Since its first development more than 100 years ago, Ground Penetrating Radar technique has gained a notable importance for the investigation of the earth subsurface, with applications ranging from the shallow centimetric scale of civil engineering to the detection of deep and extended geological evidences. In this wide scenario, this talk will illustrate a number of experimental case studies to introduce some of the key elements affecting the performance of the GPR methodology and will provide an outline of the challenges faced to ensure proper imaging performance. Special attention will be put on how these capabilities can be transferred in the framework of environmental monitoring infrastructures.