



Geo-information for Disaster Management

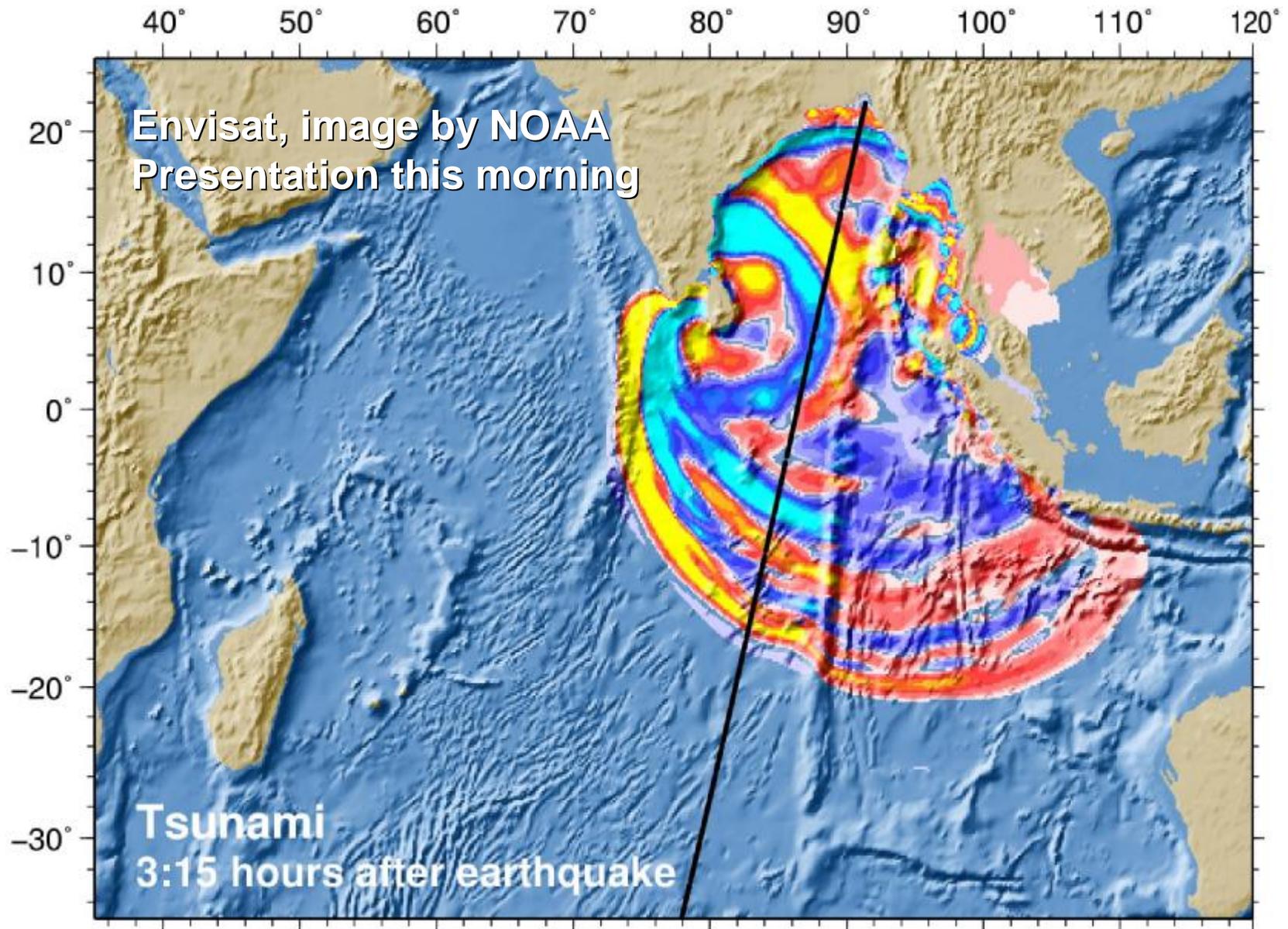
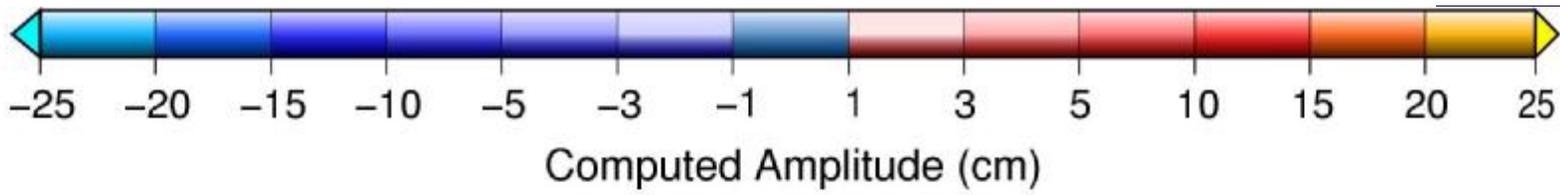


The First International Symposium on Geo-information for Disaster Management (Gi4DM) Delft, The Netherlands, March 21-23, 2005

Madison, US

Report of the Symposium to the Annual Meeting of FIG Commission 7

Christiaan Lemmen, Peter van Oosterom, Sisi Zlatanova, Elfriede Fendel

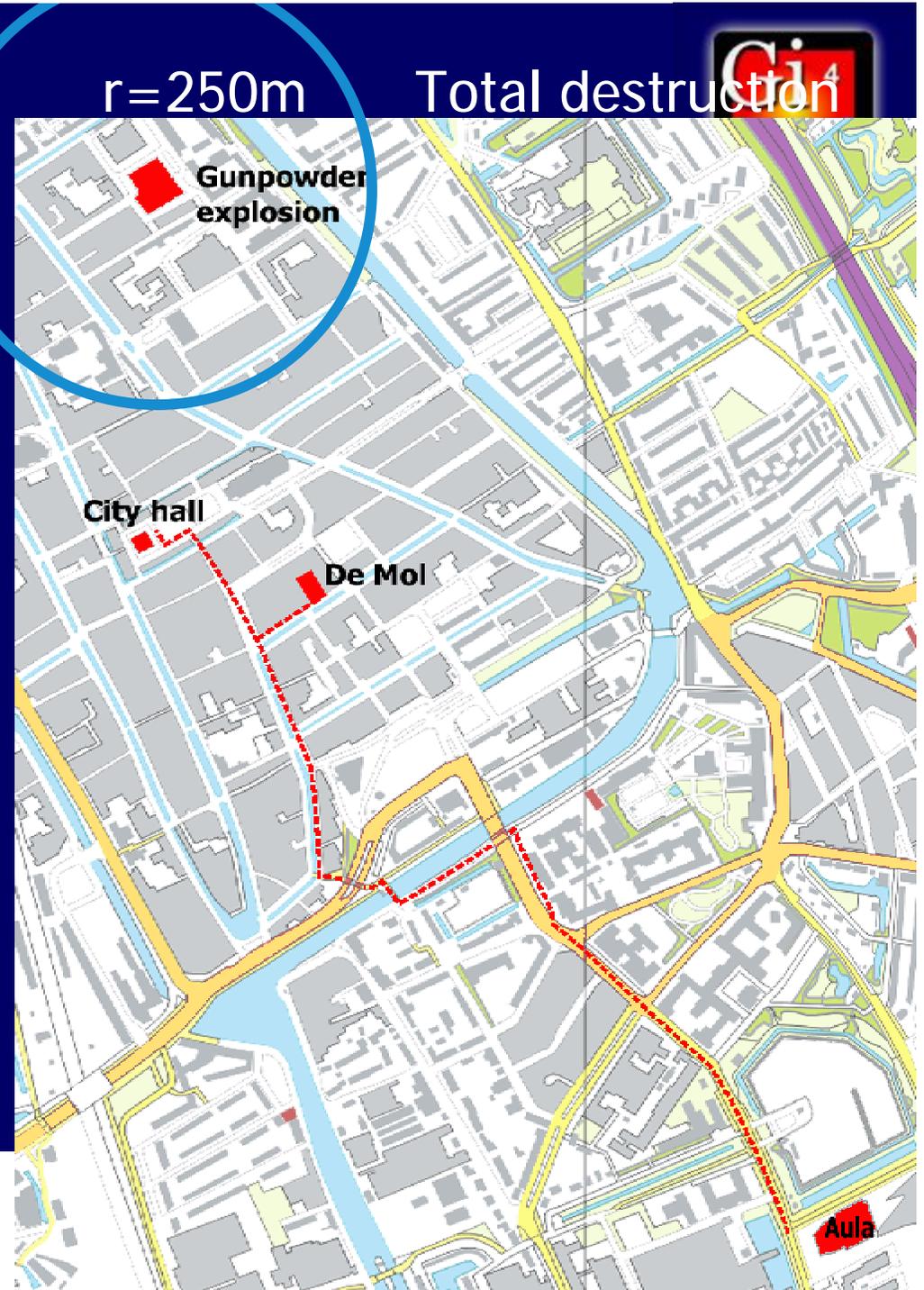


Painting by Egbert Lievensz van der Poel, 1654
collection Stedelijk Museum Het Prinsenhof, Delft



Gunpowder explosion, Delft 12 October 1654

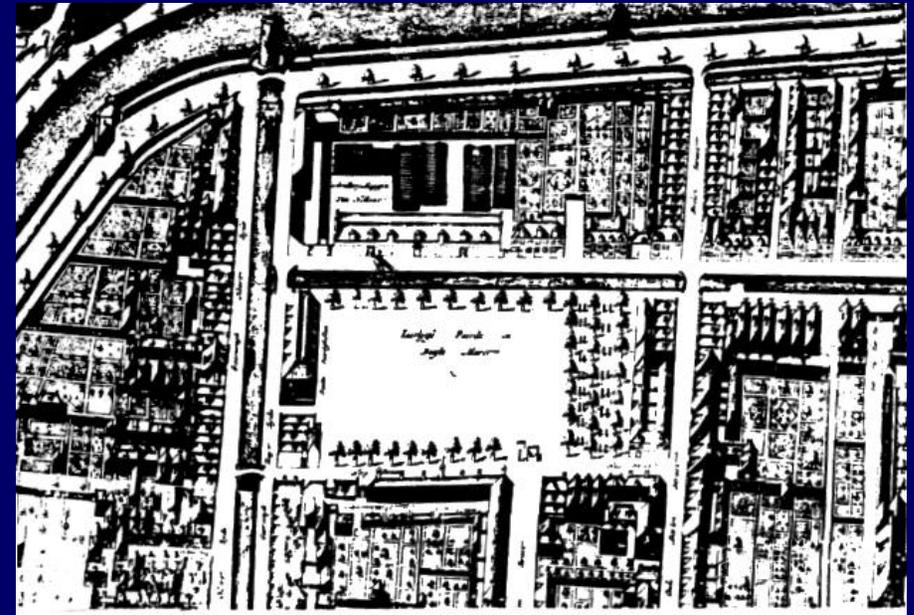
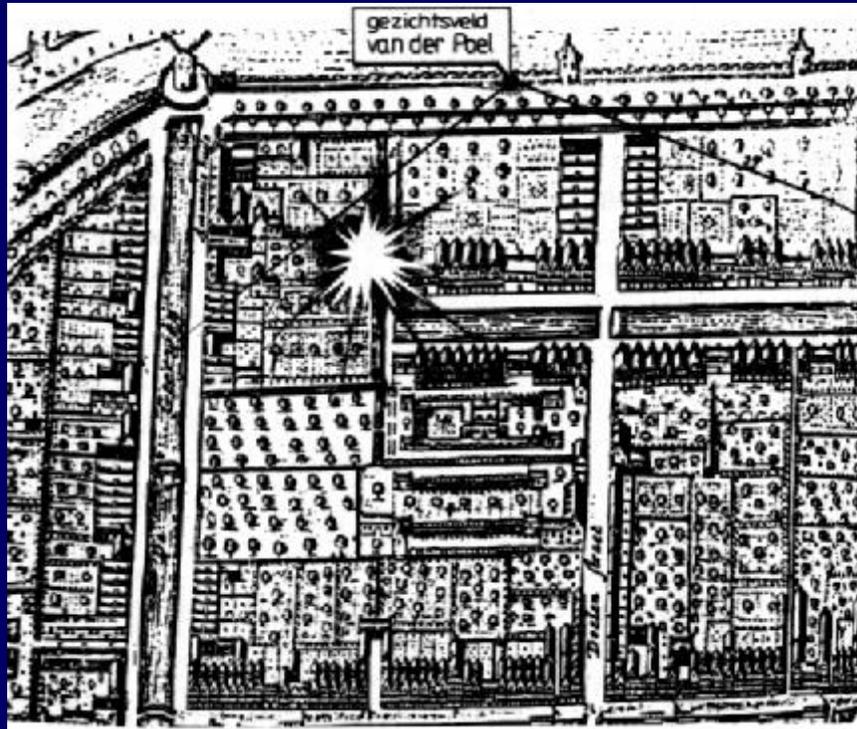
- 90.000 pound exploded (TNO: 40 ton TNT_{eq})
- 200 houses not found back, hundreds more destroyed
- 100 fatal casualties (some reports 1000s)
- Blast could be heard up to Texel (> 100km North)
- Warehouse was in the city



Old 'map'

<1654>

New 'map'





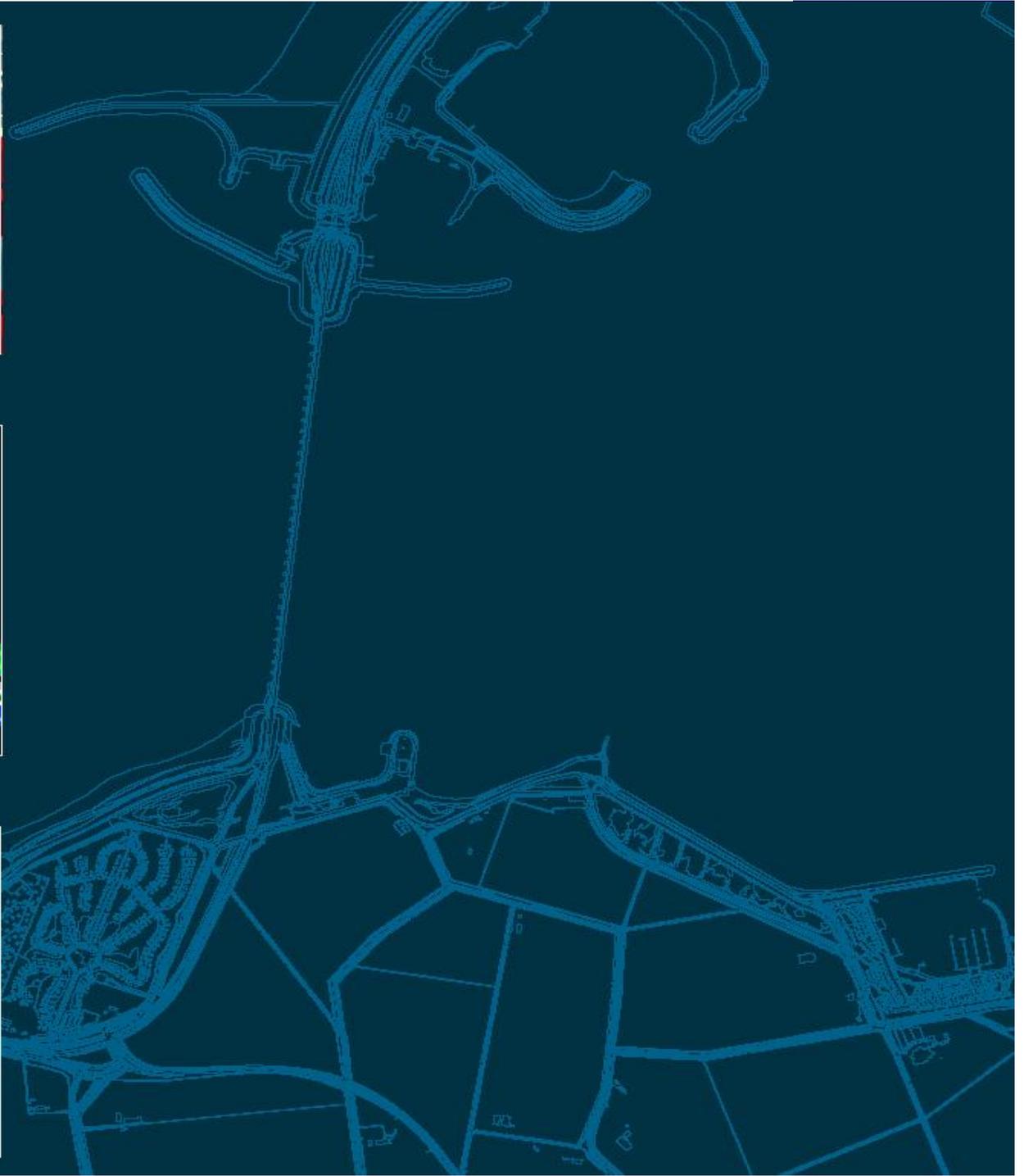
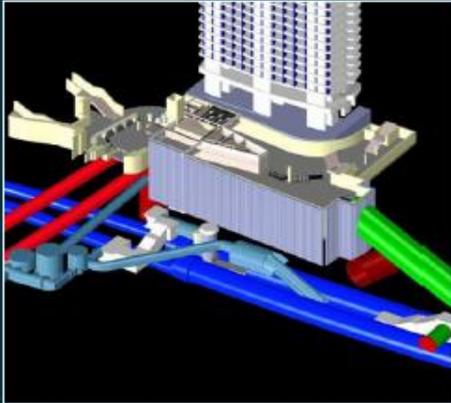
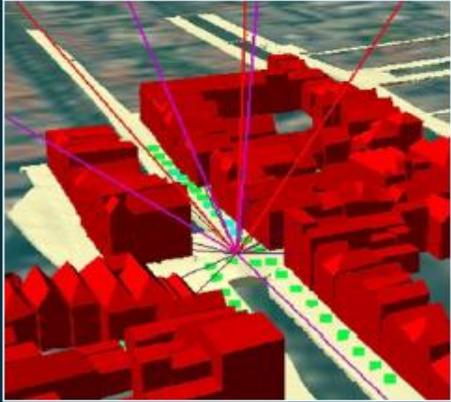
People learn (1)

- After Tsunami: warning system should be created in Indian Ocean; see resolution of International Union of Geological Sciences (IUGS), recommends
 1. establish system/procedures for early warning
 2. include geological hazards at all educational levels
 3. create/improve disaster management systems (monitor known indicators of natural disasters)
 4. multidisciplinary/multinational research on geological hazards (improve understanding /forecasting)
- Tsunami caused by: earthquakes, volcanic eruptions, and landslides
- Most dangerous natural disaster: meteorite, 3 times all life on Earth was destroyed (prof. Stefan Luthi)

People learn (2)

- Some examples from the recent NL past:
 - sea flooding Zeeland 1953 à Delta-works
 - river flooding Betuwe 1995 à New program for river management and improved dikes
 - firework disaster Enschede 2000 (4-5 ton TNT_{eq}) à more stringent regulations, checking of regulations







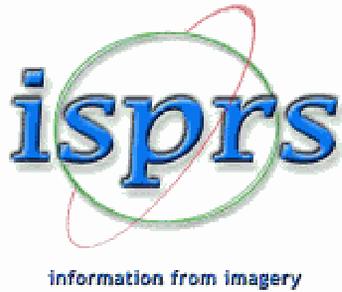
Geo-information

- Provides context awareness 'what/who is where'
- Integration from multiple sources needed
- 3D and temporal aspect very important
- Mixed indoor (CAD) and outdoor (GIS) information
- Enables analysis (routes, flooding prediction,...)
- Provides clear interface 'the map'
- Up to date information; monitoring by satellite sensors
- Positioning and navigation (GPS, Galileo)
- Location based services (LBS)



Cooperation

- Organizers: ISPRS, UN OOSA, ICA, FIG, OGC, AGILE, EuroSDR
- Sponsors: GIN, Rijkswaterstaat, Intergraph, ESRI, Bentley, Octaaf
- Working groups:
 - Spatial Data Integration for Emergency Services (ISPRS)
 - Early Warning and Risk management (ICA)
 - Risk and Crisis Management (OGC)
 - Disaster Management – Preventing Environmental Catastrophes
 - by Spatial Planning and Land Management (FIG)
- Next events India (2006), Canada (2007), China (2008) final planning
Joint Board of Spatial Information Societies



331 Participants from 58 Countries

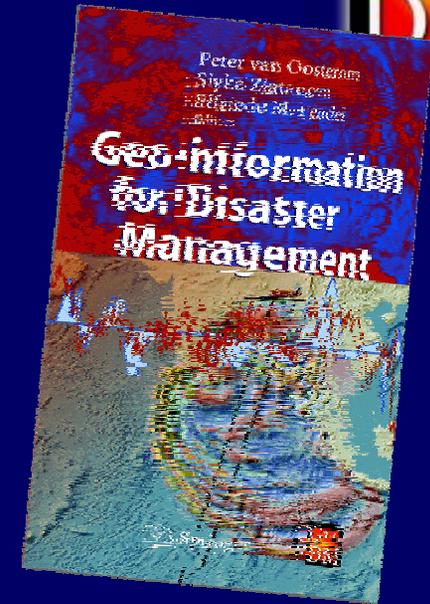


Afghanistan	1	Guatemala	1	Romania	3
Algeria	1	Hungary	1	Russia	5
Armenia	1	India	4	Saudi Arabia	1
Australia	2	Indonesia	7	Sierra Leone	4
Austria	7	Iran	2	South Africa	1
Belgium	11	Italy	13	South Korea	3
Botswana	1	Ivory Coast	1	Spain	1
Brunei	2	Japan	2	Sri Lanka	2
Bulgaria	4	Macedonia	1	Sweden	16
Cameroon	1	Malaysia	10	Switzerland	2
Canada	6	Nepal	3	Syria	1
China	12	Nigeria	7	Thailand	3
Congo	2	Norway	1	The Netherlands	106
Czech	1	Oman	1	Turkey	4
Denmark	5	Pakistan	2	Uganda	1
Egypt	3	Philippines	1	United Kingdom	8
Ethiopia	1	Poland	2	USA	12
Finland	1	Portugal	2	Vietnam	2
France	9				
Germany	17				
Ghana	5				
Greece	2				

Gi4DM Programme



- 4 keynotes
- 22 presentations in plenary sessions
- 49 presentations in parallel sessions
- 50 poster presentations
- Special sessions include:
 - Life Geo-web services 'high river water scenario'
 - Discussion panel (moderated by Orhan Altan, secretary general of the ISPRS)





Symposium goal: treat disaster management in its entirety

- Technology: hard/software
- user requirements for geo-information information
- providers (data and standards).
- Aspects addressed:
 1. state-of-the-art in Disaster Management
 2. review of tools, software, geo-information sources, organizational structures and methods for work in crisis situations
 3. outline of the drawbacks in current use of geo-information
 4. some suggestions for future research directions

What was said:

- 'GIS is a tool, it does not solve everything by itself'
- 'there is difference between 'small' disasters and 'big' disasters'
- 'we have to educate disaster managers'
- 'geo-ICT has to learn from disasters'
- 'technologically everything is possible'
- 'the problem is organization and communication between partners'
- 'our geo-information dates from 1973'
- 'response phase cannot be isolated from prevention'
- 'data integration should be based on ontology and semantics'
- 'data are available after 3 days' vs. 'data were available after 3 hours'
- 'we have to stay close to the users'
- 'not all the people can work with total station but everybody can measure with steal type'
- 'is it possible to extend this software to 3D?'

Factors

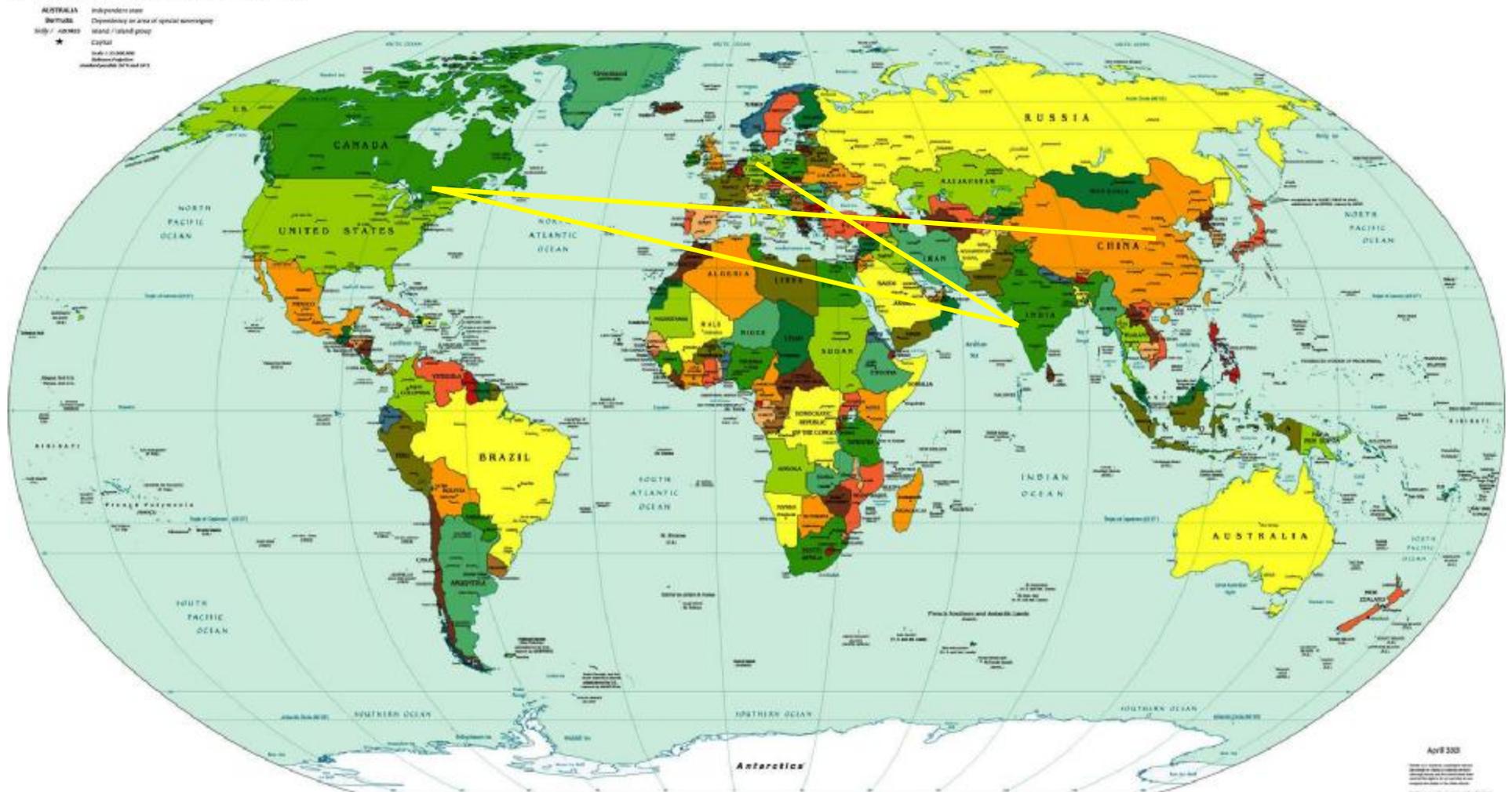
- Type and extend of the disaster
- Phase of disaster management
- Decision-making level
- Available data & technology (vary from country to country)
- Legislation
- Human factor (behavior in stress)

Technology for emergency response



- Fast
- Context awareness 'what/who/where/how'
- Integration from multiple sources
- 3D and temporal aspect very important
- Mixed indoor (CAD) and outdoor (GIS) information
- Enables analysis (evacuation routes, flooding prediction,...)
- Provides clear presentation (image, 2D/3D graphics, video, text, sound/voice)
- Up to date information: monitoring by terrestrial, airborne, satellite sensors
- Positioning and navigation (GPS, Galileo, telecommunications)
- Wireless communication and services
- Web-based, open source
- Multidisaster, multiteam

Political Map of the World, April 2001



Series Symposia across the continents

Next Symposia in 2006

October 9-13, 2006 in Goa, India



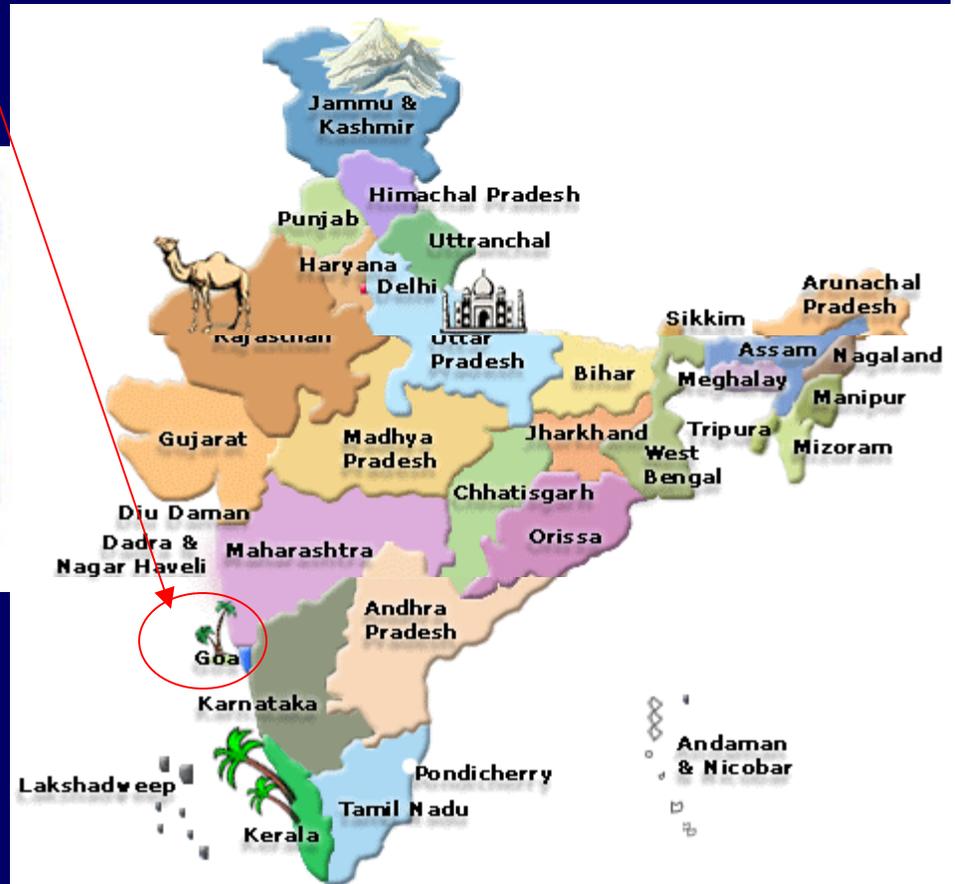
Anjuna Beach



Basilica Church



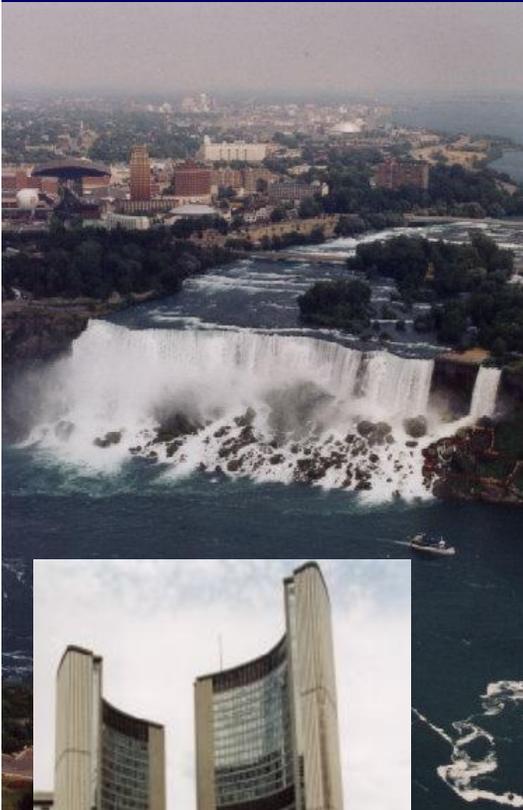
Mahadev Temple, Tambdi Surla



Gi4DM in 2007, Toronto Canada

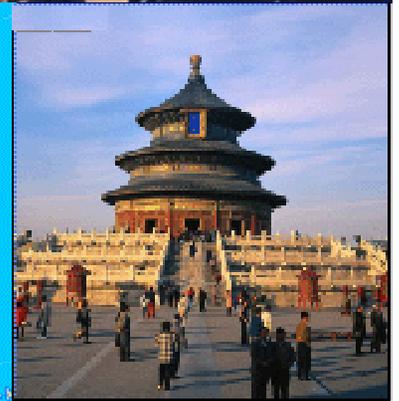
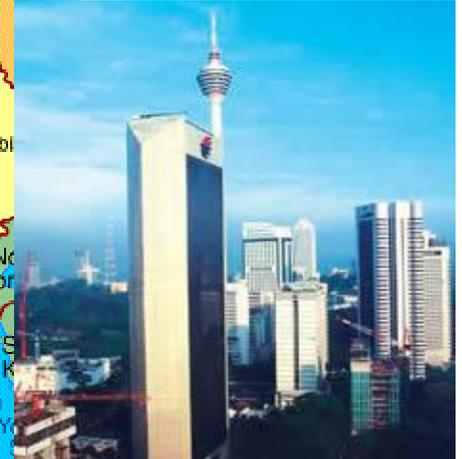


May or June 2007, Toronto, Ontario



Gi4DM in 2008, Beijing, China

July 2007, Beijing China





International Cooperation

- Co-organizers: ISPRS, EuroSDR, AGILE, UN OOSA, ICA, FIG, OGC

Working groups:

- Hazards, Disasters and Public Health, ISPRS WG VIII/2
- Early Warning and Risk management (ICA)
- Risk and Crisis Management (OGC)
- Disaster Management – Preventing Environmental Catastrophes by Spatial Planning and Land Management (FIG)

FIG, April, Cairo, Joint Board of Spatial Information Societies





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Pictures by
Axel Smits



Thank you

