



Unique Ground Penetrating Radar techniques for investigation of geological structures

GPR in boreholes

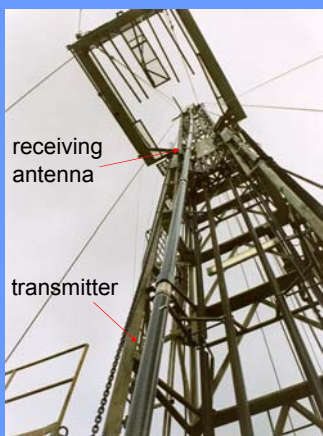


Borehole logging tool in a drift.

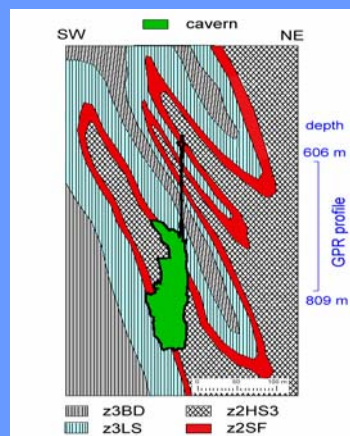


Vertical geological section in a salt mine with results from radar measurements in a horizontal borehole.

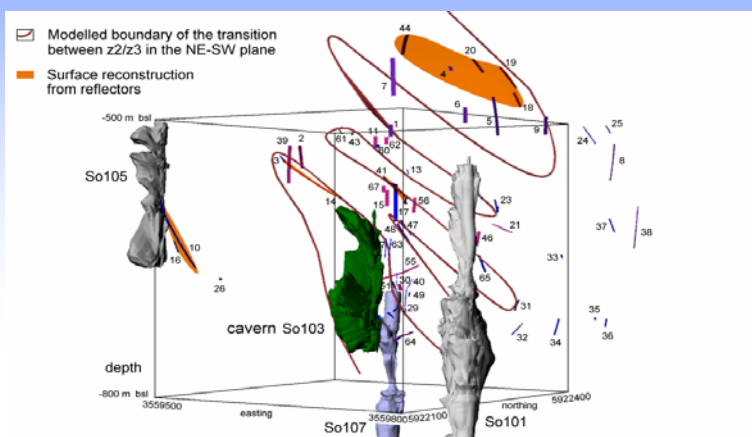
Example of investigations in oil filled caverns



Direction sensitive logging tool
Radar probe at the starting position above the cavern borehole.



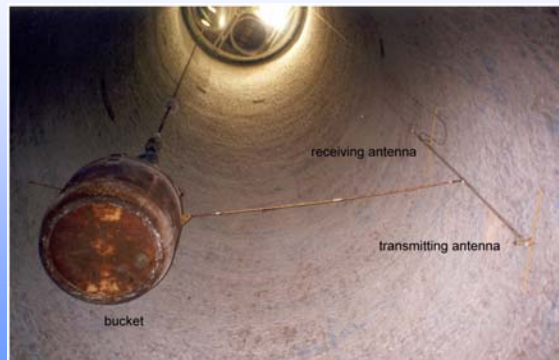
Assumed geological section
2D Geological section in a strongly folded salt dome with oil filled caverns.



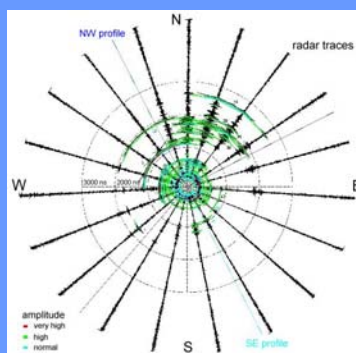
Perspective view of the cavern field with results from GPR

Even from one single borehole it is possible to get spatial information of the internal structure of a salt dome. The information can be combined with sonar data of the cavern shapes and other geological data to create a three dimensional model.

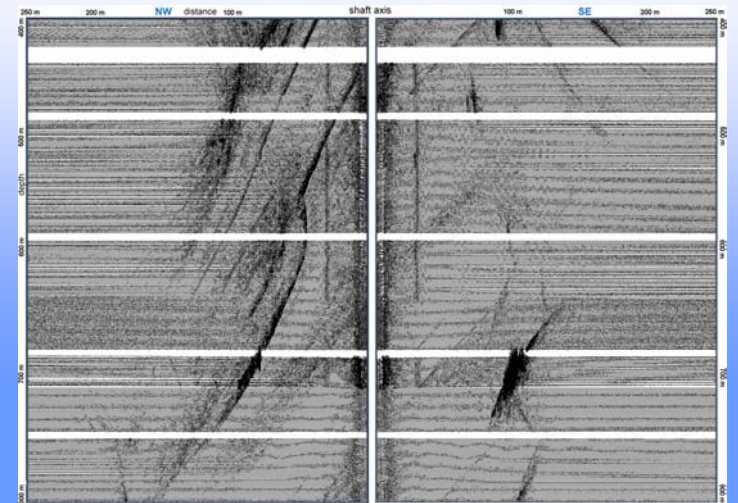
GPR in a shaft



Dipole antennae on a profile in the shaft.



Getting the direction of reflections by its maximum amplitude.



Vertical NW-SE Radar section of measurements in a mine shaft.

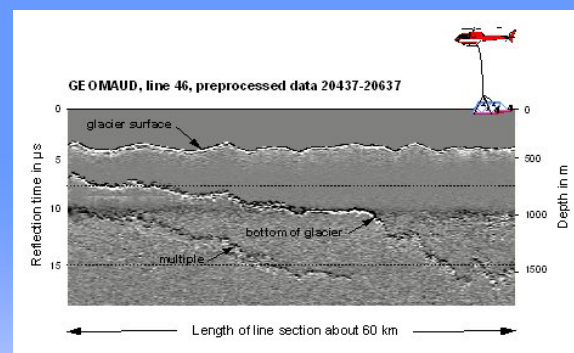
GPR allows geologists and miners to better target their activities with greater safety. Underground exploration requires measuring techniques that provide spatial information of structures or heterogeneities. Therefore BGR develops unique radar systems. Additionally for environmental climate change problems helicopter borne systems make it possible to investigate large areas over dangerous or poorly accessible ground.

GPR in a drift



Mobile data recording unit with operator at measurements in a drift in salt.

Helicopter borne GPR systems



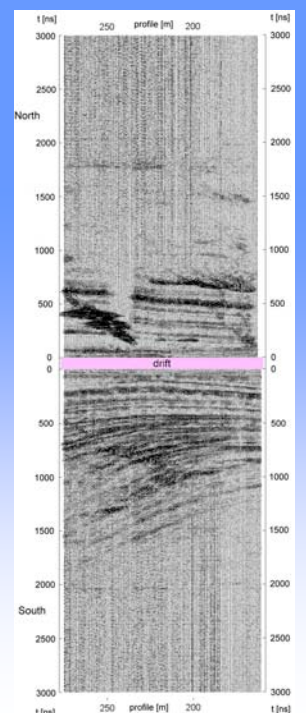
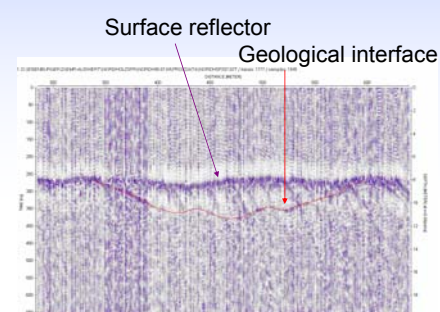
Pulse radar system

The pulse radar system works successful on helicopters or airplanes to estimate the ice thicknesses on polar glaciers.



Stepped Frequency radar system

The Stepped Frequency system works with variable bandwidth providing the capability to resolve shallow structures.



Radar section of profiles at the side wall of a drift.