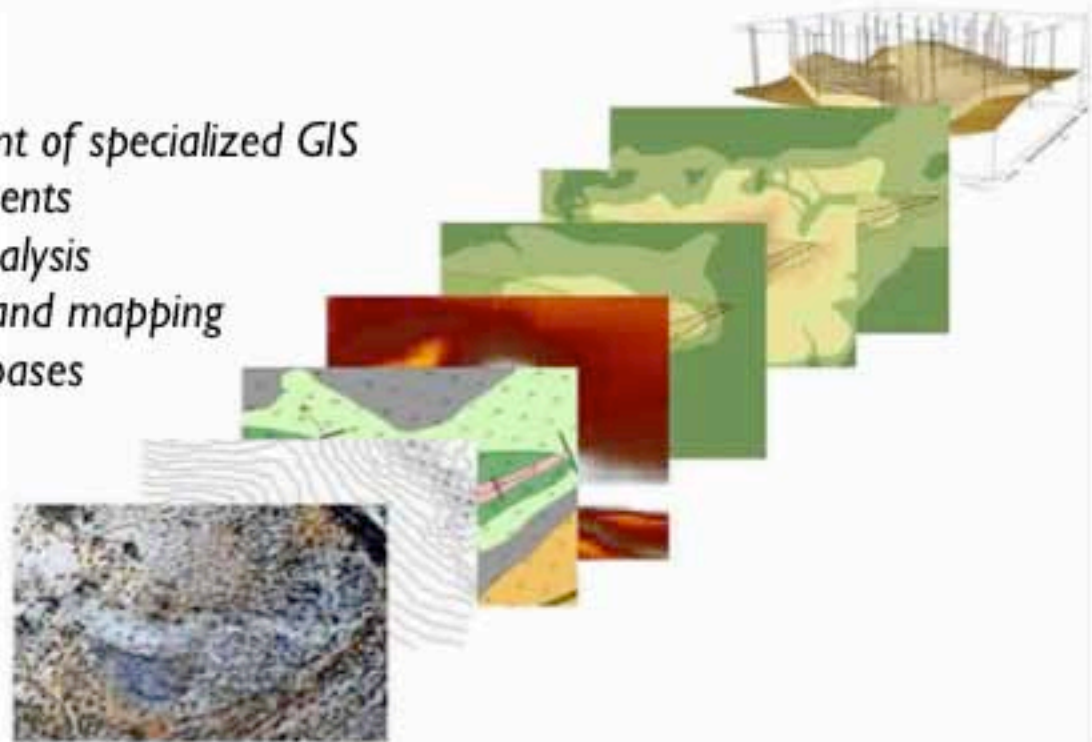


**Geo-spatial data implication in flood
risk management: lessons learned
from the implementation of EU Flood
Directive in Bulgaria**

Seville,
June, 2014

Leonid Todorov,
Geographica, Ltd.

- *Regional planning*
- *Spatial planning*
- *Design and development of specialized GIS*
- *Environmental assessments*
- *Spatial and regional analysis*
- *Flood risk assessment and mapping*
- *GIS datasets and databases*
- *Geomarketing*
- *Digital cartography*



Climate change & water

- Climate change impacts:
 - More extreme weather:
Floods & Droughts
 - Water security
 - Infrastructure and land loss
- **'Wet gets wetter and dry gets drier'**
(International Panel of Climate Change - IPCC)

Floods

“Floods have the potential to cause fatalities, displacement of people and damage to the environment, to severely compromise economic development and to undermine the economic activities of the Community.” *(Directive 2007/60/EC)*

Water-related Legislation

- **Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy**
- **Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks**
- **Both Directives are transposed in the national legislation through the Bulgarian Water Act and relevant regulations**

Water management in Bulgaria

In 2002, under Art. 153 of the Water Act (WA) and in accordance with Article 3 (paragraph 1) of Directive 2000/60/EC were created four basin directorates to the Ministry of Environment and Water:

- **Danube River Basin Directorate**
- **Black Sea River Basin Directorate**
- **East Aegean River Basin Directorate**
- **West Aegean River Basin Directorate**



Water management in Bulgaria

There are two main documents that should be created in each basin directorate for assuring the process of water management:

- River basin management plans
- Flood risk management plans

Flood risk management



Preliminary flood
risk assessment

Preparing flood
hazard maps and
flood risk maps

Establishing and
implementing
flood risk
management plan

Flood Directive terms of implementation

- *Preliminary Flood Risk Assessment (PFRA) – 2011*
- *Flood hazard & flood risk maps – December 2013*
- *Flood Risk Management Plans – December 2015*
- *Update – every 6 years*

Preliminary Flood Risk Assessment

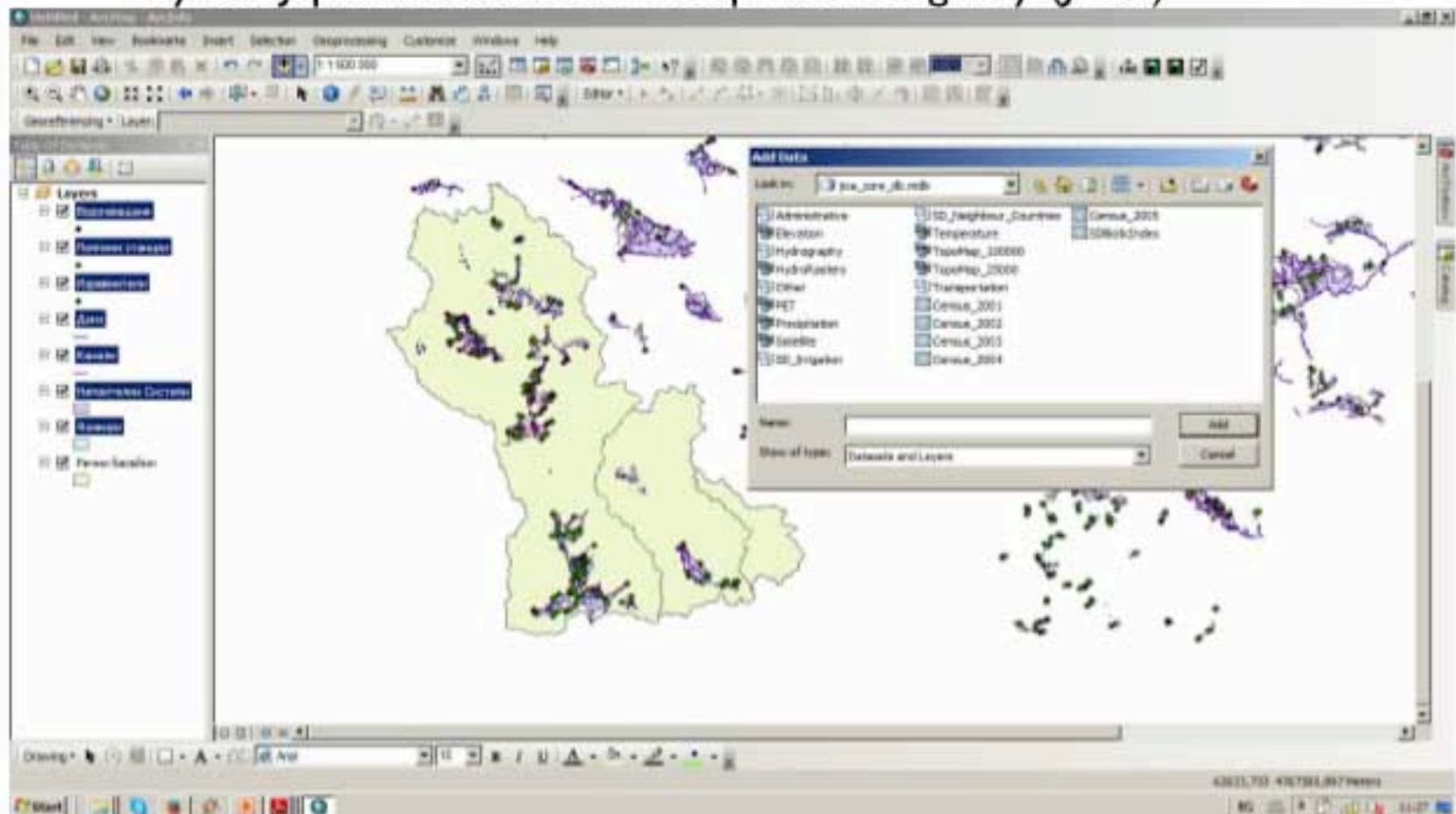
- Delineating flood risk zones
- Vulnerability of society to floods
- Vulnerability assessment of key infrastructure
- Mapping and forecasting

The specific case – identifying areas with significant potential flood risk

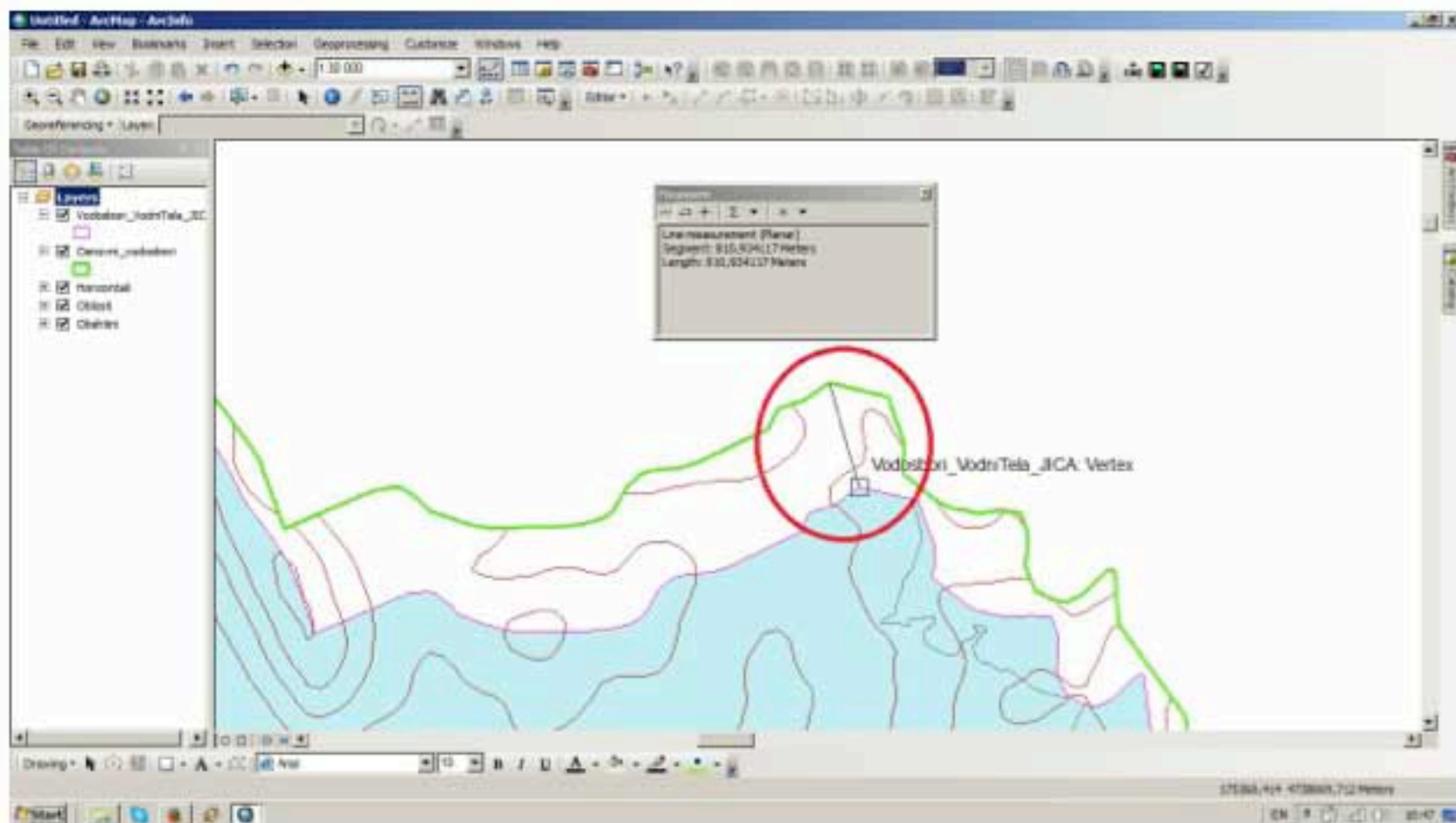
- The area - West Aegean River Basin Directorate
- Geospatial data:
 - ❖ JICA database
 - ❖ Topographic maps M 1:25 000
 - ❖ Aerial photos (2011/2007)
 - ❖ Attribute data
- Methodology – approved by the Minister of Environment and Water

JICA database (2008)

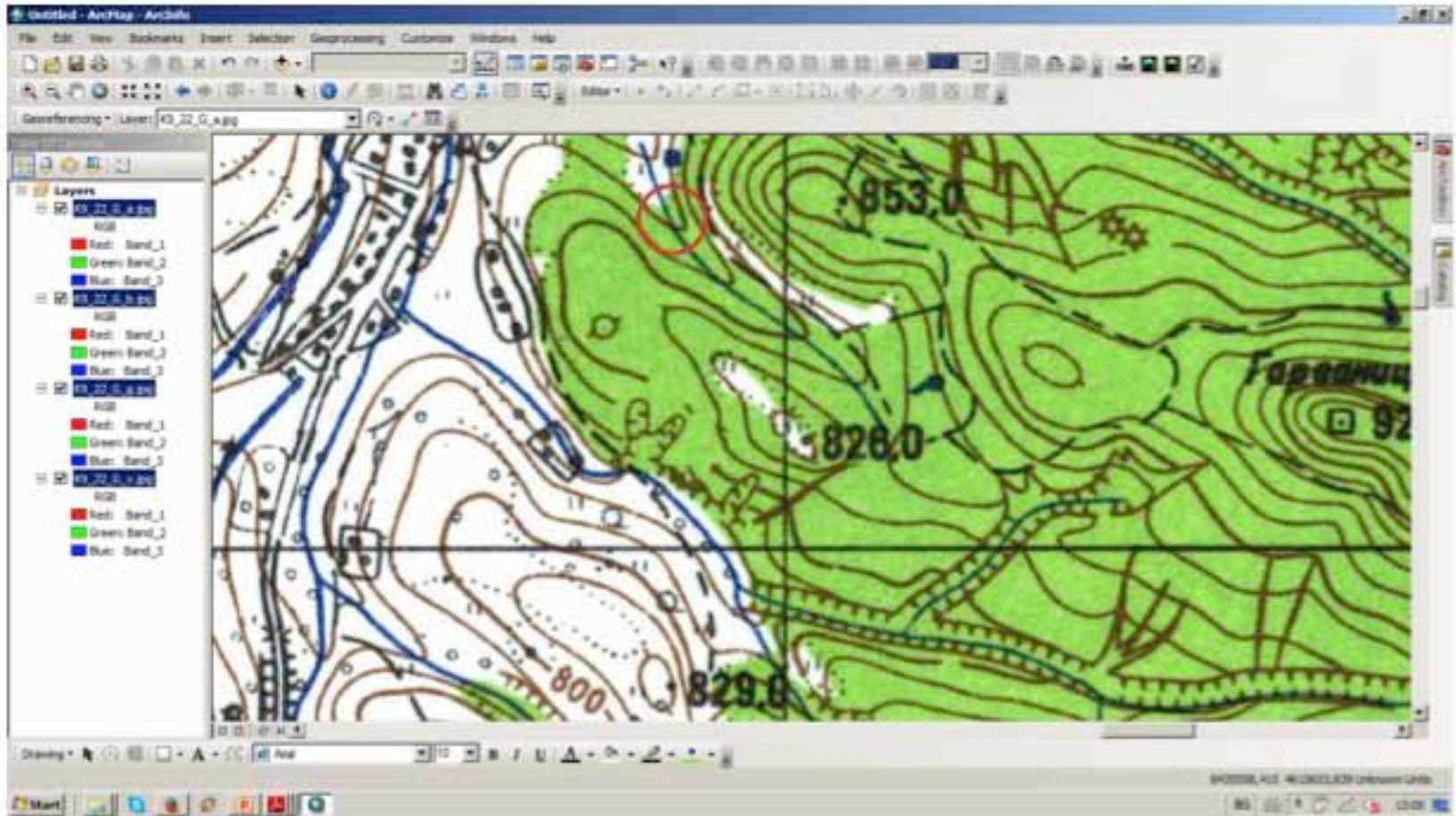
- Created in the project “The Study on Integrated Water Management in the Republic of Bulgaria” that has been conducted by the Japan International Cooperation Agency (JICA)



Some problems with the primary vector data

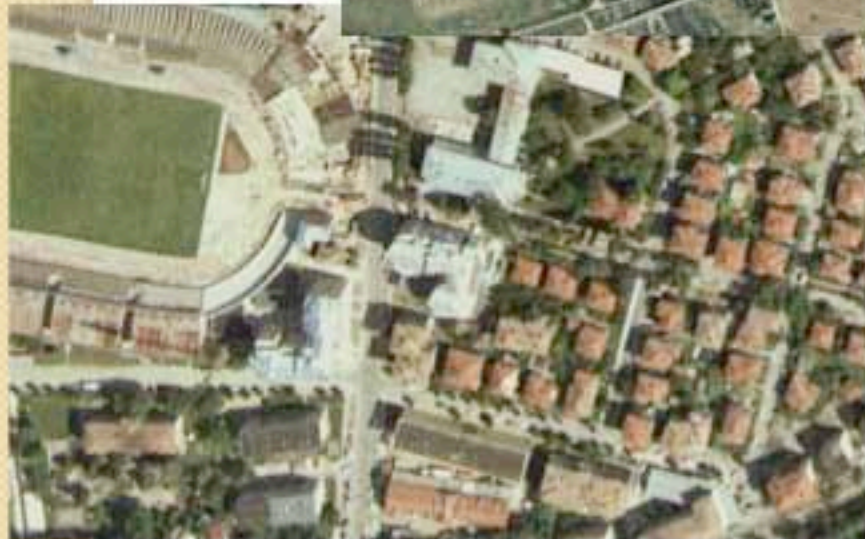


Topographic maps



Aerial photos

From 2011



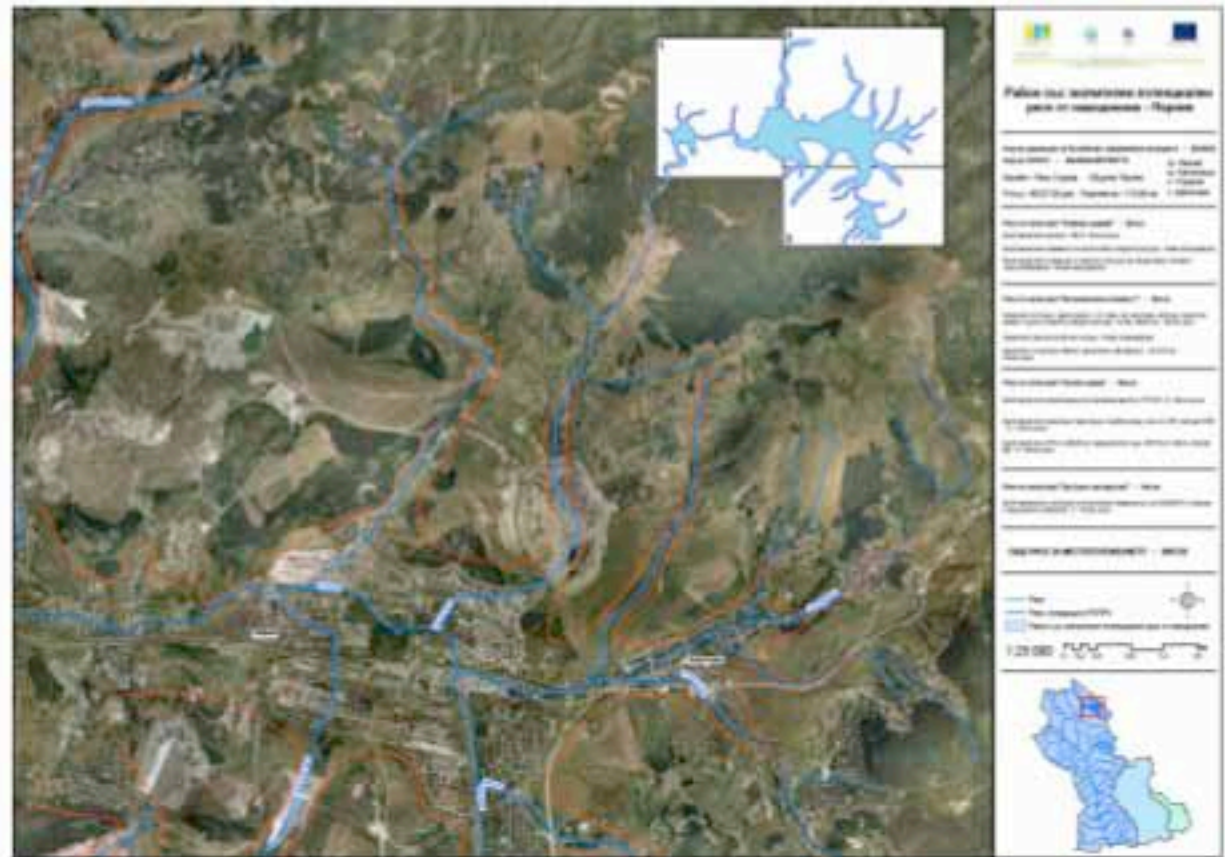
From
2006/2007

Attribute data

- Database describing past and potential floods – number of victims, financial losses, damaged infrastructure (number, length), affected protected areas etc.
- * Missing data about some important settlements – ex. Bansko 2010

Results

- 14 areas with significant potential flood risk
 - ❖ 10 – high flood risk
 - ❖ 4 – medium flood risk



Conclusions

- *The 1-st step of Prevention has been implemented*
- *Data reliability (uncertainties & gaps)*
- *Data specifications /standardization / compatibility*
- *Regular update and maintenance of information*

Recommendations

- *Risk-informed spatial planning*
- *Co-operation at all management levels*
- *Coordination*
- *Regular maintenance and update of the information*
- *Easy and free access to data and information*



***Thank you for your
attention!!!***