Wood Land Trust

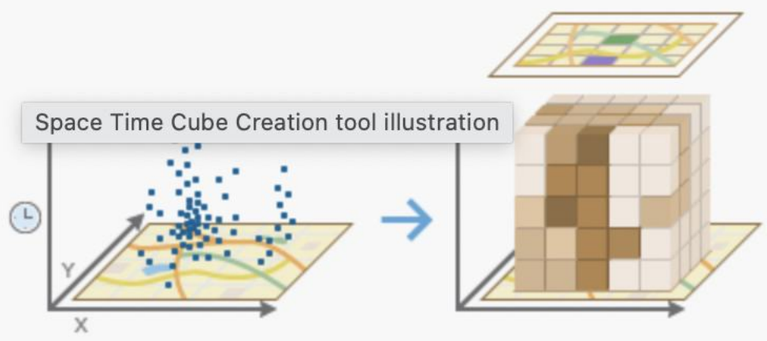
Low Burn Hall Estate

Desmond Julie Amber

What is a data cube?

A data cube is a **multi-dimensional** data structure that organizes information beyond traditional tables. It represents data in more than two dimensions, allowing for efficient grouping and retrieval **across various dimensions.**

Constructed Workflow

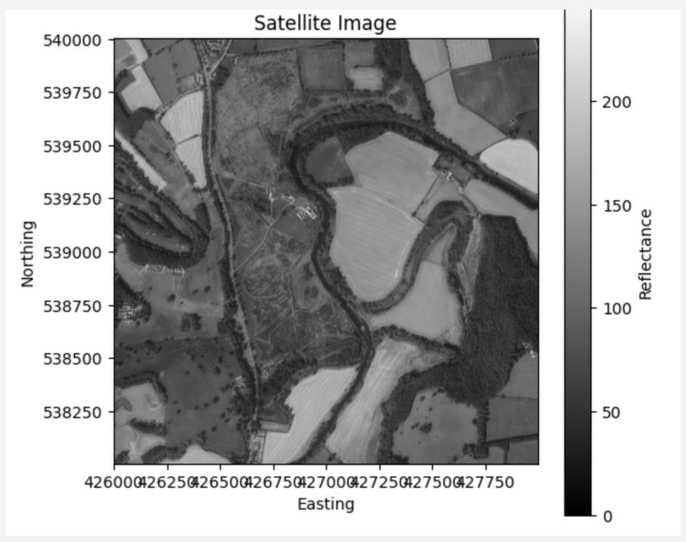


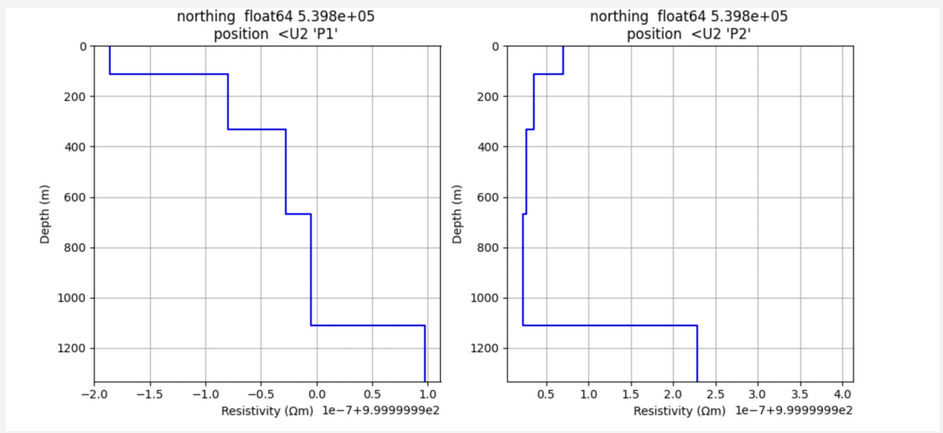
the illustration is from ARC GIS Pro Esri Product

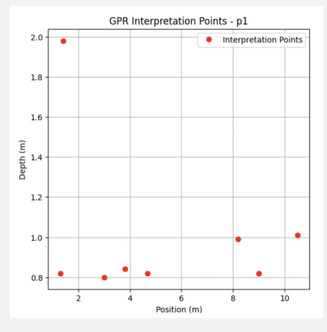
Our Data Cube

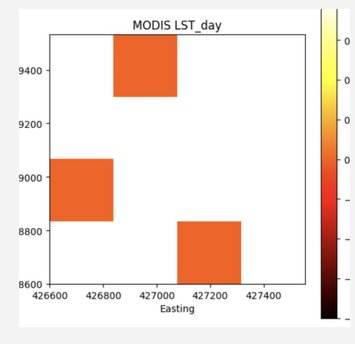
Construction of Our Datacube:

Dimension 1: latitude
Dimension 2: longitude
Dimension 3a: Resistivity
Dimension 3b: GPR (Depth)
Dimension 3c: MODIS (Temperature)









Approach:

Data Collection:
→ with Pulse EKKO
→ with resistivity equipment

Data Cleaning:
→ remove outliers
→ remove duplicates

Data Structuring:
→ location coordinate
→ geophysics inversion

Data Stacking:
→ MODIS Temperature
→ Resistivity & depth
→ GPR & depth

Data Visualization:

Limitation:

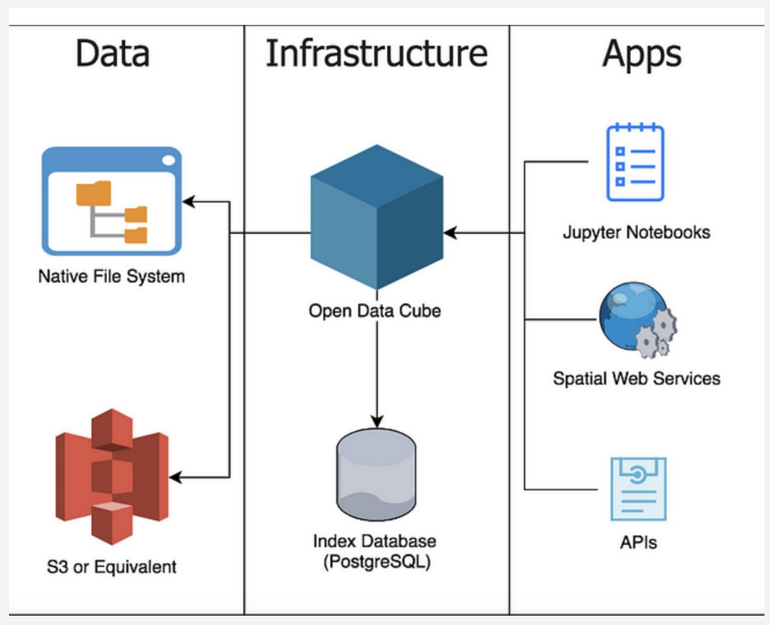
Performance and Scalability: our cube may be limited by performance bottlenecks. In particular, there are high demands on hardware resources for data management and processing, which may affect its scalability and processing speed.

Flexibility and openness: our cube may not be as flexible as some open source GIS software (e.g. QGIS or open source Python libraries) in some specific data processing and analysis tasks. In addition, our cube can have limitations in terms of data formats.

Data Updates and Maintenance: Real-time updates and maintenance of data are key when working with Data Cube, and our cube may struggle with very large datasets or data that requires frequent updates.

Improvement:

Open Data Cube Framework



More Efficient Data Retrieval

Better Scalability and Flexibility

Result: