

Climatology of the surface-based inversions in the cities of the Arctic zone of the Russian Federation and its impact on air quality

Vorotilova Polina

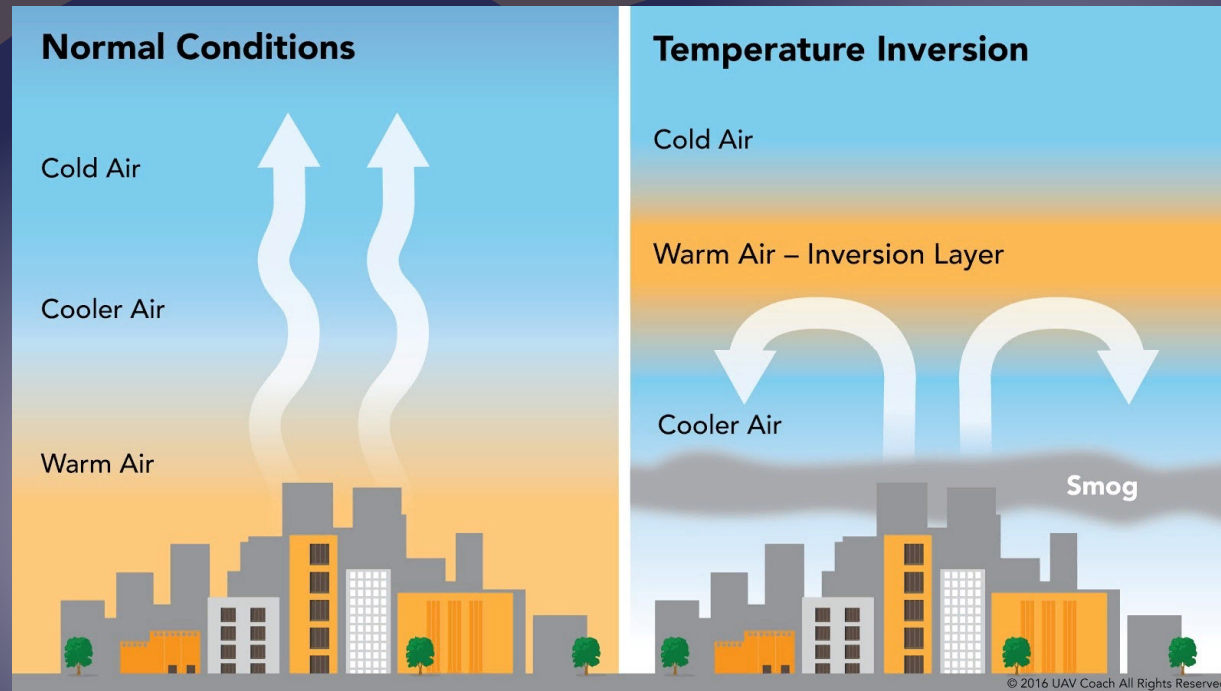
Konstantinov Pavel

Department of meteorology and climatology
MSU

vorotilova99@mail.ru

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Motivation



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- In the Arctic zone of Russian Federation more than 80% people live in the cities
- Surface-based inversions are persistent feature of the Arctic climate
- Surface-based inversions in the Arctic cities are poorly understood

Main issue:

Make climatological analysis of the surface-based inversions in the cities of **Apatity** and **Nadym**.

Objectives of the research:

- to install gradient observation complexes in the cities of Apatity and Nadym
- to analyze the data obtained during the observation period
- to estimate the spatial heterogeneity, temperature gradient and frequency of the surface-based inversions

Conclusions

1. Periodicity of surface-based temperature inversions at the background and urban areas are almost no different (the difference isn't more than 1-2%).
2. The value of the temperature gradient of the inversion at the background zone **in 2 times for Nadym** and **4 times for Apatity** exceeds corresponding values at the urban area.
3. The average temperature gradient of the inversion in the city of **Apatity** is $0.67^{\circ}\text{C}/\text{m}$ for the background area and $0.19^{\circ}\text{C}/\text{m}$ for the urban area.

The average temperature gradient of the inversion in the city of **Nadym** is $0.18^{\circ}\text{C}/\text{m}$ for the background area and $0.12^{\circ}\text{C}/\text{m}$ for the urban area.

Perspectives

1. Modelling of the surface-based inversions in the Arctic zone.
2. Using as a basis for the formation of environmental policy in the cities of the Arctic zone of the Russian Federation.

The background is a solid dark blue. Two large, overlapping circles of a slightly lighter shade of blue are positioned behind the text. The circles overlap in the center, creating a subtle gradient effect.

Thanks for your attention!