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cell phone  
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facility!



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YOUR COOPERATION!**

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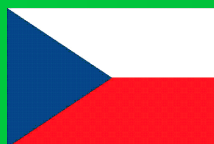




# Project RIMADIMA

*Ref.nr.: 5D102 RIMADIMA*

**Risk-, Disaster-Management & prevention of natural hazards in mountainous and/or forested regions**



**Workshop - SERM - South Europe Regional Meeting**  
**Climate changes and Forest Fires, Skopje 9.04.2008**

**Presenter:**  
**IVAN BLINKOV**



## ***Associate professor Ivan Blinkov, PhD***

**Permanent: Faculty of Forestry – Dept. Land and Water**

**Honorary: Interdisciplinary studies of Environmental engineering**

### **Basic Info**

**Age – 47**

**Civil Status – Married, 1 daughter**

#### **Education:**

**BSc – Forestry ; MSc, PhD - Forest Environment > Natural hazards > Watershed management, Erosion**

**Teaching: Land and Water related courses,**

**Leader of MSc group: Management of Land and Water in Mountainous ecosystems**

**Membership: WASWC; Alliance21  
GAOF. MES. BIOEKO ...**

### **Professional achievements:**

**2 textbooks, 3 internal scripts  
1 chapter in Oxford monograph**

**30 domestic projects**

**8 scientific domestic projects**

**10 International projects**

**50 published papers on international conferences**

**Reviser on scientific conferences, magazines, domestic projects**

**Invited lecturer, Member of Expert council of the Min. of environment**

## EU Programme: INTERREG IIIb CADSES



**CADSES zone**

### Priority 4:

**Environment protection,  
resource management  
and risk prevention**

### Measure 4.2.

**Promoting Risk  
management and  
prevention of disasters**

# Project consortium:

## Italy:

- Community Mountain "Appennino Forlivese" (LEAD PARTNER)



## Bulgaria:

- Smolyan Region
- Association of Small and Medium Enterprises



## Poland:

- Silesian Voivodeship Office in Katowice, Crisis Management Department



## Serbia:

- Toplicki District
- Public Enterprise SRBIJAVODE, Belgrade
- Faculty of Forestry, Belgrade



## Czech Republic:

- Nature Conservation BERKUT



## Hungary:

- Lake Balaton Development Coordination Agency



- Faculty of Forestry - Skopje University
- Public Enterprise "Parks and Greenery" - Skopje





# National Project team:

- Prof. d-r Ivan Blinkov – FFS - project coordinator,
- grad. eng. Velian Jagev , PEPG , deputy coordinator

## Expert stuff:

- prof. d-r Ivan Blinkov, team leader, overall expert,
- grad. eng. Ivan Mincev – GIS/RS/DSS expert
- prof. d-r Nikola Nikolov – wildfires expert
- prof. d-r Aleksandar Trendafilov, erosion and torrents expert
- grad. eng. Velian Jagev – IT/DSS expert

## Other

- grad. eng. Bozin Trendafilov - GIS database development, IT
- grad. eng. Ljubomir Nedkov – GPS measuring
- grad. eng. Bojan Simovski – forest ecosystem, IUCN
- other supported staff...

# Project objectives

- 1) Planning, modernization and development of Natural Disaster Management System integrated in national, regional and local entities targeting an increase of security for an enhancement of the socio-economic structures (tourism, enterprises, infrastructure, etc).
- 2) Promotion of co-operation and exchange of experiences on European level between institutions related to CM on national, regional and local level and spatial development departments on national, regional and local level based on common European legislation and common.
- 3) Elaboration and improvement of common spatial development directives, laws and procedures in risk prevention and risk management.

# Beneficiaries of the project :

- Municipality and city administration (*note: with the program for decentralization management of risks became their obligation on local level*)
- Enterprises that prepare various plans (spatial plans for spatial-functional units; urban plans; plans for regions of special purpose; forest management plans; wildfire protection plans; watershed plans, tourist plans, other plans)
- Enterprises that manage forested or mountain regions (PE Macedonian forests; PI National Parks; Public communal enterprises);
- Scientific community



# Activities - Work Packages

- **wp1 – Project management**
- **wp2 – Creation of a basic data related to natural hazards**
  - Study of natural and soc-economy factors;
  - Creation GIS database;
  - Study about monitoring related to natural disasters;
  - Study about planning – in forestry, agriculture, watermanagement, spatial, urban
  - Study about management of natural resources
  - Study about dominant risks
  - Transnational study on risk probability violation of forest ecosystem / meteorological
- **wp3 – System of risk/disaster management**
  - Study of the system on national / regional / local level ; other institutions (legal basis, competences, capacities, SWOT analyses)

- **wp4 – Technical implementation of the developed measures —Development of: RISK maps; DSS**

- Risk assessment (per hazard and mutual)
- Development of Map of critical facilities
- Development Risk maps (per hazard)
- Development methodology and multihazard risk map
- Establishing Centre for risk management in the PEPG (hardware, software)
- Establishing Laboratory for GIS modelling on the Faculty
- Development of Decision Support System for planning
- Development of Decision Support System for emergency

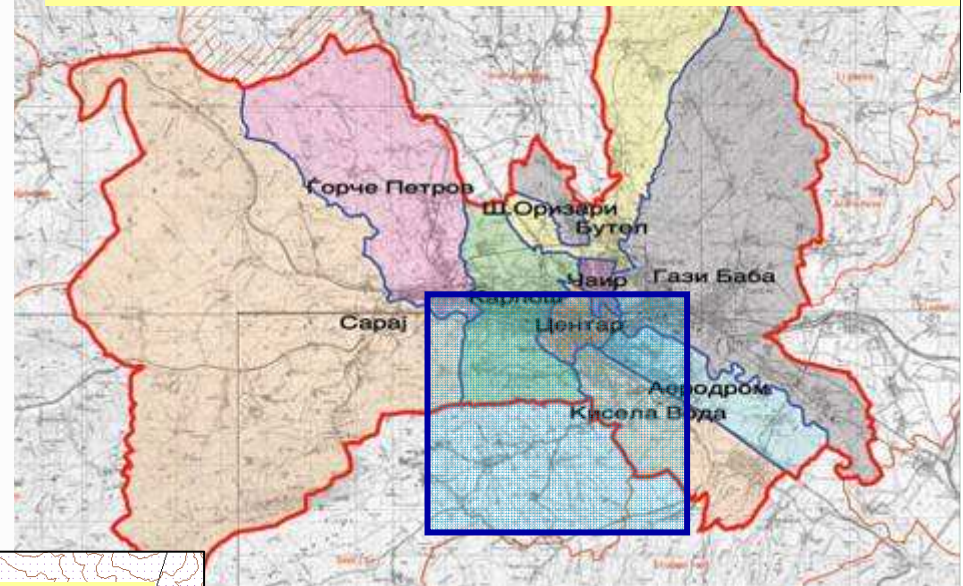
- **wp5 – Recommendations for public authorities**

- Study on acceptable level of risk
- Development of recommendation for improvement of the risk management system for different stakeholder

- **wp6 – Dissemination of results and strengthening the public awareness of risk prevention.**

- workshops, presentations, medias, information, leaflets, pamphlets, web-site

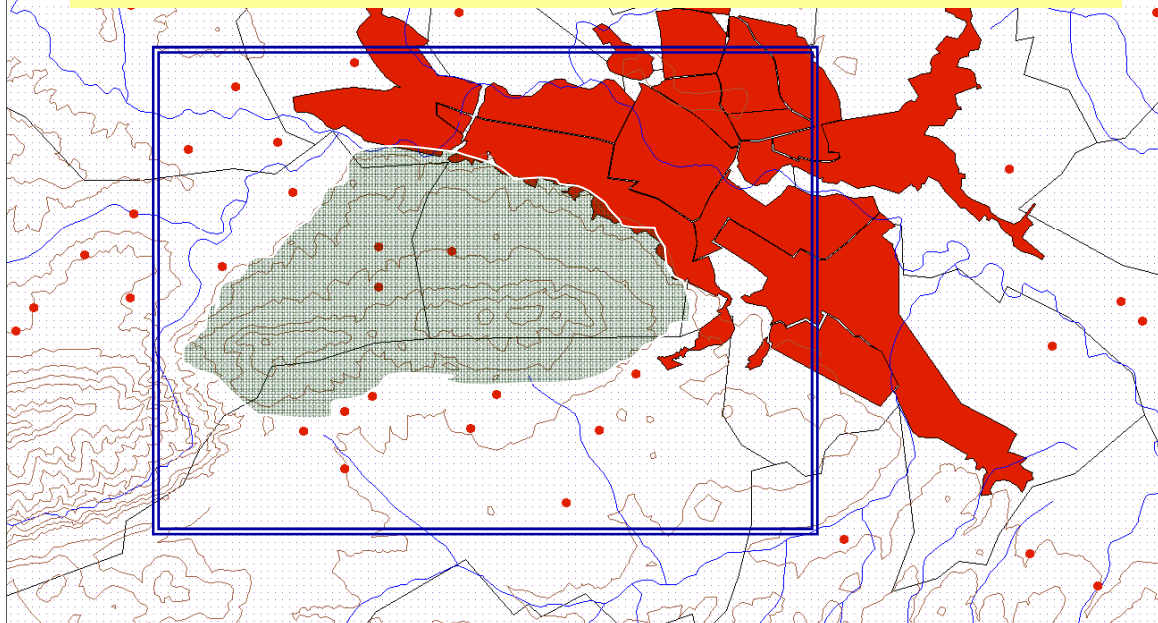
## WORKING AREA – square



## WORKING REGION



## WORKING AREA – Vodno and the surrounding area



### **Boundaries**

West to east from  
7523000 to  
7524000;  
south to north from  
4643000 to  
4653000

**DEM:** lowest point  
is 240m (the river  
Vardar), to 1068 m  
top of the Vodno  
mountain.





## Legend :

- 1 – Ancient Skupi
- 2 – Justiniana prima ???
- 3 – Skopje (XV-XIX)
- 4 – (XX c. – 1963)
- \* - villages around the city (-1963)
- 5 (yellow filled) – present city  
600 000 citizens

Vodno 1920



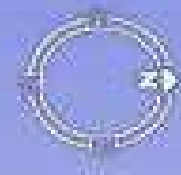
Vodno 2005



## Main problems in the project area

- The bare area is still large and are not spatially determined.
- The fires not only destroy the forest areas on Vodno, but also degrade the soil, affect the water regime and contribute to the air pollution to the city.
- Danger from torrents is still present especially on the eastern and southern slopes. This is further emphasized by the appearance of forest die-back especially in the black pine stands on the lower northern parts of the mountain.
- Illegal construction
- Low public awareness,

# STRUCTURAL MEASURES in PAST



Afforested , torrents regulated  
Partially  
No measures

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Google

Point: 41°58'07.19" N 2°25'27.45" E elev 594 m Streaming 100%

Eye alt 120 km



# Climate elements in the project area

Period	$\Sigma P$	PET		T	Md					
1951-1990	mm	mm	Cd	oC	mm	G	Na	Nsa	Is	DF
Skopje	501,7	725,3	0,68	12,0	284,0	sa	6	2	22,8	41,81

## DROUGHT PERIOD 1991-2000

Decrease of precipitation - 13.1 % (- 65.6 mm)

$\Sigma P = 487$  mm ;

Increase of temperature + 5.8 % ( + 0.7 °C)  $t = 12,1$

$Cd < 0,65$

**Region of Skopje is vulnerable to desertification**

## CONSEQUANCES

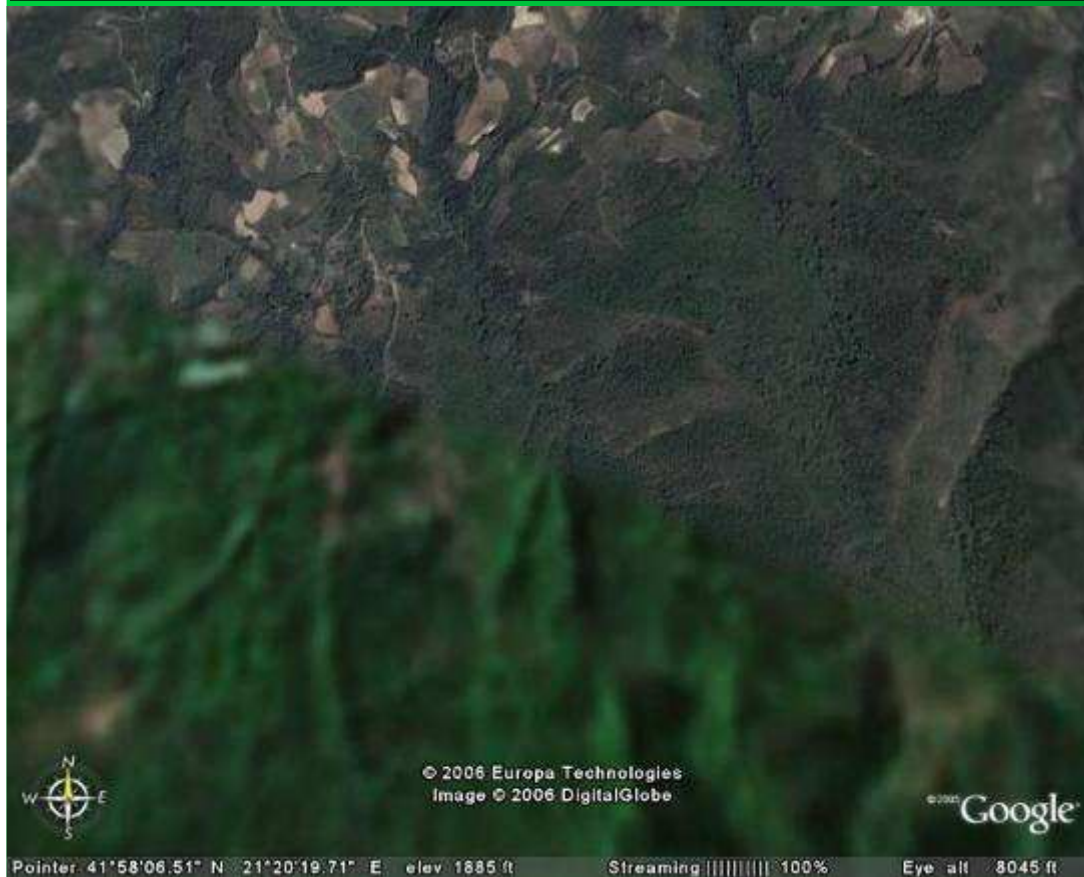
Increase of erosion processes, Flash floods.  
Wildfires, Forest decline ,,,

# Bare lands





# Wildfires

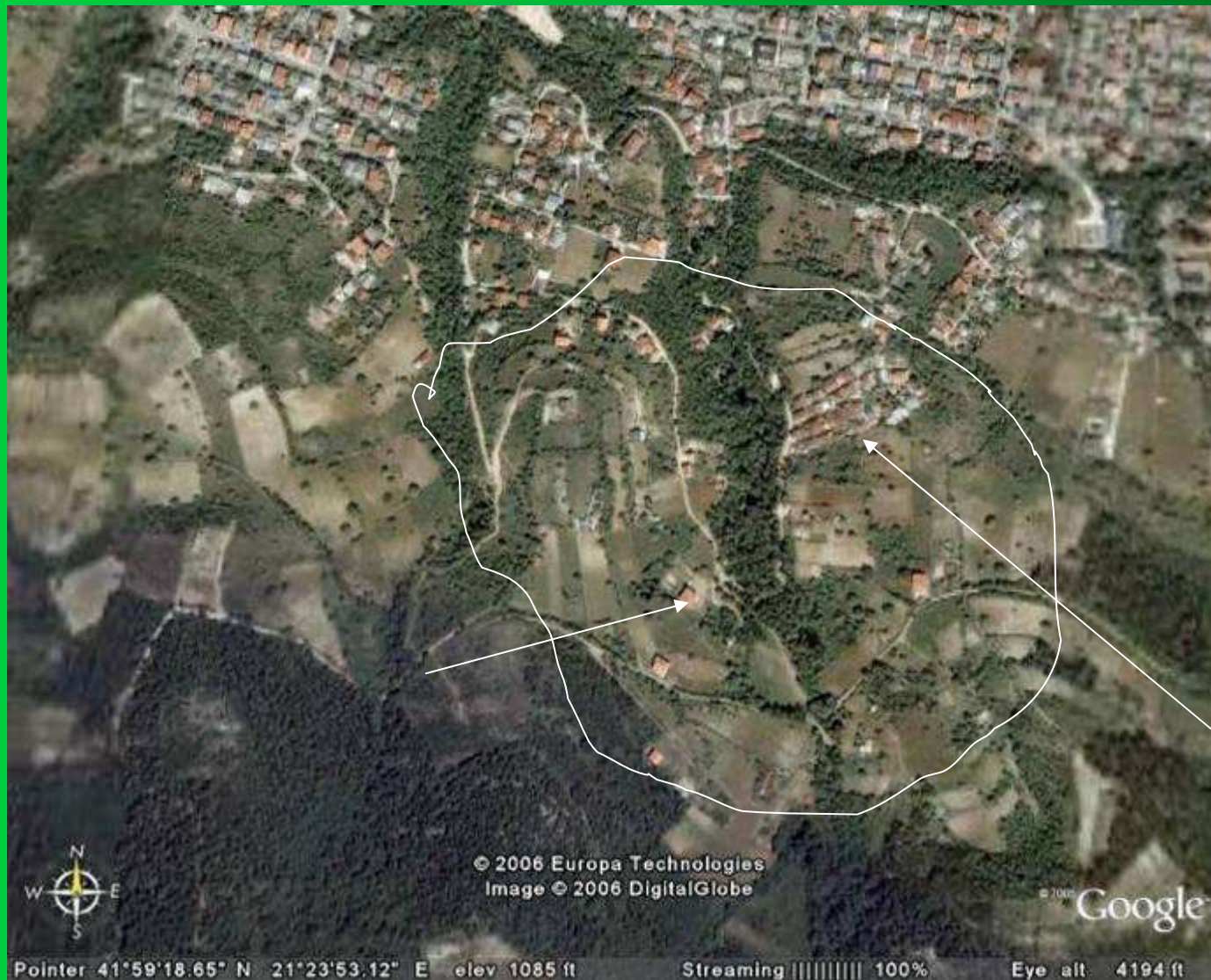


# LAND MOVEMENT





# <OTHER PROBLEMS>



**ILLEGAL CONSTRUCTIONS**



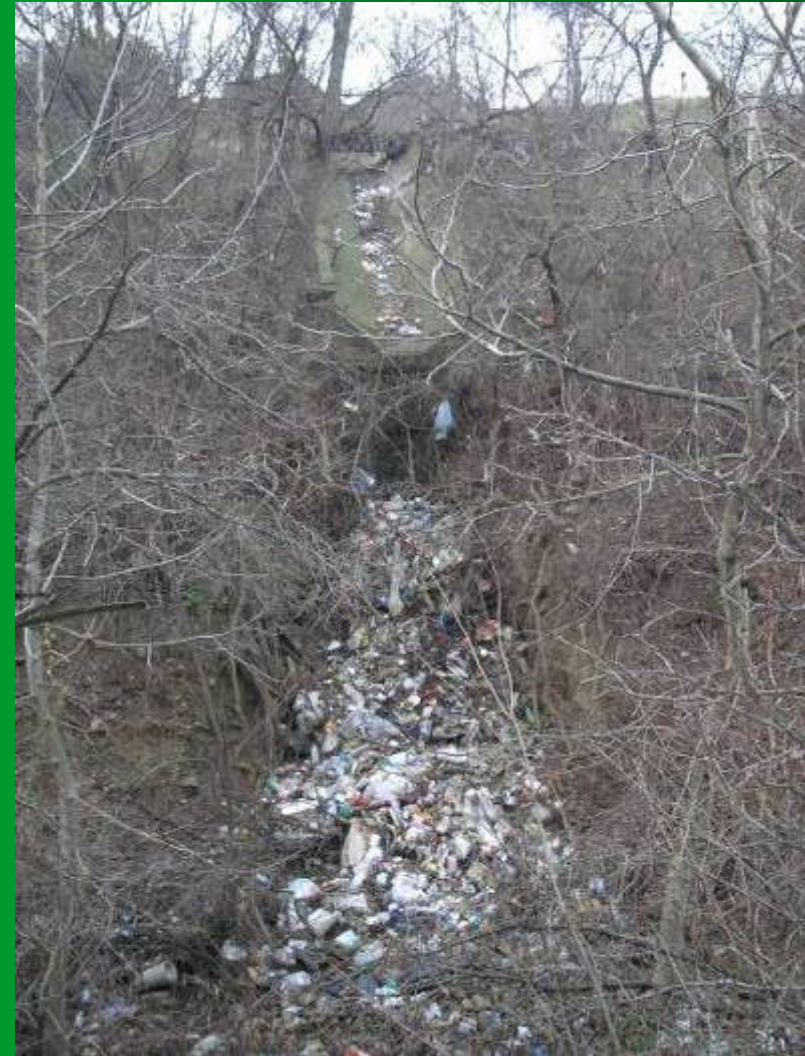


# Illegal constructions into the channels





# Waste – wild landfills





# Excavation Waste



# Disasters in past

- *Drought -*
- *Erosion and Torrents – 1951 last big flash flood (1 guilty, no evidence for damages)*
  - after almost each more intensive rainfall, small damages in the eastern part of the city*
- *Wild fires - evidence only for last 6 years – cca 150 ha burned*
- *Landslides - the biggest one 2006 – v. Rakotinci 45 houses damaged, no evidence for smaller events*



# Nature



**Area:** 4573 ha,  
- 2168 ha forest,  
- 850 ha agricultural land  
- 1555 ha other.

**Altitude :** 266 – 1066 m asl  
slopes >45 %

**Vegetation: 1010 taxons**  
868 domestic and  
142 introduced species



**Monument of nature**

# CULTURAL HERITAGE

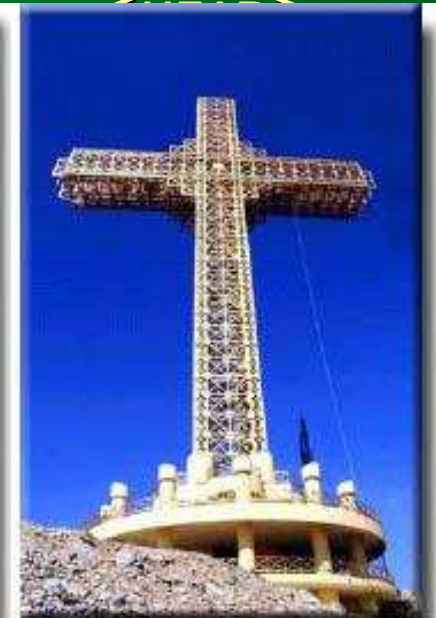
## Neolithic sculpture



**XII century - beginning of  
renaissance???**



**MONASTERY ST. PANTELEJMON**



**THE MILENIUM CROSS ON VODNO, THAT CAN  
BE SEEN IN RADIUS OF 50 KM, IS 66 METERS HIGH**

# ACHIEVEMENTS

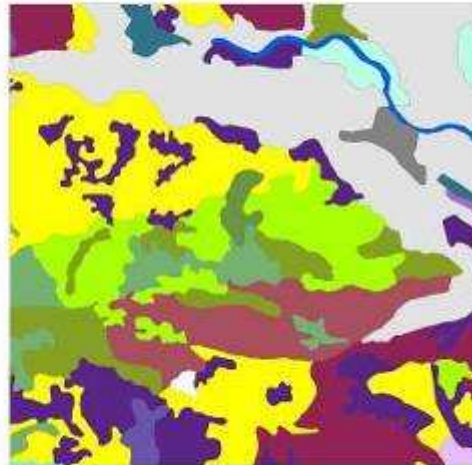
- **1 - Analysis of the state on the Vodno park-forest including field measurement and valuation and GIS modeling. Based on the analyzes several GIS layers**
- **2 - Development of hazard maps adjusted for the main topics:**
  - **Natural disasters (especially wildfires; erosion; torrential flows)**
  - **Sustainable ecological tourism concepts**
  - **Preservation of nature in the park-forest Vodno as a pilot area for the country**
- **3 - The GIS-based hazard maps will be complementary to each other, technically due to standard interfaces and with regards to the content in spatial planning.**
- **4 - Development of an Open-Source DSS Demo-version:**  
**It integrates the hazard maps and other statistical and GIS data, targeting:**
  - **Improvement of the reaction time and communication flow for the Crisis Management Unit in the PEPG and Skopje city**
  - **Improvement of planning methods for the spatial development departments in the country in order to enhance the planning processes in danger zones of the settlements around the park-forest.**
- **5 - Public awareness rising**
- **6 - Promotes amendments or other legal instruments for risk reduction.**



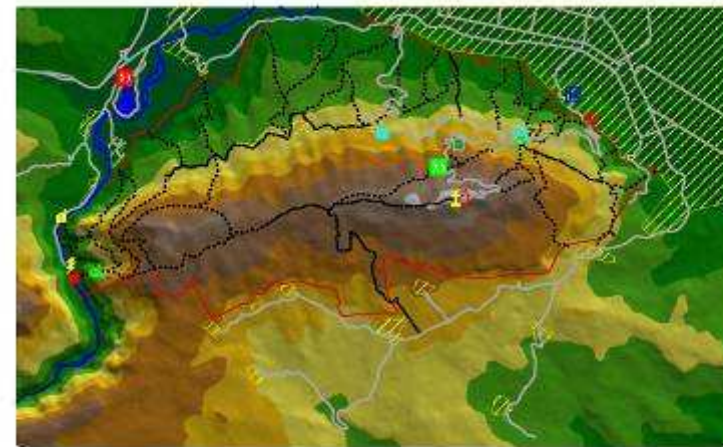
## Land use square 10x10 km

### Legend

- Broad-leaved forest
- Complex cultivation patterns
- Coniferous forest
- Continuous urban fabric
- Discontinuous urban fabric
- Green urban areas
- Industrial or commercial units
- Land principally occupied by agriculture
- Mineral extraction sites
- Mixed forest
- Natural grasslands
- Non-irrigated arable land
- Pastures
- Road and rail networks and associated land
- Sclerophyllous vegetation
- Transitional woodland-shrub
- Vineyards
- Water courses



0 0.5 1 2 3 4



- Tocki.shp
- Detsko odmaralište
- HE "Metka"
- Hotel Panorama
- Hotel Vodno
- JP "Parkovi i zelenilo"
- Milenijanski Križ
- Planinarski dom
- Poljanski dom
- Seizmološki zavod
- SRG "Treska"
- Sv. Andreja
- Sv. Bogorodica
- Sv. Nikola
- Sv. Pantalejmon
- Patista.shp
- Potoki.shp
- Koteli pat.shp
- Reki.shp
- Ezana.shp
- Granica cija.shp
- Nesoljeni mesta.shp

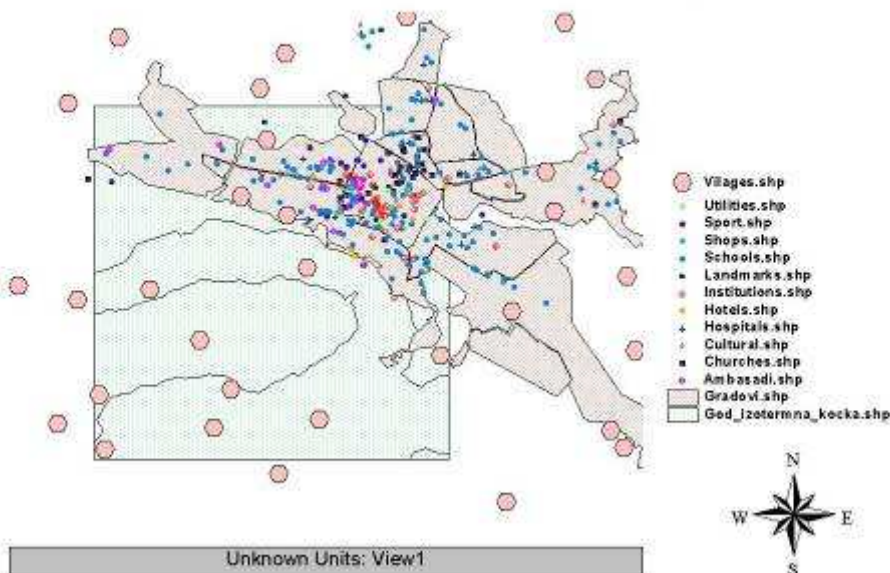
- Tin1060
- Elevacija
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- 600 - 700
- 700 - 800
- 800 - 900
- 900 - 1000
- 1000 - 1060



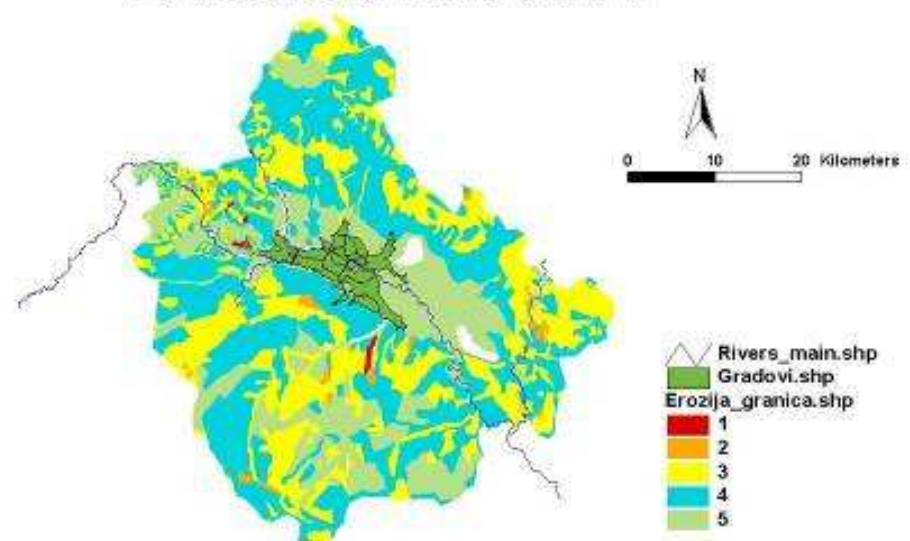
DEM ; infrastructure

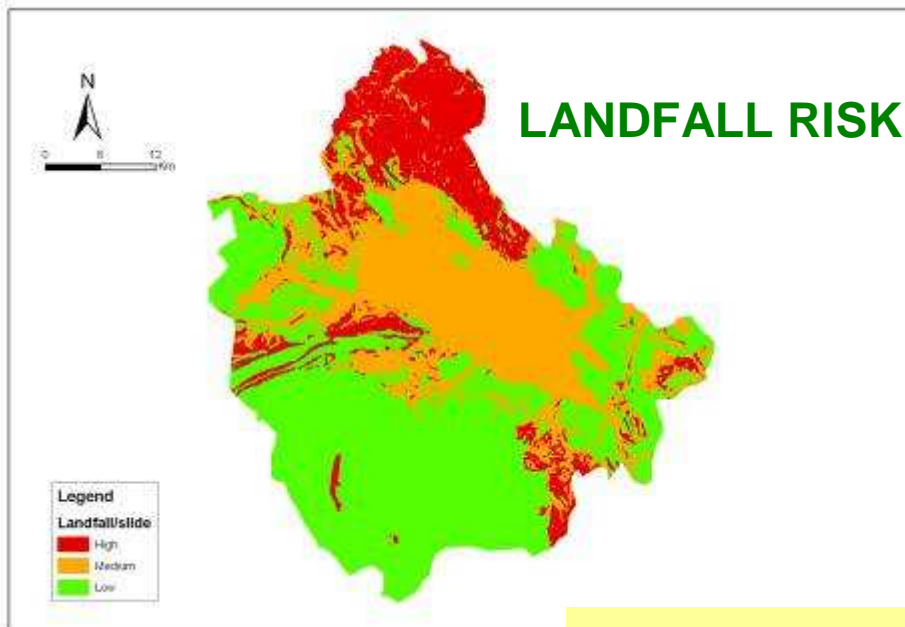
## OUTPUT MAPS

### FACILITY MAP - working area

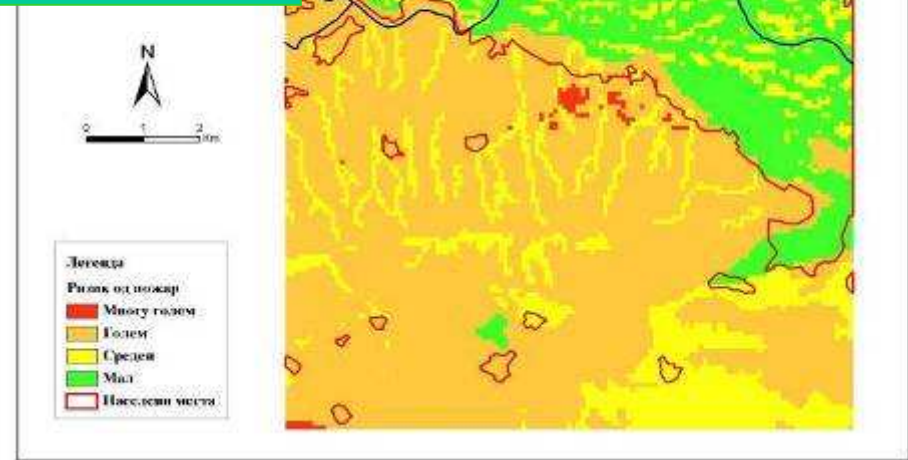


### EROSION RISK MAP

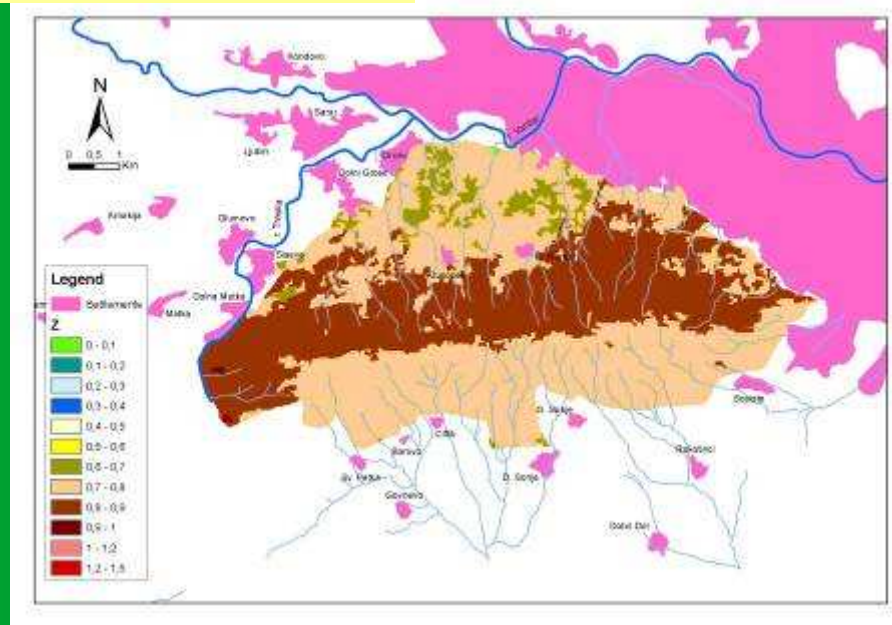
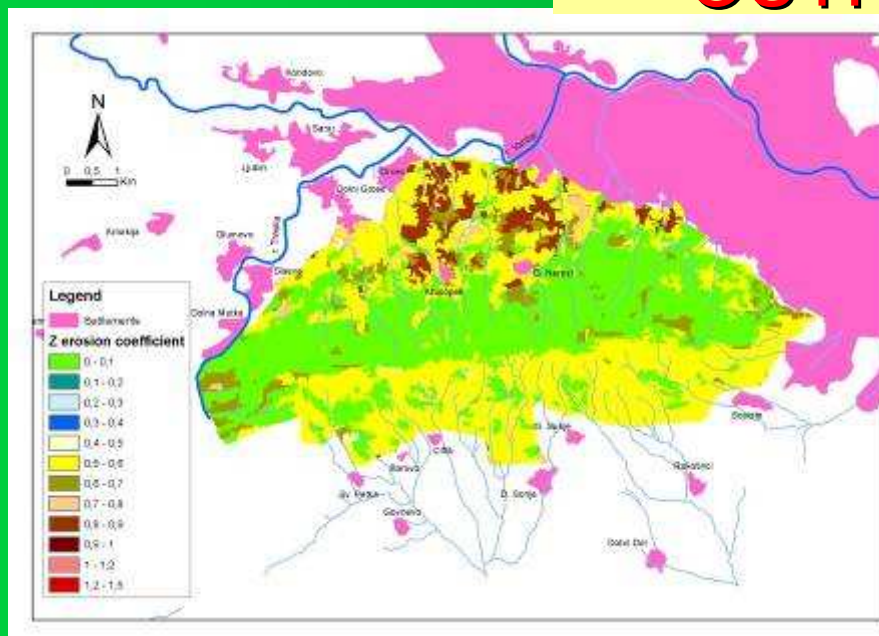




## WILDFIRES RISK MAP



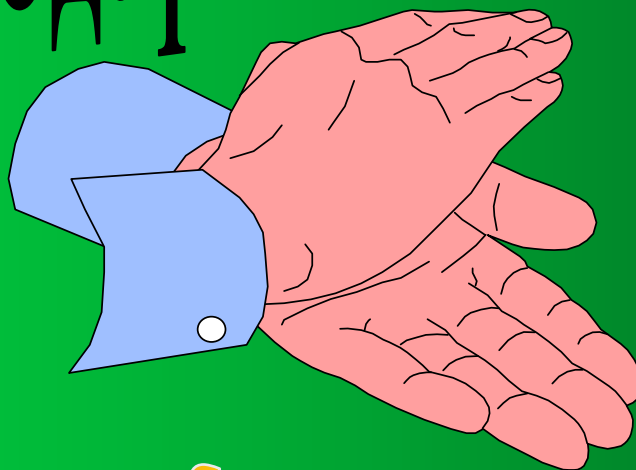
## OUTPUT MAPS



**ACTUAL - EROSION RISK MAPS - POTENTIAL**



Благодарам на вниманието



Thank you for your attention