

12th AEROCOM workshop,
Hamburg 23-27 September

On the application, use and access to ground based aerosol observations through EBAS

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NILU - Norsk institutt for luftforskning

Norwegian Institute for Air Research



Outline

Motivation

- Some recent examples on the use of data in EBAS
- What is there?

What is EBAS?

- Background and development
- Type of data
- Harmonisation and quality assurance
- File format

How to find and inspect data

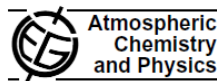
- EBAS web interface
- Formats and information about the files

Access to data

- Data policy
- Single user
- User community

Some examples of recent papers using data from EBAS

Atmos. Chem. Phys., 12, 5447–5481, 2012
 www.atmos-chem-phys.net/12/5447/2012/
 doi:10.5194/acp-12-5447-2012
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Introduction to the European Monitoring and Evaluation Programme (EMEP) and observed atmospheric composition change during 1972–2009

K. Tørseth, W. Aas, K. Breivik, A. M. Fjæraa, M. Fiebig, A. G. Hjellbrekke, C. Lund Myhre, S. Solberg, and K. E. Yttri

NILU – Norwegian Institute for Air Research, P.O. Box 100, 2027 Kjeller, Norway

Correspondence to: K. Tørseth (kt@nilu.no)

Received: 31 December 2011 – Published in Atmos. Chem. Phys. Discuss.: 19 January 2012

Revised: 16 May 2012 – Accepted: 3 June 2012 – Published: 22 June 2012

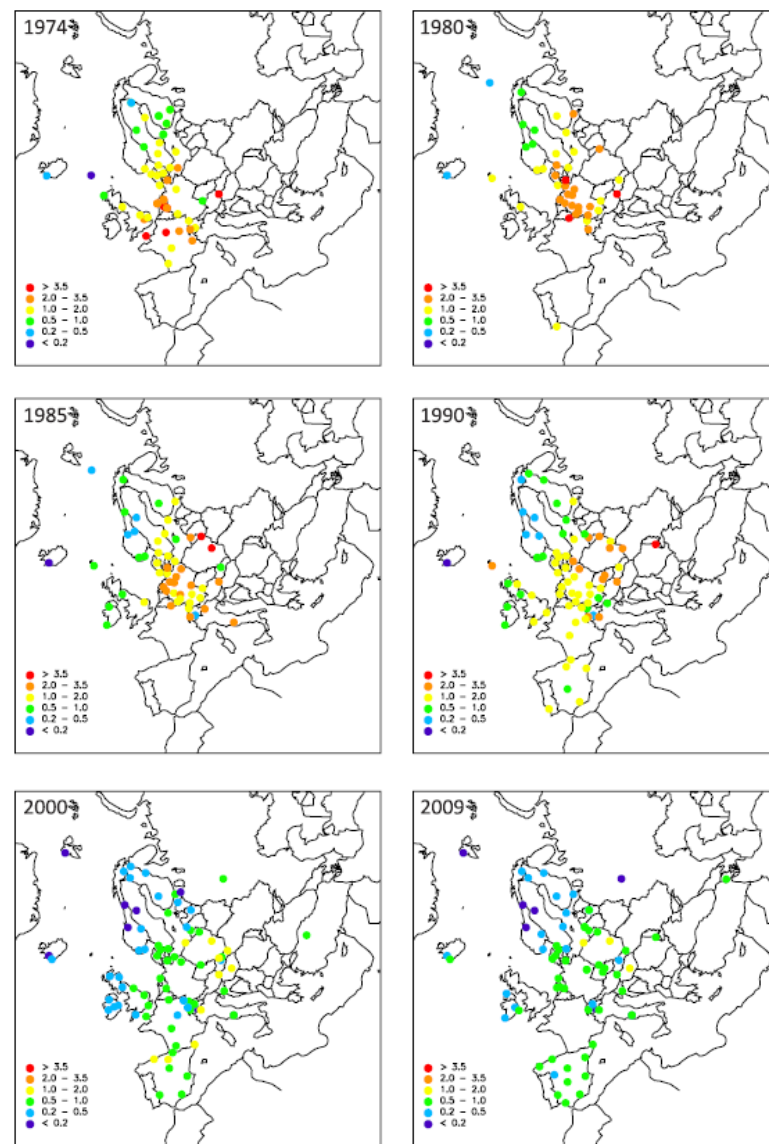
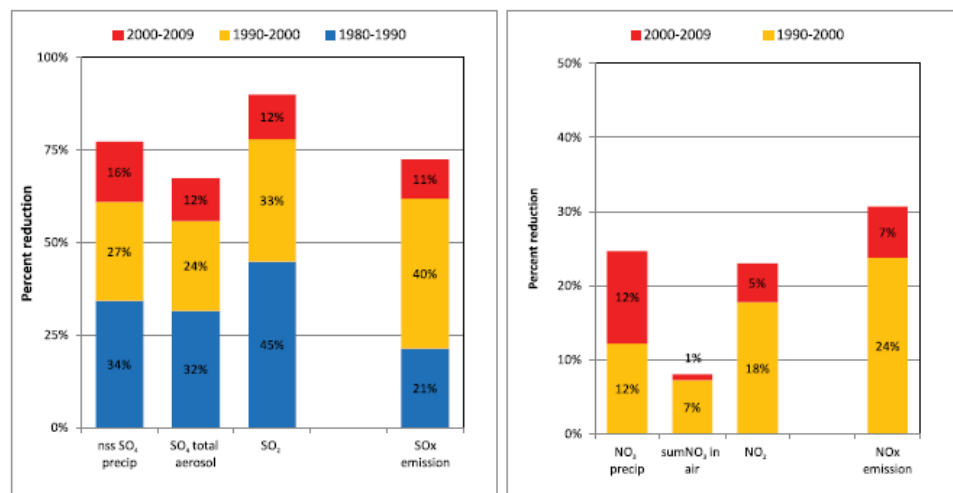
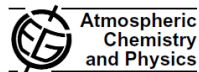


Fig. 2. Average observed reduction in sulphur and nitrogen components compared to the end of the 1980s.

Fig. 3. Annual mean concentrations of SO_4^{2-} in aerosols from 1974 to 2009. Unit: $\mu\text{g S m}^{-3}$.

Some examples of recent papers using data from EBAS

Atmos. Chem. Phys., 13, 869–894, 2013
 www.atmos-chem-phys.net/13/869/2013/
 doi:10.5194/acp-13-869-2013
 © Author(s) 2013. CC Attribution 3.0 License.

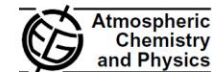


Aerosol decadal trends – Part 1: In-situ optical measurements at GAW and IMPROVE stations

M. Collaud Coen¹, E. Andrews^{2,3}, A. Asmi⁴, U. Baltensperger⁵, N. Bukowiecki¹, D. Day⁶, M. Fiebig⁷, A. M. Fjaeraa⁷, H. Flentje⁸, A. Hyvärinen¹¹, A. Jefferson³, S. G. Jennings⁹, G. Kouvarakis¹⁰, H. Lihavainen¹¹, C. Lund Myhre⁷, W. C. Malm⁸, N. Mihalopoulos¹⁰, J. V. Molenar¹², C. O'Dowd⁹, J. A. Ogren³, B. A. Schichtel¹³, P. Sheridan³, A. Virkkula⁴, E. Weingartner⁵, R. Weller¹⁴, and P. Laj¹⁵

¹Federal Office of Meteorology and Climatology, MeteoSwiss, 1530 Payerne, Switzerland
²University of Colorado, CIRES, Boulder, Colorado, 80305, USA
³National Oceanic and Atmospheric Administration, Earth System Research Laboratory, Boulder, Colorado, 80305, USA
⁴Department of Physics, University of Helsinki, P.O. Box 64, Helsinki, Finland

Atmos. Chem. Phys., 13, 895–916, 2013
 www.atmos-chem-phys.net/13/895/2013/
 doi:10.5194/acp-13-895-2013
 © Author(s) 2013. CC Attribution 3.0 License.

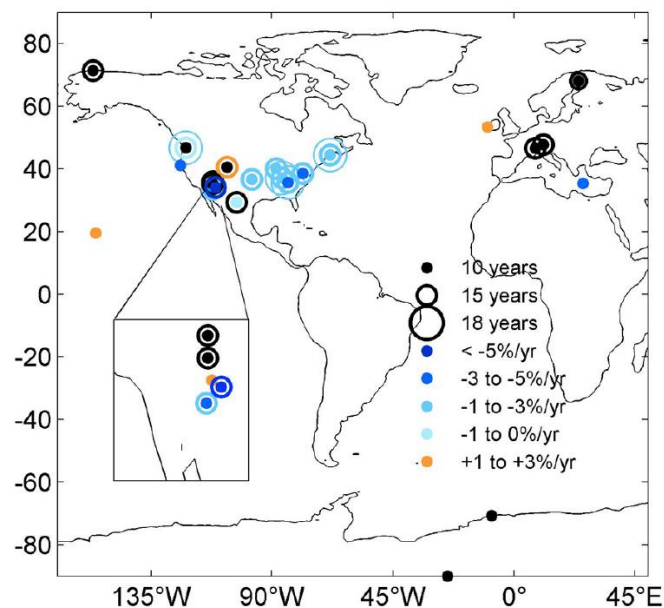


Aerosol decadal trends – Part 2: In-situ aerosol particle number concentrations at GAW and ACTRIS stations

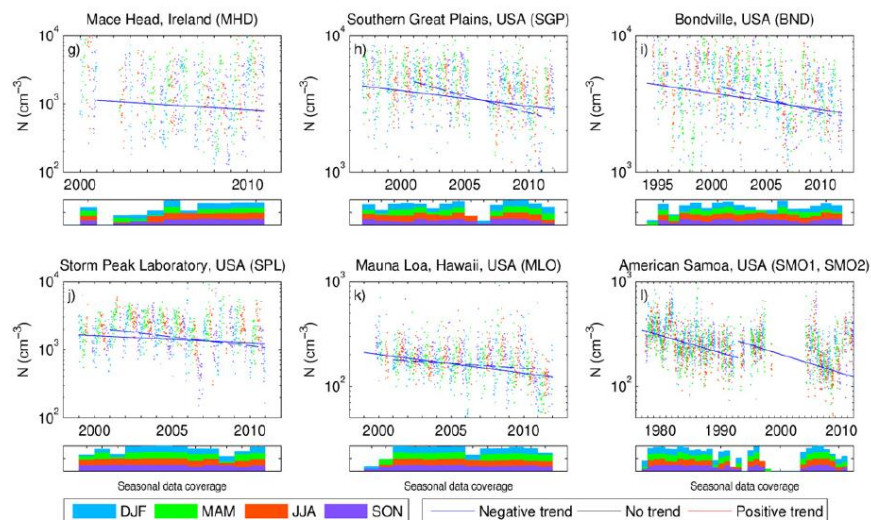
A. Asmi^{1,16}, M. Collaud Coen², J. A. Ogren³, E. Andrews^{3,4}, P. Sheridan³, A. Jefferson^{3,4}, E. Weingartner⁵, U. Baltensperger⁵, N. Bukowiecki⁵, H. Lihavainen⁶, N. Kivela⁶, E. Asmi⁶, P. P. Aalto⁶, M. Kulmala⁶, A. Wiedensohler⁷, W. Birmili⁷, A. Hamed^{7,8}, C. O'Dowd⁹, S. G. Jennings⁹, R. Weller¹⁰, H. Flentje¹¹, A. M. Fjaeraa¹², M. Fiebig¹², C. L. Myhre¹², A. G. Hallar¹³, E. Swietlicki¹⁴, A. Kristensson¹⁴, and P. Laj¹⁵

¹Department of Physics, University of Helsinki, P.O. Box 64, 00014, Finland
²Federal Office of Meteorology and Climatology, MeteoSwiss, 1530 Payerne, Switzerland
³NOAA Earth System Research Laboratory, Boulder, USA
⁴Cooperative Institute for Research in Environmental Science, University of Colorado, Boulder, USA

Trends in scattering coefficient, 2001-2010



Trends in aerosol particle number concentrations 2001-2010



The data base infrastructure EBAS

EBAS is a database infrastructure operated by NILU – Norwegian Institute for Air Research.

It's main objective is to handle, store and disseminate atmospheric composition data generated by international and national frameworks like long-term monitoring programmes and research projects.

Status September 2013

Number data sets:

60 000 (1 data set is 1 full time series)

Number of sites reported data:

1068

Number of countries:

72

Type of Variables:

713

Different instruments:

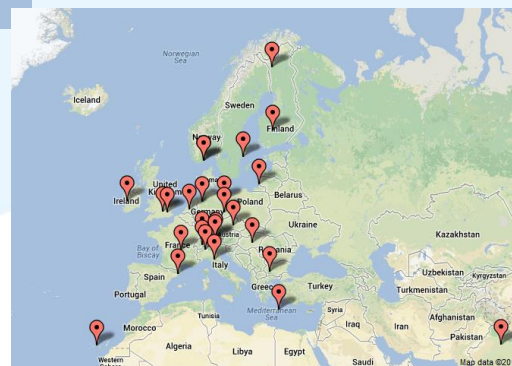
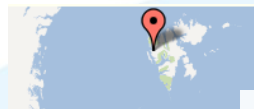
95



Regional Coverage by Parameter

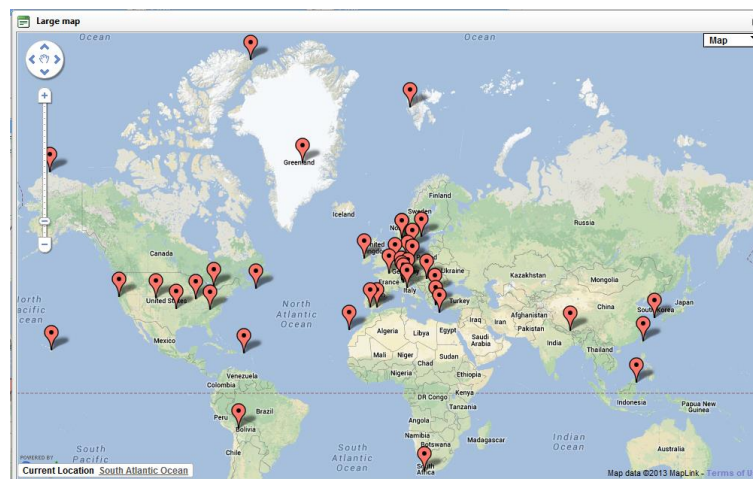
Sulphate,

Size Distribution



Scattering Coeff.

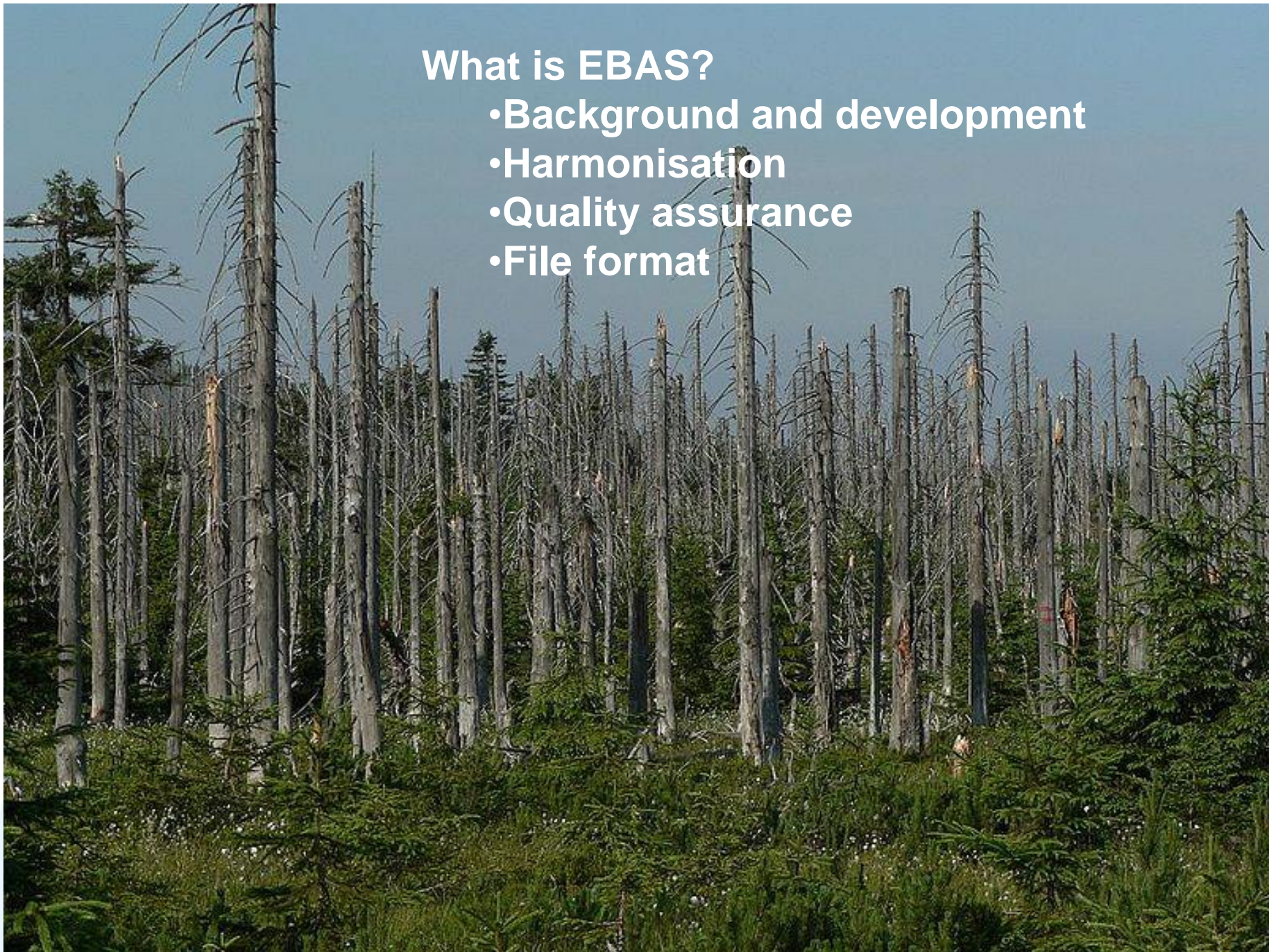
Absorption Coeff., incl. BC



Can be long time series, or shorter periods

What is EBAS?

- Background and development
- Harmonisation
- Quality assurance
- File format



The EBAS History

Convention on Long-range Transboundary Air Pollution (1979, UNECE-CLRTAP, 51 Parties)

- **EMEP: European Monitoring and Evaluation Programme**
- Science based and policy driven programme to solve transboundary air pollution problems.
- National funding and obligations, long term measurements

The main objectives of EMEP are to:

- Provide observational and modelling data on pollutant concentrations, deposition, emissions and transboundary fluxes on the regional scale and identify their trends in time;
- Identify the sources and assess the effects of changes in emissions;
- Improve our understanding of chemical and physical processes relevant to the effects
- Harmonised and QA measurements from regional background

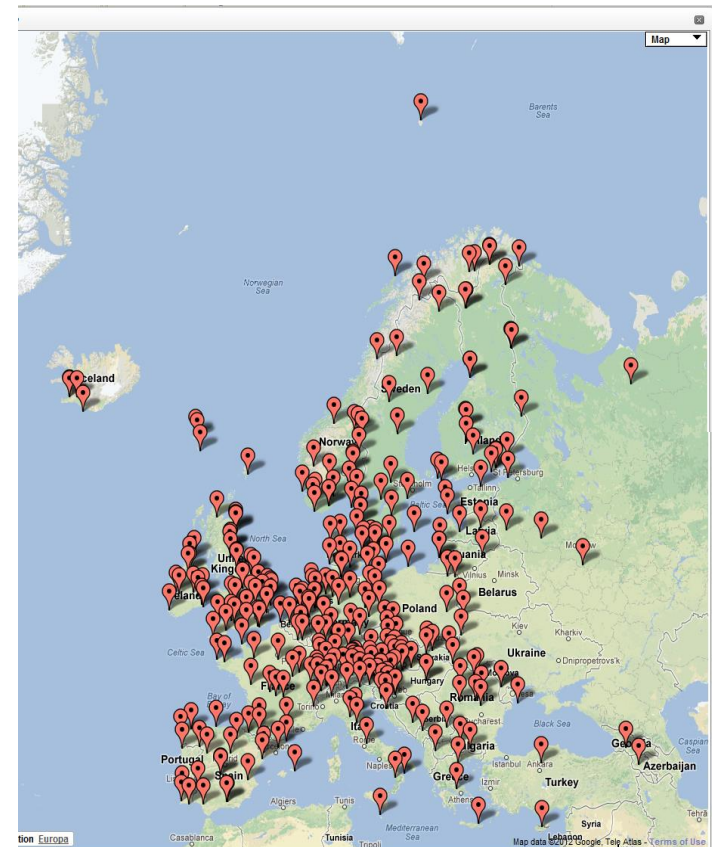
EBAS

- Name is derived from **EMEP dataBASE**.
- Today's relational database used since the mid-90s on varying hardware.



NILU: chemical coordination centre of EMEP

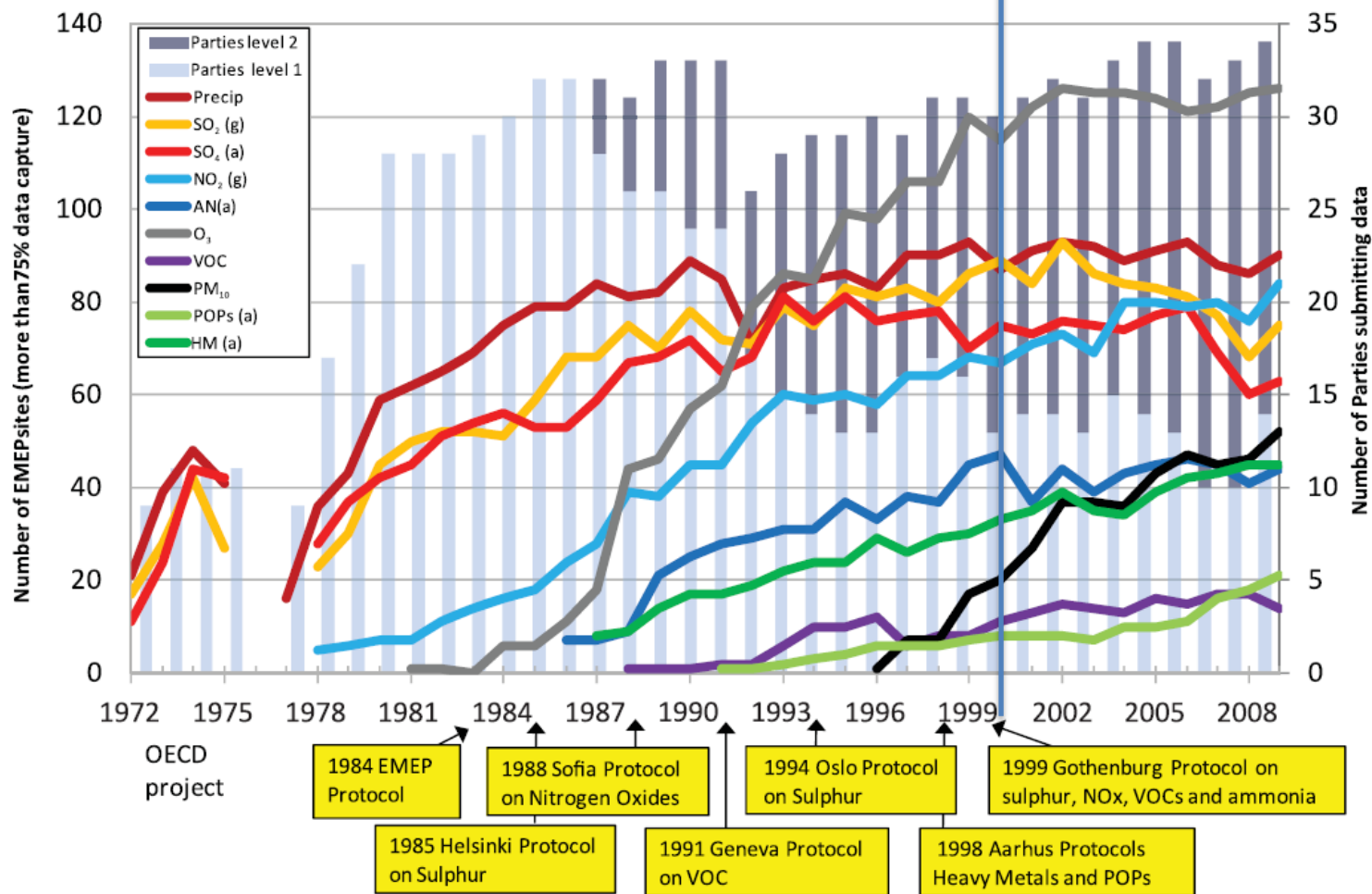
Met.no: Meteorological Synthesizing Centre - West (MSC-W)



Development of the EMEP measurement programme

EU-projects:
 CREATE -> 2003
 EUSAAR -> 2011
 ACTRIS -> 2014

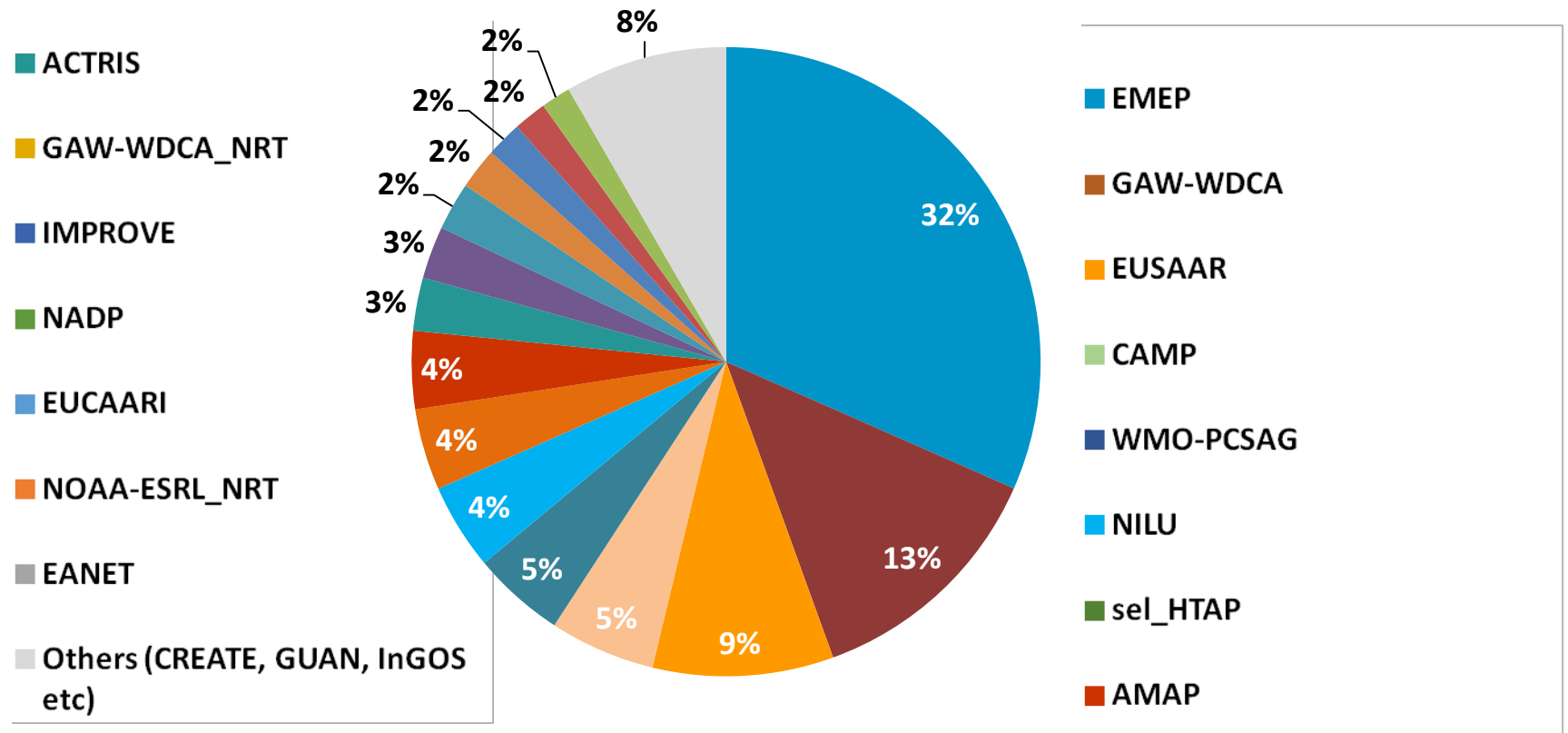
Global link:
 GAW and seek to implement harmonised strategy on observations



Contribution of other projects and networks to EBAS data infrastructure

Since the year 2000 EBAS also used widely used by other projects and frameworks.

Dataset distributed on framework, September 2013



Harmonisation and QA

Important objective:

- Harmonised QA measurements across countries, regions, and even on global scale

Requires:

-
-
-
-
-
-



reference
story in
various
ent th



developed
variables with

Why Using NASA Ames 1001 Format for Reporting?

1. Simplicity

- Pure ASCII text, human readable, readily opened or edited by simple means (any editor or spreadsheet application).
- Explanation relatively short, yet contains necessary metadata.

2. Reduce Format Confusion

- Don't increase number of existing formats (NASA Ames, Narsto, NetCDF, HDF, ...) unnecessarily as long as metadata can be transported in old format, even though some features are old-fashioned.
- Existing libraries can be used to handle files.

3. Keep threshold low

- More modern, binary formats exist (NetCDF, HDF), but need special editors and steep learning curve to assemble.
- NASA Ames can be assembled with simple tools rather quickly.



How to find and inspect data?

- **EBAS web interface**
- **Plot and download**
- **File structure and formats**
- **Flagging system**

Free tropospheric site Jungfraujoch, 3580 meter

The EBAS Web-Interface 1 / 3

<http://ebas.nilu.no>

Web-interface since 2009, linking also other tools.

EBAS web-interface functions:

- Search datasets by criteria:
Framework, country, station, matrix, instrument type, component.
- Visualise distribution of stations on map.
- Manage access restricted data
- Plot, browse, compare datasets
- Download data

The screenshot displays the EBAS web interface. At the top, there is a navigation bar with the EMEP logo and various project logos (ACTRIS, INGOs, GUAN, NILU). Below this is a search bar and a 'Login' button. The main content area features four dropdown menus for filtering data: Framework [48], Country [72], Station [1068], and Matrix [24]. The 'Component' dropdown is also visible, showing options like 1-2-3-trimethylbenzene, 1-2-4-trimethylbenzene, 1-3-5-trimethylbenzene, 1-3-butadiene, 1-3-butadiene_statistics, and 1-butene. Below the filters, there are 'Reset' and 'List datasets' buttons, and a note that 59578 datasets are available. At the bottom, there is a map titled 'Map (Populate) (Show large)' showing the distribution of stations across the globe. To the right of the map is a list of 'Additional resources' including Air mass trajectories, Measurement network (EMEP), Measurement network (GAW), Data submission, EMEP/CCC reports, Quality assurance, EMEP manual, EMEP laboratory intercomparisons, TFMM, HTAP, and Measurement programme/strategy (pdf). A Twitter link for @EBAS_NILU is also present.

The EBAS Web-Interface 2 / 3

Home Index Contents Search Glossary Help First Previous Next Last Up Copyright Author

emep Global Atmosphere Watch World Data Centre for Aerosol

ACTRIS InGOS GUAN NILU

PREVIOUS PROJECTS:
 GREAT'S EUROPE (GEOCAN)
 GEOMON - Global Earth Observation Monitoring
 HOC - Heavy Metals over Europe
 IMPACTS - Integrated Monitoring Programme on Acidification of
 Chinese Terrestrial Systems
 SOGE - System for Observing Halogenated Greenhouse Gases in Europe

Home Acknowledgment Policy Login

Latest month
 One month Dec

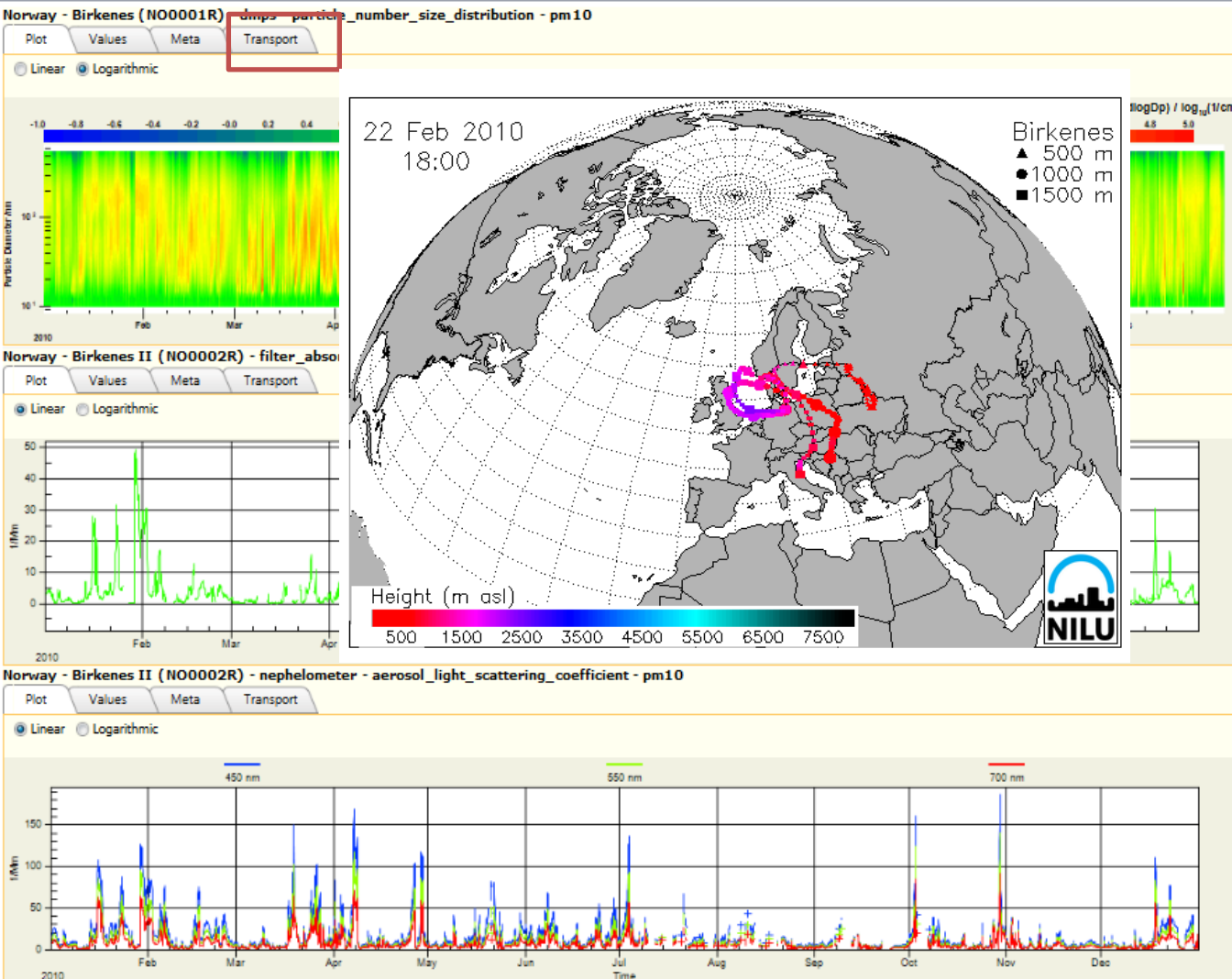
 One year 2013
 From/To date: to

Group	Station	Station name	Instrument type	Component	Matrix	Resolution	Start time	End time	Remarks	
<input type="checkbox"/>	1	BO0001R	Mount Chacaltaya	filter_absorption_photometer	flow_rate	pm10	5mn	2011-12-09	2012-03-16	sample line
<input type="checkbox"/>	1	BO0001R	Mount Chacaltaya	filter_absorption_photometer	pressure	instrument	5mn	2011-12-09	2012-03-16	instrument inter
<input type="checkbox"/>	2	BO0001R	Mount Chacaltaya	filter_absorption_photometer	bypass_fraction	pm10	5mn	2011-12-09	2012-03-16	
<input type="checkbox"/>	2	BO0001R	Mount Chacaltaya	filter_absorption_photometer	attenuation_coefficient	pm10	5mn	2011-12-09	2012-03-16	
<input type="checkbox"/>	2	BO0001R	Mount Chacaltaya	filter_absorption_photometer	black_carbon	pm10	5mn	2011-12-09	2012-03-16	
<input type="checkbox"/>	2	BO0001R	Mount Chacaltaya	filter_absorption_photometer	reference_beam_signal	pm10	5mn	2011-12-09	2012-03-16	
<input type="checkbox"/>	2	BO0001R	Mount Chacaltaya	filter_absorption_photometer	sensing_zero_signal	pm10	5mn	2011-12-09	2012-03-16	
<input type="checkbox"/>	1	BO0001R	Mount Chacaltaya	filter_absorption_photometer	temperature	instrument	5mn	2011-12-09	2012-03-16	instrument inter
<input type="checkbox"/>	2	BO0001R	Mount Chacaltaya	filter_absorption_photometer	sensing_beam_signal	pm10	5mn	2011-12-09	2012-03-16	
<input type="checkbox"/>	2	BO0001R	Mount Chacaltaya	filter_absorption_photometer	reference_zero_signal	pm10	5mn	2011-12-09	2012-03-16	
<input type="checkbox"/>	1	BO0001R	Mount Chacaltaya	filter_absorption_photometer	relative_humidity	instrument	5mn	2011-12-09	2012-03-16	instrument outle
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	pressure	aerosol	1h	2010-07-07	2013-08-25	instrument inter
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	pressure	aerosol	1h	2008-01-01	2013-01-01	instrument inter
<input type="checkbox"/>	2	BG0001R	BEO Moussala	nephelometer	relative_humidity	aerosol	1mn	2010-07-07	2013-08-25	
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	status	instrument	1mn	2010-07-07	2013-08-25	instrument statu
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	relative_humidity	instrument	1h	2012-01-01	2013-01-01	instrument inter
<input type="checkbox"/>	3	BG0001R	BEO Moussala	nephelometer	aerosol_light_scattering_coefficient_zero	aerosol	1mn	2010-07-07	2013-08-25	
<input type="checkbox"/>	6	BG0001R	BEO Moussala	nephelometer	aerosol_light_scattering_coefficient_statistics	aerosol	1h	2012-01-01	2013-01-01	
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	electric_current	instrument	1mn	2010-07-07	2013-08-25	lamp supply
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	flow_rate	aerosol	1mn	2010-07-07	2013-08-25	
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	electric_tension	instrument	1mn	2010-07-07	2013-08-25	lamp supply
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	temperature	aerosol	1h	2008-01-01	2013-01-01	instrument inter
<input type="checkbox"/>	1	BG0001R	BEO Moussala	smps	pressure	aerosol	1h	2008-12-01	2009-01-01	instrument inter
<input type="checkbox"/>	150	BG0001R	BEO Moussala	smps	particle_number_size_distribution_statistics	aerosol	1h	2009-01-01	2011-06-01	
<input type="checkbox"/>	1	BG0001R	BEO Moussala	smps	pressure	aerosol	1h	2009-01-01	2011-06-01	instrument inter
<input type="checkbox"/>	1	BG0001R	BEO Moussala	smps	temperature	aerosol	1h	2009-01-01	2011-06-01	instrument inter
<input type="checkbox"/>	1	BG0001R	BEO Moussala	smps	temperature	aerosol	1h	2008-12-01	2009-01-01	instrument inter
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	temperature	aerosol	1mn	2010-07-07	2013-08-25	inlet
<input type="checkbox"/>	1	BG0001R	BEO Moussala	nephelometer	temperature	aerosol	1h	2010-07-07	2013-08-25	instrument inter
<input type="checkbox"/>	11	BG0001R	BEO Moussala	smps	particle_number_size_distribution	aerosol	1h	2008-12-01	2009-01-01	
<input type="checkbox"/>	22	BG0001R	BEO Moussala	smps	particle_number_size_distribution_statistics	aerosol	1h	2008-12-01	2009-01-01	
<input type="checkbox"/>	25	BG0001R	BEO Moussala	smps	particle_number_size_distribution	aerosol	1h	2009-01-01	2011-06-01	
<input type="checkbox"/>	6	BG0001R	BEO Moussala	filter_absorption_photometer	aerosol_absorption_coefficient_statistics	aerosol	1h	2012-01-01	2013-01-01	

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).
- FLEXTRA trajectories

What if you want to download and use the data?

- You will get a multi column zip file containing:
- 1 file for each instrument selected in the list per year of data
 - E.g. Birkenes organic carbon: 10 years of data -> 10 files
 - Web interface not developed for download of larger data volumes

Comprehensive meta data describe the measurements to document the quality
How to interpret this?

The screenshot shows the EMEP web interface. At the top, there are navigation links (Home, Index, Contents, Search, Glossary, Help, First, Previous, Next, Last, Up, Copyright, Author) and a search bar. Below this is a banner for 'emep' and 'Global Atmosphere Watch' with logos for ACTRIS, InGOS, and NILU. A navigation bar includes 'Home', 'Acknowledgment', 'Policy', a username field, and a 'Login' button. A filter section allows selecting a time range (Latest month, One month, Dec, 2013, One year, 2013, From/To date) and provides 'Direct link', 'Download', and 'Plot' buttons. A table lists data groups with columns for Group, Station, Station name, Instrument type, Component, Matrix, Resolution, Start time, End time, and Remarks. A detailed view of a data file is shown below, including file metadata (e.g., 'NO001R_20110101_20110101_prec-chem.precip.lyd.NO01L_bt_d.NO01L_IC_cnas - Netpad'), instrument details (AAS Wenne, NO01L), and a list of chemical components with their units and flags. A large text box at the bottom of the screenshot contains the question: 'Comprehensive meta data describe the measurements to document the quality How to interpret this?'



EBAS file structure and formats

NASA Ames 1001;

- assume that you read the file header and each column is described here
- Description of all metadata included in the header at: <http://ebas-submit.nilu.no/>

The image shows a Notepad window with an EBAS data file and a browser window displaying the EBAS website. The Notepad window contains the following text:

```
65 1001
Aas wenche
NO01L, Norwegian
Hjellbrekke Anne
CAMP(insert) EME
1 1
2011 01 01
1
Days from the fi
28
1. 1. 1. 1. 1. 1
999 999.99 9.999
end time, days f
sodium, mg/l
numflag sodium,
calcium, mg/l
numflag calcium,
ammonium, mg N/l
numflag ammonium
potassium, mg/l
numflag potassi
nitrate, mg N/l,
numflag nitrate,
magnesium, mg/l
numflag magnesiu
sulfate total
```

The browser window shows the EBAS website with the following content:

Data Format for Regular Submission of Aerosol Particle Mass Co Obtained by Gravimetric I

Convention on Long-Range Transboundary Air Pollution

emep

Co-operative programme for monitoring and evaluation of the long-range transmissions of air pollutants in Europe

List of flags used in the EMEP data base

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

Flag	V/I/H	Description
Group 9: Missing flags		
999	I	Missing measurement, unspecified reason
990	I	Precipitation not measured due to snow-fall. Needed for historic data, should not be needed for new data
980	I	Missing due to calibration or zero/span check
900	H	Hidden and invalidated by data originator
Group 8: Flags for undefined data elements		
899	I	Measurement undefined, unspecified reason
890	I	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	I	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.
771	V	Value above range, data element contains upper range limit
770	V	Value above range, data element contains estimated value
750	I	H' not measured in alkaline sample
741	V	Non refractory AMS concentrations. Don't include compounds that volatilises 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
681	I	Low data capture
680	V	Undefined wind direction
679	V	Unspecified meteorological condition
678	V	Hurricane
677	I	Iceing or hoar frost in the intake
676	V	station inside cloud (visibility < 1000 m)
675	V	no visibility data available
670	I	Incomplete data acquisition for multi-component data sets
600		

The browser window also shows a sidebar with navigation links: Submit Data, Data Policy, Publications, and a list of reporting options: Regular, Annual Data Reporting; Advanced Data Reporting; Full List of Flags Used for Data Reporting.

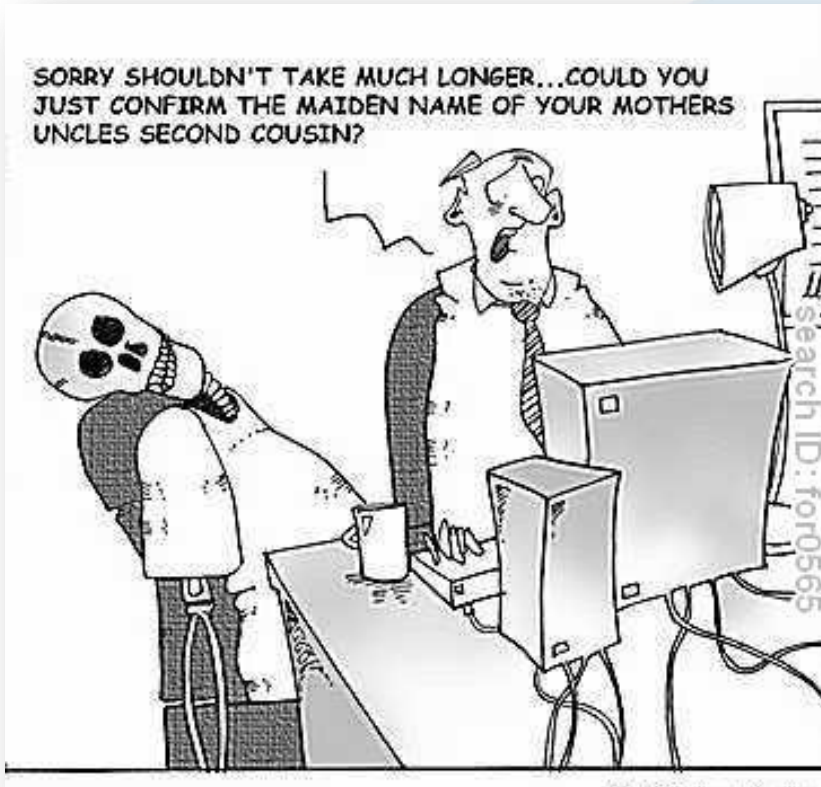


The flagging system

All flags are grouped in three categories:

V (valid measurement), I (invalid measurement) or H (hidden and invalid measurements).

Convention on Long-Range Transboundary Air Pollution		
emep		Co-operative programme for monitoring and evaluation of the long-range transmissions of air pollutants in Europe
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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
681	I	Low data capture



Access to data

- Data policy
- Single user
- User community

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

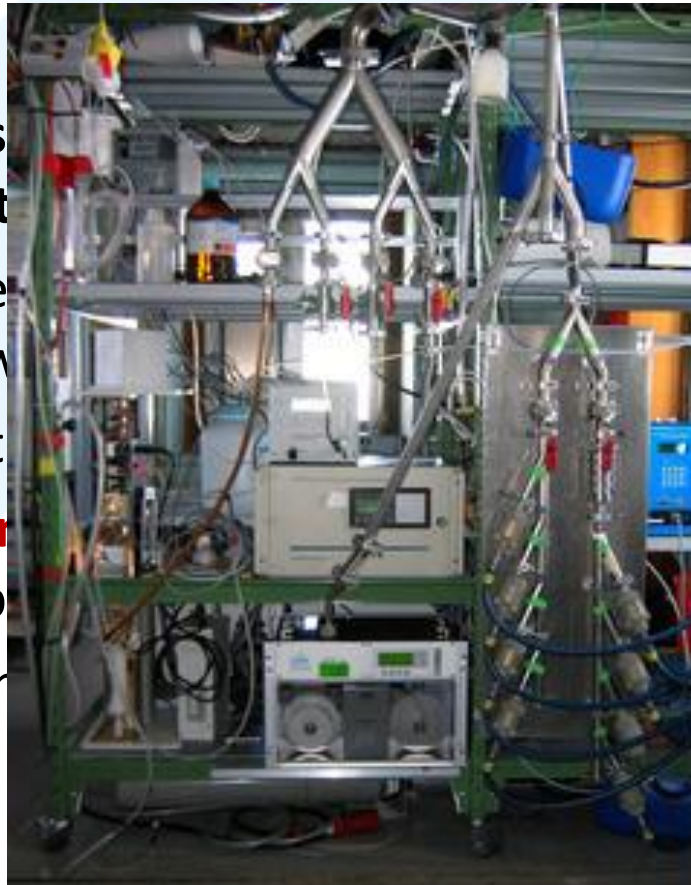
Who owns the data in the data base?

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

Data policy: The general rule is that data policy is on program level

Regulate the use of data in the programs into

- Facilitate the use of data within the programs
- Lot of effort to ensure proper data use, data providers
- **Reduce misinterpretation** of data use, data providers
- Make the funding situation important for future funding



the data providers and

providers to ensure proper

providers

een data use, data

important for future funding

Access to data and proper use

Main rule for the open data: "you as data user accept that an offer of co-authorship will be made through personal contact with the data providers or owners whenever substantial use is made of their data. In all cases, an acknowledgement must be made to the data providers or owners and to the project name"

Guidelines for offering co-authorship vs acknowledgement ("rule of thumb")

Offer co-authorship at an early stage;

- When you need site or instrument information to understand, analyze or interpret the data
- Type of data can be relevant: relatively new variables/parameters/methods normally requires offering of co- authorship

Acknowledge the program and EBAS;

- Model validation using large data volumes, aggregated to monthly mean values etc
- Data from regulatory monitoring under e.g. EMEP (e.g. Sulphate, nitrate etc)

NILU can always guide in what to do and provide advice

- Know the intention of the programs and the culture and "politics"



**If there is any doubt:
contact the PI in the second line of the file, or NILU**

Access to data for AEROCOM user

Few data sets;

- use the web interface!

Alternative 1: for single user of large data volumes

- I. Use the web interface to browse and decide about the data wanted (variable, components, time period, sites). NILU group can assist and provide advice for various purposes (start e.g. with Markus Fiebig or me)
- II. Formulate a request specifying the data sets you want to ebas@nilu.no
- III. NILU personel perform an extract from the data base of the exact specified files, and generate a zip-file (Paul Eckhardt, NILU).
- IV. An e-mail with the data policy corresponding to the project affiliation of files describing the condition of use will be sent to the user.
- V. After acceptance of the condition of use, a zip-file will be made available at a ftp server at NILU containing all data in NASA Ames format, including the metadata for each file.
- VI. Report back to NILU about use of data in publications



NOTE: Re-distribution of data to third users are not in accordance with the data policies, direct contact with NILU is encouraged if this is an issue

Access to data for AEROCOM model community

Alternative 2: for AEROCOM community

E.g. AEROCOM experiment

MoU with AEROCOM community; for larger groups using exact same data sets

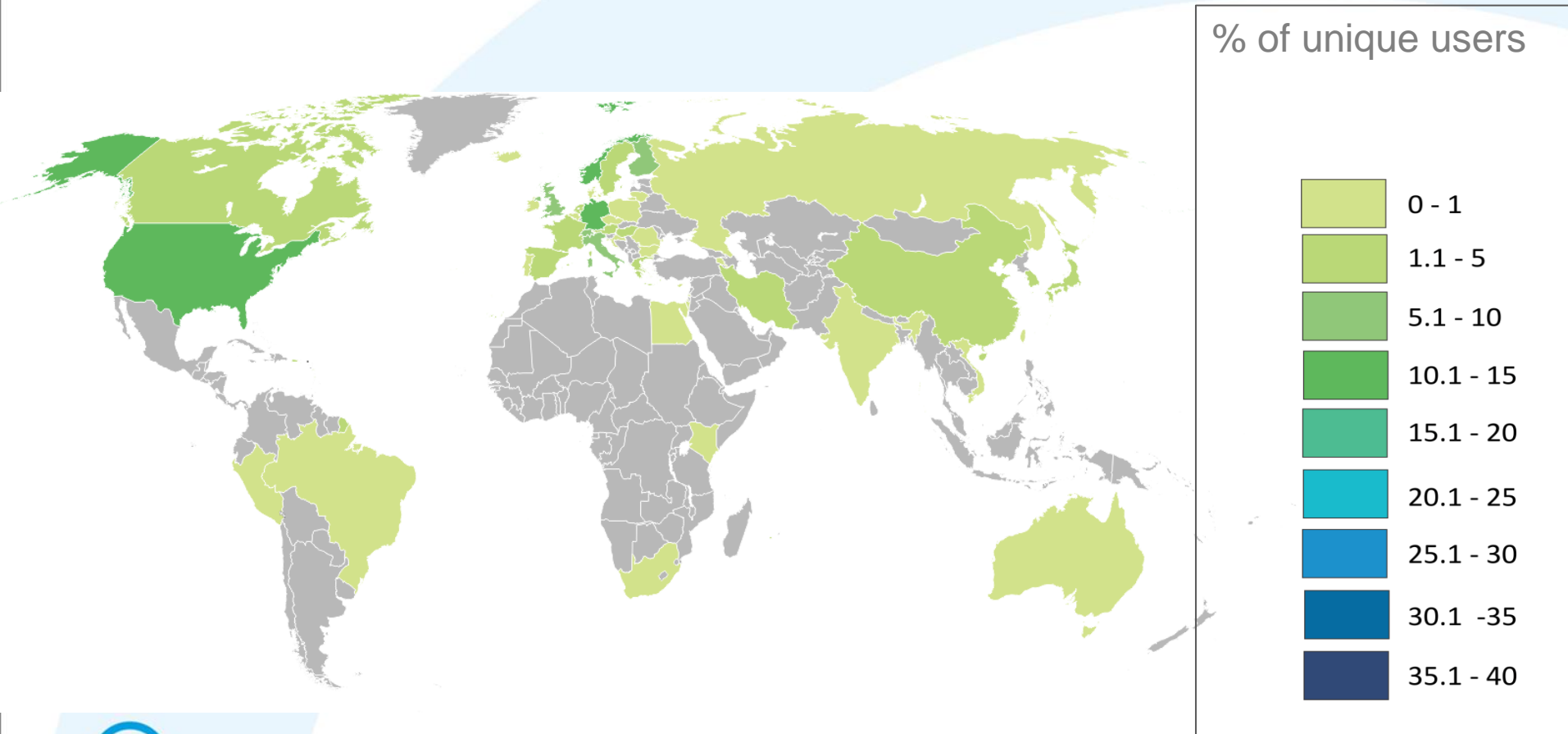
This implies that the data sets can be transferred to AEROCOM INTERFACE for further analysis

MoU containing description of e.g.;

- The experiment
- Specification of the data sets
- Transfer of data to AEROCOM server
- The data processing by AEROCOM
- Data policy and condition of use
- Description of report to NILU upon the use of the data by the AEROCOM community

On the use of situ data non-regulatory data (aerosol + trace gases) variables since 1. april 2011

1092 users from 49 Countries, have downloaded ca 450 000 data sets data since 1. april 2011 (ACTRIS, GAW-WDCA, EUSAAR)



Summary

EBAS Data base:

✓ <http://ebas.nilu.no>

Information about meta data for most instruments and methods:

✓ <http://ebas-submit.nilu.no>

Flagging system:

✓ <http://www.nilu.no/projects/ccc/flags/index.html>

Access to large data volumes:

✓ ebas@nilu.no

Advice? Contact

- ✓ Kjetil Tørseth: kt@nilu.no
- ✓ Cathrine Lund Myhre: clm@nilu.no
- ✓ Markus Fiebig: mf@nilu.no



ACTRIS - Aerosols, Clouds and Trace gases Research Infrastructure
and access to ACTRIS Data: <http://actris.nilu.no/>
Cathrine Lund Myhre¹, Gelsomina Pappalardo² and Paolo Laaj³

(1) NILU - Norwegian Institute for Air Research, Kjeller, Norway
(2) Consiglio Nazionale delle Ricerche - Istituto di Meteorologia per l'Ambiente (CNR-IMAA), Italy
(3) Laboratoire de Glaciologie et Géophysique de l'Environnement, CNRS-Université J. Fourier, Grenoble, France

The Aerosols, Clouds and Trace gases Research Infrastructure (ACTRIS) is a European project integrating atmospheric superites equipped with advanced instrumentation for studying aerosols, clouds, and short-lived gas-phase species: <http://www.actris.net>

ACTRIS

- ✓ improves measurements from numerous instruments located at more than 40 European sites illustrated in the map to the right
- ✓ ground based in situ measurements include aerosol optical, physical and chemical properties and measurements of short-lived trace gases (volatile organic carbon and nitrogen oxides) at ~25 European sites
- ✓ aerosol profile measurements provide aerosol scattering and extinction profiles, and more, at ~25 European sites
- ✓ cloud profile measurements provide detailed drop sizes, ice water content, and more at ~10 European sites

The ACTRIS data centre (ACTRIS DC) is giving free and open access to all data resulting from the activities of the infrastructure complemented with data from relevant networks and data bases.

ACTRIS ILLUSTRATIONS

Snapshot from ACTRIS Data Centre, more on <http://actris.nilu.no/>

Basics about ACTRIS DC: One great asset scientists with discovering and accessing atmospheric composition data. It contains an up-to-date catalogue of available datasets in a number of databases distributed throughout the world. Number of data sets identified through the DC is now 53048 from 1672 sites. Data bases and networks currently available are e.g. ACTRIS, IMPF, EUGAR, EDGAR, EARLINET, CLOUDNET, GAW-WOGA, GAWIS, WDCGG...

Search & find data: Search for atmospheric data across various data bases and networks, more will be implemented the AERONET.

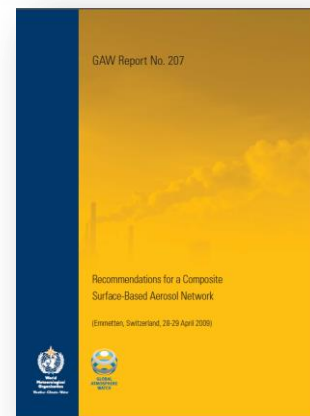
Network affiliation: The map shows an example with all sites reported data to GAWCOA with the information available in the markers for Nepal Climate Observatory and the variables measured at this site.

Download: All ACTRIS data, and a lot of other data can be downloaded. Access is regulated through data protocols. The example shows data from Cabauw. Some data need registration and login (EARLINET) some are open (EUGAR, IMPF). Download of larger data volumes for model use can be arranged. Number of aerosol profiles: ca 27 000. Number of aerosol in situ time series: ca 1700. Number of trace gas time series: ca 100.

Collocation of measurements: The map shows sites with measurements of absorption coefficient, black carbon, (Elemental carbon) and extinction coefficient and collocation of these observations in Europe.

Interested in ACTRIS or ACTRIS data? Contact Cathrine Lund Myhre, clm@nilu.no (PI ACTRIS Data Centre), or Gelsomina Pappalardo gelsomina.pappalardo@mos.cnr.it (coordinator ACTRIS) or Paolo Laaj laaj@ipag.obs.ju-grenoble.fr (Co-coordinator ACTRIS).

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Thank you!

Cathrine Lund Myhre: clm@nilu.no



Why cannot NILU re-distribute data from the database?

No re-distribution of data because:

- Not “our data”, associated to programs
- No proper acknowledgment
- Data base is dependent on **trust** to continue to receive data
- Data can be misused and misinterpreted

Solution:

Develop mechanisms/interface for getting data to keep better control of the use. This will also avoid duplications and several versions of same data available and distributed. Not good for anyone..

Data sharing agreements/protocols