

**11th International Workshop on the Geological Aspects
of Radon Risk Mapping, Prague, Czech Republic**



Institute of Industrial Ecology UB RAS

**Radon mapping based on
indoor radon survey results
and geological aspects**

Aleksey Vasilyev, Aleksandra Onishchenko,
Ilya Yarmoshenko, Michael Zhukovsky

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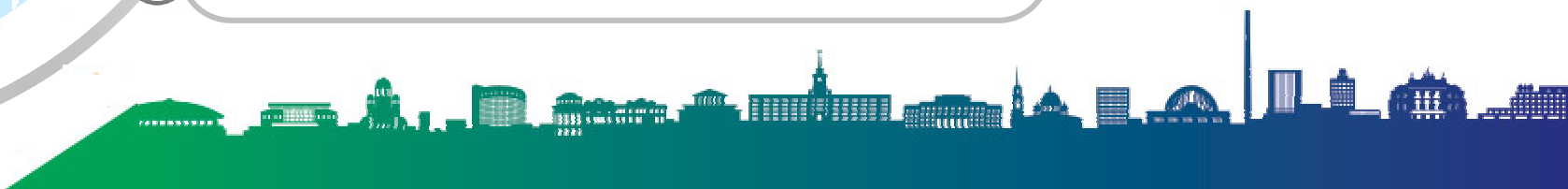
Introduction

Indoor radon survey

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Results and discussion

Conclusions



Introduction

Maps of radon potential related to geological aspects:

1. Map of radon potential related to radon concentration in soil, ground water and etc.
2. Map of radon potential related to plate tectonics and cracks.

Results of indoor radon survey

Typical parameters of radon concentration in dwellings situated in different geological zones

Objective

- ❖ The objective of this indoor radon mapping is to display the distribution of indoor radon concentration in Ekaterinburg, one of the largest city of Russia, and indoor radon concentration relevance with geological aspects.

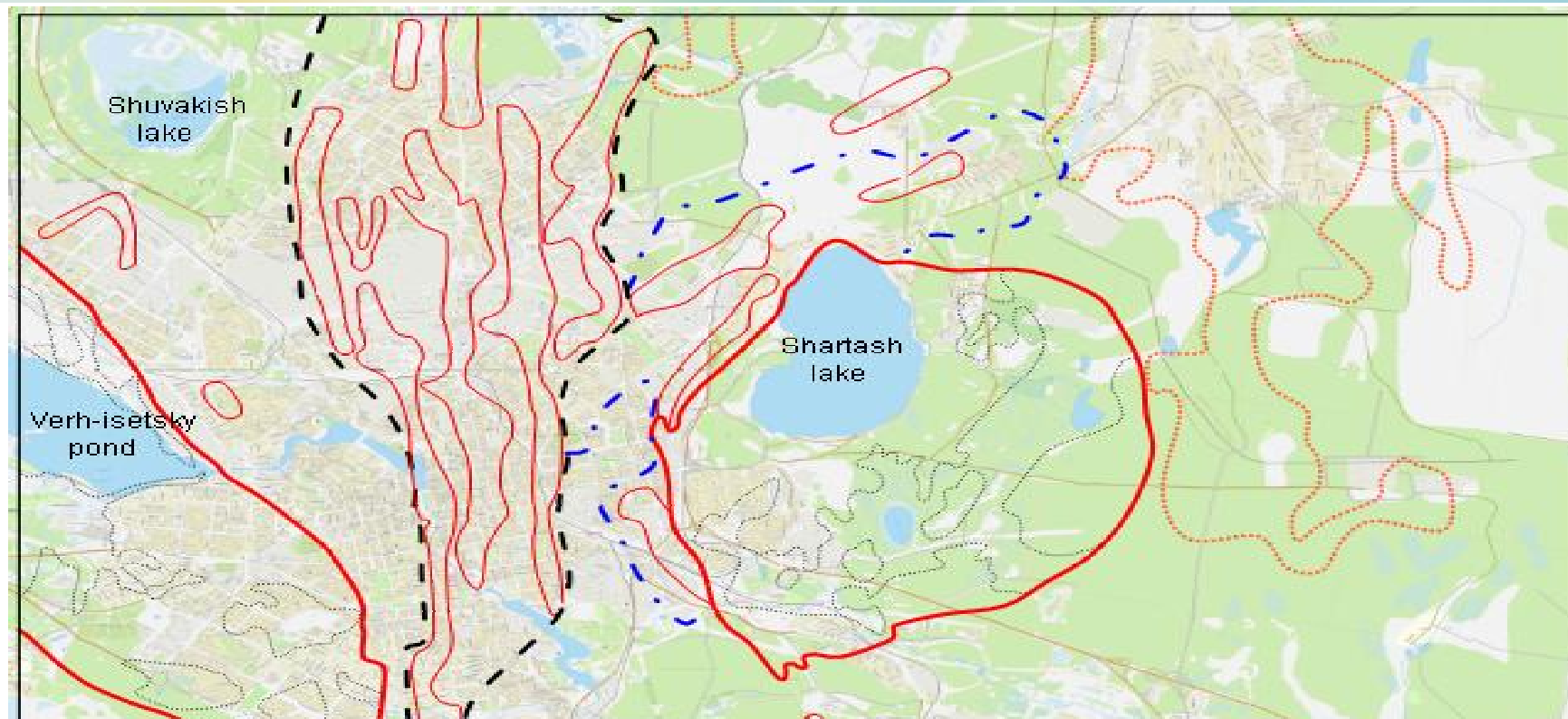


Indoor radon survey

- ❖ Detailed **radon survey** was conducted from 2007 to 2011
- ❖ Measurements were performed in **404 apartments** in Ekaterinburg residential buildings
- ❖ About half of the direct measurements were carried out in buildings **constructed between 1950 and 1989**



Map of radon potential ("Zelenogorskaya Expedition")

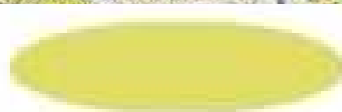


- · - Zone with medium radon potential. Base rock is presented by layer of slates
- Zone with attenuated radon percolating from base rock
- Zone with elevated radon potential related to the layer of igneous-sedimentary rocks
- Local zones of high radon potential
- Zone with high radon potential

Map of radon potential related to plate tectonics and cracks for the territory of Ekaterinburg



 - cracks



- zones with high radon potential

Parameters of radon concentration distribution in the groups of dwellings depending on potential zone

[A] Zone with low radon potential

[B] Zone with medium radon potential.

Base rock is presented by layer of slates, often carbon-bearing.

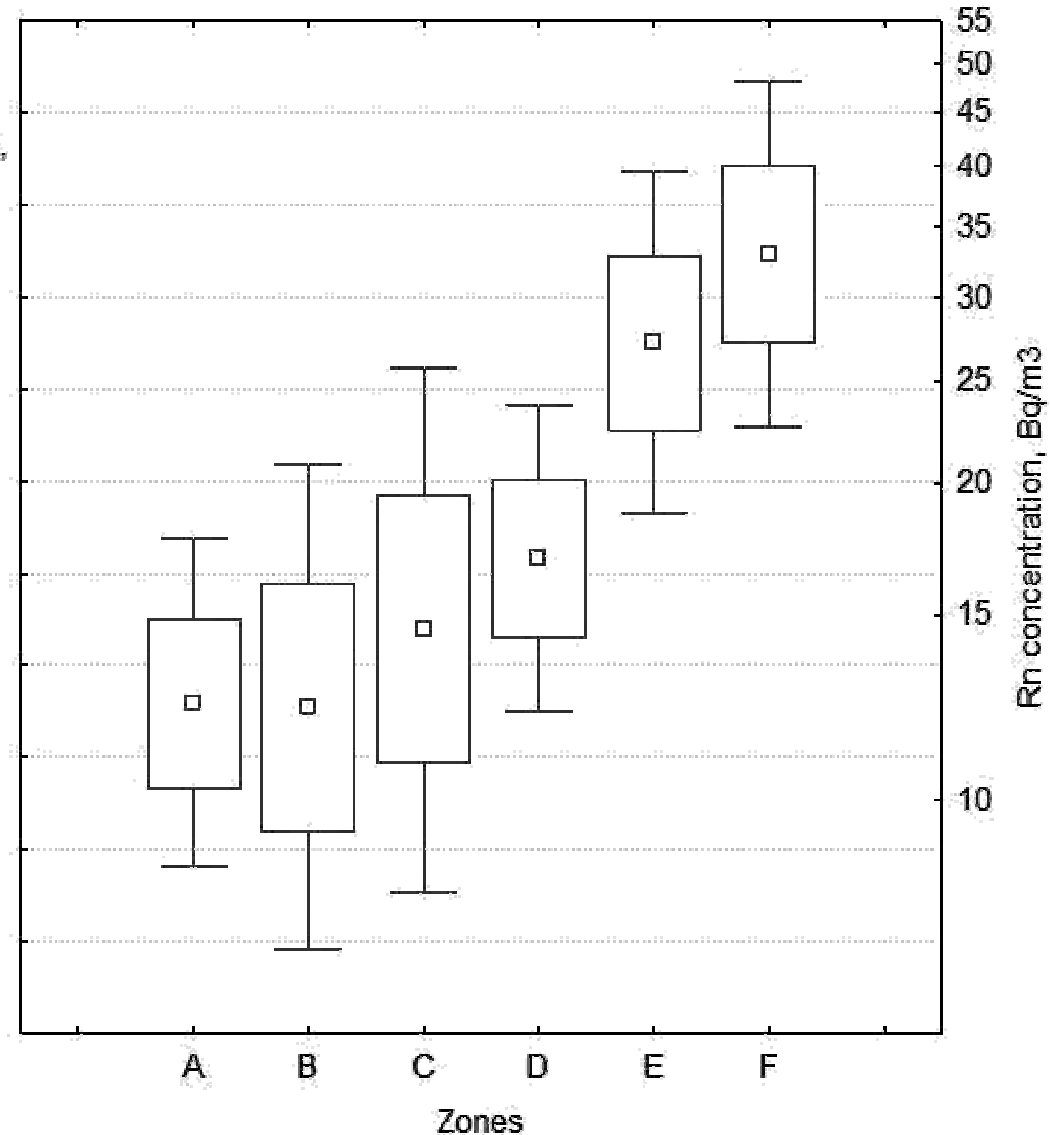
[C] Zone with attenuated radon percolating from base rock (elevated water-bearing, shielding).

[D] Zone with elevated radon potential related to the layer of igneous-sedimentary rocks.

[E] Local zones of high radon potential.

[F] Zone with high radon potential related to layers contained crouan.

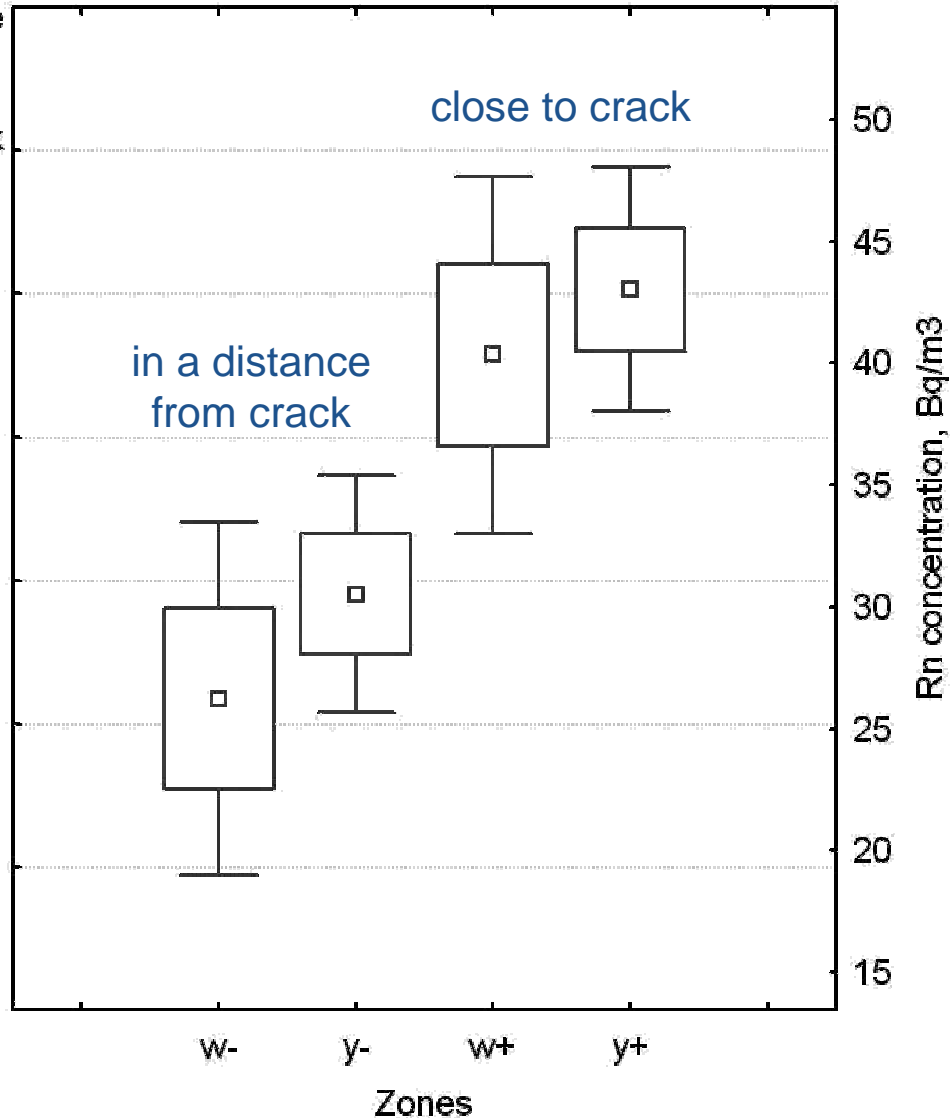
□ Mean
 □ Mean±SE
 ┆ Mean±1,96*SE



Parameters of radon concentration distribution in the groups of dwellings depending on presence of cracks

[w-] Low radon potential zone in a distance from crack
 [y-] Elevated radon potential zone in a distance from crack
 [w+] Low radon potential zone close to crack
 [y+] Elevated radon potential zone close to crack

□ Mean
 □ Mean±SE
 I Mean±1,96*SE



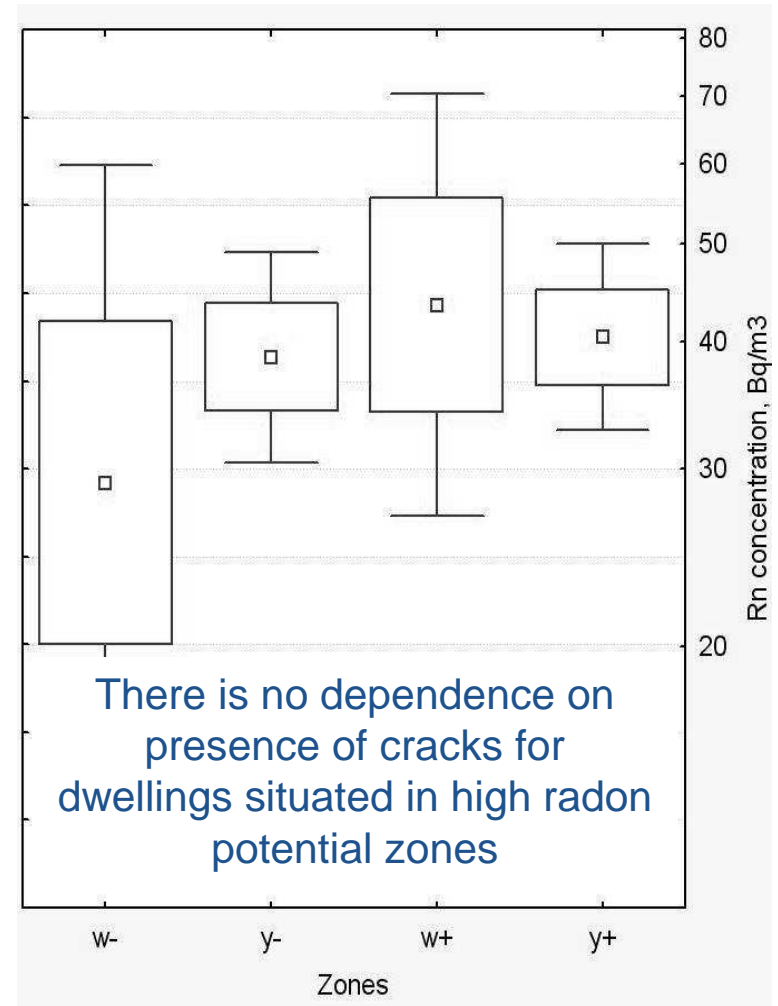
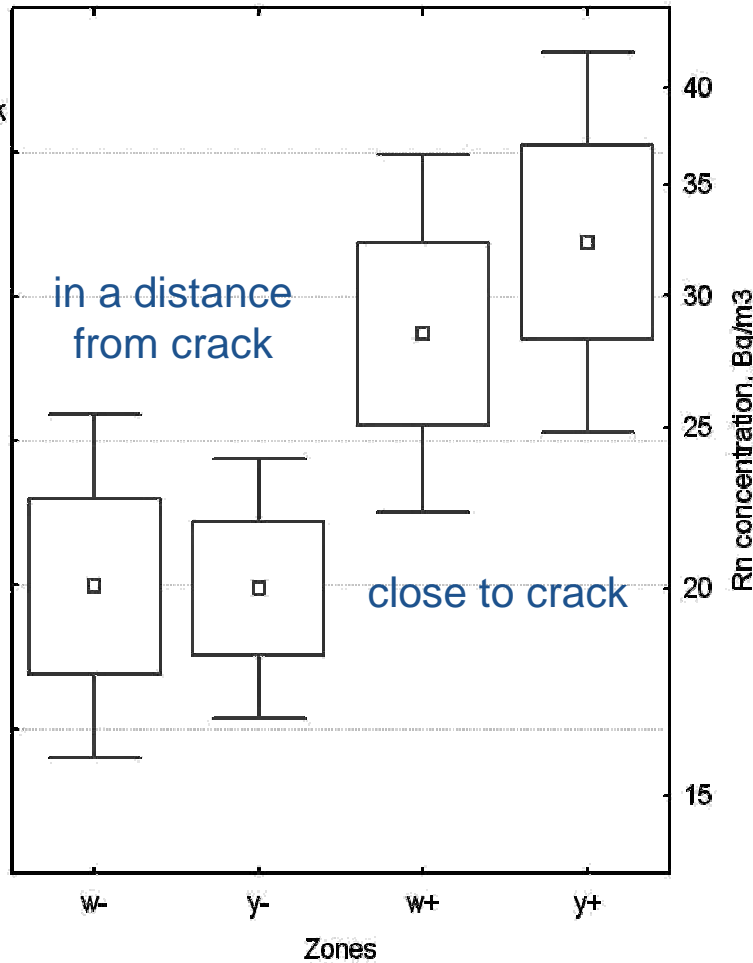
Parameters of radon concentration distribution in the groups of dwellings depending on presence of cracks

in low radon potential zones

in high radon potential zones

[w-] Low radon potential zone in a distance from crack
 [y-] Elevated radon potential zone in a distance from crack
 [w+] Low radon potential zone close to crack
 [y+] Elevated radon potential zone close to crack

□ Mean
 □ Mean±SE
 ┆ Mean±1,96*SE



Conclusions

- ❖ The maps of radon potential related to geological aspects combined with the results of radon survey allow to estimate the typical parameters of radon concentration in dwellings situated in different geological zones and give base for the necessary radon protection measures in the new buildings constructed in this region



Thank You !

vav@ecko.uran.ru