Supported by:

FÉDÉRATION WALLONIE-BRUXELLES

FOSS4G in the frame of Lifewatch biodiversity research infrastructure

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EARTH & LIFE INSTITUTE

An European e-infrastructure for biodiversity and ecosystem research

- Lead by Spain, the Netherlands and Italy
- Belgium is an important contributor
  - VLIZ, INBO, ANTABIS, ULg and UCL

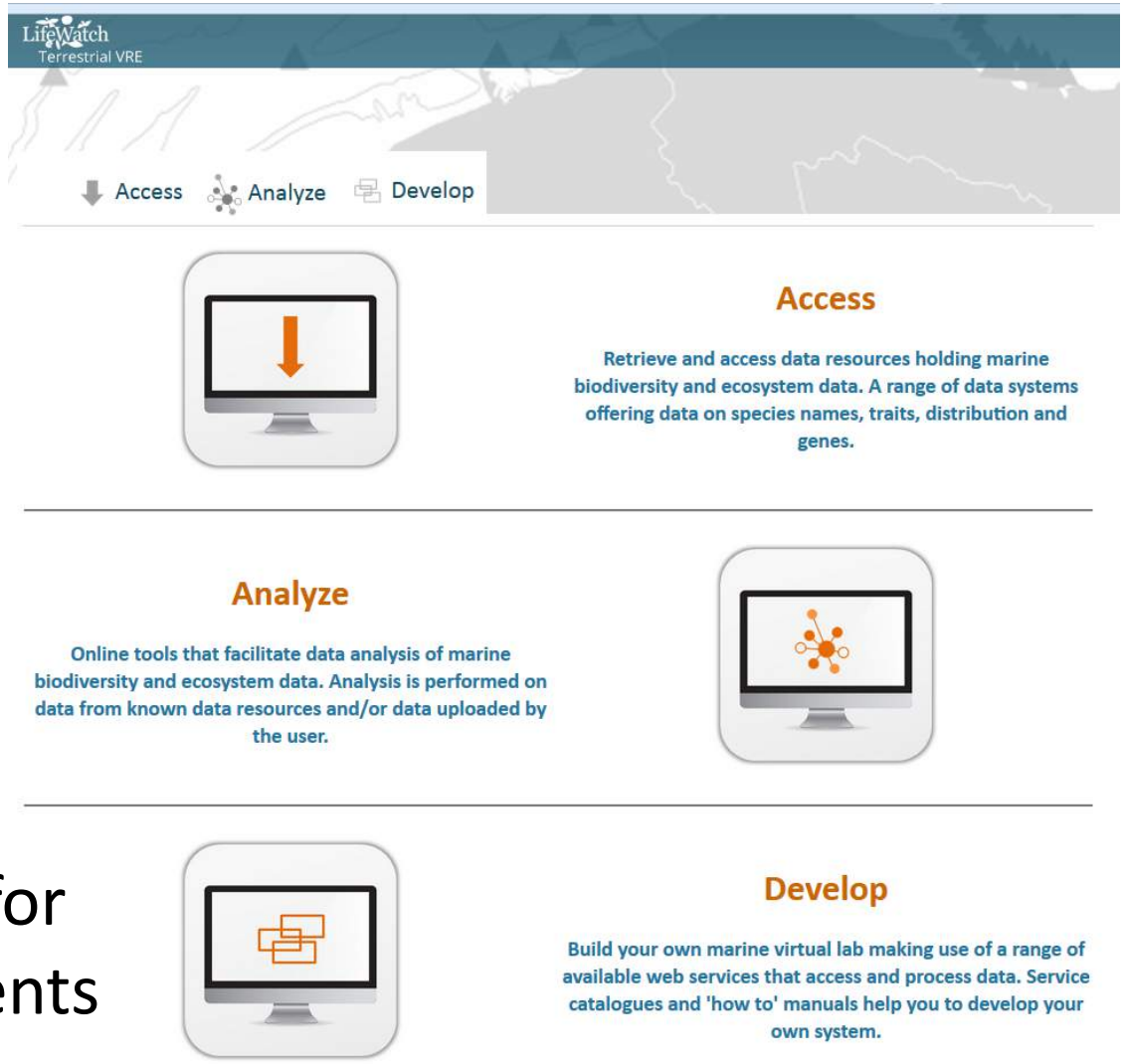
- Organized in Virtual Research Environments
  - Alien species
  - Marine
  - Terrestrial and Freshwater

Empowering biodiversity research

Open data

Open softwares

ITC infrastructure for further developments

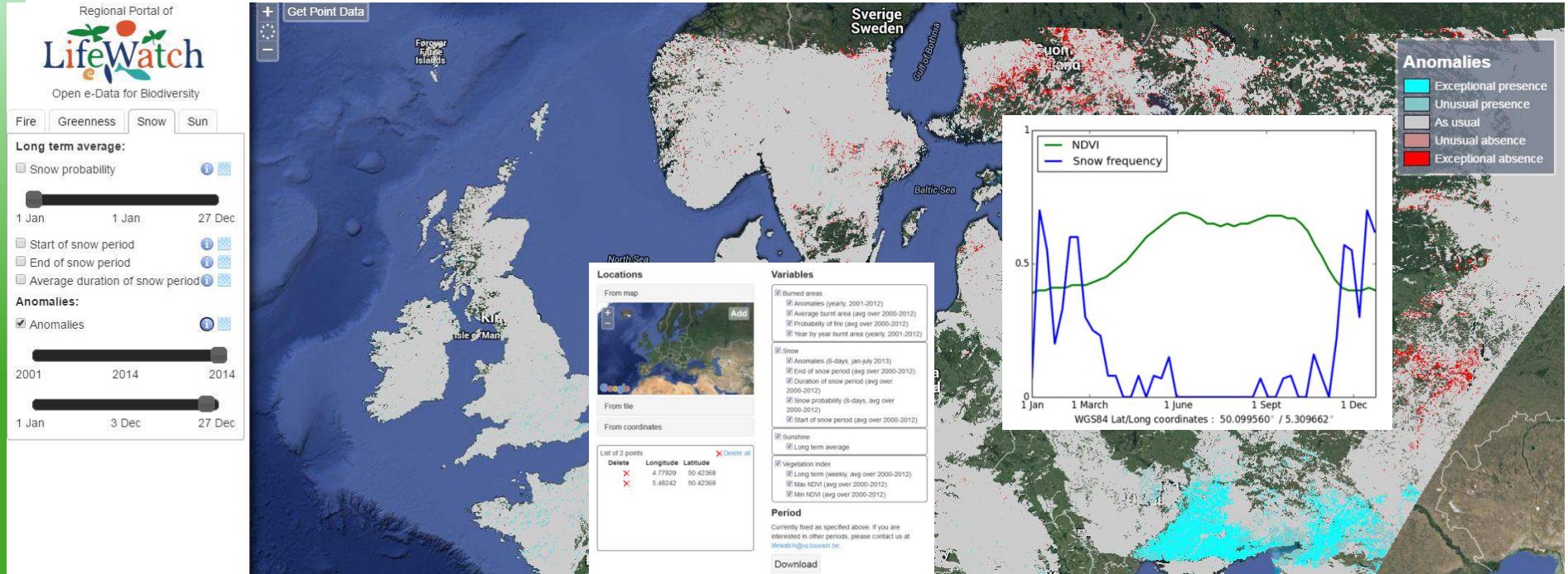


Lifewatch/Wallonia-Brussels

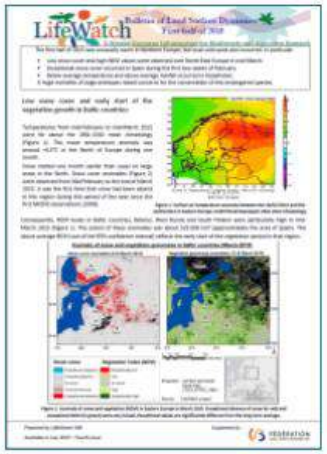
- Open data about land cover dynamics
  - Vegetation greenness, snow and fire
  - Temporal analysis up to 15 years in Europe
  - Long term mean or probabilities from CCI land cover
  - Monthly updated anomalies
- Development of a new type of database
  - Designed for modellers
  - Purpose of fit tested by habitat modellers
  - Current prototype for the Walloon region

Data distribution through the Web

- WMS including GetFeatureInfo from MapServer
- OpenLayer portal
  - Visualization, profile tool and extraction tool
- Data available for download

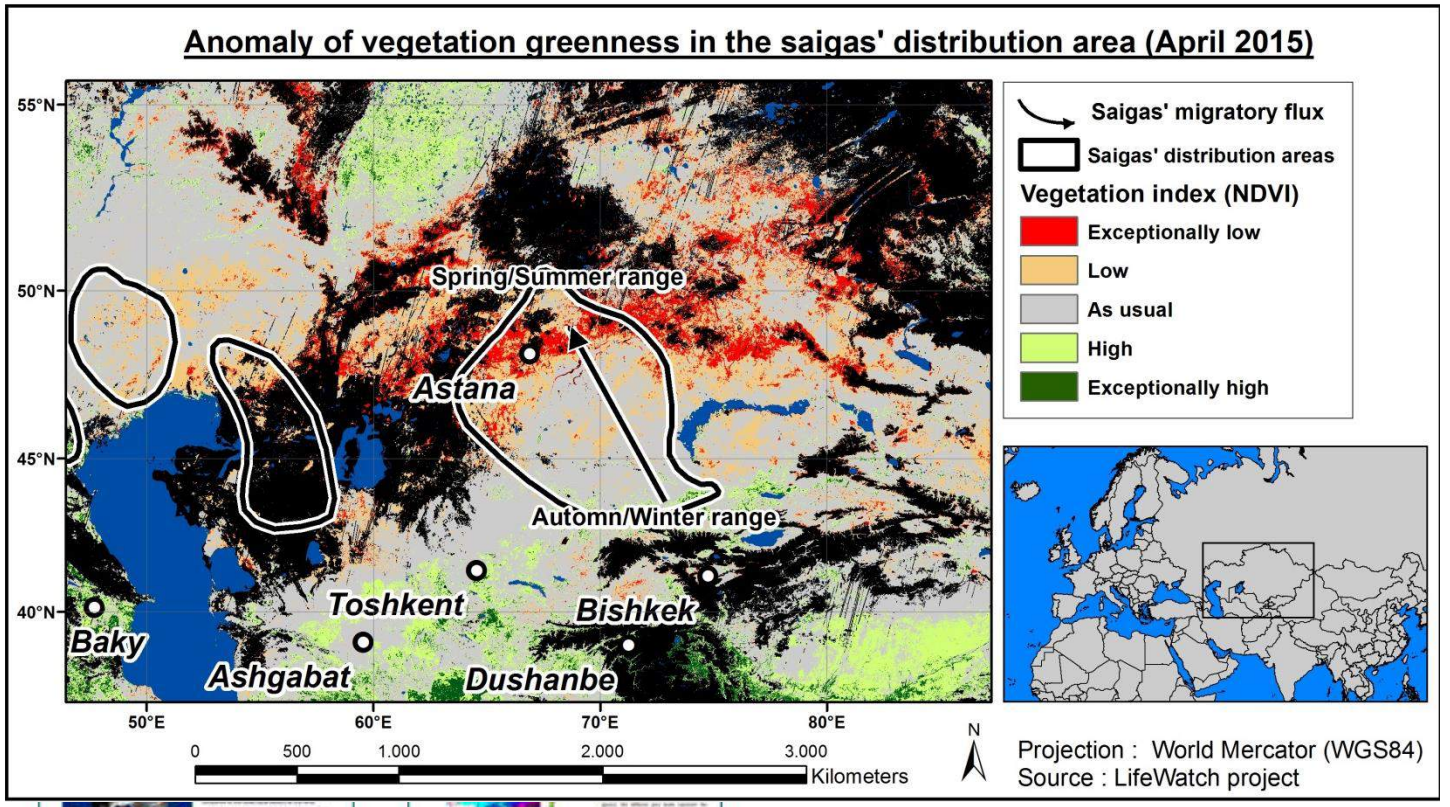


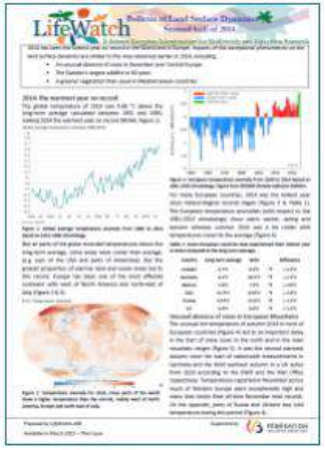
Information on exceptional ecological events published in semestrial bulletin



Bulletin mid-2015 New!

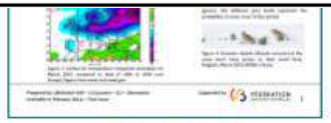
- Subscribe on uclouvain.be/lifewatch





Bulletin end-2014

Bulletin mid-2014

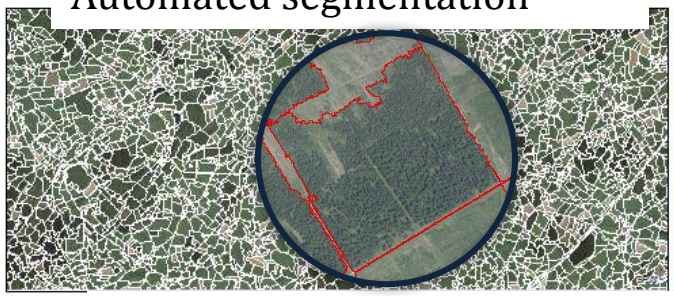


Bulletin 2013

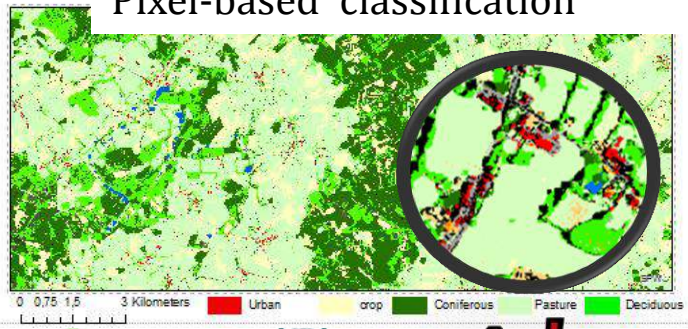
Object database with quantitative land cover characterisation

Ortho-images and Pleiades

Automated segmentation



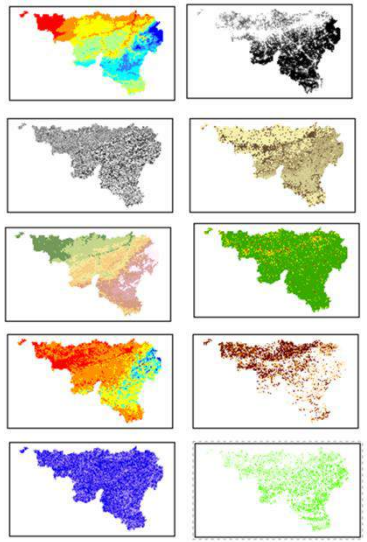
Pixel-based classification



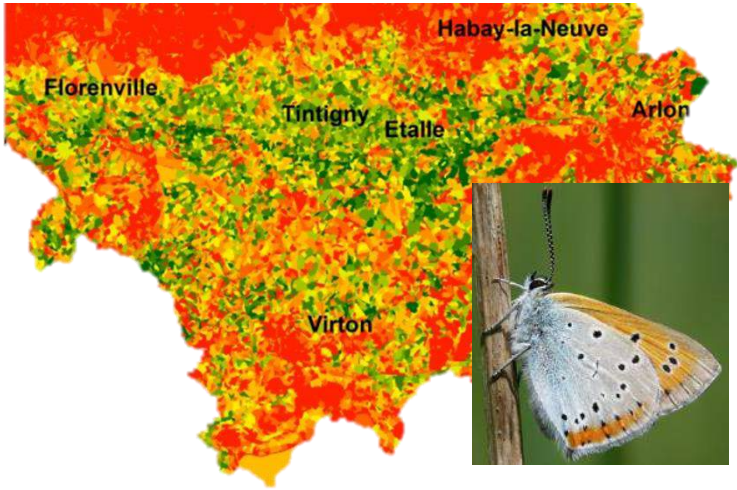
2 meter resolution

50 + attribute fields used as model inputs

Thematic layers



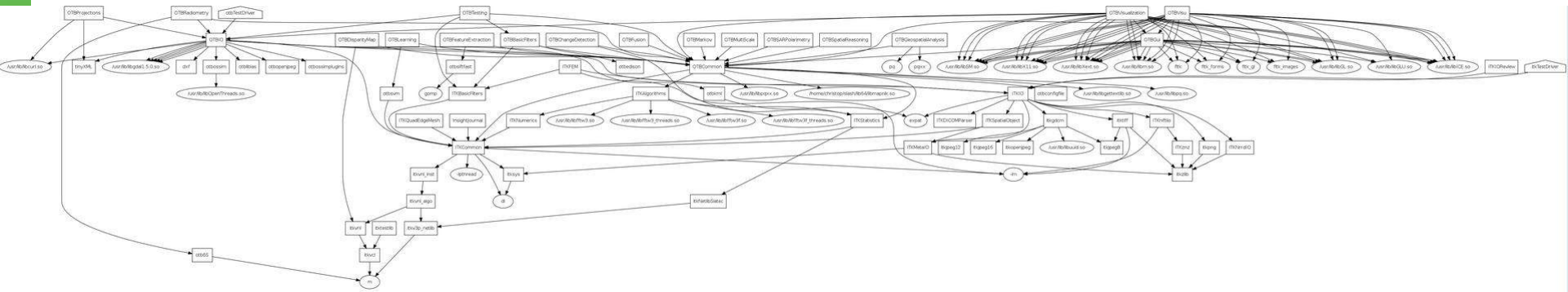
Suitability map



Lycaena dispar

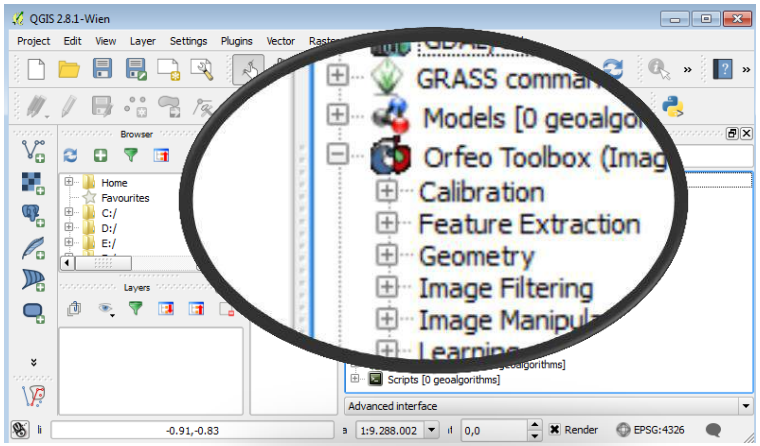
OTB for RS image processing

- Orfeo Toolbox is a C++ Library
- CeCILL v2 (similar to GNU GPL)
  - Copyleft
- Launched by CNES in the frame ORFEO program



Multiplatform solution for different user levels

- Source code for developer
  - Software guide + doxygen
- OTB Applications
  - Command line or GUI
  - OTB cookbook for functionalities
  - Embedded in, e.g., Python and QGIS
- Monteverdi interface



Example

- Otbcli_BandMath
  - Input : list of images (multi and/or monoband)
  - Output : one monoband image
  - Expression : most mathematical functions and logical operators are supported
  - Image and band indexing starting at 1
- NDVI (vegetation index)

>> otbcli_BandMath –il in.tif –out out.tif –exp « (im1b4-im1b3)/(im1b4+im1b3) »

Why we use OTB ?

- Built on ITK and gdal
  - Recently upgraded to ITK V4
- Among the first to propose large data handling
  - Multithreading → parallel processing
  - Streaming → No size limits
- Many recent algorithms have been implemented
- Use of generic programming

What we do with OTB ?

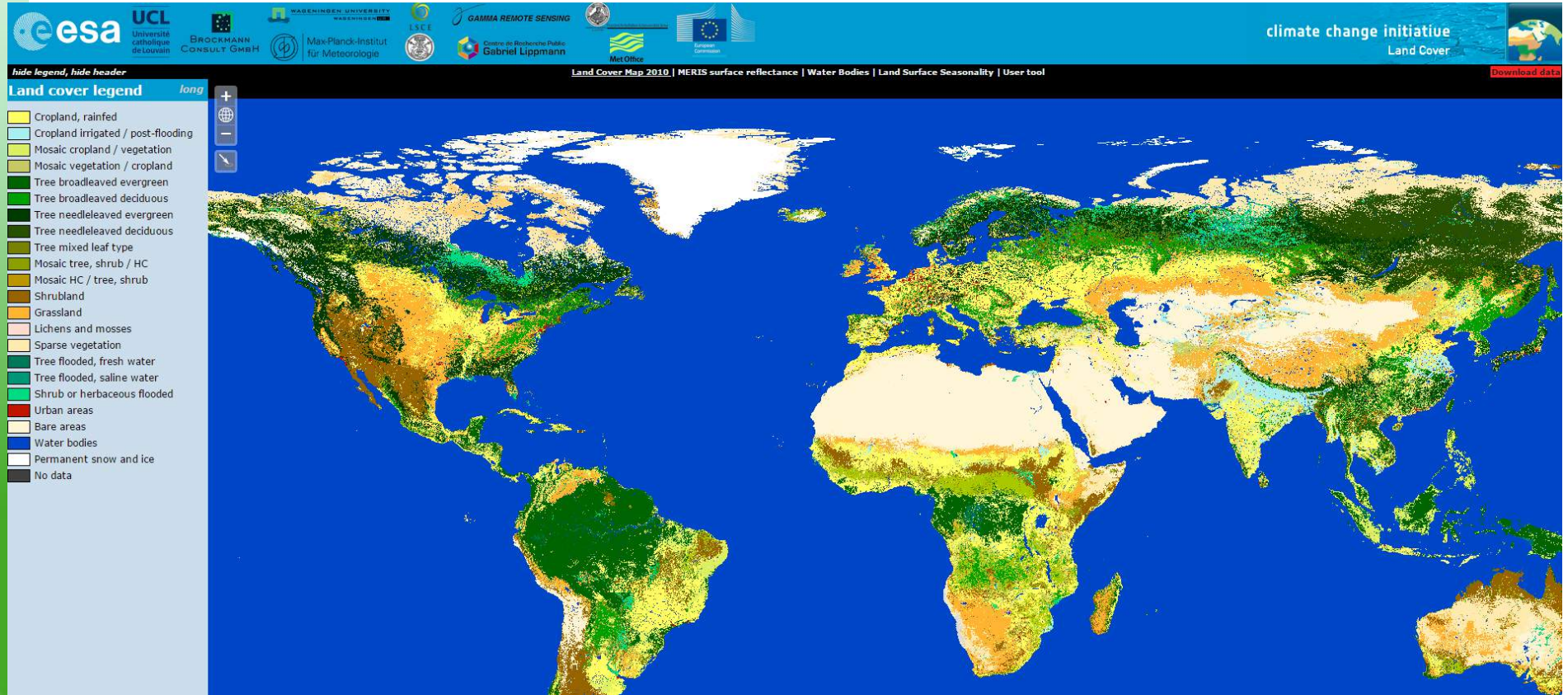
- Time series processing
  - Time series analysis for MODIS, SPOT/VGT, MERIS and PROBA-V archives
- Supervised classification
  - Orthophotos of the walloon region
- Spatial analysis tools
  - Efficient map algebra based on muParser
  - « home made » tabulate area and zonal statistics
- Contribute with our own filters
  - Bayesian data fusion for image pansharpening

What we don’t do with OTB ?

- Image segmentation
  - Sorry, but the best software is not open source
  - Or is it ?
- Accessing large stripes of images
  - E.g. topographic shadow, pixel area computation
  - GDAL has better memory handling for that purpose

Other projects using OTB at UCL

- SEN2AGRI (open source toolbox development, with CESBIO and CS)
- ESA Land Cover CCI (OTB part of classif workflow and conditions processing)



Conclusion

- Lifewatch aims at boosting biodiversity research through the distribution of open data and softwares
- OTB allowed us to process big data from remote sensing in order to tune thematic products for biodiversity models