

Automatic pollen monitoring in Europe

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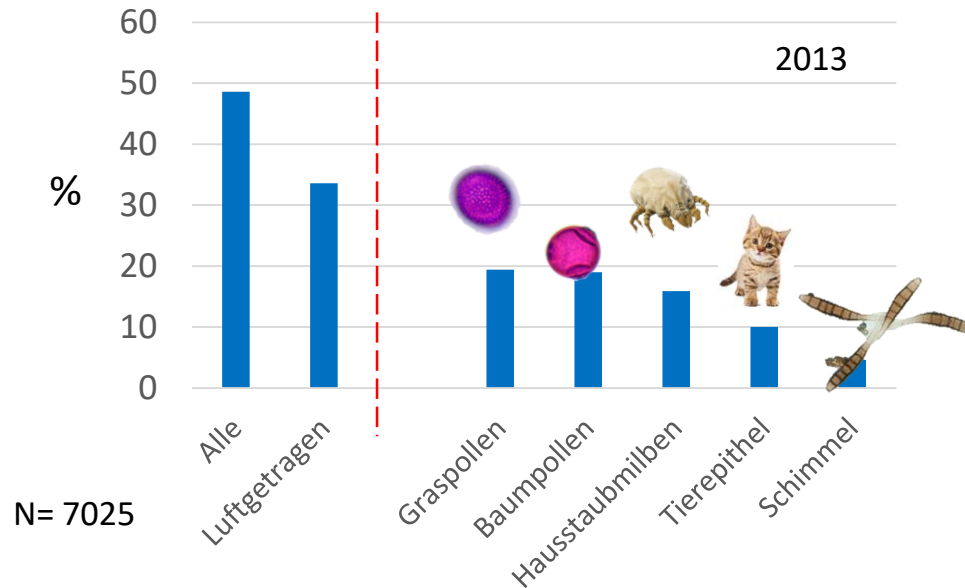
¹ ZAUM, Center of Allergy & Environment
Helmholtzzentrum- and Technical University Munich, Munich German

HelmholtzZentrum münchen

Deutsches Forschungszentrum für Gesundheit und Umwelt



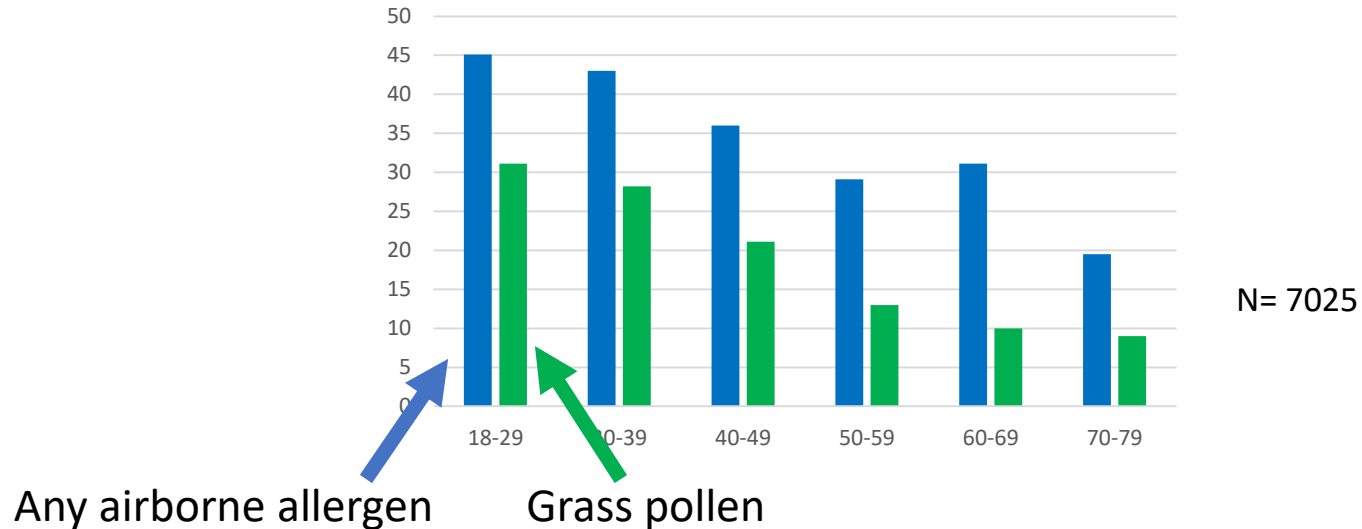
Allergic sensitizations in Germany



Haftenberger, M. *et al.* [Prevalence of sensitisation to aeroallergens and food allergens: results of the German Health Interview and Examination Survey for Adults (DEGS1)]. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz* **56**, 687-697, (2013).

Allergic sensitizations according to age

- Allergy-Epidemic in Germany -

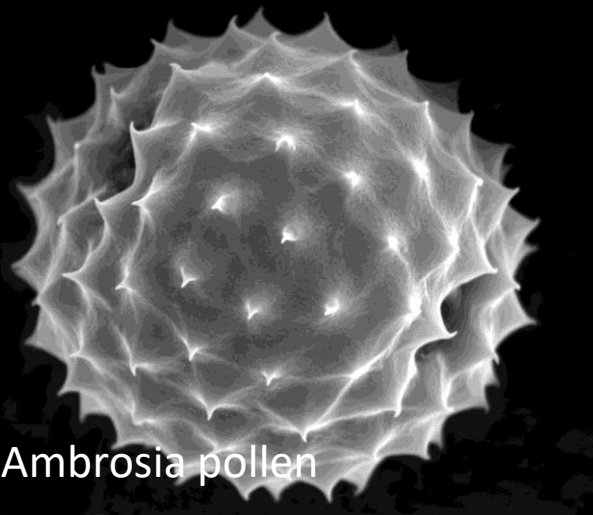


Haftenberger, M. *et al.* [Prevalence of sensitisation to aeroallergens and food allergens: results of the German Health Interview and Examination Survey for Adults (DEGS1)]. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz* **56**, 687-697, (2013).

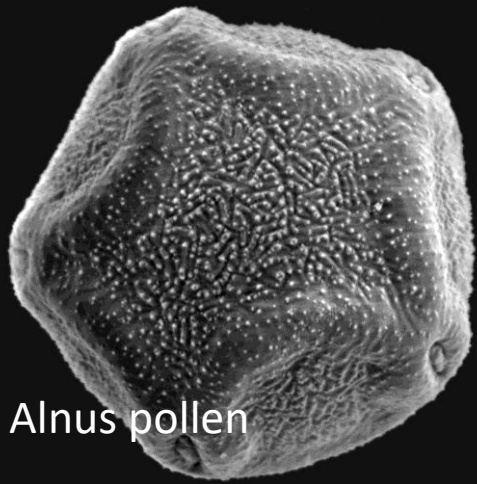


Birch pollen

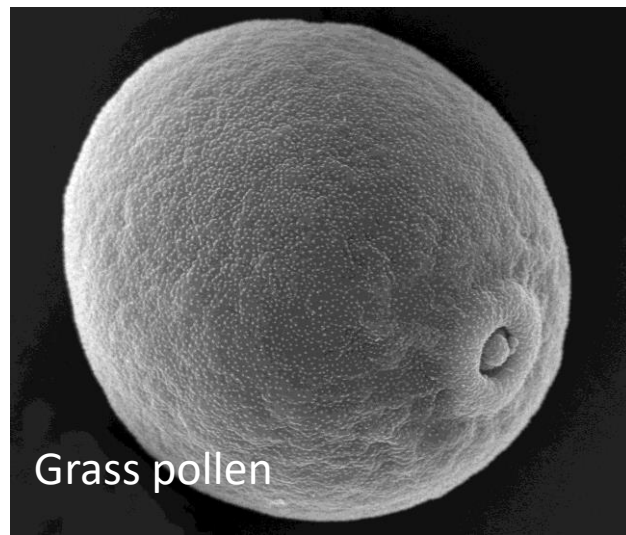
Manual Hirst-type
pollen and spore
trap
(a.k.a. Burkard,
1952)



Ambrosia pollen



Alnus pollen

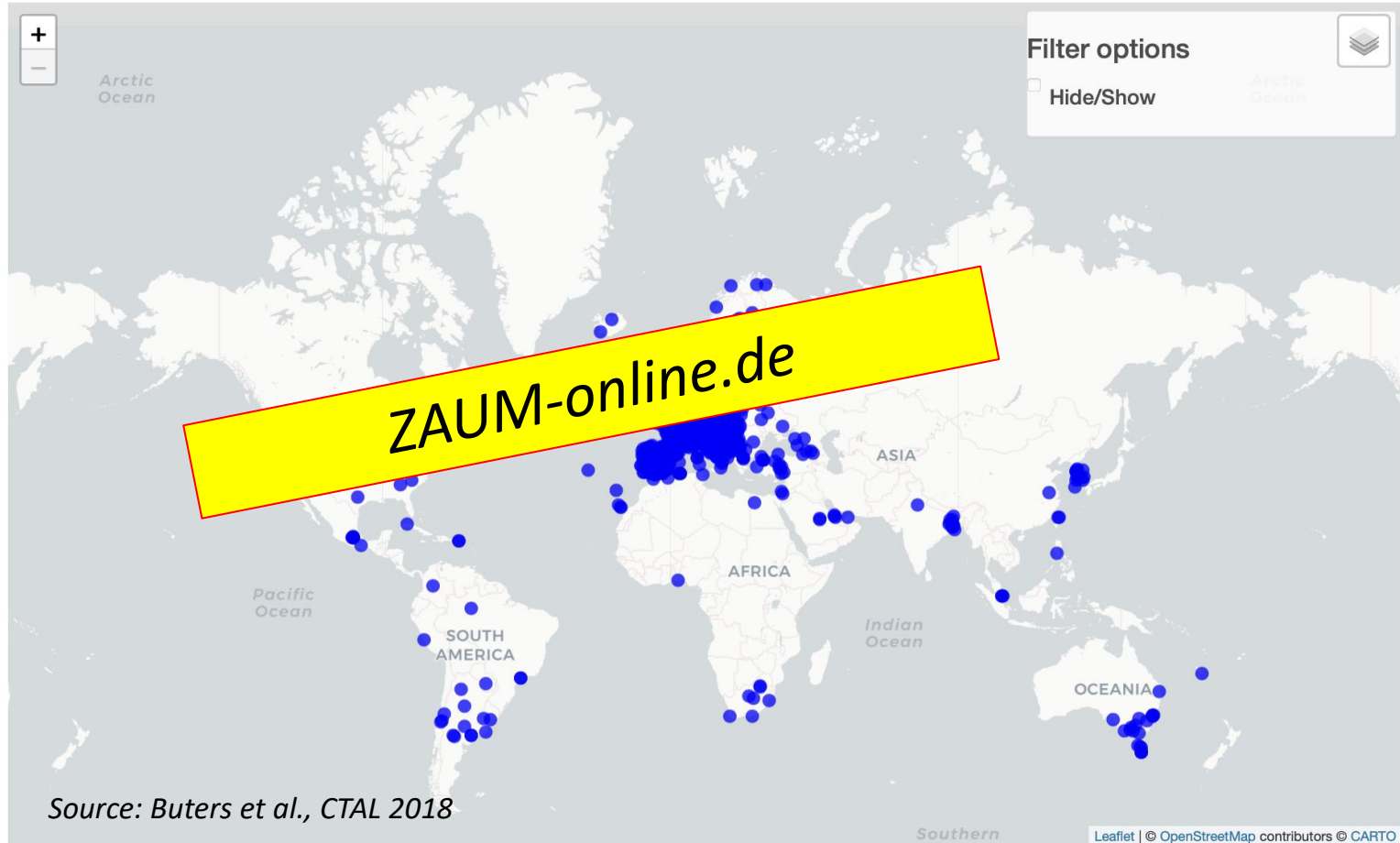


Grass pollen

Worldwide Map of Pollen Monitoring Stations

Interactive map

About / Update Information



Source: Buters et al., CTAL 2018

Southern

Leaflet | © OpenStreetMap contributors © CARTO

Time to go online!

That only works with
Automatic Pollen Monitoring

AutoPollen-ADOPT Instrument Intercomparison



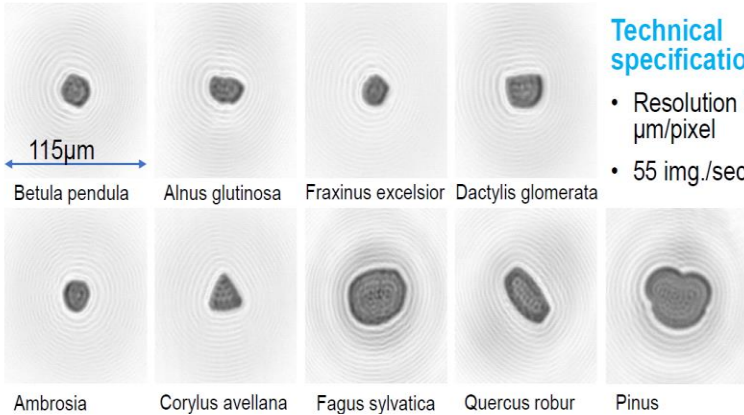
2 Top runner instruments



Holograms

Poleno

Holographic images - Morphology



Technical specifications

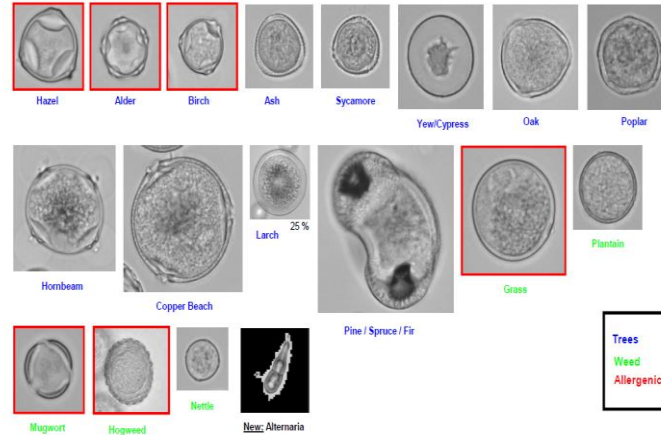
- Resolution 0.56 µm/pixel
- 55 img./sec.



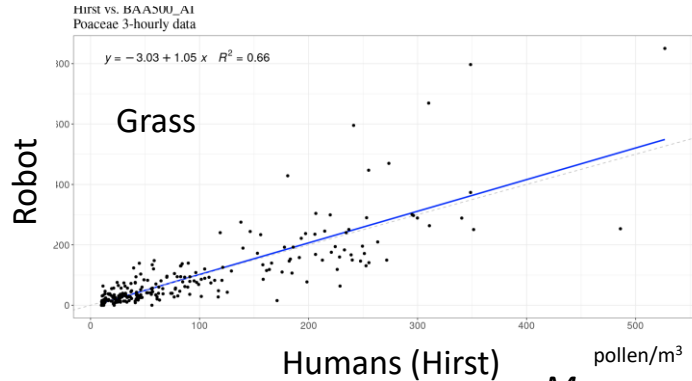
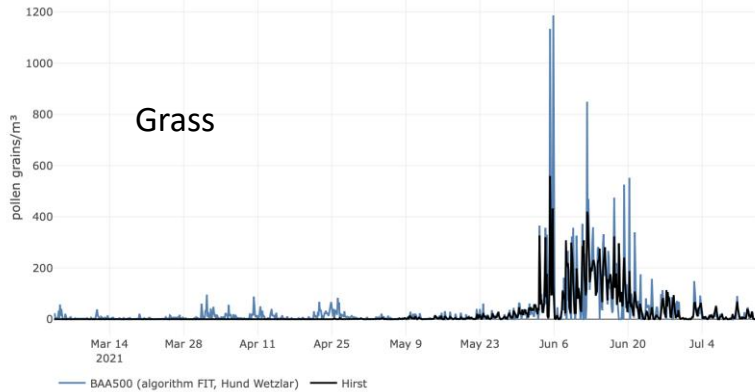
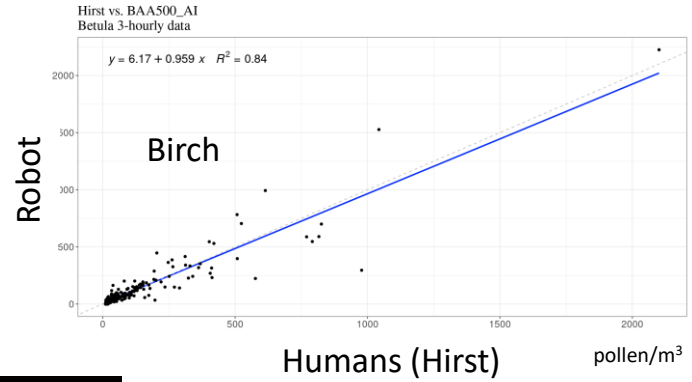
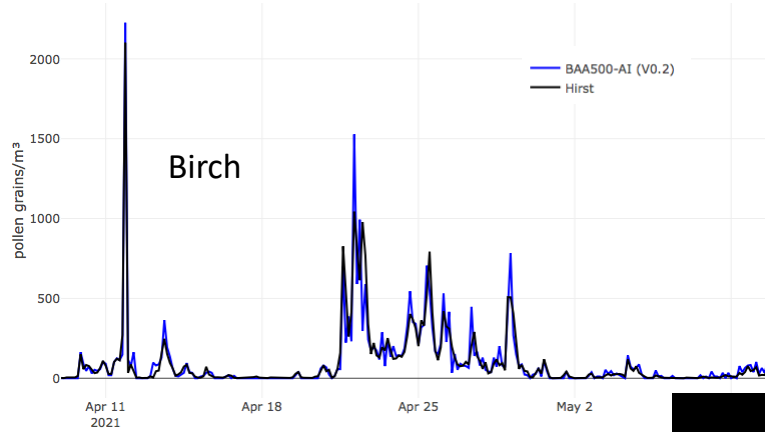
Image recognition

POMO (or BAA500)

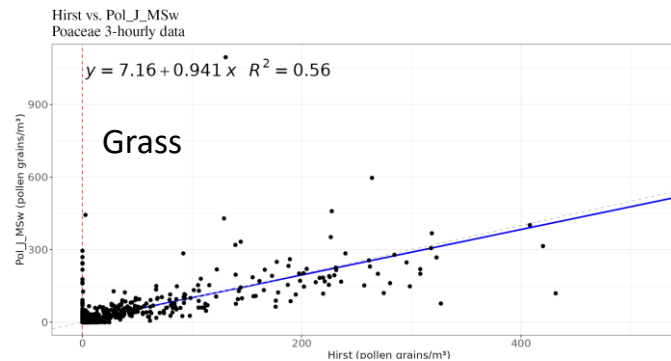
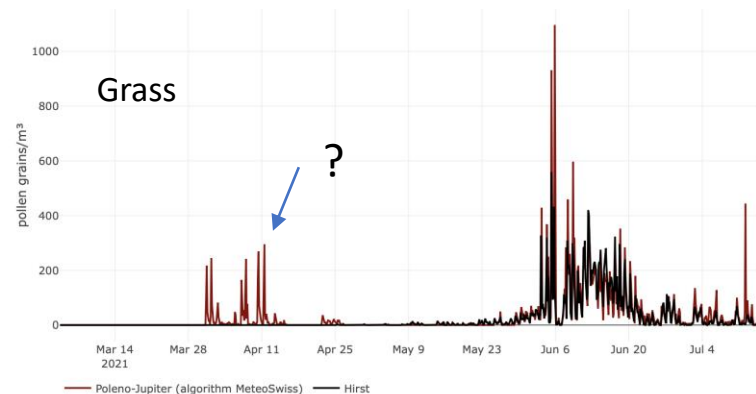
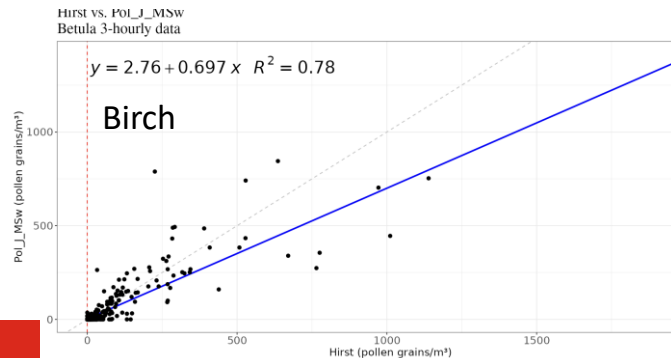
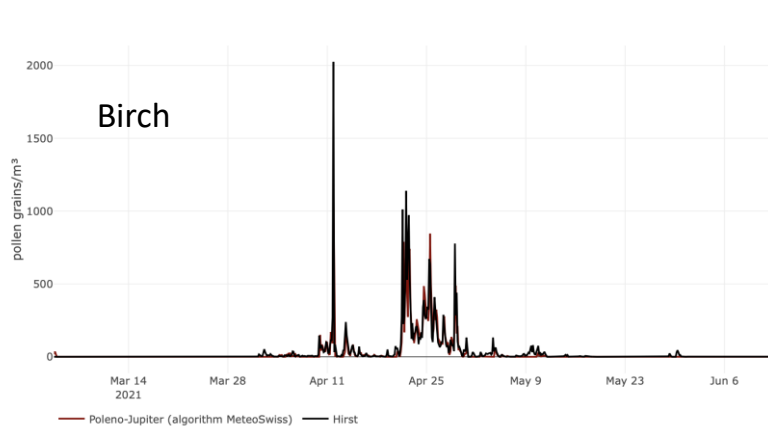
Pollen Classification



Robot versus humans: birch and grass pollen



Robot versus humans: birch and grass pollen



Pollenflight online: Munich today



PollenScience.eu

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[Historische Daten](#)

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Ort

München (Biedersteiner Straße)

Pollen [alle auswählen](#)

Schimmel (Fungus), Eiche (Quercus), Platane (Platanus)

Zeitraum:

1 Monat

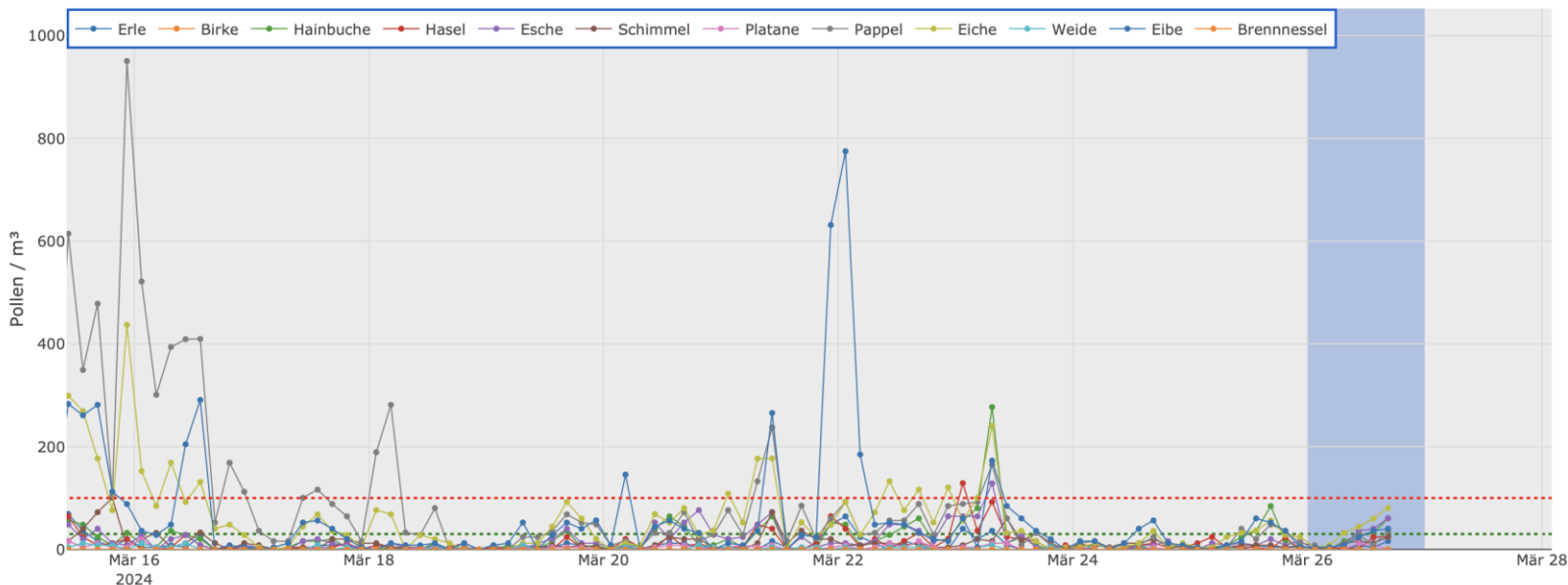
Anzeige

heute

Ausschnitt wählen

Zeitachse verschieben

Ansicht zurücksetzen



Schwellenwert: wenig Allergiesymptome zu erwarten (30 Pollen/m³) Allergiesymptome zu erwarten (100 Pollen/m³)

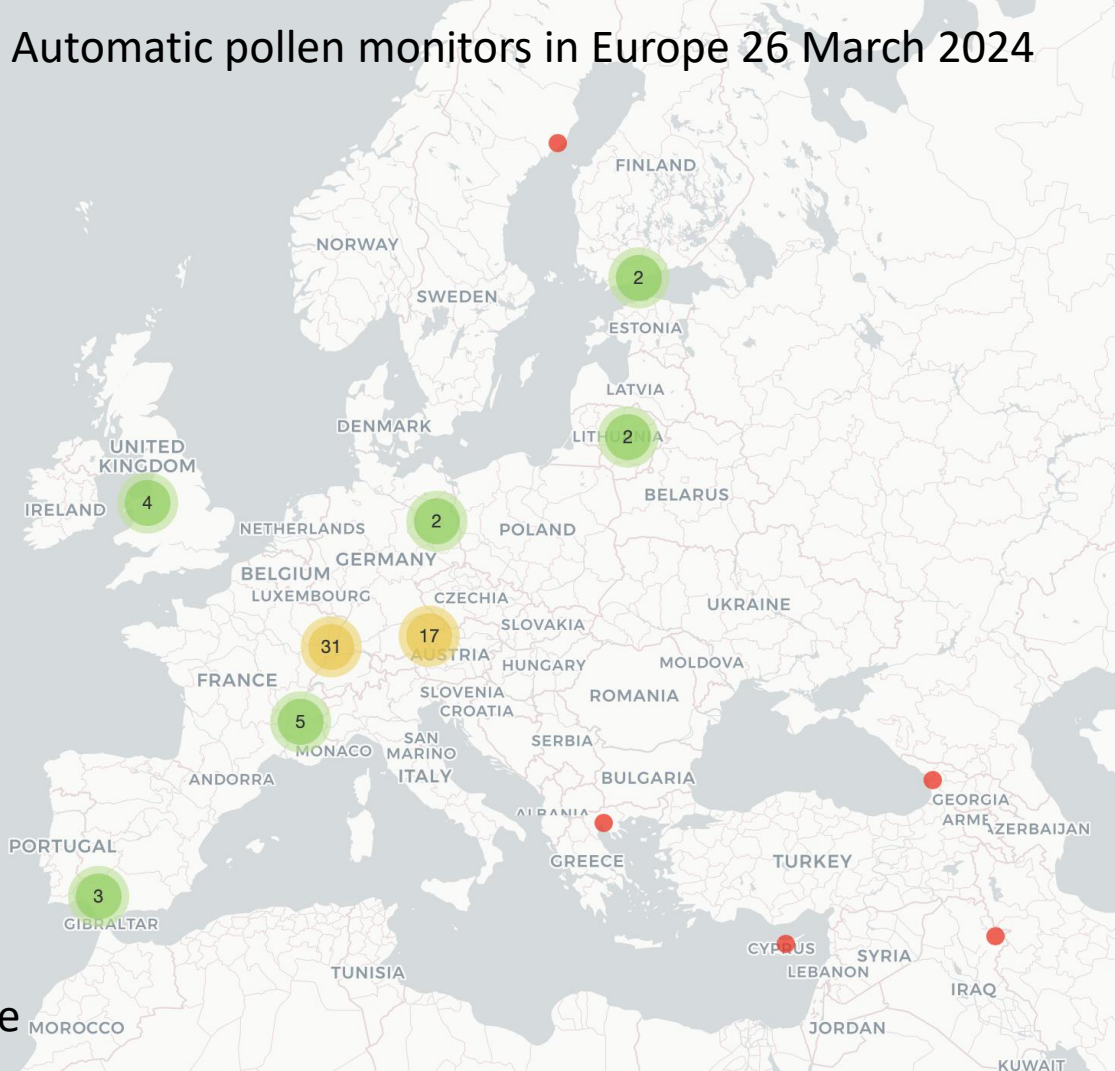
Buters et al., 2024

Automatic pollen monitors in Europe 26 March 2024

In 2024:
73 Automatic vs
565 Manual monitors

In 2018:
8 Automatic monitors

Source: ZAUM-online.de



Current situation in european pollen monitoring:

European Aerobiology Network (EAN): Big Excel file

nobody pays, delay of receiving data is months, no benefits for the data provider,
no open access, only paid access

Who will store the automatic data?

1. Everybody by themselves?
2. A huge amount of data. Level 1 or also Level 0 data?
3. Per Network (county)?
4. What about algorithm change?
5. What about pollen crossing borders?



The SYLVA IT Infrastructure currently stores **16.85** terrabytes of data being delivered by **3** devices at **3** locations.

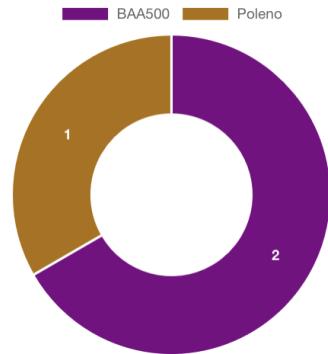
3 devices in 6 months = 16.8 Terrabyte
100 devices for 30 years = 100 Petabytes (with direct access)

Terrabytes by Year



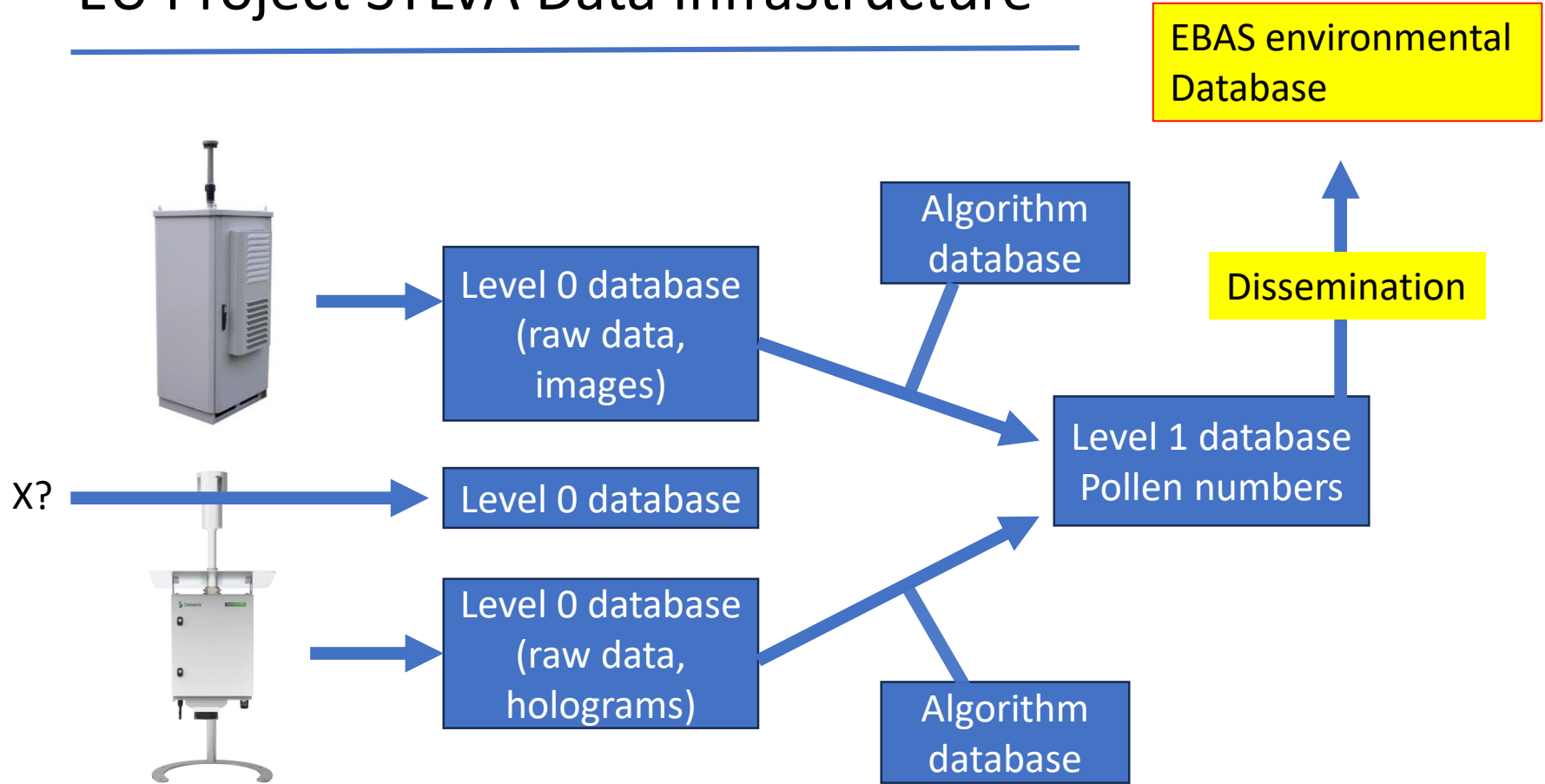
[View Data Size Details in Location Overview](#)

Devices by Type



[View All Devices in Location Overview](#)

EU Project SYLVA Data Infrastructure



Framework [4]

>>All
AutoPollen_NRT
AutoPollen_restricted_NRT
PollenScience_NRT
SYLVA_NRT

Country [5]

>>All
Germany
Lithuania
Serbia
Spain

Station [6]

>>All
Córdoba - Universidad (ESCORD)
Luzern Kantonsspital
München Biedersteiner (DEBIE)
Novi Sad, University

EBAS European Environmental Database (Norway)

Instrument type [1]

>>All
pollen_monitor

Component [52]

>>All
flow_rate
pollen_abies
pollen_acer
pollen_aesculus
pollen_alnus
pollen_ambrosia
pollen_artemisia
pollen_asteraceae

Matrix [2]

>>All
aerosol
instrument

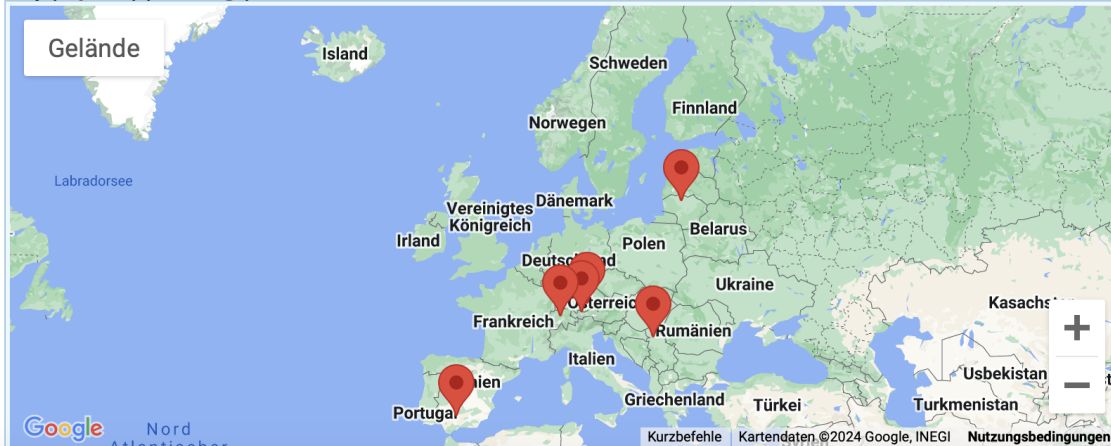
From >>All To >>All

Available datasets: 345

Reset

List datasets

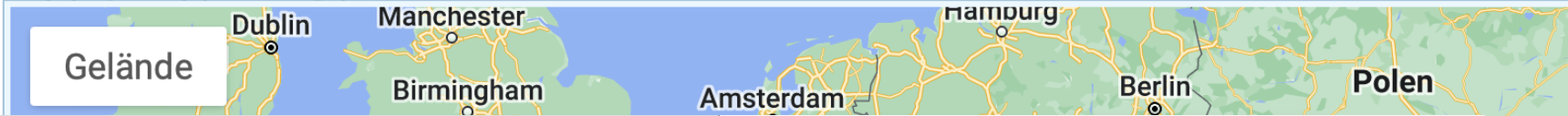
Map (Populate) (Show large)



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





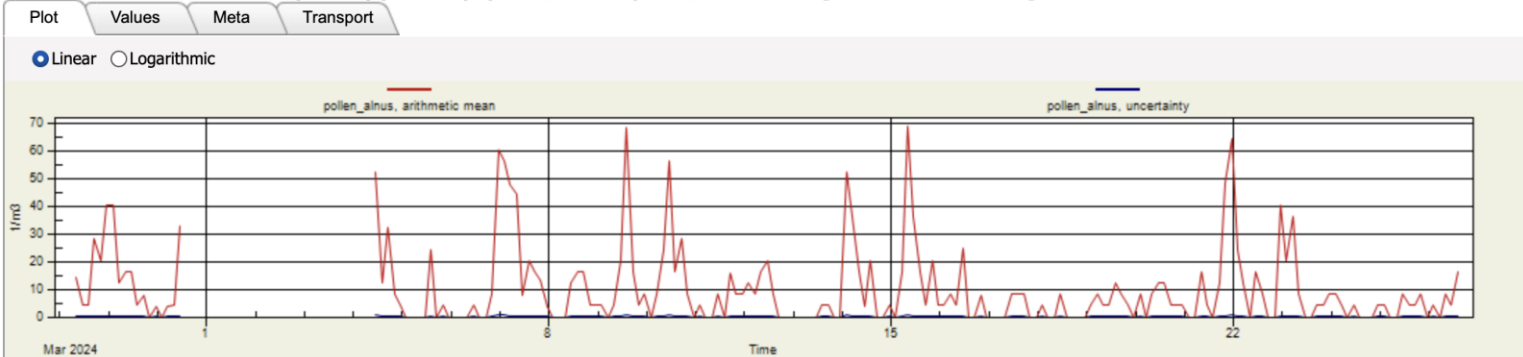
emep logo | WMO Global Atmosphere Watch World data centres on - Aerosols (GAW-WDCA) - Reactive Gases (GAW-WDCRG) | AMAP GUAN | OSPAR SIOS | European Union flag

NILU logo | WMO Global Atmosphere Watch World data centres on - Aerosols (GAW-WDCA) - Reactive Gases (GAW-WDCRG) | ACTRIS logo | AMAP GUAN HELCOM | OSPAR SIOS | European Union flag

Home | Dataset list | Acknowledgment | Data policy | | | Login

Month | | | Year | | From/To date | | | Download | Plot

Germany - München Biedersteiner (DEBIED) (DE0203U) - pollen_monitor - pollen_alnus - aerosol [2023.10.28-2024.03.26]



- Near-
- Europ
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KO

Problems

1. Somebody else has to make a nice app
2. Who will pay for the infrastructure after SYLVA has finished?
3. Who will pay for open access (who will pay the data providers)?

Conclusions

1. Automatic pollen monitoring works and is being implemented in Europe

2. Check online data at

- www.pollenscience.eu

or

- <https://www.meteoschweiz.admin.ch/home/messwerte.html?param=messwerte-pollen-birke-1h>

3. The EU- SYLVA project will change the pollen monitoring landscape in Europe



Usefull websites

1. ZAUM-online.de (map of the world of pollen monitoring stations)
2. Pollenscience.eu (pollen data online)
3. Validation.pollenscience.eu (images of pollen made by the pollenmonitor)
4. Epin.bayern.de (online pollen data)
5. <https://ebas-data.nilu.no/Default.aspx>
6. buters@tum.de