

**Environmental Risk Management Tools F  
or Water Quality Monitoring  
Workshop, NOC, 30<sup>th</sup> March 2009**

**Sensor Networking Architecture**

**Sensors Anywhere (SANY) and Marine Risk  
Prediction**

Mark Lidstone, BMT Cordah Limited

- ✿ Multidisciplinary environmental consultancy.
- ✿ Provide software and services to sectors concerned with **marine risk**, e.g. oil spill, search and rescue and underwater noise.
- ✿ [www.bmtcordah.com](http://www.bmtcordah.com)
- ✿ Presently developing e-coli risk models to support Bathing Water and Aquaculture legislation in conjunction with the EU Consortium Project, Sensors Anywhere (SANY).

# Sensors Anywhere (SANY)

✱ The **SANY** integrated project focuses on interoperability of in-situ sensors and sensor networks. **SANY** architecture will provide a quick and cost-efficient way to reuse data and services from currently incompatible sensor and other data sources.

✱ FP6-033564

# Sensors Anywhere

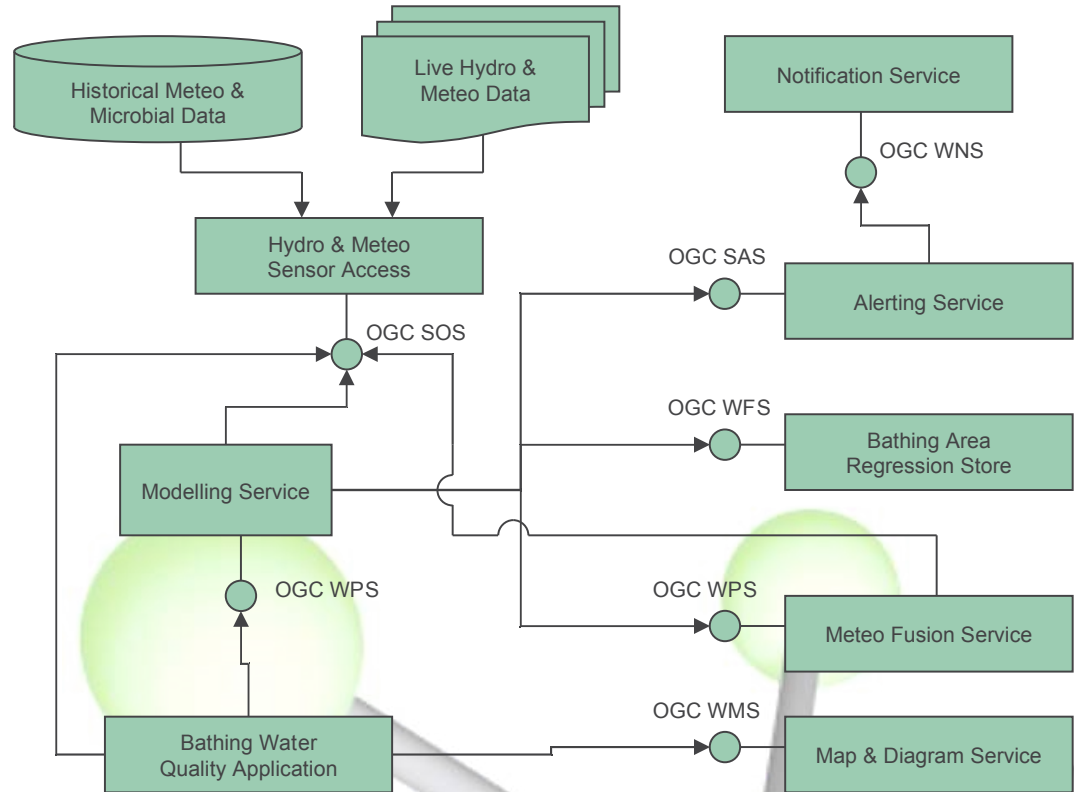
**SANY IP** shall deliver:

- ✱ Standard service-oriented architecture for environmental sensor networks. **SANY** services shall be self-describing and capable of seamless "plug and measure" and sharing ("virtual networks").
- ✱ Reference implementation (examples!) of reusable sensor and domain independent services, including decision support and generalized data fusion services.
- ✱ Three innovative risk management applications covering the areas of **air pollution (SP4)**, **marine risks (SP5)** and **geo hazards (SP6)**.

- ✱ BMT is leading the **SANY Bathing Water Quality Risk Pilot** (Poland) and the **Aquaculture River Basin Risk Pilot (UK)**
- ✱ A new online decision support tools are being developed in the project.
- ✱ These tools use geographically distributed services of environmental data providers around Europe

- Geographically distributed environmentally specialised services
- Interactive system of services enables the assessment of water quality risks
- New services can be involved and linked in to this structure for added value to users

# Bathing Water Quality Risk



S@NY  
Sensors Anywhere

**Introduction**  
Overview

**Modelling**  
Perform Simulation

**Support**  
Contact  
Help

**Data Sources**  
Rain Sources  
Wind Sources  
Cloud Cover Sources  
Sea Temp. Sources  
Salinity Sources  
Bathing Area WFS

**Personalisation**

**Search**

**Sitemap**

**Login**

**Bathing Water Quality Pilot** 30/03/2009

This is a scenario for the prediction of bathing water quality along the Gdansk-Gdynia coastline.

**Simulation Parameters**  
Enter input parameters for simulation service *BMT AQUARISK v1*

**Scenario Setup**

Date:	<input type="text" value="2 November 2006"/>	Contaminant:	<input type="text" value="E-Coli"/>
Beach:	<input type="text" value="Gdynia - Srodmiemie"/>	Threshold:	<input type="text" value="235"/> No/100ml
Model Type:	<input checked="" type="radio"/> <b>Regression</b> <input type="radio"/> <b>Neural Network</b>		

**Environmental Parameters Setup**

Meteorology		Hydrology	
Past Rainfall	0 to 24 hours <input type="text"/> mm	Sea Temperature	<input type="text"/> deg C
	24 to 48 hours <input type="text"/> mm	Salinity	<input type="text"/>
	48 to 72 hours <input type="text"/> mm		<input type="text"/> Retrieve
	<input type="text" value="SP5 SANY SOS Baseline"/> Retrieve		
Wind Speed	<input type="text"/> m/s		
Wind Direction	<input type="text"/> deg		
	<input type="text" value="SP5 SANY SOS Baseline"/> Retrieve		
Cloud Cover	<input type="text"/> (0-8)		
	<input type="text" value="SP5 SANY SOS Baseline"/> Retrieve		

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- SOS Meteorology v1
- SOS Wind v1
- SOS Hydrology v1
- WFS Bathing v1

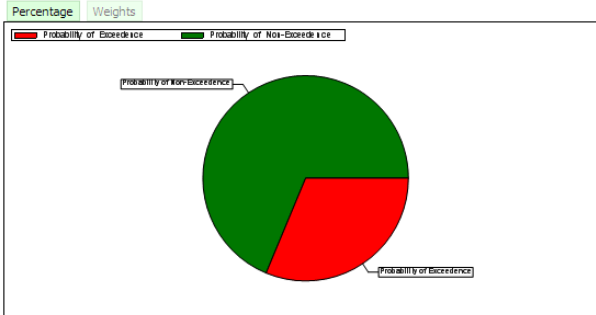
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**Bathing Water Quality Pilot** 30/03/2009

Result from "BWQMv1 (1.0.0)" model = 31.3% probability of exceeding 235 No/100ml.

- Show all simulation results
- Show WPS Execute request



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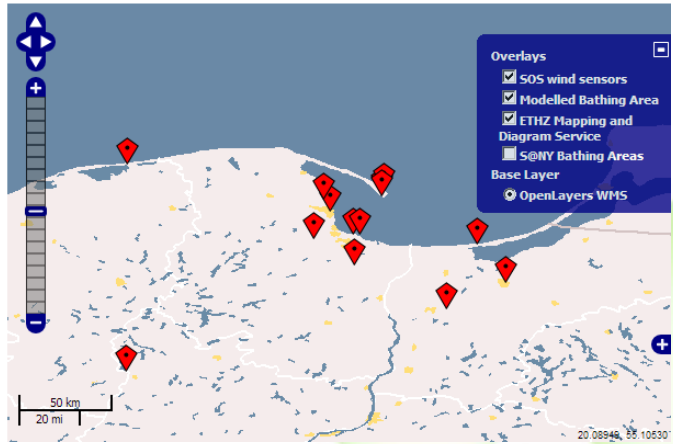
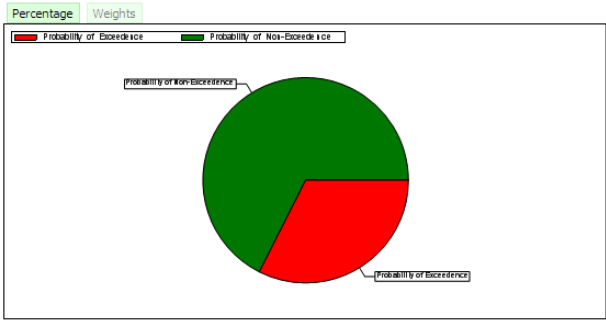
**Personalisation**

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**Bathing Water Quality Pilot** 30/03/2009

Result from "BWQMv1 (1.0.0)" model = 32.5% probability of exceeding 235 No/100ml.

- Show all simulation results
- Show WPS Execute request



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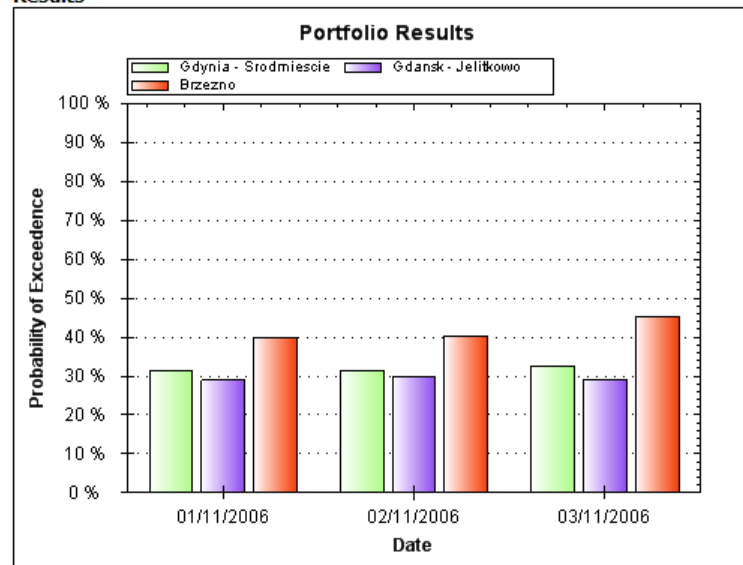
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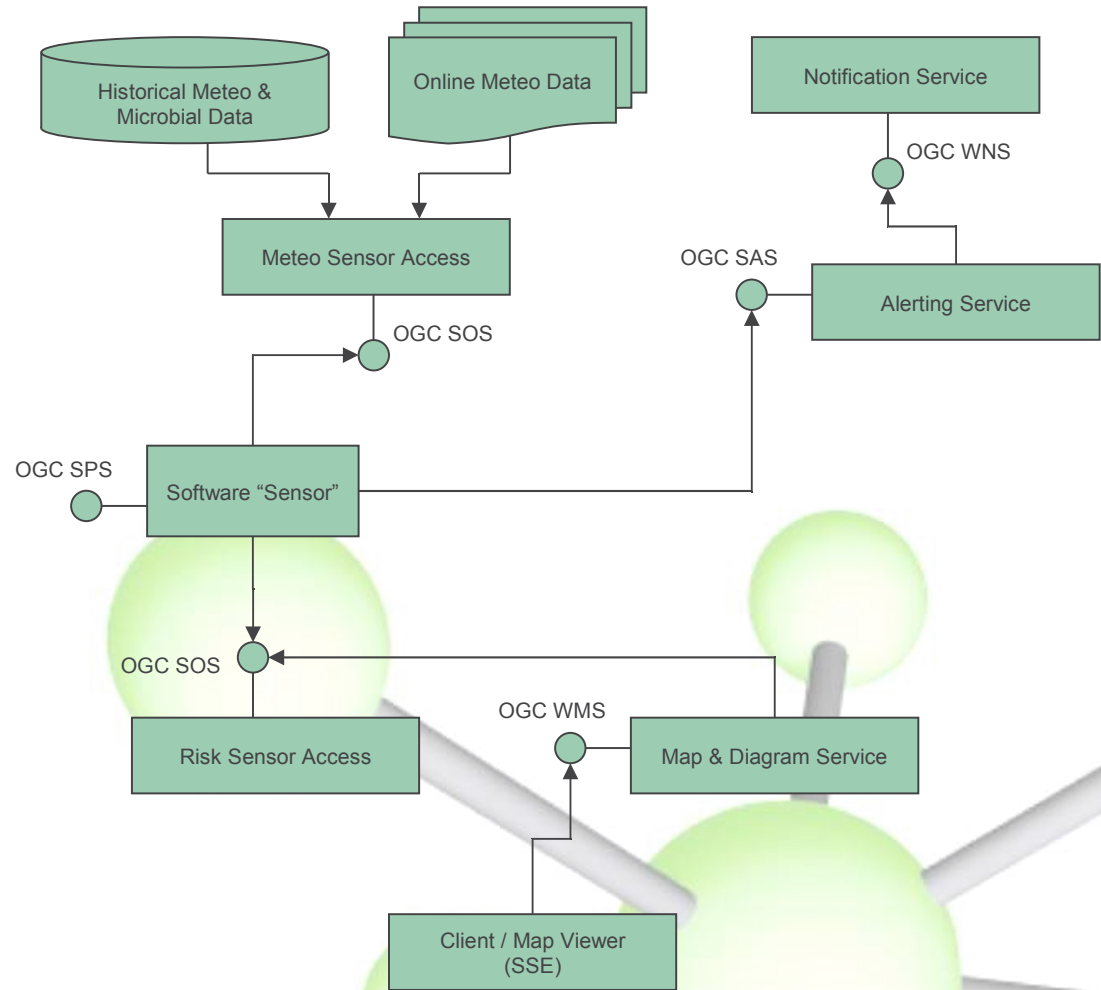
Results



	Gdynia - Srod miescie	Gdansk - Jelitkowo	Brzezno
01/11/2006	31.5522%	28.9480%	39.8694%
02/11/2006	31.2788%	29.6526%	40.4176%
03/11/2006	32.6724%	29.0857%	45.3310%

- Hydrographic data from mobile marine sensors (buoys)
- Interactive system of services enables the assessment of water quality risks to shellfish
- New services can be involved and linked in to this structure for added value to users

# Aquaculture Water Quality Risk



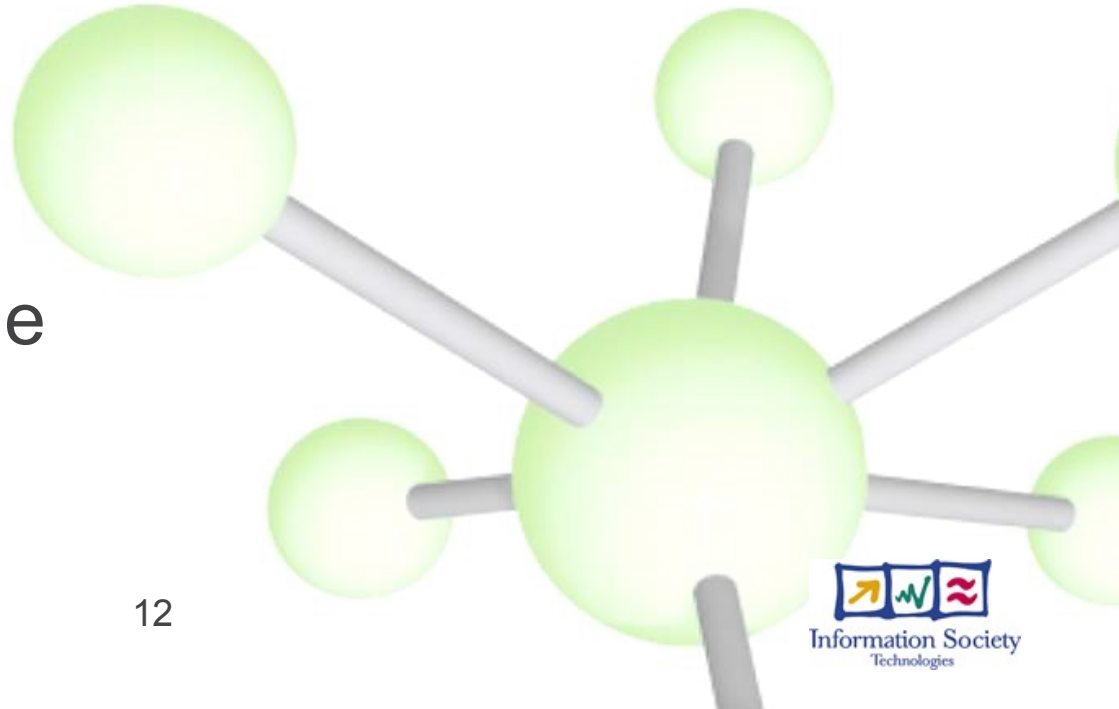
## ✱ SWE

- O&M, SensorML, SOS, SPS, SAS

## ✱ Generic Fusion

- WPS “Kriging”

## ✱ Semantic Catalogue



- ✱ “Orchestra” Catalogue
  - Orchestra IP, FP6
- ✱ Extension of OGC Catalogue
- ✱ Semantic + Geospatial Search

**Thank you\_**

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