Session L2

Geoethics and Society: Geosciences serving the public

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ABSTRACTS BOOK

Data on Seismic Risk Perception in Italy

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risk perception, earthquake, awareness, seismic risk perception

Risks perception involves complex cognitive processes of collecting, selecting and interpreting signals about events, activities or technologies that may have consequences on us, even if they are unpredictable, and their impact is uncertain. In the natural sciences 'risk' means the probability distribution of adverse effects, but the everyday use of 'risk' has different connotations (Renn, 2008), and the two terms, hazards and risk, are often used interchangeably by the public. Within the social sciences however the terminology of 'risk perception' has become the conventional standard (Slovic, 1987). A theory that offers an integrative, as well as empirically valid, approach in understanding and explaining risk perception is still missing. To understand the perception of risk is necessary to consider several areas: social, psychological, cultural frames, and their interactions. Among the various researches in the international context on the perception of natural hazards and risks, the approach using the method of semantic differential seems to be promising (Osgood, C.E., Suci, G., & Tannenbaum, P. 1957, The measurement of meaning. Urbana, IL: University of Illinois Press).
We set up a test on seismic risk perception in Italy, based on the semantic differential. Opposite adjectives or terms are confronted on a Likert's scale of seven points. The test consists in an informative part and six sections respectively dedicated to: hazard; vulnerability (home and workplace); exposed value (with reference to population and territory); seismic risk in general; risk information and their sources; comparison between seismic risk and other natural hazards. The test allows to obtain the perception scores for seismic hazard, exposed values, and vulnerability; then, these scores can be put in relation with the scientific knowledge, to check awareness and resiliency of the society.
The first survey took place in Italy from January to June 2013, in the frame of the activities funded by the DPC-INGV S2 project (https://sites.google.com/site/ingvdpc2012progettos2/). Collected data will be discussed at regional scale.

The improvement of our understanding on the perception of seismic risk would allow us in planning more effective information initiatives and in developing specific educational projects for risk mitigation.

ScienzAperta, an outreach week about Earth Science at INGV

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science dissemination, outreach strategies, open week

Scientific exhibitions, hands-on laboratories for kids, meetings and seminars with researchers, guided tours to laboratories are the ingredients for the outreach week "ScienzAperta" at Istituto Nazionale di Geofisica e Vulcanologia (INGV). ScienzAperta, the Open Science Week, responds to the needs and the request of the society for more information on issues regarding our Planet. The common goal is to engage INGV researchers to be involved in a correct, straightforward and efficient communication to public about research and technological innovations they perform.
In a world that request citizens to be more informed, aware and able to make crucial decisions about their own health and safety, the knowledge is crucial to handle doubts and to know how to choose with consciousness.
Since 2011, ScienzAperta held once per year during spring; several INGV headquaters over the Italian territory open their doors to public. The goal is to help raise awareness about earth sciences, and research activities at INGV, as well as intrigue, interest, and stimulate audiences of all ages. Researchers and technicians involved in outreach activities conceive scientific programs to present research as the heritage of all.
Some activities were organized in collaboration with other institutions and with transdisciplinary approaches. For example in 2011 edition, in collaboration with Istituto Nazionale di Ricerca per gli Alimenti (INRAN), geophysics and nutrition sciences were linked through geodynamic evolution and diet evolution of the Mediterranean. In all the past three editions music-based initiatives were designed to attract young people as well as generic public, such as the performances "seismic waves, sound waves, from earthquake to music", "musical journey of Italian earthquakes", "waves, sympathy and music", "landscapes, territory and wines".
The ScienzAperta programs were designed giving special attention to pupils and teachers. Hand-on laboratories for kids on earthquakes, volcanoes, and also on INGV researches in Antarctica were organized, and achieved great participation and appreciation. Analysis of questionnaires distributed among adult visitors and children during an Open Saturday in 2013 in Rome provided hints to improve the outreach event format. Acquired pieces of information were perceived as useful to get more in depth with the topics by mostly all adult visitors; nothing was perceived as not clear, appreciation comments came as well as invitations to repeat such events more frequently; children perceived the games as very interesting, very useful and well organized, but in some cases the notions not so easy to be understood.

Earthquakes: as research institutes communicate hazard and risk. The case of the USGS

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seismic risk communication, citizen involvement, citizen preparedness

Italy is a high seismicity area. In 2012, over 16,000 seismic events occurred, an Italian region, Emilia Romagna, was hit by two strong earthquakes, unexpected, which caused

numerous deaths and severe economic consequences. In 2012, the judgment of L'Aquila trial shook the scientific world, not only the Italian one, bringing to the forefront the role and social responsibility of scientists, particularly seismologists.
This latter event has raised the importance of communication in seismic risk mitigation activities, spurring a debate in the international scientific community, with sincere self-criticism and awareness actions of researchers who have questioned the approach of transmission of information about seismic hazard, and natural hazards in general. The present work comes from this premise: looking at the activities of the main U.S. geophysics research institute, the USGS, the questions raised were how seismic risk is communicated to population, in what forms communication is realized, what are the best practices implemented. This analysis aims to provide food for thought to delineate an effective and smooth communication strategy in our country.
Seventy-five million Americans and thirty-nine states involved. These are the numbers related to seismic risk in the United States of America.
The USGS, the institute in charge of seismological monitoring in the U.S., addresses this issue by participating, with other government agencies, the 2013 128 million dollars budget National Earthquake Hazards Reduction Program, the national program for the mitigation of seismic risk. This program was established to improve the understanding and the evaluation of seismic risk and vulnerability, and to promote the application of the results of scientific research to prepare the population for seismic events. The USGS communication with non-experts in this field is divided according to the parties and the media used. The analysis is centered on the web, the main channel of information. The USGS also has a strong presence in social media.
Web communication marks a strong informative purpose, aimed especially at the proper preparation of citizens to seismic events. This objective is pursued through the direct involvement of local communities (California) in decision-making and resulting actions to reduce risk, and through the participation in multi-disciplinary projects that integrate theoretical scientific knowledge with socio-economic analysis, to increase the resilience of exposed community.

The communication during the emergencies

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Communication, Geologists, Psychologists

Citizens communities often are not aware of the degree of the danger of the territory in which they live and are not aware of the risk to which they are subjected during seismic events and hydrogeological phenomena that occur. Geologists play an essential and predominant role in the context of the actions aimed at better face the natural risks both during the emergency, such as technical support for the decisions, and in the post-emergency phase for the analysis of the damage and of the subsequent actions to be undertaken. The geologists thus have to dialogue with other professionals, with the institutions involved and with the victims of the destructive natural event. The victim is in a state of 'ignorance', because she 'did not know' that would take place the disaster and its consequences, and 'ignores now' its causes, the chances that it re-check again, the ways to prevent or avoid it. This unawareness, generates an helplessness sense, which in turn produces anxiety, fear and confusion. In this context, the role of the geologist becomes important, as holder of the technical-scientific knowledge and thus he becomes the point of reference for those involved both in impersonal terms (external environment), and personal and internal terms. Precisely for the psychological aspects of the victims of the disaster, the geologist can be flanked to other professionals, such as psychologists, to develop a correct and effective communication.

Scientific research and new technologies for enhancing knowledge and proactive management of geoheritage in mountain regions: geodiversity and geohazards of the Susa Valley (W-Alps, Italy)

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geohazard, geodiversity, vulnerability

Mountain regions have a range of geological and geomorphological features that make them attractive for tourism activities. Consequently, increased human "pressure" causes impacts on geoheritage sites and higher geomorphological risks. These effects are magnified by active geomorphic processes characterizing mountains areas. In term of "human sensitivity", sociological surveys showed that "perceived risk", not "real risk", influences people's behavior towards natural hazards. The same approach can be applied to geoheritage. Based on these assumptions, we considered the possible strategic roles played by diffusion of scientific research and application of new technologies: 1) to enhance awareness, either of geodiversity or environmental dynamics and 2) to improve knowledge, both on geoheritage management and natural risk reduction.
Within the activities of the "ProGEO-Piemonte Project" (Progetti d'Ateneo 2011, cofunded by Università Degli Studi di Torino and Compagnia di San Paolo Bank Foundation), we performed a systematic review of geodiversity and natural hazards information in the Piemonte Region (NW-Italy). Then we focused our attention on the Susa Valley, an area of the Western Alps where the geoheritage is affected by very active morphodynamics, as well as by a growing tourism, after the 2006 winter Olympics. These area became one of the 9 strategic geothematic areas selected to represent the geodiversity of the Piemonte region, each characterized by high potential for enhancement of public understanding of science, and recreation activities supported by local communities. Then we contributed to the awareness-raising communication strategy of the "RiskNat project" (Interreg Alcotra 2007-2013, Action A.4.3) by synthesizing geoscience knowledge on the Susa Valley and information on slope instabilities and prevention warning systems. Visual representations and evolutionary models have been prepared for didactic trails and virtual laboratory, for contributing to the popularization of geological history, environmental changes, natural hazards and related risk management practices.
By combining geodiversity and geohazards knowledge, a new conceptual and operational discipline has been achieved in the management of the geoheritage of the Susa Valley. New techniques for recognizing and managing its rich geodiversity have been developed and applied to the territory of the "Alpi Cozie Geopark" (Interreg Alcotra 2007-2013, Project 2) for geosites selection, geo-trails preparation and management and dissemination activities. As final results, better recognition of the economic value of geodiversity and stronger perception of natural risks have been achieved: both valuable contributions to reduce local vulnerability to disasters and to support an integrated quality management system of geoheritage, suitable for a sustainable tourism.

Geology and society: new perspectives

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Geo-Sciences, Society, Communication

The figure of geologist, in a country as Italy is, should be more authoritative and appreciated. The discipline, in a professional sense, is confined into the area of the applied geology and suffers from a sort of subordination to other professions. Referring to the latest dramatic events occurred in Italy, emerged the need to provide the society with correct and clear information on the situation of the geo-environmental scenarios of our country. A first step in this new direction is to pay attention, in the professional field, to the environmental geology and, at the same time, to create a new kind of communication that can activate a wider and conscious target. The Italian National Council of Geologists and the Regional Professional Orders are the institutions concerned in this project and, today more than ever, is urgent an efficient and timely activation in geo-environmental protection as well as in the field of scientific communication.
A hectic way to reach a balanced management of the territory, must be based on a shared knowledge, aiming to involve society in a participatory democracy.
One of the most important goals is the popularization of the Earth sciences and the geologists. An interesting experience has been performed within the International Year of Planet Earth, a project that has divulged the scientific heritage using topics more accessible to the people.
The dissemination of scientific heritage is a complex process : a very sensitive point is how to organize information in a strategic way – thinking about objectives, audiences and messages - in order to communicate the contents to the largest audience.
Landscape plays a key role in the knowledge processes: it is the result of the endogenous and exogenous activities that mould Earth's surface and, at the same time, is the object of human perceptions. A path trough landscapes is a path trough the earth sciences: nature, culture, sports will be useful tools in the hands of a modern geologist, in this new challenge.
The modern technology offers new powerful tools: the GIS are able to synthesize, manage and represent a large amount of data; thanks to GIS it's almost easy to reach an evaluation of the state of the studied landscapes, referring to the dual risk/resource which characterizes our country.
At the same time, GIS represent a modern and friendly way to teach and learn environmental sciences.

Pitfalls of negationist approach in communicating induced seismicity hazard in Italy

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induced seismicity, gas storage

Italy is a country rich in hydropower, geothermal wells, extraction/reinjection of hydrocarbons, but surprisingly from 1964 to date only three papers have been published on the seismicity induced by dams, two on the problem of seismicity induced by reinjection of fluids and one that studies the effect on seismicity by the variation of the groundwater regime possibly caused by the excavation of a tunnel or by climate change.
What has happened in Italy to cause this (at least apparent) disregard for the induced seismicity?

We must go back to 1964, after the catastrophe of Vajont. In that year, prof. Caloi, then principal geophysicist of the National Institute of Geophysics published a work in which he noted as the start of the reservoir impounding gave rise to a sequence of induced seismicity in the same rock shoulder that later collapsed causing an inundation claiming more than 2000 casualties.
Since then induced seismicity is a taboo, constantly downplayed by companies and utilities, dismissed as impossible or communicated with artifacts like the constant use of the prefix "micro-".
The Emilia 2012 occurred close to a site that was selected for a gas storage facility in an (un)confined aquifer. Regional government denied permission due to the vicinity to an active fault and the question was still pending in front of the National authority in charge of licensing the plant when the earthquake occurred. The local residents, that were opposing the gas storage, misinterpreted the motivation of the denial of permission, understanding that the fault would became active only if the storage was working. Thus they concluded the the earthquake occurred because the company performed secret drillings. Badly informed journalists mounted the case, calling it a "fracking" operation. Incredible it may sound, the governor of the Emilia-Romagna region appointed an international commission charged to investigate the relationship between drillings (not storage) and earthquakes. In the meantime, the L'Aquila sentence convinced the population that all the seismologists are corrupted, politically-linked flunkeys. Other hydrocarbons operation are now strongly opposed by residents and even geothermal projects, once hailed as eco-friendly, are blocked by local authorities on the base that "any drilling will cause earthquakes". The fact that there are not reliable expert in the field of induced seismicity is making things difficult to resolve, since no opinion is considered trustworthy.

Geoethics and geoscientists role to protect geodiversity for societal development

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Geoethics, Role, Society

All over the world, the areas with abundant natural resources are associated with increasing population, urbanization and industrialization, even if such areas are at high risk from natural calamities (landslides, earthquakes, floods, etc.). In most such areas, there is total lack of public awareness and perception of risk, and the status of knowledge on the clear aggregate situation is often limited for hazard resilient management response requirements. Therefore, when any such calamity occurs, people get panicky from possible disaster, due to absence of coherent policies to check half baked media communication and various types of generic opinions to gain popularity. Hazards result in disasters due to human tendency to manage risks by ad hoc and tactical preparedness measures, and get regionally polarized on political fronts with narrow mindset, parochial exploitation and fight with self interest. Geoscientists can play very significant role to change the mindsets of public (including mining/industry operators, researchers, administrators), by interaction, new communication strategies and disseminating information on natural heritage, genuine engineering and scientific advancements and evidences, and strengthen policy guidelines on prevention, mitigation and recovery. Geoscientists can help in proper search and selection of the location of sites for construction, maintenance of the infrastructures, and preparedness strategies to manage activities for ecosystem restoration and rehabilitation. They can use their wide experience and maturity to inform public on significance of properly using the resources, and for risk assessment from possible flood events, and impacts on safe extraction and supply from groundwater collecting works, geo- hydro- spheres contamination, etc., appreciating the overall impacts of what they say. Partnerships of geoscientists with public, and the private sector could yield new resources and more efficient methods, especially in hydropower generation, flood-risk management, and

port and harbor maintenance. Geoscientists can reorient and consolidate efforts by critical research/analysis of inextricable linkages and geo-ethical dilemmas, to educate all stakeholders including politicians and policy-makers how to promote harmony and enhance efficiency by individuals trust, knowledge, transparency, respect of interests and share of responsibility and resources, and adopt a problem-solving integrated-disciplinary approach, and restricting corrupt and unscrupulous practices working hand-in-hand with greedy investors for private gain. The choices guided by the best obtainable scientific information, and socio-economical considerations planned in association with the users with moral values (honesty, trust, treating others fairly and loyally) offer the best hope to manage, prevent or mitigate such hazards, and protect the 'geodiversity' and natural resources.

Natural hazards revealed to children: the other side of prevention

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education, natural hazard, prevention.

Living on a land prone to natural hazards is not a prerequisite that warrants a crucial compulsory education on the subject. Whereas this is a common paradox in many countries, in Italy it is an issue claiming major efforts towards mitigation, given the multiplicity of hazard exposure and the relevant vulnerability of land and infrastructures. As knowledge is clearly connected with understandings, perception of natural hazards and risks in the local environment should be mandatory accomplished with the help of education. In this paper we present targeted science outreach activities, involving both non-formal and informal learning, to raise children awareness towards natural hazards. They span from classroom lessons and laboratories activities, to generic science venues with scientific games, interactive exhibitions up to scientific theatre performances. Having children as chief target allows to rely on emotional intelligence and prompt behaviors that might get best imprinted in the mind. People tend to deal with hazardous situations in the way they did in the past no matter they had been trained otherwise. This is something that has to do with processes inside our mind. A way to avoid that would be either repeated training until earlier wrong behaviors are replaced, or start training and education at early ages when emotional intelligence is prevalent. Training children on natural hazard response is a fundamental way to look at risk prevention and preparedness. Since the whole process relies on emotional learning, a prerequisite is that experts communicating to children must be skilled on conveying self-motivation, which is the ability to generate feelings of enthusiasm, zeal, confidence, and persistence, especially during setbacks. We are engaged on enduring research to implement educational and communication models that raise risk perception, emphasizing the hazard intrinsic to the Italian territory while ending up with the importance of shared behaviours within the community.

The Geologist: professional ethics, competences and comunication

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Role of geologist, ethic of communication, geologists in administrations

The geologist is more and more often involved to lead to the Society own competencies and know how in environmental issues. Our experience is required for a growing number of frameworks, both private and public. In particular, in the public sector, the skill of geologist,

coat a fundamental role in a front-end situation in routines of authorization to build up infrastructures and complex projects with significant impacts both on environment and for the economic development, nationally.
The complexity and specificity of some impacting projects of very high profile (together with a budget of significant experience) are not easily available, mostly in the field of energetic use of underground, penalized by a very scarce knowledge of the discipline (very few university courses available).
This fact involves that the VIA procedures (Environmental Impact Evaluation) inside the local authorities are very low understood in terms of competencies (geological formation path).
Regions, provinces and municipalities have geologists in the staff, but they are not opportunely evaluated and prizemen. In these cases, the official statements of these administrations are in the hands of poorly qualified people, allowing delays in authorizations, escaping of operators abroad.
The formation in these administration is pre-requisite, taking in consideration scientific aspects and their renewing on the basis of the state of art evolution.
The Ordine dei Geologi and Consiglio Nazionale dei Geology are probably the more appropriate entity to address new formation in cooperation of university and research institutions

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Geologists: ethics, professional knowledge and communication

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Ethic, communication, technical

Geologists, mainly the ones working for Government, Regional and local agencies, are increasingly asked to participate to the authorization processes for complex projects that can have a significant impact on the environment. Some projects require specific knowledge and experience that not often are available. Projects in the Energy sector are very often severely penalized by this situation.
The involvement in the authorization processes at both regional and local level, of not experienced people, is continuously causing long delays in the approval of industrial projects. Most of the authorizations with prescriptions or denials without valid motivations, are caused by the lack of preparation or by ideological reasons.
It is necessary to elaborate as soon as possible a "Code of Ethics" for the Geologists that separates the personal ideology from the technical and analytical expression of an opinion. The evaluation of a project must be based only on technical evidences and facts.
Professional training and update should not be directed only to students but also to the people already operating within the private and public organizations.
The "Consiglio Nazionale dei Geologi" and the "Ordini Regionali dei Geologi" should play an active role in monitoring the professional behavior and the application of the "Ethic" principles.

Analysis of the mass-media communication, role and failures in the last ten years, about underground use to produce heat and energy (geogas storage, geothermics)

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NIMBY syndrome growth, ethics of journalists, underground use for energy

The paper considers the needs of a complex and motley stakeholders community make by scientific-industry-institutions, involved in the difficult task to study and accept (or refuse) projects strongly impacting the lived territory & underground, in densely populate countries, as Italy, in terms of appropriate public communication and sound deontological behaviour.

Successively, the paper recalls years of "scientific" communication within the mass-media, highlighting the positive and negative messages, in comparison to the true and objective experimental data gathered by the real scientific work, as perceived by citizens of medium scholastic culture, which not delve the geologic disciplines, but receive simply the journalistic front-end, very often as sensationalist scoop.
The authors retrace case histories of heuristic-participatory communication with the citizenship about the scientific results on challenges raised by certain technologies.
The objective and rational communication is often impeded by local interests and by local journalism, which prefers to create sensationalist news more than scientific truths.
This path progressively tangles as a consequence of the complex and with conflicting use of underground to produce energy (heat as gas storage, geothermics, unconventional gas exploitation, mining, etc…). Even the chain of renewables meets by now serious issues, exacerbated also by the need to start mining and drilling for the smart grids materials too (metals, rare Earths, etc..).
Review a "paper" on a newspaper or a blog could be more difficult than review a scientific paper, as a consequence of the peculiar situations behind the scenes and the conflicts of interests staying in the nest in a newspaper article or in a blog comment (locally political interests, commercial interests, attention-seeking, colleagues envies, etc..). The scientific journalists are normally of low scientific and ethical level and they are often coopted by negative mechanisms (mainly political for some newspapers or TV).
The paper travel over again the AAPG rule of ethics (American Association of Petroleum Geology), taking the advantage of certain concepts developed by Nomisma Energia too and of concepts coming from our work building questionnaires addressed to the population, also with municipalities affected by disastrous geological adverseness (i.e., earthquakes, contamination, slides, floods), even managing infrastructures of energetic production from underground (rims, storage, geothermics, etc…). In conclusions we suggest a "scientific journalist licence" and grave procedures of "Hyppocrates adjuratory" for scientific journalists as well as for scientific community and operators involved in the sector. The *case histories* reported emblematic of how the road is long, meandrous but necessary.

From «information deluge» to structured knowledge: how web technologies and web collaboration could support Natural Hazards Communication

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disaster resilience, wiki, web sematic, participatory approach, knowledge

In the last 20 years the debate on disasters preparedness and relief operations underlined the need to evolve from "war" against hazards to "preparedness" in order to decrease vulnerability [Wisner et al., 1994]. In this perspective the key word "resilience" fosters a cultural change that should drive the risk & emergency management towards a participatory dimension involving scientific communities, experts, civil protection bodies, media, citizens, volunteers, civil society. In other words: from protection (passive behaviour) to resilience, supporting a wide responsibility and proactive behaviour. One of the enabler of this cultural change is the open knowledge approach, that could allow a better understanding and communication on Natural Hazards and related risks. Without any doubt, recent disasters highlighted how the new media increase the information complexity; the internet and the web 2.0 have augmented information and data availability, however some critical points are arising: easy access to information, precision and reliability, that are at the centre of the current debate. The internet "information deluge" is a continuous and rather chaotic flow, with poor filtering function, that brings to the idea of a tool to organise complexity allowing a better knowledge transfer, education, communication, information spreading and sense-making. How to give answer to

the increasing need of clear, and trustworthy information on NH? How to open knowledge? How to support a citizen-science perspective? Which are the best practices to switch towards a new resilient information ecosystem? The challenge is to find models and tools to build an open and structured knowledge to facilitate the access to validated and reliable information, build a common understanding on NH and local risks, so to react and take the right decision in order to cope with and reduce the impact of disasters. A "Natural Hazard Wikisaurus" (NHW) is here proposed as a "matrix" of a model to be used in "practice". The NHW is intended as a structured and collaborative web platform with validated information on geosciences to support a common understanding; the overall aim is to propose an operational and collaborative approach for acknowledged practitioners, citizens, civil servants, media representatives, and students allowed to collaborate or to retrieve information through the collective content validated by the scientific users of the platform. Furthermore, this first step could foster a next step that will take advantage from the power of «linked data» so to contribute to a natural hazard semantic, or to a «semantic disaster resilience».

Web Information Emergency Management: the role of information in the framework of the Italian Emergency Management

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web 2.0, civil protection, information management, informing population

The need for a clear and correct information in emergency and hazards matters is crucial and increasingly complex. Web 2.0 augments information and data availability, however the post-Gutenberg age arises some critical points: easy access to information, precision and reliability: the center of the current debate. Particularly in hazards and emergency matters, information is crucial to cope with disaster and to allow, either practitioners or population to take decision. Informing population during disaster events is a duty: however the web era is highlighting the gap between institutional communication and the information deluge of social media channels. The widespread availability of validated emergency information requires both a high degree of cooperation and an interdisciplinary approach. In this perspective, there is a need to involve and commit not only experts, scientists, practitioners, civil servants, but also citizens, volunteers and media representatives. This approach is based on knowledge, information, skills and competencies (abilities) pertaining to various thematic fields: scientific, legal, logistics, historical, organizational, psychological, sociological, cultural, health. If not taken into account, this complexity can augment the exposure to the «unsafe» side of social information. The post-Gutenberg revolution challenges institutions to redefine the whole information process within the civil protection system and the emergency institutional bodies, taking the uppermost of the web revolution. This imply some changes: redesigning the Communication Function as an official source of information and acknowledged by the internet users as reliable; reshaping skills and competences within the emergency players reckoning emergency management, web communication and hazards knowledge; last but not least, a high level of information sharing between the "nodes" of the emergency bodies for feeding the web content flow. Is this a technological matter or a cultural one? How emergency institutional bodies are coping with this global changes? How to coordinate the different institutional level involved? The analysis of Verbania Civil Protection Exercise - in the framework of STRADA Strategic Project (INTERREG cooperation program Italy -Switzerland 2007-2013) presents a case of web emergency communication processes and procedures addressed to the definition of guidelines for practical implementation of a disaster resilience communication.

Geoheritage preservation: a geo-resource for the sustainable development of regions. The case of the Estremadura Limestone Massif (Portugal)

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Karst geoheritage, Sustainable development, Limestone quarries

The Estremadura Limestone Massif (ELM) it's one of the most rich areas from the point of view of the preserved geoheritage in Portugal. Located in Central Portugal not far from the Atlantic Ocean (20km in straight line), about 100km north of Lisbon, it's formed by uplifted limestone compartments belonging to the eastern border of the ancient N-S Meso-Cenozoic Basin. Really the ELM makes the contact between two sedimentation basins: one close to the ocean already inactive and differentially uplifted, another in the interior still active and subsiding, corresponding to the Tagus basin. The ELM makes the contact, by overthrust, between this two major morphostructural units. These structural conditions (continuous uplift) allied to the important thickness of the carbonate rocks (sometimes more than 400m), justified the great development of the karst forms (at the surface and underground) and hydrology. So, we can find in the ELM almost all types of karst typical features, very well preserved and scientifically representative, and some show even a value of rarity that put them not only at national level but also at international level. This is, of course, a very good thing because geoheritage can be promoted as a geo-resource (taking into account the specific vulnerability of each site) and contribute, together with the other regional resources, to the sustainable development of the ELM. However, there is a major conflict between this strategy and another one based in the exploitation of the limestone resource, that involves the installation of different types of quarries (according to the different types of rough materials extracted). This human intervention is far from more damaging in what concerns the geoheritage preservation than the natural hazards more frequent and with larger magnitude in the ELM - the rockfalls. Moreover rockfalls occurs in inhabited areas and so they don't represent a real risk to the population. The conflict preservation of geoheritage *versus* exploitation of limestone in disseminated quarries, have obvious ethical implications. Both activities involve earth scientists responsabilities that should be measured and discussed.

Degree of preparation of an Ecuadorian academic community to natural disasters in a multi-hazard zone

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Disaster response, urban risk, Ecuador

A recent survey has been undertaken in an Ecuadorian university with the highest national academic ranking, directed by the Army, in which lecturers, researchers and administrative staff as well as students were interviewed about their preparation degree towards natural hazards. This survey, which should determine a first diagnostic part about the preparedness of the people constituting the university, resulted to significantly surprising results, as this institution of higher education has been considered as the best prepared academic unit related to hazardous geologic and hydro-metereologic events as well as man related hazards due to the presence of personnel of the army. Also, the potential ability to respond to the mentioned hazards has been also analyzed. The obtained results demonstrate, that about half of the interviewed persons (total N = 2008) have no first aid kit in their offices, homes or even cars. However, a majority (around 78.7%) of those who do have a first-aid kit do not have fundamental contents. While some 9.6% do not know their own blood type, some 39.8% have

no idea about the blood type of their closest relatives. Some 53.6% of the total never participated in a first-aid workshop, while some 19.5% participated in a workshop longer than five years ago. Nonetheless, a majority (80.7-90.7%) those who participated in a first-aid workshop lack of fundamental skills. About the same percentage (56%), who do have a list of important phone numbers, do not have a sufficient amount of water for their families for the duration of three days in case of an emergency. Emergency plans are not known or ever applied in homes (81.4%) or in the working area (82%). However, only a minority knows the closest shelter for emergencies related to their home (36.6%) or working area (26.7%). A great majority (85%) replied not to be able at all to get prepared if an announced disaster would strike in 24 hours. Similar questions about the degree of preparedness got repeated high percentages of deficiency in response towards hazards. This survey demonstrates the obvious lack of knowledge, the wrong perception and weak preparedness of Ecuador's academic public towards any future potential natural hazardous event. As the first guideline for preparedness planning should be based upon accurate knowledge of the threat and of likely human responses, a lot of efforts need to be made to be able to respond adequately to the next natural disaster in Ecuador.

The role of media and internet in influencing perception. How easy it is to become a geologist thanks to the net; how a geologist should react

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media, geo-ethics, underground

Main information flow is actually driven by the Internet. The net is becoming the absolute truth in a number of disciplines and activities. Three main reasons:

- scientists are very often not used to use "simple wording" and face the mass, with the consequence of giving space to "experts of everything"
- local authorities are very often driven by the research of maximum consent instead of the maximum benefit for the communities, giving space to oppositions and protests
- industry, central authorities, professional categories are very often silent or unable to easily explain the business, with the silence occupied again by oppositions and protests

The 2012 Emilia-Romagna Earthquake event is just one of the last examples: the knowledge of few key-words and how to use them is giving the opportunity for experts of different disciplines to find fame, in the name of environmental protection and sustainable development. Words like fracking, drilling, storage, subsidence become common and are used without knowing the real meaning but for "other reasons". This is a good example on how easy is to become "geologist" or "expert in geology". And how hard is to remove this label once the net has promoted it.

The fact that Emilia Romagna was a seismogenic area prior to the last year's event; that Earthquakes have been happening for millennia; that underground resources have been exploited safely for decades and that underground resources will continue to be the basic energy sources for the next tens of years is lateral or just "told by experts in conflict of interest".

There has been a dangerous silence from, and not enough space given to, the geologists to explain in real time what was going on. And to re-proportion the growing phenomena.

This lack of knowledge, linked with a suspended decision making process too often emerging from local political games - are the best cultural soil where the NIMBY grows.

Geologists should take the lead in explaining, debating, avoiding the mechanisms of "declining everything", demanding a correct media coverage and refusing to be silent, proactively participating in creating a solid and concrete share and spread of knowledge, avoiding any "licence of kowledge" when not supported by any "guarantee of knowledge".

Ethics and awareness of a sustainable development, even when speaking about the dirty but still necessary oil&gas business: environment care, excellence of technology and professionalism, development of jobs must be part of our "Hippocrates Oath".