

## **ENVIROFI: Future Internet for Future INSPIRE**

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Large European communities generate significant amounts of valuable environmental observations at local and regional scales using mobile communication devices, computers and sensors which are mostly connected to the Internet. These communities' environmental observations represent a wealth of information which is currently unused and therefore in need for integration with other fragmented data and information sources, traditionally managed by research and educational institutions and industries. The ENVIROFI project (<http://www.envirofi.eu>) will address such important issues by specifying the requirements, and building conceptual prototypes, of the specific enablers of the environmental usage area in the Future Internet – Public Private Partnership (FI-PPP) programme. It will bring these diverse stakeholder communities together to understand environmentally observed processes with higher spatial resolutions and contextual situation awareness at an unprecedented scale.

This achievement alone could have a profound socio-economic impact in Europe and contribute towards meeting the global challenges of industrial competitiveness and smart living in this decade. ENVIROFI will explore the advances needed by the stakeholder communities for secure access to decentralized, interactive Internet-enabled geospatial services using content from authorities, researchers, people and private sector organisations. It will allow all these participants to plug in their personalised experiments and also feedback into the ENVIROFI Environmental Observation Web.

As part of the FI-PPP, ENVIROFI will consolidate the Future Internet requirements from the Environmental Usage Area perspective and provide technical specifications and prototypes of interoperable geospatial Environmental Enablers, such as intelligent data fusion, environmental models, and context aware alerting. These shall be deployed in the terrestrial, atmospheric and marine environments in collaboration with large stakeholder communities; and set the stage for large-scale trials in the Environmental Usage Area with a perspective of achieving sustainable socio-economic progress in Europe.

In terms of phenomena on the land, we focus on terrestrial biodiversity. The UN Convention on Biodiversity (CBD) and the EU have set a new target of halting the loss to biodiversity by the year 2020. In order to meet this goal we must first provide a solid basis upon which to judge this progress. Observational data on biodiversity must be merged from all available sources while assuring high quality. Using outreach groups for data survey, we can greatly widen the base from which observational data may be gleaned. Scenarios on biodiversity occurrence illustrate the use of humans supported by mobile devices such as smart phones as the main 'sensor' for data provision.

On the atmospheric sphere, we concentrate on individualized exposure assessment. Today, we have easy access to a great deal of information via television, radio and the World Wide Web. This includes pollution, pollen and meteorological data which are all relatively easily accessed in one or more dissemination channels. All this data contributes to a common sense, but it is not tailored to individual user needs. Relevancy of data and interpreting it are key issues for users today, especially with regards to pollen and pollution. Future eEnvironment services shall therefore aid the users towards in tailoring information relevant to their individual requirements.

For the marine domain, the challenge for research and innovation is to create synergies with the market and with policy needs that are necessary to deliver significant value added to Europe from its vast marine resources. Enabling technology platforms are currently deployed across a range of existing marine related sectors including shipping, security and logistics, environmental monitoring and offshore energy. Next generation decision based management tools have to dissolve national borders. They shall address these developments in respect to distributed sensing, and wireless and cable communications.

Beyond these rather classical scenarios, which are likely to become reality, we expect applications, such as:

- a fully scalable, real-time environmental and social footprint;
- event tracing through observation webs, tweets and newspaper articles; or
- social networking with sensors and environmental models,

as well as the cross-domain applications taking into account the individual environment-related sensitivity, exposure and preferences, to become reality within the next decade.

While this is all quite far away from INSPIRE as we know it today, there are many parallels. INSPIRE itself is slated to evolve as technology develops; ENVIROFI will lead the way towards integration of the future infrastructure for spatial information in Europe and the emerging “Future Internet” infrastructure. Our goal is to support European Community environmental policies, and policies or activities which may have an impact on how the environment will develop, while at the same time assuring the environmental information can be easily used outside of the regulatory context. Furthermore, the experiences in community consolidated specifications that have been acquired during the technical co-ordination of INSPIRE provide a valuable contribution for defining the governance within the FI-PPP programme and provide an excellent opportunity to promote INSPIRE beyond the initially intended audience. Along this line, the applied research, which has been carried out since the INSPIRE Directive was put into force will lead to innovation in a wide spectrum of (Future Internet) applications.