Introduction

Earthquakes cause major damages and casualties among all natural disasters.

About 360 fatalities due to earthquakes are reported in Bulgaria since 1901 until now.
Disaster Management activities

- **assessment, preparedness and prevention**, including hazard analysis, risk assessment, scenarios, monitoring, planning the emergency activities;
- **protection**, including early warning, rescue planning, organizing rescue operations, evacuation and **coordination** of the operations of the Integrated Rescue System;
- **recovery**, including human help, economic support, rehabilitation, reconstruction, strategic development.
Cartography and Disaster Management

Maps

Pre-Disaster
- Hazard maps
- Risk assessment maps
- Maps based on statistical data
- Early warning maps
- Maps for Disaster Management planning

Disaster
- Rapid maps
- Reference maps
- Maps for planning of evacuation activities

Post-Disaster
- Damage assessment maps
- Maps for recovery

Risk assessment maps
Maps based on statistical data
Early warning maps
Maps for Disaster Management planning

Cartography and Disaster Management

FIG Working Week 17-21 May, Sofia, Bulgaria

Type of natural disasters

FIG Working Week 2015 3
Research Project for Expert Earthquake Risk Assessment
at University of Architecture, Civil Engineering and Geodesy

• Conceptual model for information system for expert express assessment of the earthquake risk over the Bulgarian territory.
Disaster management requires accurate information.

Participants in activities for disaster management need special geographic information.

Main source of such information are thematic maps.

Considering the importance of the demographic and social information combined with business / communications / industry information several maps were produced.
Thematic mapping for expert evaluations of seismic risk assessment

Research Project for Expert Earthquake Risk Assessment

Maps representing:
- short-term statistics on residential buildings;
- housing fund - useful living area;
- business statistics - number of building permits;
- business statistics - sectorial statistics - average annual prices;
- information society - household access to the Internet;
- demographic statistics - population density;
- demographic and social statistics – urbanization;
- health sector - number of hospital beds.

Maps for the Information Data Set for Seismic Risk Evaluation:
- Urbanization process;
- Transport infrastructure- density of the international / national / regional network;
- Mining and quarrying;
- Electricity network;
- Chemical industry;
- Others.
Thematic mapping for expert evaluations of seismic risk assessment

Mapping Demographic and Social Information

Map of newly built housing constructions for 2010

FIG Working Week 17-21 May, Sofia, Bulgaria

Thematic mapping for expert evaluations of seismic risk assessment

Mapping Demographic and Social Information

Map of newly built housing constructions for 2013

FIG Working Week 17-21 May, Sofia, Bulgaria
Thematic mapping for expert evaluations of seismic risk assessment

Mapping Demographic and Social Information

Map of useful living area for 2013

Thematic mapping for expert evaluations of seismic risk assessment

Mapping Demographic and Social Information

Map of the building permits number for 2013
Thematic mapping for expert evaluations of seismic risk assessment

Mapping Demographic and Social Information

Map of average annual prices for housing for 2010

FIG Working Week 17-21 May, Sofia, Bulgaria

Thematic mapping for expert evaluations of seismic risk assessment

Mapping Business Communication and Industry Information

A map presenting household access to the Internet for 2013

FIG Working Week 17-21 May, Sofia, Bulgaria
Data Harmonization

Combination of international, national and regional data. Usage of heterogeneous data provided by various services, agencies and organizations.

Main aspects of data harmonization

- Georeferencing the information into a geographical reference system
- Standardizing the attribute structure
- Standardizing the object classification
- Standardizing the level of detail of the information
- Unifying the cartographic visualization
Conclusion

• Information data sets
• Thematic maps
• Support the integrated crisis management

Thank you for your attention!

Dr. Eng. Silvia Marinova
University of Architecture, Civil Engineering and Geodesy
Bulgarian Cartographic Association
1, Chr. Smirnenski Blvd.
1046 Sofia, BULGARIA
Email: silveto_marinova@yahoo.com
Web site: www.cartography-gis.com