

Development and testing of practical Guidelines for the assessment of resource costs and benefits in the Water Framework Directive in Romania

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ECRAN Regional Workshop, Skopje, 29-31 March 2016

Practical Guidelines for the Assessment of Environmental and Resource Costs and Benefits in the WFD

- Developed in the EU Aquamoney project
- Provide guidance on key issues in economic valuation related to the implementation of the Water Framework Directive
- Provide guidance on how to address specific key issues in economic valuation studies of water resources and how, given a variety of difficulties encountered, these values can be aggregated to determine a water resource's Total Economic Value
- Intend to address the specific problem of valuing water resources in the context of particularly Article 9 and 4 in the WFD.

Content (1)

- Concept of water as an economic good and the water valuation framework used to assess environmental and resource impacts
- A list of aquatic ecosystem goods and services
- Overview of the various valuation methods and techniques used in water resource valuation to assess Total Economic Value
- Overview of existing non-market values for different water services based on meta-analysis
- Issue of water scarcity
- Translation of the WFD objectives into goods and services through the development of a WFD-specific water quality ladder

Content(2)

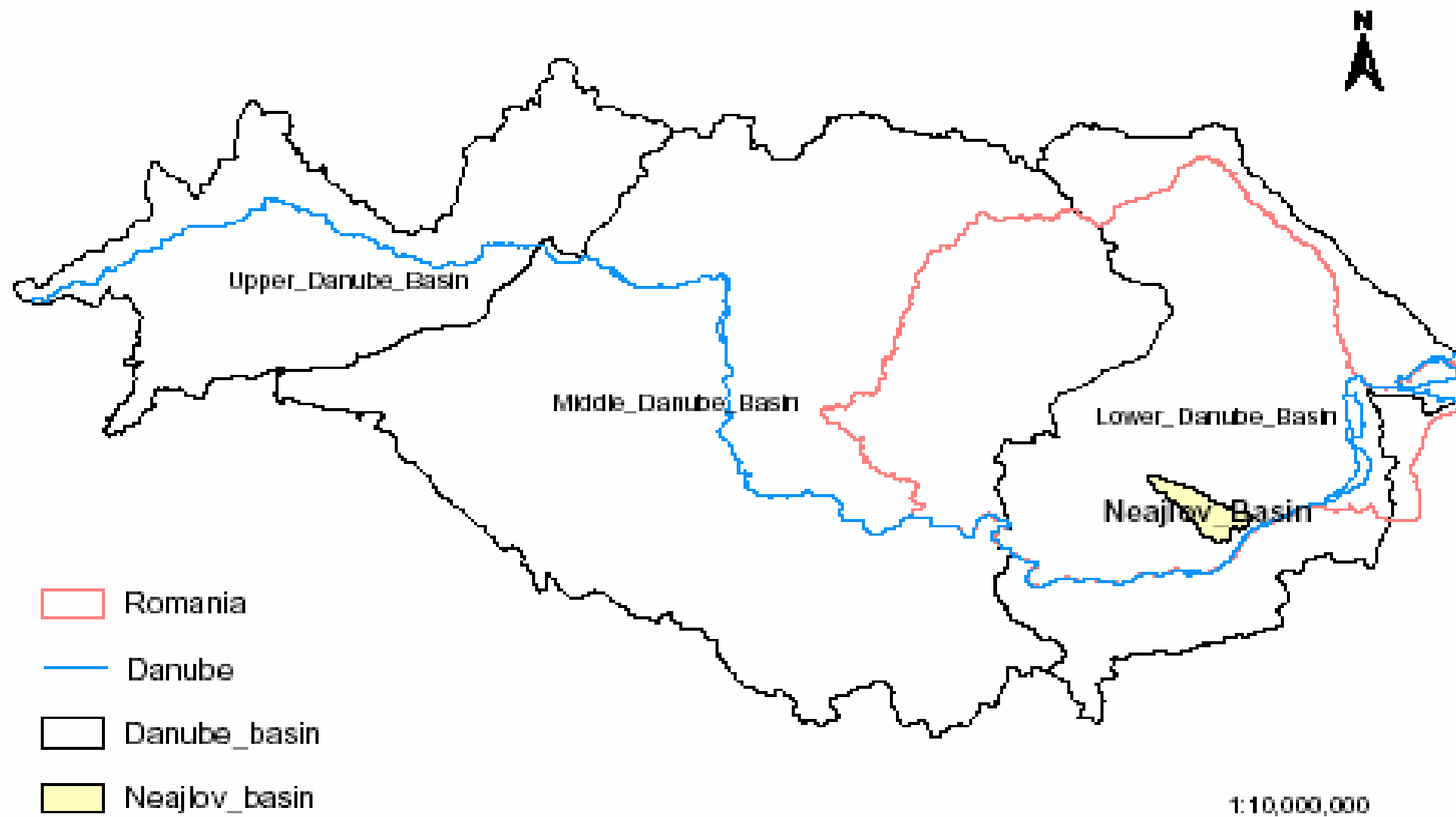
- A new approach developed in AquaMoney to value water quality improvements at the level of the river basin district
- Account for substitution effects when estimating the non-market value of simultaneous ecological quality improvements across water bodies in catchments with multiple water bodies that provide a wide variety of ecosystem services
- Examining differences found when valuing part of a river basin like a water body first and the whole river basin second or the other way around.
- The uncertainty introduced through the use of stated preference methods in an international river basin context.
- Value aggregation procedures to calculate a *Total Economic Value* for the river basin as a whole

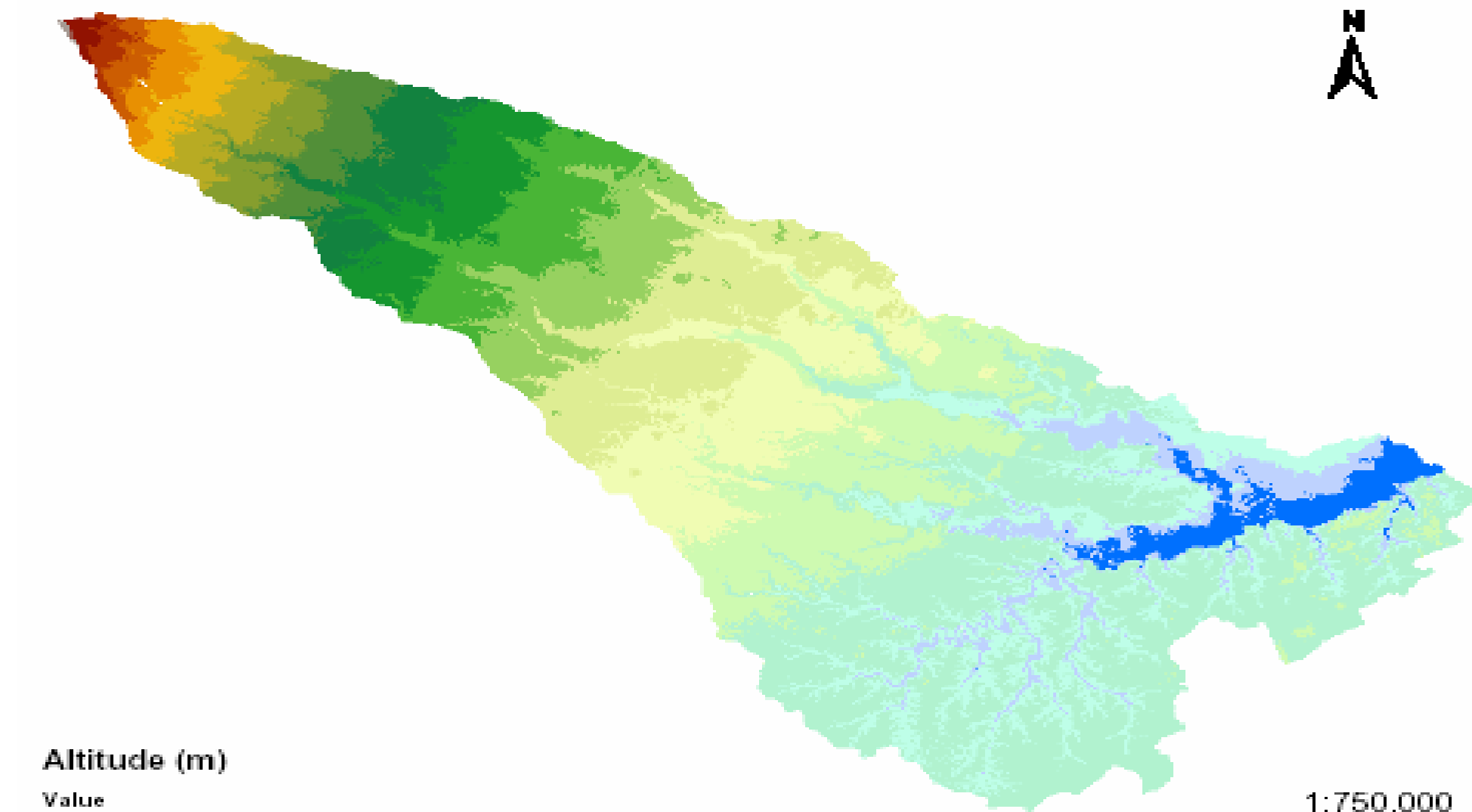
Proposed general steps in economic valuation

- Identification of the environmental changes
- Identification of goods and services
- Identification of beneficiaries
- Identification of economic values
- Value elicitation
- Primary valuation + Value transfer
- Value aggregation

Study case: Neajlov River Basin

- The Neajlov River and its catchment are a tributary and a sub-catchment of the river Arges, which in turn is one of the main tributary for the lower Danube river stretch
- The Neajlov Catchment has been identified as a subregional socio-ecological complex, part of the national network of sites for Long Term Socio – Ecological Research (LTSER), and of the global ILTER – network.





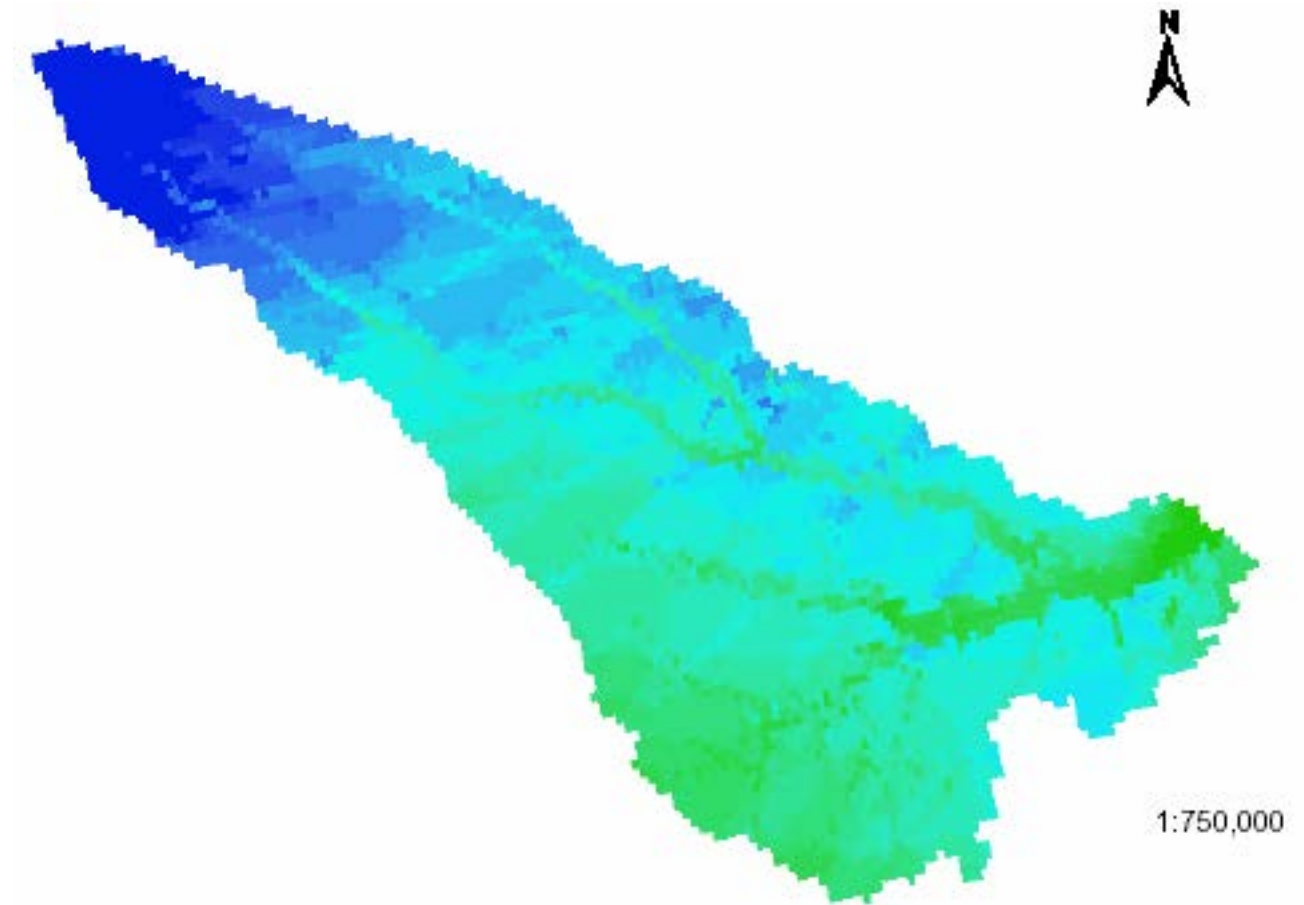
Altitude (m)

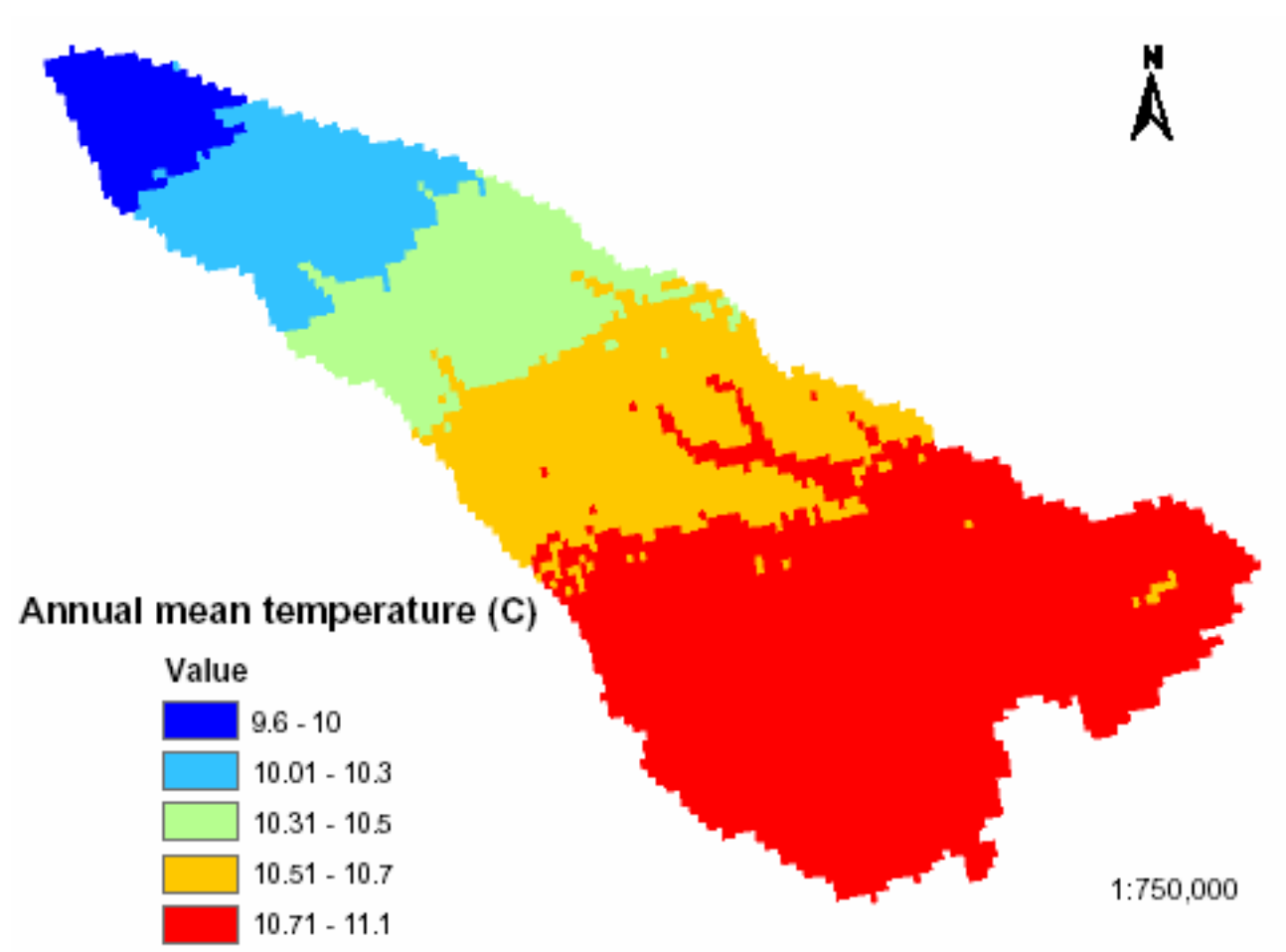
Value

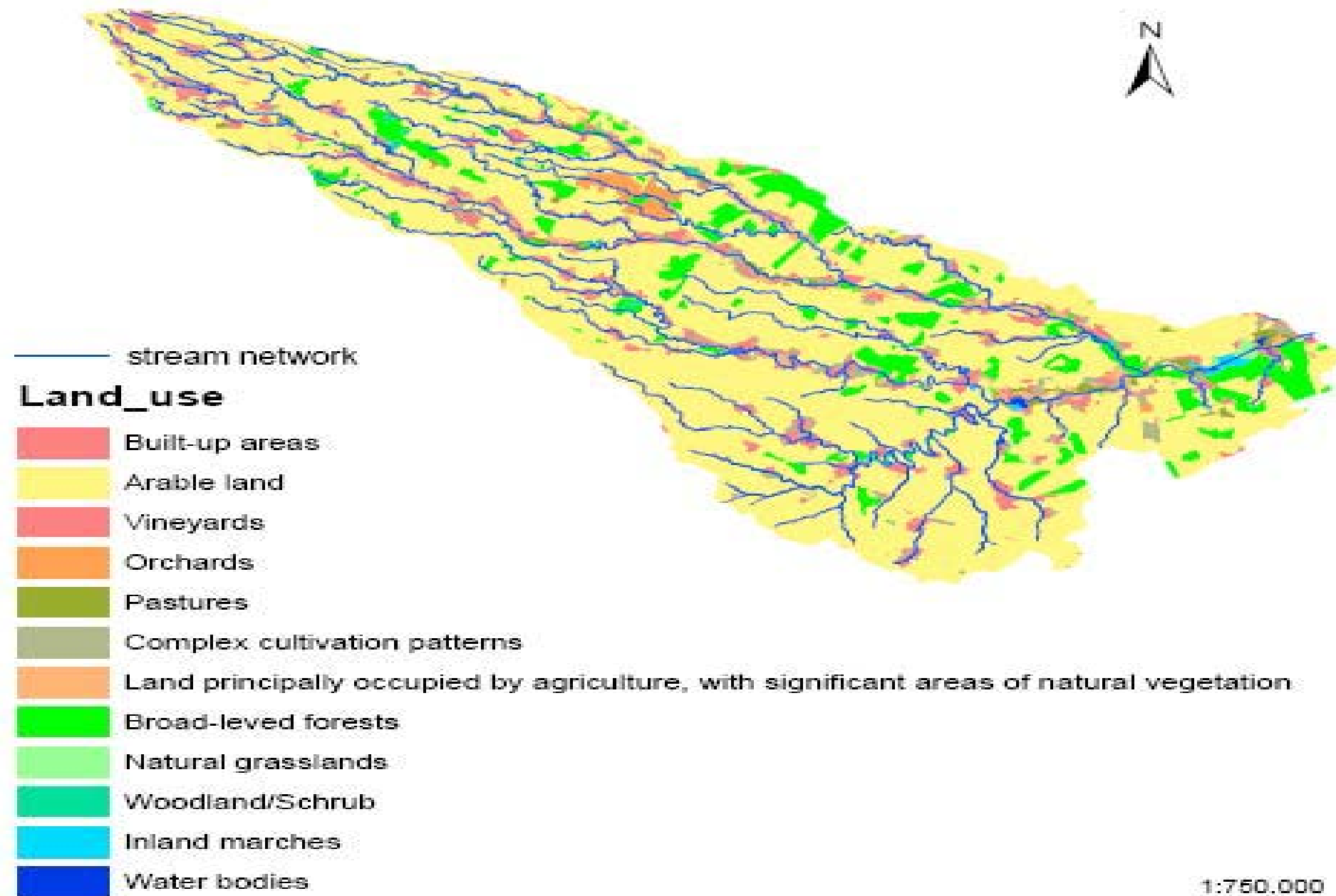
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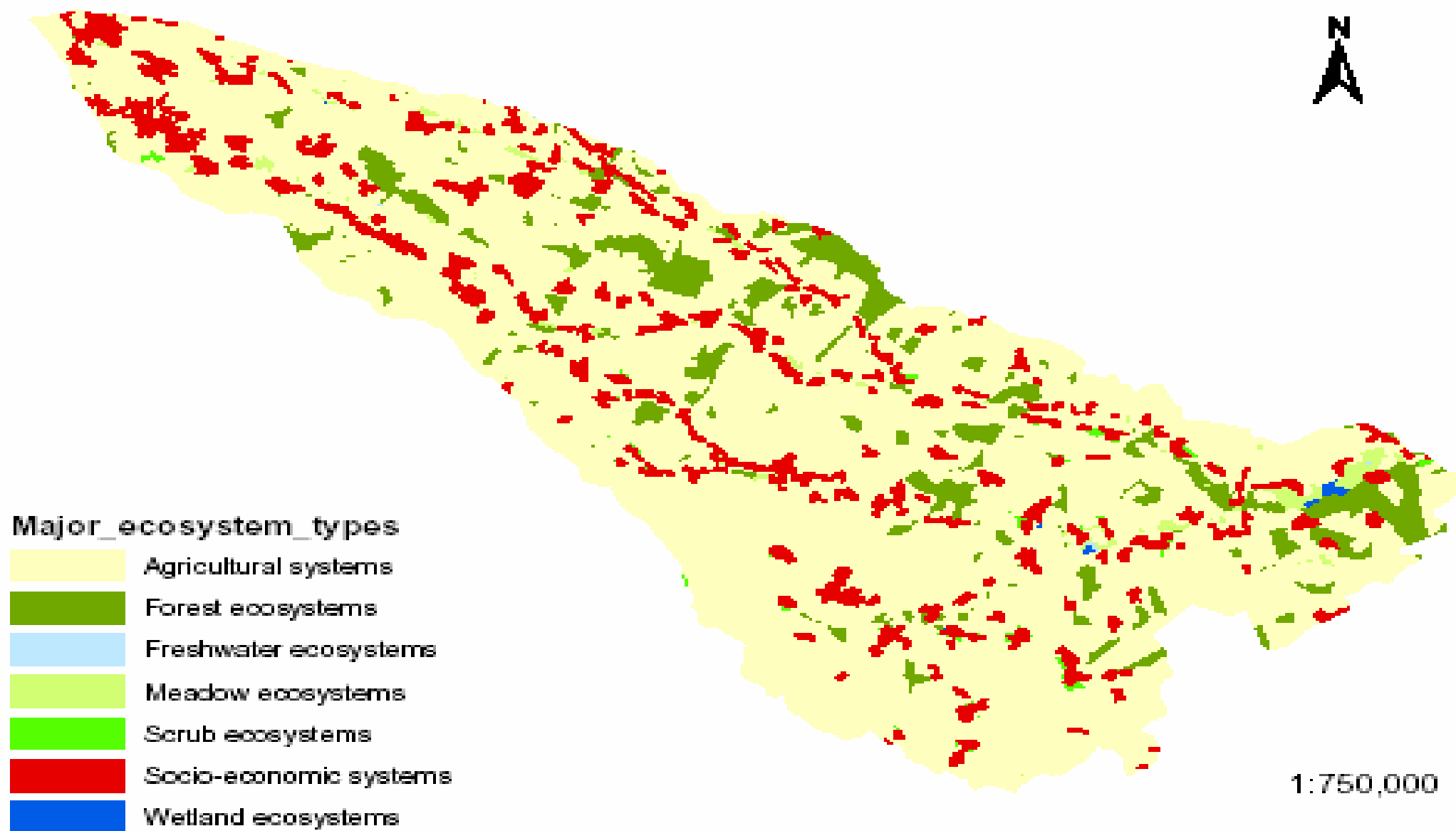


Precipitation

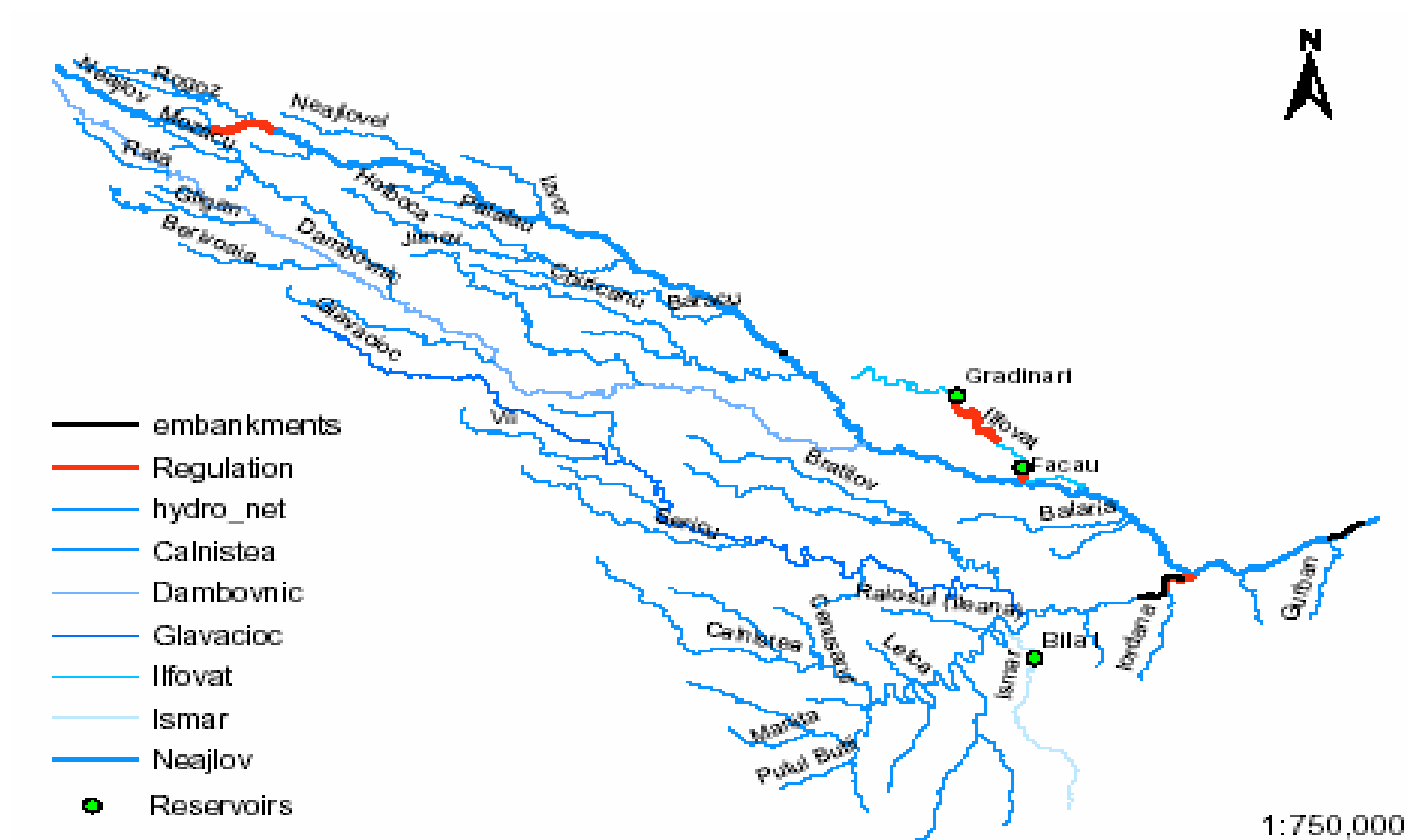




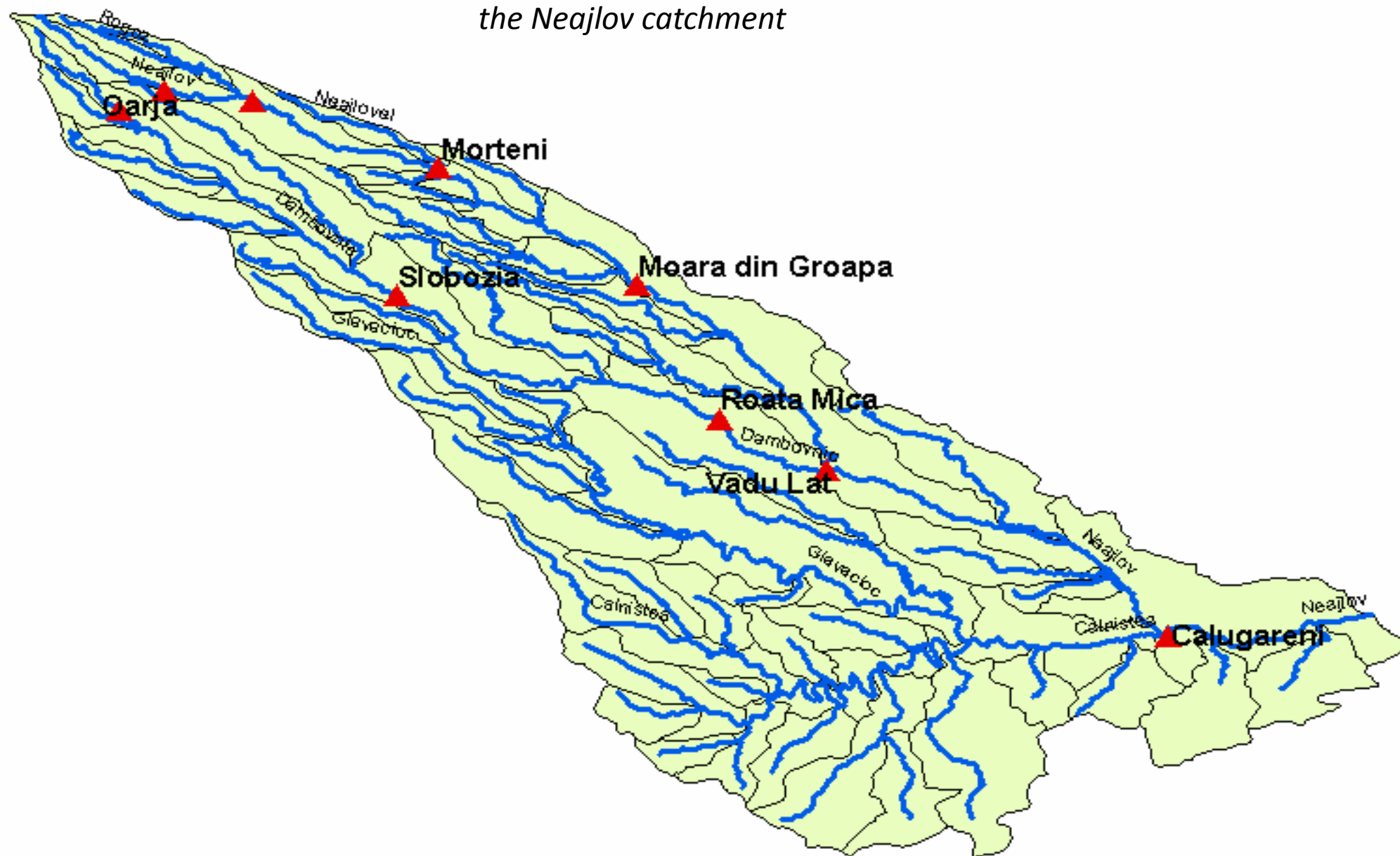




Neajlov catchment network



Selected measuring points for the additional sampling program in the Neajlov catchment



Significant pressures impacting on water status

- Emission points of the chemical industry ARPECHIM - Pitesti - **Suseni** (organic compounds, heavy metals oil spills);
- Breeding farm SUINTEST – **Oarja** (nutrients, organic matter);
- Waste waters from the beverage industry Cateasca are discharged near **Furduiesti** (organic compounds, nutrients);
- **Roata** an oil extraction region (oil pollution);
- **Moara din Groapa** the receiving point of the effluents from the Waste Water Treatment Plant (WWTP) Gaesti (nutrients, organic matter);
- Downstream both Neajlov and Dambovnic rivers the emissions originate mostly from agricultural areas and rural settlements (nutrients).

Impacts on surface and groundwater bodies

- Eutrophication is one of the most important problems reported for the region, and previous studies showed that important nutrient fluxes originate from agriculture, especially as diffuse sources;
- Increase of surface water loads and sediment concentrations in chemical compounds as: phenols, aromatic hydrocarbons (PAH) in the upper part of the catchment, near Pitesti;
- Accumulation of heavy metals: Cr, Fe, Mn in sediments and surface waters, along the Dambovnic River;
- Decrease of groundwater quality due to accumulation of organic compounds (chemical oxygen demand – COD) in the aquifers near Pitesti, COD, ammonium and nitrates in aquifers located in the southern part of the catchment;
- Decrease of water surface area for Comana Lake from about 1300 ha in 1960 to 600-650 ha in the present period, due to decrease of groundwater level.

Water bodies at risk of not achieving a good status

- Suseni, located on **Dambovnic River**, due to pollution with phenols, PAH, heavy metals from ARPECHIM - Pitesti;
- Suseni (**Dambovnic River**) receptor of waste waters from breeding farm SUINTEST - Oarja;
- Roata, Poeni (**Dambovnic River**) due to accidental pollution with oil (extraction platform);
- Cateasca (Neajlov River) receiving the waste waters from beverage industry (accidental pollution) with organic matter;
- Rogoz chanel - Neajlovel – pollution with oil from Oarja platform

Major issues

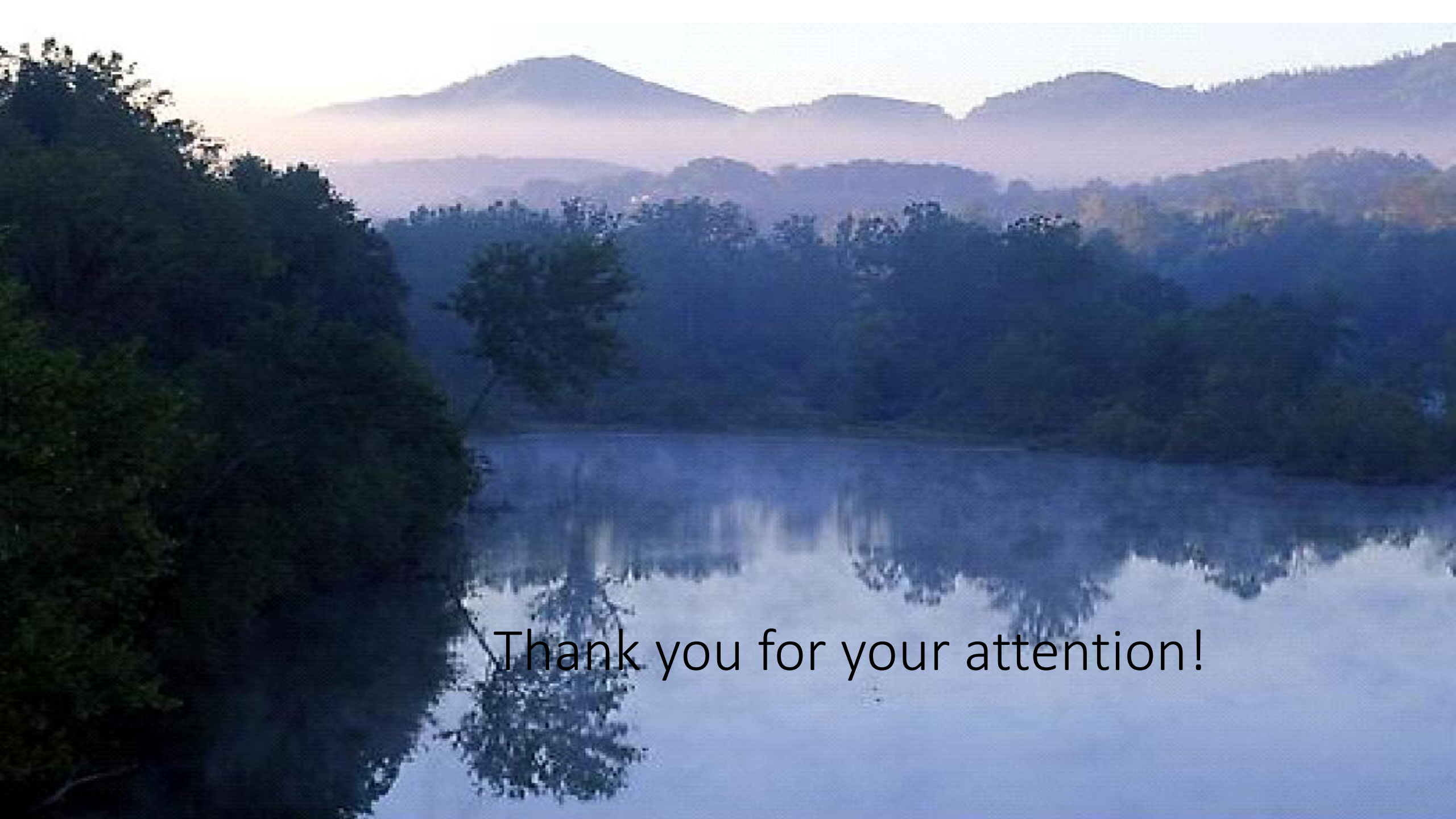
- Increased frequency of droughts alternating with heavy rains and floods;
- For the time being few aggressive point sources pollution, which are responsible for low water quality of Dambovnica and Neajlova streams
- Abandonment and deterioration of the irrigation system;
- Siltation of the man made water accumulation;
- Very poor development of water supply system.

Major water policy issues

- The need to adapt the water strategy and management to the trend of increasing frequency and intensity of droughts and floods;
- Agricultural landscape planning for multifunctional farming system which may allow for effective diffuse pollution control, habitat connectivity and biodiversity conservation / adaptation;
- Rehabilitation of water quality and the ecosystem health of degraded water bodies (including siltation of water reservoirs);
- Rehabilitation and development of the irrigation system as an effective tool for adaptation;
- Ensure water supply infrastructure development (60 percent of the population living in the Neajlov catchment to benefit by 2015);
- Build efficient and effective waste water treatment infrastructure development.

Resource cost

- Based on the existing available data and on the review of the water use there was not established a resource costs
- Additional information required for economic valuation through methods based on the revealed or stated preferences



Thank you for your attention!