

## Safety in GPR prospecting: a rarely-considered issue

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Safety issues (of people first of all, but also of the equipment and environment) are rarely considered in Ground-Penetrating Radar (GPR) prospecting and, more in general, in near-surface geophysical prospecting. As is right and fully understandable, the scientific community devotes greatest attention first of all to the theoretical and practical aspects of GPR technique, affecting the quality of attainable results, secondly to the efforts and costs needed to achieve them [1-2]. However, the (luckily) growing GPR market and range of applications make it worth giving serious consideration to safety issues, too.

The existing manuals dealing with safety in geophysics are mainly concerned with applications requiring "deep" geophysical prospecting, for example the search for oilfields and other hydrocarbon resources [3]. Near-surface geophysics involves less dangers than deep geophysics, of course. Nevertheless, several accidents have already happened during GPR experimental campaigns. We have personally had critical experiences and collected reliable testimonies concerning occurred problems as mountain sickness, fractures of legs, stomach problems, allergic reactions, encounters with potentially-dangerous animals, and more. We have also noticed that much more attention is usually paid to safety issues during indoor experimental activities (in laboratory), rather than during outdoor fieldworks. For example, the Italian National research Council is conventioned with safety experts who hold periodical seminars about safety aspects. Having taken part to some of them, to our experience we have never heard a "lecture" devoted to outdoor prospecting.

Nowadays, any aspects associated to the use of the technologies should be considered. The increasing sensibility and sense of responsibility towards environmental matters impose GPR end-users to be careful not to damage the environment and also the cultural heritage. Near-surface prospecting should not compromise the flora and fauna (for example, the nesting of several species of birds should not be disturbed). No blaze should be caused or facilitated, no polluting substances should be improperly left in situ, no artworks should be damaged.

Last but not least, the prospectors have to be protected (as far as possible) against injuries of their goods and work. For example, the safety of the equipment has to be ensured: in our experience things not always work as expected and instruments can get easily damaged. Advices related to the transportation of equipment are worth to be given. On the basis of these considerations, the COST (European COoperation in Science and Technology) Action TU1208 "Civil engineering applications of Ground Penetrating Radar" has undertaken the effort to prepare and issue a book on these topics [4], entitled "Recommendations for the Safety of People and Instruments in Ground-Penetrating Radar and Near-Surface Geophysical Prospecting." Several experts from all over the world contributed to the preparation of this volume, including Action's Members and other specialists. The book has been published by the European Association of Geophysicists and Engineers (EAGE) in 2015.

The aim of this contribution is to present, disseminate and discuss, during the GI3.1 Session of the 2016 European Geosciences Union General Assembly, the most significant and interesting topics dealt within [4].

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