Flood Risk Assessment in the Czech Republic

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Flood Directive

on the assessment and management of flood risks (2007/60/ES)

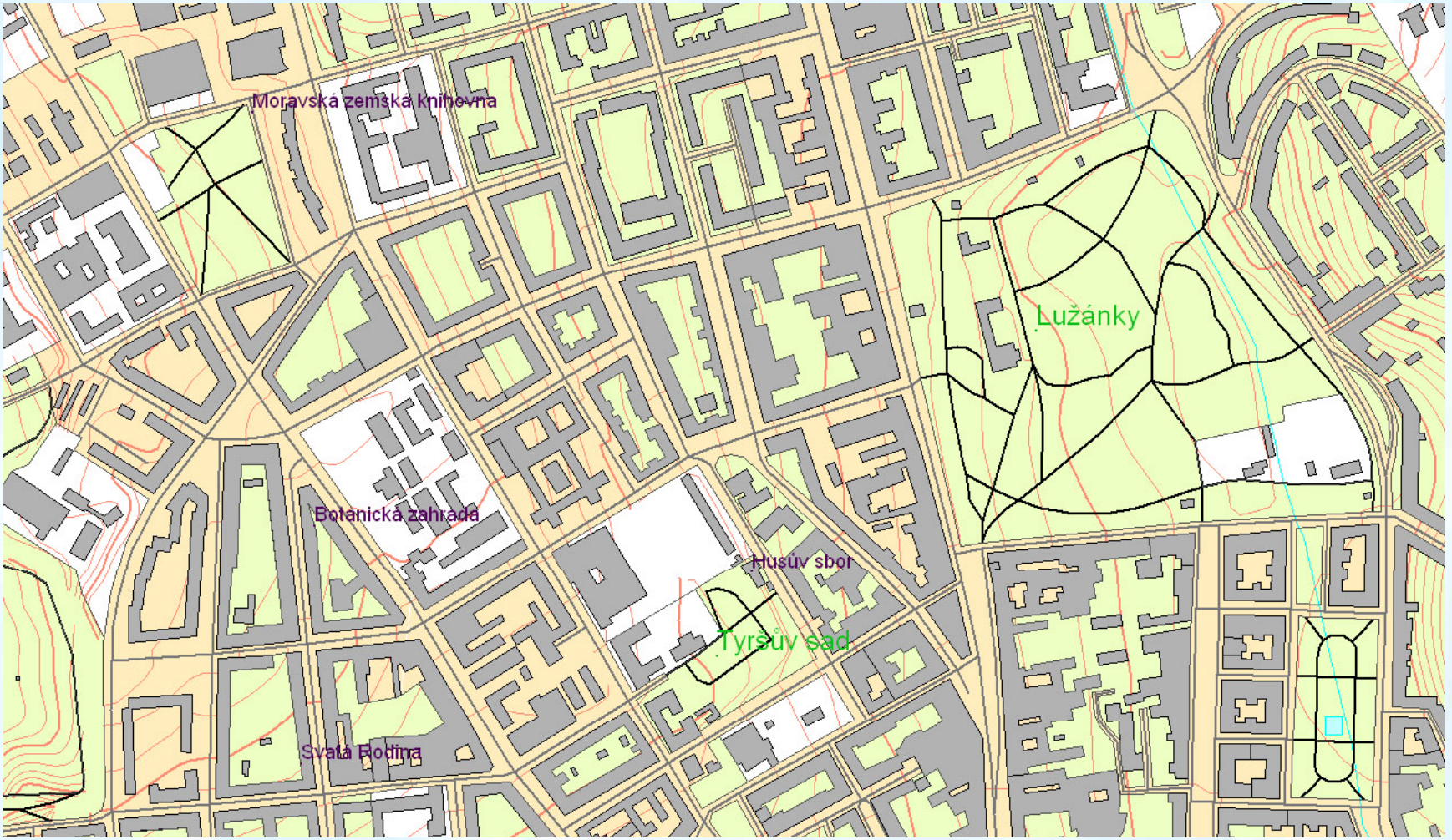
demands:

1. **Preliminary Flood Risk Assessment**
- before end of the year 2011
- identify areas where the flood risk is significant

2. **Flood Hazard Maps & Flood Risk Maps**
- risk analysis for areas with significant flood risk
- before end of the year 2013

3. **Flood Risk Management Plans**
- before end of the year 2015

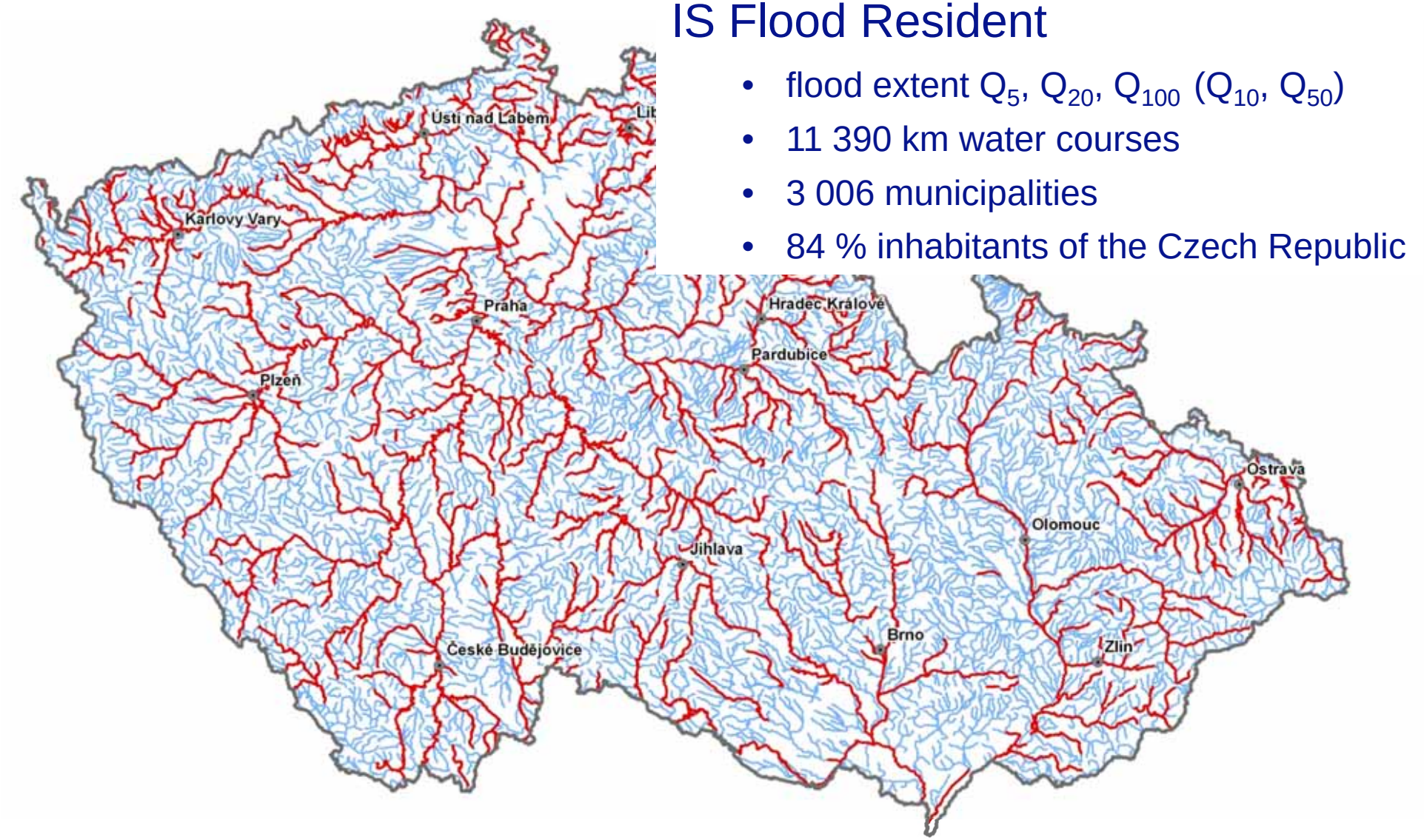
Preliminary Flood Risk Assessment



Water courses with determined flood extent for return period 100 years

IS Flood Resident

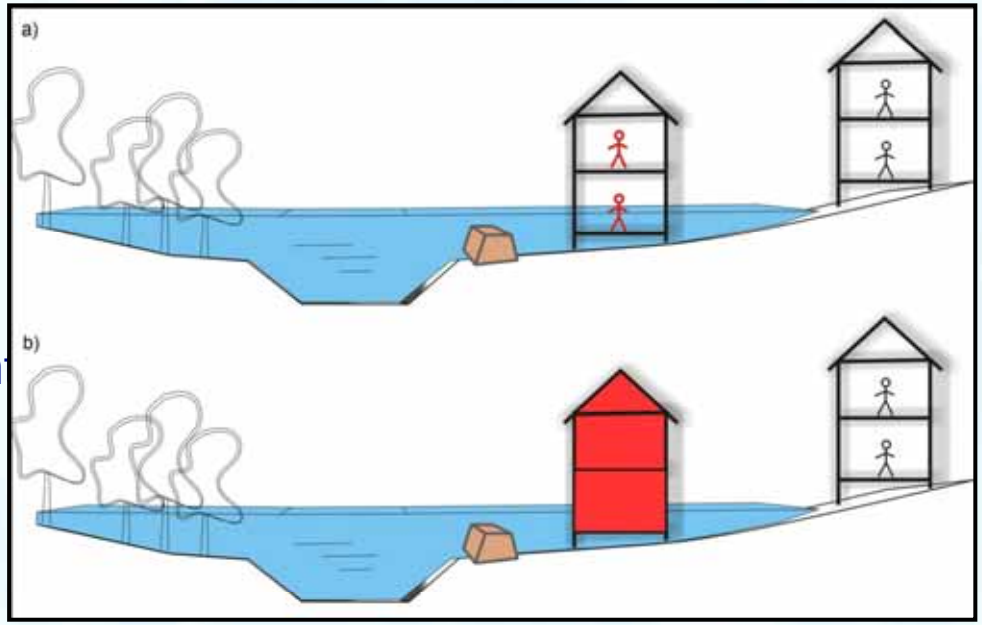
- flood extent Q_5, Q_{20}, Q_{100} (Q_{10}, Q_{50})
- 11 390 km water courses
- 3 006 municipalities
- 84 % inhabitants of the Czech Republic



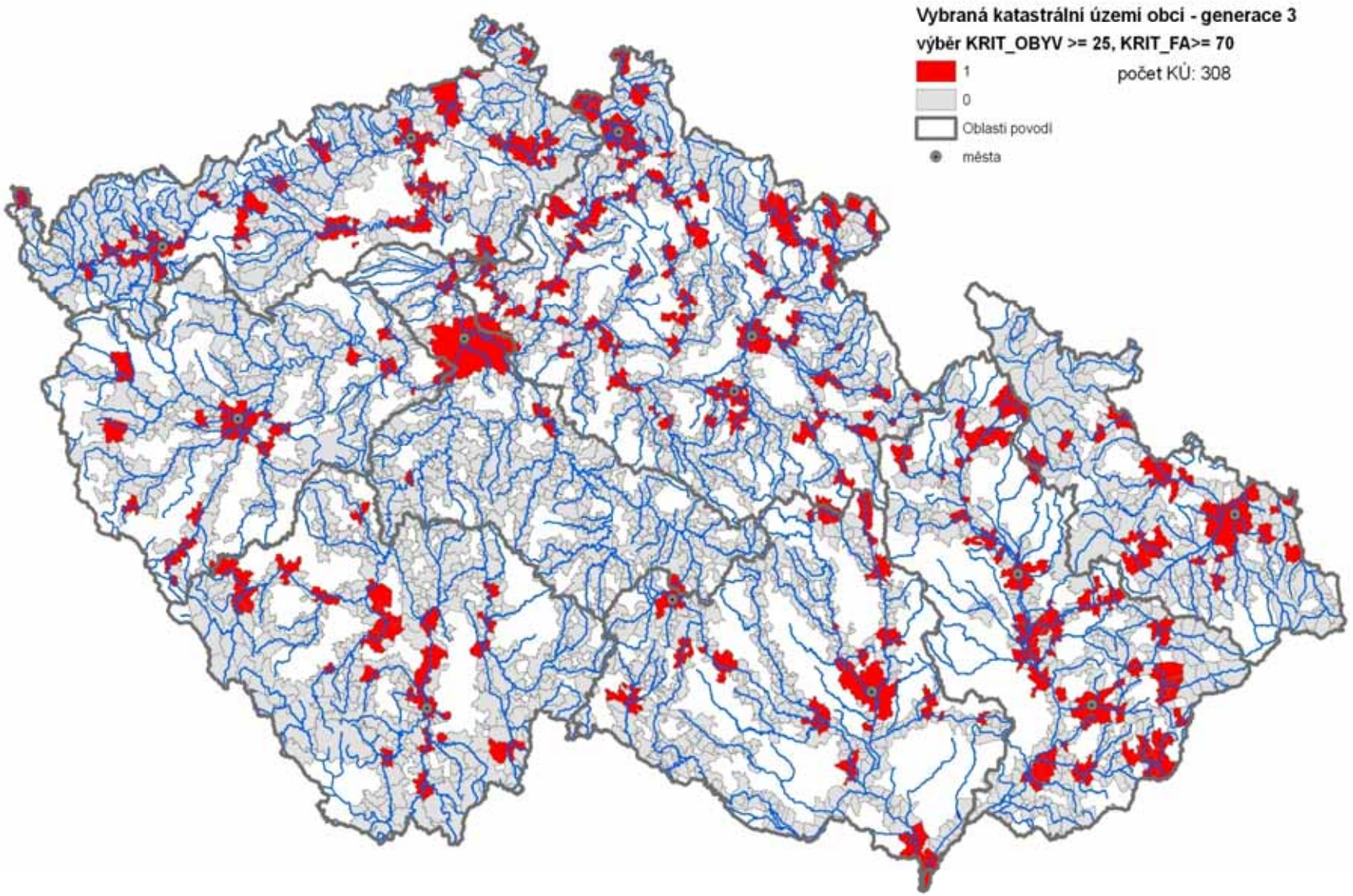
Preliminary Flood Risk Assessment

- **Main aspects**
  - number of permanent residents aggrieved by the flood extent in flood plains
  - value of property aggrieved by the flood extent in flood plains
    - for various probabilities of occurrence (respectively return period – min. 5, 20, 100 years) of flood hazard (hazard scenarios)

- **Auxiliary aspects**
  - potential sources of pollution
  - significant culture monuments
    - aggrieved by the flood exten

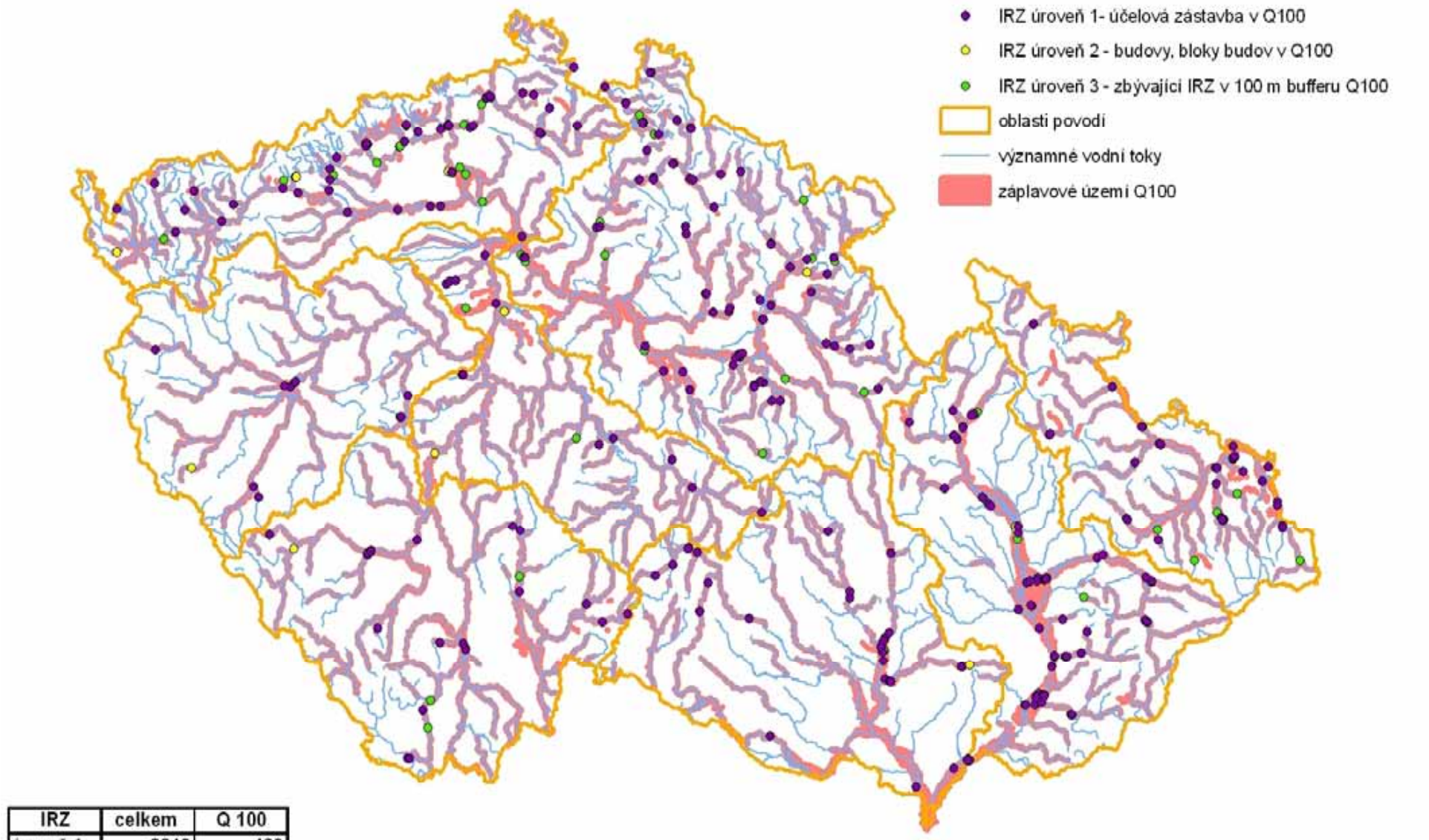


Municipalities with significant flood risk according to main aspects



Potential sources of pollution

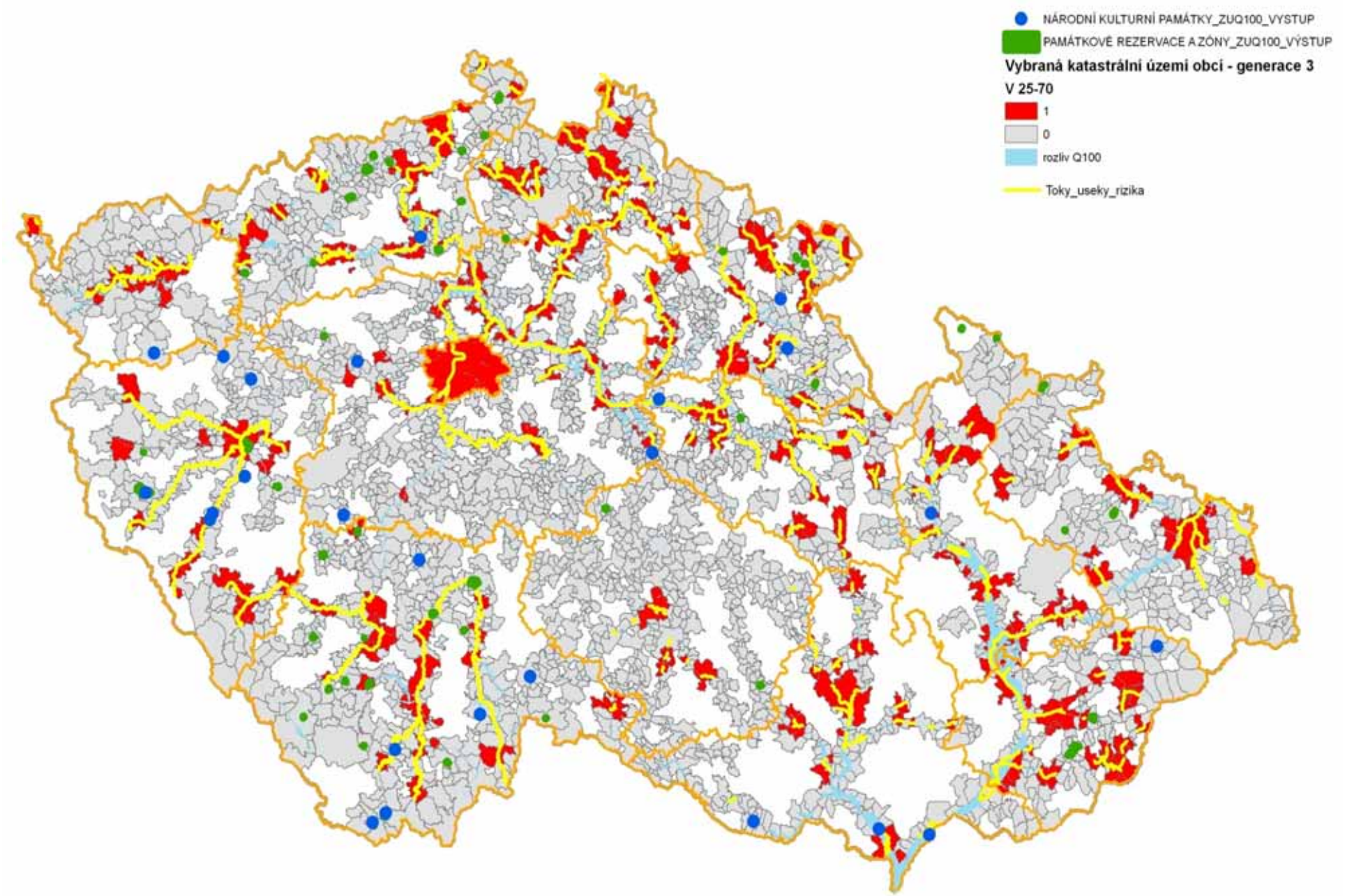
Integrovaný registr znečišťování - 2004-2007



IRZ	celkem	Q 100
úroveň 1	2040	423
úroveň 2	161	16
úroveň 3	321	68

z toho: 33 přímo v Q100
35 do 100 m

Significant culture monuments

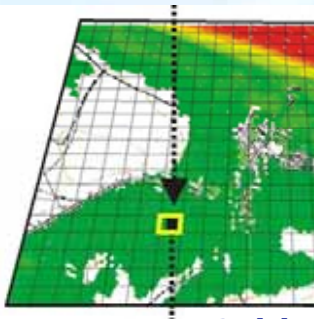


Proposed river segments in areas of significant flood risk - 1st stage

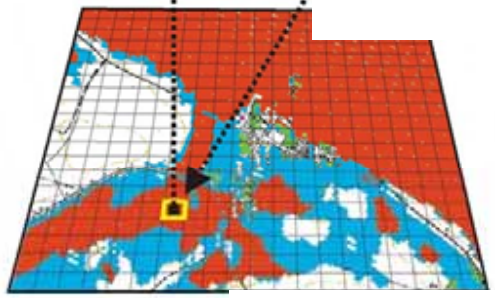
Flood Risk Mapping

- for proposed river segments in areas of significant flood risk
- **Maps of flood hazard** - Q5yr, Q20yr, Q100yr, Q500yr
  - map of flooding / inundation
  - map of depths
  - map of water flow velocity
- $\Rightarrow$ **intensity of flood**
- **Map of Flood Danger**
  - Method of Risk Matrix (Beffa, Switzerland)
    - no need for quantification of flood damages
- **Map of Flood Risk**
  - **danger + vulnerability of objects**

Method of Risk Matrix

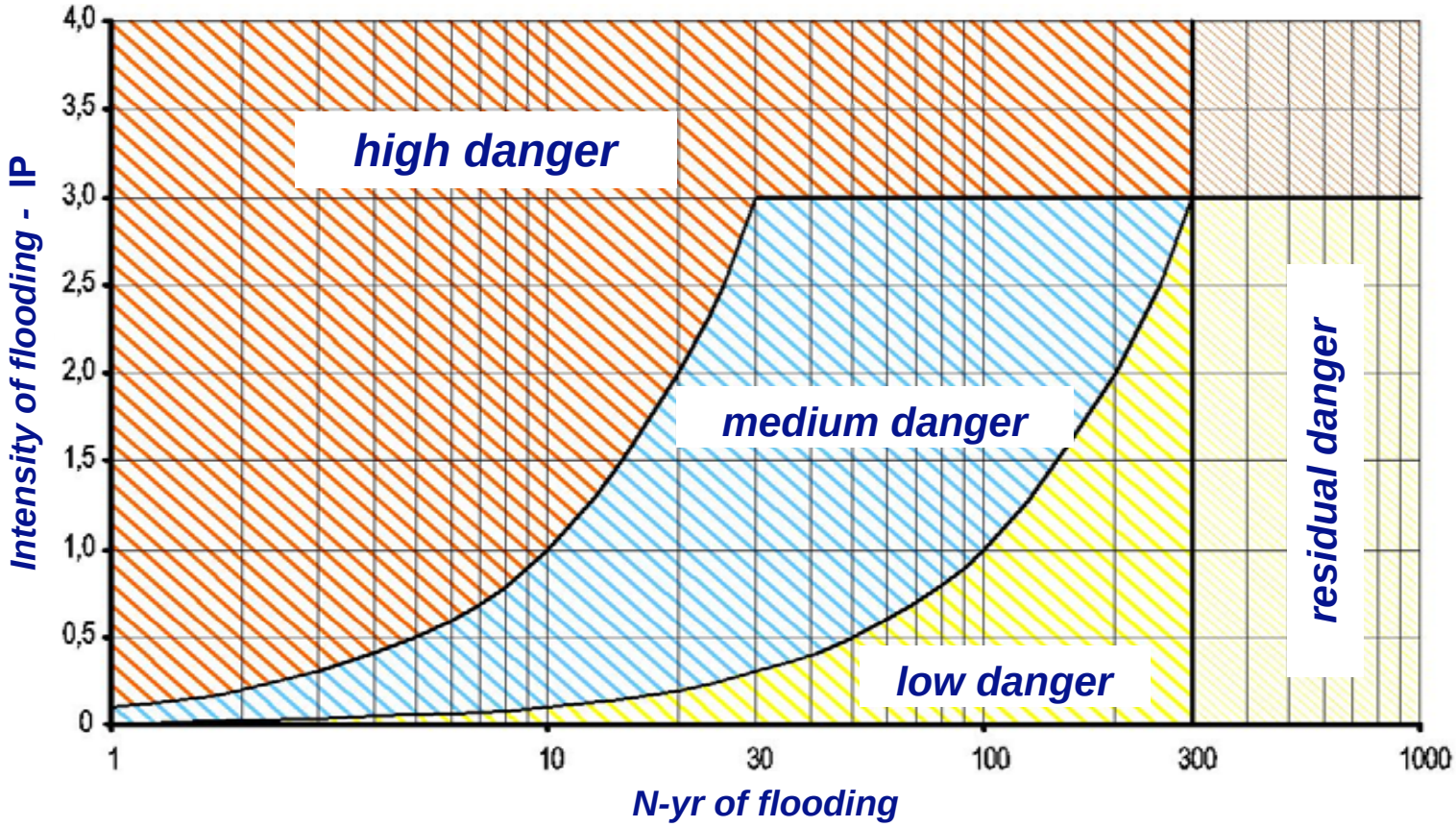


Grid –

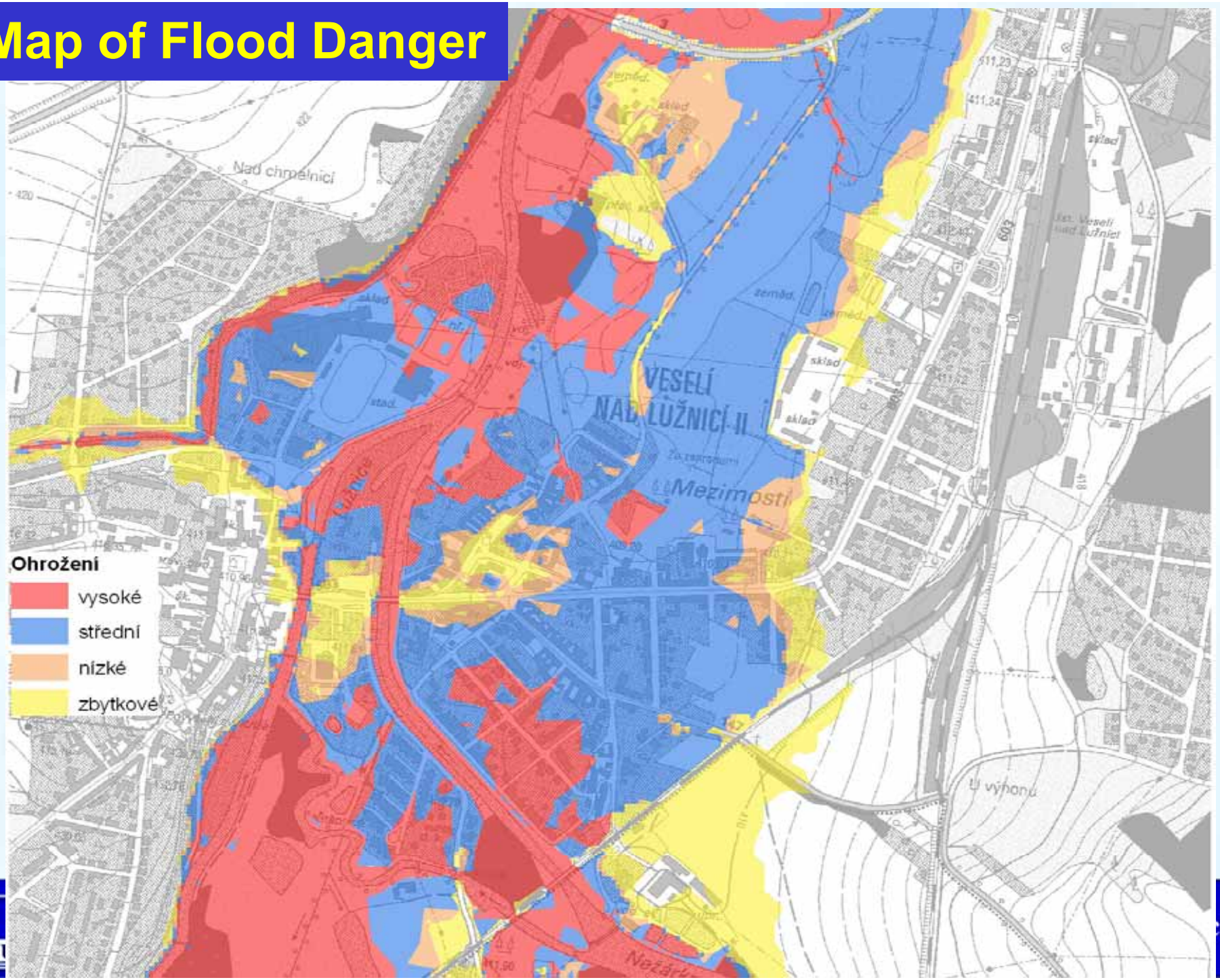


Grid - danger - H

Matrix of Risk



Map of Flood Danger



Interpretation of Results

- **color scale – categories of flood threat in floodplain**

Classification of Danger

Danger H	*Category of Danger*	*Recommendation*
H > 0,1 or IP > 3	**(4) *High***	Do neither allow new nor extend recent build-up areas, where can people or animal live. For recent build-up areas suggest such flood protection, which will reduce risk to acceptable level.
0,01 < H < 0,1	**(3) *Medium***	Development is possible with some restrictions resulted from detailed analysis of potential flood hazard. Build-up of sensitive objects (e.g. hospitals, schools, fire station etc.) is unsuitable there. It is not
P > 0,0033 (N-yr > 300)	**(1) *Residual***	Flood protection is solved by long-term planning of land use zoning focused on especially sensitive objects (health care institution, historical objects etc.)

- review of present and future land use
- restriction of some activities in areas with higher level of flood danger
- use: process of land use planning, proposal of flood protection measures

Map of Flood Risk

- combination of danger and vulnerability of objects in floodplain
- setting of land use classes
- assignment of maximal acceptable risk to every class

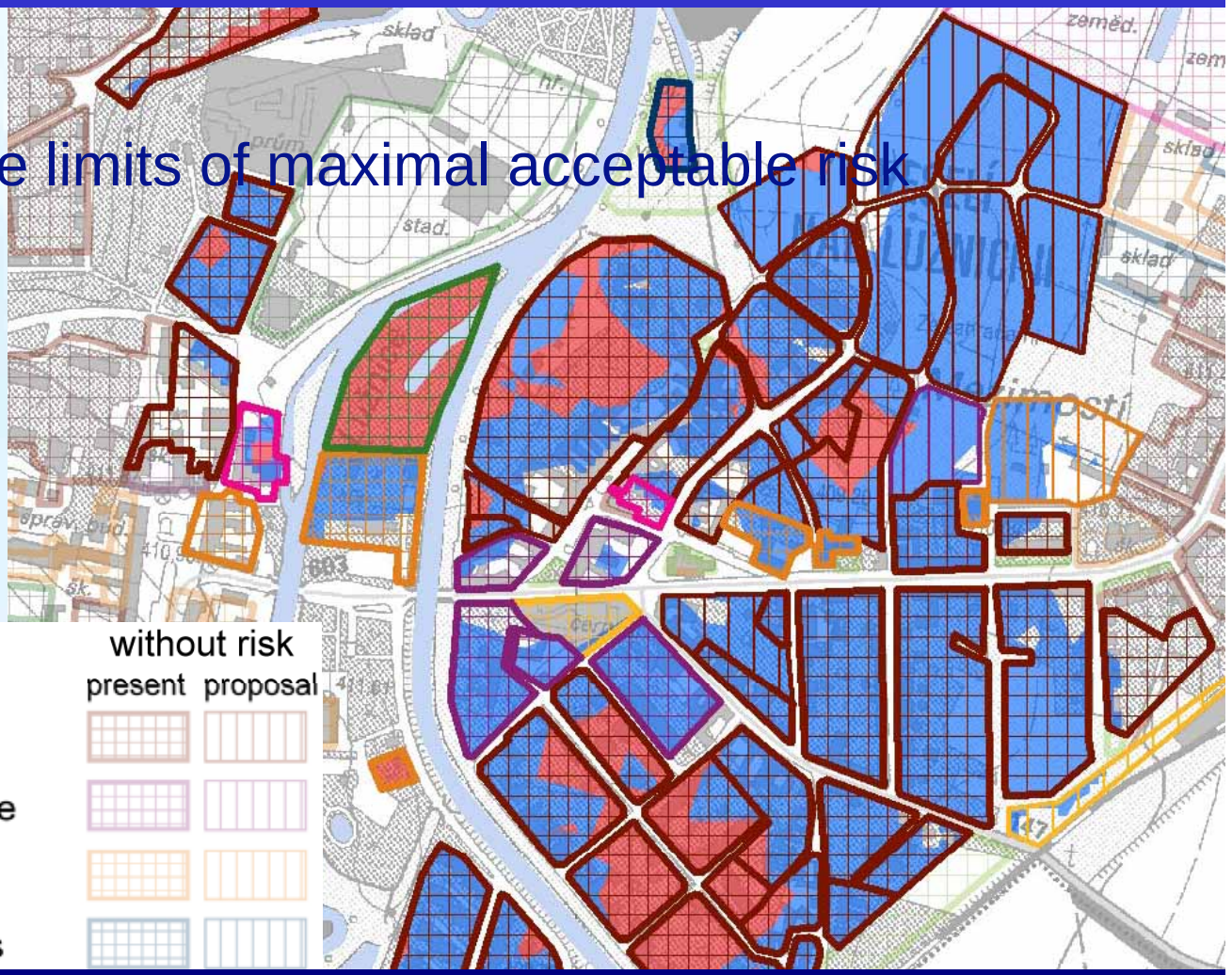
Classes of land use

Living	Low
Civic amenities	Low
Transport and technical infrastructure	Low
Manufacture	Low
Agricultural manufacture	Low
Sport and collective recreation	Medium

Map of Flood Risk

Result

- areas beyond the limits of maximal acceptable risk (present, future)



- **Next step** - detailed appraisal of these „areas in risk“ from point of view of risk management (reduction of risk to acceptable level)
- basis for Flood Risk Management Plan

Thank you for you attention