



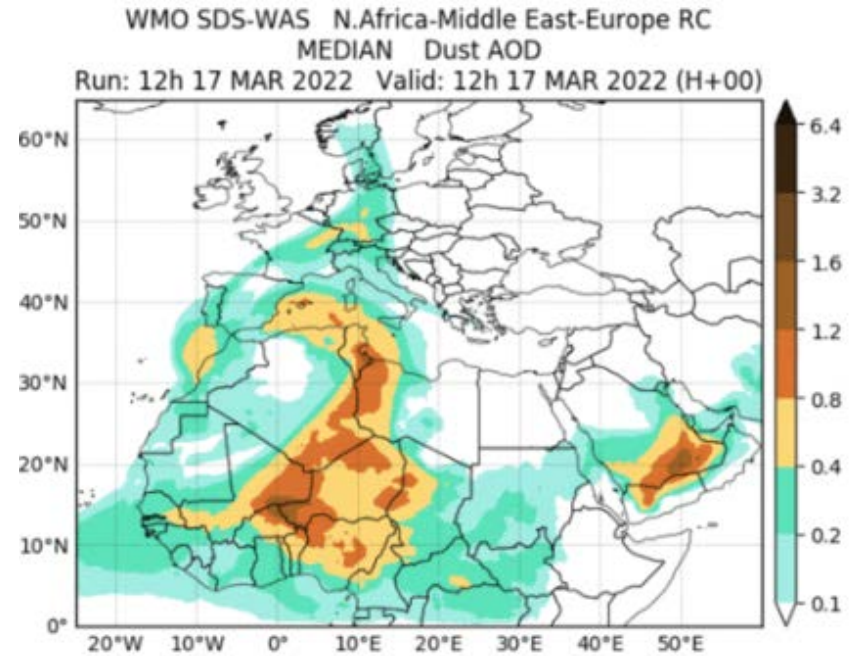
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Desert Dust in Austria 15.-17.3.2022 – Comparison of different assessment results

Wolfgang Spangl, 4.-6.10.2023

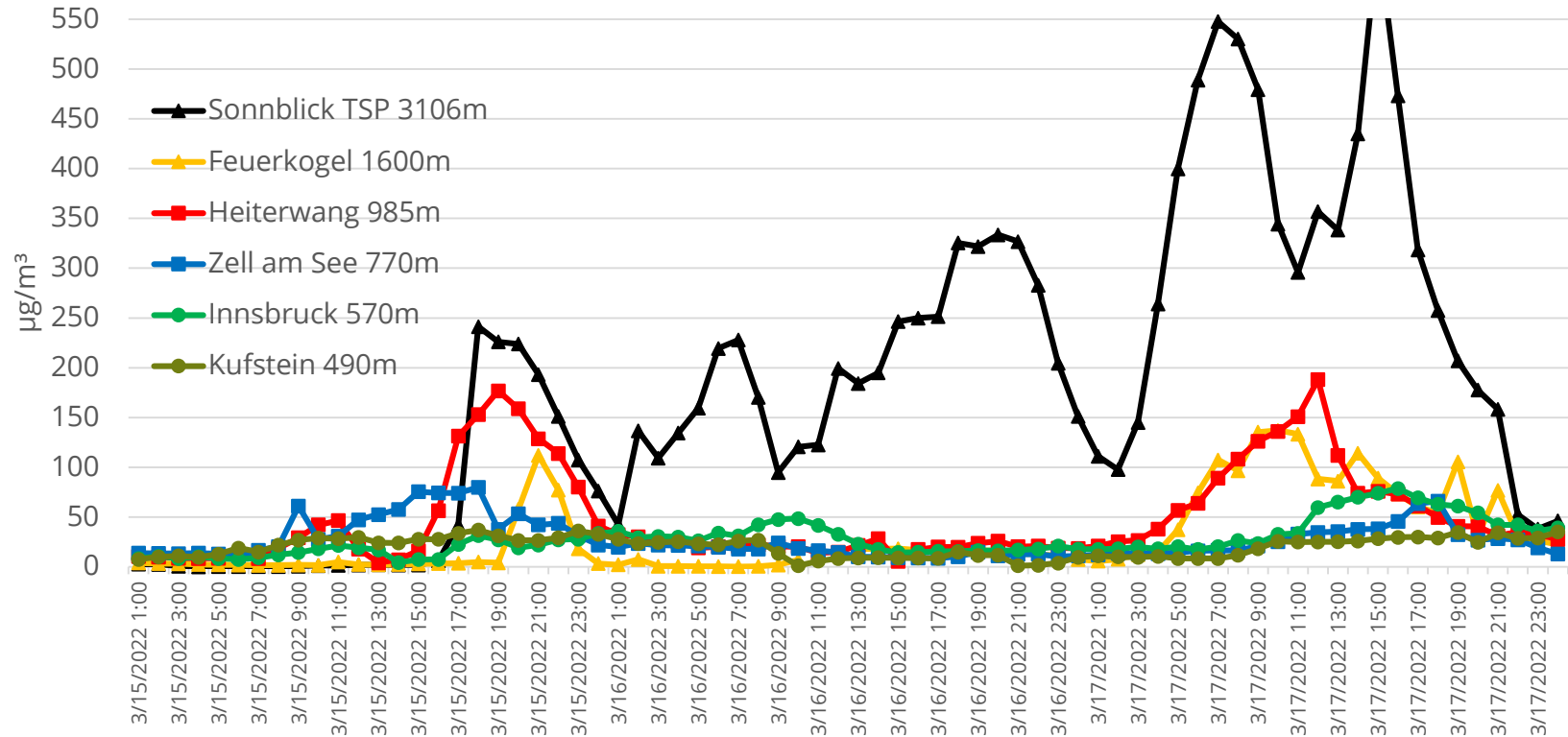
CHARACTERISTICS OF DESERT DUST EVENTS IN AUSTRIA

- In most cases advection from West (from western Sahara over Spain and France) to the Alps, less frequently directly from South (over Italy)
- Advection of desert dust in high altitudes → highest PM concentrations at high alpine monitoring sites
- Ground-level PM concentrations depend on vertical mixing → complex spatial and temporal concentration pattern in Alpine regions.



Source: WMO SDS-WAS

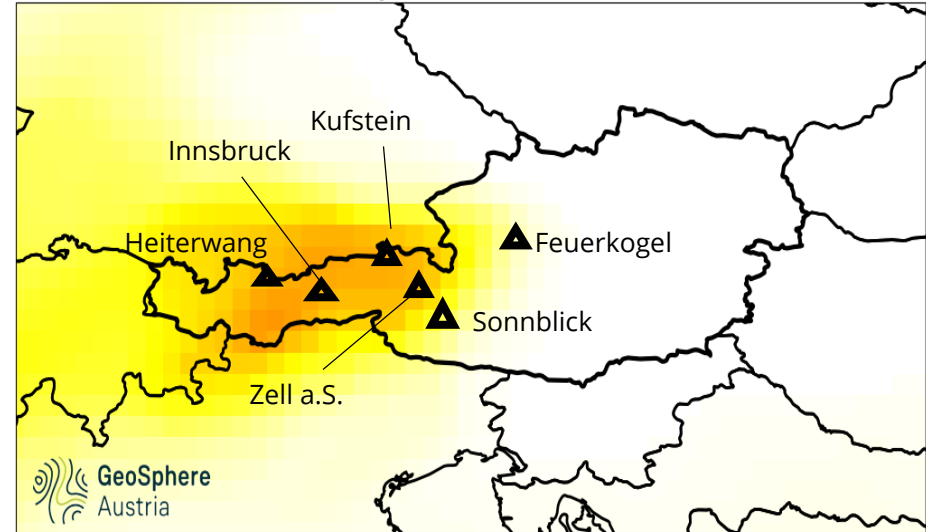
PM₁₀ MEASURED CONCENTRATIONS 15. – 17.3.2022



MODELLED GROUND-LEVEL DESERT DUST IN AUSTRIA

- Sahara Dust reached ground levels in the western parts of Austria
- The region of high desert dust concentrations is modelled quite well
- Locations, time periods and concentrations of desert dust are not precisely modelled

WRF-Chem: Dust concentration
Daily Mean 17.03.2022



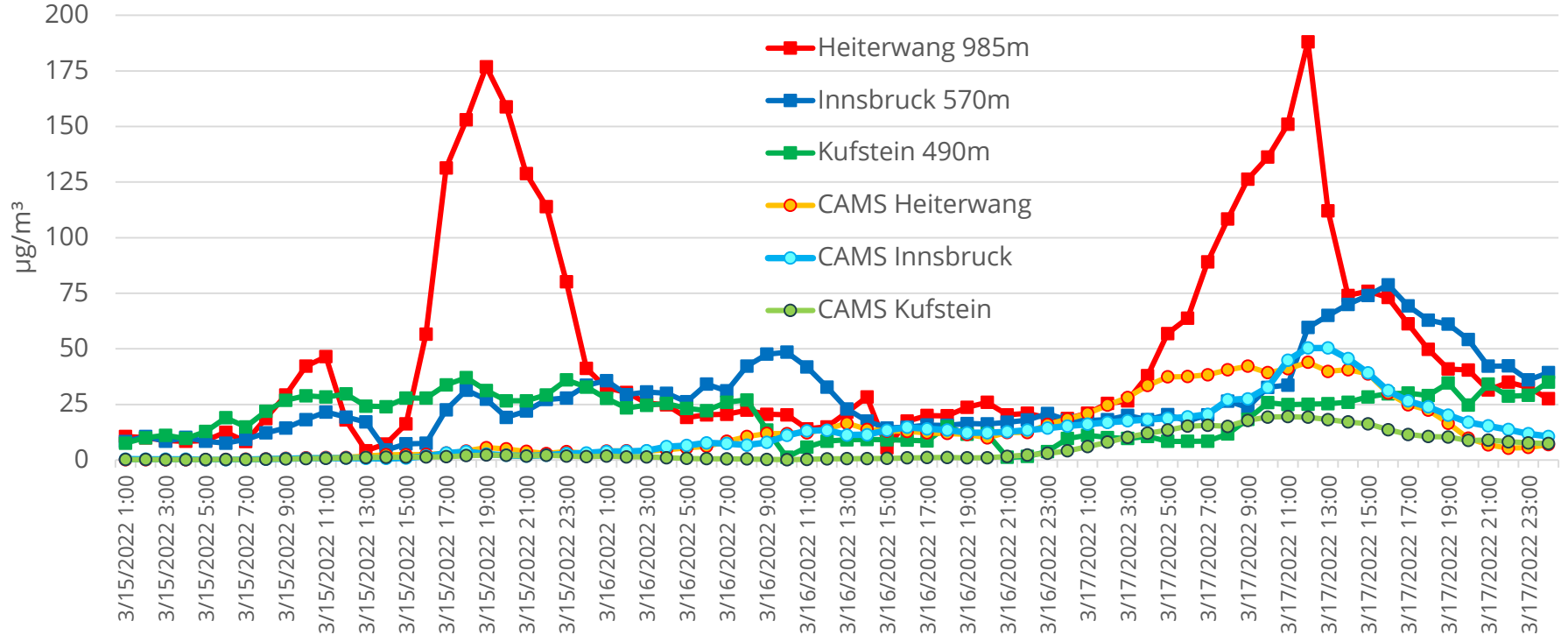
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ASSESSMENT OF DESERT DUST IN AUSTRIA

Comparison of different assessment methods:

- CAMS model results: Hourly values for PM monitoring sites
- Commission Staff Working Paper establishing guidelines for demonstration and subtraction of exceedances attributable to natural sources under the Directive 2008/50/EC on ambient air quality and cleaner air for Europe (2011) (based on method developed for Spain by Escudero, Pey)
- Analysis of additional monitoring data as indicators for desert dust:
 - Low $PM_{2,5}/PM_{10}$ ratio,
 - Low relative humidity,
 - High temperature,
 - Low concentrations of anthropogenic pollutants

MEASURED PM₁₀ CONCENTRATIONS, CAMS MODELLED DESERT DUST CONTRIBUTION



DESERT DUST (DD) CONTRIBUTION - COMPARISON OF DIFFERENT ASSESSMENT METHODS

Station	Date	PM ₁₀ observed (µg/m ³)	DD - CAMS (µg/m ³)	DD - EC Guideline (µg/m ³)	DD - Additional data (RH, PM _{2.5} , ...) (µg/m ³)
Zell a.S.	15.3.	39	0	17	~5
Zell a.S.	16.3.	10	2	0	0
Zell a.S.	17.3.	28	19	9	~10
Innsbruck	15.3.	17	1	1	0
Innsbruck	16.3.	27	10	10	~5
Innsbruck	17.3.	40	26	25	~20
Heiterwang	15.3.	54	2	37	~35
Heiterwang	16.3.	21	11	4	0
Heiterwang	17.3.	70	28	54	~50

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FAIRMODE Technical Meeting

Athens, 4-6 Oct. 2023