

#### Standardizing geomodeling and geotechnical data exchanges: the SCUDDD and MINND projects

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# Standardizing geomodelling exchange

- Statement
  - Several geomodelling tools exist (e.g. two « homemade » tools exist in BRGM) and have their own native format,
  - Geomodels shall be updated by considering new available data,
  - Conversion between format is often tricky and not lossless
- Rationale
  - Having a pivot format would probably mean maintaining at least two formats:
    - The raw data format,
    - The "to share" format
- Is there other solutions?

How to cope with users thirst of geological models data?

- Expression of the "geological architecture" (P. Calcagno & al.)
  - "How geology is here"
    - Define which geological units are involved
    - Define relationship between them (onlap, erod, ...)
  - Not about geometries expression and exchange
- Develop APIs to query geological models stored in their native formats (SCUDDD project: C. Loiselet & al.)
  - Extraction of relevant code from the geomodelling tools to query the model
  - Develop services to build on demand representations and visualizations



# SCUDDD architecture

(adapted from Loiselet & al., 2016)



# **SCUDDD** interface



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The MIN<sup>N</sup>D project

- Interoperable Information Model for Sustainable Infrastructures
- A French consortium of 60 partners
- 1 goal: enhancing BIM capabilities for infrastructure modeling and management
- In relationship with its environment





http://www.minnd.fr/en/

# Underground Infrastructure use case (UC8)

14 partners
Processus & Innovation
Processus & Setec
Processus & Setec</

- 2 working groups
  - Developing / adjusting IFC standards to describe Underground Infrastructure and its equipment
  - Describe relationship between built part and environment and standardize geotechnical data exchanges (Lead by BRGM)

### • 5 main actions

- Cartography of data exchanges
- Elicitation of semantics
- Conceptual model definition
- Definition of data access and representations
- Standardization through BSI and OGC





# What do we have in MIN<sup>N</sup>D?

- Targetting the « Holy Grail » BIM level 3
  - BIM level 2 ~ Exchange data in standardized format (IFC)
  - BIM level 3 ~ Service approach and data centralization
- Revisiting some French normative documents (AFNOR, CETU) on which data shall be exchanged at which moment of the project + update & adjust with experience of the team
- Feedback from first meetings:
  - Geotechnical data are mostly geoscience data
  - Geological models / geotechnical models are shaped and reshaped until uncertainty assessment is « acceptable »

- We can (shall?) use our classical tools to provide data (O&M, WFS, ...) + maybe have to address (again?) the uncertainty assessment topic GC<sup>®</sup> Copyright © 2017 Open Geospatial Consortium

## Opportunities about geomodelling standardization

- Geology Architecture
  - Might be a very good linked data use case ?
  - Same features but with different relations depending on location
- Standardizing geomodeling querying
  - By defining standard requests + parameters
  - By defining standardized outputs
  - By developing more APIs linked to geomodelling tools in order to be able to handle more native formats



## Opportunities with geotechnical data standardization

- Construction domain is a big geoscience data producer and consumer
  - MIN<sup>N</sup>D UC8 offers a very applied use case to demonstrate usage of standardized geoscience data in production mode
  - Facilitate data transfer from construction domain to geoscience community to enhance our capacity of understanding subsurface
  - Facilitate data integration in modelling process while construction works are realised
- Collaboration between BSI and OGC
  - Positioning OGC standards as solutions to help reaching BIM level 3
  - Perhaps not only for GeoScience data...(WFS to serve IFC?)