

# SENSOR WEB TECHNOLOGY FOR SHARING ENVIRONMENTAL DATA ACROSS EUROPE

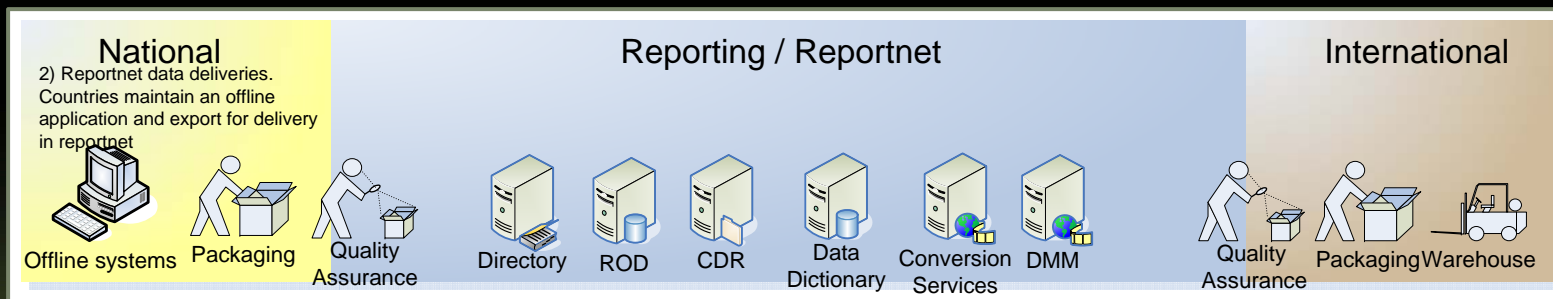
Inspire conference 30<sup>th</sup> June 2011

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# TRADITIONAL REPORTING

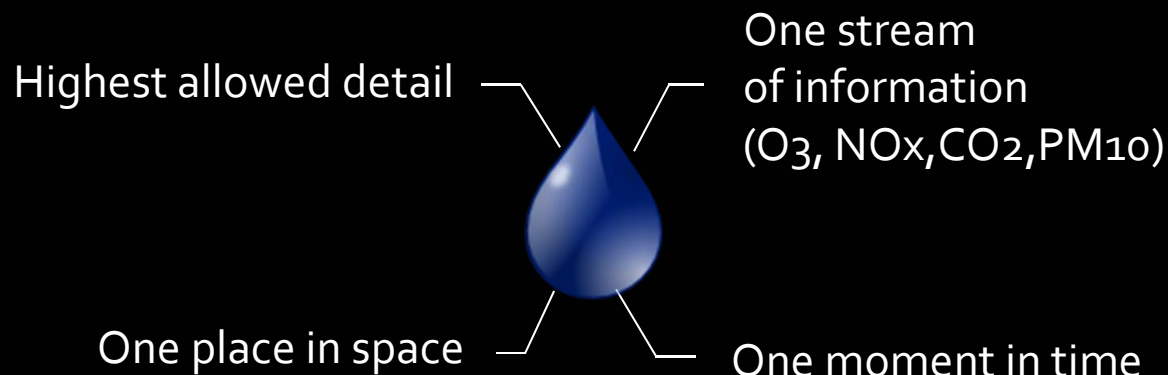
- Collecting
- Processing
- Analysing
- Packaging
- Publishing



# NEAR REAL TIME DATAFLOW



Single drop of information



# NEAR REAL TIME DATAFLOW



# CURRENT NEAR REAL TIME DATAFLOW

- Widely use of proprietary dataformats
- Every dataflow needs specific development
- Develop and maintainance cost are high
  - Data **provider** have to develop and maintain
  - Data **receiver** have to develop and maintain
- Domain specific development



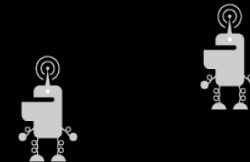
# CHALLENGES



- Increased **demand** for near real time data
- **More** data required - high quality
- **Quality** control
- More **timely** data
- More **efficient** monitoring
- High level of **interoperability**
- **Integration** between in-situ and satellite
- Data **re-use**
- Higher **efficiency**
- Thematical **independency**
- Improved and **flexible** access
- Less **ressources** to maintain multiple flows
- **SEIS** compliancy



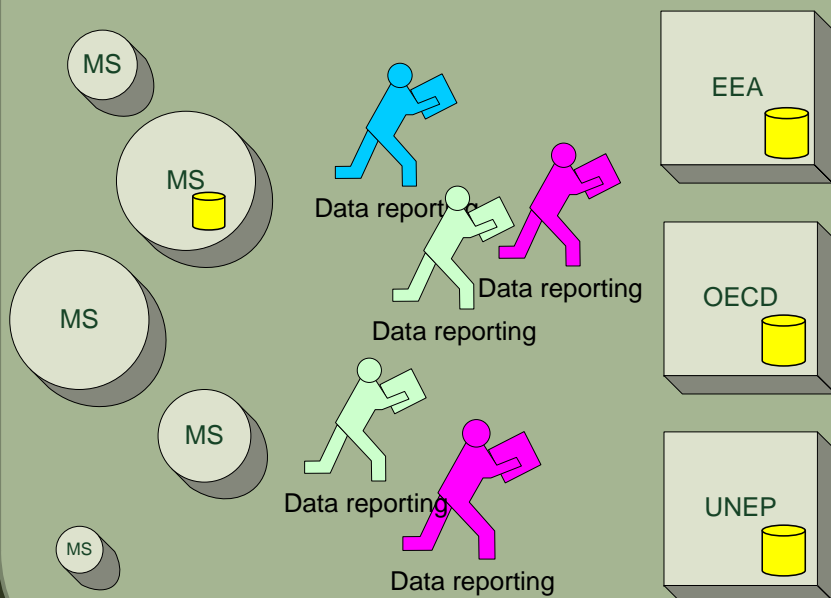
# TRANSITION SCENARIO



## The current data flows

Member states

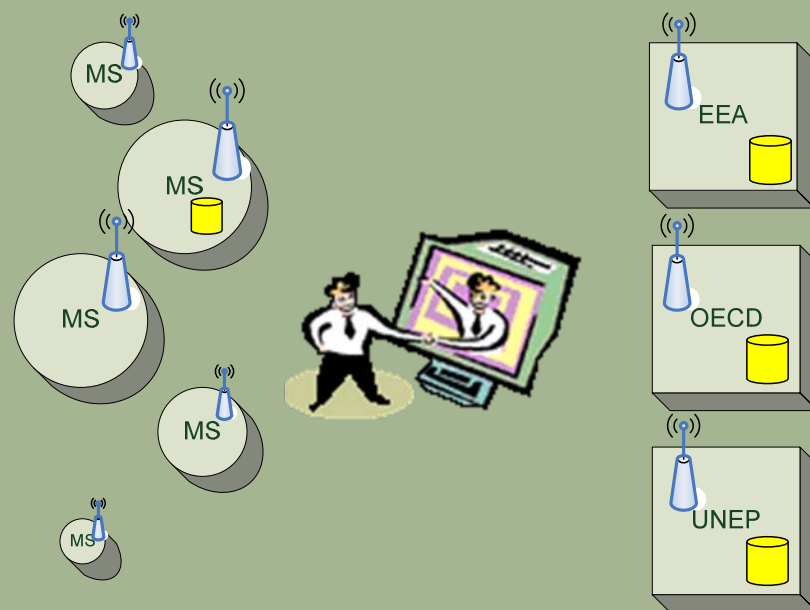
Organisations



## NRT Information Systems

Member states

Organisations



# OZONE WEB

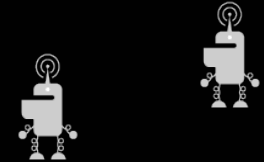


- Since 2006
- 1200 stations
- 70 data providers
- 30.000 measures per day
- Near real time data - hourly





# EYE ON EARTH

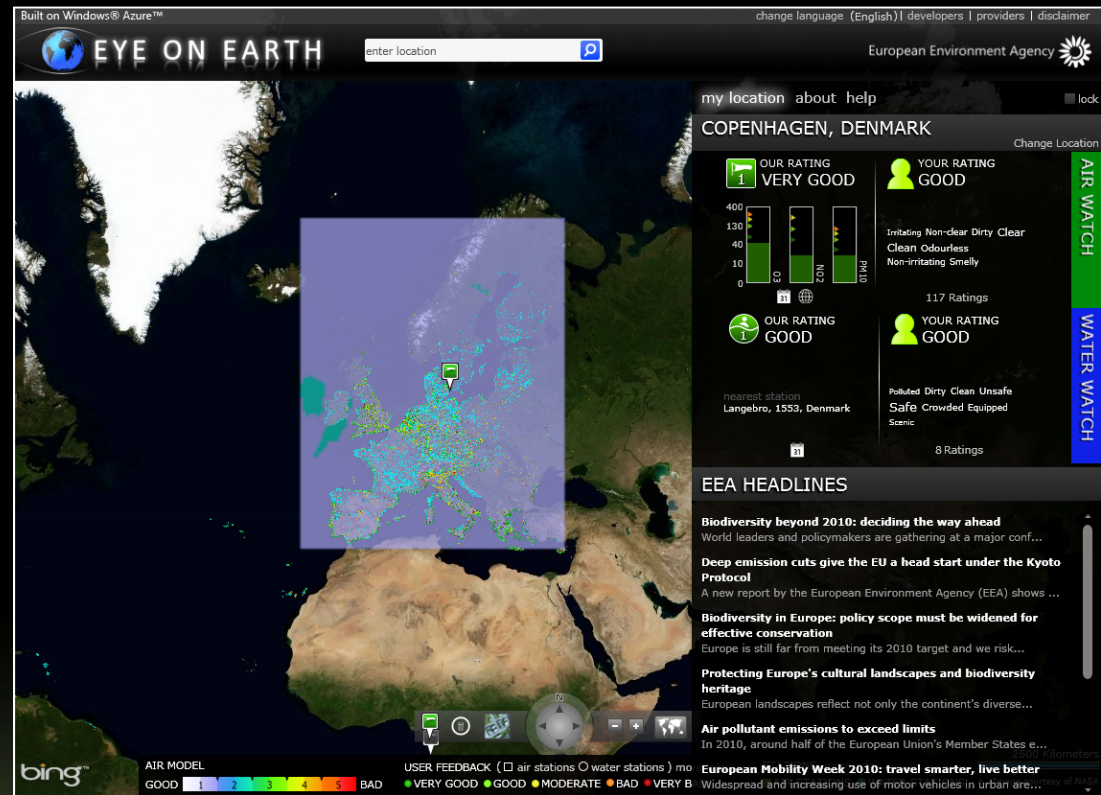


## Watches

- Waterwatch
- Airwatch
- Noisewatch
- Climatewatch ?
- Naturewatch ?
- ...

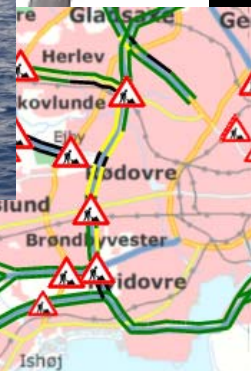
## Data source

- Near real time airquality data
- Seasonal waterquality
- Historical waterquality
- User rating

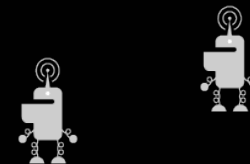


# WHAT KIND OF OBSERVATIONS?

- Air quality
- Water quality
- Water level
- Water quantity
- Noise
- Traffic
- Forrest fire
- Bouys (waves, wind, current)
- Biodiversity
- Ice cap monitoring
- Human sensors?



# WHERE TO GO



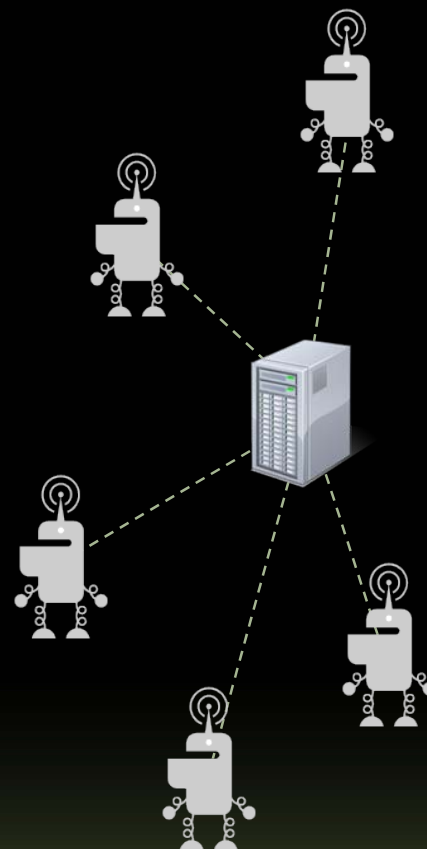
- **Standardise** Near Real Time observation data system
- Improve the way we **handle** NRT observation data
- Use SOS to **exchange** and **expose** NRT observation data
- Make the GIS **industry support** SOS
- **Better access** to NRT observation data through **services**



# WHAT IS SENSOR WEB?

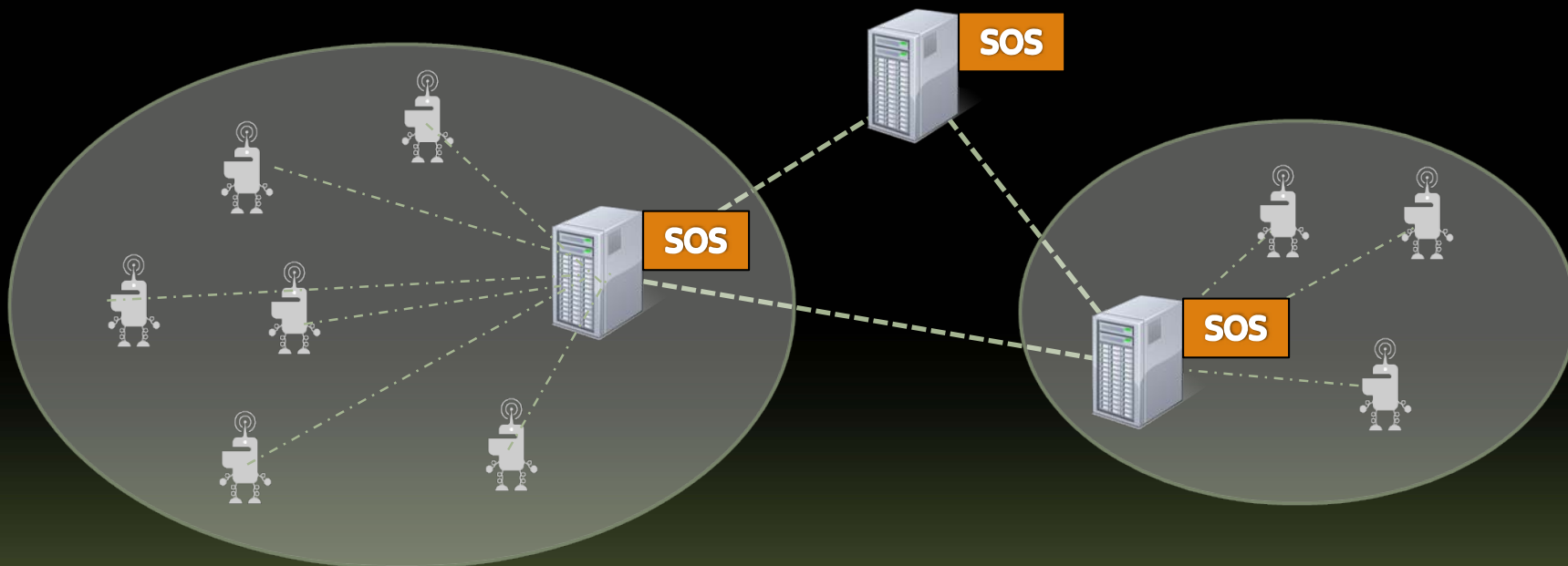
SWE - Sensor Web Enablement :

- **SOS - Sensor Observation Service**
  - **Exchange and query observation data**
- O&M – Observations & Measurements
- SensorML – Sensor Model Language
- SES – Sensor Event Service (SAS v.2)
- SPS - Sensor Planning Service
- TML - Transducer Model Language
- WNS – Web Notification Service



# SOS NETWORK

- No direct communication with sensors
- Communication on service / database level



# LOW COST SENSOR NETWORKS

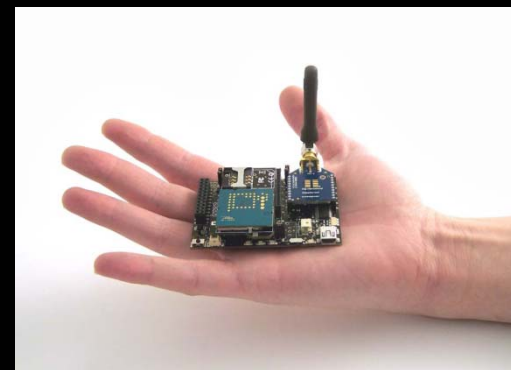


Cheap, simple data acquisition

Reliable?

Is this a way to improve data coverage?

Combine with existing network?



Sensor pictures from Libelium.com



# LOW COST SENSOR NETWORKS



EEA demonstration sensor

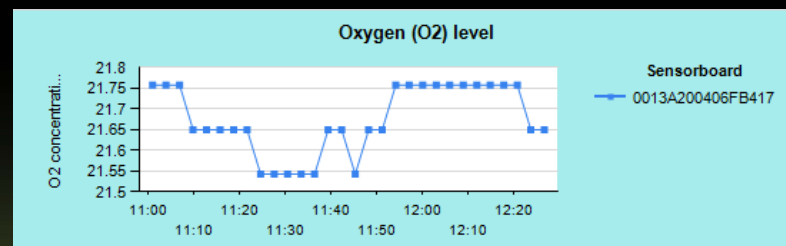
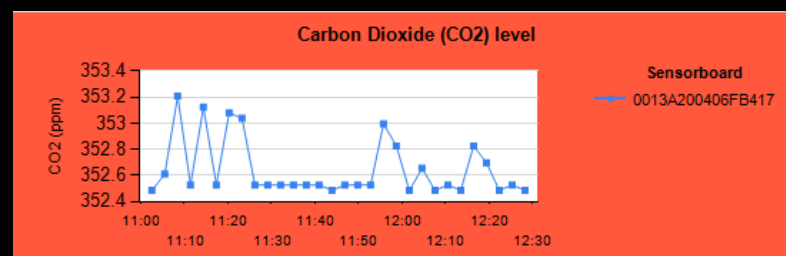
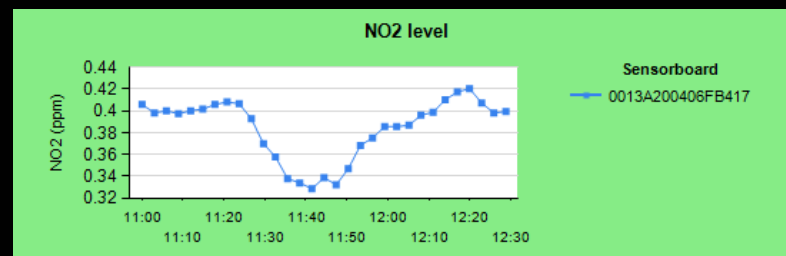
- Strengths
- Weaknesses
- Calibration issue
- Learn what they can and can't do



# LOW COST SENSOR NETWORKS

EEA demonstration sensor  
sample output; NO<sub>2</sub>, CO<sub>2</sub>, O<sub>2</sub>

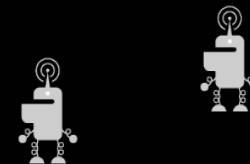
Plan to make test data  
available as SOS node



Note: Sensors not calibrated



# SOFTWARE SUPPORT



- Minimize software development – **industry support**

- ESRI

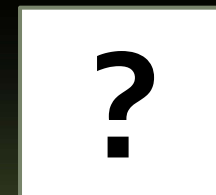
- SOS to be supported in ArcGIS Server
  - First implementation as Server Extension Object developed by 52North.org
  - Implementation supported by ESRI



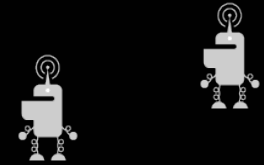
- Open source software available from 52North.org



- MapServer ?
- Openlayer (client access)
- ...



# SUMMARY



- Common platform for observation data is needed
- Need a service oriented approach
- Need industry support to get SOS going
- SOS based NRT platform parallel to Reportnet
- SOS should be a benefit – not a burden
- Pramatic approach to implement SOS



# QUESTIONS?

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