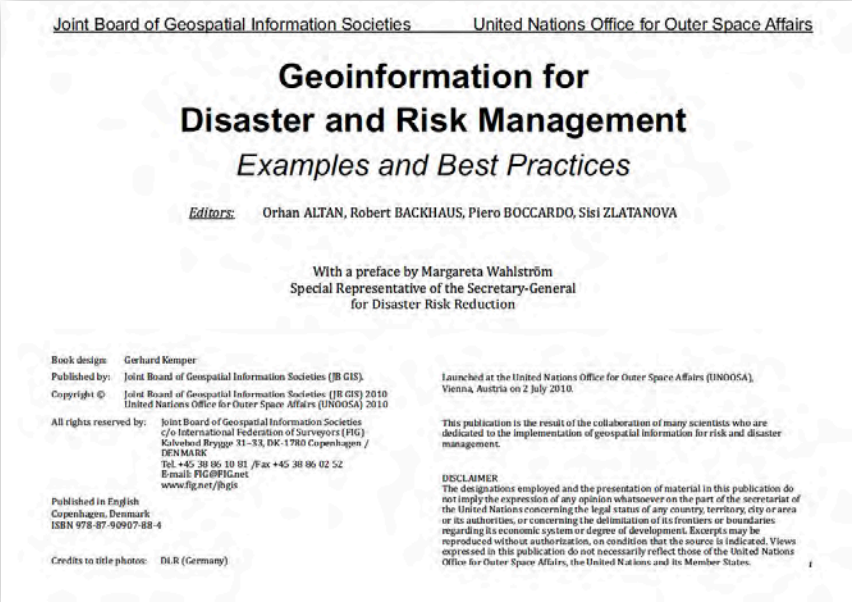
- Establish and grow capacity
- Deliver timely, comprehensive and useful geospatial information

JB GIS ad hoc
Committee on Risk and Disaster Management



http://www.fig.net/jbgis/publications/jbgis_booklet_2010.pdf

Geoinformation for Disaster and Risk Management, Examples and Best Practices Booklet



Joint Board of Geospatial Information Societies — United Nations Office for Outer Space Affairs

Geoinformation for Disaster and Risk Management

Examples and Best Practices

Editors: Orhan ALTAN, Robert BACKHAUS, Piero BOCCARDO, Sisi ZLATANOVA

With a preface by Margareta Wahlström
Special Representative of the Secretary-General
for Disaster Risk Reduction

Book design: Gerhard Kemper
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This publication is the result of the collaboration of many scientists who are dedicated to the implementation of geospatial information for risk and disaster management.

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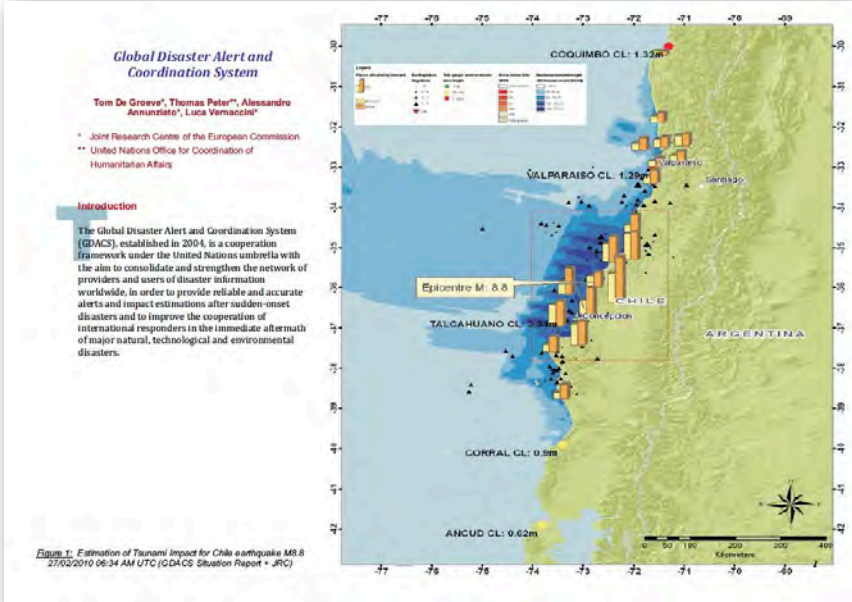


Global Disaster Alert and Coordination System

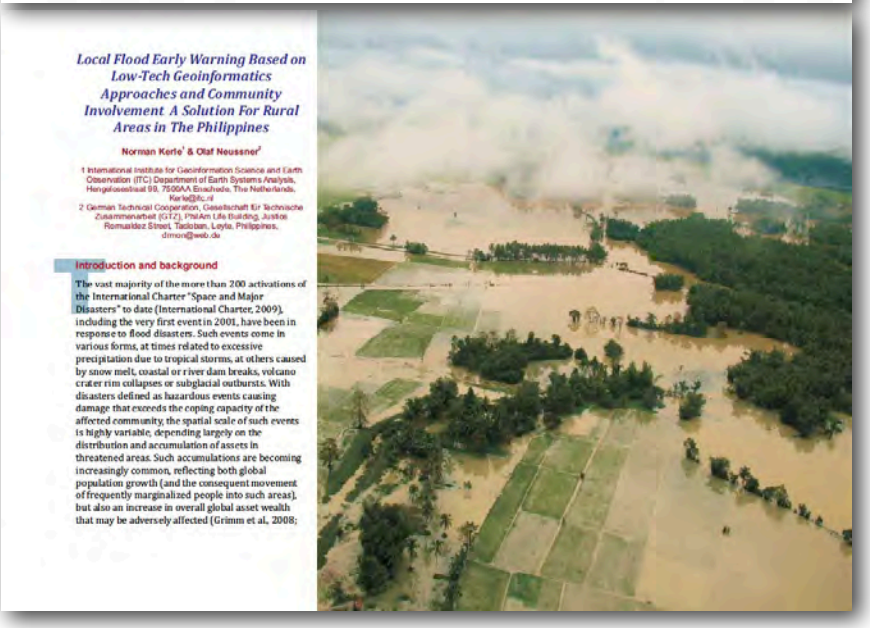
Tom De Groeve*, Thomas Peter**, Alessandro Annunziato*, Luca Vernaccini*

* Joint Research Centre of the European Commission
** United Nations Office for Coordination of Humanitarian Affairs

Introduction

The Global Disaster Alert and Coordination System (GDACS), established in 2004, is a cooperation framework under the United Nations umbrella with the aim to consolidate and strengthen the network of providers and users of disaster information worldwide, in order to provide reliable and accurate alerts and impact estimations after sudden-onset disasters and to improve the cooperation of international responders in the immediate aftermath of major natural, technological and environmental disasters.

Figure 1: Estimation of Tsunami Impact for Chile earthquake M8.8 27/02/2010 06:34 AM UTC (GDACS Situation Report • JRC)



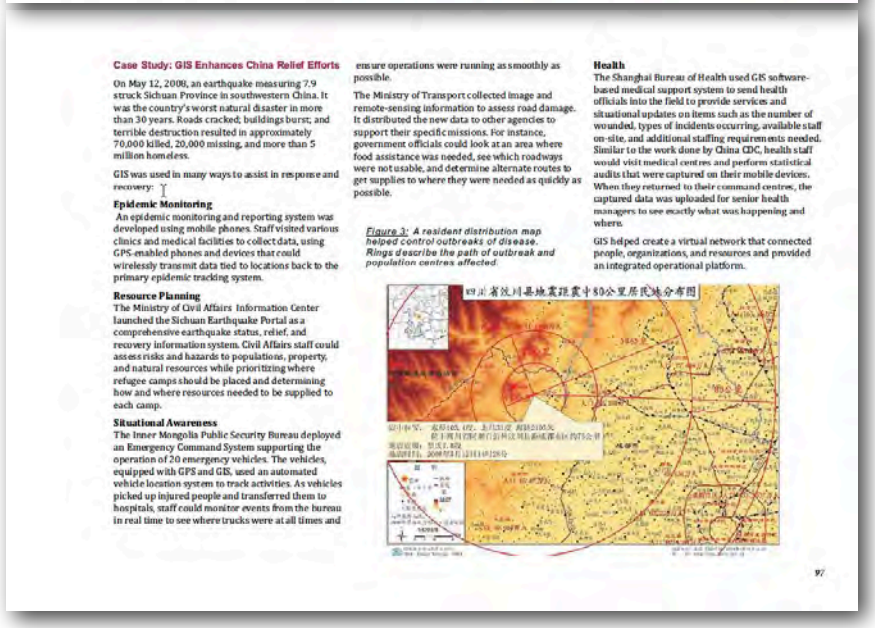
Local Flood Early Warning Based on Low-Tech Geoinformatics Approaches and Community Involvement A Solution For Rural Areas in The Philippines

Norman Kerle[1] & Olaf Neussner[2]

1 International Institute for Geoinformation Science and Earth Observation (ITC) Department of Earth Systems Analysis, Hengelosestraat 99, 7500AA Enschede, The Netherlands, Kerle@itc.nl
2 German Technical Cooperation, Gesellschaft für Technische Zusammenarbeit (GTZ), PhilAm Life Building, Justice Romualdez Street, Tacloban, Leyte, Philippines, dmon@web.de

Introduction and background

The vast majority of the more than 200 activations of the International Charter "Space and Major Disasters" to date (International Charter, 2009), including the very first event in 2001, have been in response to flood disasters. Such events come in various forms, at times related to excessive precipitation due to tropical storms, at others caused by snow melt, coastal or river dam breaks, volcano crater rim collapses or subglacial outbursts. With disasters defined as hazardous events causing damage that exceeds the coping capacity of the affected community, the spatial scale of such events is highly variable, depending largely on the distribution and accumulation of assets in threatened areas. Such accumulations are becoming increasingly common, reflecting both global population growth (and the consequent movement of frequently marginalized people into such areas), but also an increase in overall global asset wealth that may be adversely affected (Grimm et al, 2008;



Case Study: GIS Enhances China Relief Efforts

On May 12, 2008, an earthquake measuring 7.9 struck Sichuan Province in southwestern China. It was the country's worst natural disaster in more than 30 years. Roads cracked; buildings burst; and terrible destruction resulted in approximately 70,000 killed, 20,000 missing, and more than 5 million homeless.

GIS was used in many ways to assist in response and recovery:

Epidemic Monitoring
An epidemic monitoring and reporting system was developed using mobile phones. Staff visited various clinics and medical facilities to collect data, using GPS-enabled phones and devices that could wirelessly transmit data tied to locations back to the primary epidemic tracking system.

Resource Planning
The Ministry of Civil Affairs Information Center launched the Sichuan Earthquake Portal as a comprehensive earthquake status, relief, and recovery information system. Civil Affairs staff could assess risks and hazards to populations, property, and natural resources while prioritizing where refugee camps should be placed and determining how and where resources needed to be supplied to each camp.

Situational Awareness
The Inner Mongolia Public Security Bureau deployed an Emergency Command System supporting the operation of 20 emergency vehicles. The vehicles, equipped with GPS and GIS, used an automated vehicle location system to track activities. As vehicles picked up injured people and transferred them to hospitals, staff could monitor events from the bureau in real time to see where trucks were at all times and ensure operations were running as smoothly as possible.

The Ministry of Transport collected image and remote-sensing information to assess road damage. It distributed the new data to other agencies to support their specific missions. For instance, government officials could look at an area where food assistance was needed, see which roadways were not usable, and determine alternate routes to get supplies to where they were needed as quickly as possible.

Figure 3: A resident distribution map helped control outbreaks of disease. Rings describe the path of outbreak and population centres affected.

Health
The Shanghai Bureau of Health used GIS software-based medical support system to send health officials into the field to provide services and situational updates on items such as the number of wounded, types of incidents occurring, available staff on-site, and additional staffing requirements needed. Similar to the work done by China CDC, health staff would visit medical centres and perform statistical audits that were captured on their mobile devices. When they returned to their command centres, the captured data was uploaded for senior health managers to see exactly what was happening and where.

GIS helped create a virtual network that connected people, organizations, and resources and provided an integrated operational platform.

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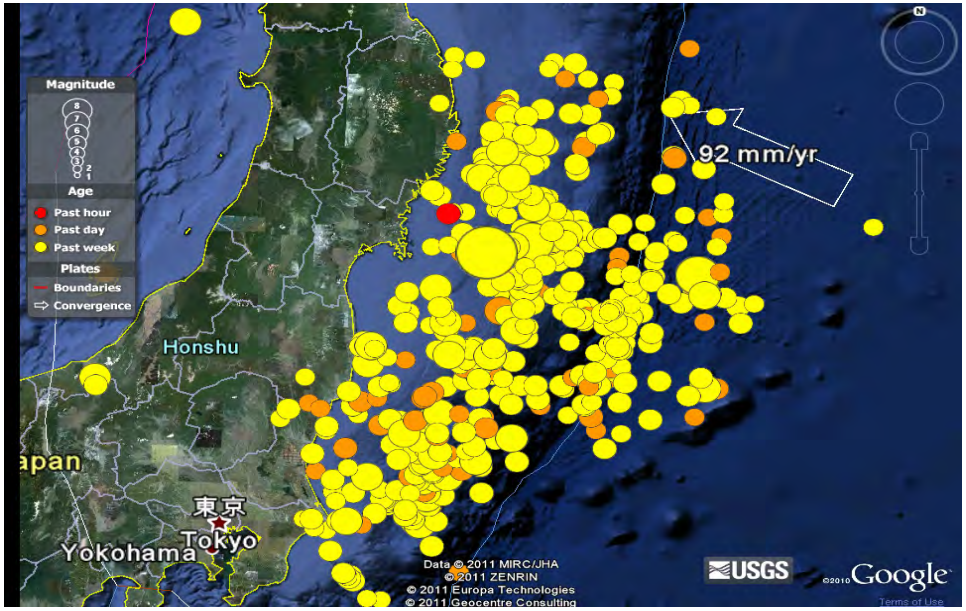
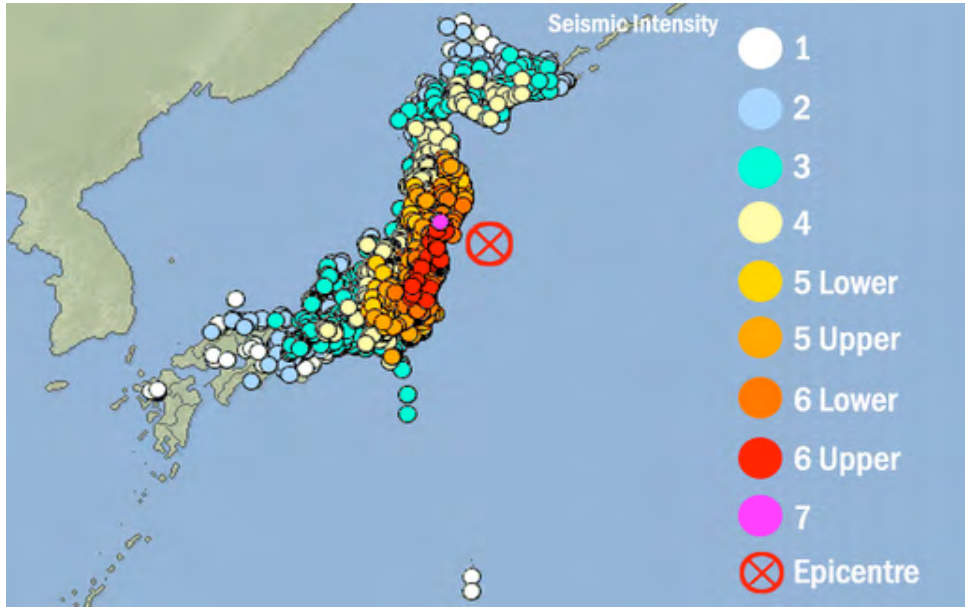
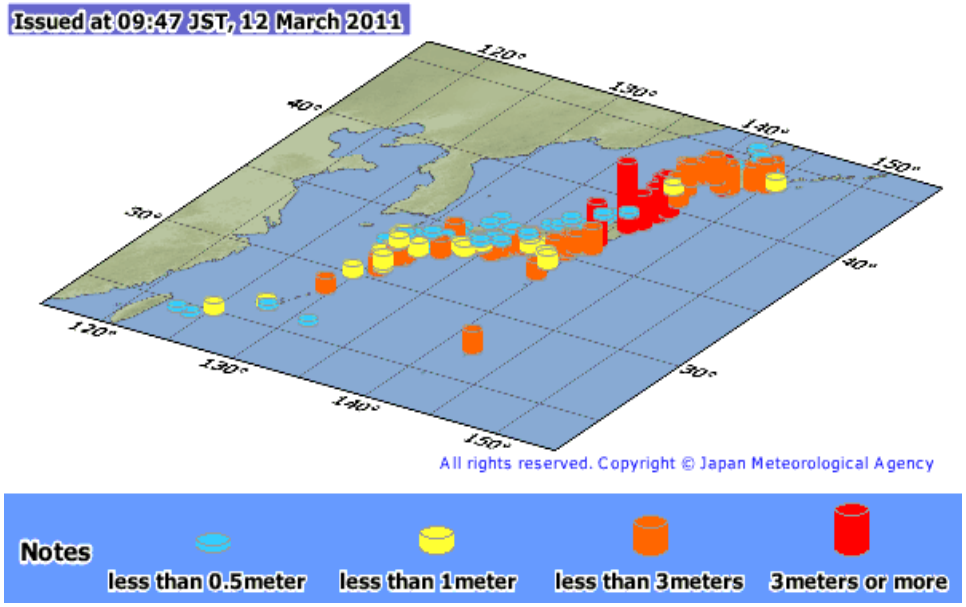
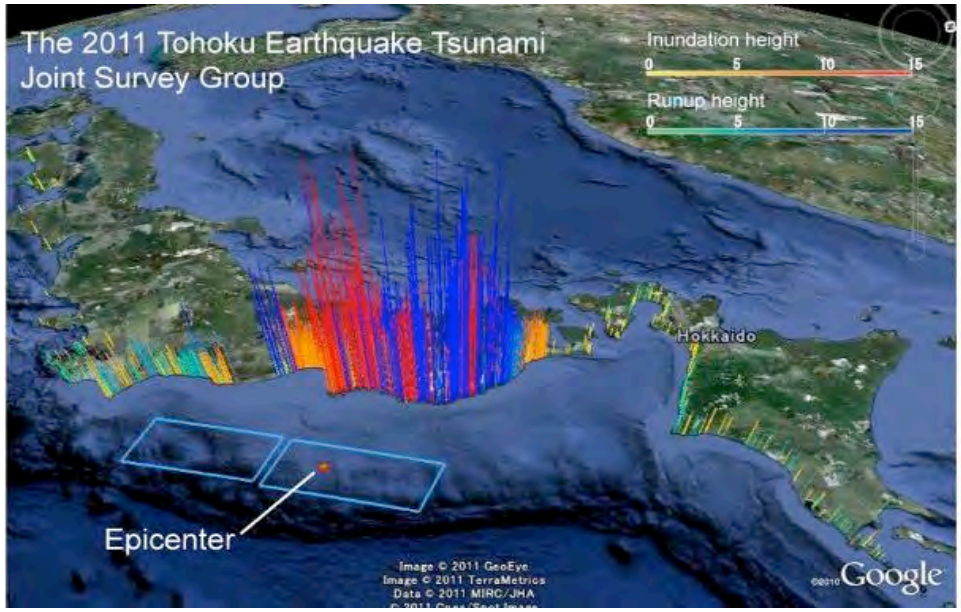
ITC

Maps

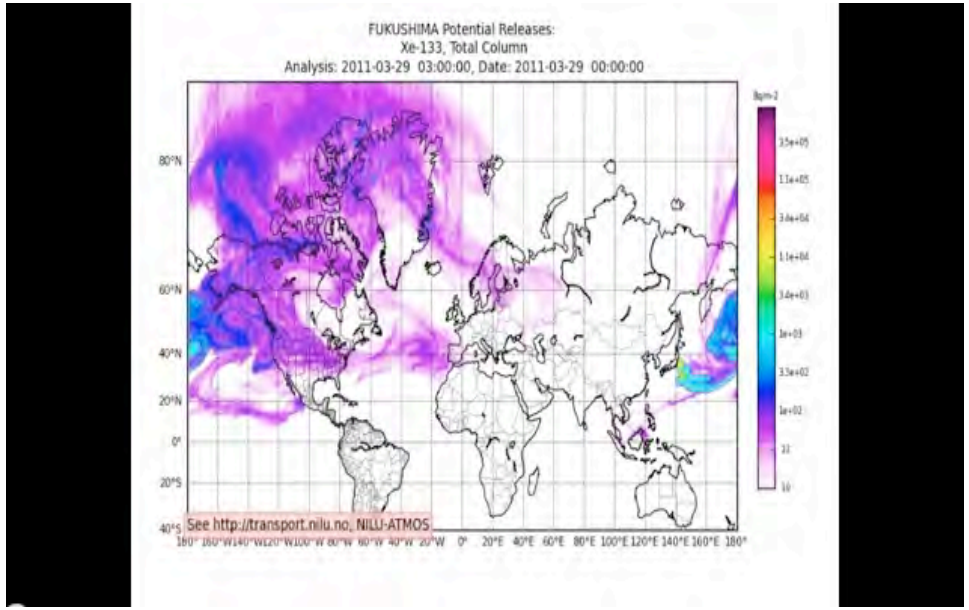

Magnitude
Age
Past hour
Past day
Past week
Plates
Boundaries
Convergence
Honshu
92 mm/yr
東京
Tokyo
Yokohama
Data © 2011 MIRC/JHA
© 2011 ZENRIN
© 2011 Europa Technologies
© 2011 Geocentre Consulting
USGS
Google

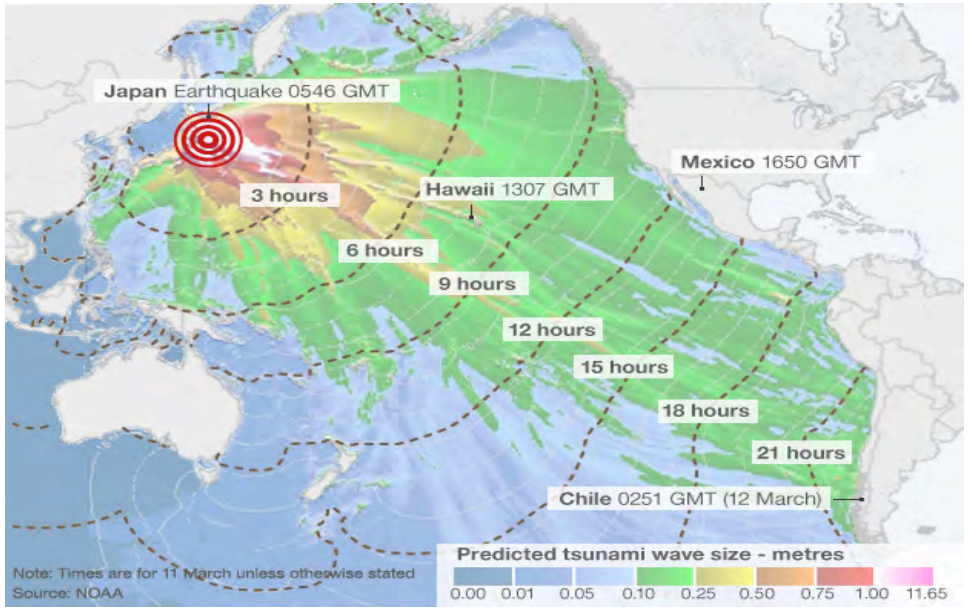

Seismic Intensity
1
2
3
4
5 Lower
5 Upper
6 Lower
6 Upper
7
Epicentre

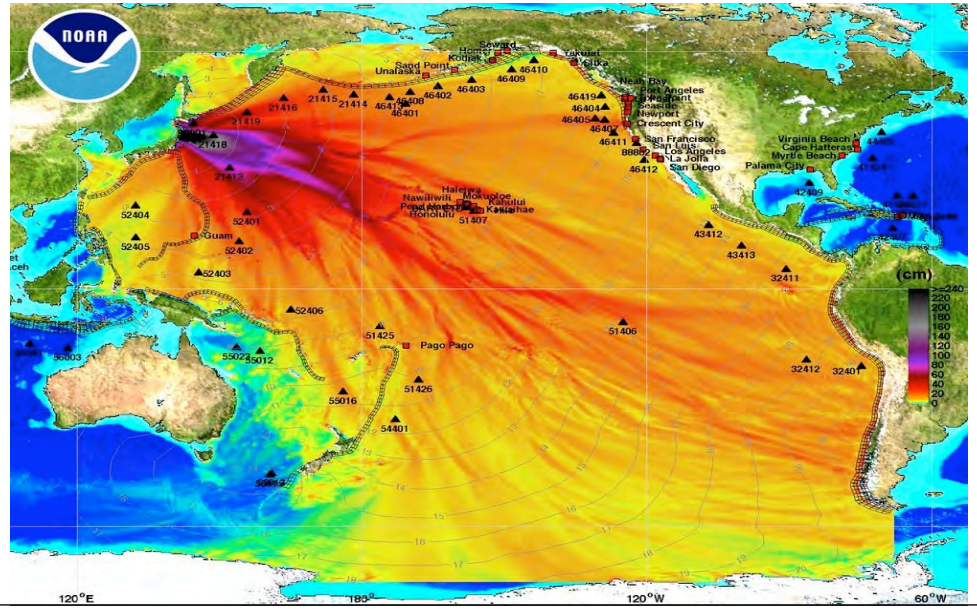

Issued at 09:47 JST, 12 March 2011
120°
130°
140°
150°
40°
30°
All rights reserved. Copyright © Japan Meteorological Agency
Notes
less than 0.5meter
less than 1meter
less than 3meters
3meters or more

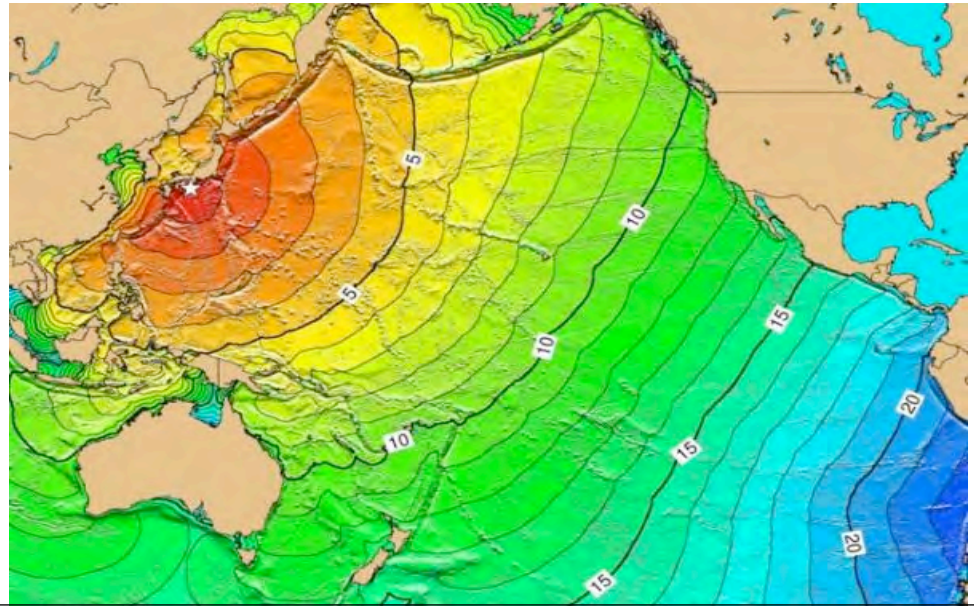

The 2011 Tohoku Earthquake Tsunami
Joint Survey Group
Inundation height
0
5
10
15
Runup height
0
5
10
15
Hokkaido
Epicenter
Image © 2011 GeoEye
Image © 2011 TerraMetrics
Data © 2011 MIRC/JHA
Google

Maps


FUKUSHIMA Potential Releases:
Xe-133, Total Column
Analysis: 2011-03-29 03:00:00, Date: 2011-03-29 00:00:00
See http://transport.nilu.no, NILU-ATMOS

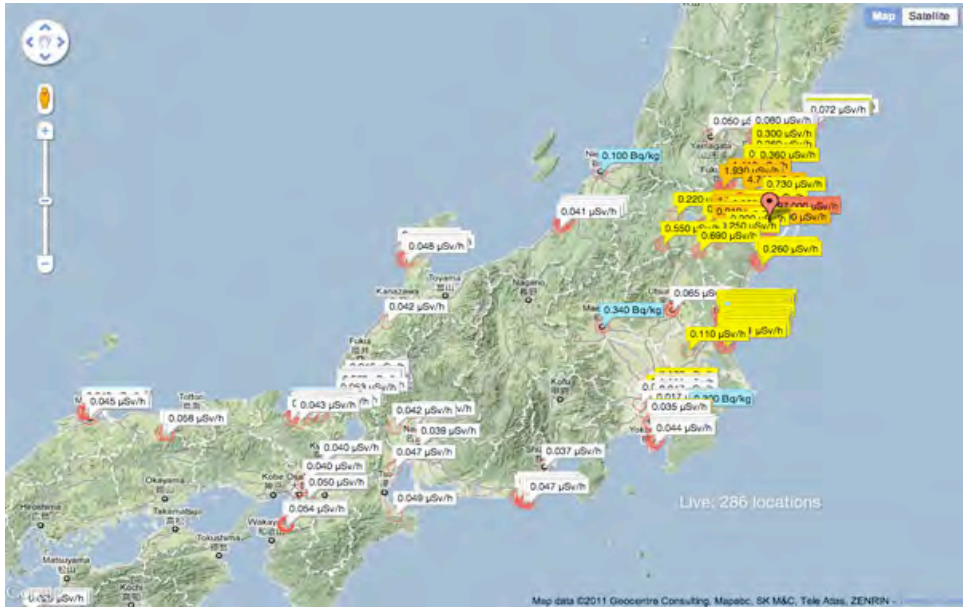

Japan Earthquake 0546 GMT
3 hours
Hawaii 1307 GMT
Mexico 1650 GMT
6 hours
9 hours
12 hours
15 hours
18 hours
21 hours
Chile 0251 GMT (12 March)
Predicted tsunami wave size - metres
0.00 0.01 0.05 0.10 0.25 0.50 0.75 1.00 11.65
Note: Times are for 11 March unless otherwise stated
Source: NOAA


NOAA
(cm)
120°E
180°
120°W
60°W

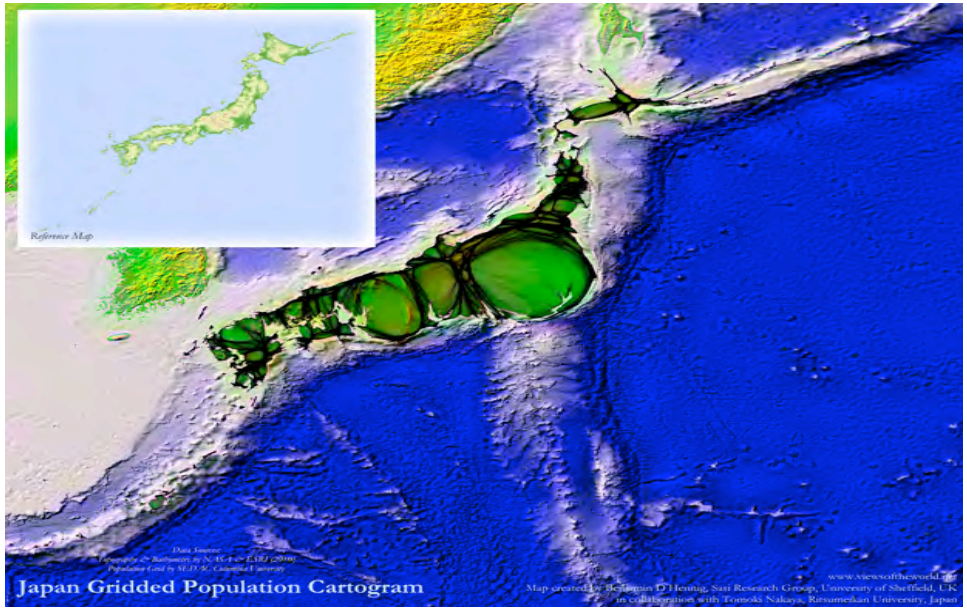


Maps

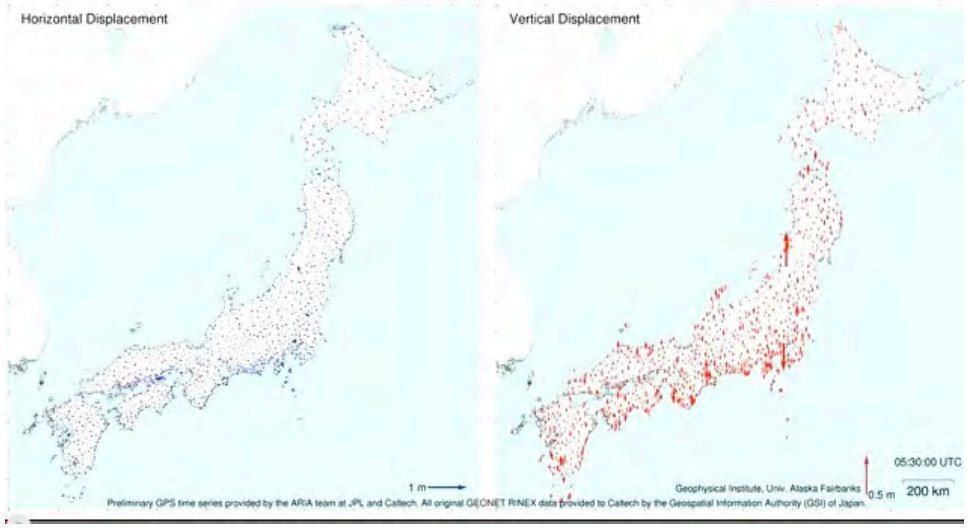
year 1 - red
year 2 - orange
year 3 - yellow
year 4 - light blue
year 5 - violet
Courtesy of J. Churaede
©2009 Google


Map
Satellite
Live: 286 locations
Map data ©2011 Geocentre Consulting, Mapebc, SK M&C, Tele Atlas, ZENRIN

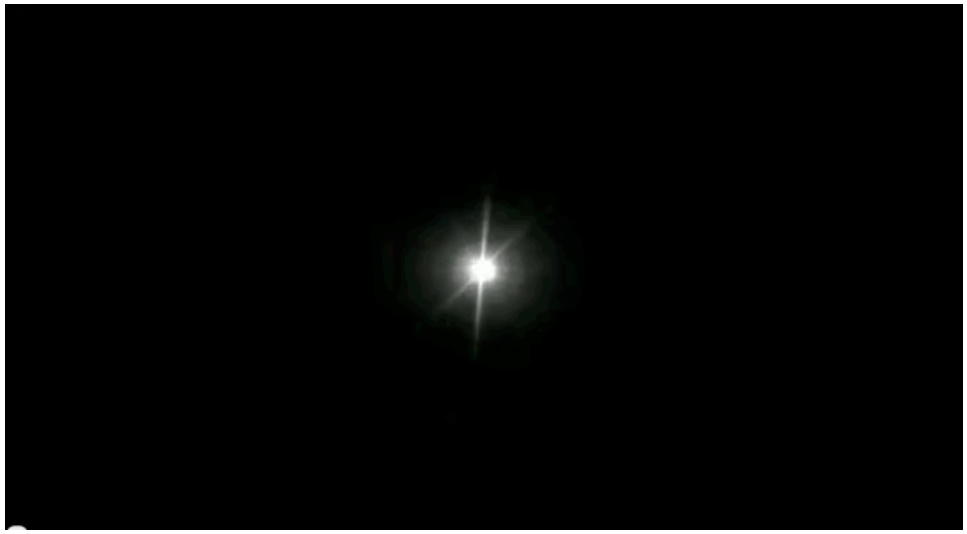
JAPAN'S NUCLEAR POWER PLANTS
TOMARI
JAPAN
ONAGAWA
SHIKA
FUKUSHIMA
TOKAI
TAKAHAMA
SHIBUYAEGGMAN
IKATA
HAMAOKA
SENDAI
FOX NEWS .COM
S KUNDUZ PROVINCE... THE ATTACK IS THE SE
S&P 500 1,296.39


Reference Map
Japan Gridded Population Cartogram

Maps


Horizontal Displacement
Vertical Displacement
1 m
05:30:00 UTC
0.5 m
200 km
Geophysical Institute, Univ. Alaska Fairbanks
Preliminary GPS time series provided by the ARIA team at JPL and Caltech. All original GEONET RINEX data provided to Caltech by the Geospatial Information Authority (GSI) of Japan.

2011-03-11 04:34



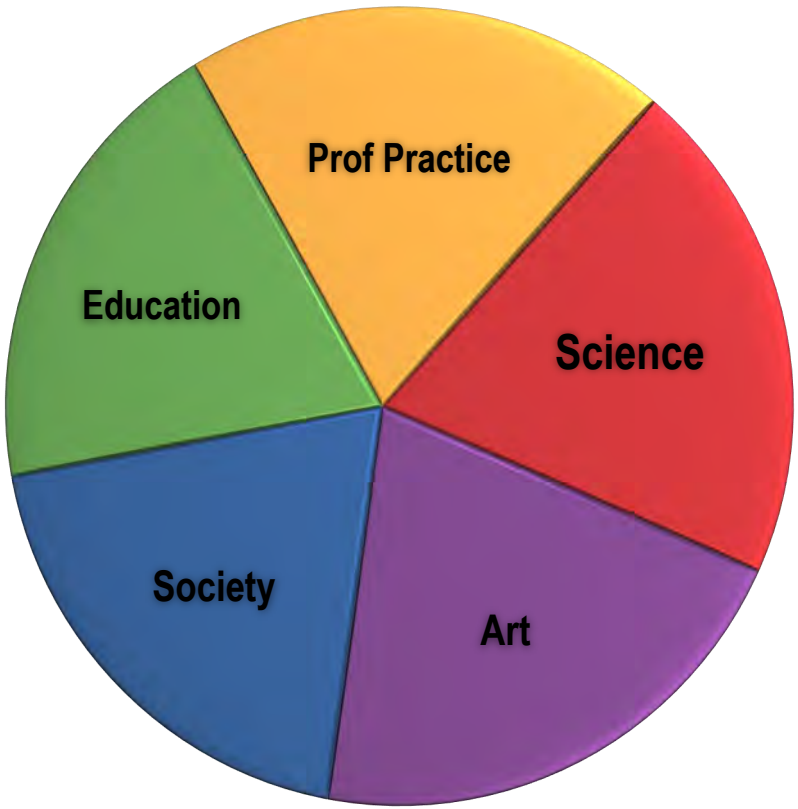
International Cartographic Association

- The International Cartographic Association aims to advance the study of cartographic or geographic information (GI) science issues.

- It realizes this by initiating, fostering and co-ordinating research in cartography and GI science, and by organizing international and regional conferences, meetings, exhibitions and outreach programs.

www.icaci.org

ICA's operating environments

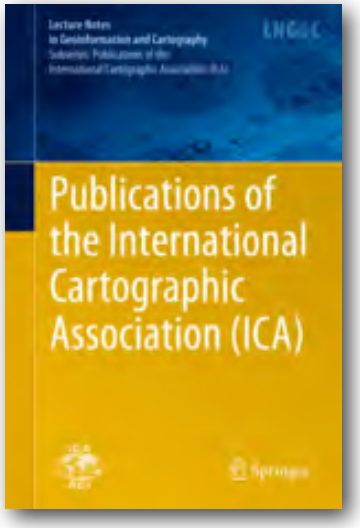


- promote application of cartography
- development and promotion of our subject
- support professionals and users
- development scientific and technology base
- stimulate a good design

ICA Instruments: publications

books

proceedings



newsletter

ICA Instruments:
outreach and capacity building programs

ICA Instruments: conferences

ICA Instruments: Commissions

- Commission on Map Design
- Commission on Map Production and Geo-Business
- Commission on Map Projections
- Commission on Mapping from Remote Sensor Imagery
- Commission on Maps and Graphics for Blind and Partially Sighted People
- Commission on Maps and Society
- Commission on Maps and the Internet
- Commission on Mountain Cartography
- Commission on Neocartography
- Commission on Open Source Geospatial Technologies
- Commission on Planetary Cartography
- Commission on Theoretical Cartography
- Commission on Ubiquitous Mapping
- Commission on Use and User Issues
- Commission on Art and Cartography
- Commission on Atlases
- Commission on Cartography and Children
- Commission on Cartography in Early Warning and Crisis Management
- Commission on Cognitive Visualization
- Commission on Data Quality
- Commission on Digital Technologies in Cartographic Heritage
- Commission on Education and Training
- Commission on Generalisation and Multiple Representation
- Commission on Geoinformation Infrastructures and Standards
- Commission on Geospatial Analysis and Modeling
- Commission on Geovisualization
- Commission on GI for Sustainability
- Commission on the History of Cartography

Commission on Cartography in Early Warning and Crisis Management

Terms of Reference

- Provide leadership in the development of concepts ...
- Promote the cartographic use of ...
- Investigate psychological condition of end user ...
- Foster quality mapping and cartographic modeling ...
- Participate and contribute to ...
- Promote the development of dynamic and real-time cartographic ...
- Establish and cultivate professional networks ...
- Develop mechanisms of command and control systems ...
- Develop mapping methodologies .... in children perspectives ...

The 8th International Conference on Geo-information for Disaster Management

Gi4DM 2012

13-14 December, 2012,

Enschede, The Netherlands

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International Cartographic Association
Association Cartographique Internationale