



LifeWatchGreece

Christos Arvanitidis

EU BON - LTER Europe, workshop, 9-10 December, Granada





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and more...

LifeWatch - the concept of ESFRIs



LifeWatch - biodiversity is...

Genes and DNA

10^6 to 10^9 nucleotides in a DNA molecule



Species (organisms and their populations)

$>10^7$ species; each species with 10^2 - 10^{12} individuals



Ecosystems

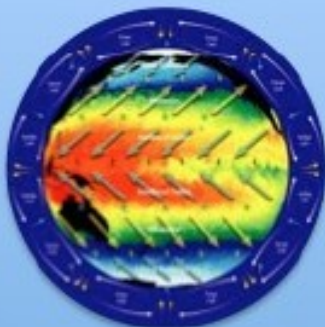
habitats with 10^4 to 10^6 species,
and manifold interactions



LifeWatch - challenges



oceanic and
atmospheric
processes



Climate system
as driver of
change



Biological
processes,
biodiversity and
ecosystems



Substrate of
lithosphere and
hydrosphere

Earth as a single complex and coupled system

LifeWatch - challenges (Questions)

Modelling Biodiversity on Earth

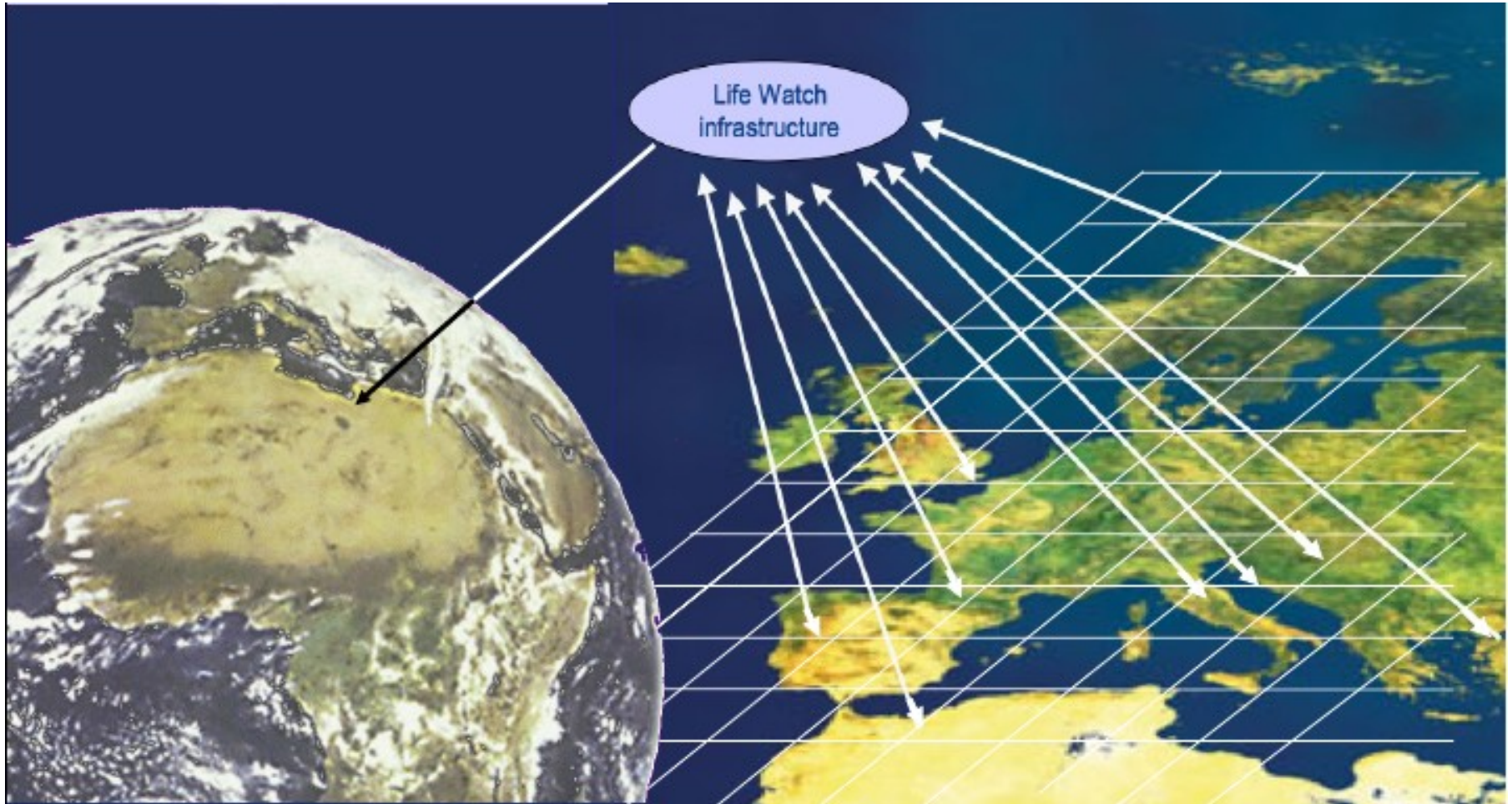
- Diversity, biomass, productivity and socio-economics
- Patterns, Processes and consequences from Change
- Prognosis under certain scenarios

LifeWatch - challenges (Infrastructure)

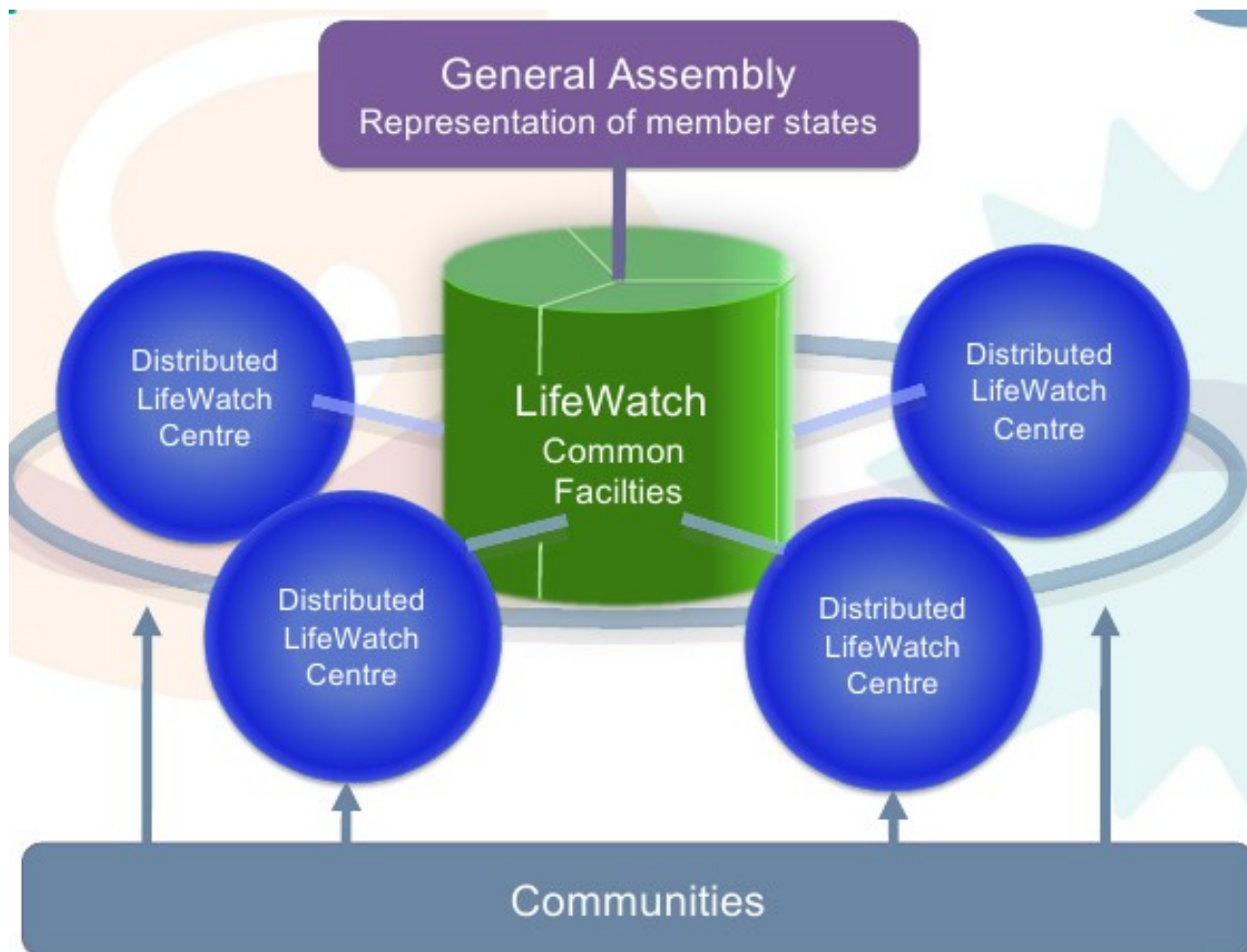
VRE: Virtual Research Environment

- vLabs: Virtual Laboratories
- Computational capacity unlimited space
- Transparency in scientific research practice

LifeWatch -distributed infrastructure



LifeWatch - organization



LifeWatch - where are we?

Marine LifeWatch VRE (webpage)
Developed by VLIZ)

LifeWatch VREs under
development on terrestrial and
freshwater biodiversity

↓ Access  Analyze  Develop ☐ About



Access

Retrieve and access data resources holding marine biodiversity and ecosystem data. A range of data systems offering data on species names, traits, distribution and genes.

Analyze

Online tools that facilitate data analysis of marine biodiversity and ecosystem data. Analysis is performed on data from known data resources and/or data uploaded by the user.



Develop

Build your own marine virtual lab making use of a range of available web services that access and process data. Service catalogues and 'how to' manuals help you to develop your own system.

LifeWatch - where are we?

READY to submit the ERIC final application

LifeWatchGreece - What makes it?

- Human Network
- Physical Installations
- Equipment (mostly hardware)
- Software

LifeWatchGreece – Data Management Team

LifeWatch Greece

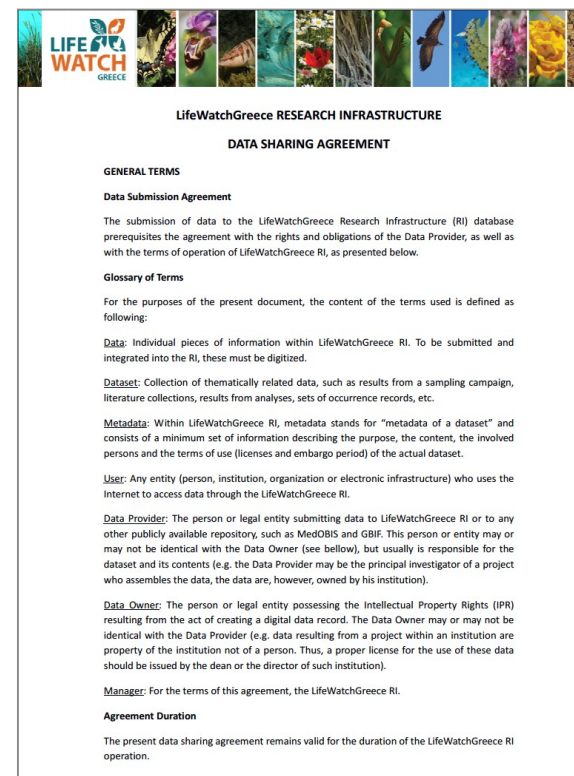
LifeWatchGreece – Data Policy – Open Access Driven



from “I OWN THE DATA”



To data publishing mentality



LifeWatchGreece - e-infrastructure



portal.lifewatchgreece.eu

Lifewatch Greece Portal

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[Forgot your password?](#) [Sign Up](#)



R vLab

The R vLab makes use of "R" which is a statistical processing environment widely used by scientists working in related disciplines. It supports an integrated and optimized (in respect to computational speed-up and data manipulation) environment. This vLab tackles common problems faced by R users, such as severe computational power deficit, routines operating under the R environment, such as the calculation of several biodiversity indices and the running of multivariate analyses, are often of high computational demand and cannot deliver a result when the respective data form of large matrices.



MedOBIS vLab

The MedOBIS [Mediterranean node of Ocean Biogeographic Information System (IOBIS: <http://www.iobis.org/>)] vLab reliable and quality controlled marine species datasets, meta-data and satellite data from all over the Mediterranean concept of MedOBIS, in agreement with IOBIS, is to create a comprehensive system for the retrieval of Mediterranean data and to deliver them to IOBIS and ultimately to GBIF.



GBIF Greece

This vLab provides integrated terrestrial species lists and species distribution services for biodiversity data and The Greek node of GBIF, therefore, will join the GBIF international project (<http://www.gbif.org>) by continuously and delivering all the biodiversity data from the national node to GBIF's central infrastructure. Consequently, this vLab informatics lab available for biodiversity research and applications and will include functions on publishing, discovery, integrating, retrieving and analysing processes.



Lifewatch Greece Portal

[Home](#)

[Administration](#)

[Emmanouella Panteri](#)

Home Page



R vLab



MedOBIS vLab



GBIF
GBIF Greece



Literature Mining



Data Services



Metadata Catalogue



MicroCT Services



Genetic Services



**Taxon Information
System (TIS) Services**



**Biological Specimens
Collection Services**



Mobile Applications



SemMedObs

Announcements



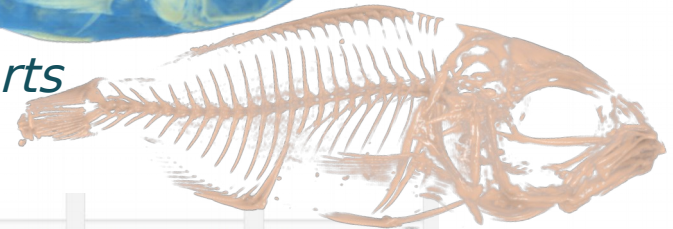


Visualise



Exterior parts

Interior parts



Eunice sp. (Polychaeta) - PTA staining

Eunice sp. (Polychaeta) - Iodine staining

Eunice roussaei (Polychaeta)

Ophiuroidea (Echinodermata)



The screenshot displays the R vLAB virtual Laboratory interface. On the left, the 'Workspace File Management' panel lists available input files (e.g., softlagoonAbundance.csv) and shows storage utilization. Below this is a 'Recent Jobs' table.

Job ID	Function	Status	Submitted At
Job312	taxa2dist	Completed	2015-08-22 21:04:25
Job339	taxondive	Failed	2015-08-31 14:21:39
Job340	vegdist	Completed	2015-08-31 14:21:55
Job341	taxa2dist	Completed	2015-08-31 14:22:13
Job342	anova	Failed	2015-08-31 14:22:39
Job344	taxondive	Failed	2015-08-31 14:52:47

The main panel shows the 'Submit a new Job' workflow. The 'Statistical Function' dropdown is set to 'taxa2dist'. The 'Input files' section indicates 'No files in your workspace!'. The 'Parameters' section shows 'varstep' set to FALSE and 'check_taxa2dist' set to TRUE. A red circle highlights the 'Parallel' implementations dropdown menu, which lists options like 'Parallel taxa2dist', 'Parallel taxa2dist postgres', 'Parallel anosim', 'Parallel mantel', 'Parallel taxa2dist to taxondive', and 'Parallel permanova'. A callout box points to this menu with the text 'Parallel implementations'. Another callout box points to the 'taxa2dist' dropdown with the text 'Function documentation'.

Developed by HCMR

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

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

A	B	C	D	E	F	G	H
scientificName	specificEpithet	genus	family	class	order	phylum	kingdom
Abra alba	alba	Abra	Semelidae	Bivalvia	Veneroida	Mollusca	Animalia
Cerastoderma edule	edule	Cerastoderma	Cardiidae	Bivalvia	Veneroida	Mollusca	Animalia
Cerithium vulgatum	vulgatum	Cerithium	Cerithiidae	Gastropoda	[unassigned] Caenogastropoda	Mollusca	Animalia
Dexamine spinosa	spinosa	Dexamine	Dexaminidae	Malacostraca	Amphipoda	Arthropoda	Animalia
Eumida sanguinea	sanguinea	Eumida	Phyllodocidae	Polychaeta	Phyllodocida	Annelida	Animalia
Gammarus aequicauda	aequicauda	Gammarus	Gammaridae	Malacostraca	Amphipoda	Arthropoda	Animalia
Idotea balthica basteri	balthica basteri	Idotea	Idoteidae	Malacostraca	Isopoda	Arthropoda	Animalia
Loripes lucinalis	lucinalis	Loripes	Lucinidae	Bivalvia	Lucinoida	Mollusca	Animalia
Paranemonia cinerea	cinerea	Paranemonia	Actiniidae	Anthozoa	Actiniaria	Cnidaria	Animalia
Perinereis rullieri	rullieri	Perinereis	Nereididae	Polychaeta	Phyllodocida	Annelida	Animalia
Phylo foetida	foetida	Phylo	Odiniidae	Polychaeta		Annelida	Animalia
Platyhelminthes						Platyhelminthes	Animalia

Species aggregation file

Factor file

Environmental data file

Abundance matrix file

A	B	C	D	E	F	G	H	I	J	K	L
scientificName	IT-ORIS01-MIS-P1-R1	IT-ORIS01-MIS-P1-R2	IT-ORIS01-MIS-P1-R3	IT-ORIS01-MIS-P2-R1	IT-ORIS01-MIS-P2-R2	IT-ORIS01-MIS-P2-R3	IT-ORIS01-MIS-P3-R1	IT-ORIS01-MIS-P3-R2	IT-ORIS01-MIS-P3-R3	IT-CU01-VE-P1-R1	IT-CU01-VE-P1-R2
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0

A	B	C	D
fieldNumber	waterBody	locality	locationRemarks
IT-ORIS01-MIS-P1-R1	Mediterranean	Oristano Gulf	Mistras lagoon
IT-ORIS01-MIS-P1-R2	Mediterranean	Oristano Gulf	Mistras lagoon
IT-ORIS01-MIS-P1-R3	Mediterranean	Oristano Gulf	Mistras lagoon
IT-ORIS01-MIS-P2-R1	Mediterranean	Oristano Gulf	Mistras lagoon
IT-ORIS01-MIS-P2-R2	Mediterranean	Oristano Gulf	Mistras lagoon
IT-ORIS01-MIS-P2-R3	Mediterranean	Oristano Gulf	Mistras lagoon
IT-ORIS01-MIS-P3-R1	Mediterranean	Oristano Gulf	Mistras lagoon
IT-ORIS01-MIS-P3-R2	Mediterranean	Oristano Gulf	Mistras lagoon
IT-ORIS01-MIS-P3-R3	Mediterranean	Oristano Gulf	Mistras lagoon
LT-CU01-VE-P1-R1	Baltic sea	Curonian lagoon	Vente
LT-CU01-VE-P1-R2	Baltic sea	Curonian lagoon	Vente
LT-CU01-VE-P1-R3	Baltic sea	Curonian lagoon	Vente
LT-CU01-VE-P2-R1	Baltic sea	Curonian lagoon	Vente
LT-CU01-VE-P2-R2	Baltic sea	Curonian lagoon	Vente
LT-CU01-VE-P2-R3	Baltic sea	Curonian lagoon	Vente
LT-CU01-VE-P3-R1	Baltic sea	Curonian lagoon	Vente
LT-CU01-VE-P3-R2	Baltic sea	Curonian lagoon	Vente
LT-CU01-VE-P3-R3	Baltic sea	Curonian lagoon	Vente
PL-VL-W-P1-R1	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad
PL-VL-W-P1-R2	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad
PL-VL-W-P1-R3	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad
PL-VL-W-P2-R1	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad
PL-VL-W-P2-R2	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad
PL-VL-W-P2-R3	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad
PL-VL-W-P3-R1	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad
PL-VL-W-P3-R2	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad
PL-VL-W-P3-R3	Baltic Sea	Vistula Lagoon	Vistula Lagoon Kad

A	B	C
fieldNumber	maximum Temp	
1		
2	0.6	23.2
3	0.6	23.2
4	0.6	23.2
5	0.6	23.8
6	0.6	23.8
7	0.6	23.8
8	0.6	22.6
9	0.6	22.6
10	0.6	22.6

Jobs

R vLab

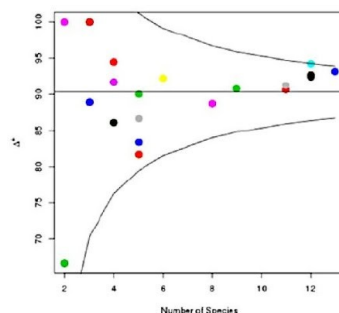
Workspace File Management

Recent Jobs:

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Job341	taxa2dist	Completed	2015-08-31 14:22:13
Job342	anova	Failed	2015-08-31 14:22:39
Job344	taxondive	Failed	2015-08-31 14:52:47
Job346	taxondive	Submitted	2015-08-31 16:26:57

Wait for results to be generated

Jobs Results



R vLab

Job313 Information/Results (taxondive)

Files produced as output:

taxondive.csv

R output:

```
{
  Delta Delta* Delta+ sd(Delta+) z(Delta+) Pr(>|z|)
IT_ORIS01_MIS_P1_R1 68.2023 93.8069 92.4242 1.9686 1.0758 0.28203
IT_ORIS01_MIS_P1_R2 66.0322 96.8665 90.6061 2.1681 0.1369 0.89111
IT_ORIS01_MIS_P1_R3 48.8741 98.8147 90.7407 2.7708 0.1567 0.87547
IT_ORIS01_MIS_P2_R1 58.9161 97.9866 93.1624 1.7813 1.6033 0.10888

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

>
> proc.time()

user system elapsed
2.305 0.083 3.869
```

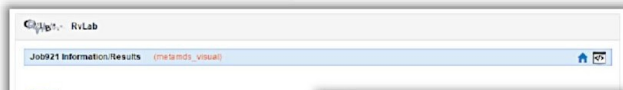
Legend:

- IT_ORIS01_MIS_P1_R1
- IT_ORIS01_MIS_P1_R2
- IT_ORIS01_MIS_P1_R3
- IT_ORIS01_MIS_P2_R1
- IT_ORIS01_MIS_P2_R2
- IT_ORIS01_MIS_P2_R3
- IT_ORIS01_MIS_P3_R1
- IT_ORIS01_MIS_P3_R2
- IT_ORIS01_MIS_P3_R3
- LT_CU01_VE_P1_R1
- LT_CU01_VE_P1_R2
- LT_CU01_VE_P1_R3
- LT_CU01_VE_P2_R1
- LT_CU01_VE_P2_R2
- LT_CU01_VE_P2_R3
- LT_CU01_VE_P3_R1
- LT_CU01_VE_P3_R2
- LT_CU01_VE_P3_R3
- PL_VLE_P1_R1
- PL_VLE_P1_R2
- PL_VLE_P1_R3
- PL_VLE_P2_R1
- PL_VLE_P2_R2
- PL_VLE_P2_R3
- PL_VLE_P3_R1
- PL_VLE_P3_R2
- PL_VLE_P3_R3
- PL_VLW_P1_R1
- PL_VLW_P1_R2
- PL_VLW_P1_R3
- PL_VLW_P2_R1
- PL_VLW_P2_R2
- PL_VLW_P2_R3
- PL_VLW_P3_R1
- PL_VLW_P3_R2
- PL_VLW_P3_R3

Add Files to Workspace

Download files

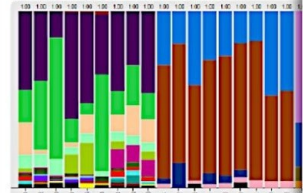
<http://rvlab.portal.lifewatchgreece.eu/>



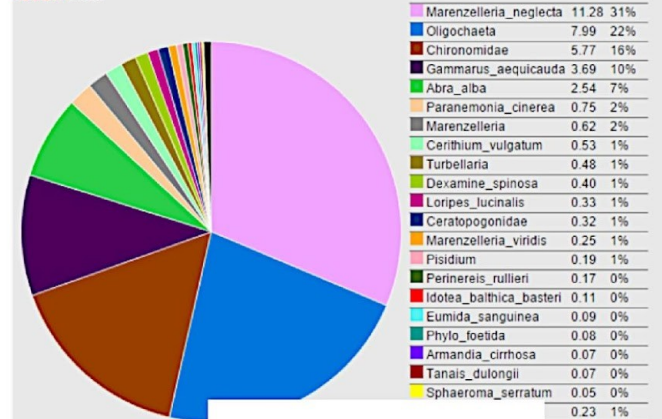
SUMMARIZEplot

This graph is an ad hoc version of the original visualization available at <http://rsvlab.org.pl/auc/summary/summary.html>. It is developed by Dr. Umit Koz (http://rsvlab.org.pl/auc/summary/summary.html). Please address any visualization questions to: koz@rsvlab.org.pl.

Note: Clicking on the bars loads a proportion of items for a particular sample on the pie chart. When clicking on the pie chart, the bars display the distribution of particular items and removes all the selected samples from the pie plot.



Pie chart: Overall



REGRESSION FUNCTION RESULTS

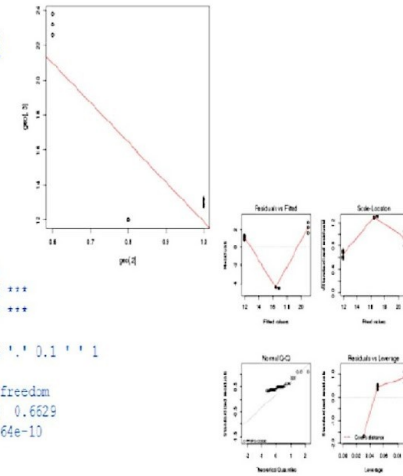
Call:
lm(formula = geo[, 3] ~ geo[, 2])

Residuals:
Min 1Q Median 3Q Max
-4.4465 -0.4437 1.0638 1.4437 2.8232

Coefficients:
Estimate Std. Error t value Pr(>|t|)
(Intercept) 34.568 2.348 14.725 2.56e-16 ***
geo[, 2] -22.652 2.711 -8.356 9.36e-10 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.697 on 34 degrees of freedom
Multiple R-squared: 0.6725, Adjusted R-squared: 0.6629
F-statistic: 69.82 on 1 and 34 DF, p-value: 9.364e-10



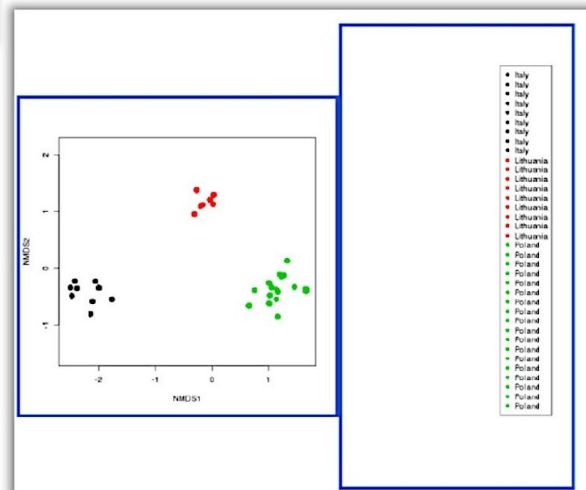
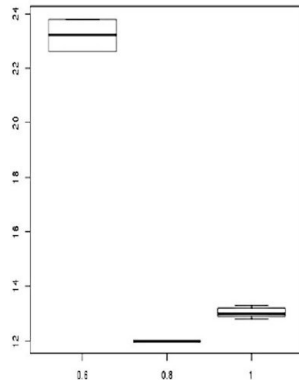
biocluster.lifewatchgreece.eu/Rvlab/workers.php?mode=checkAnova&argument1=37776150

ANOVA FUNCTION RESULTS

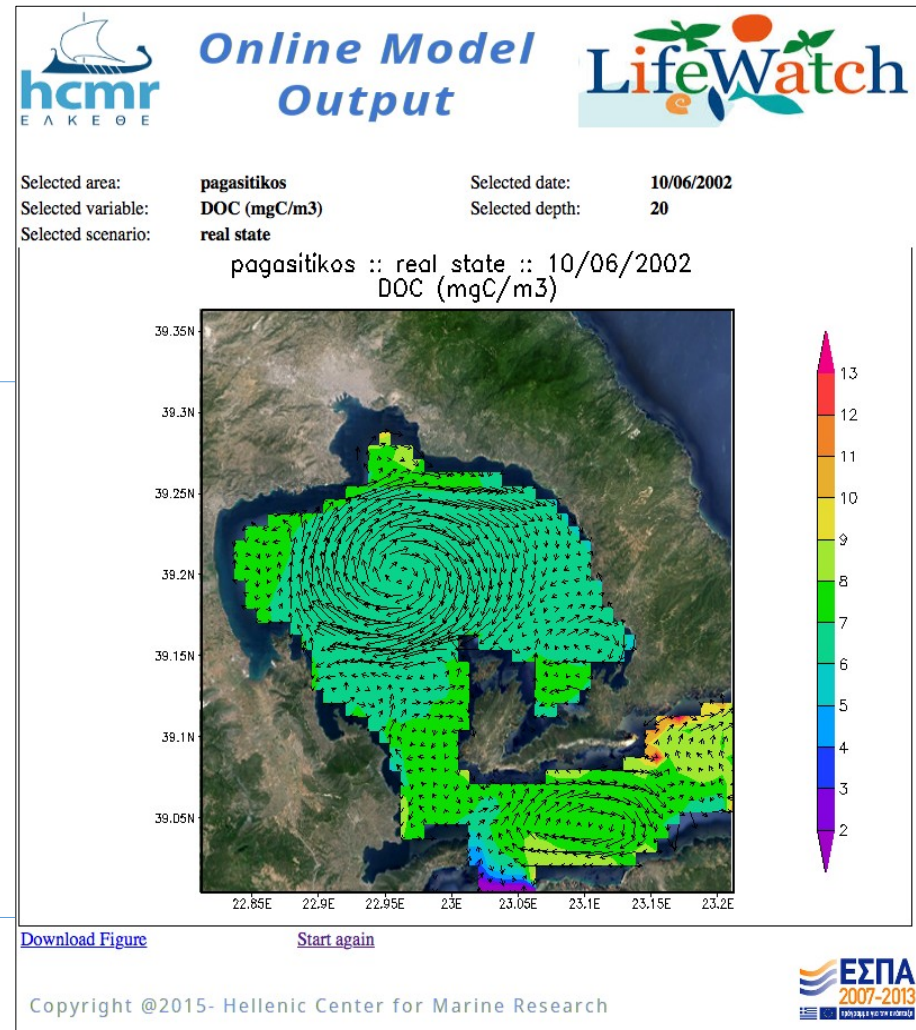
```

Df Sum Sq Mean Sq F value    Pr(>F)
get(factor2) 1 508.0    508.0    69.83 9.36e-10 ***
Residuals   34 247.3      7.3
---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
>
> proc.time()
   user  system elapsed 
 3.816   0.375   3.889

```

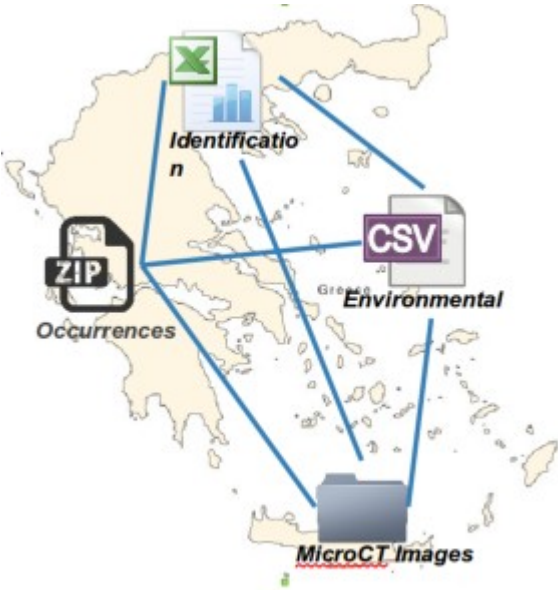


An online graphic user interface to to dynamically explore model results and ecological indices





Semantics with Data Services



Data Services

Search

Basic Search Fundamental Search Advanced Search Browse Contents SPARQL Endpoint Full Text Search

Search Dataset Description

Dataset Name

Owner

Dataset URI

Dataset Type

Not defined

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

and

Row	Dataset Title	Dataset URI	Owner	Curator	Dataset Type	Download Dataset	
1	Pola_Expedition_Polychaeta	http://www.lifewatchgreece.eu/ontology/dataset/pola_expedition_polychaeta	HCMR	Marilena Tsombanou	Occurrence Dataset	Download	+ More info
2	EasternMedSyids	http://www.lifewatchgreece.eu/ontology/dataset/easternmedsyids	HCMR	Sarah Faulwetter	Temp/Dats 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: N-HAC
 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: EasternMedSyids

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

mobile Applications



LifeWatchGreece - What can DO for EU BON - LTER?

- Provide the R_vLab as the platform for additional functions
- Parallelize/Optimize the relevant R libraries
- Decrease analysis time
- Increase transparency
- Provide Data and Function use and download Factor



LifeWatchGreece-How can I participate?

- Explore the web site:

<http://www.lifewatchgreece.eu>

- Inform us about your needs (methods of analysis, software, etc.)

Your messages to: **info@lifewatchgreece.eu**

- Contribute and **publish your own data** and metadata



Thank you

<http://www.lifewatchgreece.eu>
info@lifewatchgreece.eu