

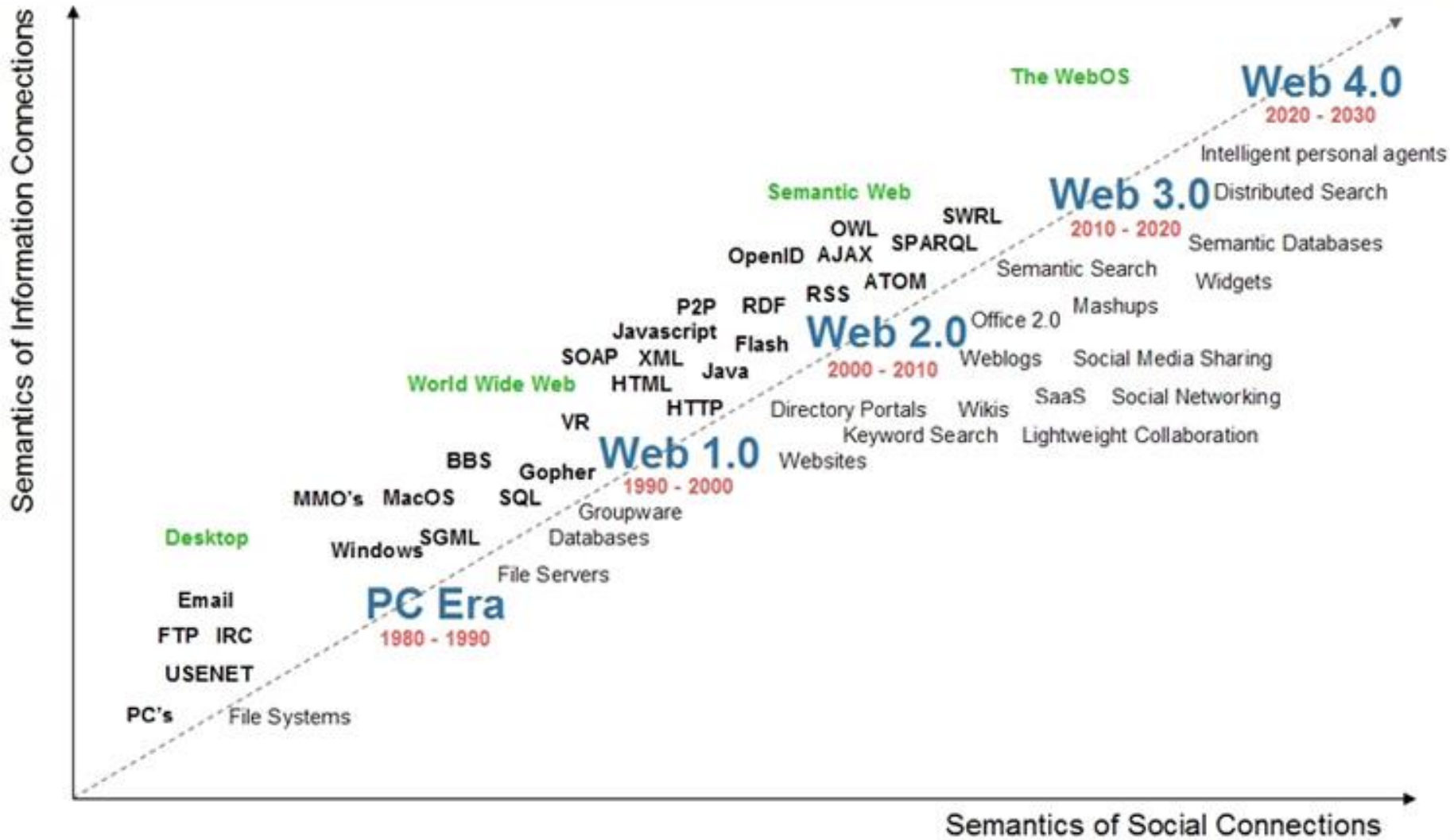


Introduction to web services and LifeWatch virtual labs

Stefanie Dekeyzer, Klaas Deneudt



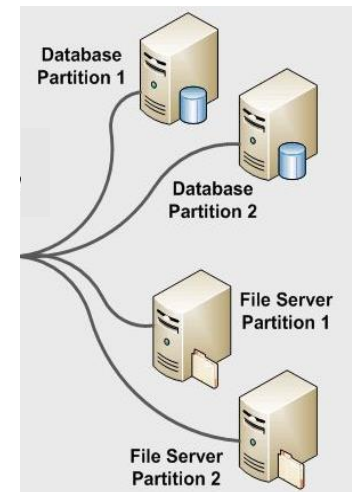
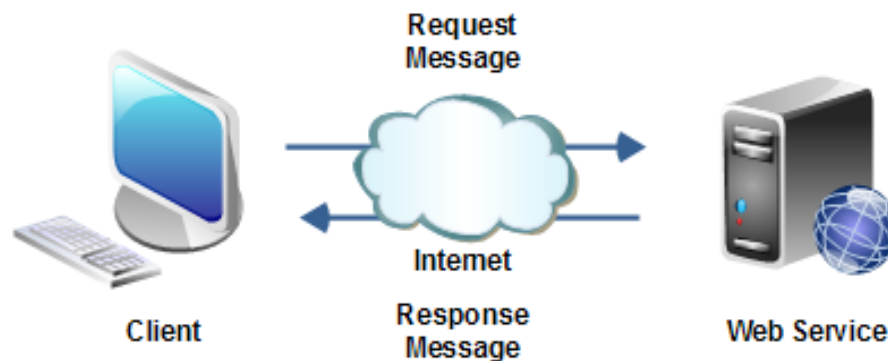
Vlaams Instituut voor de Zee vzw
Flanders Marine Institute

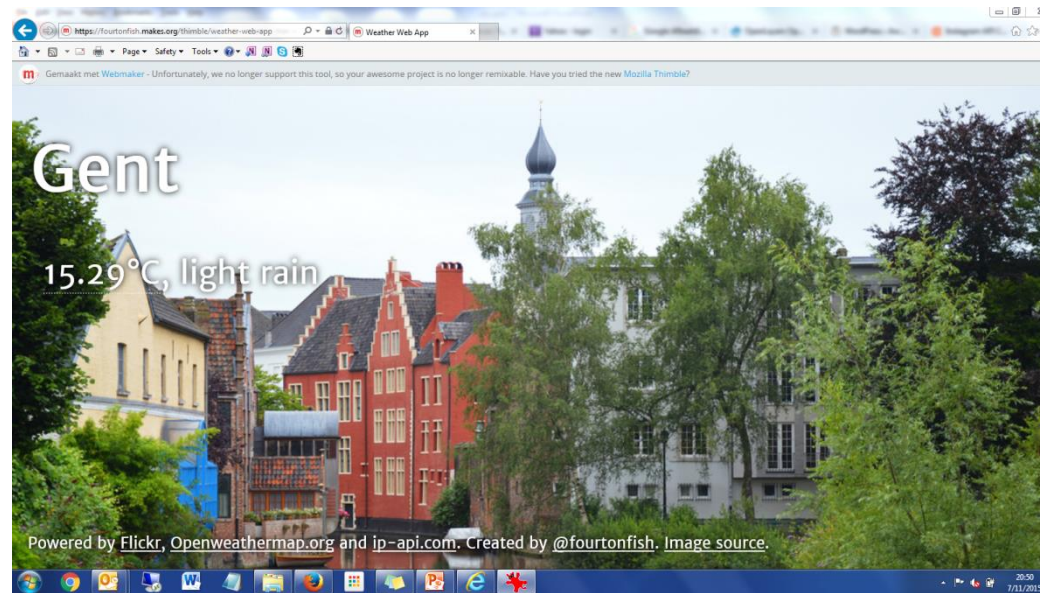


Source: Radar Networks & Nova Spivack, 200

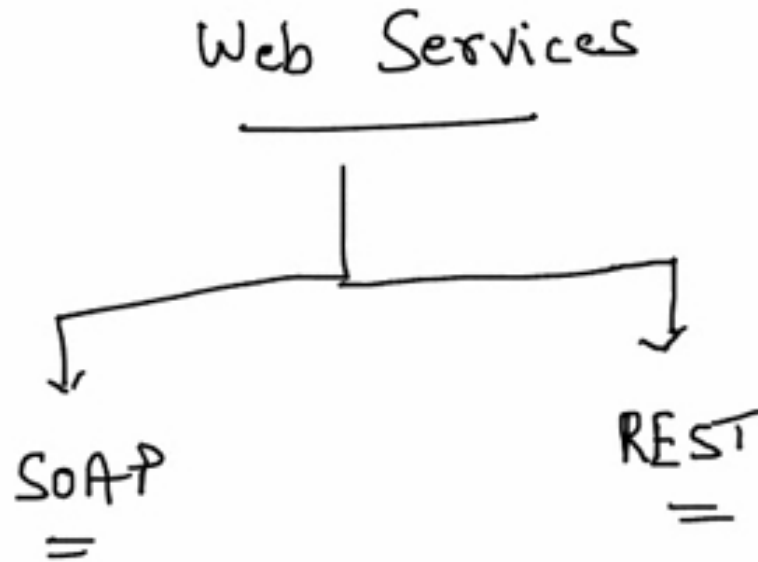
What are web services?

Web services are systems that allow communication between several computers over the web, and allow the user to access information directly from within other applications.





What are web services?



Simple Object Access Protocol

protocol

only XML

WSDL (web service description language)

HTTP, SMTP, ...

additional features on security,

transaction,

Representation State Transfer

architectural style

XML, JSON, etc...

only over HTTP

What are web services?

Examples from everyday live:

- Google Maps

<http://maps.googleapis.com/maps/api/geocode/json?address=oostende>

- Openweathermap

<http://api.openweathermap.org/data/2.5/weather?q=Oostende&mode=xml&appid=2de143494c0b295cca9337e1e96b00e0>

- Twitter

<https://api.twitter.com/1.1>

- Google

<https://developers.google.com/apis-explorer/#p/>

- Facebook

Geospatial web services

- **OGC: Open Geospatial Consortium**

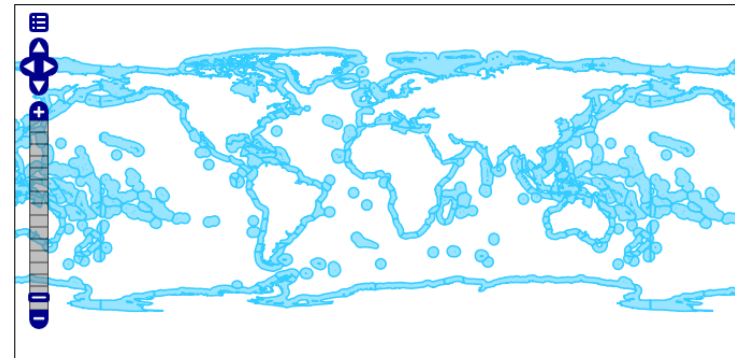


- Standards for:
 - Data Discovery:
 - CSW = Catalog Services for the Web
 - Data Visualization:
 - WMS= Web Mapping Services
 - Data Access:
 - WMS= Web Feature Services

Geospatial web services: WMS

- **WMS = Web Mapping Services**
 - Request to a web service for an image of a map

```
http://geo.vliz.be/geoserver/Ecoregions/wms?service=WMS
&version=1.1.0
&request=GetMap
&layers=Ecoregions:ecoregions
&styles=
&bbox=-180.0,-89.9,180.0,86.919
&width=671
&height=330
&srs=EPSG:4326
&format=application/openlayers
```



Scale = 1 : 279M
Click on the map to get feature info

15.11719, -93.43256

Geospatial web services: WMS

- **WFS = Web Feature Services**
 - Request to a web service for attribute information (GetCapabilities, DescribeFeatureType, GetFeature, GetGMLObject)

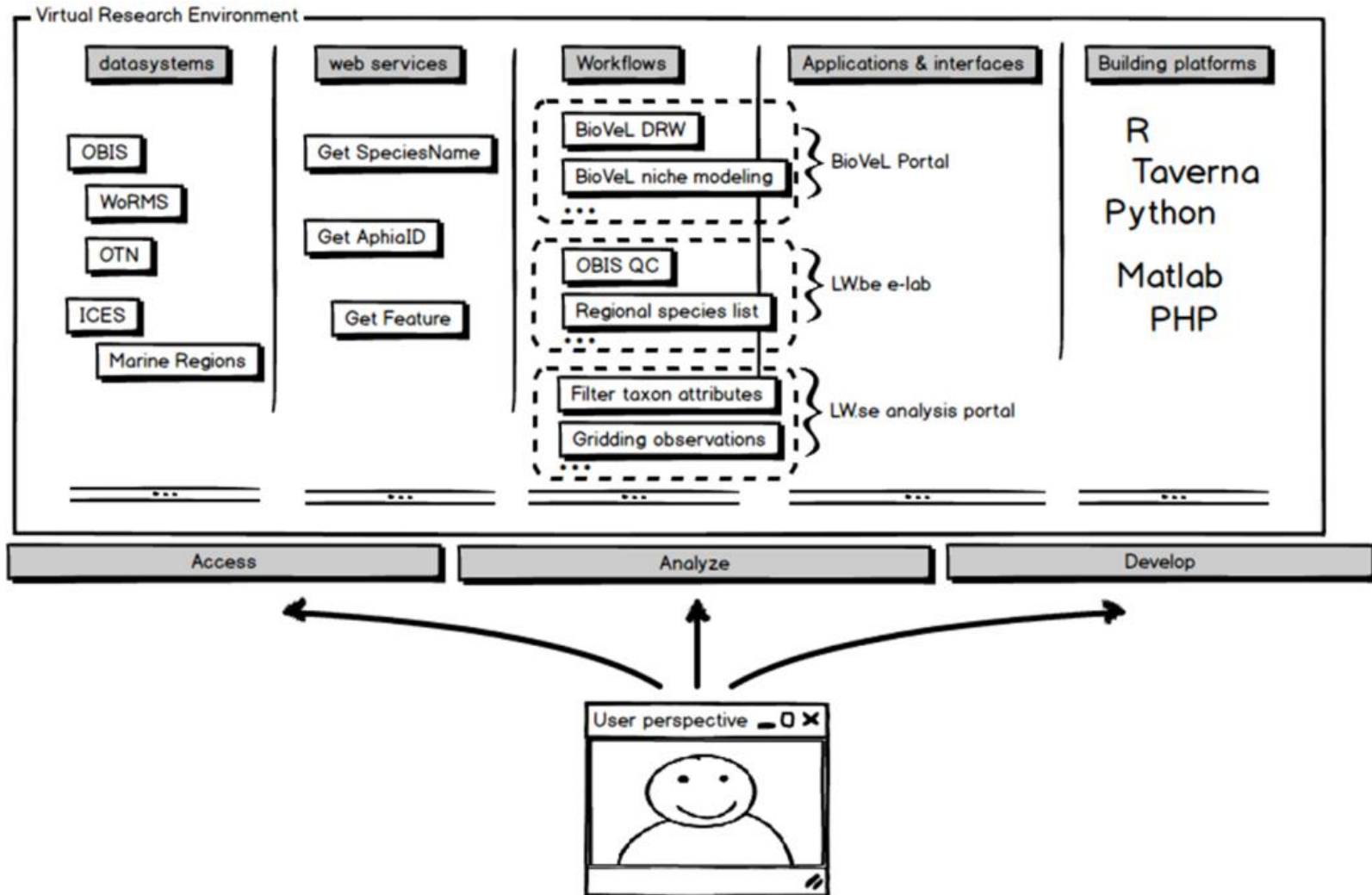
[http://geo.vliz.be/geoserver/wfsrequest=getfeature](http://geo.vliz.be/geoserver/wfsrequest=getfeature&service=WFS&version=1.1.0&typeName=Ecoregions:ecoregions&outputFormat=kml&filter=<PropertyIsEqualTo><PropertyName>Mrgid</PropertyName><Literal>21912</Literal></PropertyIsEqualTo>)
&**service**=WFS
&**version**=1.1.0
&**typeName**=
Ecoregions:ecoregions
&**outputFormat**=kml
&**filter**=

<PropertyIsEqualTo>
<PropertyName>Mrgid
</PropertyName>
<Literal>21912</Literal>
</PropertyIsEqualTo>

```
<wfs:FeatureCollection numberOFFeatures="1" timeStamp="2015-11-25T11:08:56.519Z" xsi:schemaLocation="http://geo.vliz.be/Ecoregions http://geo.vliz.be:80/geoserver/wfs?service=WFS&version=1.1.0&request=DescribeFeatureType&typeName=Ecoregions%3AEcoregions http://www.opengis.net/wfs http://geo.vliz.be:80/geoserver/schemas/wfs/1.1.0/wfs.xsd">
  <gml:boundedBy>
    <gml:Envelope srsDimension="2" srsName="urn:x-ogc:def:crs:EPSG:4326">
      <gml:lowerCorner>49.283605094526536 -4.431527895396897</gml:lowerCorner>
      <gml:upperCorner>64.11292524271684 12.934791161931827</gml:upperCorner>
    </gml:Envelope>
  </gml:boundedBy>
  <gml:featureMembers>
    <Ecoregions:ecoregions gml:id="ecoregions.215">
      <gml:boundedBy>
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          <gml:upperCorner>64.11292524271684 12.934791161931827</gml:upperCorner>
        </gml:Envelope>
      </gml:boundedBy>
      <Ecoregions:eco_code>20025</Ecoregions:eco_code>
      <Ecoregions:ecoregion>North Sea</Ecoregions:ecoregion>
      <Ecoregions:lat>55.54280090332</Ecoregions:lat>
      <Ecoregions:long>4.59313011169</Ecoregions:long>
      <Ecoregions:placetype>Marine Ecoregion of the World (MEOW)</Ecoregions:placetype>
      <Ecoregions:mrgid>21912</Ecoregions:mrgid>
    </Ecoregions:the_geom>
  </gml:MultiSurface srsDimension="2" srsName="urn:x-ogc:def:crs:EPSG:4326">
    <gml:surfaceMember>
      <gml:Polygon srsDimension="2">
        <gml:exterior>
          <gml:LinearRing srsDimension="2">
            <gml:posList>
              54.70506078786252 11.975780236653065 54.57266723353672 11.978350986115089 54.58693616656058 11.974446169948777 54.60944509704885
              11.967886244943056 54.6297220943333 11.963052146016338 54.64777621092952 11.96000113325195 54.663328161762706 11.958606216921595
              54.680545093847314 11.961945231879895 54.699436059638884 11.969721123477427 54.70506078786252 11.975780236653065
            </gml:posList>
          </gml:LinearRing>
        </gml:exterior>
      </gml:Polygon>
    </gml:surfaceMember>
  </gml:surfaceMember>

```

Why do we need web services in LW?



Why do we need web services in LW?

Say, a certain scientist has a certain question:

What is the maximum and minimum salinity where organisms with DNA seq homology above $x\%$ with this DNA seq. have been found?

To solve this question you need:

Genomic, taxonomic, biogeographic & environmental data

? Where is this data available? → distributed repositories

? Do you have access to the data? → sometimes poor

? How to piece all data together to form a coherent answer?

Where to find web services?

Catalogues

Discover

Register

Annotate

Monitor

Catalogues with relevant web services:

- **BiodiversityCatalogue**

- Focus on biodiversity science web services
- <https://www.biodiversitycatalogue.org/>

- **BioCatalogue**

- Focus on life science web services
- <https://www.biocatalogue.org/>

Both catalogues are **community-oriented** websites where service providers and community experts can **register** and **curate** services, and where users can **discover** them.

Where to find web services?

Catalogues

Discover

Register

Annotate

Monitor

Geographic web services are listed in numerous spatial data catalogues, often with a specific contextual scope.

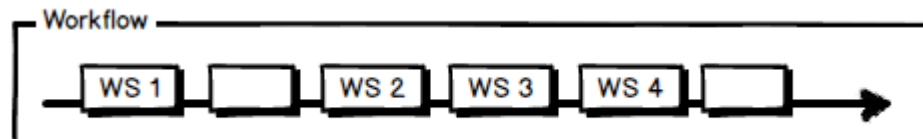
- **GeoNetwork Opensource**

- Offers catalogue applications for managing spatially referenced resources and documenting their web service parameters.
- Example: <http://geonetwork.vliz.be>

Specifications of the geographic web services are specified by the **OGC standards** (<http://www.opengeospatial.org/>).

How to connect web services into workflows?

- **myExperiment**
 - find, use and share scientific workflows
 - <http://www.myexperiment.org/home>
- **BioVeL Portal**
 - run scientific workflows
 - <https://portal.biovel.eu/>
- **Taverna Workbench**
 - design and execute scientific workflows
 - <http://www.taverna.org.uk/>



1. Upload your file

Select one of the demo data files and choose from several web services, models and applications to process the data.

To work with other data files, please [log in](#).

If you are new to this service, please read the [manual](#).

File: No file chosen

Use demo file:

Allowed filetypes: Plain text [TXT] | Plain text [CSV] | excel [XLS] | excel [XLSX]

Maximum rows in file: 60000

Heading First row contains column names

Column delimiter:

Decimal symbol:

Data format:

2. Select webservices

Name	Source	Description	Environment	Status
<input type="checkbox"/> Data validation and QC services				
<input type="checkbox"/> MarineRegions gazetteer services				
<input type="checkbox"/> Taxon observations				
<input type="checkbox"/> Taxon services				
<input type="checkbox"/> Tidal services				
<input type="checkbox"/> Geographical services - Administrative boundaries				
<input type="checkbox"/> Geographical services - Bathymetry				
<input type="checkbox"/> Geographical services - Biogeographical classification				
<input type="checkbox"/> Geographical services - Environmental data				
<input type="checkbox"/> Geographical services - Features				
<input type="checkbox"/> Geographical services - Protected areas				
<input type="checkbox"/> Geographical services - Total biological valuation				

3. Verify order, change order if necessary and run

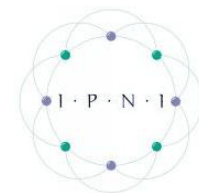
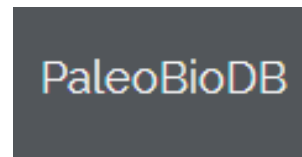
Selected services

Comment:

<http://www.lifewatch.be/data-services/>

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Increased data access: data systems are interconnected and accessible in one place (both local and global data systems)



Marineregions.org

towards a standard for georeferenced marine names

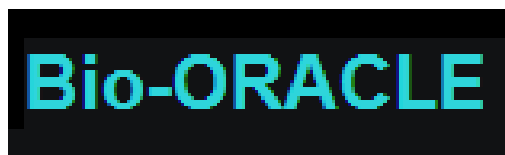
MARSPEC

Ocean Climate Layers for Marine Spatial Ecology

Administrative boundaries
Biogeographical classification

Flemish Ecological Network

Marine and Terrestrial Biological Valuation maps



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Increased data access: data systems are interconnected and accessible in one place (both local and global data systems)

Data standardization

Quality control

Visualization

Data analysis

Retrieval of additional data

Available through an online interactive data portal:

<http://www.lifewatch.be/data-services>

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Select one of the demo data files and choose from several web services. To work with other data files, please [log in](#). If you are new to this service, please read the [manual](#).

File: No file chosen

Use demo file: View demo file

Allowed filetypes: Plain text [TXT] | Plain text [CSV] | excel [XLS] | excel [XLSX]

Maximum rows in file: 60000

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<input type="checkbox"/> Data validation and QC services		
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<input type="checkbox"/> Geographical services - Administrative boundaries		
<input type="checkbox"/> Geographical services - Bathymetry		
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<input type="checkbox"/> Geographical services - Protected areas		
<input type="checkbox"/> Geographical services - Total biological valuation		

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Selected services

demofile_lifewatch_marine (6) - Notepad

ScientificName	Latitude	Longitude	Eventdate
Abtudomelita obtusata	51.14	2.376667	2009/03/03T10:48:00Z
Abra 51.29117	2.524167	2009/03/03T10:48:00Z	
Abra alba	51.12267	2.533333	2009/03/03T10:48:00Z
Abra prismatica	51.12183	2.603333	2009/03/03T10:48:00Z
Acanthomysis longicornis	51.12183	2.603333	2009/03/03T10:48:00Z
Acari 51.09076	2.370717	2009/03/03T10:48:00Z	
Acartia clausi	51.30833	2.626333	2009/03/03T10:48:00Z
Achelia 51.185	2.701167	2009/03/03T10:48:00Z	
Achelia hispida	51.185	2.701167	2009/03/03T10:48:00Z
Acidostoma obesum	51.27917	2.616667	2009/03/03T10:48:00Z
Acrocnida brachiata	51.27083	2.905	2009/03/03T10:48:00Z
Actinaria 51.23617	2.8555	2009/03/03T10:48:00Z	
Aeolidia papilosa	51.33333	2.7	2009/03/03T10:48:00Z
Aeolidiidae 51.325	3.05	2009/03/03T10:48:00Z	
Aequipecten opercularis	51.325	3.05	2009/03/03T10:48:00Z
Agonus cataphractus	51.27783	2.913167	2009/03/03T10:48:00Z
Alcyonium digitatum	51.283	2.9213	2009/03/03T10:48:00Z
Alloteuthis subulata	51.283	2.9213	2009/03/03T10:48:00Z
Alosa alosa	51.27783	2.913167	2009/03/03T10:48:00Z
Alosa fallax	51.66033	2.85217	2009/03/03T10:48:00Z
Ammodytes 51.33333	2.683333	2009/03/03T10:48:00Z	
Ammodytes lanceolatus	51.46	2.791667	2009/03/03T10:48:00Z
Ammodytes marinus	51.41667	3.4	2009/03/03T10:48:00Z
Ammodytes tobianus	51.41667	3.4	2009/03/03T10:48:00Z
Ammodytidae 51.4142	3.321256	2009/03/03T10:48:00Z	
ampelisca 51.50783	2.891167	2009/03/03T10:48:00Z	
Ampelisca brevicornis	51.52633	2.913833	2009/03/03T10:48:00Z
Ampharete 51.43333	2.808333	2009/03/03T10:48:00Z	
Amphilochus manudens	51.5	2.976333	2009/03/03T10:48:00Z
Amphilochus neapolitanus	51.5	2.999667	2009/03/03T10:48:00Z
Amphinema dinema		2009/03/03T10:48:00Z	
Amphipholis squamata	51.52367	2.097	2009/03/03T10:48:00Z
Amphipoda 51.38467	2.7775	2009/03/03T10:48:00Z	
Amphiura 51.27667	2.613333	2009/03/03T10:48:00Z	
Amphiura brachiata	51.4405	2.900833	2009/03/03T10:48:00Z
Amphiura chajaei	51.24873	2.730233	2009/03/03T10:48:00Z
Amphiura filiformis	51.24873	2.730233	2009/03/03T10:48:00Z
Amphiuridae 51.2465	2.726167	2009/03/03T10:48:00Z	
Ampithoe 51.2505	2.734667	2009/03/03T10:48:00Z	
Anapagurus hyndmanii	51.2465	2.726167	2009/03/03T10:48:00Z
Anarhichas lupus	51.2505	2.734667	2009/03/03T10:48:00Z
Anchialina agilis		2009/03/03T10:48:00Z	
Anguilla anguilla	51.30833	2.85	2009/03/03T10:48:00Z
Angulus tenuis	51.30833	2.85	2009/03/03T10:48:00Z
Anomia 51.53333	2.765	2009/03/03T10:48:00Z	
Anomura 51.51667	3.316667	2009/03/03T10:48:00Z	
Anoplodactylidae 51.60133	2.83	2009/03/03T10:48:00Z	
Anoplodactylus petiolatus	51.61833	2.955	2009/03/03T10:48:00Z

Comment:

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Heading First row contains column names
 Column delimiter
 Decimal symbol
 Data format

2. Select webservice

Name	Source	Description	Environment	Status
<input type="checkbox"/> Data validation and QC services				
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<input type="checkbox"/> Geographical services - Bathymetry				
<input type="checkbox"/> Geographical services - Biogeographical classification				
<input type="checkbox"/> Geographical services - Environmental data				
<input type="checkbox"/> Geographical services - Features				
<input type="checkbox"/> Geographical services - Protected areas				
<input type="checkbox"/> Geographical services - Total biological valuation				

3. Verify order, change order if necessary and run

Selected services

Comment:

<http://www.lifewatch.be/data-services/>

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Maximum rows in file: 60000

Heading First row contains column names

Column delimiter:

Decimal symbol:

Data format:

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<input type="checkbox"/> Data validation and QC services				
<input type="checkbox"/> MarineRegions gazetteer services				
<input type="checkbox"/> Taxon observations				
<input type="checkbox"/> Taxon services				
<input type="checkbox"/> Tidal services				
<input type="checkbox"/> Geographical services - Administrative boundaries				
<input type="checkbox"/> Geographical services - Bathymetry				
<input type="checkbox"/> Geographical services - Biogeographical classification				
<input type="checkbox"/> Geographical services - Environmental data				
<input type="checkbox"/> Geographical services - Features				
<input type="checkbox"/> Geographical services - Protected areas				
<input type="checkbox"/> Geographical services - Total biological valuation				

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Selected services

Comment:

<http://www.lifewatch.be/data-services/>

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→ Data validation and QC services

2. Select webservices

	Name	Source	Description	Environment	Status
<input type="checkbox"/> Data validation and QC services					
<input type="checkbox"/>	Show on map	VLIZ	This service generates a map based on the latitude and longitude in the uploaded data file. The resu... Read more	Marine & terrestrial	Good
<input type="checkbox"/>	Data format validation	VLIZ	The LifeWatch portal uses a specific standard data format based on Darwin Core and the OBIS scheme (... Read more	Marine & terrestrial	Good
<input type="checkbox"/>	Check OBIS file	VLIZ	Checks if the uploaded data file matches the OBIS scheme (mandatory and missing fields), checks the ... Read more	marine	Good
<input type="checkbox"/> MarineRegions gazetteer services					
<input type="checkbox"/> Taxon observations					
<input type="checkbox"/> Taxon services					
<input type="checkbox"/> Tidal services					
<input type="checkbox"/> Geographical services - Administrative boundaries					
<input type="checkbox"/> Geographical services - Bathymetry					
<input type="checkbox"/> Geographical services - Biogeographical classification					
<input type="checkbox"/> Geographical services - Environmental data					
<input type="checkbox"/> Geographical services - Features					
<input type="checkbox"/> Geographical services - Protected areas					
<input type="checkbox"/> Geographical services - Total biological valuation					

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→ MarineRegions gazetteer services

2. Select webservices

	Name	Source	Description	Environment	Status
☐ Data validation and QC services					
☐ MarineRegions gazetteer services					
<input type="checkbox"/>	Get lat-long by mrgid	MarineRegions	Returns the latitude and longitude of the centroid and the preferred gazetteer name of a Marine Regi... Read more	Marine & terrestrial	Good
<input type="checkbox"/>	Get lat-long by name	MarineRegions	Returns the latitude, longitude, matched name and the Marine Regions ID (MRGID) of a given gazetteer... Read more	Marine & terrestrial	Good
<input type="checkbox"/>	Get gazetteer name by Lat-long	MarineRegions	Returns the Marine Regions place name and the Marine Regions ID (MRGID) of the bounding box (radius ... Read more	Marine & terrestrial	Good
<input type="checkbox"/>	Get lat-long by accepted name	MarineRegions	Returns the latitude, longitude, accepted name and the Marine Regions ID (MRGID) of a given gazetteer... Read more	Marine & terrestrial	Good
☐ Taxon observations					
☐ Taxon services					
☐ Tidal services					
☐ Geographical services - Administrative boundaries					
☐ Geographical services - Bathymetry					
☐ Geographical services - Biogeographical classification					
☐ Geographical services - Environmental data					
☐ Geographical services - Features					
☐ Geographical services - Protected areas					
☐ Geographical services - Total biological valuation					

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→ Taxon observations

2. Select webservices

Name	Source	Description	Environment	Status
☒ Data validation and QC services				
☒ MarineRegions gazetteer services				
☒ Taxon observations				
<input type="checkbox"/> Number of observations of a marine taxon	OBIS	Returns all observation points (latitude and longitude) in the Ocean Biogeographic Information System. Read more	marine	Good
<input type="checkbox"/> Number of observations in a 1000m radius around a point	OBIS	Gives the number of observations of a taxon in a radius of 1000 meter around a point.	marine	Good
<input type="checkbox"/> Taxon list of a certain region	OBIS	Gives a taxon list based on observations from the obis database for a certain region (mrgid as input). Read more	marine	Good
☒ Taxon services				
☒ Tidal services				
☒ Geographical services - Administrative boundaries				
☒ Geographical services - Bathymetry				
☒ Geographical services - Biogeographical classification				
☒ Geographical services - Environmental data				
☒ Geographical services - Features				
☒ Geographical services - Protected areas				
☒ Geographical services - Total biological valuation				

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→ Taxon services

2. Select webservice

Name	Source	Description	Environment	Status
☐ Data validation and QC services				
☐ MarineRegions gazetteer services				
☐ Taxon observations				
☐ Taxon services				
<input type="checkbox"/> get AphiaID World Register of Marine Species (WoRMS)	WoRMS	Returns the (first) exact matching AphiaID for a given taxon name, based on ScientificName in the up... Read more	marine	Good
<input type="checkbox"/> Reverse taxon match by ITIS TSN	WoRMS and ITIS	Returns the AphiaRecord (scientificName, taxonomicStatus, etc...) by providing an <i>ITIS TSN</i>	marine	Good
<input type="checkbox"/> Reverse taxon match by AphiaID	WoRMS	Returns the AphiaRecord (scientificName, taxonomicStatus, etc...) by providing a <i>WoRMS AphiaID</i>	marine	Good
<input type="checkbox"/> Taxon match	WoRMS CoL ITIS PESI IPNI	Matches your taxon list with the World Register of Marine Species (WoRMS), Catalogue of Life (CoL), ... Read more	Marine & terrestrial	The current status of PaleoDB is unconfirmed
☐ Tidal services				
☐ Geographical services - Administrative boundaries				
☐ Geographical services - Bathymetry				
☐ Geographical services - Biogeographical classification				
☐ Geographical services - Environmental data				
☐ Geographical services - Features				
☐ Geographical services - Protected areas				
☐ Geographical services - Total biological valuation				

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→ Tidal services

2. Select webservice

	Name	Source	Description	Environment	Status
<input type="checkbox"/>	Data validation and QC services				
<input type="checkbox"/>	MarineRegions gazetteer services				
<input type="checkbox"/>	Taxon observations				
<input type="checkbox"/>	Taxon services				
<input type="checkbox"/>	Tidal services				
<input type="checkbox"/>	Calculate tidal reduction	MDK Meetnet Vlaamse Banken	Calculates tidal heights in NAP, GLLWS and TAW based on Latitude, Longitude and EventDate in the upl... Read more	marine	Good
<input type="checkbox"/>	Geographical services - Administrative boundaries				
<input type="checkbox"/>	Geographical services - Bathymetry				
<input type="checkbox"/>	Geographical services - Biogeographical classification				
<input type="checkbox"/>	Geographical services - Environmental data				
<input type="checkbox"/>	Geographical services - Features				
<input type="checkbox"/>	Geographical services - Protected areas				
<input type="checkbox"/>	Geographical services - Total biological valuation				

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→ Geographical services

2. Select webservices

Name	Source	Description	Environment	Status
▣ Data validation and QC services				
▣ MarineRegions gazetteer services				
▣ Taxon observations				
▣ Taxon services				
▣ Tidal services				
▣ Geographical services - Administrative boundaries				
<input type="checkbox"/> EMODnet regions	EMODnet regions	Returns the name of the EMODnet regions	marine	Good
<input type="checkbox"/> Exclusive Economic Zones	Marine Regions	Returns the name of the EEZ where the given coordinate is located.	marine	Good
<input type="checkbox"/> ICES Ecoregions	The International Council for the Exploration of the Sea (ICES)	Returns the ICES ecoregion code and description based on latitude and longitude.	marine	Good
<input type="checkbox"/> IHO Sea areas	IHO (International Hydrographic Organization) / Marine Regions	Returns the IHO Sea Areas code and name based on latitude and longitude. This dataset represents the... Read more	marine	Good
<input type="checkbox"/> Intersect of the EEZ and IHO	MarineRegions	Returns the intersect of EEZ and IHO areas	marine	Good
<input type="checkbox"/> World countries	ESRI - Environmental Systems Research Institute (GIS-software)	Returns the country based on latitude and longitude.	terrestrial	Good
<input type="checkbox"/> FAO Fishing areas	VLIZ - Flanders Marine Institute, based on FAO Fishing Areas	Returns the FAO Fishing Area code and name based on latitude and longitude.	marine	Good
▣ Geographical services - Bathymetry				
▣ Geographical services - Biogeographical classification				
▣ Geographical services - Environmental data				
▣ Geographical services - Features				
▣ Geographical services - Protected areas				
▣ Geographical services - Total biological valuation				

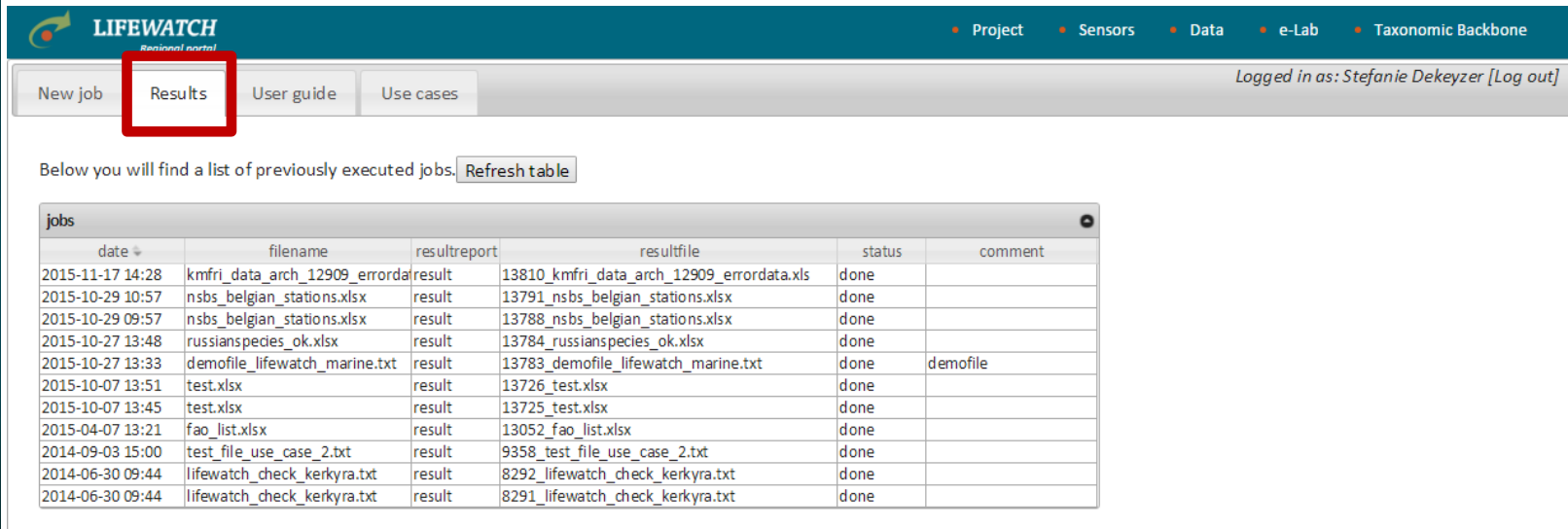
Belgian LifeWatch e-Lab

→ Geographical services – Environmental data

2. Select webservices

	Name	Source	Description	Environment	Status
<input type="checkbox"/>	Data validation and QC services				
<input type="checkbox"/>	MarineRegions gazetteer services				
<input type="checkbox"/>	Taxon observations				
<input type="checkbox"/>	Taxon services				
<input type="checkbox"/>	Tidal services				
<input type="checkbox"/>	Geographical services - Administrative boundaries				
<input type="checkbox"/>	Geographical services - Bathymetry				
<input type="checkbox"/>	Geographical services - Biogeographical classification				
<input type="checkbox"/>	Geographical services - Environmental data				
<input type="checkbox"/>	Cloud Cover (maximum)	Bio-ORACLE: a global environmental dataset for marine species distribution modeling.	Returns the Cloud Cover (maximum) based on latitude and longitude.	marine	Good
<input type="checkbox"/>	Chlorophyll A (mean)	Bio-ORACLE: a global environmental dataset for marine species distribution modeling.	Returns the Chlorophyll A (mean) based on latitude and longitude.	marine	Good
<input type="checkbox"/>	Chlorophyll A (maximum)	Bio-ORACLE: a global environmental dataset for marine species distribution modeling.	Returns the Chlorophyll A (maximum) based on latitude and longitude.	marine	Good
<input type="checkbox"/>	Sea Surface Temperature (maximum)	Bio-ORACLE: a global environmental dataset for marine species distribution modeling.	Returns the Sea Surface Temperature (maximum) based on latitude and longitude.	marine	Good
<input type="checkbox"/>	Silicate (mean)	Bio-ORACLE: a global environmental dataset for marine species distribution modeling.	Returns the Silicate (mean) based on latitude and longitude.	marine	Good
<input type="checkbox"/>	Diffuse Attenuation (maximum)	Bio-ORACLE: a global environmental dataset for marine species distribution modeling.	Returns the Diffuse Attenuation (maximum) based on latitude and longitude.	marine	Good

Belgian LifeWatch e-Lab



The screenshot shows the 'Results' tab selected in the navigation menu. Below the menu, there is a 'Refresh table' button and a table of jobs. The table has columns for date, filename, resultreport, resultfile, status, and comment.

date	filename	resultreport	resultfile	status	comment
2015-11-17 14:28	kmfri_data_arch_12909_errordata.xls	result	13810_kmfri_data_arch_12909_errordata.xls	done	
2015-10-29 10:57	nsbs_belgian_stations.xlsx	result	13791_nsbs_belgian_stations.xlsx	done	
2015-10-29 09:57	nsbs_belgian_stations.xlsx	result	13788_nsbs_belgian_stations.xlsx	done	
2015-10-27 13:48	russianspecies_ok.xlsx	result	13784_russianspecies_ok.xlsx	done	
2015-10-27 13:33	demofile_lifewatch_marine.txt	result	13783_demofile_lifewatch_marine.txt	done	demofile
2015-10-07 13:51	test.xlsx	result	13726_test.xlsx	done	
2015-10-07 13:45	test.xlsx	result	13725_test.xlsx	done	
2015-04-07 13:21	fao_list.xlsx	result	13052_fao_list.xlsx	done	
2014-09-03 15:00	test_file_use_case_2.txt	result	9358_test_file_use_case_2.txt	done	
2014-06-30 09:44	lifewatch_check_kerkyra.txt	result	8292_lifewatch_check_kerkyra.txt	done	
2014-06-30 09:44	lifewatch_check_kerkyra.txt	result	8291_lifewatch_check_kerkyra.txt	done	

LifeWatch is a European research infrastructure - portal development by VLIZ @- contact at info@lifewatch.be

filename = input file, file you uploaded

resultreport = overview of job properties, requested services, a preview of the result file, how many data records each selected service could add, explanation of the added fields

resultfile = input file + additional data requested through selected web services

status = pending, done, error

Home » Manual

Manual

Through this interactive section of the LifeWatch.be portal users can upload their own data using a standard data format, and choose from several web services, models and applications to process the data.

1. HOW TO USE THE WEB SERVICES
2. DESCRIPTION DATA FORMAT
3. DESCRIPTION WEB SERVICES

1. HOW TO USE THE WEB SERVICES

1. Upload your file

Prepare your data file for upload. Allowed file types: Plain text [TXT], Plain text [CSV], Excel [XLS] and Excel [XLSX]. To feed the required information to the portal, you can use the standard LifeWatch data format based on and compatible with Darwin Core and the OBIS Schema. For the web service "Check OBIS file" the data can also be uploaded to the portal in the OBIS Schema format. In [Section 2](#) of the manual you can find a description of the LifeWatch data format, some examples, and an overview of the required fields for every web service.

Click on "Browse" to upload your file. This will open the file explorer on your PC. Select your file. For uploading your own data files a login and password are required. You can also use a demo file with marine or terrestrial data.

Select the way you have delimited your data by choosing the relevant row and column delimiter. Use the flag box to indicate whether your first row contains the column names or not. Indicate whether you use comma (,) or point (.) as decimal symbol. Select the format the data is in: LifeWatch format or OBIS Schema.

Select one of the demo data files and choose from several web services, models and applications to process the data.

To work with other data files, please log in.

If you are new to this service, please read the manual.

File Geen bestand geselecteerd.

Use demo file: [View demo file](#)

Allowed filetypes: Plain text [TXT]

Maximum rows in file: 10000

Row delimiter First row contains column names

Column delimiter

Decimal symbol

Data format

USE CASE 1:
Marine species observations in a 1000m radius around your own observation points

Acartia clausi

USE CASE 2:
Marine species list and number of observations per geographical area

Which species occur in the Belgian EEZ?
And how many times where they observed?

USE CASE 3:
List of geographical areas per marine species

Acartia clausi *Abiodonella obtusata*

USE CASE 4:
Quality control of biodiversity datasets

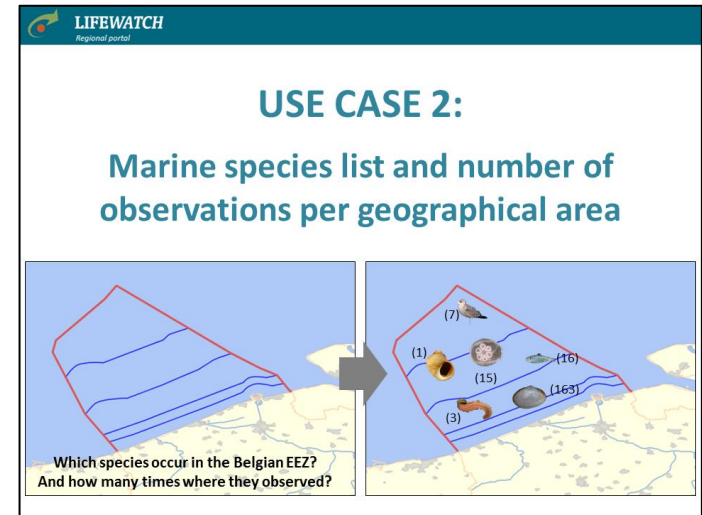
DATA FORMAT CHECK:
Missing mandatory fields?
Missing information in mandatory fields?

TAXONOMIC CHECK:
 WoRMS
World Register of Marine Species

GEOGRAPHIC CHECK: plot on map

Concatenated use of the data services

You upload a list with marine place names (e.g. North Sea, Atlantic Ocean) and want to know which species have already been observed in these areas and how many times (based on OBIS).



Developed data services:



1. Get lat-lon by name
2. Taxon list of a certain region

[New job](#)[Results](#)[Manual](#)[Use cases](#)[Changelog](#)

1. Upload your file

Select one of the demo data files and choose from several web services, models and applications to process the data.

To work with other data files, please log in.

If you are new to this service, please read the manual.

File

No file chosen

Use demo file:

Marine ▾

[View demo file](#)

Allowed filetypes:

Marine

| [Plain text \[CSV\]](#) | [excel \[XLS\]](#) | [excel \[XLSX\]](#)

Maximum rows in:

Terrestrial

Heading First row contains column names

Column delimiter

Tab ▾

Decimal symbol

Point(.) ▾

Data format

lifew. ▲

obis

2. Select webservices

Name	Source	Description	Environment	Status
<input type="checkbox"/> Data validation and QC services				
<input type="checkbox"/> MarineRegions gazetteer services				
<input type="checkbox"/> Taxon observations				
<input type="checkbox"/> Taxon services				
<input type="checkbox"/> Tidal services				
<input type="checkbox"/> Geographical services - Administrative boundaries				
<input type="checkbox"/> Geographical services - Bathymetry				
<input type="checkbox"/> Geographical services - Biogeographical classification				
<input type="checkbox"/> Geographical services - Environmental data				
<input type="checkbox"/> Geographical services - Features				
<input type="checkbox"/> Geographical services - Protected areas				
<input type="checkbox"/> Geographical services - Total biological valuation				

3. Verify order, change order if necessary and run

Selected services

[New job](#) | [Results](#) | [Manual](#) | [Use cases](#)

[Changelog](#)

1. Upload your file

Select one of the demo data files and choose from several web services, models and applications to process the data.

To work with other data files, please log in.

If you are new to this service, please read the manual.

File

No file chosen

Use demo file: Marine ▾ [View demo file](#)

Allowed filetypes: Marine | Plain text [CSV] | excel [XLS] | excel [XLSX]

Maximum rows in: Terrestrial

Heading First row contains column names

Column delimiter Tab ▾

Decimal symbol Point(.) ▾

Data format lifewatch

obis

2. Select webservices

Name	Source	Description	Environment	Status
<input type="checkbox"/> Data validation and QC services				
<input type="checkbox"/> MarineRegions gazetteer services				
<input type="checkbox"/> Taxon observations				
<input type="checkbox"/> Taxon services				
<input type="checkbox"/> Tidal services				
<input type="checkbox"/> Geographical services - Administrative boundaries				
<input type="checkbox"/> Geographical services - Bathymetry				
<input type="checkbox"/> Geographical services - Biogeographical classification				
<input type="checkbox"/> Geographical services - Environmental data				
<input type="checkbox"/> Geographical services - Features				
<input type="checkbox"/> Geographical services - Protected areas				
<input type="checkbox"/> Geographical services - Total biological valuation				

3. Verify order, change order if necessary and run

Selected services

2. Select webservice

Name	Source	Description	Environment	Status
▣ Data validation and QC services				
▣ MarineRegions gazetteer services				
<input type="checkbox"/> Get lat-long by accepted name	MarineRegions	Returns the latitude, longitude, accepted name and the Marine Regions ID (MRGID) of a given gazetteer... Read more	Marine & terrestrial	Good
<input type="checkbox"/> Get lat-long by mrgid	MarineRegions	Returns the latitude and longitude of the centroid and the preferred gazetteer name of a Marine Regi... Read more	Marine & terrestrial	Good
<input checked="" type="checkbox"/> Get lat-long by name	MarineRegions	Returns the latitude, longitude, matched name and the Marine Regions ID (MRGID) of a given gazetteer... Read more	Marine & terrestrial	Good
<input type="checkbox"/> Get gazetteer name by Lat-long	MarineRegions	Returns the Marine Regions place name and the Marine Regions ID (MRGID) of the bounding box (radius ... Read more	Marine & terrestrial	Good
▣ Taxon observations				
<input type="checkbox"/> Number of observations in a 1000m radius around a point	OBIS	Gives the number of observations of a taxon in a radius of 1000 meter around a point.	marine	Good
<input checked="" type="checkbox"/> Taxon list of a certain region	OBIS	Gives a taxon list based on observations from the obis database for a certain region (mrgid as input... Read more	marine	Good
<input type="checkbox"/> Number of observations of a marine taxon	OBIS	Returns all observation points (latitude and longitude) in the Ocean Biogeographic Information System... Read more	marine	Good
▣ Taxon services				
▣ Tidal services				
▣ Geographical services - Administrative boundaries				
▣ Geographical services - Bathymetry				
▣ Geographical services - Biogeographical classification				
▣ Geographical services - Environmental data				
▣ Geographical services - Features				
▣ Geographical services - Protected areas				
▣ Geographical services - Total biological valuation				

3. Verify order, change order if necessary and run

Selected services

- ↓ Get lat-long by name ×
- ↓ Taxon list of a certain region ×

USE CASE 2:
Marine species list and number of observations per geographical area

1. Get lat-long by mrgid
2. Taxon list of a certain region

When you click "Next", you are redirected to the preview screen. Make sure that every column name from the uploaded file corresponds with a column name from the pick list. In this case choose 'Location'.

Preview of the file 'test_file_use_case_2.txt' (first 20 records)

Please select a columnname from the dataformat term that corresponds to your column and click 'Start'.

column 0

Location

Location

Wandelaar
Belgian Exclusive Economic Zone
North Sea

Your concatenated webservices are stated below.

1. Get lat-long by name

Input columns

- Location (column 0)

2. Taxon list of a certain region

Your concatenated webservices are stated below.

1. Get lat-long by name

2. Taxon list of a certain region

Input columns

- LocationID (Get lat-long by name)

Your concatenated webservices are stated below.

1. Get lat-long by name

2. Taxon list of a certain region

legend :

- Field is present in the inputfile.
- Field is present in the output of previous webservices.
- Field is missing from inputfile and from the output of previous webservices.
- There are more than one possible input fields, choose the preferred field.

[New job](#) [Results](#) [Manual](#) [Use cases](#)

[Changelog](#)

Your job is in progress.

If there are validation errors, they will appear on top.

To submit another job, click on the button 'newjob'. To view all jobs, click on the button 'results'.

[new job](#) [Results](#)

[New job](#) [Results](#) [Manual](#) [Use cases](#)

[Changelog](#)

Below you will find a list of previously executed jobs. [refresh table](#)

date	filename	resultreport	resultfile	status	comment
2014-09-03 15:00	test_file_use_case_2.txt	open	9358_test_file_use_case_2.txt	done	
2014-06-30 09:44	lifewatch_check_kerkyra.txt	open	8292_lifewatch_check_kerkyra.txt	done	
2014-06-30 09:44	lifewatch_check_kerkyra.txt	open	8291_lifewatch_check_kerkyra.txt	done	

Job properties

Name: Dekeyzer Stefanie
 Number job: 5816
 Comment:
 Inputfile: test_file_use_case_2.txt
 Resultfile: 5816_test_file_use_case_2.tab

Requested Services (2)

- Get lat-long by name
- Get a taxon list of a certain region (mrgid)

Resultfile

[\[F\]](#)

Results - Get lat-long by name

Number of no exact match(es) :0
 Number of fuzzy match(es) :0
 Number of no match(es) :0
 Number of error(s) :0
 Number of exact match(es) :19

Results - Get a taxon list of a certain region (mrgid)

Wandelaar: Number of unique species found in OBIS => 0
 Belgian Exclusive Economic Zone: Number of unique species found in OBIS => 6805
 North Sea: Number of unique species found in OBIS => 5147
 Central North Sea: Number of unique species found in OBIS => 15930
 Northern North Sea: Number of unique species found in OBIS => 15930
 Southern North Sea: Number of unique species found in OBIS => 17025
 German part of the North Sea: Number of unique species found in OBIS => 5147
 Danish part of the North Sea: Number of unique species found in OBIS => 4487
 Dutch part of the North Sea: Number of unique species found in OBIS => 7258
 Norwegian part of the North Sea: Number of unique species found in OBIS => 5692
 French part of the North Sea: Number of unique species found in OBIS => 2757
 United Kingdom part of the North Sea: Number of unique species found in OBIS => 10224
 Belgian part of the North Sea: Number of unique species found in OBIS => 6805
 North Sea Bottom Current: Number of unique species found in OBIS => 6805

Legend - added fields

added_row_ws Indicates which service has added the row to the result file
 aphiaid Unique identifier within the Aphia database
 Latitude_by_name
 Longitude_by_name
 matched_name the name of the matching marineregions gazetteer name
 mrgid_by_name
 required_fields_check Are the required fields present and completed? (1=yes, 0=no)
 Scientific_name Name of taxon
 taxonlist_mrgid_note Note on taxonlist for mrgid

List of species for the North Sea

Number of observations for that species in the North Sea

	A	B	C	D	E	F	G	H	I	J	L
1	location	required_fields_check	latitude_by_name	longitude_by_name	matched_name	mgrgid_by_name	scientific_name	aphiaid	tax	added_row_ws	num_observation
6812	North Sea	1	5.596.853	5.596.853	North Sea	2350					
6813							Microcystis wesenbergii	146561	taxonlist_mgrgid		1
6814							Ampharetinae	152252	taxonlist_mgrgid		7
6815							Culicimorpha	150928	taxonlist_mgrgid		5
6816							Raniceps raninus	126442	taxonlist_mgrgid		1
6817							Munnidae	118263	taxonlist_mgrgid		5
6818							Protohydridae	22788	taxonlist_mgrgid		1
6819							Rhodophyta	852	taxonlist_mgrgid		50
6820							Rhizostoma	135257	taxonlist_mgrgid		5
6821							Talorchestia	101788	taxonlist_mgrgid		1
6822							Gyrodinium spirale	109876	taxonlist_mgrgid		1
6823							Pyramidellinae	224522	taxonlist_mgrgid		1
6824							Eulimidae	135	taxonlist_mgrgid		3
6825							Hirudinea	2041	taxonlist_mgrgid		1
6826							Thalassiosira nitzschioides	149227	taxonlist_mgrgid		1
6827							Proclea	129711	taxonlist_mgrgid		1
6828							Phaxas	138335	taxonlist_mgrgid		18
6829							Clytia	117030	taxonlist_mgrgid		119
6830							Cellaria salicornia	153836	taxonlist_mgrgid		1
6831							Scopelocheirus hopei	102720	taxonlist_mgrgid		1
6832							Pasiphaea sivado	107677	taxonlist_mgrgid		2
6833							Laminariaceae	143755	taxonlist_mgrgid		2
6834							Margelopsis	117151	taxonlist_mgrgid		32
6835							Halaphanolaimus longisetosus	121257	taxonlist_mgrgid		1
6836							Cydippida	1251	taxonlist_mgrgid		458
6837							Metopa	101764	taxonlist_mgrgid		1
6838							Carpelimus (Taenosoma) foveolatus	150688	taxonlist_mgrgid		2
6839							Dictyosphaerium pulchellum	178933	taxonlist_mgrgid		3
6840							Lagerheimia genevensis	178610	taxonlist_mgrgid		3
6841							Delavalia	347056	taxonlist_mgrgid		11
6842							Nassarius nitidus	140509	taxonlist_mgrgid		1
6843							Choniolaimus papillatus	120928	taxonlist_mgrgid		2
6844							Monhysteridae	2188	taxonlist_mgrgid		137
6845							Chaetonotus (Schizochaetonotus)	371021	taxonlist_mgrgid		1
6846							Microlaimus pinguis	153418	taxonlist_mgrgid		3
6847							Heterocheila	151022	taxonlist_mgrgid		2
6848							Ironidae	2199	taxonlist_mgrgid		121
6849							Alosa fallax	126415	taxonlist_mgrgid		15
6850							Jania	144012	taxonlist_mgrgid		1
6851							Lymnocardiinae	381865	taxonlist_mgrgid		17
6852							Strombidiidae	1703	taxonlist_mgrgid		1
6853							Tomopteris krampi	131556	taxonlist_mgrgid		1
6854							Anthamionella ternifolia	163275	taxonlist_mgrgid		2
6855							Pherusa flabellata	130110	taxonlist_mgrgid		1

LIFEWATCH
Regional portal

USE CASE 2:

Marine species list and number of observations per geographical area

Which species occur in the Belgian EEZ?
And how many times where they observed?

Future data services

More data bases and data systems will become interlinked and accessible through the LifeWatch data services:

- Both European and global data
- Both marine and terrestrial data
- Taxonomic, biogeographic, ecological and genomic data

More data services are being developed, based on the needs identified by the scientific community.

Future data services

The ultimate goal is to answer complex scientific questions:

- If I take a benthos sample in the North Sea, which species can I expect?
- Which invasive pelagic species are known to occur in the Black Sea?
- Give me the maximum and minimum salinity where organisms with DNA seq homology above x% with this DNA seq. (=seqA) have been found.
- Etc.

Future data services



Give me the maximum and minimum salinity where organisms with DNA seq homology above x% with this DNA seq. (=seqA) have been found.

Step1: use seqA in blast / fasta against genbank

- get list of genbank entries above cut-off

Step2: feed list to WoRMS hierachy match

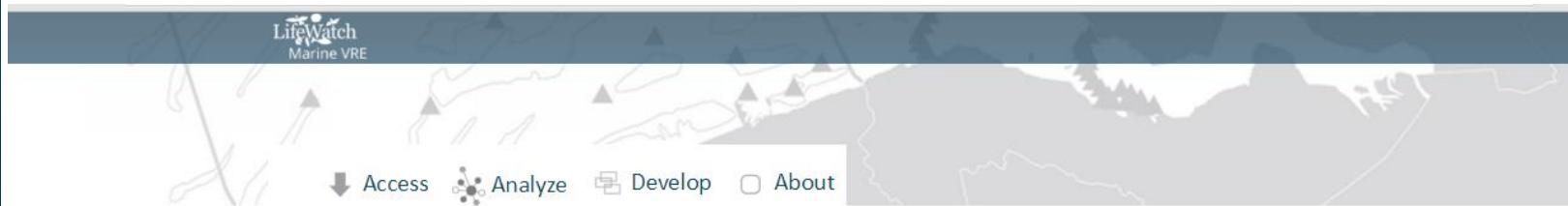
- get list of taxa & specimens matching this seq.list

Step3: feed list to EurOBIS mapping tool

- get list of observations (positions, map, UW features)

Step4: spatial query to environmental databases

- select min/max salinity at these positions



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 Marine VRE

↓ Access Analyze Develop About ↓ Access

Showing 17/17 data systems.

Select your interests:

- Phytoplankton
- Biovolume calculation
- terrestrial
- global data
- taxonomy
- Biodiversity
- Regional data
- Mapping tool
- Biogeography
- Tracking data
- Birds
- Gazetteer
- Microalgae
- Protozoa
- local data
- Images
- Polychaeta
- Traits
- Antarctica
- freshwater
- Observation data
- Specimen data
- Descriptive species data
- mapping tools
- Literature
- Introduced species

Atlas of Shapes

Catalogue of Life (CoL)

Catalogue of Life

EMODnet Biology Portal

Pilot Portal For Biology
Data Discovery and Access Service

EMODnet
European Marine Observation and Data Network

Global Biodiversity Information Facility (GBIF)

Global Biodiversity Information Facility

Free and Open Access to Biodiversity Data

570,331,322 1,611,321 15,109 763

iAtlas

BIOGEOGRAPHIC ATLAS OF THE SOUTHERN OCEAN

LifeWatch.be GPS tracking network for large birds

MarineRegions

Nordic Microalgae

Ocean Biogeographic Information System (OBIS)

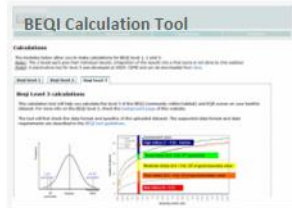
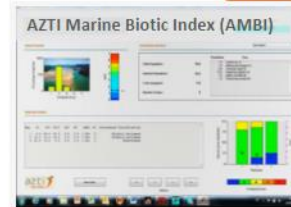
OBIS OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM



Showing 16/16 data systems:

Select your interests:

- local data mapping tools terrestrial freshwater Animals Plantae
- Chromista Fungi Protozoa Bacteria Observation data Quality assessment
- Macrobenthos Invertebrates Calculation tool Mapping tool Quality control
- Benthos Biological index workflow environment Data access Data sharing
- Phytoplankton Statistical analyses Vegan package R Biological indices
- Multivariate analyses Genetics Plankton Birds Tracking data



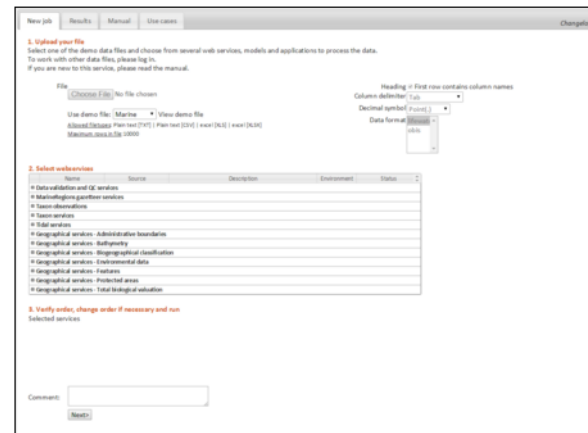
Submitted by vlizadmin on Fri, 09/04/2015 - 10:43

Belgian LifeWatch e-Lab

The ultimate goal of LifeWatch is to set up a network for data exchange and data analysis through web services. Web services are systems that allow communication between two computers over the web, and allow the user to access the most recent and up-to-date information directly from within other applications.

In the framework of LifeWatch Belgium, several web services are being developed to standardize, analyze and visualize your data, and to extract additional data. An online tool was developed where users can select several web services at once in an easy, user friendly way. In this online interface the majority of the web services built by the Belgian LifeWatch partners are available.

These web services can also be used in a concatenated way, where the output of one web services is the input for the next web service. This is demonstrated in a few use cases.



Website:

<http://www.lifewatch.be/data-services>

Tags:

marine
terrestrial
Mapping tool
Calculation tool
Quality control

Developed by:

The online interface of the Belgian LifeWatch e-Lab is developed by the Flanders Marine Institute (VLIZ).

Used data resources:

- MarineRegions (gazetteer)
- Ocean Biogeographic Information System (OBIS) (biogeographic data system)
- World Register of Marine Species (WoRMS) (taxonomic database)
- Catalogue of Life (CoL) (taxonomic database)



↓ Access



📄 Develop

□ About

Submitted by stefanie on Mon, 10/05/2015 - 10:17

LifeWatch Greece RvLab

The R vLab makes use of “R” which is a statistical processing environment widely used by scientists working in many biodiversity related disciplines. It supports an integrated and optimized (in respect to computational speed-up and data manipulation) online R environment. This vLab tackles common problems faced by R users, such as severe computational power deficit. Many of the routines operating under the R environment, such as the calculation of several biodiversity indices and the running of the multivariate analyses, are often of high computational demand and cannot deliver a result when the respective datasets are in the form of large matrices. This vLab allows for a predefined, commonly used set of R functions to run on the LifeWatch Infrastructure in order to support large-scale computational and modeling activities.



Website:

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

Tags:

Statistical analyses
 Observation data
 Vegan package
 R
 Calculation tool
 Biological indices
 Multivariate analyses

Developed by:

RvLab was developed at the Institute of Marine Biology, Genetics and Aquaculture (IMBBC), Hellenic Centre for Marine Research (HCMR), in collaboration with the Information Systems Laboratory of the Foundation for Research and Technology Hellas (FORTH-ICS), in the framework of LifeWatch Greece project.

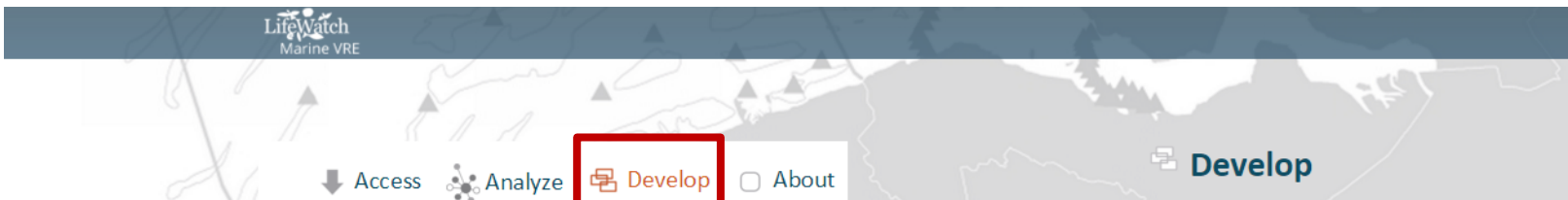
Used data resources:

Except some demo data that users can use for testing, all the other input is files uploaded by the users.

Web services:

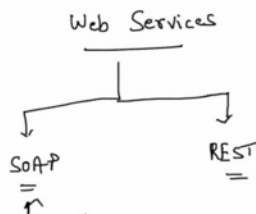
The RvLab can be accessed at the website <https://rvlab.portal.lifewatchgreece.eu/>

Used in tools:



Build your own marine virtual lab making use of a range of available web services that access and process data.

What are web services?



Within the envisaged e-infrastructure of LifeWatch, data exchange and data analysis are largely based on the use of web services. Web services are systems that allow communication between two computers over the web, and allow the user to access the most recent and up-to-date information directly from within other applications.

Web services can roughly be divided into two categories: SOAP (Simple Object Access Protocol) and REST (Representational State Transfer). SOAP has the ability to discover and describe web services via the WSDL (Web Services Description Language) standard, but usually needs a platform dependent library to work. REST uses standard HTTP (and JSON) and is much simpler to use, but lacks a standard way of description (as is the case with SOAP WSDL).

Where to find the web services?

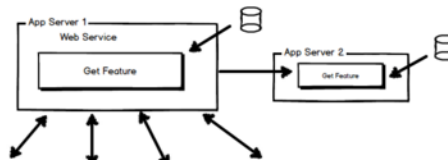
Several catalogues exist listing the available web services. The BiodiversityCatalogue (developed by BioVeL) is a curated catalogue of available web services that are specific to the interests of the biodiversity science community. This catalogue is related to the BioCatalogue, which focus is on life science web services.

Both catalogues are community-oriented websites where service providers and community experts can register and curate services, and where users can discover them. Users can browse the catalogues and access full search options for services, checking their status and availability.

Geographic web services in general are listed in numerous spatial data catalogues, often with a specific contextual scope. Spatial data catalogue systems like the GeoNetwork Opensource offers catalogue applications for managing spatially referenced resources and documenting their web service parameters. Specifications of the geographic web services are specified by the OGC standards.



How to access the web services?



Web services can be accessed from within several platforms or software. Web services can for example be built into PHP web pages, service management tool, R scripts, and even spreadsheets software like MS Excel. Secondary application servers can use the web service to access data from the provider and combine this output with other local processes.

Some example implementations (specific for the WoRMS web services) can be