



## Natural Hazards in Earth Science education projects

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In the last decades, the awareness of the role of geoscientists in the society increased, while a deeper awareness of the importance of an ethical behavior developed in the geoscientists professional work, in the communication with the public, in the students and teachers training.

Recently, the scientific contributions on geoethics have increased, as well as the organization of special scientific sessions in important international congresses, consolidated by the publication of significant synthesis, proceedings of conferences, special issues of prestigious journals of Geosciences. Starting from these assumptions, considering that geoethic involves widespread interests of different cultural fields, it is proposed a review of training activities related to Natural Hazards developed at the University of Turin, in collaboration with other institutions and authorities of Piemonte region (Italy). Different activities will be exposed, based on the same goals and methods, shared within an interdisciplinary research group.

A few examples of these activities will be mentioned belonging to institutional training (courses and university laboratories, thesis and doctoral dissertations, graduate schools for teachers training, masters and seminars), but also collaboration with Natural History Museums and Natural Parks of the Piemonte region, as well as occasional workshops proposed in conferences, seminars developed with Teachers Associations, single didactic proposals offered in schools. These activities include, as an example, events of tsunami in the Pacific Ocean, floods and slopes instability events, abandoned waste and interference with soil and groundwater, risk of degradation of fossil localities etc.

These proposals were structured in order to carry out didactic research on students' misconceptions, on the conceptual difficulties of certain topics, on the skills of abstraction required: some relevant concepts are extremely difficult to conceive, as it happens reconstructing situations recognizable only by clues and following events widely spread in geologic times.

These examples will illustrate how methodologies and strategies have been applied to achieve the following purposes: (i) to act according to the principles of geoethics in the formation of professionals of Geosciences education and communication; (ii) to increase individual and collective awareness of the interference of mankind on natural systems, especially on geological heritage.

All the mentioned activities have been designed following these common strategies:

- to respect and to value the great emotional impact of the issues proposed;
- to lighten the irrational aspects of an approximate communication carried out by some media;
- to place the impulsive events between the effects of "normal" terrestrial dynamical processes;
- to train to a constant and curious attention towards "common" situations, in order to be able to interpret them with awareness;
- to highlight the complexity of the phenomena and the richness of the relations between abiotic and living world, despite of convenient simplifications;
- to highlight the role of mankind in the system of relationships, as "victim" or "creator" of the changes;
- to encourage the awareness of individual responsibility, to enhance the development of a respectful and careful attitude towards other living beings and the Earth system, attitude mindful of the values and the need to protect them.

The importance of taking care of the communication approach has been evaluated and tested, giving constant attention to the interlocutors participation, creating informal moments of dialogue, valuing the contributions of their previous knowledge and experience, integrating other contributions of knowledge, relevant to the humanities and the arts.