Cartography for risk evaluation

6th Vilnius Seminar on Cartosemiotics

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Goals

- To create risk evaluation methodology using cartography.

- To create interactive multiscale Lithuania risk map.

- Separate and visualize regions in Lithuania by typical risk distribution.

Tasks

- To collect, load and store data in to DB
- To create procedural model for risk evaluation.
- Data preparation for model.
- Calculations and tuning of the model.
- Risk mapping.
- Defining criterias for separation of risk regions
- Define and draw risk regions
- To create deployment infrastructure for results

Instruments

- IT infrastructure: database.
- Geographic information system.
- Spatial analysis and geostatistic.
- Geospatial modeling.
- Methods of modern cartography.
- IT infrastructure: servers for results dissemination.
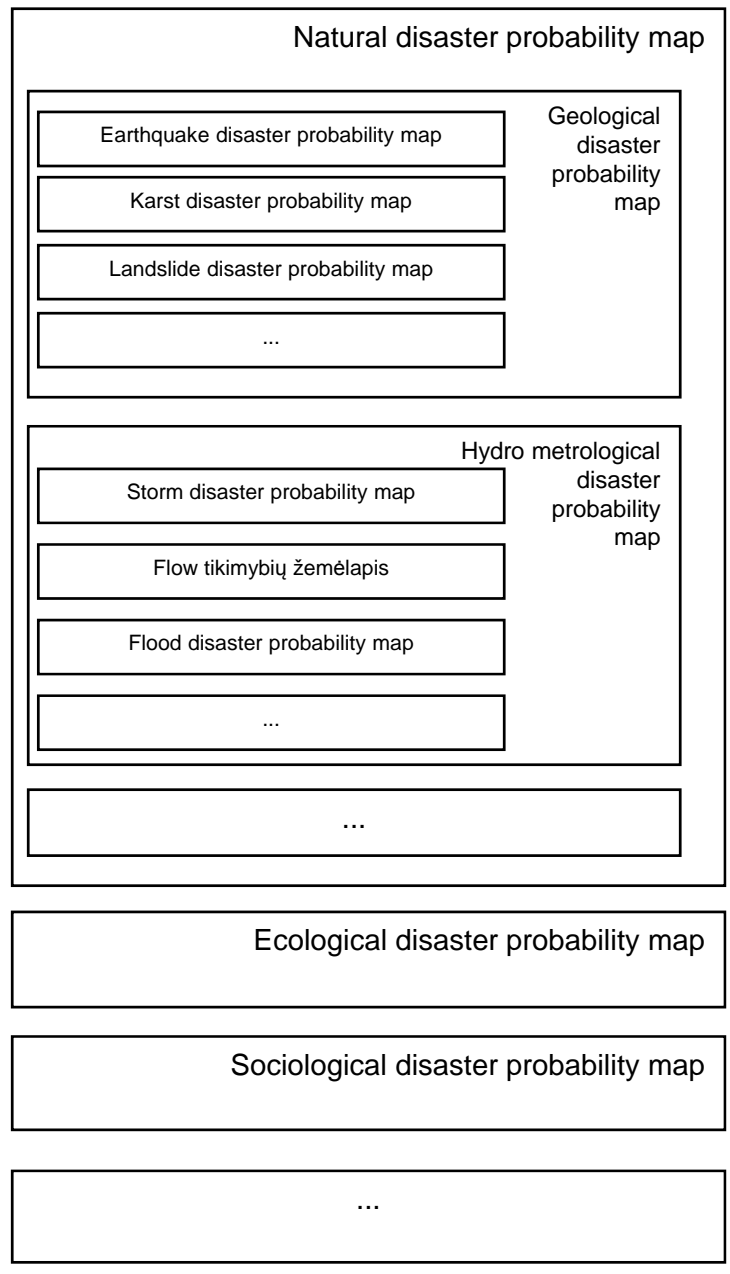
Sample of spatial analysis
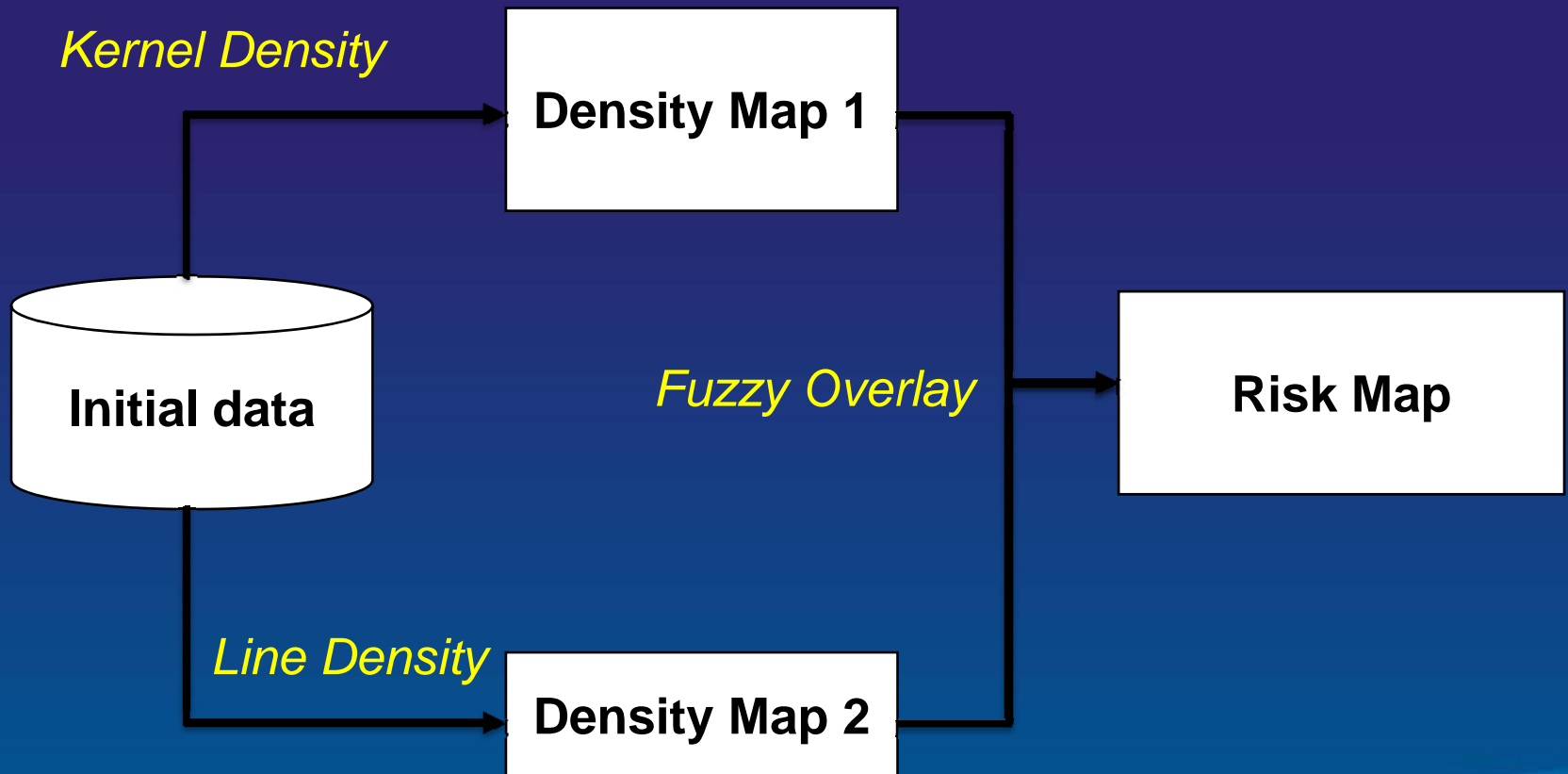
Results

- Flexible model which can dynamically evaluate criterias or data which are important in risk calculation.

- Lithuania regions with different risk types and quantities parameters.

- At the end of each stage maps for each risk will be created.
- Risk types maps
- Overall interactive multiscale risk map of Lithuania in internet
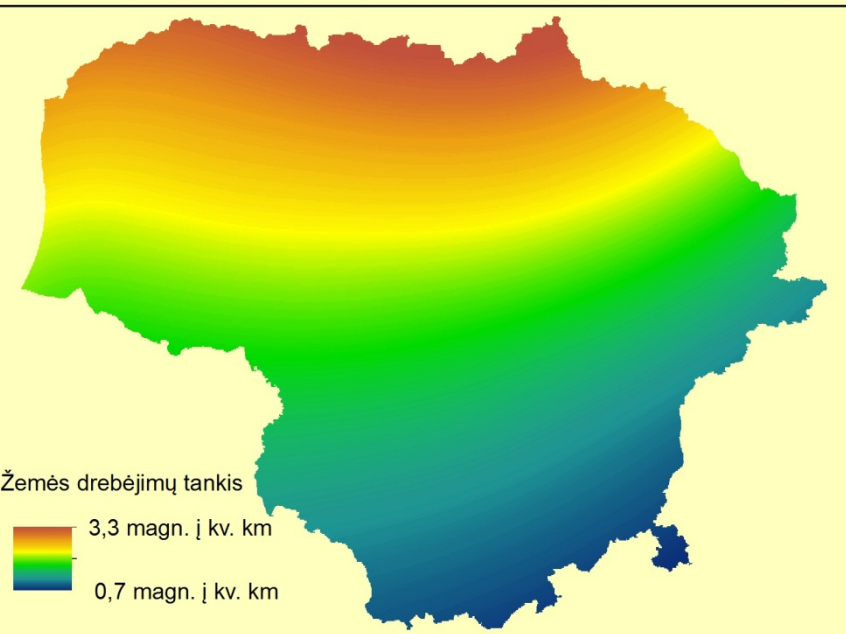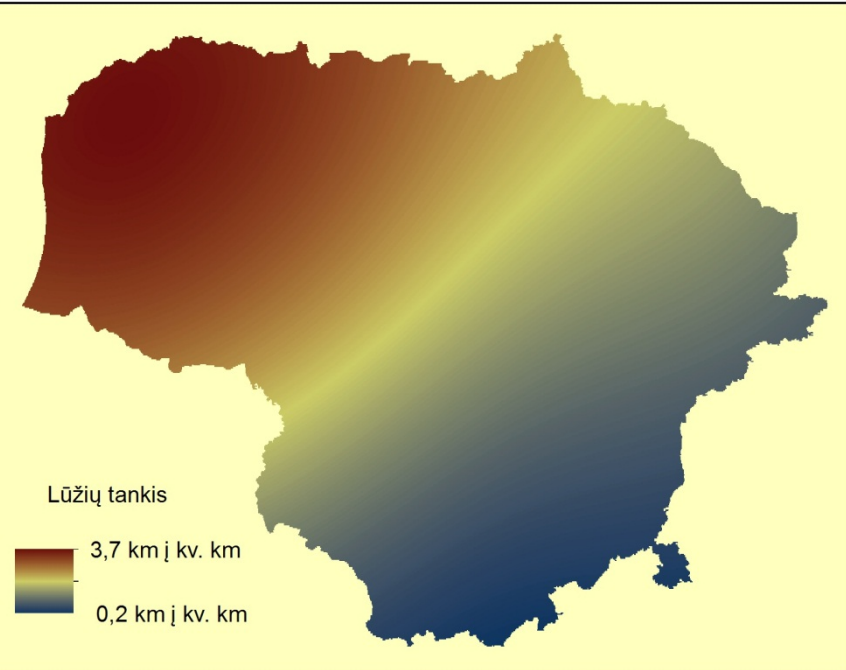
Cartographic information system of risk evaluation

Natural disaster probability map

Geological disaster probability map

Earthquake disaster probability map

Karst disaster probability map

Landslide disaster probability map

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Hydro metrological disaster probability map

Storm disaster probability map

Flow tikimybių žemėlapis

Flood disaster probability map

...

...

Ecological disaster probability map

Sociological disaster probability map
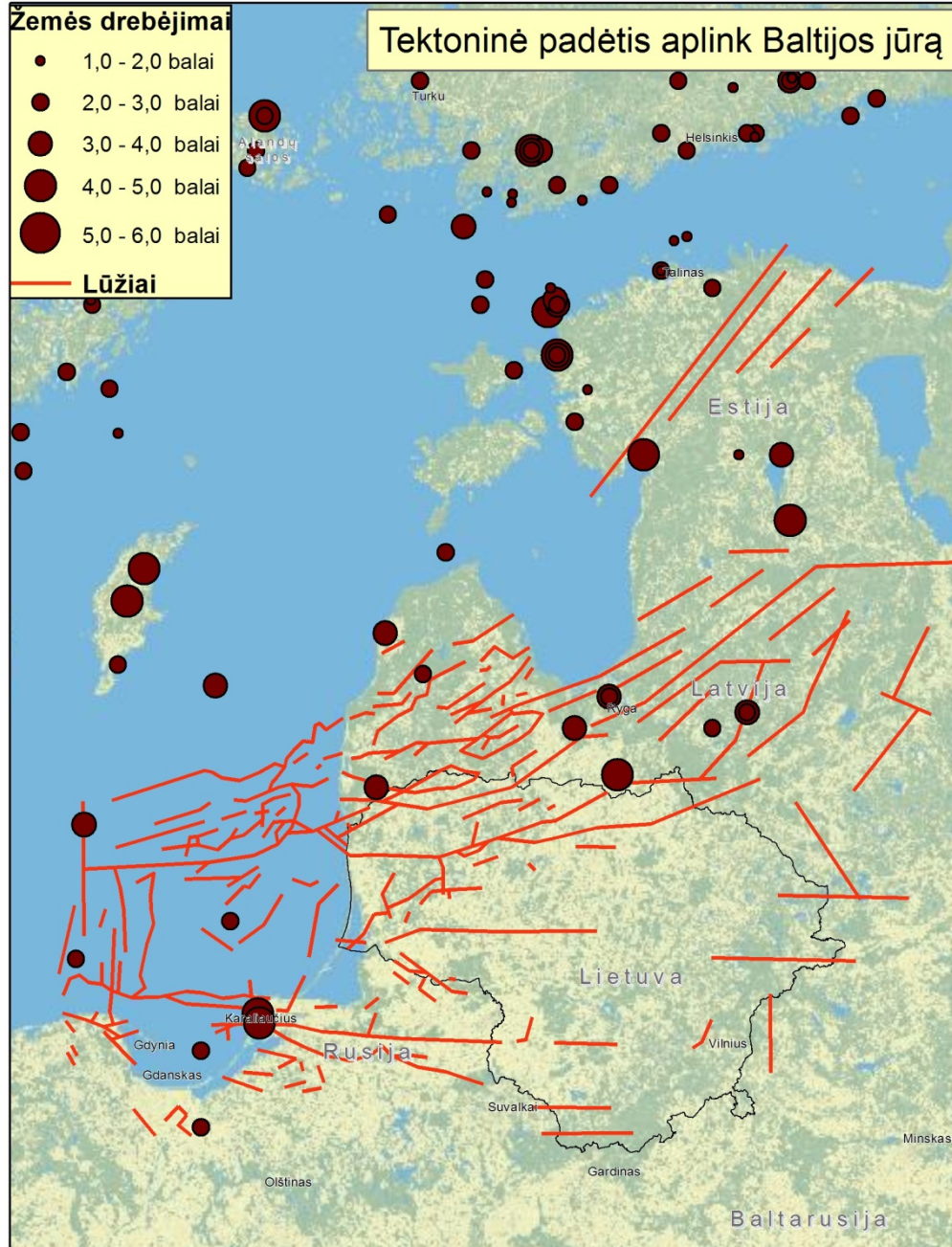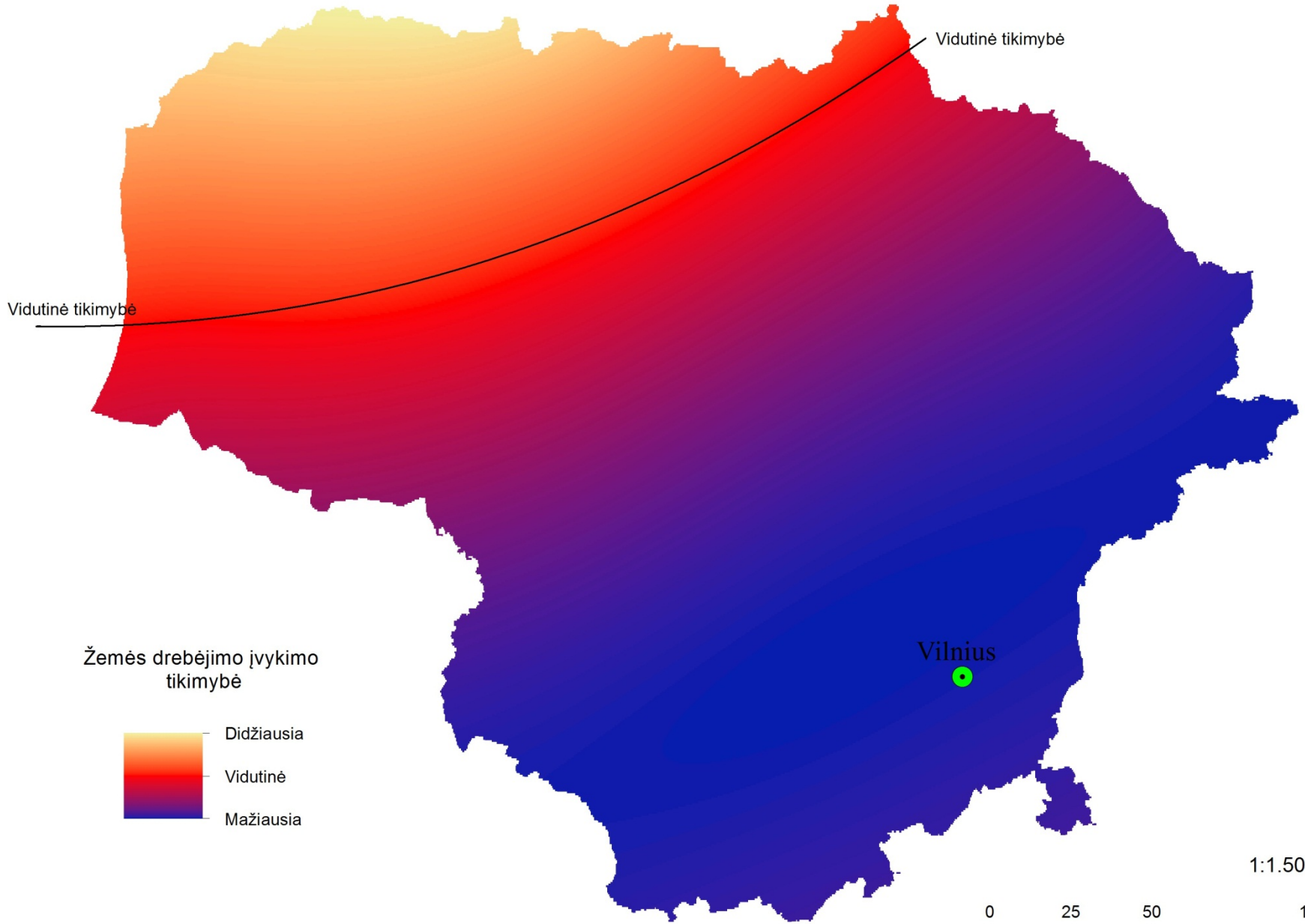
...

Tektoninė padėtis aplink Baltijos jūrą

Žemės drebėjimai
- 1,0 - 2,0 balai
- 2,0 - 3,0 balai
- 3,0 - 4,0 balai
- 4,0 - 5,0 balai
- 5,0 - 6,0 balai
— **Lūžiai**

Turku
Ahvenų salos
Helsinkis
Talinas
Estija
Latvija
Ryga
Lietuva
Karaliaučius
Gdynia
Gdanskas
Rusija
Vilnius
Suvalkai
Minskas
Olštinas
Gardinas
Baltarusija

Lūžių tankis
3,7 km į kv. km
0,2 km į kv. km

Žemės drebėjimų tankis
3,3 magn. į kv. km
0,7 magn. į kv. km

Vidutinė tikimybė

Vidutinė tikimybė

Žemės drebėjimo įvykimo
tikimybė

Didžiausia

Vidutinė

Mažiausia

Vilnius

1:1.500.000

0   25   50   100 Km.

Problems

- Collection and preparation of data
- Development of the United Model using united (one) measurement system
- Tuning of the model
- Evaluation risk regions defining rules

Prospects

- Improvement of elements of model using more precise data (LIDAR, new satellite and ortophoto imagery, various data collected from different areas using a more precise instrument)

Prospects

- Improvement of algorithm for determination of risk and regionalism
- Data providing to various application areas: Fire and Rescue Department, determination of insurance risk, determination of the changes of residential quality, localization of risk-sensitive objects

Thanks!