Update from EMEP-CCC

- EMEP/EBAS data identification
- Chemicals of emerging concern
- Near-real time data for CAMS
- CCC-Webpage revision

Kjetil Tørseth, Markus Fiebig and Wenche Aas

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Strong push to ensure that research data are «FAIR»

FAIR principles address:

- Data serving as basis for articles not accessible.
- Data aren’t documented, or metadata use custom conventions, or no conventions.
- Data stored in inaccessible format.
- Access conditions not clarified or arbitrary
- Data originators expect attribution when their data are used

FORCE11

The Future of Research Communications and e-Scholarship

https://force11.org/info/about-force11/

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The Data FAIRness Principles

Findable

F1: (Meta)data have eternal PID.
F2: Rich metadata.
F3: Indexed in search portal and similar.
F4: Metadata include PID.

Accessible

A1: (Meta)data retrievable by PID with standardised protocol
A1.1: open and free protocol
A1.2: authentication / authorization possible
A2: Metadata always accessible

Interoperable

I1: (Meta)data use formal, accessible, shared, broadly appicable language.
I2: (Meta)data use FAIR vocabulary.
I3: (Meta)data include qualified references

Reusable

R1: (Meta)data have a plurality of accurate and relevant attributes.
R1.1: (meta)data have data usage license.
R1.2. (meta)data document provenance.
R1.3. (meta)data meet domain-relevant community standards.

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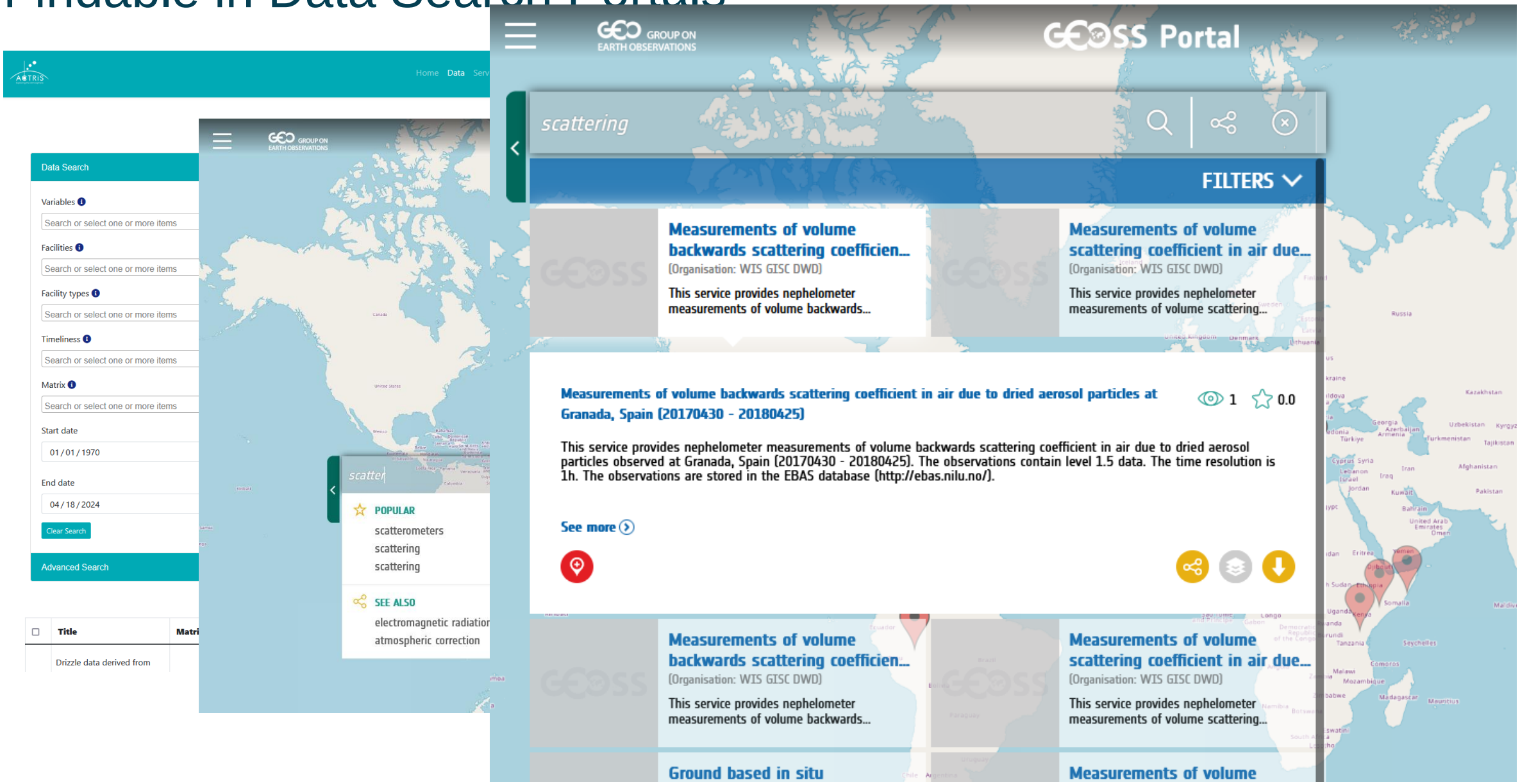
Findable in Data Search Portals



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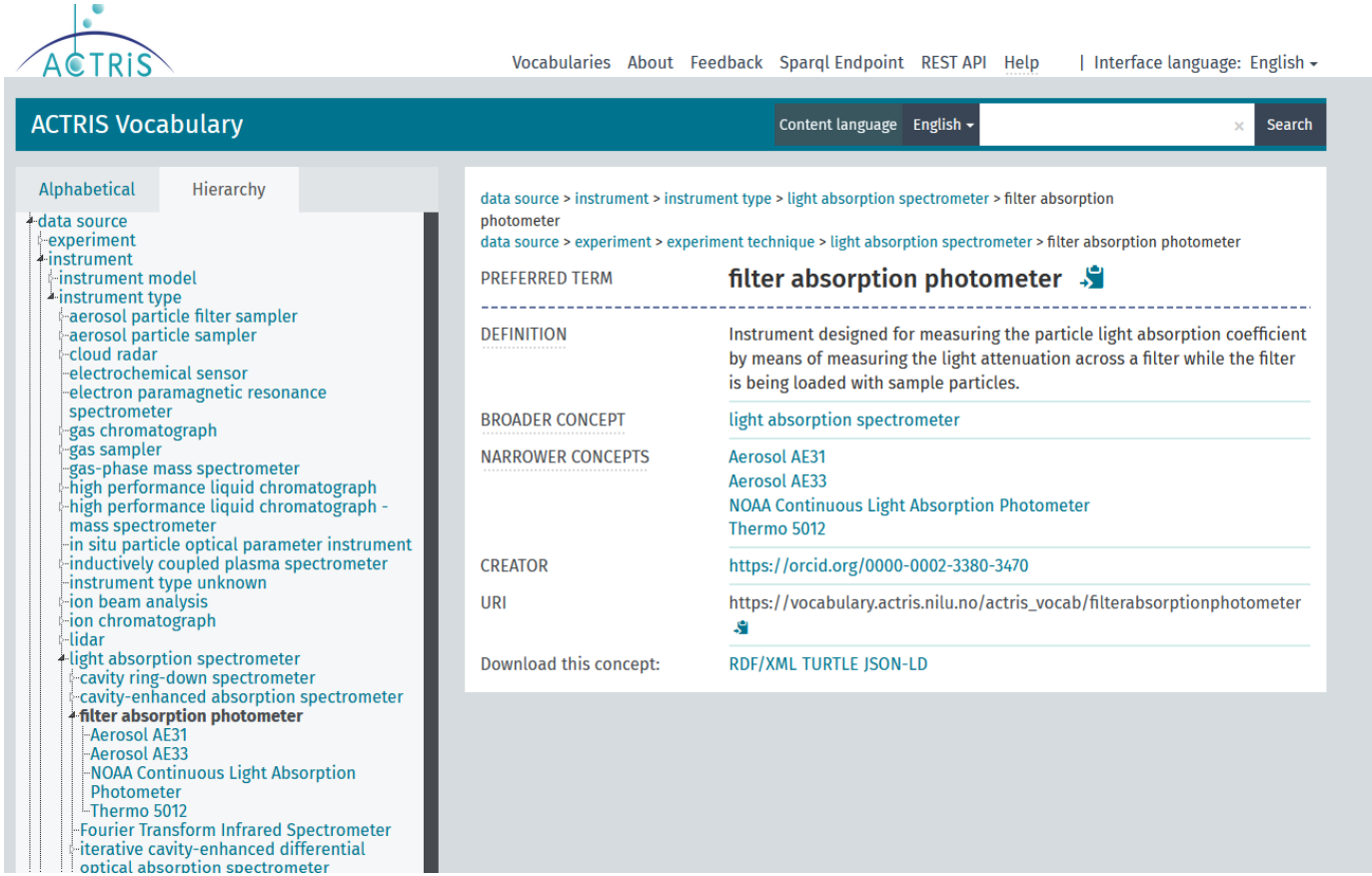
FAIR Vocabulary

- https://vocabulary.actris.nilu.no
- Well-defined terms («concepts») instead of freetext.
- Concepts may be used as seach categories.
- All concepts have definitions.
- All concepts should be understandable for non-experts.
- Well-defined relations between concepts (ontology).
- Website is only the interface for humans, may display only part of content.
- Underlying database (triple-store) is machine readable.



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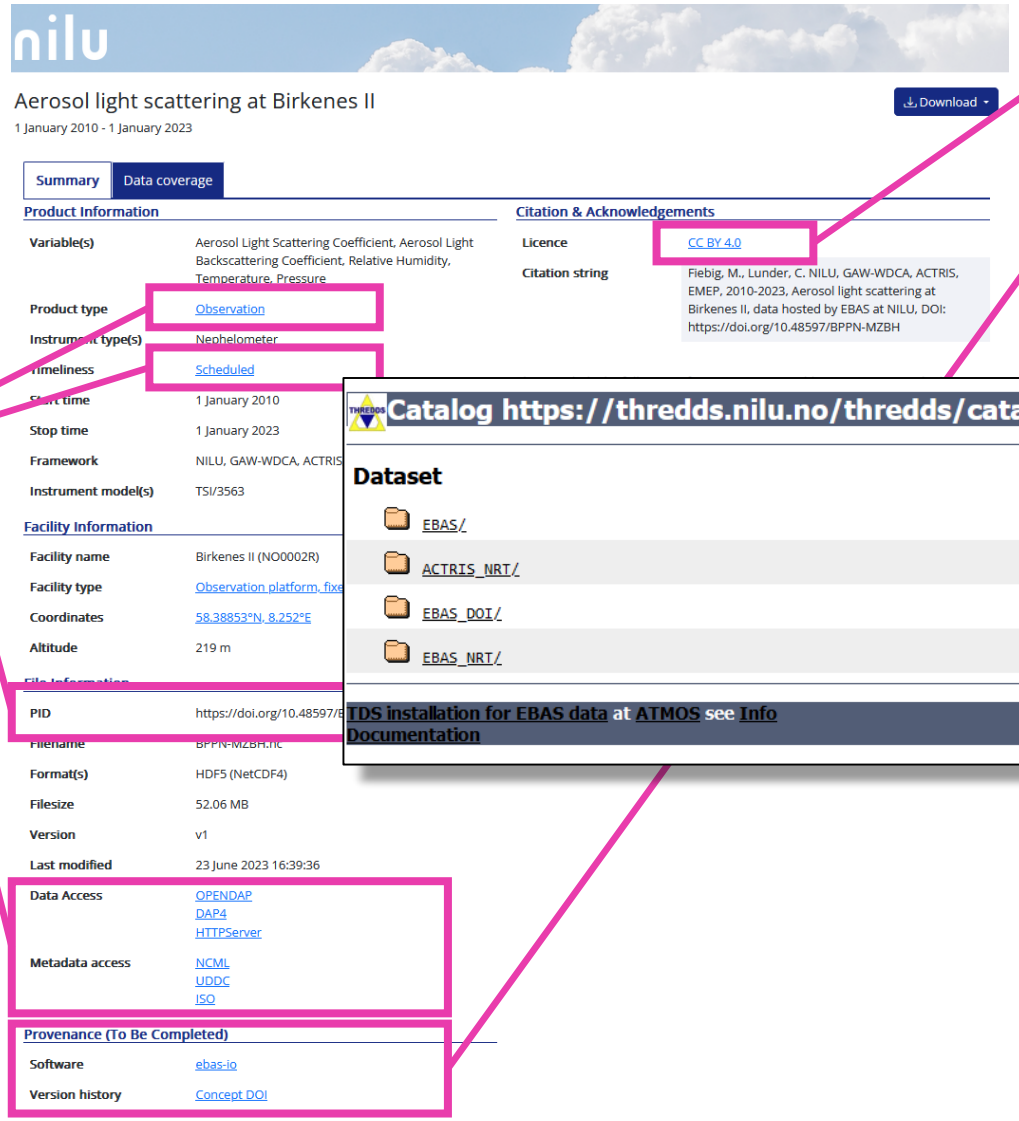
How EBAS Landing Pages Implement FAIRness

F1. (Meta)data have eternal PID.
F4: Metadata include PID

A1: (Meta)data retrievable by PID with standardised protocol

I3: (Meta)data include qualified references

https://doi.org/10.48597/AMG9-



R1.1: (meta)data have data usage license.

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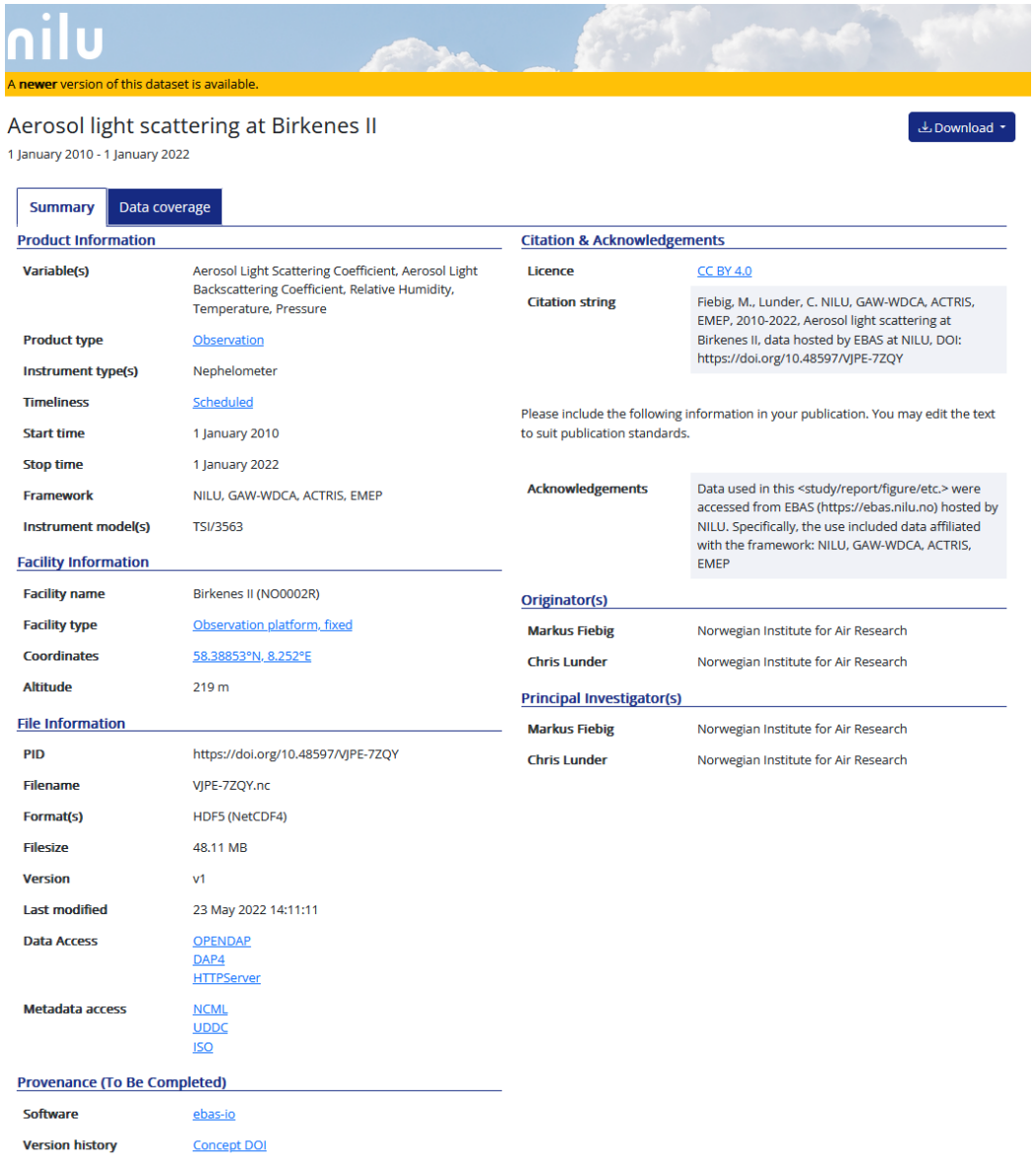
A2: Metadata always accessible



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A **newer** version of this dataset is available.

Aerosol light scattering at Birkenes II

1 January 2010 - 1 January 2022

Download

Summary | Data coverage

Product Information

Variable(s)	Aerosol Light Scattering Coefficient, Aerosol Light Backscattering Coefficient, Relative Humidity, Temperature, Pressure
Product type	Observation
Instrument type(s)	Nephelometer
Timeliness	Scheduled
Start time	1 January 2010
Stop time	1 January 2022
Framework	NILU, GAW-WDCA, ACTRIS, EMEP
Instrument model(s)	TSI/3563

Facility Information

Facility name	Birkenes II (NO0002R)
Facility type	Observation platform, fixed
Coordinates	58.38853°N, 8.252°E
Altitude	219 m

File Information

PID	https://doi.org/10.48597/VJPE-7ZQY
Filename	VJPE-7ZQY.nc
Format(s)	HDF5 (NetCDF4)
Filesize	48.11 MB
Version	v1
Last modified	23 May 2022 14:11:11
Data Access	OPENDAP DAP4 HTTPServer
Metadata access	NCML UDDC ISO

Provenance (To Be Completed)

Software	ebas-io
Version history	Concept DOI

Citation & Acknowledgements

Licence	CC BY 4.0
Citation string	Fiebig, M., Lunder, C. NILU, GAW-WDCA, ACTRIS, EMEP, 2010-2022, Aerosol light scattering at Birkenes II, data hosted by EBAS at NILU, DOI: https://doi.org/10.48597/VJPE-7ZQY

Please include the following information in your publication. You may edit the text to suit publication standards.

Acknowledgements	Data used in this <study/report/figure/etc.> were accessed from EBAS (https://ebas.nilu.no) hosted by NILU. Specifically, the use included data affiliated with the framework: NILU, GAW-WDCA, ACTRIS, EMEP

Originator(s)

Markus Fiebig	Norwegian Institute for Air Research
Chris Lunder	Norwegian Institute for Air Research

Principal Investigator(s)

Markus Fiebig	Norwegian Institute for Air Research
Chris Lunder	Norwegian Institute for Air Research

- Each dataset version has its own DOI and landing page.
- Also obsolete dataset versions are still accessible by the same interfaces.
- Obsolete datasets are cleary marked as such.

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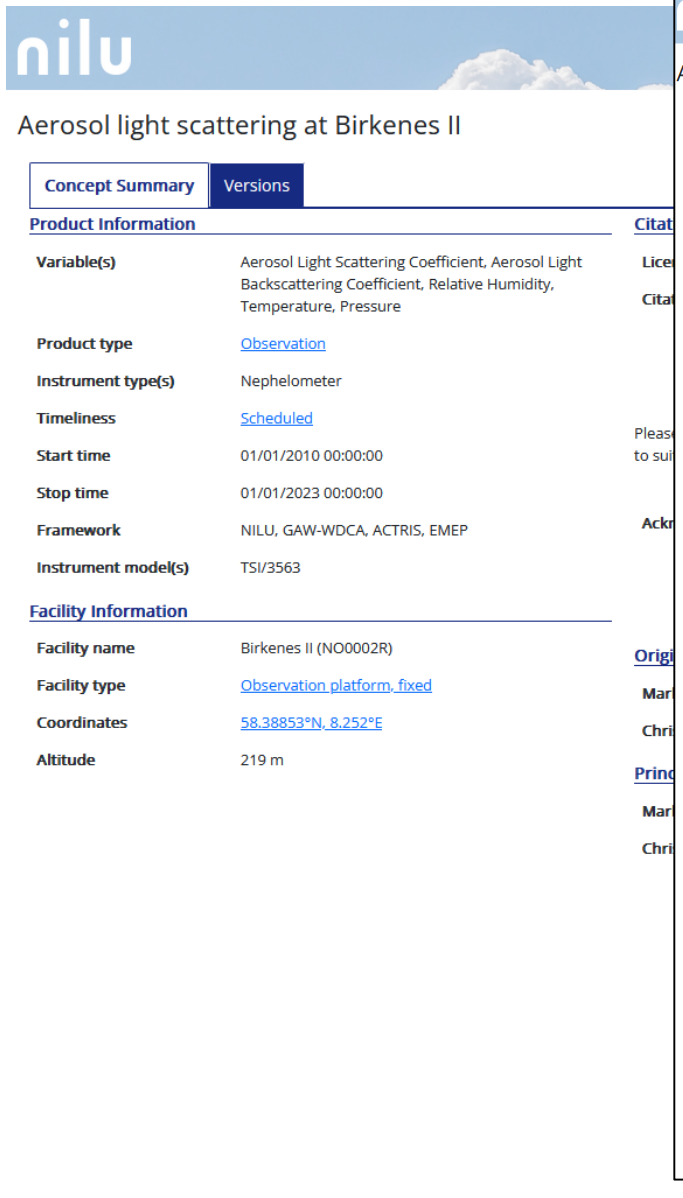
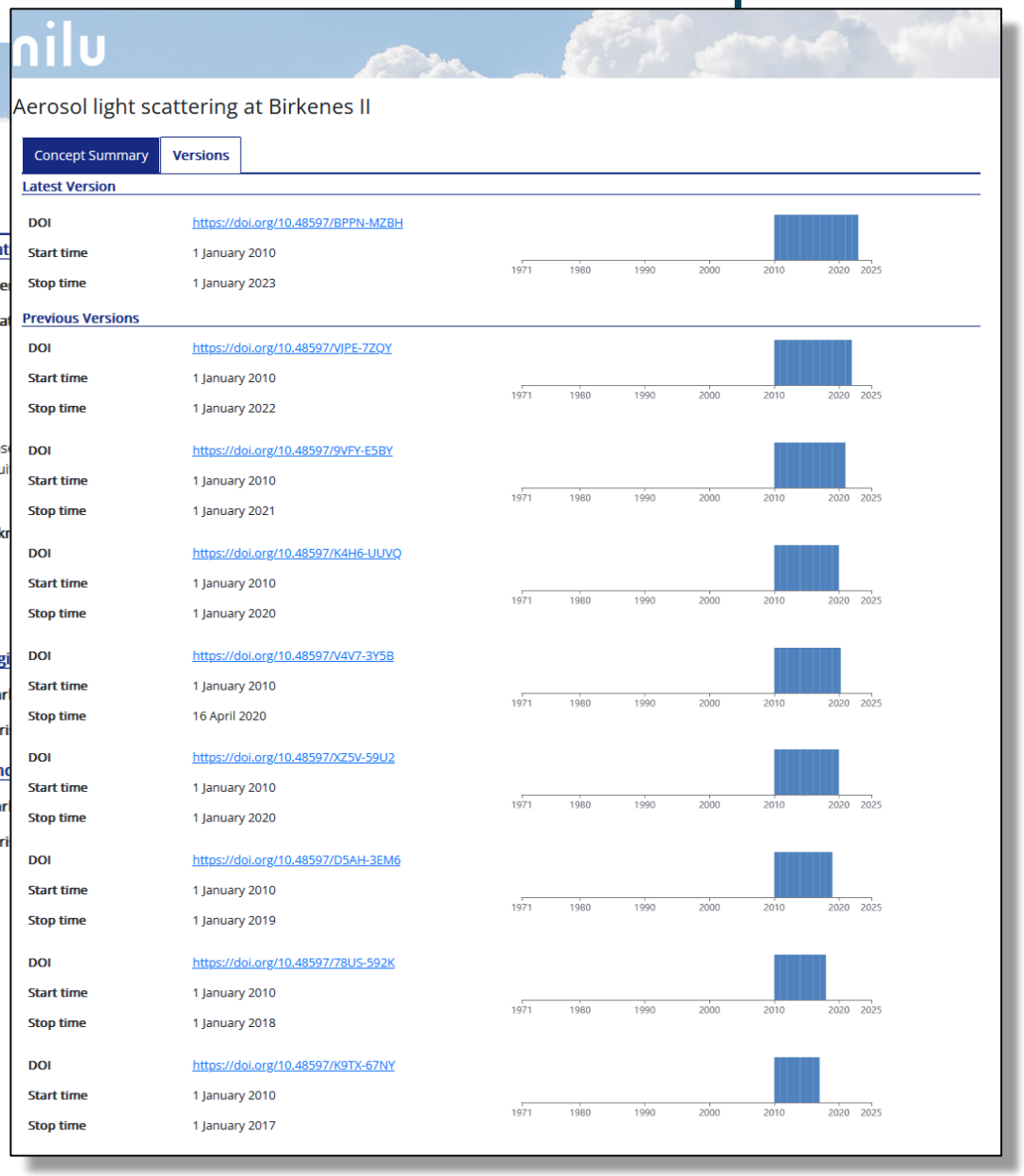
Landing Page Types: Version and Concept





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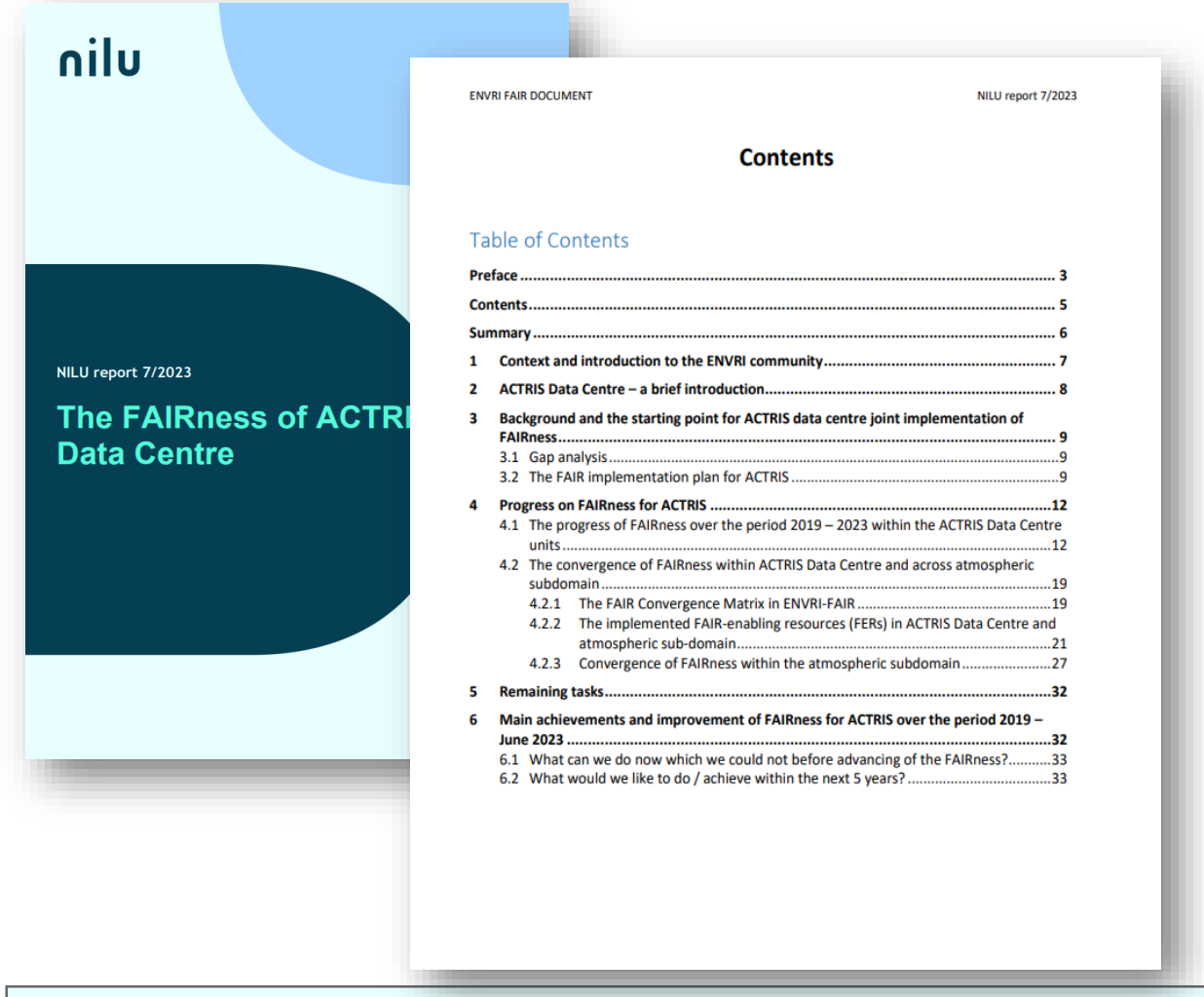
NILU report on FAIRness of ACTRIS Data Centre



Document the **achievements** and **convergence** of FAIRness within ACTRIS Data Centre and across atmospheric subdomain (ACTRIS, ICOS-atm, SIOS-atm, IAGOS, EISCAT-3d)

Explains

- FAIR Implementation Profile (FIP)
- FAIR-enabling resources (FERs) in ACTRIS Data Centre and full atmospheric sub-domain
- FAIRness gap analysis and assessments
- Convergence of FAIRness within the atmospheric subdomain and common solutions

Document status and solutions for ACTRIS DC including and EBAS

Implementation as part of ENVRI-FAIR and ACTRIS-Norway
Lund Myhre et al, 2024 [NILU Brage: The FAIRness of ACTRIS Data Centre (unit.no)]

Where to find the DOIs…

In NASA-Ames file:

```
93 1001
Fiebig, Markus; Lunder, Chris
NO01L, Norwegian Institute for Air Research, NILU,
Lunder, Chris; Bäcklund, Are
ACTRIS EMEP GAW-WDCA NILU
1 1
2022 01 01 2023 06 23
0.041667
days from file reference point
11
1 1 1 1 1 1 1 1 1 1 1
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aerosol_light_scattering_coefficient, 1/Mm, Waveleng
aerosol_light_scattering_coefficient, 1/Mm, Waveleng
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68
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Data license:               "https://creativecommo
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Timezone:                   UTC
File name:                  NO0002R.20220101000000
Represents DOI:
Contains data from DOI:     "https://doi.org/10.48
File creation:
Export state:               20240403100048240170
Export filter:              exclude-900,exclude-in
Startdate:                  20220101000000
Revision date:              20230623070057
Version:                    1
Version description:        initial revision, Adis
Data level:                 2
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Resolution code:            1h
Sample duration:            1h
Orig. time res.:            30s
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In NetCDF file:

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:project = "ACTRIS, EMEP
:acknowledgement = "Data
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:license = "https://crea
:citation = "Fiebig, M.,
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:date_metadata_modified
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:publisher_email = "ebas
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:geospatial_bounds_crs =
:geospatial_lat_min = 58
```

On landing page:

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Aerosol light scattering at Birkenes II

1 January 2010 - 1 January 2023

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Summary | Data coverage

Product Information

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Facility Information

Citation & Acknowledgements

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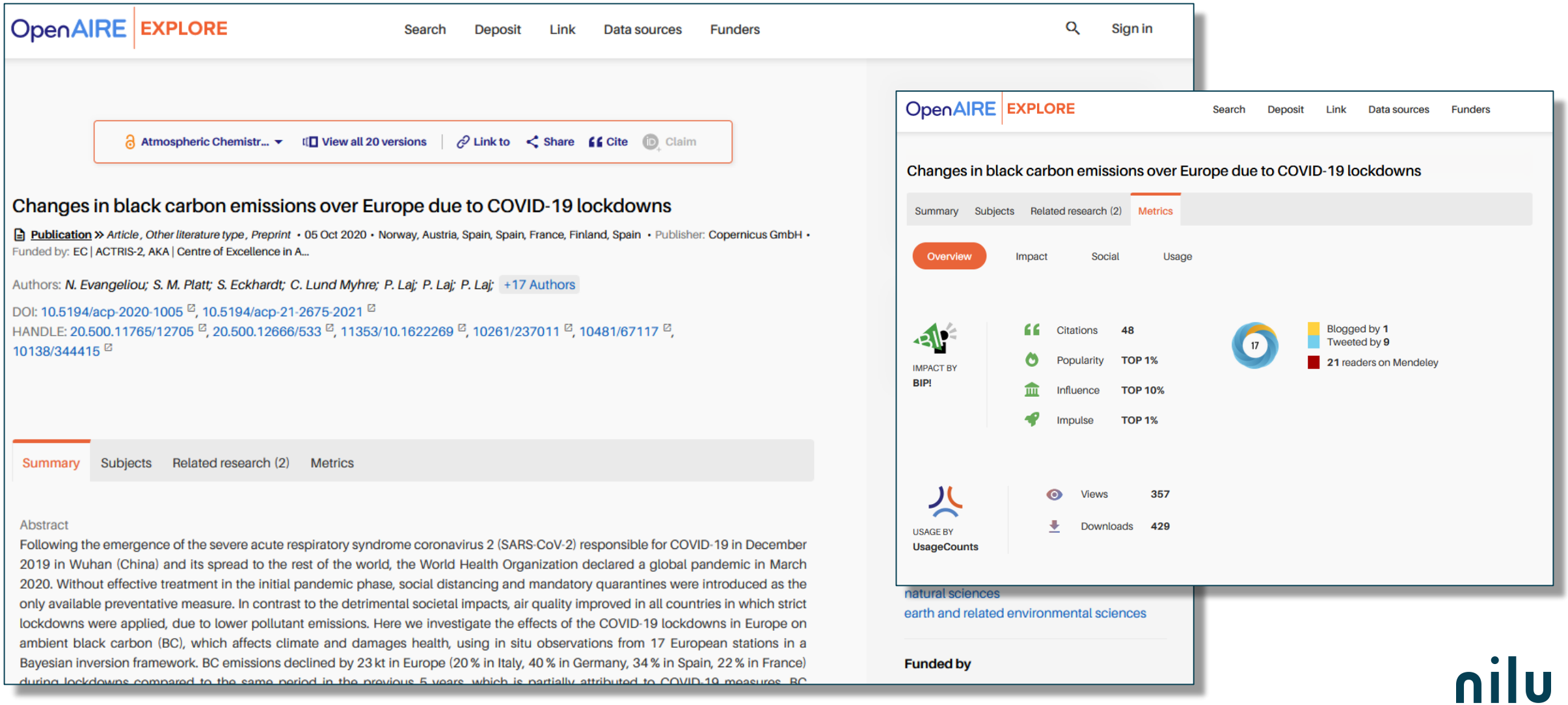
Outlook: See Where Your Data Has Been Used!



Towards a harmonized approach for atmospheric monitoring of Chemicals of Emerging Concern (CECs)

Workshop 8-10 November 2023 at NILU, Kjeller, Norway.

Thematic sessions:

- Siloxane and Chloro-paraffins
- PFAS
- Flame retardant
- Microplastic and plastic additives

Close cooperation and with support to the work of the Arctic Monitoring Program (AMAP) and the global monitoring plan (GMP).

Presentations available at
https://projects.nilu.no/ccc/tfmm/kjeller_2023/index.html

Report with recommendations in progress.

Executive summary

Recommendations with aim to standardize monitoring practices, fill knowledge gaps, and enhance understanding of emerging pollutants in the atmosphere. A general recommendation was to conduct measurement campaigns.

PFAS:

- Alignment of sampling methods (Nordic countries align with those in Canada)
- Expansion of EMEP monitoring at existing POP sites
- Expand target analytes: inclusion of GenX (HFPO-DA)

Flame Retardants:

- Monitoring Extension: Include regulated PBDEs and dechlorane in existing EMEP monitoring.
- Attention to OPFRs

Chlorinated Paraffins:

- Reinvestigation of existing data.
- Reanalysis of previous samples.
- Dedicated workshop on sampling and analytical methods.

Siloxanes:

- Expand the program on the regulated siloxanes.
- Investigate in new measurement techniques, PTR-MS.
- comparative sampling campaign with ABN and thermal desorption tubes.

Microplastics and plastic additives:

- Prepare and distribute guidelines to avoid contamination
- Develop measures to make microplastics data available in EBAS
- Prioritize total deposition sampling approaches
- Develop a wider range of standard reference materials
- Focus on plastic additive chemicals.

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Decision 2019/1

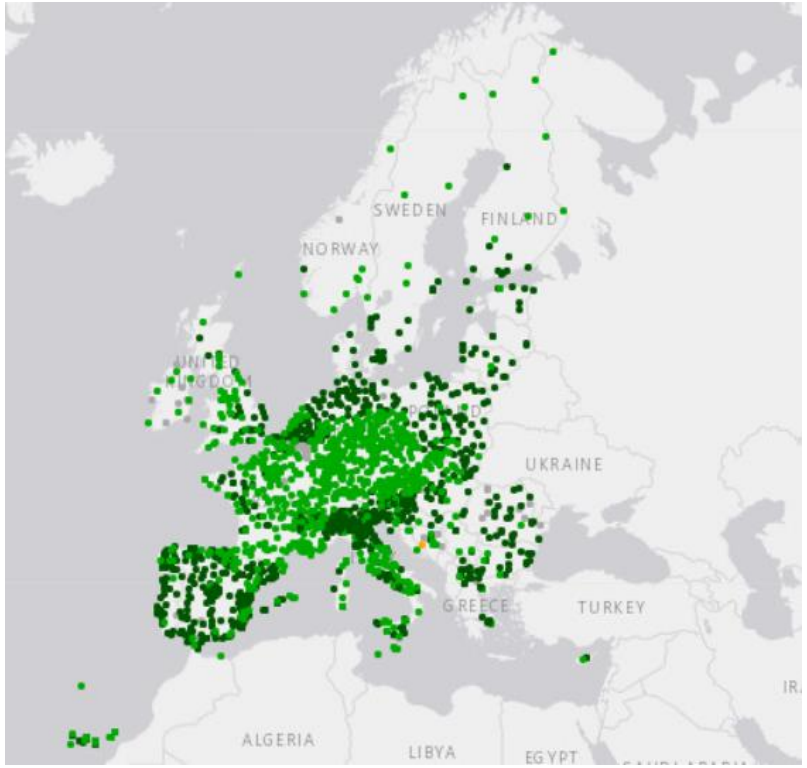
Monitoring strategy for the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe for the period 2020–2029

12. EMEP will, where relevant and appropriate, continue its efforts to increase the monitoring and reporting of parameters and data timelines, facilitating more rapid access to air pollution information (“Near Real Time” or “Real Real Time” data delivery). Such efforts will be based on voluntary contributions from Parties and will follow the guidance of the EMEP Steering Body.

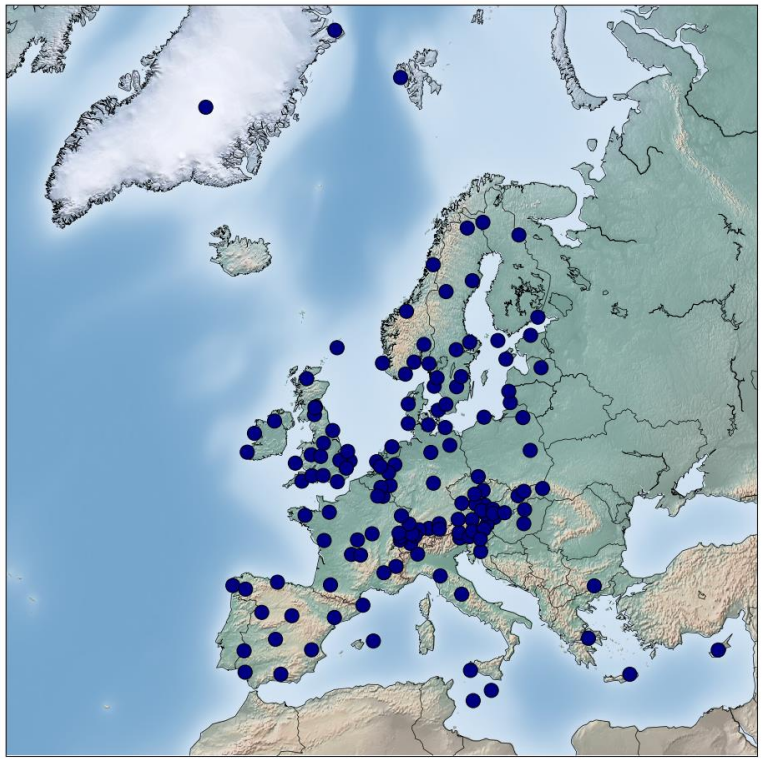
18. EMEP observations are also made available to users and stakeholders though initiatives such as the Global Earth Observation System of Systems and the European Union’s Earth Observation Programme (COPERNICUS).

Mapping of sites/instruments providing data to CAMS via EEA versus data reported to EBAS (EMEP, WMO-GAW or ACTRIS)

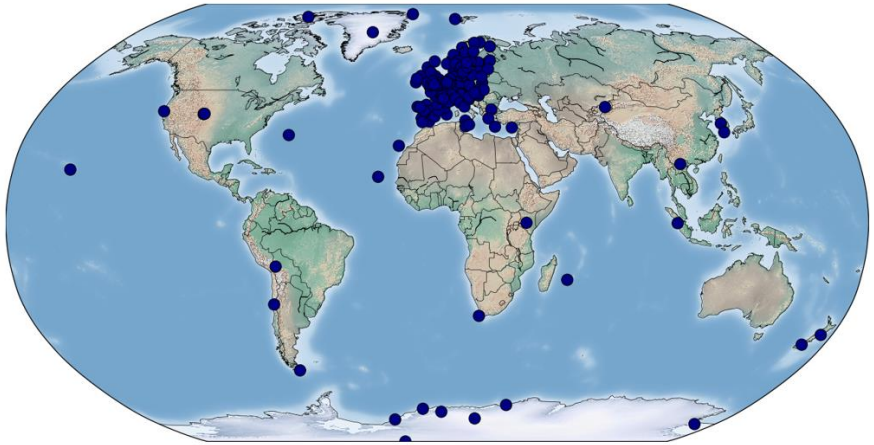
Ozone stations



EEA



EBAS

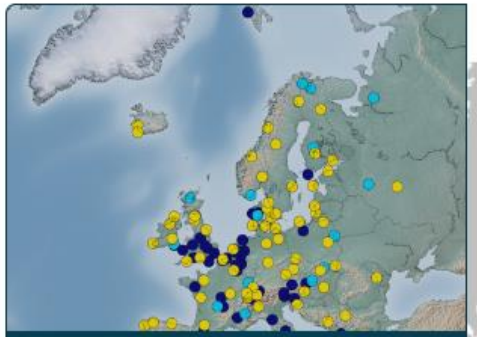


Findings

- Many discrepancies in station metadata and observation data between EBAS and EEA makes it challenging to map stations
- Large overlap i stations (since most countries report data from EMEP stations also to the EEA)
- Some stations are only available in EBAS, and could potentially be included in future CAMS delivery;
  - Ozone ~15 sites
  - NO2 ~10 sites
  - PM2,5 ~8 sites
- Work ongoing to establish methods for RRT data QA
- Operationalisation pending on later discussions

Chemical Co-ordinating Centre of EMEP

Home | Laboratory Intercomparison | EMEP/CCC Reports | Monitoring Strategy | QA Measure | TFMM



EBAS

Data access and submission

LABORATORY INTERCOMPARISON

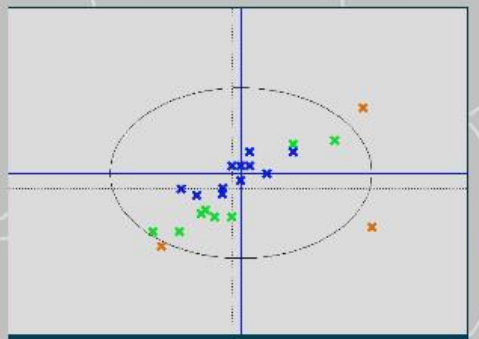
Information on and submission of results from EMEPs annual lab intercomparisons

REPORTS

List of downloadable reports

MONITORING STRATEGY

EMEP monitoring strategy 2020-2029



QA MEASURE

Annual reslts based on laboratory intercomparison

TFMM

EMEP Task Force on measurements and modelling

About EMEP

The cooperative program
the long-range transmiss
to the Convention on Lo
(CLRTAP). The main obje
regularly provide govern
CLRTAP with qualified s
development and further
protocols on emission re
convention.

Read more

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EMEP/CCC Reports

Search

Report name	Authors	Report number	Filename
Data Report 2021 Particulate matter, carbonaceous and inorganic compounds	Anne-Gunn Hjellbrekke	EMEP/CCC-Report 1/2023	EMEP_CCC-Report 1_2023 Data Report 2021 FINAL.pdf
Ozone measurements 2021	Anne-Gunn Hjellbrekke and Sverre Solberg	EMEP/CCC-Report 2/2023	EMEP_CCC-Report_2_2023_Ozone_measurements_2021_FINAL.pdf
Heavy metals and POP measurements 2021	Wenche Aas, William Frederik Hartz, Katrine Aspmo Pfaffhuber, Helene Lunder Halvorsen and Nora Yttri	EMEP/CCC-Report 3/2023	EMEP_CCC-Report 3_2023 Heavy metals and POP - FINAL.pdf
VOC measurements 2021	Sverre Solberg, Anja Claude and Stefan Reimann	EMEP/CCC-Report 4/2023	EMEP_CCC-Report_4_2023_VOC_measurements_2021_versjon_2.pdf
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Ozone measurements 2020	Anne-Gunn Hjellbrekke and Sverre Solberg	EMEP/CCC-Report 2/2022	EMEP_CCC-Report_2_2022_Ozone_measurements_2020.pdf

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