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CAMS – FAIRMODE WG8 Joint evaluation exercise
Natural Dust contribution to exceedances of limit values

Contribution from Poland

Cams policy user workshop 04.10

Atmosphere Monitoring

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Method details:

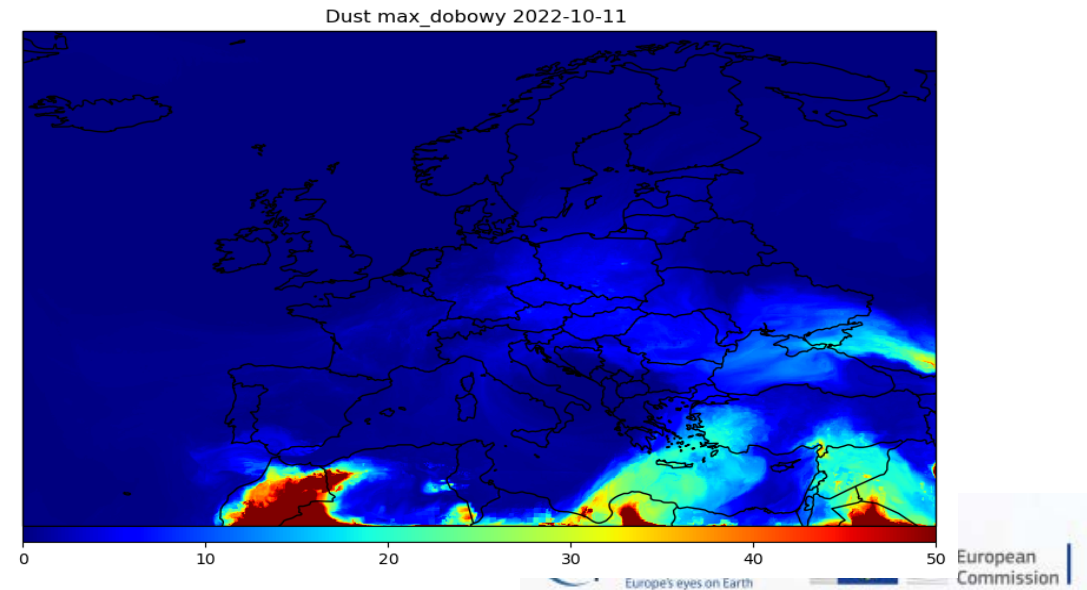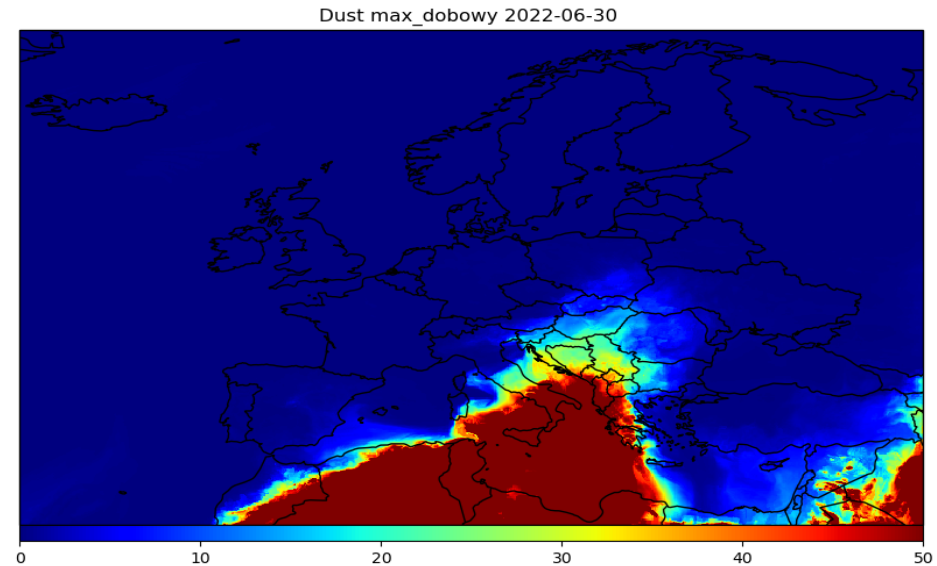**IOS-PIB provides CAMS data to GIOS → GIOS decides on the methodology and deduction**

1) the timeframe of the exceedance to be analyzed: one year (assessment year)
2) and the main reason why this episode is selected: exceedances at stations (observed)

3) Currently used deduction methodology: internal document - Guidelines for subtracting the contribution of natural sources and road sand and salt in air quality assessments based on European Commission guidance (2022) – different options including CAMS

4) Testing CAMS dust products: DUST, PMWF, PM10 – ENSEMBLE analysis from CAMS2_40

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- **Currently calculated natural dust contribution:**

  - Daily average and daily maximum DUST, PMWF, PM10, fraction DUST/PM10, PMWF/PM10 – data, maps and time series for station locations

  - deduction of natural dust concentrations using the calculated contribution from CAMS models and concentrations observed at rural background stations(PM10_GIOŚ)

  - based on time-series and the animation of DUST concentration the episodes of dust inflow are selected

Dust max_dobowy 2022-06-30

Dust max_dobowy 2022-10-11

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Current calculated natural dust contribution,

- **Load_PM10_rural = (DUST/PM10) x PM10_GIOŚ** (nearest rural background station)

- **PM10_corrected = PM10_GIOŚ** (station with exceedances) **- Load_PM10_rural**

Kod stacji	2022-04-23		2022-04-25		2022-04-26	
	S24 before	S24 after	S24 before	S24 after	S24 before	S24 after
	[μg/m³]	[μg/m³]	[μg/m³]	[μg/m³]	[μg/m³]	[μg/m³]
KpNaklSkargi	67	61	54	50	48	41
KpInowSolank	78	71	125	121	48	41
KpGrudSienki	38	31	67	63	55	48
KpZielBoryTu	51	45	46	42	58	51

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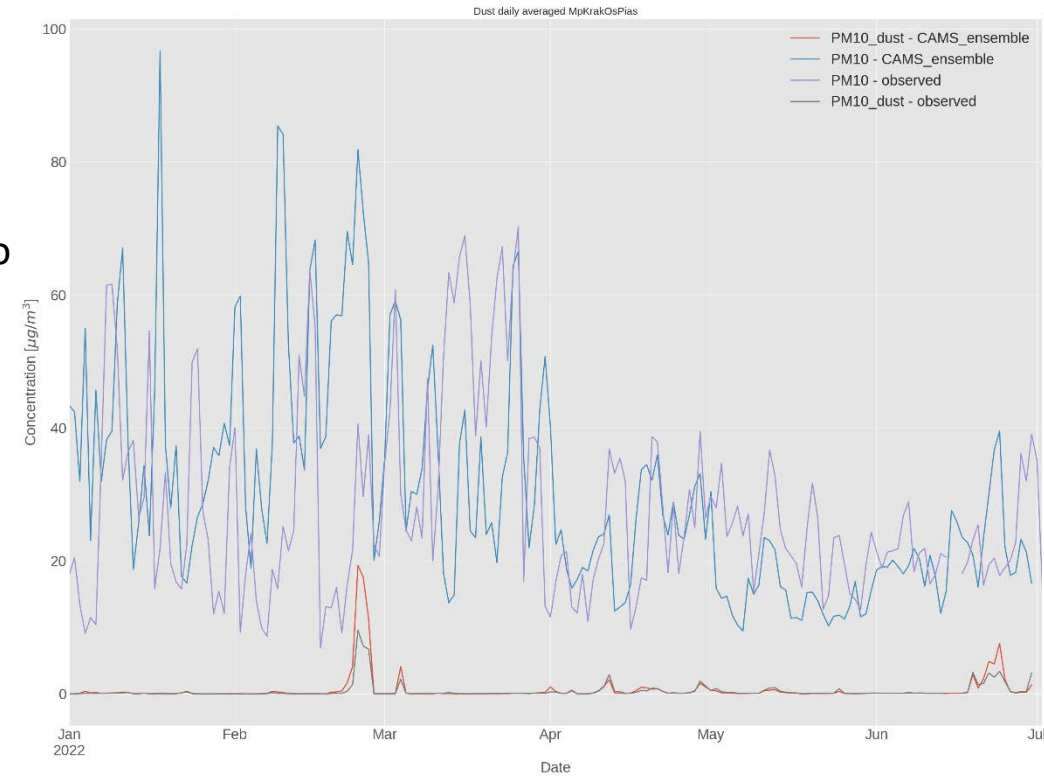
Current methodology used

- each voivodship makes deductions in its own area on the basis of adopted rules – guidelines

- there is no collective report on deductions for the whole country

- deductions are made when a maximum of 35 days exceeding 50 ug/m3 or an annual average is exceeded at a station

- a report of deductions is made if the threshold <35 days with exceedances is obtained as a result of deductions (attachment to the report of the annual air quality assessment). If the threshold <35 days is not obtained, it is only mentioned that the deduction was unsuccessful

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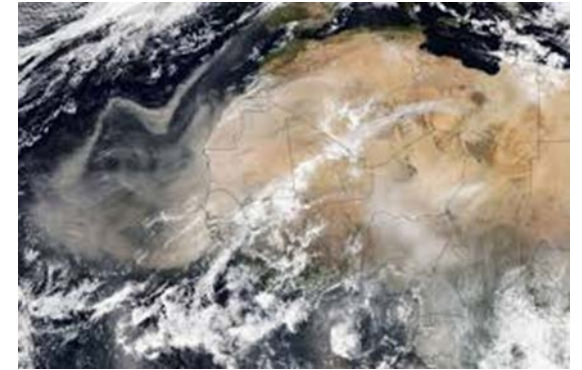
- How to define the dust episode (threshold set for DUST or for fraction?)

- Correct or not:
  - Deduction only for stations with exceedances (not linked to the modelled concentrations provided for the assessment, not applied for all stations)
  - Deduction only for days with exceedances (not directly linked to the dust episodes)
  - Deduction for urban stations based on fraction calculated for the other grid point (representing nearest rural station)
  - „Regional DUST load" is subtracted and not scaled

- Traffic stations – shall we include traffic stations in dust deduction analysis?

Dust daily averaged MpKrakOsPias

Legend:
- PM10_dust - CAMS_ensemble
- PM10 - CAMS_ensemble
- PM10 - observed
- PM10_dust - observed

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Updated guidelines refering to CAMS data submitted to Chief Inspectorate on 02.10.2023
Main lessons learned:
- Modelled DUST is highly variable – very high daily maximum as compared to daily average
- Modelled DUST in peaks may exceed observed PM10 concentrations
- Using scaling at traffic stations leads to overestimated contribution, subtraction lead to negligible change

Next steps
- Application of method for entire year / domain / stations
- Testing different deduction methods
- Comparison with the GEM-AQ dust from the national modelling
- Natural dust provision as a part of CAMS NCP – completed for 2023

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Thank you!