

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

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*AQ modelling data
processing overview*

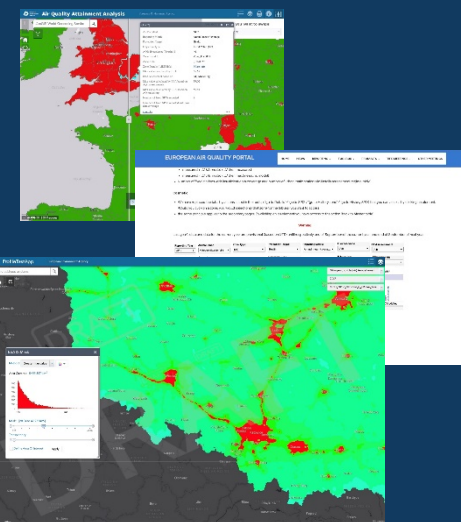
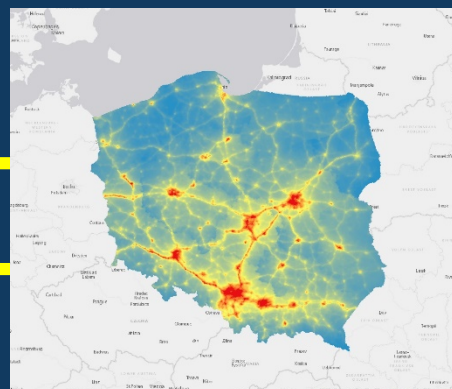


AQ modelling data: processing overview

The screenshot shows the EIONET Central Data Repository interface. The main content area displays details for a report titled 'Etb_2019_version_1'. The report is for Poland, covering the year 2019, and was reported on 24 Sep 2020. The status is 'Envelope is complete (Technically accepted)'. Below the report details, there is a list of files in the envelope, including various model output files (e.g., mod_pl_nox_19h_2019.zip, mod_pl_nox_a_2019.zip) and their respective sizes. A feedback section at the bottom lists several automated actions, such as 'AutomaticQA result for file PL_REP_Etb_2019_RETRO.v1.xml' and 'Confirmation of receipts'.

AQ modelling data:
reporting and automated
QC in ReportNet2.

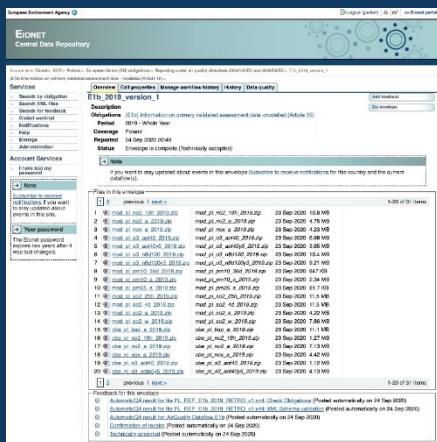
AQ modelling meta data:
processed and stored
in SQL DB.



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



AQ modelling data: processing to common format



Inline
(swe
-array)

External (zip, tgz)

geometryLink /
ModelArea.localFile
(shp)

ModelArea.GML

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

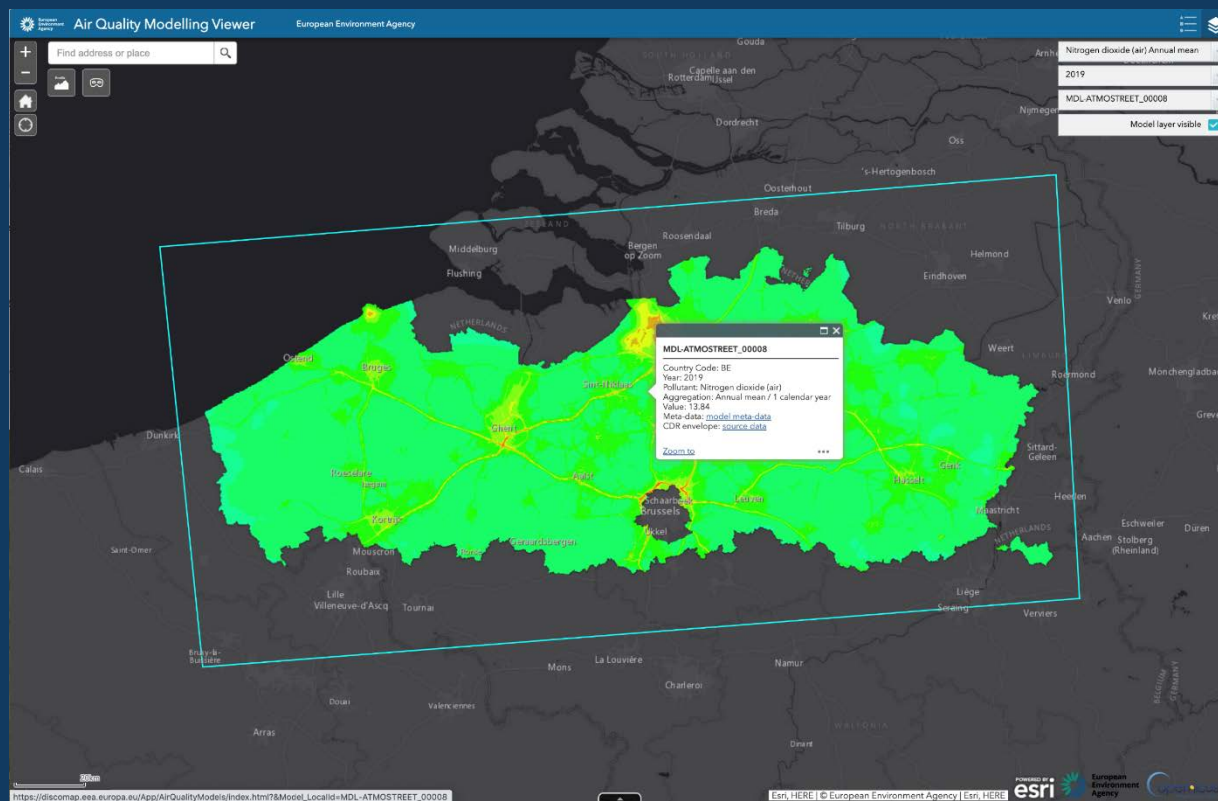
***AQ modelling data
maps and tables***



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.

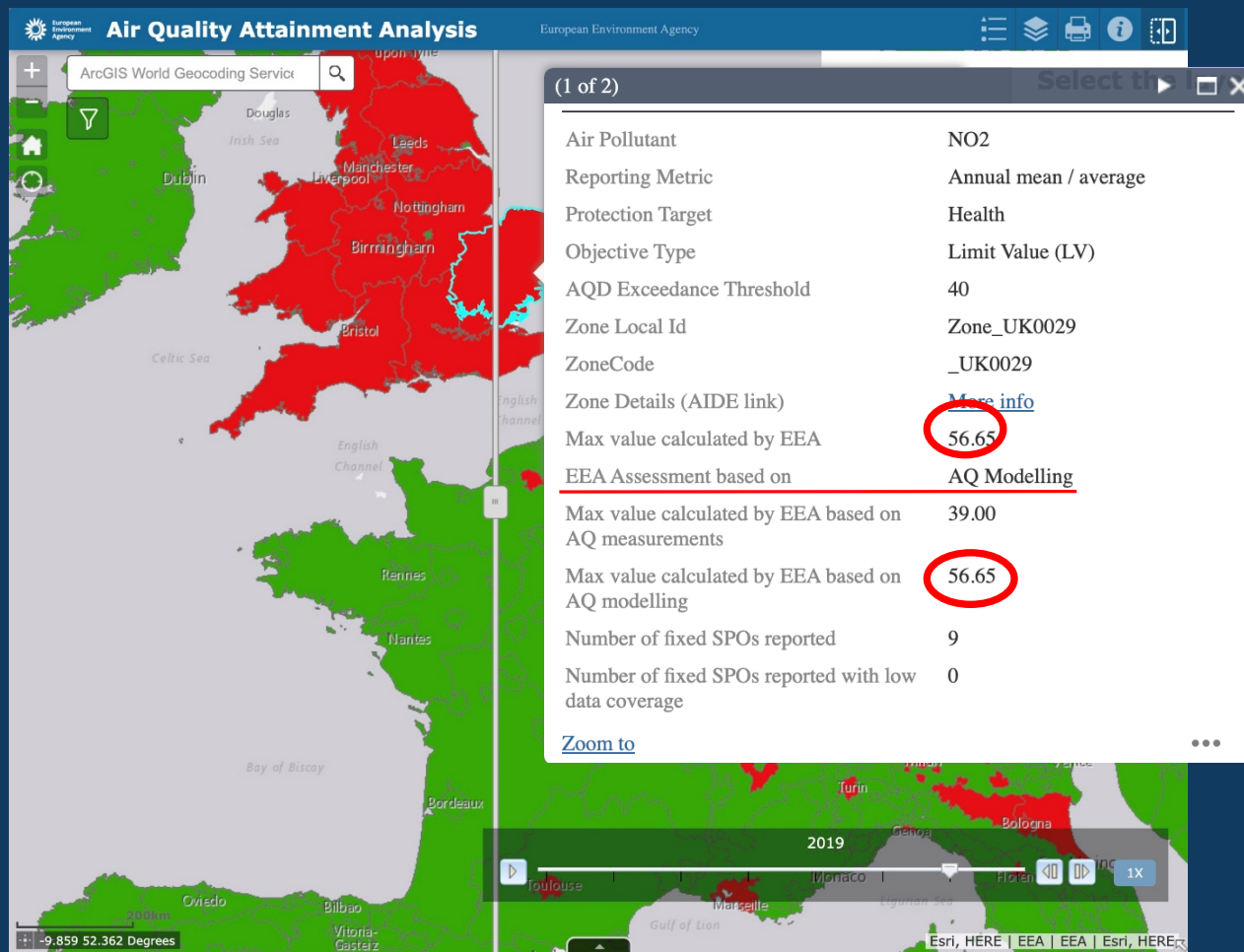


*AQ modelling data
in EEA's assessments*



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

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

Feature selection
(VIF & corr. vs target)

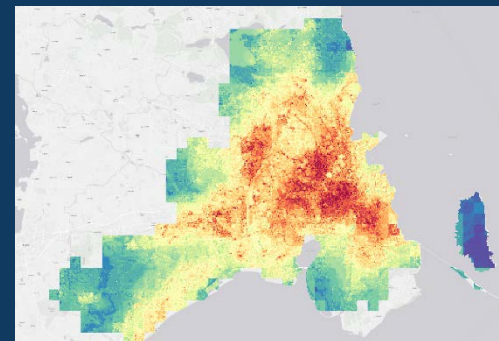
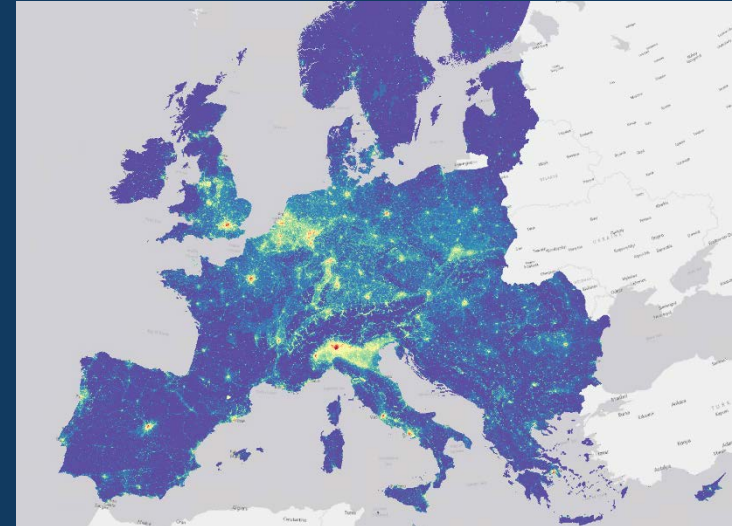
not automated,
Databricks
notebooks

ML algorithm
(XGBoost)

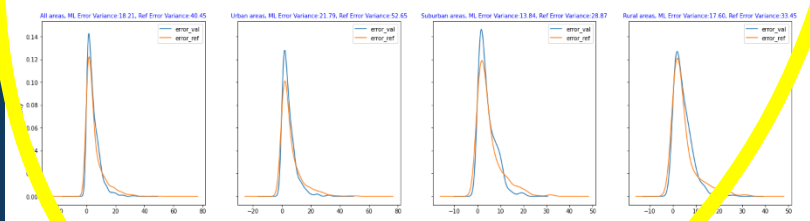
Hyperparameter
tuning (cv)

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

predictions



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

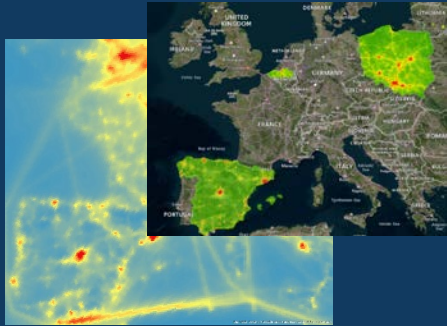


NO2 MQI, ML: 1.00 , Ref: 1.27
NO2 Correlation with AQ data, ML: 0.86 , Ref: 0.78
NO2 RMSE, ML: 6.21 , Ref: 8.34

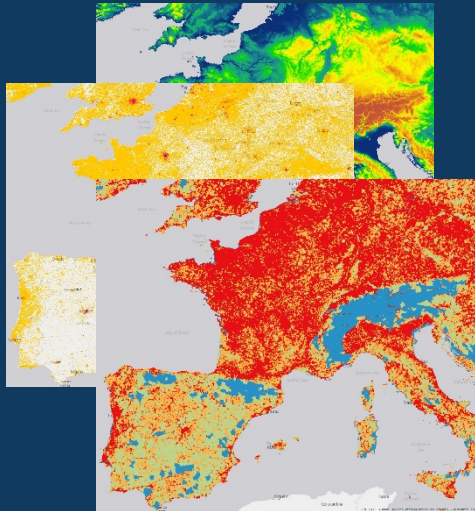


Machine learning: air quality maps

Copernicus
Atmospheric
Monitoring
Service



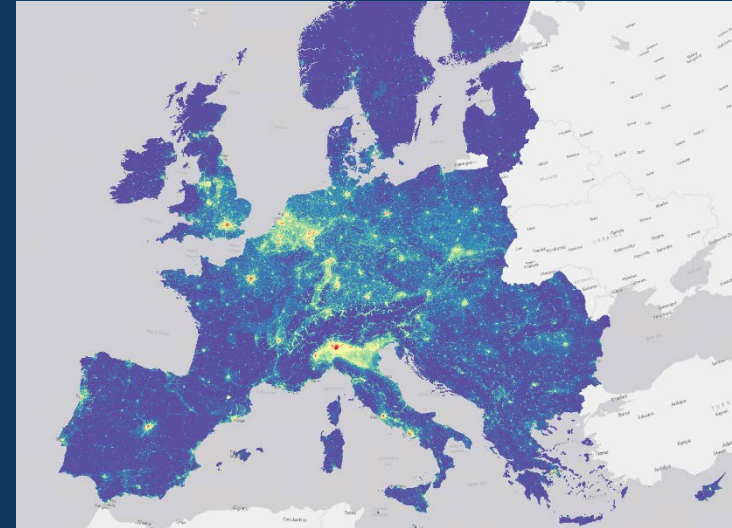
Copernicus
Land
Monitoring
Service



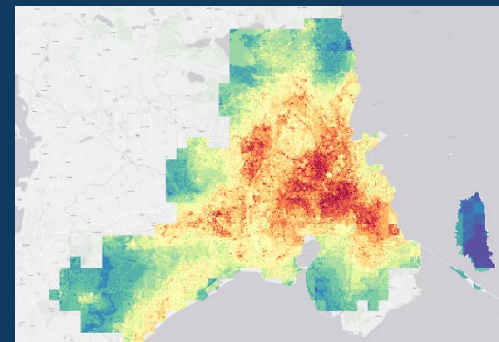
ML product
of CAMS trained
on reported AQ
modelling results



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



*Air Quality
e-Reporting*



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



Thank you for your attention!

