GUIDELINEGEO

ABEM | MALÅ

CASE STORY

Environment - Permafrost mapping

| RESISTIVITY |

Geophysical identification of permafrost in Antarctica

CLIENT

Uruguayan Antarctic Institute (IAU)
http://www.iau.gub.uy/

Challenge

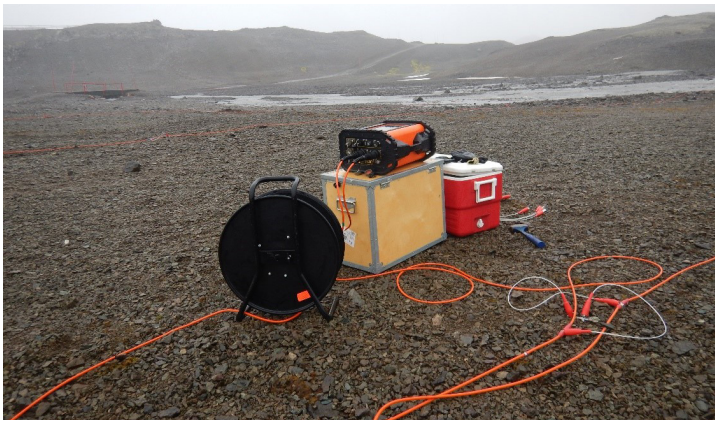
Some of the foundations of the Antarctic scientific bases on King George Island are anchored directly on the permafrost. With increasing global temperatures and the associated risk of permafrost melting, the stability of the island's infrastructure could be in jeopardy as the frozen zone contracts.
The objective of the geophysical survey was to characterize the depth of the permafrost layer and identify any localized melt zones.

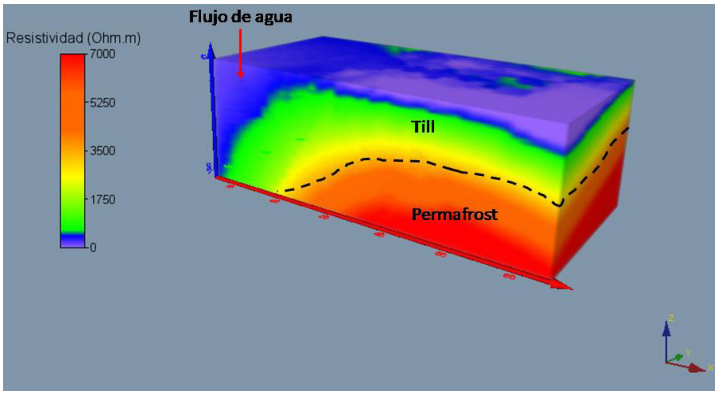
Solution

The resistivity instrument ABEM Terrameter LS was used for a three-dimensional (3D) acquisition of resistivity values, with an 8x5 grid with 10-m electrode spacing and a Gradient-type array.

Result

The results clearly show the presence of high resistivity values (6000 - 9000 Ohm-m) that are associated with the permafrost layer at an average depth of 7 meters.
The result is consistent with the information reported from test-drillings at nearby bases.





PROJECT

- **Type of geology:** Mainly glacial till (piles of varied sediments of glacial origin) on basaltic lavas, agglomerates and lapilli tuffs.
- **Method:** Resistivity
- **Configuration/Solution:** ABEM Terrameter LS resisitivity instrument/ 8x5 grid, 10 meter electrode spacing/Gradient type array
- **Inversion & Visualization SW:** RES3DINV & Voxler