New: ESFRI Roadmap 2016

Wouter Los was director of the Zoological Museum at the University of Amsterdam, resulting in his interest for applying large-scale biodiversity data in research. After coordinating the LifeWatch infrastructure for biodiversity and ecosystem research, he is now involved in a few spin-off projects.

The first ESFRI Roadmap was published in 2006 and now 10 years later, the new Roadmap 2016 (1) is the fourth in sequence.

Since the very start in 2006, 60% of the selected ESFRI projects reached the implementation phase by the end of 2015. These so-called 29 ESFRI Landmarks are complemented with 15 still ongoing projects identified in earlier years and six new research infrastructures that fill in gaps in the science landscape. The box below shows the acronyms for only ENVRIplus related infrastructure projects. The ESFRI introduced some new considerations to facilitate the process towards the new Roadmap. An important one was the eligibility condition that a proposal required a funding commitment from the submitting Member State or Associated Country along with a political commitment from at least two others.
Indeed, this is facilitating the ESFRI but also a major threshold for new initiatives. Another consideration was the attention of infrastructures for their lifecycle, from preparations, through construction and operation, up to either re-design or shut down. The ESFRI is planning periodic monitoring of both Landmarks and Projects, according to their stage.

Key observations are the urgent need to sustain, integrate and further develop a diverse set of Environmental research infrastructures in a way that Europe can address both the key societal and economic challenges as well as improve our basic scientific knowledge

ESFRI Strategy Working Groups performed Landscape Analyses as a reference for understanding the potential of the new ESFRI Projects and the impact of the ESFRI Landmarks. Most interesting for ENVRIplus is the analysis of the environmental sciences, and the Roadmap 2016 presents this for the following domains: atmosphere, hydrosphere, marine, biosphere, geosphere, as well as for the related topics of big data and socio-economic impact.
Key observations are the urgent need to sustain, integrate and further develop a diverse set of Environmental research infrastructures in a way that Europe can address both the key societal and economic challenges as well as improve our basic scientific knowledge, while at present, the environmental research landscape in Europe is only partially covered by ESFRI research infra-

Landmarks	*Running*	*New ESFRI projects*
EMSO	ESICAT_3D	ACTRIS
EURO-ARGO	EPOS	DANUBIUS-RI
IAGOS	SIOS	EMPHASIS
ICOS	AnaEE	
LifeWatch	EMBRC	
ELIXIR	MIRRI	

As for the presented vision, a basic statement is that because of its complexity the environmental domain should be equipped with infrastructures for comprehensive observervations with an integrated approach.
Following this, the most important challenge for the long-term sustainability of environmental research infrastructures is the recommendation to create a framework for integrating monitoring facilities and focused infrastructures in the main environmental domains.
As a key driver for the future development of all environmental research infrastructures is also recommended a federated approach to IT resources and greater integration and interoperability. This is central in the ENVRIPLUS work plan, and as such recognized in the ESFRI landscape analysis. It is finally informative to fully cite the gaps to be covered according to the ESFRI landscape analysis.

- Sustainability and integration of long-term data, covering the whole EU (from the deep sea to the upper atmosphere) is a basic requirement. Several regions are under-sampled.
- In all fields there is a severe scarcity in basic data (taxonomy, climate parameters, etc.)
- A sustainable platform for climate modeling research is needed
- Data needs to be freely accessible.
- There are explicit needs for developing electronic infrastructures.
- A multidisciplinary approach is essential in order to fully understand environmental processes.
- There is a demand to integrate on-going public agency monitoring programmes with data collected for research purposes.
- There is need for agreements on funding and governance models.

References

(1) ESFRI Roadmap: http://ec.europa.eu/research/infrastructures/pdf/esfri/esfri_roadmap/esfri_roadmap_2016, Retrieved on 4.5.2016

Figure 1: ESFRI scheme for spatial and temporal scales associated with Earth Systems' processes and phenomena