e-SOTER
Regional pilot platform as EU contribution to a Global Soil Observing System

Standards and services for Soil and Terrain Data Exchange: SoTerML
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Reporting based on our paper:

Introduction

- Development of an exchange format for soil and terrain data
- Based on interoperability principles
- Separate the data from the application
- Use existing interfaces
Introduction

Data → Model → Web → Application → Data

Standard interface
XML

- XML is the language of the web
  - machine and human readable
  - standard interfaces (OGC & ISO) use XML
  - structured and addressable elements
  - Integration

- Schema - describes the data

- Instance document – the data
GML

- Geography Markup Language
- XML grammar for structuring and exchanging geographic data
- Application schemas allow user communities to add their own grammar based around GML
- Interoperability of geographical datasets led by OGC
- OGC Web Feature Services
Related works

- INSPIRE – spatial data infrastructure based on OGC standards
- GEOSS – European ‘system of systems’
- GeoSciML – GML application schema developed by European geological community for query and exchange of data
- SODA – ENVASSO soil database
- ESD and SOMIS services
- ISO – Recording and exchange of soil-related data
- Soil-ML – Conceptional model for global adoption
SoTerML design

- Data model (UML)
- XML schema (XSD)
- Attribute pattern
Attribute pattern design

- Separation of attributes from class hierarchy
Attribute pattern design

- Acceptable value defined in the attribute pattern

AttributeReference.xml
Attribute pattern design

• Fixed
  ...
  \textlt{horizon}\textgt
  \textlt{clayMineralogy}\textgt{CH}\textlt{/clayMineralogy}\textgt
  ...

• Open approach used
  ...
  \textlt{horizon}\textgt
  \textlt{attribute name=“clayMineralogy”}\textgt
  \textlt{value}\textgt{CH}\textlt{/value}\textgt
  ...

Implementation

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Version beta 5.0, schema developed by Amir Pourabdollah, centre for Geospatial science, The University of Nottingham and e-Soter WIP team.
Data exported by the eSoterParser developed by Andrew Rayner; Stephen Hallett; Daniel Sims, Cranfield University, NS1. -->
<SoTerML xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="SoTerML.xsd">
  <!-- Attribute vocabulary for validating the attributes in the XML. The address may need to be changed to a
valid url where the AttributeReference.xml file sits. -->
  <xml:include href="AttributeReference.xml"/>
</SoTerML>

/* Definition of a soter unit, including its geometry, it's Terrain Components and Soil Components */
<soterUnit><soterUnitId>
  <gco:characterString>104</gco:characterString>
</soterUnitId>
  <SourceMapId><gco:characterString>K010</gco:characterString>
</SourceMapId>
  <attribute>
    <name>3GOCountryCode</name>
    <value>valueId</value></value>
</attribute>
  <nameYearOfDataCollection>1983</nameYearOfDataCollection>
</soterUnit>
```
OGC Web Feature Service
Summary

Standard for soil and terrain data, schema and attribute reference

Data available over the internet in a standard format (OGC WFS)

Integration with other services and applications

Merging legacy and new data across domains