Airborne EM-data interpretation

Wouter Deleersnyder







Research @ KULAK and @ UGent

Department of Physics @ KULAK

Research team:

2 PhD's on geophysical modelling and inversion

Department of Geology– Research Unit Hydrogeophysics @ UGent

Research team:

5 in-house PhD Students + 3 joint PhD (Uliège, KU Leuven)

Research themes:

- Saltwater intrusion and submarine groundwater discharge
- Electric and electromagnetic geophysical methods
- Geophysical inversion
- Stochastic modelling and uncertainty quantification
- Groundwater modelling
- Shallow geothermal systems

Project 1: Improving salinity estimation from the salinization map

Bet



Data collection: EM induction



Validation

Geographical location: Overlap with salinization map

Goal: Validating methodological developments

Sensory Data: All available electrical conductivity measurements of groundwater (i.e. in wells) at several depths.

No further wishes ③

Data: Processing: In-house, IoW data would be coupled to VMM data of the salinization map.

Project 2: Characterization of submarine groundwater discharge along the Belgian coast

Geographical location: Westhoek Nature Reserve

Goal: Estimating freshwater discharge.



Project 2: Characterization of submarine groundwater discharge along the Belgian coast

3D mapping of freshwater discharge footprint through ERT, marine Continuous Resistivity Profiling (CRP) and FDEM









Characterization of submarine groundwater discharge along the Belgian coast



Direct estimation of the flux through well measurements:

Finite-Volume Point Dilution Method

Influence of tides and seasonal cycles



Long-term monitoring with data transmission to be launched in 2020

Sensory data

- In wells, including hydraulic head
- At least 3 sensors per aquifer level (there are 2 levels)
- Location: near (max. 500m) Slufter in De Panne
- Frequency: ~5 min
- Realtime: less important, FVPDM will be real-time
- Sensors should be located in deep wells (min 3.5bar)



Data

PROCESSING:

• In-house (developing a model)

OTHER DATA:

- Geophysical surveys (in well and at surface)
- IoW data would be coupled with water pressure in wells and flux measurements

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