

CALL FOR ABSTRACTS

INTERNATIONAL CONFERENCE ON ENERGY, ENVIRONMENT AND DISASTERS (INCEED 2005)

Bridging the Gaps for Global Sustainable Development

(UNESCO – ISEG – GADR)

CHARLOTTE, NORTH CAROLINA, USA

July 24 - 30, 2005



Founded in the 1740's and named for the German-born wife of Britain's King George III (hence it's nickname, "Queen City"), Charlotte today is one of the Southeast's premier places to live. The climate is sunny and pleasant year-round. The city is located near the western mountains of North Carolina and four hours from the state's Atlantic beaches. Financial experts know Charlotte as the nation's second-largest banking center (after New York City). The city is home to 292 of the top Fortune 500 companies and more than 340 foreign firms. It is also a major distribution hub and center of the largest consolidated rail system in the United States. Charlotte's uptown area, Center City, is one of the five fastest-growing metropolitan areas in the United States. The inner city has a population of 527,000, with an additional 6.3 million people living within a 100-mile radius. Charlotte is consistently ranked among the top five most livable cities in the United States.

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International Society for Environmental Geotechnogy (ISEG), Charlotte, USA



Global Alliance for Disaster Reduction, Charlotte, USA



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THE CONFERENCE CHAIR'S REMARKS AND INVITATION OF PARTICIPANTS

This is a century of increasing convergence of issues, approaches and disciplines of sustainable development across national frontiers. This necessary development belies the recognition that global sustainability requires a combination of instruments to avert the tragedy of commons. Major environmental quality and economic development issues such as global warming, ocean pollution, desertification, excessive waste generation, transcontinental transport of dust and disease vectors have both local and global drivers and effects. The challenges that we face are many and require careful analyses and establishment of appropriate balances among environmental quality, economic development for provision of goods and services, and social equity. It is now widely recognized that poor sanitation, inadequate availability of safe water, food contamination and indoor pollution constitute the greatest environmental threats to human health. Recent calculations by the World Health Organization and the World Bank indicate that improvement of environmental conditions of the poor could possibly reduce the prevalence of major diseases by 40%. In a strange way, poverty often confines an individual to conditions and locations of environmental stress as in the slums, ghettos, shanty towns and favelas that are either nested or ring most major cities in the world. Globally, it is estimated (from data quoted by the World Resources Institute) that about 1.4 billion people still do not have access to safe drinking water and about 2.9 billion people do not have access to sanitation.

At the Millennium Summit in 2000, leaders of most nations agreed to take collaborative steps to reduce the number of people without access to safe drinking water by 50% by 2015. That target date is approaching fast, and there are high-utility roles for professional organizations, institutes and non-governmental organizations involved in the upcoming conference. In this regard, it is commendable that the United Nations has taken leadership in developing a World Water Assessment Program (WWAP) that has so far involved pilot studies in the Chao Phraya River Basin (Thailand), Greater Tokyo (Japan), Lake Peipsi/Chudskoe-Pskovskoe (Estonia and the Russian Federation), Lake Titicaca Basin (Bolivia, Peru), Ruhuna Basin (Sri Lanka), Seine-Normandy Basin (France) and the Senegal River Basin (Guinea, Mali, Mauritania and Senegal).

Global sustainable development is an issue on which there is justification for collaboration among countries of diverse economic and human development levels. The relative adequacy of management systems in the technologically advanced countries when compared to the developing and underdeveloped countries is somewhat negated by the higher generation rate of new environmental problems in the former. There is a need for the creation and implementation of programs that would accomplish the objectives of the National Environmental Action Plans (NEAPs) that most countries agreed at the 1992 Rio de Janeiro UN Conference to develop and implement. In many countries (especially the low-mid income countries), integrated capacity is lacking on NEAP aspects such as appropriate policies/regulations, technical guidance, education, incentives and enforcement. Despite recent differentiation between materials mining/recovery and product manufacture in national economies, materials utilization has been an index of human civilization. Its translation from source to user has significant economic and environmental impacts: indeed, it is a materials world. In 1984, a study by the U.S. National Academy of Sciences found that 78% of high-production-volume chemicals did not have data that are needed for health effects screening. Of course, the subsequent development of OECD's Screening Information Data Set (SIDS) that initially divided up responsibilities among 18 countries for testing and generation of toxicological and related information on 2550 chemicals is a positive development. It illustrates the utility of international collaboration among corporations and agencies. Nevertheless, the rate of synthesis

of new chemicals exceeds the rate of testing and generation of health-related information on them.

Any discussion about global sustainable development without addressing the issue of energy sustainability is incomplete. It is now recognized globally that energy resource use is indispensable to economic development. Asia currently holds 50% of the global population (about 2.5 billion) but takes 24% of the global energy consumption. Although estimates are very approximate, global energy use is expected to rise by 57% by 2020, relative to the 1997 level. Fossil fuel will still account for 90% of the global energy source. Currently, out of a global population of about 5 billion, 2 billion people are without electricity, a factor that retards their regional economic development and contributes to socio-political strife.

Energy is the life blood of economic development programs. In spite of the fact that basically every country that has a coastline now produces oil, prices now fluctuate within the excessively high range of US \$30 - \$50 per barrel. With respect to electricity, global annual consumption per capita was about 2066 kilowatt-hours per 1999 data compiled by the UN Development Program (745 kilowatt-hours for developing countries and 7001 kilowatt-hours for OECD countries). With the intensification of industrialization efforts in developing countries, the disparity in energy consumption patterns should be expected to decrease. The implementation of alternative energy systems such as geothermal energy, biomass (waste-derived) energy, wind energy, solar energy and fuel cell systems is desirable. However, existing infrastructure and initial capital cost considerations make it feasible to deploy such energy systems only as 8-15% of the total energy mix. In specific localities where natural conditions demand and generation/transmission/delivery systems are adequate, the increase in the level of alternative energy in the mix could be beneficial.

Another issue that is covered by the scope of the upcoming conference is the toll exacted by natural disasters, especially where birth rates and population are highest. With or without human population explosion, the redistribution of population within regions is increasingly a problem. This has led to the occupation of marginal lands with a consequent increase in the frequency of serious human and infrastructural damages by natural hazards. Recent loss of lives from earthquakes in Iran, mudslides in the Caribbean, and floods in China and Haiti are few examples. Indeed, the coalescence of the impacts of natural disasters and environmental degradation is costly in many countries. It is estimated that disasters cause economic losses at the levels of \$1 billion per week in the United States and \$10 billion per week globally. More than 100,000 people die each year as a result of disasters such as earthquakes, wildfires, hurricanes, floods, typhoons, tsunamis and volcanic eruptions. The vulnerability of advanced countries derives from the build-up of infrastructure whereas in the low-income countries lack of mitigation systems and occupation of marginal lands are responsible for the high toll recorded in human life losses. Disasters challenge wars as the generator of the largest number of refugees annually. In 2003 alone, there were as many as 700 disasters. About 50,000 people died and economic losses reached about US \$60 billion as a result of the disasters.

The sustainable development challenges that we face tax our collective talents but do not exceed our intellectual capacity. With humility, I invite you on behalf of the collaborating organizations, to the upcoming conference to present your views, exhibit your techniques and methodologies, and establish linkages that will lead to improvement of the environment and human condition.

Prof. Hilary I. Inyang
Chair, INCEED 2005
December 2004

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INVITATION STATEMENT, PURPOSE AND HISTORY OF THE CONFERENCE SERIES

As an expert or professional who is interested in advancing global sustainable development through efficient/effective programs, research and policy implementation on the triple areas of energy, environment and disasters, you are invited to contribute your ideas and communicate your research results to a global audience at the upcoming INCEED 2005 Conference. The conference, which will be hosted by the Global Institute for Energy and Environmental Systems (GIEES) of the University of North Carolina at Charlotte, USA in Charlotte, July 24-30, 2005, is jointly organized by the International Society of Environmental Geotechnology (ISEG), the Global Alliance for Disaster Reduction (GADR) and UNESCO along with other large national and international organizations. More than 40 other organizations are supporters of this conference which is expected to draw more than 800 researchers, corporate officials, policy makers, teachers and students from all over the world. About 100 sessions, panels and forums that will feature keynote lectures, presentations, recorded debates and discussion panels are planned. Some of the session discussions will be video-taped for subsequent television broadcast. The best papers on thematic topics will also be selected for review and possible publication in special editions of reputable, peer-reviewed international journals.

The expanded INCEED 2005 Conference is an outgrowth of the regular ISEG conferences which started in 1993 with the continuing objective of applying technical and social science knowledge from a diversity of disciplines to address critical issues in sustainable development. Conferences that have been hosted in North America, Asia, South America and Europe have drawn an average of 500 participants from 50 countries. These conferences are held biennially and rotated among different continents. INCEED 2005 is a special intermediate year conference that has been expanded to include coverage of the plans and programs of UNESCO and GADR as well as other organizations on hazards. Research advances communicated at these events and some consensus positions will be directly put into public policies by agencies in many countries. The ISEG-GADR-UNESCO trio of organizers seeks to continue to promote scientific cooperation among countries, organizations and individuals on the thematic issues of this conference.

THEMATIC AREAS OF THE 2005 INCEED CONFERENCE

(Papers are solicited from authors on topics that fall within any of the following thematic areas)

A. ENERGY SYSTEMS

- A.1 Energy Consumption Patterns and Policies
- A.2 Renewable Energy System Integration
- A.3 Solar Energy Systems
- A.4 Geothermal Energy Systems
- A.5 Wind Energy Systems
- A.6 Hydrogen and Other Alternative Fuels
- A.7 Hydroelectric Power Systems
- A.8 Nuclear Energy Systems
- A.9 Ocean Wave Energy Systems
- A.10 Biomass Energy Systems
- A.11 Coal Combustion Systems
- A.12 Combined Cycle Plants
- A.13 Oil Recovery and Refining Systems

B. ENERGY IN TRANSPORTATION, CIVIL AND INDUSTRIAL SYSTEMS

- B.1 Electric Vehicles
- B.2 Energy-efficient Engines
- B.3 Transportation Infrastructure for New Energy Systems
- B.4 Pipelines in Difficult Terrain
- B.5 Energy Investments in Highway Construction
- B.6 Building Energy Systems
- B.7 Lighting Systems
- B.8 Energy Storage and Transmission Systems

C. POLLUTANT EMISSIONS, FATE AND TRANSPORT PROCESSES

- C.1 Airborne Toxic Substances
- C.2 Air Pollutant Formation Processes
- C.3 Dust Release Mechanisms
- C.4 Erosion from Exposed Terrains
- C.5 Contaminant Leachability from Wastes and Soils
- C.6 Contaminant Fate and Transport: Air
- C.7 Contaminant Fate and Transport: Water
- C.8 Contaminant Fate and Transport: Subsurface
- C.9 Leakages from Waste Containment Systems
- C.10 Industrial Effluent Releases
- C.11 Acid Rain and Acid Mine Drainage
- C.12 Solid Waste Generation (Municipal/Industrial)
- C.13 Long Range Pollutant Transport
- C.14 Marine and Riverine Oil Spills

D. HUMAN HEALTH AND ECOLOGICAL EFFECTS OF POLLUTION

- D.1 Risk Assessment Frameworks
- D.2 Biodiversity Issues
- D.3 Contaminated Sediments
- D.4 Indoor Air Quality Issues
- D.5 Crop Contamination Issues
- D.6 Ozone Depletion and Its Impacts
- D.7 Water Pollution
- D.8 Exposure Pathways
- D.9 Risk Perception
- D.10 Genetic Susceptibility
- D.11 Endocrine Modulation and Immune Disruption
- D.12 Potency Factors of Contaminants
- D.13 Radiological Impacts
- D.14 Ecotoxicity and Environmental Security
- D.15 Occupational Health Impacts
- D.16 Integration of Risks and Remedial Actions
- D.17 Ecological Cost Accounting
- D.18 Environmental Justice and Equity

E. WASTES AND CONTAMINATED SITE TREATMENT SYSTEMS

- E.1 Wastewater and Effluent Treatment Processes
- E.2 Waste Recycling and Utilization
- E.3 In-situ Treatment of Contaminated Sites
- E.4 Natural Attenuation Processes of Contaminants
- E.5 Waste Classification Systems and Testing Protocols
- E.6 Mined Land Reclamation Techniques

F. WASTE CONTAINMENT SYSTEMS

- F.1 Reliability of Waste Containment Systems
- F.2 Design and Analyses of Landfills, covers, Liners, Impoundments, Tank Systems and Repositories
- F.3 Design and Analyses of Innovative Barriers (Reactive Walls, Capillary Barriers, Georad Barriers, Biofilm Barriers, etc)
- F.4 Contaminant Sorption and Attenuation Processes in Barrier Systems
- F.5 Novel Barrier Materials for Waste Containment
- F.6 Dust Control and Soil Stabilization

G. NATURAL AND TECHNOLOGICAL DISASTERS AND THEIR IMPACTS

- G.1 Droughts and Deforestation
- G.2 Erosion and Mudflows
- G.3 Earthquakes and Volcanic Eruptions
- G.4 Tornadoes, Tsunamis and Hurricanes
- G.5 Floods and Lightning
- G.6 Wildfires and Heat waves
- G.7 Explosions and Radiation
- G.8 Global Warming and Its Impacts
- G.9 Dam Failures and Electric Power Disruptions
- G.10 Invasive Species

H. DISASTER AND POLLUTION PREVENTION AND MANAGEMENT TECHNIQUES

- H.1 Sustainability Concepts
- H.2 Disaster and Environmental Policies
- H.3 Environmental Security and Emission Standards
- H.4 Disaster Management at Local and Larger Scales
- H.5 Disaster Information Systems
- H.6 Emergency Response Systems

J. SPECIAL SESSIONS (Contact the persons listed if you are interested in joining the panels or making a presentation)

- J.1 Special Session on the **Taiwan Strait Tunnel (TST)** (Prof. H.Y. Fang, GIEES, UNC Charlotte and ISEG, email: jsf4@lehigh.edu)
- J.2 Special Session on the **International Decade on Education for Sustainability** organized by UNESCO/GADR/ISEG (Dr. Walter Hays - email: walter_hays@msn.com, Prof. Hilary I. Inyang, GIEES/UNC Charlotte, ISEG and GADR, and Dr. Badaoui Rouhban, UNESCO)
- J.3 Special Session on **Research Programs and International Linkages** (Dr. Juan Pestana, U.S. National Science Foundation and Univ. of California, Berkeley, email: jpestana@nsf.gov)
- J.4 Special Session on **Renewable Energy Systems** (Dr. Osman Benchikh, UNESCO, email: o.benchikh@unesco.org, and Dr. Steve Piet, Idaho National Engineering and Environmental Laboratory, USA, email, pietsj@inel.gov)
- J.5 Special Session on **Innovative Graduate Education on Infrastructure, Disasters and the Environment** (Prof. David Young, University of North Carolina at Charlotte, USA, email: dyoung@uncc.edu)
- J.6 Special Session on **Mining, Energy and Environmental Issues in China** (Prof. Shi Bin, Nanjing University, email: shibin@nju.edu.cn, Dr. Albert Koenig, Hong Kong University and Prof. Bian Zhengfu, China University of Mining and Technology, email: zfbian@cumt.edu.cn)
- J.7 Special Session on **Teaching Environmental Sustainability in the Context of the AP Environmental Science Course** organized by the Development Committee, APES, Educational Testing Service, Princeton, NJ, USA (Dr. Dean Goodwin, KimballUnion Academy, Meriden, NH, USA, email: dgoodwin@kua.org, Mr. Tom Corley, ETS, Princeton, USA, email: tcorley@ets.org and Ms. Beth Nichols, ETS, Princeton, USA, email: bnichols@ets.org)
- J.8 Special Forum on **Leadership Principles and Approaches** (Mr. Norwood Davis, Director, Living Leadership Maximum Impact, Georgia, USA, email: norwood.davis@maximumimpact.com and Dr. Emma S. Etuk, Emida International Publishers, Washington, DC, USA, Tel.: 301-333-8755)
- J.9 **Duke Energy Public Programs and Distinguished Professors' Forum** (Prof. Hilary I. Inyang, GIEES/UNC Charlotte, USA, and Ms. Hilary Davidson, Duke Energy Corporation, Charlotte, USA, email: hsdavids@duke-energy.com and Ms. Cindy Angelleli, Duke Energy Corporation)
- J.10 Special Session on **Radioactive Waste Disposal** (Dr. Ming Zhang, Research Center for Deep Geological Environments, Ibaraki, Japan, email: m.zhang@aist.go.jp)
- J.11 Special Session on the **Hydrail Project** (Mr. Stan Thompson, Chairman, Hydrogen Economy Advancement Team, Mooresville/South Iredell Chamber of Commerce, NC, USA, email: HST2nd@aol.com)
- J.12 Special Session on **Regional Resource versus Environment Conflicts in the Niger Delta** (Mr. Tom Mbeke Ekanem, Ibom's People's Congress and California Dept. of Environmental Protection, tedey@aol.com, Dr. J. Akhere, GIEES/UNC Charlotte, USA, email: jiakhere@uncc.edu, and Prof. Tanure Ojaide, GIEES, and Dept. African American Studies/UNC Charlotte, USA)
- J.13. Special Session on **Disasters in Africa: Prevention and Management Measures** (Dr. Daniel Don Nanjira, Kenya, email: ddc-donnanjira@msn.com)
- J.14. Special Session on **Regional Science Operations** organized by the Charlotte Area Science Network (CASN) and the Discovery Place, Charlotte, USA (Ms. Hilary Davidson, Duke Energy Corporation, email: hsdavids@duke-energy.com)
- J.15. Special Session on **Commercialization of Sensors** (Mr. John Thrower, National Saint Louis University, Madrid, Spain, email: jhthrower@prime-solutions.org)
- J.16. Special Session on **Brownfields Development** (Prof. Peter Schwarz, Dept. of Economics and GIEES/UNC Charlotte, USA, Email: pschwarz@email.uncc.edu)
- J.17. Special Session on **Biomass-Hydrogen Power Park Development Approaches** (Mr. Dennis McGee, email: enviro-tech@carolina.rr.com)
- J.18. Special Session on **Community Health in Developing Countries and Congested Cities** (Dr. Augustine Onwukwe, Providence Family Practice, Charlotte, USA, email: prfmpract@aol.com, and Prof. Jacob J. Steinberg, Montefiore Medical Center, Bronx, NY, USA, email: steinber@aecom.yu.edu, Ms. Emeh Ekpo, phone: 718-810-3813, and Dr. Nsidibe Ikpe, Miami, FL, USA, email: ikpen@aol.com)
- J.19. **Young Scholars Research Forum on Environment and Sustainable Development** (Dr. Dean Goodwin, KimballUnion Academy, Meriden, NH, USA, email: dgoodwin@kua.org)
- J.20. Special Session on **Empowerment Models of Sustainability in Poor Urban Communities** (Prof. John Stanfield, Boston, USA, jstansie@indiana.edu)

- H.7 Disaster Recovery and Insurance Systems
- H.8 Industrial Ecology and Pollution Prevention Policies
- H.9 Disaster and Environmental Education
- H.10 Disasters' Impacts on the Economy and Environment
- H.11 Economic and Socio-economic Mechanisms for Environmental Improvement and Disaster Mitigation
- H.12 Environmental Laws and Global Treaties

I. MONITORING AND VISUALIZATION SYSTEMS FOR RISK ASSESSMENT AND DECISION SUPPORT

- I.1 Global Satellite Observation Systems
- I.2 Ecological Indicators
- I.3 Biosensors and Electrochemical Sensors
- I.4 Subsurface Characterization Technologies
- I.5 Groundwater Well Systems and Tracers
- I.6 Radiation, Monitoring Systems
- I.7 Geographic Information Systems (GIS) and Global Positioning Systems (GPS)
- I.8 Data Interpolation, Compression and Broadcast Systems
- I.9 Structural Monitoring and Forensics
- I.10 Environmental Impact Assessment Techniques

CONFERENCE SCHEDULE

ABSTRACT SUBMISSION DEADLINE: MAY 15, 2005

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- 2006 - 8th International Symposium on Environmental Geotechnology and Global Sustainable Development, FCT, Abuja, Nigeria**
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- 2007 - International Conference on Waste Management, Ljubljana, Slovenia**
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- 2008 - 9th International Symposium on Environmental Geotechnology and Global Sustainable Development, Hong Kong, China**
Chairpersons: Dr. Albert Yeung, Department of Civil Engineering, University of Hong Kong, China (email: yeungat@hkucc.khu.hk) and Dr. Irene Lo, Department of Civil and Environmental Engineering, Hong Kong University of Science and Technology, China (email: cemlo@ust.hk)

GADR ALLIANCE CONFERENCE SERIES

- 2005 - World Conference on Disaster Reduction, Kobe, Japan, January 18-22, 2005**
Contact: Dr. Yuki Matsuoka, ISDR, Geneva, Switzerland (email: matsuoka@un.org)
- 2006 - GDIN-GADR World Conference on Disaster Information, Davos, Switzerland, August 27-September 1, 2006.**
Chairperson: Dr. Walter Ammann, Department of Natural Hazards, Swiss Federal Institute for Snow and Avalanche Research, Davos, Switzerland (email: wamm@slf.ch or ammann@cfl.ch)

PAST EVENTS

(Proceedings available online at <http://www.iseg.giees.uncc.edu>)

- 2004 - 7th International Symposium on Environmental Geotechnology and Global Sustainable Development, Helsinki, Finland**
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- 2002 - 6th International Symposium on Environmental Geotechnology and Global Sustainable Development, Seoul, South Korea**
Chairpersons: Dr. Won-Pyo Hong, Chung-Ang University
- 2001 - International Symposium on Application of Natural Materials for Environmental Geotechnology, Tokyo, Japan**
Chairperson: Prof. Hideo Minato
- 2000 - 5th International Symposium on Environmental Geotechnology and Global Sustainable Development, Belo Horizonte, Brazil**
Chairperson: Prof. T. Cassia de Brito Galvão
- 1999 - 1st International Symposium on High Altitude and Sensitive Ecological Environment, Nanjing, China**
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- 1998 - 4th International Symposium on Environmental Geotechnology and Global Sustainable Development, Boston, USA**
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- 1996 - 3rd International Symposium on Environmental Geotechnology and Global Sustainable Development, San Diego, USA**
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The Global Institute for Energy and Environmental Systems (GIEES) is an internationally recognized, cross-college, interdepartmental and multi-disciplinary research, educational, policy and outreach unit of the University of North Carolina. Its program focuses on environmental issues associated with industrial, civil and energy infrastructure development and operation. Its objectives are to: (1) perform cross-disciplinary research and provide technical support to local, state, and federal agencies on environmental issues pertinent to environmentally sustainable development, energy infrastructure, and hazard mitigation; (2) enhance the capacities of traditional academic departments at UNC Charlotte to provide high quality cross-disciplinary research experience to students on critical environmental and energy issues; (3) develop research and allied program links with other institutes and centers globally on critical environmental issues, and lead consortia of universities on collaborations under the auspices of national and international agencies such as the United Nations and the World Health Organization; and (4) operate professional development, outreach, and technology transfer activities such as seminar and colloquia series, international conferences, and exchange programs that, together with strong research and academic programs, will continue to support UNC Charlotte's role as a leading university on integrated analyses of energy and environmental systems. More information on GIEES is available on the internet at: <http://www.giees.uncc.edu>





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GADR is a diverse, international non-governmental organization (NGO) that networks more than 1000 professionals and 100 supporting organizations in 70 countries. GADR which is headquartered at the Global Institute for Energy and Environmental Systems of the University of North Carolina-Charlotte, NC, USA, was established in 2001 with the mission of facilitating global cooperation, communication, coordination and collaboration among United Nations agencies, academia, and public and private organizations that have missions and programs relevant to natural and technological hazards. The organization was officially certified as an NGO in 2003. It comprises administrators, policy makers, educators, researchers, technologists and emergency service officers from government agencies, the private sector and NGOs. Their responsibilities and interests embrace the reduction of disasters from natural and technological hazards and introduction of cost-effective disaster reduction concepts into programs for sustainable development, disaster-resilient communities and environmental management.

Since 2001, GADR has created the authoritative serial documents: Blueprints for Change to integrate the theory and practice of disaster resilience and highlight/recommend best practices in different parts of the world. It is also providing leadership in collaboration with UNESCO, UN-ISDR and other organizations to operate a Knowledge Management and Education program as a component of the United Nation's Decade of Education for Sustainable Development (2005-2014).

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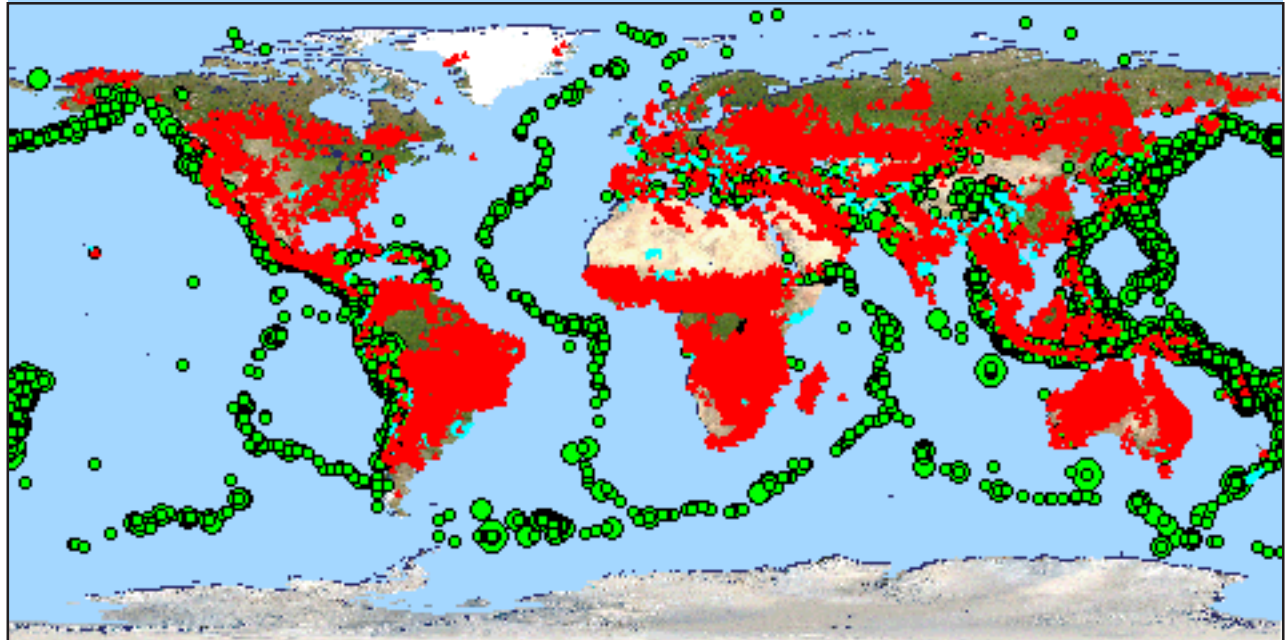
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