

ACHIEVING 3D THEMATIC CARTOGRAPHY THROUGH OPEN SOURCE: SYNERGY OF QGIS AND THREE.JS

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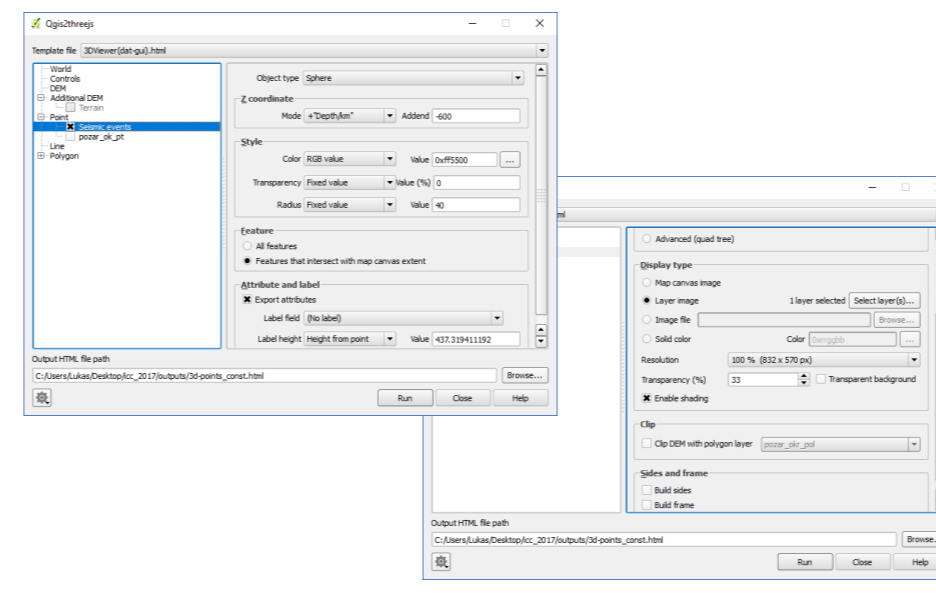
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INTRODUCTION

The 3D visualization of geospatial data is nowadays used in many areas and to various issues, which is conditioned by expansion of hardware devices and software tools enabling 3D geovisualization. 3D geovisualizations include broad spectrum of instances from photorealistic visualizations to abstract depictions of attribute data. Exploration of applicability or possible modifications of traditional cartographic visualization methods in 3D is therefore progressive topic. We studied possibilities of creation and effective use of 3D dot maps, statistical surfaces (fishnet maps), prism maps and graduated 3D symbols (3D diagram maps).

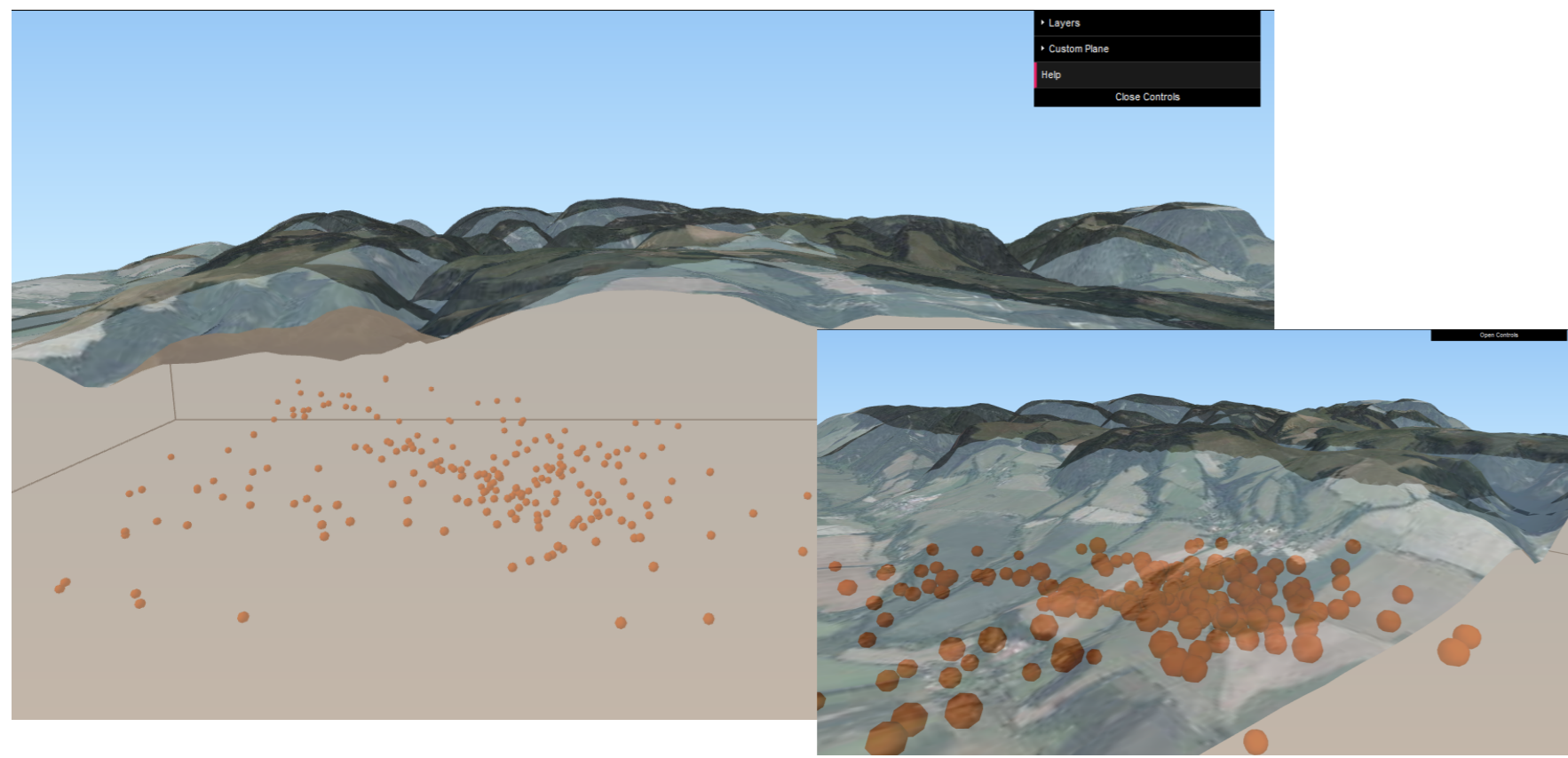
QGIS & QGIS2THREE.JS



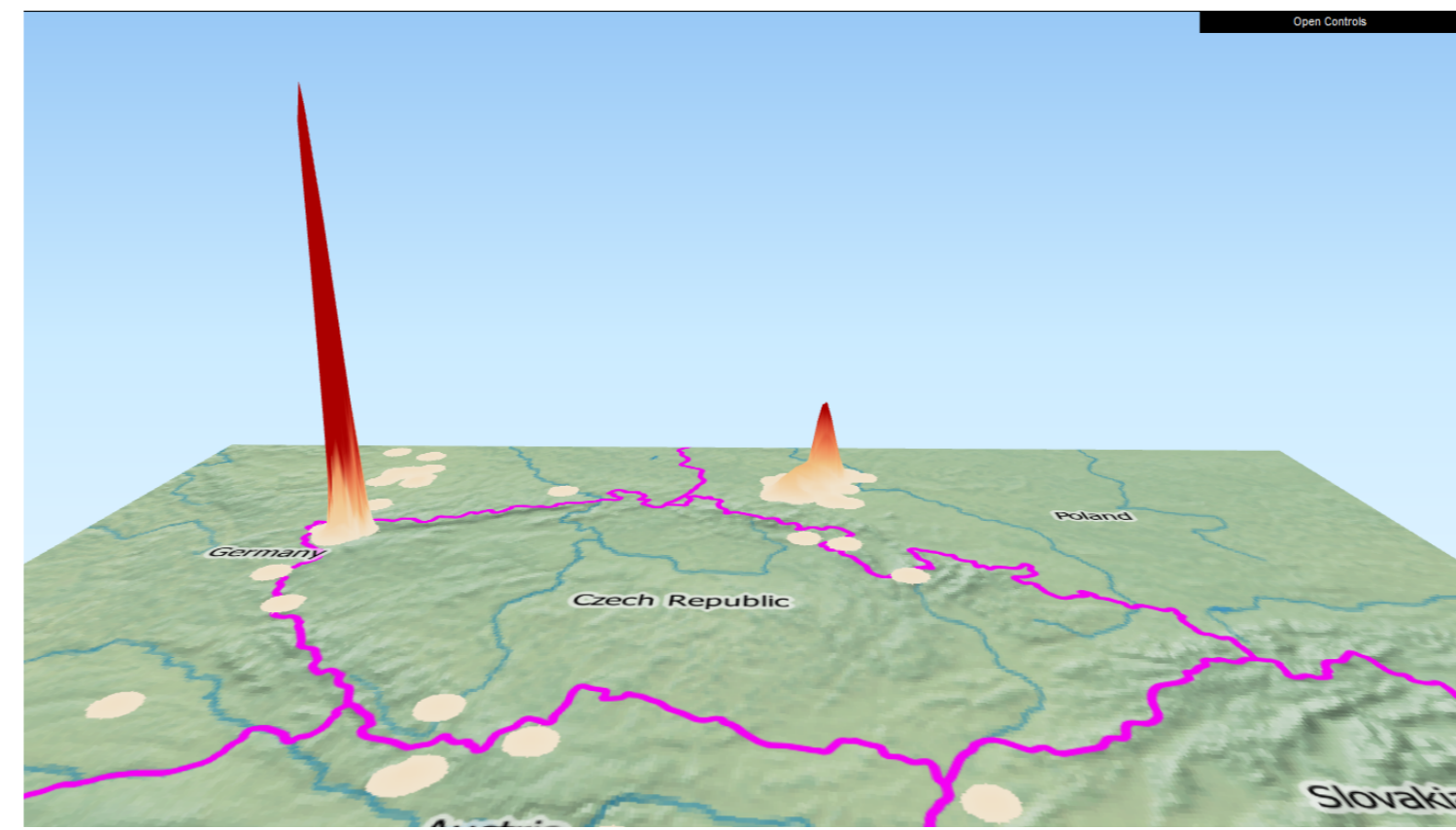
Qgis2three.js plugin exports surface data, map canvas images and vector data to web browser. You can view exported 3D objects on web browser, which supports WebGL.

EXAMPLES OF 3D THEMATIC MAPS

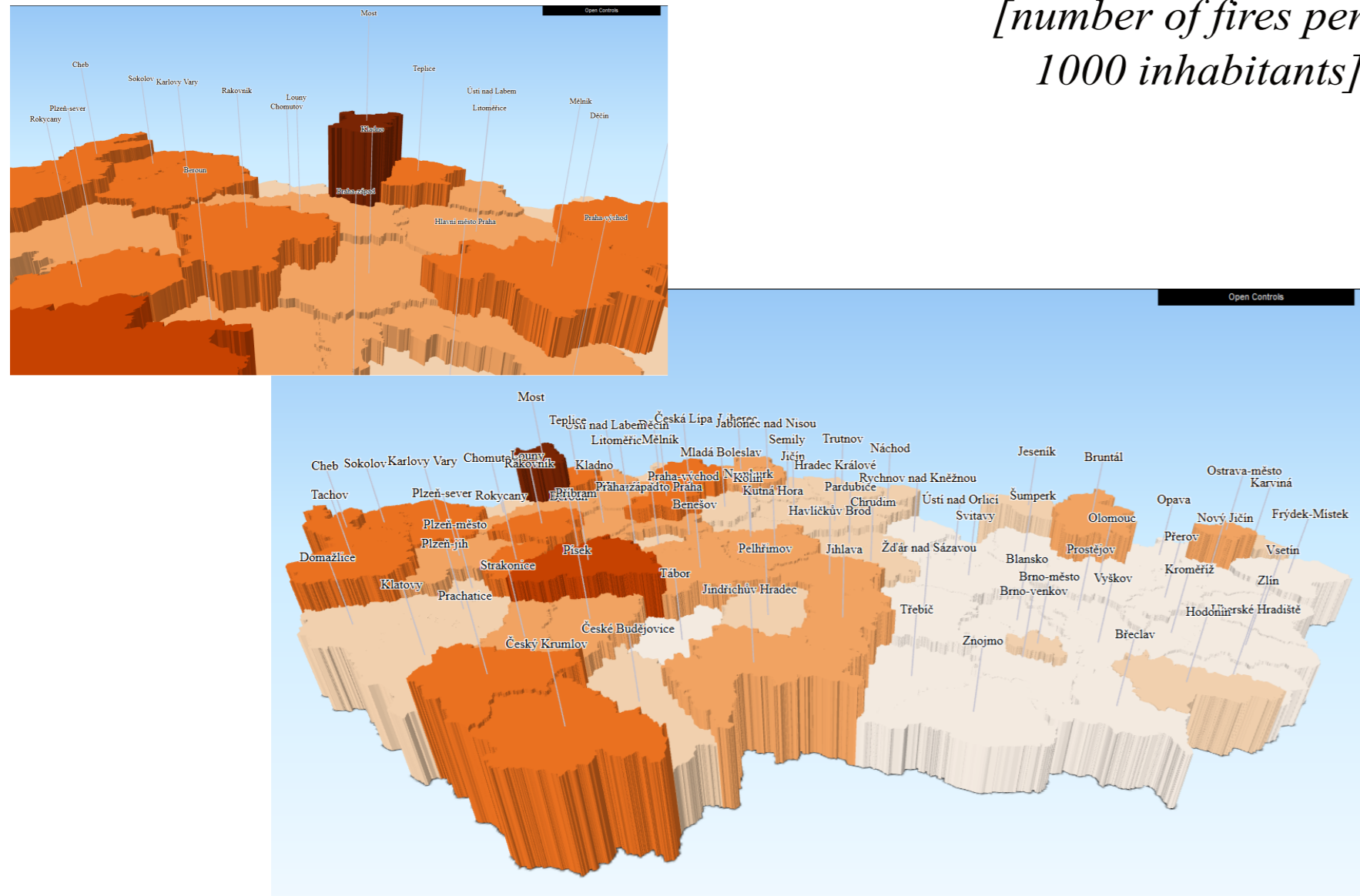
3D dot maps - seismic events in 2015 in north-western Czechia



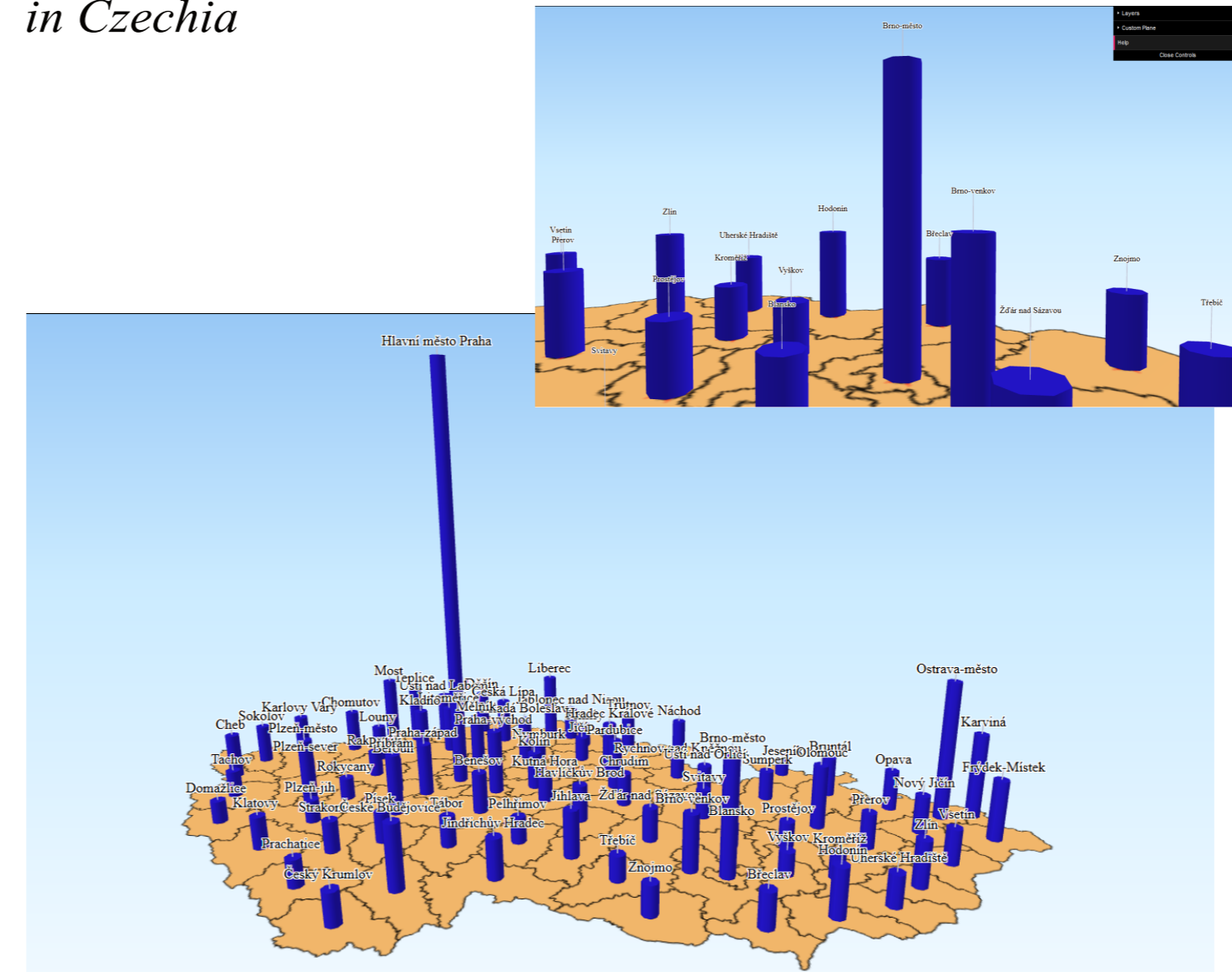
Fishnet map - seismic events in 2015 in Czechia



Prism maps - relative amount of fires in 2015 in Czechia [number of fires per 1000 inhabitants]



3D diagram maps - absolute amount of fires in 2015 in Czechia



DISCUSSION

Advantages of using 3D thematic maps:

- + more space for displaying additional data variables,
- + resolving the issues related to hidden symbols,
- + more familiar view of the space.

Possible usability problems of 3D thematic maps:

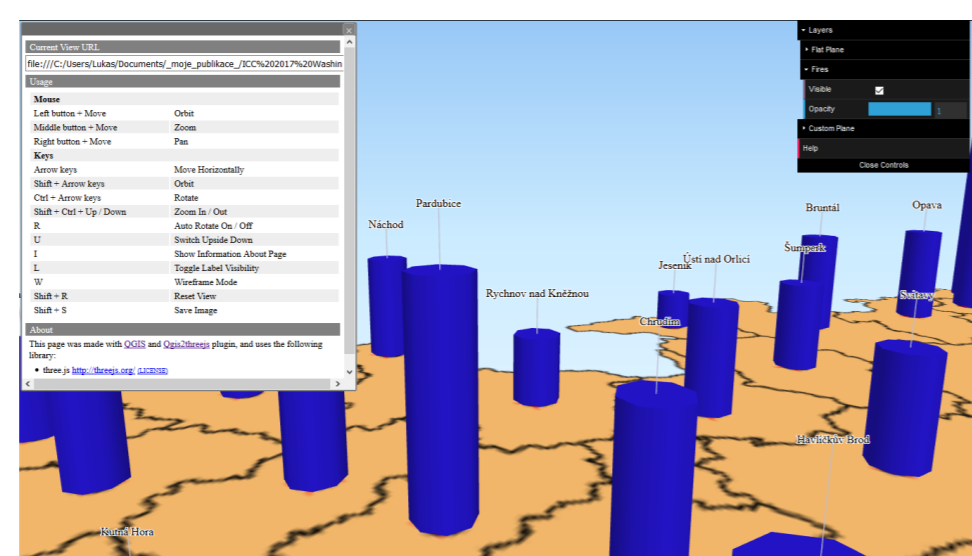
- occlusion of objects in a 3D scene,
- perspective distortion,
- countless scales within one view,
- incomparable geometries of objects.

Solutions of disadvantages of 3D thematic maps:

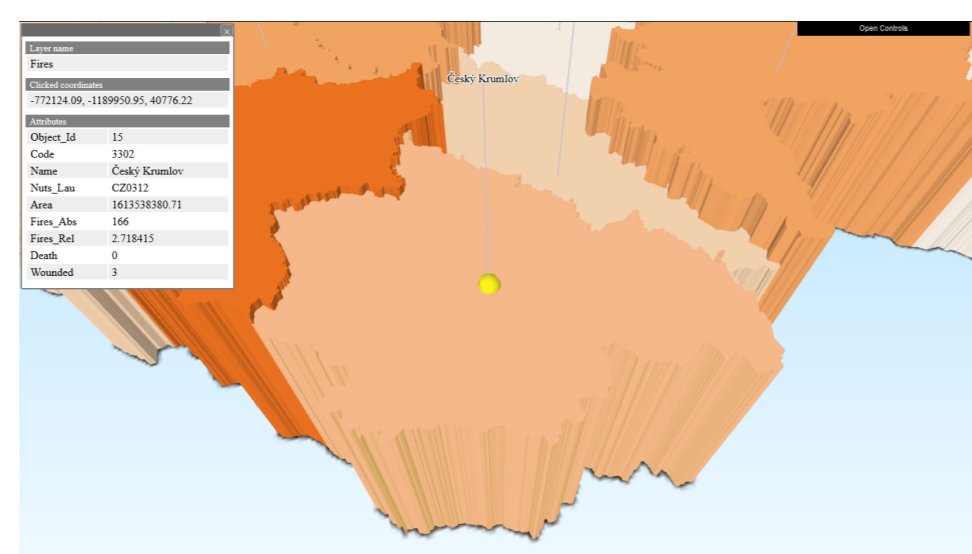
- + interactive movement,
- + setting transparency of map layers,
- + cutting planes,
- + pop-up windows.

Used data sources:
 Czech Statistical Office – <https://www.czso.cz/csu/czso>
 Natural Earth – <http://www.naturalearthdata.com>
 Ortophoto CUZK – http://geoportal.cuzk.cz/WMS_ORTOFOTO_PUB/WMSservice.aspx
 RUIAN – <http://vdp.cuzk.cz>
 SeismicPortal – <http://www.seismicportal.eu>

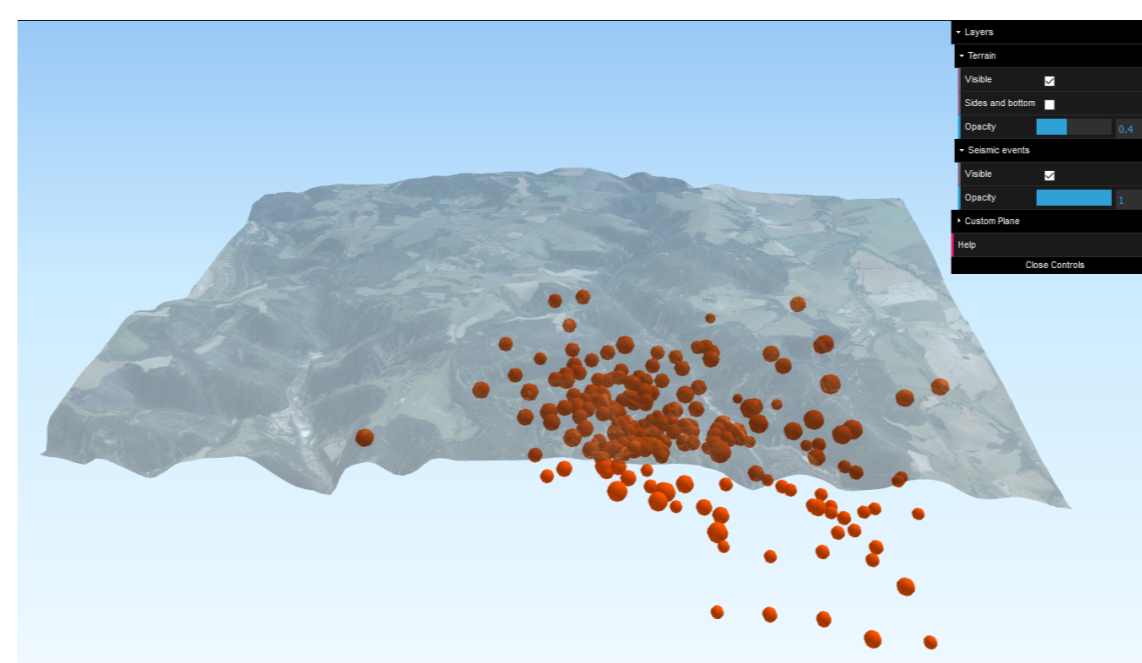
Used software:
 QGIS 2.12
 Qgis2Three.js plug-in
 Inkscape



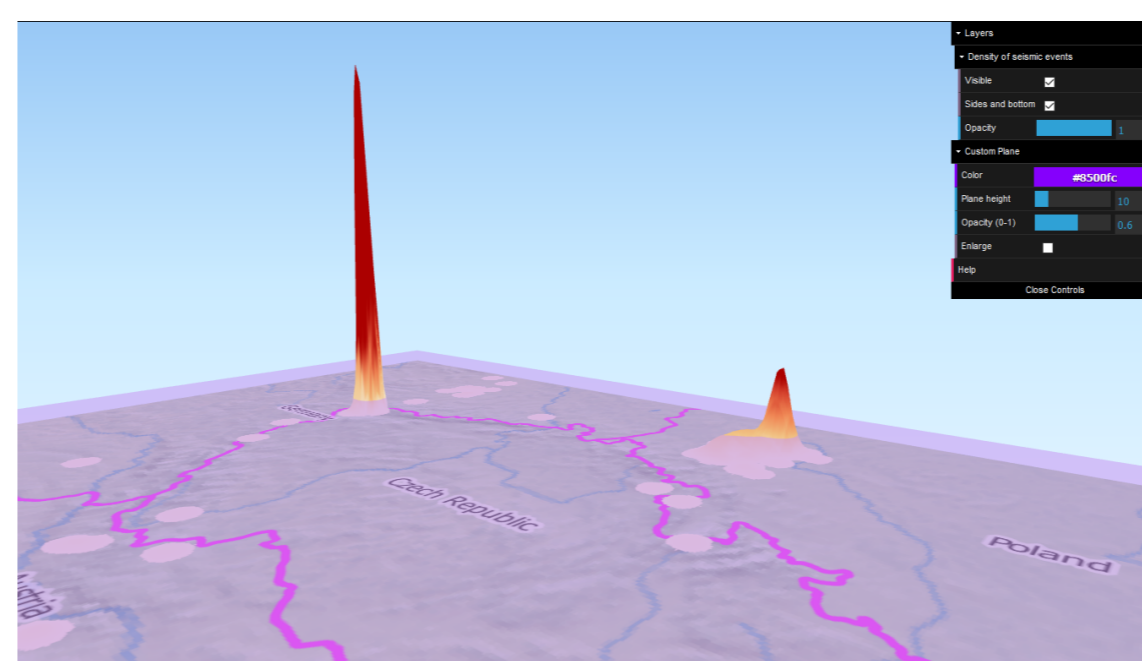
Interactive movement



Pop-up window



Setting transparency



Cutting plane

Interactive versions of 3D maps:



<http://web3dvis.esy.es/qgis2threejs/>

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