

OGC **S**ensor **O**bservation **S**ervice and its Application in Practice

Dr. Arne Bröring

**ECMWF – 4th Workshop on the use of GIS/OGC standards in meteorology
Reading, 4 – 6 March 2013**

52°North

- Open Source GEO Software
- Topics:
 - Sensor Web Enablement
 - GeoProcessing
 - Linked (GEO)Data
 - ...
- OGC standardization
 - SOS 2.0
 - WPS 2.0
- Commercial & Academic Shareholders ...



Sensor Observation Service (SOS)

- Web service optimized for **time series** data

- Based on well-defined data models:

- **Observations & Measurements (O&M)**
- **SensorML**

INSPIRE
Data Specification on
Environmental Monitoring

- SOS interface has well-defined
temporal, spatial, and thematic filters
for **near realtime** environmental data

- **OGC standard (version 2.0)**

soon to be brought into
INSPIRE...

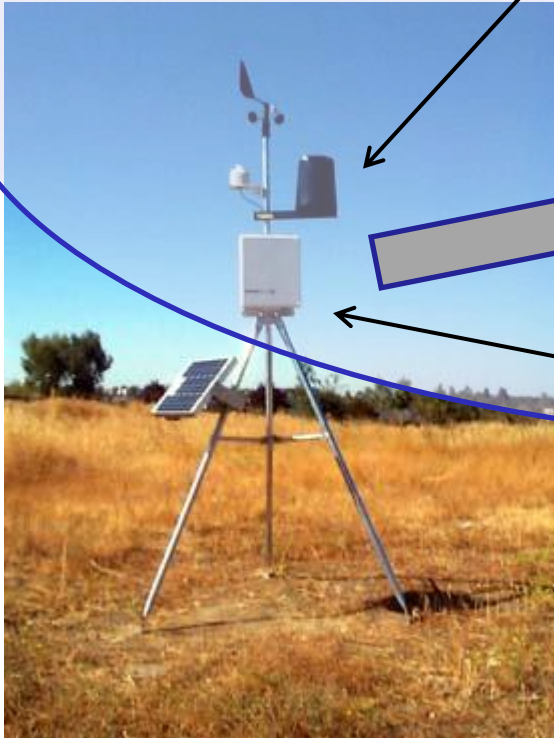
Observations & Measurements

Observed Property := "temperature"

Phenomenon Time

Procedure

Result



11°C

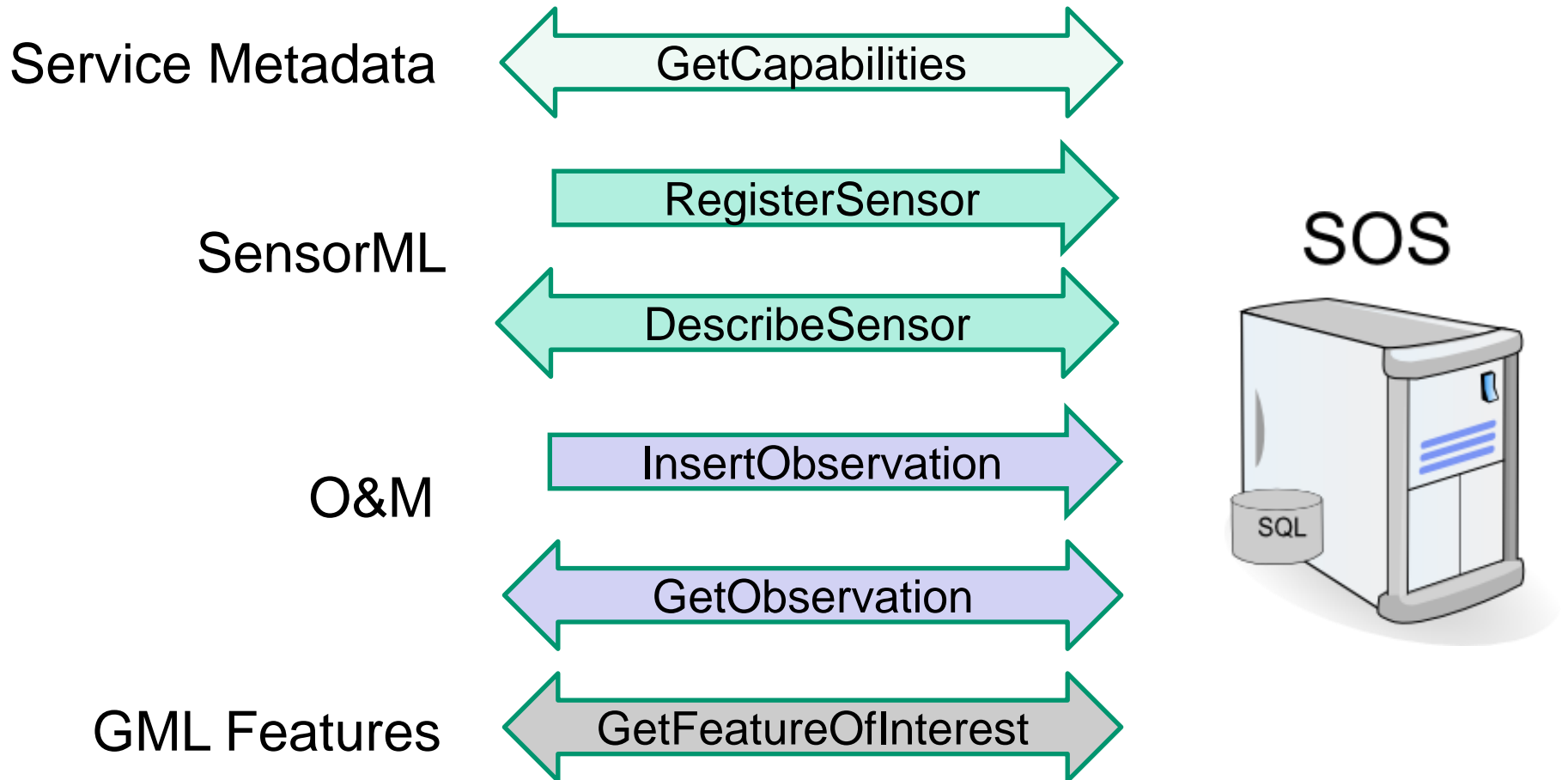
6.3.2013 9:15

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Feature of Interest

Observation

Sensor Observation Service



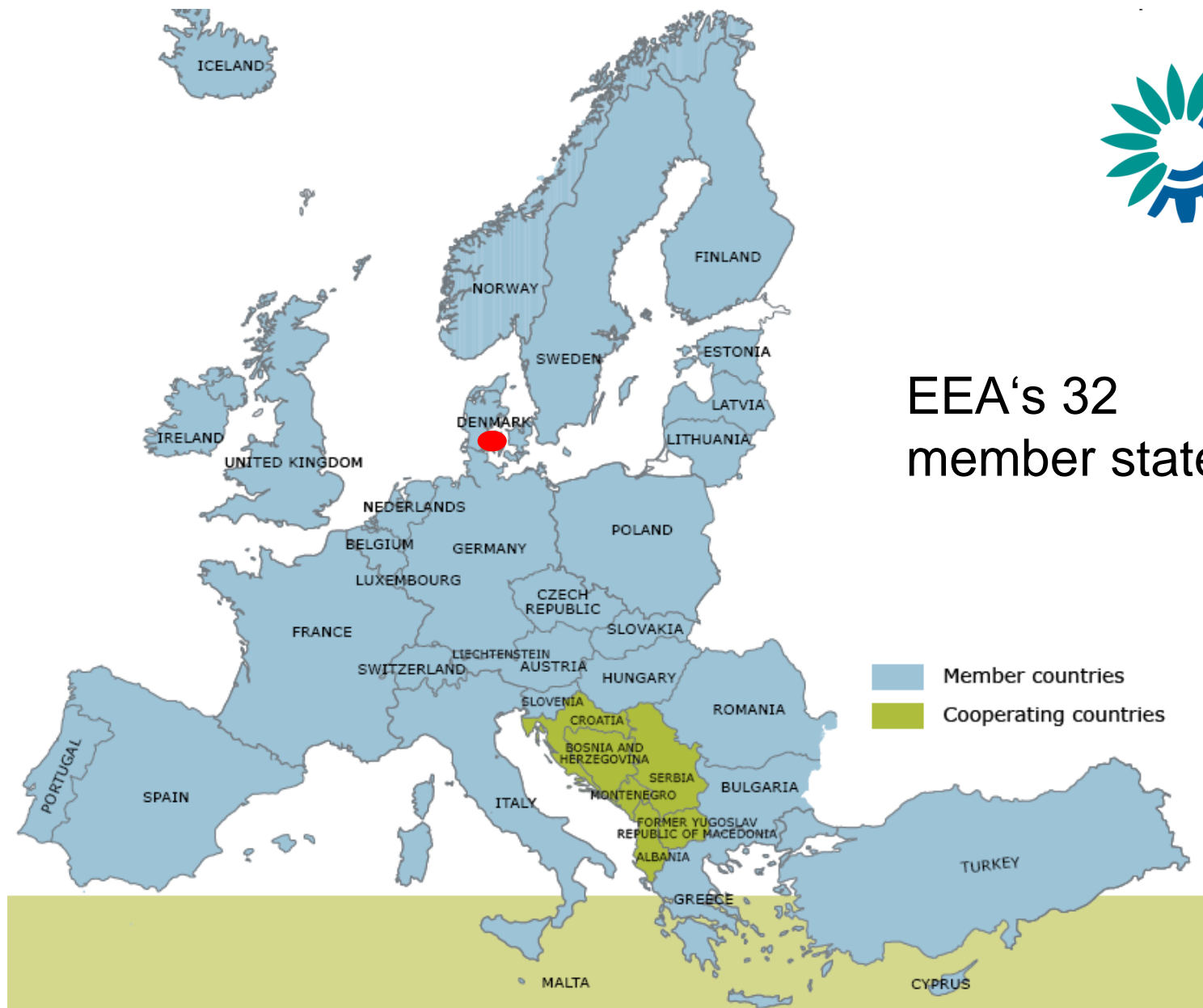


Case 1:

European Air Quality Sensor Network



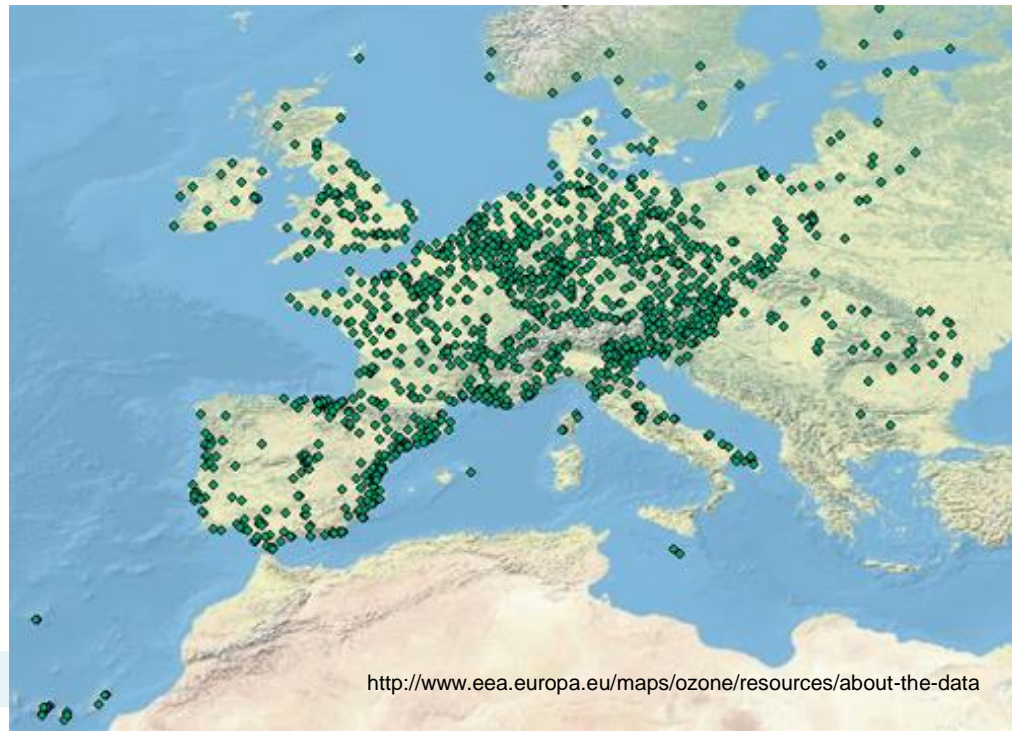
EEA's 32 member states



http://www.eea.europa.eu/publications/general-brochure-2009/at_download/file

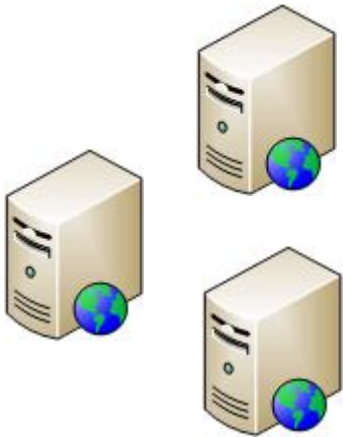
European Environment Agency (EEA)

- **Collection, coordination** and **dissemination** of environmental data and information
- ~ 1,500 air quality stations (measuring O₃, CO, ...)
- > 1,000,000 observations for 30 days



Problem: Proprietary AirQuality Reporting

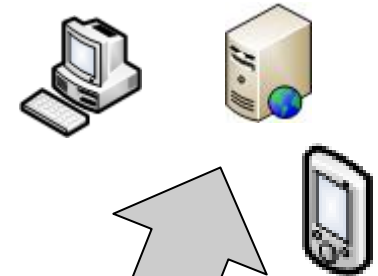
Member State
Env. Agencies



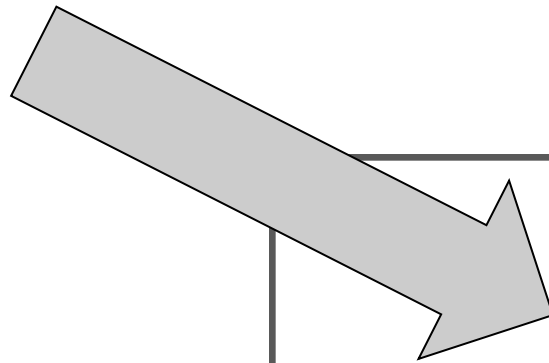
Annual Air quality Reporting

- Proprietary formats (CSV, XLS)
- FTP / HTTP

Data Consumers



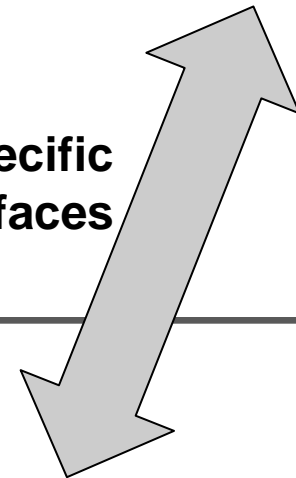
**Application-specific
Interfaces**



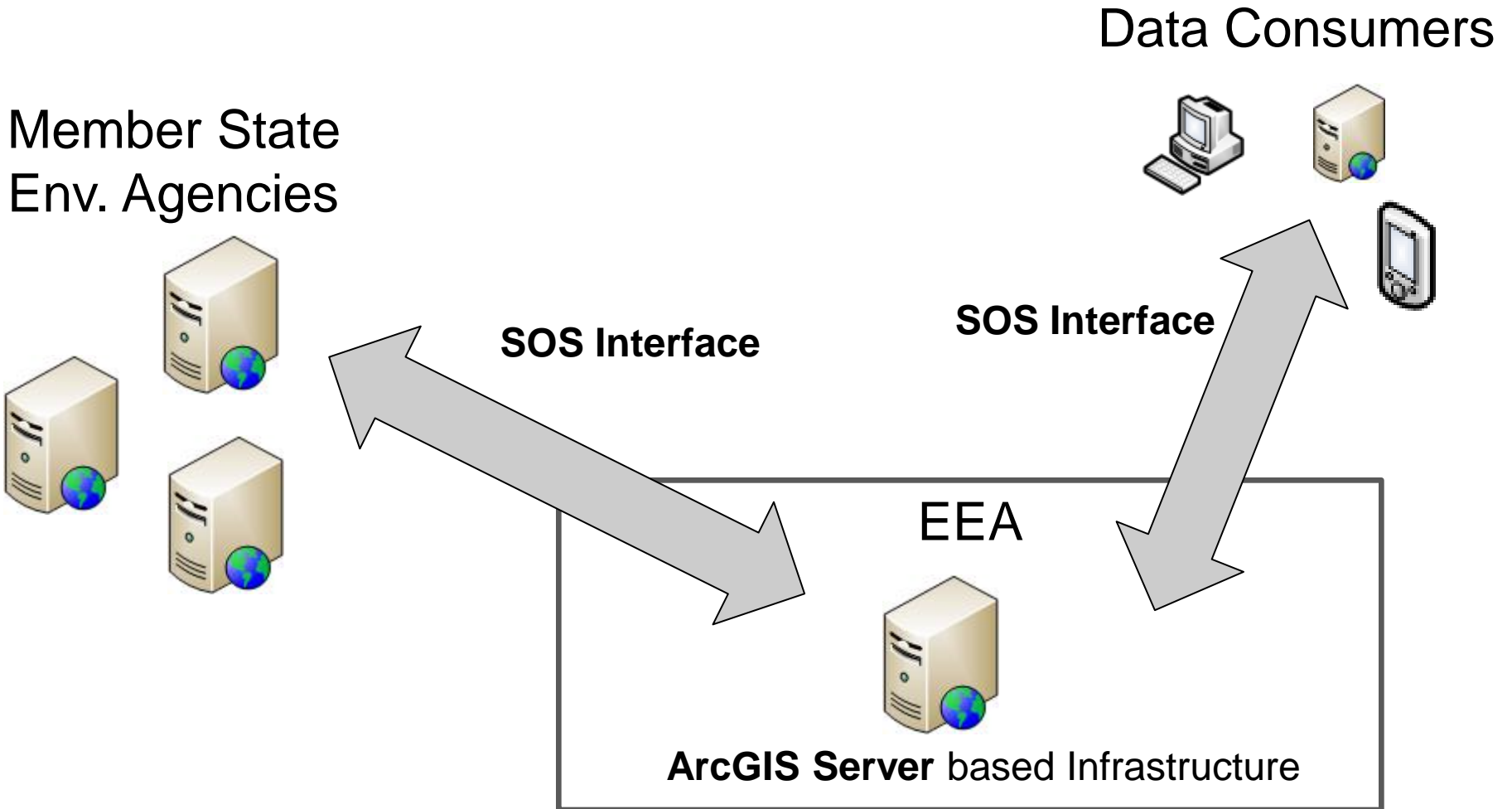
EEA



ArcGIS Server based Infrastructure

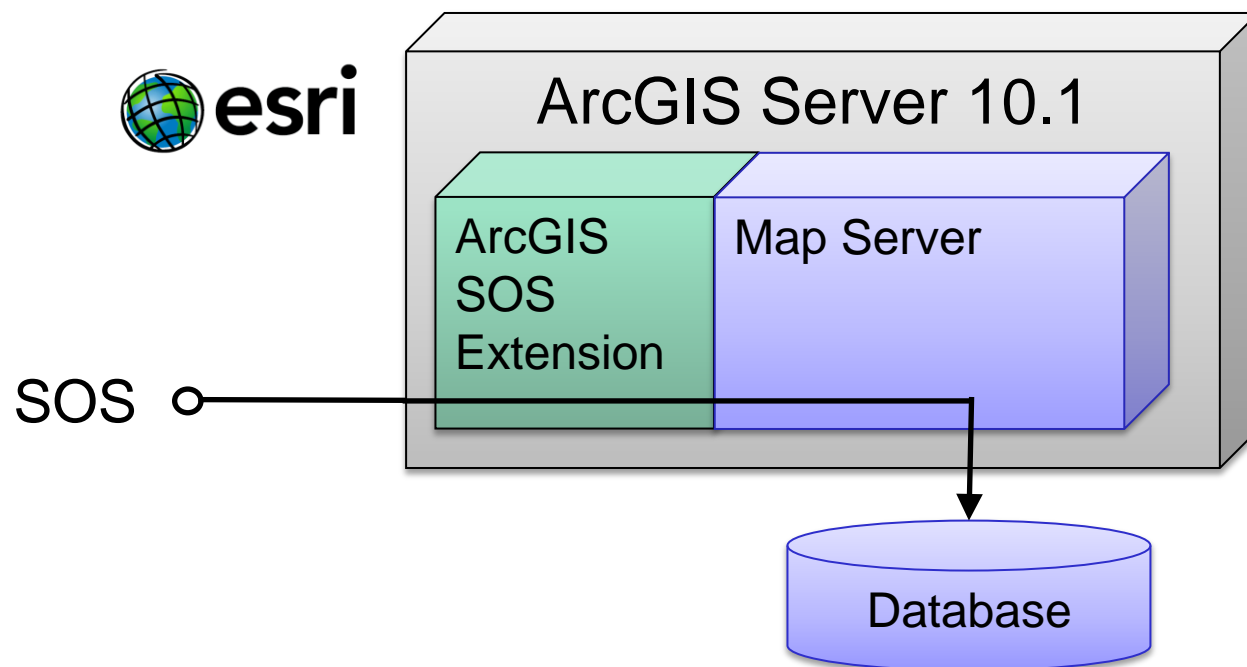


Approach



52°North SOS Implementation

- **SOS Extension for ArcGIS Server**
 - Supports SOS standard version: 2.0
 - Flexible DB support, since based on ArcGIS Server + ArcSDE





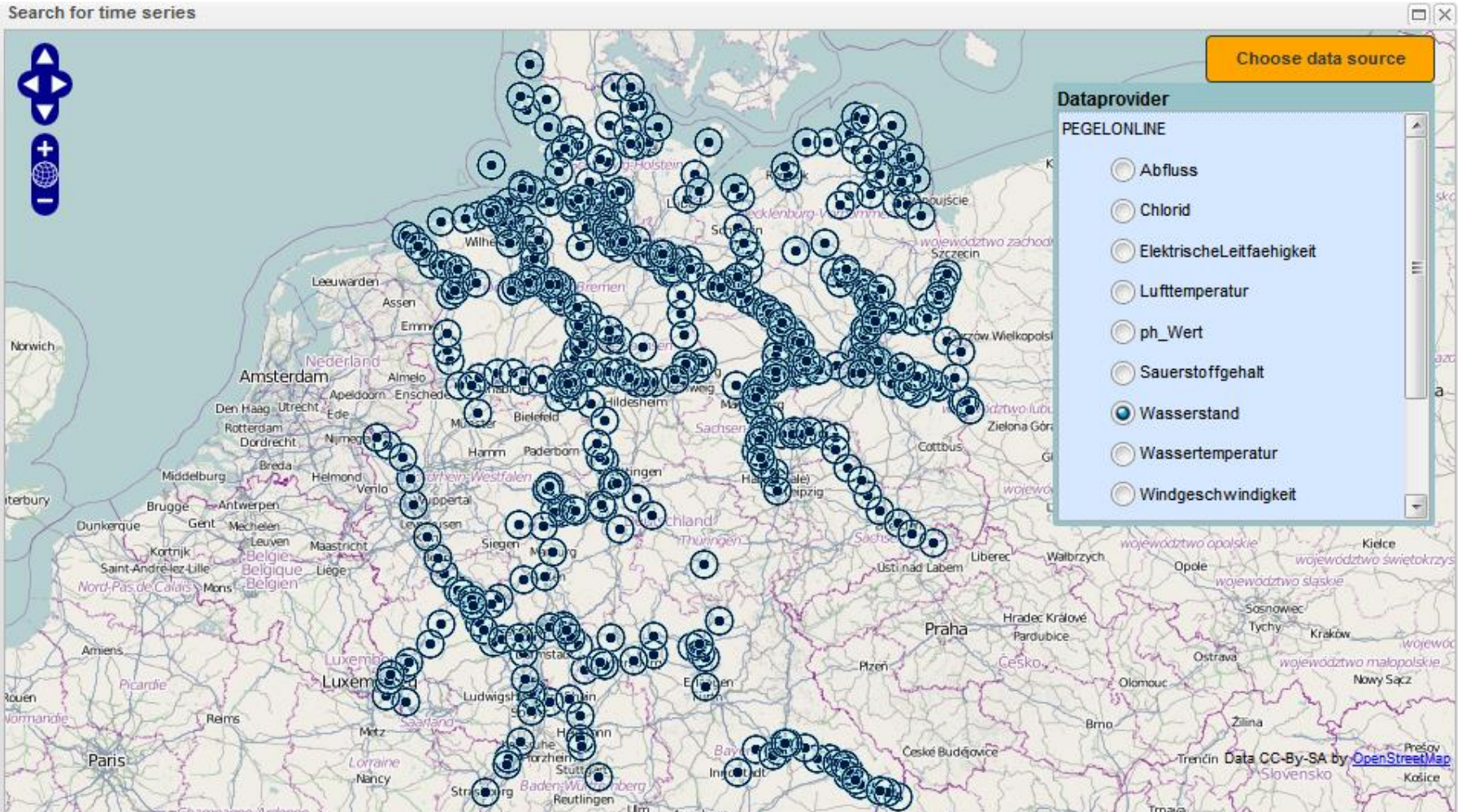
Case 2:

Hydro / Met Sensor Network in Germany

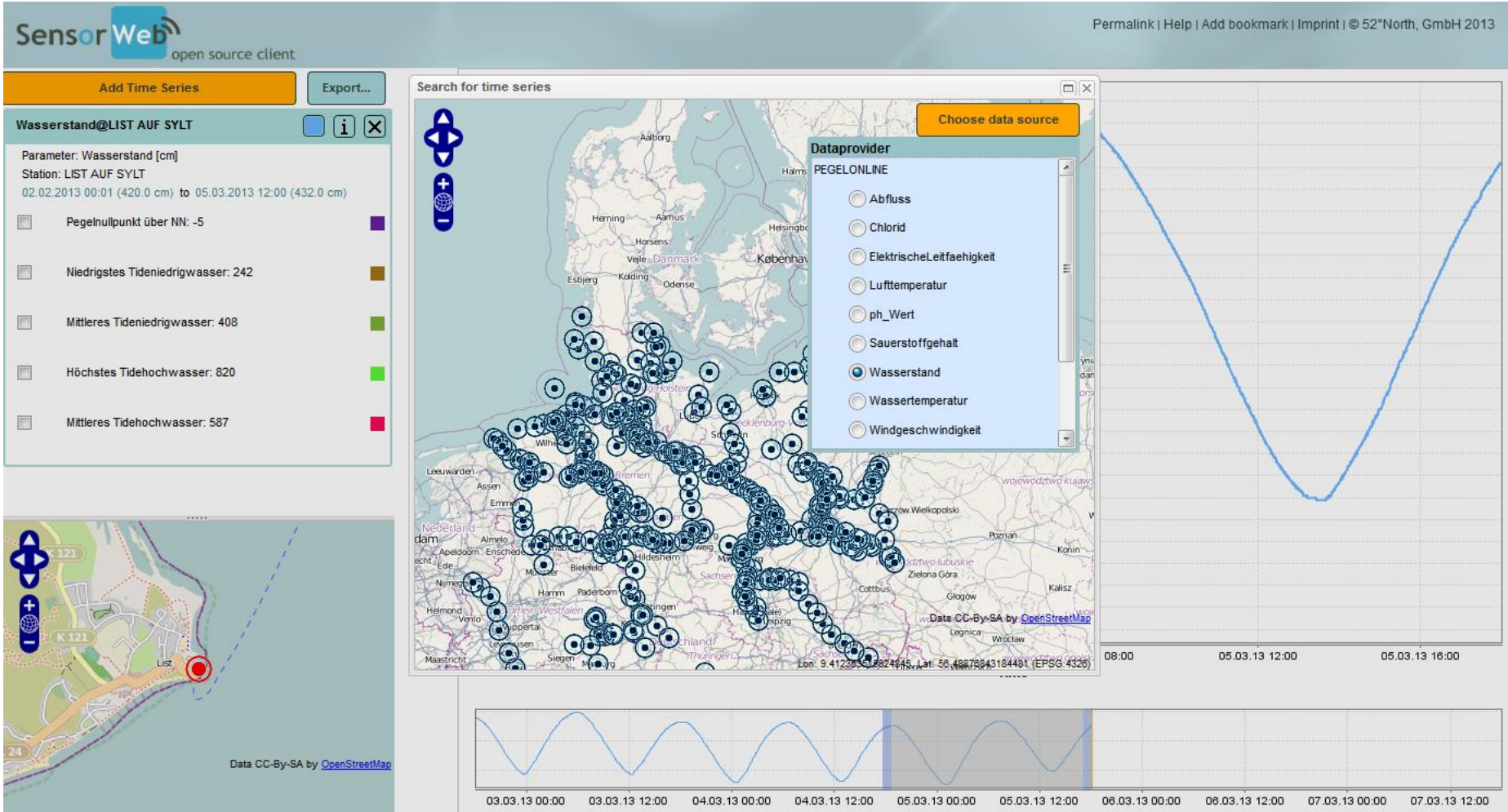
DLZ-IT

- **Service Centre IT of the Federal Ministry**
of Transport, Building and Urban Development
- Administered sensor networks:
 - Water gauges / Weather stations: ~1,600 sites
 - Groundwater monitoring stations: >10,000 sites
 - Waterway structure monitoring (e.g. locks): >1.000 sites
- Data provision via:
Sensor Observation Service

DLZ-IT – SOS



SOS Client



SOS Client

Add Time Series

Export...

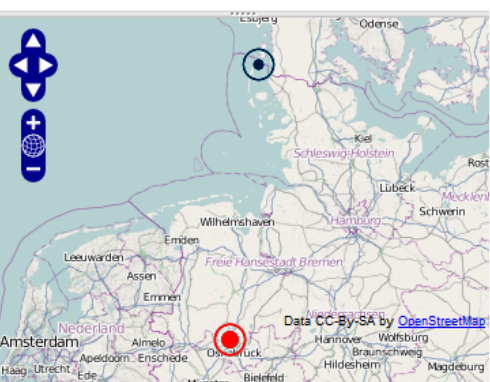
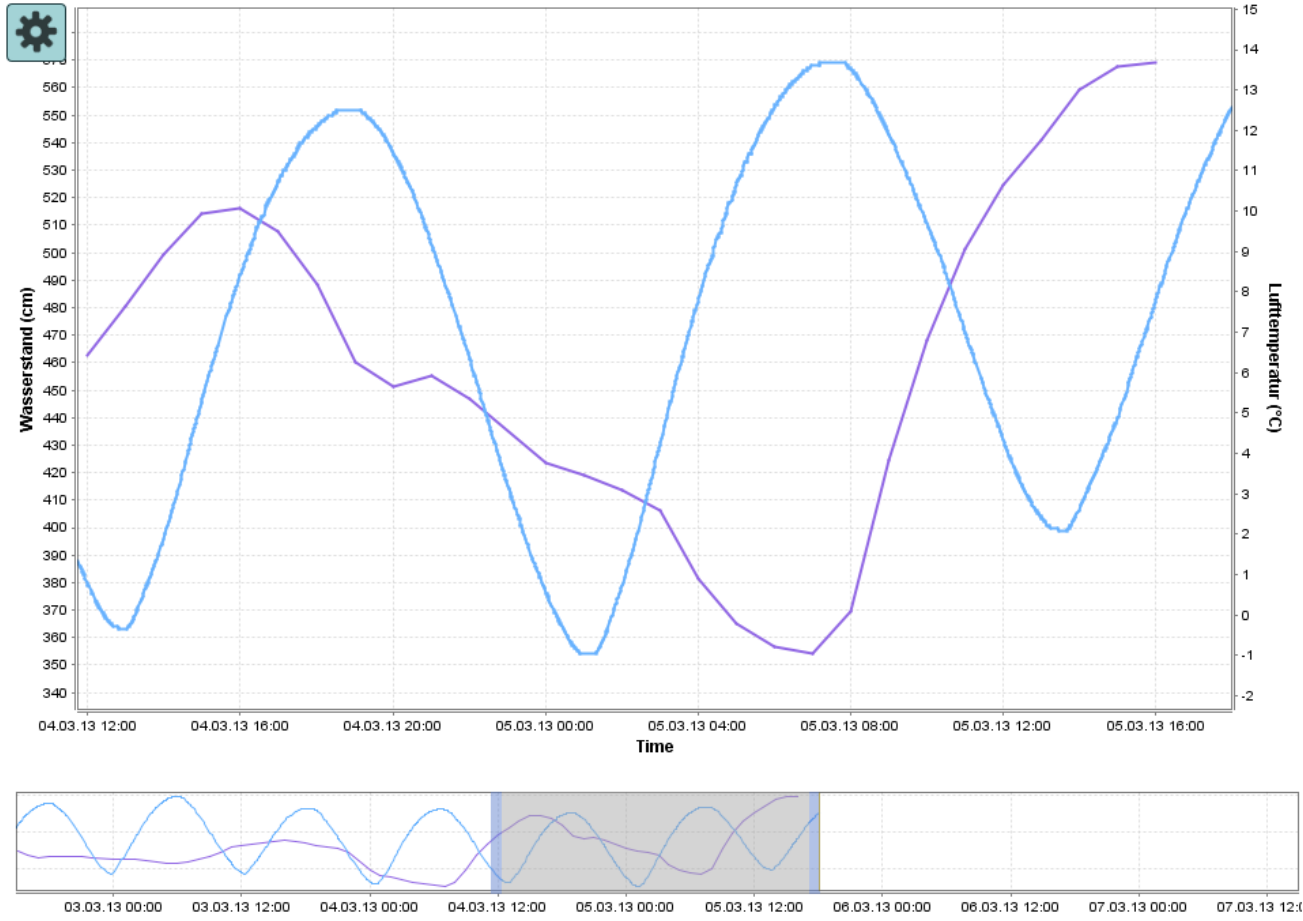
Wasserstand@LIST AUF SYLT

Lufttemperatur@BRAMSCHE

Parameter: Lufttemperatur [°C]
Station: BRAMSCHE
02.02.2013 01:00 (1.9 °C) to 05.03.2013 12:00 (10.63 °C)

oberer Bezugswasserstand: 50.35

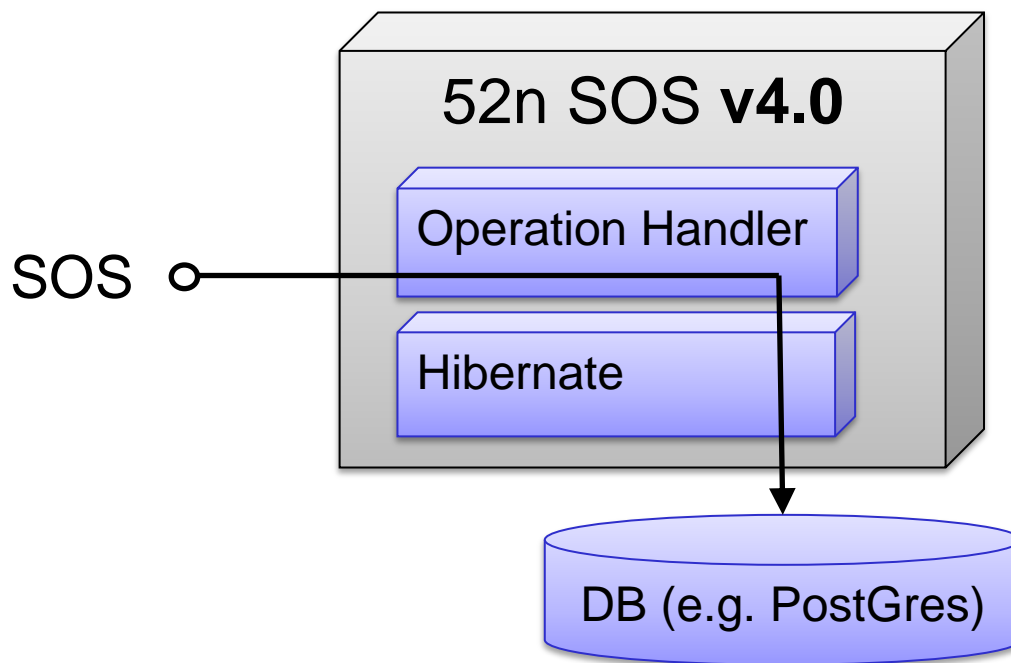
unterer Bezugswasserstand: 50.23



52°North SOS Implementation

- **52n Standalone SOS**

- Supported SOS standard versions: 1.0 + 2.0
- Flexible DB support, since based on Hibernate (e.g. PostGIS, Oracle Spatial)



Conclusions & Outlook

- Sensor Observation Service
 - Efficient & interoperable exchange of **near realtime data**
 - 2 implementations @ 52°North:
 - ArcGIS Server based
 - Standalone
- INSPIRE compliance:
 - O&M is already part of INSPIRE Data Specification for Environmental Data
 - SOS is in discussion

<http://52north.org/arcgisServerSOS>
<http://52north.org/sos>

Questions?

Thank you!



Dr. Arne Bröring

E-mail: broering@52north.org

Website: <http://52north.org>