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**Geoanalysis techniques used in  
evaluating the versant's  
functional units**

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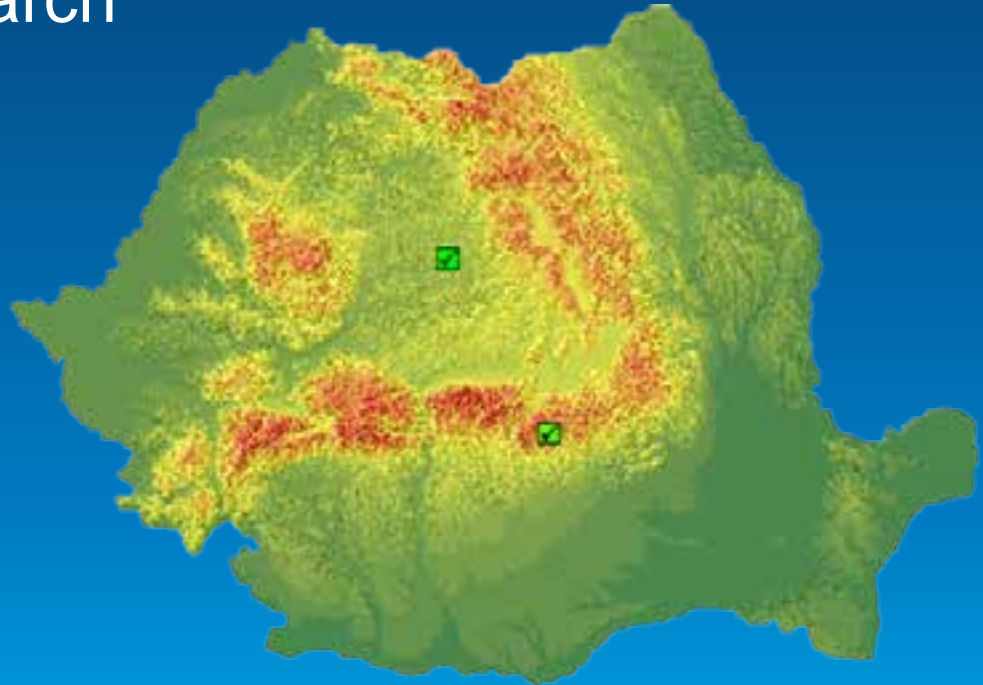
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# Overview

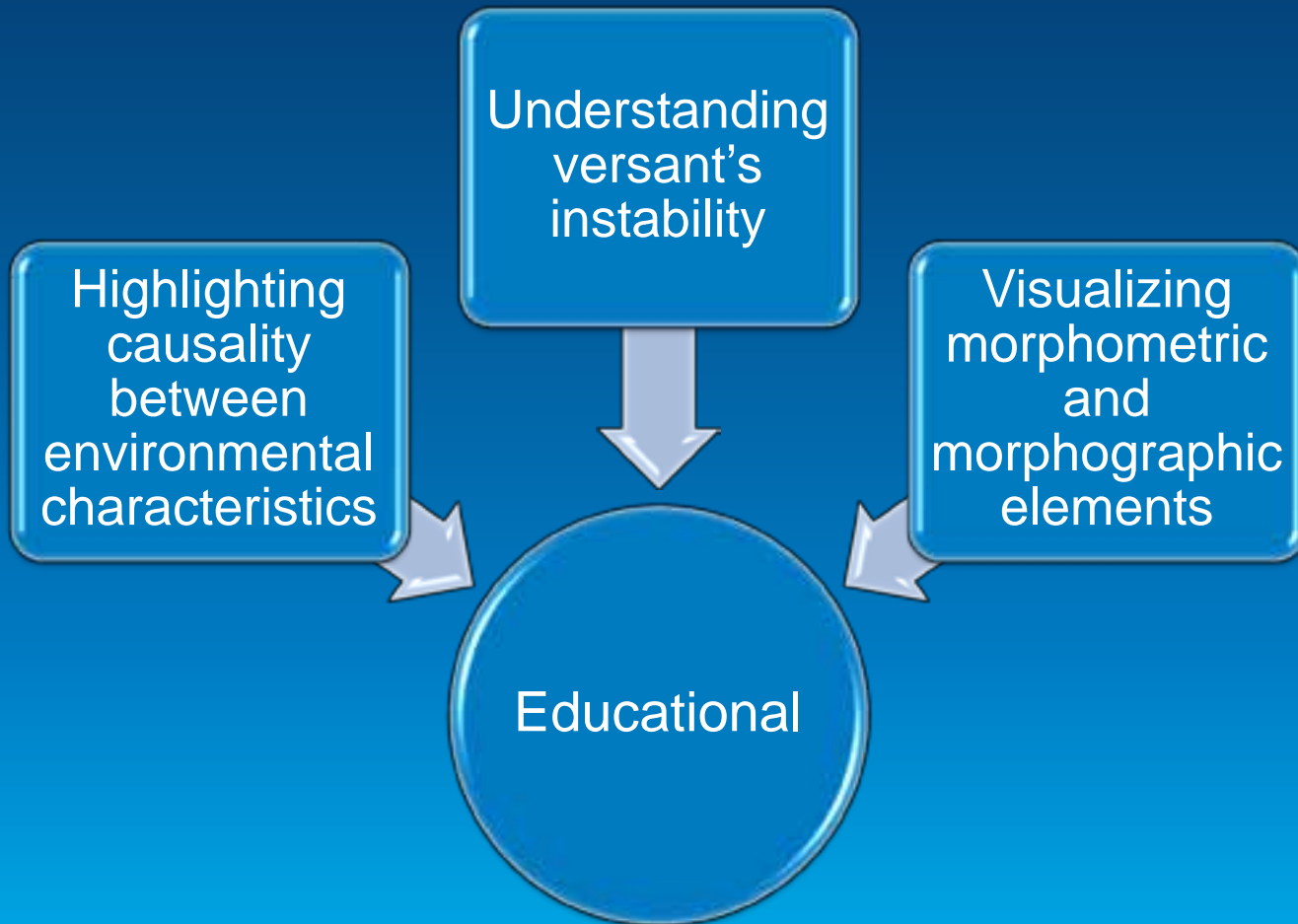


- A. Aim of the research
- B. Methodology
- C. Workflow
- D. Results
- E. Conclusion

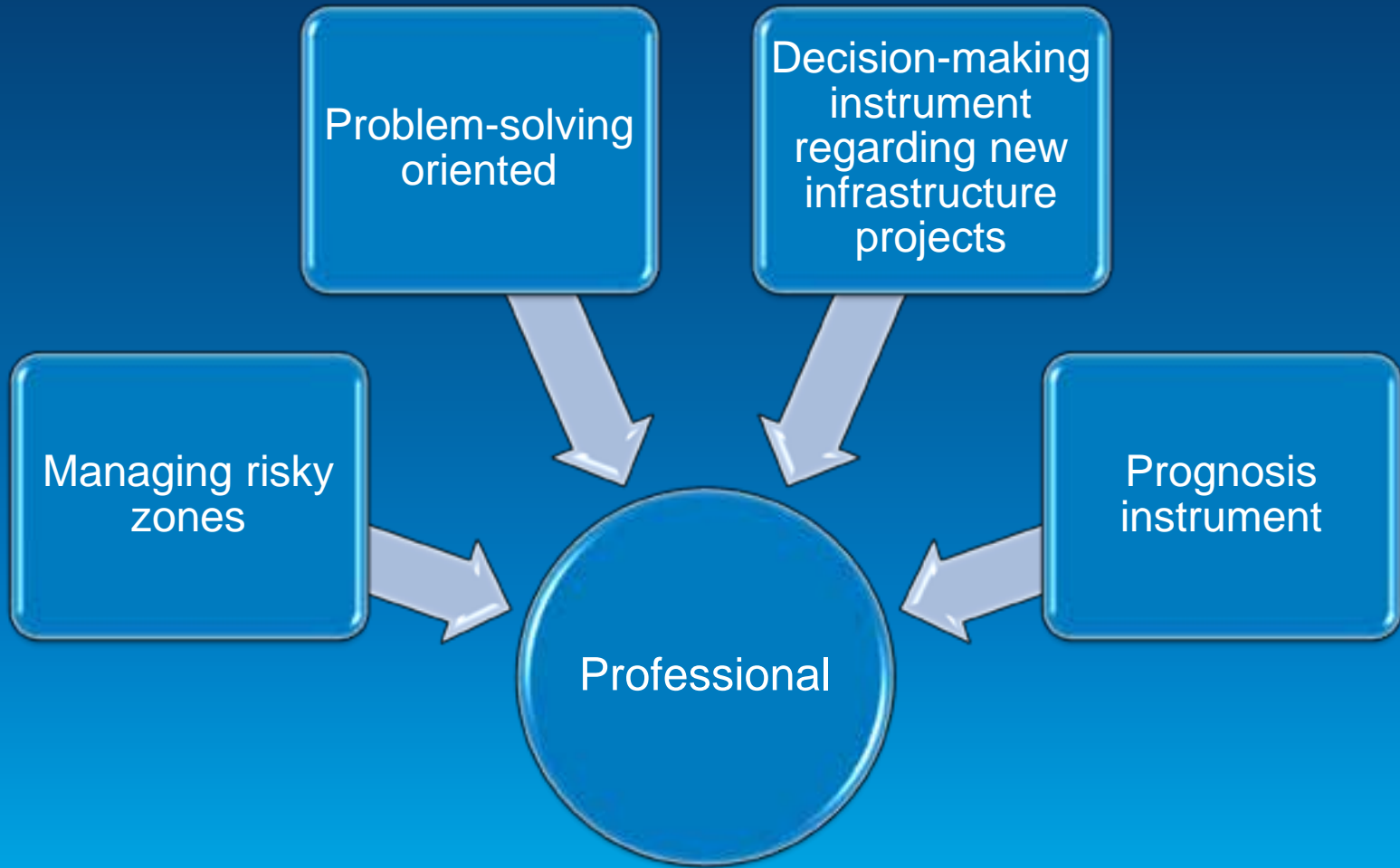


# A. Aim of the research

- ∅ Two main directions – educational and professional



# Aim of the research



# B. Methodology

- q Data collection and field trips phase
  - q Data survey in the field
  - q Data acquiring
  - q Digital collection of data (populating personal DB)
  - q Standardizing all data
- q Analysis phase
  - q Building the analysis model
  - q Applying the model for a hilly landscape
  - q Validating the model for a mountainous area
  - q Interpreting results
- q Validating data in the field phase
  - q Field trips to validate resulting data
- q Interpreting final results

# Resources



## Images and vector data

**Topographical map** of Bucegi Area and Targu Mures City

**Orthophoto** of Bucegi Area and Targu Mures (0,5 m resolution)

### Database

Corine Land Cover - European Environmental Agency

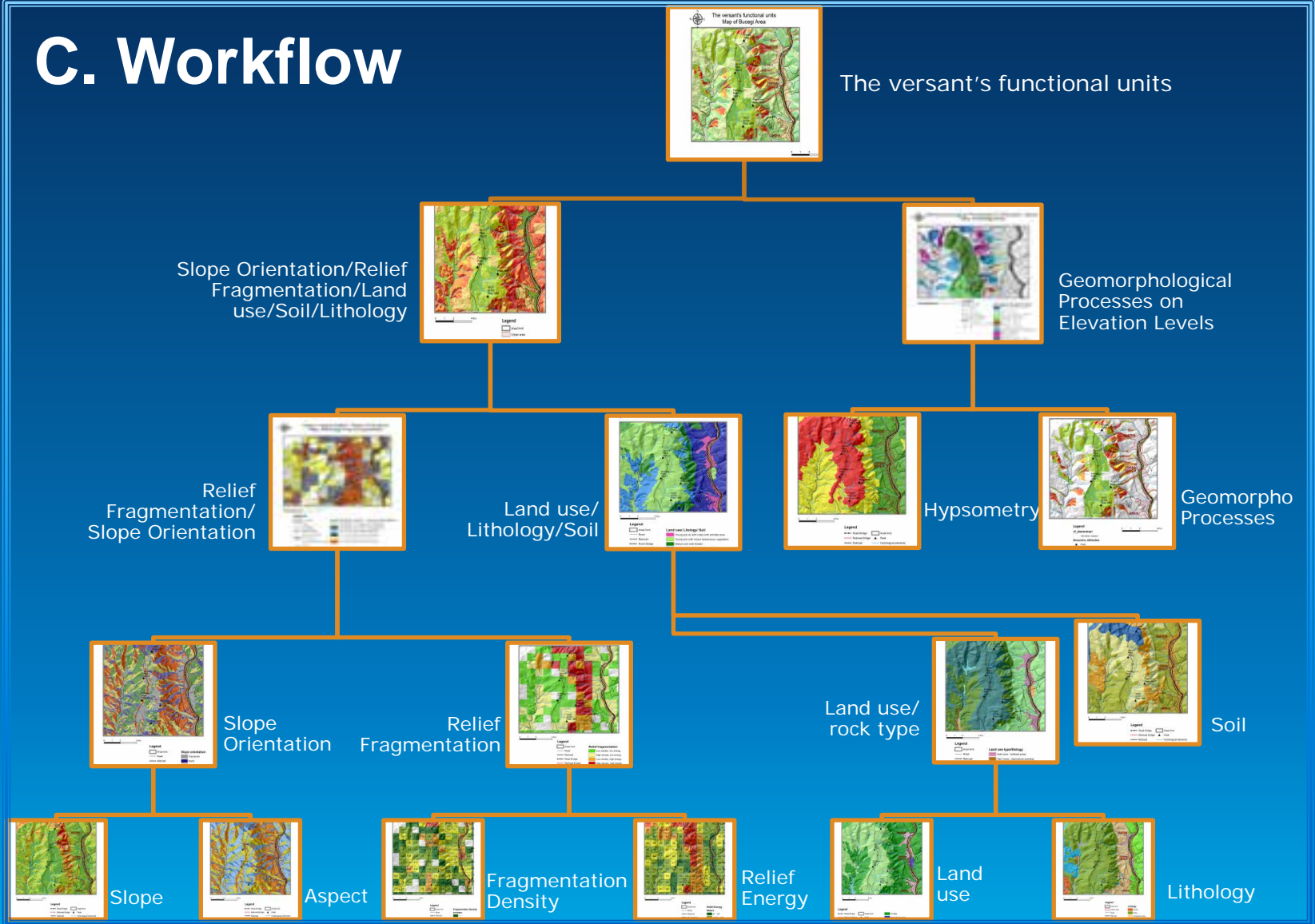
Geology of Romania

Soils of Romania

Administrative limit of settlements

**Personal datasets:** Contour lines (10 m equidistance), Elevation Points, Infrastructure in Bucegi Area And Targu Mures city, Hydrological elements, Geomorphological Processes

# C. Workflow







Relief Fragmentation/ Slope Orientation  
Map of Bucegi Area

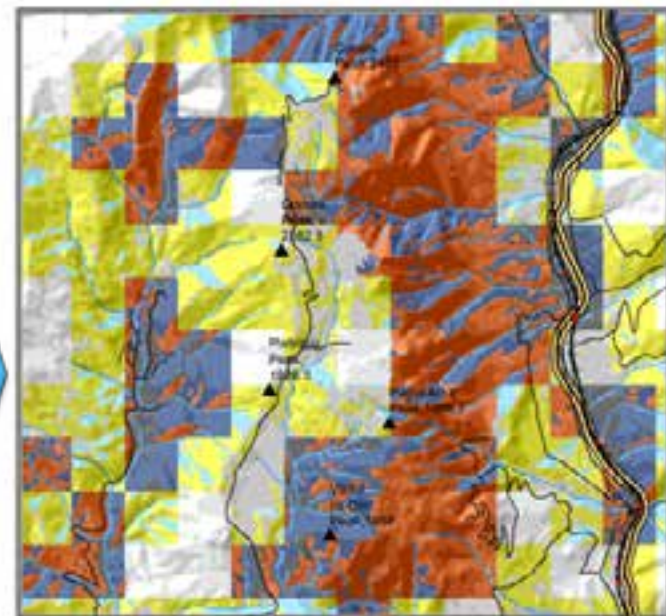


**Legend**

▲ Peak	<b>Relief Fragmentation * Slope Orientation</b>	South + low energy, low density
—+—+— Road Bridge	Flat terrain + low energy, low density	South + low energy, high density
..... Railroad Bridge	Flat terrain + low energy, high density	East + high energy, low density
—+—+— Railroad	Flat terrain + high energy, low density	East + low energy, low density
—+—+— Road	Flat terrain + high energy, high density	East + high energy, high density
—+—+— A3 Highway	North + low energy, low density	West + low energy, high density
Urban area	North + low energy, high density	South + high energy, low density
Areal limit	East + low energy, low density	South + high energy, high density
Hydrological elements	North + high energy, low density	West + high energy, low density
	South + low energy, high density	West + high energy, high density
	North + high energy, high density	



Relief Fragmentation/ Slope Orientation  
Map of Bucegi Area (reclassified)



**Legend**

□ Areal limit	<b>Relief fragmentation * Slope Orientation</b>
— Road	Flat terrain with low erosive potential
—+—+— Railroad	Flat terrain with high erosive potential
—+—+— Road Bridge	N + W with low erosive potential
..... Railroad Bridge	N + W with high erosive potential
—+—+— A3 Highway	S + E with low erosive potential
Hydrological elements	S + E with high erosive potential
▲ Peak	



## D. Results

- ∅ A complex database regarding geomorphological processes connected to slope orientation, relief fragmentation, lithology, land use, soil, elevation levels
- ∅ Model applied to Targu Mures City: 20 classes
  - ∅ Three geomorphological processes: landslide, gully, torrent
- ∅ Model applied to Bucegi Area: 174 classes
  - ∅ Five geomorphological processes: gully, torrential organism, rockfall, creeping, fluvial erosion
- ∅ Each pixel in the final raster dataset contains information about the above mentioned characteristics

**Creeping and torrential organisms**



**Fluvial processes and infrastructure**

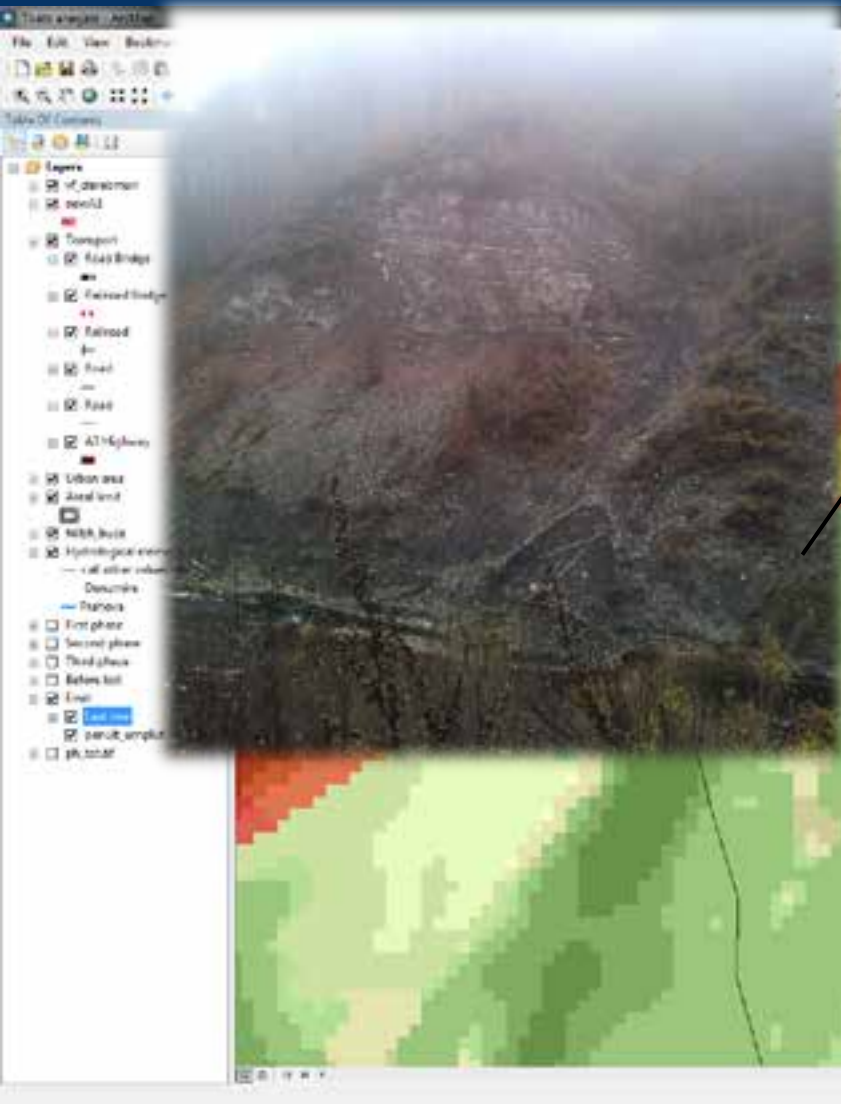


**Creeping and rockfall**



**Rockfall**





Identify

Identify from: Last one

Last one: 26837

Location: 541,870.224 401,536.222 Meters

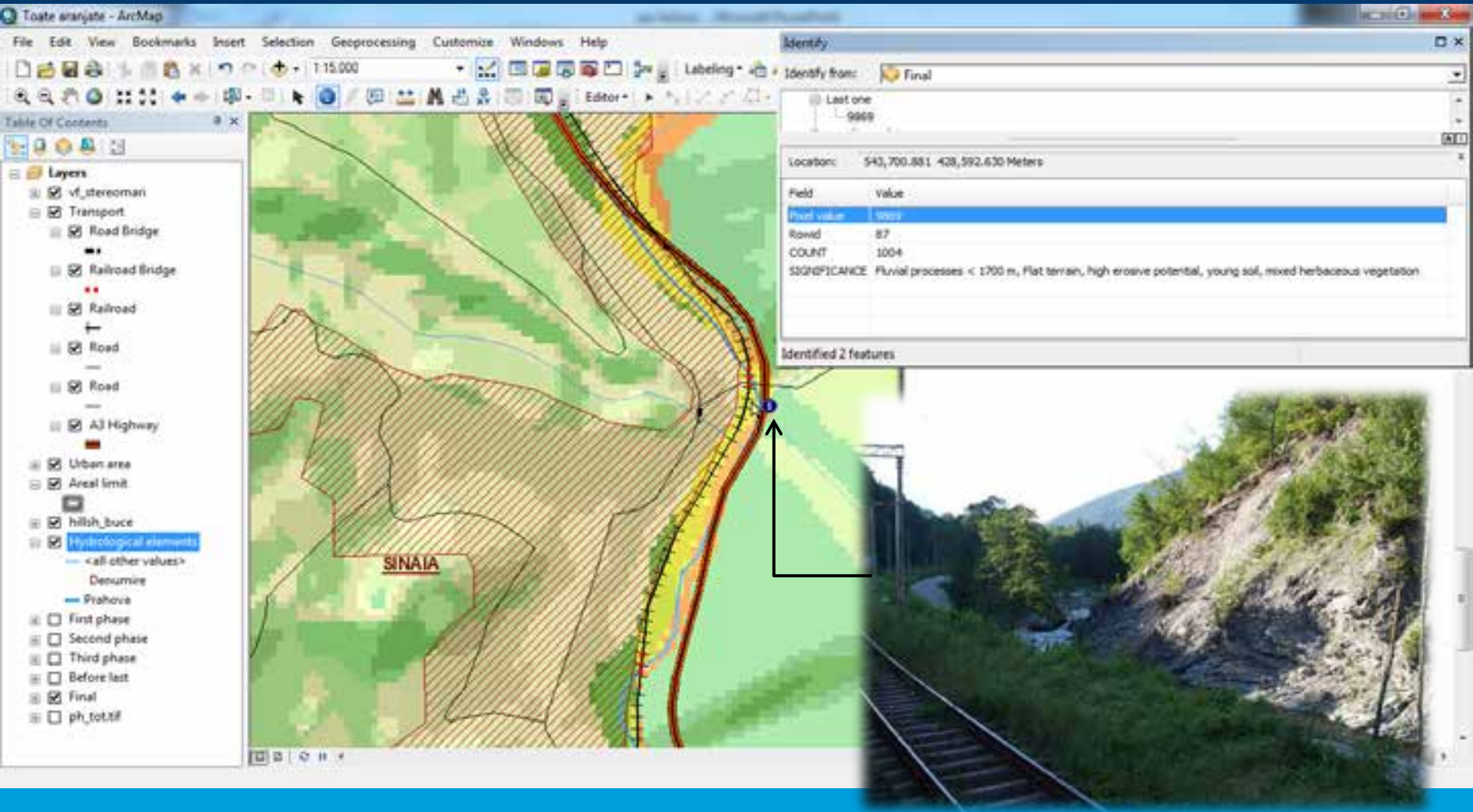
Field	Value
Pixel value	26837
Rowid	150
COUNT	2689
SIGNIFICANCE	Sully < 1700 m, South + East, high erasive potential, young soil, soft rocks, forests

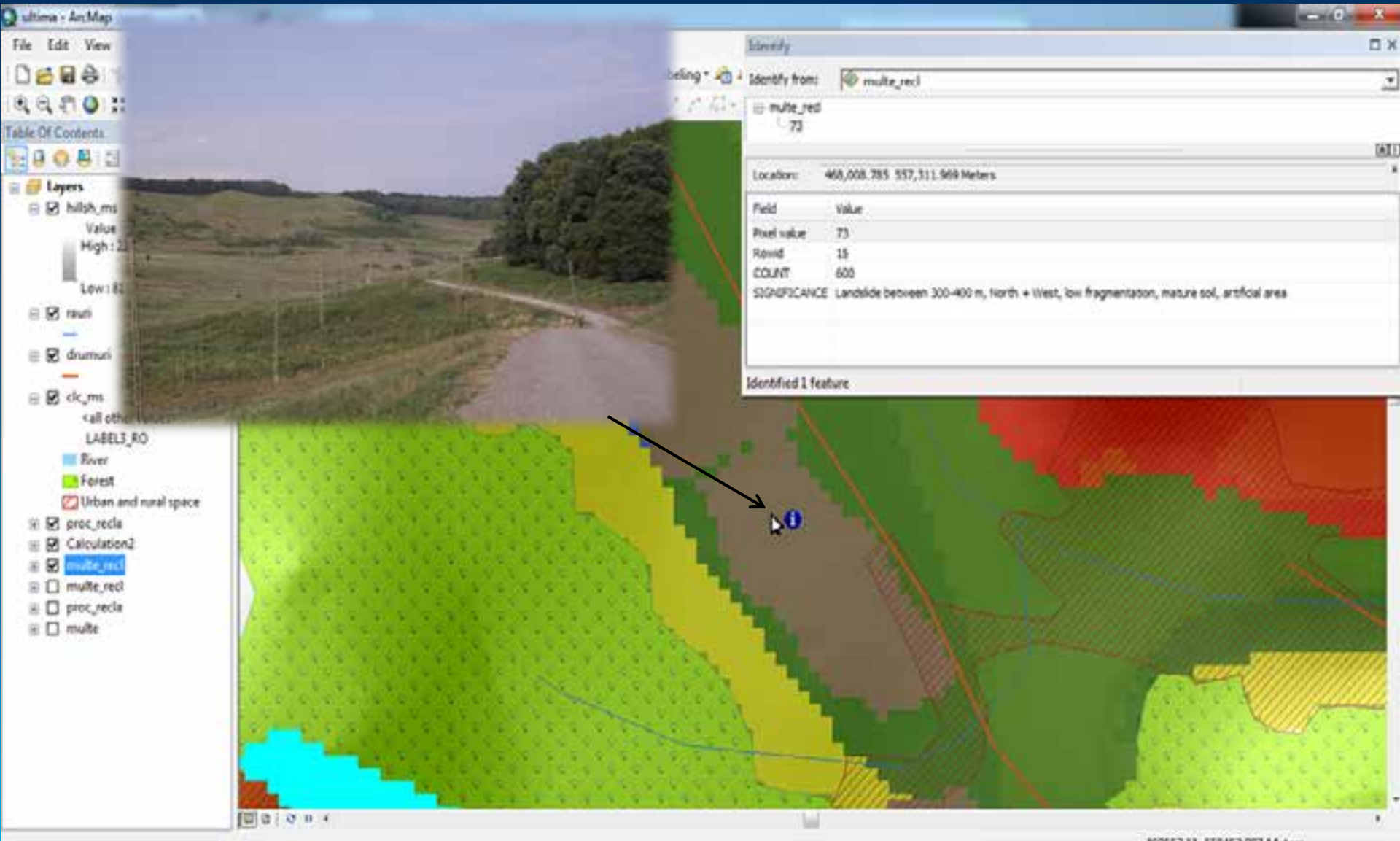
Identified 1 feature



Protection net







## **E. Conclusions**

- ü This methodology represents the basis in evaluating the versant's functional units**
- ü Visual support in the morphodynamics field – new perspective on morphographic and morphometric characteristics**
- ü Applicable to all types of terrain**
- ü Useful in managing risky zones, feasibility studies, monitoring versant's instability**
- ü Decision-making tool**



# Thank you for your attention!

