

Thinking globally, acting locally: *"LifeWatch ERIC and Sustainability plans"*

Dr. Juan Miguel González-Aranda & Dr. Benjamín Sánchez-Gimeno

Secretariat –of-State for Research, Development & Innovation Ministry of Economy, Industry and Competitiveness of Spain



E-IRG "Workshop on Long-term Sustainability for e-Infrastructures" Session on Long-term Sustainability: structure and financing/funding Qawra, St. Paul's Bay – MALTA, June 8-9, 2017

CONTENTS

• PART I. Introductory Context: LifeWatch distributed e-Infrastructure in a nutshell

• PART II. Looking for synergies. Constructing not from scratch (facts rather than statements): Moving from "satellite" projects contributions to the construction of a pan-European distributed & federated e-Infrastructure

• PART III. Long-term Sustainability of LifeWatch ERIC e-Infrastructure: Synergies between Structural Funds and H2020 initiatives case study

PART IV. CONCLUSIONS: EXPECTED IMPACT & NEXT STEPS

PART I Introductory Context: LifeWatch distributed e-Infrastructure in a nutshell

Lifewatch E-Science European Infrastructure for Biodiversity and Ecosystem Research

LifeWatchERIC(EuropeanResearchInfrastructureConsortium)isapan-Europeane-SciencedistributedInfrastructurefocused on how to measure the impact of GlobalChange issues on EarthBiodiversity and Ecosystem Research.





addresses the big environmental challenges and support knowledge-based strategic solutions to environmental preservation.



Tackling complexity of big scientific and societal biodiversity challenges requires **BIG DATA** analysis from many origins.

AMONG OTHERS, 2 CONCRETE CHALLENGES:

- ✓ SCALE: Users and data generators in the large Networks of Excellence
- ✓ HETEROGENEITY: Interconnected nature of biodiversity ideas, outputs and repositories

...Therefore, (Meta-)Data, modelling and analysis capabilities must be guaranteed by the provision of the proper COMMON e-Infrastructure Services to guarantee INTEROPERABILITY

LifeWatch ICT e-Infra & BIG DATA architecture in place

- e-Services for scientific cooperation
- Select the data, software and computing power for your project
- Integrate resources
- Linking to resources (databases, sensors, software, computing power)

This **mission** is achieved by providing access to a multitude of data sets, services and tools enabling the construction and operation of **Virtual Research Environments** which provide the environments for integrating data, software and computation as developed in European infrastructure cooperation.

PART II

Looking for synergies. Constructing not from scratch (facts rather than statements): **Moving from "satellite" projects** contributions to the construction of a pan-European distributed & federated e-Infrastructure

Interministerial agreements (Brussels, February 2011) and Commission Mandate based on ERIC Establishment Cooperation and Integration: PARTICIPATING COUNTRIES "in cash" + "in kind" contributions + SUPPORTING Projects and Initiatives (only some of them below).

COOPEUS FIELDS OF RESEARCH

COOPEUS

COOPEUS COOP+

ø

And not only!

European Commission

RDA

European Open Science Cloud

LifeWatch Competence Center

Data accounting (Cloud-Elapsed time Number of Processors-hours by Operations Centre and VO-Custom VOs, certified in GOCDB): Nearly 5 million of hours since <u>LifeWatch EGI-Engage</u> <u>Competence Center</u> was established (2 years ago), corresponding to VM for Marine VREs, GBIF, Natusfera, etc. All of them hosted at JRU LW.ES-IFCA and therefore belonging to IBERGRID (joing Portugal-Spain EGI.eu initiative).

Together with the two Communities: LHC, and CMS-ATLAS, is the Virtual Organization with the highest use of Cloud resources as part of the EGI federation.

NOTE: IBERLIFE is the joint Portugal-Spain LifeWatch initiative.

The Cloud Compute EGI view shows the accounting data from all Cloud Resource centres in the EGI infrastructure. Data can be organized by Operations Centre or country. Accounting information is only gathered from Resource Centres that are part of the EGI Federation and are certified in GOCDB. The metric shown is Elapsed time * Number of Processors, grouped by Operations Centre and VO, a custom selection of VOs are shown. No local jobs are shown is Elapsed time * Number of Processors, grouped by Operations Centre and VO, a custom selection of VOs are shown. No local jobs are shown is Elapsed time * Number of Processors, grouped by Operations Centre and VO, a custom selection of VOs are shown. No local jobs are shown is Elapsed time * Number of Processors, grouped by Operations Centre and VO, a custom selection of VOs are shown. No local jobs are shown is Elapsed time * Number of Processors, grouped by Operations Centre and VO, a custom selection of VOs are shown. No local jobs are shown is Elapsed time * Number of Processors, grouped by Operations Centre and VO, a custom selection of VOs are shown. No local jobs are shown is Elapsed time * Number of Processors, grouped by Operations Centre and VO, a custom selection of VOs are shown. No local jobs are shown is Elapsed time * Number of Processors, grouped by Operations Centre and VO, a custom selection of VOs are shown. No local jobs are shown is Elapsed time * Number of Processors.

Operations Centre	ATLAS	CMS	fedcloud.egi.eu	peachnote.com	vo.lifewatch.eu	Total	Percent
CERN	2,678,444	6,241,396	0	0	Û	8,919,840	35.47%
NGI_CZ	45	0	2,612,737	3,610,023	0	6,222,806	24.75%
NGI_DE	64,714	0	611,331	1,700	0	677,744	2.7%
NGI_FRANCE	0	15,932	319,523	0	0	335,455	1.33%
NGI_GRNET	0	0	2,874	0	0	2,874	0.01%
NGI_IBERGRID	305,961	394,237	1,005,124	0	4,768,868	6,474,191	25.75%
NGI_IT	78,713	41,936	2,036,382	0	0	2,157,031	8.58%
NGI_MARGI	0	0	16,596	0	0	16,596	0.07%
NGI_NL	0	0	13,693	0	0	13,693	0.05%
NGLPL	0	0	142,989	0	0	142,989	0.57%
NGI_SK	38,205	0	99,564	0	0	137,769	0.55%
NGI_TR	0	0	15,468	0	0	15,468	0.06%
NGI_UK	0	0	28,918	0	0	28,918	0.12%
Russia	0	0	186	0	0	186	0%
Total	3,166,083	6,693,501	6,905,386	3,611,723	4,768,868	25,145,561	
Percent	12.59%	26.62%	27.46%	14.36%	18.97%		
1 - 14 of 14 results						< 1 > Number of ro	ws per page 30 🔽

Cloud — Elapsed time * Number of Processors (hours) by Operations Centre and VO (Custom VOs)

ESFRI Projects & Landmarks 2016 recently published by European Commission.

LifeWatch ESFRI considered as an ENVIRONMENT strategic one.

STRATEGY REPORT ON RESEARCH INFRASTRUCTURES

ROADMAP 2016

Congratulations to @II LifeWatch Community !

Last May 23rd, 2017, European Commission Director-General for Research & Innovation, Robert Jan-Smits, awarded the LifeWatch ERIC Plate to the Spanish Secretary of State for Research, Development & Innovation, Carmen Vela, who received it on behalf of the entire LifeWatch community, also represented there by some of our colleagues and friends (see Family Photo), who were accompanied by 120 attendees representing other regional, national and international stakeholders. (+info)

Since March 2017 LifeWatch is considered (the 14th) ERIC. Its 1st General Assembly took place on May 8th-9th in Seville. In the same city, on May 23rd,DG R&I Robert Jan-Smits awarded the LifeWatch ERIC "Plate" in a ceremony also held in Seville (Spain).

To this end, LifeWatch is cooperating with "distributed" Centres in cooperating countries <u>(including their</u> <u>REGIONS</u>). These Centres are developing and operating virtual and physical media and other components.

Virtual Labs Ser (Amsterdam, (Leco The Netherlands)

Service Centre (Lecce-Region Puglia, Italy)

headquaters, Statutory Seat & ICT e-Infrastructure Office (Andalusia, Spain)

TYPE: distributed COORDINATING COUNTRY: ES MEMBER COUNTRIES: BE, EL, ES, IT, NL, PT, RO A* March 7th, 2016 update PARTICIPATING COUNTRIES: FI, FR, HU, NO, SE, SI, SK

TIMELINE

- ESFRI Roadmap entry: 2006
- Preparation phase: 2008–2011
- Construction phase: 2011-2016
- Operation start: 2016

ESTIMATED COSTS

- Capital value: 66 M€
- Operation: 10 M€/year

HEADQUARTERS Statutory Seat: Seville (ES) Common facilities: ES-IT-NL

WEBSITE http://www.lifewatch.eu

PART III

Long-term Sustainability of LifeWatch ERIC e-Infrastructure: Synergies between Structural Funds and H2020 initiatives case study

•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).

They bring together a wide diversity of actors looking for solutions to global and local problems, following the premise of "thinking globally, acting locally" (including the regional dimension).

•Moreover, RIs can be considered as research-focused inter-organizational knowledge systems which are tight related with and the space where they are located, making them valuable assets when thinking about territorial competitiveness considering a multi-level (European, National, Regional), and trans-national, trans-regional and trans-boundary perspectives (Carlsson, 2003):

 \checkmark For instance, and as it will be discussed later in this presentation, by tackling shared problems related to the common management of biodiversity and ecosystems (González-Aranda et al., 2013).

 Individual countries commit to participate in ESFRI RIs following specific strategies, which usually are also based on regional interests.

• There is a growing interest and involvement of regional authorities in each country, which demand to be part of this process. Not-surprisingly, several regions of Eastern & Southern Europe have included the construction or the upgrade of RIs in their Regional Strategies for Smart Specialization (RIS3) with the aim to mobilize the Structural Funds allocated to them:

✓ That is the case of the 3 European regions which will focus our case study: Andalusia-ES; CCDR-N Porto Norte-PT; and Regione Puglia-IT

RIS³-related initiatives

Workshop on the use of Structural Funds for the construction of distributed e-Infrastractures supporting ENVironment initiatives May 12th, 2014

EU Commission - DG CONNECT

Avenue de Beaulieu 25, (room S1), 1160 Brussels

http://www.rich2020.eu/symposium2016 Madrid, April 2016

RICH Symposium on Funding Instruments for developing Research Infrastructures

ATAS Proceedings JULY 10-11 LOC APDR CONGRESS DEVANDER OF THE REGIONS OF SOUTHERN EUROPE ISBN 978-989-8780-01-0 SBN 978-989-8780-01-0

MAKING A JOINT USE OF EU-FUNDS: OPPORTUNITIES AND CHALLENGES ASSOCIATED TO EUROPEAN RESEARCH INFRASTRUCTURES

Juan Miguel González-Aranda^{1*}, Benjamín Sánchez Gimeno¹, Fernando Ballestero¹, Ricardo Migueis², Alberto Basset³, Daniel Escacena Ortega⁴

¹ Ministry of Economy and Competitiveness, C/ Albacete 5 28027-Madrid, Spain, juanmiguel.gonzalez@mineco.es
 ² Fundação para a Ciência e a Tecnologia-Ministry of Education and Science, Av. D. Carlos I 126 1249-074 Lisboa, Portugal, ricardo.migueis@fct.pt
 ³ University of Salento, Vía per Monteroni 73100-Lecce, Italy, alberto.basset@unisalento.it
 ⁴ Andalusian Knowledge Agency-Regional Government of Andalusia, C/ Max Planck 3 Edificio Iris 1 Isla de la Cartuja 42092-Sevilla, Spain, daniel.escacena@juntadeandalucia.es

This interest was reflected in the attendance to this workshop, over 80 persons from 15 countries and over 20 regions

- RETHILAGRO, "Portugal-Spain Network of Excelence for the Biodiversity Preservation and Sustainable Development of Iberian AGRO-Systems"
- Interreg Sudoe

GOBIERNO DE ESPAÑA PENVIMA, "France-Portugal-Spain Virtual Research Environments Platform to support Environmental Research initiatives"

Ministry of Economy, Industry and Competitiveness of Spain Internationalization Project for updating Doñana Singular Scientific and Technological Research Infrastructure for LIFEWATCH (FEDER – Technological Funds)

80% - 20% **ESIF** Co-funding 5,998,650.40 M€ + 1,499,662.60 M€ = **7,498,313.00** €

Interministerial agreements (Brussels, February 2011) and Commission Mandate based on ERIC Establishment Cooperation and Integration: PARTICIPATING COUNTRIES "in kind" contributions.

- "Realistic" Construction and associated Business Plan (from now on CBP) based on "real" needs and users' requirements.
- Including a "feasible" Governance Scheme and Funding Strategy in order to guarantee the RI Sustainability based on an early identification of "inkind" and "in-cash" Member States (including their Regions-RIS³) contributions, consisting of at least a 5years period "Cash Flow" Analysis.
 - The CBP follows a sequence of releases, starting with a down-scaled level and a **incremental & iterative construction methodology** ("Agile"-based) with a proper Quality Assurance & Risk Management Plan associated. Establishment of the proper Working Methodologies, including Technical Advisory and Operational Committees.

LifeWatch ERIC Distributed Construction STRATEGIC PLAN

Technical working document in regards to the specific tasks for the coordination and management of the distributed construction operations of the distributed e-Infrastructure, as required by the Article 4 of the ERIC regulations directives

and corresponding mapping of tasks into the http://construction.lifewatch.eu SmartSheet (Financial) & OpenProject (Technical) BACKLOGS Intranets Málaga meeting: A well defined operating procedure Advancing towards construction

PART IV CONCLUSIONS: EXPECTED IMPACT & NEXT STEPS

Expected IMPACT: LifeWatch as a structuring tool for the **European Research Area**, also supporting policy decision making addressing Societal Challenges which demand scientific knowledge:

- ✓ Climate action, resource efficiency and raw materials;
- \checkmark Food security, sustainable agriculture, marine and maritime research, and the bio-economy;
- ✓ Secure, clean and efficient energy;
- ✓ Smart, green and integrated transport;
- Health, demographic change and wellbeing;
- ✓ Inclusive, innovative and secure societies.

e-Science

INTEROPERABILITY

Environmental policy & management

POLICY & DECISION

MAKERS

- ✓ Research Infrastructures-RI are important both for the progress of the European excellence in Science and Innovation, particularly those included in the ESFRI roadmap, as well as for the development of the Regional and Innovation Strategies for Smart Specialization-RIS³ of the territories that have identified them in terms of economy, high-quality employment and trans-national cooperation (RIS³ as one of the "ex-ante" conditions for the use of Structural Funds). Therefore, RIs are important targets for both European Regional and RTD&I policies to in turn reinforce Cohesion Policy.
- ✓ RIs calls for a synergistic combination of European Structural and Innovation Funds (ESIF) and H2020 funds, as well as of other National and Regional funding. At the same time, this involves particularities related with the investment of ESIF in ESFRI RIs that need to be specifically addressed.
- ✓ European Commission and National Authorities should set specific guidelines to the regional authorities interested in mobilizing ESIF in the construction and operation of ESFRI RIs and their use, combined or sequential, in different stages of the RIs construction and operation.
- ✓ The creation of new RI must be performed through an iterative and incremental update process involving the existing distributed facilities (e.g. "Agile" Methodology).

...HOWEVER:

- ✓ The implementation of RIs would be at serious risk if RIS³ policies are not taken into account during Research Infrastructures construction phases. Their consideration would prevent H2020 funding instruments from being simple extensions of Preparatory Phase projects, enabling "realistic" constructions and granting the sustainable operation of new-born facilities. This a crucial issue as normally ESFRI Preparatory Phases are usually conceptual-based exercises and they do not take into consideration the actual commitments of the countries (including their regions). New "drivers/catalysts" should be appointed in order to integrate all the pieces of this complex jigsaw puzzle.
- ✓ LifeWatch is a particularly relevant case of ENVironment ESFRI from the regional perspective:

As it is a **distributed e-infrastructure**, some regions are aware of its potential for:

- ✓ Capitalizing already existing investments
- ✓ Improving ICT developments that may be useful for biodiversity research and for other purposes
- ✓ Special attention must be placed to the expected impact in the regional industrial sectors
- ✓ Complex System Modelling related to the impacts of the Climate Change by using BIG DATA paradigm-based tools

...Therefore, next steps...

- 1. Consolidation of identified Biodiversity & Climate Change STAKEHOLDERS and users' community (existing networks), as well the existing "COMMONS" among them in relation with their e-Infrastructures.
- 2. In parallel to 1., consolidation of Members States (Ministries and Regional Contacts) "real" interests and their further commitments: From LoIs -> MoUs with LifeWatch ERIC based on existing National Infrastructures, many of them related to thematic ones such as GEO BON, GBIF, etc.
- 3. Feedback from them with identified bottlenecks (e.g., administrative procedures' ones) and time scales to collaboratively create a "realistic" Construction and associated Business Plan in turn based on "real" needs and users' requirements. It must include a "feasible" Governance Scheme and Funding Strategy in order to guarantee the Observatories Sustainability based on an early identification of "in-kind" and "in-cash" contributions (consisting of at least a 5-years period "Cash Flow" Analysis).

CONSTRUCTION	OPERATION	DEVELOPMENTS
Upgrade of existing facilities Construction of new elements		
 Funding from countries Structural Funds (Smart Specialization Platforms, PIS2), EDDE 	 Funding from Countries Fees from services to public & private companies 	 > H2020 > National & Regional Programmos
$\frac{1}{1} \frac{1}{1} \frac{1}$	> FIR	i iogrammes

...Therefore:

- It is essential to perform a periodical assessment of the impact of international cooperation processes related to the development of Research Infrastructures (Rodríguez-Clemente & González-Aranda, 2007).
 - ✓ In essence, this is related to the assessment of the mobilization of the socio economics activity, supported by the huge "social capital" potential of the involved Europe regions, particularly Eastern & Southern Europe regions.
- It is very important to establish efficient multi-layer (at regional, national an European level) governance mechanisms that include the inter-regional perspective to better coordinate the different initiatives related to RIs, and above all, to guarantee their <u>SUSTAINABILITY.</u>
- As a result, in the case of LifeWatch ERIC, the existing knowledge and services related with biodiversity & climate change-related and environmental information from cooperating initiatives among territories should be better connected. This a real challenge for Environmental RIs which also includes specific topics such as shared ICT developments, Intellectual Property Rights (IPR), Open Access (Research Data Alliance-RDA) and European Open Science Cloud (EOSC) connections. All of these items demand a great involvement of the interested stakeholders communities.

Thank you very much ! ¡ Muchas gracias ! Any questions ? http://www.lifewatch.eu

juanmiguel.gonzalez@mineco.es