



PROGRESS

Interreg Europe



European Union
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Development Fund

CROSS-BORDER ASSESSMENT OF NATURAL AND TECHNOLOGICAL HAZARDS IN THE DANUBE FLOODPLAIN

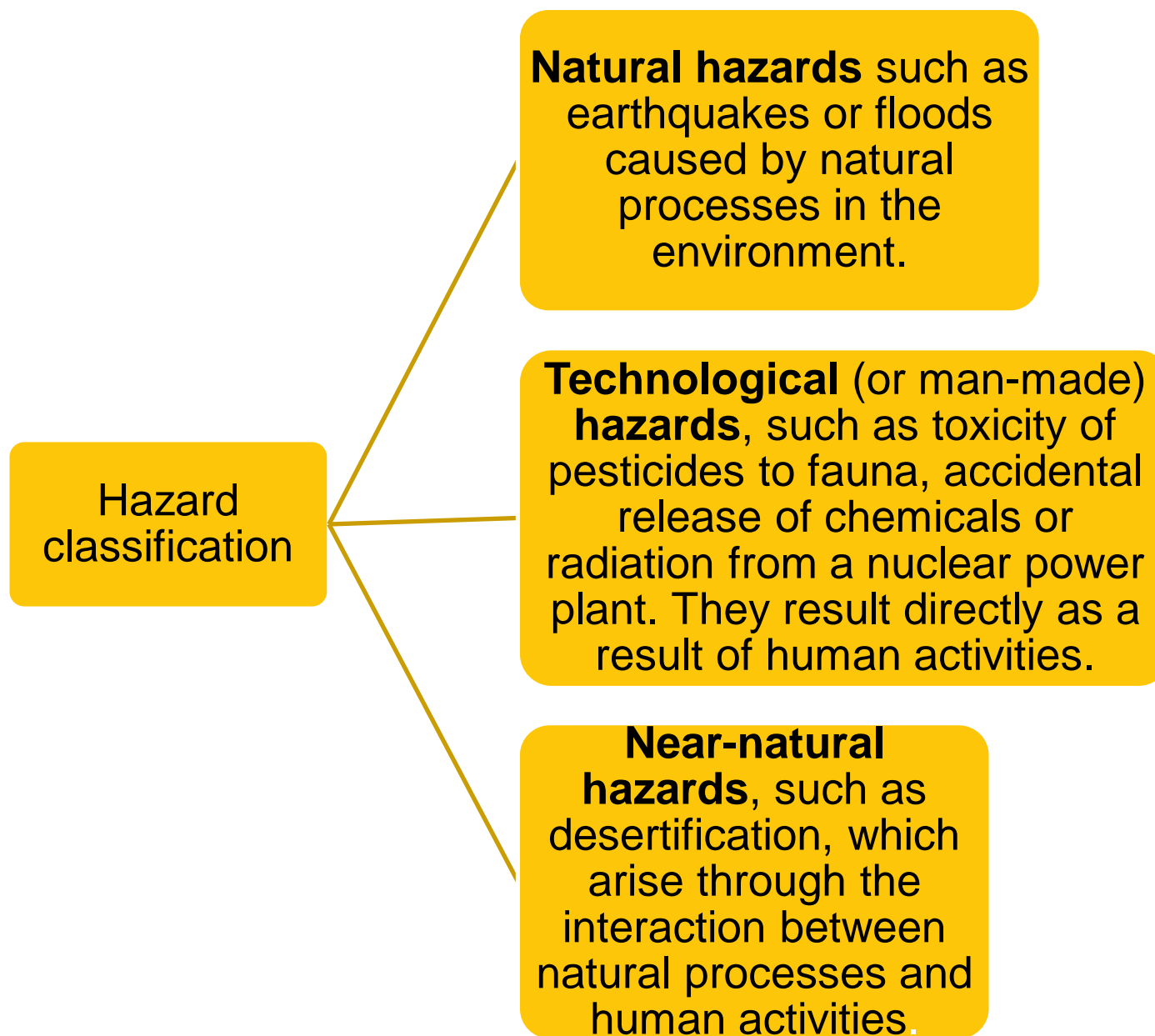
University of Craiova



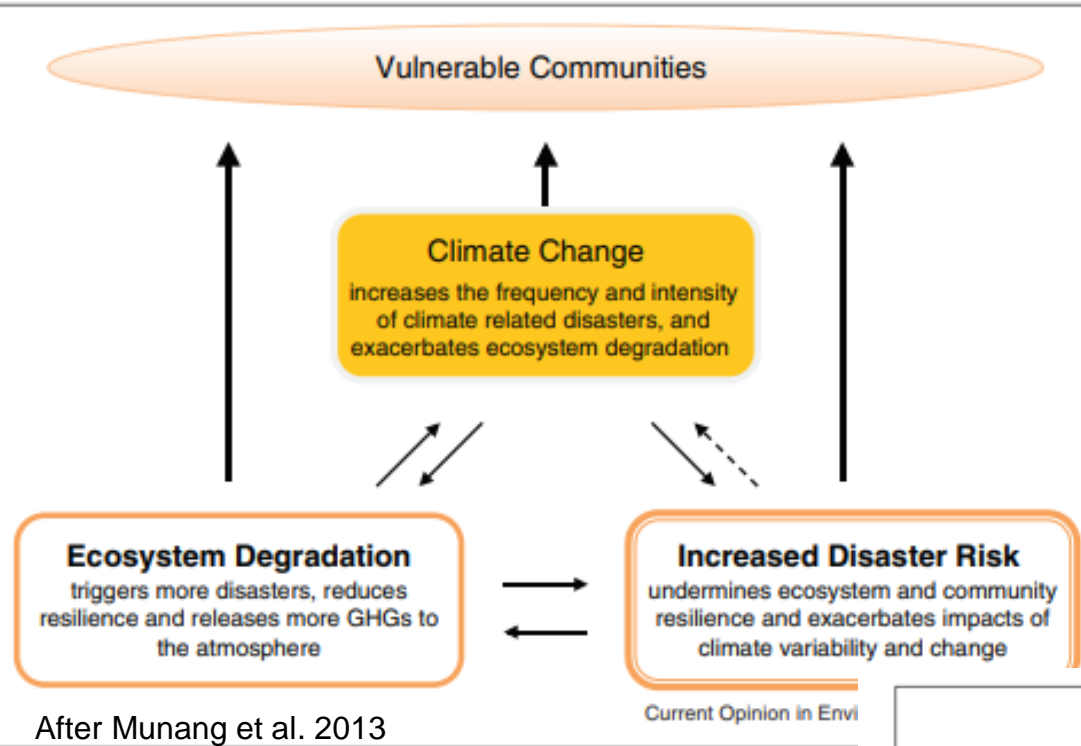
Definition of hazard



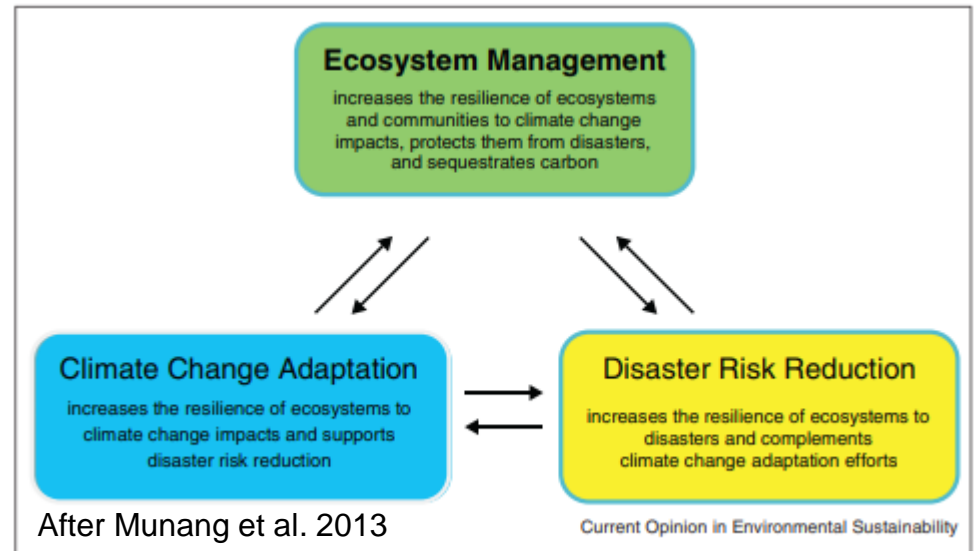
A dangerous phenomenon, a substance, human activities or conditions which can lead to loss of human life, injury or other effects on health, material damage, loss of livelihood and service interruption, social and economic disruption or damage brought to the environment (2009 UNISDR Terminology on Disaster Risk Reduction).



Interactions between climate change, ecosystem degradation and increased disaster risk



Central role of ecosystems in disaster risk reduction and climate change adaptation.



**INSTITUTE OF
GEOGRAPHY,
ROMANIAN ACADEMY**

Lead
partner

Original title
of the project

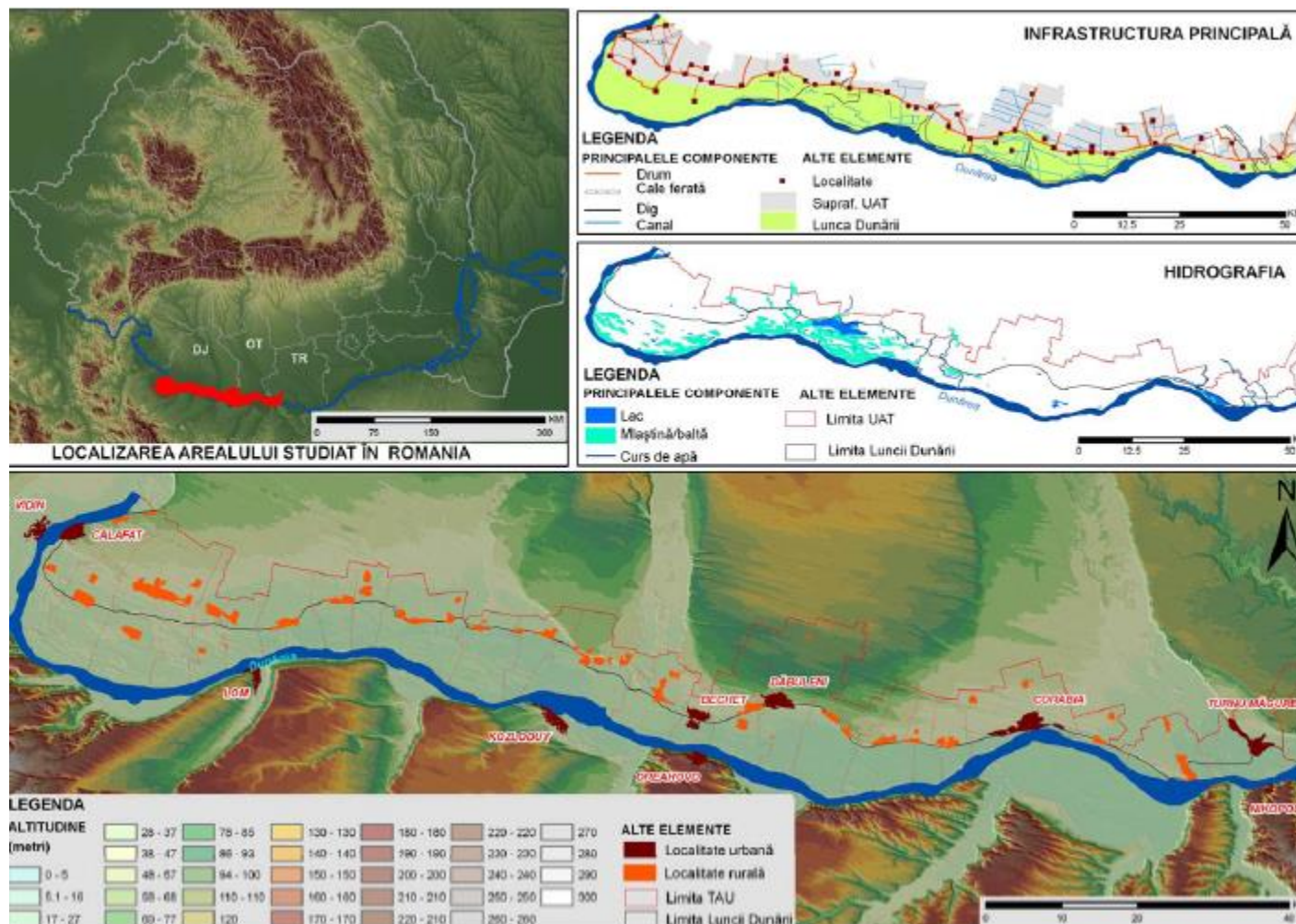
**ROMANIAN – BULGARIAN
CROSS-BORDER
JOINT NATURAL AND
TECHNOLOGICAL HAZARDS
ASSESSMENT
IN THE DANUBE FLOODPLAIN.
THE CALAFAT-VIDIN – TURNU
MĂGURELE-NIKOPOLE SECTOR**

**INSTITUTE OF GEOGRAPHY
BULGARIAN ACADEMY OF SCIENCES**

**NATIONAL INSTITUTE OF RESEARCH AND
DEVELOPMENT
FOR OPTOELECTRONICS, INOE 2000,
RESEARCH INSTITUTE FOR ANALYTICAL
INSTRUMENTATION,
ICIA, CLUJ-NAPOCA SUBSIDIARY**

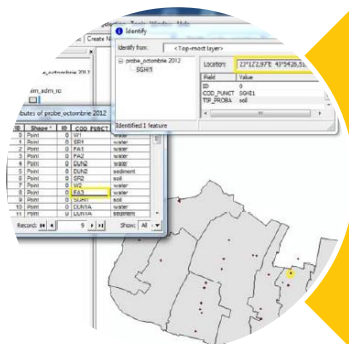
**GEOLOGICAL INSTITUTE
BULGARIAN ACADEMY OF SCIENCES**

**UNIVERSITY OF CRAIOVA,
GEOGRAPHY DEPARTMENT**



The location and main characteristics of the area under consideration

Project objectives



To elaborate a joint integrated GIS database for the Calafat-Vidin – Turnu Măgurele-Nikopole Danube Floodplain sector

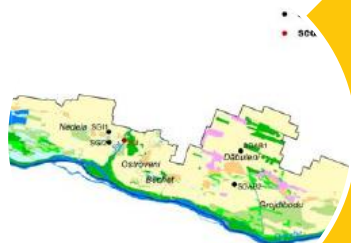


To identify the natural and technological hazards typologies

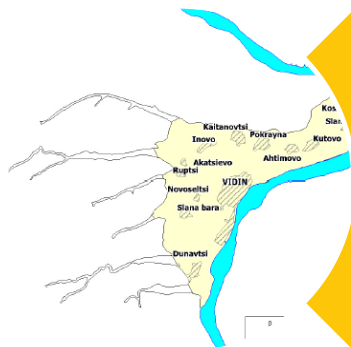


To assess the vulnerability to the natural and technological hazards

Project objectives



To elaborate the specialised natural and technological hazards maps



To assess soil and water quality and aquifer vulnerability to pollution with nutrients, pesticides and heavy metals



To identify the best sustainable development strategies for environmental protection

GIS DATABASE

This database represents the support for the maps with spatial distribution of sampling sites, as well as for interpolating the concentrations in order to realise the distribution maps of each chemical element. An example in this matter can be found in the preliminary map on NO₃ concentration in the phreatic aquifer, made by IDW interpolation (Inverse Distance Weighted).

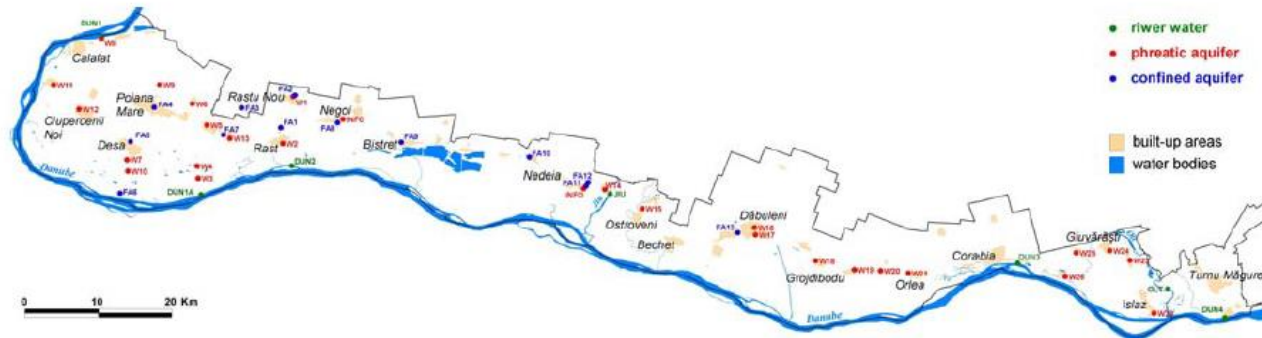


Fig. 3. Spatial distribution of water samples



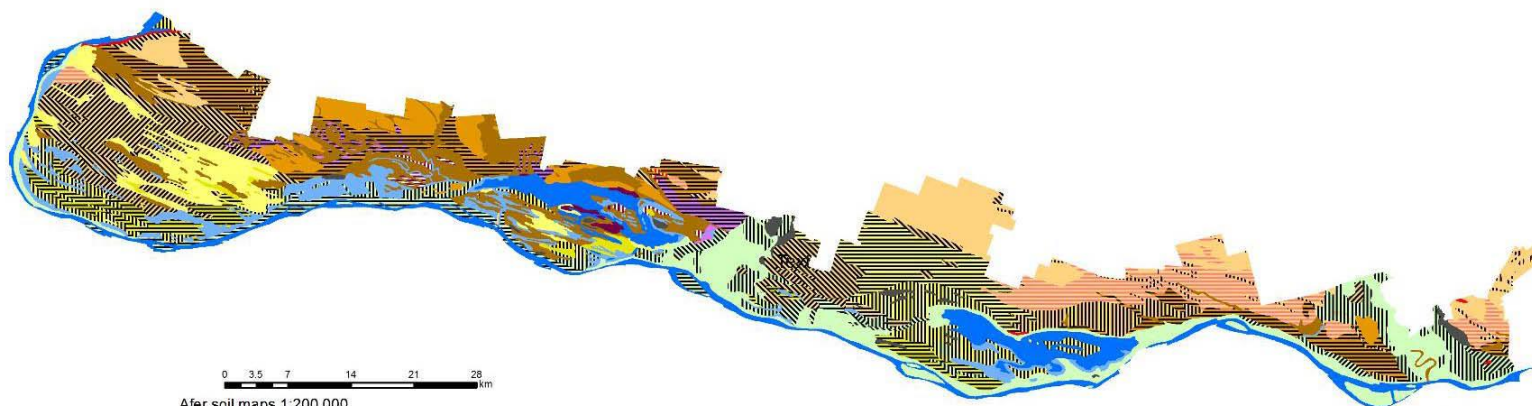
Fig. 4. Spatial distribution of nitrate concentration in phreatic aquifer (according to the Mark Kit)

Slope declivity map.

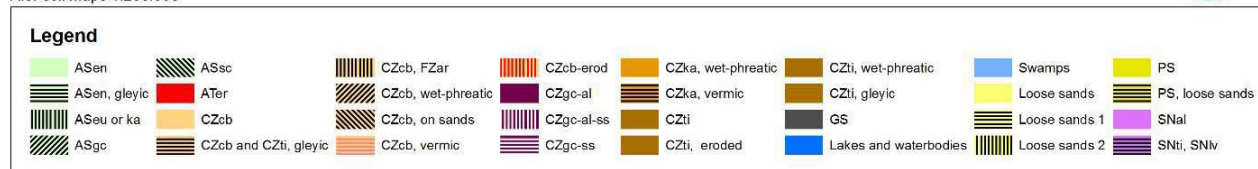
The slope represent an important indicator in realising hazard maps, mainly for the geomorphological hazards, but also in the evaluation of water resources vulnerability to pollution. A high declivity indicates a high favourability for slope processes (landslides, fall within the loess deposits), being also a good indicator in deliniating the landforms within the floodplain, either anthropic or natural (levees, excavations, islands, dried lakes, meanders, ox-bows, sand dunes).



Fig. 5. Slope declivity map



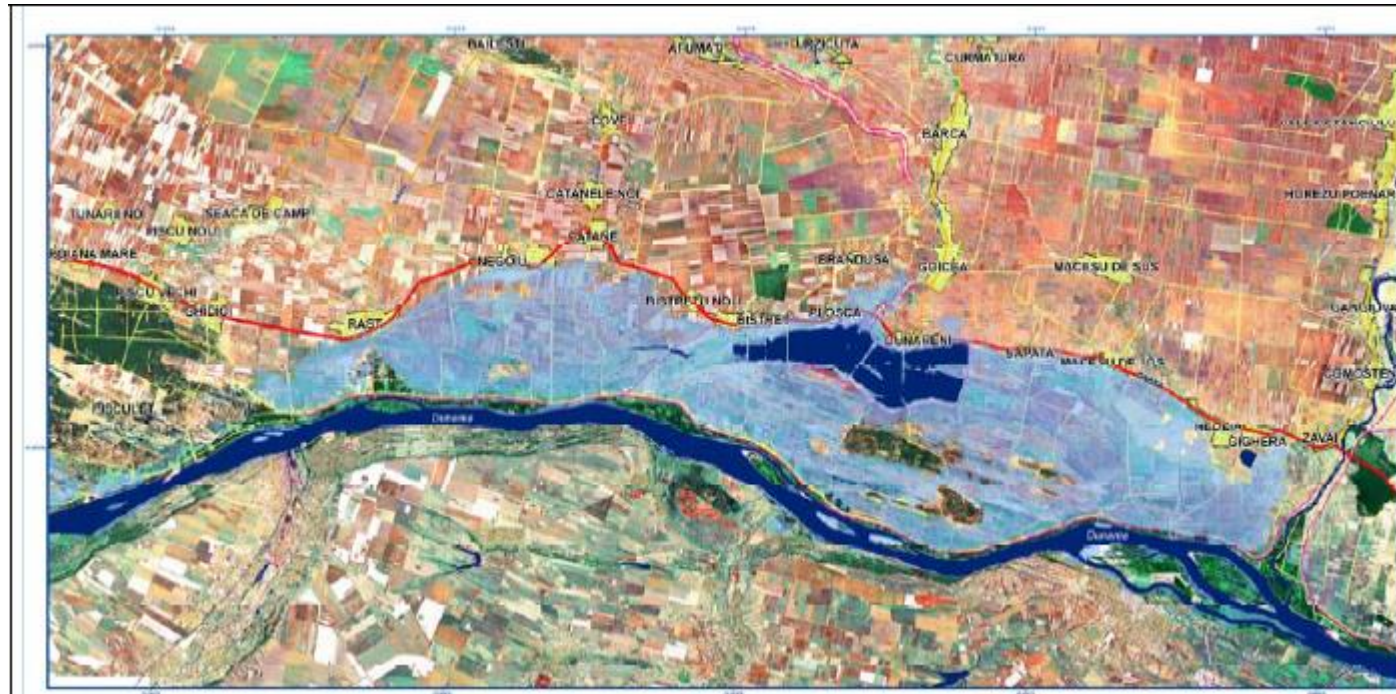
Afer soil maps 1:200.000



Soil types within the Danube floodplain (Calafat-Vidin – Tunu Magurele-Nikopole sector)

Natural and technological hazards typologies

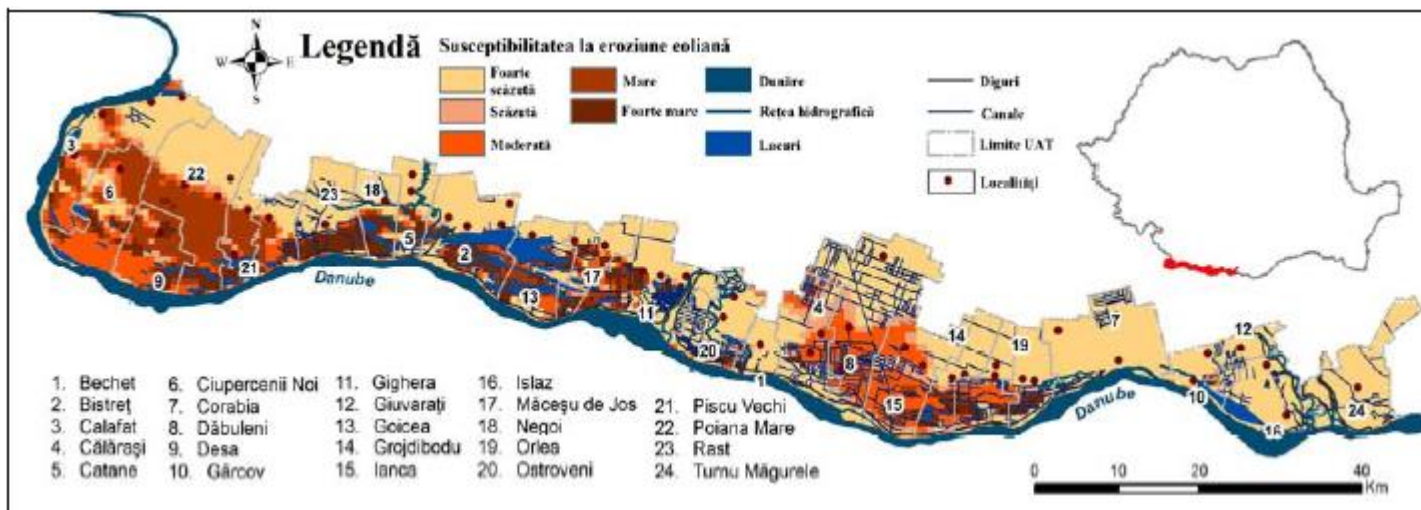
Among the natural dangerous phenomena that characterize the Danube Floodplain, the hydrometeorological hazards are prevalent. For the study area, the main dangerous phenomena of atmospheric or hydrological nature include **floods**, drought, heat waves and, to a lesser extent, thunderstorms, hailstorms, blizzards, heavy snowfall, cold spells etc. Hydrometeorological conditions can be a factor in other hazards such as the transport and dispersal of toxic substances.



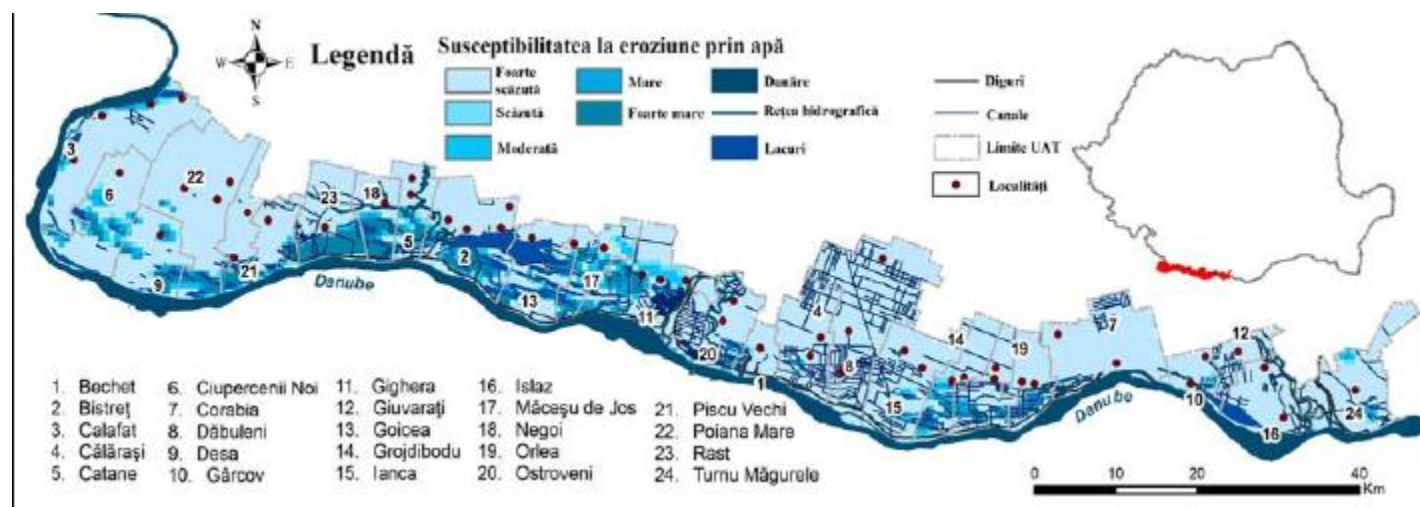
Hazard assessment

Risk assessment is the process through which the nature and extent of risk are determined by analyzing potential hazards and evaluating existing vulnerability; these could be a menace to people, property, livelihoods and the environment on which they depend.

The methodologies that are applied during the process of risk assessment respond to the given definition of risk: the probability and frequency of a hazard event, exposure of people and their property to hazardous action and the consequences of such exposure.



Map of soil susceptibility to wind erosion



Map of soil susceptibility to erosion through water

The practice contributed to the improvement of the existent information on natural and technological hazards on both Romanian and Bulgarian border areas



The main results of the project are:

- a joint complex assessment and database of natural and technological hazards;
- hazard maps;
- data regarding the soil and water quality;
- raising awareness for citizens, land owners and policy makers.



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Thank you!

Questions welcome



Project smedia