

# Exposure to human activity in Slovakia in the year 2001

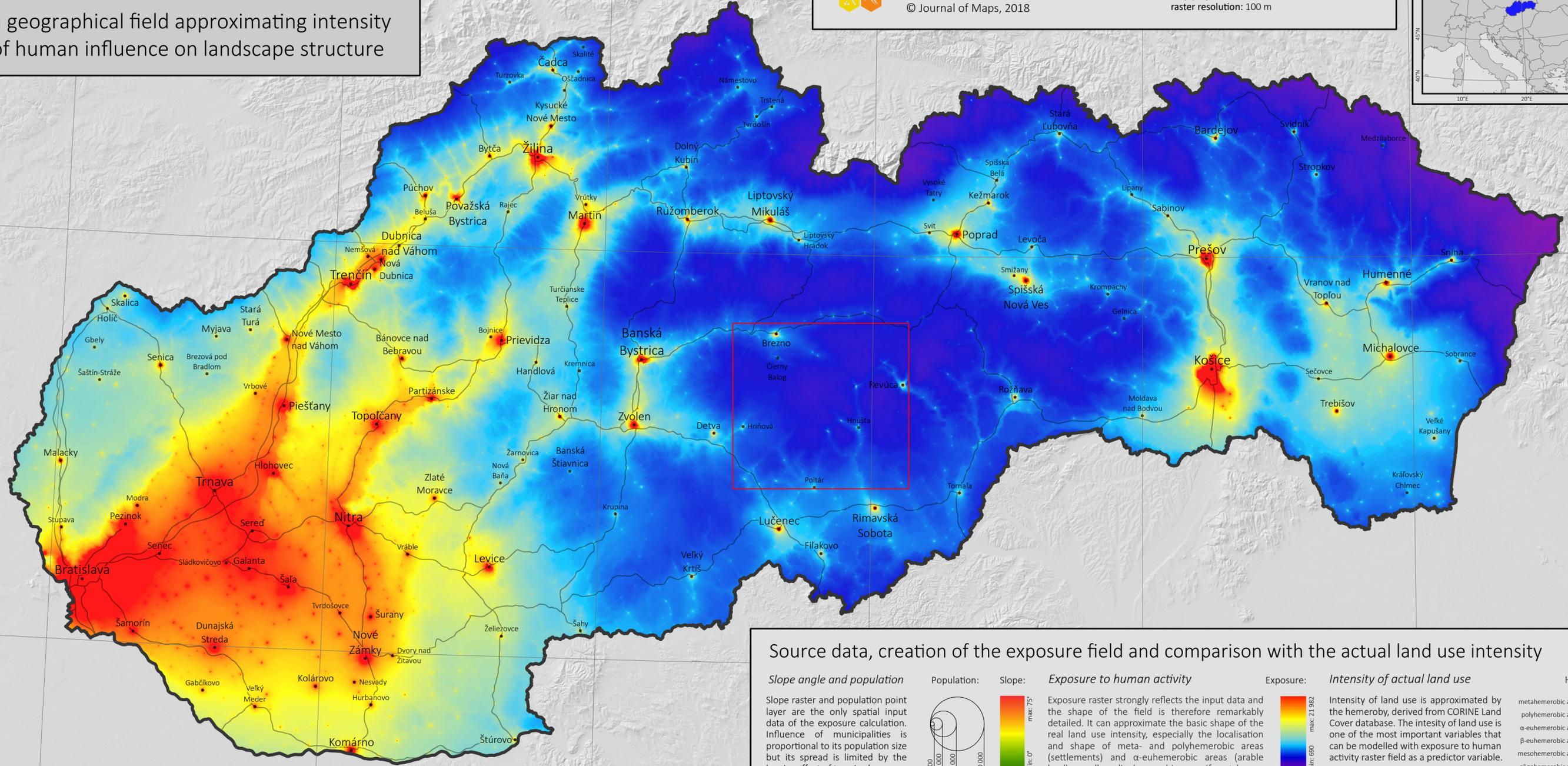
a geographical field approximating intensity of human influence on landscape structure



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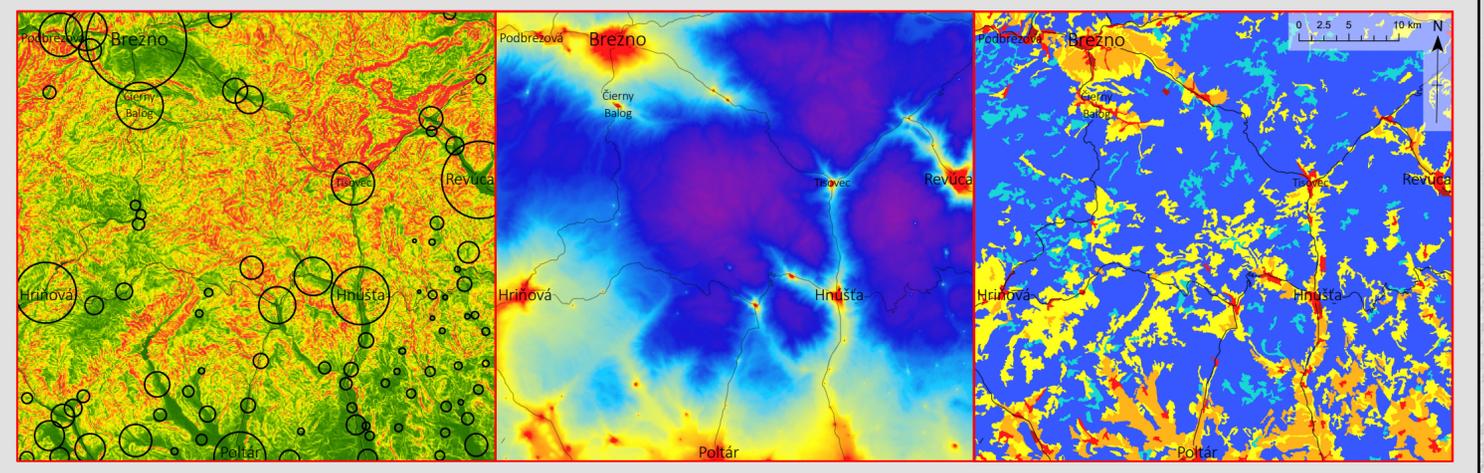
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coordinate system: ETRS 1989 UTM Zone 34N  
datum: European Terrestrial Reference System 1989  
spheroid: GRS 1980  
map projection: Transverse Mercator  
raster resolution: 100 m

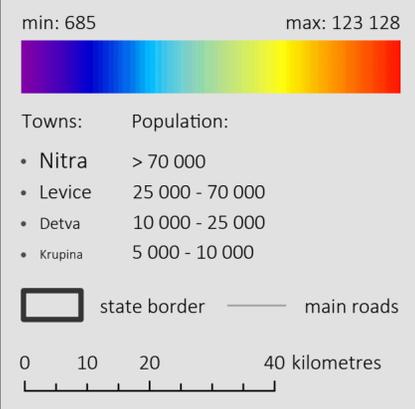


## Source data, creation of the exposure field and comparison with the actual land use intensity

<p><b>Slope angle and population</b></p> <p>Slope raster and population point layer are the only spatial input data of the exposure calculation. Influence of municipalities is proportional to its population size but its spread is limited by the barrier effect of terrain slope.</p>	<p><b>Population:</b></p>	<p><b>Slope:</b></p>	<p><b>Exposure to human activity</b></p> <p>Exposure raster strongly reflects the input data and the shape of the field is therefore remarkably detailed. It can approximate the basic shape of the real land use intensity, especially the localisation and shape of meta- and polyhemic areas (settlements) and α-euhemic areas (arable land) as well as oligohemic areas (forests).</p>	<p><b>Exposure:</b></p>	<p><b>Intensity of actual land use</b></p> <p>Intensity of land use is approximated by the hemeroby, derived from CORINE Land Cover database. The intensity of land use is one of the most important variables that can be modelled with exposure to human activity raster field as a predictor variable.</p>	<p><b>Hemeroby:</b></p> <ul style="list-style-type: none"> <li>metahemic areas</li> <li>polyhemic areas</li> <li>α-euhemic areas</li> <li>β-euhemic areas</li> <li>mesohemic areas</li> <li>oligohemic areas</li> </ul>
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### Exposure to human activity



### The exposure computation

**EXPOSURE** to settlement is directly proportional to its population size and inversely proportional to the cost distance from this settlement. Overall exposure to human activity sums all exposures to individual settlements in a region.

**COST DISTANCE** is calculated as the least-cost path over a cost surface. Sine of the slope is used as the cost surface.

$$Ex = \sum_{i=1}^n \frac{population_i}{1 + \frac{cost\ distance_i}{d1}}$$

$i$  = individual settlement from the total set of  $n$  settlements  
 $d1$  = "distance one" - calibration coefficient used for setting, how intensively the exposure disappears with rising cost distance.

**SOURCE DATA:**  
**POPULATION:** Tomášiková V., (2010). Demo(geo)grafický a metadátoýv informačný systém so zreteľom na dynamiku obyvateľstva Slovenska. Dissertation thesis source data. Comenius University in Bratislava.  
**DEM:** European environment agency (2013). Digital Elevation Model over Europe (EU-DEM).  
**LAND COVER:** European environment agency (2016). Corine Land Cover 2012 seamless vector data.