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

**Arranged within the frame of SAMLAC in November 2018**

**Ann Mari Fjæraa (amf@nilu.no)**

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

**NILU** Norsk institutt for luftforskning

# Outline

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

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# 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**
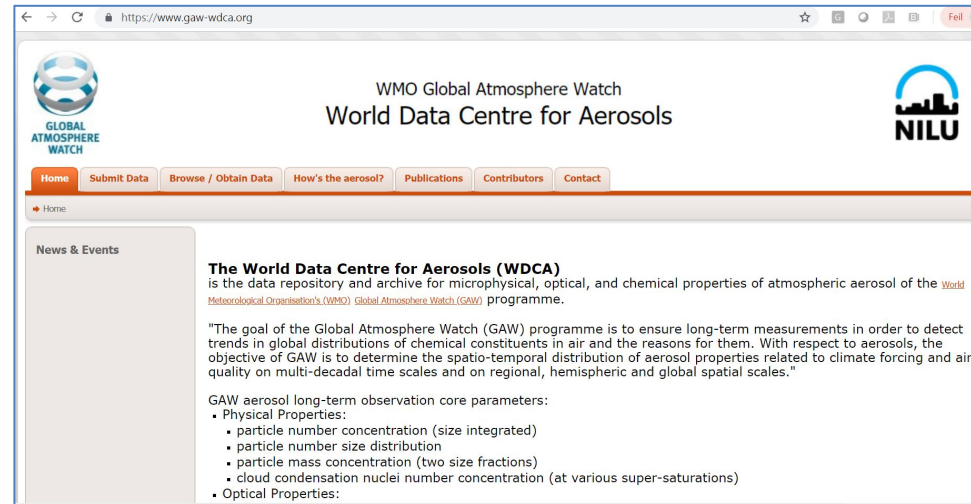
**Main services of the data centre:**

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.
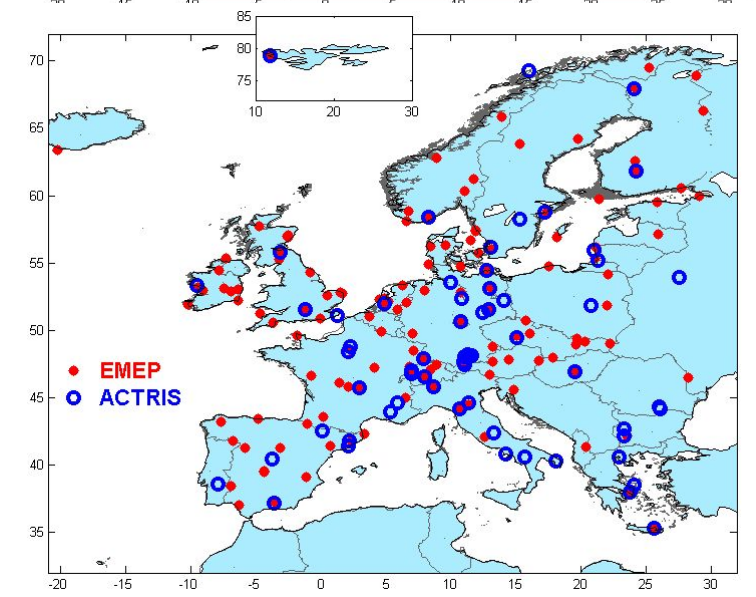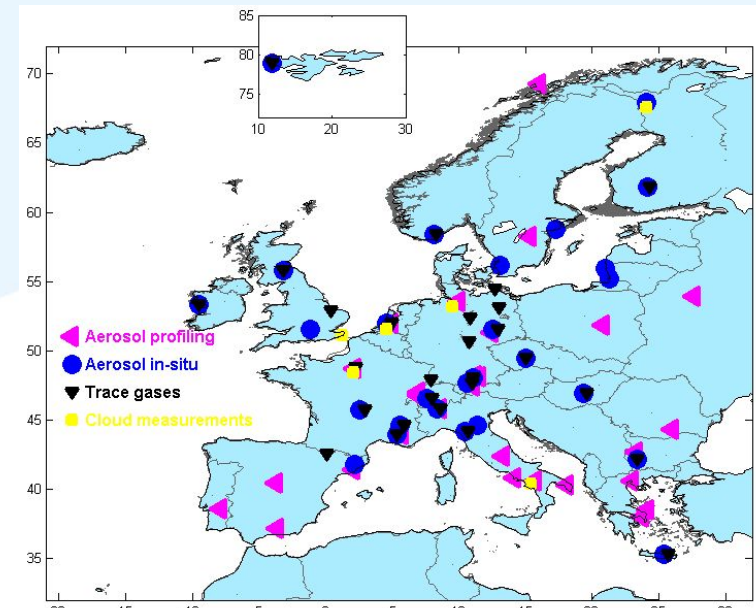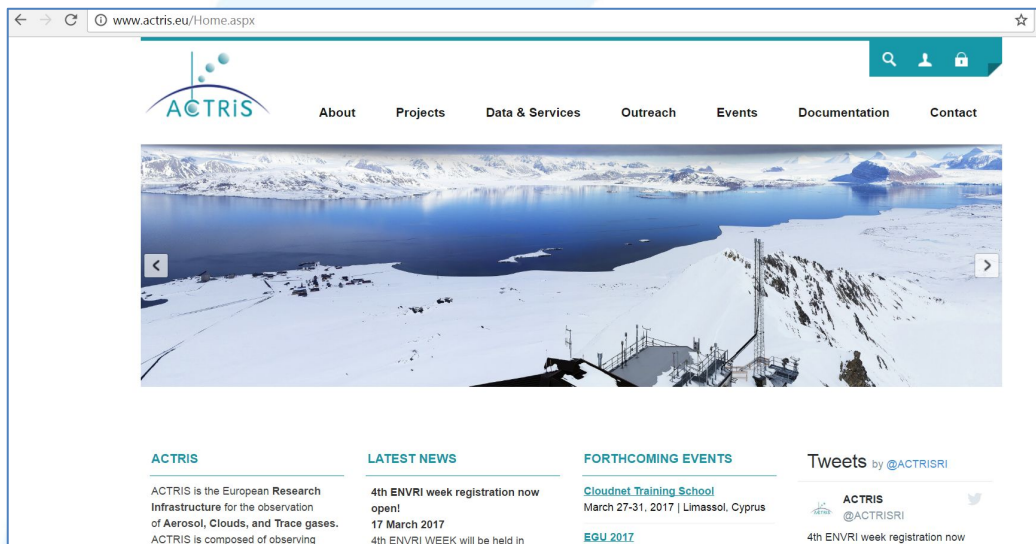


**http://www.gaw-wdca.org**

# 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

# 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.
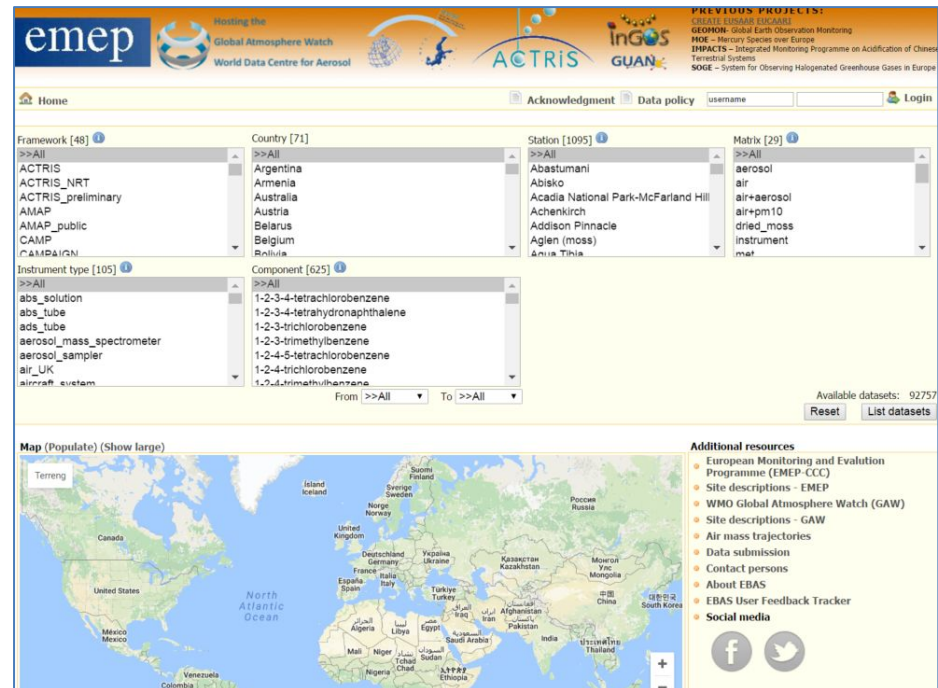
# Data reporting, sharing and ownership

# 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,*

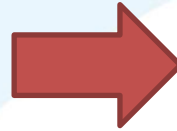*important that data are used!*

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*

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# 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 bodes judges projects by number and rank of data users/data sets etc.

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# 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.

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ACTRIS

emep

# 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.
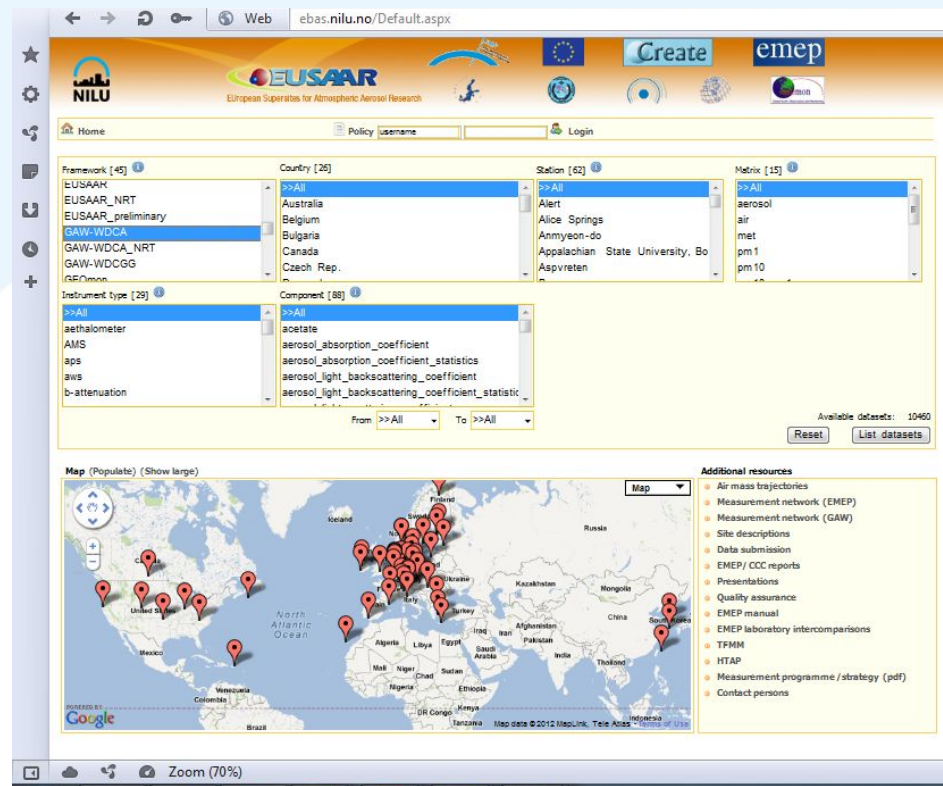
# Users of EBAS

**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, …

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# Data use has to be fair and regulated

Lot off 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.
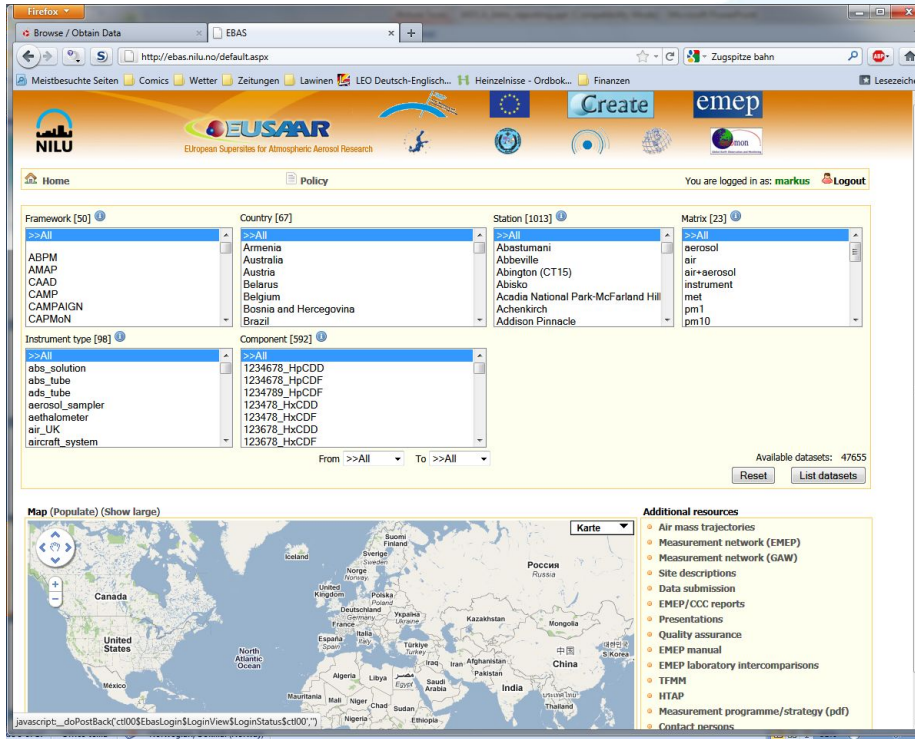
**Public, open, easy access is the goal...**

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# Data formatting and submission

# The EBAS web interface 1 / 3
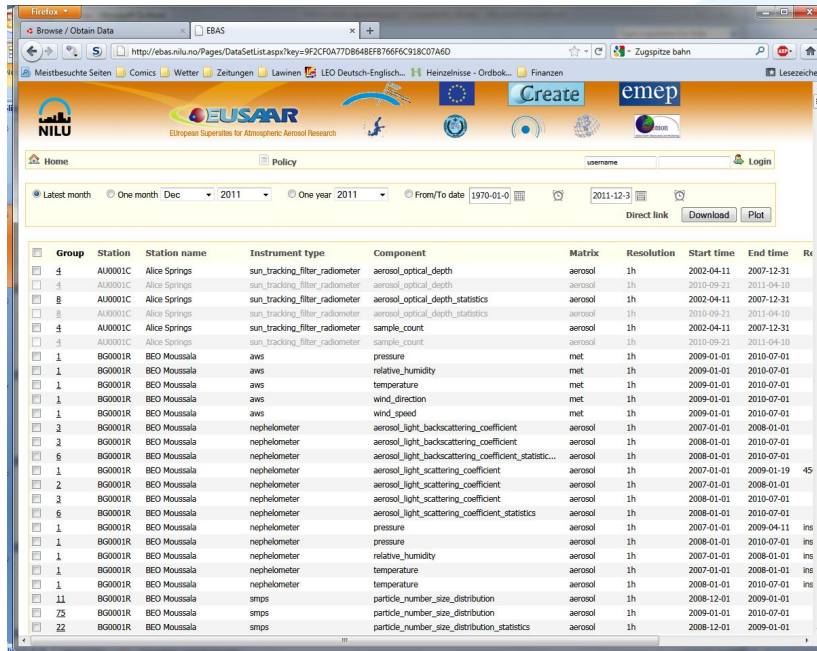


**http://ebas.nilu.no**

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.
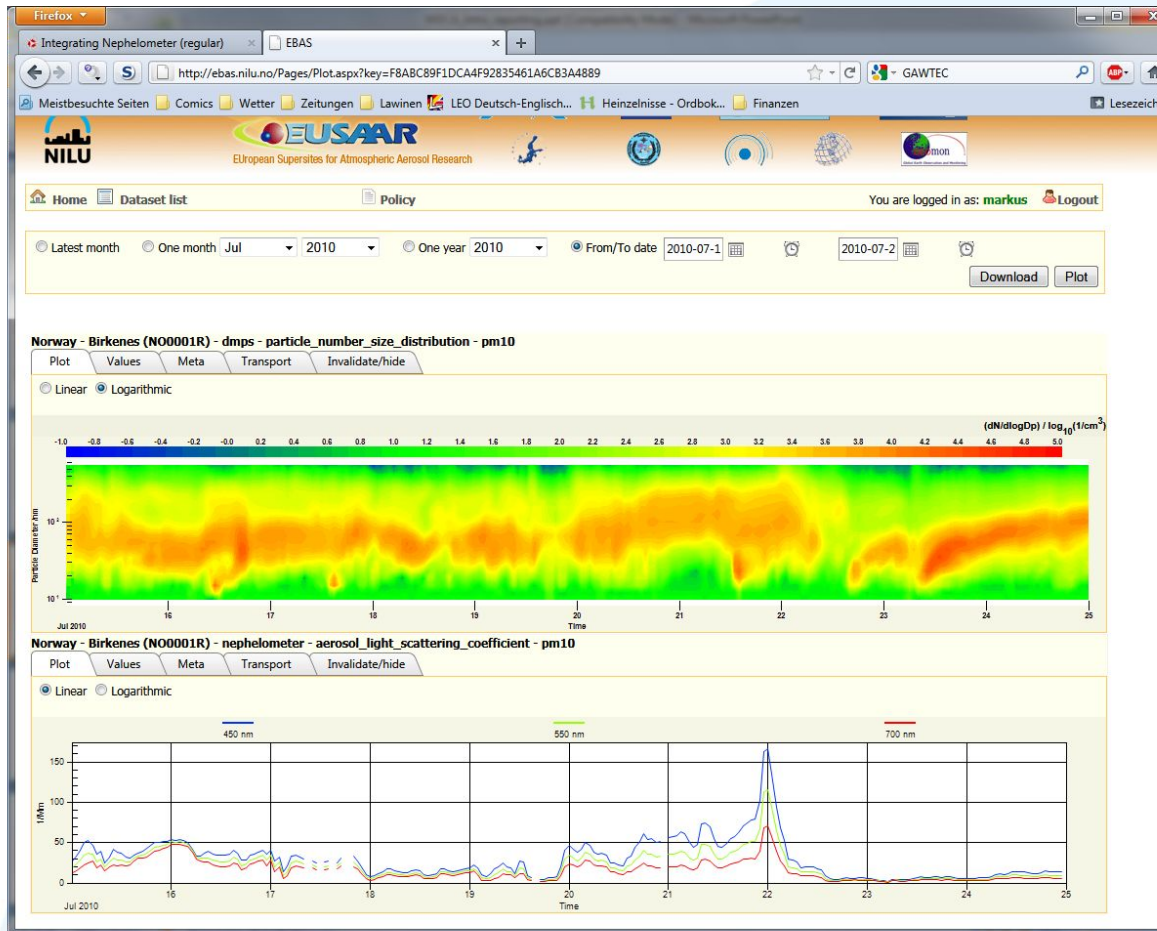
# The EBAS web interface 2 / 3



Search result page of EBAS web-interface:

- Lists datsets 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 automatcally 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.

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# 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.

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# Online formatting templates

http://ebas-submit.nilu.no/
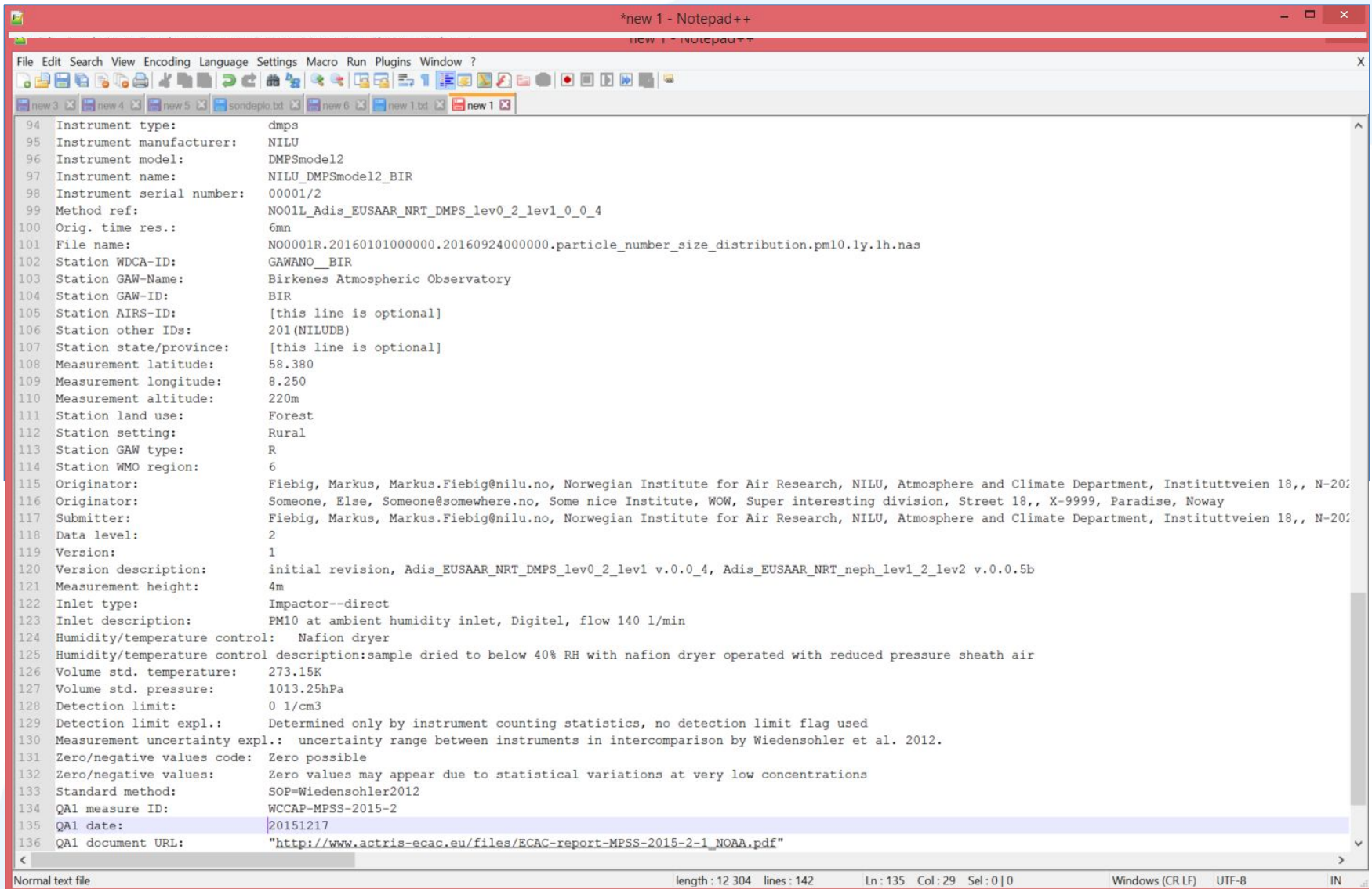
**Templates**

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 Optrical 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

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# Online formatting templates

# 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.

# 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)
- NOx (chemiluminescence photometer)
- NOy
- VOCs
- Online aerosol chemical speciation (ACSM / AMS)
- EC / OC
- Air ion spectrometer
- Meteorological parameters

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# Format checker and submission tool

## http://ebas-submit-tool.nilu.no/
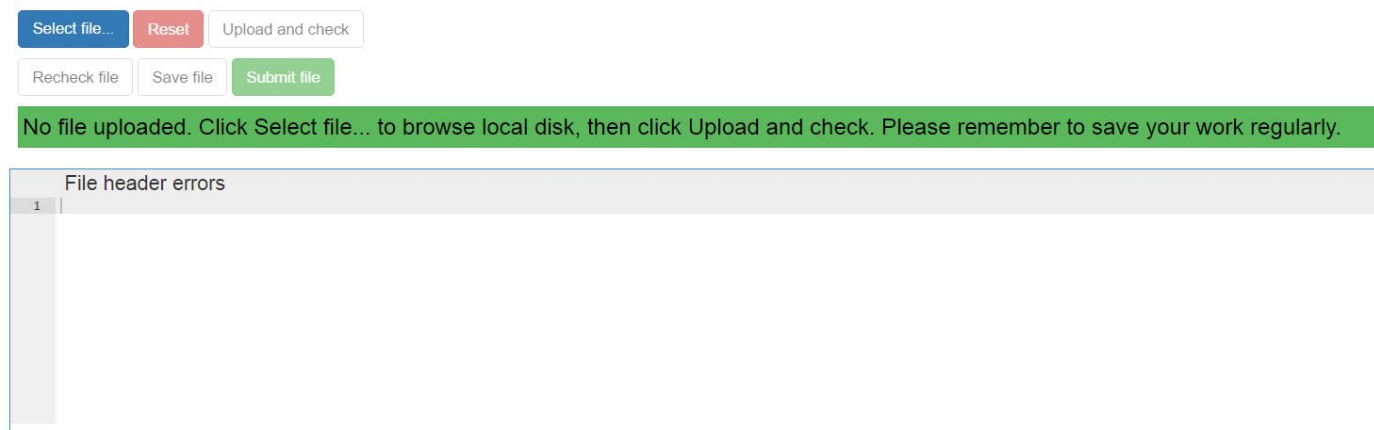
The EBAS Data Submission Tool

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.

# Format checker and submission tool

## http://ebas-submit-tool.nilu.no/

# Format checker and submission tool

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## 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    ···

Mark as read

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

To: Ann Mari Fjæraa;

Your data file :

ES0018G.20080101000000.20170502000000.nephelometer.aerosol_scattering_coefficient.pm10.1y.1h.ES07L_TSI_356
3_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)

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# Data from GAW-WDCA stations

# Practical examples

Open [http://ebas.nilu.no/](http://ebas.nilu.no/)

Open [https://ebas-submit.nilu.no/](https://ebas-submit.nilu.no/)

Open [https://ebas-submit-tool.nilu.no/](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.

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# Practical examples

Collect your data in the spreadsheet
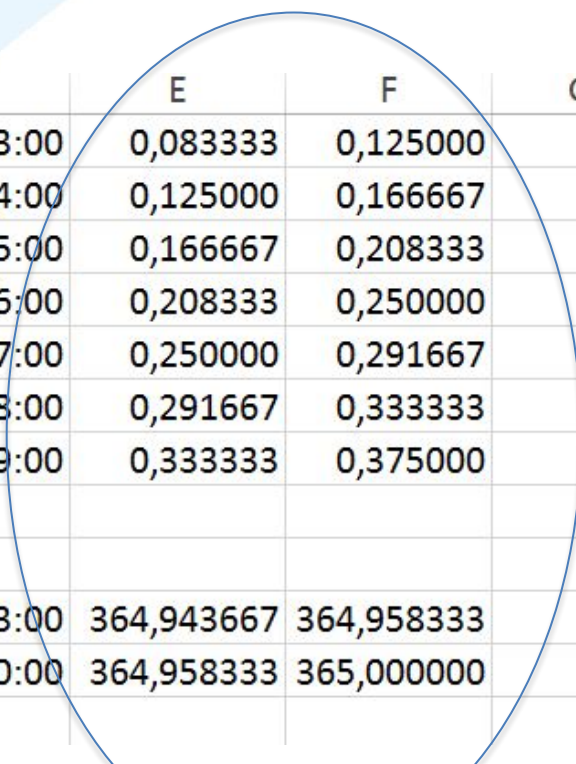
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Start date | End date | Start time | End time | P | RH | T | sc1 | sc2 | sc3 | bsc1 | bsc2 | bsc3 | perc1_sc1 | perc2_sc1 | perc1_sc2 | 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 | -0,25646 | 0,53206 | 0,04478 | -0,17078 | 0,21553 | 0,10302 | 0,1746 | 0,32222 | 1,49409 | 0,89575 | 2,25861 |

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

| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 0,25646 | 0,53206 | 0,04478 | 0,17078 | 0,21553 | 0,10303 | 0,1746 | 0,33223 | 1,49409 | 0,80575 | 2,25861 |

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 |

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# 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 |
|------|-------|-------------|
| **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

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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 |

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# Flagging of data

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| 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 |

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# Save your file and add header

Save spreadsheet file as .txt and open in text editor

# Save your file and add header

Find your template at https://ebas-submit.nilu.no/

# Save your file and add header
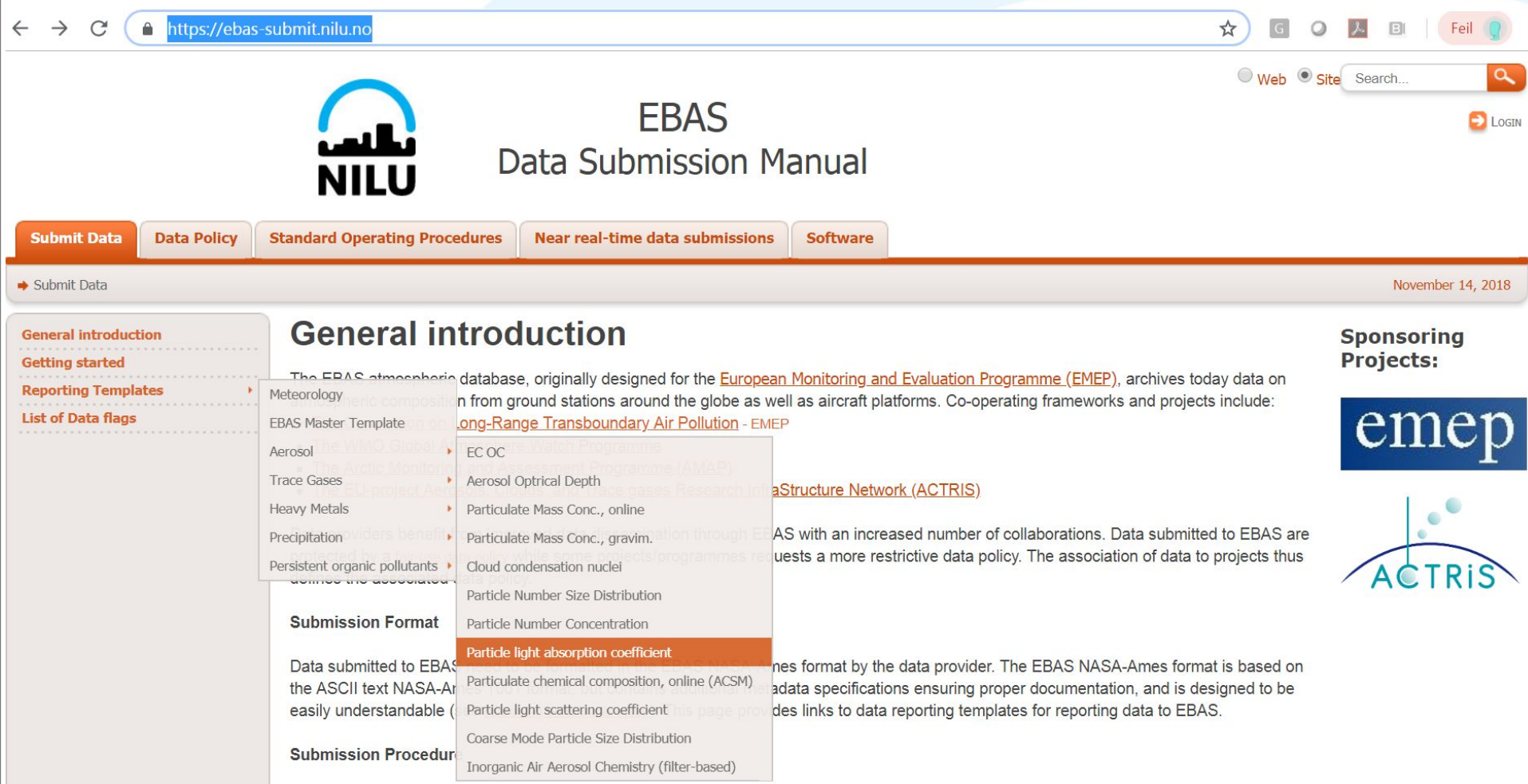
Find your template at https://ebas-submit.nilu.no/
Add header, save and submit.

# Let's try in practice!

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