

Training session on data formatting and data submission to GAW/EBAS data centre

Arranged within the frame of SAMLAC in November 2018

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With contribution from Markus Fiebig, Cathrine Lund Myhre
and the EBAS-team

Outline

- About NILU, GAW, EBAS and ACTRIS
- Motivation for a central database and data reporting
- Data formatting and -submission

NILU - Norsk institutt for luftforskning

Norwegian Institute for Air Research

NILU is a private independent, nonprofit institution established in 1969.

- Research Council of Norway
- Norwegian and international industry
- Government agencies
- The EU's research programs, Ca 40% of the institute is international activity

More than 180 employees

- Main office in Oslo, Norway
- Tromsø
- Poland, The United Arab Emirates and in South Africa.

Chemical analysis, atmospheric observatories, modelling, consulting services

- Laboratories are among the most advanced in Europe
- Observatories in the Arctic, in Antarctica and in Norway
- Atmospheric data centre for ESA EVDC, EMEP, GAW-WDCA, EU-projects and others



GAW-WDCA and GAW-WDCRG data centre

Integrating information and measurements from all parts of the globe to obtain new information and facilitate easy access to the data

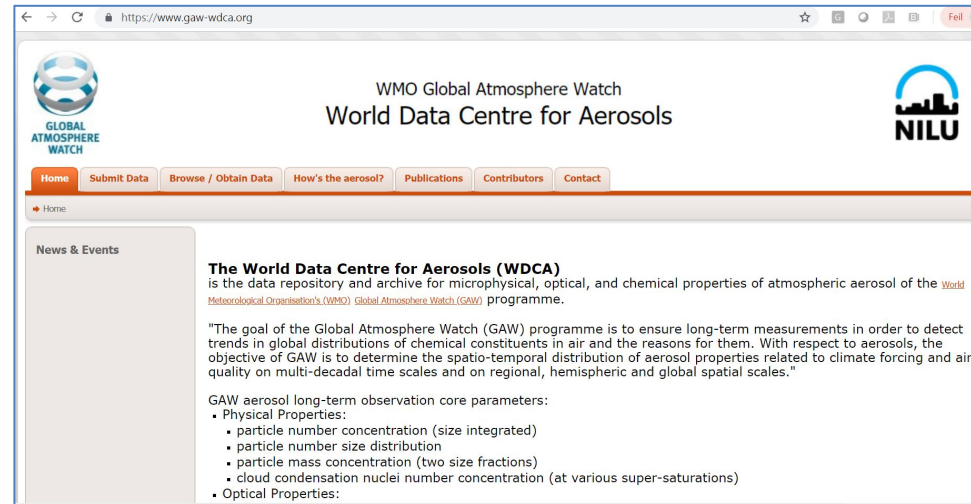
Main services of the data centre:

Collect and archive all project data in a long term sustainable system.

Provide free and open access to all data resulting from project.

Complement with data from other relevant networks.

Provide new products and tools for analysis of atmospheric composition.



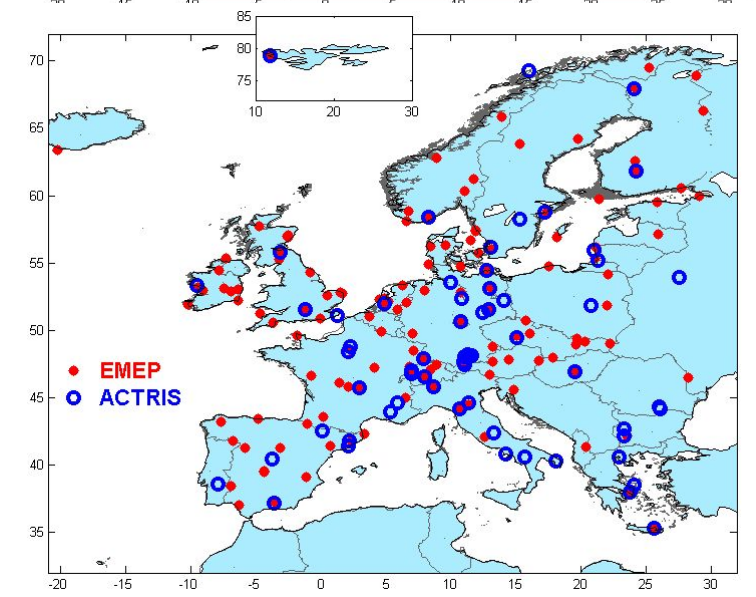
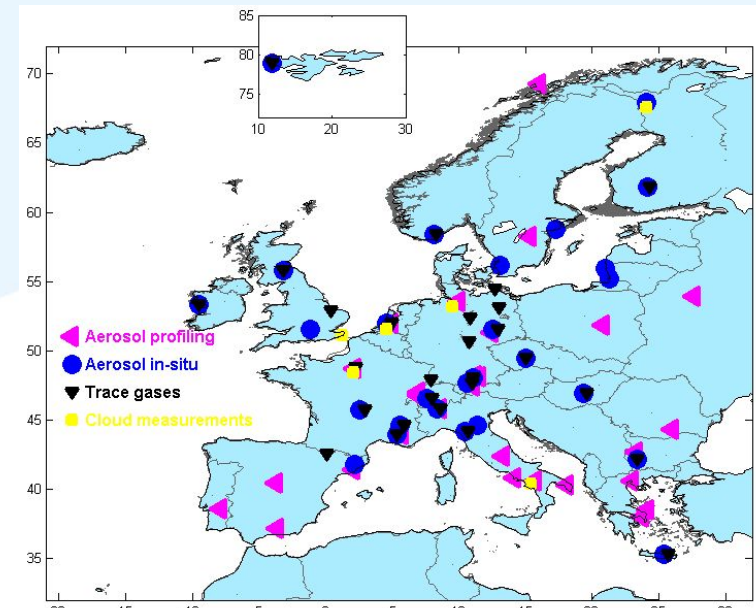
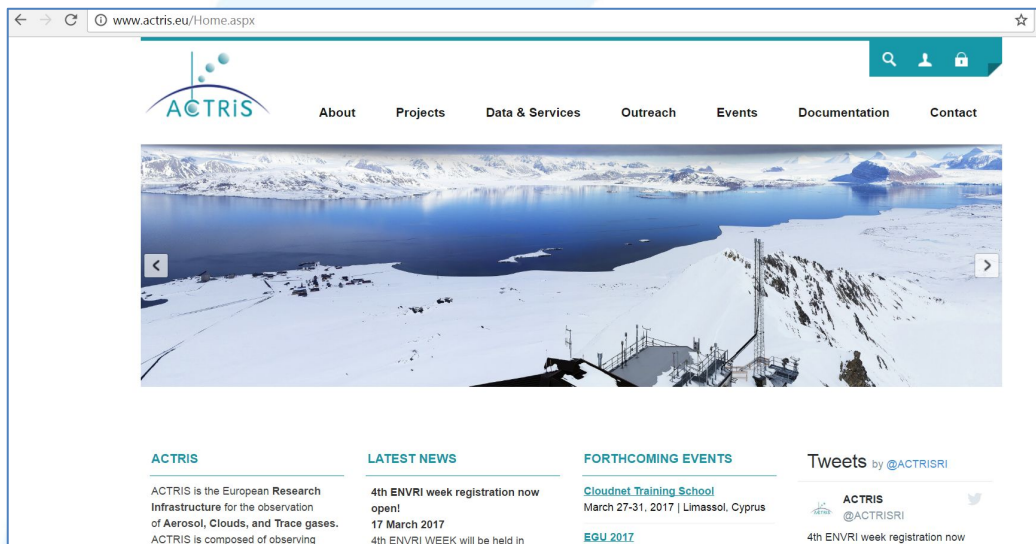
<http://www.gaw-wdca.org>



ACTRIS: Aerosol, Cloud and Trace Gases Research Infrastructure Network

ACTRIS is an EU infrastructure project improving atmospheric observations, developing new methods and protocols, and harmonizing existing observations. <http://www.actris.eu>

We focus on ground based in situ data and EBAS during this course



EBAS Web portal

Placeholder for all GAW-WDCA, GAW-WDCRG, EMEP and ACTRIS groundbased in-situ data, among data from a wide range of other projects.

<http://ebas.nilu.no>

The screenshot displays the EBAS Web portal interface. At the top, there is a header with logos for EMEP, ACTRIS, InGOS, and GAW, along with the text "Hosting the Global Atmosphere Watch World Data Centre for Aerosol". Below the header, there is a navigation bar with links for "Home", "Acknowledgment", "Data policy", a "username" field, and a "Login" button. The main content area is divided into four filter sections: "Framework [48]", "Country [71]", "Station [1095]", and "Matrix [29]". Each section has a dropdown menu with "All" selected. Below these, there are two more filter sections: "Instrument type [105]" and "Component [625]". The "Instrument type" section has a dropdown menu with "All" selected. The "Component" section has a dropdown menu with "All" selected. Below the filter sections, there is a "Map (Populate) (Show large)" section. The map shows a world map with various countries labeled, including Canada, United States, Mexico, Venezuela, Colombia, North Atlantic Ocean, Europe, and Asia. To the right of the map, there is a section titled "Additional resources" with a list of links: "European Monitoring and Evaluation Programme (EMEP-CCC)", "Site descriptions - EMEP", "WMO Global Atmosphere Watch (GAW)", "Site descriptions - GAW", "Air mass trajectories", "Data submission", "Contact persons", "About EBAS", "EBAS User Feedback Tracker", and "Social media". At the bottom right, there are social media icons for Facebook and Twitter.

Available datasets: 92757
Reset List datasets

EBAS Database history

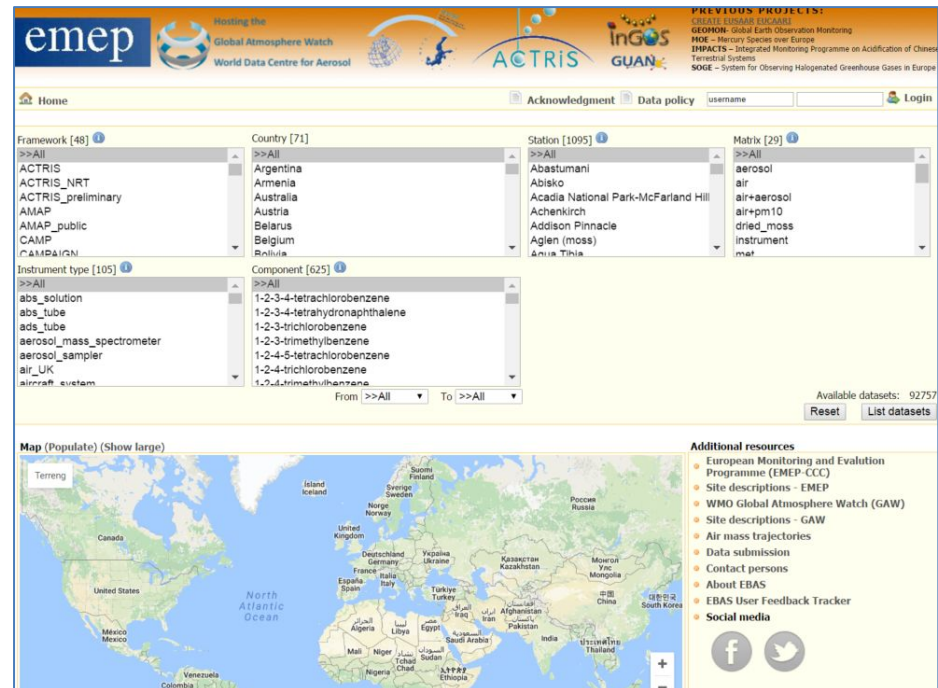
Originally the data archive of the European part of the UN Convention for Long-Range Transport of Air Pollution (CLRTAP), the European Monitoring and Evaluation Programme (EMEP) – first version in 1979.

Placeholder for all GAW-WDCA and GAW-WDCRG data.

New web interface in 2009,
upgraded in 2017,
linking also to **other tools**.

<http://ebas.nilu.no>

Currently ~110 000 datasets
in the archive, and growing.



Data reporting, sharing and ownership

Background

Why is data reporting important?

Added value of reporting and sharing data.

Who owns the data in the data base?

Association to projects and the labelling of data:

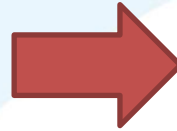
- GAW-WDCA data
- GAW-WDCRG data
- ACTRIS data
- EMEP data

Data policies, Fair and regulated use of data.

Why is data reporting important?

*Lot's of effort behind atmospheric observations,
important that data are used!*

Atmospheric measurements are hard work by many people and considerable amount of money is invested



Reporting makes the data available for various users, now and in the future, to contribute to solve the central environmental questions within air quality and climate

Goal to provide access to data for many users for

- ✓ ACTRIS aerosol and trace gas activities
- ✓ EMEP
- ✓ GAW-Aerosol (GAW-WDCA)
- ✓ GAW-Reactive Gases (GAW-WDCRG)

*Central data base with common standards for import and export facilitate
easy access to data for a wide range of users*

The value of reporting and sharing data

Make data available for various users now and in the future in sustainable data base.

Access to data for variety of users can hopefully also result in:
Improved funding situation by demonstrating the use and value of data.

Improved data quality by improving methods and measurement practice as more data are used.

Facilitate collaboration and interactions between measurement communities.

Illustrate project progress: The data centre is a prominent PR instrument for projects.

EU commission and other bodies judges projects by number and rank of data users/data sets etc.

Who owns the data in the data base?

Every dataset created within ACTRIS, EMEP, GAW (and other programs) is **owned** by the partner/data providers who created this dataset.

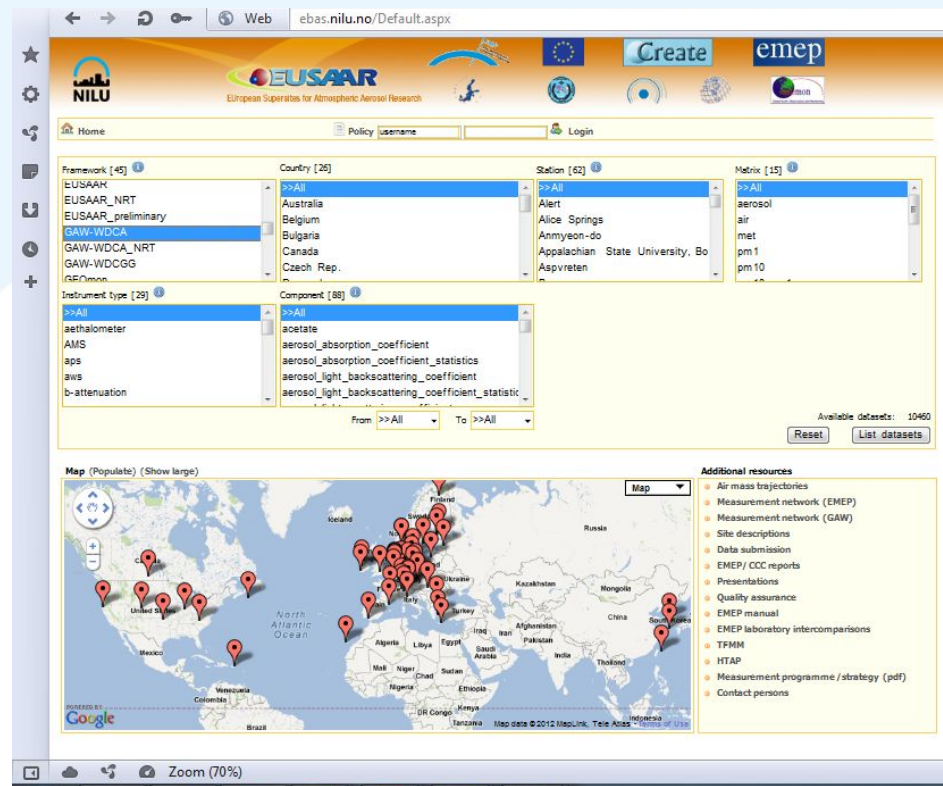
**Public data with easy access is the goal,
but it has to be regulated...**

The conditions of use of data is regulated in data policy documents for various programs/networks.

Data associated to WMO-GAW

All measurements performed within the GAW-program at GAW sites will have the GAW-WDCA and GAW-WDCRG label in EBAS.

Some of the sites overlapping with both ACTRIS and EMEP.



Users of EBAS

Data Providers:

- **Policy Frameworks:** CLRTAP, EMEP, HTAP, HELCOM, AMAP
Data is owned by country or agency contributing to framework.
- **Scientific Networks:** GAW (WDCA, WDCRG)
Data is owned by data provider or PI.
- **Research Projects:** EUSAAR, EUCAARI, GEOmon, ACTRIS
Varying data ownership, but usually data provider / PI.

Data Users:

- The providing frameworks themselves.
- Modellers, EEA, ECMWF, Aerocom, ...

Data use has to be fair and regulated

Lot of effort behind, **visibility** to the data providers.

Facilitate the involvement of the data providers to ensure proper use of data when necessary.

Reduce misinterpretations (balance between data use, data analysis, depending on use etc).

Make the funding source visible, also important for future funding situation.

Public, open, easy access is the goal...

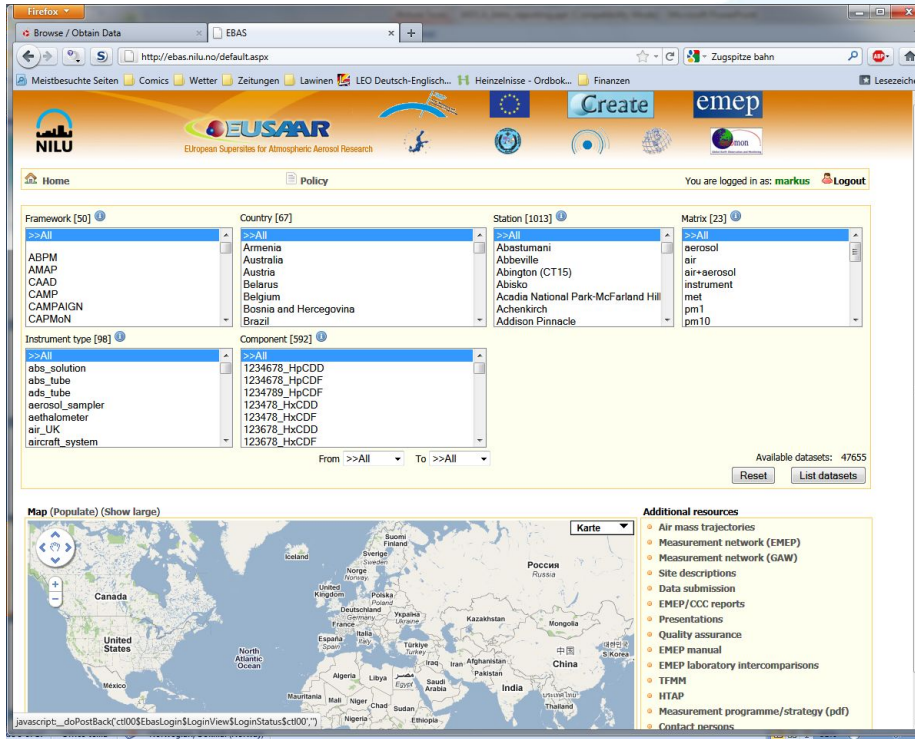
Data formatting and submission

The EBAS web interface 1 / 3

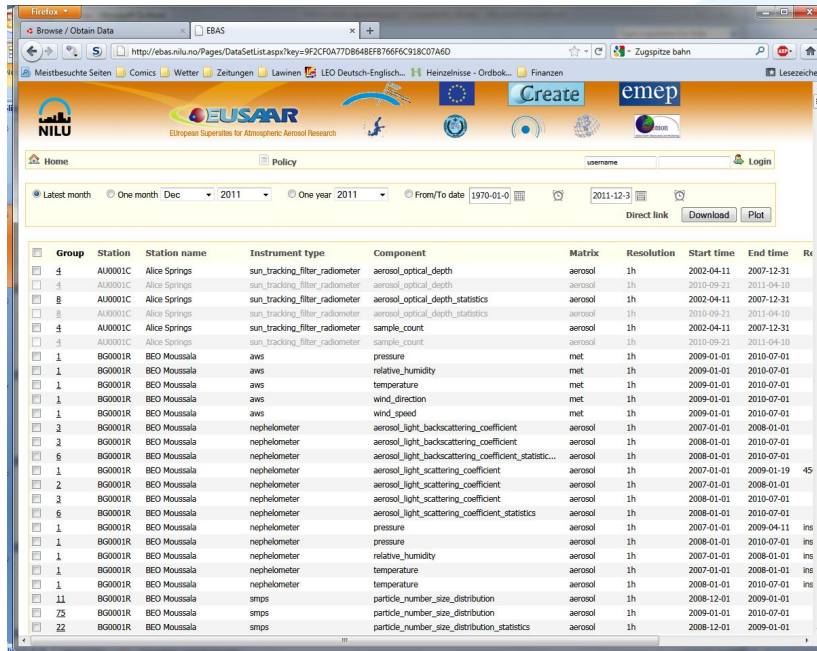
<http://ebas.nilu.no>

EBAS web-interface functions:

- Search datasets by criteria: Framework, country, station, matrix, instrument type, component.
- Visualise distribution of stations on map.
- Manage access to restricted data.
- Links to other resources, e.g. trajectory calculations for station.
- Plot, browse, compare datasets.
- Download data.



The EBAS web interface 2 / 3

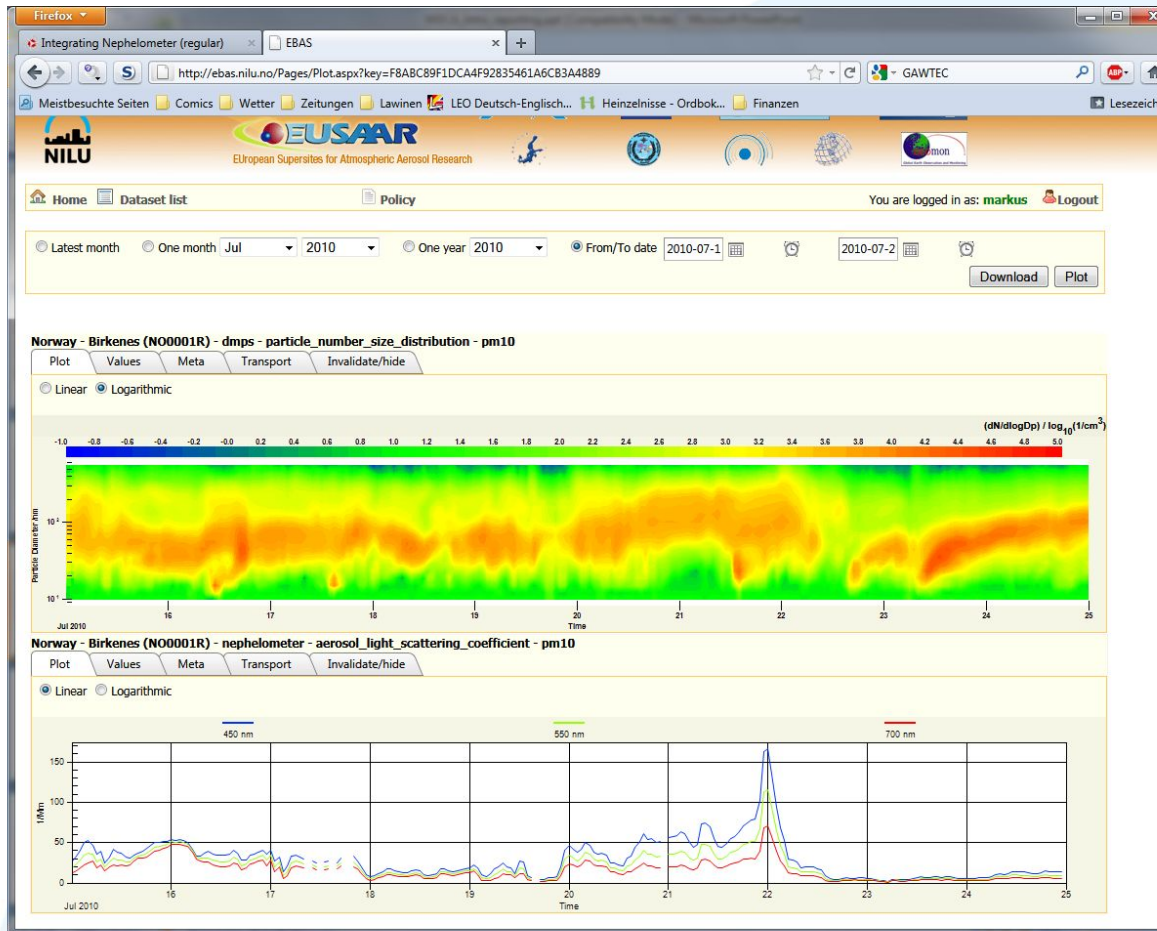


Group	Station	Station name	Instrument type	Component	Matrix	Resolution	Start time	End time	
4	AU0001C	Alice Springs	sun_tracking_filter_radiometer	aerosol_optical_depth	aerosol	1h	2002-04-11	2007-12-31	
4	AU0001C	Alice Springs	sun_tracking_filter_radiometer	aerosol_optical_depth_statistics	aerosol	1h	2002-04-11	2007-12-31	
8	AU0001C	Alice Springs	sun_tracking_filter_radiometer	aerosol_optical_depth_statistics	aerosol	1h	2010-09-21	2011-04-10	
4	AU0001C	Alice Springs	sun_tracking_filter_radiometer	sample_count	aerosol	1h	2002-04-11	2007-12-31	
4	AU0001C	Alice Springs	sun_tracking_filter_radiometer	sample_count	aerosol	1h	2010-09-21	2011-04-10	
1	BG0001R	BEO Mousala	aws	pressure	met	1h	2009-01-01	2010-07-01	
1	BG0001R	BEO Mousala	aws	relative_humidity	met	1h	2009-01-01	2010-07-01	
1	BG0001R	BEO Mousala	aws	temperature	met	1h	2009-01-01	2010-07-01	
1	BG0001R	BEO Mousala	aws	wind_direction	met	1h	2009-01-01	2010-07-01	
1	BG0001R	BEO Mousala	aws	wind_speed	met	1h	2009-01-01	2010-07-01	
3	BG0001R	BEO Mousala	nephelometer	aerosol_light_backscattering_coefficient	aerosol	1h	2007-01-01	2008-01-01	
3	BG0001R	BEO Mousala	nephelometer	aerosol_light_backscattering_coefficient	aerosol	1h	2008-01-01	2010-07-01	
6	BG0001R	BEO Mousala	nephelometer	aerosol_light_backscattering_coefficient_statistics	aerosol	1h	2008-01-01	2010-07-01	
1	BG0001R	BEO Mousala	nephelometer	aerosol_light_scattering_coefficient	aerosol	1h	2007-01-01	2009-01-19	45
2	BG0001R	BEO Mousala	nephelometer	aerosol_light_scattering_coefficient	aerosol	1h	2007-01-01	2008-01-01	
3	BG0001R	BEO Mousala	nephelometer	aerosol_light_scattering_coefficient	aerosol	1h	2008-01-01	2010-07-01	
6	BG0001R	BEO Mousala	nephelometer	aerosol_light_scattering_coefficient_statistics	aerosol	1h	2008-01-01	2010-07-01	
1	BG0001R	BEO Mousala	nephelometer	pressure	aerosol	1h	2007-01-01	2009-04-11	ins
1	BG0001R	BEO Mousala	nephelometer	pressure	aerosol	1h	2008-01-01	2010-07-01	ins
1	BG0001R	BEO Mousala	nephelometer	relative_humidity	aerosol	1h	2007-01-01	2008-01-01	ins
1	BG0001R	BEO Mousala	nephelometer	temperature	aerosol	1h	2007-01-01	2008-01-01	ins
1	BG0001R	BEO Mousala	nephelometer	temperature	aerosol	1h	2008-01-01	2010-07-01	ins
11	BG0001R	BEO Mousala	smps	particle_number_size_distribution	aerosol	1h	2008-12-01	2009-01-01	
75	BG0001R	BEO Mousala	smps	particle_number_size_distribution	aerosol	1h	2009-01-01	2010-07-01	
22	BG0001R	BEO Mousala	smps	particle_number_size_distribution_statistics	aerosol	1h	2008-12-01	2009-01-01	

Search result page of EBAS web-interface:

- Lists datasets that meet search criteria set on home page.
- Datasets that are present, but access restricted, are displayed in grey.
- Time period for plotting or download to be selected on top (select appropriate radio button!).

The EBAS web-interface 3 / 3



Plot page for selected datasets:

- Screen, evaluate, compare between instruments, compare between stations, ...
- Download datasets (data is automatically grouped by instrument).

Modes of data submission

1. Regular, annual data submission

- Final, fully quality assured data, including uncertainty, and variability where applicable.
- Deadlines depend on framework reported to: EMEP / ACTRIS: 31 July following year.

2. Advanced data reporting

- Designed to establish traceability of data back to the time of measurement.

3. Near-Real-Time data reporting

- Data should be available to the user within max. 3 hours of measurement.
- Data is being processed and screened automatically, lower quality and higher uncertainty as with regularly reported data accepted.

Why do we ask providers to format the data?

1. Avoid errors

- Reformating data and frequent iterations with provider induce misunderstanding and errors.

2. Scientific standard of provider

- Yearly submission is essence of a year's work, data (often) remains property of PI, they are responsible for the quality (policy dependent).

3. Work load at data centre:

- EBAS receives over 6000 datasets annually. Submitting formatted data frees resources for other services, e.g. dissemination.

Online formatting templates

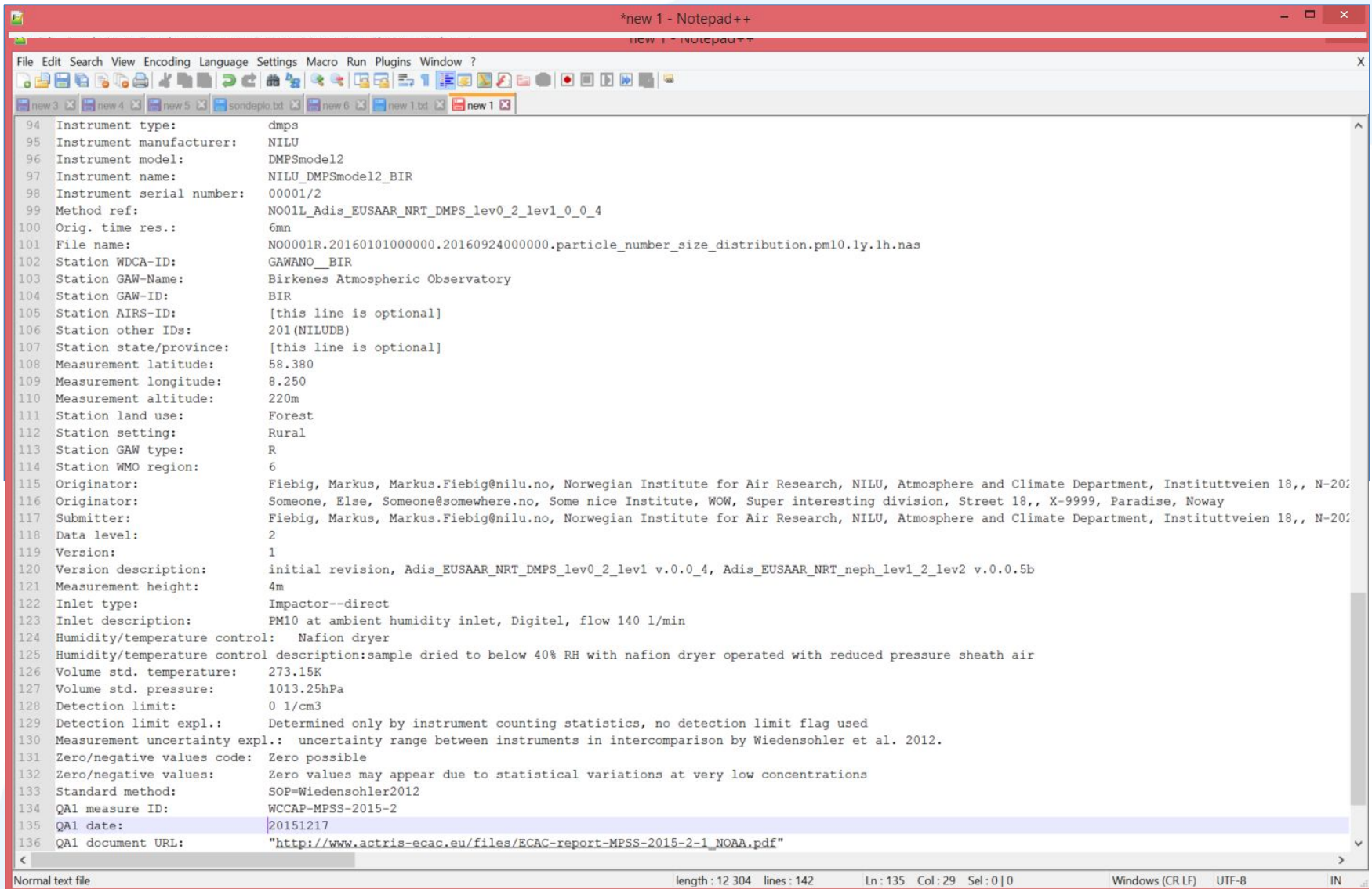
<http://ebas-submit.nilu.no/>

Templates

Please browse the different [categories](#) for a list of templates, or select from the complete list below:

[NOx](#)
[Cloud condensation nuclei](#)
[Particle Number Concentration](#)
[Particle Number Size Distribution](#)
[Particle light absorption coefficient](#)
[Particle light scattering coefficient](#)
[Aerosol Optical Depth](#)
[Particulate Mass Conc., gravim](#)
[Particulate Mass Conc., online](#)
[Particulate chemical composition, online \(ACSM\)](#)
[VOC](#)
[Inorganic air/aerosol chemistry \(filter-based\)](#)
[Inorganic Precipitation Chemistry](#)
[EC OC](#)
[Heavy metals in aerosol particle-phase](#)
[Heavy metals in precipitation](#)
[Meteorology](#)
[Ozone](#)
[Coarse Mode Particle Size Distribution](#)
[NMHC](#)
[Mercury in air or aerosols](#)
[Mercury in precipitation](#)
[EBAS Master Template](#)

Online formatting templates



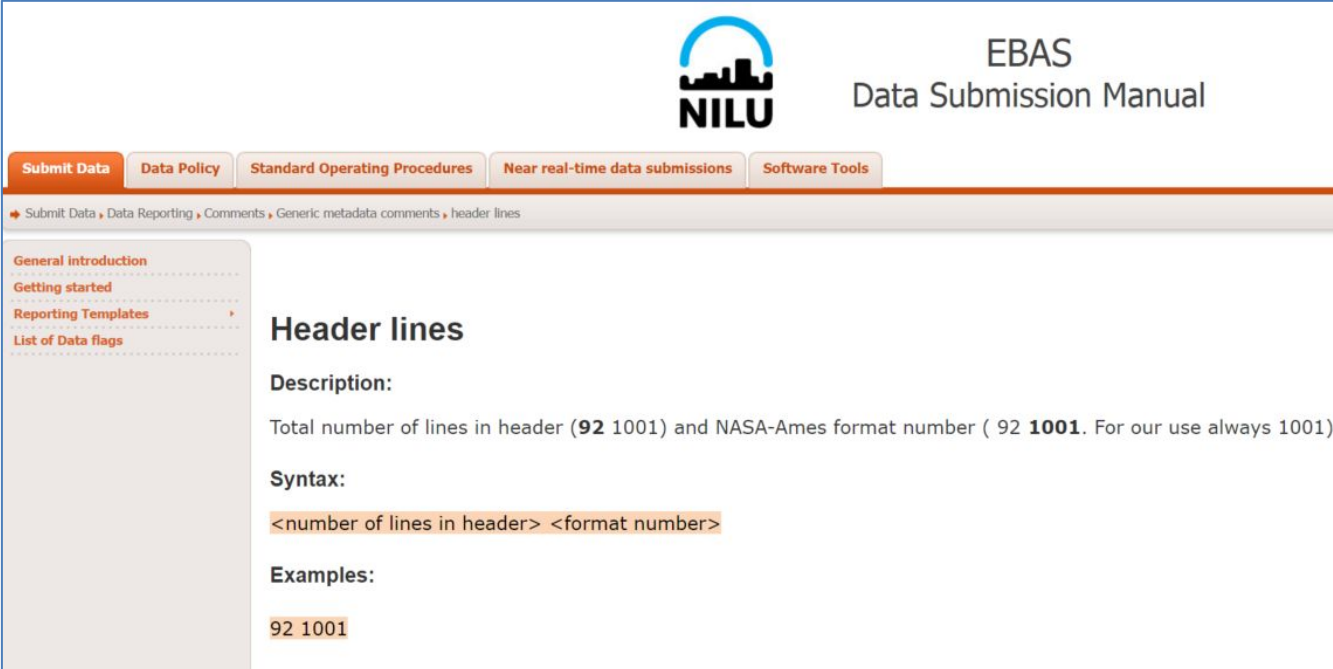
```
*new 1 - Notepad++
new 1 - Notepad++
File Edit Search View Encoding Language Settings Macro Run Plugins Window ?
new 3 new 4 new 5 sondeplo.txt new 6 new 1.txt new 1
94 Instrument type:      dmps
95 Instrument manufacturer: NILU
96 Instrument model:     DMPSmodel2
97 Instrument name:      NILU_DMPSmodel2_BIR
98 Instrument serial number: 00001/2
99 Method ref:          NO01L_Adis_EUSAAR_NRT_DMPS_lev0_2_lev1_0_0_4
100 Orig. time res.:     6mn
101 File name:           NO0001R.20160101000000.20160924000000.particle_number_size_distribution.pm10.ly.1h.nas
102 Station WDCA-ID:     GAWANO_BIR
103 Station GAW-Name:    Birkenes Atmospheric Observatory
104 Station GAW-ID:      BIR
105 Station AIRS-ID:     [this line is optional]
106 Station other IDs:   201 (NILUDB)
107 Station state/province: [this line is optional]
108 Measurement latitude: 58.380
109 Measurement longitude: 8.250
110 Measurement altitude: 220m
111 Station land use:    Forest
112 Station setting:     Rural
113 Station GAW type:    R
114 Station WMO region:  6
115 Originator:          Fiebig, Markus, Markus.Fiebig@nilu.no, Norwegian Institute for Air Research, NILU, Atmosphere and Climate Department, Instituttveien 18,, N-200
116 Originator:          Someone, Else, Someone@somewhere.no, Some nice Institute, WOW, Super interesting division, Street 18,, X-9999, Paradise, Noway
117 Submitter:           Fiebig, Markus, Markus.Fiebig@nilu.no, Norwegian Institute for Air Research, NILU, Atmosphere and Climate Department, Instituttveien 18,, N-200
118 Data level:          2
119 Version:             1
120 Version description:  initial revision, Adis_EUSAAR_NRT_DMPS_lev0_2_lev1 v.0.0_4, Adis_EUSAAR_NRT_neph_lev1_2_lev2 v.0.0.5b
121 Measurement height:  4m
122 Inlet type:          Impactor--direct
123 Inlet description:    PM10 at ambient humidity inlet, Digitel, flow 140 l/min
124 Humidity/temperature control: Nafion dryer
125 Humidity/temperature control description: sample dried to below 40% RH with nafion dryer operated with reduced pressure sheath air
126 Volume std. temperature: 273.15K
127 Volume std. pressure:  1013.25hPa
128 Detection limit:      0 1/cm3
129 Detection limit expl.: Determined only by instrument counting statistics, no detection limit flag used
130 Measurement uncertainty expl.: uncertainty range between instruments in intercomparison by Wiedensohler et al. 2012.
131 Zero/negative values code: Zero possible
132 Zero/negative values:  Zero values may appear due to statistical variations at very low concentrations
133 Standard method:      SOP=Wiedensohler2012
134 QA1 measure ID:       WCCAP-MPSS-2015-2
135 QA1 date:             20151217
136 QA1 document URL:     "http://www.actris-ecac.eu/files/ECAC-report-MPSS-2015-2-1_NOAA.pdf"
<
Normal text file
length: 12 304 lines: 142 Ln: 135 Col: 29 Sel: 0 | 0 Windows (CR LF) UTF-8 IN
```

Online formatting templates

Metadata is “data about data”

Will ensure that your data will be **understood and interpreted** by any user.

Click on each line for **detailed explanations** of each metadata item.



The screenshot displays the EBAS Data Submission Manual website. At the top right is the NILU logo and the title 'EBAS Data Submission Manual'. Below this is a navigation bar with links: 'Submit Data', 'Data Policy', 'Standard Operating Procedures', 'Near real-time data submissions', and 'Software Tools'. A breadcrumb trail reads: 'Submit Data > Data Reporting > Comments > Generic metadata comments > header lines'. On the left is a sidebar menu with links: 'General introduction', 'Getting started', 'Reporting Templates', and 'List of Data flags'. The main content area is titled 'Header lines' and contains the following text:

Description:
Total number of lines in header (**92 1001**) and NASA-Ames format number (**92 1001**. For our use always 1001)

Syntax:
<number of lines in header> <format number>

Examples:
92 1001

Available templates

Reporting formats for

- Particle number size distribution (DMPS / SMPS)
- Aerosol scattering coefficient (integ. nephelometer)
- Aerosol absorption photometer (filter abs. photometer)
- Particle number concentration (CPC)
- Parameters with reporting formats updated with additional metadata:
- PM mass concentration (gravimetric)
- PM mass concentration (online methods)
- Cloud condensation nucleus number concentration (CCNC)
- Cloud condensation nucleus number size distribution (DMPS / CCNC)
- NO_x (chemiluminescence photometer)
- NO_y
- VOCs
- Online aerosol chemical speciation (ACSM / AMS)
- EC / OC
- Air ion spectrometer
- Meteorological parameters

Format checker and submission tool

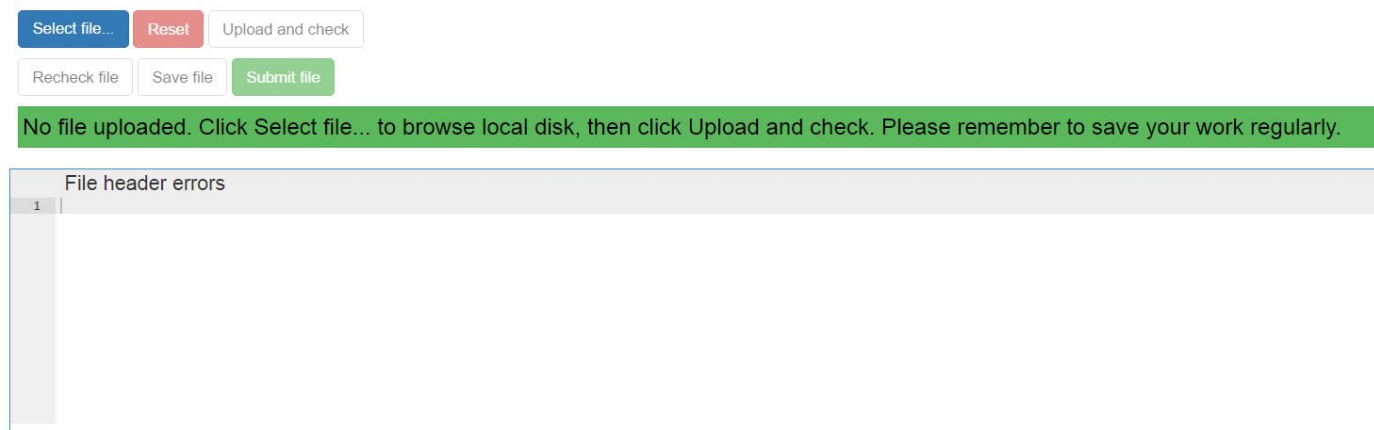
<http://ebas-submit-tool.nilu.no/>

The EBAS Data Submission Tool

is an **online file format checker** and a **data submission system**.

It is designed to give the data submitters direct feedback on the formatted NASA Ames files and to deliver files through online data submission.

It gives you information on how to best troubleshoot validation errors.



The screenshot shows the EBAS Data Submission Tool interface. At the top, there are five buttons: 'Select file...' (blue), 'Reset' (red), 'Upload and check' (white), 'Recheck file' (white), and 'Save file' (white). Below these buttons is a green message box that reads: 'No file uploaded. Click Select file... to browse local disk, then click Upload and check. Please remember to save your work regularly.' Below the message box is a section titled 'File header errors' with a table containing one row with the number '1' in the first column.

File header errors	
1	

Format checker and submission tool

<http://ebas-submit-tool.nilu.no/>

← → ↻ ⓘ ebas-submit-tool.nilu.no

Select file... Reset Upload and check

Recheck file

No file upload folder

This PC ▸ viper (\\prod-app1) (Z:) ▸ ebas ▸ underarbeid ▸ fr ▸

Name	Date modified	Type
ACTRIS_COV-Data_PUY_Routines-2013	21.04.2017 13:24	NAS File
ACTRIS_COVOnline-Data_PUY_Summer2015	21.04.2017 13:24	NAS File
FR0030R.20110412120000.20161204150000.ads_tube.nmhc.air.54h.3h.FR04L_Perkin_Elmer_G...	20.04.2017 09:09	NAS File
FR0033R.20120604120000.20170403000000.steel_canister.NMHC.air.7mo.4d.FR07L_SilcoCan...	10.04.2017 09:52	NAS File
FR0033R.20120604120000.20170403000000.steel_canister.NMHC.air.7mo.4d.FR07L_SilcoCan...	07.04.2017 17:49	NAS~ File
FR0033R.20130107120000.20170403000000.steel_canister.NMHC.air.12mo.84h.FR07L_SilcoCa...	07.04.2017 17:49	NAS File
FR0033R.20140102120000.20170403000000.steel_canister.NMHC.air.6mo.4d.FR07L_SilcoCan...	07.04.2017 17:49	NAS File
FR0013R.20160104120000.20170331000000.offline_canister_gc.NMHC.air.1y.84h.FR07L_MD-...	03.04.2017 14:10	NAS File
FR0015R.20160104120000.20170331000000.steel_canister.NMHC.air.1y.84h.FR07L_MD-GC_N...	31.03.2017 19:15	NAS File
FR0015R.20150101120000.20160729000000.offline canister qc.NMHC.air.1y.84h.FR07L MD-...	31.03.2017 12:09	SAVE File

File data errors (returning up to a maximum of 1000 rows)

Format checker and submission tool

<http://ebas-submit-tool.nilu.no/>

Select file... Reset Upload and check

FR0030R.20110412120000.20161204150000.ads_tube.nmhc.air.54h.3h.FR04L_Perkin_Elmer_GC-MS_Clarus600_PUY_ambient.FR04L_ads_tube_Perkin_Elmer_GC-MS_Clarus600.lev2.nas

Recheck file Save file Submit file

No file uploaded. Click Select file... to browse local disk, then click Upload and check. Please remember to save your work regularly.

Format checker and submission tool

<http://ebas-submit-tool.nilu.no/>

Select file...

Reset

Upload and check

FR0030R.20110412120000.20161204150000.ads_tube.nmhc.air.54h.3h.FR04L_Perkin_Elmer_GC-MS_Clarus600_PUY_ambient.FR04L_ads_tube_Perkin_Elmer_GC-MS_Clarus600.lev2.nas

Recheck file

Save file

Submit file

Exception reading NASA AMES file: 6 Errors, 3 Warnings

File header errors (errors 6, warnings 3)

```
33 numflag n-pentane, no unit
34 o-xylene, pmol/mol
35 numflag o-xylene, no unit
36 styrene, pmol/mol
37 numflag styrene, no unit
38 toluene, pmol/mol
39 numflag toluene, no unit
40 trans-2-pentene, pmol/mol
41 numflag trans-2-pentene, no unit
42 1-hexene, pmol/mol
43 numflag 1-hexene, no unit
44 1-pentene, pmol/mol
```

ERROR: line 36: Variable 23: Regime/Matrix/Component combination 'IMG'/'air'/'styrene': unit 'pmol/mol' not allowed, should be 'ug/m3'

<http://ebas-submit-tool.nilu.no/>




Format checker and submission tool

<http://ebas-submit-tool.nilu.no/>

Data file upload successful

⏮ REPLY ⏮ REPLY ALL ➡ FORWARD ⋮



NILU EBAS ftp drop <ebas@nilu.no>
Wed 03/05/2017 11:38

Mark as read

To: Ann Mari Fjæraa;

Your data file :

ES0018G.20080101000000.20170502000000.nephelometer.aerosol_scattering_coefficient.pm10.1y.1h.ES07L_TSI_3563_SN70738230-PM10amb.ES07L_sct_coef_PM10amb_TSI3562_v1.lev2.nas (2560202 bytes)

was successfully uploaded to NILU and has been sent to QA and processing.
Thank you for your submission!

You will be contacted in case of questions or format issues.

Sincerely,
Your NILU EBAS Database team (ebas@nilu.no)

Data from GAW-WDCA stations



Practical examples

Open <http://ebas.nilu.no/>

Open <https://ebas-submit.nilu.no/>

Open <https://ebas-submit-tool.nilu.no/>

These are the links needed for data formatting, -checking and submission.

Make sure to have minimum a spreadsheet and a text file editor installed on your pc, e.g. MS Excel and Notepad ++

More advanced users might want to use programs such as python for the file formatting.

Practical examples

Collect your data in the spreadsheet

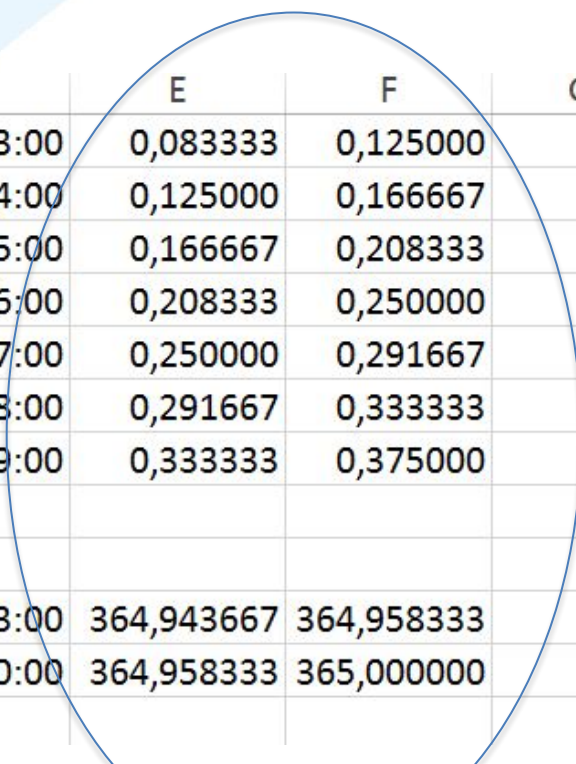
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Start date	End date	Start time	End time	P	RH	T	sc1	sc2	sc3	bsc1	bsc2	bsc3	perc1_sc1	perc2_sc1	perc1_sc2	perc2_sc2	perc1_sc3	perc2_sc3
2	01.01.2017	01.01.2017	00:00	01:00	975,2	19,5	300,9	0,27187	-0,09045	0,61103	0,11978	-0,12408	0,3127	0,21548	-0,05436	0,49024	2,42093	1,70594	3,07579
3	01.01.2017	01.01.2017	01:00	02:00	975	19,1	300,9	0,12322	-0,30607	0,50115	0,16233	-0,02604	0,35287	0,1493	-0,09245	0,43942	2,48594	1,63732	3,32603
4	01.01.2017	01.01.2017	02:00	03:00	975,2	18,7	300,8	0,26316	-0,15821	0,59956	0,22416	0,06541	0,38332	0,03342	-0,19336	0,32035	2,41977	1,52134	3,21641
5	01.01.2017	01.01.2017	03:00	04:00	975,1	17,8	300,8	-0,03984	-0,43657	0,29166	0,12779	-0,03693	0,3035	0,16246	-0,05457	0,38271	1,53822	0,56632	2,48587
6	01.01.2017	01.01.2017	04:00	05:00	975,2	17,2	300,8	0,07285	-0,27135	0,49095	0,19372	0,01417	0,37442	0,03456	-0,29016	0,28149	1,30223	0,39315	2,24446
7	01.01.2017	01.01.2017	05:00	06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	01.01.2017	01.01.2017	06:00	07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	01.01.2017	01.01.2017	07:00	08:00	1075,3	95	1300,7	30,37	-26,584	33,494	10,811	-45,62	30,694	18,994	-11,363	50,267	104,284	-12,62	203,627
10	01.01.2017	01.01.2017	08:00	09:00	975,4	14,6	300,8	-0,02694	-0,54638	0,39194	-0,07726	-0,26191	0,07819	0,23279	-0,12984	0,55131	1,29487	0,49192	1,88645
11	01.01.2017	01.01.2017	09:00	10:00	976,4	13,6	300,8	0,50022	0,50022	0,50022	0,4067	0,4067	0,4067	0,25991	0,25991	0,25991	2,17815	2,17815	2,17815
12	01.01.2017	01.01.2017	10:00	11:00	976,4	13,5	300,8	0,21934	-0,15618	0,58582	0,18057	-0,03336	0,38659	-0,03386	-0,35864	0,2591	1,92234	1,10031	2,75977
13	01.01.2017	01.01.2017	11:00	12:00	976,4	13,6	300,9	0,19353	-0,18554	0,56217	0,13241	-0,05095	0,30615	0,17171	-0,15002	0,46601	1,71889	0,93046	2,40406
14	01.01.2017	01.01.2017	12:00	13:00	976,3	13,9	301	0,17879	-0,14647	0,50496	0,16256	-0,03532	0,34888	0,18183	-0,03816	0,4122	1,80356	0,86475	2,54504
15	01.01.2017	01.01.2017	13:00	14:00	976,5	14	301,1	0,16751	-0,15616	0,53206	0,04478	-0,17078	0,21553	0,10303	-0,1746	0,22222	1,40400	0,80575	2,35861

You will need to modify the **start_time** and **end_time** parameters.

Practical examples

The level 2 data must be in 1h averages, continues measurements

The year start at time 0, and after one full day of 24hours time is 1
 $1/24 = 0.041667$



	A	B	C	D	E	F	G	H	I	J
4	01.01.2017	01.01.2017	02:00	03:00	0,083333	0,125000		975,2	18,7	30
5	01.01.2017	01.01.2017	03:00	04:00	0,125000	0,166667		975,1	17,8	30
6	01.01.2017	01.01.2017	04:00	05:00	0,166667	0,208333		975,2	17,2	30
7	01.01.2017	01.01.2017	05:00	06:00	0,208333	0,250000		0	0	
8	01.01.2017	01.01.2017	06:00	07:00	0,250000	0,291667		0	0	
9	01.01.2017	01.01.2017	07:00	08:00	0,291667	0,333333		1075,3	95	130
10	01.01.2017	01.01.2017	08:00	09:00	0,333333	0,375000		975,4	14,6	30
11										
12										
13	31.12.2017	31.12.2017	22:00	23:00	364,943667	364,958333		980,2	13,1	30
14	31.12.2017	01.01.2018	23:00	00:00	364,958333	365,000000		981,2	12,8	30
15										

Missing data, suspicious data

How to deal with missing data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Start date	End date	Start time	End time	P	RH	T	sc1	sc2	sc3	bsc1	bsc2	bsc3	perc1_sc1	perc2_sc1	perc1_sc2	perc2_sc2	perc1_sc3	perc2_sc3
2	01.01.2017	01.01.2017	00:00	01:00	975,2	19,5	300,9	0,27187	-0,09045	0,61103	0,11978	-0,12408	0,3127	0,21548	-0,05436	0,49024	2,42093	1,70594	3,07579
3	01.01.2017	01.01.2017	01:00	02:00	975	19,1	300,9	0,12322	-0,30607	0,50115	0,16233	-0,02604	0,35287	0,1493	-0,09245	0,43942	2,48594	1,63732	3,32603
4	01.01.2017	01.01.2017	02:00	03:00	975,2	18,7	300,8	0,26316	-0,15821	0,59956	0,22416	0,06541	0,38332	0,03342	-0,19336	0,32035	2,41977	1,52134	3,21641
5	01.01.2017	01.01.2017	03:00	04:00	975,1	17,8	300,8	-0,03984	-0,43657	0,29166	0,12779	-0,03693	0,3035	0,16246	-0,05457	0,38271	1,53822	0,56632	2,48587
6	01.01.2017	01.01.2017	04:00	05:00	975,2	17,2	300,8	0,07285	-0,27135	0,49095	0,19372	0,01417	0,37442	0,03456	-0,29016	0,28149	1,30223	0,39315	2,24446
7	01.01.2017	01.01.2017	05:00	06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	01.01.2017	01.01.2017	06:00	07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	01.01.2017	01.01.2017	07:00	08:00	1075,3	95	1300,7	30,37	-26,584	33,494	10,811	-45,62	30,694	18,994	-11,363	50,267	104,284	-12,62	203,627
10	01.01.2017	01.01.2017	08:00	09:00	975,4	14,6	300,8	-0,02694	-0,54638	0,39194	-0,07726	-0,26191	0,07819	0,23279	-0,12984	0,55131	1,29487	0,49192	1,88645
11	01.01.2017	01.01.2017	09:00	10:00	976,4	13,6	300,8	0,50022	0,50022	0,50022	0,4067	0,4067	0,4067	0,25991	0,25991	0,25991	2,17815	2,17815	2,17815
12	01.01.2017	01.01.2017	10:00	11:00	976,4	13,5	300,8	0,21934	-0,15618	0,58582	0,18057	-0,03336	0,38659	-0,03386	-0,35864	0,2591	1,92234	1,10031	2,75977
13	01.01.2017	01.01.2017	11:00	12:00	976,4	13,6	300,9	0,19353	-0,18554	0,56217	0,13241	-0,05095	0,30615	0,17171	-0,15002	0,46601	1,71889	0,93046	2,40406
14	01.01.2017	01.01.2017	12:00	13:00	976,3	13,9	301	0,17879	-0,14647	0,50496	0,16256	-0,03532	0,34888	0,18183	-0,03816	0,4122	1,80356	0,86475	2,54504
15	01.01.2017	01.01.2017	13:00	14:00	975,5	14	301,1	0,16781	0,35546	0,53206	0,04478	0,17078	0,21553	0,10303	0,1746	0,23223	1,40400	0,80575	2,35861

Missing values are always combinations of 999s

Missing values must be to a power of 10 higher than [max value]
for each parameter.

If [max pressure] is **1030.00** hPa → missing value for pressure is
99999.99

Missing data, suspicious data

How to deal with missing data

E	F	G	H	I	J	K	L	M	N	O
0,083333	0,125000		975,2	18,7	300,8	0,26316	-0,15821	0,59956	0,22416	0,06541
0,125000	0,166667		975,1	17,8	300,8	-0,03984	-0,43657	0,29166	0,12779	-0,03693
0,166667	0,208333		975,2	17,2	300,8	0,07285	-0,27135	0,49095	0,19372	0,01417
0,208333	0,250000		99999,9	9999,9	9999,9	99999,99999	99999,99999	99999,99999	99999,99999	99999,99999
0,250000	0,291667		99999,9	9999,9	9999,9	99999,99999	99999,99999	99999,99999	99999,99999	99999,99999
0,291667	0,333333		1075,3	95	1300,7	30,37	-26,584	33,494	10,811	-45,62
0,333333	0,375000		975,4	14,6	300,8	-0,02694	-0,54638	0,39194	-0,07726	-0,26191

E	F	G	H	I	J	K	L	M	N	O
0,083333	0,125000		975,2	18,7	300,8	0,26316	-0,15821	0,59956	0,22416	0,06541
0,125000	0,166667		975,1	17,8	300,8	-0,03984	-0,43657	0,29166	0,12779	-0,03693
0,166667	0,208333		975,2	17,2	300,8	0,07285	-0,27135	0,49095	0,19372	0,01417
0,208333	0,250000		99999,9	9999,9	9999,9	99999,99999	99999,99999	99999,99999	99999,99999	99999,99999
0,250000	0,291667		99999,9	9999,9	9999,9	99999,99999	99999,99999	99999,99999	99999,99999	99999,99999
0,291667	0,333333		1075,3	95	1300,7	30,37000	-26,58400	33,49400	10,81100	-45,62000
0,333333	0,375000		975,4	14,6	300,8	-0,02694	-0,54638	0,39194	-0,07726	-0,26191

Flagging of data

How to flag your data

Full list of data flags at

<https://ebas-submit.nilu.no/Submit-Data/List-of-Data-flags>

List of flags used in ebas

All flags are grouped in four categories: V (valid measurement), I (invalid measurement), M (missing measurement) or H (hidden and invalid measurements).

Flag	V/I/H	Description
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Group 9: Missing flags

999	M	Missing measurement, unspecified reason
990	M	Precipitation not measured due to snow-fall. Needed for historic data, should not be needed for new data
980	M	Missing due to calibration or zero/span check
900	H	Hidden and invalidated by data originator

Group 8: Flags for undefined data elements

899	M	Measurement undefined, unspecified reason
890	M	Concentration in precipitation undefined, no precipitation

Group 7: Flags used when the value is unknown

799	I	Measurement missing (unspecified reason), data element contains estimated value
798	V	Measurement missing (unspecified reason), data element contains estimated value. Considered valid.
797	V	Data element taken from co-located instrument
784	I	Low precipitation, concentration estimated
783	M	Low precipitation, concentration unknown
782	V	Low precipitation, concentration estimated
781	V	Value below detection limit, data element contains detection limit
780	V	Value below detection or quantification limit, data element contains estimated or measured value. Use of flag 147 is encouraged.
771	V	Value above range, data element contains upper range limit
770	V	Value above range, data element contains estimated value
760	V	Value estimated by summing up the constituents measured
750	M	H ⁺ not measured in alkaline sample
741	V	Non refractory AMS concentrations. Don't include compounds that volatalises above 600 deg C
740	V	Probably biased gas/particle ratio
701	I	Less accurate than usual, unspecified reason. (Used only with old data, for new data see groups 6 and 5)

Group 6: Mechanical or instrumental problem

699	I	Mechanical problem, unspecified reason
-----	---	--

Flagging of data

How to flag your data

Full list of data flags at

<https://ebas-submit.nilu.no/Submit-Data/List-of-Data-flags>

Say something about the quality of the data

perc2_bsc1	perc1_bsc2	perc2_bsc2	perc1_bsc3	perc2_bsc3	flag
1,31303	2,18575	1,63356	1,12328	2,03477	0,000
1,79935	2,44452	1,43118	1,09692	1,84614	0,000
1,91803	2,60812	1,64051	1,16969	2,08107	0,000
1,10412	1,94116	1,0576	0,63175	1,43576	0,000
0,76698	1,73577	0,95629	0,52078	1,36632	0,000
99999,99999	99999,99999	99999,99999	99999,99999	99999,99999	0,999
99999,99999	99999,99999	99999,99999	99999,99999	99999,99999	0,999
800,28	1653,41	66,296	311,09	1025,36	0,599
0,75819	1,48232	1,28995	0,85156	1,71366	0,000

Flagging of data

How to flag your data

Full list of data flags at

<https://ebas-submit.nilu.no/Submit-Data/List-of-Data-flags>

E	F	G	H	I	J	K	L	M	N	O
0,083333	0,125000		975,2	18,7	300,8	0,26316	-0,15821	0,59956	0,22416	0,06541
0,125000	0,166667		975,1	17,8	300,8	-0,03984	-0,43657	0,29166	0,12779	-0,03693
0,166667	0,208333		975,2	17,2	300,8	0,07285	-0,27135	0,49095	0,19372	0,01417
0,208333	0,250000		99999,9	9999,9	9999,9	99999,99999	99999,99999	99999,99999	99999,99999	99999,99999
0,250000	0,291667		99999,9	9999,9	9999,9	99999,99999	99999,99999	99999,99999	99999,99999	99999,99999
0,291667	0,333333		1075,3	95	1300,7	30,37000	-26,58400	33,49400	10,81100	-45,62000
0,333333	0,375000		975,4	14,6	300,8	-0,02694	-0,54638	0,39194	-0,07726	-0,26191

Save your file and add header

Save spreadsheet file as .txt and open in text editor

*C:\Users\amf\Documents\new 2.txt - Notepad++

File

Edit

Search

View

Encoding

Language

Settings

Macro

Run

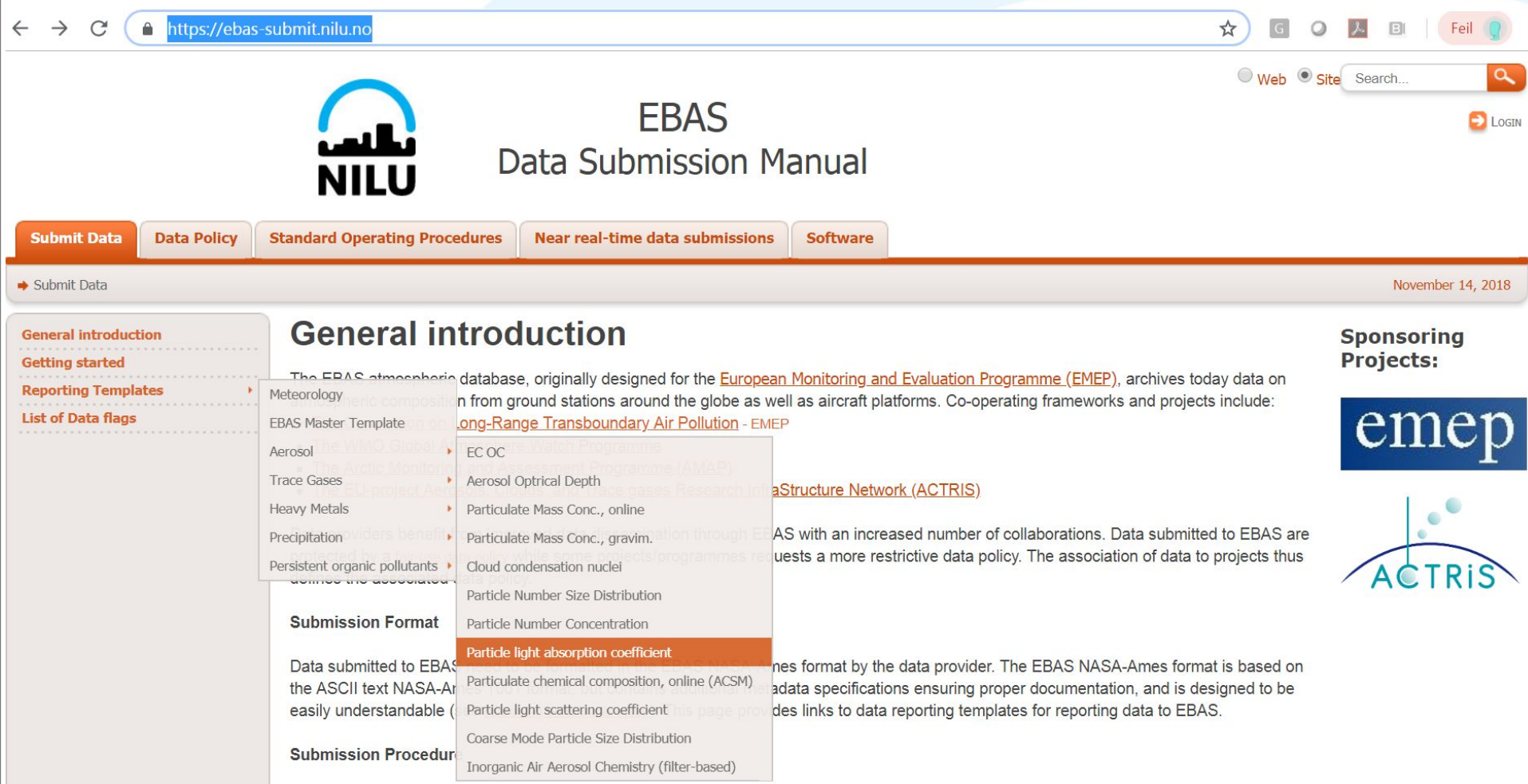
Plugins

Window

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Save your file and add header

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