

GROUND-PENETRATING RADAR (GPR)

Andrew Martindale (UBC)

History



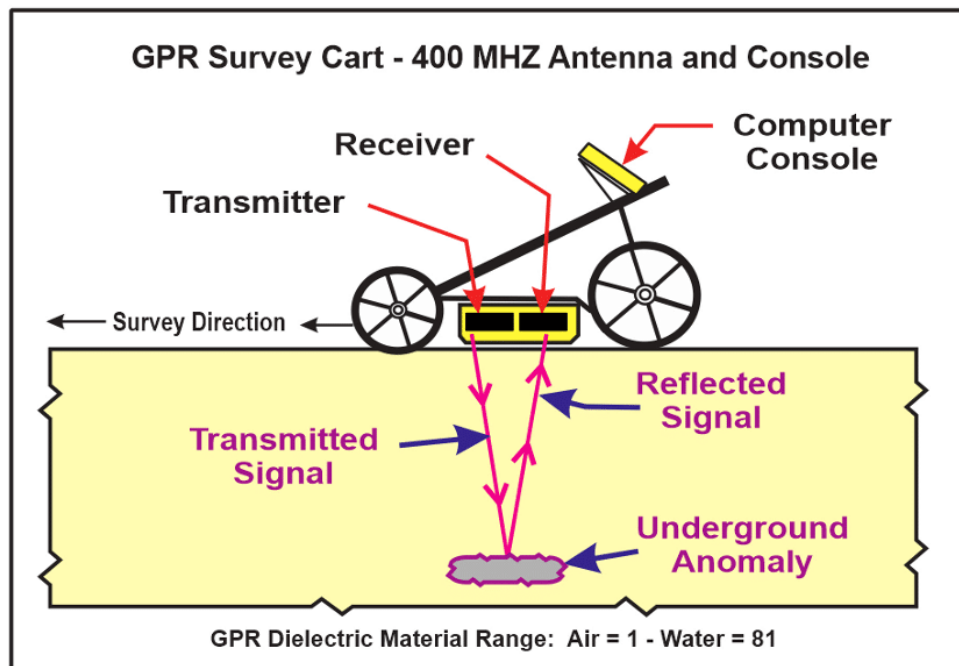
Developed in the 1970's for military and industrial use; self-contained units developed in 2000's.



Widely applied in archaeology, useful in cemeteries, increasingly in IRS contexts.



Similar to navigational radar: detects difference by patterns of reflected waves.



HOW IT WORKS

Patterns underground influence the reflected signal.

Reflections can be visualized and interpreted.

Frequencies used to map burials reach about 2m underground.

GPR detects the grave shaft more than contents.

Cemeteries

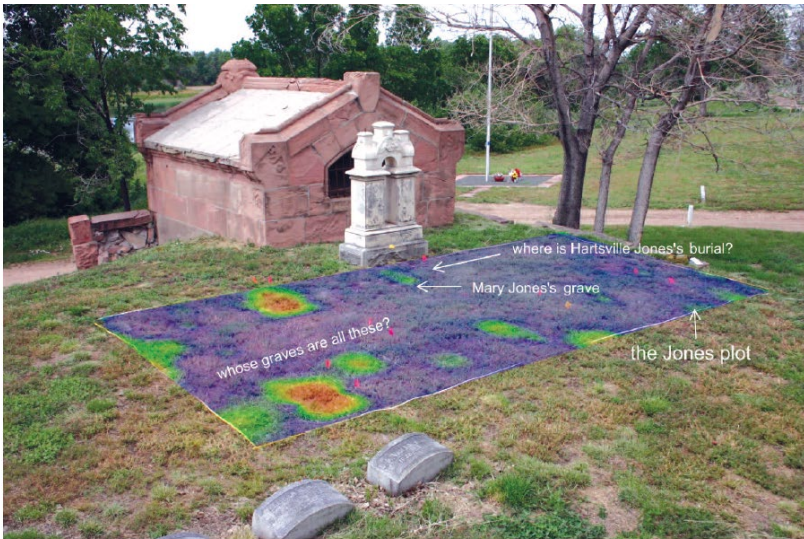


Figure 8-3: Overlay of the GPR amplitude map on the Jones plot in Riverside Cemetery, Colorado. The Jones mausoleum is in the background, made of red sandstone. The mystery about where Mr. Jones's body was buried remains unsolved, as GPR shows no burial next to his wife Mary.

Conyers, LB (2016). *Interpreting Ground-penetrating Radar for Archaeology*. London: Routledge.

- GPR works well in formal cemeteries.
- Graves stand out against background sediment that is homogenous and not reflective.
- Less is known about using GPR in informal and clandestine burials.
- Such contexts are likely to 1) include less visible burial shafts, and 2) occur in places with competing GPR signals.

Field Methods

Mapping landscapes and GPR grid locations is essential for locating graves.

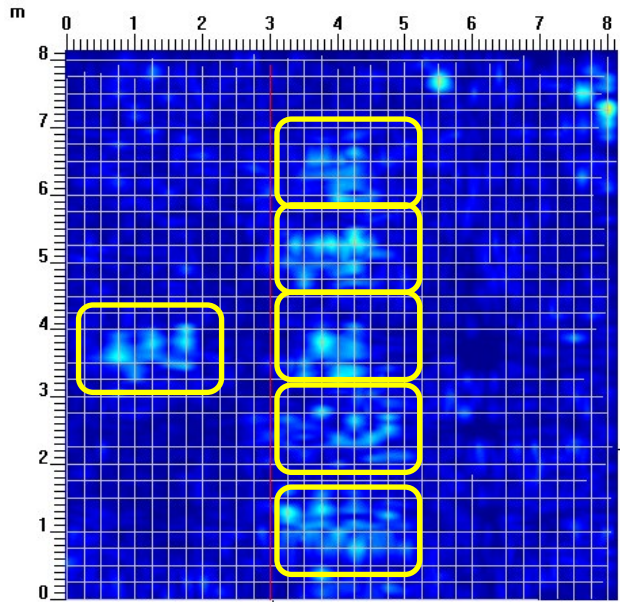
Two modes of GPR: prospecting and investigation.

A range of frequencies and data collection parameters – best practices are being tested.

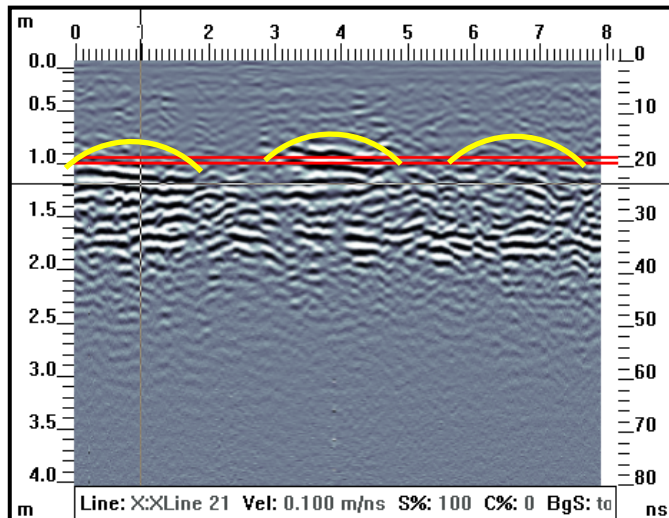
A GPR survey can be a burden for survivors and must follow appropriate ceremonies and protocols and offer necessary supports.

Visualization and Interpretation

- GPR produces maps and profiles of signal *anomalies*: patterns of difference.



GPR Plan View



GPR Sub-Surface Profile

- Grave shafts have characteristic shapes and qualities – Musqueam/UBC are developing a guide.

Application in IRS Contexts

GPR is a reliable tool for locating near-surface burials, but there are other methods.

It is not 100% certain, but uncertainty can be evaluated from known examples.

GPR relies on trained and experienced researchers using appropriate equipment and careful mapping.

The CAA is producing technical documents.

Communities can develop this capacity themselves.

Locating all missing children will take time and resources.