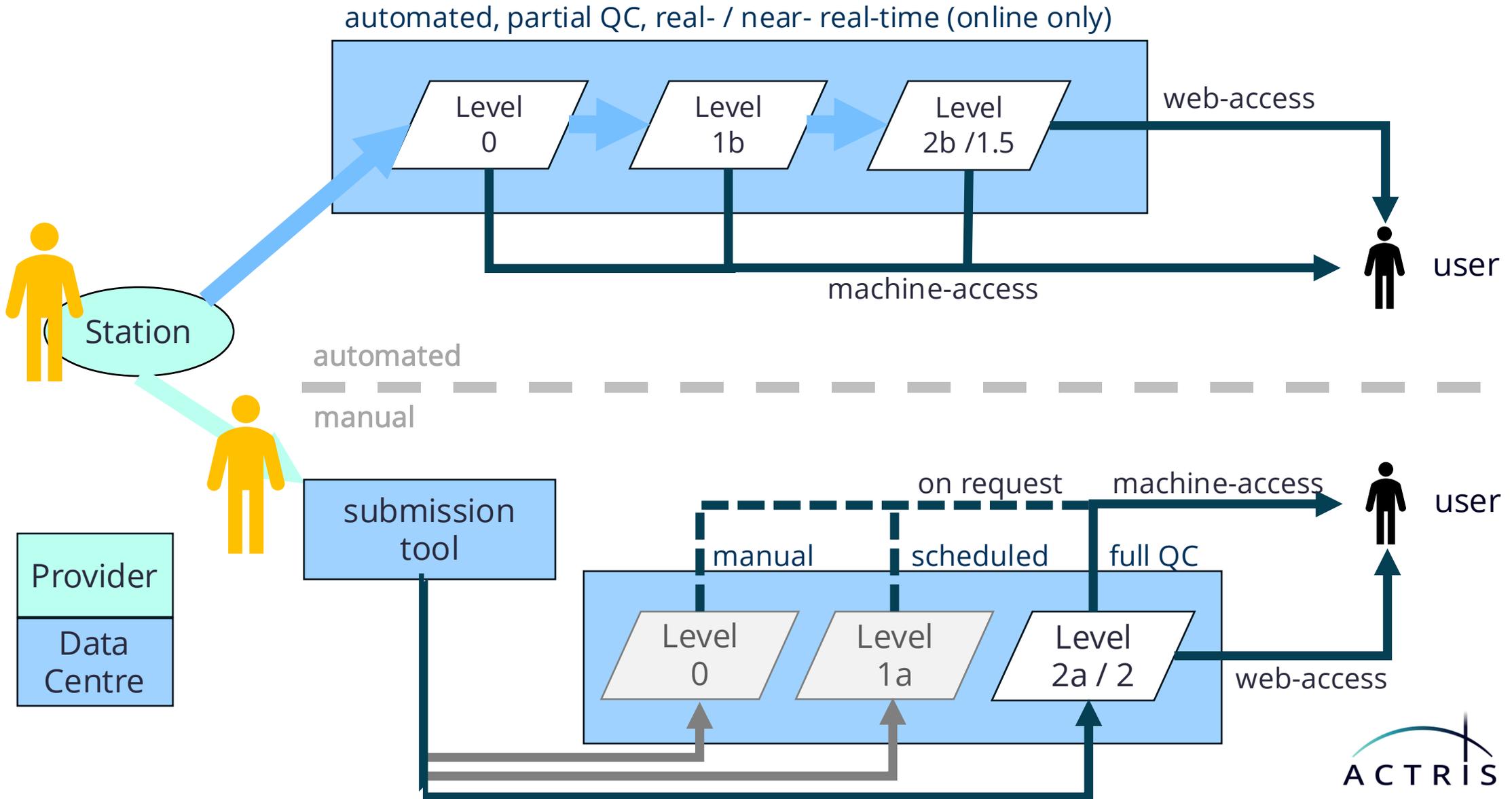




Data Reporting and Data QC – Intro & Repetition

M. Fiebig and the EBAS Team,
esp. Y. Lin & L. Eder Murberg

EBAS Data Production



EBAS Home

- ebas.nilu.no

EBAS HOME

Station info
Information about the station and links to resources.

QA/QC
Standard operation procedures (SOP) and quality assurance of measurements

Data Submission
At the EBAS pages you will find information on how to submit data to EBAS.

EBAS Data Submission Tool

Note: At the moment, the EBAS data submission tool is mainly targeted for data level 2 submissions. Not all level 0 and level 1 formats are supported yet, but we constantly work on improving this. Currently supported level 0 formats: dmpps/smpps, cpc, nephelometer, NOx, meteorology, NMHC, OVOC, CCNC and DMPS-CCNC.

Please note, that after submitting, the file will go through a manual QA and data curation workflow at NILU. Therefore it will take time before the actual data is available in EBAS.

If you experience problems with missing vocabulary (like for example instrument type, instrument manufacturer, instrument model, standard method, inlet type, QA measure ID, ...), please contact the EBAS-team. We are constantly working on improving the tool.

EBAS HOME

Tools And Tutorials
E-learning tutorials

NILU Issue Tracker

| Issue ID | Project | Instrument | Method | QA Measure ID | Level | Status | Created |
|----------|---|--|--------------------------------------|---------------|--|----------------|------------------|
| 0006038 | Eis Termis ES00148 2025 | low_vol_sampler pm25 | ES011_ES00148_MCV-1Dm lev2 | OC/EC | [All Projects] Task - 2026-01-29 10:19 | Unassigned | 2026-01-29 10:19 |
| 0006037 | Zorra ES00128 2025 | low_vol_sampler pm25 | ES011_ES00128_MCV-1Dm lev2 | OC/EC | [All Projects] Task - 2026-01-29 10:19 | Unassigned | 2026-01-29 10:19 |
| 0006036 | Niesbrø ES00088 2025 | low_vol_sampler pm25 | ES011_ES00088_DERENDA_MVS-6.1 lev2 | OC/EC | [All Projects] Task - 2026-01-29 10:19 | Unassigned | 2026-01-29 10:19 |
| 0006035 | Vinar ES00078 2025 | low_vol_sampler pm25 | ES011_ES00078_MCV-1Dm lev2 | OC/EC | [All Projects] Task - 2026-01-29 10:19 | Unassigned | 2026-01-29 10:19 |
| 0006034 | San Pablo de los Montes ES00018 2025 | low_vol_sampler pm25 | ES011_ES00018_DERENDA_108.07 lev2 | OC/EC | [All Projects] Task - 2026-01-29 10:19 | Unassigned | 2026-01-29 10:19 |
| 0006033 | Villaverde d'Ascq FR0027U 2025 | smpp pm25 | FR208_TSI_3082_VDA lev2 | OC/EC | [All Projects] Task - 2026-01-29 10:02 | Unassigned | 2026-01-29 10:02 |
| 0006032 | Villaverde d'Ascq FR0027U 2025 | smpp pm25 | FR208_TSI_3082_VDA lev1 | OC/EC | [All Projects] Task - 2026-01-29 10:02 | Unassigned | 2026-01-29 10:02 |
| 0006031 | Villaverde d'Ascq FR0027U 2025 | smpp pm25 | FR208_TSI_3082_VDA lev0 | OC/EC | [All Projects] Task - 2026-01-29 10:02 | Unassigned | 2026-01-29 10:02 |
| 0006028 | Granada ES0020U 2025 | filter_absorption_photometer aerosol | ES085_Thermo_5012_UGR lev2 | OC/EC | [All Projects] Task - 2026-01-29 09:58 | Unassigned | 2026-01-29 09:58 |
| 0006026 | Granada ES0020U 2025 | filter_absorption_photometer aerosol | ES085_Thermo_5012_UGR lev1 | OC/EC | [All Projects] Task - 2026-01-29 09:58 | Unassigned | 2026-01-29 09:58 |
| 0006200 | BEO Mossala BG00018 2020 | filter_absorption_photometer aerosol | BG021_GMD_CLAP-3W_BEO lev0 | OC/EC | [All Projects] Task - 2025-11-11 09:16 | Reported by Me | 2025-11-11 09:16 |
| 0006199 | BEO Mossala BG00018 2020 | filter_absorption_photometer aerosol | BG021_GMD_CLAP-3W_BEO lev1 | OC/EC | [All Projects] Task - 2025-11-11 09:16 | Reported by Me | 2025-11-11 09:16 |
| 0006081 | Mt Cimone IT00098 2007-2024 | filter_absorption_photometer aerosol | MAAP | OC/EC | [All Projects] Task - 2025-06-24 23:51 | Reported by Me | 2025-06-24 23:51 |
| 0005178 | Appalachian State University US3446C 2024 | filter_absorption_photometer pm1 | US106_GMD_CLAP-3W_APP_pm10 lev2 | OC/EC | [All Projects] Task - 2025-06-17 16:48 | Reported by Me | 2025-06-17 16:48 |
| 0006060 | Appalachian State University US3446C 2024 | filter_absorption_photometer pm1 | US106_GMD_CLAP-3W_APP_pm1 lev2 | OC/EC | [All Projects] Task - 2025-06-17 16:48 | Reported by Me | 2025-06-17 16:48 |
| 0006061 | Appalachian State University US3446C 2024 | filter_absorption_photometer pm10 | US106_GMD_CLAP-3W_APP_pm10 lev2 | OC/EC | [All Projects] Task - 2025-06-17 16:45 | Reported by Me | 2025-06-17 16:45 |
| 0005062 | Neumayer DE00060 2020-2022 | filter_absorption_photometer aerosol | DE15L_Thermo-MAAP_5012_NMY | OC/EC | [All Projects] Task - 2025-01-30 13:14 | Reported by Me | 2025-01-30 13:14 |

Management

Timeline

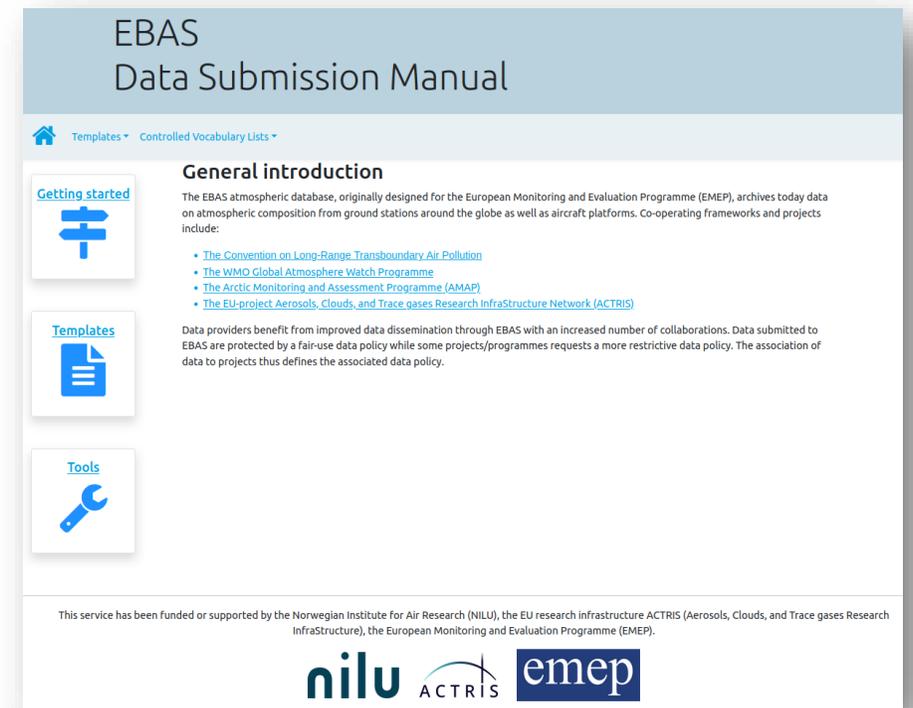
- Maria Leneth Feyen commented on issue 0006200
- Maria Leneth Feyen reopened issue 0006200
- Maria Leneth Feyen commented on issue 0006496
- Maria Leneth Feyen closed issue 0006496
- Maria Leneth Feyen commented on issue 0006211
- Maria Leneth Feyen reopened issue 0006209
- Maria Leneth Feyen reopened issue 0006211
- Maria Leneth Feyen reopened issue 0006210
- Maria Leneth Feyen commented on issue 0006496
- Maria Leneth Feyen assigned issue 0006496 to EBAS Datacenter
- Maria Leneth Feyen commented on issue 0006447
- Maria Leneth Feyen closed issue 0006447
- Maria Leneth Feyen commented on issue 0006450
- Maria Leneth Feyen closed issue 0006450
- Line Eder Murborg commented on issue 0006749
- Line Eder Murborg closed issue 0006749

Data Submission – Resource URLs

- Metadata / header – Find template
- Assemble data

Tools:

- EBAS Data Submission Manual
<http://ebas-submit.nilu.no/>
- EBAS-io python package
<https://git.nilu.no/ebas/ebas-io/-/wikis/home>
- E-learning videos
<https://ebas.nilu.no/delivery/tools-and-tutorials/>



EBAS
Data Submission Manual

Home Templates Controlled Vocabulary Lists

Getting started

General introduction

The EBAS atmospheric database, originally designed for the European Monitoring and Evaluation Programme (EMEP), archives today data on atmospheric composition from ground stations around the globe as well as aircraft platforms. Co-operating frameworks and projects include:

- [The Convention on Long-Range Transboundary Air Pollution](#)
- [The WMO Global Atmosphere Watch Programme](#)
- [The Arctic Monitoring and Assessment Programme \(AMAP\)](#)
- [The EU-project Aerosols, Clouds, and Trace gases Research InfraStructure Network \(ACTRIS\)](#)

Data providers benefit from improved data dissemination through EBAS with an increased number of collaborations. Data submitted to EBAS are protected by a fair-use data policy while some projects/programmes requests a more restrictive data policy. The association of data to projects thus defines the associated data policy.

This service has been funded or supported by the Norwegian Institute for Air Research (NILU), the EU research infrastructure ACTRIS (Aerosols, Clouds, and Trace gases Research InfraStructure), the European Monitoring and Evaluation Programme (EMEP).

nilu ACTRIS emep

Data Submission – Create files - Templates

Find template at the EBAS Data Submission Manual <http://ebas-submit.nilu.no/>

The screenshot shows the EBAS Data Submission Manual website. On the left, there is a navigation menu with icons for 'Getting started', 'Templates' (circled in blue), and 'Tools'. The main content area is titled 'EBAS Data Sub' and features a 'General' section with a list of links: 'The Conver', 'The WMO C', 'The Arctic', and 'The EU-pro'. Below this, it states 'Data providers t' and 'EBAS are protec' and 'data to projects'. The main part of the page is a table with two columns: 'Category' and 'Template'. The 'Aerosol' category is highlighted with a pink box and contains the following templates: 'EC/OC', 'Aerosol Optical Depth', 'Particulate Mass Concentration, online', 'Particulate Mass Concentration, gravimetric', 'Cloud Condensation Nucleus Counter', 'Differential / Scanning Mobility Particle Sizer', 'Condensation Particle Counter', 'Filter Absorption Photometer', 'Particulate chemical composition, online (ACSM)', 'Integrating Nephelometer', 'Coarse mode particle size distribution', 'Bioaerosols (Pollen, Spores)', and 'Inorganic air/aerosol chemistry (filter-based)'. Other categories include 'Trace gases', 'Heavy metals', 'Precipitation', 'Persistent organic pollutants', and 'Meteorology', each with its own set of templates. At the bottom, there is a footer with logos for 'nilu', 'ACTRIS', and 'emep', and a note: 'This service has been funded or supported'.

| Category | Template |
|----------|---|
| | EC/OC |
| | Aerosol Optical Depth |
| | Particulate Mass Concentration, online |
| | Particulate Mass Concentration, gravimetric |
| | Cloud Condensation Nucleus Counter |
| | Differential / Scanning Mobility Particle Sizer |
| | Condensation Particle Counter |
| | Filter Absorption Photometer |
| | Particulate chemical composition, online (ACSM) |
| | Integrating Nephelometer |
| | Coarse mode particle size distribution |
| | Bioaerosols (Pollen, Spores) |
| | Inorganic air/aerosol chemistry (filter-based) |
| | GHG |
| | Methane isotopes |
| | Volatile Organic Carbon (VOC) |
| | NOx |
| | Inorganic air/aerosol chemistry (filter-based) |
| | Ozone |
| | NMHC |
| | Heavy metals in precipitation |
| | Heavy metals in aerosol particle phase |
| | Mercury in air or aerosols |
| | Mercury in precipitation |
| | Inorganic precipitation chemistry |
| | Mercury in precipitation |
| | Heavy metals in precipitation |
| | POPs in precipitation |
| | POPs in precipitation |
| | POPs in aerosols |
| | POPs in aerosols |
| | Meteorology |
| | EBAS Master Template |

EBAS – Controlled vocabularies

- Instrument types, manufacturers and models

https://ebas-submit.nilu.no/templates/comments/all_instrument_types_manufacturers

- Analytical Measurement Technique, Analytical Instrument Manufacturer and model

https://ebas-submit.nilu.no/templates/comments/analytical_instruments

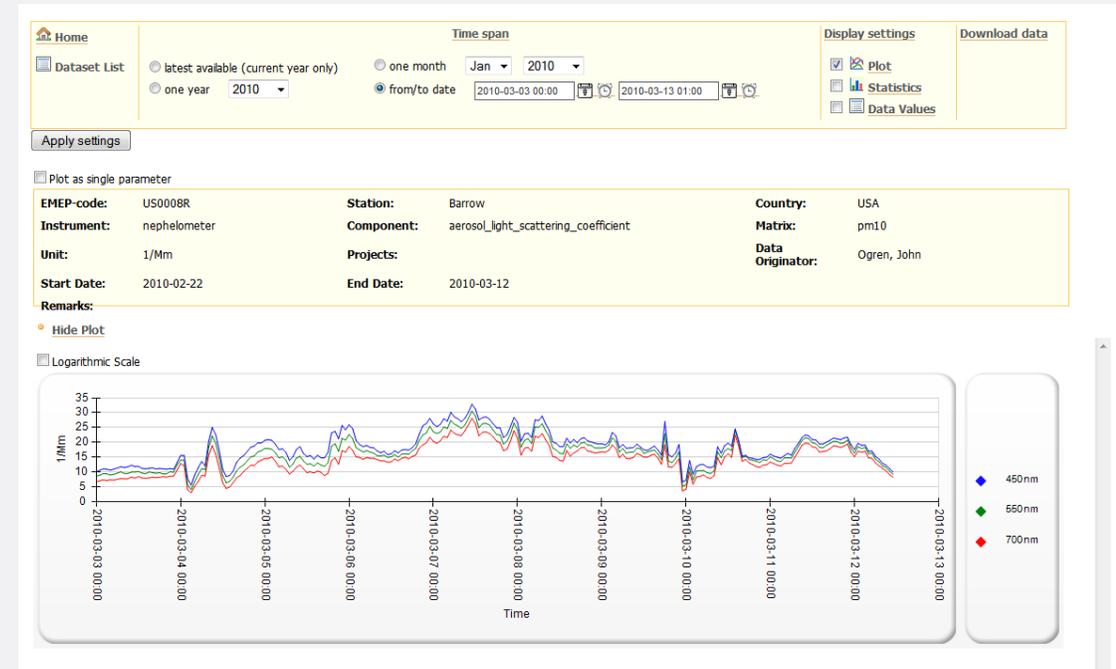
- QA Measures

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

- ACTRIS vocabulary currently only for data download! Data submission still uses EBAS vocabulary.

Data Submission – Create files – Data Section

- Selection of time series to report:
 - Yearly data (multi-year submission possible)
 - Timeseries needs to be split according to any significant changes with regards to instrumentation etc.
- Quality assurance:
 - Follow the respective Standard Operating Procedure (SOP) valid for the instrument during data collection, data processing and evaluation.
 - Manual inspection of graphic display, 1-2 weeks at a time.
 - Inspect instrument status parameters for proper operation.
 - Inspect calibration protocols and station logs.
 - For invalid data, missing data -- **Flagging**



Data Submission – Create files – Flag Philosophy

Observe differences in roles:

Data documentation: annotate your data with the best information you have, independent of application or use case.

Data analysis: data are filtered for one specific purpose or use case.

Thus:

Data invalid **only for instrument failure** (and construction at station, or other SOP violations).

All other conditions are flagged as local / regional influence, but **valid**.

Using flags from **shortlist** for homogeneous flagging across network is strongly recommended.

Data Submission – Create a file – Flag Types

There are three different types of flag:

General flag (V, valid): Indicate a special condition at the station, but instrument has operated correctly, the data are therefore considered valid. Depending on policy, the flag might indicate the nature of the special condition.

Missing flag (M): Showing that data are not available (not measured, deleted)

Invalid flag (I): Mainly used for level 0 data to be able to exclude these data when being reprocessed to level 1 and level 2.

Data Submission – Create a file – Flags

A shortlist of flags for each measurement and each level

For example: Mobility Particle Size Spectrometer

Level 0

| Group 0: Valid data | | |
|---|----------|---|
| Flag | Validity | Description |
| 000 | V | Valid measurement |
| Group 1: Exception flags for accepted, irregular data | | |
| Flag | Validity | Description |
| 111 | V | Irregular data checked and accepted by data originator. Valid measurement |
| Group 5: Chemical problem | | |
| Flag | Validity | Description |
| 559 | V | Unspecified contamination or local influence, but considered valid |
| Group 6: Mechanical or instrumental problem | | |
| Flag | Validity | Description |
| 640 | V | Instrument internal relative humidity above 40% |
| 682 | I | Invalid due to calibration or zero/span check. Used for Level 0. |
| Group 9: Missing flags | | |
| Flag | Validity | Description |
| 999 | M | Missing measurement, unspecified reason |

Level 1

| Group 0: Valid data | | |
|---|----------|---|
| Flag | Validity | Description |
| 000 | V | Valid measurement |
| Group 1: Exception flags for accepted, irregular data | | |
| Flag | Validity | Description |
| 111 | V | Irregular data checked and accepted by data originator. Valid measurement |
| Group 5: Chemical problem | | |
| Flag | Validity | Description |
| 559 | V | Unspecified contamination or local influence, but considered valid |
| Group 6: Mechanical or instrumental problem | | |
| Flag | Validity | Description |
| 640 | V | Instrument internal relative humidity above 40% |
| Group 9: Missing flags | | |
| Flag | Validity | Description |
| 999 | M | Missing measurement, unspecified reason |

Level 2

| Group 0: Valid data | | |
|---|----------|---|
| Flag | Validity | Description |
| 000 | V | Valid measurement |
| Group 1: Exception flags for accepted, irregular data | | |
| Flag | Validity | Description |
| 111 | V | Irregular data checked and accepted by data originator. Valid measurement |
| Group 3: Flags for aggregated datasets | | |
| Flag | Validity | Description |
| 390 | V | Data completeness less than 50% |
| 392 | V | Data completeness less than 75% |
| 394 | V | Data completeness less than 90% |
| Group 5: Chemical problem | | |
| Flag | Validity | Description |
| 559 | V | Unspecified contamination or local influence, but considered valid |
| Group 6: Mechanical or instrumental problem | | |
| Flag | Validity | Description |
| 640 | V | Instrument internal relative humidity above 40% |
| Group 9: Missing flags | | |
| Flag | Validity | Description |
| 999 | M | Missing measurement, unspecified reason |

Use **flag shortlists** for data homogenization across the network!!!

Boundary Checks and QA Documents

Boundary Check

https://ebas-submit.nilu.no/boundary_check

- A basic sanity check
- Default and station/instrument dependent boundaries
- All values with invalidating / checked flags are exempted from all boundary checks

ACTRIS Aerosol In-Situ Measurement Guidelines & Data Treatment Procedure:

- ACTRIS Guidelines for Manual Quality Control by TC and DC: <http://www.actris-ecac.eu/measurement-guidelines.html>
 - Manual QC of nephelometer (e.g., TSI 3563, Ecotech Aurora 4000-3000), Manual QC of filter absorption (AE33, MAAP), Manual QC of MPSS data

Data Submission – Check files and submit

Upload to EBAS data submission portal:
<http://ebas-submit-tool.nilu.no/>

- Dedicated web-page for checking data files before submission.
- Errors in the header / metadata and data section will be highlighted and commented.
- Check plot of file
- "Submit file" when there is **0 error** in the data file.

The screenshot shows the EBAS Data Submission Tool interface. At the top left, it says "EBAS Data Submission Tool". On the right, there are navigation links: "Ebas-Submit-Tool", "Documentation", "Troubleshooting", and "Plot data". Below these links are two icons: "EBAS submit manual" and "EBAS IO-reading/writing NASA-Ames 1001". A red note box states: "Note: At the moment, the EBAS data submission tool is mainly targeted for data level 2 submissions. Not all level 0 and level 1 formats are supported yet, but we constantly work on improving this. Currently supported level 0 formats: dmeps/smeps, NOx, meteorology, NMHC and OVOC." Below the note is a yellow box with text: "Please note, that after submitting, the file will go through a manual QA and data curation workflow at NILU. Therefore it will take time before the actual data is available in EBAS." The main interface has a control bar with buttons: "Select file...", "Reset", "Upload and check", "Recheck file", "Save file", and "Submit file". Below the buttons is a green message bar: "No file uploaded. Click Select file... to browse local disk, then click Upload and check. Please remember to save your work regularly." There are two error tables: "File header errors" and "File data errors (returning up to a maximum of 1000 rows)". Both tables are currently empty, showing only a header row with a "1" in the first column.

Data Submission – Follow up of files – Issue tracker

Mantis issues created for all expected data in January.

Issue statuses for EBAS data: **Called**, **curation**, **feedback**, and closed

Links:

- Mantis – NILU Issue Tracker <https://mantis.nilu.no/>
- EBAS Queue / Data Curation Status <https://data-curation-status.nilu.no/>

The screenshot shows the Mantis Issue Tracker interface. At the top, there's a navigation bar with the URL https://mantis.nilu.no/login_page.php and buttons for 'Report Issue' and 'Invite Users'. Below the navigation bar, the user 'yong_lin (Yong Lin) administrator' is logged in. The main area is divided into 'Filters' and 'Viewing Issues'. The 'Filters' section includes a table with various criteria like Reporter, Assigned To, Monitored By, Note By, Priority, Severity, View Status, etc. The 'Viewing Issues' section shows a table of issues with columns for Project, Category, ID, Status, Due Date, Updated, and Summary. The 'Status' column is highlighted with a red box, and the 'Summary' column is also highlighted with a red box. The 'Summary' column contains text like 'Zeppelin mountain (Ny-Ålesund) | NO0042G | 2020 | filter_absorption_photometer | aerosol | Magee_AE33_ZEP_dry | lev0'. The 'Status' column contains values like 'Called (Markus Fiebig)', 'curation (EBAS Datacenter)', and 'closed (EBAS Datacenter)'.

Levels

Status

Instrument type

Data Submission – Data archived and Accessible in Data Portals

EBAS Data Portal

The EBAS Data Portal interface features a header with logos for NILU, emep, WMO Global Atmosphere Watch, ACTRIS, AMAP, OSIPAR, SIOS, HELCOM, and the European Union. The main content area includes filters for Framework (61), Country (86), Station (1416), Instrument type (93), Component (881), and Matrix (33). A map of Europe is shown at the bottom left, and a list of additional resources is on the bottom right.

Available datasets: 155718

Additional resources:

- Near-Real-Time data
- European Monitoring and Evaluation Programme (EMEP-CCC)
- Site descriptions - EMEP
- WMO Global Atmosphere Watch (GAW)
- Site descriptions - GAW
- Air mass trajectories
- Data submission
- About EBAS
- EBAS User Feedback Tracker

ACTRIS Data Portal

The ACTRIS Data Portal interface features a header with the ACTRIS Data Centre logo and navigation links for Home, Data, Services, About, and Documentation. The main content area includes four large buttons: Data (Search for data in the ACTRIS data catalog), Services (Access ACTRIS Data Center tools and services), About (Find out more about the ACTRIS Data Center), and Documentation (Get more information about the data and services). The background is a 3D visualization of a globe with data points and a hand pointing at the screen.

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Last Comments

Submission Requirements:

- **Deadline: May 31, iterated.**
- **Data levels: level 0, level 1 and level 2**

- Submit early: No “quick and dirty” submissions right before the deadline.
- No default deactivation of boundary checks.

The End!