Deliverable 10.5: Documentation and release of new ACTRIS data portal versions with implementation of new functionalities and tools

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Work package no	WP10
Deliverable no.	D10.5
Lead beneficiary	NILU
Deliverable type	☐ R (Document, report) ☑ DEC (Websites, patent fillings, videos, etc.) ☐ OTHER: please specify .....
Dissemination level	☑ PU (public) ☑ CO (confidential, only for members of the Consortium, incl Commission)
Estimated delivery date	M20
Actual delivery date	03/01/2017
Version	1
Comments	The web portal is public and official, but this report describing the main development is only for the consortium and the commission.

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1 Introduction to the ACTRIS Data Portal

ACTRIS measurement data are available through the ACTRIS Data Portal http://actris.nilu.no. The data are handled in 3 highly specialised topic data repositories. By the start of ACTRIS-2, measurement data from about 60 sites and ~130 different atmospheric variables were included in the ACTRIS data centre (including instrument variables). The data curation is closely linked to the networking activities and to the calibration centres to facilitate and ensure standardized and comparable procedures throughout the infrastructure. By 31 August 2016, the ACTRIS data centre has been handling data from about 75 sites and ~130 different atmospheric variables, of these ca 80 different trace gases, 10 different aerosol variables measured near the surface, 10 aerosol profile variables, and 8 cloud variables. The data are resulting from ca. 30 different methodologies, both near surface and remote observations, with time resolution ranging from seconds to 1 week.

The ACTRIS data portal is a metadata catalogue. Development, management and maintenance of the data flow to the ACTRIS data portal is a centralised task performed by NILU, and the portal is up and running close to 100% of the time, 24/7. Figure 1 shows the main structure of the portal. The metadata catalogues are updated regularly, every night through various procedures, so potentially new data added to the topical data bases are available through the portal latest the following day. The structure is flexible, e.g. to add and change access to topic databases, implementation of various password and registrations procedures etc.

The data curation of the ACTRIS primary measurements data is organised in the 3 specialised data repositories:

- All cloud profile data are archived in Cloudnet DB: http://cloudnet.fmi.fi/ under the responsibility of FMI.
- All aerosol profile data are archived in EARLINET data base: http://access.earlinet.org/ under the responsibility of CNR
- All aerosol and trace gas near surface data are archived in EBAS: http://ebas.nilu.no/, under the responsibility of NILU

In addition, AERIS-ICARE is the forth topic database and offers satellite data support to facilitate products combining with ACTRIS ground data with Earth observation data.

All data repositories are linked in the ACTRIS data portal: http://actris.nilu.no/, and the ACTRIS measurements data are accessible also through the portal. Additionally, the portal provide access to secondary data. Secondary datasets are derived from primary measurement data by e.g. averaging, filtering of events, interpolation of data etc. Secondary datasets are usually the result of analysis for a targeted article, special studies or processed for model experiments. Primary datasets are regularly updated mainly due to extension of new years, secondary datasets are normally not updated over time.

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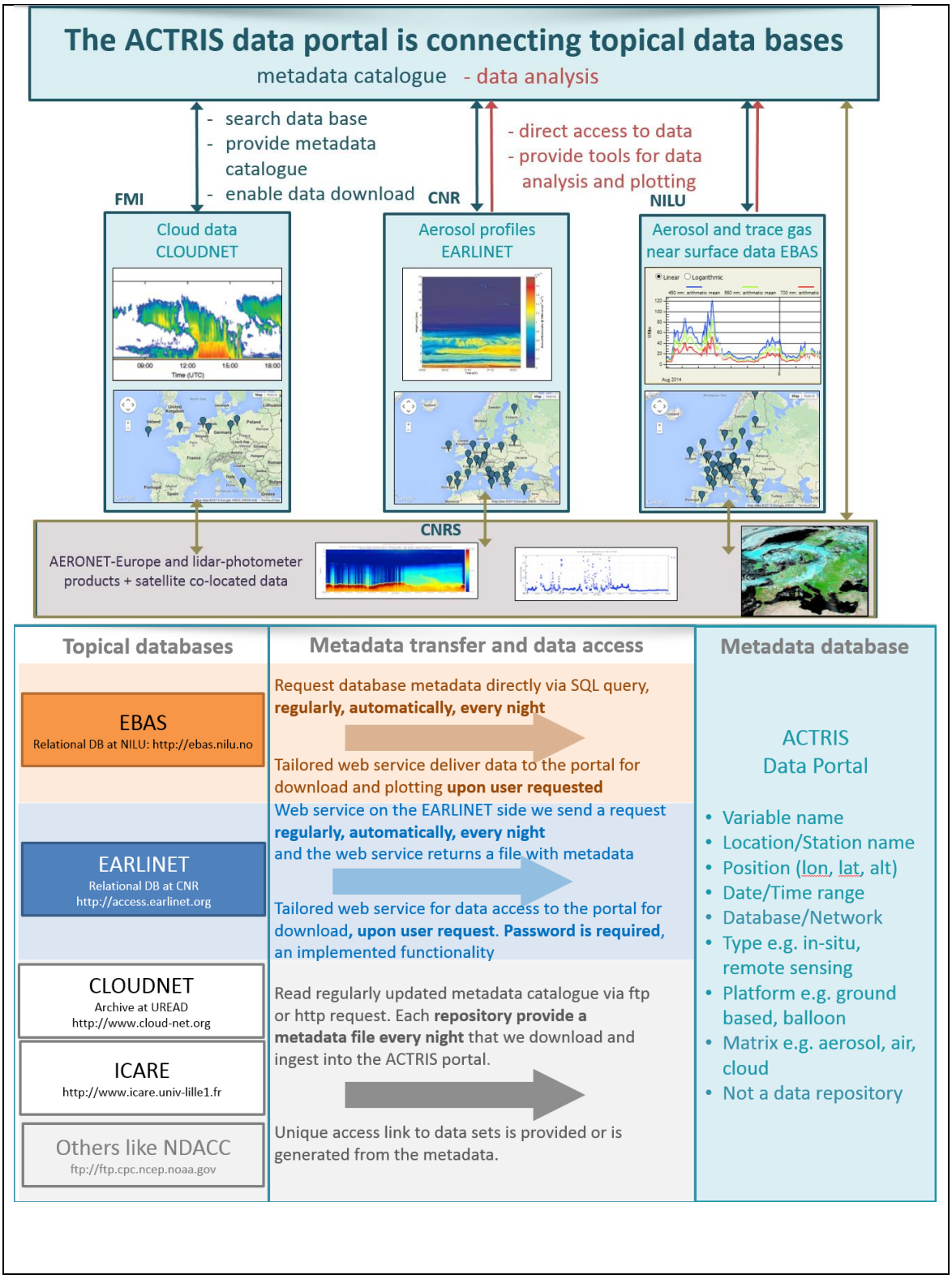

Figure 1: Overview of the core structure of the ACTRIS Data Centre (upper panel) and technical solution of the meta data transfer and access of data through the ACTRIS data portal (lower panel), per 31 August 2016.

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2 Overview of new functionalities and tools implemented in the ACTRIS data portal

Since the start of ACTRIS-2 there has been published new online versions of the ACTRIS data portal 8 times. All versions are tagged and documented at NILU, and details can be provided. Last version was released 15th December 2016 at 10.14.52 AM. This deliverable gives a brief overview of the development since start of ACTRIS-2. Not all changes and work on the portal is included, but the main development and tasks are covered. Modifications are made both in accordance with the *ACTRIS-2 Description of Work*, and based on user request and suggestions during the project expressed during meetings, in e-mails and through the feedback portal http://ebas-feedback.nilu.no/login_page.php.

The following sub-sections briefly describe the main updates, revisions and extensions performed since the start of ACTRIS-2. Table 1 shows the dates of releases, and the tagged revision numbers. More details can be provided upon request, referring to the tagged revision number.

Table 1: Release dates and tagged revision numbers. More details of the work and development included in each of the tagged versions can be provided upon request.

Release date	Tagged revision number
28. May 2015 at 21.24.04	1.6.500
3 June 2015 at 12.21.26	1.6.800
21 October at 2015 11.05.03	1.8.300
5 July 2016 at 13.41.10	1.9.500
11. July 2016 at 10.05.46	1.9.600
26 August 2016 at 12.16.58	2.0.0
14 December 2016 at 14.51.56	2.0.100
15 December 2016 at 10.14.52	2.0.150

2.1 New content and functionalities

This section include a list describing briefly the new content, restructuring of all menu items and layout changes.

- Transfer of the data portal in ACTRIS-FP7 to ACTRIS-2 and adaption to ACTRIS-2 layout and design (shift from ACTRIS-FP7)

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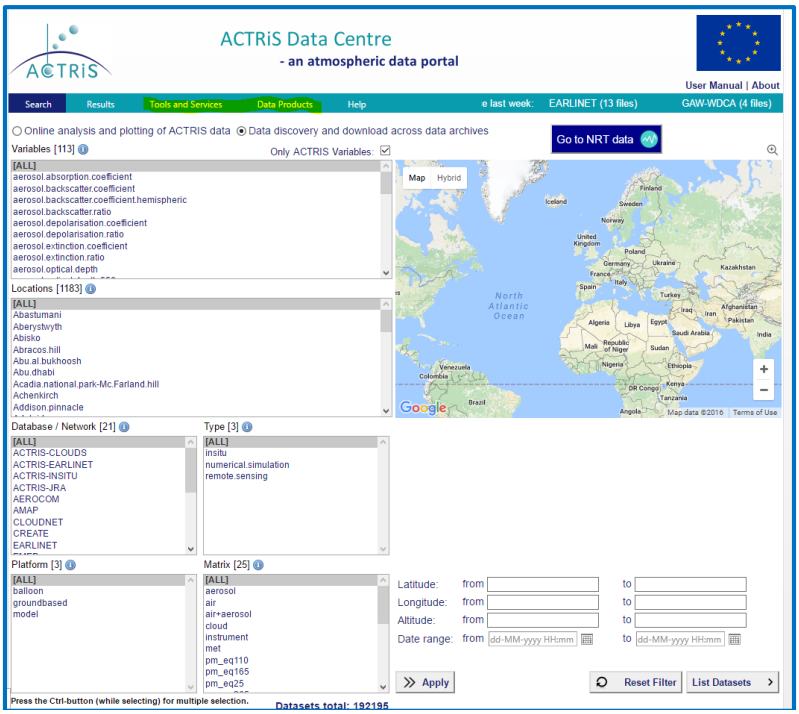
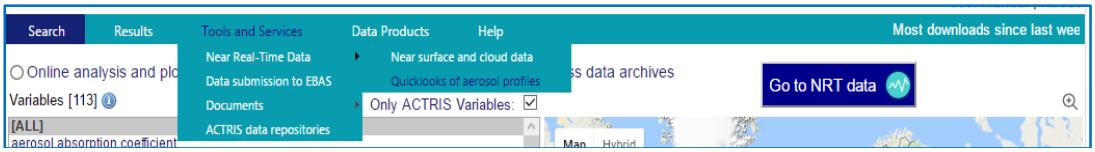
- Restructuring the menu items and add more items: Divide old "Products" page in to separate menu-items and sub-pages under both "Tools and Services" and "Data Products". Added content to these pages. *Illustrative example: Front page with new menu items in yellow and present sub-menu of "Tools and services" -> and "Near Real Time" entry*





- Embed of Near-Real time data as separate page for both "Near surface and cloud data" and "Quicklooks for aerosol profiles". Linking to NRT data via front-page. *Illustrative example: NRT page. Quicklooks of NRT data from particular sites can be scrolled in the lower panel and the balloon gives access to the actual NRT data.*

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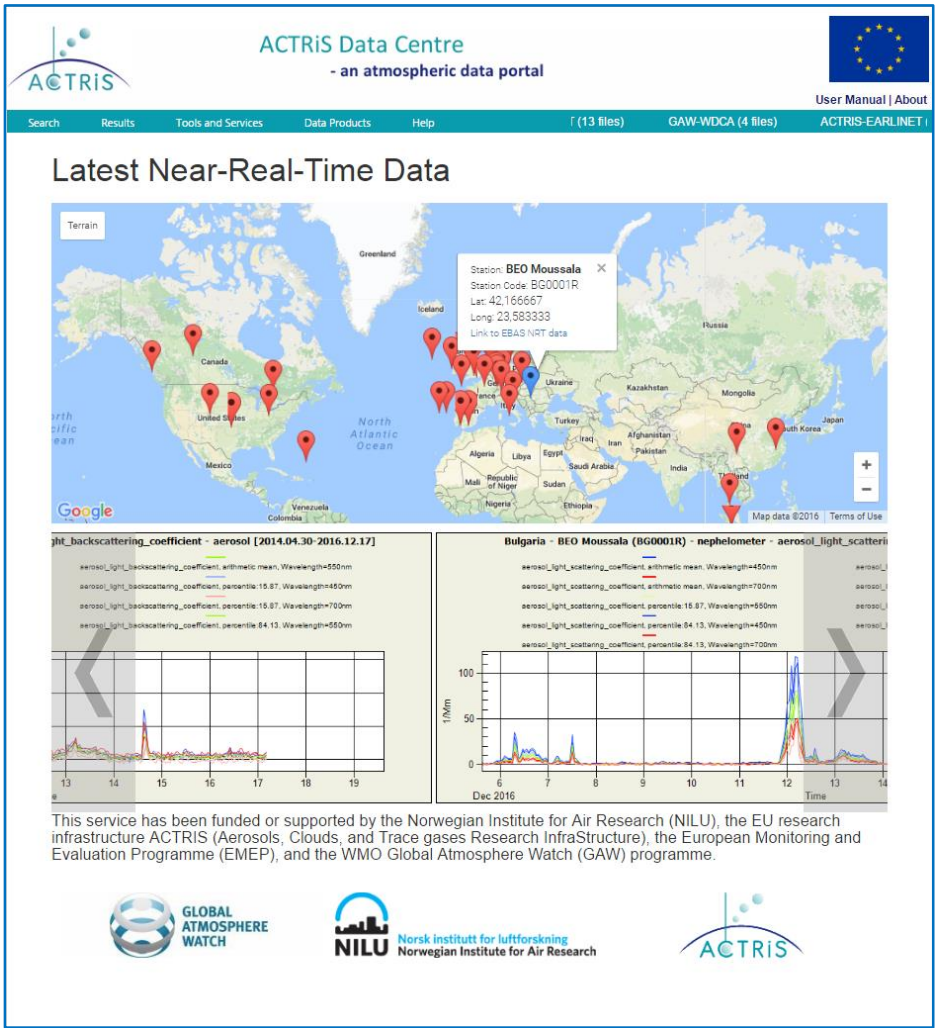
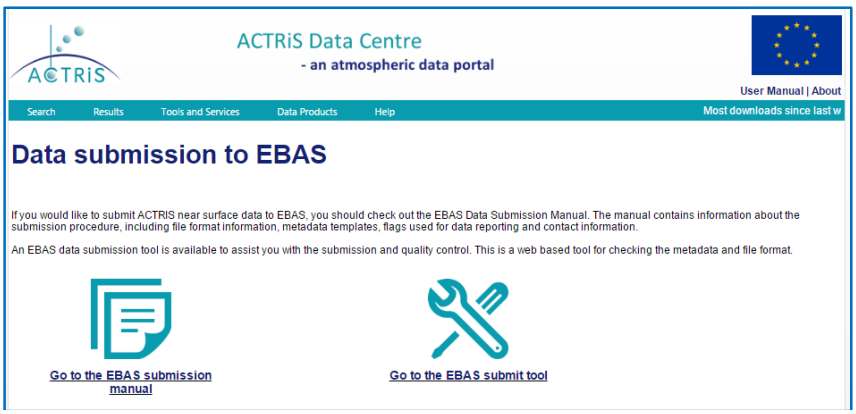
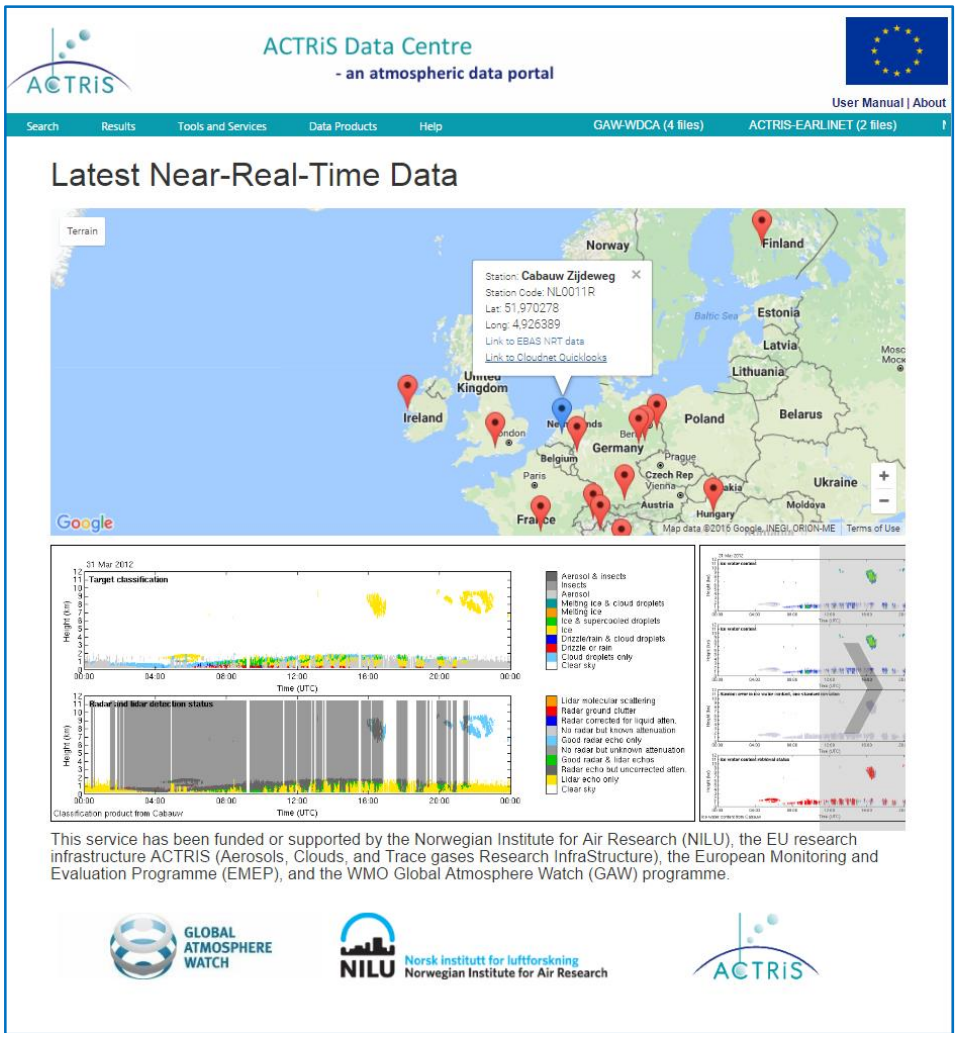


- Initiated a page for information in data submission, *Illustrative example: added access to the new interactive submission tools (See D10.6) and data submission manual for near surface data as first step.*



- Cloudnet DB moved to FMI, and new meta data flow was necessary to set up for all Cloudnet data
- Set up data flow of Cloudnet NRT quick looks to NILU for visualisation in the ACTRIS portal.
  Illustrative example: NRT data on both cloud and near surface data for Cabauw



- Embed EARLINET NRT quick looks at a separate page:

- Embed the “Trend tool” developed at Met.No as part of ACTRIS JRA3 in the portal. Trend analysis is now possible. *Illustrative example: Trends in aerosol number concentrations at Hohenpeissenberg*

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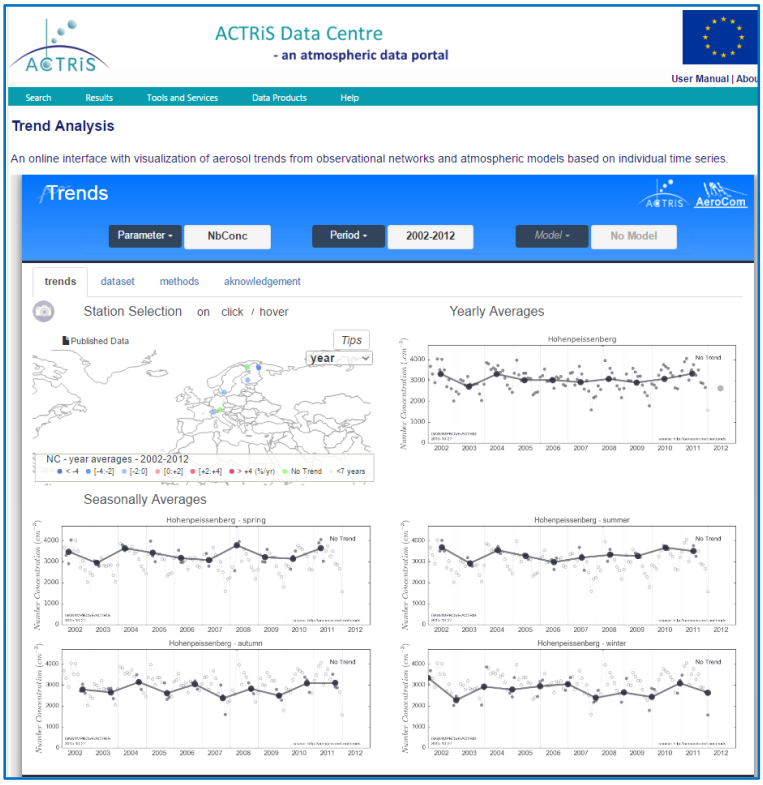
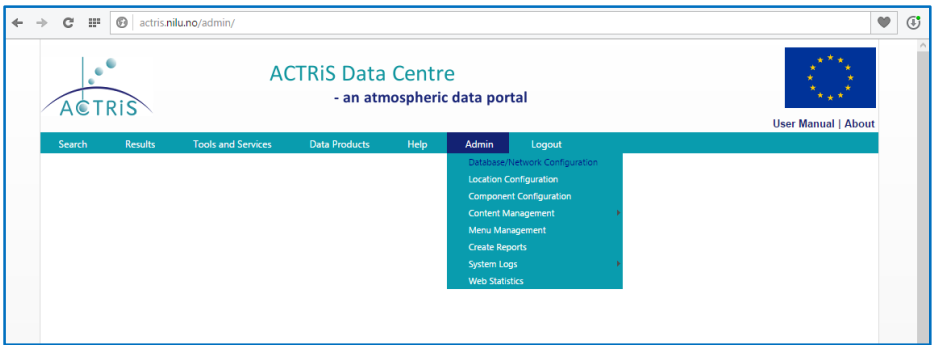


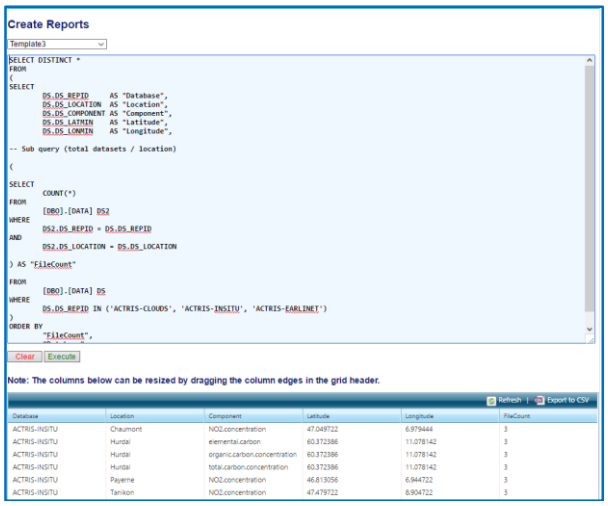
- Revised content of "Data Policy" page, making this more flexible: http://actris.nilu.no/Content/?pageid=85d537d385ab4761b19b497ad0315b91
- Page linking to external resources regarding data submission to EBAS including the new data submission tool for EBAS: http://actris.nilu.no/Content/?pageid=e02eafd4aa184995b9341289c1982c0f
- Ability to add custom CSS for styling of HTML for the user-generated content
- URL alias for "Secondary datasets" and NRT data: http://actris.nilu.no/Content/products and http://actris.nilu.no/content/nrt-data
- Removed "Browser Information" page
- Add Direct links for menu items

2.2 Administrative interface for management and maintenance

Dynamic menu and content management system: There was a strong need for developing the menu and content management system to make this more flexible for maintenance, and easier updates involving more persons within the data centre. It was important also to make the portal less vulnerable on personal resources. A dynamic menu and content management system, enabling the data centre group to create their own menu items and pages was implemented. It is now possible to edit all menu elements except for the "Search" page containing the search functionality and "Results" menu item. *Illustrative example: The admin web interface after login (4 users at the data centre have currently access)*



Further development of the report module: This module is used to produce targeted reports combining criteria and information on sites, variables, locations, collocations, data updates, etc. New SQL templates in the "Reports" module was added. *Illustrative example: Script run to provide the ACTRIS sites and number of data sets of each variable at each site.*



- Add new query template in the admin reports module

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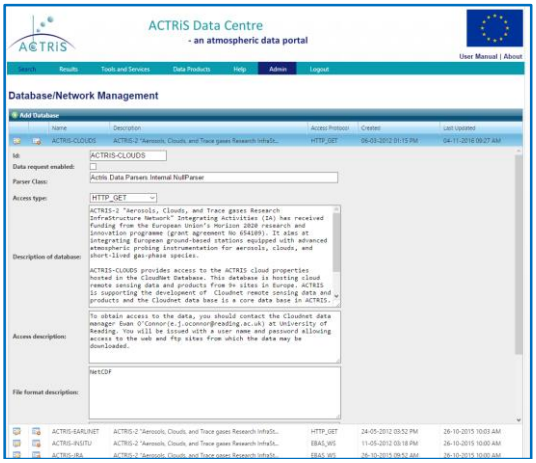
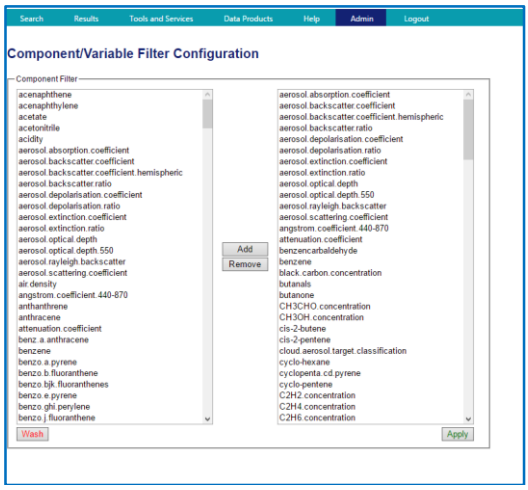
2.2.1 Examples from selected entries listed under the Administrative interface

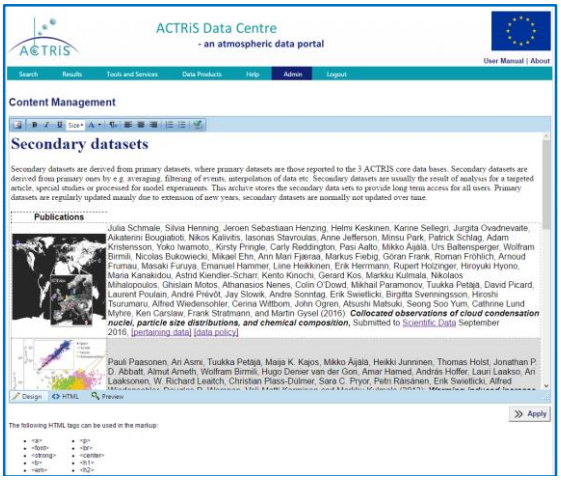
Update information on topic data base, regulate the access level, password restrictions etc.



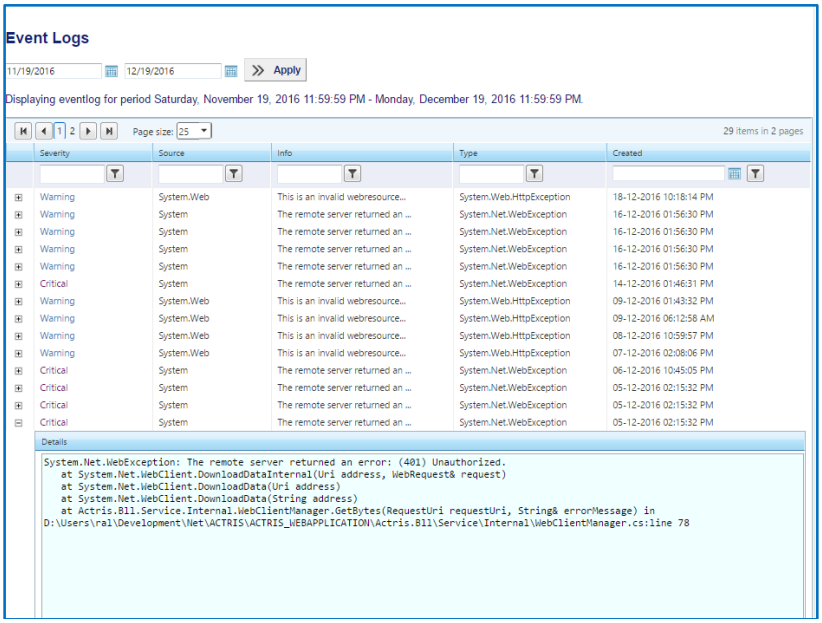
Update add/remove variables associated to ACTRIS, change names to e.g. CF conventions when needed/ready:



Flexible updates of "Secondary data sets" page:

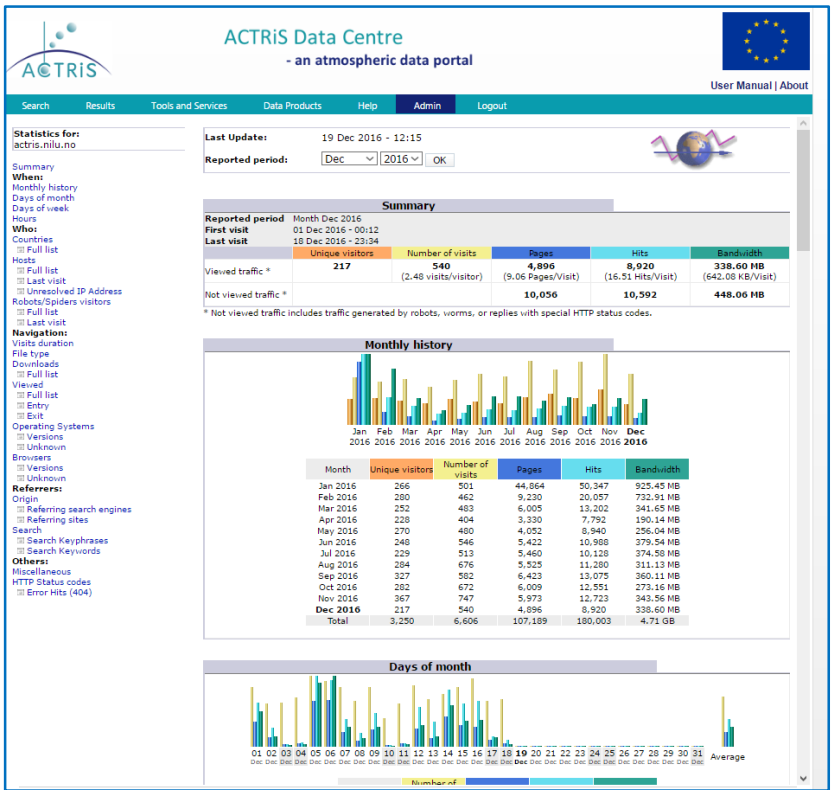


Event log to detect errors, technical problems and possible down time as early as possible, and to easy detect the problems:



Additionally the following has been implemented to make the solution more robust and flexible for more people involved in the data portal maintenance:

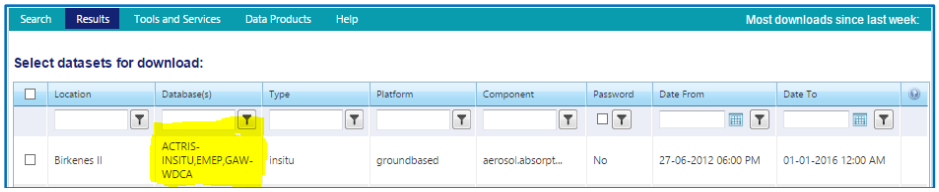
- Implementation of ACTRIS web statistics module via the administration panel. Easy to provide statics for the portal and follow the use: *Illustrative example of use of portal in December 2016*



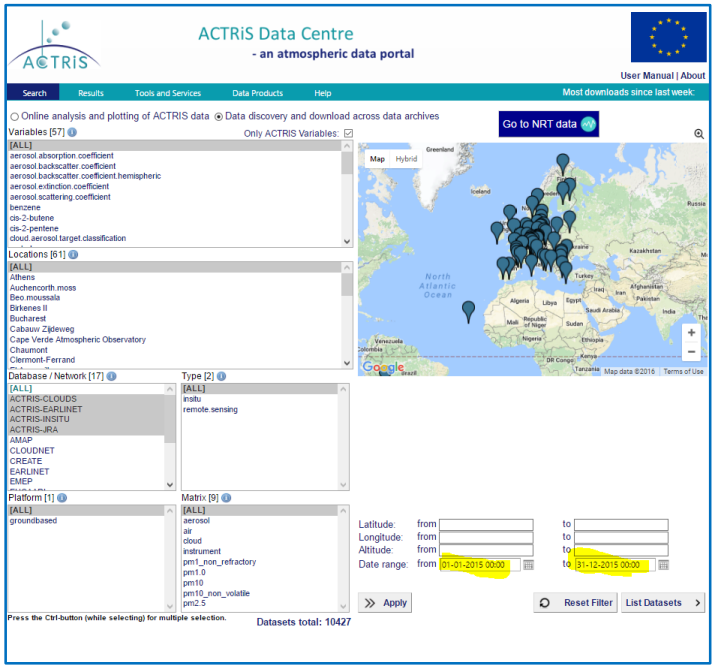
2.3 Various technical updates and bug fixing

Major revision of the code was done to solve and improve the following:

- All data available through the portal are associated to data bases and networks, and upon user requests all data for each networks/framework are listed. The result was that data associated to several networks, was listed once for each network/framework (e.g. a profile associate to both ACTRIS and EARLINET will be listed twice in the data set list). Major revision of the code was done to have aggregated results for identical data sets belonging to multiple frameworks. Data sets are now displayed and downloaded as aggregates in order to avoid downloading of the same data set multiple times. *Illustrative example:* The framework information is kept visible (yellow mark).



- Improve filtering of datasets with new search functionality. The ACTRIS data portal is a meta data portal, hence information stored within files are not available upon user requests. This made the search functionality on date difficult, and only on start and stop time of the files, not providng files within the interval between. The new version allows the user to search for datasets that falls over/under or into a specific time-range. In this way all ACTRIS data for a certain period will be possible to retrieve through the portal. *Illustrative example: All variables and sites providing with data covering ACTRIS 2015:*



In addition minor bug-fixes and refactoring of code has been done

- in order to support the new logic, architecture and structure (see 2.1 and 2.2), both in terms of the user interface and to support the menu and content generation functionality.
- Minor code refactoring in same module. The report templates are now stored as text files (UTF-8) instead of being hard coded.
- "Handle session timeout in file download / plotting page (plotting mode)"
- Fixing issue related to downloading of data when using Google chrome.
- Minor GUI changes related to the menu and information boxes
- Minor code refactoring.
- Minor updates of textual content.
- Minor cosmetic changes in relevant mark-up file(s).

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