FAIRMODE | 2-3rd of March 2023 | Rome

Air Quality e-Reporting: processing of data from models at the EEA, status and perspectives

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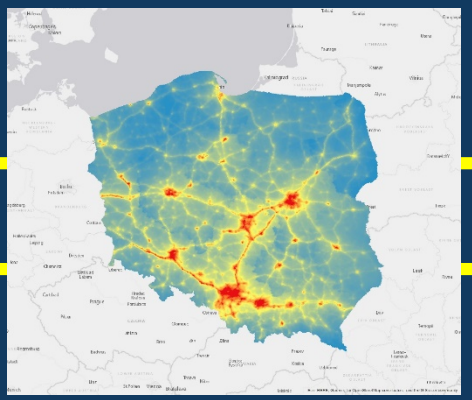
European Environment Agency

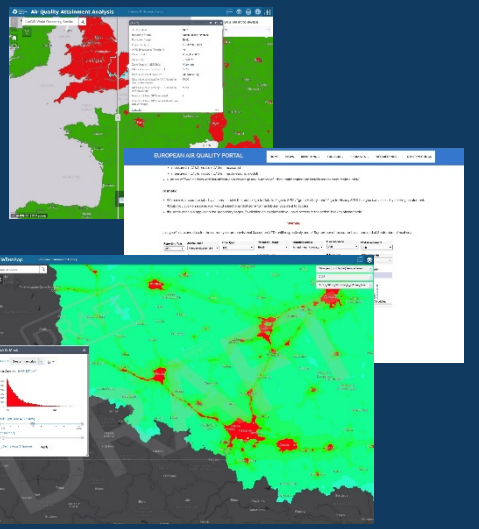
AQ modelling data processing overview

AQ modelling data: processing overview

AQ modelling data:
reporting and automated
QC in ReportNet2.

AQ modelling meta data:
processed and stored
in SQL DB.





AQ modelling results:
processed to GeoTIFFs on EEA grid before being used in maps, tables and assessments.

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AQ modelling data: processing to common format

Inline (swe -array)

geometryLink / ModelArea.localFile (shp)

ModelArea.GML

External (zip, tgz)

GeoTiff

shp

ASCII

GeoTiffs on EEA grid (3035)

find files, fetch aggregation, read/match value attributes

read projection (re-project), match resolution

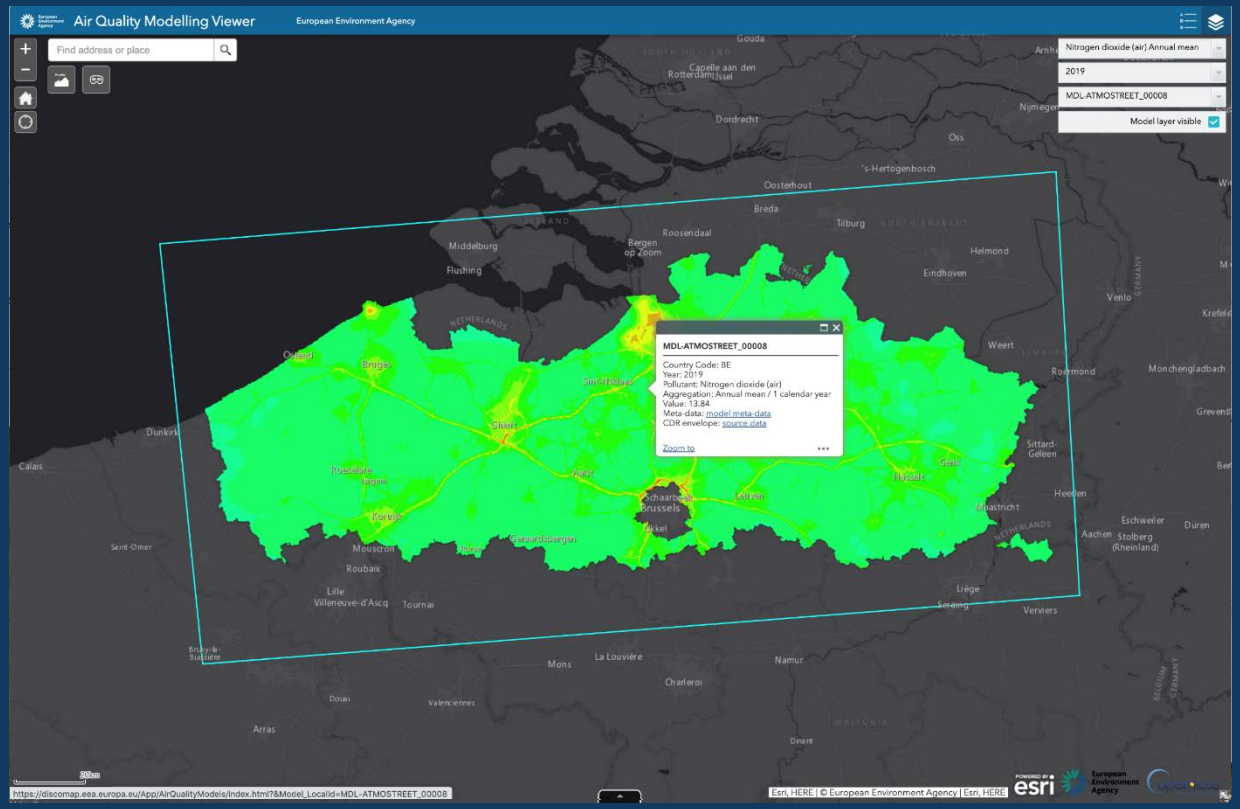
MQI, attainment, selection for viewer

AQ modelling data
maps and tables

AQ modelling data: maps and tables

AQ modelling map viewer

- AQ profiles,
- Mask functions,
- Pop-ups with links to CDR envelopes and meta-data.

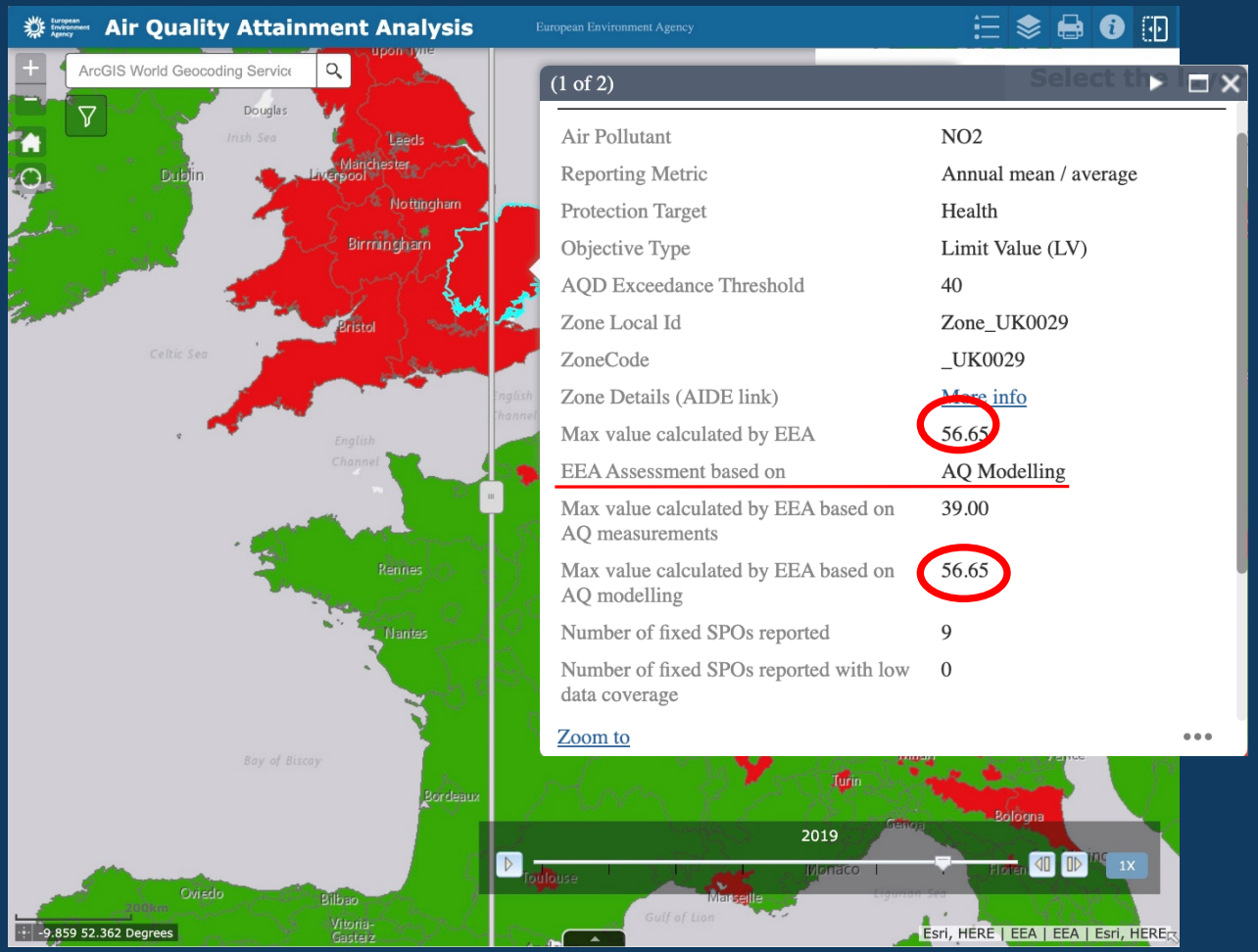


Work in progress: improving automated updates, symbology missing for some pollutant/aggregations.

AQ modelling data in EEA's assessments

AQ modelling data: EEA's assessments

Attainment analysis



Attainment analysis includes reported modelling results in attainment status calculations.

AQ modelling data in EEA's assessments - future

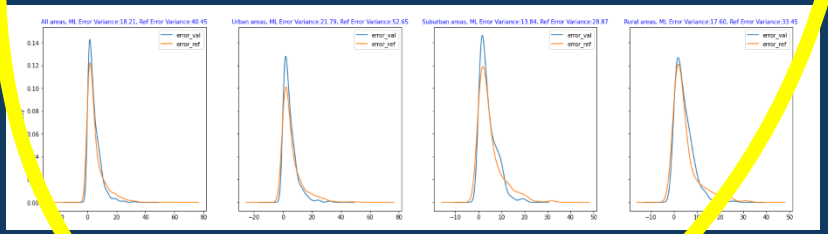
Machine learning: air quality maps

Feature selection (VIF & corr. vs target)

ML algorithm (XGBoost)

Hyperparameter tuning (cv)

Error analysis (test data set);
example below using 2014 – 2020 data

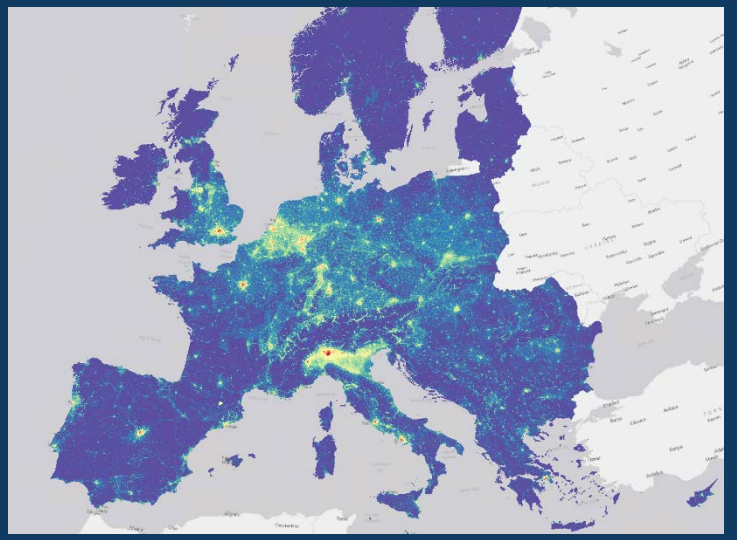


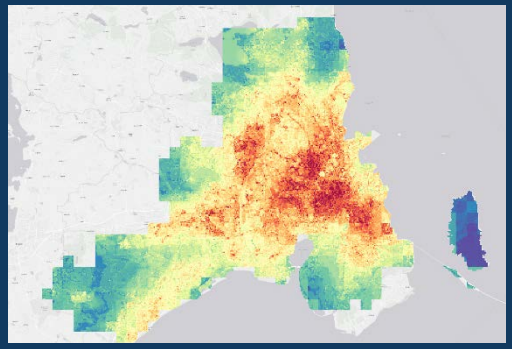
```
NO2 MQI, ML: 1.00 , Ref: 1.27
NO2 Correlation with AQ data, ML: 0.86 , Ref: 0.78
NO2 RMSE, ML: 6.21 , Ref: 8.34
```

not automated, Databricks notebooks

predictions

Air Quality spatial predictions
(downscaling to 1 km for Europe, 100 m for cities)





NO2, 2020, annual mean, Europe on 1km, Copenhagen on 100m

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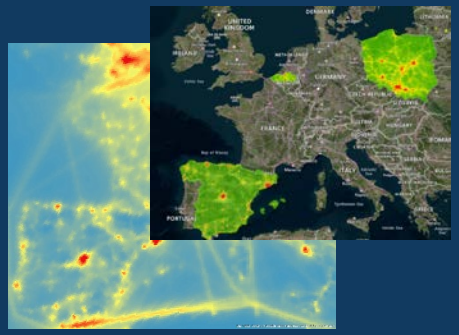
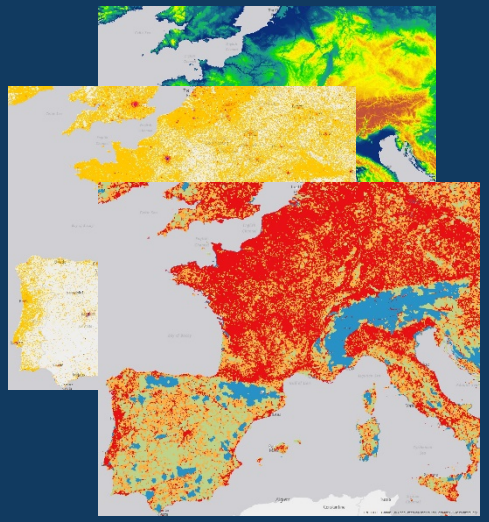
Machine learning: air quality maps

Copernicus Atmospheric Monitoring Service



ML product of CAMS trained on reported AQ modelling results

Copernicus Land Monitoring Service



Air Quality e-Reporting

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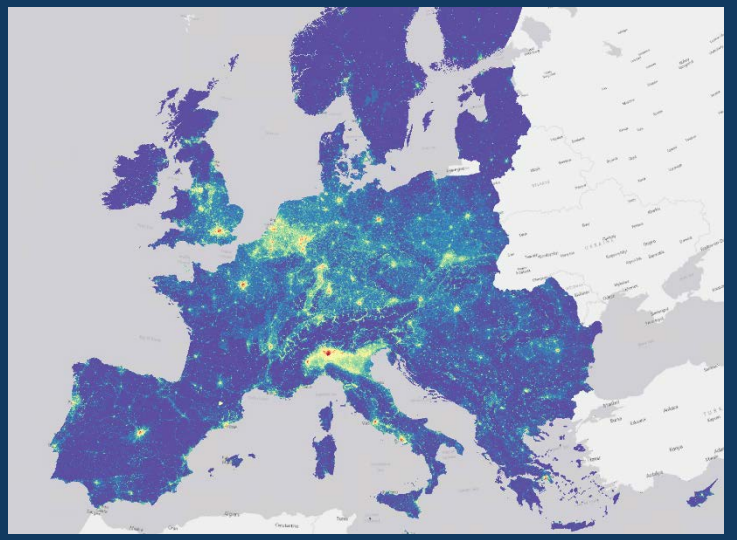

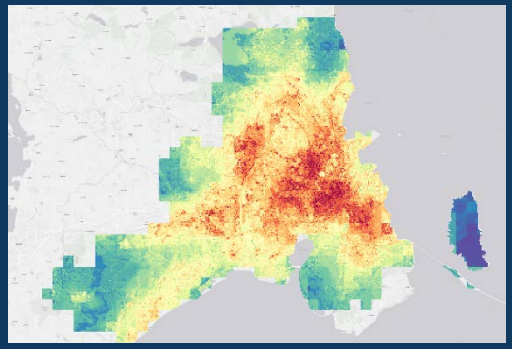

NO2, 2020, annual mean, Europe on 1km, Copenhagen on 100m

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Thank you for your attention!