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
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
• 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

  ...

  <horizon>
    <clayMineralogy>CH</clayMineralogy>
  ...

- Open approach used

  ...

  <horizon>
    <attribute name="clayMineralogy">
      <value>CH</value>
    </attribute>
  ...

  ...
Implementation

Soter database 'KENSOTER_UPDATE_Sep2007.xml'.
2679 Soter Units processed.
With 20 warnings.

Definition of a SoTer unit, including its geometry. It's Terrain Components and Soil Components

xml version="1.0" encoding="UTF-8"?>
<!-- Version Beta 5.0, Schema developed by Amir Pourabdollah, Centre for Geospatial Science, University of Nottingham and e-SOTER WP6 team. Data exported by the esoterParser developed by Andrew Rayner; Stephen Hallett; Daniel Simms, Cranfield University, NS1. -->
<SoterML xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsi:xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsi: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.xm file sits, -->
    <xsi:include href="AttributeReference.xml"/>
</SoterML>

<definition of a SoTer unit, including its geometry. It's Terrain Components and Soil Components>
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