iBERGRID

11th Iberian Grid Conference
Faro, 10th – 13th October 2022

LifeWatch ERIC

EOSC Activities in the Environmental Sciences

Antonio José Sáenz-Albanés
ICT Core e-Infrastructure Operations Coordinator
aj.saenz@lifewatch.eu
ON BEHALF OF

Dr. Juan Miguel González-Aranda
Chief Technology Officer - Executive Board Member
cto@lifewatch.eu

Dr. Christos Arvanitidis
Chief Executive Officer - Executive Board Member
ceo@lifewatch.eu

Junta de Andalucía

Andalucía se mueve con Europa

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN

EUROPEAN UNION
European Regional Development Fund
"A way to build Europe"

NIS-IMPACT

Climate Change Impact on Biodiversity and Ecosystems in Europe

Assessing the impact of Non-Indigenous Invasive Species (NIS) in European ecosystems

Partners

LifeWatch ERIC

MARIS

OGS

ICOS ERIC

IFREMER

EMSO ERIC

NOC-BODC

EMBRC ERIC

VLIZ

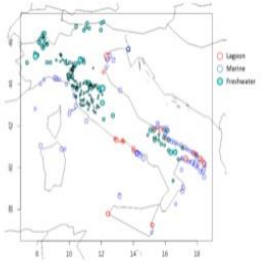
Cluster (-s)

SSHOC

ENVRI FAIR

EOSC-Life

Objectives



- **To integrate data** from different scientific disciplines in the marine subdomain **into an analytical framework** in order to advance our knowledge on the impact of NIS on European marine biodiversity and ecosystems;
- **To connect the analytical framework** and **federate access** to relevant data infrastructures at the EOSC portal in order to mobilise and empower a larger community of researchers and potential data providers; and
- To **demonstrate and promote** the **benefits** and potential of **web-based science using EOSC**.

This will solve

- Addresses a hot topic, the one on the invasive species impacts, which is directly linked to the mission of climate change but also to the new Biodiversity Strategy and therefore the European Green Deal.
- There are also links to society and economy because of the implications the NIS may have to the local ecosystems and their services, as well as the societal goods and services mankind makes out of them. Since many of the above impacts may be of local scale, they may alter common practices in circular economies.

By

- Combining different sources of data and information
- Using a workflow to analyse the data
- Integrating its resources with core EOSC services and potentially horizontal services available
- Engaging the relevant scientific communities

Users will be able to

- Analyse distribution patterns of invasive species from different sources of data
- Compare the above patterns
- Provide managerial suggestions to relevant authorities
- Build on the existing infrastructure to address more complex questions (interactions)

20 services onboarded

- Ecoportal
- Oceanographic buoy Vida
- RvLab VRE
- WoRMS Taxon match
- WRiMS Taxon match
- Extractor Resampler and Masking
- Occurrences DataCube Analyst
- Data-driven Classifier
- CIMPAL Calculator (Cumulative IMPacts of invasive ALien species calculator)
- Occurrences DataCube Builder
- Biotope GRISS Extractor
- Biotope GBIF extractor
- WRiMS Taxon match
- GBIF NIS Verifier
- Metabarcoding Runner
- PEMA Runner
- PEMA Sequences Retriever
- Environmental Data Extractor
- Trophic Positions Modeler

>2 services to be onboarded

- BON data access (DM-BON) including ARMS-MBON, OSD, EMO-BON
- Updates to WoRMS and WRiMS as their linked-data services are added

EOSC Core	Integrated	Pending Integration
Accounting	✗	✓
Monitoring	✗	✓
AAI	✗	✓
Data Source Onboarding	✗	✓
Validation Software	✗	?
Other*	✗	?

*Eg. (Marketplace, Procurement) tools the project uses. e.g. connection with EOSC; will there be a catalogue, connected with EOSC, similar for data, tools

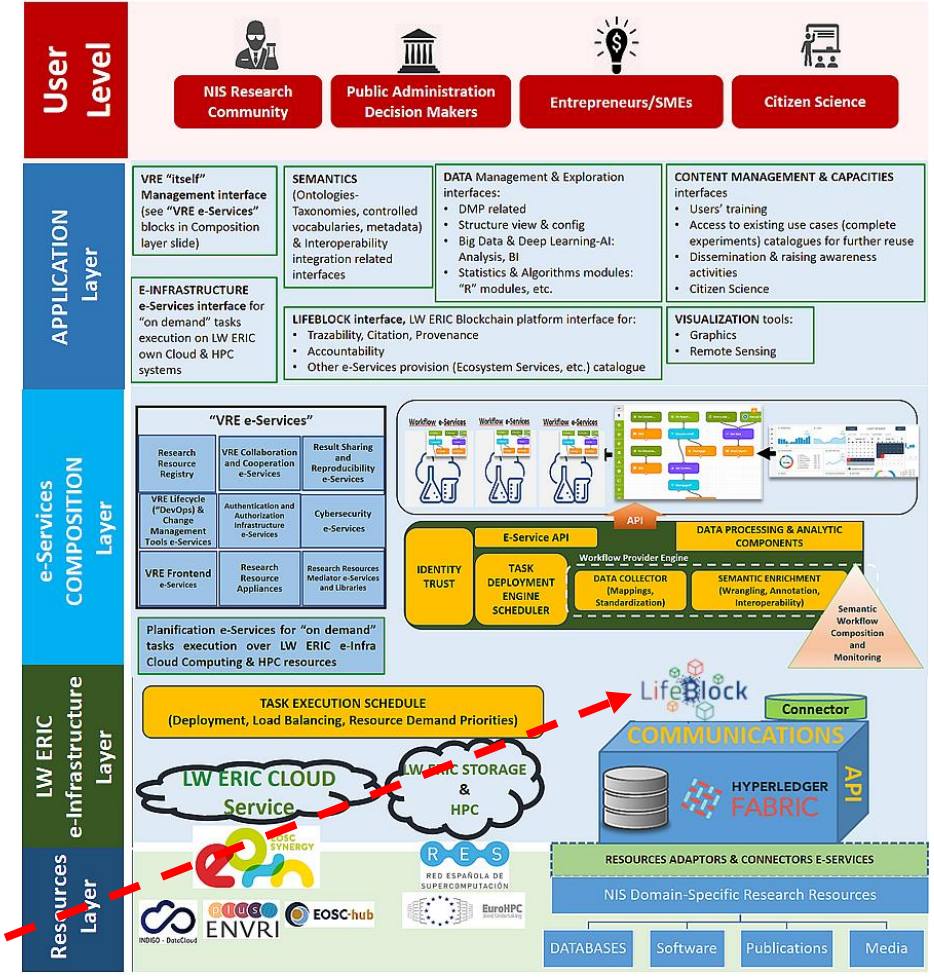
Challenges, Bottlenecks, Support, Way forward

- Align the resources and plans
- Provide a complete Template (proposal to be published in peer-reviewed journal)
- Keep up with regular meetings (started as bi-weekly)
- New members have been admitted
- Budget re-allocated
- Understand how the EOSC platform works and realize the work waiting ahead
- JIRA monitoring
- Mockup designed in the form of a workflow to drive further development and application of the SP
- Streamlining new types of data from other SPs/disciplines
- Community engagement plan

LifeWatch ERIC
Tesseract

How are we building it?

1. AAAI: Backend of authorization, accountability authentication & identification, including global cybersecurity issues
2. Linking Workflows to VREs: Workflow Catalogue
3. "On demand" e-Services to Cloud –EOSC– & (RES-EuroHPC)
4. Semantics applications & e-tools (taxonomic backbone)
5. Statistics packets (R, Jupiter python-based, etc.) for vLabs
6. DMPs and external databases access mechanisms
7. Big Data & AI-Deep Learning applications for Modelling
8. VREs management and admin components
9. Visualization: GIS-Remote Sensing & graphical analytic: KPI & socioeconomic impact visualization, including EBVs & ecosystem services analysis tools
10. Interfaces to online Training Seminars; "Success case studies"; Dissemination (publications, media) thematic-related resources (e.g. on NIS-IAS); and links to thematic-related Citizen Science activities
11. LifeBlock: Transparent to users, not existing any "specific" interface, but embedded to all of system e-Services provided.



Based on the Orchestra model

LifeBlock

LifeWatch ERIC Tesseract

LifeBlock

Context that prevents Big-Bang approaches

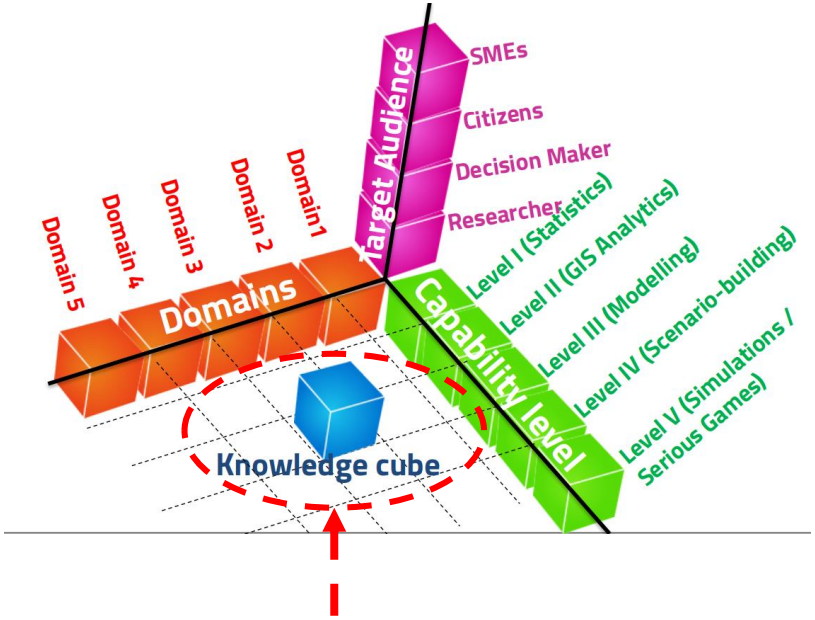
- Different computing paradigms
- Big-data
- Machine learning
- Heterogeneous research groups
- Different Ecosystems
- Legacy software systems
- Deprecated or unmaintained components
- Need to give answers as soon as possible
- Need to provide improved future answers
- Non-secured legacy systems
- Power (technical) users
- Illiterate (technical) users
- Heterogeneous e-infrastructures
- Distributed e-infrastructures
- Need to provide research infrastructures
- Need to provide decision-making tools

... all these just to name a few

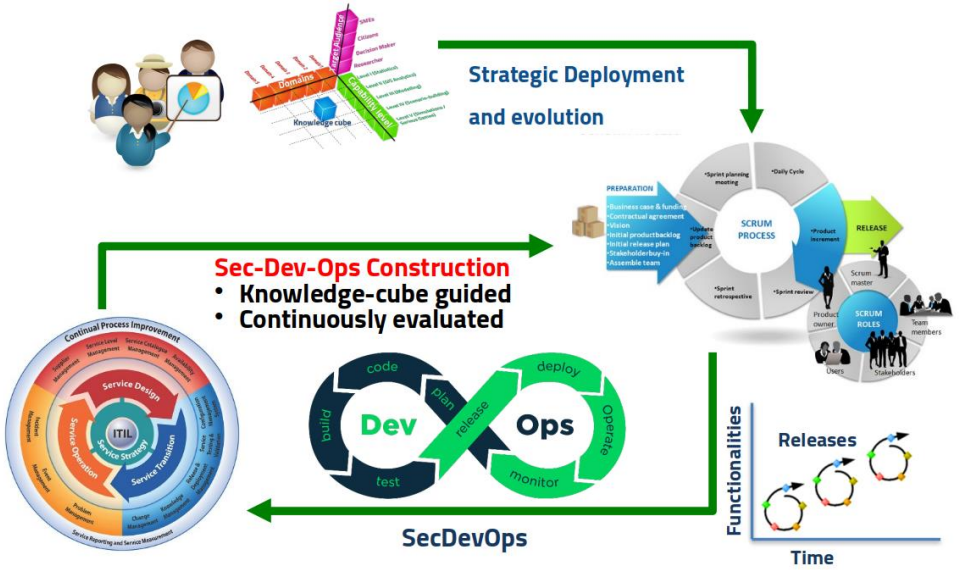
Knowledge-cube requirement elicitation methodology and SecDevOps

LifeWatch ERIC Tesseract

LifeBlock

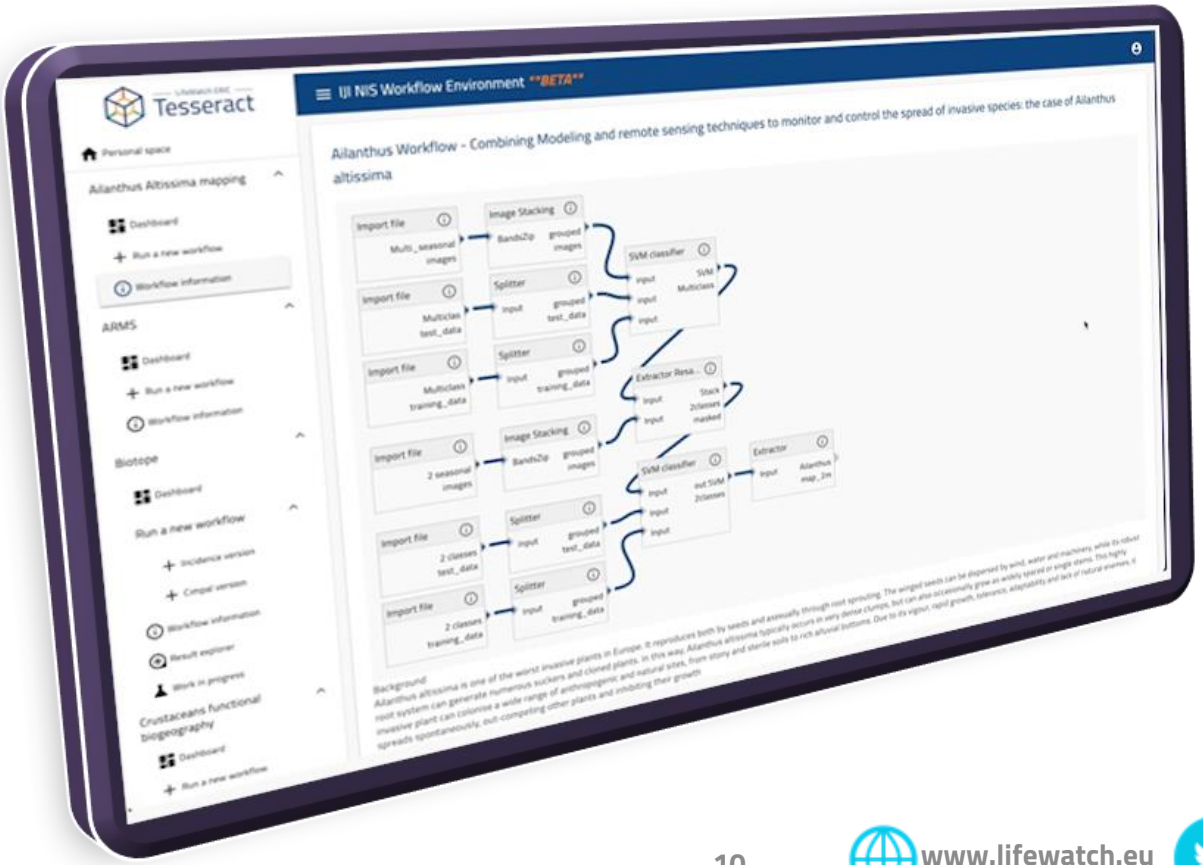


Use-case, key points, requirements



The selection and prioritization of knowledge cubes were guided by the IJI-NIS Initiative

https://youtu.be/COKpTNqvfk4



ENVRI-FAIR

- ENVRI-FAIR is the connection of the ESFRI Cluster of Environmental RIs (ENVRI) to the European Open Science Cloud (EOSC).

- The goal is that all participating RIs build FAIR data services to enhance researchers' efficiency & productivity, support innovation, enable data/knowledge based decisions & connect ENVRI Cluster to EOSC.

- LifeWatch ERIC coordinates WP11 (implementation in Biodiversity/Ecosystems subdomain) & co-coordinates WP6 (training), and participates in and represents the marine domain.

- ENVRI-FAIR has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824068.

EOSC-Synergy, EOSC-Hub and ERIC-Forum

EOSC-Synergy & EOSC-Hub

- Many results and services provided by LifeWatch ERIC

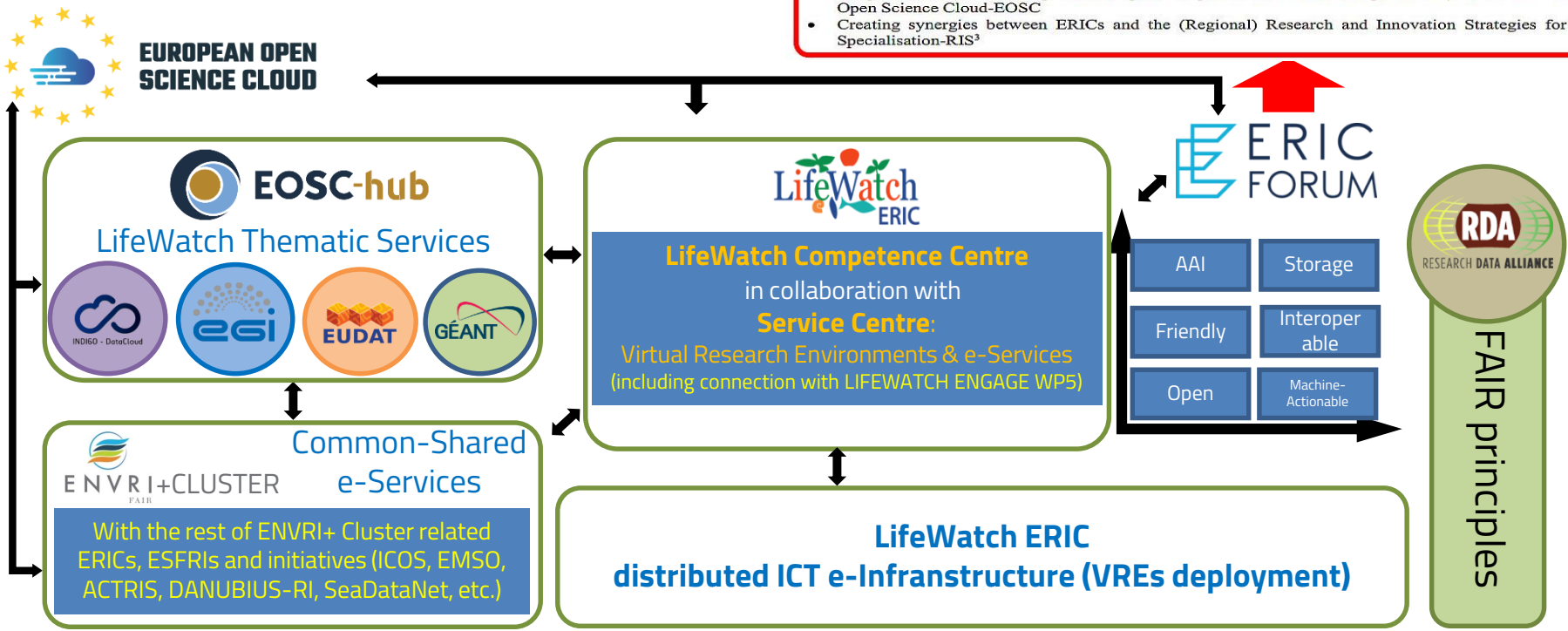
ERIC-Forum

- Co-leadership of WP6 at the political level to establish synergies between all ERICs and EOSCs, especially through the use of ESIF-ERDF, Next-Generation & Resilience Funds

All together…

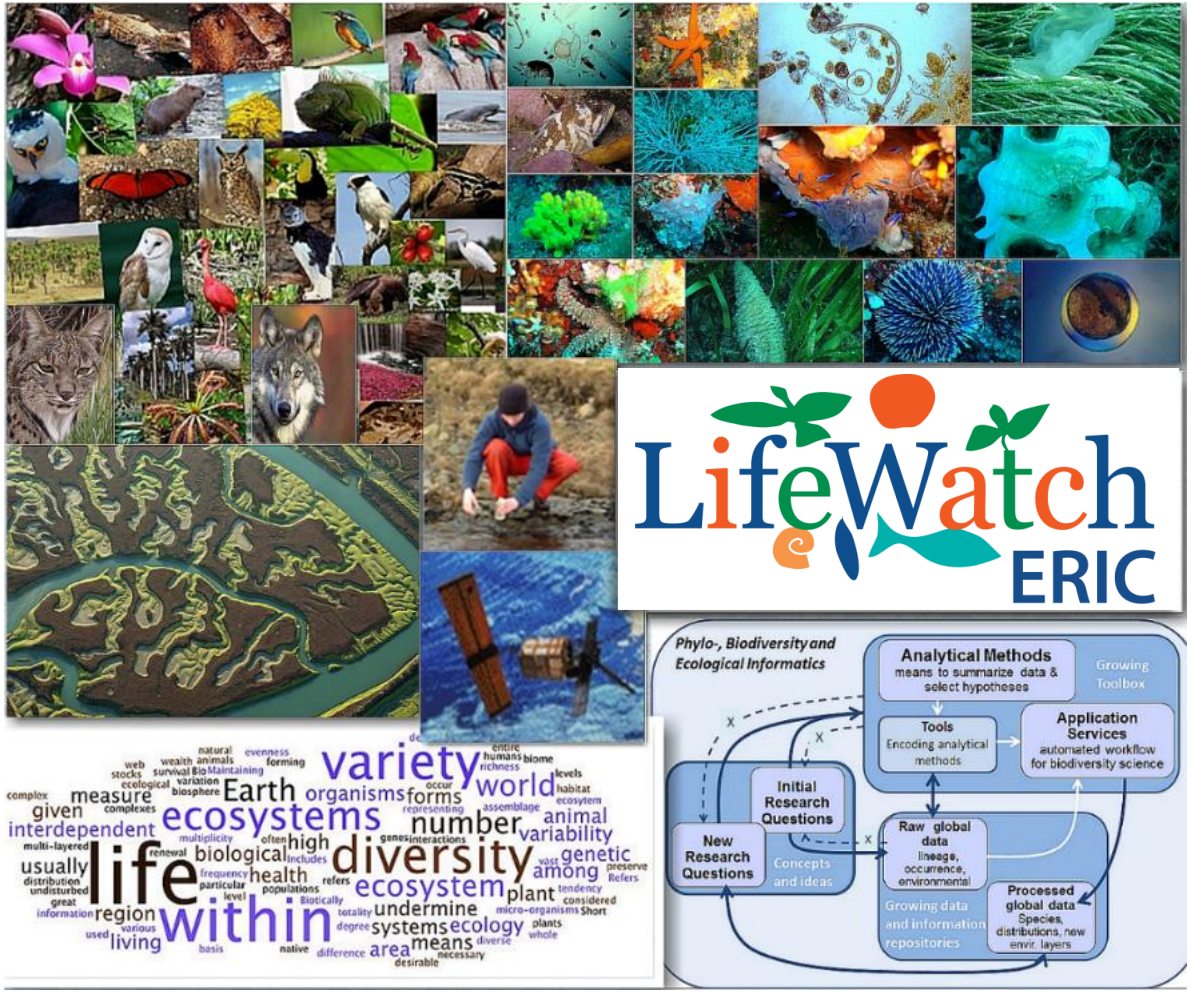
Task 6.2: *ERICs technical & innovation multi-scale integration (Task Lead LIFEWATCH)*
Due to the importance of the integration of ERICs at different regional, national and pan-European scales being based on their distributed nature, two specific topics will be covered in this task and will result in reports to be presented during the ERIC FORUM seminars:

- Integration of ERIC development into pan-European e-Infrastructures, particularly in the new European Open Science Cloud-EOSC
- Creating synergies between ERICs and the (Regional) Research and Innovation Strategies for Smart Specialisation-RIS³



(Meta-)Data interoperability

Existing Cloud Computing and other related technologies support Providers
(INDIGO DataCloud, EGI, EUDAT, PRACE, etc.)



Thanks !

www.lifewatch.eu

@LifeWatchERIC

Junta de Andalucía

GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA E INNOVACIÓN

Andalucía se mueve con Europa

EUROPEAN UNION
European Regional Development Fund
"A way to build Europe"