



ICMGP 2024

CAPE TOWN • SOUTH AFRICA • 21 - 26 JULY



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**A multi-year record of atmospheric mercury concentrations
at a regional site in the South African interior**

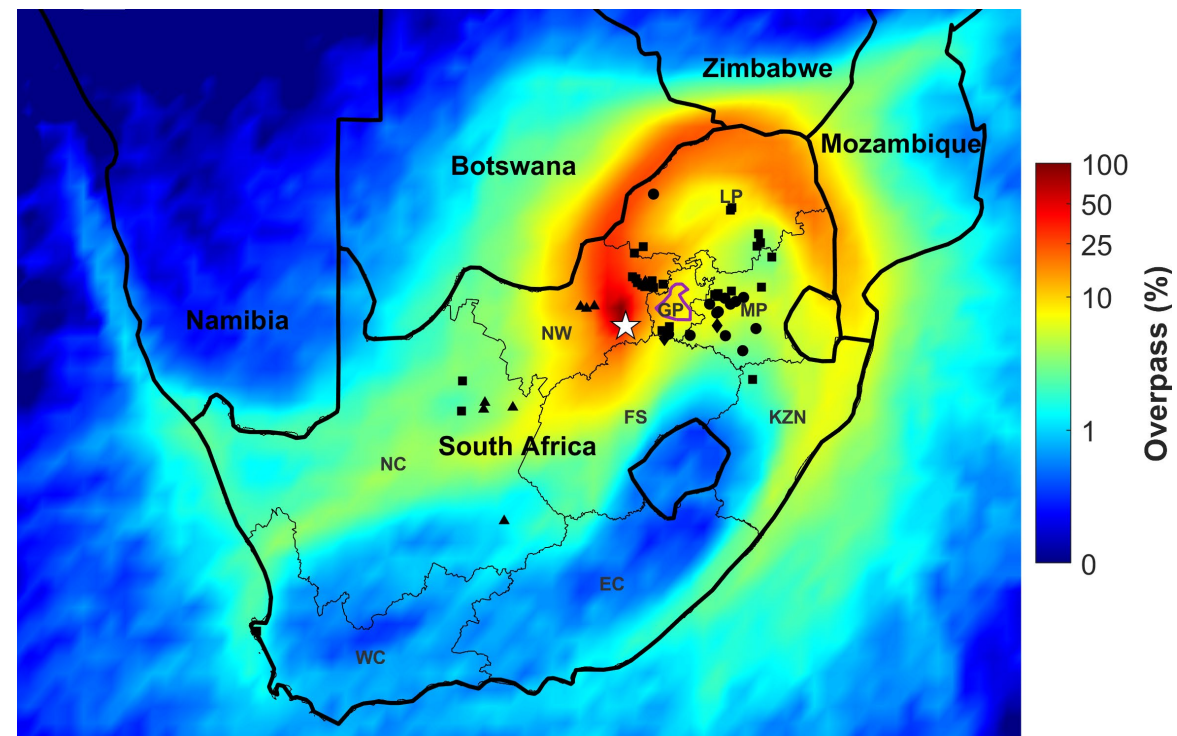


What is the research gap?

- Atmospheric mercury pollution is a **global** health concern.
- **South Africa** (SA) is one of the most prominent Hg emitters globally.
- Signatory of the **Minamata Convention**.
- No **ambient air quality standard** currently exists for Hg.
- **Previous** Hg research in SA:
 - CP GAW – marine background site.
 - Inland sites – industry, polluted areas, short campaigns.
- **Welgegund** is an inland site that samples a variety of air masses.



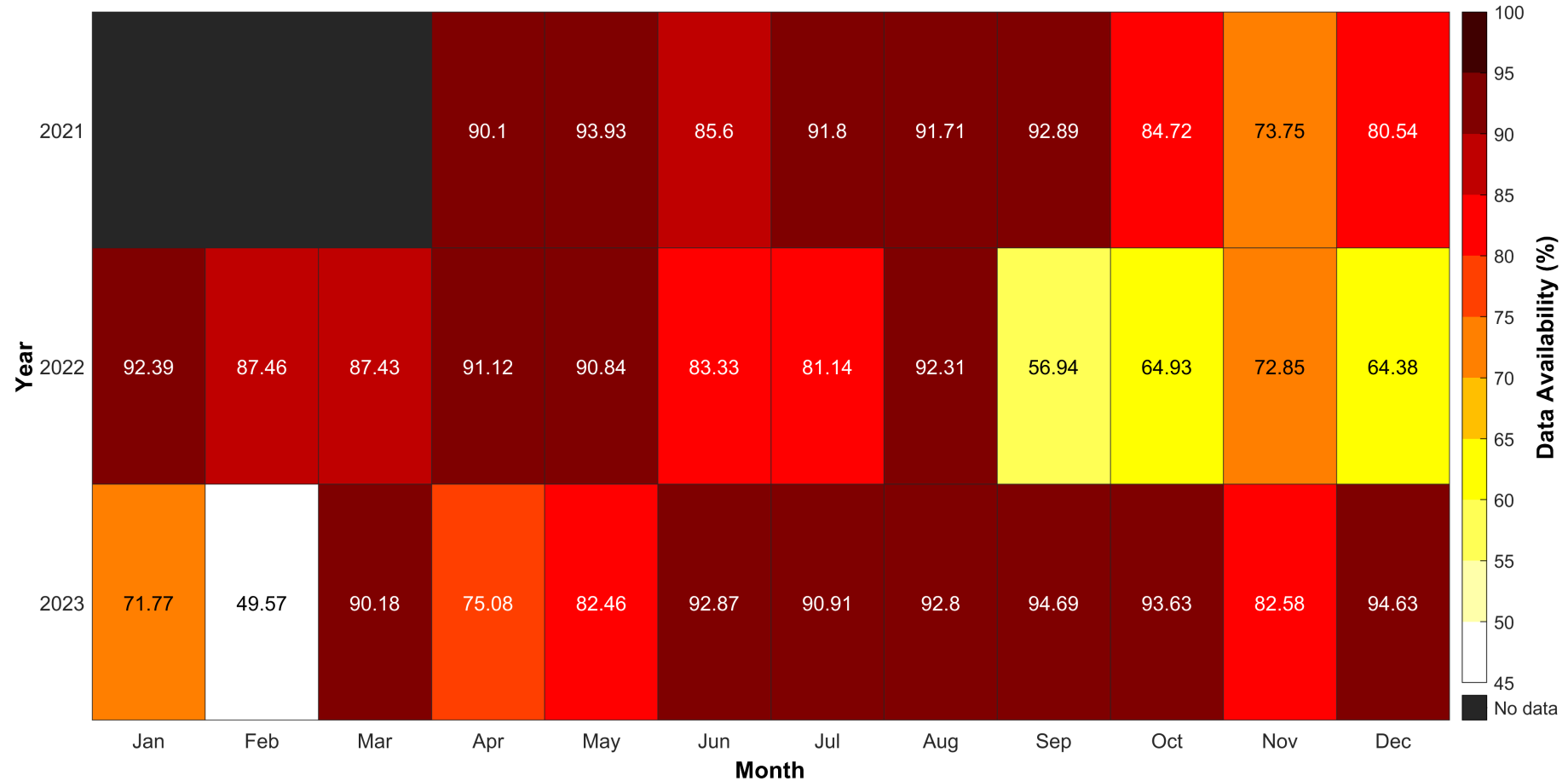
Welgegund monitoring site



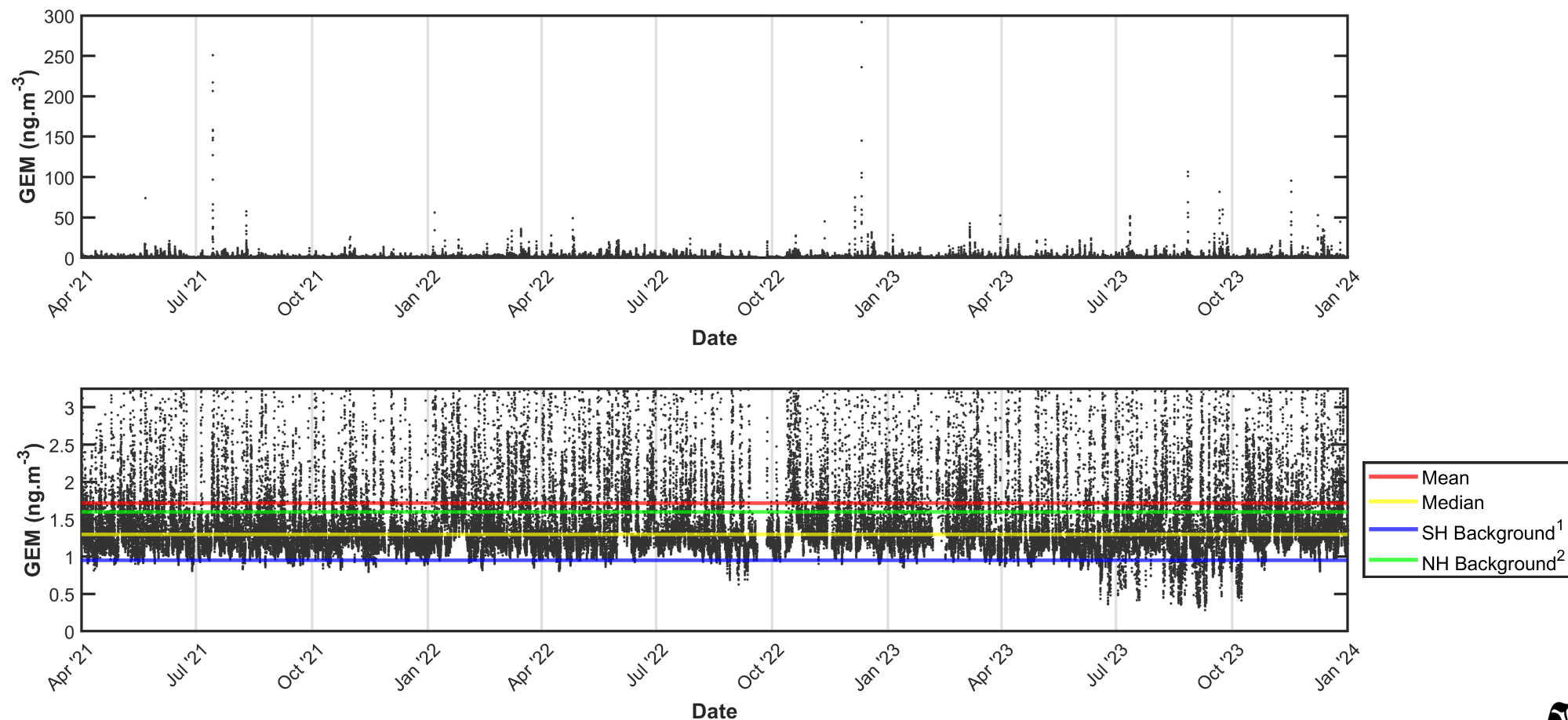
<https://en.ilmatieltenlaitos.fi/welgegund-research-station>



“Loadshedding” impacted data availability



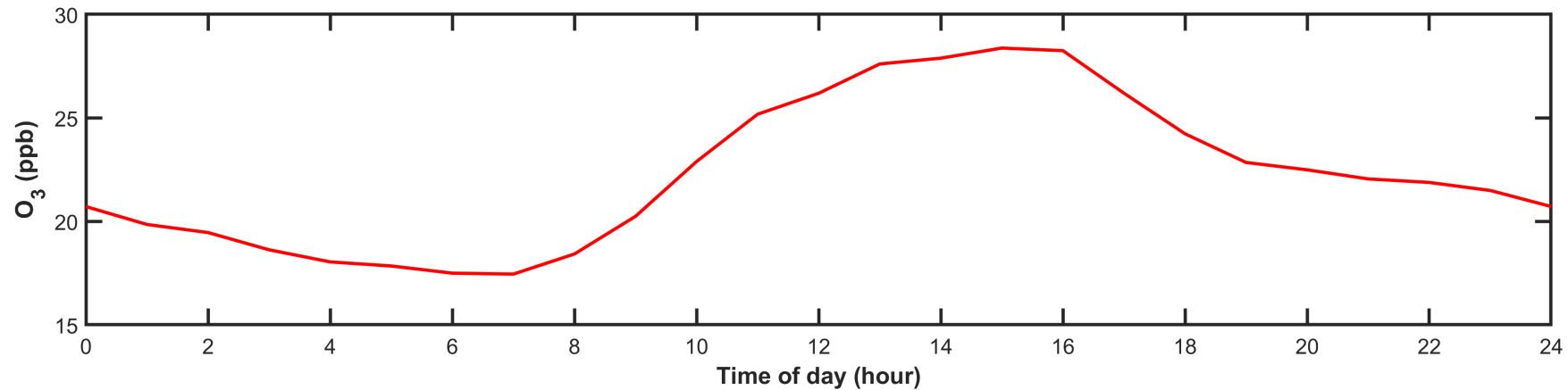
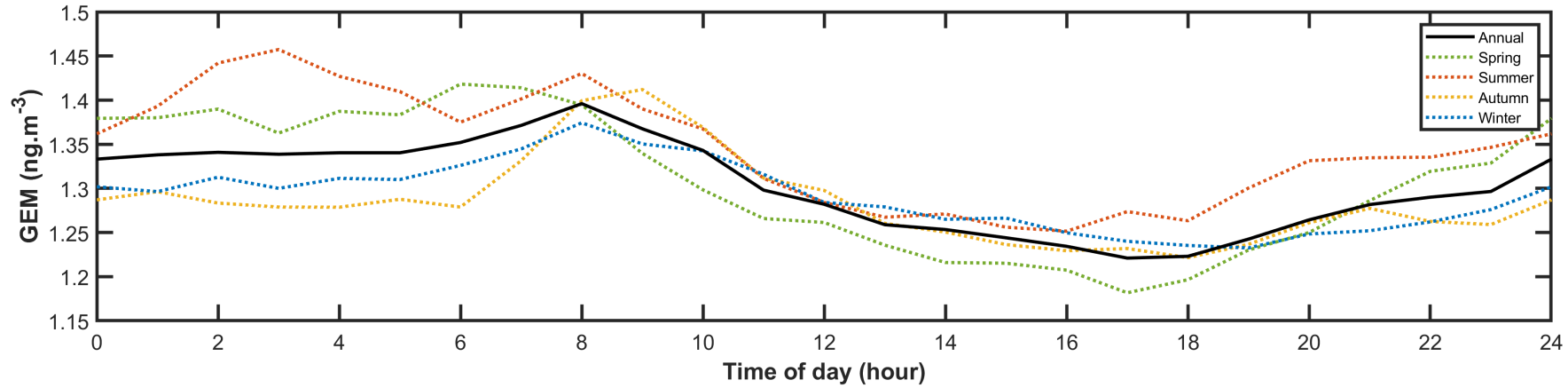
GEM at Welgegund within the global context



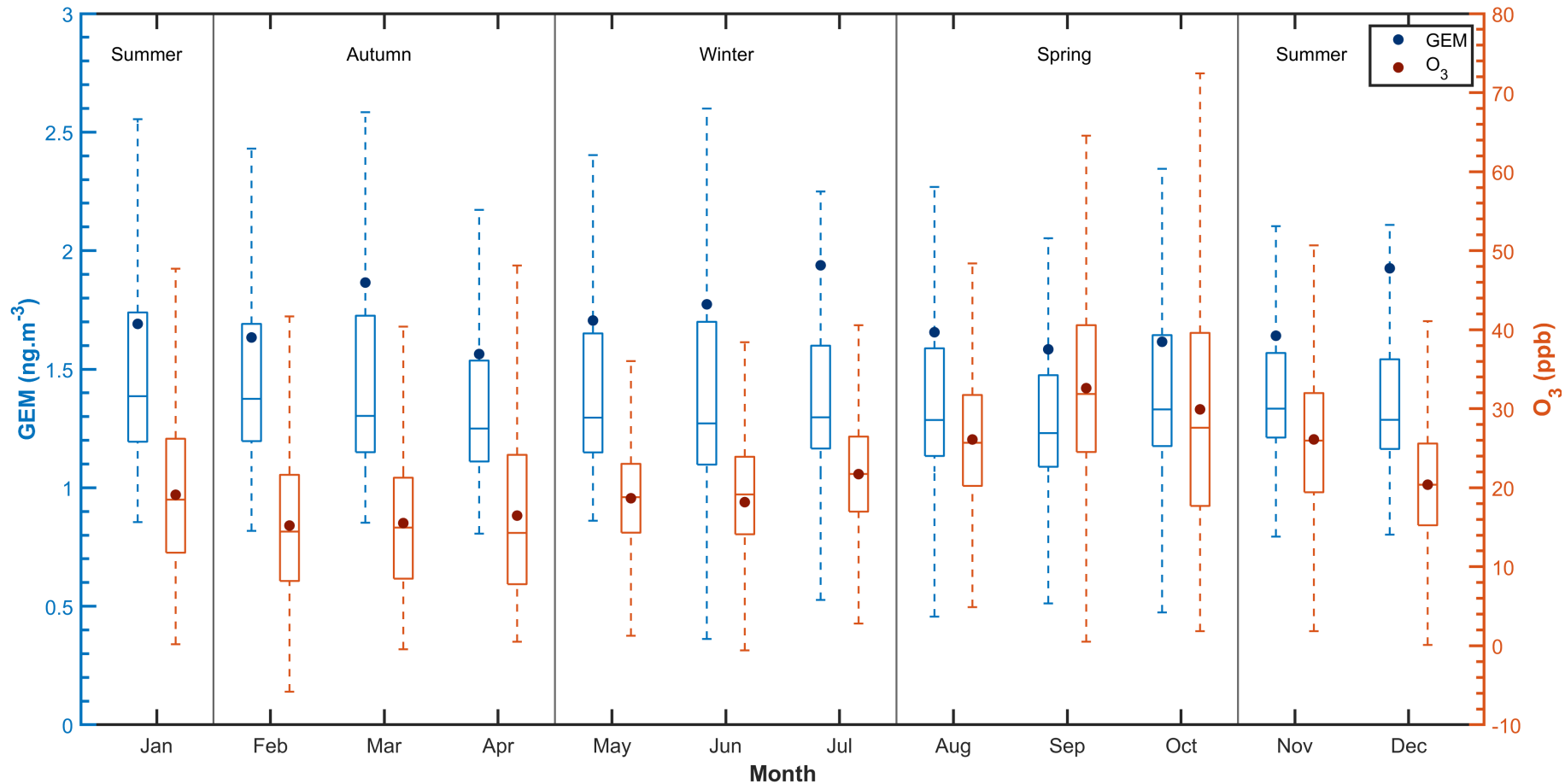
[1] Slemr *et al.*, 2015, [2]. Sprovieri *et al.*, 2016



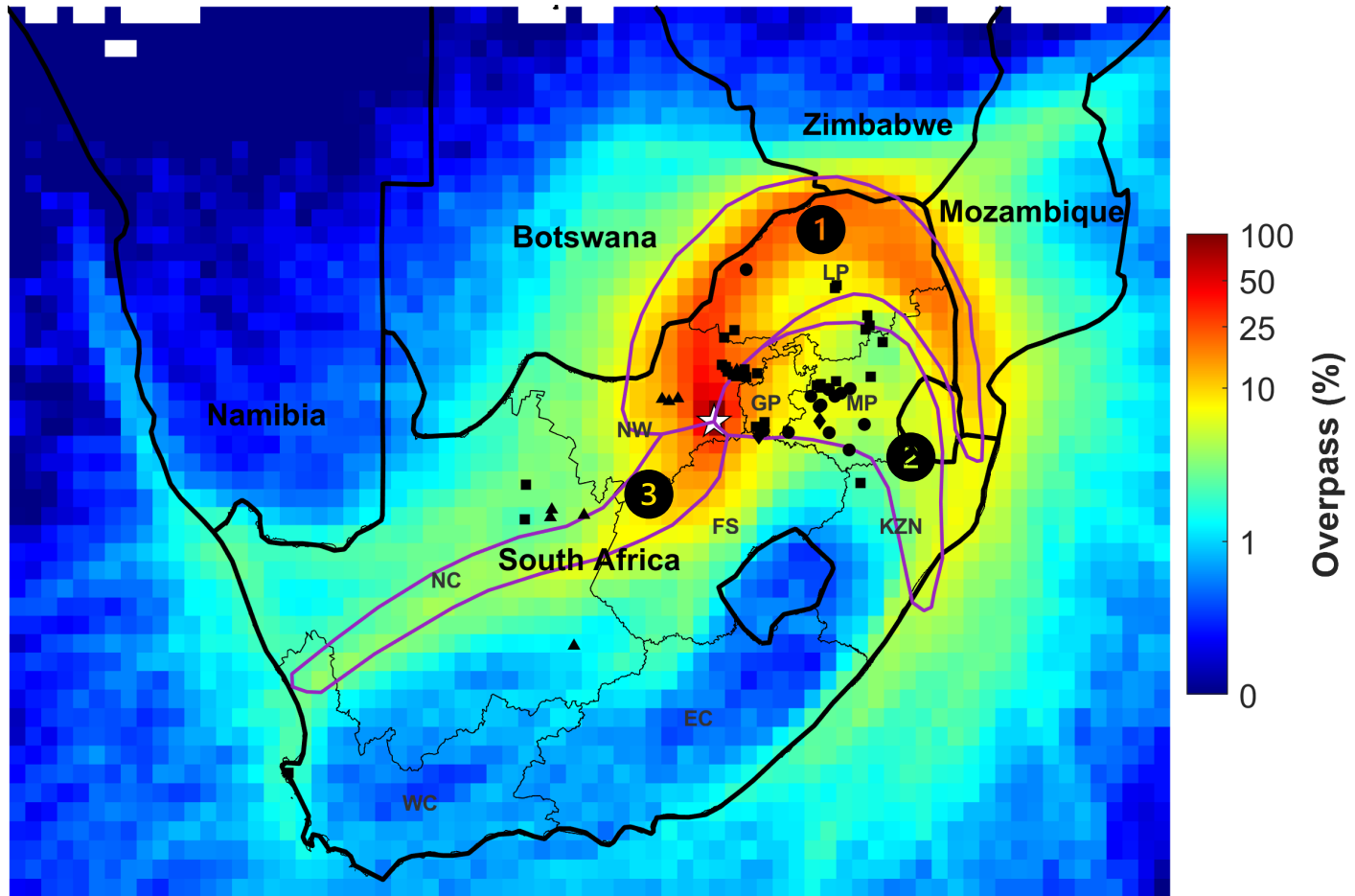
Diurnal variation in GEM



Seasonal variation in GEM



Spatial variation in GEM

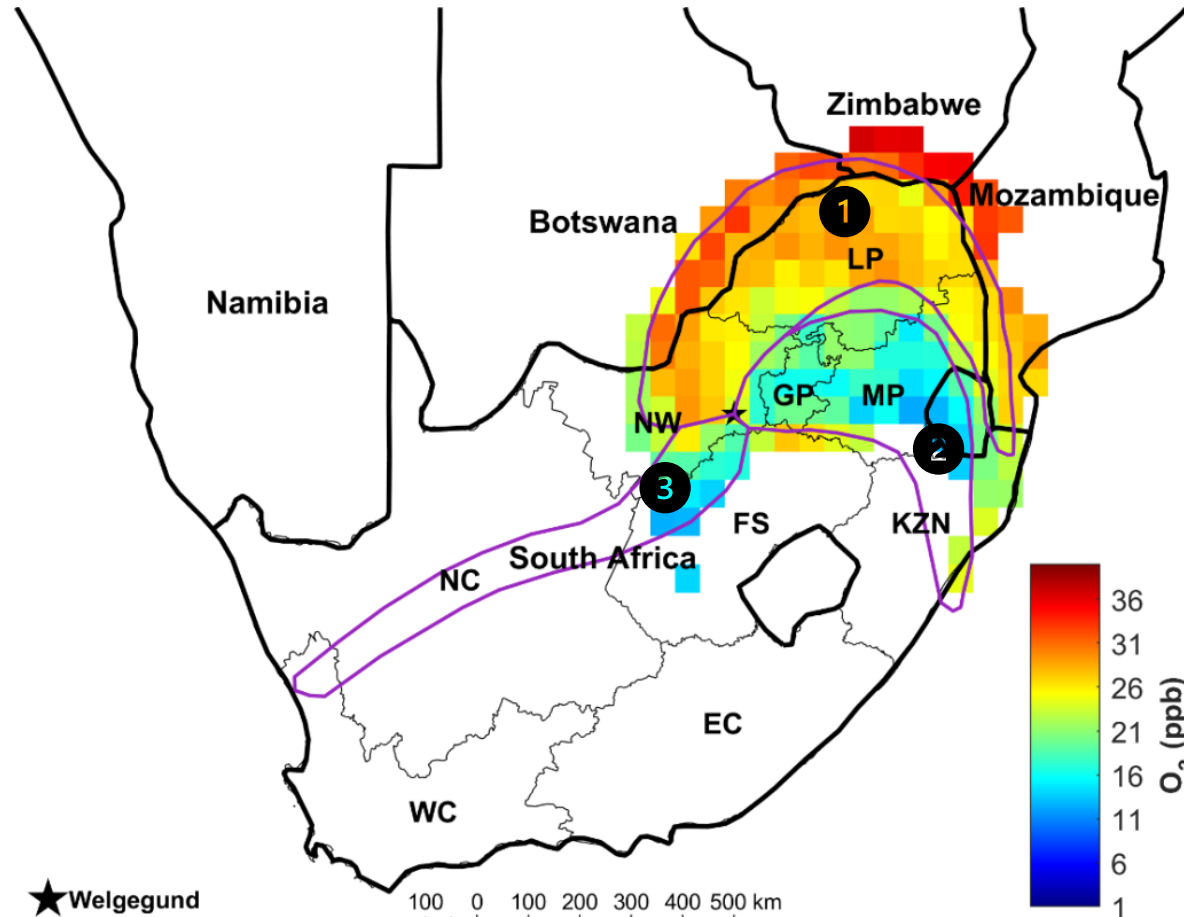


Regional GEM mean:

- ① 1,25 ng.m⁻³
- ② 1,91 ng.m⁻³
- ③ 2,01 ng.m⁻³



Spatial variation in GEM

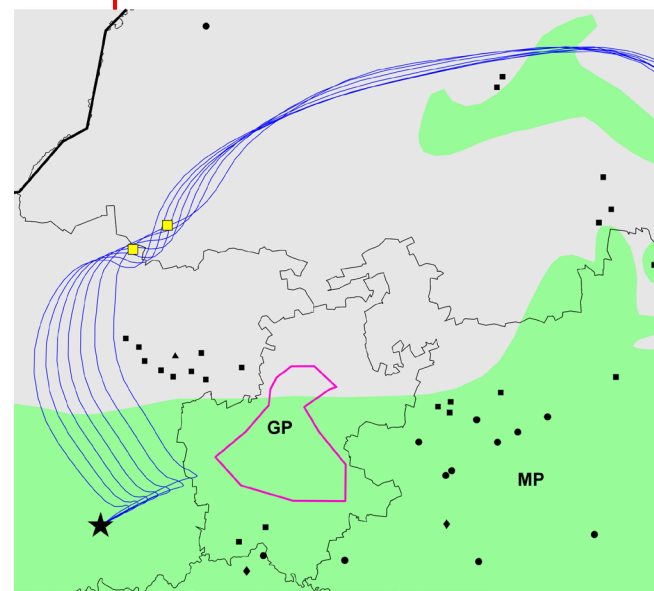
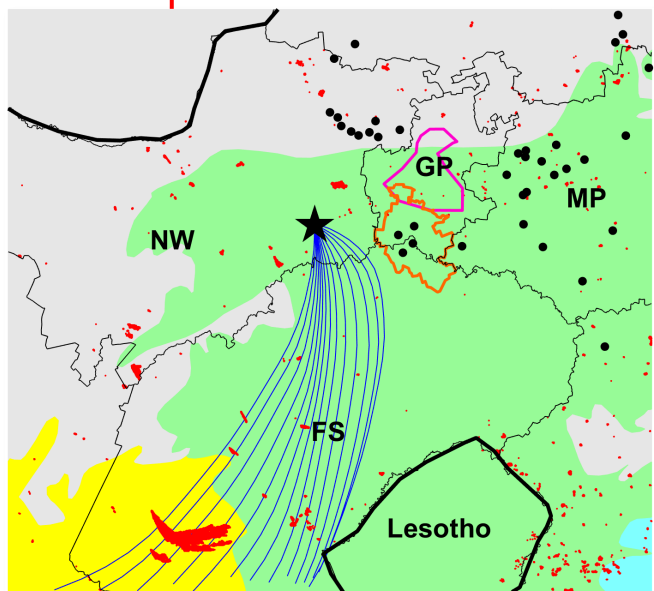
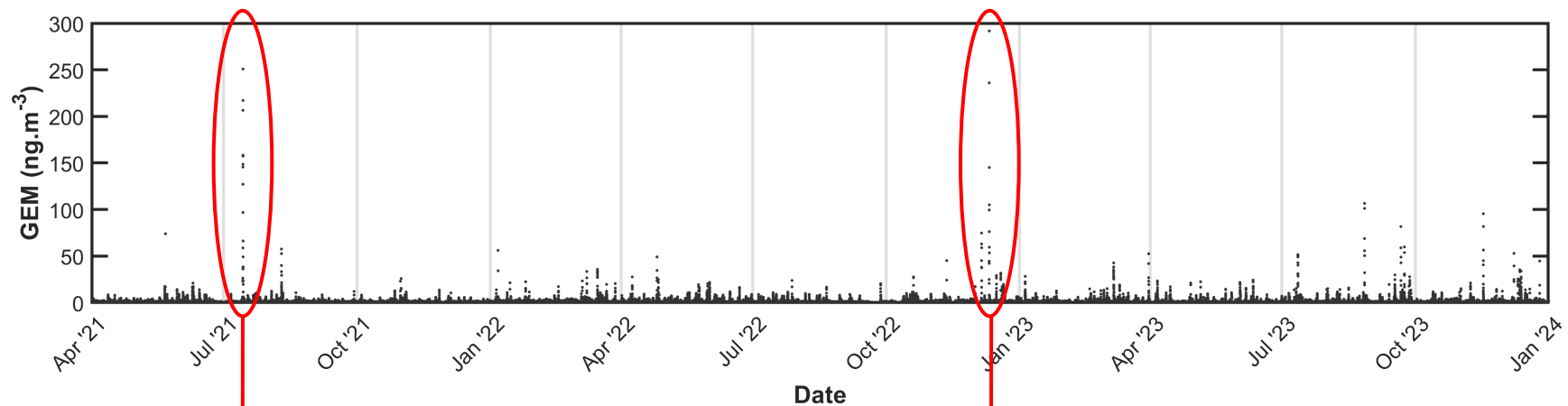


Regional GEM mean:

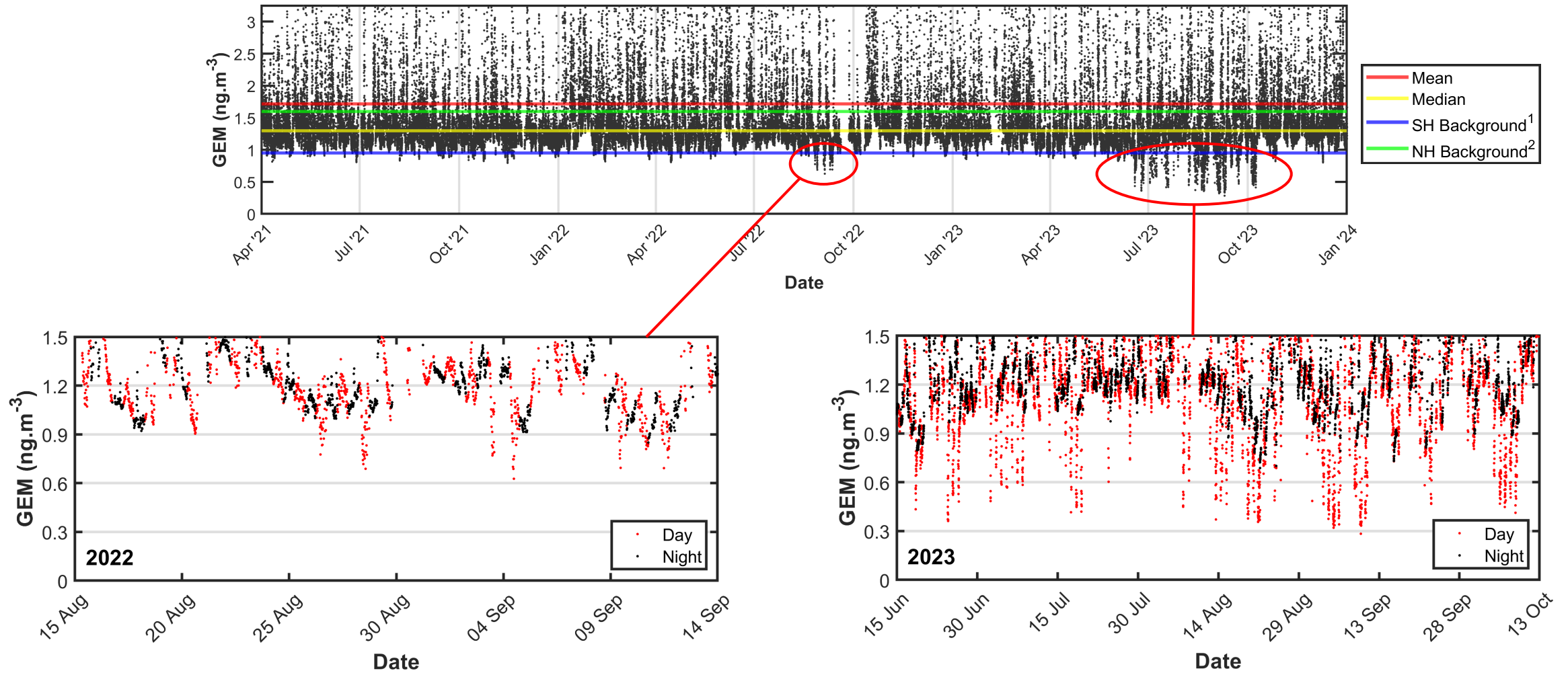
- ① 1,25 ng.m⁻³
- ② 1,91 ng.m⁻³
- ③ 2,01 ng.m⁻³



Case study 1: Pollution events



Case study 2: Depletion events



[1] Slemr *et al.*, 2015, [2]. Sprovieri *et al.*, 2016

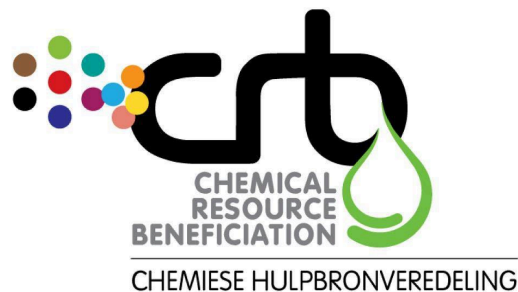
Conclusion

- **Welgegund** GEM correlates well with other sites.
- GEM **diurnal** pattern shows anti-correlation with ozone.
- **Seasonality** of GEM is influenced by chemistry and meteorology.
- **Spatial distribution** of GEM is influenced by air mass history and ozone.
- **Pollution events** had natural and anthropogenic origin.
- Cause of **depletion events** still unknown.





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