Using the OGC SOS as INSPIRE Download Service for Observation Data

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18th June 2014, INSPIRE Conference 2014 – Aalborg (Denmark)

Agenda

- Motivation
- Sensor Web
- Proposed Update for the Technical Guidelines on INSPIRE Download Services
- Implementation
- Conclusion

Motivation

- Observation data → important source for information in many domains
  - Hydrology
  - Air quality
  - Weather monitoring
  - Humans as Sensors
  - Traffic
  - Geology
  - …
- Relevance for INSPIRE Annex II and III themes

Motivation

- Already available: Guidelines for the use of Observations & Measurements and Sensor Web Enablement-related standards in INSPIRE Annex II and III data specification development
- Does not define the interface
- Proposal for an update of the Technical Guidance document for INSPIRE Download services

Sensor Web Basics

- Interoperability
- Reduce the integration efforts of new data sources
- Enhancement of Spatial Data Infrastructures (SDIs) to handle sensor data
- Sensor Web Enablement (SWE): A suite of standards of the OGC for building the Sensor Web
- OGC Sensor Observation Service (SOS) as data access interface
- ISO/OGC Observations and Measurements (O&M) as data model and encoding

Observations & Measurements

- Used for encoding data observed by sensors
- An observation comprises
  - Timestamp
  - Value (if applicable including unit of measurement)
  - Observed property
  - Feature of interest
  - …
- O&M 2.0 data model approved as an ISO standard
- O&M 2.0 XML encoding approved as an OGC standard

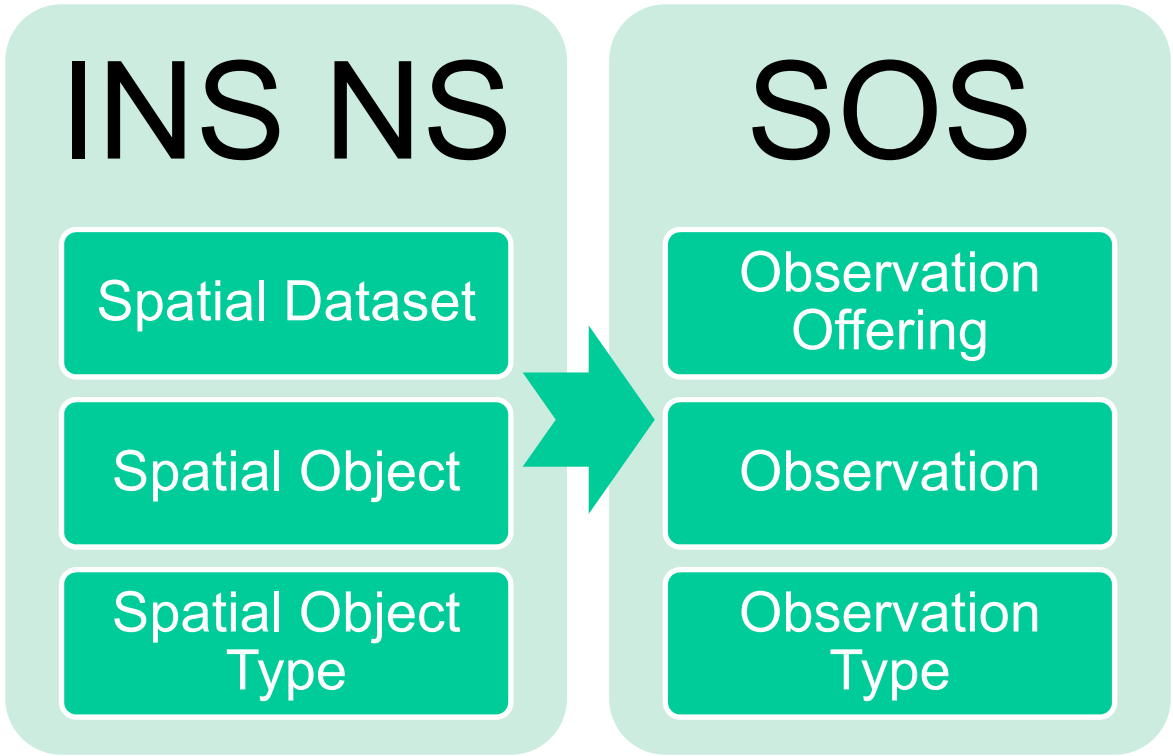
Sensor Observation Service

- Pull-based access to observations
- Mediator between:
  - client ⇔ data archive / simulation / real-time sensor system
- Hides the heterogeneous structure of proprietary sensor data formats and protocols
- Data formats: O&M and SensorML
- Versions: 1.0 and 2.0

Mapping INSPIRE and SOS

- INSPIRE Regulation for Network Services (976/2009) - Operations of a **Download Service:**
  - Pre-defined Access Download:
    - **Get Download Service Metadata** → SOS::GetCapabilities
    - **Get Spatial Data Set** → SOS::GetObservation
    - **Describe Spatial Dataset** → SOS::GetCapabilities
    - **Link Download Service** → CSW
  - Direct Access Download:
    - **Get Spatial Object** → SOS::GetObservation
    - **Describe Spatial Object Type** → SOS::GetCapabilities

Concept Overview



Proposal Change Overview

4 INSPIRE Download Services

- 4.1 How the Technical Guidance maps to the Implementing Rules
  - *4.1.4 Mapping the SOS-based Technical Guidance to the Implementing Rules*
- 4.2 Conformance Classes for Download Services Technical Guidance
- 4.3 Language Requirements
- 4.4 Implementation Roadmap for Download Services

5 Atom Implementation of Pre-defined Dataset Download Service

6 Web Feature Service and Filter Encoding Implementation of Pre-defined Dataset Download Service

7 Web Feature Service and Filter Encoding implementation of Direct Access Download Service

8 Sensor Observation Service and Filter Encoding implementation of Pre-defined Dataset Download Service

9 Sensor Observation Service and Filter Encoding implementation of Direct Access Download Service

10 Quality of Service

SOS Enhancements

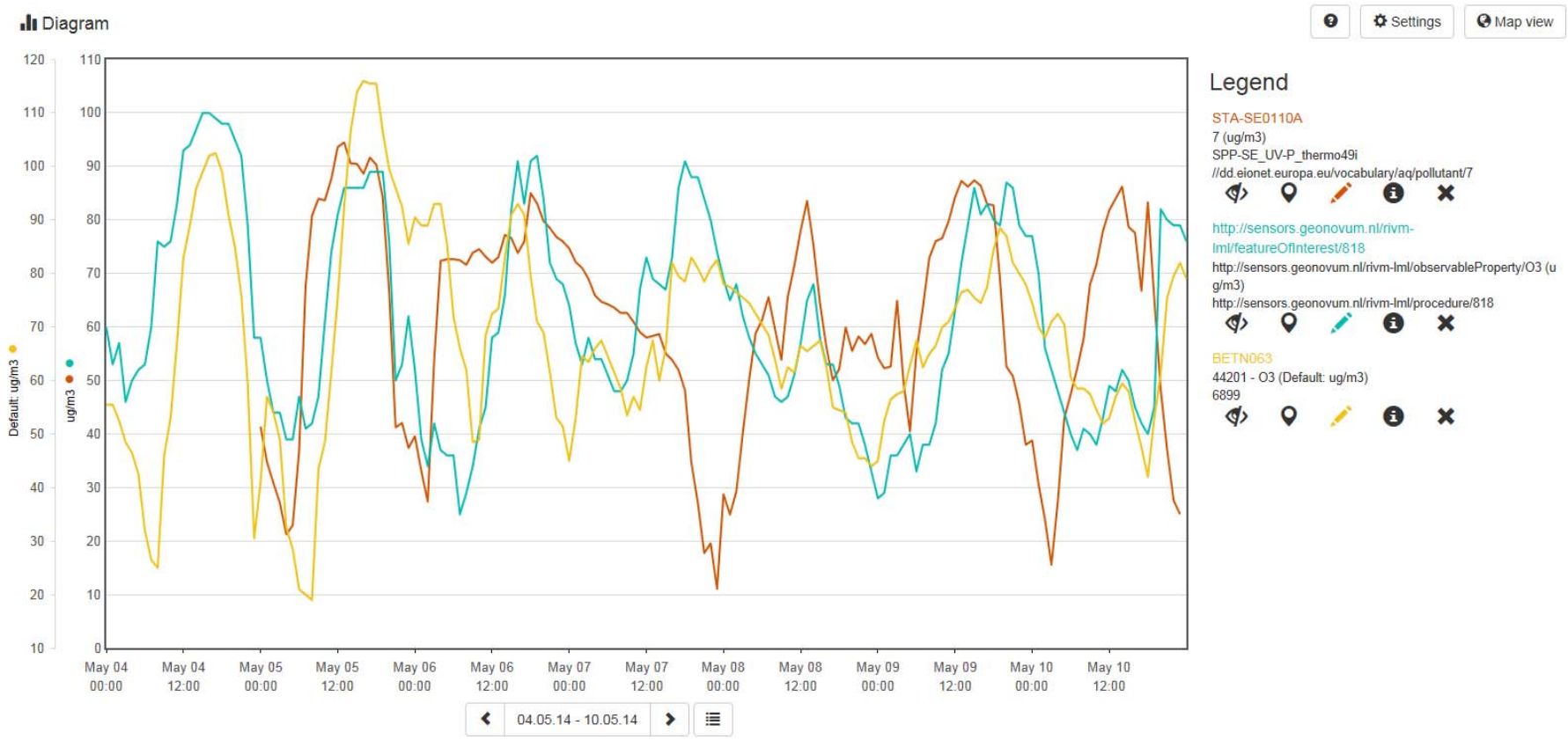
- INSPIRE Metadata
- CRS
  - Metadata about supported CRS
  - Request parameters
- Multilinguality
  - Metadata about supported languages
  - Request parameters

Implementation

- Open source implementation has been developed
- Enhancement of the 52°North SOS 4.0
- Flexible approach to couple the SOS with existing infrastructures
- Can be linked to multiple database management systems
- Hibernate for mapping existing database models to the SOS data model

Implementation

http://sensorweb.demo.52north.org/jsClient-0.2.0/



Conclusion

- SOS as optimised interface for accessing observation data
- Proposed update of the Technical Guidelines for Download Services → How to provide observation data in an INSPIRE compliant manner?
- Open Source SOS implementation → 52°North SOS
- Additional components
  - JavaScript SOS Client
  - SOS4R
  - …
- Evaluation!

Thank you for your attention!

Questions?

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