LifeWatch Greece web and mobile application for the R environment

by Christos Arvanitidis

Contributors: Anastasios Oulas, Alexandros Gougousis, Irene Filiopoulou, Theodore Patkos, Konstantinos Varsos, Emmanouela Panteri

EGI Lifewatch CC, September 3 2015 Santander

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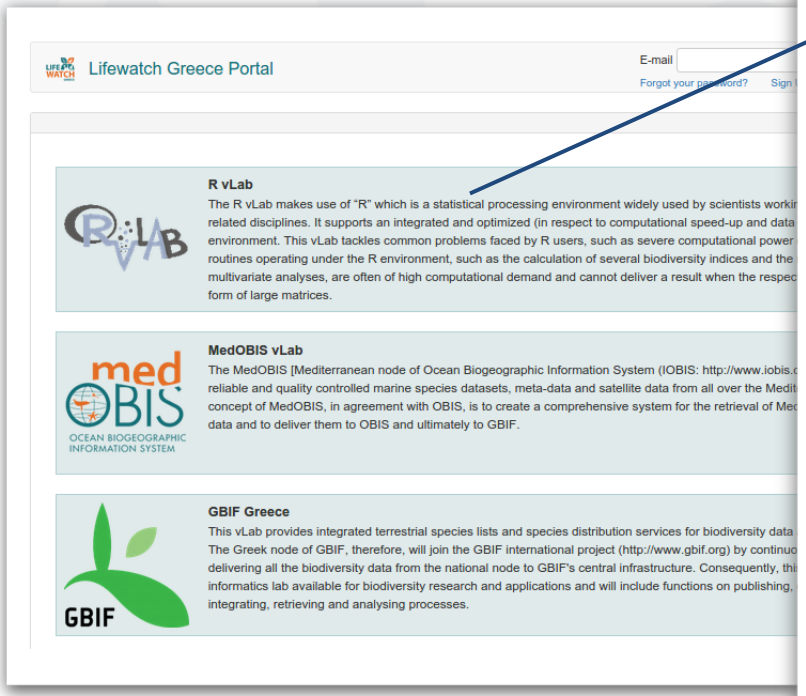
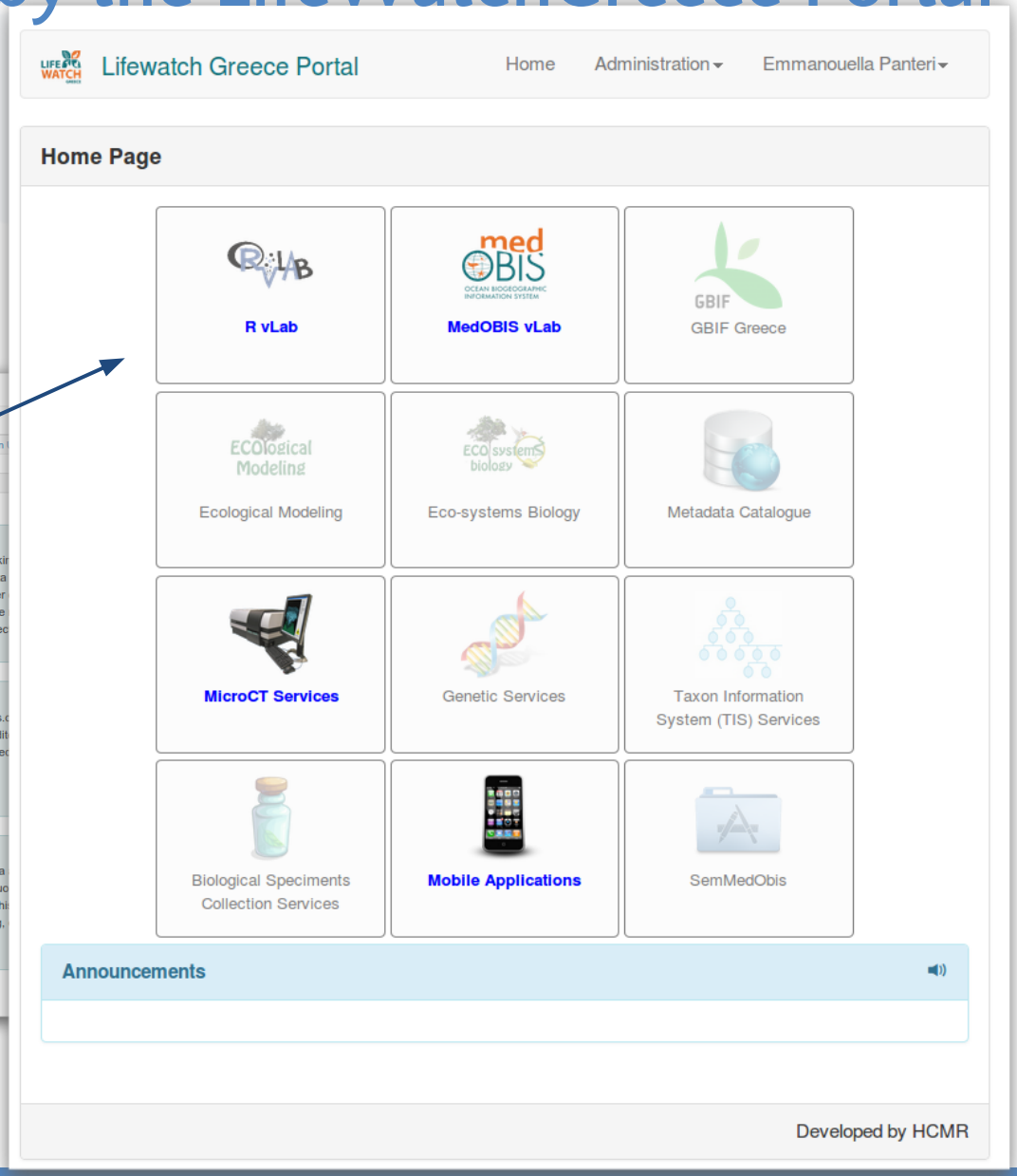
www.egi.eu

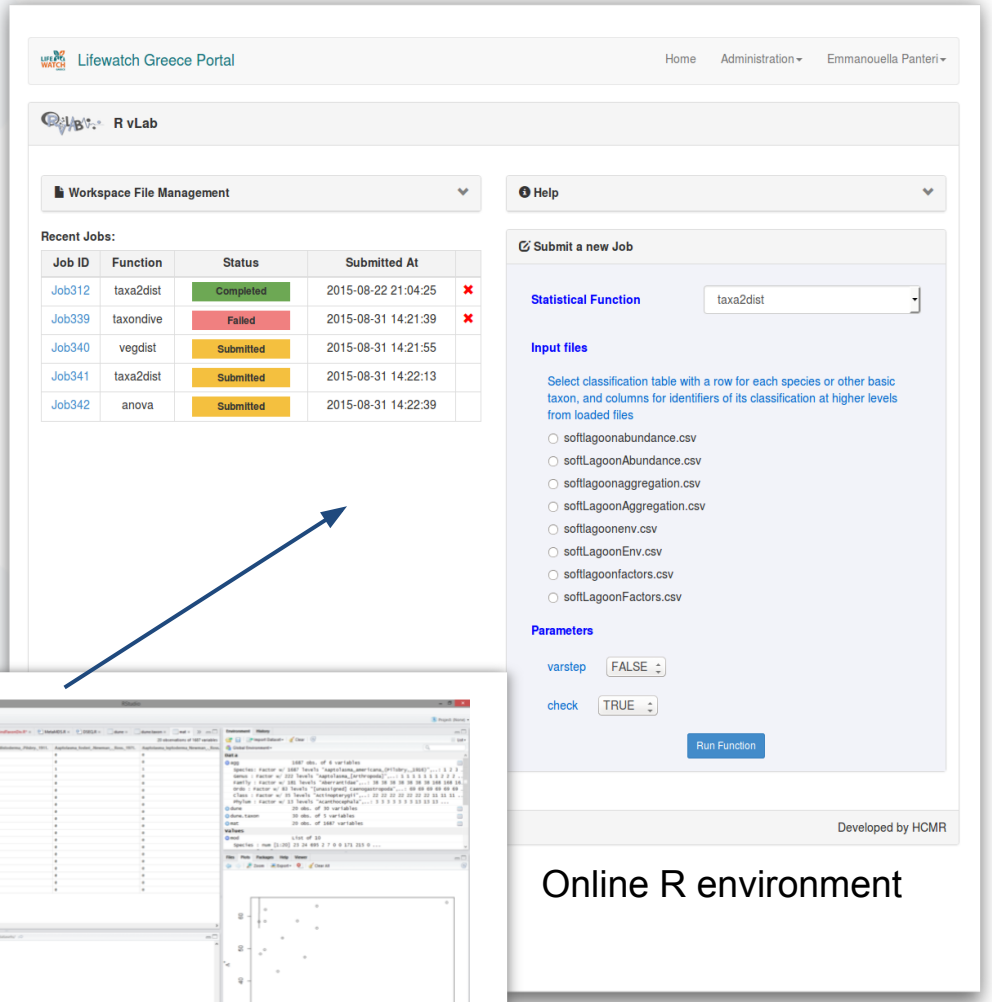
portal.lifewatchgreece.eu



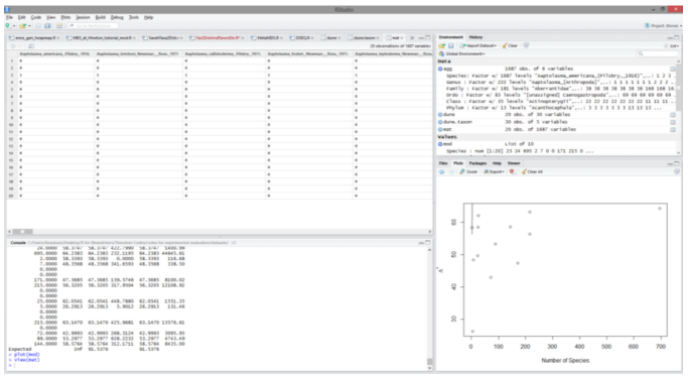


The RvLab

- Uses the “R” programming language
- Supports an integrated and optimized online R environment (data manipulation and computational speed-up)
- Allows to overcome severe computational power deficit, e.g.: Calculation on large matrices of several biodiversity indices and of multivariate analyses



Online R environment



Local R environment

Main file formats required for R

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	Orbiniidae	Polychaeta		Annelida	Animalia
Platyhelminthes						Platyhelminthes	Animalia

- Abundance matrix
- Species aggregation file
- Environmental data file
- Factor file

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

```
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-
Abra alba,0,0,0
```

Main file formats required for R

```
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-
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Cerastoderma edule,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Cerithium vulgatum,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Dexamine spinosa,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Eumida sanguinea,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Gammarus aequicauda,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Idotea balthica basteri,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Loripes lucinalis,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Paranemonia cinerea,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
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Phylo foetida,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Platyhelminthes,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Armandia cirrhosa,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Capitella capitata,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Sphaeroma serratum,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Tanais dulongii,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Anchialina agilis,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Chironomidae,0,0,0,0,0,0,0,0,0,0,42,40,31,49,32,83,42,35,33,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Oligochaeta,0,0,0,0,0,0,0,0,0,20,11,24,21,12,21,9,34,29,14,12,2,92,85,116,2,0,1,23,0,12,18,30,28,0,15,16
Pisidium,0,0,0,0,0,0,0,0,0,1,0,1,1,1,3,2,2,2,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Ceratopogonidae,0,0,0,0,0,0,0,0,0,2,8,0,5,2,5,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Sphaerium corneum,0,0,0,0,0,0,0,0,0,0,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Pontogammarus robustoides,0,0,0,0,0,0,0,0,0,0,0,0,0,0,2,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
Marenzelleria neglecta,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,11,39,9,30,21,41,41,29,26,59,61,65,42,39,47,11,43,22
Marenzelleria,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,2,4,0,1,1,1,0,4,1,1,5,1,1,1,0,1,4,2
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Turbellaria,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,7,14,0,0,2,5,0,9,1
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Glyptotendipes,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,2
```

Comma delimited file (csv)

Layout of abundance matrix for R

	A	B	C	D	E	F	G	H	I	J	K	
1	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	LT-CU01-VE-P1-R1	LT-
2	Abra alba	0	0	0	0	0	0	0	0	0	0	
3	Cerastoderma edule	0	0	0	0	0	0	0	0	0	0	
4	Cerithium vulgatum	0	0	0	0	0	0	0	0	0	0	
5	Dexamine spinosa	0	0	0	0	0	0	0	0	0	0	
6	Eumida sanguinea	0	0	0	0	0	0	0	0	0	0	
7	Gammarus aequicauda	0	0	0	0	0	0	0	0	0	0	
8	Idotea balthica basteri	0	0	0	0	0	0	0	0	0	0	
9	Loripes lucinalis	0	0	0	0	0	0	0	0	0	0	
10	Paranemonia cinerea	0	0	0	0	0	0	0	0	0	0	
11	Perinereis rullieri	0	0	0	0	0	0	0	0	0	0	
12	Phylo foetida	0	0	0	0	0	0	0	0	0	0	
13	Platyhelminthes	0	0	0	0	0	0	0	0	0	0	
14	Armandia cirrhosa	0	0	0	0	0	0	0	0	0	0	
15	Capitella capitata	0	0	0	0	0	0	0	0	0	0	
16	Sphaeroma serratum	0	0	0	0	0	0	0	0	0	0	
17	Tanais dulongii	0	0	0	0	0	0	0	0	0	0	
18	Anchialina agilis	0	0	0	0	0	0	0	0	0	0	
19	Chironomidae	0	0	0	0	0	0	0	0	0	42	
20	Oligochaeta	0	0	0	0	0	0	0	0	0	20	
21	Pisidium	0	0	0	0	0	0	0	0	0	1	
22	Ceratopogonidae	0	0	0	0	0	0	0	0	0	2	
23	Sphaerium corneum	0	0	0	0	0	0	0	0	0	0	
24	Pontogammarus robustoides	0	0	0	0	0	0	0	0	0	0	
25	Marenzelleria neglecta	0	0	0	0	0	0	0	0	0	0	
26	Marenzelleria	0	0	0	0	0	0	0	0	0	0	
27	Marenzelleria viridis	0	0	0	0	0	0	0	0	0	0	
28	Turbellaria	0	0	0	0	0	0	0	0	0	0	

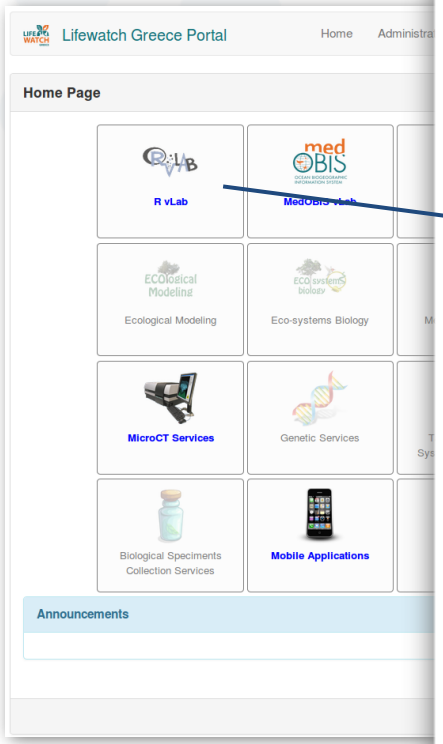
Abundance matrix

Layout of abundance matrix for R

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

Environmental data and factor file for R

RvLab Registration



Lifewatch Greece Portal

R vLab

R vLab Registration (Select and submit. That's it!)

Please, provide me access to R vLab for:

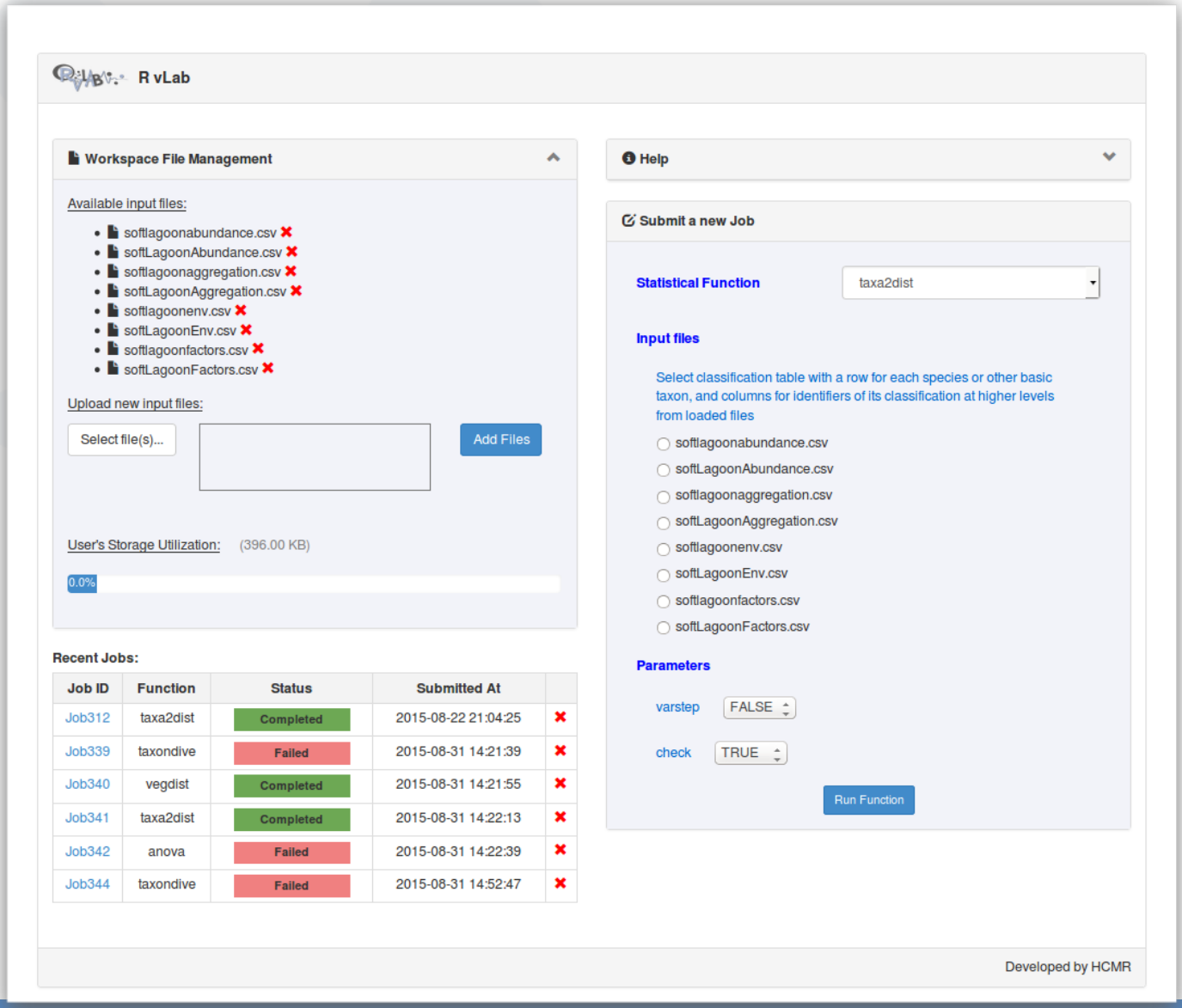
- 1 week
- 1 week
- 1 month
- 6 month

Register

Note: Please, try to select the registration period that represents in the best way your intentions. For example, if you are requesting short-term access only to try or check out the R vLab functionality, select the "1 day". Making such a selection help us to provide a minimum quality of service to as many users as possible.

Developed by HCMR

RvLab Main Page

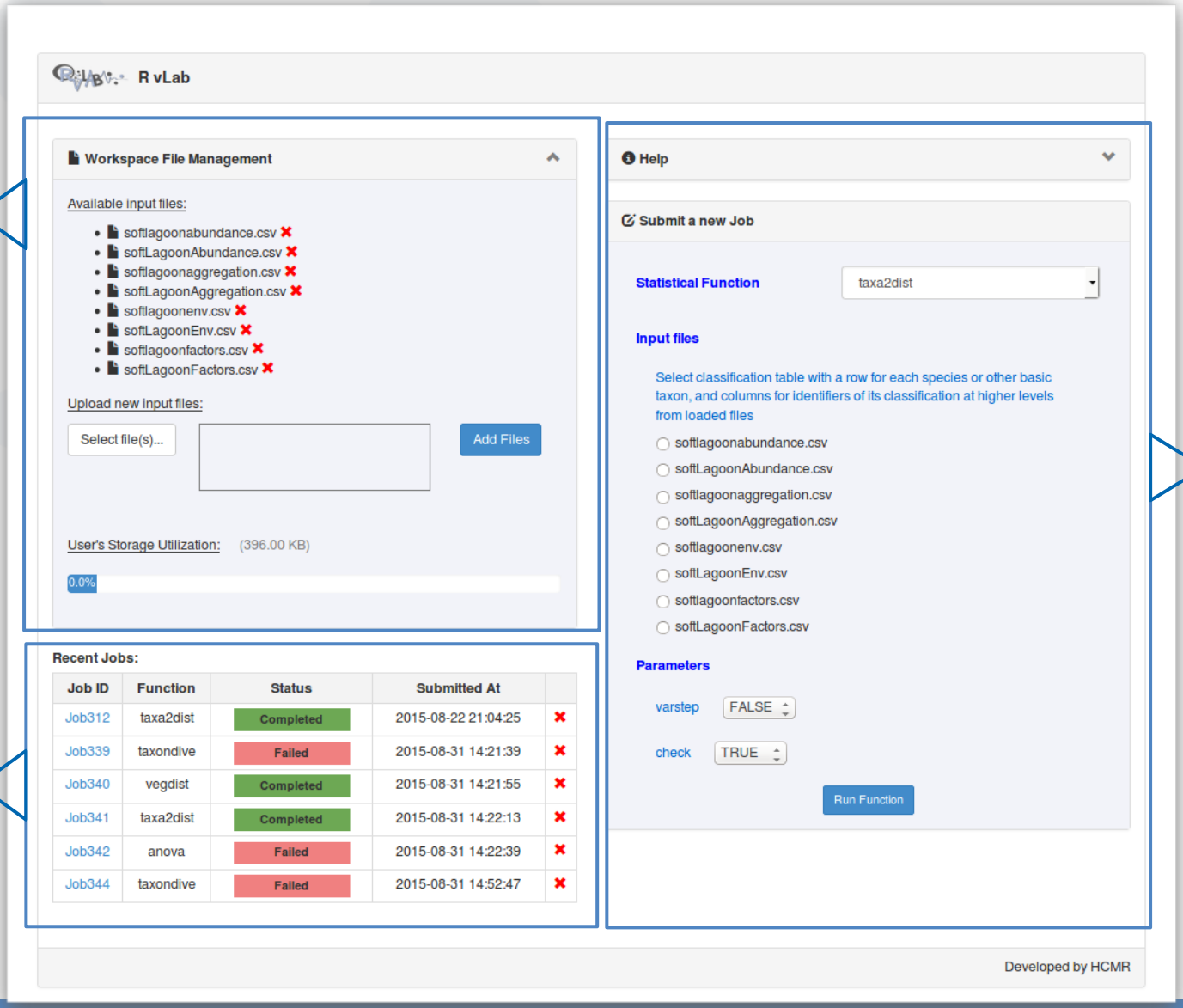


RvLab Main Page

Workspace (Files)

Jobs Submitted

Functions area

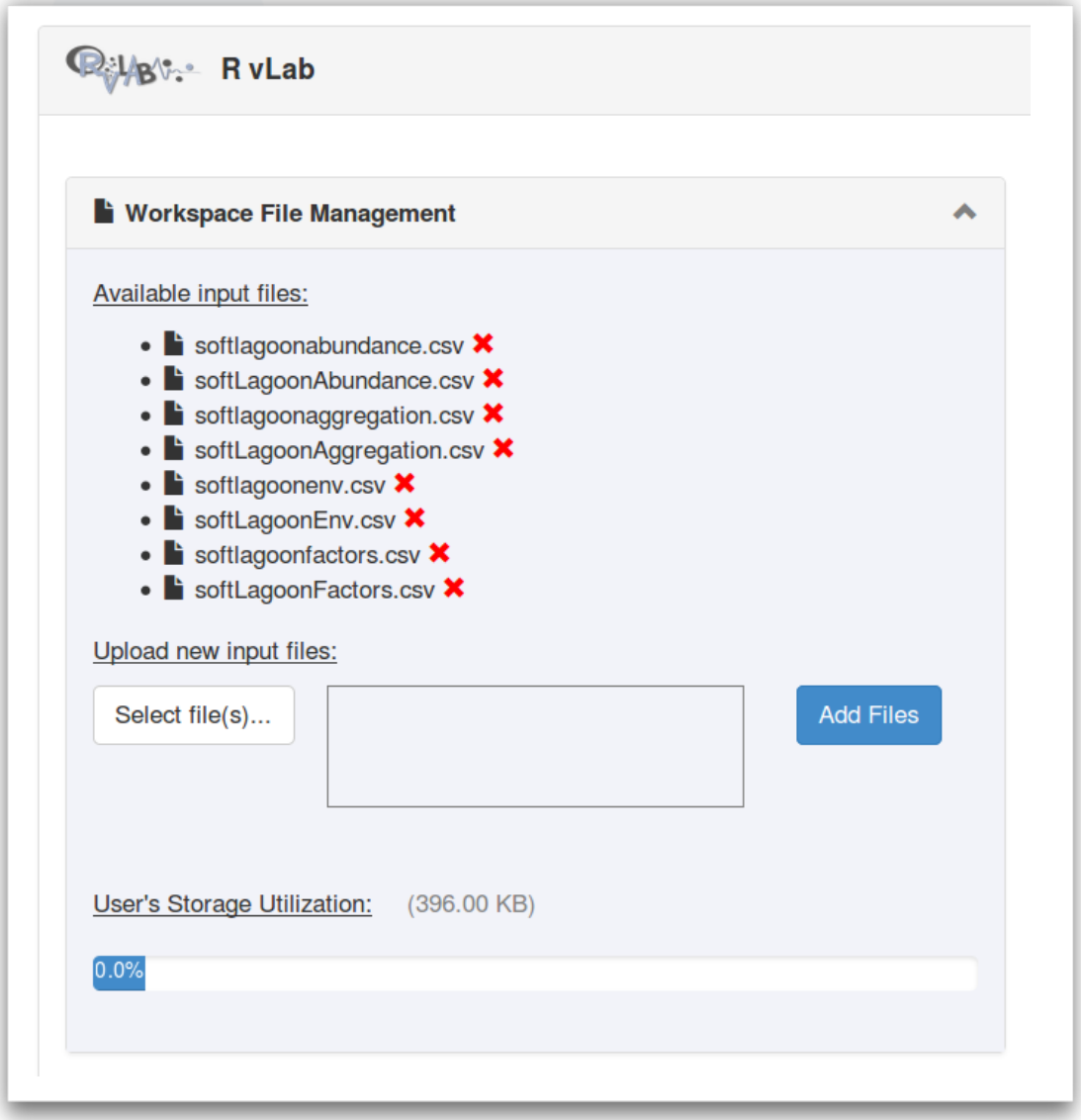


RvLab Workspace

Workspace (Files)

Upload (Files)

User Storage

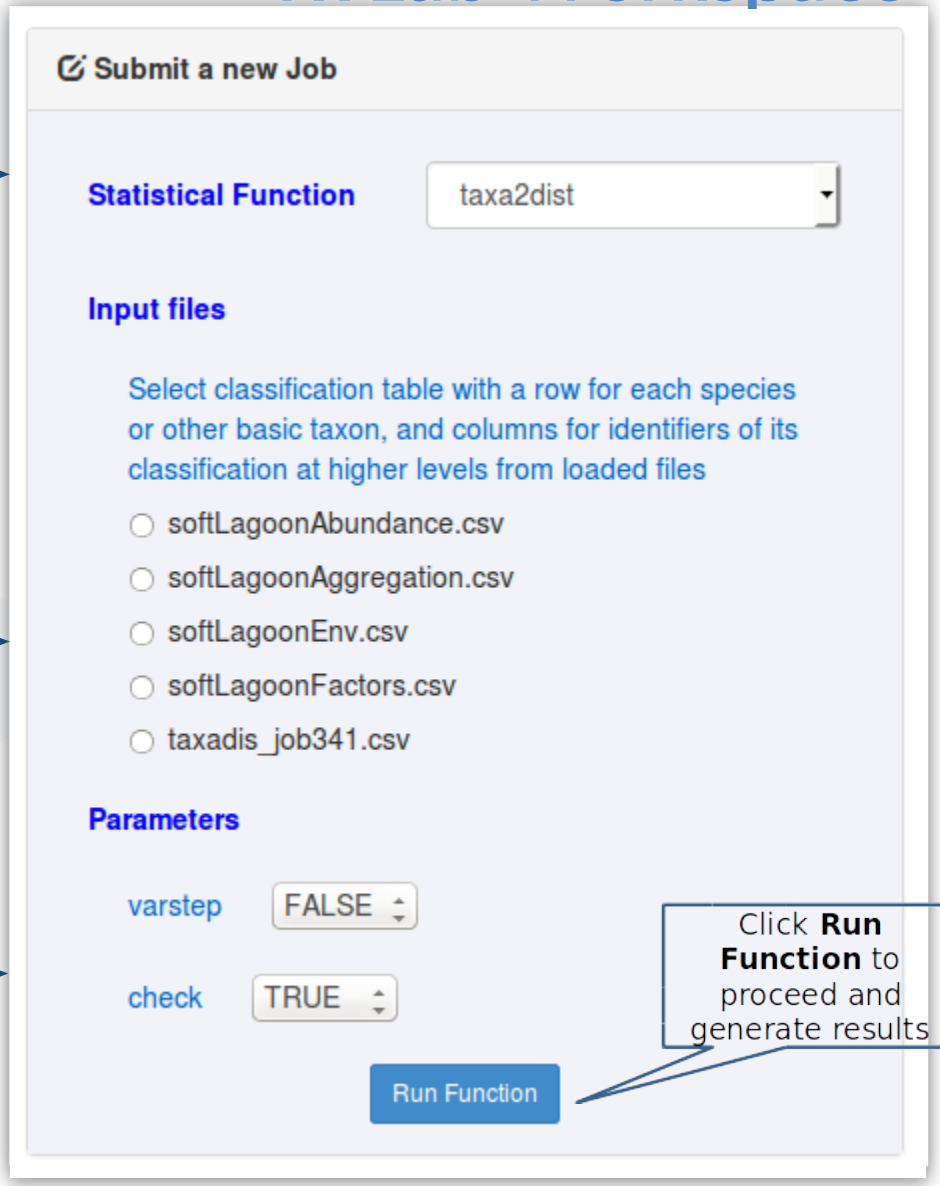


RvLab Workspace

Functions Selection

Files Selection

Other Parameters



RvLab Jobs

Jobs

R vLab

Workspace File Management

Recent Jobs:

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	✖
Job346	taxondive	Submitted	2015-08-31 16:26:57	

Wait for results to be generated

Jobs Results

R vLab

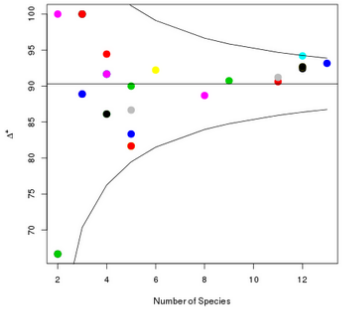
Job313 Information/Results (taxondive)

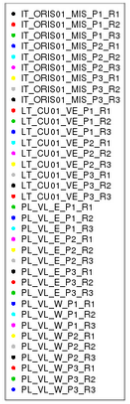
Files produced as output:

taxondive.csv

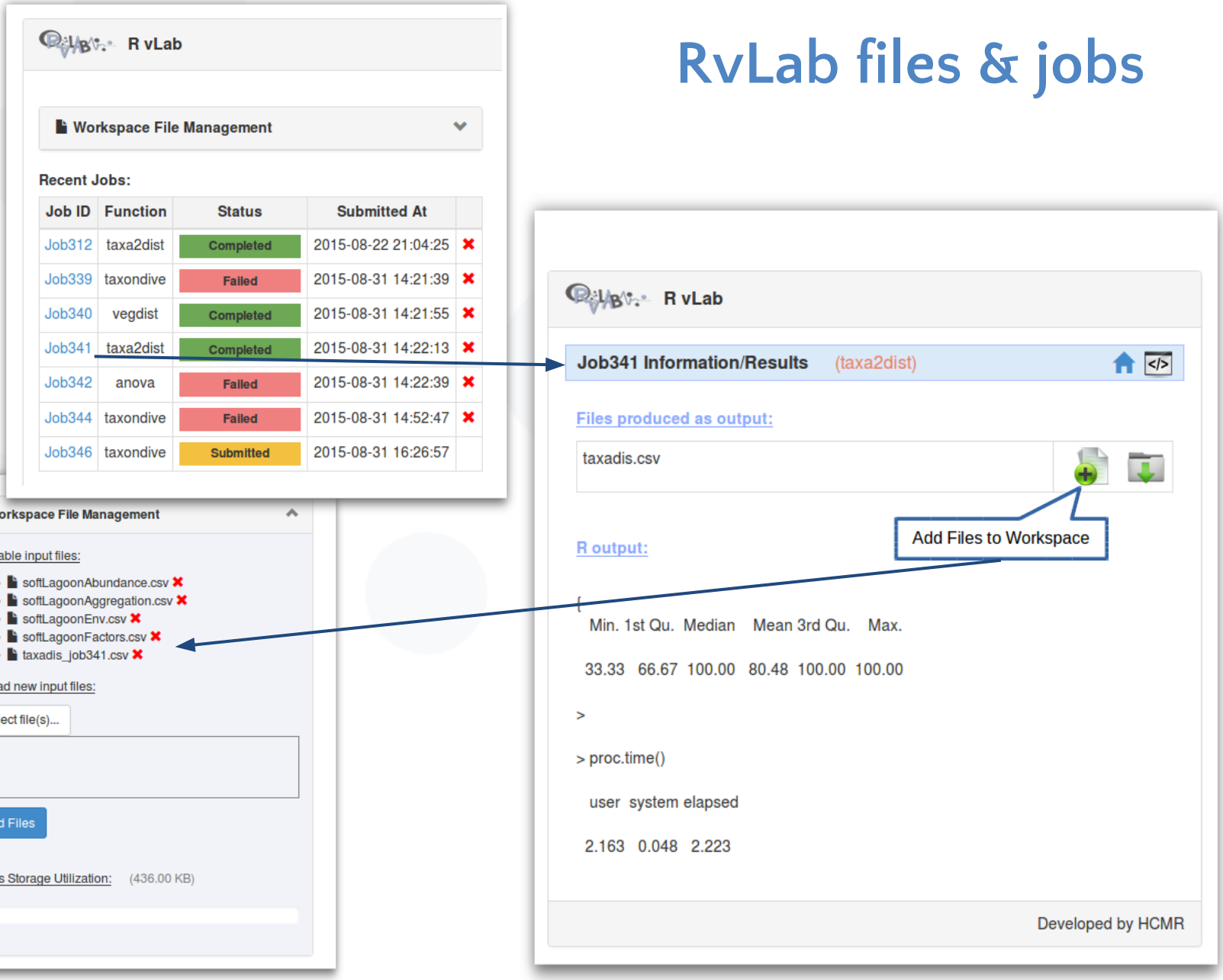
R output:

```
{
                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    2.1881    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
```





RvLab files & jobs



RvLab Mobile Application

www.egi.eu

portal.lifewatchgreece.eu

RvLab Mobile app workflow

LifeWatchGreece

LifeWatchGreece Research Infrastructure , funded by the GSRT (Greek government: structural funds), is the national effort to address the above requirement and to support relevant studies.
To materialize its aim, LWG RI adheres to the central **lifewatch.eu** guidelines, and attempts to ally all the Greek scientific human resources working on biodiversity data and data observatories.
Coordinated by the Institute of Marine Biology, Biotechnology and Aquaculture (IMBBC, www.imbbc.hcmr.gr) of the **Hellenic Center for Marine Research** (HCMR, www.hcmr.gr), LWG includes 49 partner institutions covering a wide range of scientific disciplines (terrestrial, marine and freshwater biology, zoology, botany, geography, forestry, agriculture, genetics, biotechnology, pharmacy, aquaculture, education and law).

Thank you ;)