

LifeWatch ERIC

Metadata Catalogue



GeoNetwork Meeting, June 23rd 2020

Nicola Fiore, nicola.fiore@lifewatch.eu

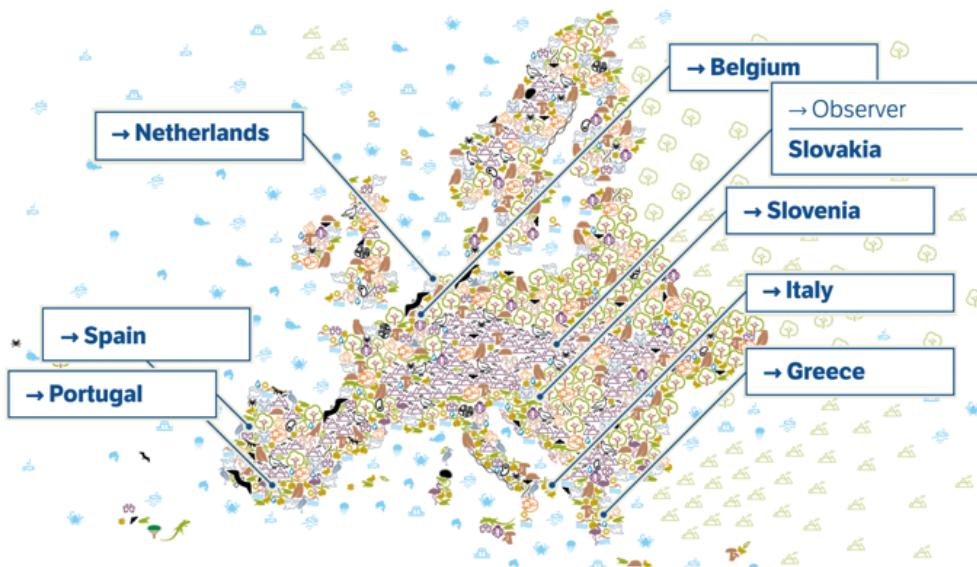
Lucia Vaira, lucia.vaira@lifewatch.eu

LifeWatch ERIC Service Centre

LifeWatch ERIC

LifeWatch ERIC is a European Infrastructure Consortium that offers e-Science research facilities to scientists investigating Biodiversity organization and Ecosystem functions and services.

Combining a wide range of ICT tools and resources with deep domain knowledge, **LifeWatch ERIC**'s mission is to be the leading worldwide provider of content and services for the Biodiversity research community, creating new opportunities for large-scale scientific development, and enabling accelerated data capture and modelling thanks to the use of innovative technologies.



LifeWatch ERIC is a distributed research e-infrastructure consortium consisting of 7 European Member States.

Its structure mirrors its nature, with central components (Common Facilities) located in 3 Member States (Spain, Italy and the Netherlands), and National Nodes in all 7 countries.

LifeWatch ERIC's current members are: Belgium, Greece, Italy, the Netherlands, Portugal, Slovenia and Spain. Slovakia participates as an Observer.

LifeWatch ERIC

With LifeWatch ERIC users can:

- find, access, work with and reuse **FAIR data** collected by science at a global level, of different typologies and scales. Advanced search functions, thesauri and ontologies are available on our catalogue to further combine data and generate new services;
- process and analyse the data in our **Virtual Research Environments** (VREs). Creating multi-spatial and biological system models, and elaborating trends and predictions are just some of the many possibilities offered by VREs, online laboratories equipped with tools for data analysis, innovative technologies, like blockchain, storage capacity and enormous computational power;
- **get trained** in the use of our services, as well as on key scientific issues through Master's and PhD courses, summer schools, webinar programmes and educational initiatives;
- receive **support** through our Helpdesk and its experts specialised in different domains.



LifeWatch ERIC Metadata Catalogue

The LifeWatch ERIC metadata catalogue is based on GeoNetwork and allows to manage (simple and complex) metadata related to four kinds of resources:

- **Virtual Research Environments**, by using a customized ISO19139 standard (25 metadata attributes)
- **Services**, by using a customized ISO19139 standard (40 metadata attributes)
- **Workflows**, by using a customized ISO19139 standard (25 metadata attributes)
- **Datasets**, by using a customized ISO19139 standard (76 metadata attributes) → EML 2.2

Metadata attributes can be optional/mandatory and can require single/multiple values (metadata cardinality)

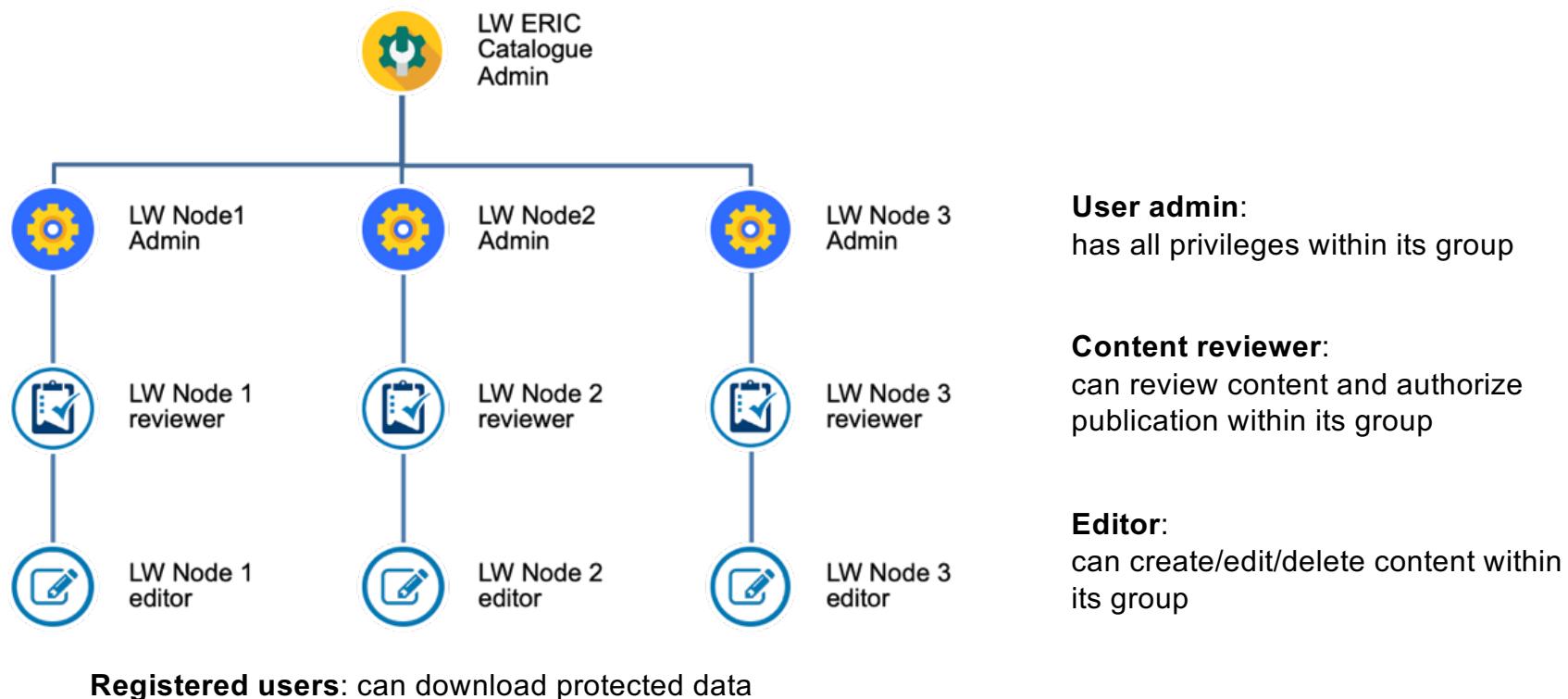
The LifeWatch ERIC metadata catalogue allows (upon validation and verification) the creation of Digital Object Identifiers (DOIs) for resources that do not have it.

Only admin users can request a DOI by exploiting the GeoNetwork – DataCite connection.

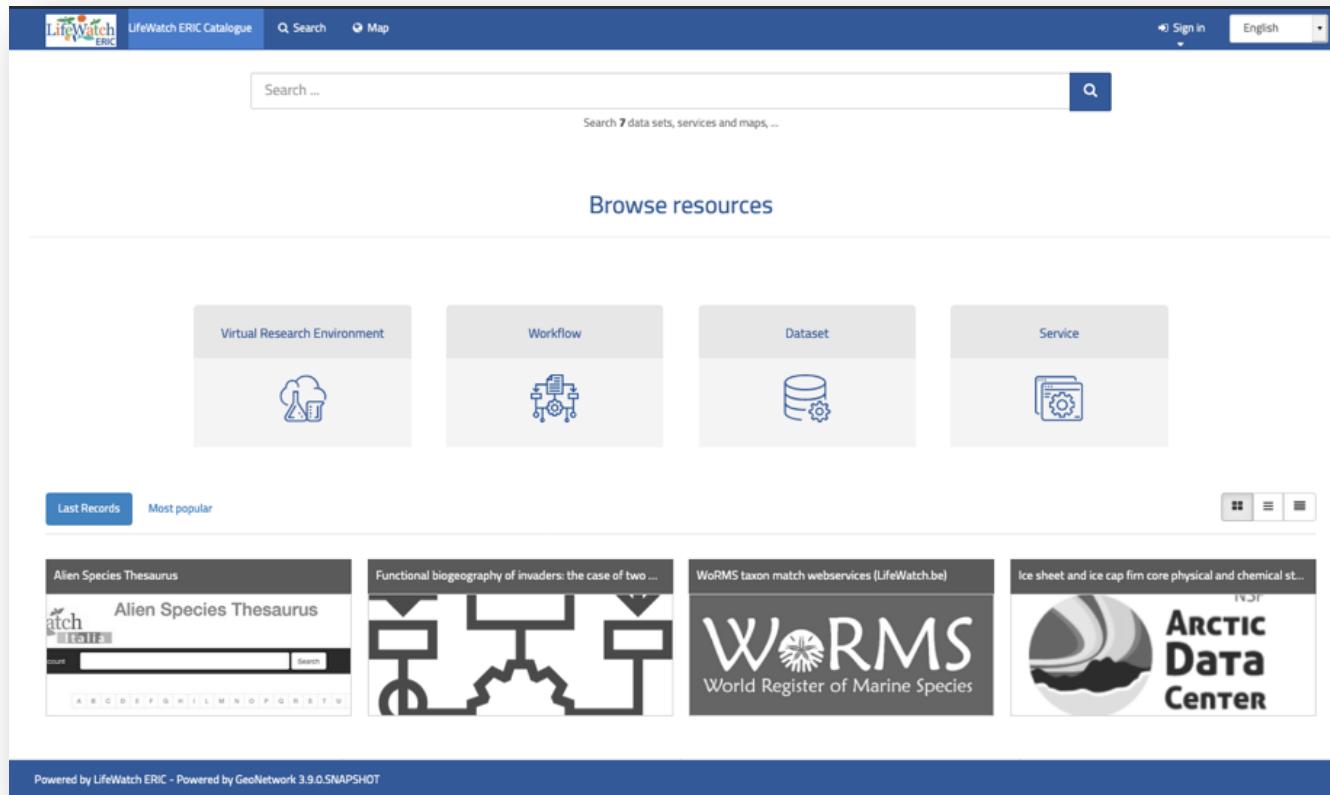
LifeWatch ERIC Metadata Catalogue

The metadata catalogue allows to:

- search resources with advanced filters (e.g., according to the provider, i.e. LifeWatch national nodes)
- manage users with the corresponding profiles and privileges:



LifeWatch ERIC Metadata Catalogue



The screenshot shows the homepage of the LifeWatch ERIC Metadata Catalogue. At the top, there is a navigation bar with the LifeWatch ERIC logo, a search bar, and language selection (English). Below the navigation bar, a search bar displays the message "Search 7 data sets, services and maps, ...". A "Browse resources" section follows, featuring four categories: "Virtual Research Environment" (represented by a cloud icon), "Workflow" (represented by a flowchart icon), "Dataset" (represented by a database icon), and "Service" (represented by a document icon with a gear). Below these categories, there are two tabs: "Last Records" (selected) and "Most popular". Underneath are four resource cards:

- Alien Species Thesaurus**: Shows a search interface with a search bar and letter filters A through Z.
- Functional biogeography of invaders: the case of two ...**: Shows a map with various locations marked.
- WoRMS taxon match webservices (LifeWatch.be)**: Shows the WoRMS logo and text "World Register of Marine Species".
- Ice sheet and ice cap firn physical and chemical st...**: Shows the Arctic Data Center logo and text "ARCTIC DATA CENTER".

At the bottom of the page, a footer bar states "Powered by LifeWatch ERIC - Powered by GeoNetwork 3.9.0.SNAPSHOT".



LifeWatch ERIC Metadata Catalogue

LifeWatch ERIC Catalogue Q Search Map Sign in English

Nothing in basket

Categories

Ice sheet and ice cap firm core physical and chemical stratigraphy, Disko Bay...

This dataset is comprised of physical and chemical stratigraphic records from firm cores collected on the western flank of the Greenland Ice Sheet, and ice caps on Disko Island, Greenland and the Nuussuaq Peninsula, Greenland. These cores were collected in support of the NSF project Collaborative Research: Investigating the Influence of Sea-surface Variability

Sarah Das
Luke Trusel

Arctic Data Center

Virtual Research Environment - LifeWatch (2)
Dataset - LifeWatch (2)
Service - LifeWatch (2)
Workflow - LifeWatch (1)

Completed

Functional biogeography of invaders: the case of two widely distributed...

Biological invasions are to date acknowledged as significant environmental and economic threats, yet the identification of key ecological traits determining species invasiveness has remained elusive. One unappreciated source of variation concerns dietary flexibility and the ability to shift trophic position within invaded food webs. Trophic plasticity may

Alien Species

Virtual Research Environment - LifeWatch (2)
Completed

Phytoplankton Virtual Research Environment

The Phytoplankton Virtual Research Environment (Phyto VRE) is a collaborative working environment supporting researchers to address basic and applied studies on phytoplankton ecology. The Phyto VRE provides the IT infrastructure enabling researchers to obtain, share and analyse phytoplankton data at a level of resolution going from individual cells to

Alien and Invasive Species Virtual Research Environment

The LifeWatch Alien Species Virtual Research Environment (Alien Species VRE) has been built and equipped in order to developing systems that support the scientist's work for experimental researches on alien species arrival and spread into different types of ecosystems (aquatic and terrestrial). The Alien Species VRE is an example of Nicola Fiore

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Nothing in basket

Categories

Phytoplankton Virtual Research Environment

Alien and Invasive Species Virtual Research Environment

Powered by LifeWatch ERIC - Powered by GeoNetwork 3.9.0.SNAPSHOT

LifeWatch ERIC Metadata Catalogue

Alien and Invasive Species Virtual Research Environment

The LifeWatch Alien Species Virtual Research Environment (Alien Species VRE) has been built and equipped in order to developing systems that support the scientist's work for experimental researches on alien species arrival and spread into different types of ecosystems (aquatic and terrestrial). The Alien Species VRE is an example of the types of scientific studies that researchers on biodiversity and alien species could undertake. The goal is to obtain a list of capabilities on the topic to be shared through the LifeWatch portal with all those interested in alien and invasive species.

Id: VRE02
URL: <http://www.servicecentre.lifewatch.eu/web/alien-and-invasive-species/home>

Provided by:

Updated: 4 days ago
Share on social sites:

Contact Point (Name): Nicola Fiore
Address: LifeWatch ERIC Service Centre
E-Mail: nicola.fiore@lifewatch.eu

VRE Contractual Information

License: All rights reserved Copyright LifeWatch ERIC - © 2018

Usage Conditions: Permitted - view, download, copy, print and save search results - view, download, copy, print and save individual articles Not permitted - use e-resources for commercial gain - transmit / disseminate online content to unauthorized users

Publications about this VRE:

- Boggero, A., Pierri, C., Alberi, R. et al. (2016) A geographic distribution data set of biodiversity in Italian freshwater. Biogeographia – The Journal of Integrative Biogeography 31: 55–72. DOI:10.21426/B61132737. Corriens, G., Pierri, C., Accoroni, S. et al. (2016) Ecosystem vulnerability to alien and invasive species: A case study on marine habitats along the Italian coast. Aquatic Conservation: Marine and Freshwater Ecosystems, 26, 392–409. DOI: 10.1002/aqc.2550. Boggero, A., Bassett, A., Austin, M. et al. (2014) Weak effects of habitat type on susceptibility to invasive freshwater species: an Italian case study. Aquatic Conservation: Marine and Freshwater Ecosystems, 24, 841–852. DOI: 10.1002/aqc.2450.

VRE Support Information

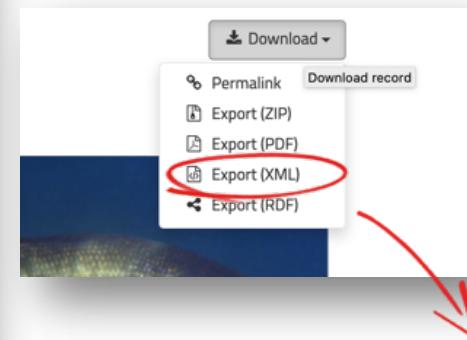
VRE Helpdesk: <https://www.lifewatch.eu/web/guest/help-desk>
VRE Training: <http://training.servicecentre.lifewatch.eu/course/view.php?id=9>

Management Info

Author: Nicola Fiore, nicola.fiore@lifewatch.eu
Maintainer: Raria Rosati, aria.rosati@cnr.it
Version: 1.0
Last Updated: 2018-12-14

VRE

Public users can browse the catalogue and view/download the resources metadata



```

<gmd:MD_Metadata xsi:schemaLocation="http://www.isotc211.org/2005/gmd http://schemas.opengis.net/csw/2.0.2/profiles/iso19115-2005.xsd">
  <gmd:id identifier="07e6c5d2-d5e5-4d65-964b-e7fd58d82a2f"><geo:CharacterString>
    ...
  </gmd:id>
  <gmd:language>
    <gmd:LanguageCode codeList="http://www.loc.gov/standards/iso639-2#> codeListValue="eng"/>
  </gmd:language>
  <gmd:hierarchyLevel>
    <gmd:MD_HierarchyLevelCode codeList="http://standards.iso.org/iso/19139/resources/gmdCodeLists.xml#MD_HierarchyLevelCode" codeListValue="vrt"/>
  </gmd:hierarchyLevel>
  <gmd:identificationInfo>
    ...
  </gmd:identificationInfo>
  <gmd:MD_DataIdentification>
    ...
    <gmd:citation>
      ...
      <gmd:characterString>
        The Alien and Invasive Species Virtual Research Environment
        ...
      </gmd:characterString>
    </gmd:citation>
    ...
  </gmd:MD_DataIdentification>
  <gmd:CI_Citation>
    ...
    <gmd:abstract>
      ...
      The Alien and Invasive Species Virtual Research Environment (hereafter AS VRE), a collaborative working environment supporting researchers to address basic and applied studies on ecosystem vulnerability to alien species arrival. The AS VRE provides the IT infrastructure enabling researchers to obtain, share and analyse biological data including the alien and invasive species traits at species level of resolution. The AS VRE allows to:
      ...
      • Obtain and share harmonised data on the national distribution of species of fauna and flora belonging to different habitats (marine, fresh and transitional waters, and terrestrial).
      • Discover, access, integrate and export both own and others' datasets (including additional metadata) held by the LifeWatch Data Portal or by the distributed data centres.
      • Share and create workflows through orchestrators such as Taverna Workbench (www.taverna.org.uk) using algorithms and web services.
      • Work together in a real-time environment fostering the share of knowledge and overcoming the limitations of traditional working practices, e.g. the transfer of large datasets between users or power demanded by the computational analysis.
    </gmd:abstract>
    <gmd:status>
      <gmd:MD_ProgressCode codeListValue="completed" codeList="http://standards.iso.org/iso/19139/resources/gmsCodeLists.xml#MD_ProgressCode"/>
    </gmd:status>
    <gmd:graphicOverview>
      ...
    </gmd:graphicOverview>
    <gmd:fileNames>
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    </gmd:characterString>
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  </gmd:CI_Citation>
  <gmd:MD_Metadata>
    ...
  </gmd:MD_Metadata>
</gmd:MD_Metadata>

```

LifeWatch ERIC Metadata Catalogue

Registered users can browse the catalogue and:

- view / download metadata of other groups
- manage / edit / delete metadata within their group

The screenshot shows a detailed view of a dataset entry in the catalogue. At the top, there are navigation links: 'LifeWatch ERIC Catalogue', 'Search', 'Map', 'Contribute', 'Admin console', and a user profile for 'Lucia Vaira USERADMIN'. Below these are search and filter buttons: 'Back to search', '< Previous', 'Next >', 'Manage record', and 'Download'.

The main content area is titled 'Phytoplankton Virtual Research Environment'. It contains a large image of a phytoplankton cell with internal structures. To the left of the image is a descriptive text block:

The Phytoplankton Virtual Research Environment (Phyto VRE) is a collaborative working environment supporting researchers to address basic and applied studies on phytoplankton ecology. The Phyto VRE provides the IT infrastructure enabling researchers to obtain, share and analyse phytoplankton data at a level of resolution going from individual cells to whole assemblages. The Phyto VRE allows to:

- Obtain and share harmonised data on taxonomy and morphological traits by using the Atlas of Phytoplankton, Atlas of Shapes and Phytoplankton Traits Thesaurus.
- Discover, access, integrate and export both own and others' datasets including additional metadata held by LifeWatch Italy Data Portal or distributed data centres.
- Share and exchange workflows through orchestrators such as Taverna Workbench using algorithms and web services.
- Work together in a real-time environment fostering the share of knowledge and overcoming the limitations of traditional working practices, e.g. the transfer of large datasets between users or power demanded by the computational analysis.

Below this text is a table with the following data:

Id	VRE01
URL	http://www.servicecentrelifewatch.eu/web/phytoplankton-vre/home
Coordination Team	
Contact Point (Name)	Elena Stanci
Address	University of Salento, Lecce - Italy

On the right side of the page, there are sections for 'Provided by' (LifeWatch), 'Updated' (4 days ago), and 'Share on social sites'.

VRE

The screenshot shows another dataset entry in the catalogue. At the top, there are navigation links: 'LifeWatch ERIC Catalogue', 'Search', 'Map', 'Contribute', 'Admin console', and a user profile for 'Lucia Vaira USERADMIN'. Below these are search and filter buttons: 'Back to search', '< Previous', 'Next >', 'Manage record', and 'Download'.

The main content area is titled 'WoRMS taxon match webservices (LifeWatch.be)'. It contains a large image of the WoRMS logo: 'WoRMS World Register of Marine Species'.

To the left of the image is a descriptive text block:

As a user or developer you can use the WoRMS webservice to feed your own application with standard WoRMS data. A non exhaustive list of applications:

- get the AphainID for your taxon
- check the spelling of your taxa
- get the authority for your taxa
- get the full classification for your taxa
- resolve your unaccepted names to accepted ones
- get all synonyms for a taxon
- fuzzy/hear match your species list
- resolve a common name vernacular to a scientific name
- get the common name(s)/vernacular for a taxon
- get the sources/references for a taxon
- get the WoRMS citation for a taxon
- get the direct children for a taxon
- get all taxa modified during a time interval
- get an external identifier for a taxon
- get the AphainID for an external identifier/database
- get all distributions for a taxon
- get all attributes for a taxon

Below this text is a table with the following data:

Date Type	Publication
Date	2016
Technical Information	
Contact Point	info@marinespecies.org
Address	Flanders Marine Institute (VLIZ) - LifeWatch.be

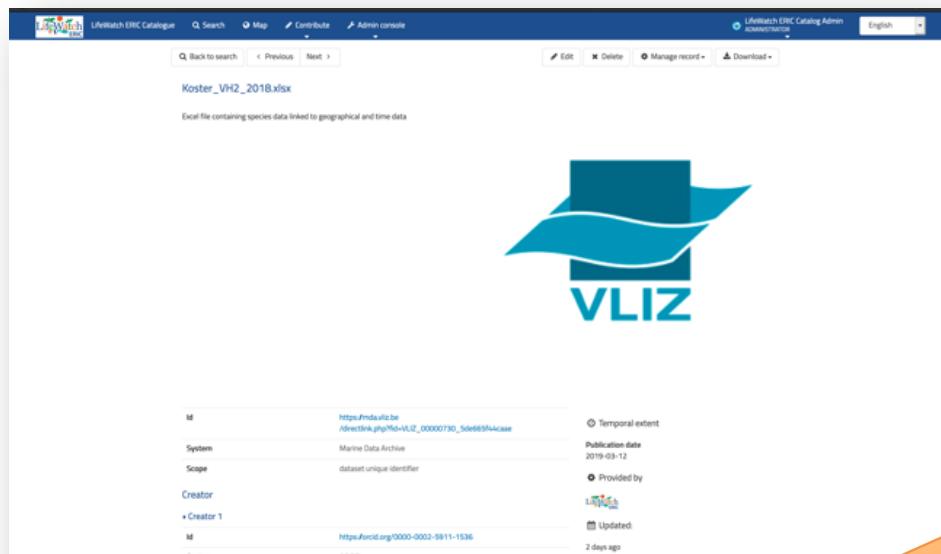
On the right side of the page, there are sections for 'Provided by' (LifeWatch), 'Updated' (2 days ago), and 'Share on social sites'.

Service

LifeWatch ERIC Metadata Catalogue

Registered users can browse the catalogue and:

- view / download metadata of other groups
- manage / edit / delete metadata within their group

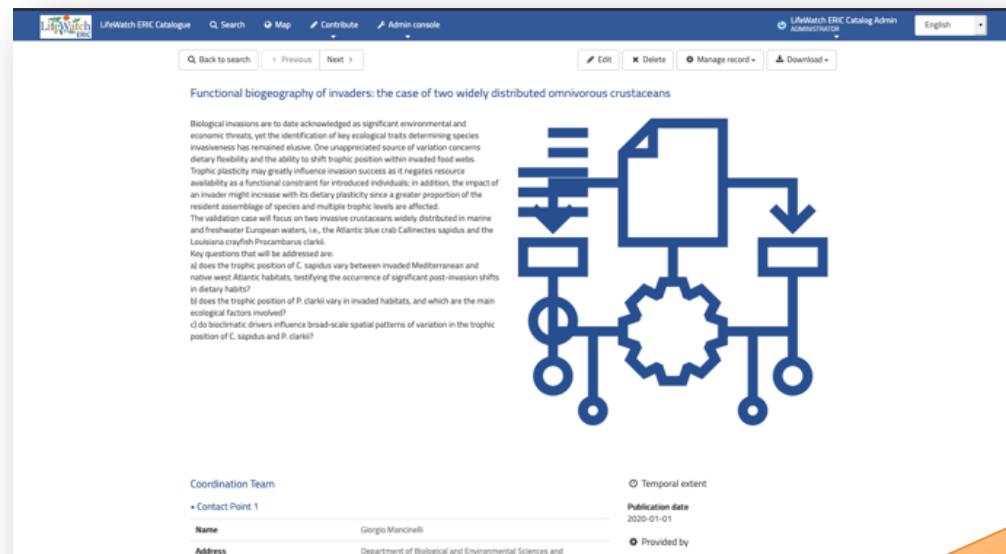


Koster_VH2_2018.xlsx
Excel file containing species data linked to geographical and time data

VLIZ

Id	https://meddata.be/Advertiser.php?Md=VLIZ_00000190_Sw66M%20case	<input type="radio"/> Temporal extent
System	Marine Data Archive	Publication date 2019-03-12
Scope	dataset unique identifier	<input checked="" type="radio"/> Provided by
Creator	+ Creator 1	
Id	https://orcid.org/0000-0002-5911-1536	<input type="radio"/> Updated: 2 days ago
System	ORCID	<input type="radio"/> Share on social sites
Scope	unique identifier for dataset's creator	

Dataset



Functional biogeography of invaders: the case of two widely distributed omnivorous crustaceans

Biological invasions are to date acknowledged as significant environmental and economic threats, yet the identification of key ecological traits determining species invasiveness has remained elusive. One unappreciated source of variation concerns dietary flexibility and the ability to shift trophic position within invaded food webs. Trophic plasticity may greatly influence invasion success as it regulates resource availability as well as the diet of introduced individuals; in addition, the impact of an invader might increase with its dietary plasticity as the trophic position of the resident assemblage of species and multiple trophic levels are affected.

The validation case will focus on two invasive crustaceans widely distributed in marine and freshwater European waters, i.e., the Atlantic blue crab *Callinectes sapidus* and the Louisiana crayfish *Pacifastacus clarkii*.

Key questions that will be addressed are:

- a) does the trophic position of *C. sapidus* vary between invaded Mediterranean and native west Antarctic habitats, testifying the occurrence of significant post-invasion shifts in dietary habits?
- b) does the trophic position of *P. clarkii* vary in invaded habitats, and which are the main ecological factors involved?
- c) do biotic drivers influence broad-scale spatial patterns of variation in the trophic position of *C. sapidus* and *P. clarkii*?

Coordination Team

+ Contact Point 1

Name	Giorgio Mancinelli
Address	Department of Biological and Environmental Sciences and Technologies, University of Milano, Italy

Temporal extent

Publication date
2020-01-01

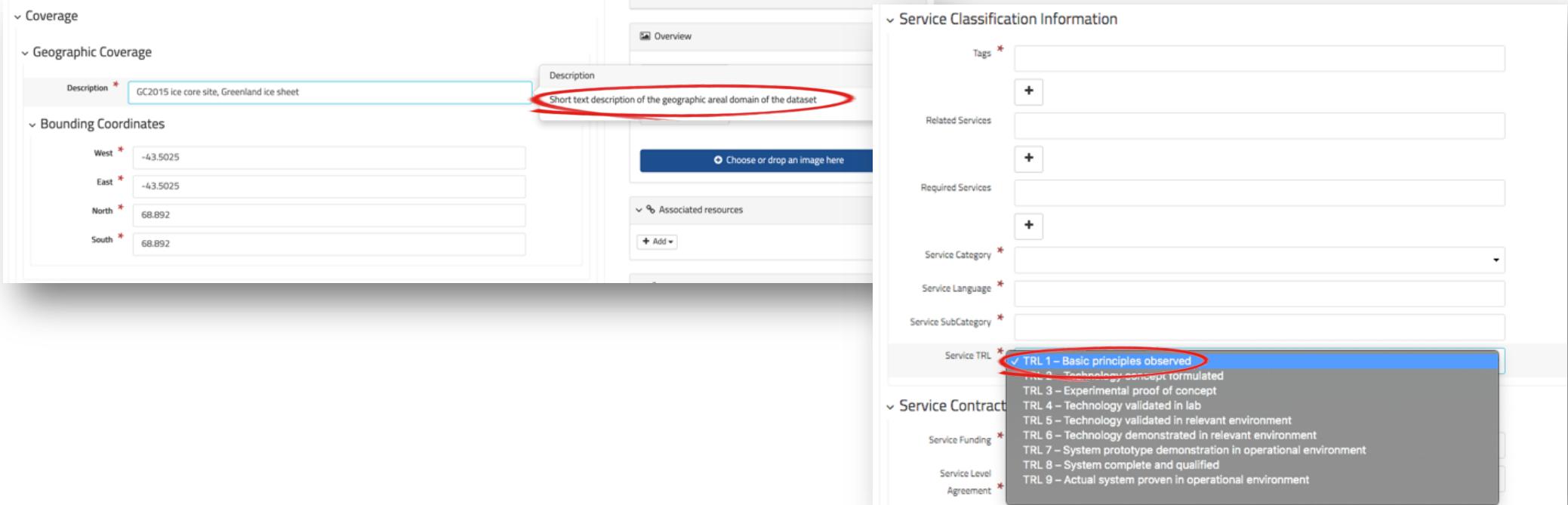
Provided by

Workflow

LifeWatch ERIC Metadata Catalogue

Users are guided in the input process by means of:

- **tooltips** for the description of the specific field
- **drop down lists** with the appropriate values of the specific field
- **multiplicity for multi-value attributes**
- **markers** for optional/mandatory metadata



The screenshot shows a web-based metadata entry form for a dataset. On the left, there are sections for 'Coverage' and 'Geographic Coverage'. The 'Description' field contains 'GC2015 ice core site, Greenland ice sheet'. A tooltip for the 'Description' field is visible, stating 'Short text description of the geographic areal domain of the dataset'. Below this is a section for 'Bounding Coordinates' with fields for West (-43.5025), East (-43.5025), North (68.892), and South (68.892). In the center, there's an 'Overview' section with a placeholder 'Choose or drop an image here' and a 'Associated resources' section with an '+ Add' button. On the right, there's a 'Service Classification Information' section with fields for 'Tags', 'Related Services', 'Required Services', 'Service Category', 'Service Language', and 'Service SubCategory'. Below this is a 'Service TRL' section with a dropdown menu open, showing options: 'TRL 1 – Basic principles observed' (which is selected, highlighted in blue), 'TRL 2 – Technology concept formulated', 'TRL 3 – Experimental proof of concept', 'TRL 4 – Technology validated in lab', 'TRL 5 – Technology demonstrated in relevant environment', 'TRL 6 – System prototype demonstration in operational environment', 'TRL 7 – System complete and qualified', and 'TRL 8 – Actual system proven in operational environment'.

LifeWatch ERIC Metadata Catalogue

Users are guided in the input process by means of:

- **tooltips** for the description of the specific field
- **drop down lists** with the appropriate values of the specific field
- multiplicity for **multi-value attributes**
- **markers** for optional/mandatory metadata

Service

Revision Date

Technical Information

Contact Point

Address

Keywords

Type of Service +

Type of association

VIEW

Technical Information

Contact Point	info@marinespecies.org
Address	Flanders Marine Institute (VLIZ) - LifeWatch.be
Keywords	* Keyword 1 marine species * Keyword 2 register * Keyword 3 synonymy
Type of service	Data analysis
Type of association	Tight

EDITOR

Management Info

Maintainer

Version

Last Updated gg / mm / aaaa

Created gg / mm / aaaa

Workflow Contractual Information (Optional, but if you want to specify it, all metadata marked with * have to be inserted)

Workflow Support Information (Optional, but if you want to specify it, all metadata marked with * have to be inserted)

VIEW

Workflow Support Information

Workflow Feedback	giorgio.mancinelli@unisalento.it
Workflow Helpdesk	giorgio.mancinelli@unisalento.it
Workflow Order	giorgio.mancinelli@unisalento.it
Workflow Training	https://writer.zoho.eu/writer /open/3d97e715a0e1a550e477d9dcae2ad6c4f80c7
Workflow User Manual	https://writer.zoho.eu/writer /open/3x97e715a0e1a550e477d9dcae2ad6c4f80c7

EDITOR

LifeWatch ERIC Metadata Catalogue

Add DOIs to resources with DataCite



A **registered user**
wants to create a new
resource in the LW
ERIC Metadata
Catalogue

Logins @LifeWatch
ERIC Metadata
Catalogue

Adds a new record

Selects the
resource type and
the template to use

Puts all mandatory
metadata for that
resource



Can edit/delete
content and
request a DOI

editor

Clicks “Save and
close” button

Which is
the role?

admin

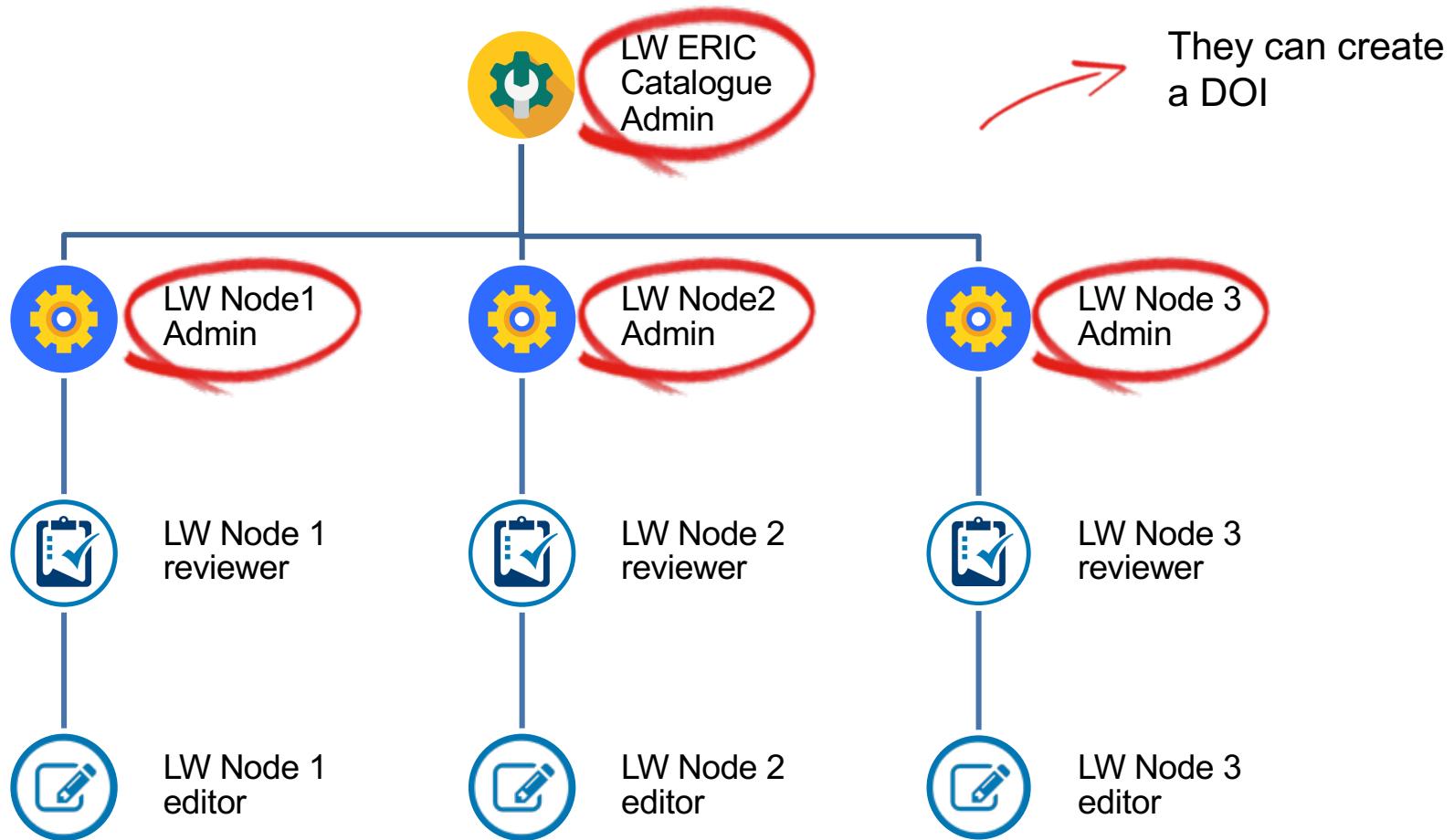
Can review content,
authorize publication
and create a DOI

Can review content,
authorize publication
and request a DOI

reviewer

LifeWatch ERIC Metadata Catalogue

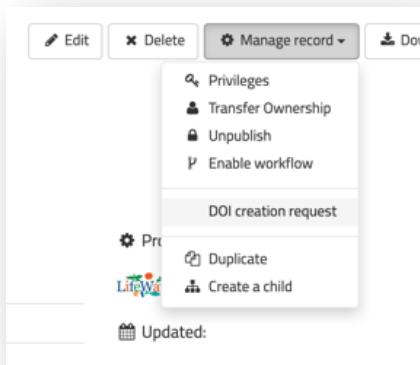
Add DOIs to resources with DataCite



LifeWatch ERIC Metadata Catalogue

Add DOIs to resources with DataCite

Once that the resource is published, the user requests a DOI



Assigns the task to (him/her)self and triggers the task

mdStatusTitle-undefined

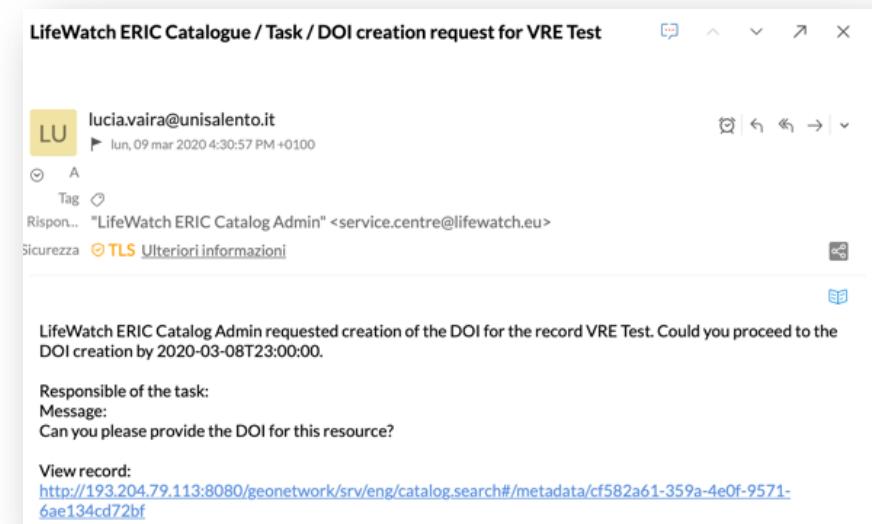
Task owner
Lucia Vaira

Due date
09 / 03 / 2020

Message
Can you please provide the DOI for this resource?

Trigger task

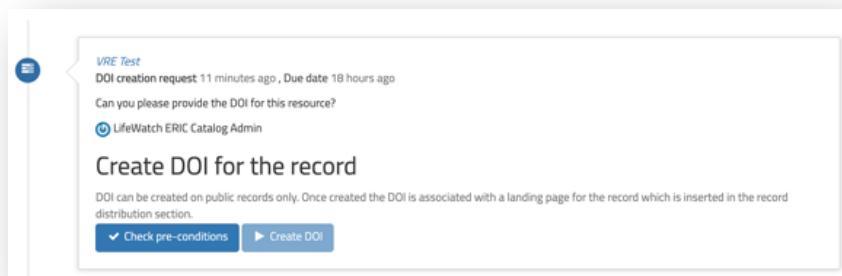
After submission of the task, the task owner is notified by email



LifeWatch ERIC Metadata Catalogue

Add DOIs to resources with DataCite

The task can then be resolved by checking the pre-conditions



VRE Test
DOI creation request 11 minutes ago. Due date 18 hours ago
Can you please provide the DOI for this resource?
LifeWatch ERIC Catalog Admin

Create DOI for the record

DOI can be created on public records only. Once created the DOI is associated with a landing page for the record which is inserted in the record distribution section.

Check pre-conditions Create DOI

DataCite mandatory fields:

1. Identifier (the prefix is already defined)
2. Creator (individual name and organization name)
3. Title
4. Publisher (set to "LifeWatch ERIC" which is the provider of the DOI)
5. Publication Year
6. ResourceType (one of the allowed values of the enumeration
[Audiovisual, Collection, DataPaper, Dataset, Event, Image, InteractiveResource, Model, PhysicalObject, Service, Software, Sound, Text, Workflow, Other])

If DOI already exists, it needs to be removed

Create DOI for the record

DOI can be created on public records only. Once created the DOI is associated with a landing page for the record which is inserted in the record distribution section.

Check pre-conditions Create DOI

Record 'ceb7992c-e684-481e-b7a9-44eba16a35a7' already contains a DOI. The DOI is '<https://doi.org/10.80186/ceb7992c-e684-481e-b7a9-44eba16a35a7>'. We cannot register it again. Remove the DOI reference if it does not apply to that record.

Otherwise, it is possible to create a DOI that will be added to the metadata record



DOI can be created on public record only. Once create section.

Check pre-conditions Create DOI

```

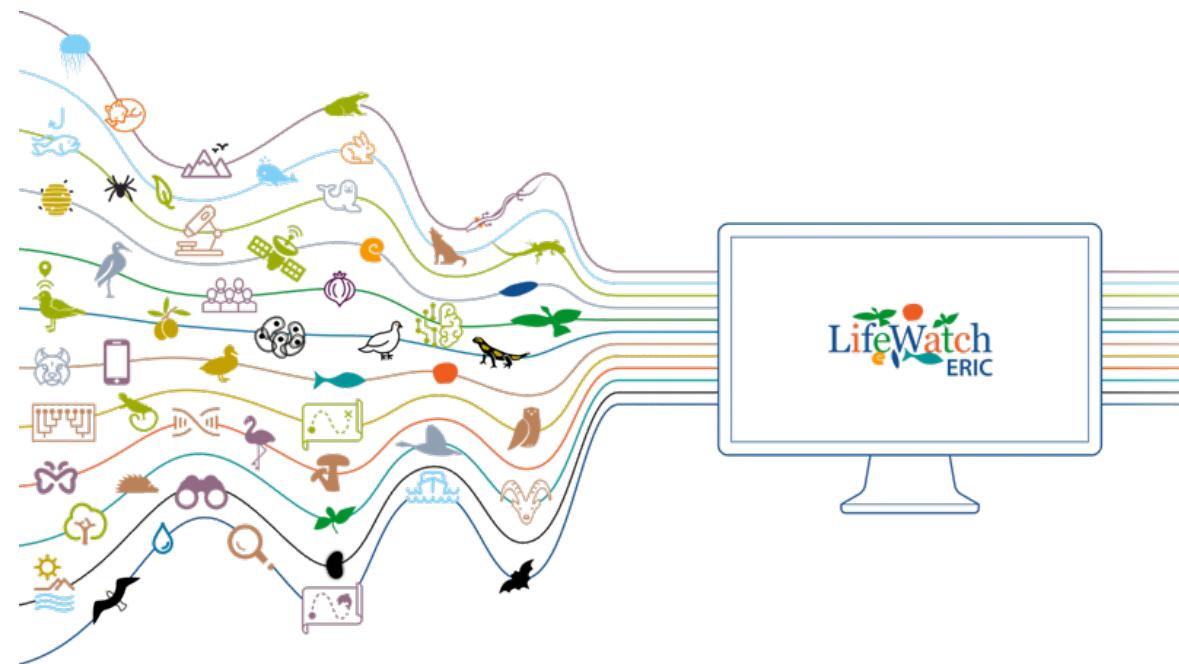
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  </gmd:CI_Citation>
    <gmd:onlineResource>
      <gmd:CI_OnlineResource>
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        </gmd:linkage>
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          <gco:CharacterString>DOI</gco:CharacterString>
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        <gmd:name>
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      </gmd:CI_OnlineResource>
    </gmd:onlineResource>
  </gmd:CI_Citation>
</gmd:MD_Metadata>

```

LifeWatch ERIC Metadata Catalogue

Next steps

- **Harvesting** features: manual import/export + machine2machine
- **Interoperability** with other catalogues (EOSC, GeoNetwork, Metacat, etc.)
- **EML 2.2 standards** for datasets (challenging task, we are defining the best approach to follow)
- **Validation** process before publication





GeoNetwork Meeting, June 23rd 2020

Nicola Fiore, nicola.fiore@lifewatch.eu

Lucia Vaira, lucia.vaira@lifewatch.eu

LifeWatch ERIC Service Centre