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Tackling hazardous Earth: a personal perspective

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Outline

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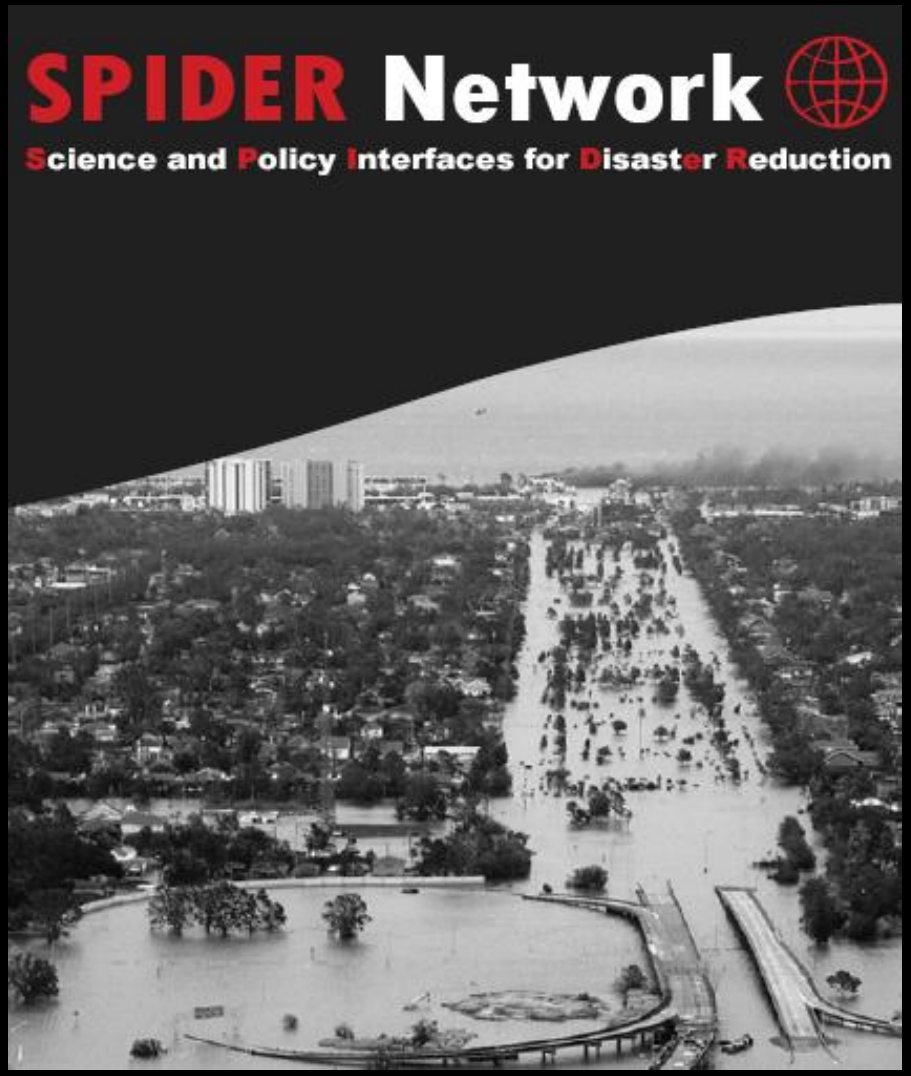
- Hazards and disasters: where are we now?
- Some key issues
- Preparing for disasters
- How can science help?
- Looking ahead: reducing disaster risk in 2030 and beyond
- Where do we go from here?



Where are we now?
a year on hazardous Earth

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Bam, Iran (2003)

- 50 or so volcanoes erupt
- Around 150 potentially destructive quakes
- 40-50 tropical cyclones
- Numerous floods, landslides, tornadoes and extra-tropical storms
- In 2000, 1 in 30 people were affected by natural hazards

From hazard to disaster

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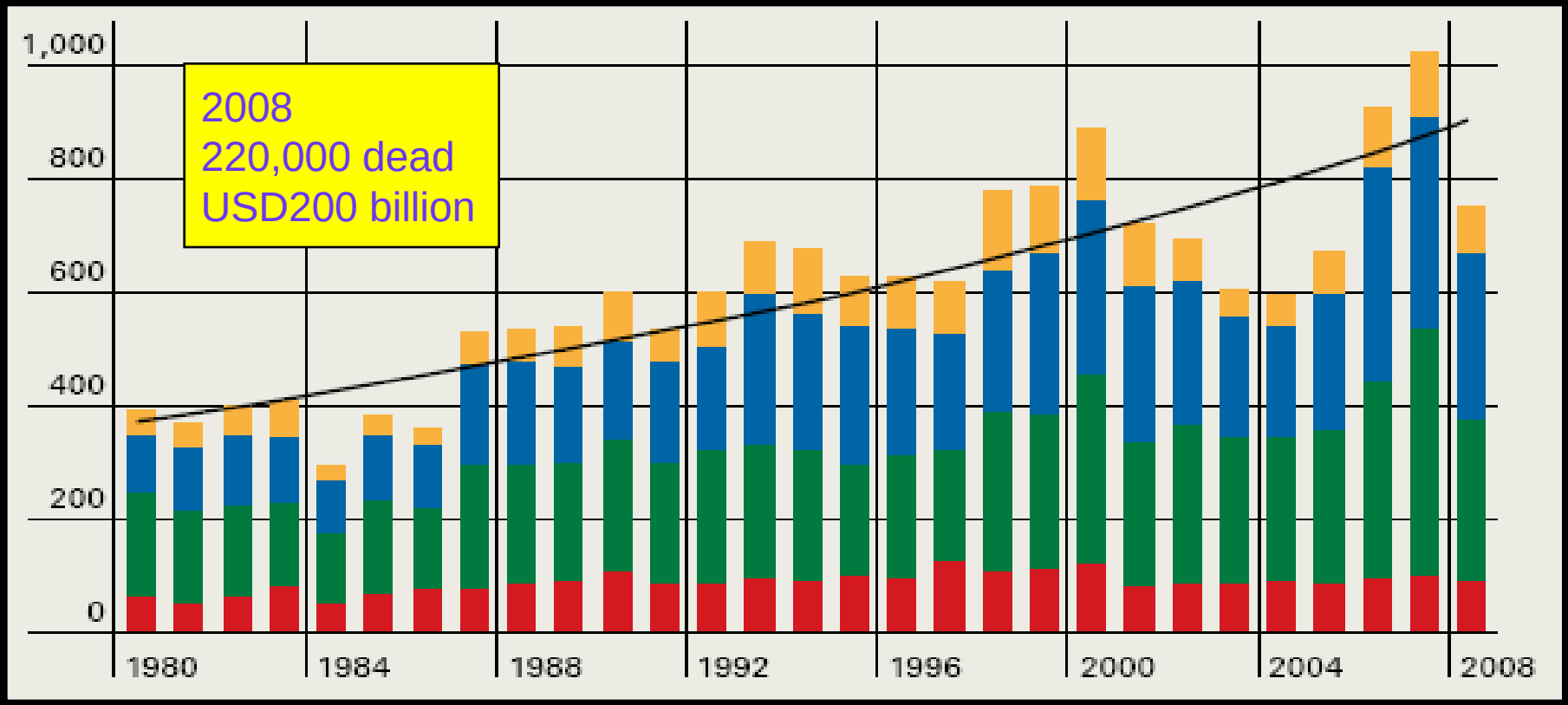

No reason: no excuse

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Banda Aceh, Indonesia (2004)

Parts of the problem

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Kashmir, Pakistan (2005)

- Focus still skewed towards response
- Inadequate awareness of the hazard
- Poor understanding of risk
- Ineffective engagement between practitioners and the scientific community
- Insufficient belief in scientific forecasts
- Lack of political will, monetary support or technical expertise

Preparedness is everything

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- Disaster response alone inadequate
  - does little to limit damage or save lives syn-event
- Purely re-active
  - does not tackle the heart of the disaster reduction problem
- Improving preparedness is THE key to reducing impact of natural disasters
  - reduces required level of response materially and financially
  - reduces recovery time
  - decreases impact of disasters on society & economy
- Is thus a KEY element in improving response

Cyclone Nargis, Myanmar (2008)

What to prepare for?

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Sichuan, China (2008)

- Natural disasters require natural hazards
- Hazard and risk recognition and characterisation requires scientific research
- Effective preparedness must look to & embrace such research
- Tectonic hazard numbers are constant
- Climate hazards are rising
  - Windstorms
  - Floods and drought
  - Landslides & avalanches
  - Cold & heat waves
  - Wildfires
- Hazard & risk science can help forecast where and when and much more

Bringing science on board

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- Effective preparedness requires hazard & risk….
  - Recognition and assessment
  - Process & mechanism research
  - Monitoring
  - Forecasting & prediction
  - Mitigation & avoidance
  - Education
  - Communication
- The hazard & risk science community has a major role to play in all of these

Gujarat, India (2001)

Monitoring and prediction

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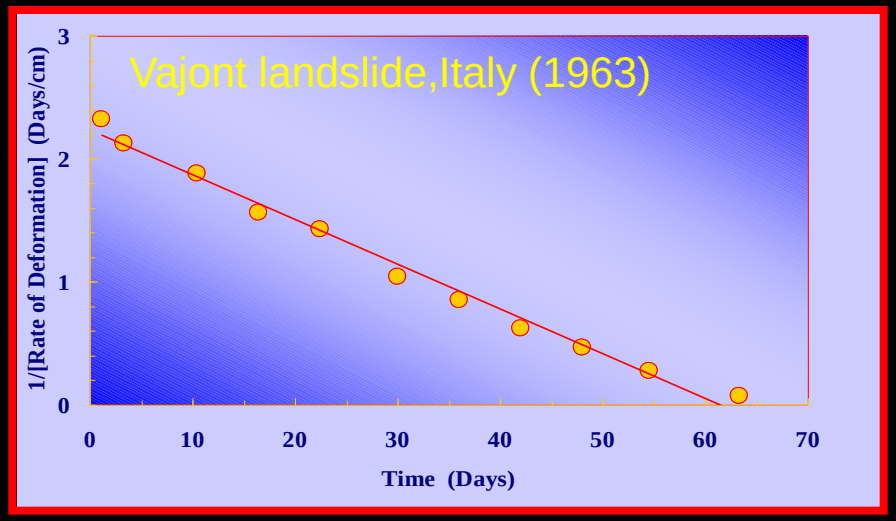

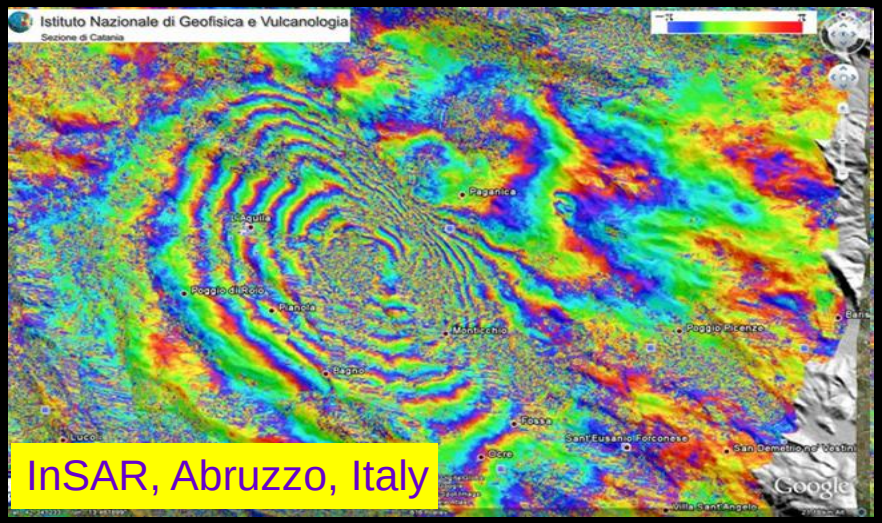

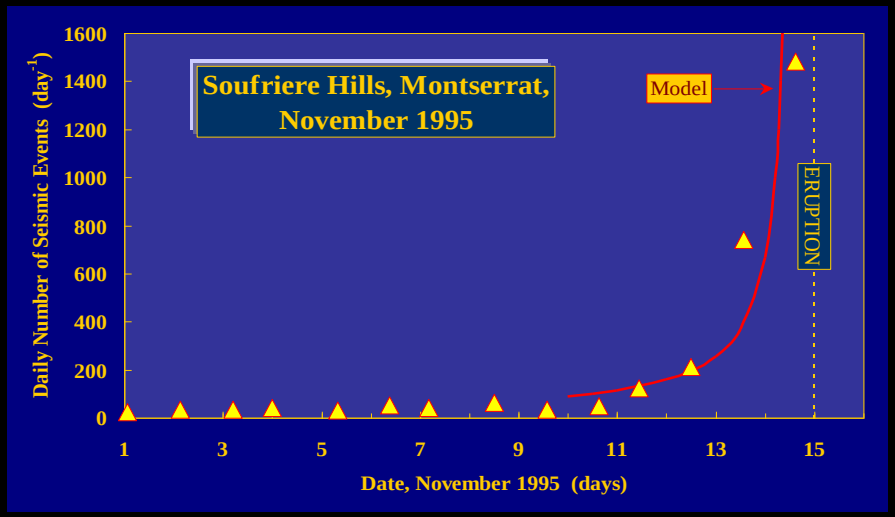

Identifying future threats

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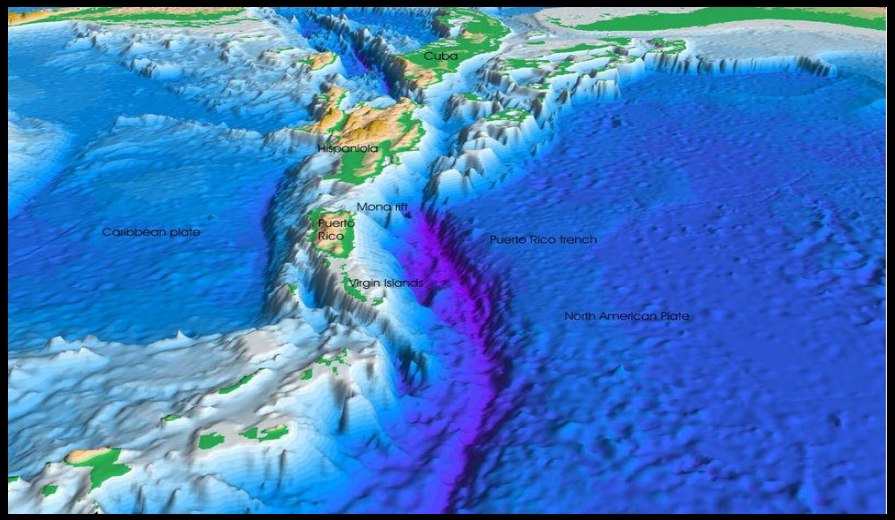

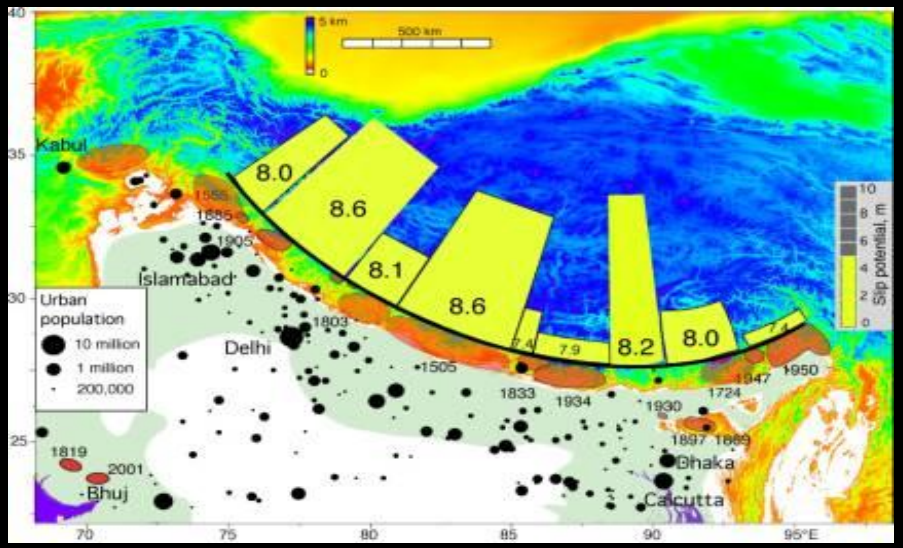

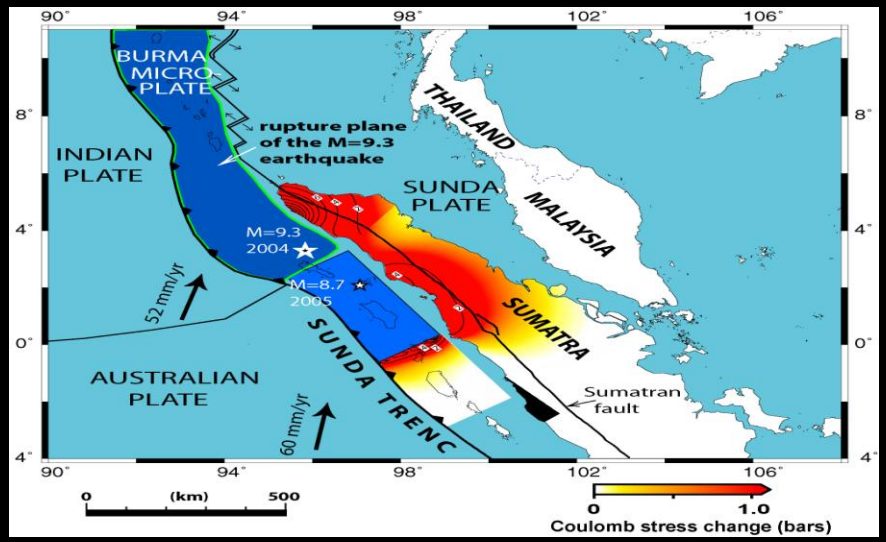

Forecasting: days to years ahead

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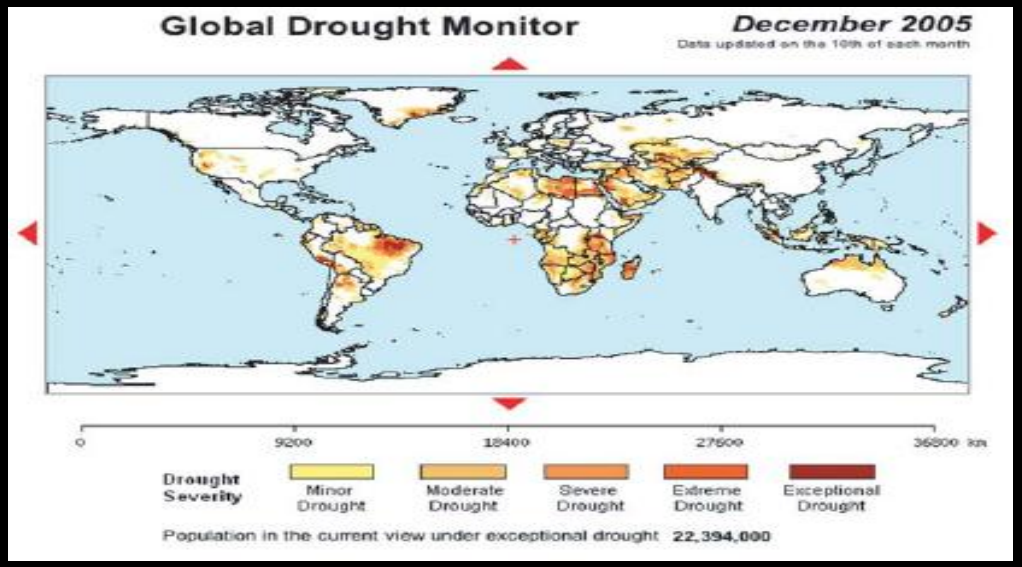

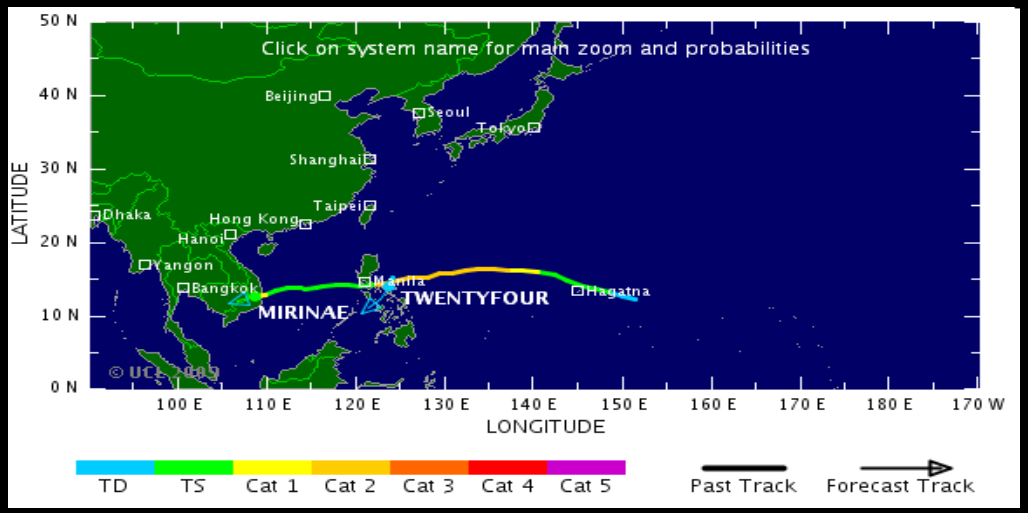

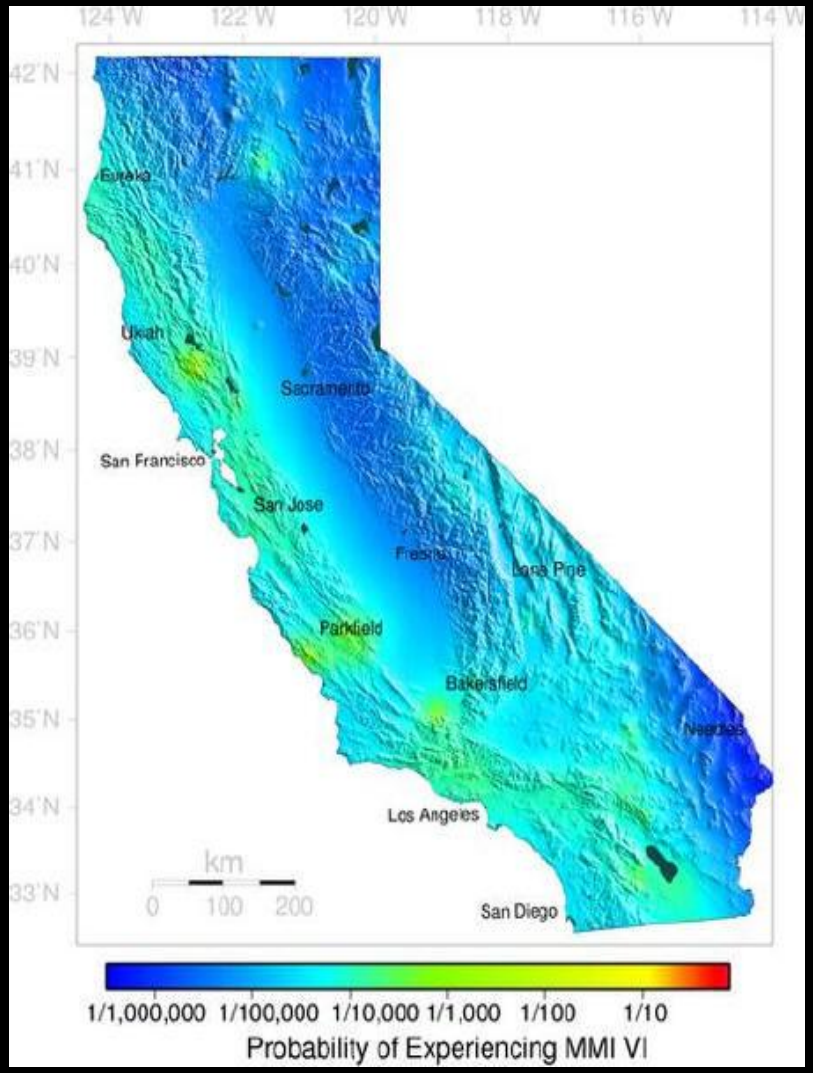

Mitigation and avoidance

Quake-proof homes (Gujarat)

- Nature and parameters of hazard needs to be known in advance
  - Likely event
  - Maximum event
- Long-term
  - Land-use planning
  - Construction codes
- Short-term
  - Temporary barriers (flood; lava)
- Issues
  - Cost/expertise
  - Prioritisation
  - Political will
  - Enforcement
- Links to education

Education & Communication

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inTERRAgate

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Developing global hazard preparedness

INTRODUCTION

2005 saw 91,963 people killed and 157,511,938 affected in a series of major disasters that included the aftermath of the Asian tsunami, the Pakistan earthquake, and hurricane Katrina, all of which highlighted the fundamental lack of hazard information held by disaster management NGOs and humanitarian agencies across the world.

Although large magnitude hazards capture global attention and generate volumes of post disaster data, there are numerous areas across the world that often experience or are overdue for small to medium scale hazard events, which have very little information held on them.

Collation of fundamental information including; those countries most prone to hazards and the types they face, potential future events, and the impacts of past events is sorely lacking. It is this information that is vital in order to provide effective pre-, during- and post- disaster data and analysis, which will enable full utilisation of resources to save lives and develop informed hazard planning and mitigation strategies.

inTERRAgate is aimed at filling this knowledge gap through the development of an online gateway aimed at disaster management NGOs and humanitarian agencies, which will provide a natural hazard inventory for every country in the world.

PARTNERSHIPS AND SERVICES

Benfield Hazard Research Centre (BHRC) and SARAID (Search And Rescue Assistance In Disasters) are working together to develop inTERRAgate - a global online database comprising:

- A hazard profile for every nation
- Forecasts and early warnings of hazardous events
- Past disasters and their impacts, to identify the potential scale and consequences of future events along with the most likely affected areas
- Contact details of in-country government departments, NGOs, and scientific contacts
- Links to online sources of information, including available and appropriate online GIS applications

Benfield Hazard Research Centre is able to draw on the services of a wide range of hazard and risk expertise from within University College London (UCL) and through an extensive research and operations network, which will be combined with logistical and primary contact data collected and updates by SARAID. This will include specific data about access to and mobility within individual countries and across the world.

WEBSITE DELIVERABLES

The inTERRAgate website will provide an online gateway to comprehensive hazard information on each of the world's nation states - drawing attention to potential future threats to improve preparedness and foster appropriate mitigation and management methodologies.

Through use of the inTERRAgate site, disaster management NGOs and humanitarian agencies can be better prepared for the occurrence of natural hazards through country specific pages that will continuously be updated with possible scenarios and effects.

Upon completion of the database it will automatically update and users will be able to upload data to it. With use of the inTERRAgate system, international response teams will be 90 percent prepared for all eventualities, being able to identify the most vulnerable countries, check the likely range of anticipated hazards, and view on-tap information about the host country.

Discussion boards will also provide a platform for the exchange of vital information between groups, and the discussion of, new research, design practices, and hazard event threads as disasters unfold.

Users will also be able to sign up to the site to receive details of important developments and events.

Figure 1 – inTERRAgate system and development user interface - A sample page can be seen online at: www.inTERRAgate.info/countries/iran/index.html (Images: Benfield Hazard Research Centre, SARAID, NASA)

Work with us....

PROJECT SPONSORS

inTERRAgate is currently working with BHRC, SARAID, and UCL. We are looking for further project sponsors and data sources to provide users with the most extensive information network available in order to make informed decisions.

If you believe that you have services or links that may be useful to the inTERRAgate project, please contact Lucy Stanbrough at L.Stanbrough@ucl.ac.uk. A sample project page can be seen at www.inTERRAgate.info/countries/iran/index.html, from which you can see the sites user interface and other development pages currently available for viewing.

If you would like to be kept up to date with project development and be alerted when new sections are uploaded please register your interest at www.inTERRAgate.info/contact/index.html

Enquiries and requests for further information can be submitted to Lucy Stanbrough via email at L.Stanbrough@ucl.ac.uk or in writing to: Benfield Hazard Research Centre, Department of Earth Sciences, 136 Gower Street, UCL, London, WC1E 6BT

www.interragate.info

- PROJECT CARIB: Communications during Volcanic Crises
  - DFID-funded project
  - Designed to improve working between scientists, authorities and media
- ESWAVE (Education for Self-warning and Voluntary Evacuation)
  - TVE tsunami awareness film proposal

Looking ahead: bleak prospects?

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- Increasing concentration of people and wealth
- Growing occupation of marginal and high risk locations
- Climate change and environmental degradation
- Resource singularity

DRR in a Perfect Storm: 2030 and beyond

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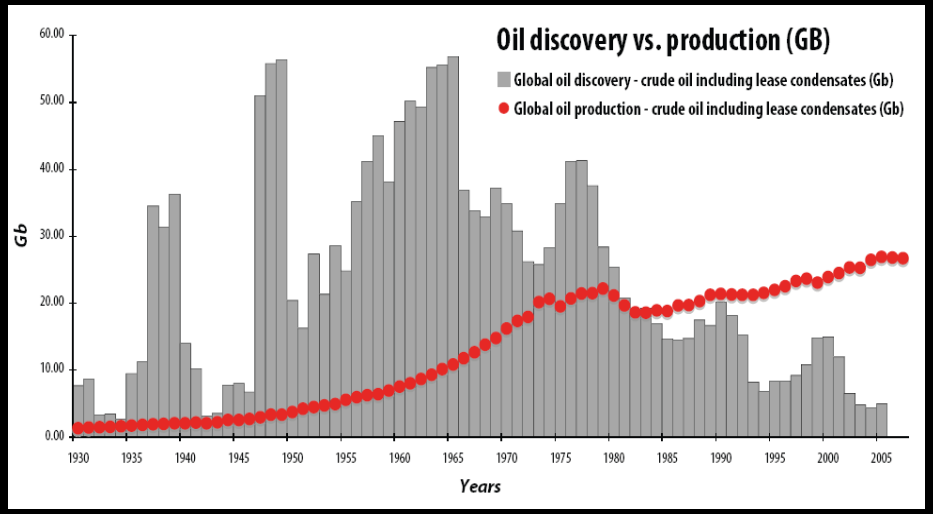

- By 2020 PEAK OIL
  - Production ceased to grow between 2005 and 2008
- By 2030 PEAK ALL
  - Global society will need resources of 2 planets to supply needs
  - 50% more food; 50% more energy; 30% more water
- Peak oil and Peak All critical
  - Massive impact on global economy
  - Affect ability of nations to prepare for and respond to disasters
  - Multipliers in relation to impact of disasters on society and economy

A role for DRR in 2050 and beyond?

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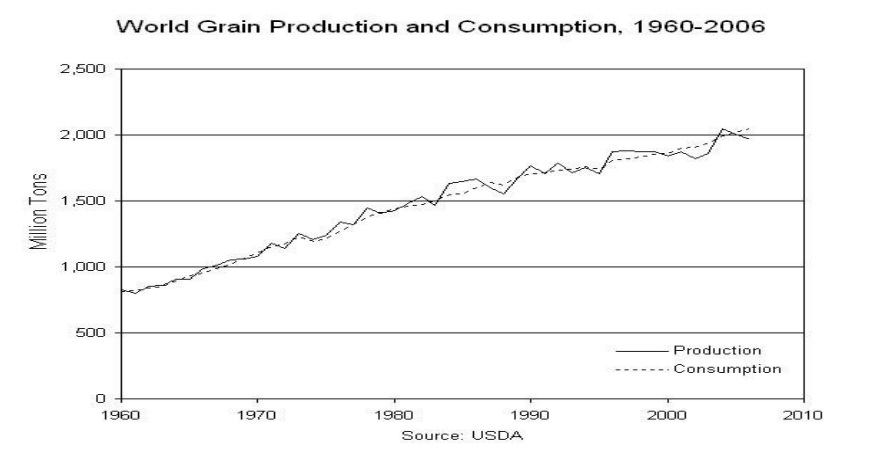
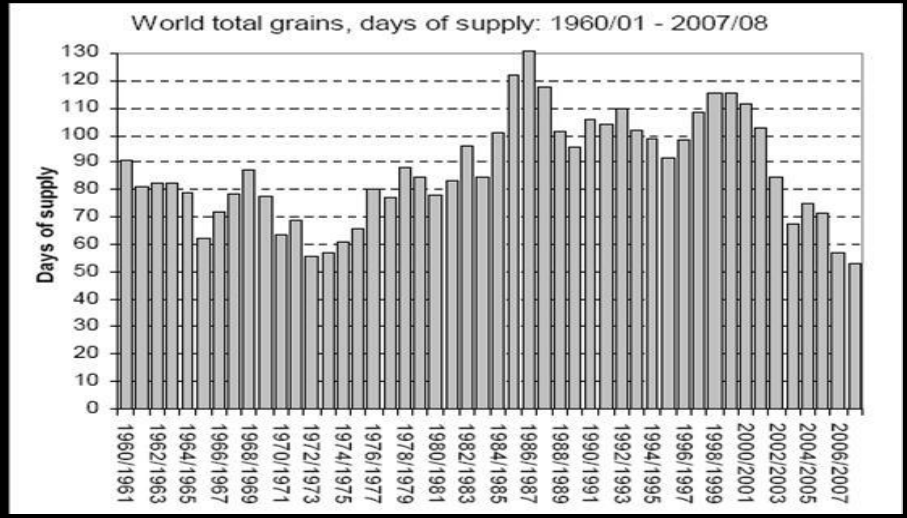
- Himalayan glaciers that supply water for 40% of world's population gone by 2050?
- 160 water wars flashpoints
- 2050 global food production could be 25% down
- Half the world predicted to face serious food shortages by 2100





Climate catastrophe?

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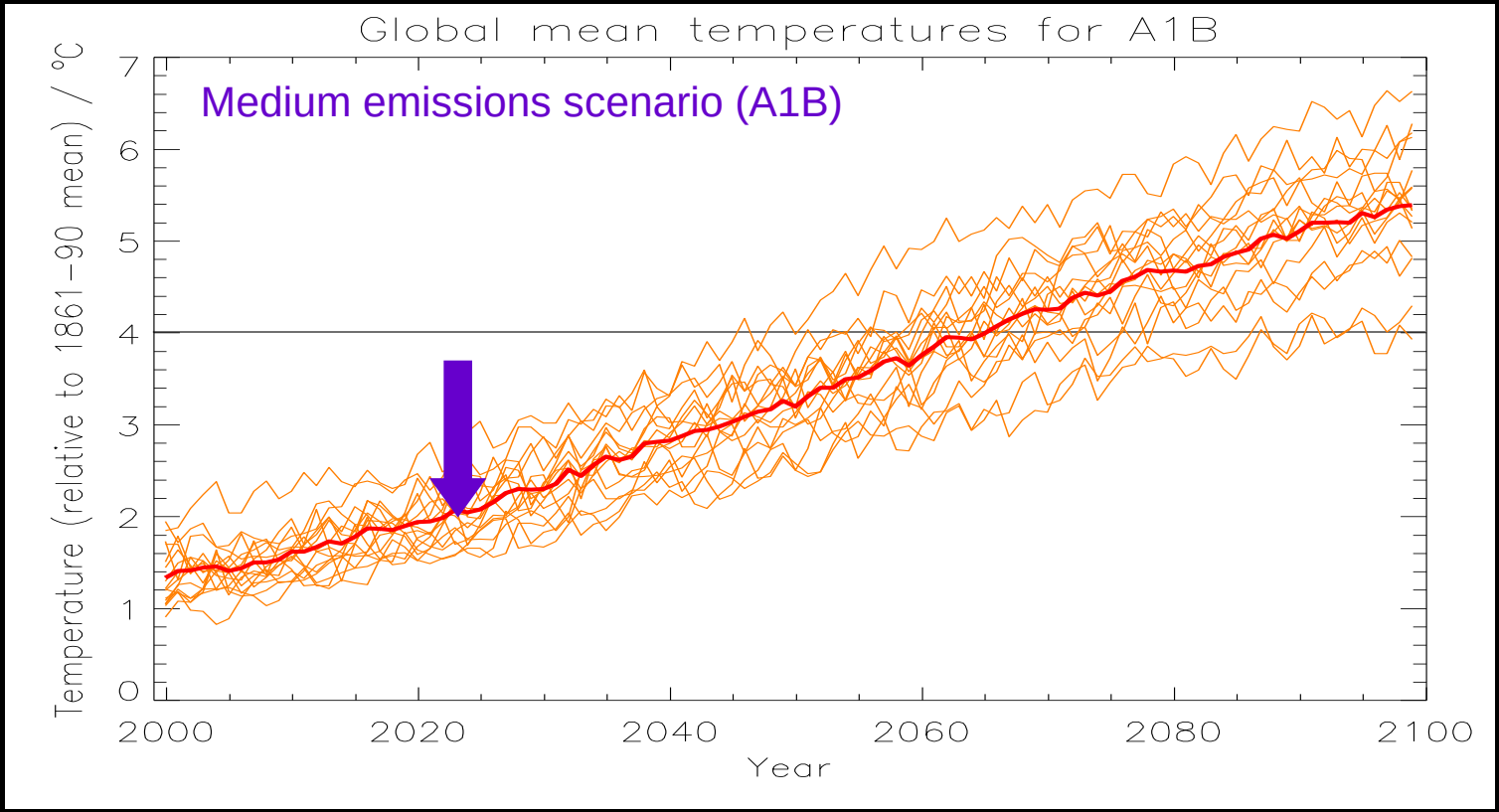

Where do we go from here? Three questions

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Popocatapetl over Mexico City

- How do we shift the focus of disaster risk reduction further from response towards preparedness?
- How can we more effectively embed hazard and risk science within DRR?
- How can DRR best operate in a chaotic world?