



# GENESIS

GENeric European Sustainable Information Space for environment:



**GENeric European Sustainable Information Space for Environment  
and the GENESIS Sensor Discovery Framework**

<http://www.genesis-fp7.eu/>



# GENESIS

GENeric European Sustainable Information Space for environment



## What is the GENESIS project ?

**GENESIS is a 3-years long Collaborative Project , started on the 1st September 2009, and co-funded by DG INFSO in the frame of the FP7 ICT work programme.**

**GENESIS will provide an integrated Environment & Health information system to be validated in six thematic pilots.**



**Air Quality**



**Water Quality**

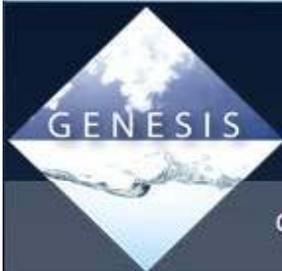


**Coastal Water Quality**



**What Impact on health ?**





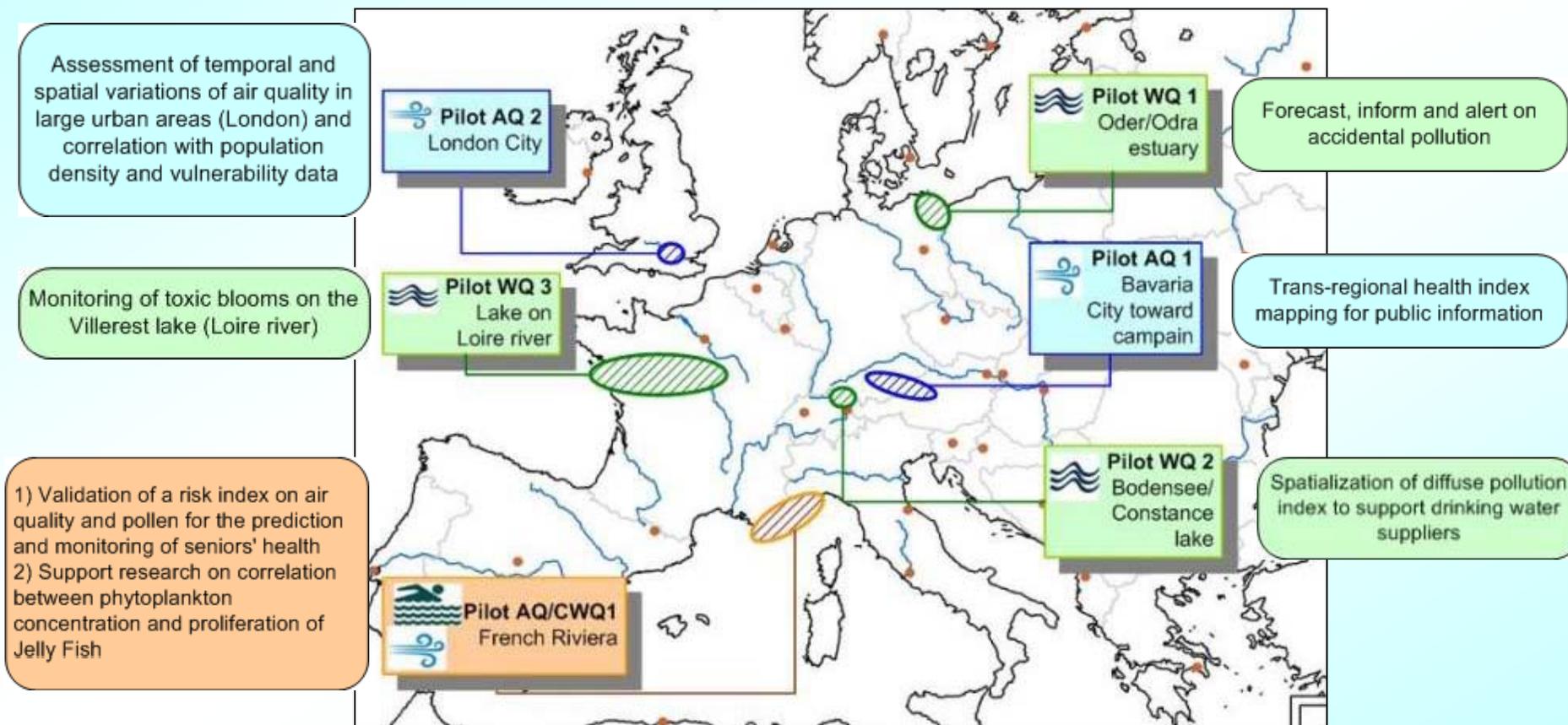
# GENESIS

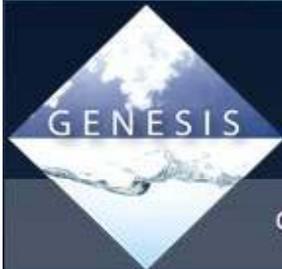
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## Six GENESIS thematic pilots

The pilots will allow to experiment and validate GENESIS solution through realistic scenarios in 3 environment and health thematic domains : Air Quality, Fresh Water Quality and Coastal Water Quality, with participation of operational actors





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**Typical functional set-up of  
GENESIS pilot application**

**Sensor Web Enablement is an important technology for GENESIS**

**Research Topics addressed by GENESIS include**

- **Sensor/SWE Discovery**
- **Event Based SWE Architecture**
- **Humans as Sensors**

**On the following slides: Introduction into the GENESIS Sensor Discovery Framework**



# Overview

- Sensor Discovery
- Challenges of Sensor Discovery
- The GENESIS Sensor Discovery Framework
- Conclusion



# Sensor Discovery

- SWE services and clients provide a powerful framework
- Clients and SWE services are loosely coupled
- Mechanisms needed for finding
  - Sensors
  - SWE services
- Specific SWE metadata formats (i.e. SensorML)
- Align Sensor Web discovery to existing standards (i.e. OGC Catalogue)



# Challenges of Sensor Discovery

- Specific metadata formats → i.e. SensorML
  - How to extract the relevant information from a SensorML document?
  - What must be contained in a SensorML document? → Profiles
  - How to map from SWE encodings to catalogue information models?
  - How to interact with the different SWE service interfaces?



# Challenges of Sensor Discovery

- Dynamic structure of sensor networks
  - How to handle continuously changing sensor metadata (e.g. mobile sensors)?
  - How to deal with sensors that are available through different SWE services? (potentially time dependent)
  - How to handle time dependent data availability?



# Challenges of Sensor Discovery

- **Sensor Status**
  - How to integrate/use additional sensor status information (e.g. battery level)?
- **Semantics**
  - How to describe what a sensor measures?
  - How to use semantics for improving interoperable search mechanisms?

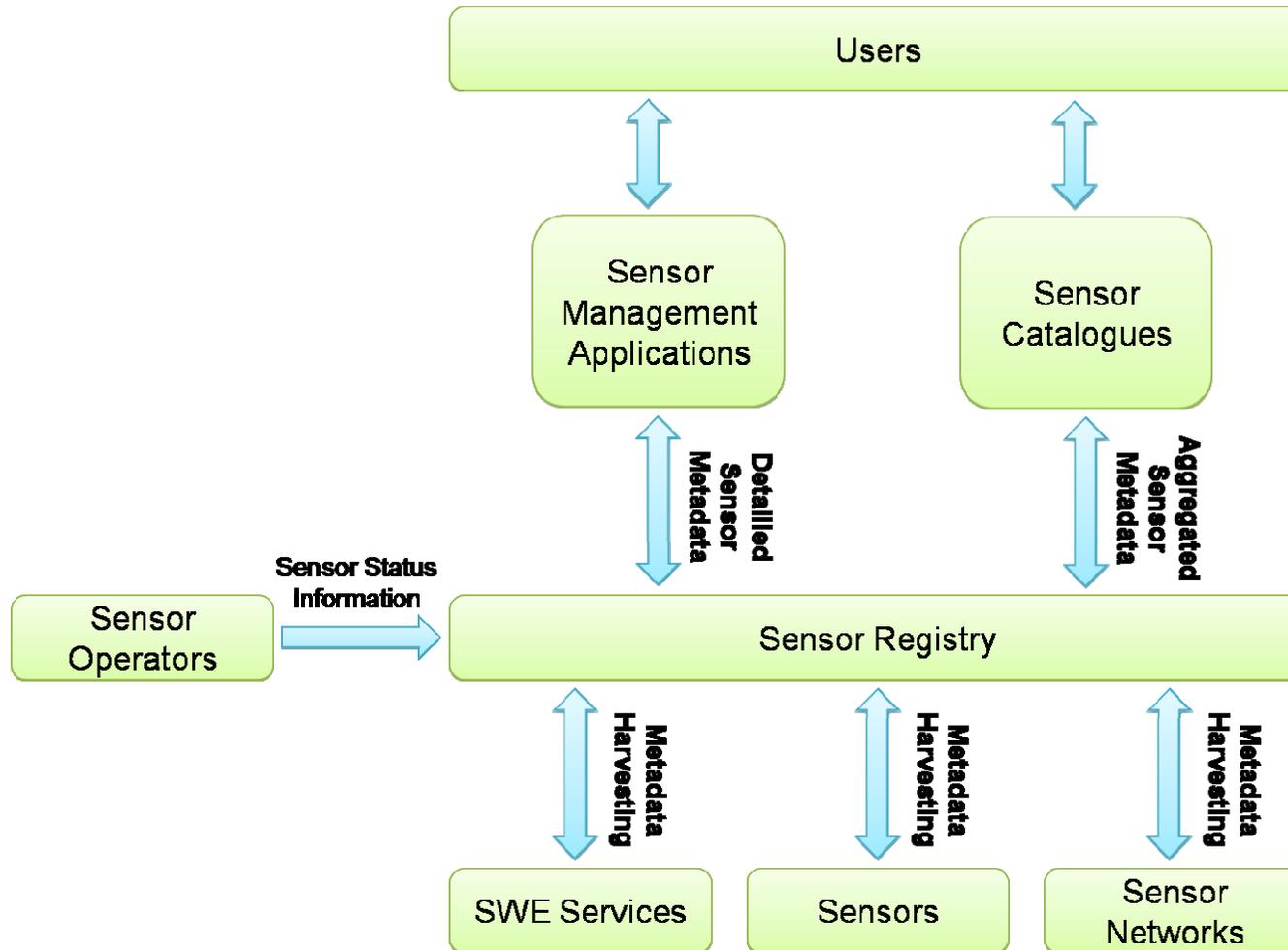


# Challenges of Sensor Discovery

- Search Interface
  - How to design an interface for a sensor catalogue/registry?
  - How to align sensor discovery with the OGC Catalogue?
- Identification of sensors
  - How to identify the same sensor within multiple sensor services?



# The GENESIS Sensor Discovery Framework





# Conclusion

- Discovery mechanisms for flexibly integrating sensors and sensor data
- Several challenges have to be addressed
- Harvesting mechanisms are a first step
- GENESIS Sensor Discovery Frameworks addresses a broad range of issues
- Work in progress
- Implementations available as Open Source software thorough 52° North



# More Information

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- 52°North: [www.52north.org](http://www.52north.org)
- GENESIS: [www.genesis-fp7.eu](http://www.genesis-fp7.eu)