LifeWatch ERIC e-Science for NIS research workshop | 20-21 May 2021

An event organised within the framework of the LifeWatch ERIC Internal Joint Initiative and with the support of the ENVRI-FAIR project

Round Table 5: IJI e-services and disruptive technologies for NIS research session

Dr. Juan Miguel González-Aranda
LifeWatch ERIC Chief Technology Officer

Dr. Wim Jansen
EC Commission

- Co-Chaired by **Wim Jansen & Juan-Miguel González-Aranda** LifeBlock (-chain)
- **Joris Timmermans** EBVs, Remote Sensing, Workflows-related
- **Ilaria Rosati** & **Nicola Fiore**; Semantics & Ontologies
- **Isabel Campos-Plasencia**; High Performance Computing & EOSC(loud) synergy
- **José-Francisco Aldana-Montes**; Big Data & Workflows-related
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Biodiversity and Ecosystem monitoring & modelling to generate new KNOWLEDGE

The Global Biodiversity Informatics Outlook (GBIO) Framework (Hobern et al. 2012) identifies 20 components as essential elements of biodiversity informatics and organized as four layers: Culture, Data, Evidence and UNDERSTANDING: Building modelled representations of biodiversity patterns and properties, based on any possible EVIDENCE using five components.

LifeWatch ERIC Tesseract

Is the product-framework we are deploying to build large scale virtual research environments focused on building understanding for ecosystem research

LifeBlock

Is the product-framework we are deploying to provide provenance and anti-tempering to our collected data (including the Environmental Observatory Networks). Guaranteeing persistence of evidences.

Facing e-Biodiversity challenges together: GBIO framework-based synergies between DiSSCo and LifeWatch ERIC

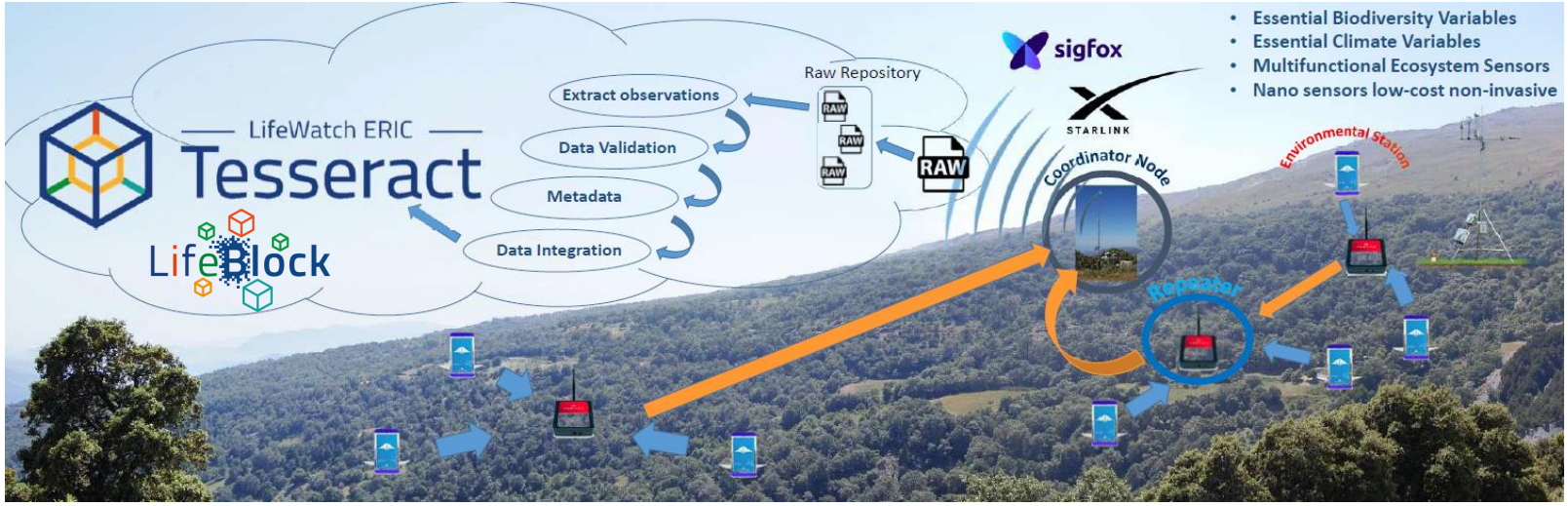
González-Aranda, Juan Miguel[1]; Koureas, Dimitris[2]; Addink, Wouter[2]; Hirsch, Tim[3]; Arvanitidis, Christos[1]; Sáenz-Albanés, Antonio-José[1]; Schalk, Peter[2].

Oral presentation during the session 'SI22-DiSSCo as a model for regional development of collections infrastructure' in the Infrastructure track at the forthcoming joint Biodiversity Next conference in Leiden, The Netherlands, October 20-25, 2019.

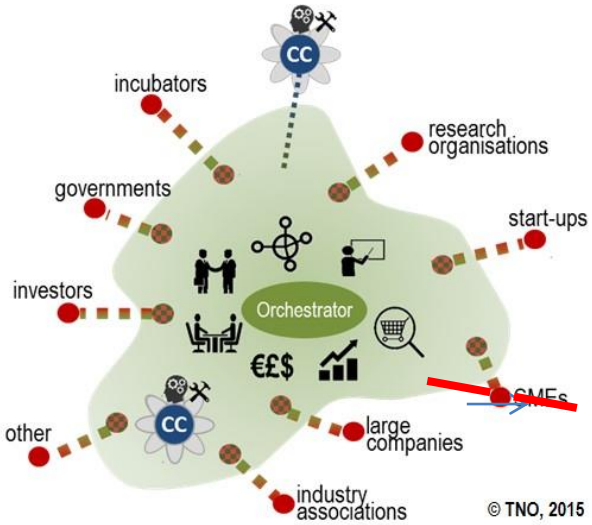
A joint conference by

*"**Disruptive technology** is an innovation that significantly alters the way that consumers (including Researchers & Technologists Communities-of-Practice), industries, or businesses operate. A disruptive technology sweeps away the systems or habits it replaces because it has attributes that are recognizably superior".* The Innovator's Solution" book, by Clayton Christensen, 2003…

…**BUT Innovations on ICT are developing so fast that yesterday's disruptive technologies are considered as "usual" ones** (e.g., cloud & big data computing, HPC, semantics & ontologies, etc.)



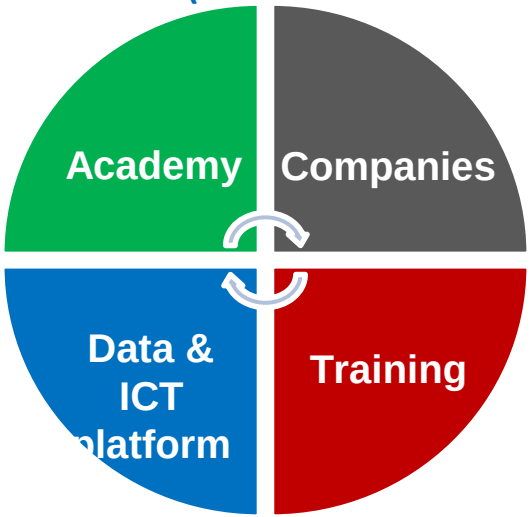
DIGITAL INNOVATION HUBS AND RESEARCH INFRASTRUCTURES



Digital innovation ecosystem

RESEARCH INFRASTRUCTURES

- Part of regional innovation ecosystem –Living Labs
- Supported by public administration – RIS3-RIS4
- "Horizontal Services" (e-infrastructures)
- "Vertical Services" (Thematic infrastructures)



▪**Research Infrastructures (RIs) are at the center of the quadruple helix (Pór, 2005), where research, academy, private companies (including SMEs), civil society organizations and public administration meet by applying an incremental and iterative process for creating new knowledge (González-Aranda et al., 2010-2013).**

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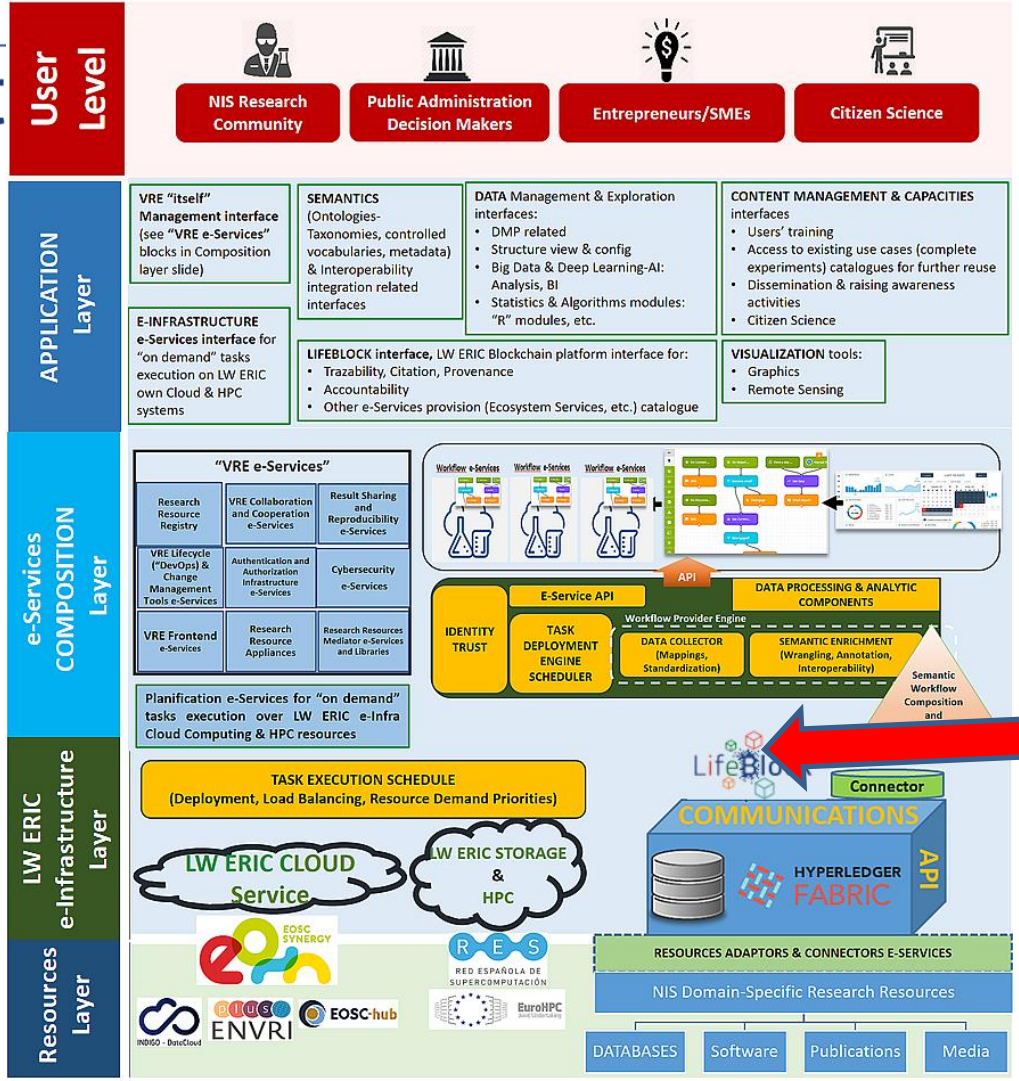
LifeWatch ERIC
Tesseract

Conceptual Architecture

11 Working Groups A to K

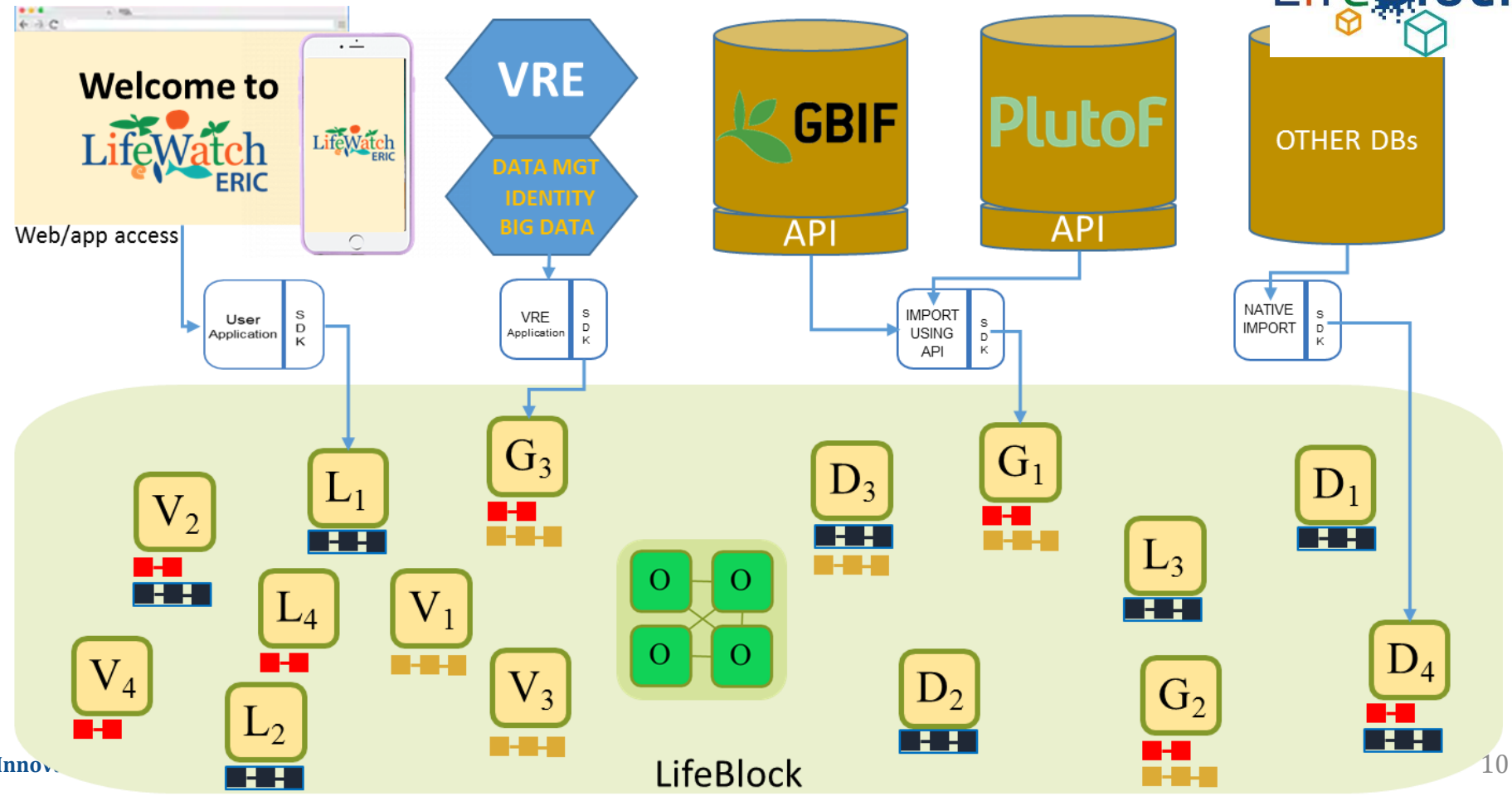


LifeBlock

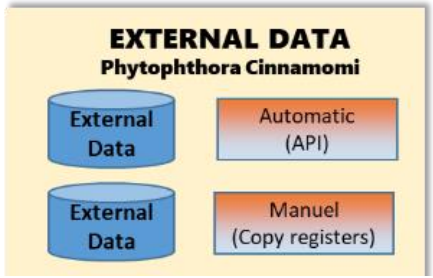
Current problems associated with the management of information on NIS-IAS which can be overcome by the use of Blockchain technologies

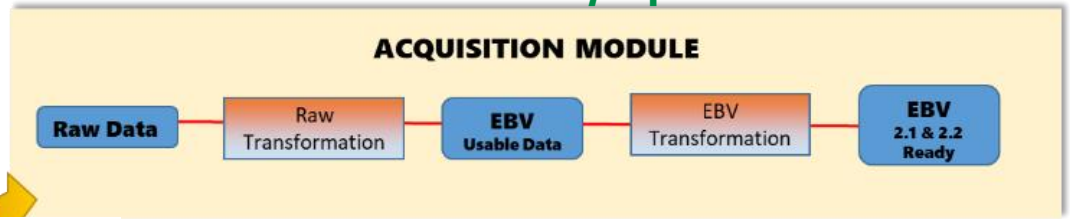
- A wide variety of databases with different formats and identifiers (DOIs, PIDs,…), information structure in overall terms;
- Problems associated with the lack of traceability, provenance, accountability and "anti-tempering" of data & information;
- Lack of interoperatbility of e-Tools associated;
- Problems associated with the information structure;
- Common APIs for adaptation of existing VREs and databases;
- Local storage of information on blockchain own nodes;
- Possibility of starting a tokenization system of stored digital assets, including applications for (socio-economics) assets valorization such as Ecosystem Services, and climate change impacts associated

LifeBlock (-chain) structure

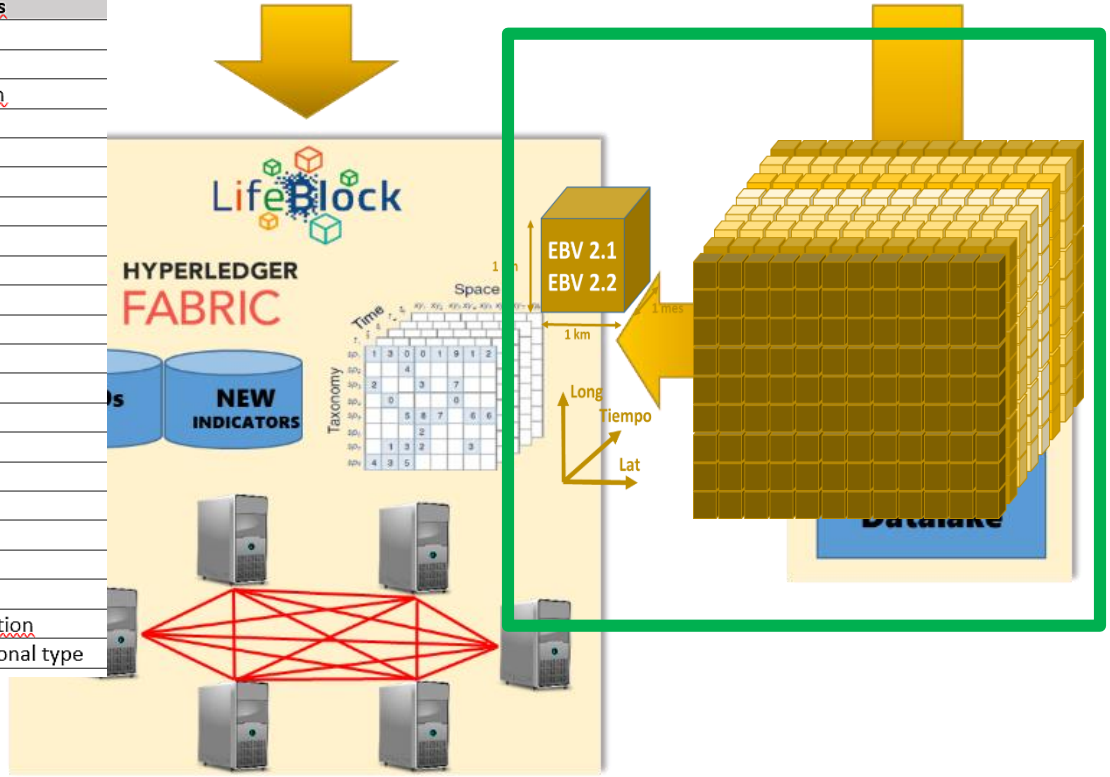


Phytophthora cinnamomi





#	EBV Classes	Candidates
1.1	Genetic Composition	Co-ancestry
1.2		Allelic diversity
1.3		Population genetic differentiation
1.4		Breed and variety diversity
2.1	Species population	Species distribution
2.2		Population abundance
2.3		Population structure
3.1	Species traits	Phenology
3.2		Body mass
3.3		Natal dispersión distance
3.4		Migratory behaviour
3.5		Demographic traits
3.6		Physiological traits
4.1	Community composition	Species richness
4.2		Species interactions
5.1	Ecosytem function	Net primary productivity
5.2		Secondary productivity
5.3		Nutrient retention
5.4		Disturbance regime
6.1	Ecosystem structure	Habitat structure
6.2		Ecosystem extent and fragmentation
6.3		Ecosystem composition by functional type



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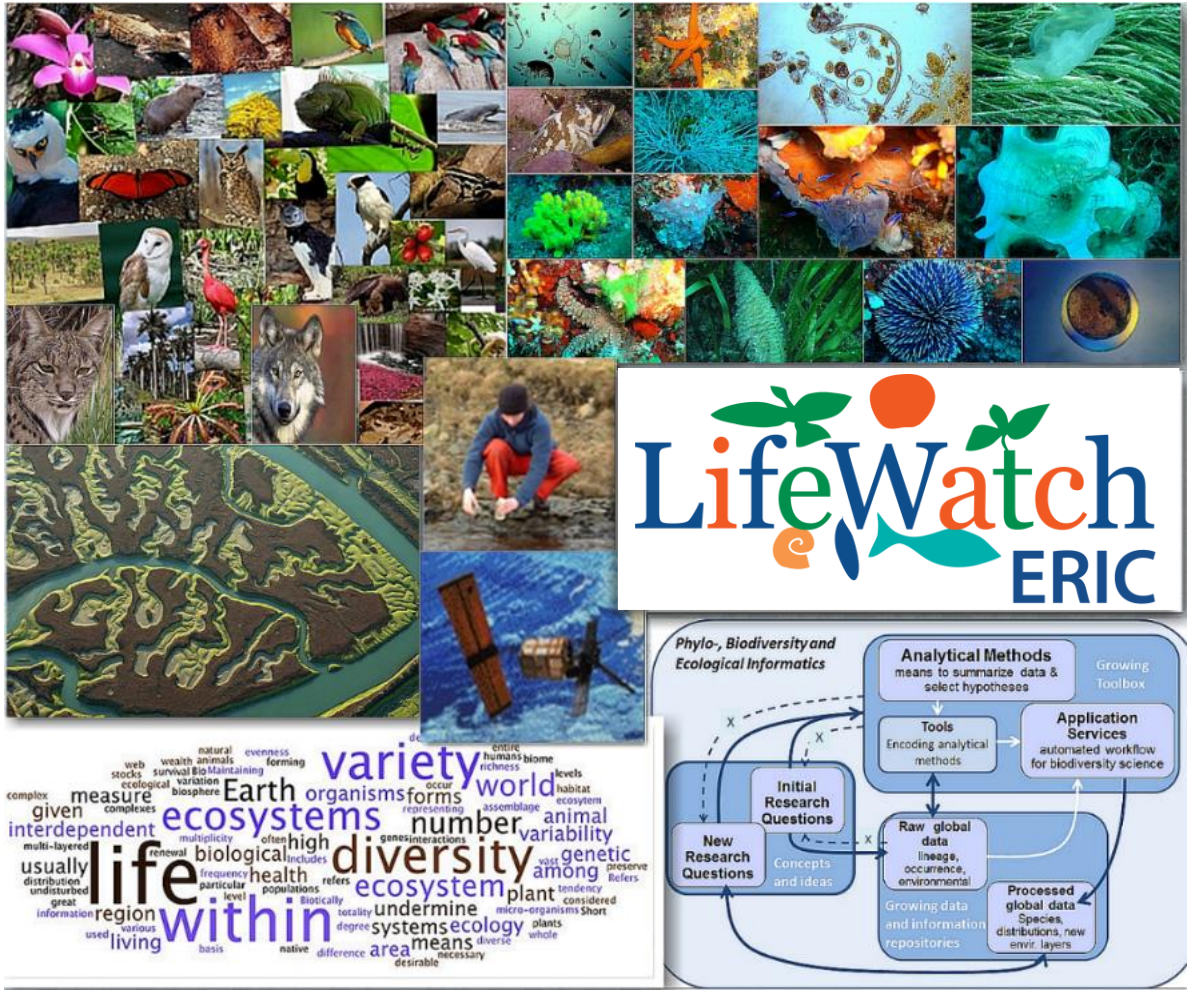

ENVRI community

Thank you very much !

https://www.lifewatch.eu

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