

FLOOD PROTECTION MEASURES OF THE SLOVAK REPUBLIC





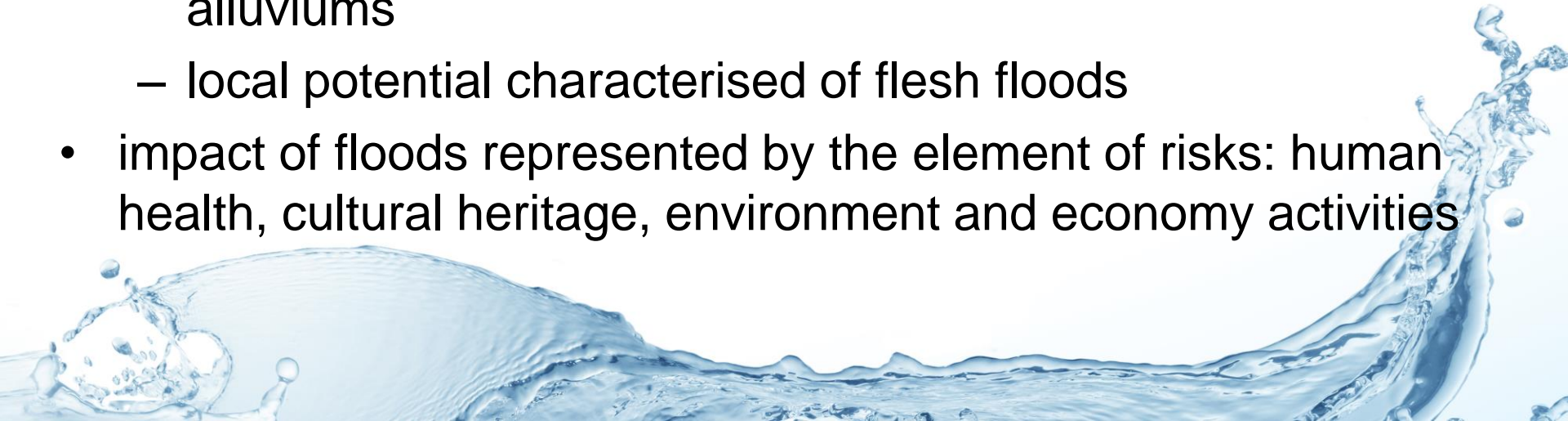
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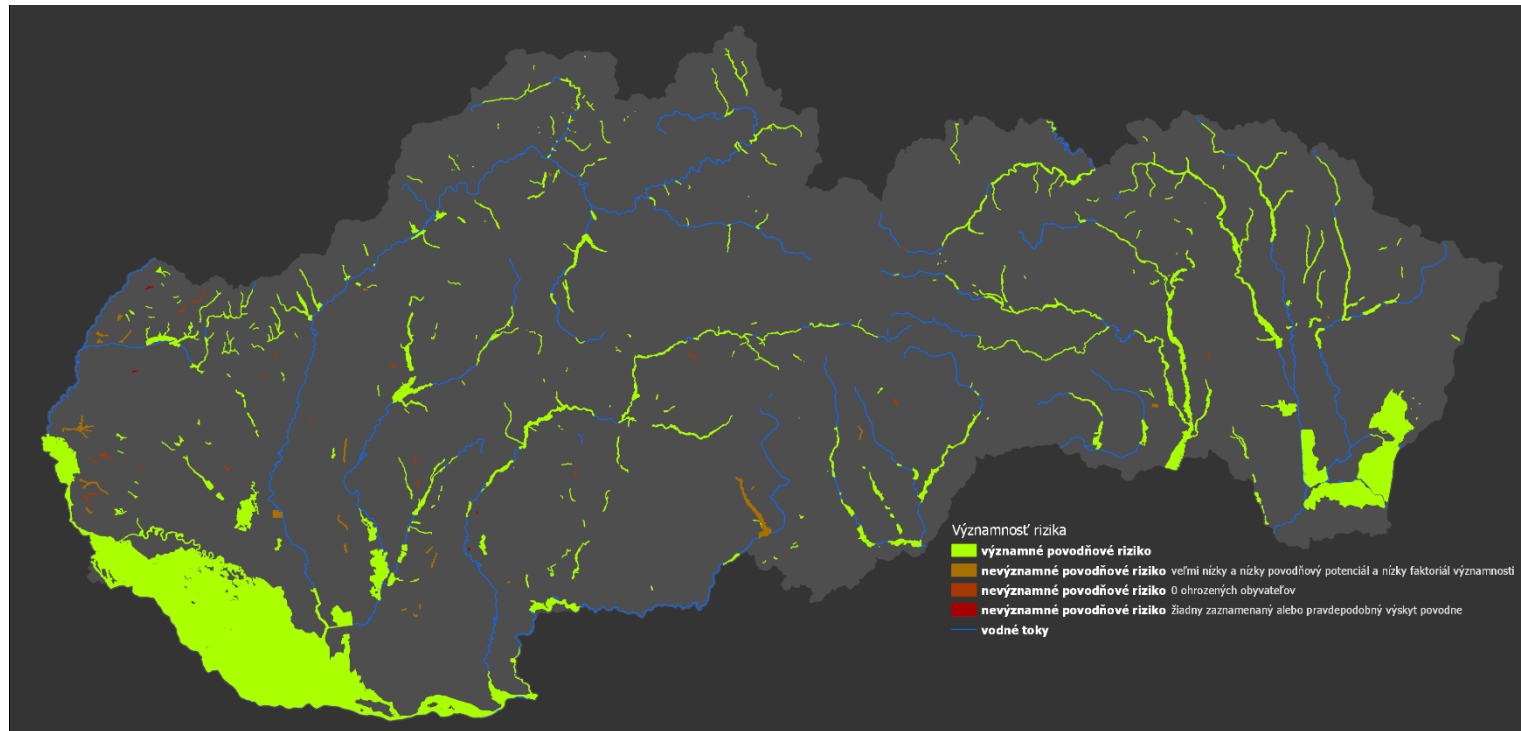
Selection / evaluation and weighting criteria of areas with potential significant flood risk



- existing flood risk – occurrence of 3rd degree of flood awareness according national the Flood protection Act
- potential occurrence of flood risks - set of potential non-dimensional aggregated value represent natural potential of maximal discharges occurrences and circumstance to creation of floods divided to:
 - regional potential characterised floods of lowlands and alluviums
 - local potential characterised of flash floods
- impact of floods represented by the element of risks: human health, cultural heritage, environment and economy activities



Factorial relative values of significance of flood risk and potential of flood risks

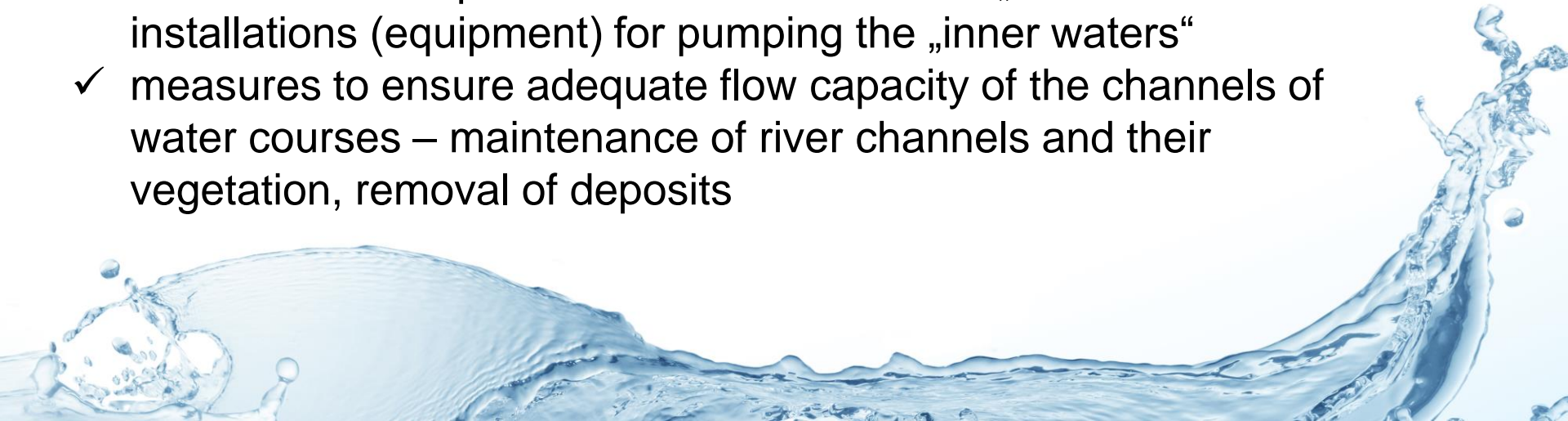


- the percentage of days with the proven existence of flood risk in relation to the overall reference period
- the categorization of a significant probable occurrence of flood risk, expressed by relevant classes of local potential and regional potential

Types of flood protection measures



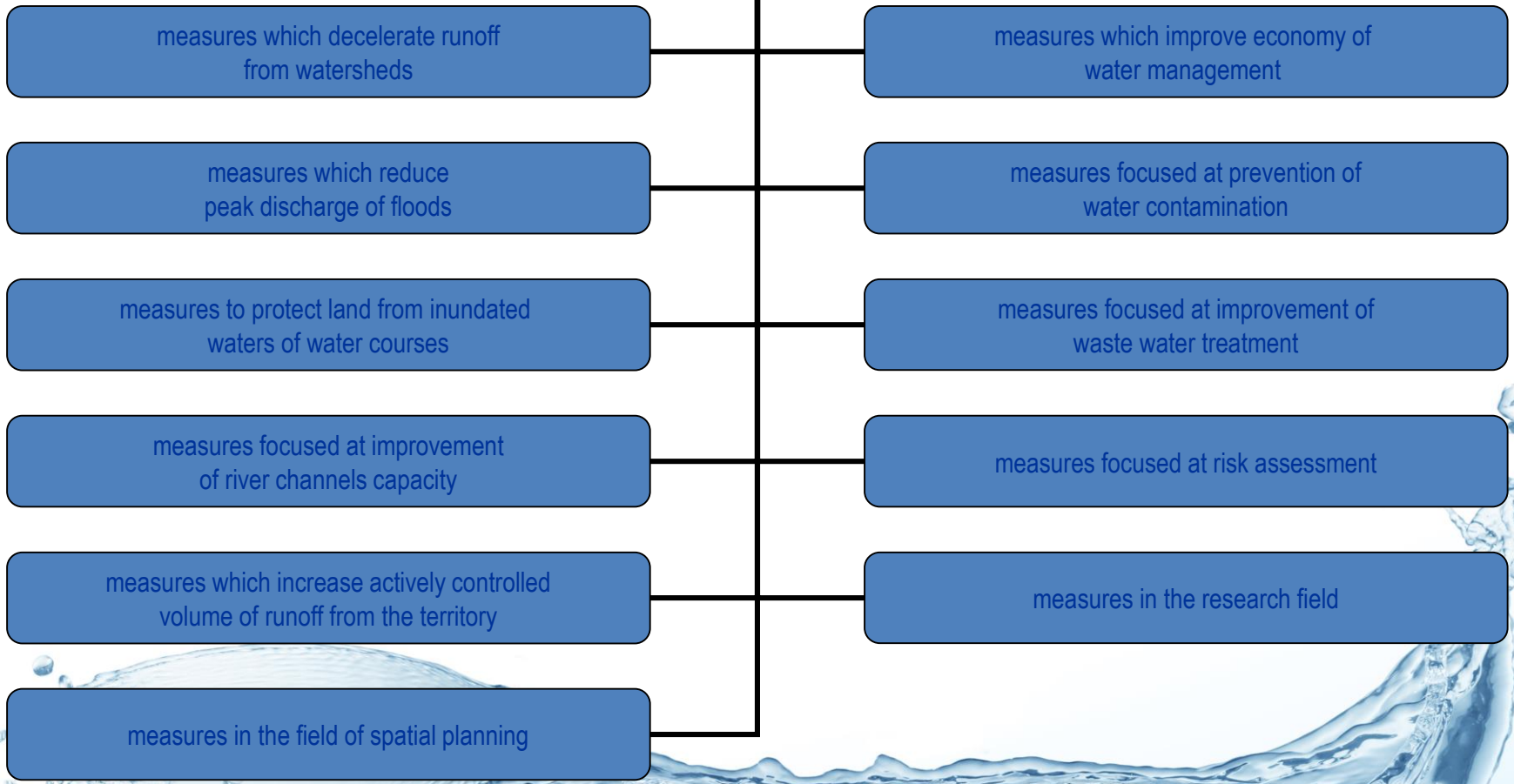
- ✓ measures to reduce (decelerate) run-off from river basin into the water courses, to increase retention capability of river basin or to support natural accumulation of water in the suitable areas – measures at agricultural soils, in forests and urban areas
- ✓ measures which reduce flood peak discharge – construction, maintenance, repair or reconstruction of water structures or polders
- ✓ measures which protect land from inundated water of water courses – technical river training works, flood protection dykes, walls, other linear flood protection structures
- ✓ measures which protect land from inundated „inner waters“ – installations (equipment) for pumping the „inner waters“
- ✓ measures to ensure adequate flow capacity of the channels of water courses – maintenance of river channels and their vegetation, removal of deposits



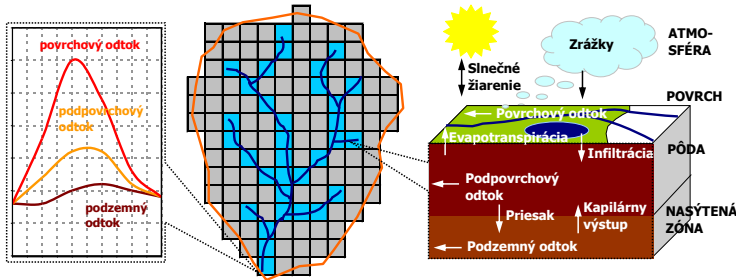
Proposed climate change adaptation measures in the field of water management



PROPOSED MEASURES IN STRATEGIC DOCUMENT

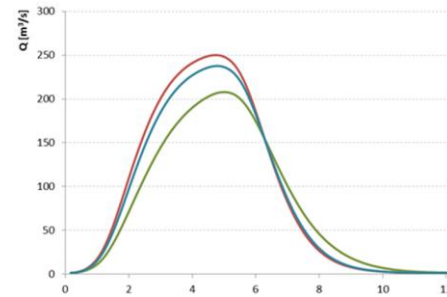


Assessment of possible impacts of current & proposed measures in catchments to achieve goals



Distributed rainfall-runoff modelling

1. ISSOP model / GIS application developed by ESPRIT, Inc.
2. Deterministic, physically based model
3. From WETSPA derived model



Critical flood waves designing

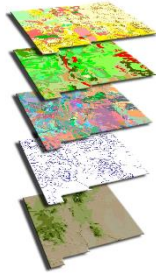
Thesis: 100-year flood wave is affected by 100-rainfall

1. Runoff designed waves calculations
2. Current landcover/landuse scenario
3. Extreme forestation scenario
4. Landcover/landuse optimizing scenario



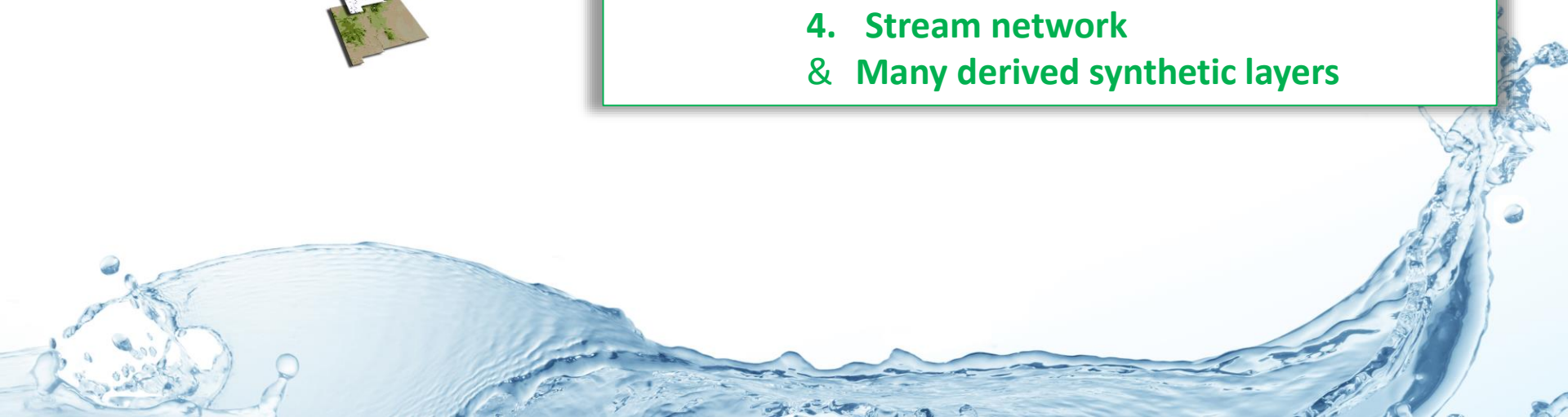
Estimation of designed rainfall

1. N-year maximum daily rainfalls map
2. Rainfall event duration equals to catchment time of concentration
3. In time-equal rainfall intensity



Landscape data inputs

1. Gridded DEM in 10 x 10 m resolution
 2. Soil types
 3. Landcover/Landuse
 4. Stream network
- & Many derived synthetic layers

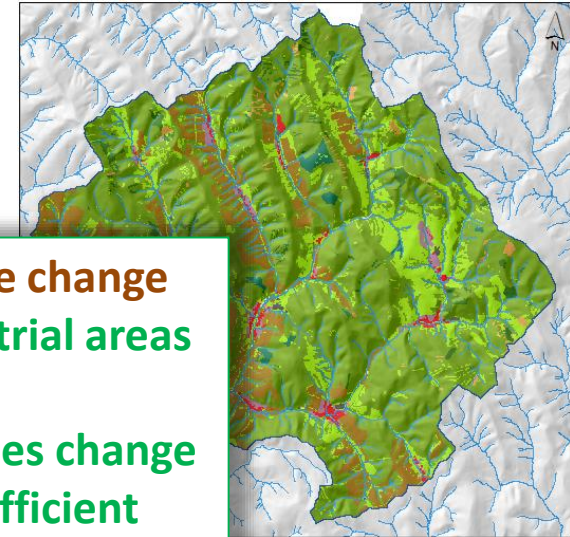


Extreme landcover / landuse change

1. Keep urbanized & industrial areas unchanged
2. Afforestation of other LCLU with potential natural vegetation

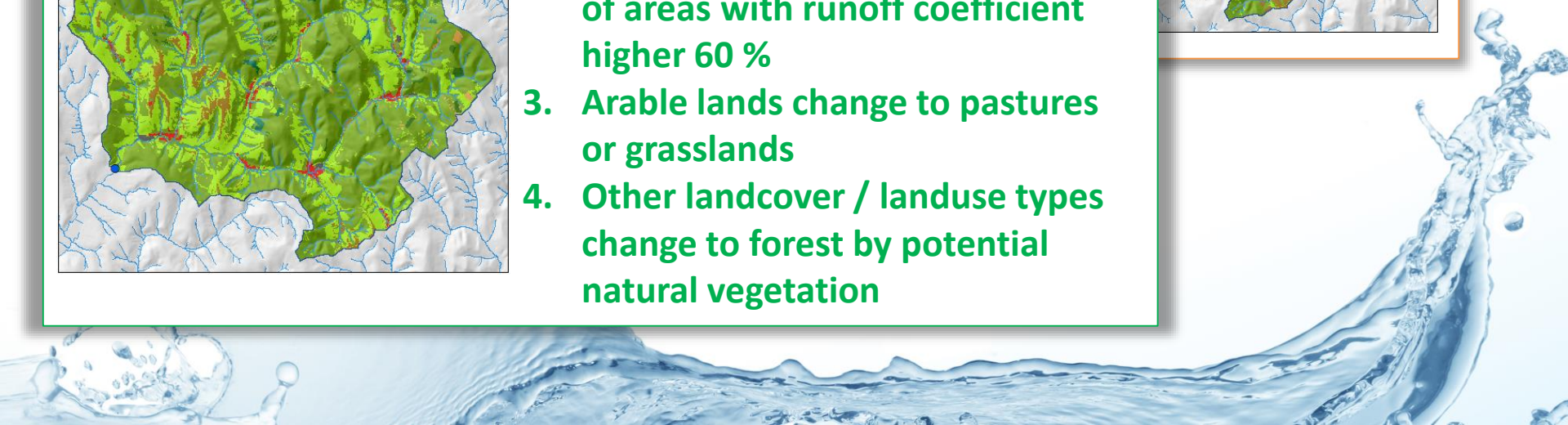
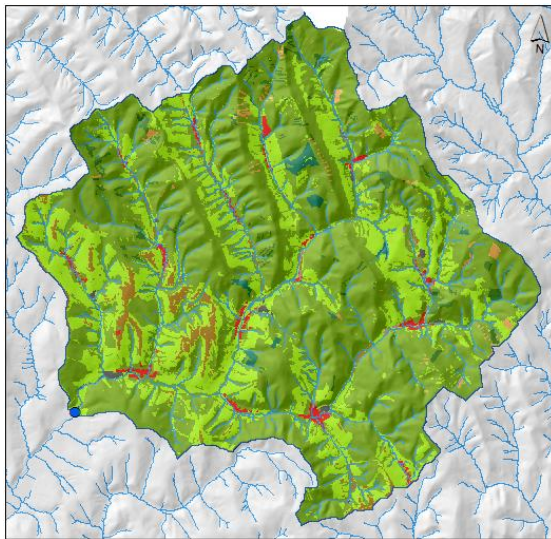


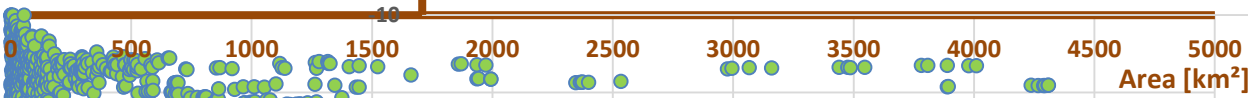
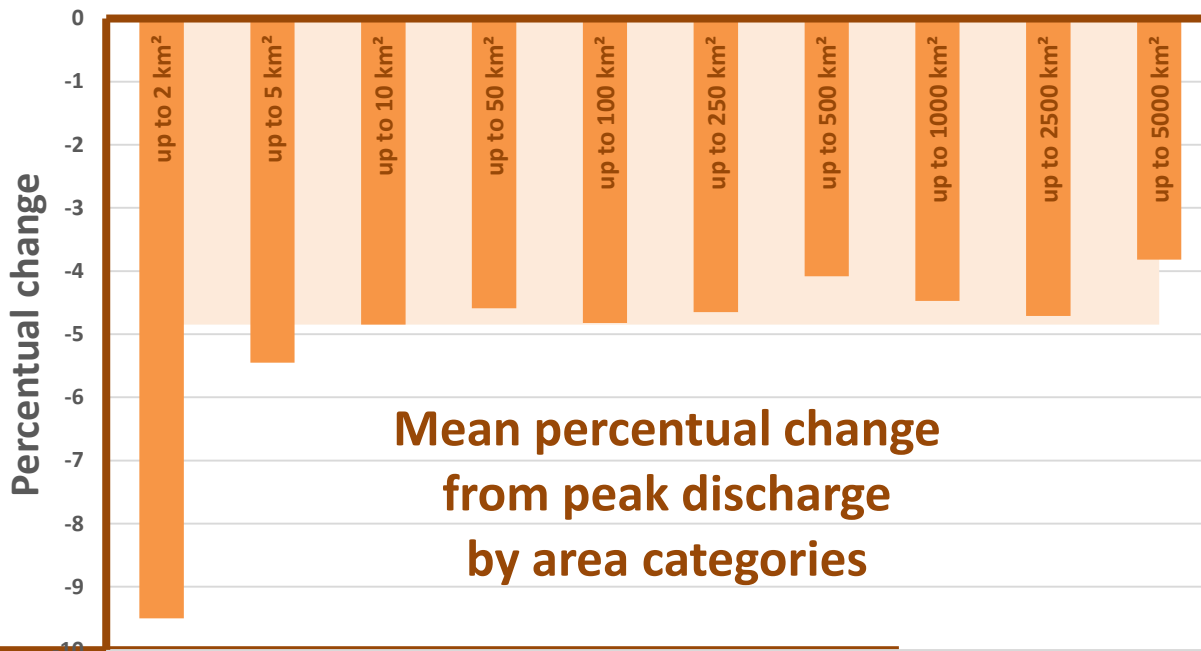
Current landcover / landuse



Optimal landcover / landuse change

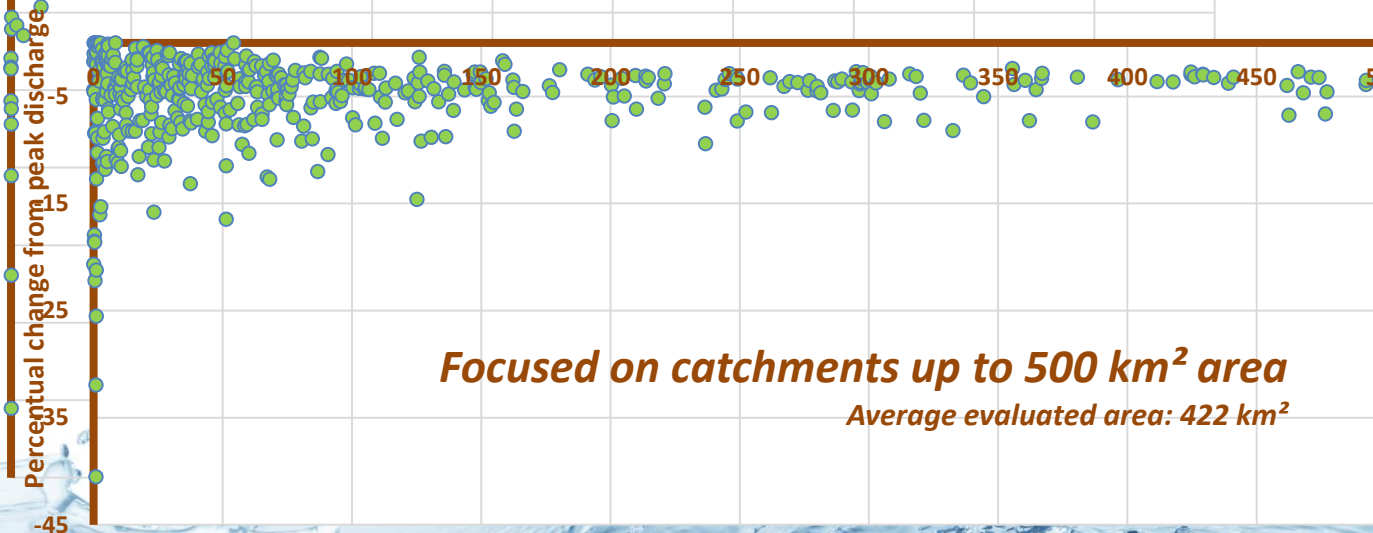
1. Keep urbanized & industrial areas unchanged
2. Landcover / landuse types change of areas with runoff coefficient higher 60 %
3. Arable lands change to pastures or grasslands
4. Other landcover / landuse types change to forest by potential natural vegetation





Determination Between Catchment Area & Effectiveness

Mean change: - 4.85 %
Category with highest mean change:



Catchments up to 2 km²
- 9.5 %
But huge range: - 40 % - 0 %





Thank you for you attention

