



AIR QUALITY DATA ANALYSIS

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SENSOR NETWORK

- Sensors analyzed: 345
- Period of analysis: May 4, 2020 to Dec 10, 2020
- Analyzed pollutants
 - Suspended particles PM_{10}
 - Suspended particles $PM_{2,5}$
 - Nitrogen dioxide (NO_2)

SENSOR NETWORK PROS AND CONS

- Pros
 - Cost
 - Ease of installation
- Cons
 - Accuracy – sensor accuracy, representativity
 - Reliability – data availability
 - Lifetime
 - Very difficult to interpret

SUSPENDED PARTICLES PM₁₀

- Dust particles (solid and liquid = aerosol) with aerodynamic diameter of up to 10 µm.
- Main sources: heating by solid fuels (coal, wood) in old boilers, agriculture, industry, traffic, long-distant transport, secondary particles, natural sources.
- No safe threshold value – the lower the concentration, the better.

SUSPENDED PARTICLES $PM_{2,5}$

- Dust particles (solid and liquid = aerosol) with aerodynamic diameter of up to 2,5 μm .
- Main sources: heating by solid fuels (coal, wood) in old boilers, industry, traffic, long-distant transport, secondary particles, natural sources.
- No safe threshold value – the lower the concentration, the better.

NITROGEN DIOXIDE (NO₂)

- Toxic gas, created by oxidation of NO, produced during incomplete combustion.
- Main sources: traffic, energetics, industry.

LIMIT VALUES

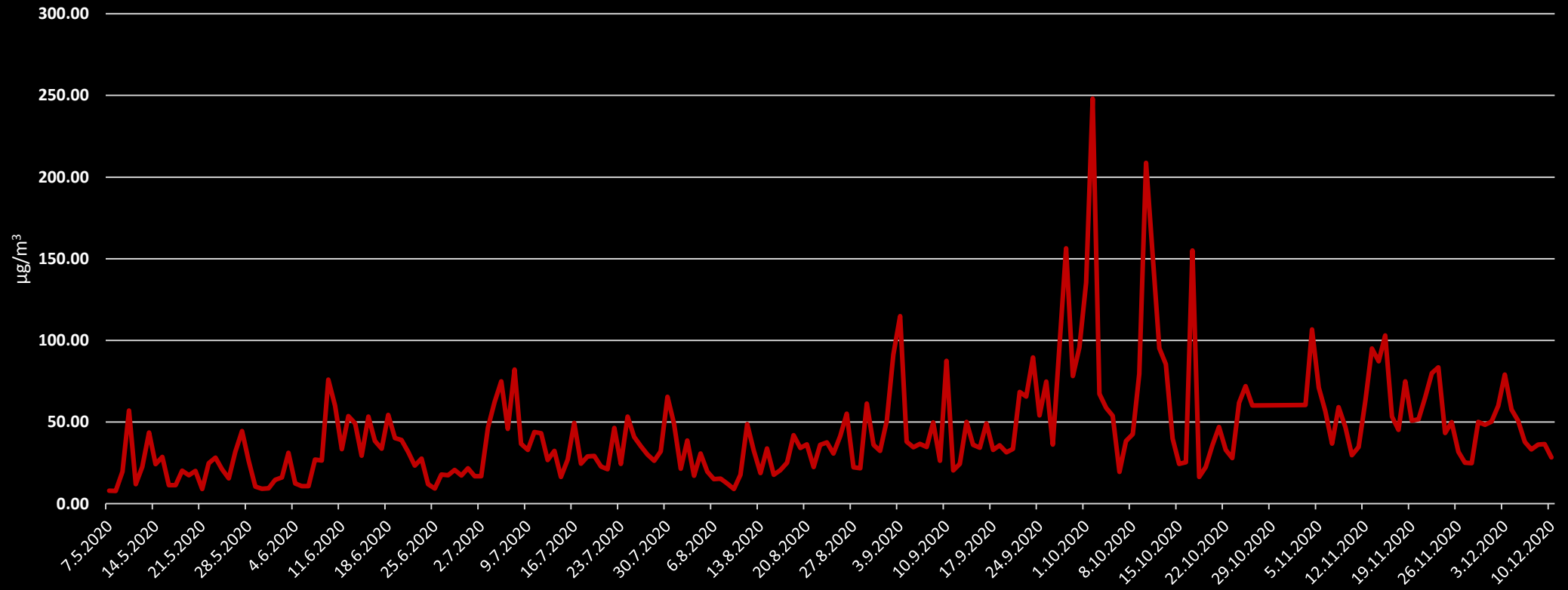
Pollutant	Averaging time	Limit value in UA [µg/m ³]	Limit value in EU [µg/m ³]	Limit value according WHO [µg/m ³]
PM _{2.5}	20 min	25	–	–
	24 h		–	25
	1 year		20	10
PM ₁₀	20 min	50	–	–
	24 h		50	50
	1 year		40	20
NO ₂	1 h	40	200	200
	24 h	200	–	–
	1 year		40	40
NH ₃	20 min	40	–	–
	24 h	200	–	–
CO	20 min	3000	–	–
	24 h	5000	10000	–
CH ₂ O	20 min	3	–	–
	24 h	35	–	–



PM₁₀

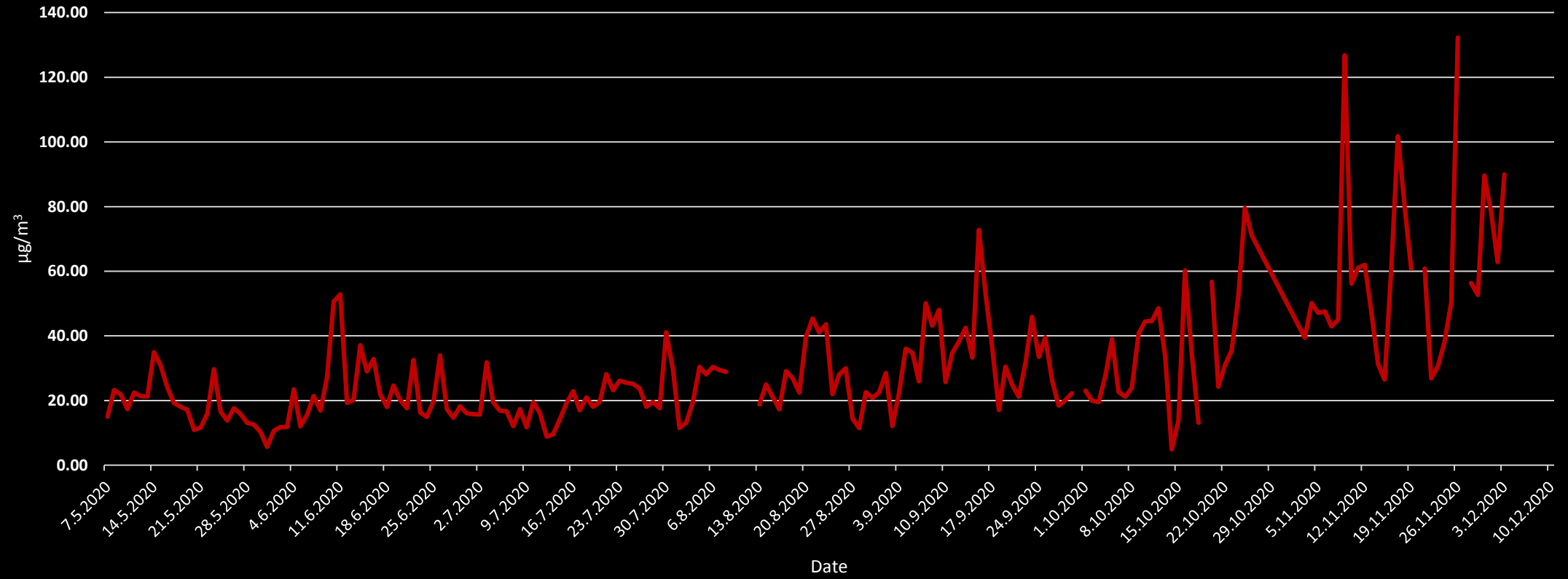
Avg: 43.9 $\mu\text{g}\cdot\text{m}^{-3}$

Zaporizhzhya



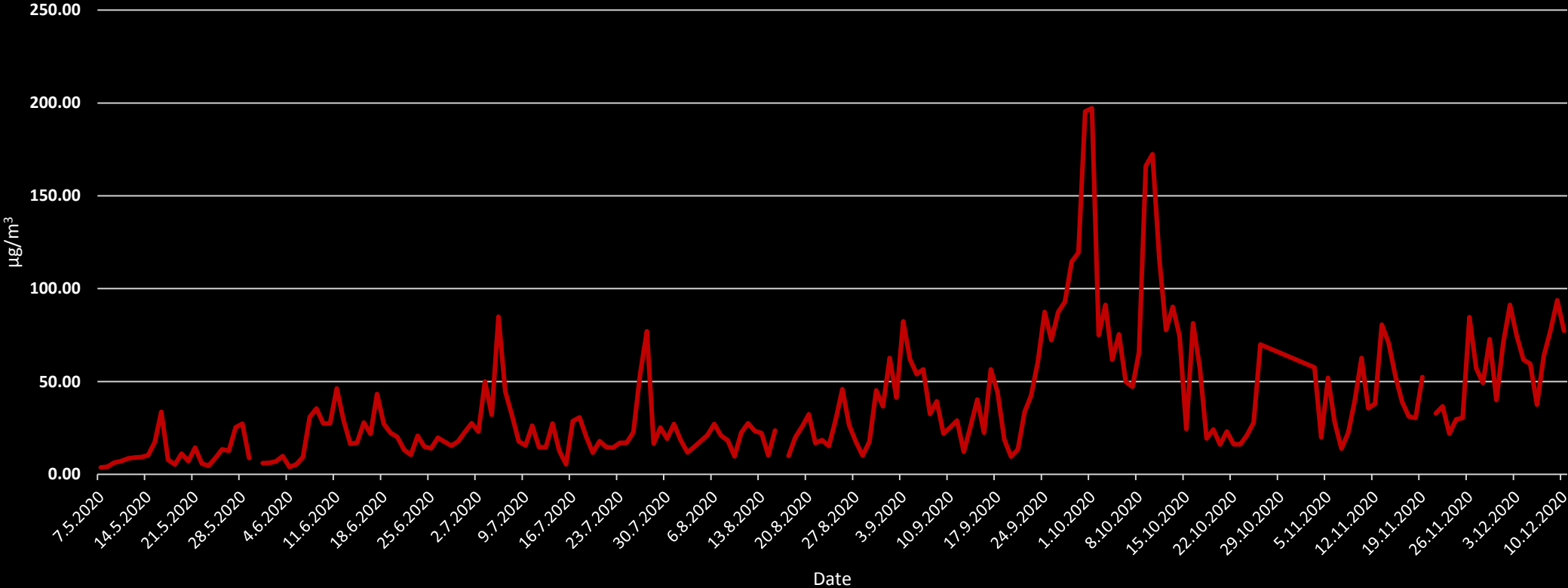
Avg: 31.1 $\mu\text{g}\cdot\text{m}^{-3}$

Lviv



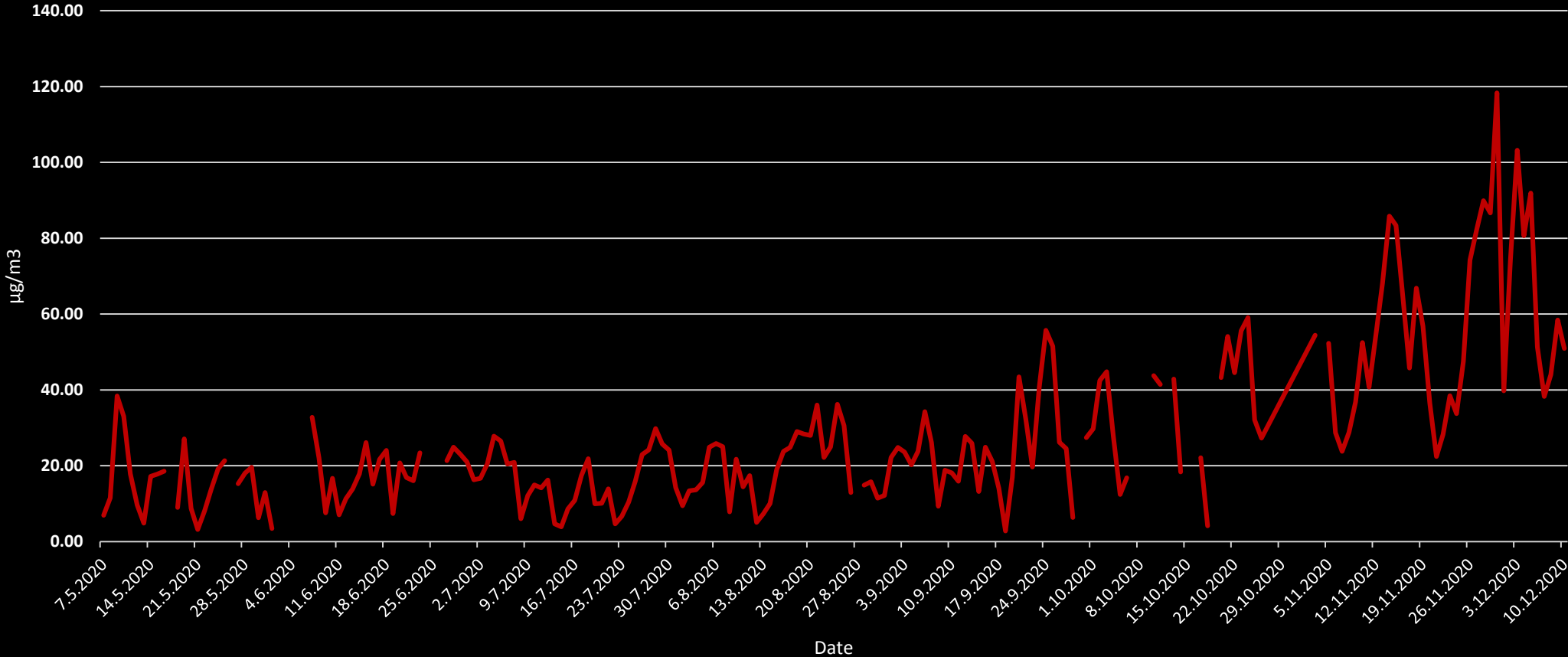
Avg: 36.9 $\mu\text{g}\cdot\text{m}^{-3}$

Mariupol



Avg: 36.9 $\mu\text{g}\cdot\text{m}^{-3}$

Kyiv

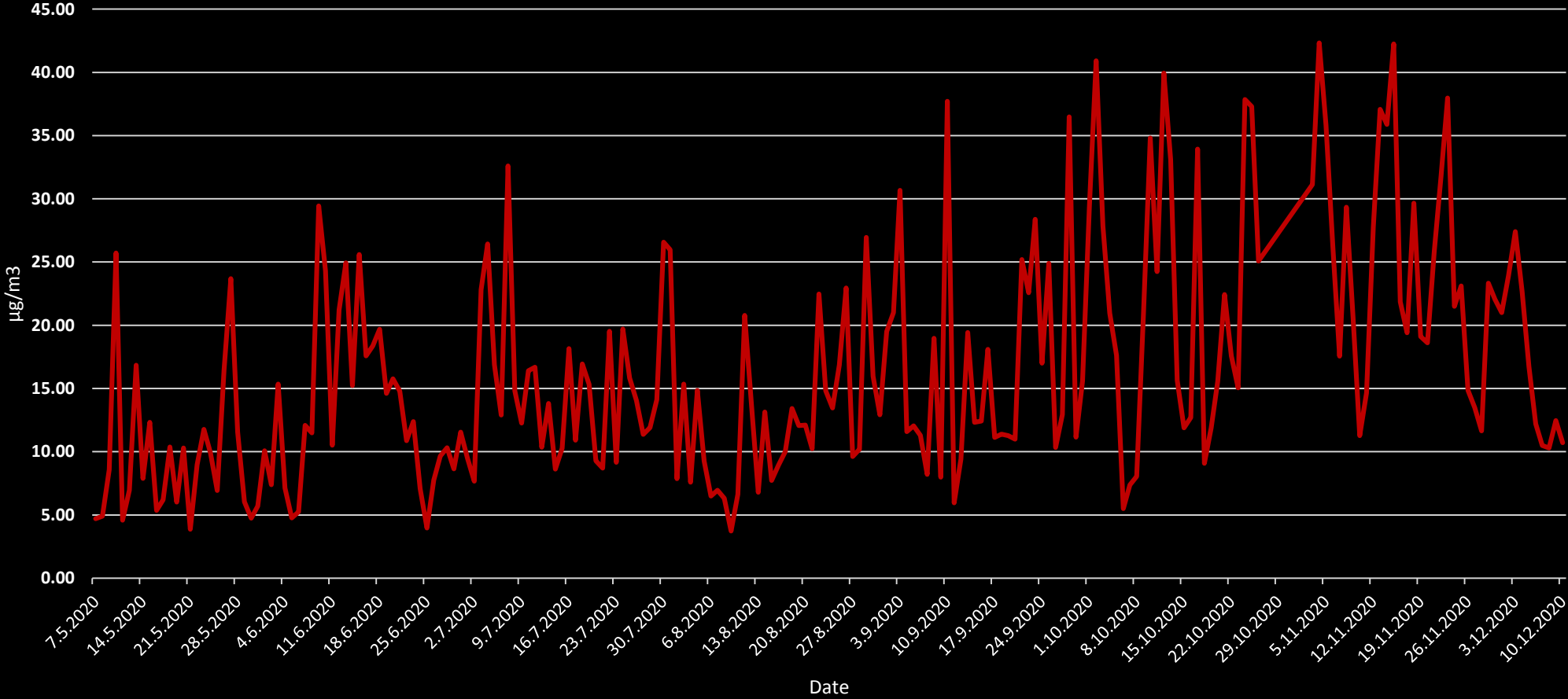




PM_{2.5}

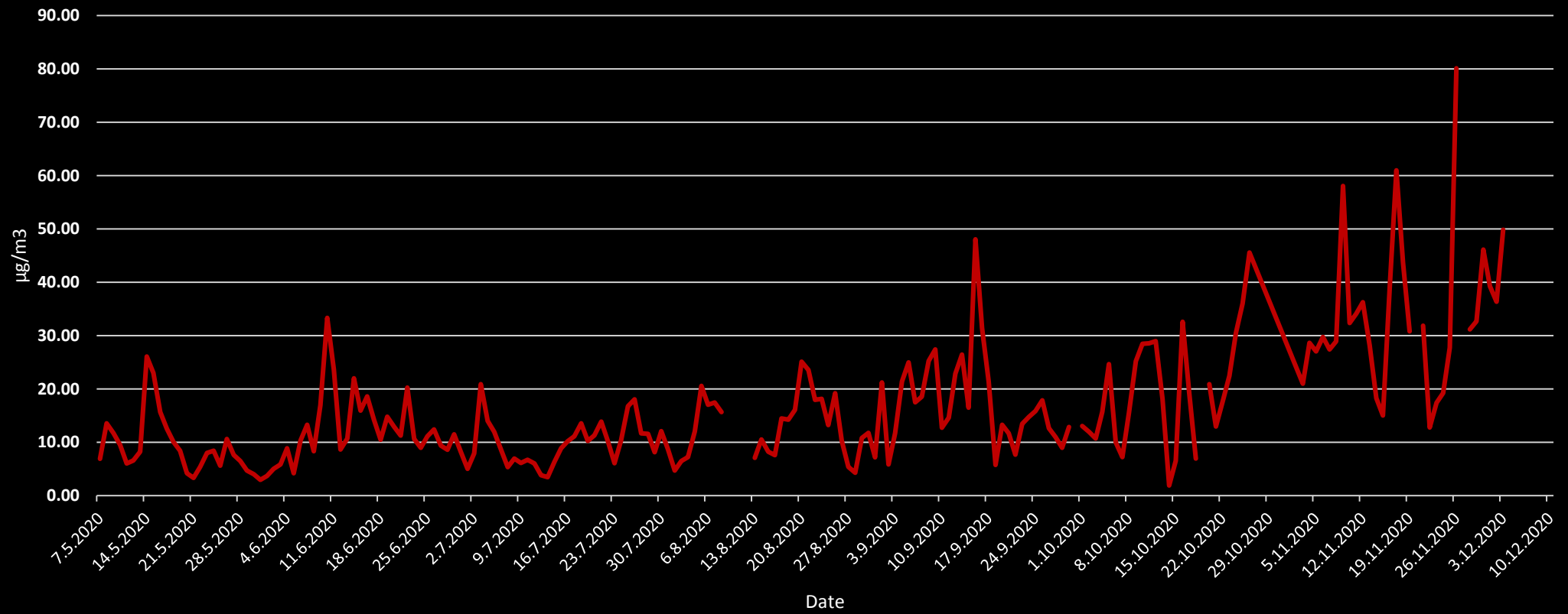
Avg: 16.4 $\mu\text{g}\cdot\text{m}^{-3}$

Zaporizhzhya



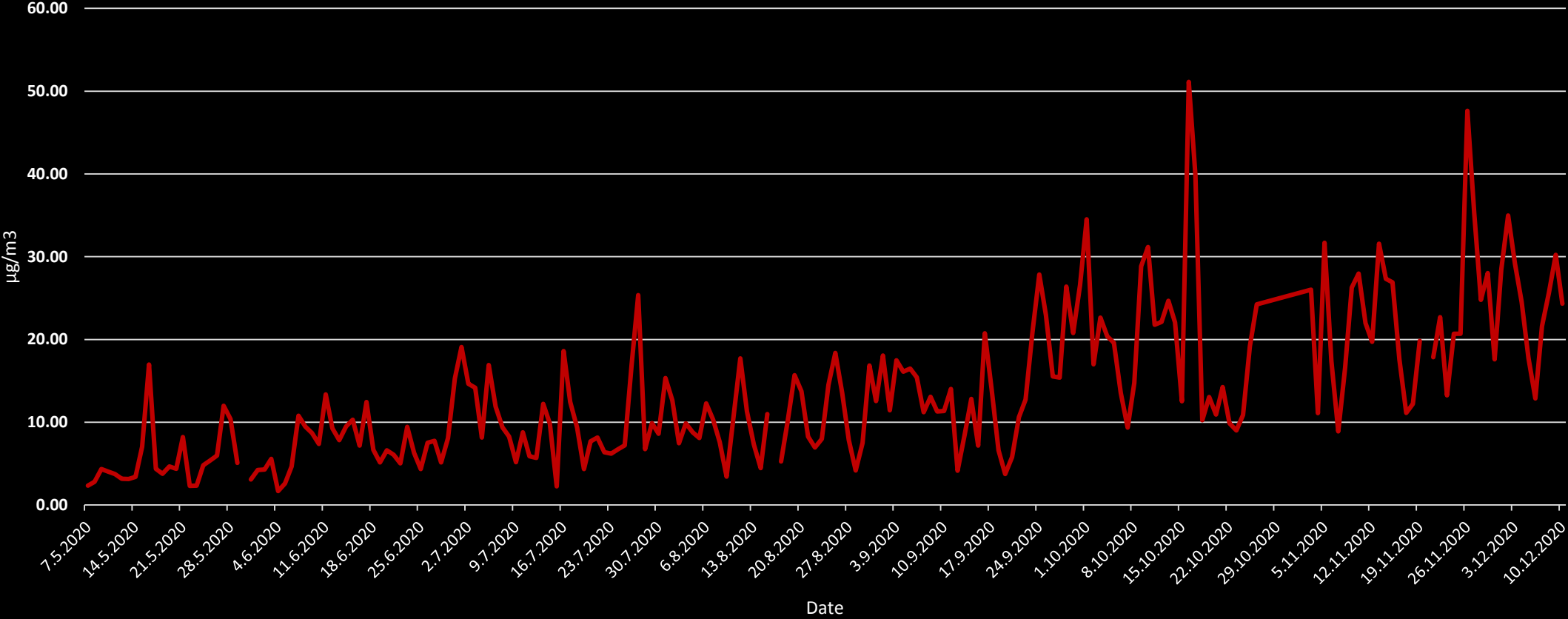
Avg: 16.6 $\mu\text{g}\cdot\text{m}^{-3}$

Lviv



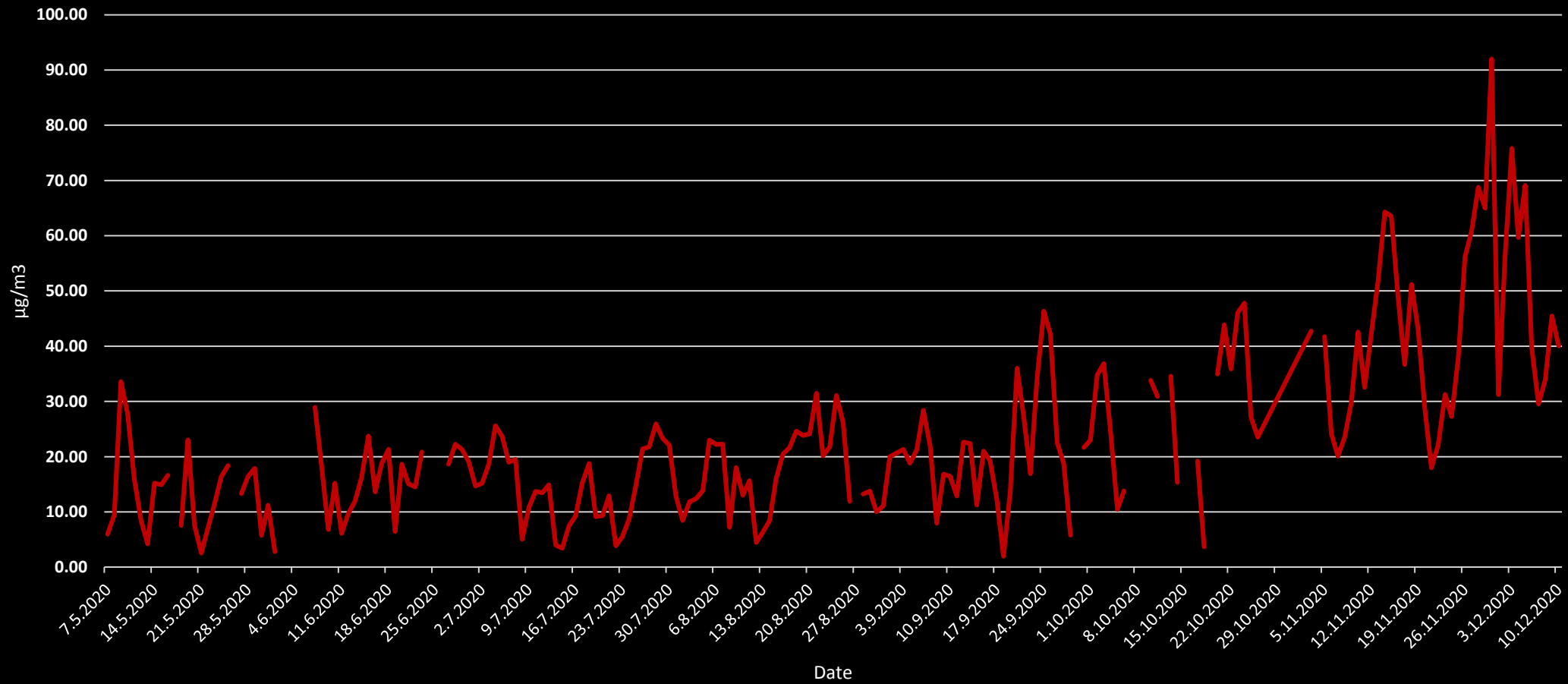
Avg: 13.4 $\mu\text{g}\cdot\text{m}^{-3}$

Mariupol



Avg: 23.0 $\mu\text{g}\cdot\text{m}^{-3}$

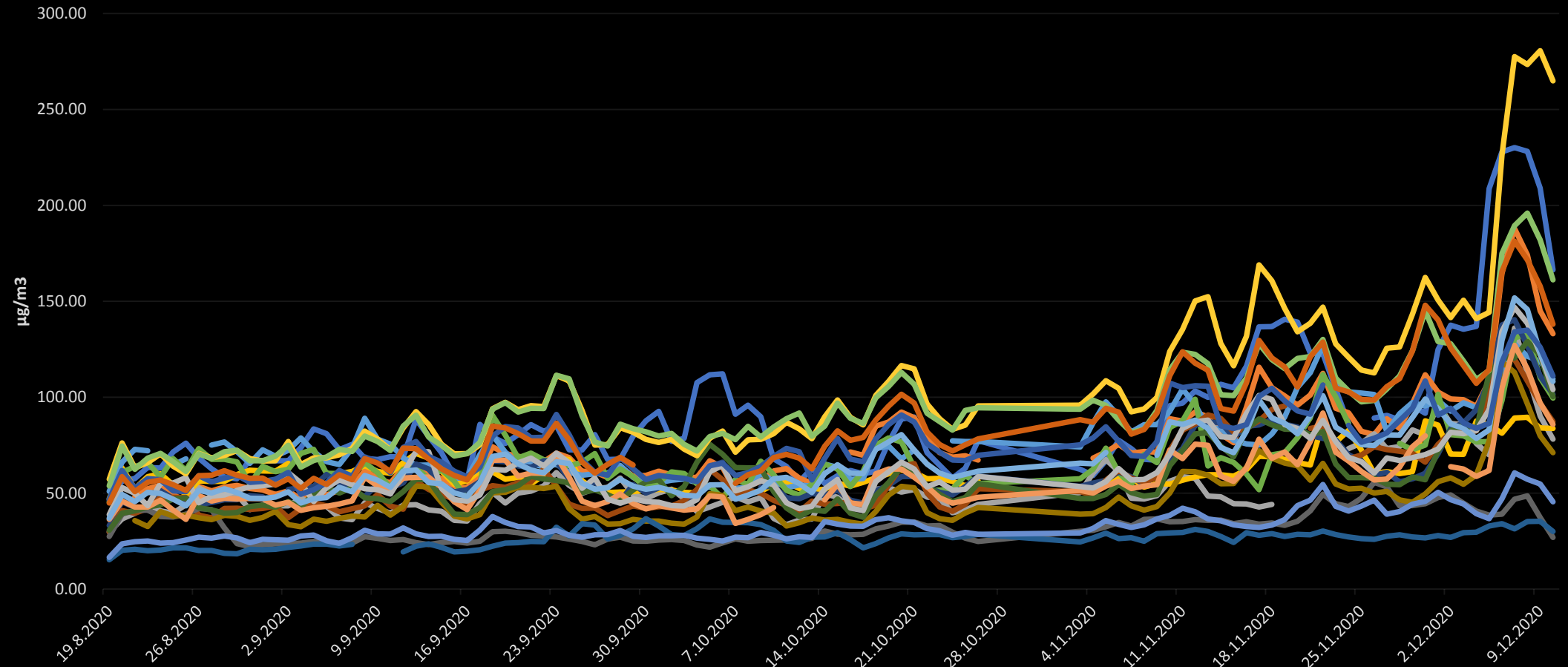
Kyiv





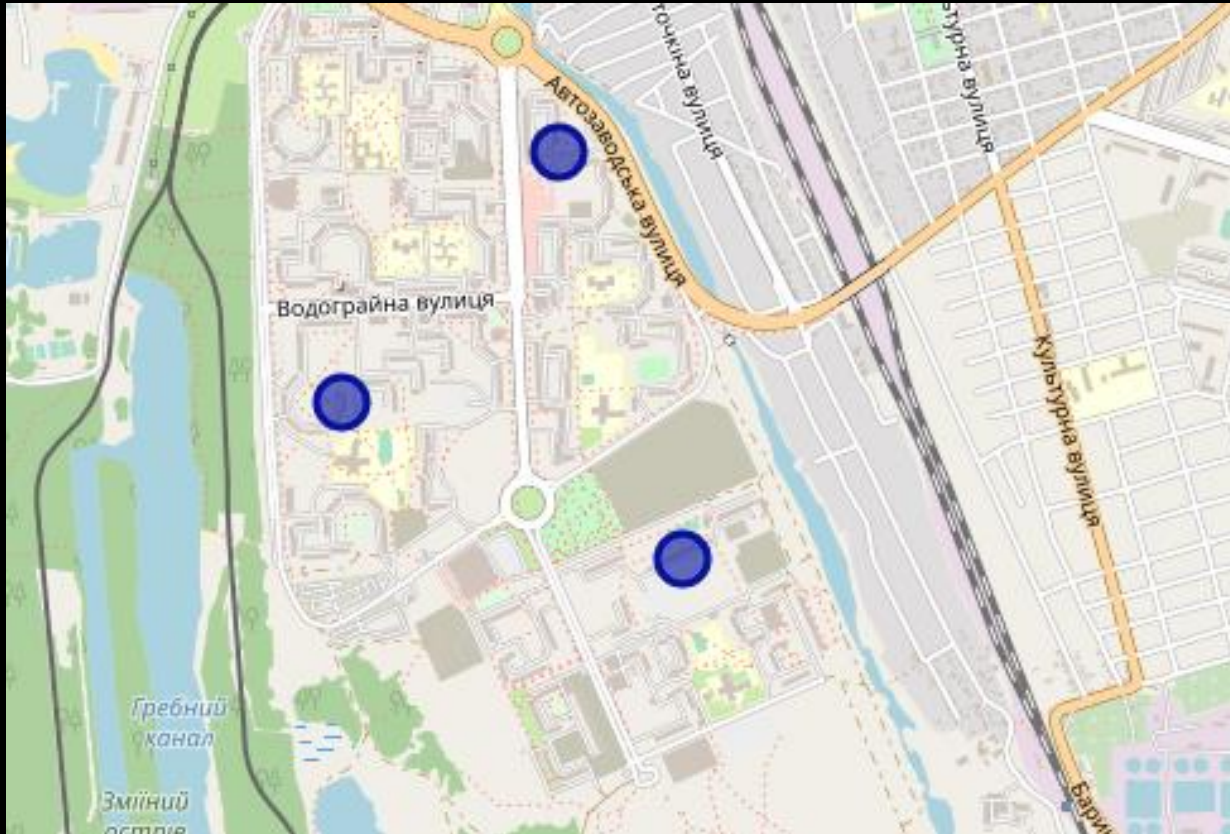
NO₂

802 – Kotsyubynske
867 - Kyiv



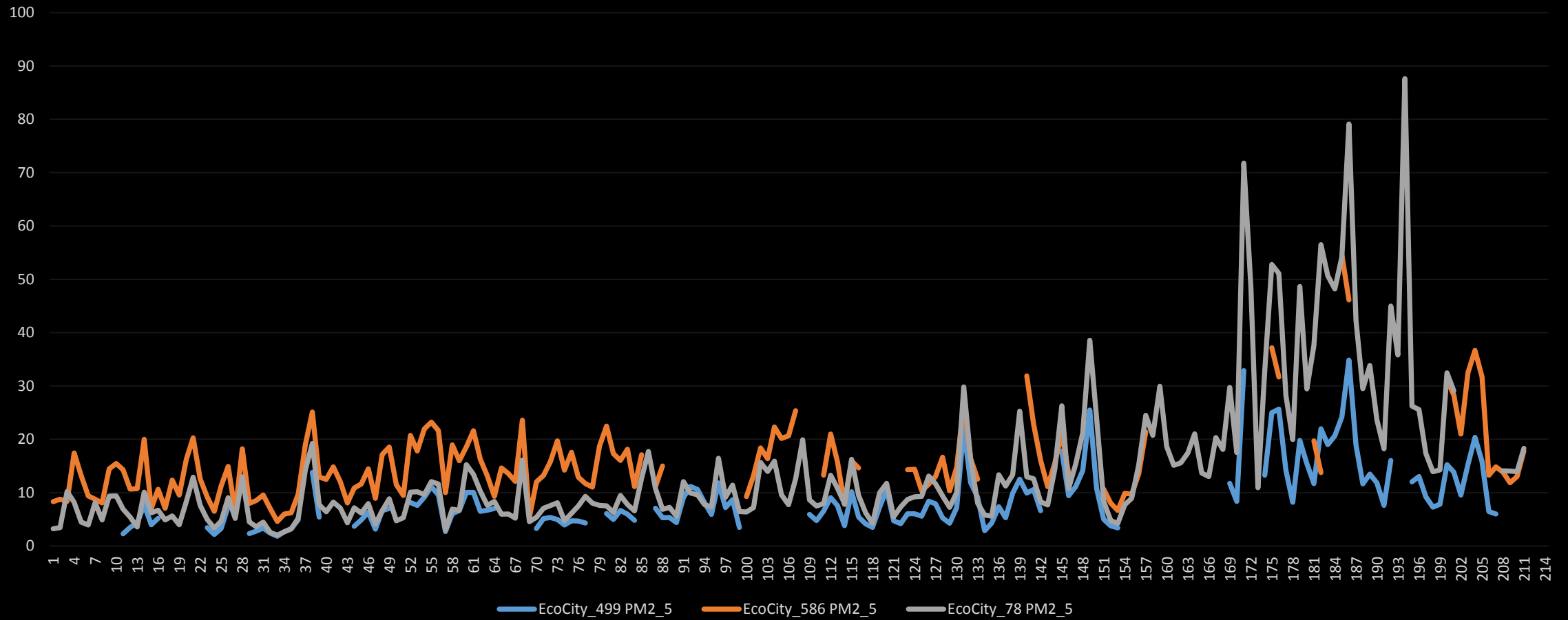
- EcoCity_354 NO2
- EcoCity_498 NO2
- EcoCity_600 NO2
- EcoCity_655 NO2
- EcoCity_660 NO2
- EcoCity_665 NO2
- EcoCity_674 NO2
- EcoCity_706 NO2
- EcoCity_717 NO2
- EcoCity_722 NO2
- EcoCity_730 NO2
- EcoCity_738 NO2
- EcoCity_745 NO2
- EcoCity_780 NO2
- EcoCity_781 NO2
- EcoCity_802 NO2
- EcoCity_858 NO2
- EcoCity_867 NO2
- EcoCity_870 NO2
- EcoCity_893 NO2

COMPARISON - DRIFT

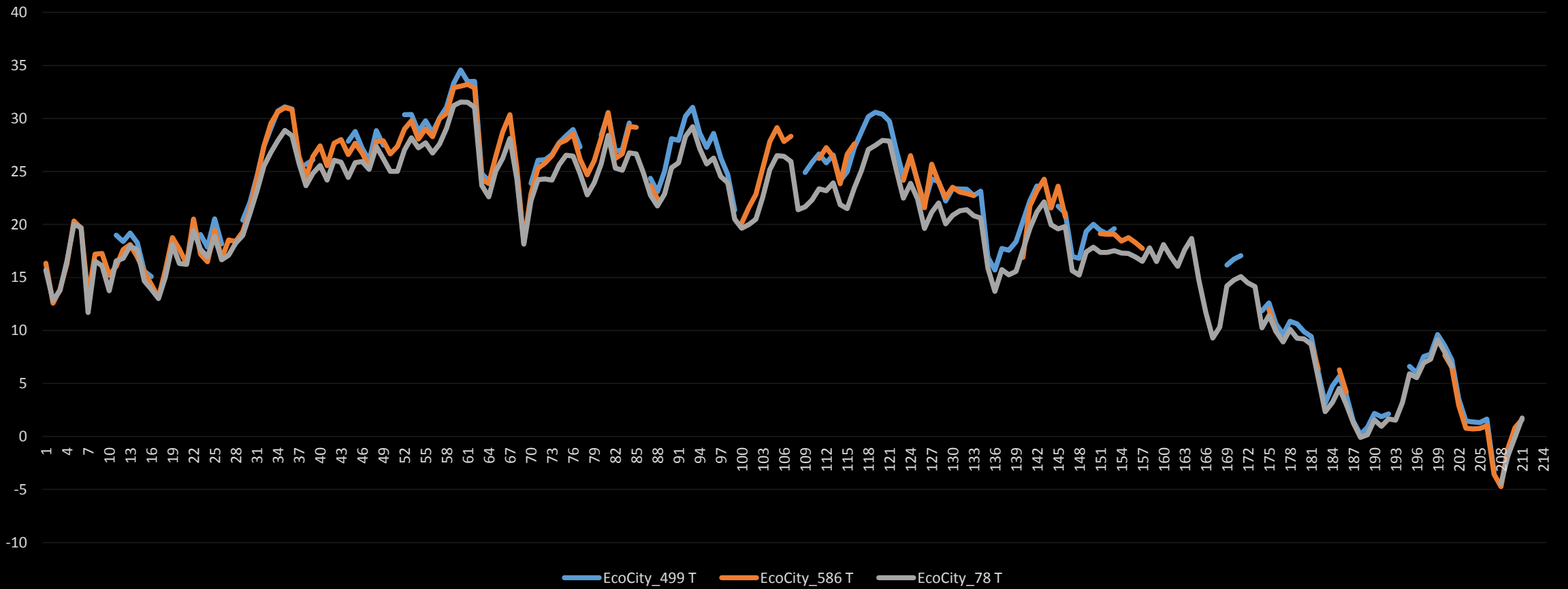


Zaporizhzhya

COMPARISON - DRIFT



COMPARISON - DRIFT



COMPLEX ANALYSIS

- Long-term data from single location (other factors)
- Reliable data
- Representative data