

# Appendix 1



IUGG Commission on Geophysical Risk and Sustainability

## GeoRisk Commission

### 2004 Report

<http://www.mitp.ru/georisk/>

The Inter-association Commission on Geophysical Risk and Sustainability is also known as the GeoRisk Commission. It was established by the IUGG Bureau in August 2000 to study the interaction between hazards, their likelihood and their wider social consequences as a result of the vulnerability of societies.

The GeoRisk Commission Executive consists of Tom Beer (Chair), Grant Heiken (Secretary), Paula Dunbar (Treasurer), Alik Ismail-Zadeh (vice-chair), and Kuniyoshi Takeuchi (vice-chair).

The representatives of the Associations are:

Commissioner	Association	e-mail address
Tom Beer	Chair	Tom.Beer@csiro.au
Alik Ismail-Zadeh	Vice-chair	aismail@mitp.ru
Hermann Drewes	IAG	drewes@dfgi.badw.de
Kosuke Heki	IAG	Heki@miz.nao.ac.jp
Susan McLean	IAGA	Susan.Mclean@noaa.gov
Kuni Takeuchi	IAHS & Vice-chair	takeuchi @yamanashi.ac.jp
Gerd Tetzlaff	IAMAS	tetzlaff@rz.uni-leipzig.de
Evgeny Kontar	IAPSO	ekontar@ocean.fsu.edu
Ramesh P. Singh	IAPSO	ramesh@iitk.ac.in
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Grant Heiken	IAVCEI & Secretary	<a href="mailto:heiken@whidbey.com">heiken@whidbey.com</a>
Uri Shamir	IUGG	shamir@tx.technion.ac.il
Harsh Gupta	IUGG	<a href="mailto:harshgupta@nic.in">harshgupta@nic.in</a>
Paula Dunbar	Treasurer	<a href="mailto:Paula.Dunbar@noaa.gov">Paula.Dunbar@noaa.gov</a>
Slava Gusiakov	Tsunami Commission	<a href="mailto:gvk@sscc.ru">gvk@sscc.ru</a>

Both the Chair (Tom Beer) and the Secretary (Grant Heiken) indicated a desire to step down from their roles. The Executive of the IUGG has appointed as replacements: Dr Alik Ismail-Zadeh as Chair, Prof. Ramesh Singh as Vice-chair, and Dr Gerd Tetzlaff as Secretary.

### Publication of Sapporo Symposium

The Commission convened and organised two sessions at the IUGG General Assembly. One of these was an invited session that formed part of the “State of the Planet” theme. Papers from this session have been published by AGU as a Geophysical Monograph Volume 150.

Further information is available at:

<https://www.agu.org/cgi-bin/agubookstore?memb=agu&topic=..GM&book=GEGM1504157>

## **Stockholm symposium**

The GeoRisk Commission again combined with EuroScience to arrange a symposium at the EuroScience meeting in Stockholm in August 2004. Professor G. Papadopoulos has delivered the Rammal Award lecture at the symposium on Risk Science, Society and Sustainability that was held in Stockholm on 26-27 August 2004. Other presentations were made by E. Kontar, A. Makarenko, U. Shamir, T. Beer, F. Wenzel, P. Wiedemann and J. Paterson. A report of the meeting was published in *EOS, Transactions of the American Geophysical Union*, **85** (44) 453 (2 November 2004).

## **Hazards 2004**

Hazards 2004 is the name given to the combined meeting that constitutes the Third Workshop of the IUGG Commission on Geophysical Risk and Sustainability & the Tenth International Symposium on Natural and Human-Induced Hazards of the Natural Hazards Society.

The meeting will be held in Hyderabad, India 2-4 December 2004.

At the close of submissions about one hundred participants were expected. The program can be found at [www.hazards2004.org](http://www.hazards2004.org), and it incorporates the business meeting of the Commission.

Plans are presently underway to have one or possibly two special issues of the Springer journal *Natural Hazards* with papers from the meeting – and possibly from the Euroscience symposium.

## **Webcyclopedia**

The webcyclopedia at:

<http://www.mitp.ru/georisk/webcyclopedia/index.html>

continues to collate information. The presentations given at the Sapporo Assembly have been incorporated into the webcyclopedia, and authors in the GeoRisk portion of the Hyderabad meeting will also be invited to submit their power point presentations for inclusion in the webcyclopedia. The commission continues to search for an editor for the project.

## **ICSU Projects**

The commission has been involved with three ICSU initiatives during the past year. These were:

1. Dark Nature Proposal
2. Near Earth Orbit Objects
3. GeoScience Unions Initiatives

### *Dark Nature Proposal*

The GeoRisk Commission supported a proposal by IUGS to study past natural catastrophes led by Prof. Suzanne Leroy of Brunel University. A planning meeting in Paris was attended

by Vice-Chair Alik Ismail-Zadeh at which it was believed that agreement was reached for the webcyclopedia to be the publication venue for the results of the project. In subsequent correspondence Prof. Leroy denied any such agreement and has indicated that there is no scope for interaction with IUGG on this project.

#### *Near Earth Orbit Objects*

Dr Slava Gusiakov attended a planning meeting on this project. The project was also successful in being funded.

#### *GeoScience Unions Initiatives*

The GeoSciences Unions of ICSU (namely IGU, IUGS, IUSS, IUGG) met in Paris in February 2004 and determined five topics for further action. One of these topics is Hazards, and IUGG agreed to lead action on this topic. Dr Tom Beer has been asked to co-ordinate action on this. An IYPE brochure on the topic is to be published by IUGS. See <http://www.esfs.org/downloads.htm> .

The GeoUnions Initiative Joint Science Team on Hazards will meet during the UN World Conference on Disaster Reduction in Kobe 18-22 January 2005. Anyone attending the Kobe meeting is invited to attend the GeoUnions meeting as an observer. Please let the Chair (Dr Beer) know if you wish to attend.

### **Future Plans**

The next workshop will be "Recent Geodynamics, Geophysical Risk and Sustainability in the Black Sea to Caspian Region", to be held in Baku, Azerbaijan from 3-6 July 2005.

Association representatives were asked to organise special sessions on Risk and Sustainability at their Association scientific assemblies. I am aware only of the session on Marine Risk and Sustainability being organised at the IAPSO scientific assembly in Cairns, August 2004.

The Commission has supported a proposal put forward by Slava Gusiakov titled: "Comprehensive historical earthquake and tsunami database for the South-West Pacific".

The Commission is part of a proposal for an EC initiative for Integrated Coastal Zone Management, known as SPICES. Evgeny Kontar represents the Commission. (see [http://www.ruoa.org/jsp/fiche\\_pagelibre.jsp?STNAV=&RUBNAV=&CODE=42971561&LANGUE=0](http://www.ruoa.org/jsp/fiche_pagelibre.jsp?STNAV=&RUBNAV=&CODE=42971561&LANGUE=0))

### **Congratulations**

Congratulations to the Commission Secretary, Grant Heiken, for election as a Fellow of the American Association for the Advancement of Science.

Congratulations to the Commission Chair, Tom Beer, for the award of a Doctor of Science degree from the University of Canterbury.

## GeoUnions Joint Science Program Hazards Initiative



Explosive eruption at Stromboli

### 1. Introduction

The societal impact of geo-hazards (geological, hydrometeorological and geophysical hazards) is significant. Every year floods, tsunamis, severe storms, drought, wildfires, volcanoes, earthquakes, landslides and subsidence claim thousands of lives, injure thousands more, devastate homes and destroy livelihoods. Damaged infrastructure and insurance premiums increase overall costs. Developed countries are affected, but the impact is disproportionate within the developing world. As population increases, more people live in hazardous areas and the impact grows.

The Budapest Manifesto of 2002 was an attempt to find a generic framework that would be suitable for a cross-disciplinary approach in which physical scientists and social scientists have to deal with issues involving risk, vulnerability and sustainability. The full text may be found on the web site at [www.iugg.org/budapest.pdf](http://www.iugg.org/budapest.pdf) and the operational parts of it are reproduced below.

Living in an often turbulent and unpredictable public environment, scientists can contribute to decision-making through a risk management framework with which to examine technical and social issues related to sustainability that consists of the following:

- Anticipating man-made and natural risks through wide-spread **consultation**.
- Determining **concerns** by using risk assessment techniques for various future situations.
- Identifying the **consequences** by systematically cataloguing hazards.
- Undertaking **calculations** on the future situations with appropriate models.

- Evaluating the **certainties**, uncertainties, and the probabilities involved in the calculations of the vulnerability and of the exposure.
- **Comparing** the computed risks against pre-determined criteria to assess the need for further action.
- Determining and acting on options to **control**, mitigate and adapt to the risk.
- **Communicating** the results to those who need to know.
- Promoting and guiding **monitoring** systems to collect, assimilate and archive data relevant to the determination of sustainability and risk, now and in the future.
- Integrating the knowledge and understanding from all relevant disciplines to provide society with the tools to **review** the sustainability and the risks of proposed policies and plans.

Though rational scientific methods hold the promise of an improved science of risk and sustainability, it must be remembered that the priorities for analyses are likely to be heavily influenced by the public and political agenda of the day. This means that implementation of risk management to achieve sustainability can be achieved only through an interaction of theory and practice.



**Floodwaters from Hurricane Isabel, Maryland USA, September 2003**

## 2. Some Key Questions

### 2.1. How have humans altered the geosphere, the biosphere and the landscape, thereby promoting and/or triggering certain hazards and increasing societal vulnerability to geo-hazards?

This question focuses on land use and development patterns (e.g. building on steep slopes, unstable ground, flood plains, etc.) and the unsustainable growth of the world's megacities in hazard-prone areas. It also examines some of the cultural differences in development patterns.

To a certain extent, the background information to address these questions is being examined as part of a number of projects in the International Geoscience Programme (IGCP) of IUGS and UNESCO, and the International Geosphere Biosphere Program (IGBP) of ICSU. IGCP projects such as Landslide Hazard Assessment and Cultural Heritage (#425) and Environmental Catastrophes (#490) exemplify the new directions of societally relevant geoscience research for the earth science community. Projects such as the SCOPE project ESPROMUD, the IGBP project Land-Use Land Cover Change (LUCC) project, and the IHDP project on Industrial Transformation (IT) examine human alterations to the biosphere, but do so within the context of urban change, or global warming and climate change, rather than within the context of societal vulnerability to natural hazards.

### 2.2. What technologies and methodologies are required to assess the vulnerability of people and places to hazards and how might these be used at a variety of spatial scales?

This question addresses the complexity involved in integrating measurements of physical and social phenomena as well as the development of comparative indices at various spatial scales. This is difficult to do well and suitable models are yet to be developed. The IGU Commission on Hazards and Risks (C-12) is focused on societal vulnerability to natural hazards and in developing generalised indices of vulnerability.

### 2.3. How do geo-hazards compare relative to each other regarding current capabilities for monitoring, prediction and mitigation and what methodologies and new technologies can improve such capabilities to help civil protection at local and global scales?

This question addresses the role of the natural sciences in providing the background information for public policy and government decision making.

The question is partially being addressed through the Geohazards Theme of the Integrated Global Observing Strategy (IGOS). The report of this theme at: [http://dup.esrin.esa.it/igos-geohazards/pdf/igos\\_report.zip](http://dup.esrin.esa.it/igos-geohazards/pdf/igos_report.zip) points out that citizens need to know a hazard's location, timing, extent, likely behaviour, and duration. The Geohazards IGOS will reduce the data gaps, between what is known and what needs to be known, by aiming to improve hazard inventories, maps and monitoring tools available to monitoring and advisory agencies. Equally prominent multilateral efforts include the information provision provided by the Centre for the Epidemiology of Disasters (CRED) at <http://www.cred.be/> and the hazards database managed by the International Research Institute for Climate Prediction at <http://iri.columbia.edu/>. National positions regarding such hazard issues are also coming to the forefront in influencing political decisions and addressing public needs directly. These are exemplified by two recent North American reports: one in Canada (An Assessment of Natural Hazards and Disasters in Canada: A Report for Decision Makers and Practitioners available at

<http://www.crhnet.ca/>) and one in the USA (USGS Circular 1244: National Landslide Hazards Mitigation Strategy – A Framework for Loss Reduction available at <http://pubs.usgs.gov/circ/c1244/>). The Spatial Hazards Events and Losses Database for the United States was recently released at <http://sheldus.org>. This provides forty years of hazard event and loss data, at the county scale, for the whole of the USA.

#### 2.4. What are the barriers to the utilization of risk and vulnerability information by governments (and other entities) for risk and vulnerability reduction policies and planning (including mitigation) from each of the geo-hazards?

This question addresses the role of science in public policy decision-making, including how issues of risk and uncertainty, data quality and data quantity, influence who uses information, what information is used, and the purpose for which it is used.

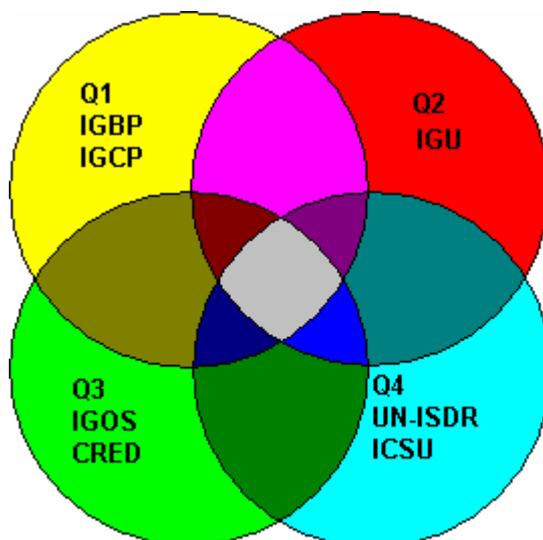
To a certain extent this question is addressed (though peripherally) in the United Nations Inter-Agency Secretariat International Strategy for Disaster Reduction (UN-ISDR). The UN-ISDR has released the 2004 version of its report: "Living with Risk: A global Review of disaster reduction initiatives" that includes information on hazard assessment and awareness. UN-ISDR is also a key player in organizing the World Conference on Disaster Reduction (WCDR - see <http://www.unisdr.org/eng/wcdr/wcdr-index.htm>) to be held in Kobe, Japan during 2005 as a prominent meeting of Governments, policy analysts and decision makers.

The importance of community interaction and participation was also stressed in the ICSU position statement on Natural Hazards at: <http://www.iugg.org/ICSUposition.pdf>  
Natural Disaster Reduction: Safer Sustainable Communities – making decisions about risk.



**Mexico City Earthquake 1985**

### 3. Summary of Research Agenda



The four key questions are shown here diagrammatically. The diagram assumes that the four key questions are not independent but are inter-related. It also indicates that any strategy of the International Year that seeks to answer these four questions will need to integrate closely with the existing and future planned work of the IGCP, IGBP, IGOS, UNESCO, and UN-ISDR. It also indicates that the key niche that can be tackled by a consortium of the geoscience unions (IUGG, IUGS, IGU, IUSG and ISPRS) relates to Question 2:

***What technologies and methodologies are required to assess the vulnerability of people and places to hazards and how might these be used at a variety of spatial scales?***

Concentrating on this question will tie in with the existing and ongoing programs of the geoscience unions and their affiliates, namely the:

IUGG (Commission on Geophysical Risk and Sustainability, called the GeoRisk Commission)(<http://www.mitp.ru/georisk/>)

IUGS (Commission on Geological Sciences for Environmental Planning called Cogeoenvironment) (<http://www.sgu.se/hotell/cogeo/index.htm>)

INQUA (Projects of the International Union for Quaternary Research) (<http://www.inqua.tcd.ie/>)

IAEG (Several commissions and working groups of the International Association for Engineering Geology and the Environment) (<http://cgi.ensmp.fr:88/iaeg/>)

ICL (International Consortium on Landslides) (<http://icl.dpri.kyoto-u.ac.jp/>)

IGU (Commission on Hazards and Risks, C-12) (<http://www.giub.uni-bonn.de/gidi/igu-c12/>)



**Complex movement, rotational slide and flow  
(November 2000, Pistoia)**

## **4. Future GeoScience Initiative Activities**

### **4.1 Webcyclopedia of Geo-Hazards**

A prototype is available at:

<http://www.mitp.ru/georisk/webcyclopedia/index.html>

The Webcyclopedia project exists to supply a web-based encyclopedia of hydrometeorological, geological and geophysical risks and hazards that deals with both the geographical, physical and human aspects of natural risks and hazards. Started on a volunteer basis by the GeoRisk Commission, this project requires considerable updating, revision and new information to become a future key source of information. Responsibility to maintain the site demands a “champion” who will recruit broader geographic coverage, wider thematic topics and technical peer review. The form of such material could be many and varied, ranging from the traditional scientific paper through to interactive hazard maps, real time data, models of the phenomena, or merely hyperlinks to other sites providing information on the topic.

### **4.2 Post-doctoral research**

Funding should be made available to establish an international network of five postdoctoral researchers (one in each continent) appointed to examine the question:

*What technologies and methodologies are required to assess the vulnerability of people and places to hazards and how might these be used at a variety of spatial scales?*

One of the researchers should be located within the Earth Science Division of UNESCO in Paris or the UN-ISDR office in Geneva to ensure contact and influence upon decision makers at the highest level. Topics to be addressed may include an examination of comparative indices at various spatial scales as well as frameworks and models for the assessment of vulnerability and responsibility for integrating physical and social phenomena.

### **4.3 Development of a research program**

A key component of this Hazards Initiative will be the development of a research program through networking. Two types of networking are needed. The first type consists of networking within the Geosciences Unions and their many affiliates designed to address Question 2. The second type of networking consists of networking with researchers within IGCP, IGOS, IGBP, ISDR, CDR and many others involved in seeking answers to Questions 1, 3 and 4. Thus a program of attendance at key conferences and meetings from 2004 to 2009 will need to be planned. Some relevant meetings so far planned are:

Hazards 2004 (see [www.hazards2004.org](http://www.hazards2004.org))

This is a combined meeting of the IUGG GeoRisk Commission and the International Hazards Society to be held in Hyderabad, India 2-4 December 2004.

World Conference on Disaster Reduction (WCDR)

(<http://www.unisdr.org/eng/wcdr/wcdr-index.htm>)

to be held in Kobe, Japan, in January 18-22, 2005. This is a UN organised meeting of Governments.

The First Symposium on Geo-Information for Disaster Management

(<http://www.gdmc.nl/gi4dm/>) Delft, The Netherlands, March 21-23, 2005

The Appendix provides a list of the major General Assemblies and Congresses of the organizations that have been mentioned in this document.

## GeoUnions Hazards Initiative Representatives

IUGG – Tom Beer

IUGS – Peter Bobrowsky

IGU – David Alexander

IUSS – Rob Fitzpatrick and Marcello Pagliai

The GeoUnions Hazards Initiative representatives wish to acknowledge the assistance of the Hazards Theme Team of the International Year of the Planet Earth in providing the text for this document. The Hazards Theme Team consists of:

Tom Beer (CSIRO, Australia), Peter Bobrowsky (Geological Survey of Canada), Paolo Canuti (University of Firenze, Italy), Susan Cutter (University of South Carolina, USA), Stuart Marsh (British Geological Survey, UK)

## Acronyms

CDR	Committee for Disaster Reduction (of ICSU)
CRED	Centre for the Epidemiology of Disasters
ESPRMUD	Earth Surface Processes, Materials Use and Urban Development
IAEG	International Association for Engineering Geology and the Environment
ICL	International Consortium on Landslides
ICSU	International Council of Science
IGBP	International Geosphere-Biosphere Programme
IGCP	International Geoscience Programme
IGOS	Integrated Global Observing System
IGU	International Geographical Union
IHDP	International Human Dimensions Programme
INQUA	International Union for Quaternary Research
ISDR	International Strategy for Disaster Reduction
ISPRS	International Society of Photogrammetry and Remote Sensing
IT	Industrial Transformation
IUGG	International Union of Geodesy and Geophysics
IUGS	International Union of Geological Sciences
IUSS	International Union of Soil Science
IYPE	International Year of the Planet Earth
LUCC	Land Use and Land Cover Change
SCOPE	Scientific Committee on Problems of the Environment
UN	United Nations
UN-ISDR	United Nations International Strategy for Disaster Reduction
UNESCO	United Nations Educational Scientific and Cultural Organization
USA	United States of America
USGS	United States Geological Survey
WCDR	World Conference on Disaster Reduction

## GeoRisk Bank Account--July 1, 2003 to November 30, 2004

<b>Date</b>	<b>\$US</b>	<b>Income - Allocations</b>
May-04	6000.00	IUGG 2004 Allocation
Jun-04	2400.00	IUGG Grant for Hyderabad meeting
	<b>\$8,400.00</b>	<b>Total Allocations</b>
<b>Date</b>	<b>\$US</b>	<b>Expenses</b>
		<b>Webcyclopedia</b>
Mar-04	3000.00	Webcyclopedia
Mar-04	270.00	CRDF fees
	<b>3270.00</b>	<b>Total Webcyclopedia Expense</b>
Jul-03	<b>4276.44</b>	<b>IUGG Sapporo Travel Expense</b> (support for the Secretary General, Vice Chair and Treasurer)
Nov-04	<b>15900.00</b>	<b>Hazards 2004 Hyderabad Travel</b> (support for the GeoRisk Executives, Commissioners, 10 Indian, 1 Pakistani and 1 Armenian Scientists)
	<b>20176.44</b>	<b>Total All Travel Expenses</b>
		<b>Publishing</b>
Oct-03	2307.93	Kluwer (Printing of Risk Science and Sustainability)
	<b>2307.93</b>	<b>Total Publishing Expenses</b>
		<b>Banking</b>
Oct-03	15.00	Wire Transfer fee
May-04	5.00	Wire transfer fee
Nov-04	32.00	Travellers checks fee
	<b>52.00</b>	<b>Total Banking Expenses</b>
		<b>Business</b>
Oct-04	69.28	Printing of Business checks
Jun-04	35.00	Suzanne Mayor Benz, CPA - 2003 tax consultation - no tax owed
	<b>104.28</b>	<b>Total Business Expenses</b>
	<b>\$25,910.65</b>	<b>Total Expenses</b>
	<b>\$8,400.00</b>	<b>Total Allocations</b>
	<b>\$23,168.25</b>	<b>Balance as of July 1, 2003</b>
	<b>\$5,657.60</b>	<b>Balance at 1st Bank as of Nov 26, 2004</b>

## IUGG GeoRisk Commission

### Duties of Officers<sup>1</sup>

#### **President**

- Represent the Commission to the IUGG Secretary-General and Executive Committee.
- Submit annual reports to the IUGG Secretary-General.
- Convene and chair business meetings of the Commission.
- Convene and chair meetings of the Officers of the Commission (physical or electronic) of the President, Secretary General, Vice-Presidents, and Treasurer.
- Liaise with the Secretary General in relation to:
  - ✓ Monthly visits to the web site, with fine tuning, and requests to Commission members for timely information.
  - ✓ Production of “GeoRisk Update” as a means of keeping the Commission members informed of activities.

#### **Secretary General**

- Keep the membership database.
- Keep minutes at business meetings of the Commission.
- Keep a record of Commission correspondence.
- Liaise with the President in relation to:
  - ✓ Monthly visits to the web site, with fine tuning, and requests to Commission members for timely information.
  - ✓ Production of “GeoRisk Update” as a means of keeping the Commission members informed of activities.

#### **Vice-Presidents:**

(Normally chosen so as to provide appropriate geographic coverage)

Provide all possible support to the activities of the chair and secretary.

#### **Treasurer:**

- Maintain Commission Finances
- Prepare and submit annual financial reports to the IUGG Treasurer.

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<sup>1</sup> The positions listed above comprise the Officers of the Commission. The Executive Body consists of the accredited representatives of the seven Associations and the IUGG. The Officers of the Commission need to be ratified by the Executive Committee of the IUGG.

**International Union of Geodesy and Geophysics**  
*GeoRisk Commission*

**International Lithosphere Program**  
*Earthquakes and Megacities Initiative*

**American Geophysical Union**  
*Russian Contact Center*

**Heidelberg Academy of Sciences**  
*World Stress Map Project*



## **International Workshop**

***Recent Geodynamics, Georisk and Sustainable Development  
in the Black Sea to Caspian Region***

3 to 6 July 2005

Baku, Azerbaijan

# **International Workshop**

## **Recent geodynamics, georisk and sustainable development in the Black Sea to Caspian region**

Baku, Azerbaijan, 3 to 6 July 2005

### **Objective**

The major scientific goals of the ARW are (1) to understand the recent geodynamics of the region, (2) to optimize the hazard and risk sciences in combination with engineering concepts, (3) to mitigate the catastrophic impacts of geohazards on society, and (4) to raise the awareness of scientific as well as political decision makers in order to launch appropriate initiatives for the Black sea to Caspian region in terms of disaster mitigation and preparedness of geohazards.

### **Need, Importance and Timeliness**

The human faces devastating geological and geophysical disasters on different scales in time and space: Earthquakes, landslides and erosions, mud volcanoes, rockfalls, sediment pollutions, subsidences and collapses, floods and other water and weather related hazards. The geohazards affect not only the human life and health, but have also dramatic impact on the sustainable development, e.g. land value, deterioration of the environment, partial or total loss of infrastructure, and other social and economic processes on which life depends. Geohazards are also a pending danger for vulnerable lifelines and constructions such as water supply and reservoirs, pipelines, and power plants. A strong earthquake, for instance, in the vicinity of a big city (megacity) can change the life and development of the nation within minutes and can damage greatly the national economy throwing it back for tens of years, if the society has not prepared concepts for the case of emergency and for efficient rebuilding of most important infrastructure. A careful assessment of the geological and geophysical risks is required to reduce the number and effects of geophysical and triggered technological disasters and to maintain sustainability over the next decades.

The recent geodynamics of the Black sea to Caspian region is quite complicated and manifested in the surface as large earthquakes, landslides, mud volcanoes, and dramatic sea level changes. At the same time, the region plays today a key role in the energy supply for many countries in Europe and America because of intensive hydrocarbon production. The hydrocarbons have to be transported through pipelines located in areas endangered by geohazards.

To mitigate the tremendous effects of these disasters in the Black sea to Caspian region, an efficient collaboration between geoscientists, engineers and policy-makers is required. The first is to identify and assess the hazard and risk quantitatively, the second is to reinforce existing and to develop safe new constructions, and the third is to provide the base for appropriate scientific and engineering measures, to constitute rescue units and to take care for the public acceptance of the essential measures in highly hazardous areas.

As the population in this region continues to increase, the vulnerability to them is magnified with each passing year undermining our ability to maintain a sustainable development. Many of the large cities in the Black sea to Caspian region are subject to the combined threats of natural and technological risks. The sensitivity of technical constructions (power plants, embankment dams of reservoirs, pipelines, underground constructions such as wells, tunnels, storages) to geohazards requires a complex technological development. Currently, datasets are incomplete and erroneous, predictions in terms of location, time and scale of hazards such as earthquakes or landslides, in general, are still not accurate. All this illustrates the timeliness to organize the workshop where many of problems of regional geodynamics and geohazards can be discussed and analyzed. The workshop will be organized by the IUGG Commission on Geophysical Risk and Sustainability, Russian Center of the American Geophysical Union and Earthquake and Megacities Initiative of the International Lithosphere Program.

## Motivation

The workshop should prepare a scientific background for enhancement of disasters risk preparedness and reduction. This is important, since, for example, an earthquake of magnitude about 7 may reoccur in the Black sea to Caspian region, causing a regional to global scale catastrophe. Such a large earthquake in the region could face the devastating damage and destabilized social order in the whole region. The workshop will bring together people of natural, social and political sciences and of industry to analyze the problems of geophysical and technological hazards, risks and sustainability in the region and to develop the social and political background and acceptance; in this way it even may contribute to the peace process in the Caucasus region.

## General approach

The workshop will concentrate on the following topics.

- (i) Which major geological and geophysical processes control the recent geodynamics of the region resulting in earthquakes, mud volcanoes, landslides, subsidence and collapse, and sea level changes? We intend to bring together leading experts in geodynamics and geophysics to clarify the question. The natural hazard assessment, risk estimations, geodynamic and risk modeling, development and implementation of early warning systems and other problems should be discussed.
- (ii) How have humans altered the geosphere and the landscape, thereby promoting and/or triggering certain hazards and increasing societal vulnerability to geohazards? This question focuses on land use and development patterns (e.g. building on steep slopes, unstable ground, etc.), subsurface exploitation (through Caspian Sea oil and gas extraction) in combination with natural (tectonic) sea level changes, and the unsustainable growth of the large cities in the region (e.g. Baku with over 2 millions habitants) in hazard-prone areas.
- (iii) How do geohazards compare relative to each other regarding current capabilities for monitoring, prediction and mitigation and what methodologies and new technologies can improve such capabilities to help civil protection at local and global scales? Can synergies in rescue resources be obtained? These questions address the role of the natural sciences in providing the background information for public policy and government decision-making. Even more, the effective co-operation between natural sciences and engineers can successfully provide tools to mitigate the disaster, e.g. computer aided comparison of pre-and post earthquake laser scanning data, which can be obtained within a few hours, will help to identify damaged and intact buildings and lifelines and help to guide effectively the rescue teams and their equipment. This co-operation should not of course stop at borderlines of each country. We will discuss how fundamental research can contribute to effective rescue programs and speedy and efficient rebuilding of lifelines.
- (iv) What are the barriers to the utilization of risk and vulnerability information by governments (and other entities) for risk and vulnerability reduction policies and planning (including mitigation) for each of the geohazards? This question addresses the role of science in public policy decision-making, including how issues of risk and uncertainty, data quality and data quantity, influence who uses information, what information is used, the purpose for which it is used, and when it can and will be used.

To a certain extent these questions are addressed in the United Nations Inter-Agency Secretariat International Strategy for Disaster Reduction (UN-ISDR). The UN-ISDR report "Living with Risk: A global Review of disaster reduction initiatives" includes information on hazard assessment and awareness. The Heidelberg Academy of Sciences contributes with its World Stress Map Project ([www.world-stress-map.org](http://www.world-stress-map.org)) a database of fundamental geo-information to the hazard community used e.g. for geodynamic modeling or vulnerability considerations of oil-companies. The importance of community interaction and participation was also stressed in the ICSU position statement on Natural Hazards at: [http:// www.iugg.org/ICSUposition.pdf](http://www.iugg.org/ICSUposition.pdf) Natural Disaster Reduction: Safer Sustainable Communities – making decisions about risk.

## Organizing Committee

Prof. A. Ismail-Zadeh, IUGG GeoRisk Commission & Russian Contact Center of the AGU.  
Prof. F. Wenzel, Earthquakes and Megacities Initiative, International Lithosphere Program.  
Prof. B. Panahi, National Academy of Sciences, Baku, Azerbaijan.

## Key Speakers

Balassanian, S. Prof. Euro-Asian Seismological Society, Yerevan, Armenia  
Beer, T. Prof. CSIRO Environmental Risk Network, Aspendale, Australia  
Bendimerad, F. Dr. Risk Management Solutions, Inc., Newark, California, USA  
Blackman, K. Dr. Federal Emergency Management Agency, Washington, USA  
Bonnin, J. Prof. Institut de Physique du Globe, Strasbourg, France  
Brunet, M.-F. Dr. Universite Pierre et Marie Curie, Paris, France  
Chelidze, T. Prof. Institute of Geophysics, Georgian Academy of Sciences, Tbilisi, Georgia  
Didenko, A. Prof. Department of Earth Sciences, Russian Academy of Sciences, Moscow, Russia  
Dunbar, P. Dr. National Geophysical Data Center, NOAA, USA  
Erdik, M. Prof. Bogazici University, Istanbul, Turkey  
Gassanov, A. Prof. Republican Center of Seismic Survey, Baku, Azerbaijan  
Giardini, D. Prof. ETH Hoenggerberg, Zurich, Switzerland  
Guliev, I. Prof. Institute of Geology, Natl Academy of Sciences, Baku, Azerbaijan  
Ismail-Zadeh, A. Prof. Russian Academy of Sciences, Moscow, Russia / Karlsruhe University, Germany  
John, W., Dr. Friedrich Naumann Stiftung, Baku, Azerbaijan  
Khesin, B. Prof. Ben-Gurion University of the Negev, Beer-Sheva, Israel  
Knapp, J. Prof. University of South Carolina, Columbia, USA  
Kontar, A. Prof. Institute of Oceanology, Russian Academy of Sciences, Moscow, Russia  
Kossobokov, V. Prof. Intl Inst Earthquake Prediction, Russ. Academy of Sciences, Moscow, Russia  
Levey, R. Prof. University of Utah, Salt Lake City, USA  
Link, M. Dr. Working Committee I of German Parliament - International Politics, Germany  
Makarenko, A. Prof. National Technical University, Kiev, Ukraine  
Mueller, B. Dr. Heidelberg Academy of Sciences, Germany  
Muir-Wood, R. Dr. Risk Management Solutions Ltd, London, UK  
Narimanov, A. Dr. SOCAR State Oil Company, Baku, Azerbaijan  
Nicolich, R. Prof. University of Trieste, Italy  
Panza, G. Prof. Abdus Salam International Center for Theoretical Physics, Trieste, Italy  
Papadopolous, G., Prof. National Observatory of Athens, Greece  
Paterson, J. Prof. University of Aberdeen, UK  
Shamir, U. Prof. Israel Institute of Technology, Haifa, Israel  
Stephenson, R. Dr. Vrije Universitaet Amsterdam, The Netherlands  
Töksoz, N. Prof. M.I.T., Cambridge, USA  
Vergino, E. Dr. Center for Global Security, Lawrence Livermore Natl Lab, USA  
Wilhelm, H. Prof. Karlsruhe University, Germany  
Willson, S. Dr. British Petroleum, Houston, USA  
Woodward, D. Dr. British Petroleum Azerbaijan, Baku, Azerbaijan  
Zschau, J. Prof. Geoforschungszentrum Potsdam, Germany

# TENTATIVE PROGRAMME

## July 3, 2005

9:15-10:00 Introduction with addresses given by representatives of the Azerbaijan Parliament - Milli Mejlis, Azerbaijan Government, International Union of Geodesy and Geophysics (U. Shamir, President), American Geophysical Union (F. Spilhaus, Executive Director), Heidelberg Academy of Sciences (K. Fuchs, Board Member), Azerbaijan National Academy of Sciences (A. Ali-Zadeh, Vice-President), SOCAR (Dr. A. Narimanov, Chief Geologist)

### Session 1: Regional Geodynamics

10:00-10:45 Töksoz, N. *Geodynamics and seismicity of the Black sea to Caspian sea region*  
10:45-11:30 Didenko, A. *Paleomagnetism and geodynamics of the Black sea to the Caspian region*  
11:30-12:15 Stephenson, R. *Paleotectonic assembly of the Black Sea-Caspian crust and controls on modern geodynamic process*  
12:15-13:00 Panahi, B. *Geodynamics and seismicity in Azerbaijan and the adjacent Caspian sea*  
13:00-14:00 Lunch break  
14:00-14:45 Brunet, M.-F. *Geodynamics of the South Caspian region*  
14:45-15:30 Guliev, I. *Geodynamics and mud volcanism in Azerbaijan*  
15:30-16:15 Knapp, J. *Modern geodynamics of the Caucasus and Caspian sea region from high-resolution seismic studies*  
16:15-16:45 Coffee break  
16:45-17:30 Wilhelm, H. *Geodynamics and geothermal modeling of the PriCaspian basin*  
17:30-18:15 Levey, R. *Neotectonics and hydrocarbons of the Black sea to Caspian sea regions*  
18:15-19:00 Khesin, B. *Geophysical studies of natural fields for geohazards assessment*  
19:00-19:30 General discussions  
20:00 Ice-breaking reception and dinner

## July 4, 2005

### Session 2: Regional Seismicity, Seismic Hazard and Risk

9:15-10:00 Solodilov, L. *Monitoring of seismicity in the Caucasus region*  
10:00-10:45 Rogojin, E. *Shaking areas of strong earthquakes in the Caucasus region*  
10:45-11:30 Gassanov, A. *Seismicity and seismic network in Azerbaijan*  
11:30-12:15 Javakhishvili, Z. *Seismicity of Eastern Georgia*  
12:15-13:00 Chelidze, T. *Seismic risk in Georgia*  
13:00-14:00 Lunch break  
14:00-14:45 Bonnin, J. *Earthquake hazard/risk in four capital cities of Caucasus : state of the art*  
14:45-15:30 Balassanian, S. *Earthquake risk mitigation in Black Sea to Caspian region*  
15:30-16:15 Anguelov, S. *Earthquake hazard mitigation in Balkan region: Multidisciplinary approach*  
16:15-16:45 Coffee break  
16:45-17:30 Wenzel, F. *Innovative use of seismic strong motion data*  
17:30-18:15 Erdik, M. *Assessment and mitigation of earthquake risk in Istanbul*  
18:15-19:00 Nicolich, R. *Contribution of geophysical prospecting to the recognition of seismological risks*  
19:00-19:30 General discussions  
20:00 Dinner

**July 5, 2005**

**Session 3: Seismic Hazard and Seismic Risk**

- 9:15-10:00 Bendimerad, F. *Risk reduction in big cities – the master plan concept of the earthquakes and megacities initiative (EMI)*
- 10:00-10:45 Mueller, B. *World Stress Map as a tool for study of geohazards*
- 10:45-11:30 Papadopolous, G. *Occurrence of large earthquakes along the North Anatolian fault*
- 11:30-12:15 Panza, G. *Hazard scenarios in the Black sea to Caspian region*
- 12:15-13:00 Giardini, D. *Seismic hazard in the Caucasus region*
- 13:00-14:00 Lunch break

**Session 4: Technological Risk and Risk Management**

- 14:00-14:45 Blackman, K. *Experience of U.S. Federal Emergency Management Agency in risk management*
- 14:45-15:30 Muir-Wood, R. *Natural and technological risk and risk management*
- 15:30-16:15 Link, M. *The European Union's Policies in the South Caucasus Region and the EU interest in Technically Secure and Politically Stable Gas and Oil Supplies*
- 16:15-16:45 Coffee break
- 16:45-17:30 Willson, S. *Tectonic stress and technological risk in oil industry*
- 17:30-18:15 Woodward, D. *Technological risk management in BP company*
- 18:15-19:00 Narimanov, A. *Natural and technological risks in hydrocarbon exploitation in Azerbaijan*
- 19:00-19:30 General discussions
- 20:00 Dinner

**July 6, 2005**

**Session 5. Geophysical Risk and Sustainability**

- 9:15-10:00 Ismail-Zadeh, A. *Georisk and sustainable development: Interdisciplinary approach*
- 10:00-10:45 Beer, T. *Environmental risk and sustainability*
- 10:45-11:30 Kontar, A. *Maritime geophysical risk and sustainability of the Black Sea region*
- 11:30-12:15 Kossobokov, V. *Earthquake prediction and earthquake risk*
- 12:15-13:00 Dunbar, P. *Earthquake loss estimation using macroeconomic indicators*
- 13:00-14:00 Lunch break
- 14:00-14:45 Vergino, E. *Disaster mitigation and preparedness of geohazards in the Caucasus region*
- 14:45-15:30 Makarenko, A. *Modeling of sustainable development of the Black sea region*
- 15:30-16:15 Paterson, J. *Different dimensions of risk and the possible legal responses*
- 16:15-17:00 Zschau, J. *Early warning systems for natural disaster reduction*
- 17:00-17:30 Coffee break
- 17:30-18:30 General discussions and workshop conclusion
- 19:00 Excursion and Dinner in the Old City of Baku



## **L. Kantorovich\* Award for Achievements in Georisk Analysis**

### **Proposal**

#### **AWARD**

The IUGG Commission on Geophysical Risk and Sustainability seeks to recognize an individual or a limited number of individuals working together in the geoscientific community for making an outstanding contribution to the understanding or development of georisk science.

The award will be presented bi-annually. The recipient will be invited to deliver a lecture at the symposiums or workshops organized by the Commission.

#### **ELIGIBILITY**

The award is open to all regardless of nationality or citizenship. Nominees must be living at the time of their nomination. Any individual or small group in the geoscientific community that has contributed substantially to the understanding or development of georisk science is eligible for this award.

#### **NOMINATION PROCEDURES**

Nominations should be written by the GeoRisk Commissioner and include the following information:

- nominator's name and title, address and contact numbers;
- nominee's name and title, institutional affiliation, and address;
- a summary of the action(s) that form the basis for the nomination (about 100 words);
- a longer statement (not to exceed 2 pages), providing additional details of the action(s) for which the candidate is nominated;
- two letters of support from the prominent members of the geophysical community;
- a curriculum vitae (3 page maximum) containing professional positions held and major publications.

The nomination documents should be sent to the Secretary General of the GeoRisk Commission and a copy to the President.

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\* Leonid Kantorovich (1912-1986), Nobel Prize in Economy (1975), Russian mathematician and economist, was a professor at Leningrad State University (1934–60); he later served (1971–76) as director of the mathematical economics laboratory at the Moscow Institute of National Economic Management. He contributed to many areas of mathematics (including linear programming and the theory of optimum allocation of resources) as well as to seismic risk. His paper "Seismic Risk and Principles of Seismic Zoning" published in 1973 became a classical article in the field of georisk analysis.