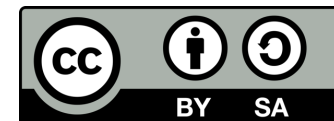


EcoDL 2025 | Tampere (Finland), 23rd September 2025



Managing FAIR research products for biodiversity and ecosystems within the LifeWatch Italy Infrastructure

Andrea Tarallo, Cristina Di Muri, Martina Pulieri, Francesco De Leo, Mariantonietta La Marra, Davide Raho, Alberto Basset and Ilaria Rosati

Preprint available at <https://doi.org/10.5281/zenodo.17184279>



UNIVERSITÀ
DEL SALENTO



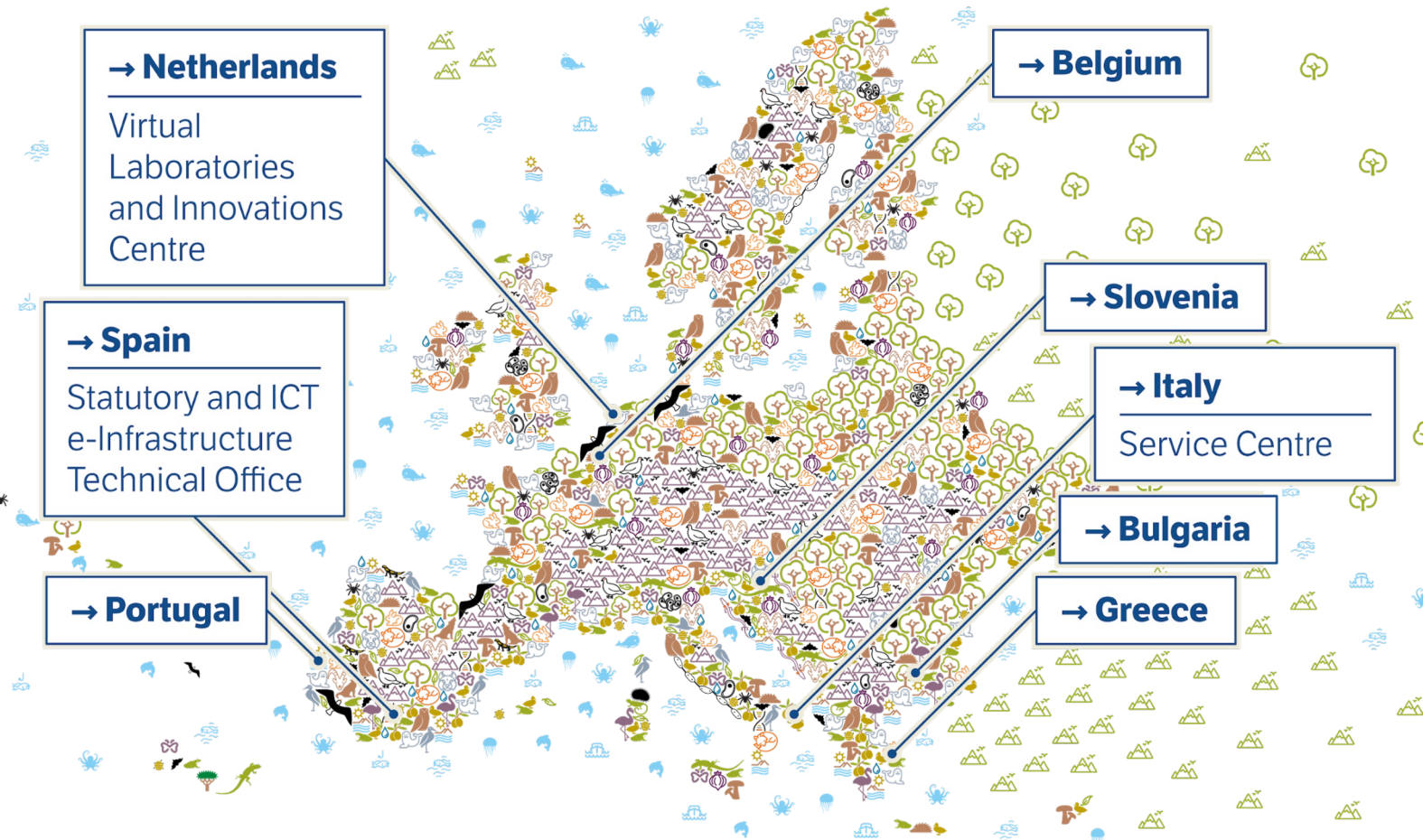
What is LifeWatch Italy? One of the 8 Distributed Centres of LifeWatch ERIC

the European Infrastructure supplying **Biodiversity** and **Ecosystem e-Science** research facilities to scientists.

It provides access to FAIR data through its **Metadata Catalogue**.

Maintains a repository of semantic resources.

Develops and offers advanced analysis services through **virtual research labs**.



LifeWatch Italy Strategic Objective

Joint Research Unit since 2010 coordinated by the CNR.
It has now **36 members** including research institutes,
universities and associations.

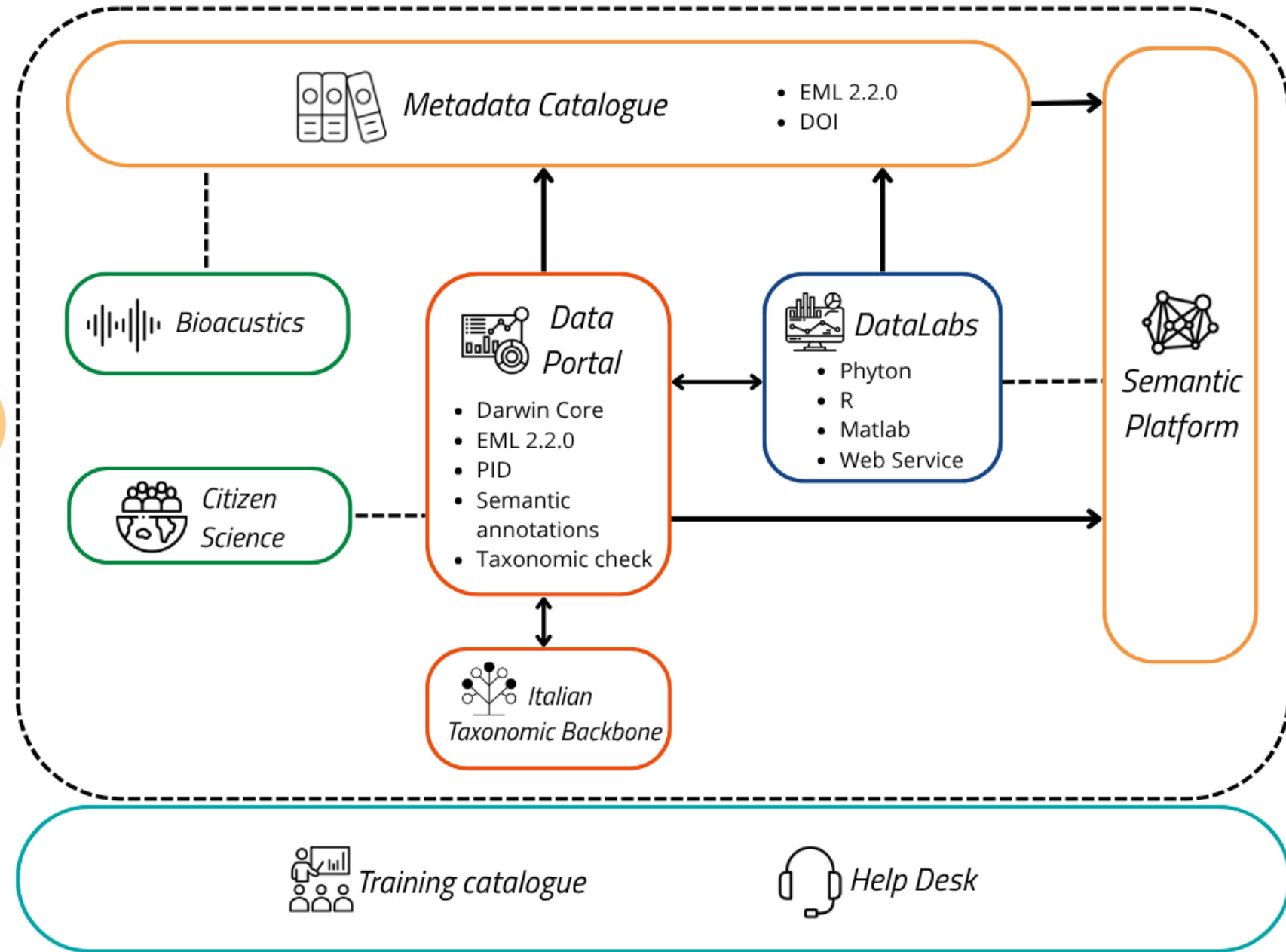


National Hub for biodiversity and ecosystem research and knowledge

- Main point access to **FAIR** and **Open data** and other **research products**
- **e-Science services** and **platforms** for supporting a **FAIR** and **Open** research lifecycle



LifeWatch Italy Digital Infrastructure





Bioacoustic Platform



Cyanistes Caeruleus
00:00 00:15

Observation Site

Title	Value
Country*	Italy
Latitude*	45.06472188177703
Longitude*	7.688728067327236
Radius*	0
Date*	20/01/2025 20:34
Recording Device*	X
Microphone*	X

- Collect, recognise, share and search acoustic data and associated metadata
- Increasing knowledge base



Citizen Science Platform

12:27 48

zenscience.lifewatchitaly.eu

Back New Observation LifeWatch CITIZEN SCIENCE

Nuovo avvistamento

Find location

Lat: 40.8545967432416 - Lon: 14.224956760630585

Età Select

Area dell' avvistamento Select

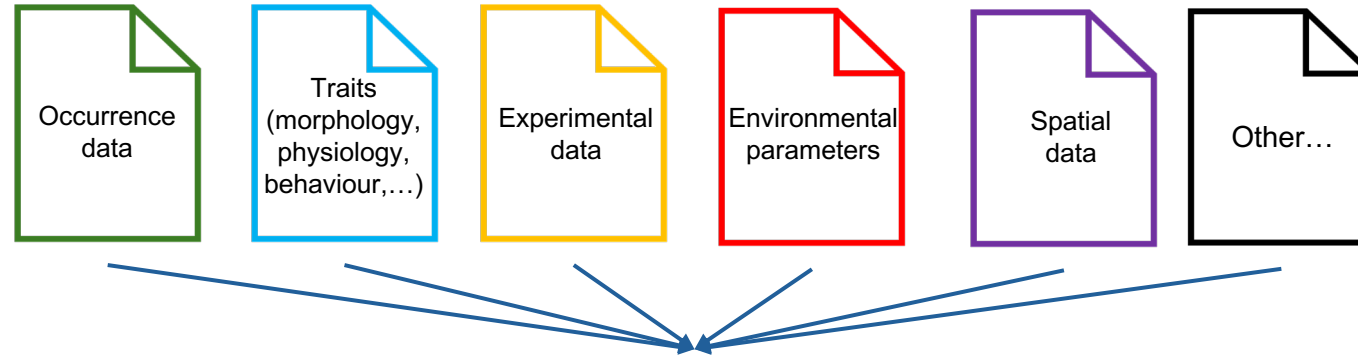
Interazione con l'uomo Select

Numero di individui

UPLOAD AN IMAGE

28

- Sharing knowledge, tools, training material etc.
- CS projects metadata catalogue
- Support CS Projects from web app building up to data collection and storage.



LifeWatch Italy Data Portal

Open data formats can be uploaded: csv, tiff, json, png, etc.

Drop files to attach them to the item, or [browse](#)

General information

Person organisation

Coverage

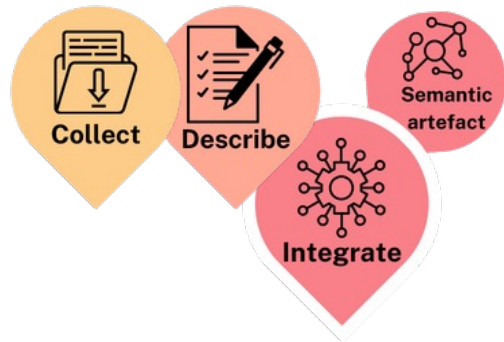
License

Project Detail

Methods

Ecological Metadata Language 2.2.0 as metadata schema for describing ecological data.

Every section contains a set of attributes, e.g. Title, Publication date, Temporal coverage, Taxonomic coverage, etc., to thoroughly describe your data.



LifeWatch Italy Data Portal



<https://ecoportal.lifewatch.eu>

Semantic Annotation

- Reduces ambiguity
- Increases data reuse and machine-actionability
- Metadata are mapped to the ontological model and can be queried through the **Semantic Platform** enabling data integration

Hierarchical tree view

Select a subject to add as search filter

Search Reset

- ▼ EuroVoc Core Concepts
 - ▼ physical environment
 - ▼ biosphere
 - biodiversity
 - ▼ eLTER Controlled Lists
 - > biodiversity threats and pressures addressed
 - > Biodiversity Thesaurus
 - ▼ Environmental Thesaurus
 - ▼ variable
 - biodiversity loss

Biodiversity Information Standards TOWG

Attribute Information

Variables

organismID
acceptedNameUsage
scientificNameAuthorship
acceptedNameUsageID
taxonRank
decimalLatitude
decimalLongitude
eventDate
bodyLength

Name bodyLength

Label Body length

Definition The total distance from point to point along the longest axis of the body of an organism.

Storage Type

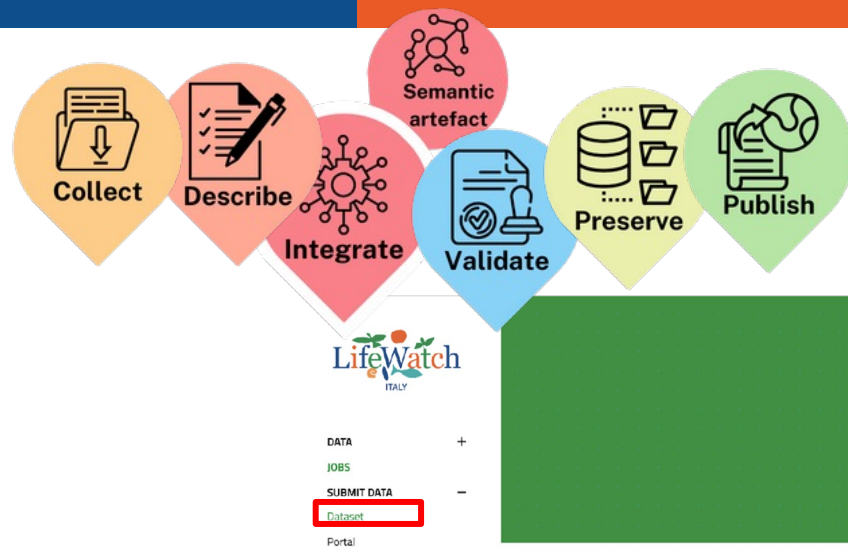
Measurement Type ratio

Measurement Domain

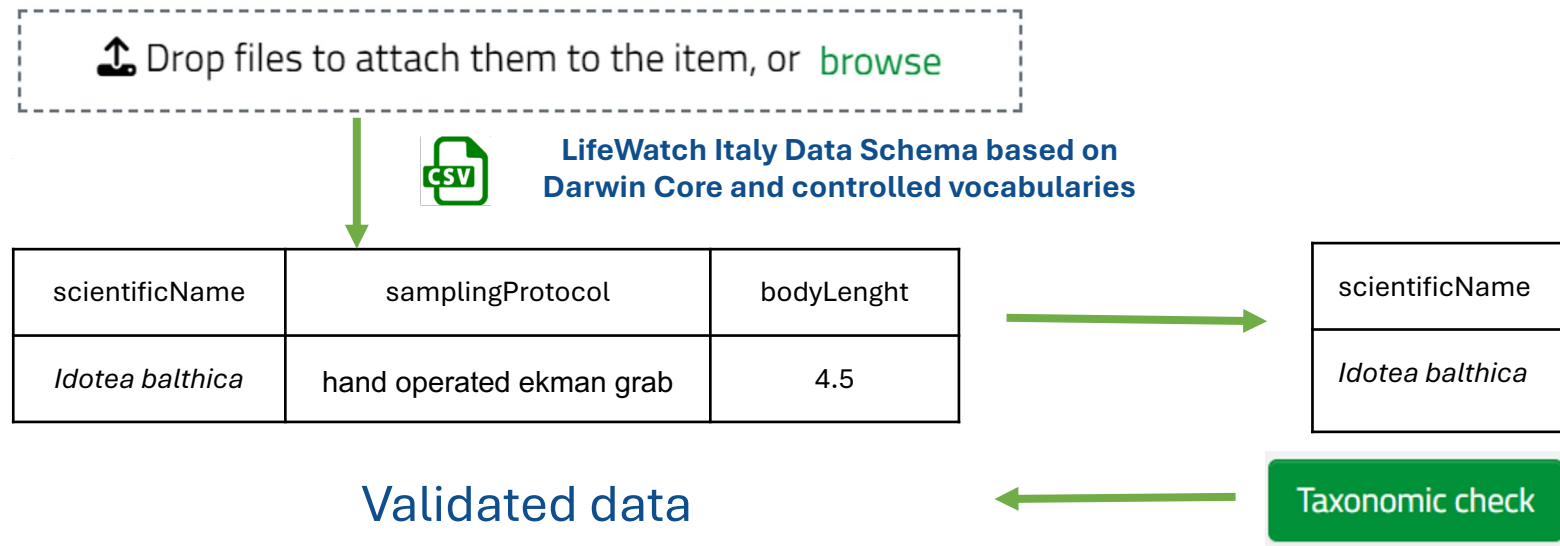
Unit	Precision	Numeric Domain
millimeter		real

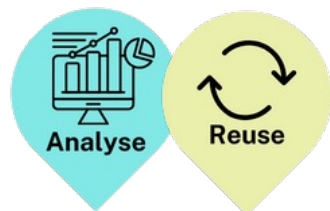
Annotation

Property Label	Property URI	Value Label	Value URI
contains measurements of type	http://ecoinformatics.org/oboe/oboe.1.2/oboe-core.owl#containsMeasurementsOfType	Body length	https://kos.lifewatch.eu/thesauri/traits/c_d266fb02



Workflow of Data Curation and Validation





DataLabs



HOMEPAGE
PROJECTS
SERVICES
HELP DESK
TRAINING
FAQS

```
if taxlev != 'community':  
    if len(dataset[taxlev].unique()) == 1:  
        taxlev = 'community'  
  
# In case the mandatory fields are not provided, the script provides an empty output  
if 'density' not in dataset.columns:  
    dataset['density'] = 1  
if 'biolume' not in dataset.columns:
```

Simple ☐ 0 \$ 0

Mode: Command index.ipynb

Input

Name

Size

Actions

Phytoplankton_Progetto_Strategico_2009_2012_United_Kingdom.csv

7.59 MB



Attach new file input

Select your file from your device or Data Portal

Local

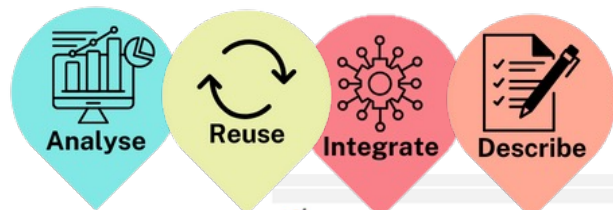
Data Portal



Output

Warnings and Alerts

Team



DataLabs



File Edit View Run Kernel Git Tabs Settings Help CPU: 10% Mem: 155 / 3906 MB

index.ipynb

Code git Python3.10.0

```
plt.plot(xx, den, marker='o')
if param == 'biovolume':
    plt.xlabel('average biovolume ( $\mu\text{m}^3$ )')
elif param == 'cellcarboncontent':
    plt.xlabel('average cell carbon content (pg C)')
plt.ylabel('density (cell·L-1)')
plt.title('Whole dataset')
plt.savefig(file_graph)

mat.index = ['density', 'average biovolume', 'average cell carbon content']
mat.to_csv('output/sizedensity_DATA.csv', sep=';', index=True, header=False, quoting=0, encoding='lat

plt.show()
```

Last executed at 2023-11-15 11:50:28 in 29ms

```
[ ]: calc_fun(datain, cluster, taxlev, param)
Last executed at 2023-11-15 11:50:34 in 1.18s
```

cluster: country, locality, year, month, day, parenteventid, eventid

cluster*scientificname

ty (cell·L⁻¹)

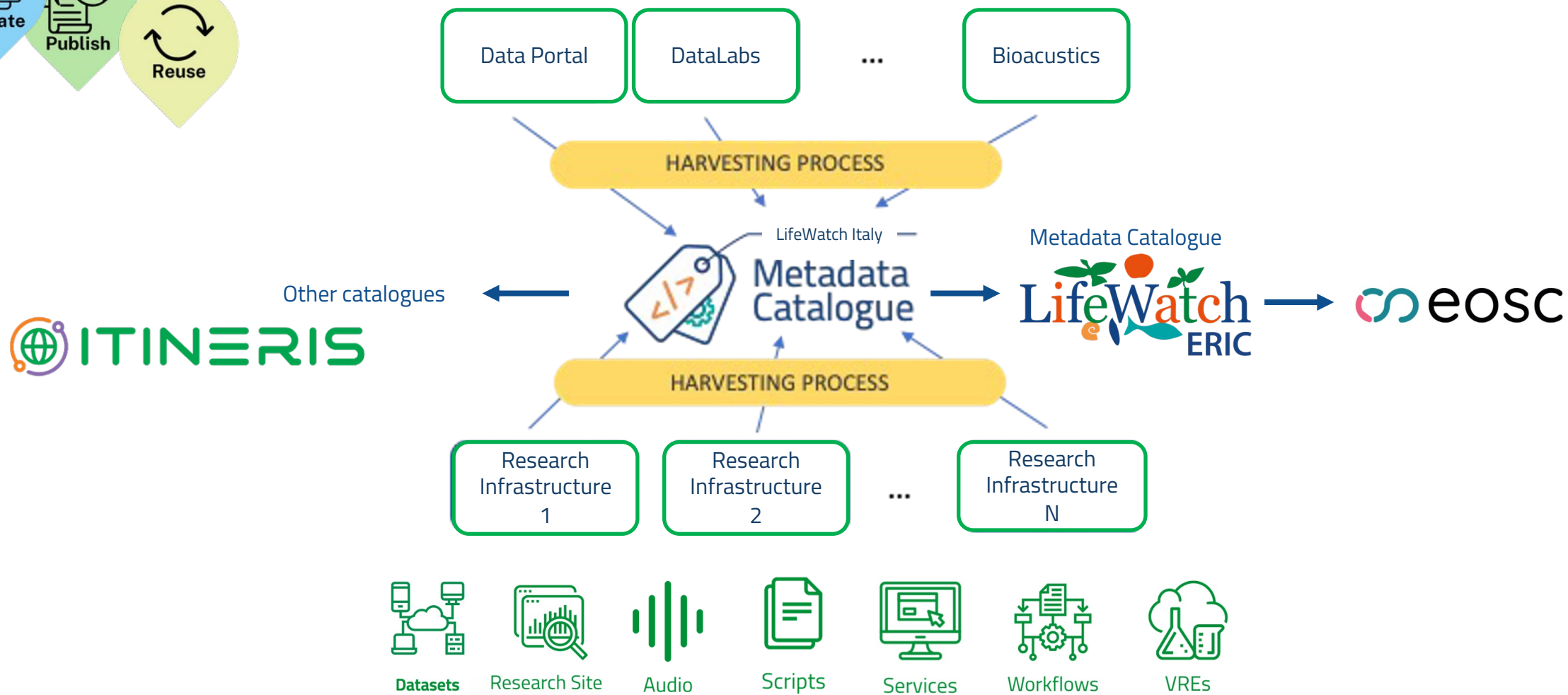
10²

16.1·M^{-0.17}
R²=0.06

Simple 0 1 Mode: Command index.ipynb



LifeWatch Italy Metadata Catalogue



Future developments and considerations

➤ Unified ecosystem of platforms & services

- ☒ Single Sign-On access to all digital products

- ☒ Full interconnection between Data Portal, Metadata Catalogue, and DataLabs

- ☐ Bioacoustic & Citizen Science Platforms

➤ Significance of the RI

- ☐ Positive growth (+600 users in one year)

- ☐ National-level dissemination to boost adoption

- ☐ User feedback

➤ Resources & People

- ☐ Continuous financial investment for infrastructure

- ☐ Skilled ICT, data scientists & stewards essential



**Finanziato
dall'Unione europea**
NextGenerationEU



Thank you 😊



Check out our paper and poster as well!
<https://doi.org/10.5281/zenodo.17184279>



andrea.tarallo@cnr.it



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