Geological Surveys – the long journey from iron and steam power to interoperability and climate neutrality

- Accessible information structured data
- Policy relevance a challenge?
- Vision creativity enthusiasm young talent

by Dr. Jarmo Kohonen Geological Survey of Finland



Roots

Trunk

Branches

History

Support

Organization

David Hockney 'Bigger Trees Near Warter'

ROOTS

- Geology •
- **Earth Resources** \bullet
- Utilitarism \bullet
- Wealth of the Nation ٠



The first geological map by William Smith 1812 **COAL**





REE, 'BATTERY METALS' (Li, Co, Ni)

Living standards 1950 > **COPPER, OIL**

TRUNK & BRANCHES

- Structures
- Organizations
- Governance
- Support

These are ponds

Information ponds or river with tributaries?

Carrying water from ponds to ocean in buckets?

Or

Creating a landscape collecting the water via tributaries to **information river** and to the ocean of **sustainable growth**? VOCABULARY Water = Geologic Information Tributary = Shared information system River = Geologic Information Platform Ocean = Sustainable growth

Slope = Stable funding (EU) Bucket = Project



Foliage

Interaction Production Vitality Power-house

David Hockney 'Tunnel 2'

FOLIAGE



- Out-reach
- Activities



Relevant data are **not** the same on the different shells!

Thematically it is long way from the expert-to-expert zone to 'Societal Impact Zone'

Communication between the shells?



Challenges with the 'Societal Impact Zone':

- Changing policy focus areas
- Slowly accumulating new geologic data
- Harmonization and structuring of 'policy data'
- Different application areas with variable use-cases
- Short term projects vs. long term infrastructures

How to define the 'shells' (the different levels of the information platform) and improve communication between the 'shells' - an example from Building Information Modeling (BIM)

Multi Scale Modeling in GIS

Different Levels of Detail (LOD) in order to handle the large scale range in GIS

- LOD 0 Regional model Geology involved – 2.5D Digital Terrain Model
- LOD 1 City / Site model (Geology sometimes involved)
 - "block model" w/o roof structures
- LOD 2 City / Site model
 - textured, differentiated roof structures
- LOD 3 City / Site model
 - detailed architecture model
- LOD 4 Interior model
 - "walkable" architecture models

buildingSMART 😥 position on BIM BIM is about sharing Open Structured Semantic Standard data SMART 🔊 [Date]





Geological Information Service for Europe – some thoughts of an outsider

- Science-based, solid core of the Information Platform stable foundation for changing focus areas consolidation (restructuring?) of INSPIRE (?)
- Harmonized, **structured and standardized core data** towards true interoperability and shared data hard, tedious work of **primary importance** for the further steps
- Clear definition of the 'Policy shell' with LoD (Levels of Detail) would potentially improve communication between the experts and the policy-makers
- Mind the risk of technical tinkering the content is more interesting than the user interface buttons
- Objective-oriented activities (lively foliage) rather than complex organization structures and steering groups on top of each other... (trunks and branches)



• Focused data sets and application areas linked to the selected innovation ecosystems



• AND...

...AND Critical minerals

- The **global race** is on...the strategic alliances are currently taking new forms
- New technologias demand new Earth Resources optional raw material supply sources for EU?
- EU raw material policy needs to be based on **reliable information from various sources**



Reaching out for the 6th (and 7th) Wave



Out-of-the box

- Innovative combinations of data with other science communities
- Artificial intelligence is here
- Data visualization creates flashes of comprehension

Heads up - radar for NEW OPPORTUNITIES

- Enablers for material science and new technologies
- Novel uses of the subsurface (thermal storage, chemical megabattery caves, nuclear minireactors etc.)
- Analysis of the changing value chains public service must be value adding

Brainpower - sustainable growth is an optimizing process based on information

- Information support for environmental innovations
- Maximising the handprint minimising the footprint (new tech + systemic design>>>>circular economy)



we need creative ways to gather new geologic data

innovative linkages to model-based design

courage to approach true value chains

more geoinformation people with a science background

data is out there

raining on the mountains

thank you