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Final release of CLIPC user interfaces

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Abstract

At the end of the CLIPC project all services and the user interfaces are available under the CLIPC website www.clipc.eu. The user interfaces have been developed with expertise from CLIPC partners, based on services produced by WP4, data from WP6 and 7, and in close cooperation with users (consultations from WP2).

This report documents the current status of the interfaces and these should be seen as a possible setup of how to bring data and services to the user. However, there are many other possibilities as well. CLIPC and the CLIPC portal have the goal the show the potential of services and standardisation to the community, and aims at uptake of the services and standards to C3S, EEA, and other possible stakeholders and users.

Release Date

Issue Date

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1. Introduction

This deliverable is related to task 3.1 CLIPC web portal development and describes the final release of CLIPC portal user interfaces. The final release of the portal interfaces is called version 2.0 and was developed in close cooperation with other workpackages. The user interfaces have been developed with expertise from CLIPC partners in WP8 (Toolkit compare/combine), based on services produced by WP4, data from WP6 and 7, and in close cooperation with users (consultations from WP2), and using standards defined in WP5.

Version 2 was released first as a development website. This non-public development website made it possible to have already very early versions of interfaces available for user consultation and internal discussions. When components were mature enough they were published under the “live” version of the portal.

The final version of the website can be reached via the URL: <http://www.clipc.eu>.

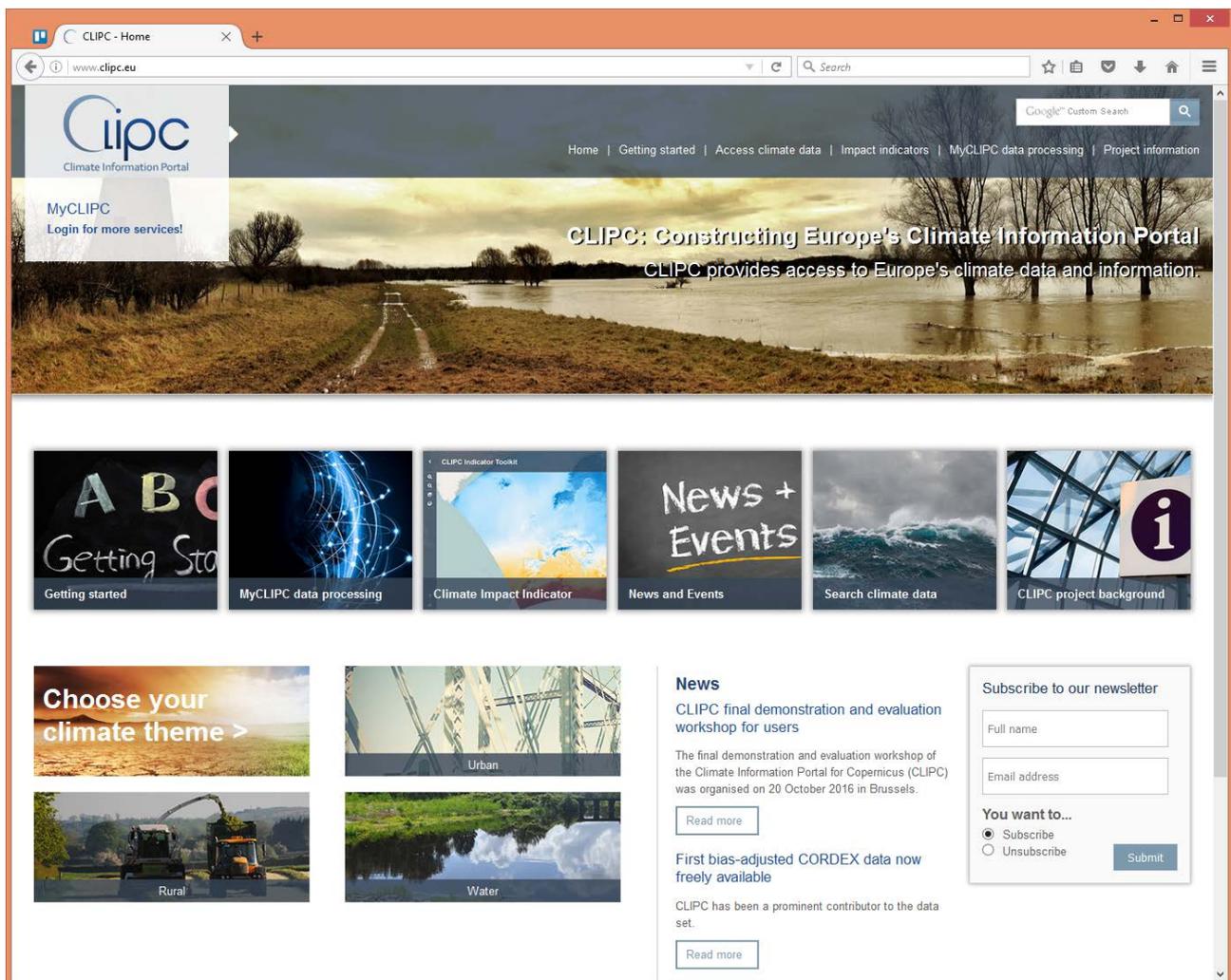


Figure 1: Screenshot of the CLIPC portals homepage

In next chapters a short overview (snap shot) of the state of the portal in November 2016 is given.

2. Approach

The approach for the latest CLIPC portal (also called portal V2) has been:

- Focus on services instead of project information. As can be seen in figure 1 the focus of the CLIPC portal V2 has been on services, so directly on the homepage users are guided to most important applications of the project. General (internal) project information is all put under one menu option and made less important.
- Direct users as easy as possible to services for processing, accessing data, downloading and viewing climate data sets and impact indicators.
- Providing the users guidance during the use of services, climate data and climate impact indicators. For first time users (or novice users in general) there is a section “Getting started” with background information on the applications, concepts and terminology.
- All services are integrated in one portal, while services or data might be stored or running from different servers. The CLIPC interpretation of the one-stop-shop concept.

3. Developed user interfaces

The following components will be described:

- Portal design and sitemap
- Content Management System developed for updating website content
- Specific user interfaces:
 - Climate Impact Indicator Toolkit, including compare and combine function
 - CLIPC dataset catalogue
 - MyCLIPC data processing
 - Climate data search
 - Guidance and glossary integration in the portal as part of the knowledge base

3.1 New design central portal website and new sitemap

Since the first version published at M6 the CLIPC V2 web portal www.clipc.eu has completely been redesigned incorporating all services required according to D3.1. New features are e.g. the MyCLIPC login option, climate theme descriptions, “Getting started” chapters, and direct access to the main applications.

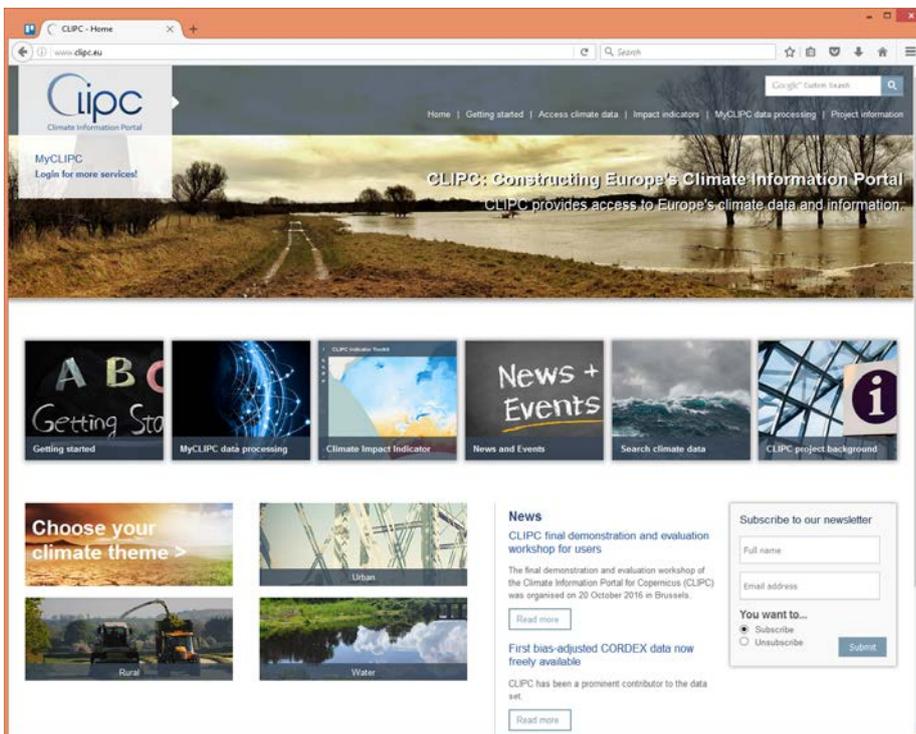


Figure 2: New design of the central portal

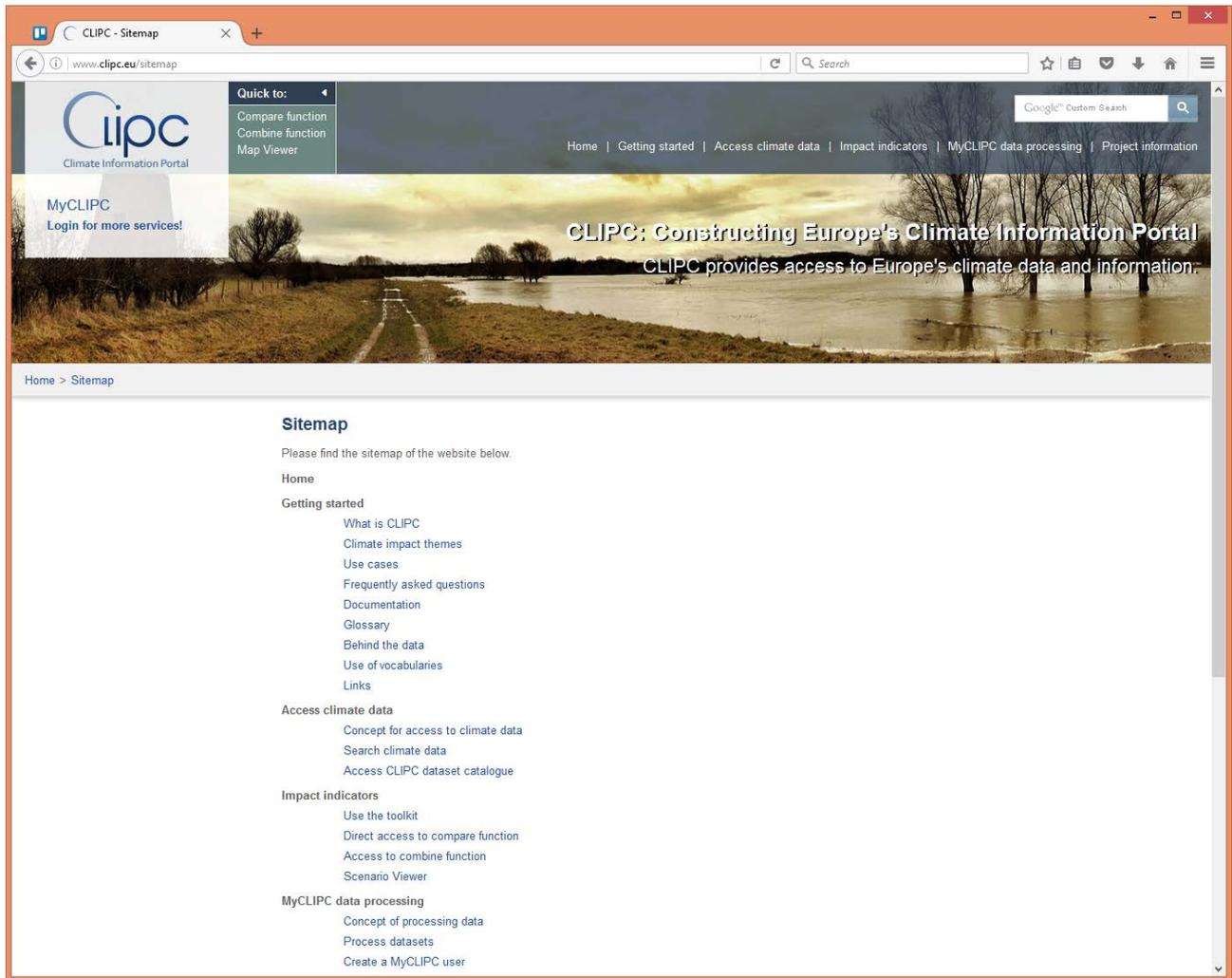


Figure 3: Latest sitemap (basis)

3.2 CLIPC V2 Content Management System

The password protected CMS for the web portal <http://www.clipc.eu/cms/> has been redeveloped (newer generation) and has received additional modules to manage the climate indicator descriptions in the toolkit, the uncertainty factsheets, and the glossaries used to guide users while reading portal texts.

Access rights can be set by the CMS master user per module, so a certain user account can have access to one or more modules.

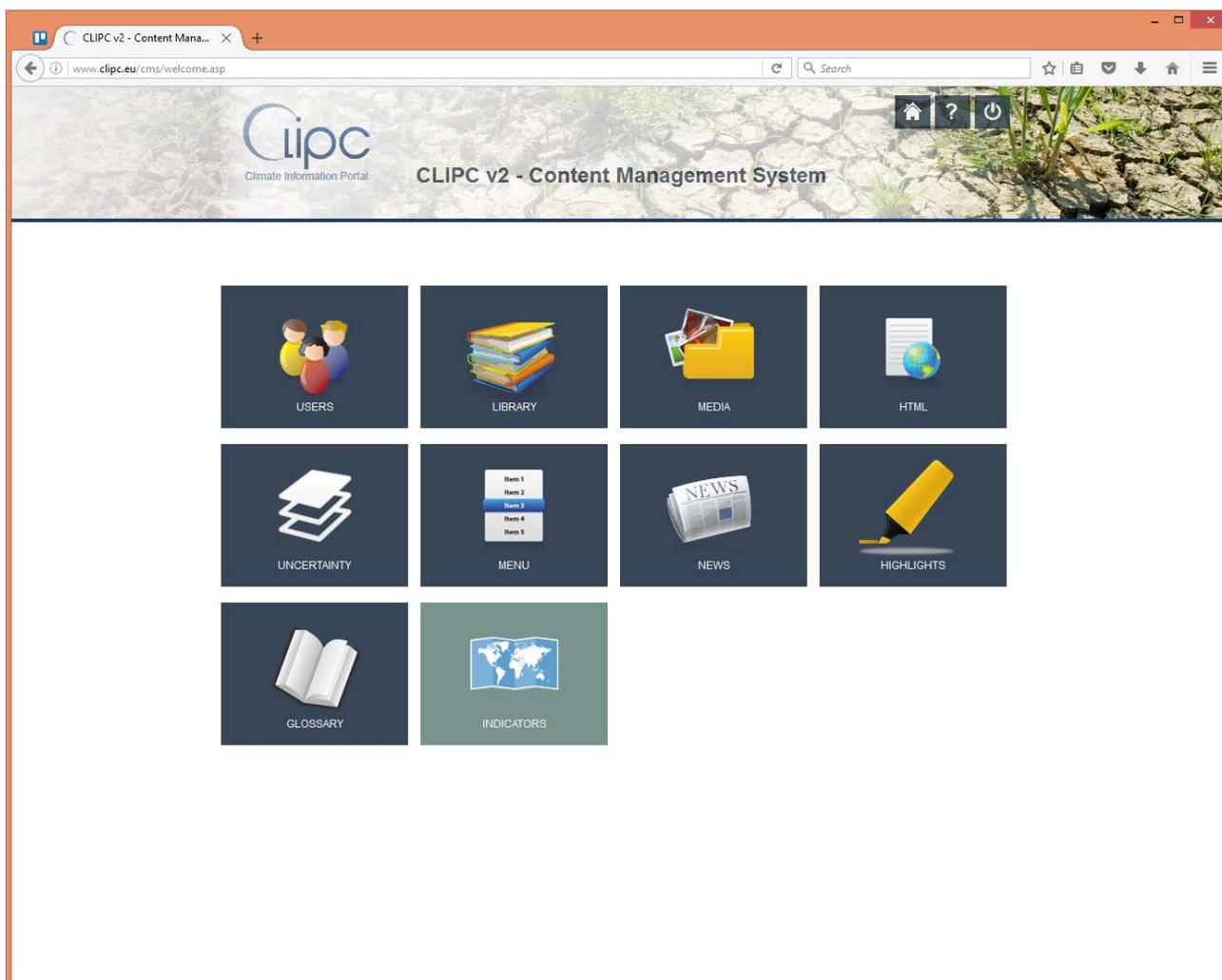


Figure 4: Overview of modules in new portal CMS

The available modules – see figure 4 – are :

- Users: User accounts can be created by the master user. Each user can be provided access to one or more modules.
- Library: In this module various fixed terms in the website can be set.
- Media: Documents and images used in the website are uploaded here. Images can be cropped to a certain format when needed.

- **HTML** : The textual content pages are created and edited in this section. For the content an editor is available. Pages can be connected to a menu-option. See figure 5.

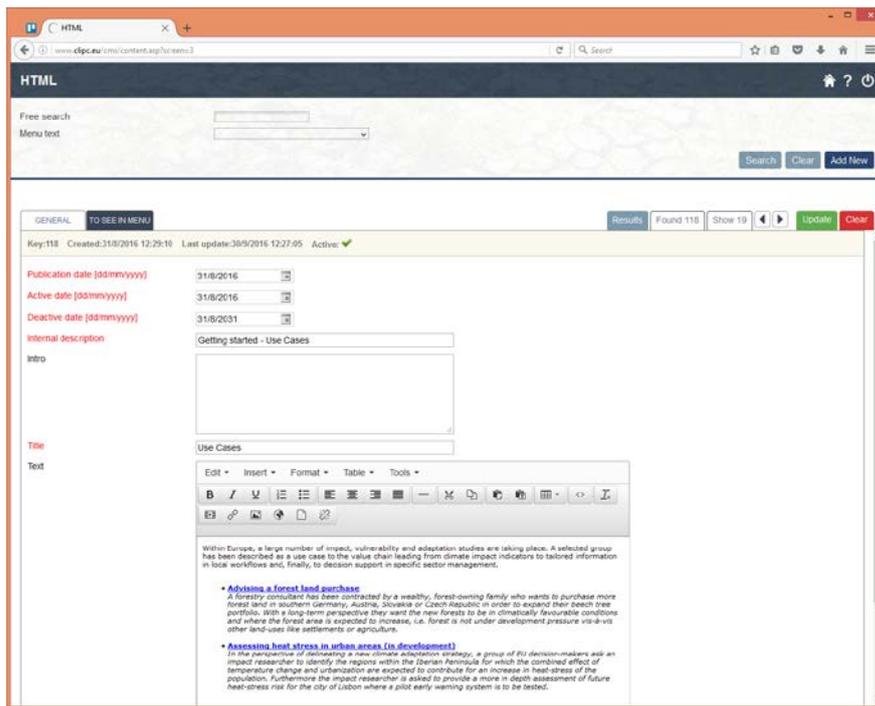


Figure 5: HTML edit page

- **Uncertainty** : A specific CLIPC module. Together with WP6 partner Gericis an uncertainty factsheet definition is created which can be managed here. Each factsheet can be linked to one or more datasets from the dataset catalogue. See figure 6.

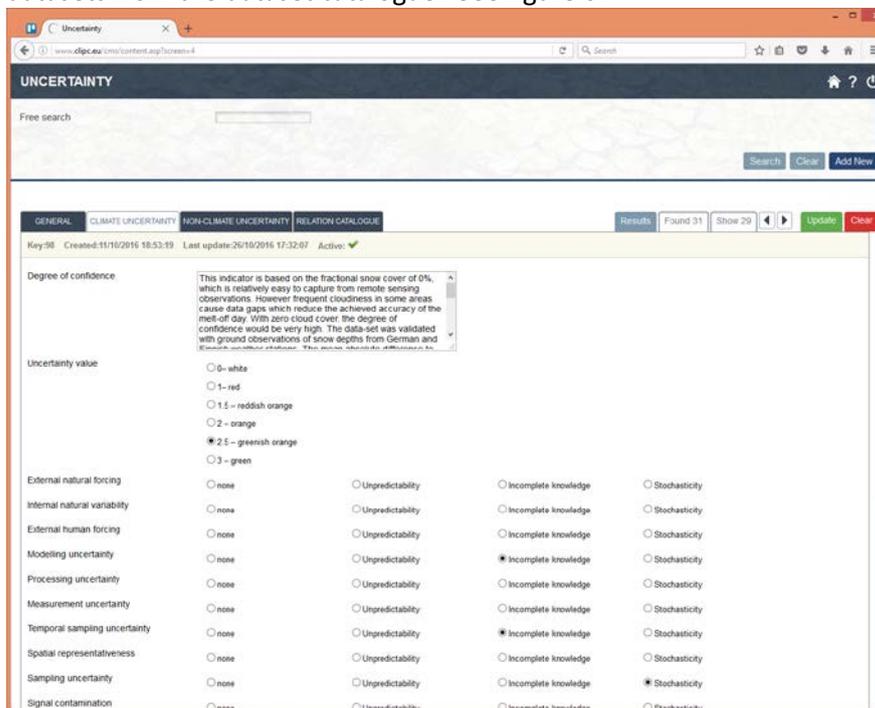


Figure 6: Edit page for uncertainty factsheet

- Menu : Main and submenu's management
- News : Publishing news items
- Highlights : Highlights published in the side bare of the website are managed in this module.
- Glossary : A specific CLIPC module. Behind the website content several glossaries are active. For every term present in the glossary the definition is shown when the user hoovers the mouse cursor over the term.
- Indicators : Another specific CLIPC module. Each climate impact indicator in the toolkit has its specific description and methodology (and code). WP7 has produced the list of indicators, and all descriptions shown in the toolkit are managed via this module. See figure 7 and 8.

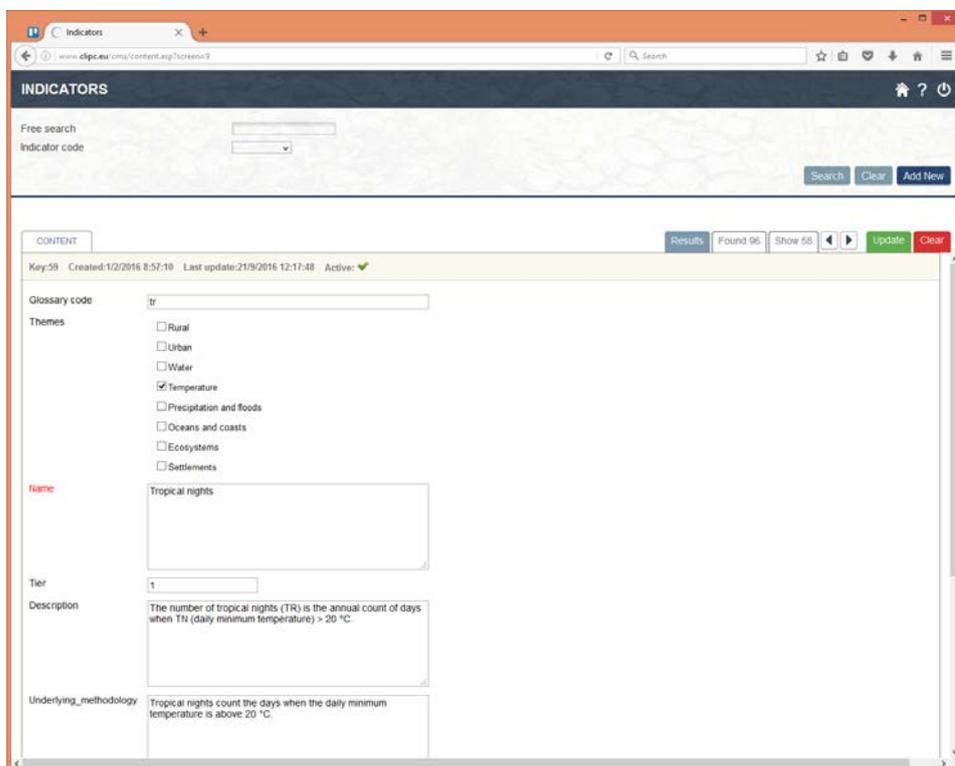


Figure 7: Edit page for indicator descriptions

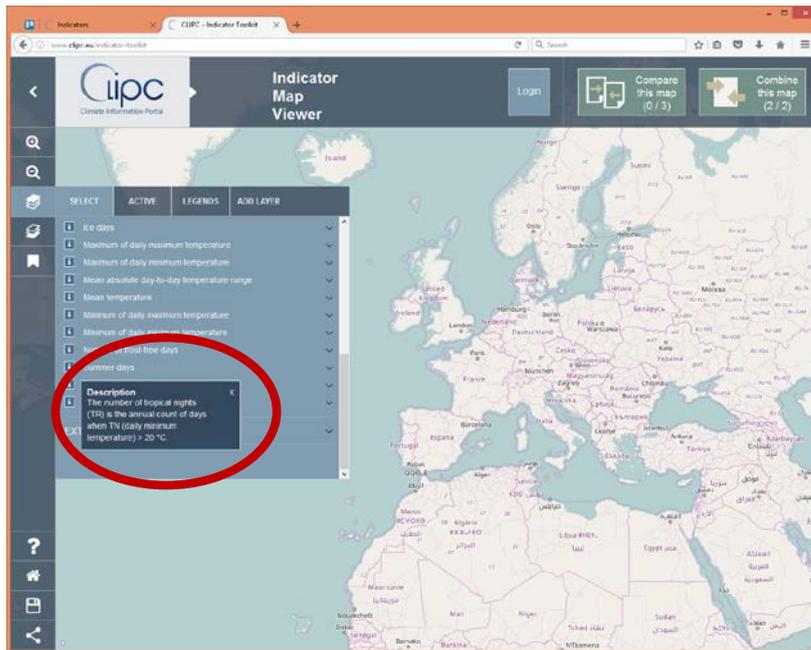


Figure 8: indicator description use

3.3 Climate impact indicator toolkit

The impact indicator toolkit is an essential part of the CLIPC project, because it combines the major efforts of various work packages:

- WP7 : Creation of impact indicators and related datasets, see D7.3 Toolkit indicator module;
- WP8 : Development of ideas/concepts for comparing, combining and using climate impact indicators, see D8.3 Comparison, ranking and aggregation of impact indicators and D8.2 Scenario based indicator exploration;
- WP4 : Implementation of developed services to visualise indicators, and the development of processing services and functions to combine indicators (add/subtract/etc.). This is described in D4.3 Visualization Manual and D4.4 Integrated Toolbox Report;
- WP6 : Creation of validated and bias corrected climate datasets as input for creating e.g. tier 1 indicators and to express uncertainty, see D6.3 Future CCII-T1 scenarios for Europe;

And WP3 collects and combines all ideas and services into user interfaces where the user can select, view, compare and combine indicators;

The toolkit consists of three main applications: A mapviewer, a compare application and a combine application. Each will be presented in the following paragraphs.

3.3.1 Indicator Map Viewer

Specifications:

- Portal software: Openlayers 3/Javascript/Php
- Makes use of KNMI ADAGUC visualization server (Visualises NetCDF data from OPeNDAP server)
- Basic functions activated:
 - View indicators per theme with description: Per indicator one or more datasets are available and can be activated and selected
 - Active layers – basic map functions: Set time-slice of a dataset, change opacity, order of presentation, legend, legend styling selection
 - Per active layer: View histogram (inspect main values in dataset), view time-series on selected locations
 - Bookmark function: Save map setting and share with others
 - Select indicators to use them in the compare and combine function

The current version of the mapviewer can be viewed at: <http://www.clipc.eu/indicator-toolkit>

Some illustrations of functions mentioned:

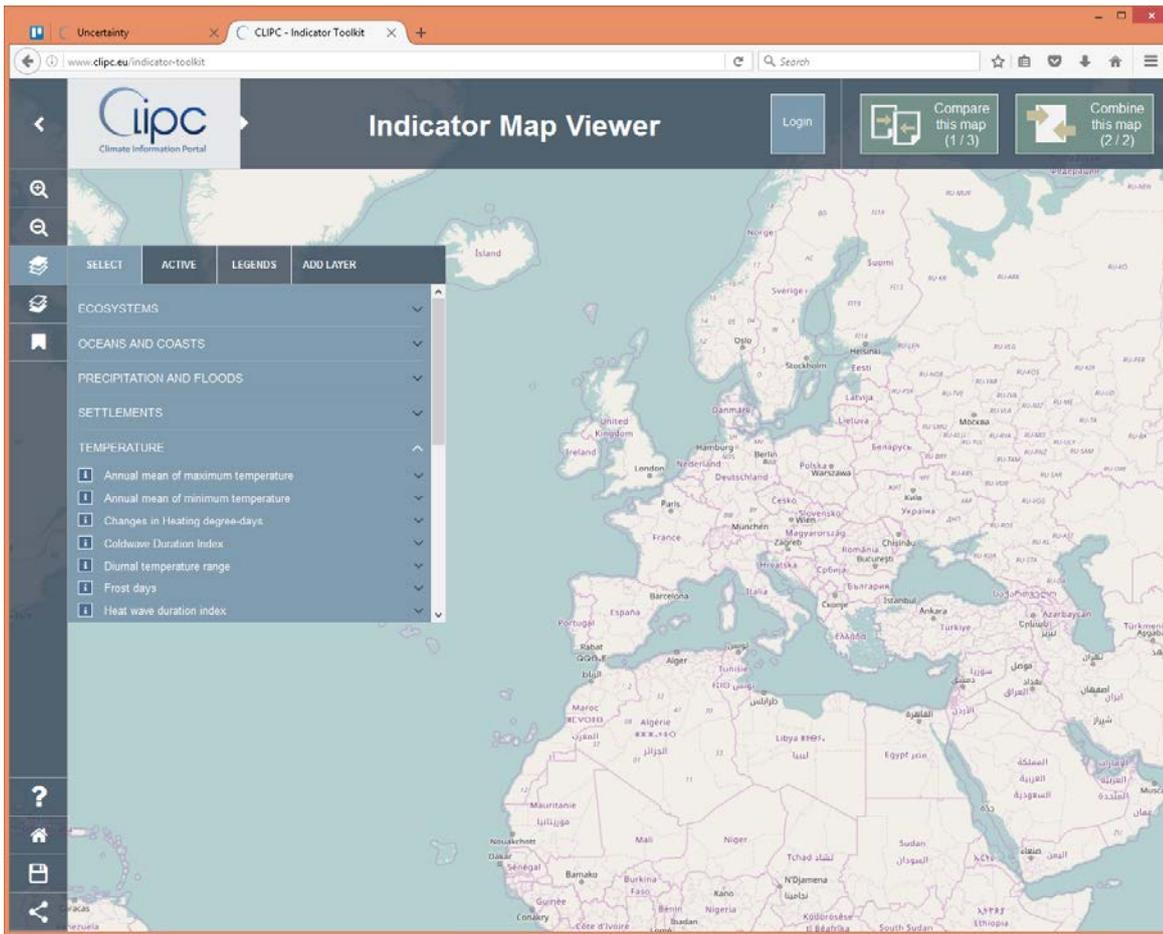


Figure 9: Start screen of the Indicator Map Viewer of the toolkit – view indicators per theme

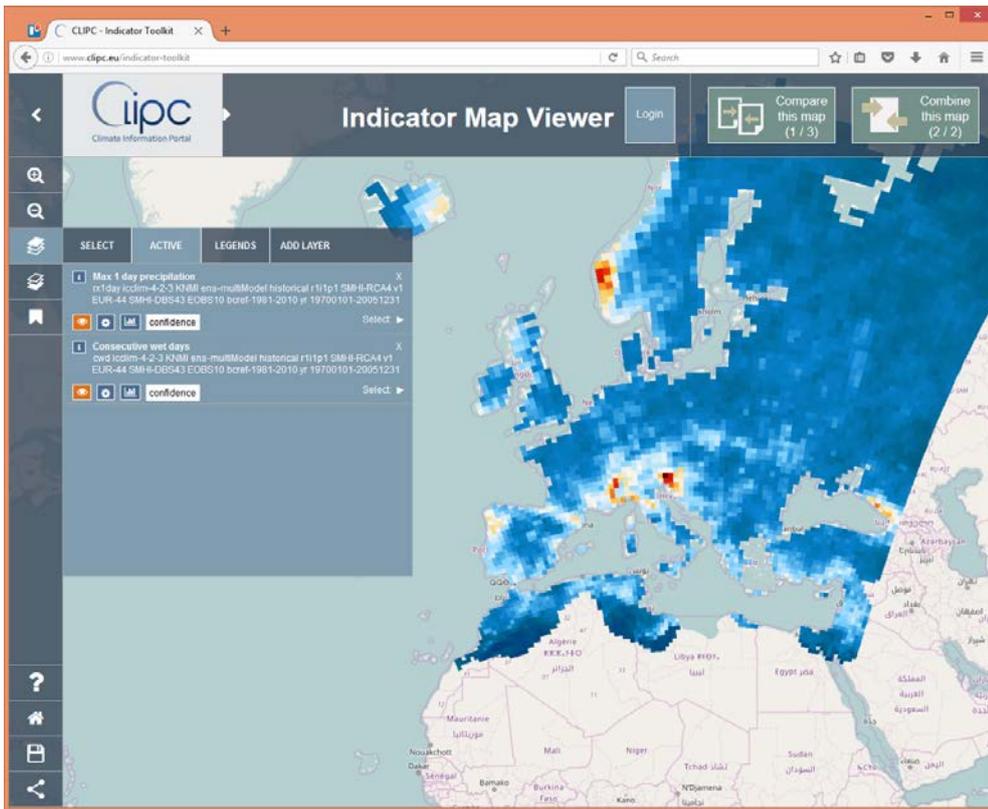


Figure 10: Active datasets as layers on map

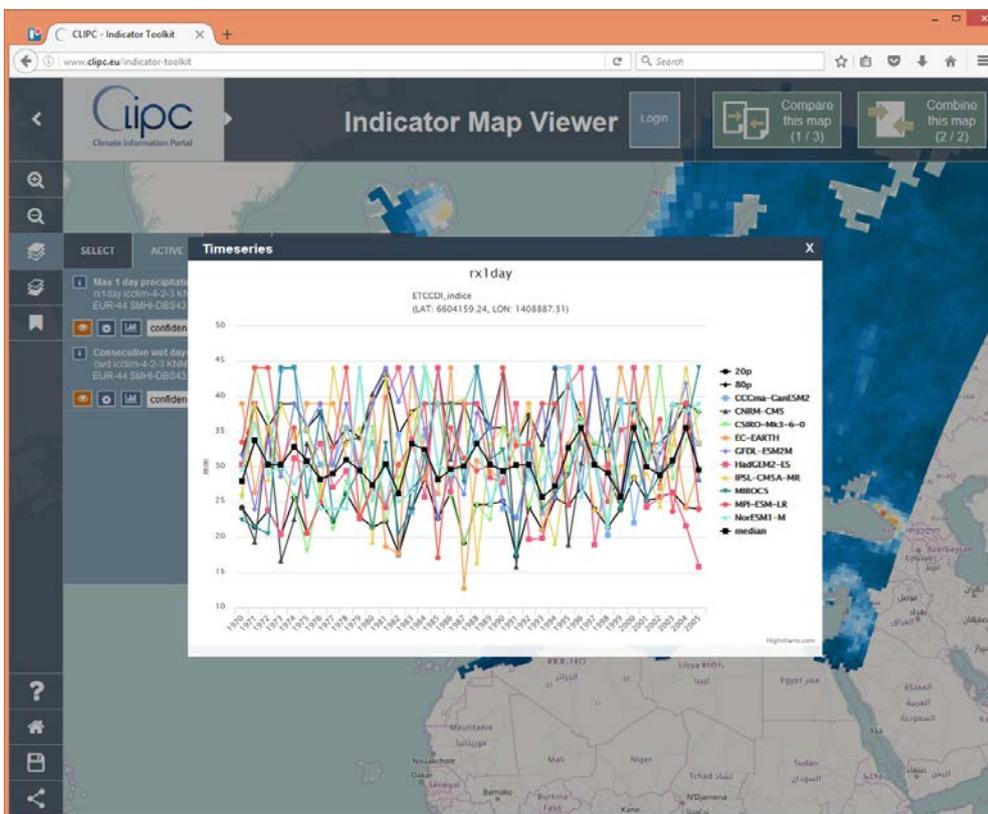


Figure 11: Time-series (of an ensemble dataset, individual members can be selected)

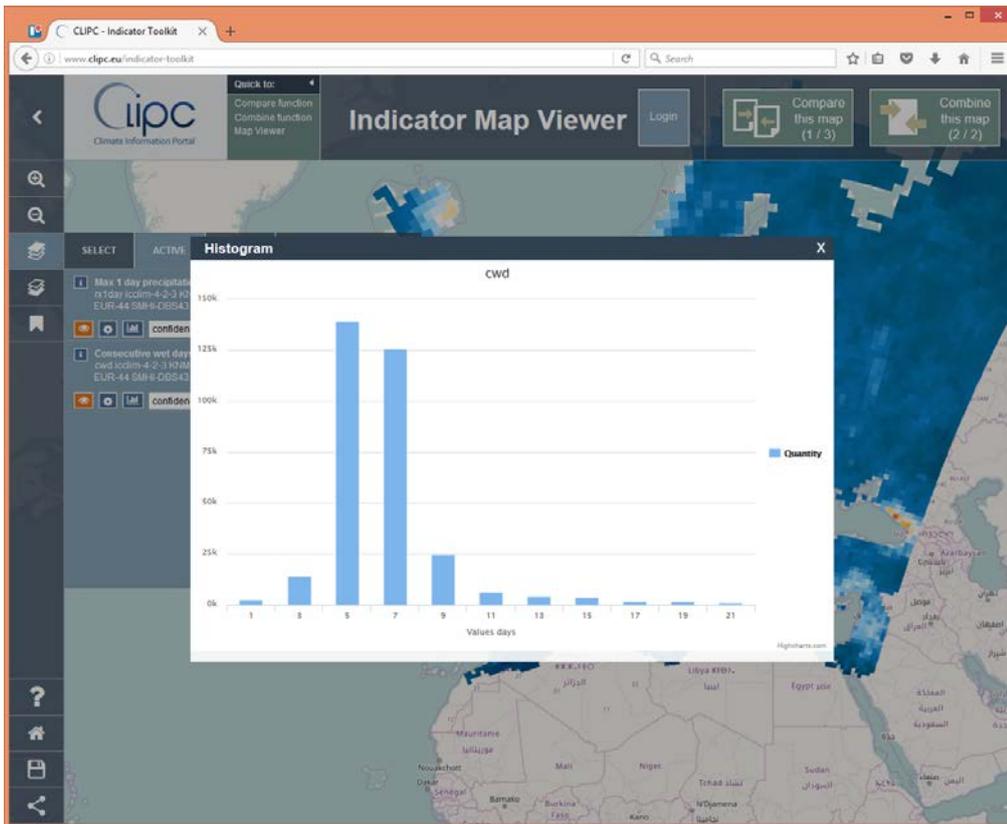


Figure 12: Histogram of a selected dataset

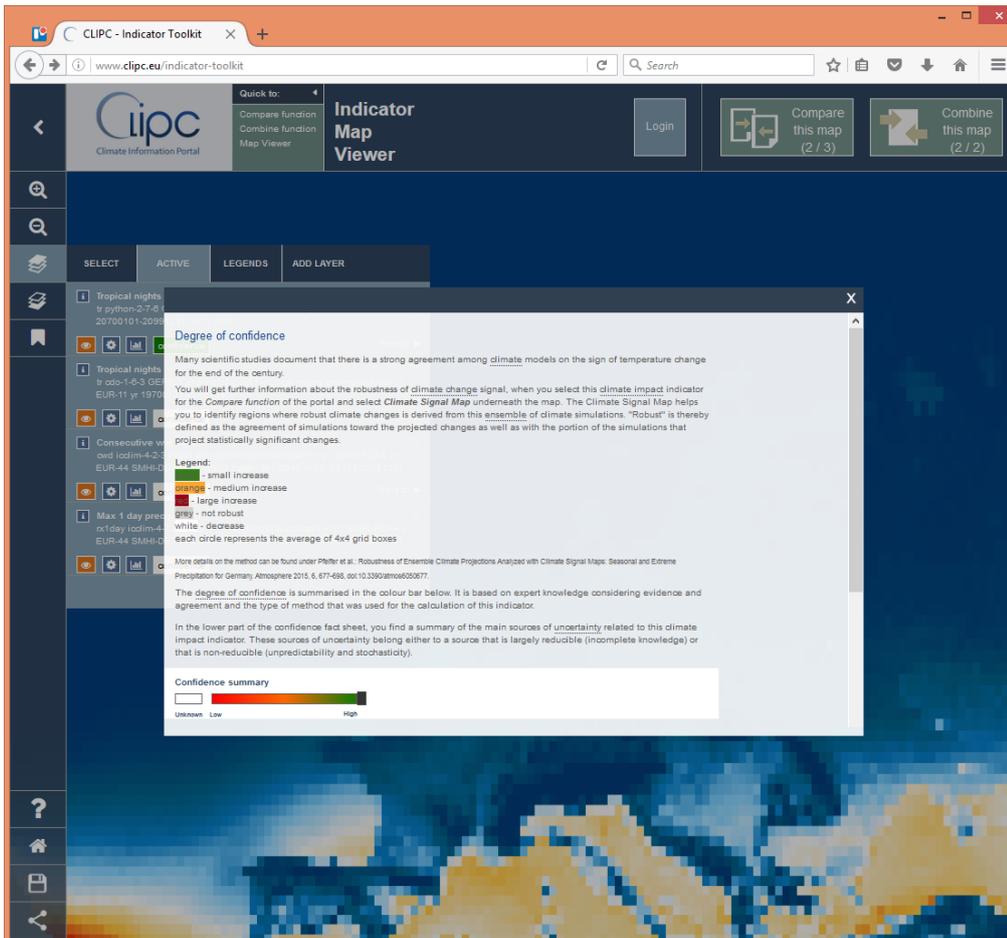


Figure 13: Uncertainty factsheet for certain datasets - in cooperation with WP6

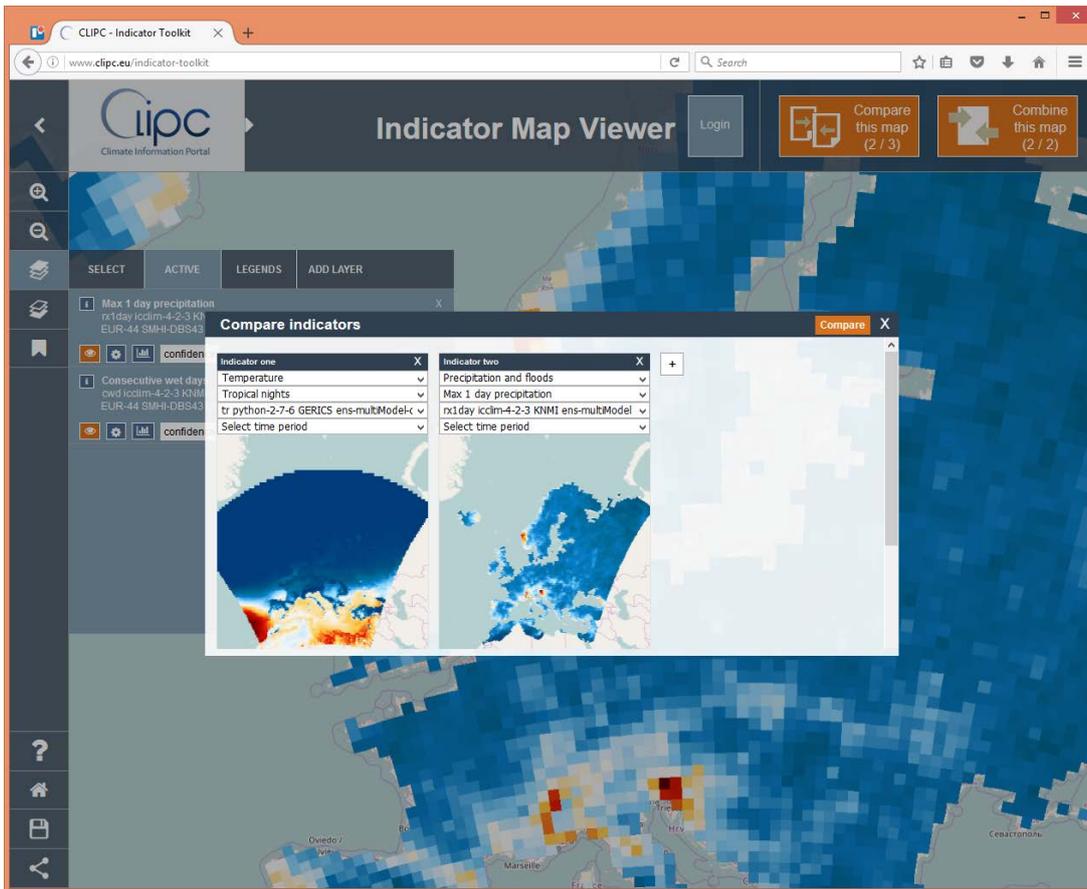


Figure 14: Select in "basket" for comparison

3.3.2 Compare indicator datasets

The full concept for the comparison of indicator datasets is documented in WP8 deliverables and milestones (D8.2, D8.3). In WP3 the focus has been on translating the concept into user interfaces to provide users the means to compare climate impact indicator datasets visually via maps, via metadata and simple statistics, and an assessment of the degree of confidence.

The user can compare indicator dataset by selecting them in the map viewer or directly in the compare interface. A basic possibility is the comparison of time stamps of a certain dataset, however that is often not the most appropriate way for studying climate change where average changes over a certain time period are important. Therefore the option has been added to create time period averages on the fly.

The compare application is accessible via http://www.clipc.eu/indicator_toolkit/compare.php

Some illustrations of functions mentioned:

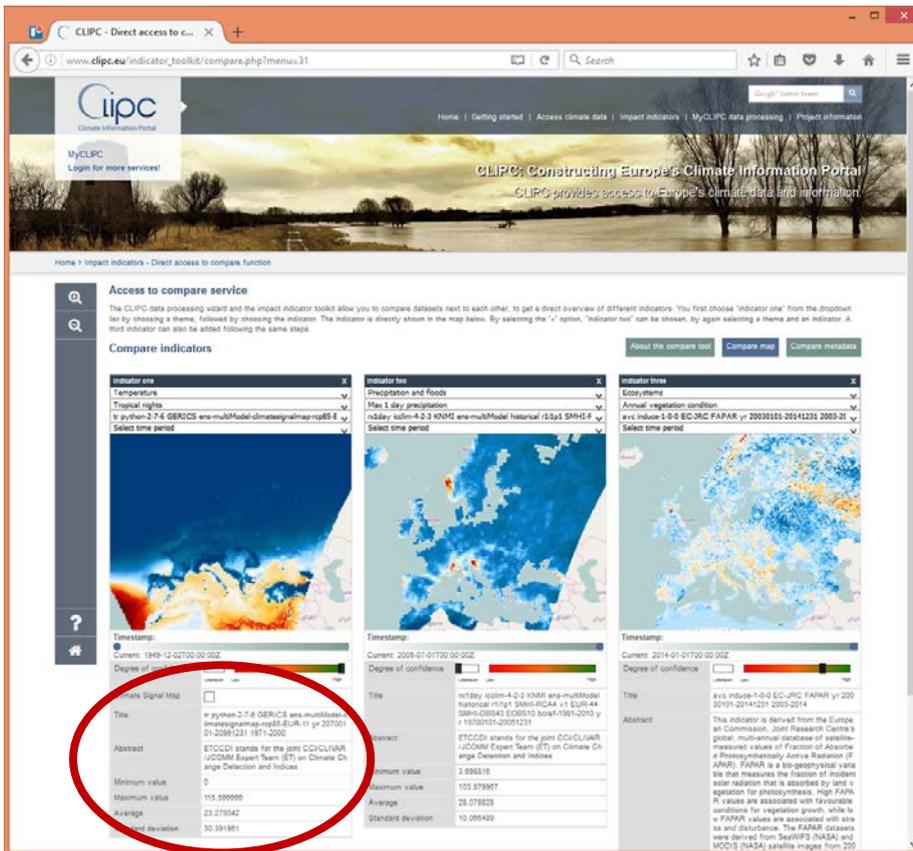


Figure 15: Compare indicator maps visually. Maps can be zoomed, at the bottom (in red circle) metadata and statistics.

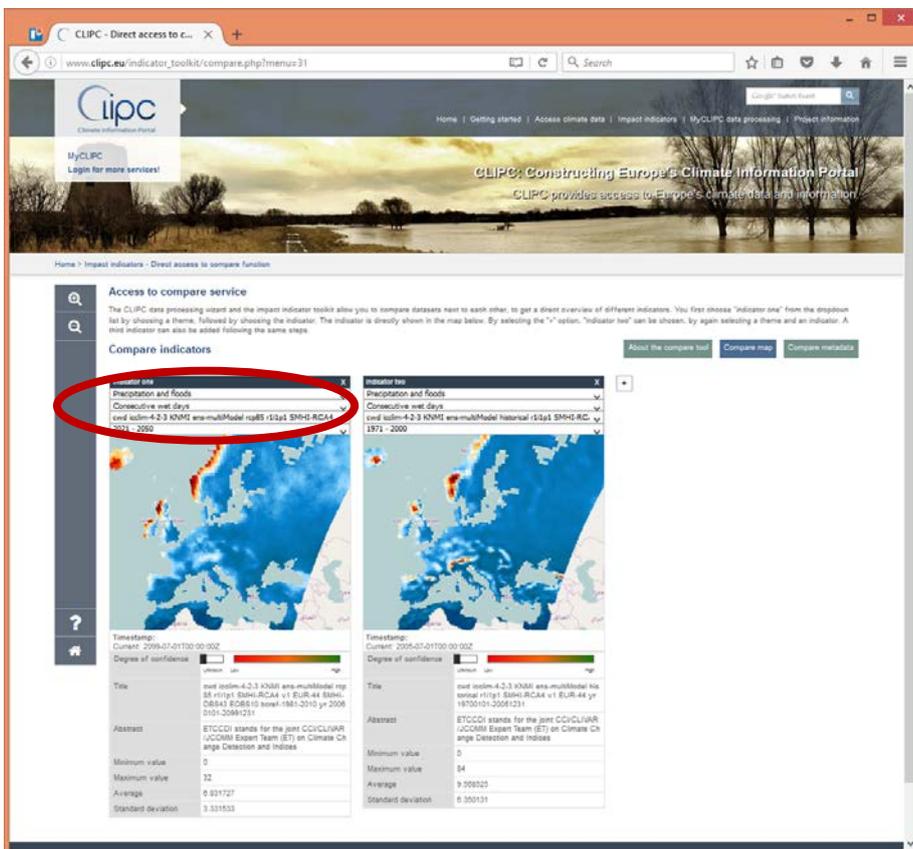


Figure 16: Comparison of time period averages. In this case consecutive wet days of 1971-2000 (right) compared to projection for 2021-2050 (left)

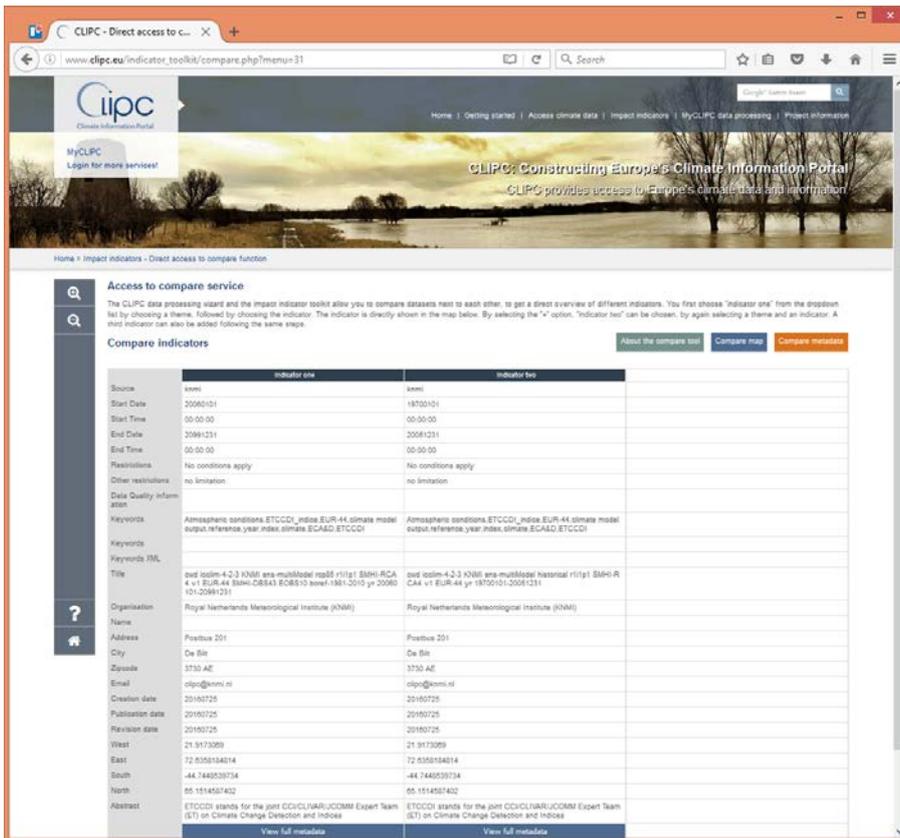


Figure 17: Same datasets as figure 15, but now metadata comparison (from CLIPC dataset catalogue)

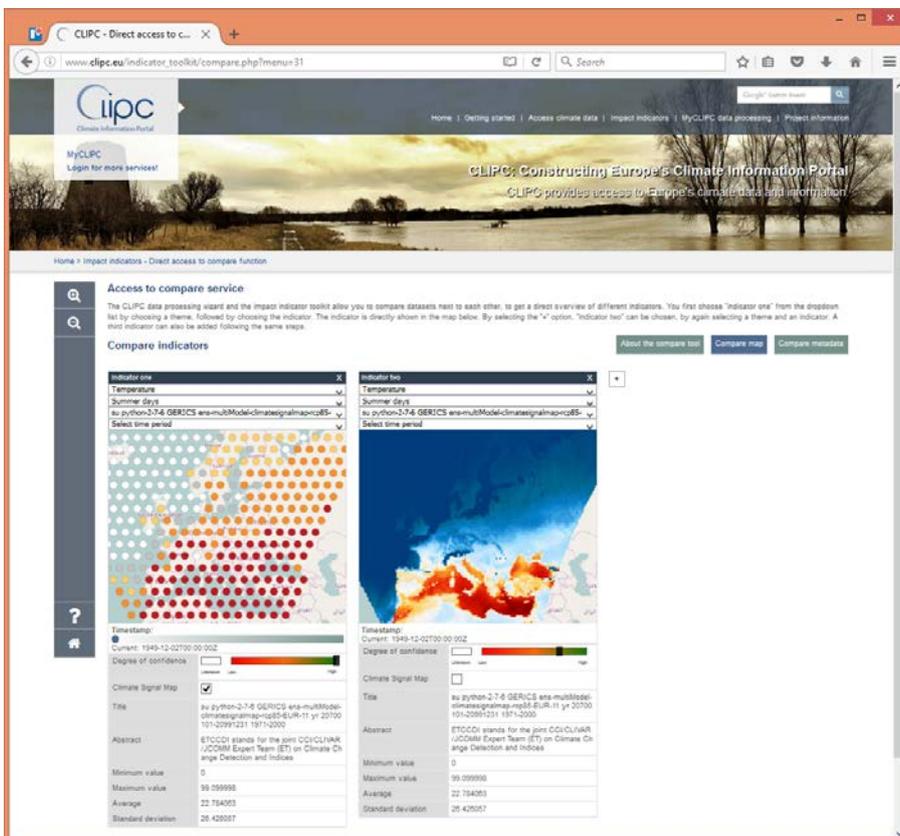


Figure 18: Inspect uncertainty - In this case visual impression of the climate signal via stippling. Original summer days dataset on the right.

3.3.3 Combine indicator datasets

Apart from viewing and comparing indicator datasets the user might want to combine two datasets into a third new dataset, e.g. subtract to calculate differences, or add them up to calculate an impact. The full concept for combining and comparing indicator datasets is documented in WP8 deliverables D8.2, D8.3.

With input from WP4 (services), WP7 (indicator datasets) and WP8 (concept) the focus within WP3 has been to translate the concept into user interfaces to provide users the means to actually combine the datasets and inspect and re-use the results.

Main features of the combine interface:

- The user has to log in first in order to save data and download it (but not required, you can 'play' freely as well)
- Select datasets: Datasets are selected via the map viewer selection option, or directly via the pulldown boxes in the combine application.
- Select timestamp or time period average: When the dataset is selected the user can inspect the metadata, adjust the timestamp or calculate a time-period average for the dataset.
- Compatibility check: The user might select datasets that are either due to their origin (e.g. resolution) or type unwise to combine. The software runs a compatibility check using WP4 services, based on WP8 algorithms, and provide the result in the centre. The user can still decide to run the calculation, but in any case on own risk.
- Calculate combination: Selection of the normalisation procedure (none, min/max, etc.), selection of the combination process type (add, subtract, etc.) and give the name of your output file.
- Calculate average over NUTS ¹regions (country or other regions average): The resulting dataset can be averaged over a polygon, in this case NUTS 0 (countries) or NUTS 3 (local area division).
- Download or print result: When done, the results can be printed via the website, or the user is directed to "My datasets" where the dataset can be downloaded as a NetCDF file.
- Guidance and example use cases: i-buttons are present wherever support is provided to explain specific terms or steps within the combine process. The CLIPC website also offers use case descriptions to illustrate the potential of the toolkit, e.g.:
<http://www.clipc.eu/content/content.php?htm=121>

The combine application is accessible via <http://www.clipc.eu/impact-indicators/access-to-combine-function>

Some illustrations of functions are mentioned in following screenshots.

¹ The NUTS classification (Nomenclature of territorial units for statistics) is a hierarchical system for dividing up the economic territory of the EU (source: Eurostat)

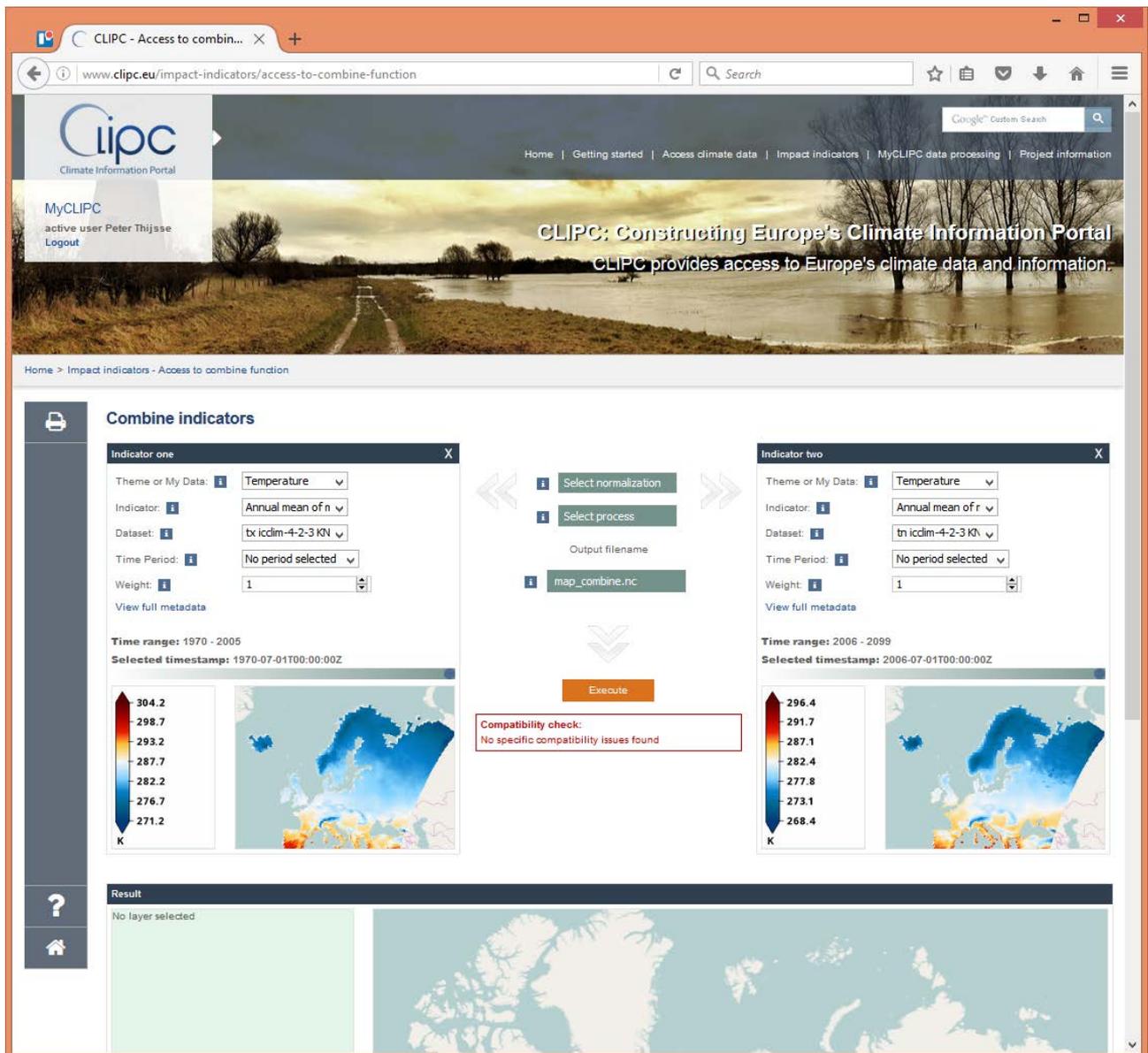


Figure 19: Select datasets - In this case a historic (left) and projection dataset (right) of annual mean of minimum temperature

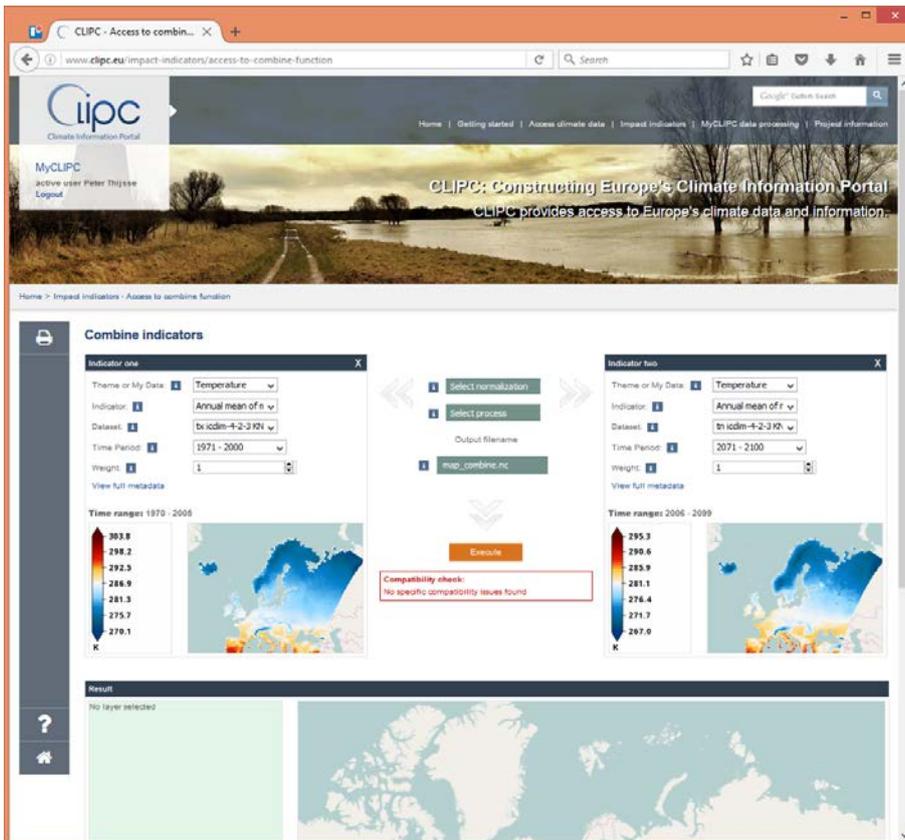


Figure 20: Select timestamp - 1971-2000 vs 2071-2100. In the middle (in red) a compatibility check is shown.

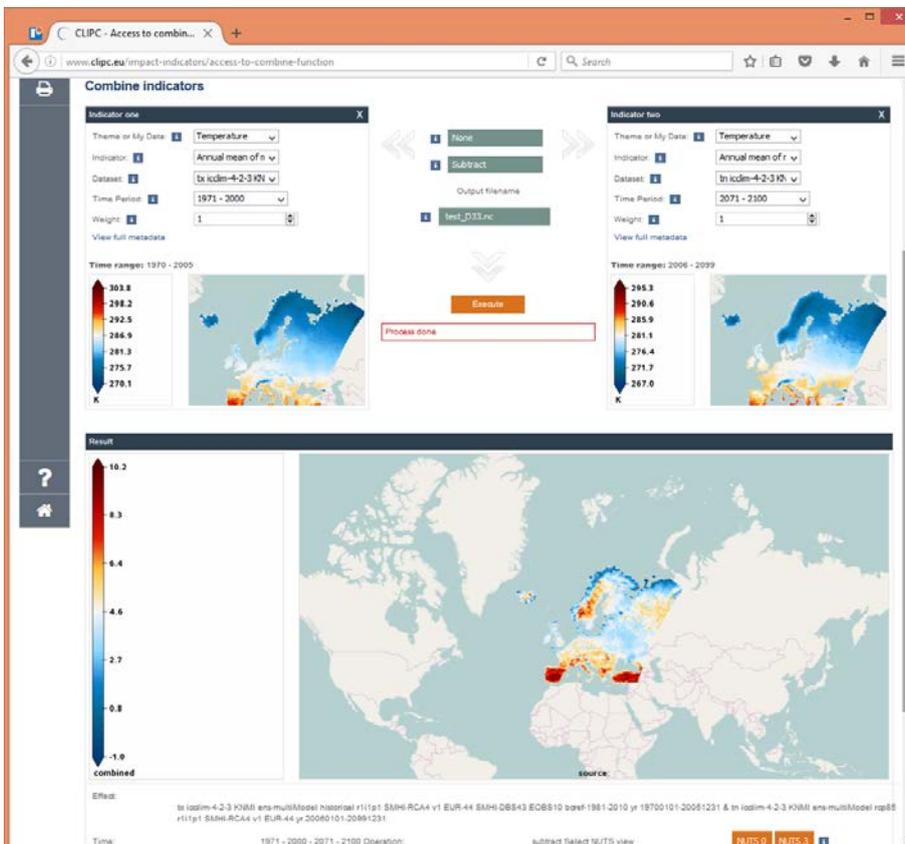


Figure 21: Selection of normalisation, process (subtract), dataset name and execute. Result shows difference of the two timeperiod averages

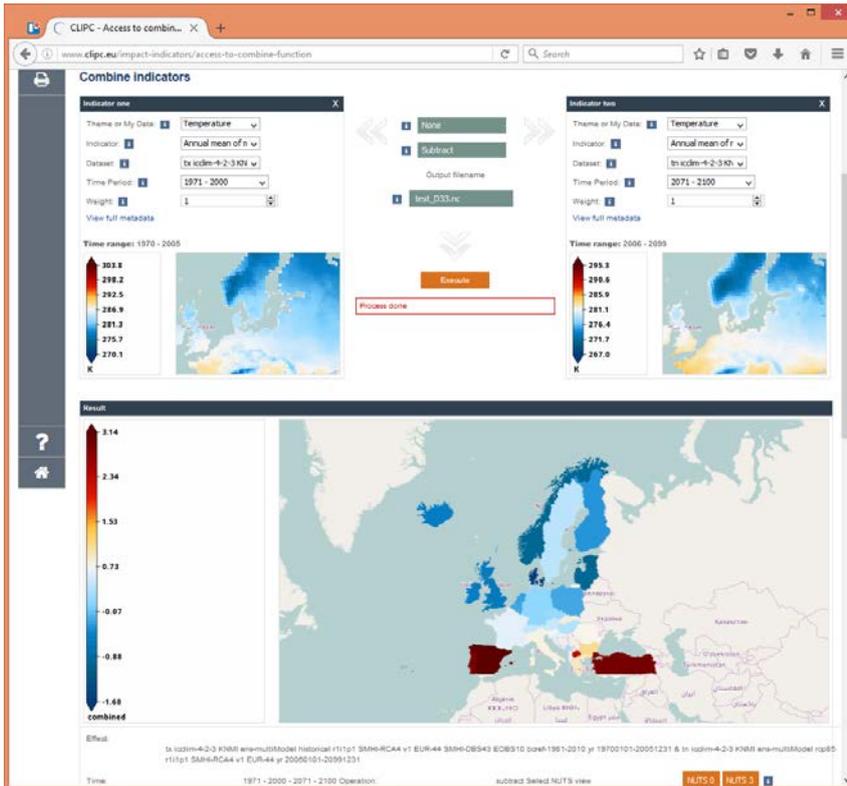


Figure 22: Calculated average over countries (no major indication of changes in the north and central Europe)

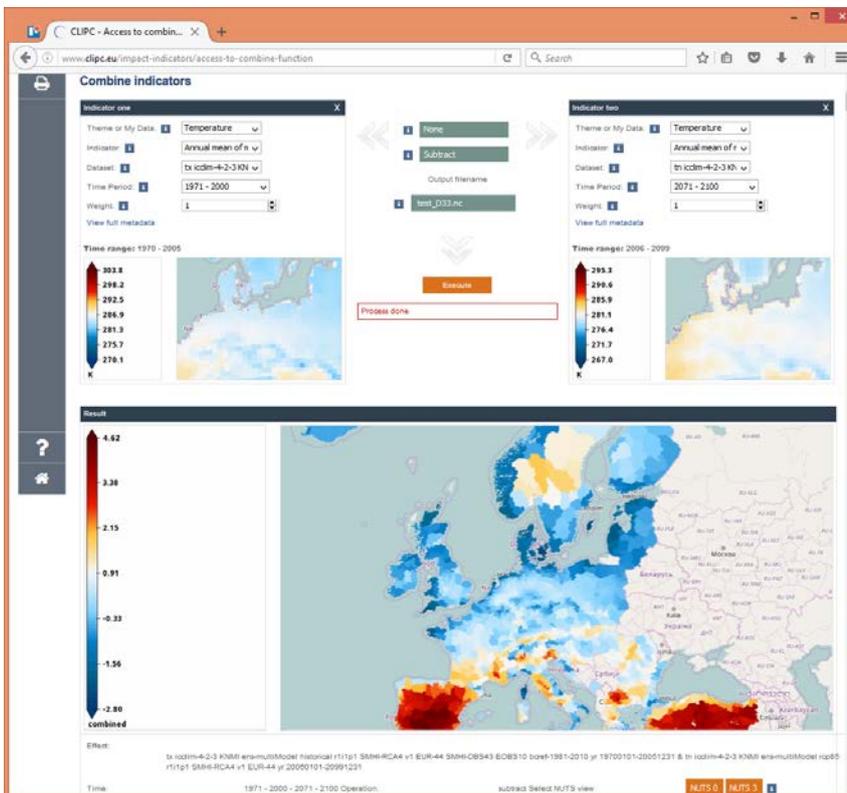


Figure 23: Result averaged over NUTS3, now clear change indication in Sweden and Alps.

The screenshot shows the CLIPC Data Basket interface. At the top, there is a navigation bar with the CLIPC logo and a search bar. Below the navigation bar, there is a banner image with the text "CLIPC: Constructing Europe's Climate Information Portal" and "CLIPC provides access to Europe's climate data and information." The main content area is titled "Dataset Basket" and contains a table of datasets. The table has columns for File, DAP, HTTP, Filesize, Date, Remove, and Download. The datasets listed include "test_D33.nc", "COPY_WEIGHT2.nc", "COPY_WEIGHT1.nc", "COPY_NORM2.nc", "COPY_NORM1.nc", "COPY_WCS2.nc", and "COPY_WCS1.nc". Each dataset has a checkbox, a download icon, and a delete icon.

File	DAP	HTTP	Filesize	Date	Remove	Download
<input type="checkbox"/> Remote data						
<input type="checkbox"/> My data						
<input type="checkbox"/> WPS_Scratch						
<input type="checkbox"/> WPS_clipc_extractnuts_execute_20161104T144958Z						
<input type="checkbox"/> WPS_clipc_extractnuts_execute_20161104T144731Z						
<input type="checkbox"/> WPS_knmi_advanced_combine_20161104T1444						
<input type="checkbox"/> test_D33.nc	true	true	16.118M	2016-11-04 14:45:01Z	X	
<input type="checkbox"/> COPY_WEIGHT2.nc	true	true	16.082M	2016-11-04 14:45:01Z	X	
<input type="checkbox"/> COPY_WEIGHT1.nc	true	true	16.084M	2016-11-04 14:45:00Z	X	
<input type="checkbox"/> COPY_NORM2.nc	true	true	16.08M	2016-11-04 14:45:00Z	X	
<input type="checkbox"/> COPY_NORM1.nc	true	true	16.084M	2016-11-04 14:45:00Z	X	
<input type="checkbox"/> COPY_WCS2.nc	true	true	461.054K	2016-11-04 14:44:59Z	X	
<input type="checkbox"/> COPY_WCS1.nc	true	true	463.378K	2016-11-04 14:44:58Z	X	
<input type="checkbox"/> WPS_wps_timeavg_20161104T144120Z						

Figure 24: In dataset basket the processed dataset is available for download

More documentation on backgrounds of compare and combine services is provided by the CLIPC deliverables D4.3 Integrated Toolbox report, D8.2 Scenario based indicator exploration and D8.3 Comparison, ranking and aggregation of impact indicators.

3.4 CLIPC dataset catalogue

The CLIPC dataset catalogue <http://www.clipc.eu/access-climate-data/access-clipc-dataset-catalogue> lists the following datasets:

- The Bias corrected datasets from CLIPC WP6
- Processed /calculated climate indices
- Tier 1/2/3 Climate Impact indicators as created and used in the project.
- Indicators from other sources outside CLIPC which have been collected and made available

The catalogue makes use of the ISO19139 datamodel and uses the Open Geospatial Consortium Catalogue Service for Web CSW standardized protocol to harvest metadata from other catalogues. In this version the metadata is harvested from the CEDA/STFC CSW server (for metadata of CLIPC WP6 climate datasets published on ESGF) and KNMI CSW server (for metadata of climate indices and climate impact indicators produced in WP7).

The user interface offers a faceted search, after which the user can browse datasets and view the metadata. The aim is to visualise the harvested metadata to others internally and externally, but the catalogue is also input for the dataset selection in the Indicator Map Viewer of the toolkit. Efforts were focussed on the harmonisation of metadata models, including the use of vocabularies in a uniform way (WP5 input). This resulted in an improved usability and presentation of metadata to the user, as well as an extension of the faceted search options of the catalogue.

The metadata includes URLs to WMS services and download location of the NetCDF files. Where possible a preview of one timestamp of the dataset is presented in the details.

The CHARM-e annotation system (<http://charme.org.uk/>) has been included to allow users to create a dataset annotation and present it within CLIPC.

The dataset catalogue application is accessible via http://www.clipc.eu/catalogue/browse_step.php?menu=63.

Some illustrations of main functions are presented in the following screenshots.

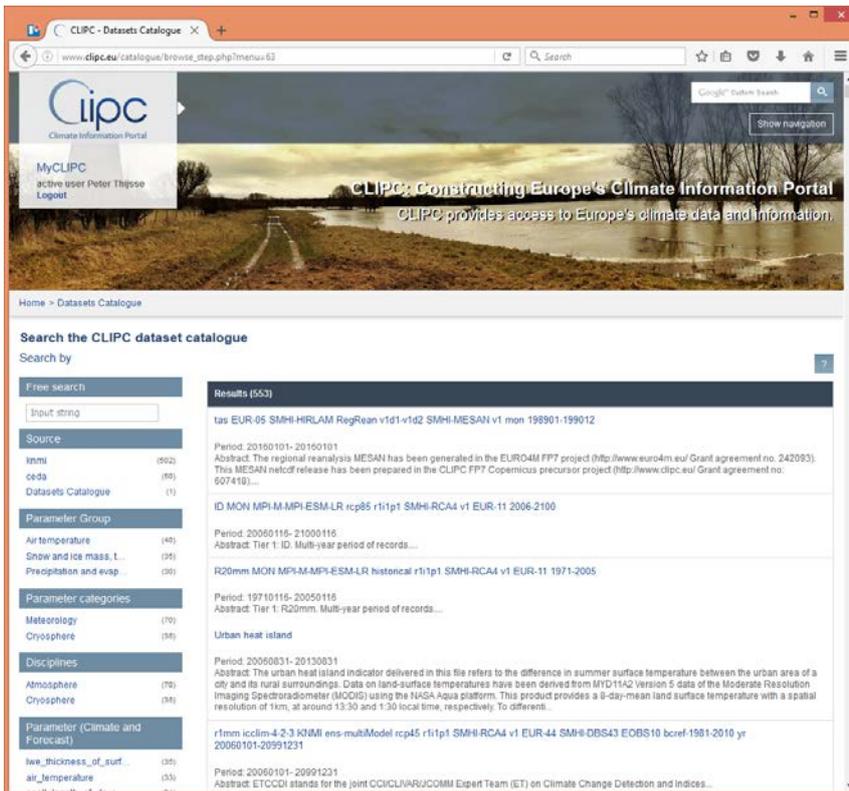


Figure 25: Browsing the dataset catalogue with search facets on the left

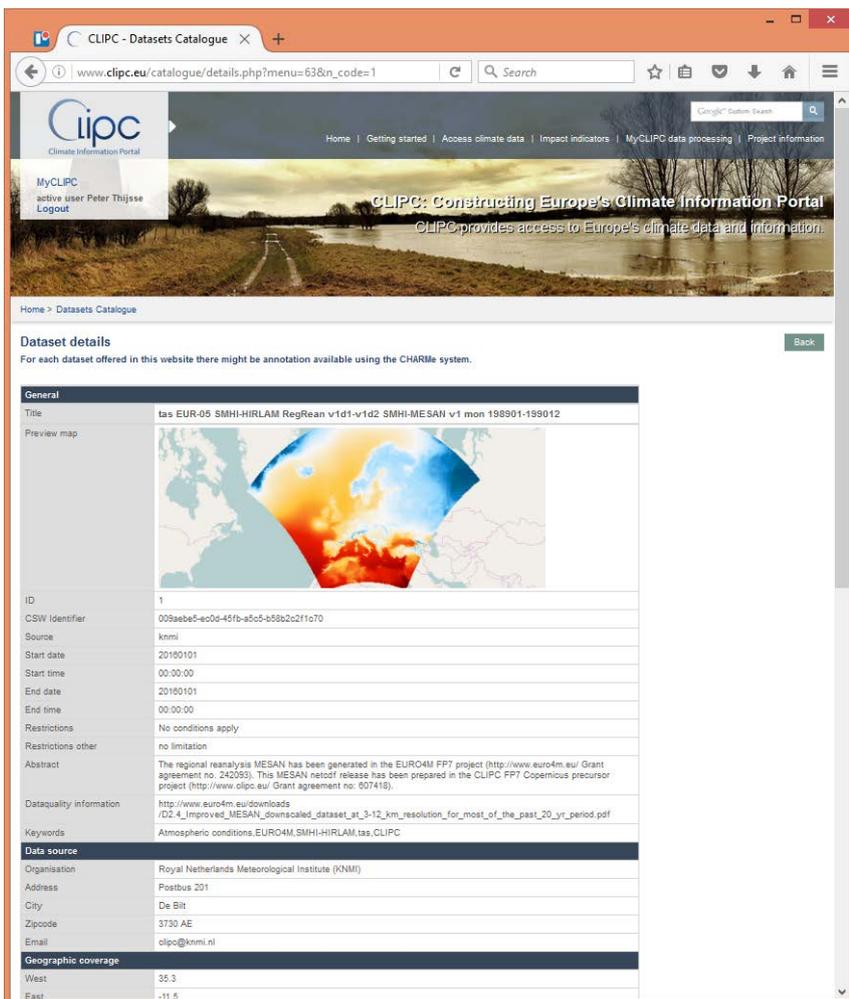


Figure 26: Dataset metadata details with a map preview

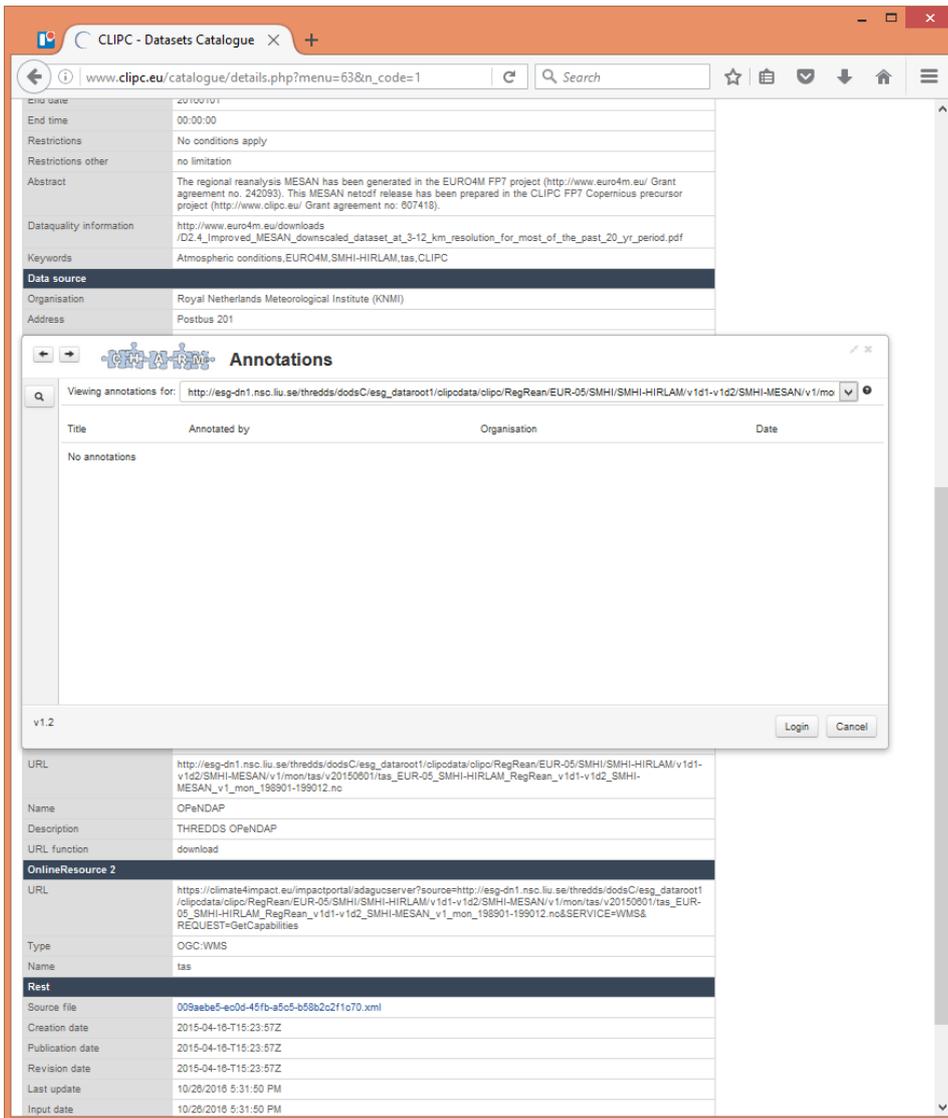


Figure 27: Example of CHARM-e annotation for datasets

3.5 Climate data search

The search function demonstrates how climate data from different infrastructures could be searched from a central location by using their regular search API's. If the infrastructures use vocabularies, then a mapping of vocabularies can be used to search via one search term from vocabulary A in infrastructure B on the fly also in infrastructure C on mapped value of vocabulary D. More concrete example: The search interface offers a search option for terms of the NERC vocabulary P02 (Parameter Group) which is used in the infrastructures SeaDataNet and EMODNet. When using a search term, e.g. Sea Level, this term is mapped on the fly to the CF (vocabulary P07) value which is used in CMEMS/MyOcean and in that way also provides results from CMEMS.

Further feature description :

- The left column contains the query filters which can be selected by the user.

- The column on the right contains the infrastructures that are queried and the amount of datasets that match the query.
- As the user sets more filters the amount of records decreases.
- Clicking on the link to the infrastructure will guide the user to his search results*. First a preview in CLIPC layout is shown. Then for the download of data the user is directed to the resource interface, where he or she can download datasets.

* It is important to state that the CLIPC data search does not provide the users direct data access (not a one-stop-shop for data from all infrastructures). An early analysis of the involved infrastructures showed that there were too many difficulties to solve to arrange direct access due to different access policies, security (access control) systems, etc.

Users can search via

- A geographical box
- Parameter – via code/index/term list (Base is P02 standard name list)
- Date from – to
- Free search term (on all titles and codes – as far as the originating infrastructure allows).

The dataset catalogue application is accessible via <http://www.clipc.eu/search-climate-datasets>.

Some illustrations of main functions are presented in following screenshots.

The screenshot shows the CLIPC search interface. The search filters are set as follows:

- Free search: Input free text
- Date: [dd/mm/yyyy] format, with Date from and Date to fields.
- Geobox: North, West, East, South.
- Parameter Group: Filtered to Salinity in the water column (PSAL).

The search results table is as follows:

Data source	Total	To data
CLIPC catalogue All climate (indicator) datasets produced and processed by CLIPC experts	0	→
SeaDataNet dataproducts Marine data products like marine climatologies created within the SeaDataNet project.	17	→
EMODNET Marine chemical data products created within the EMODNet Chemistry project.	0	→
MyOcean Marine data products and forecasts available via CMEMS - the marine component for Copernicus	34	→
ESGF records Climate data accessible via the Earth System Grid Federation infrastructure.	0	→

Figure 28: Search action for salinity data – Results in SeaDataNet and CMEMS/MyOcean

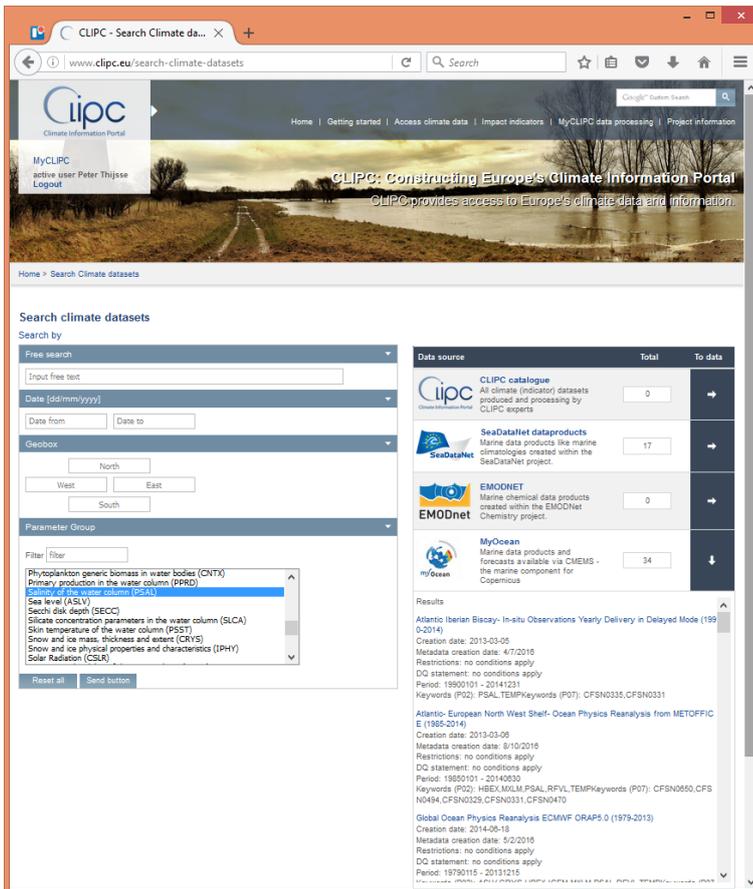


Figure 29: Preview of results in CMEMS/MyOcean

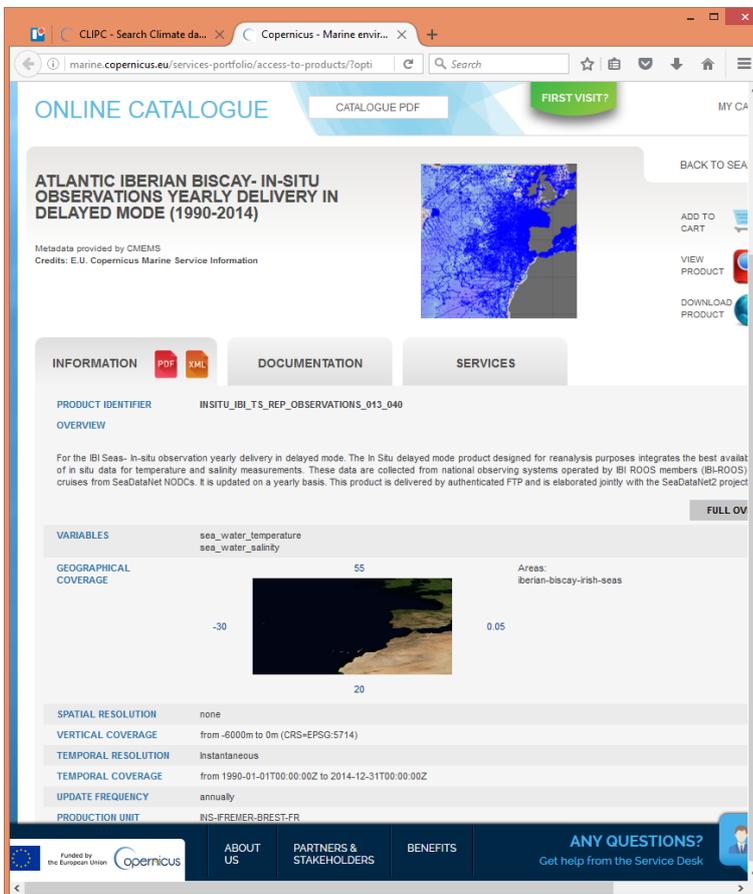


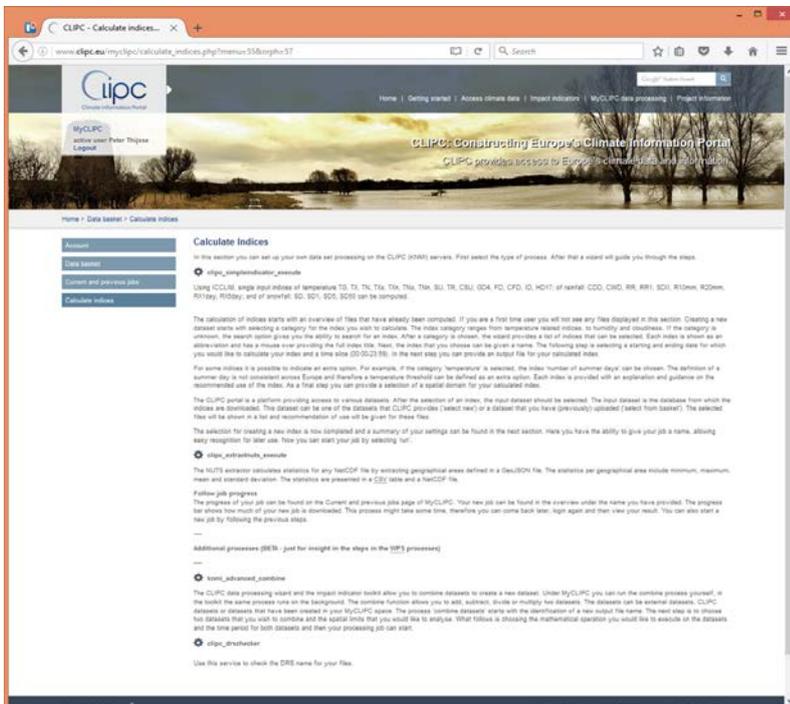
Figure 30: for download and further inspection the user is directed to the resource.

3.6 MyCLIPC data download and processing

The MyCLIPC part of CLIPC offers a more personal experience for expert users and is based on KNMI's Climate4Impact.eu platform. The user starts by logging in to the service, simply using a Google account (OAuth2 support). When logged in the user can access the two main features of MyCLIPC :

- The dataset basket : <http://www.clipc.eu/myclipc/basket.php?menu=55>. This part was already shown as part of the combine application and enables to download the calculated results. Under MyCLIPC the same processing can also be done using a wizard, and the results will then also be available for download.
- MyCLIPC processing services http://www.clipc.eu/myclipc/calculate_indices.php?menu=55&orph=57 : These services can be used to perform generic computations on climate datasets, like the calculation of Tier 1 indices. Within a wizard the user selects the relevant datasets for the calculation from the catalogue« basket of data », then selects the process and some settings and finally executes the process. Calculated datasets will be published/saved in the catalogue of the user, but not made publicly available. Afterwards, the user's private datasets can be visualised using the CLIPC portal Indicator Map Viewer (data can be found under « My data »), or as well be re-used to create new calculations or do visual comparisons etc.

The current version of the processing wizard to calculate indices is a prototype which is completely dynamically built up by the getCapabilities as set by the WPS. The code on the portal interpretes the WPS getCapabilities and builds in php the various steps to collect the input for the WPS. This could be developed to a more mature version, possibly in a next project.



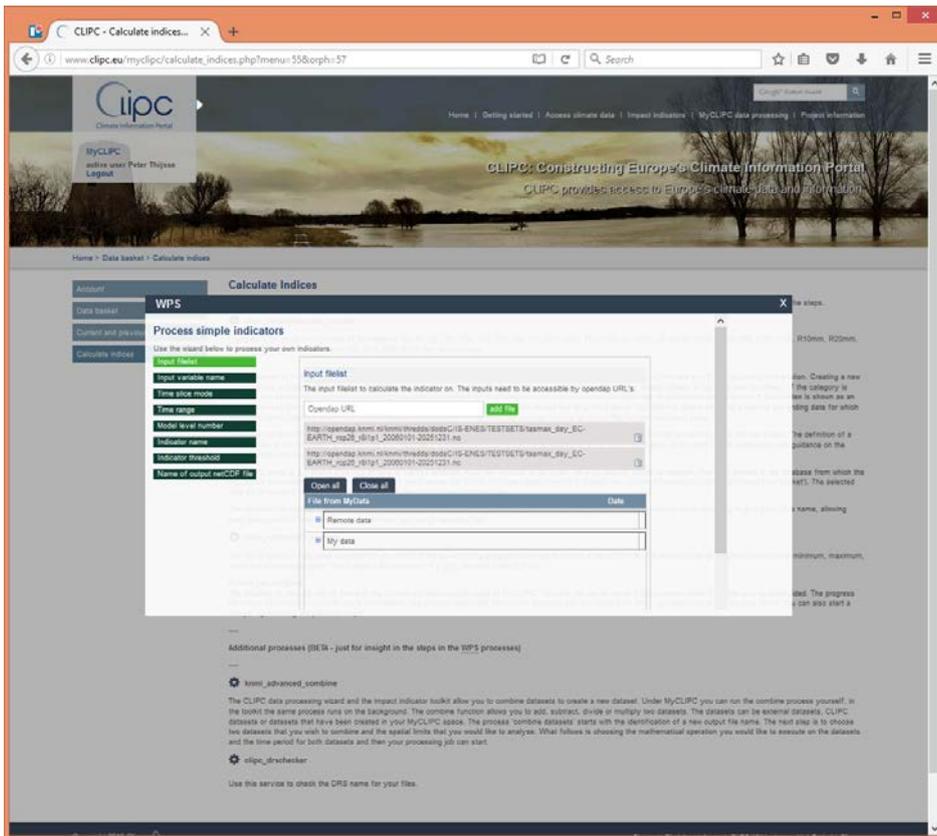


Figure 32: Wizard for processing of simple climate indices - select datasets first (also external sets via OpenDAP) and follow the steps

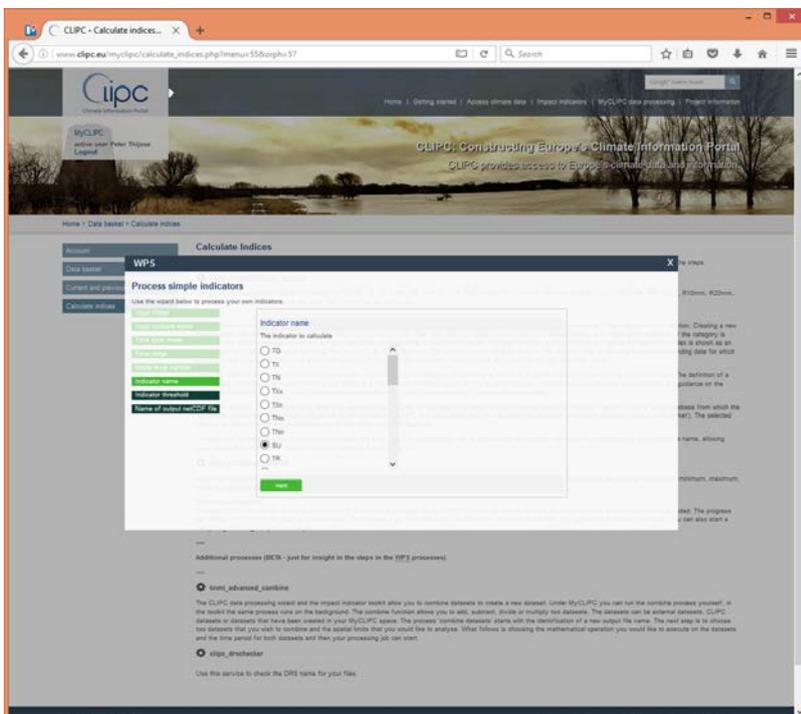


Figure 33: As one of the steps select the indicator

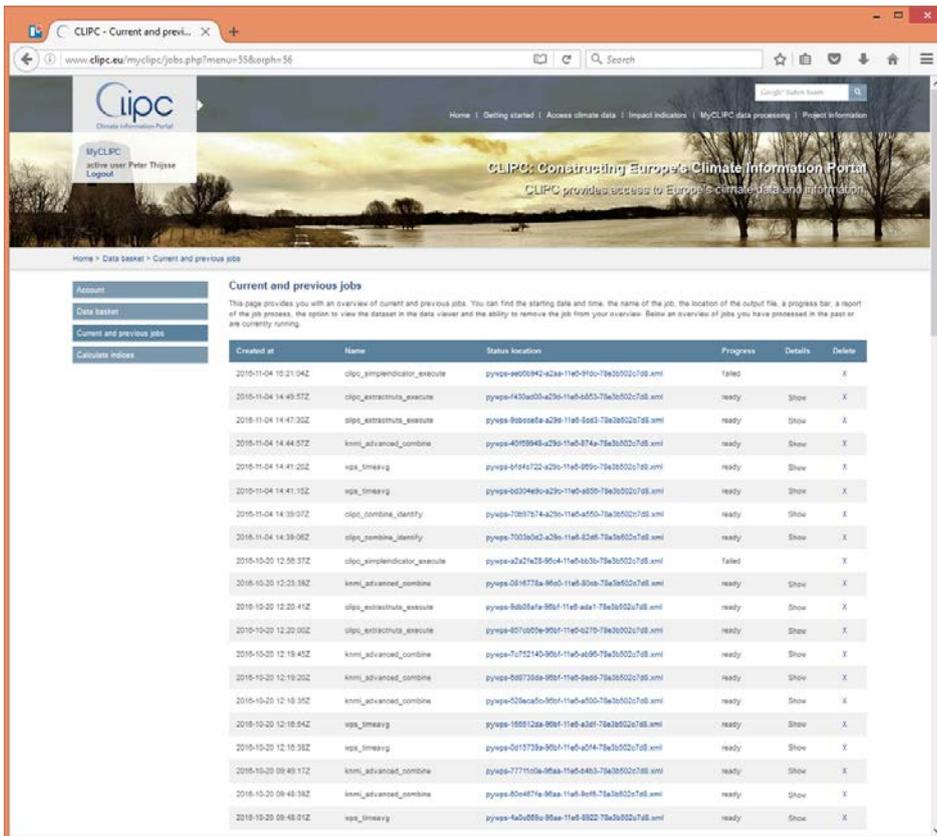


Figure 34: When finished the job overview is shown to show job progress

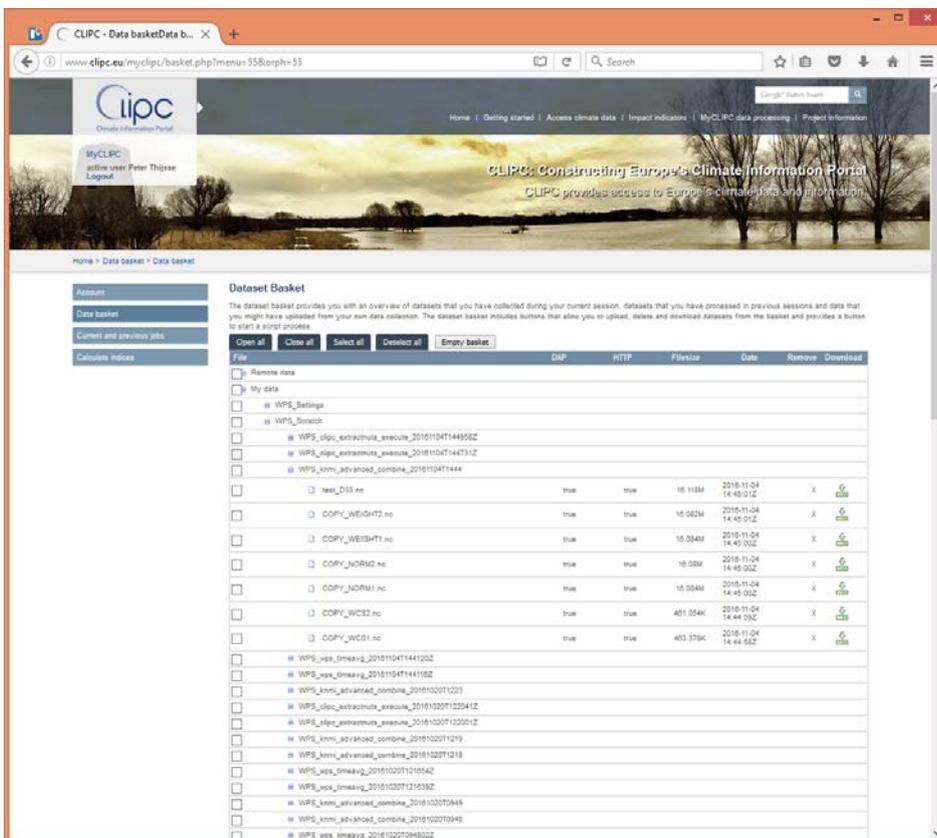


Figure 35: When the job is done, the dataset is available for download

3.7 Guidance and glossary integration in the portal as part of the knowledge base

User guidance in the portal in general, and more specific in each application, is essential for understanding by the user and in that way for achieving success of developments. CLIPC guidance (Knowledge base) has the following main features:

- Getting started section
- Use cases
- Glossary integration
- Help instructions in interfaces

3.7.1 Getting started section

Following user feedback from user consultations organised by WP2 it turned out that first time users wanted initial guidance on the topic « Climate change » and what the CLIPC portal could offer. In close cooperation with Alterra, SMHI and other partners the Getting Started section has been included as menu option 1.

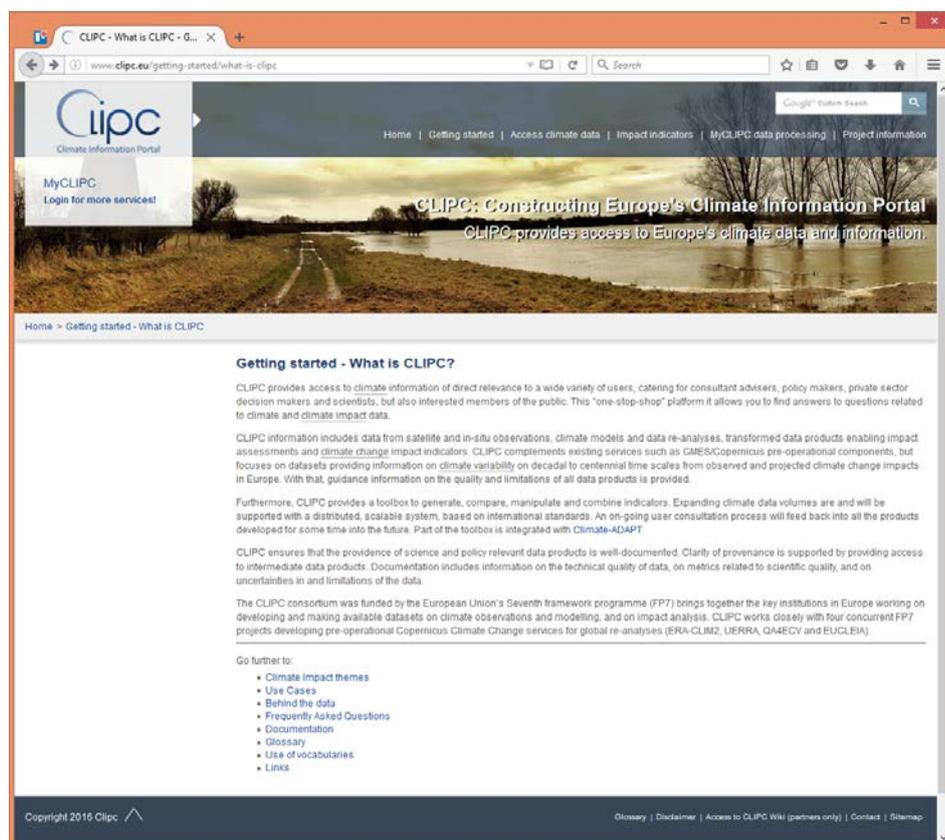


Figure 36: Page Getting Started - What is CLIPC?

This section offers :

- CLIPC impact themes : Description of some of the main climate impact themes.
- Use case descriptions : Some first examples of how a certain user can make use of the CLIPC tools, especially the toolkit.
- Behind the data : Information about the climate system, models, scenarios and other important concepts in climate science

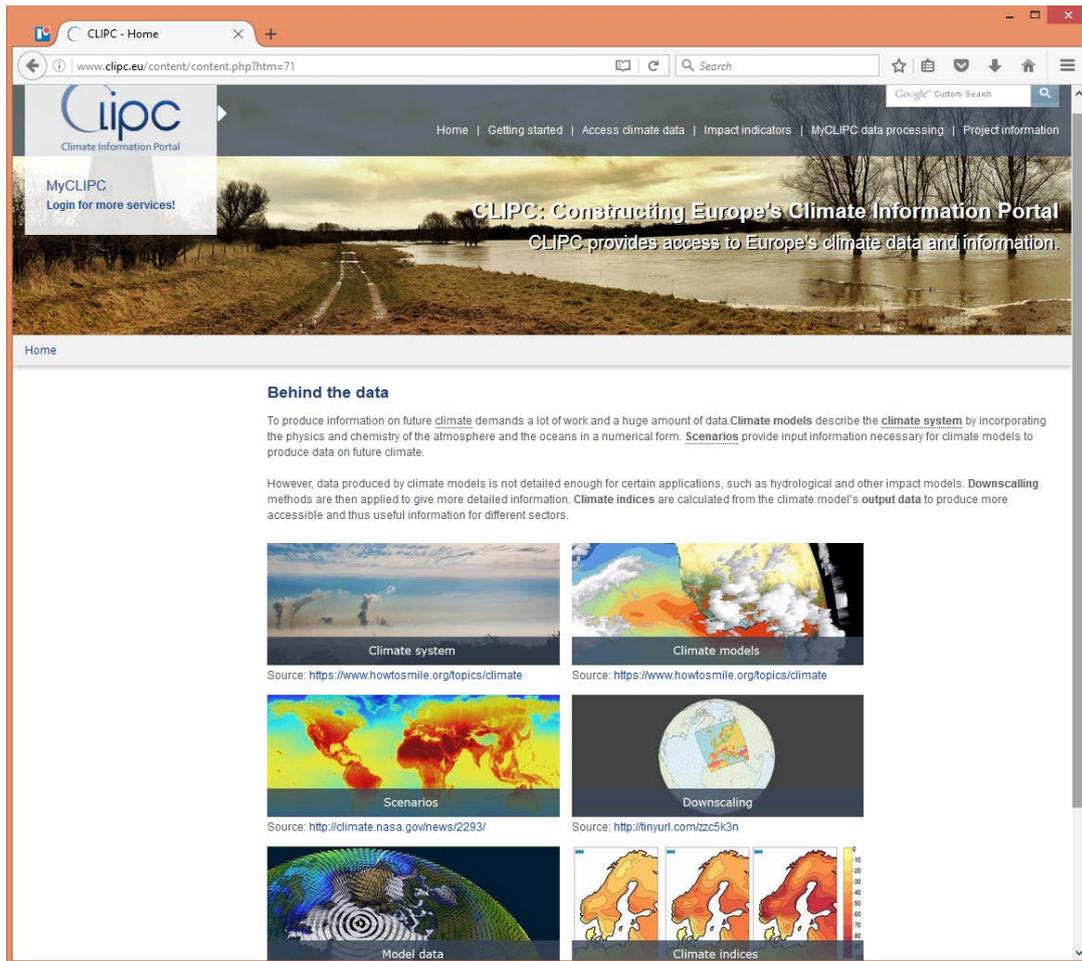


Figure 37: Snapshot of section “Behind the data”.

- FAQ : Frequently asked questions by users.
- Documentation : Some documentations produced within CLIPC.
- Glossary : Integrated glossaries for explanation of terminology.
- Use of vocabularies : Explanation of the concept how CLIPC uses vocabularies of fixed terms in metadata.

- Links : Links of important other initiatives.

Some of these features will receive more attention in next chapters.

3.7.2 Use cases

Users indicated during consultations that they wanted clear examples and guidance on how to use the CLIPC data and tools. WP8 has produced a use case description on forest land purchase advice. This use case describes both the required data as well as how to use the tools. An online video will be added as well to illustrate the process.

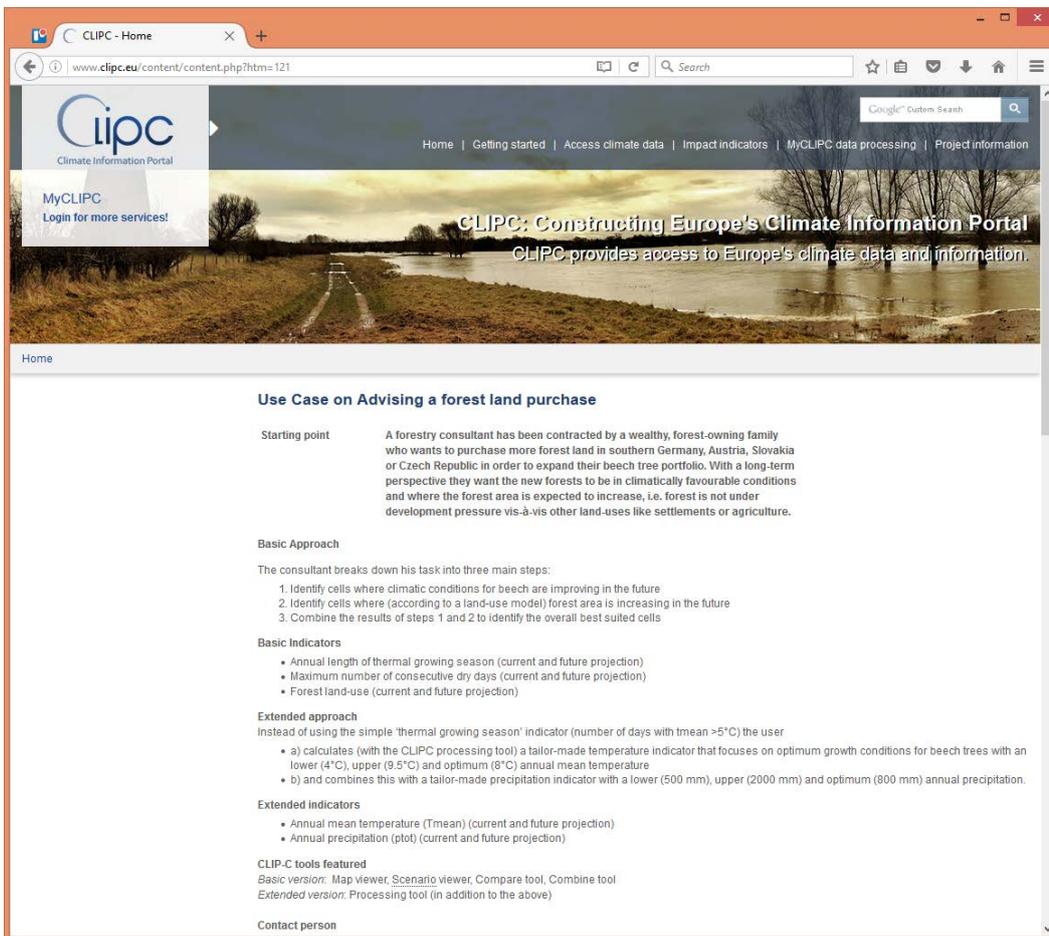


Figure 38: Snapshot of the use case

3.7.3 Glossary integration

CLIPC uses several glossaries for explaining terminology within the website and applications :

- IPCC: The IPCC has a glossary of terms compiled from the Fifth Assessment Report (AR5) Working Groups 1, 2 and 3 and a list of commonly used acronyms. All glossary terms used in this portal can be found on the IPCC-DDC glossary.
- EUPORIAS: List of definitions as created by experts and in use in the EUPORIAS FP7 project.

- Climate4Impact: List of definitions as created by experts and in use in the IS-ENES FP7 project
- CLIPC : A new glossary as extension of the others in use, with specific CLIPC terminology.

The terms from these glossaries have been incorporated into the portal. Where ever terms in the portal are underlined hovering the mouse over the term will produce a popup box with the definition of the term. See examples below.

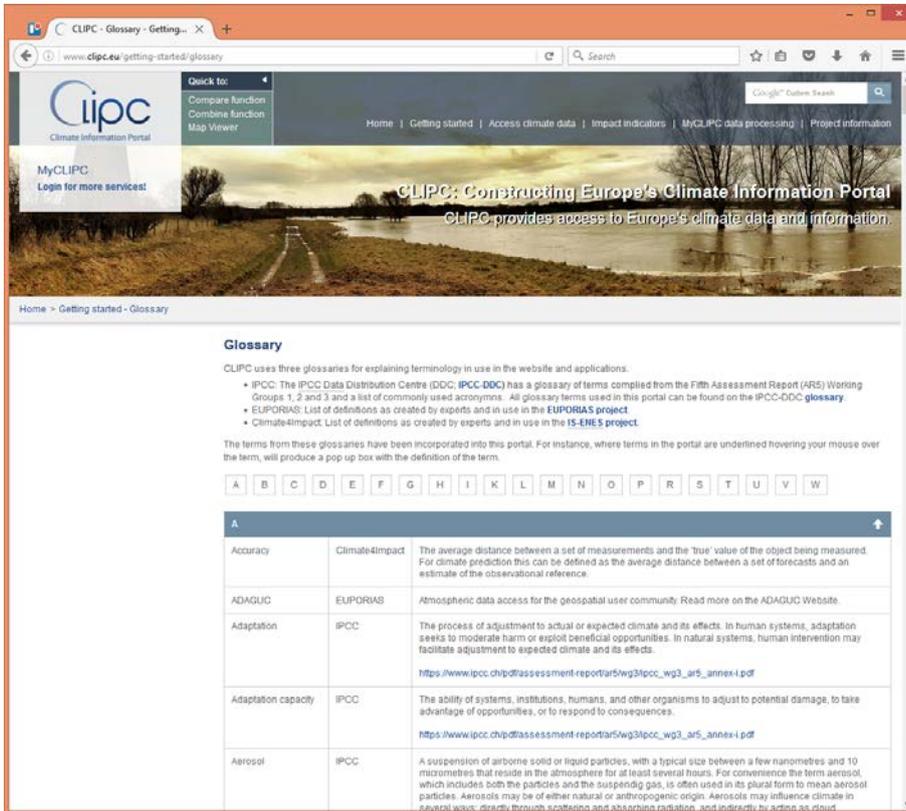


Figure 39: Overview of all glossary terms in use in the website.

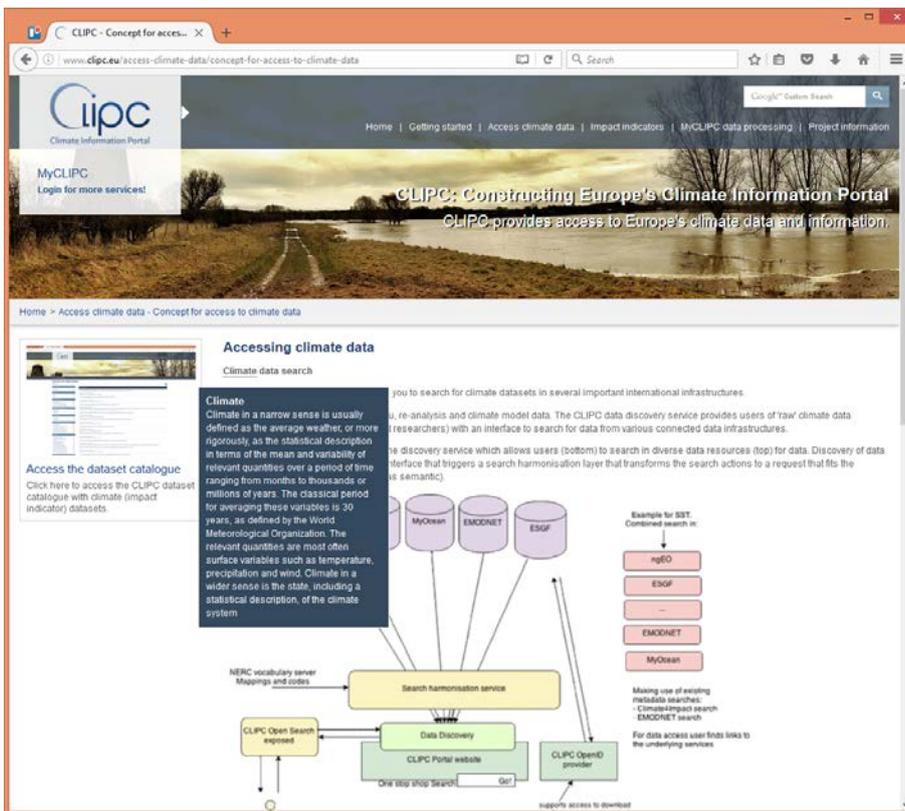


Figure 40: Example of mouse-over pop up with definition of term.

3.7.4 Help instructions in interface

In many locations of the portal applications the user will find help sections and guidance on terminology used. Help sections are marked with '?', shorter terminology support with little i-buttons. The help sections give a first instruction on how to use the application. And all i-buttons give additional detailed instructions what is meant with e.g. a certain selection option, or a certain dataset.

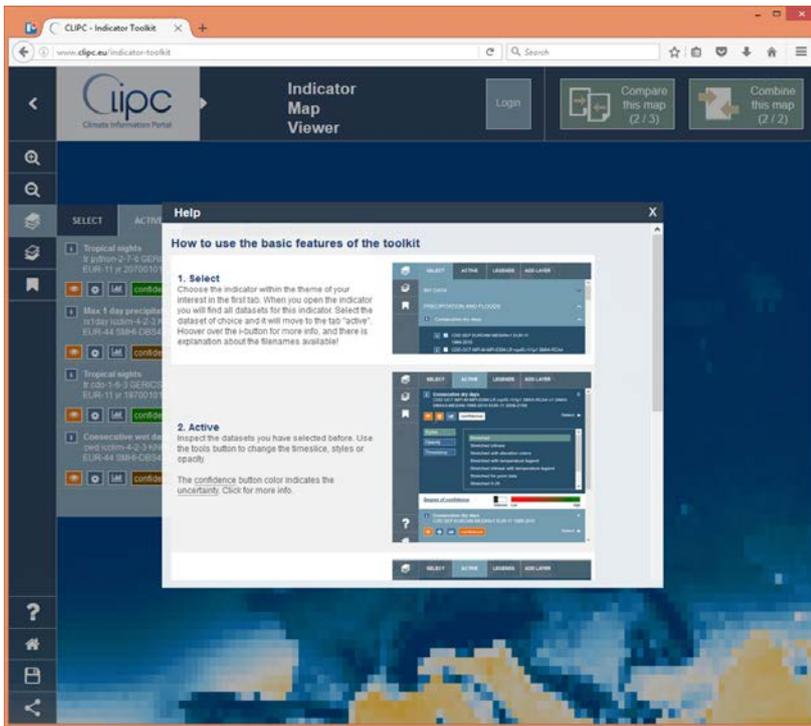


Figure 41: Help section (behind the “?”) of the toolkit (opens when starting application)

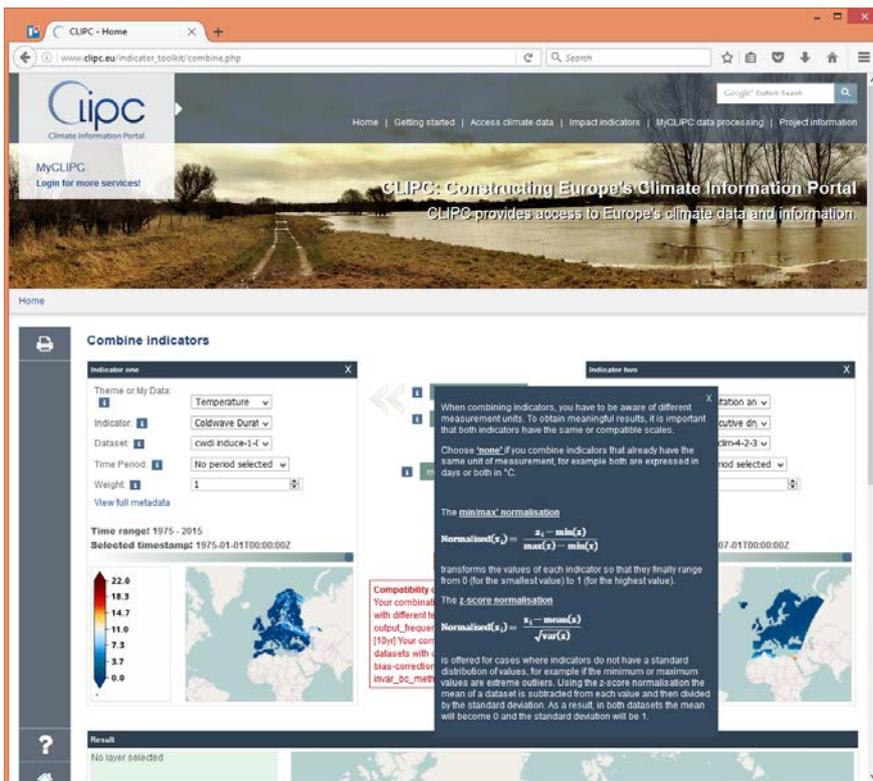


Figure 42: I-button info for the normalisation selection in the combine application

4 Webportal: First user statistics

To monitor the CLIPC portal performance statistics are being collected, both directly from the MARIS servers as well as via Google analytics. The first results in 2016 are shown below and show very good figures in the last months of the project as a results of extensive promotion activities.

Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan-16	853	1,114	2,885	17,514	2.01 GB
Feb-16	854	1,054	3,414	19,304	2.15 GB
Mar-16	958	1,185	11,961	44,026	2.29 GB
Apr-16	1,039	1,407	16,179	51,185	2.28 GB
May-16	1,136	1,635	31,903	72,435	2.79 GB
Jun-16	1,152	1,742	12,522	43,715	2.54 GB
Jul-16	1,162	1,631	6,963	32,162	2.04 GB
Aug-16	2,555	3,103	18,673	53,044	2.42 GB
Sep-16	2,360	3,301	47,369	115,944	4.20 GB
Oct-16	2,325	3,963	69,907	145,732	4.78 GB
Nov-16	0	0	0	0	0
Dec-16	0	0	0	0	0
Total	14,394	20,135	221,776	595,061	27.50 GB

5 Conclusions and next steps

The CLIPC portal contains a demonstration of possible tailored user interfaces on top of the CLIPC services that are more generic. This means that depending on different user needs a different version of interfaces could also be developed. However, for the users and user groups that CLIPC had in focus, and those that were involved in user consultations, these interfaces were a very good and well appreciated demonstration.

In the period after the end of the CLIPC project the partners will look for further opportunities in two areas:

- To develop certain interfaces and services for operational purposes. This could be done for commercial user groups (like financing organisations needing climate change assessments), but also for a more public use (like EEA).
- To do further research on the “open ends” in underlying services and well as the presentation of data. The European funding opportunities will be checked for this.