

EFFECTIVE DOSES ESTIMATED FROM THE RESULTS OF DIRECT RADON AND THORON PROGENY SENSORS (DRPS/DTPS), EXPOSED IN SOME REGIONS OF BALKANS

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Goals:

- to give an overview of direct measurements of radon and thoron progenies in some parts of Balkans
- to estimate effective doses from equilibrium equivalent radon and thoron concentrations (EERC and EETC) considering different occupancy factors for inhabitants and pupils



For thoron: D_{TR}

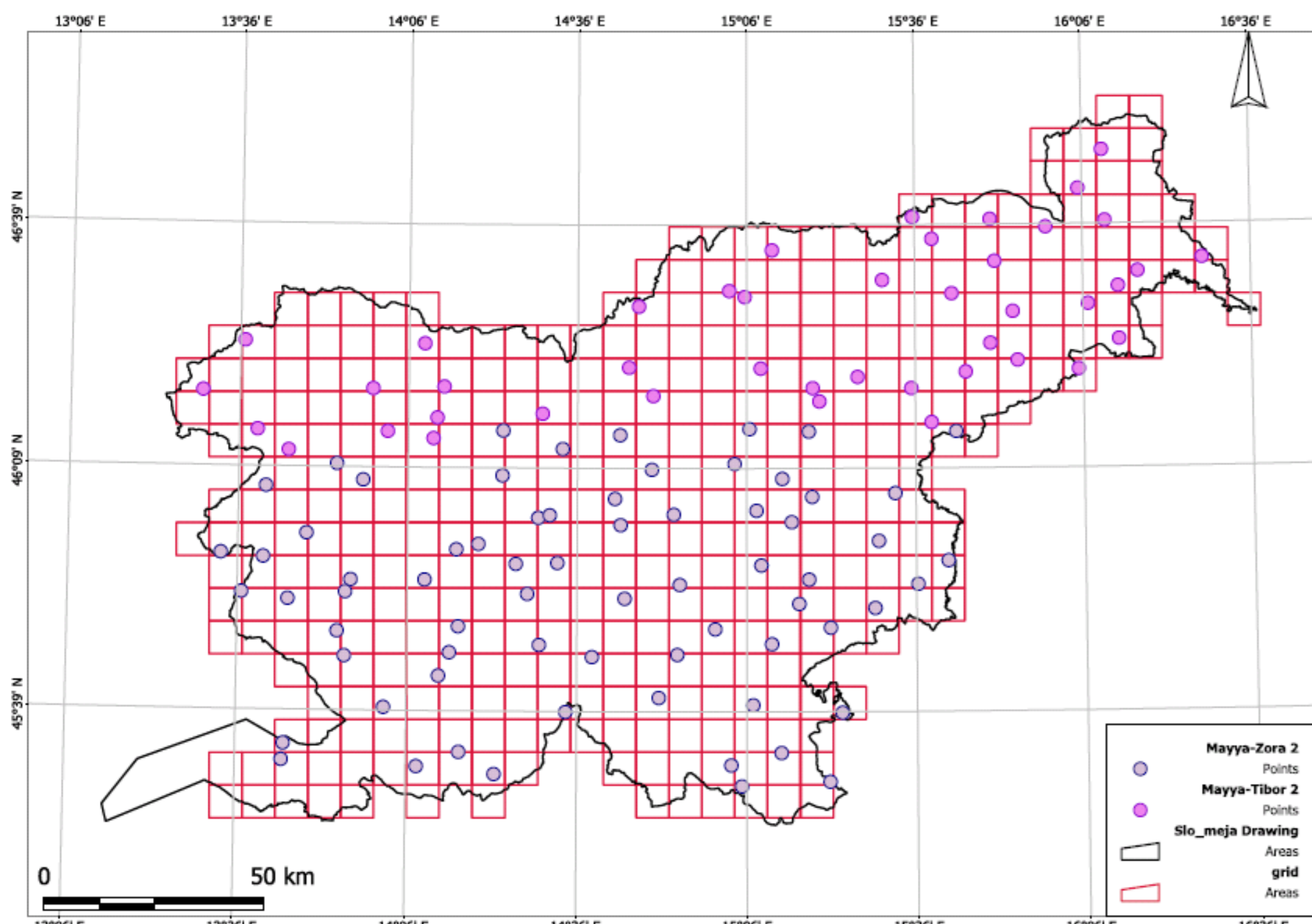
For thoron: $EETC$

For schools: 0.2

For thoron: 40

$$D_{ER} (mSv y^{-1}) = EERC (Bq m^{-3}) \cdot 8760 (h) \cdot 0.8 \cdot 9 (nSv Bq^{-1} h^{-1} m^3) \cdot 10^{-6}$$

Slovenia



No. of dwellings: 112

D_{ER} : (data from 36 locations)

range: (0.1-9.4) mSv y^{-1}

average: 2.2 mSv y^{-1}

D_{ET} :

range: ($3.5 \cdot 10^{-3}$ -0.7) mSv y^{-1}

average: 0.18 mSv y^{-1}

Materials and methods:

- Passive deposition based ^{222}Rn and ^{220}Rn Progeny sensors



Exposure surface for deposition

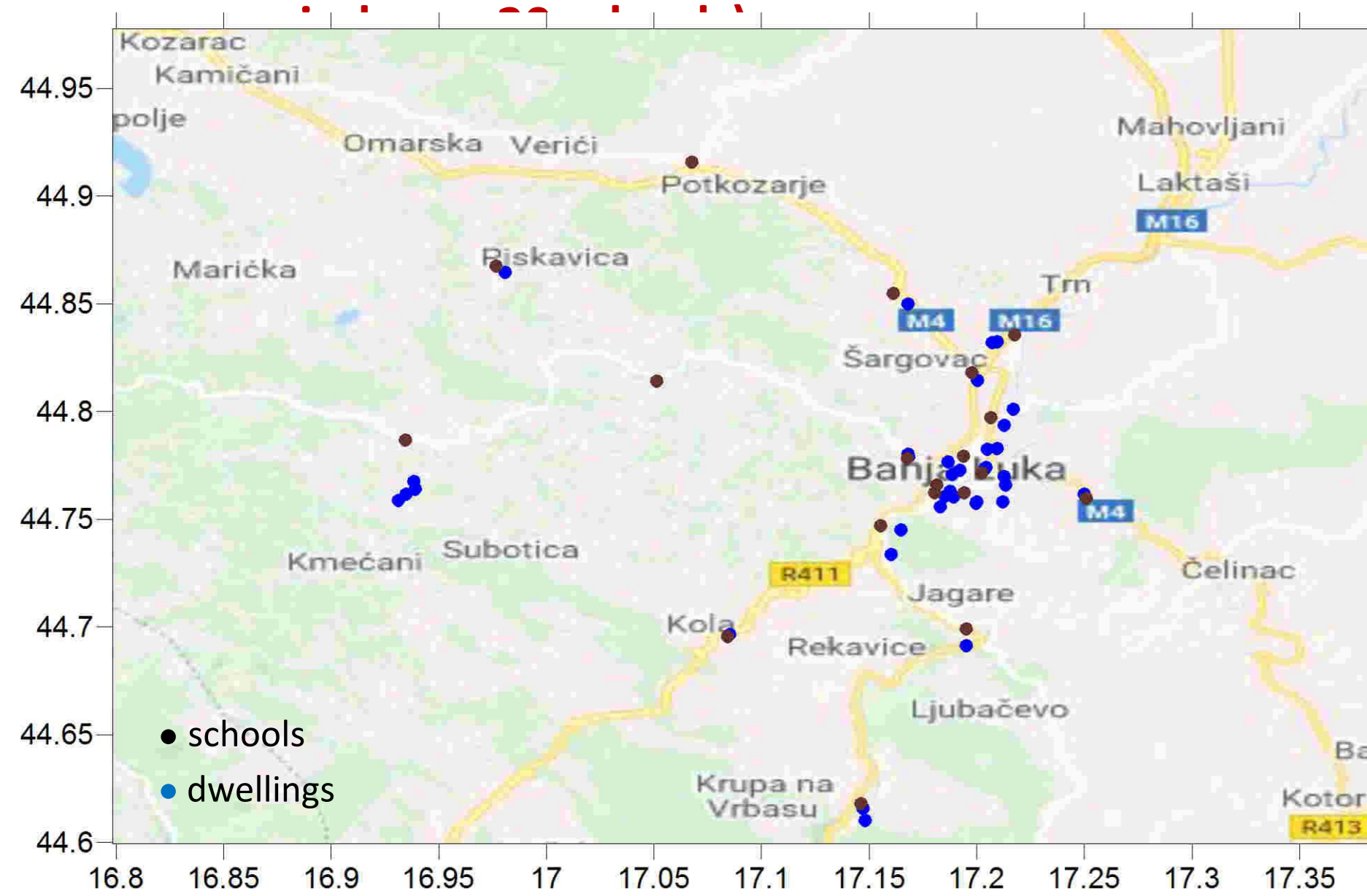
Absorber

(Aluminized Mylar)

Detector (LR-115)

- Direct Thoron Progeny Sensor (DTPS):** (50 μ absorber)
Selectively detects ^{212}Po (8.78 MeV) alpha particles
- Direct Radon progeny Sensor (DRPS):** (37 μ absorber)
Mainly detects ^{214}Po (7.69 MeV) alpha particles

Republic of Srpska



No. of dwellings: 37

D_{ER} : range: (0.4-0.9) mSv y^{-1}

average: 0.6 mSv y^{-1}

D_{ET} : range: ($3 \cdot 10^{-2}$ -0.3) mSv y^{-1}

average: 0.13 mSv y^{-1}

No. of schools: 25

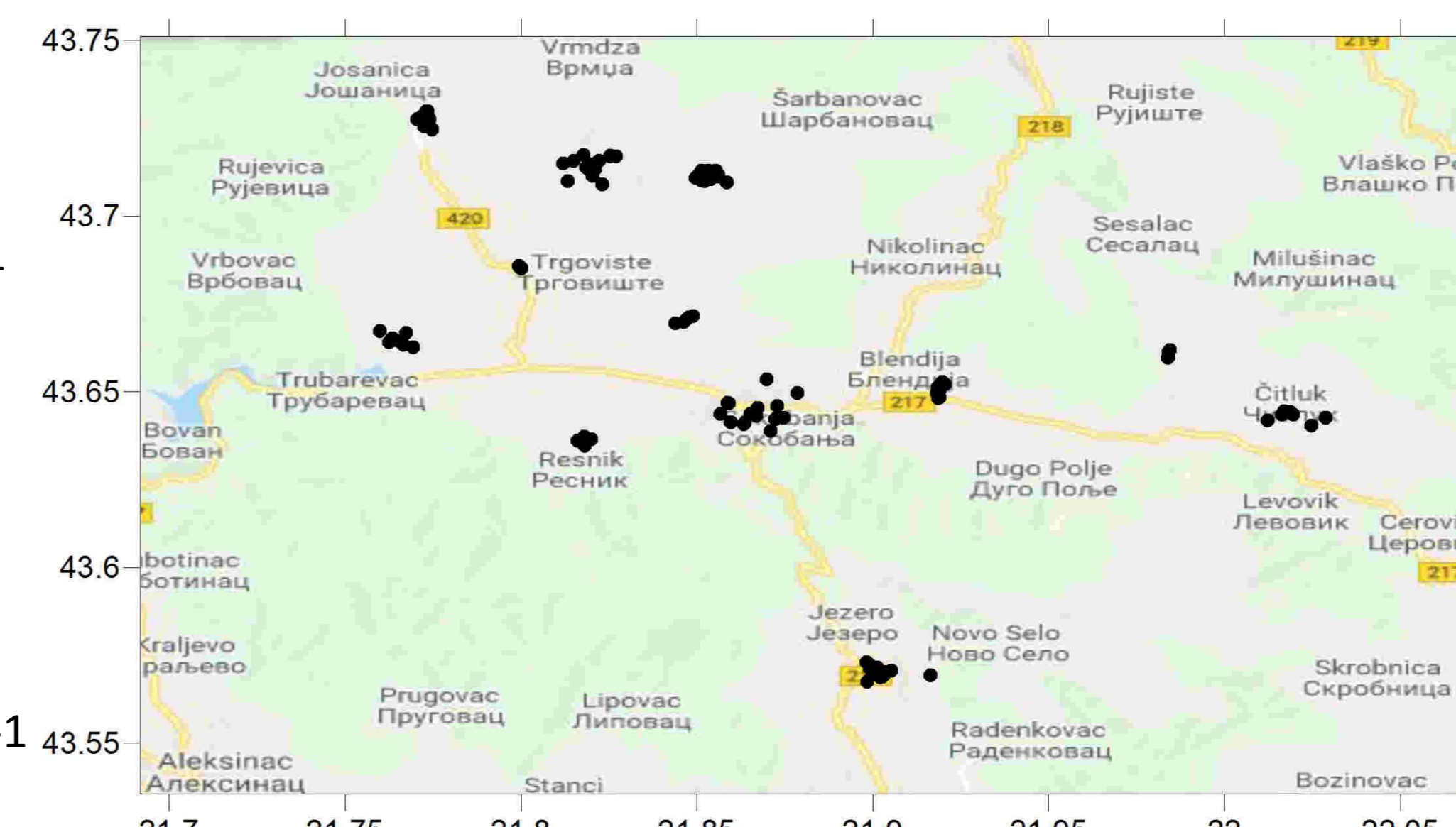
D_{ER} : range: (0.1-27.) mSv y^{-1}

average: 0.18 mSv y^{-1}

D_{ET} : range: ($6 \cdot 10^{-3}$ -0.08) mSv y^{-1}

average: 0.036 mSv y^{-1}

Soko Banja, SERBIA



No. of dwellings: 122

D_{ER} :

range: (0.25-1.) mSv y^{-1}

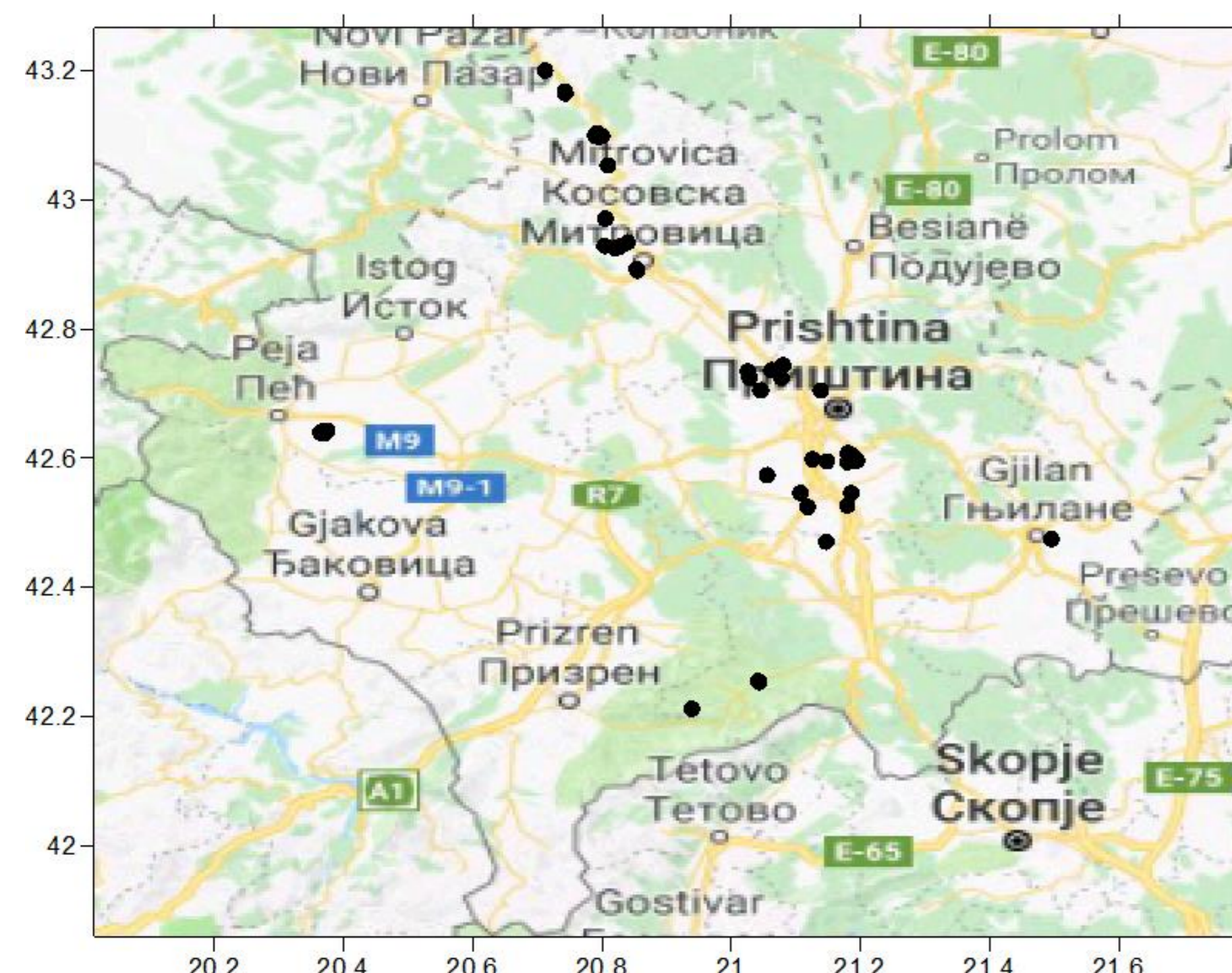
average: 0.7 mSv y^{-1}

D_{ET} :

range: ($4.0 \cdot 10^{-2}$ -0.9) mSv y^{-1}

average: 0.28 mSv y^{-1}

Kosovo



No. of dwellings: 112

D_{ER} : (data from 36 locations)

range: (0.1-9.4) mSv y^{-1}

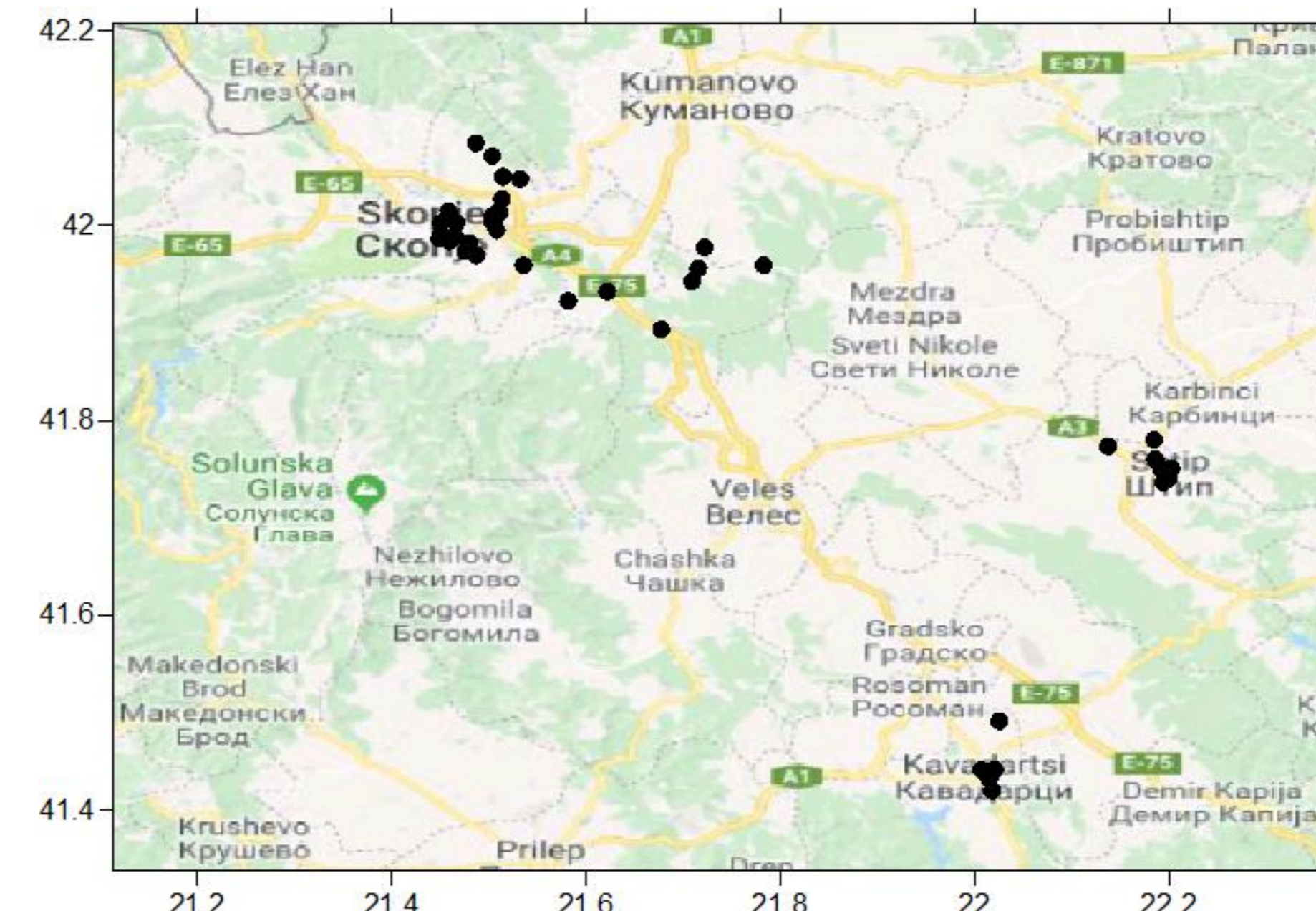
average: 2.2 mSv y^{-1}

D_{ET} :

range: ($3.5 \cdot 10^{-3}$ -0.7) mSv y^{-1}

average: 0.18 mSv y^{-1}

Macedonia



No. of schools: 44

D_{ER} :

range: (0.13-0.91) mSv y^{-1}

average: 0.45 mSv y^{-1}

D_{ET} :

range: ($5.9 \cdot 10^{-3}$ -0.43) mSv y^{-1}

average: 0.08 mSv y^{-1}

Conclusions:

- Data show a broad distribution of DRPS, DTPS detectors deployed in Balkans, within the framework of large international collaboration
- Annual effective dose due to exposure to radon and thoron progeny are estimated
- No significant risk for residents and pupils in measured locations