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LINESAM
Lithuanian National Ecosystem
Services Assessment and Mapping

Mapping groundwater recharge in Vilnius urban and peri-urban area (Lithuania)

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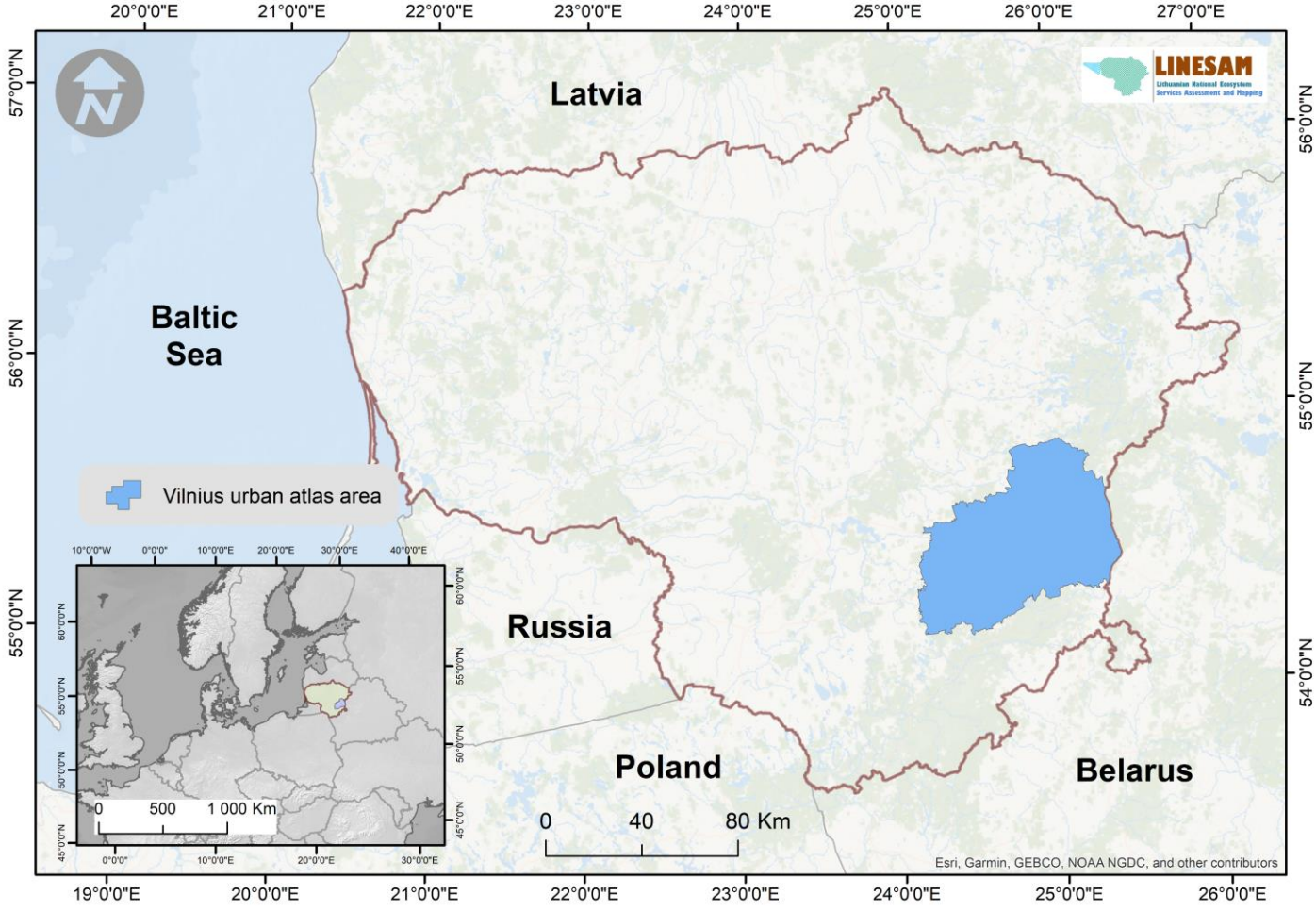
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Background and aim

- Urban sprawl is decreasing the groundwater recharge by sealing the soils. In several cases, this expansion occurs where soils have the highest quality and infiltration capacity;
- Soil sealing destroys the soil functions and reduces drastically the capacity to store water and regulate floods;
- This is especially relevant in urban areas where sprawl is a serious problem such as in Vilnius;
- The objective of this work is to map groundwater recharge capacity in Vilnius urban and peri-urban areas (urban atlas).

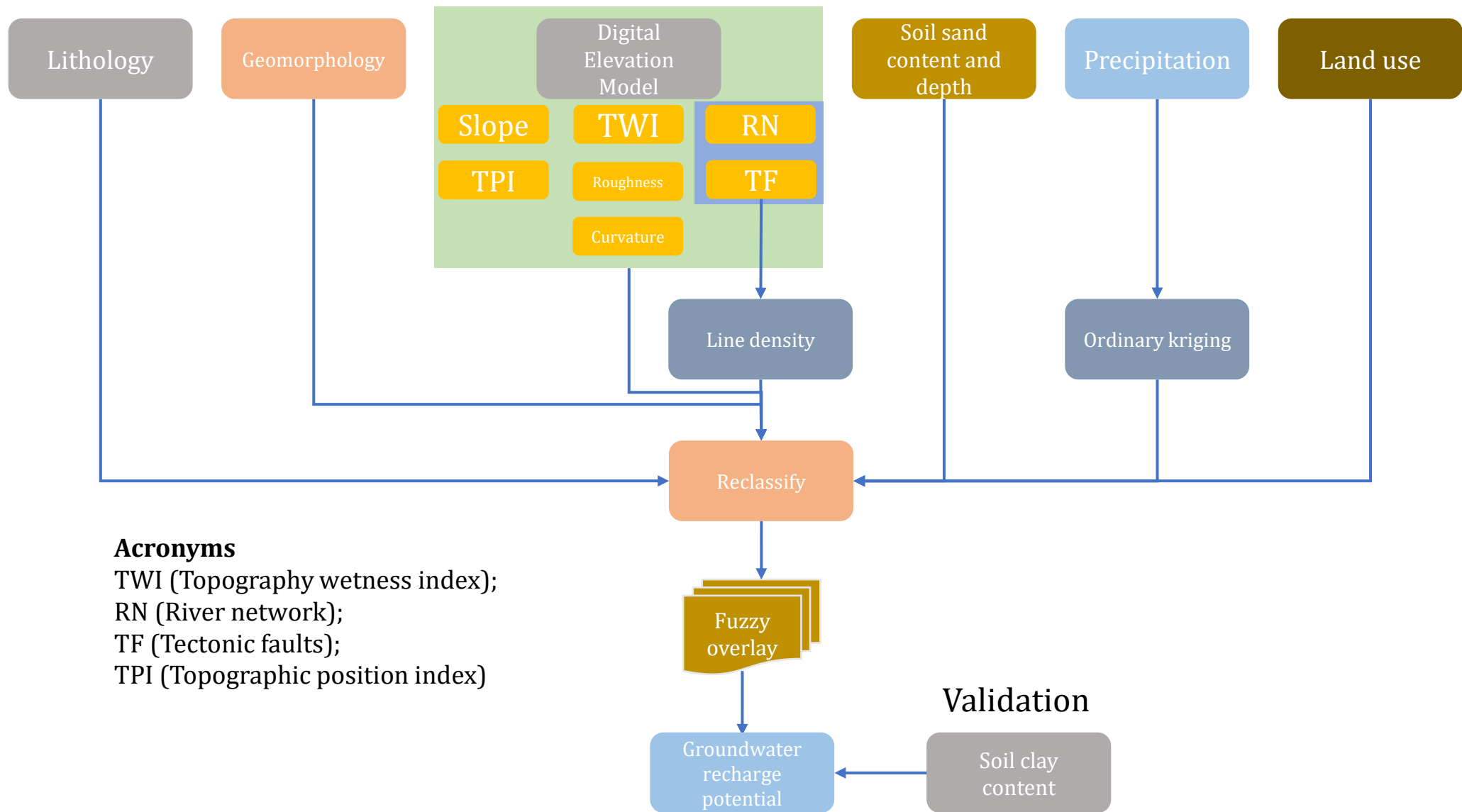
Materials and Methods

Study area



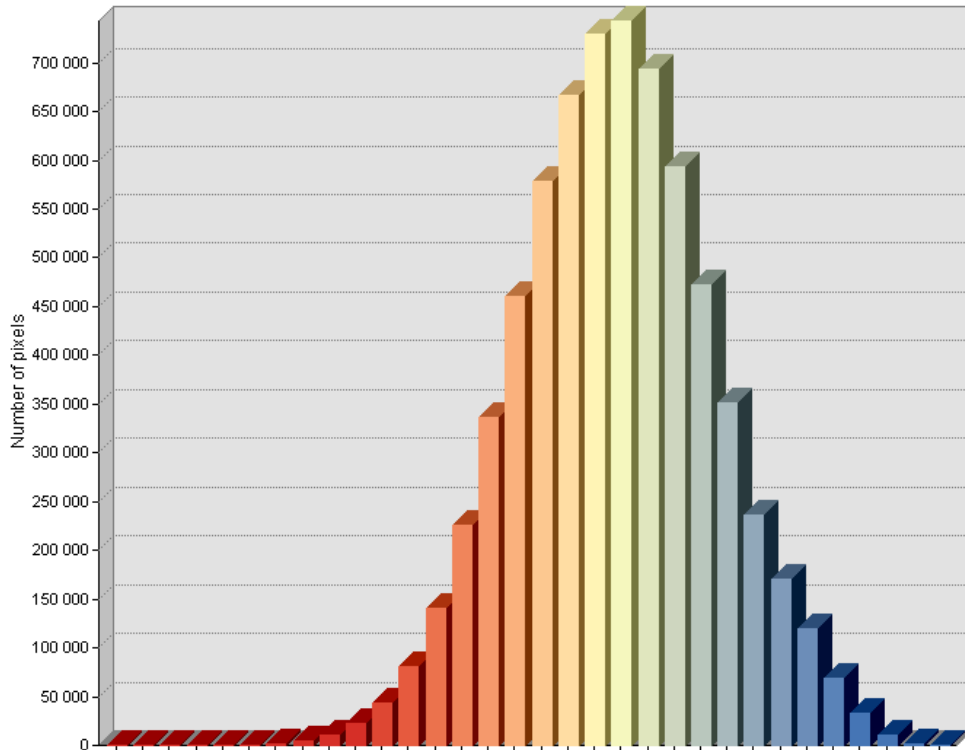
Data. ranking and models

Datasets	
Variable	Reference
Lithology	
Geomorphology	https://www.lgt.lt/
Tectonic faults	
River network	Lithuanian Cadastre (2018)
Digital elevation model	https://land.copernicus.eu/
Soil texture	
Soil depth	Panagos et al. (2012)
Precipitation 1997-2010	http://www.meteo.lt
Corine Land Cover (2018)	https://land.copernicus.eu/pan-european/corine-land-cover/clc2018



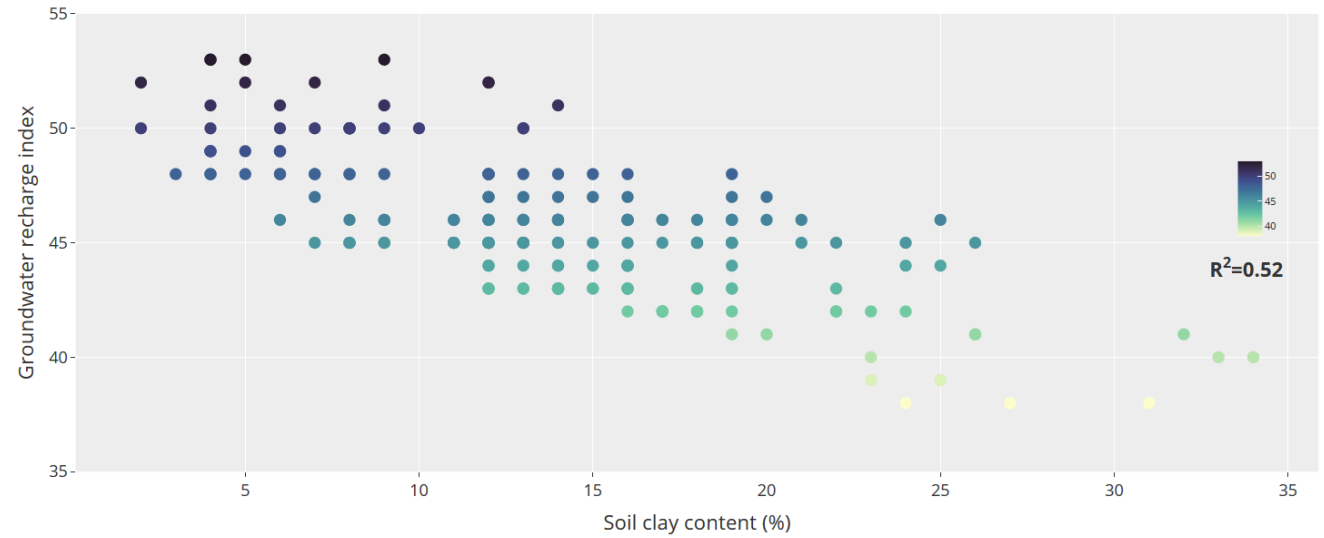
Results

Groundwater recharge index distribution



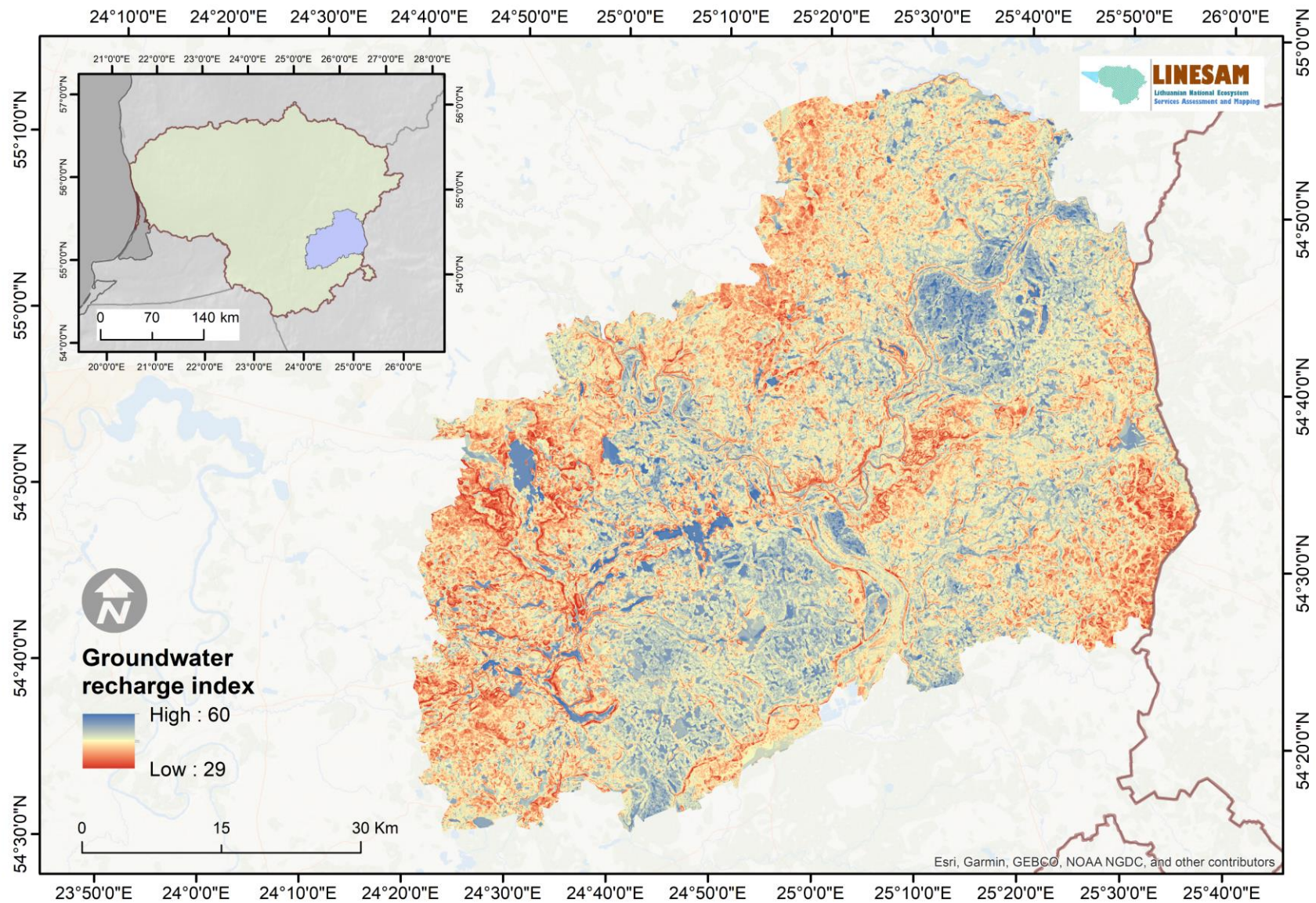
Min: 29.00
Mean: 47.64
Max: 60.64
SD: 3.65

Validation of groundwater recharge index



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Conclusions

- The areas most urbanized and located in steeper slopes have the lowest values of groundwater recharge capacity;
- Flat areas in sandy soil areas had the highest capacity for water recharge;
- The model had an acceptable validation performance ($r^2=0.52$);
- It is important to reduce urban sprawl in Vilnius urban area in order to reduce the impermeabilization of areas with high capacity for groundwater recharge.