S e m a n t i c D a y s
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Enabling Access to Environmental Models, Data, and Services on the Web

~ SINTEF projects ~

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Outline – Projects

- ENVISION
- ENVIROFI
- CITI-SENS

ENVISION – Motivation and Objectives

http://www.envision-project.eu/

- Environmental Models
  - Increasingly significant in decision making: diagnose and forecast
  - State-of-the-art: Static, centralized and closed systems, with tightly coupled components, isolated systems with limited audience (i.e. experts)

- ENVISION aims to provide a dynamic, open, distributed and shared environmental modelling infrastructure
  - Enables a high level of model reuse easily accessible for both experts and non-experts

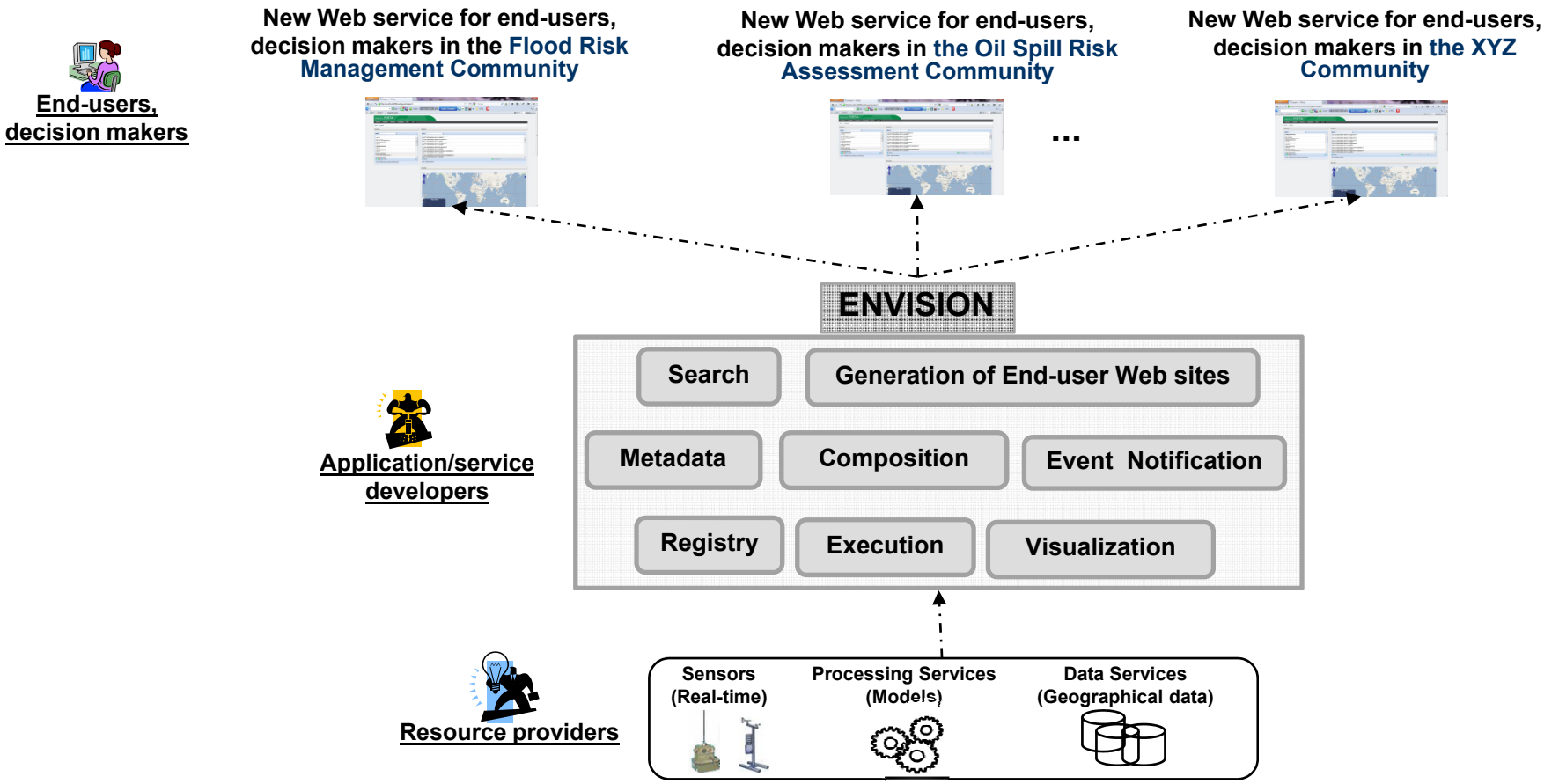
- Three pilot use cases:
  - Oil Spill Risk Analysis
  - Landslide Hazard Risk Assessment
  - Real-time monitoring of floods evolution in trans-boundary context

What does ENVISION offer to the environmental community?

- For **services creators / organizations that want to provide new, added-value environmental services**
  - **Registry/repository facilities** for heterogeneous real-time data, environmental models, and other types of environmental data
  - **Metadata creation and enhanced search** for environmental data/models
  - **Composition** of environmental data/modes in intuitive ways for design of new/enhanced models and added-value services
  - **Visualization on maps/charts** of environmental data and results of models executions
  - **Event patterns** detection, notification and alerts set-up facilities
  - Flexible **set-up of end-user communities Web sites** for role-based access to newly developed services

- For **service consumers** (e.g. decision makers)
  - **Easy sharing** of environmental information within a given community
  - **Added-value environmental services** for visualization of enhanced environmental data (real-time, forecasting, etc), event notifications

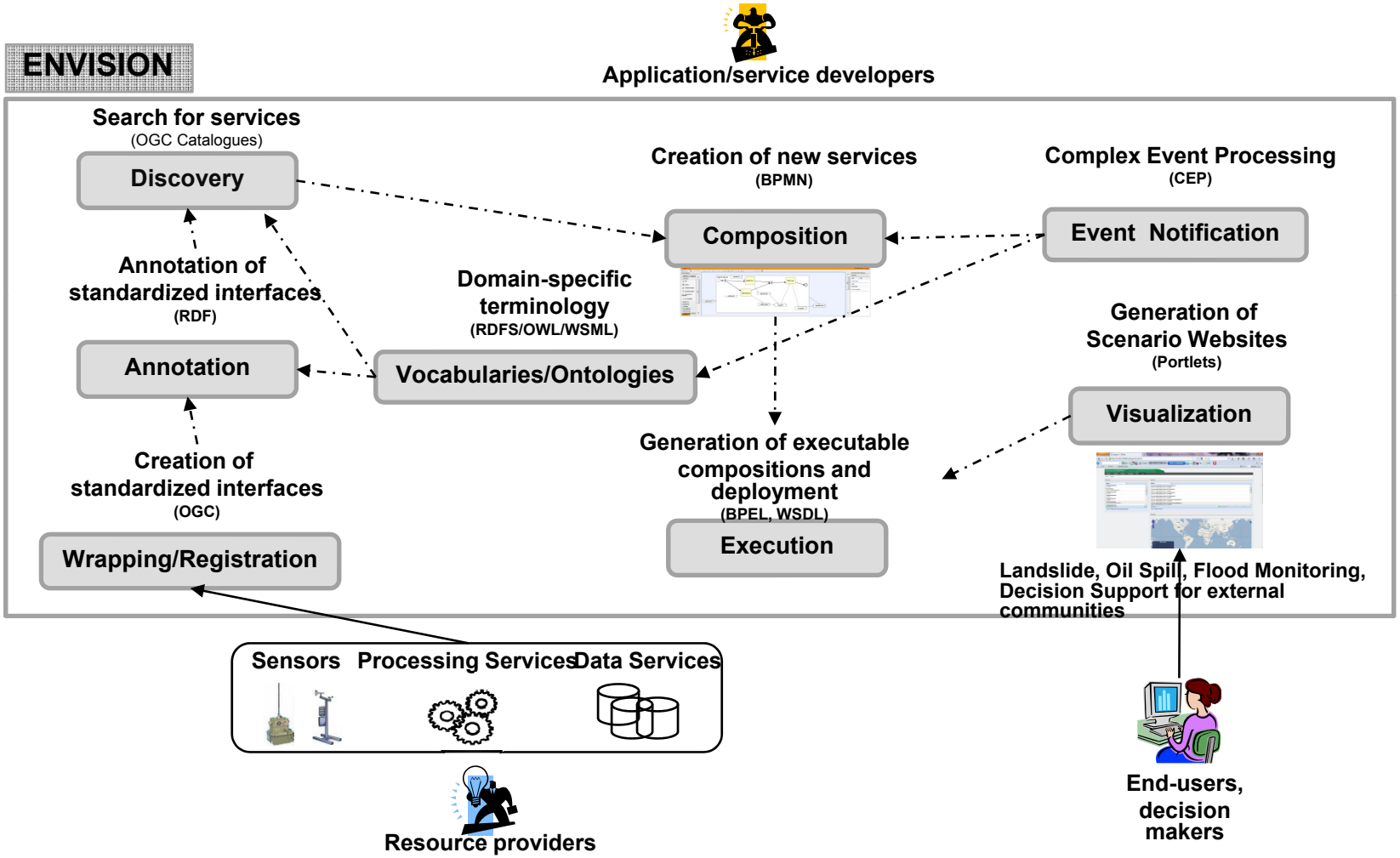
ENVISION Platform Overview



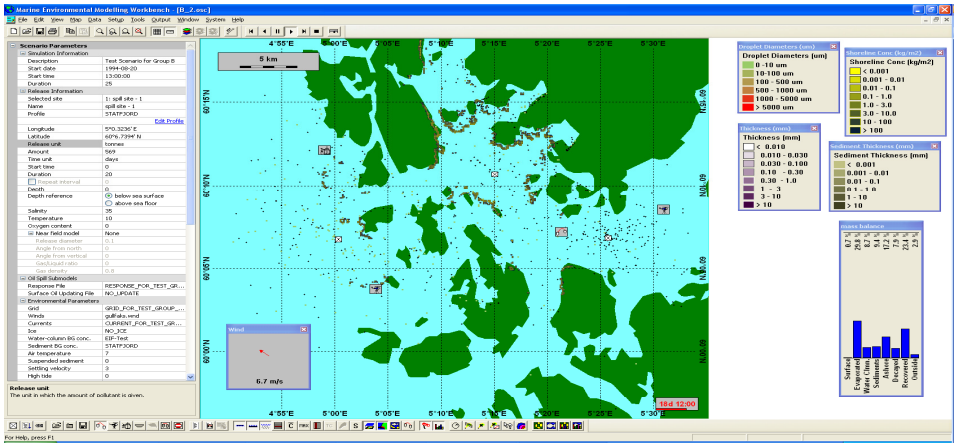
Value propositions:

- **Collaborative open source platform** for sharing environmental data and models on the Web
- Create opportunities for **faster** and **smarter development** of added-value services based on models and real-time data
- Enable **better Web-based access** to data and processing/modelling services and real-time sensor data for end users

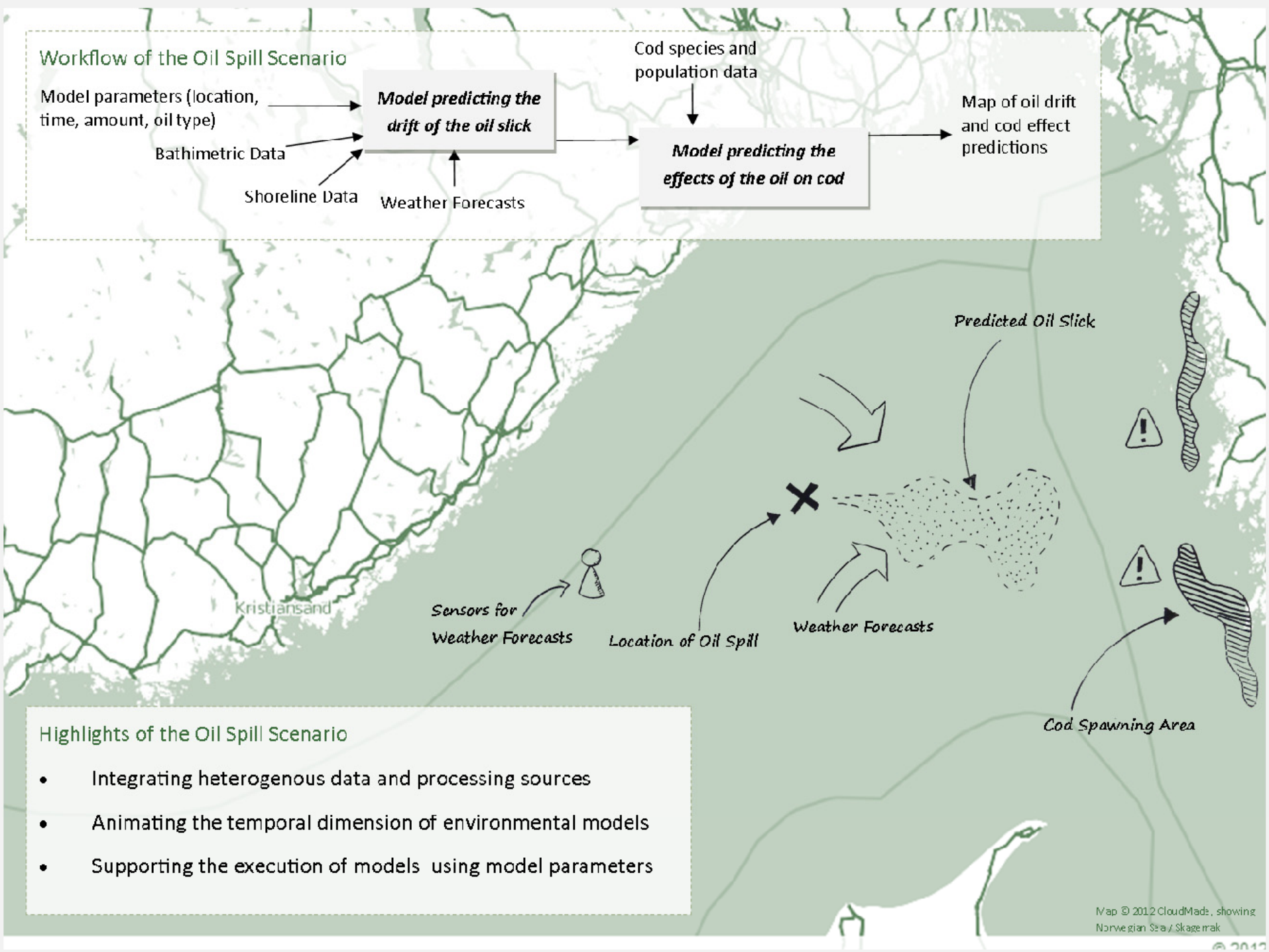
ENVISION Platform
Examples of components interactions



Oil Spill Pilot Case



- What is the problem?
  - Oil spills may have severe ecological and socio-economic effects
  - Understanding fate and effects of oil spills is key to risk mitigation and response management
  - To this end, a number of oil drift models have been developed – typically oriented towards specific regions
  - Adapting an oil drift model to another region is often difficult, due to differences in driving data's structure and semantics
  - Moreover, coupling oil drift models to other models (e.g. for biological effects) is difficult – for the same reason (non-standard interfaces)
- Who are the stakeholders?
  - This pilot case is implemented using SINTEF's oil drift model OSCAR
  - Other organizations that may be involved are oil companies, coast guards, consulting companies, researchers, and the general public


Workflow of the Oil Spill Scenario
Model parameters (location, time, amount, oil type)
Bathimetric Data
Shoreline Data
Weather Forecasts
Model predicting the drift of the oil slick
Cod species and population data
Model predicting the effects of the oil on cod
Map of oil drift and cod effect predictions
Predicted Oil Slick
Kristiansand
Sensors for Weather Forecasts
Location of Oil Spill
Weather Forecasts
Cod Spawning Area
Highlights of the Oil Spill Scenario
• Integrating heterogenous data and processing sources
• Animating the temporal dimension of environmental models
• Supporting the execution of models using model parameters
Map © 2012 CloudMade, showing Norwegian Sea / Skagerrak

Oil Spill Pilot Case (cont')

- What does ENVISION offer?
  - Easy to create and use (by non-ICT skilled users) environmental websites
  - Uniform publication of environmental resources (data services, model services)
  - Environmental models composition and distributed execution.
  - Collaborative work between organizations using ENVISION platform
- What will be the end result and how will the stakeholders use/interact with the platform and the resulting end-user website?
  - The end-user website will provide decision support for oil spill risk managers and response organizations
  - It will offer connectivity and interoperability capabilities with third parties hosting data services and model services
  - Stakeholders will create, manage and execute compositions based on resources made available in ENVISION

ENVISION – Added Value for the Oil Spill Risk Management Community

- **What added-value could ENVISION platform bring?**

  A single collaborative Web-based platform exposed as a service/portal for environmental data exchange (real-time, historical, forecasts), models sharing and models composition.

- **Who could be the stakeholders?**

  Oil companies, coast guards, consulting companies, researchers, and the general public.

- **What kind of information could be made available through the ENVISION platform?**

  Environmental models, geographical data, real-time or near real-time data and forecasts collected from heterogeneous existing sources).

Oil spill clean-up action

- **How could the information be used in the ENVISION platform?**

  Geographical data and environmental models are wrapped in standardized formats as Open Geospatial Consortium (OGC) Web Services. Metadata is attached to the OGC services in a user-friendly manner. Data/services can be searched/discovered in a semantically-enriched way. Models and data exposed as services can be aggregated as service compositions in intuitive and user-friendly environment. Aggregated models can be executed and results made available as new services. Data and results of service executions are visualized on maps and charts. Community Websites are configured and published with access restrictions.

ENVISION – Collaborative Platform

- Several organizations from different countries can provide geographical data, updated environmental forecasts, model services

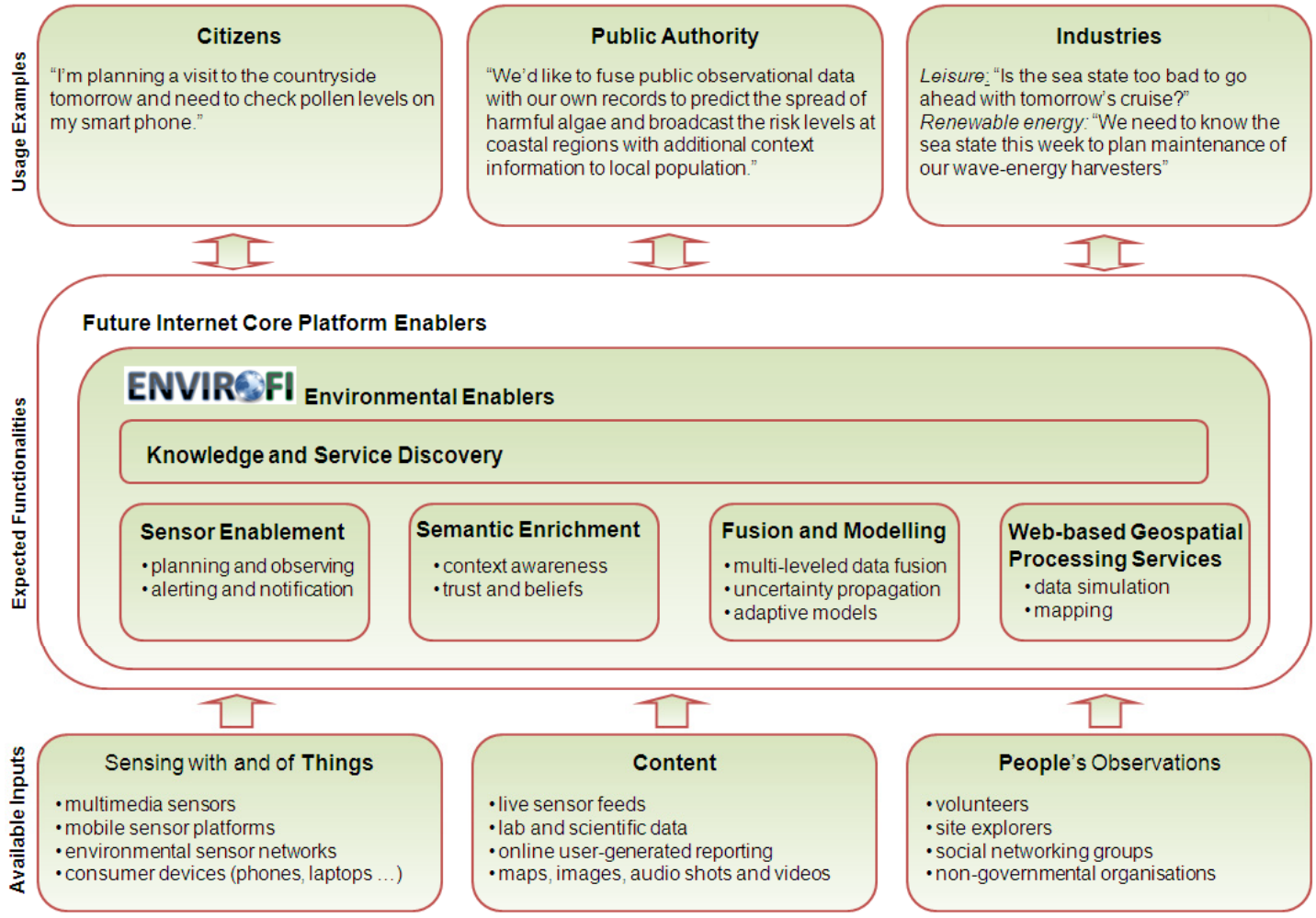
Examples:

- Sea depth data (bathymetry)
- Wind and current data – historical/forecast
- Spawning areas for fish
- Depots for response equipment
- Models for economic effects

DEMOS: http://www.envision-project.eu/screencasts-demonstrators/

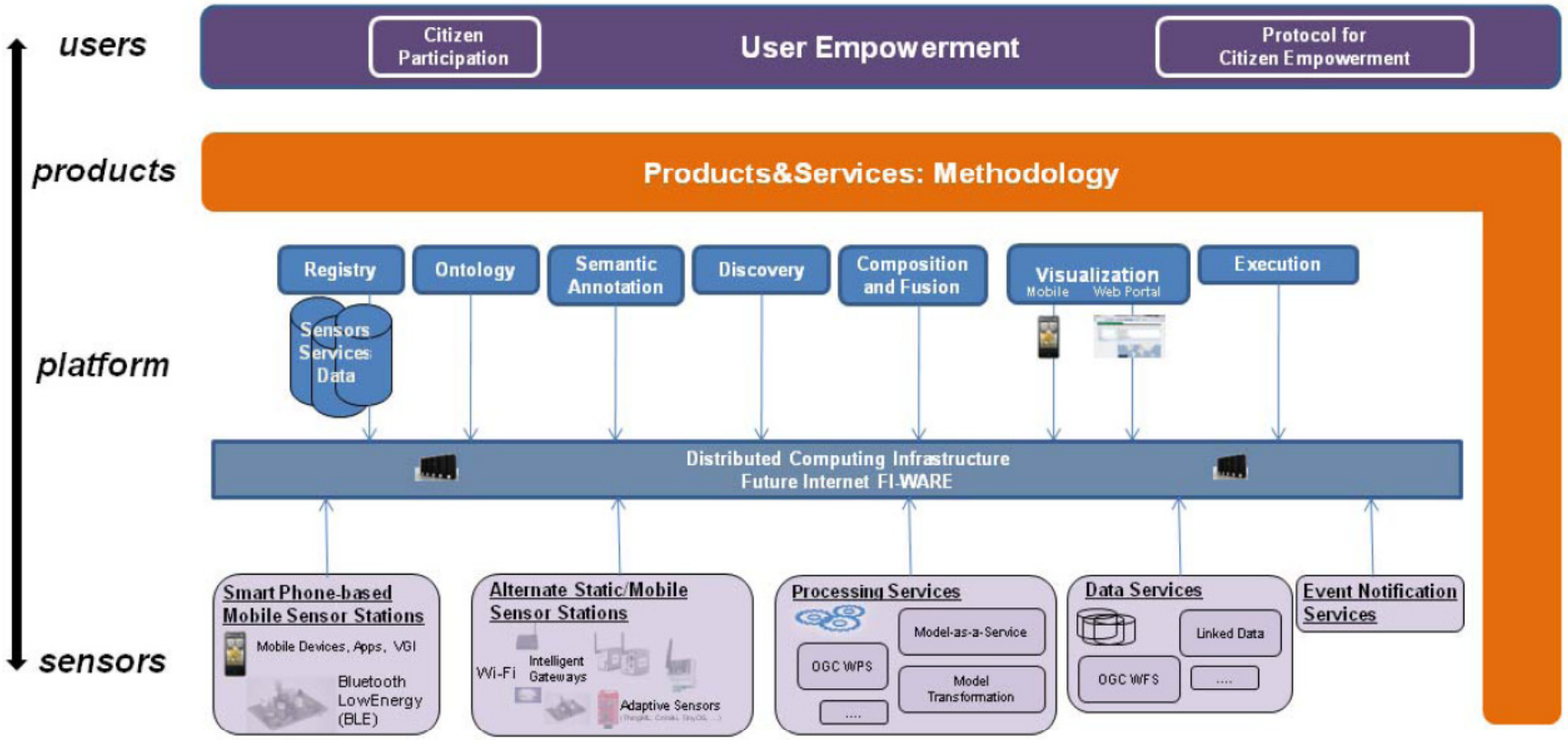
ENVIROFI http://www.envirofi.eu/

The Environmental Observation Web and its Service Applications within the Future Internet



The “CITI-SENS” project

Environmental 6.5.1 IP, from end of 2012 to 2016, 9 Meuro, 29 partners
“Development of sensor-based Citizens’s Observatory Community for improving Quality of life in cities” – currently in negotiation stage …



ENVISION End-User Workshops

http://www.envision-project.eu/workshops/

- Goals of the ENVISION end-user workshops:
  - Receive feedback on the ENVISION technologies from the community
  - Validate ENVISION technologies in concrete pilot cases
  - Follow-up activities with potential end-users
- Upcoming ENVISION end-user workshops:
  - 18-19 June 2012, Oslo, Norway
  - October 2012, Romania
- Join the workshops!

Summary

- Environmental information (sensors, models, data) are important for decision making
  - A platform of interoperating models is needed
- ENVISION – A platform for enabling access to environmental models as (Web) services
  - Flexile creation of scenario websites for accessing environmental data and models
  - Improved discovery of environmental data and models
  - Faster creation of new environmental services
- Emerging platforms/infrastructures
  - ENVIROFI, CITI-SENS,…
- We look for collaborations!

THANK YOU!

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