Airborne technologies for groundwater mapping

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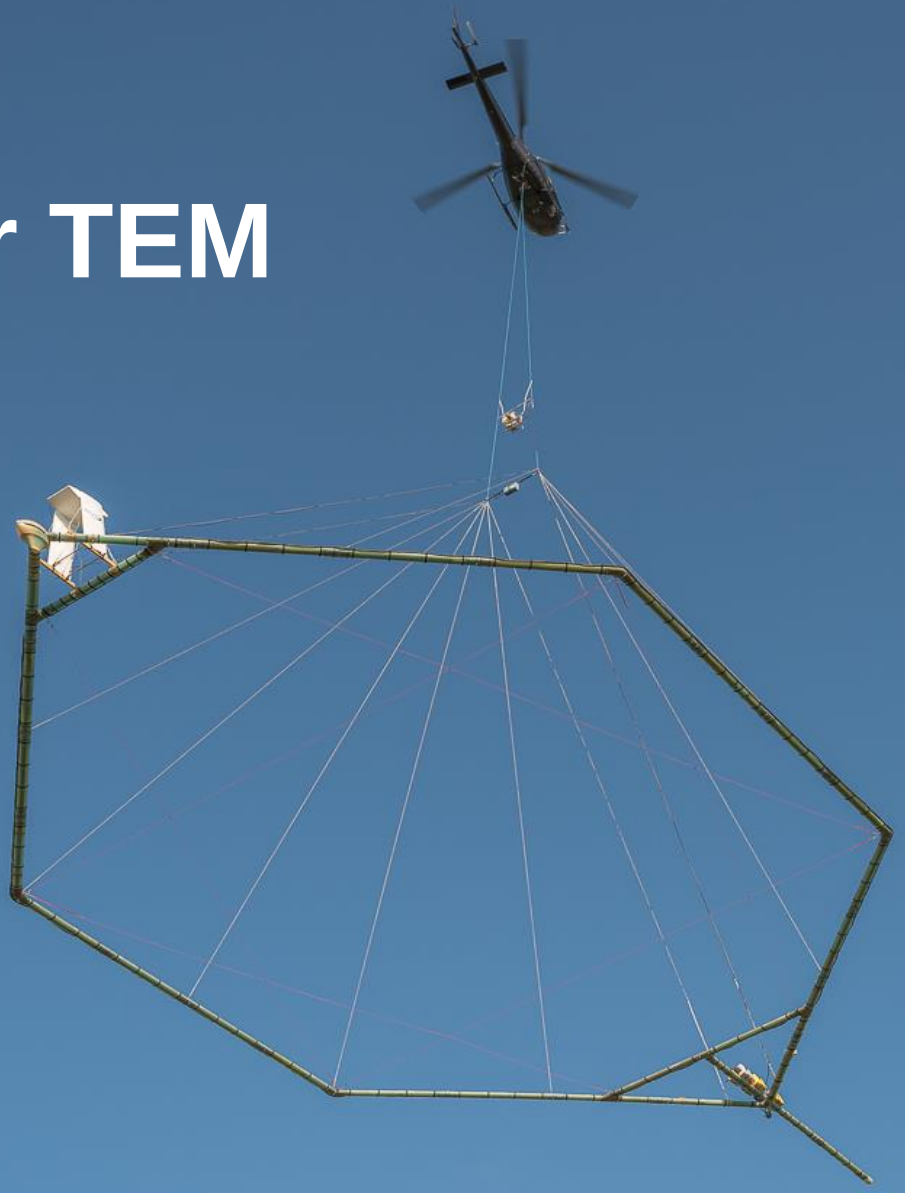
SkyTEM Surveys

- Airborne geophysical company established in 2003
- Specialized in helicopter TEM
- Mapped all main aquifers and 40% of Denmark
- Targets groundwater, minerals and civil engineering sectors
- Operates worldwide with 60+ employees

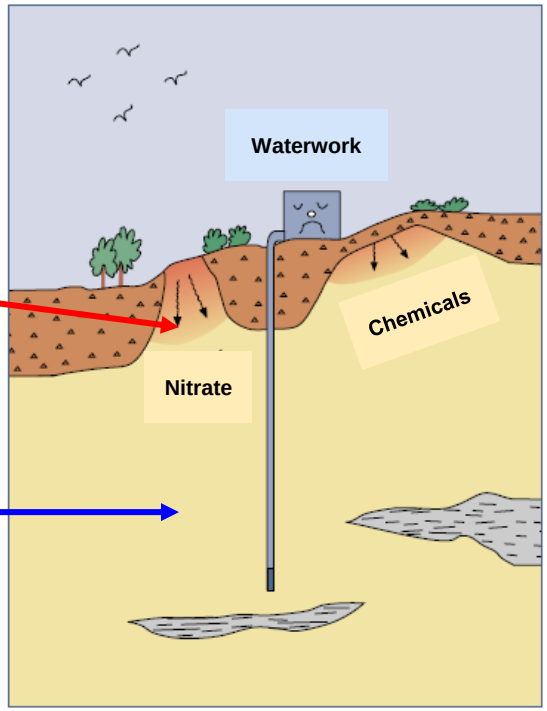
SkyTEM

Helicopter TEM (HTEM)



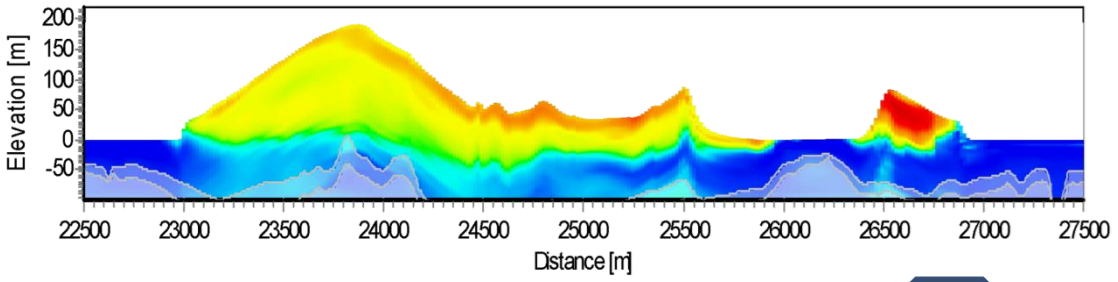
HTEM aquifer mapping

Aquifer vulnerability
(nitrate leaching)



Aquifer size and interconnections

Saltwater intrusion

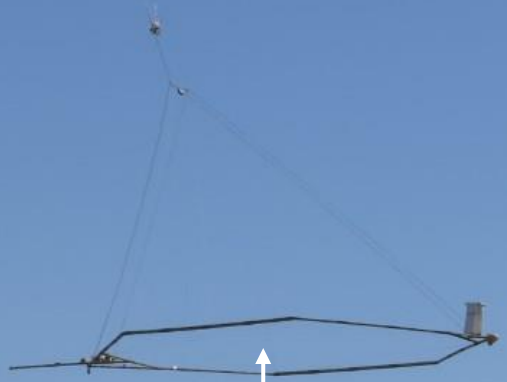


Geoscanning using helicopter TEM

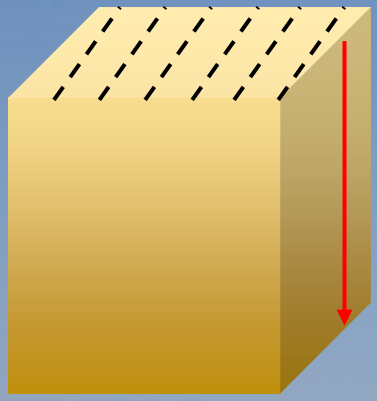
Acquisition speed 80-120 kph

250-500 km flown in a day

(50 – 100 km^2)



Flight lines (200-250 m apart)

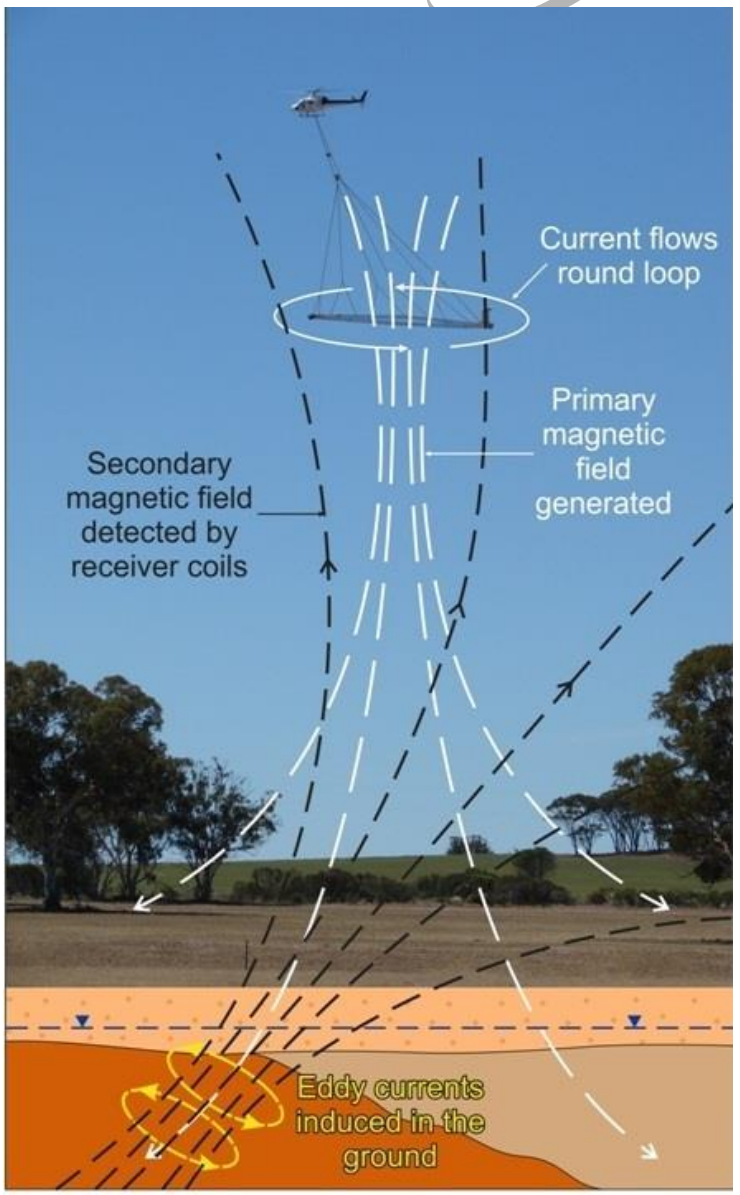


Depth penetration
up to 400 m

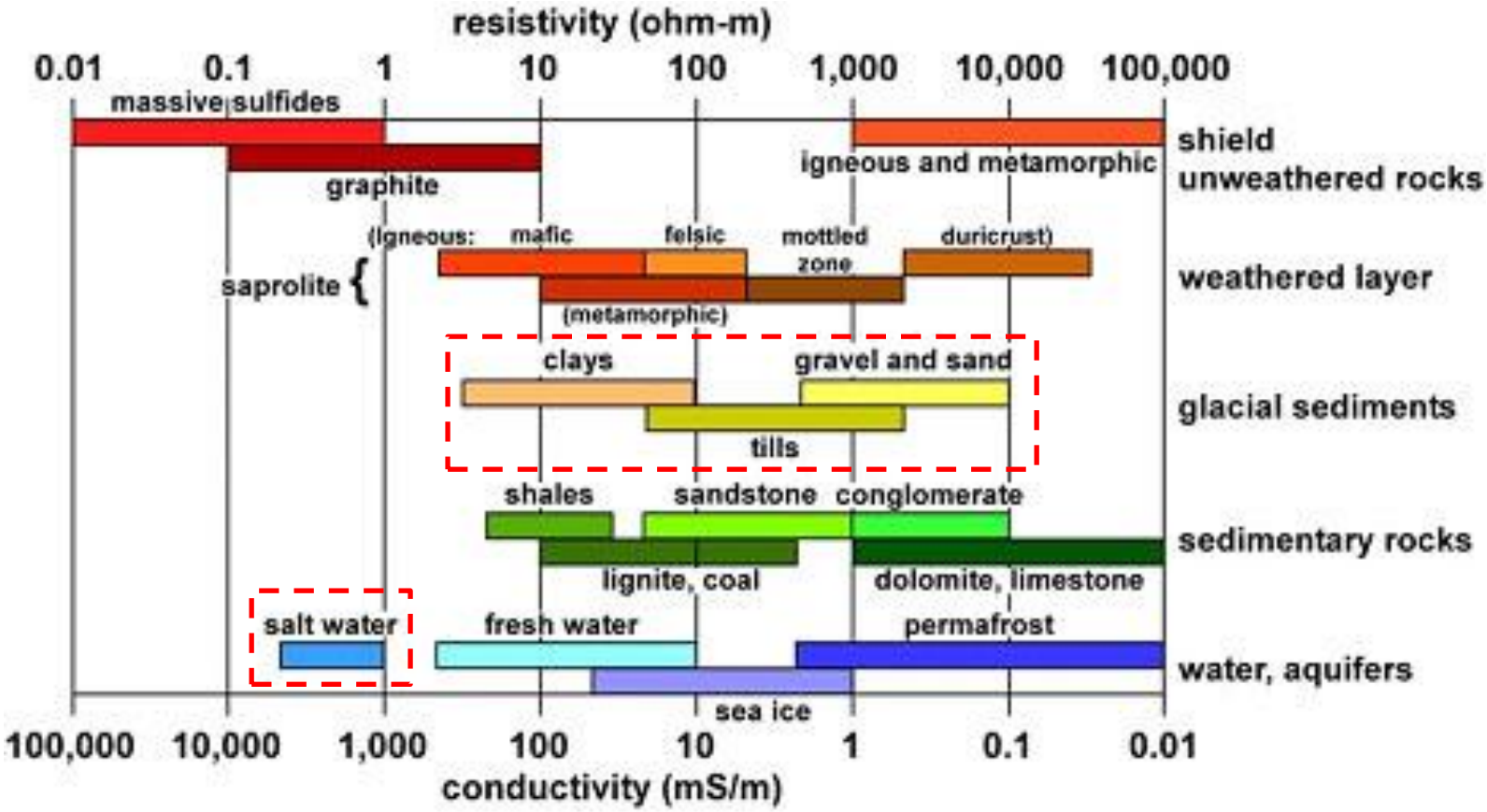
Ground clearance ~ 35 m

Electromagnetics (EM)

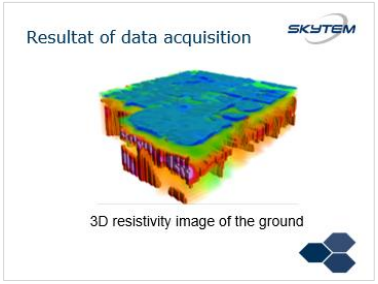
- Faraday's law of **induction**
- Records subsurface **resistivities**
- Depth range **0-400 metres**



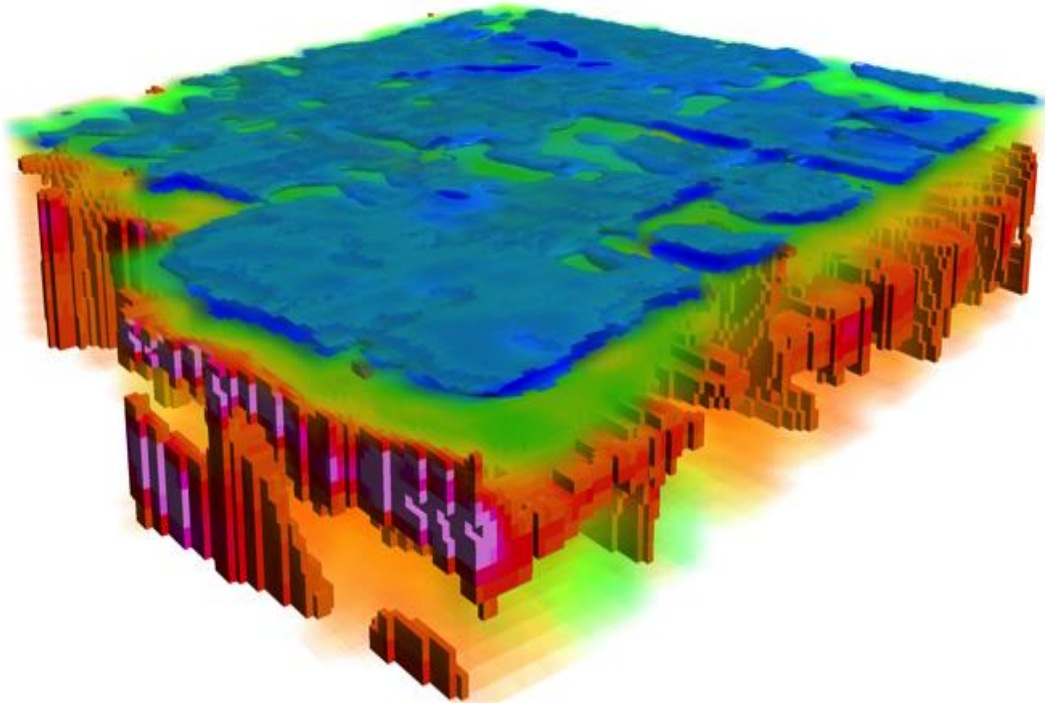
Resistivity/Conductivity values



SkyTEM produces



Resultat of data acquisition



3D resistivity image of the ground

HTEM complements boreholes

HTEM

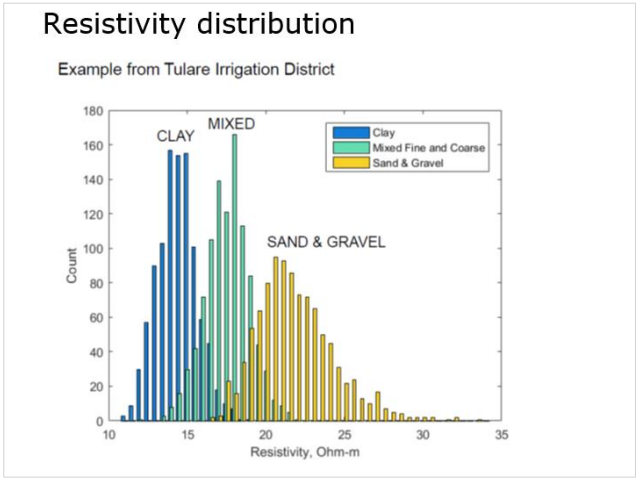
Resistivity data

+

Boreholes

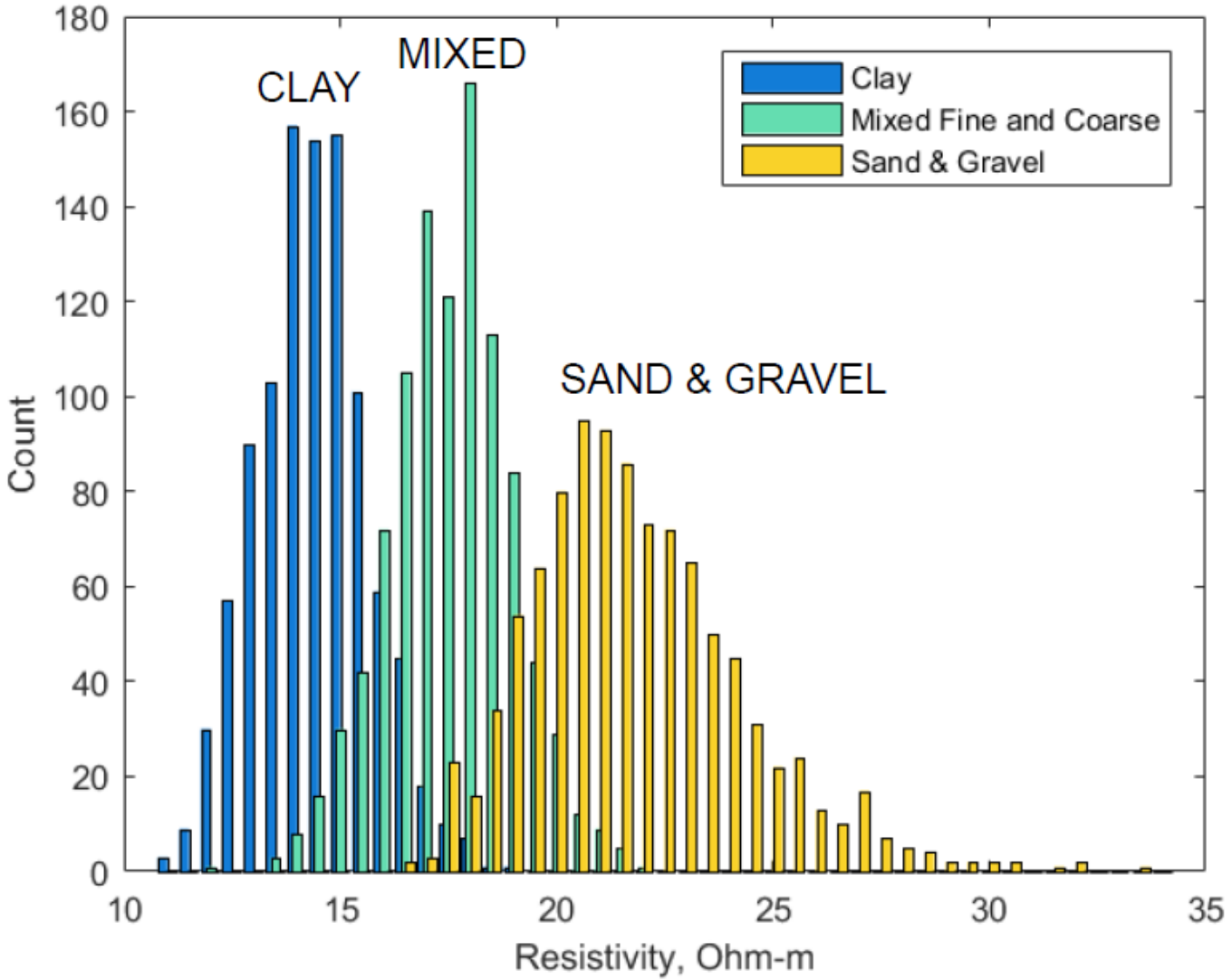
Lithology logs

=

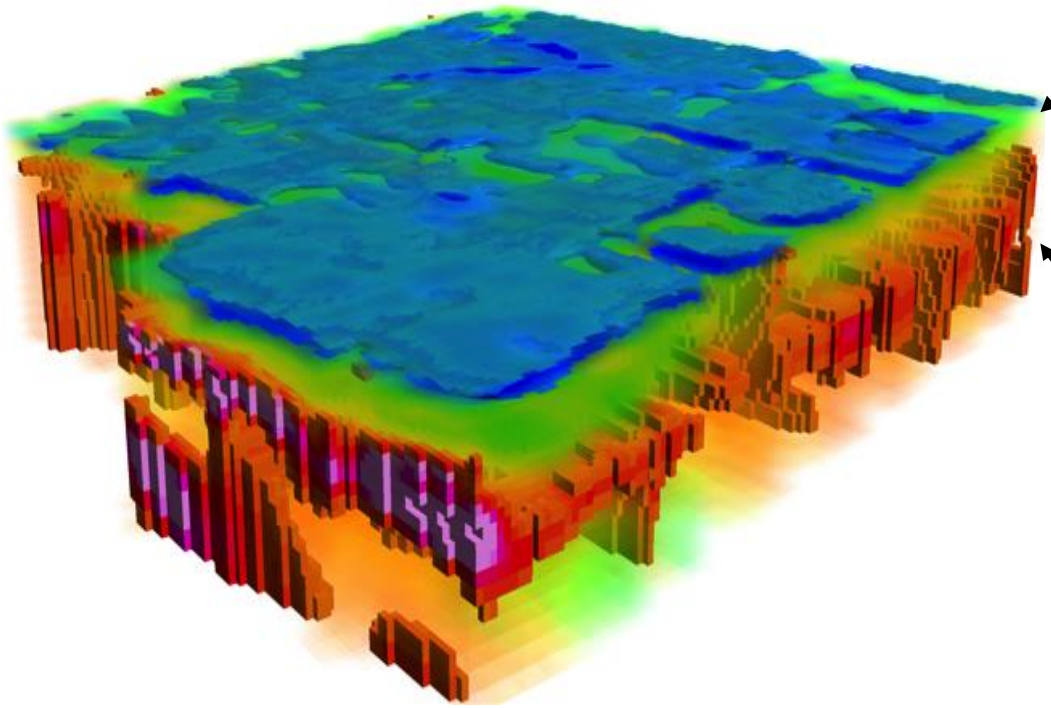


Resistivity distribution

Example from Tulare Irrigation District



Example of hydrogeological interpretation



Blue colors:

Clay cover

Red colors:

Aquifer

Summary

- SkyTEM geoscanning can quickly cover large areas (50-100 km^2 in a day)
- Not dependent on access to the ground
- Highly effective tool combined with boreholes
- Mapping of aquifer size, interconnections and vulnerability


Thank you for your attention!