



LifeWatch Greece data-services

*On supporting metadata and semantics
integration for the biodiversity domain*

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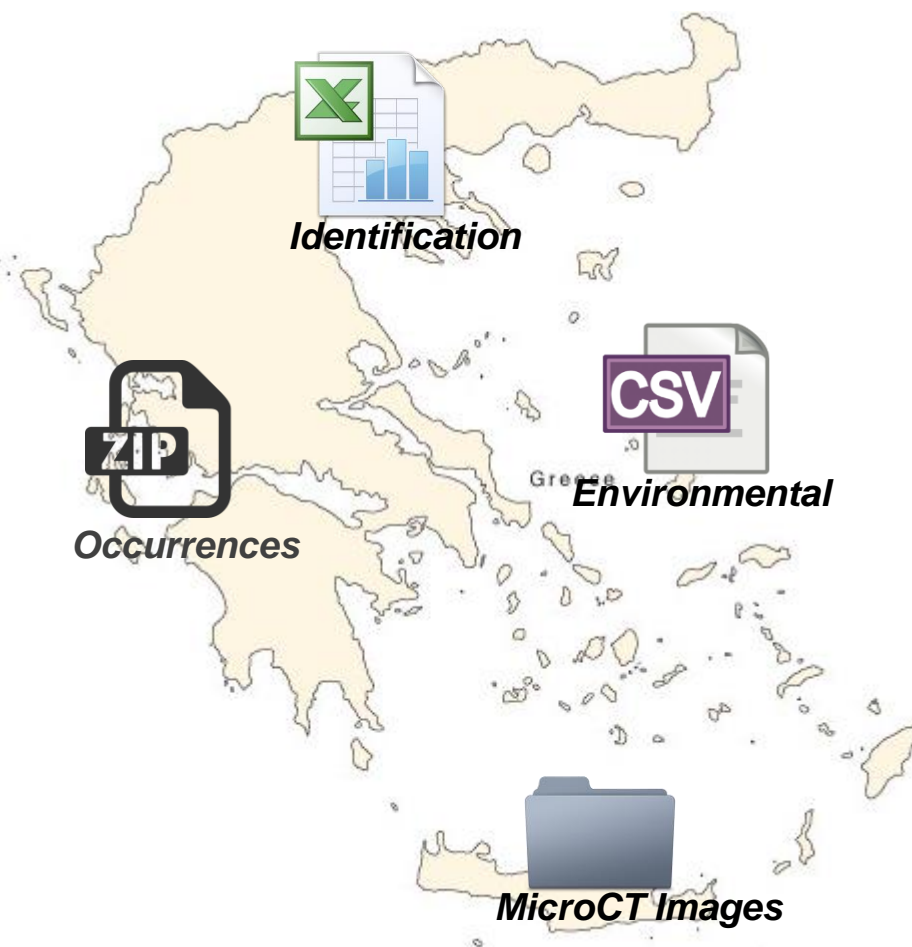
1. The Problem
2. The Goal
3. The Idea
4. Pre-design face
5. Data Services
6. User Interface / Examples
7. Conclusions



The problem

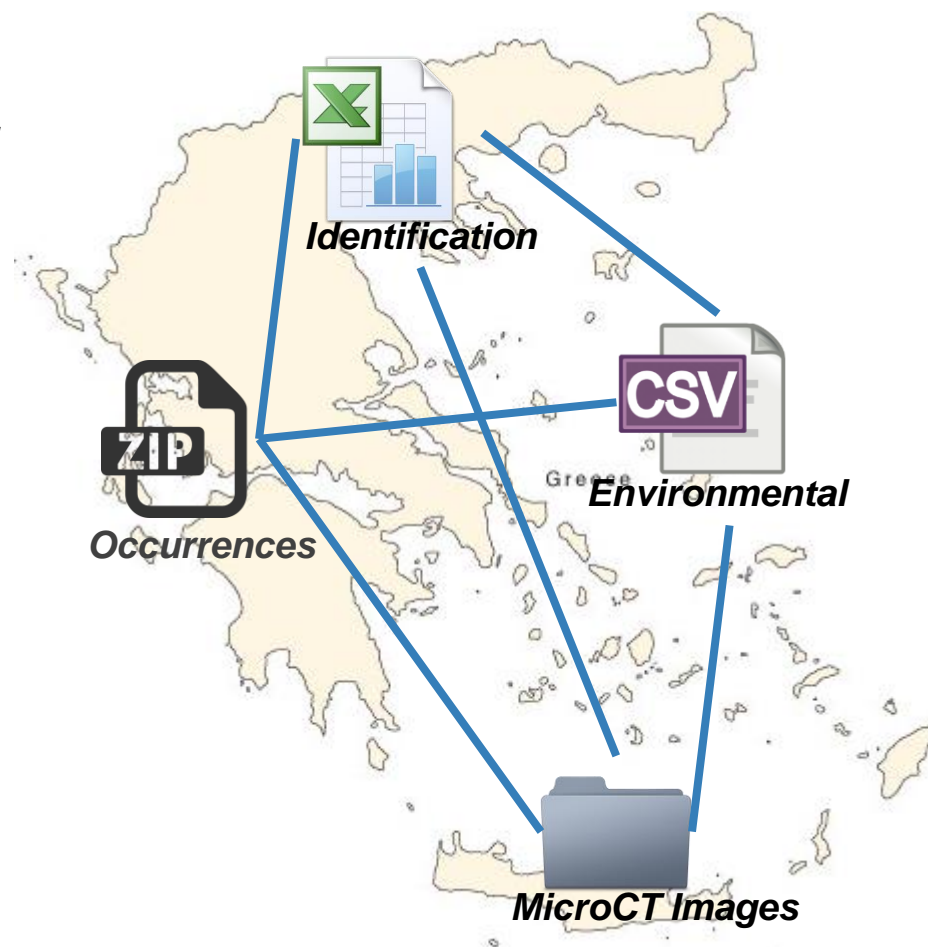
Main characteristics of biodiversity data:

1. Its ***cross-disciplinary character***.
2. The extremely ***broad range of data types*** and structures.
3. The variety of ***semantic concepts*** which encompasses.
4. It remains widely ***distributed*** and ***unconnected***.

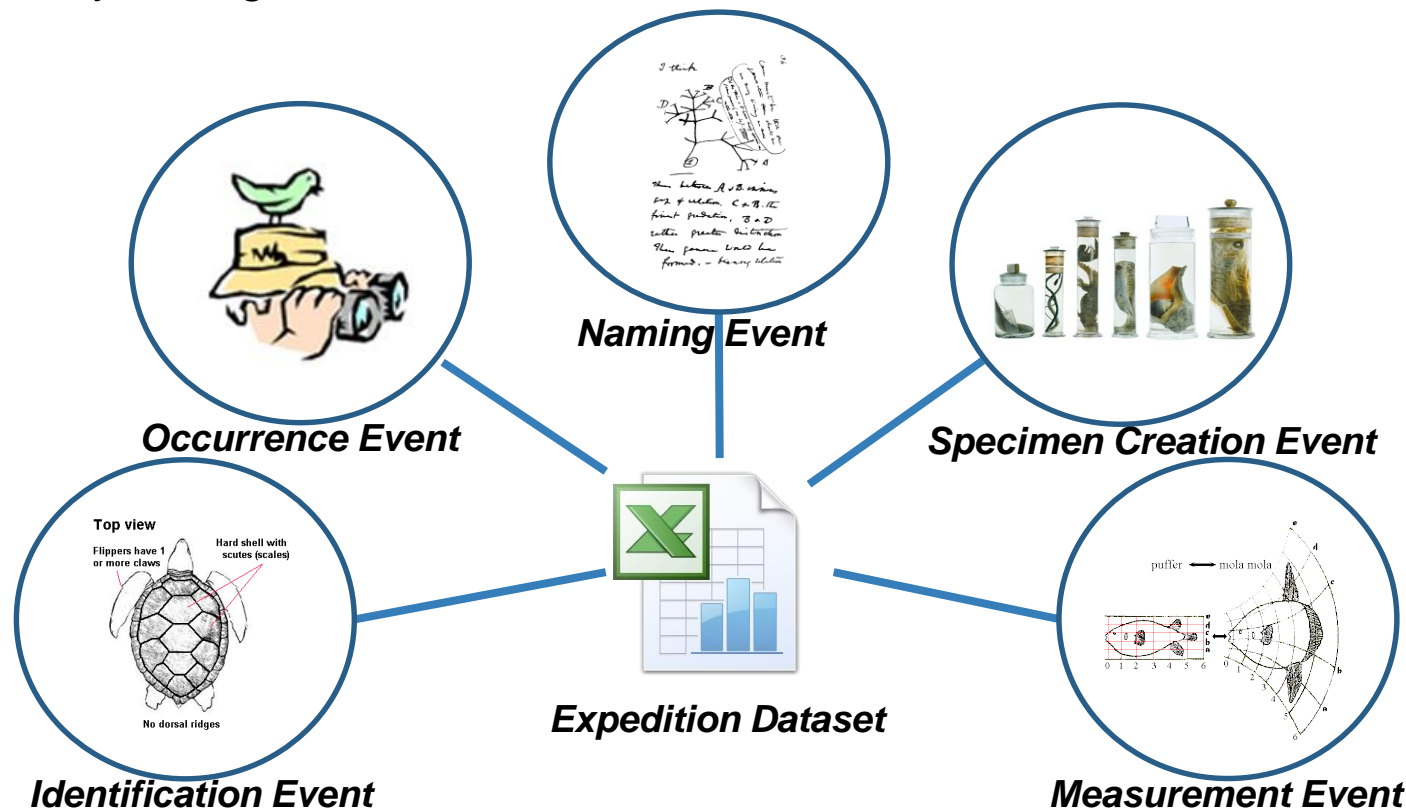


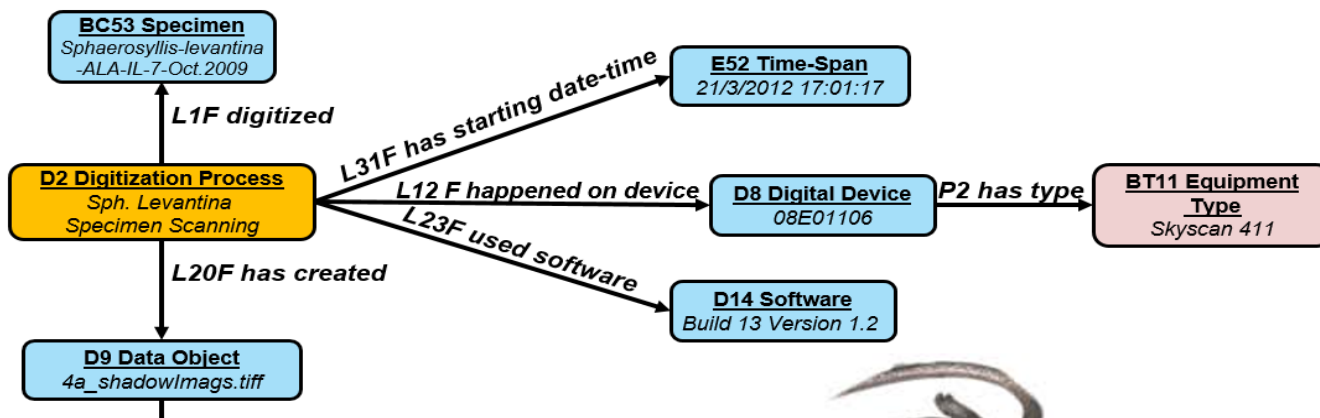
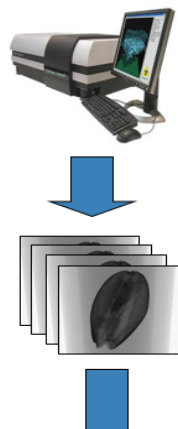
Our **goal** in the context of LW Greece:

1. **support cataloguing and publishing** of all the relevant meta-data information of the Greek biodiversity domain.
2. **integrate data from heterogeneous sources** by supporting the definitions of appropriate models.
3. **efficiently discover biodiversity data** of interest and enable the answering of complex queries that could not be answered from the individual sources.



Exploit the events' information that is explicitly or implicitly contained in the datasets, ***model the different concepts and entities*** of the biodiversity domain and ***take advantage of the semantic graph's*** capabilities to navigate efficiently through the different contents and ***discover data of interest***.





Abiotics_Amvrakikos_ALL

Benthos_Amvrakikos_February_Logarou_Tsoukalio_Mazoma

Queries

microCT_ElectronicLog

GialovaTD

20131118_simple_plants_sandbox.sql

Dataset Spongwn

dwca-zoobenthos_in_amvrakikos_wetlands

Eastern Med Syllids

traitsExportOption__2014-04-09_12_02_57

EasternMedSyllids_110	Alykes	2011-09-26	San Martin	2003, 2004, Nygren 2004	Greece	en	Animalia
EasternMedSyllids_114	Alykes	2011-09-26	San Martin	2003, 2004, Nygren 2004	Greece	en	Animalia
EasternMedSyllids_116	Alykes	2011-09-26	San Martin	2003, 2004, Nygren 2004	Greece	en	Animalia
EasternMedSyllids_126	Alykes	2011-09-26	San Martin	2003, 2004, Nygren 2004	Greece	en	Animalia
EasternMedSyllids_129	Alykes	2011-09-26	San Martin	2003, 2004, Nygren 2004	Greece	en	Animalia

Find all scans depicting marine species

How many marine species have been originally described from the Mediterranean Sea?

How many stations have pH over or lower than x?

The abundance records have the following format:

	A	B	C	D		AW	AY
1	ABUNDANCE						
2		WISTIR1	WISTIR2	WISTIR3		AUST4R3	CLASS
3	Abra segmentum	0	0	0	..	3	BIVALVIA
4	Axinus croulinensis	0	0	0		0	BIVALVIA
5	Cerastoderma glaucum	0	0	0		5	BIVALVIA
6	Chamelea gallina	1	1	1		0	BIVALVIA
7	Clausinella brongiartii	0	0	0		0	BIVALVIA
8	Corbula gibba	0	0	0		0	BIVALVIA
9	Ctena decussata	0	0	0		0	BIVALVIA
10	Lucinella divaricata	0	0	1	..	0	BIVALVIA
11	Donacilla cornea	0	0	16		0	BIVALVIA
12	Donax venustus	0	0	0		0	BIVALVIA
13	Gouldia minima	1	0	3		0	BIVALVIA
:							
71	Turbonilla lactea	0	1	0		0	GASTROPODA
72	Turbonilla striatula	0	0	0		0	GASTROPODA
73	Fustiaria rubescens	0	0	0	..	0	SCAPHOPODA
74							
75	SAMPLING	WI	WI	WI		AU	
76	STATION	1	1	1		4	
77	REPLICATE	1	2	3		3	

Design and Implementation

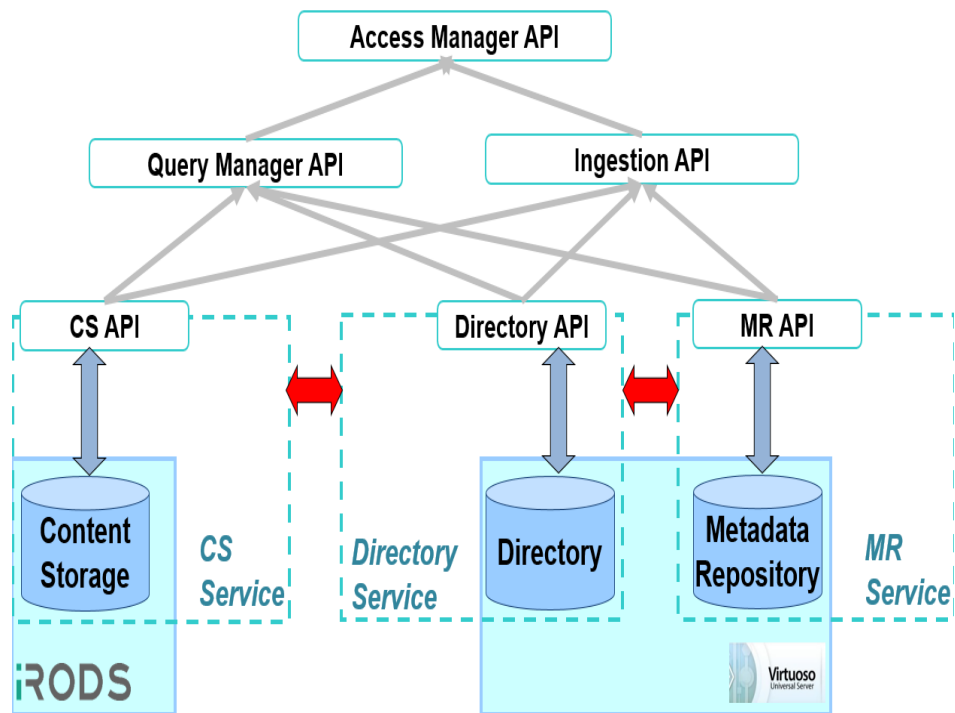
➤ 3 Components Architecture:

- 1) **Directory Service**
- 2) **Metadata Repository**
- 3) **Content Storage**

➤ More than **20 Web Services**.

- 1) Publishing Metadata/Data
- 2) Searching Metadata
- 3) Discovering Data
- 4) Browsing Services
- 5) Mapping Services
- 6) Transforming Metadata/Data
- 7) Annotation Services

➤ The **Web Application** that is hosted by the LifeWatch Greece's Portal making all these functionalities available to the LifeWatch users.



<http://metacatalogue.portal.lifewatchgreece.eu/>



RvLab



MedOBIS vLab



GBIF
GBIF Greece



Ecological Modeling



Eco-systems Biology



Data Services



MicroCT Services



Genetic Services



**Taxon Information
System (TIS) Services**



**Biological Specimens
Collection Services**



Mobile Applications



SemMedObis

Publish



New Dataset Description

[Update Dataset Description](#)

[Add Dataset Metadata](#)

[Update Dataset Metadata](#)

[Add Dataset](#)

[Download Templates](#)

New Dataset Description

Dataset Identity

Dataset ID

Fishes_Karla

Parent Dataset Name

Fishes

Use List ▾

Dataset Name *

Fishes_Karla

Description *

An occurrence record of species in the Karla Lake

Publication Date

05/10/2015



Creation Date Date

05/10/2015



Type of dataset

Occurrence Dataset ▾

Dataset Logo:

Select a file...

Access Method

Send email to Curator

Dataset People

Owner *

HCMR

Use List ▾

Creator *

Sarah Faulwetter

Use List ▾

Curator *

Sarah Faulwetter

Use List ▾

Curator E-mail *

sarifa@hcmr.gr

Contributors

Use List ▾

Publisher

Sarah Faulwetter

Use List ▾

[New Dataset Description](#)[Update Dataset Description](#)[Add Dataset Metadata](#)[Update Dataset Metadata](#)[Add Dataset](#)[Download Templates](#)

Add Metadata for a Dataset

Select dataset *

Fishes_Karla

Metadata type *

Occurrences

Select Metadata File:

Select a file...

occurrence_giannoulis.csv

[Upload File](#)[New Dataset Description](#)[Update Dataset Description](#)[Add Dataset Metadata](#)[Update Dataset Metadata](#)[Add Dataset](#)[Download Templates](#)

Add a dataset

Select dataset *

Fishes_Karla

Select Dataset File: *

Select a file...

pola_expedition_polychaeta.xlsx

[Upload File](#)

Dataset Information Found

Row	Dataset Title	Dataset URI	Owner	Curator	Dataset Type	Download Dataset	
1	Pola_Expedition_Polychaeta	http://www.lifewatchgreece.eu/entity/dataset/pola_expedition_polychaeta	HCMR	Marilena Tsombanou	Occurence Dataset	Download	+ More info
2	EasternMedSyllids	http://www.lifewatchgreece.eu/entity/dataset/easternmedsyllids	HCMR	Sarah Faulwetter	TempStats Dataset	Download	— More info

Contact Point: sarifa@hcmr.gr
Access Method: send email to curator
Description: an occurrence dataset
Keeper: [HCMR](#)
Publisher: [Sarah Faulwetter](#)
Publication Date: 2015
Creator: [Nikos Minadakis](#)
Creation Date: 2011
Contributor: [NHMC](#)
Access Rights: <http://www.opendatacommons.org/licenses/by/1.0/>
Rights Holder: [HCMR](#)
Parent Dataset: [Invertebrates](#)
Image URI:
Location:
Embargo State: On Embargo
Embargo Period: 2015
Dataset ID: EasternMedSyllids

Occurrences Information Found

Row	Species	Country	Date	Related Dataset	
1	Apomatus globifer	Libya	1890	View dataset	+ More info
2	Protula tubularia	Greece	1891	View dataset	+ More info
3	Protula marioni	Italy	1892	View dataset	+ More info
4	Serpula vermicularis	Italy	1892	View dataset	+ More info
5	Serpula vermicularis	Greece	1890	View dataset	+ More info
6	Laonome salmacidis	Turkey	1892	View dataset	+ More info
7	Polycirrus aurantiacus	Greece	1891	View dataset	+ More info
8	Hydroides norvegica	Greece	1890	View dataset	+ More info
9	Melinna adriatica	Israeli Exclusive Economic Zone	1892	View dataset	+ More info
10	Placostegus tridentatus	Turkey	1892	View dataset	+ More info

7	Polycirrus aurantiacus	Greece	1891	View dataset	More info
<p>Dataset Title: Pola_Expedition_Polychaeta</p> <p>Occurrence Event ID: http://www.lifewatchgreece.eu/entity/encounterEvent/pola_expedition_polychaeta_15</p> <p>Individual ID: polycirrus_aurantiacus_1891_15</p> <p>Actor: Panagiotis Damianidis</p> <p>Place: east of Kythira</p> <p>Water Area: Aegean Sea</p> <p>Habitat: Mud with rocks</p> <p>Equipment Type:</p> <p>Ecosystem:</p> <p>Description:</p> <p>Station URI: http://www.lifewatchgreece.eu/entity/place/stationpola_expedition_polychaeta_15</p> <p>Station Notes: maximumDepth:415,minimumDepth:415</p> <p>Bibliographic Citation:</p> <p>Sampling Protocol:</p> <p>Coordinates: 36.0917,23.1583</p>					

Info about node: **polycirrus_aurantiacus_1891_15**

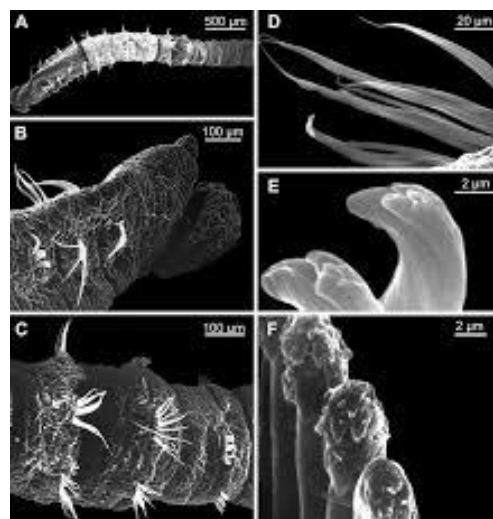
Row	Relation	Object	Object Type
1	type	BC38_Biotic_Element	-
2	LC10_belongs_to	Polycirrus aurantiacus	BT27_Species

Row	Subject	Subject Type	Relation
1	http://www.lifewatchgreece.eu/entity/identificationEvent/pola_expedition_polychaetapo	E17_Type_Assignment	P41_classified
2	http://www.lifewatchgreece.eu/entity/encounterEvent/pola_expedition_polychaeta_15	S19_Encounter_Event	O32_has_found_object
3	http://www.lifewatchgreece.eu/entity/transformationEvent/transfomationeventid7	E81_Transformation	P124_transformed

Info about node: <http://www.lifewatchgreece.eu/entity/transformationEvent/transformationeventid7>

Row	Relation	Object	Object Type
1	type	E81_Transformation	-
2	P124_transformed	polycirrus_aurantiacus_1891_15	BC38_Biotic_Element
3	P123_resulted_in	mCT-00038	BC53_Specimen
4	P4_has_timespan	2011-09-26	-
5	P14_carried_out_by	Matina Nikolopoulou	E21_Person
6	P33_used_specific_technique	preserved in ethanol	

Row	Specimen	Device	Enhancement Method	Related Dataset	
1	mCT-00038	SkyScan 1172	none	View dataset	— More info
<p>Dataset Title: Pola_Expedition_Polychaeta</p> <p>Scanning ID: http://www.lifewatchgreece.eu/entity/digitizationProcess/scan-00039</p> <p>Product: scan-00039.zip</p> <p>Actor: Sarah Faulwetter</p> <p>Date: 7/9/2012</p>					



[Basic Search](#)
[Fundamental Search](#)
[Advanced Search](#)
[Browse Contents](#)

Search by Fundamental Categories

Thing

has_me ▾

Actor

has_met_place

has_met_actor

has_met_thing

Dimension

has_met_time

from_actor

Event

from_event

from_place

Place

from_thing

from_time

by_event

by_actor

refers_to_event

refers_to_thing

Results

Row	Dataset ID	Related Dataset
1	http://www.lifewatchgreece.eu/entity/bioticElement/panthalis_oerstedii_1892_3	View Dataset
2	http://www.lifewatchgreece.eu/entity/bioticElement/salmacina_incrustans_1892_22	View Dataset
3	http://www.lifewatchgreece.eu/entity/physicalObject/sample400	View Dataset
4	http://www.lifewatchgreece.eu/entity/bioticElement/apomatus_globifer_1890_19	View Dataset
5	http://www.lifewatchgreece.eu/entity/bioticElement/serpula_vermicularis_1890_38	View Dataset
6	http://www.lifewatchgreece.eu/entity/physicalObject/sample100 DNA sample	View Dataset
7	http://www.lifewatchgreece.eu/entity/bioticElement/euphrosyne_foliosa_1892_2	View Dataset
8	http://www.lifewatchgreece.eu/entity/bioticElement/salmacina_incrustans_1890_21	View Dataset
9	http://www.lifewatchgreece.eu/entity/bioticElement/pholoe_dorsipapillata_1890_4	View Dataset
10	http://www.lifewatchgreece.eu/entity/bioticElement/vermilia_multivaricosa_1892_23	View Dataset
11	http://www.lifewatchgreece.eu/entity/physicalObject/sample500 Image	View Dataset

Search



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[SPARQL Endpoint](#)

[Full Text Search](#)

Scientific Name

Alburnus thessalicus

Search



The *Alburnus thessalicus* species belongs to the *Alburnus* genus, *Cyprinidae* family, *Cypriniformes* order, *Actinopterygii* class, *Chordata* phylum and *Animalia* kingdom. *Alburnus thessalicus* was discovered by *Alexander I. Stephanidis* in 1950. Individuals that belong to this species have been occurred in *Greece*, *Italy*, *Spain* etc. Individual *alburnus thessalicus_22* was transformed into *alb_thes_22_specimen* by *Sara Faulwetter* in 2015. *alb_thes_22_specimen* was scanned by *Niki Keklikoglou* in 2014 using a *SkyScan* MicroCT tomograph and results to the *alb_thes_scans.zip* dataset.

- **Recovery Mechanisms**
- **Update Functions**
- **Browsing Service**
- **Annotation Service**
- **Data Refinement Service**
- **Public Endpoints**



- ✓ First biodiversity fully semantic tech - based infrastructure.
- ✓ New Prototypical Architecture for e-science research infrastructure.
- ✓ Efficient data discovery.
- ✓ Exploitation of deductions and implicit knowledge.
- ✓ Implementation of web services, semantic models, e-services.
- ✓ Innovation and cross disciplinary scientific interest.

