RimaDima
RISK MANAGEMENT · DISASTER MANAGEMENT

INTERREG IIIB CADSES

An EU-funded project managed by the European Agency for Reconstruction

GIS aided Multi Hazard mapping towards improved SDSS







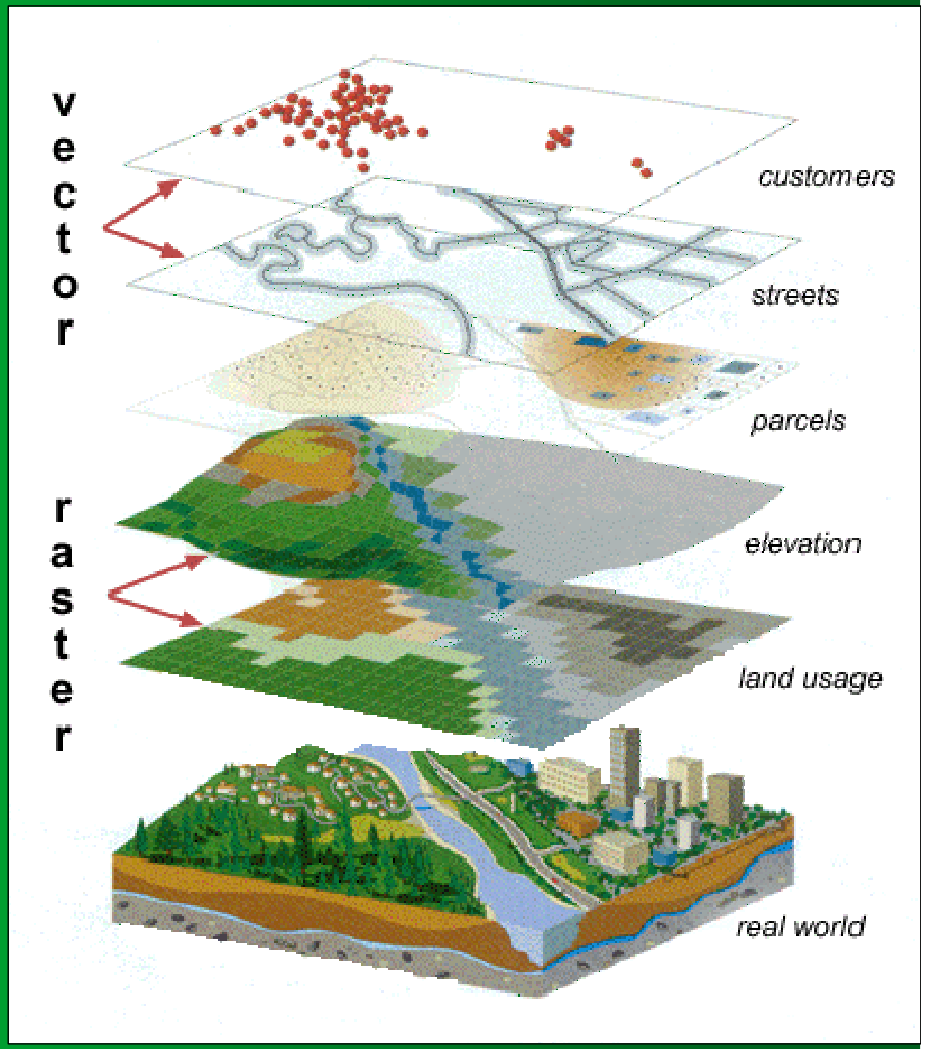
Skopje 9.04.2008 SERM workshop

IVAN MINČEV

RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

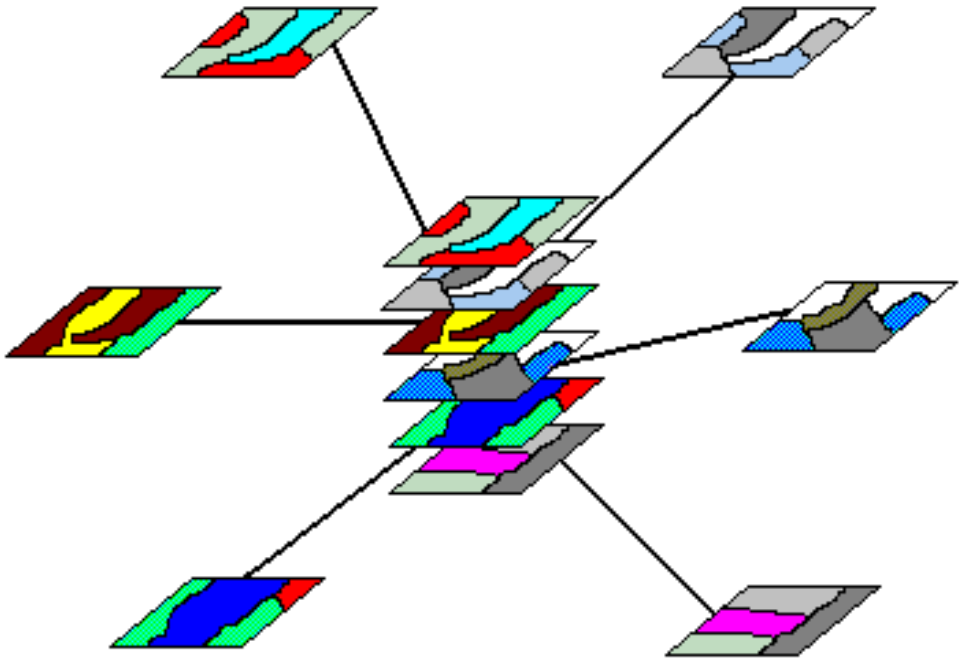
GIS, SDSS

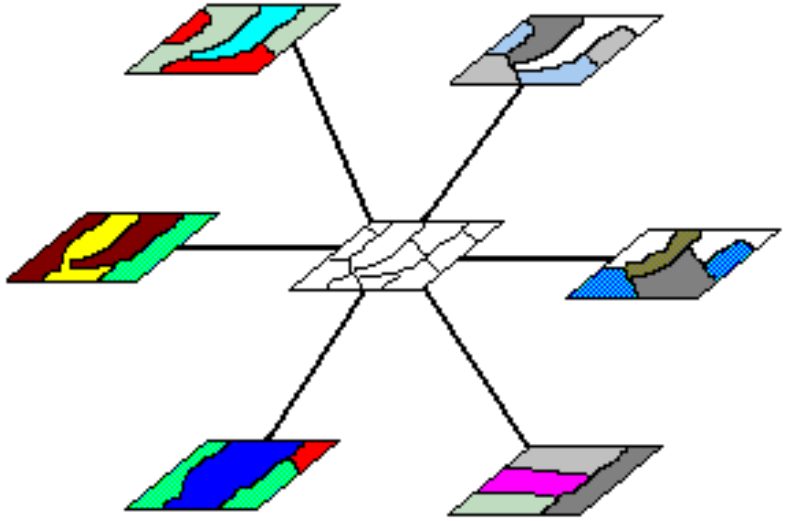
- **Geographic Information Systems (GIS)**, a systematic means of geographically referencing a number of "layers" of information to facilitate the overlaying, quantification, and synthesis of data in order to orient decisions,
- **SDSS – Spatial Decision Support System**



RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Digital Landscape model - DLM





Traditional data base compilation task: collect data and put together

Geographic data base compilation task: collect and integrate data

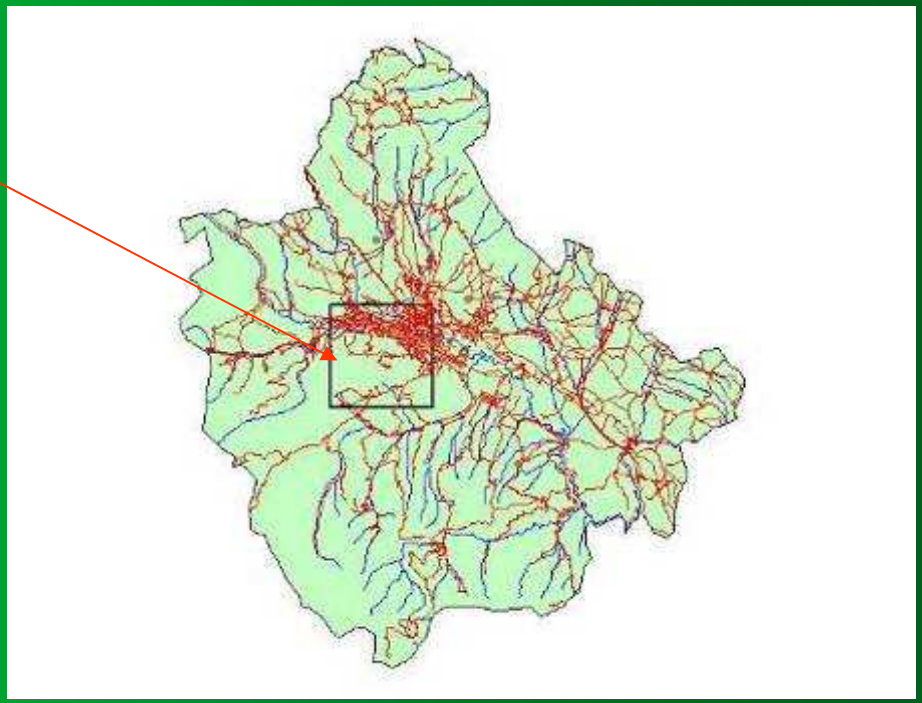
Integrated geospatial data base + GIS and/or expert package = DLM

RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Study area

(political map)

Former borders of the municipality of Skopje

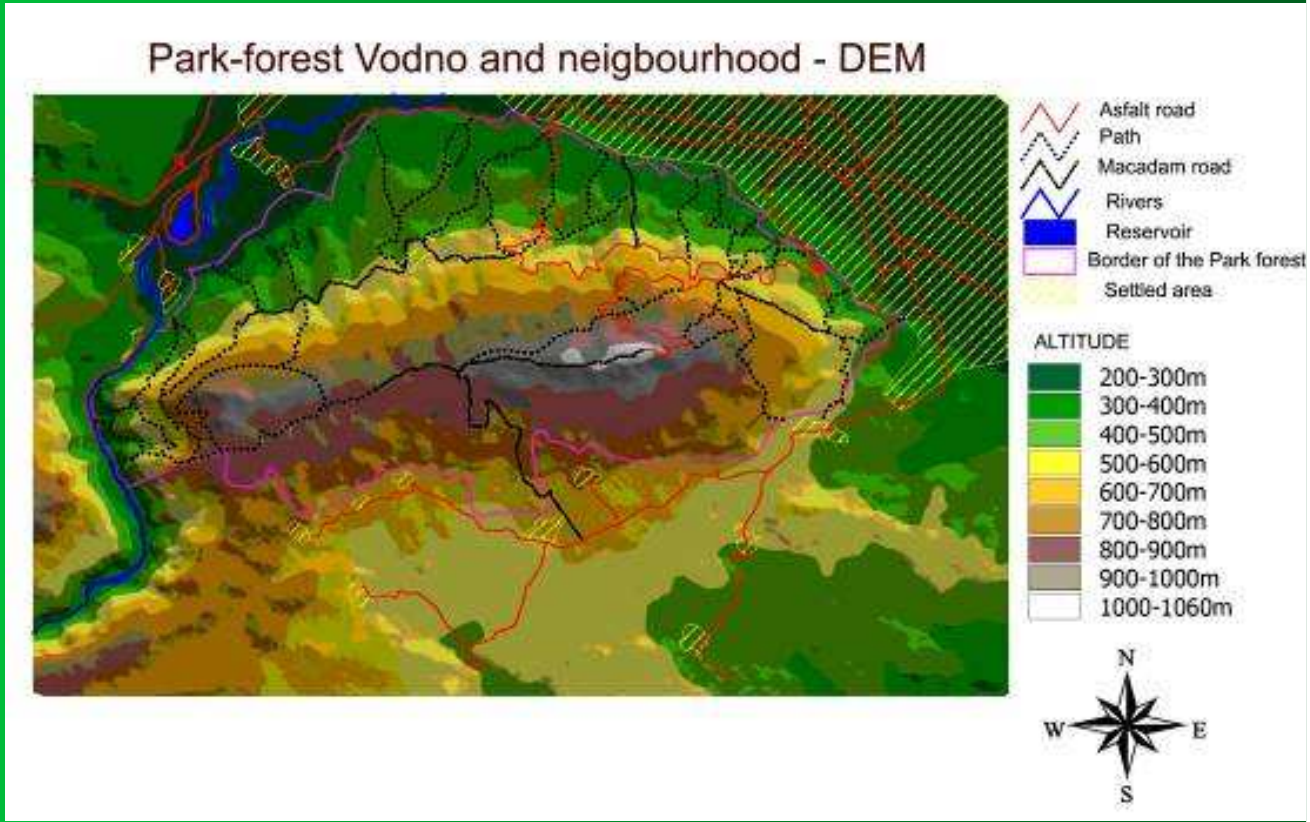


RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Natural hazard mapping

Types of hazards in the Study area:

- Soil erosion
- Landfall/ Landslides
- Wild Fires



RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

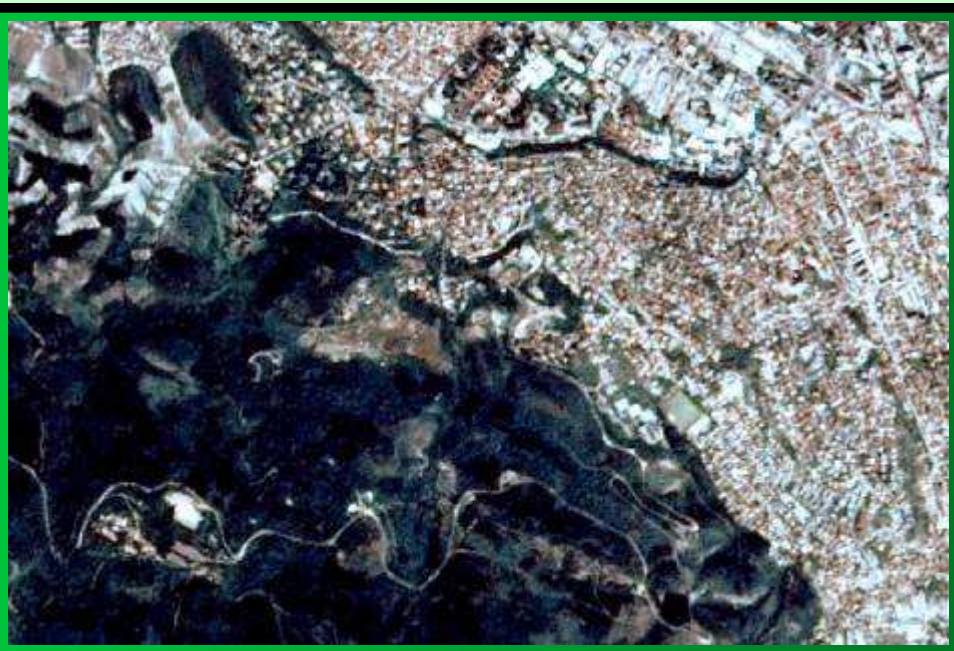
DATASET

- 1:25,000 topographic maps
- Aerial Photographs
- Satellite imagery
- DEM (Digital Elevation Model)
- Land cover/use map
- Geology map
- Soil map
- Torrential map
- Drainage map
- Climatic data, tabular data
- Infrastructure
- Critical facilities

RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

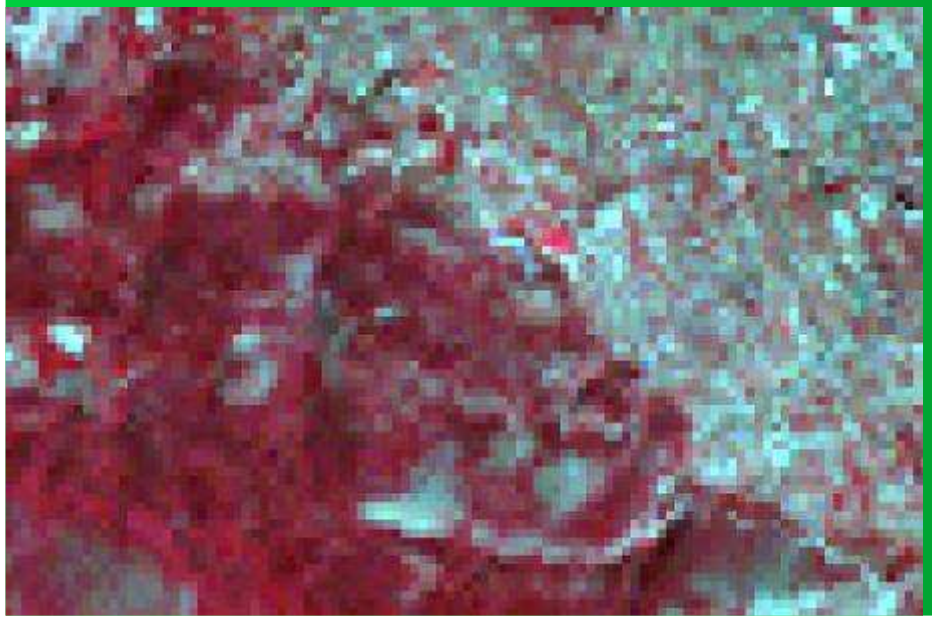
Remote Sensing

Use of appropriate dataset



Ikonos (4m)

Landsat (30m)

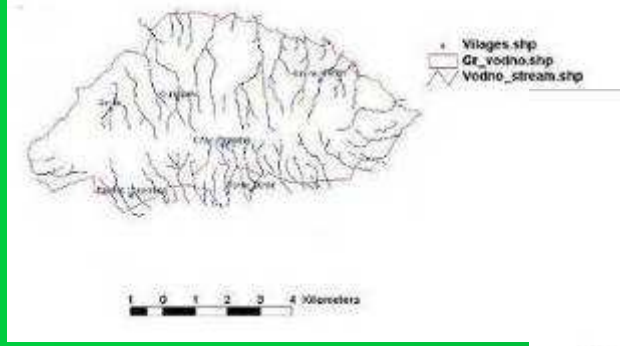


Aerial photo (0.5m)

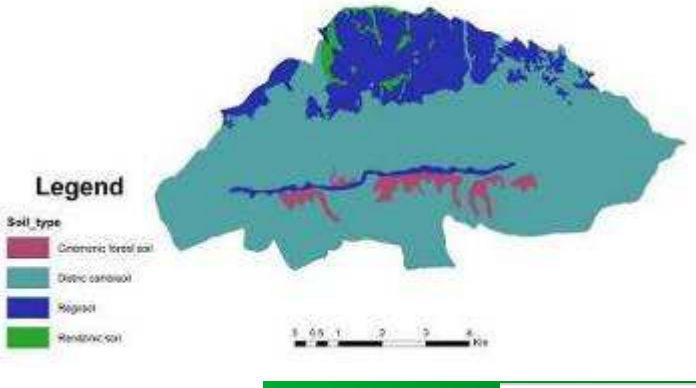
RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Basic dataset

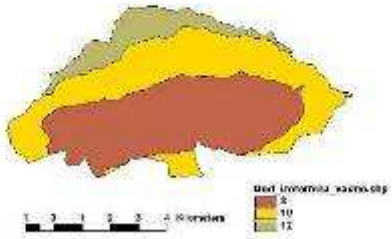
Drainage network Vodno



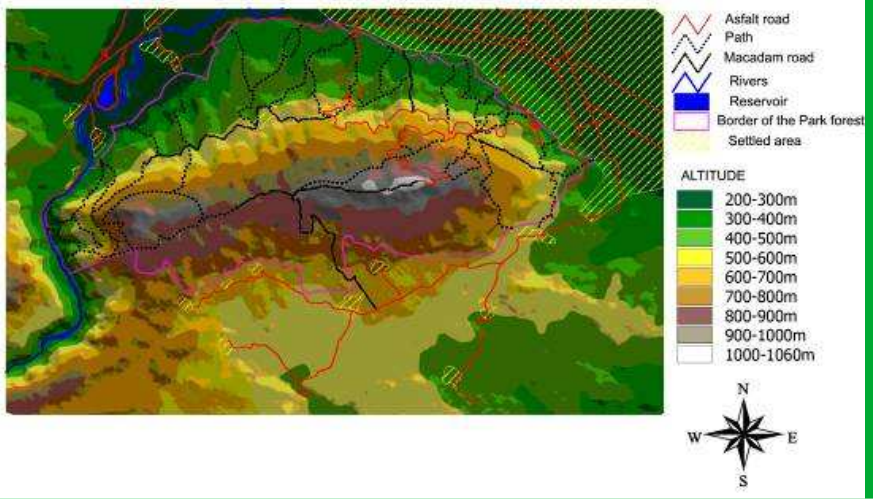
Soil types - Vodno



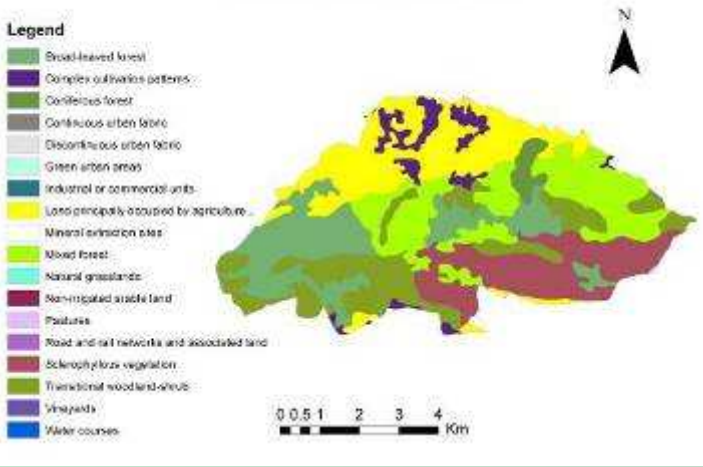
Isotermic map



Park-forest Vodno and neigbourhood - DEM



Land use Vodno

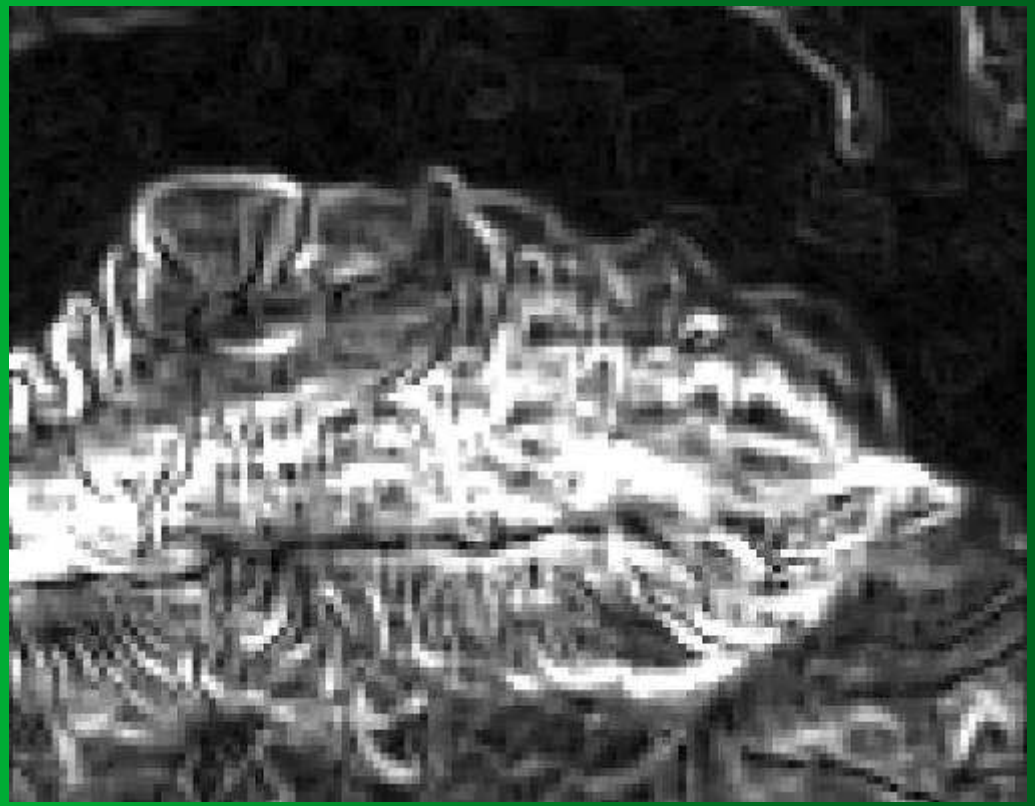


Multi criteria soil erosion hazard mapping

The soil erosion was estimated according the modified methodology of Gavrilovic, Erosion Coefficient - Z

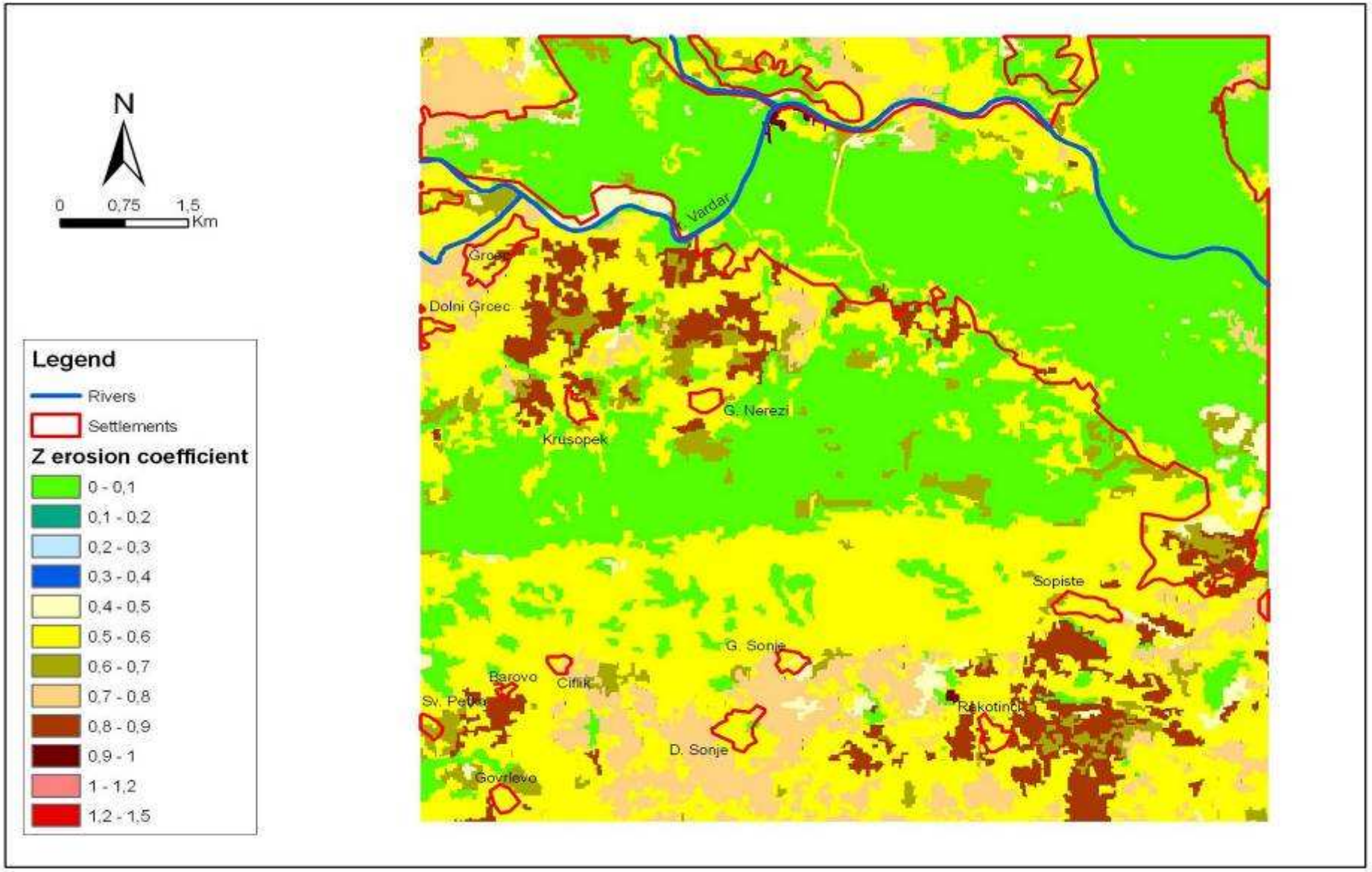
Criteria:

- Slope
- Land cover
- Soil type



RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Erosion hazard map

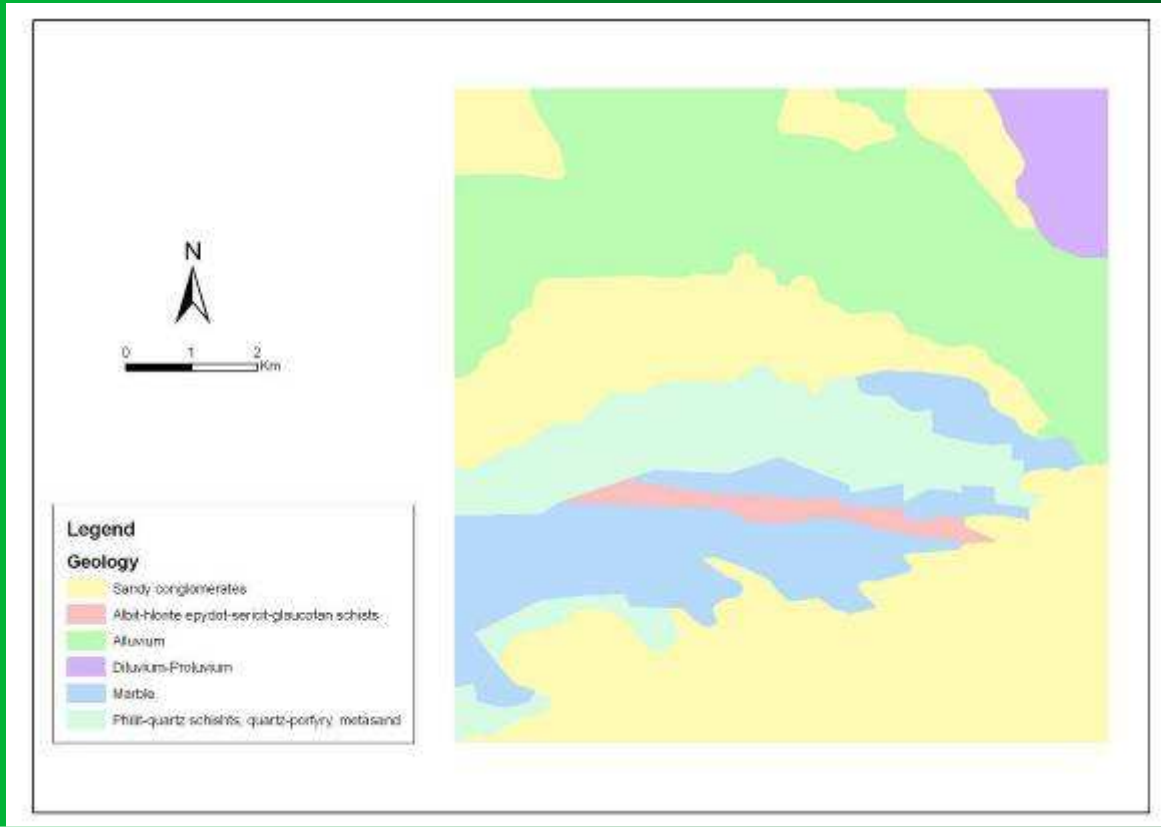


Multi criteria Landfall Land-slide hazard mapping

RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

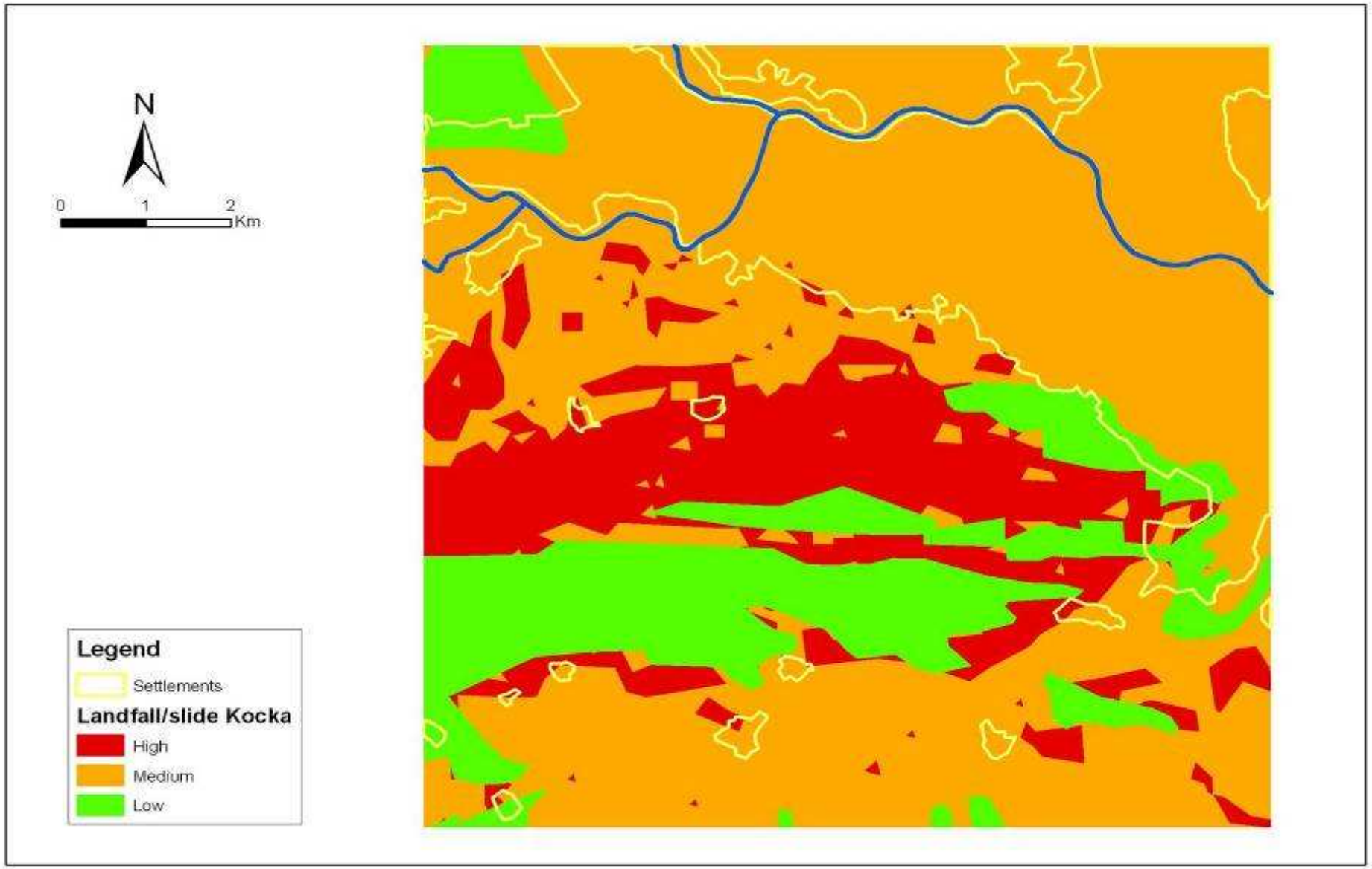
Estimation Criteria:

- Slope
- Geology



RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Landfall/Land-slide hazard map

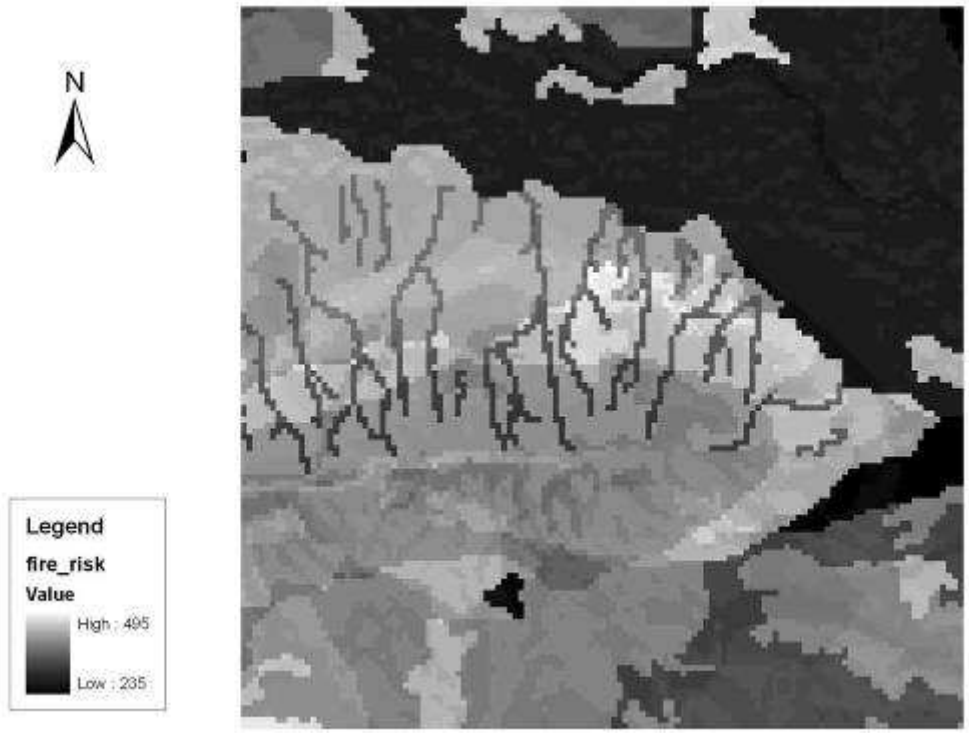


RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Multi criteria Wild fire hazard mapping

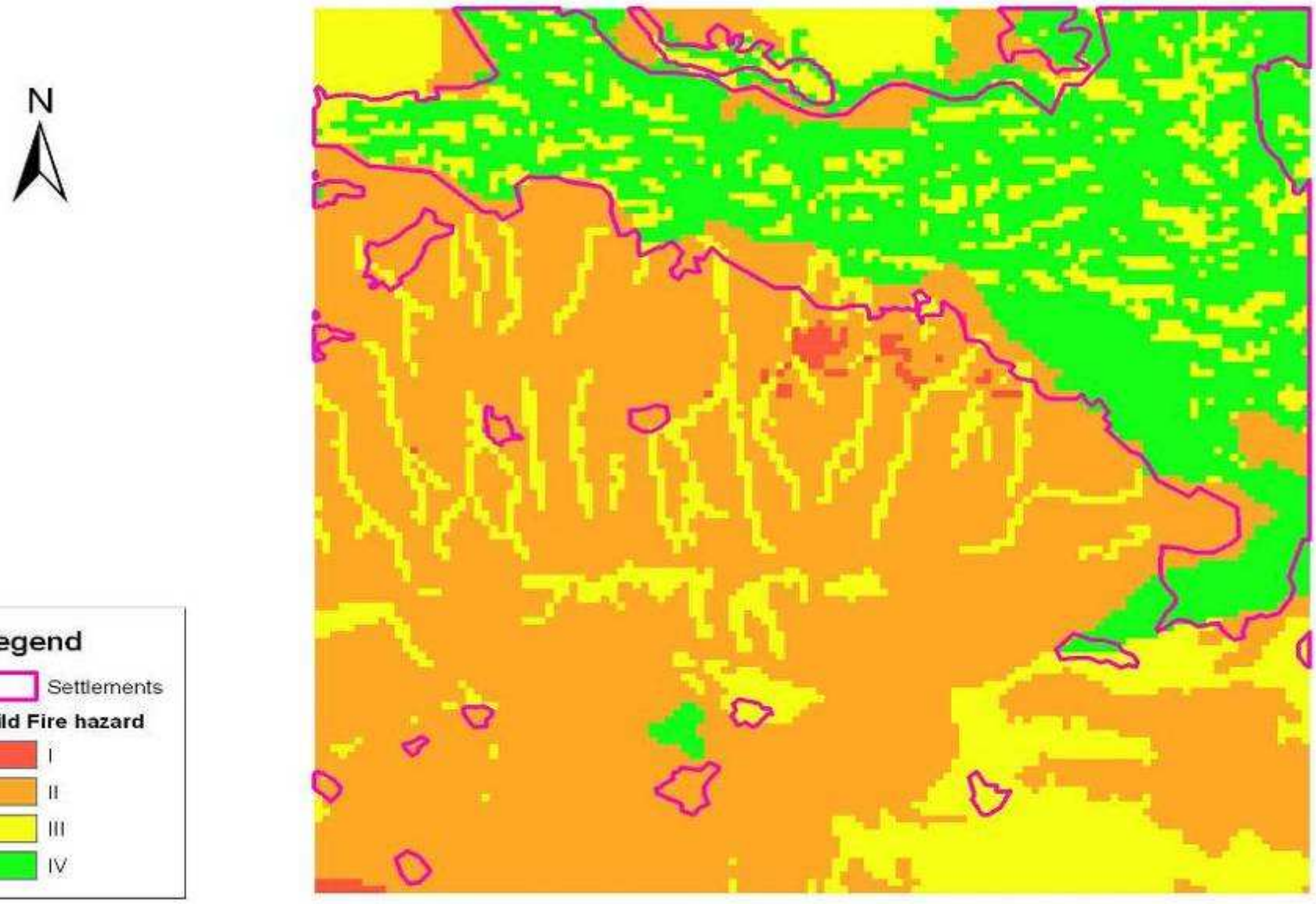
Estimation Criteria:

- Slope
- Altitude
- Aspect
- Soil
- Fuel map – Land cover
- Isothermal map
- Precipitation
- Humidity
- Human impact



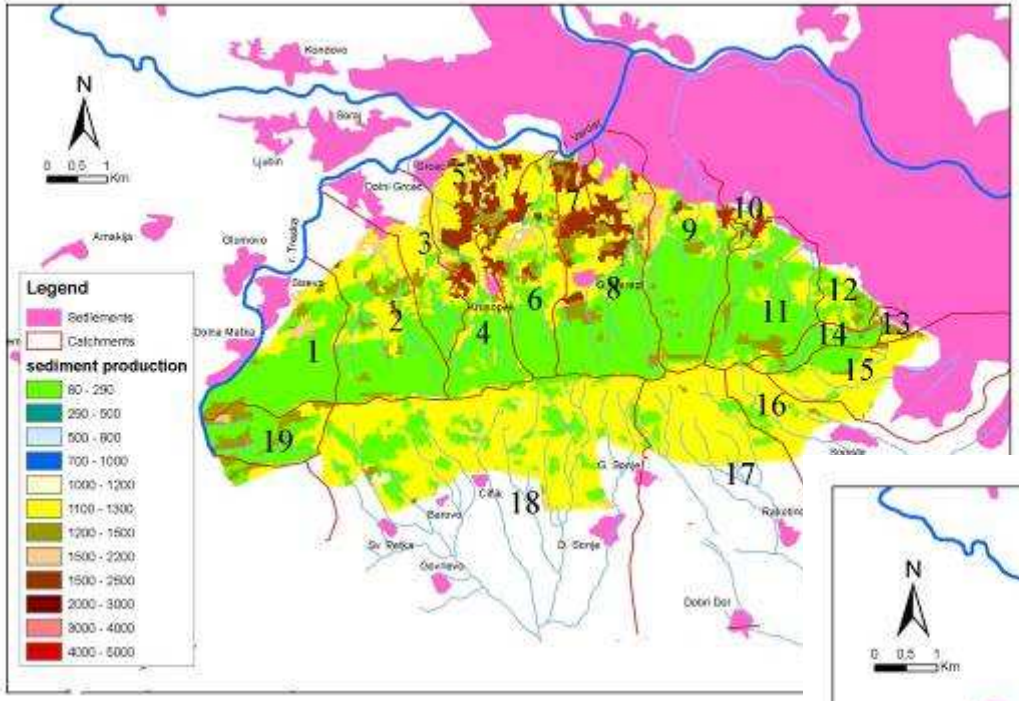
RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Wild fire hazard map



RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

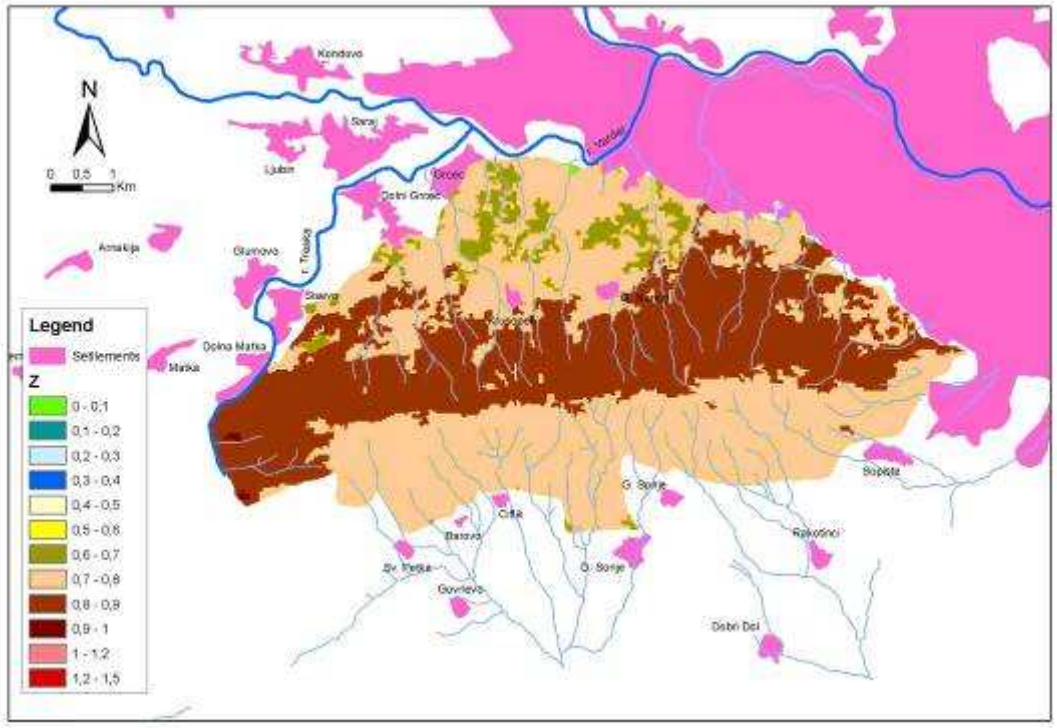
Chained hazardous events



Actual erosion risk

Potential erosion risk

after fire



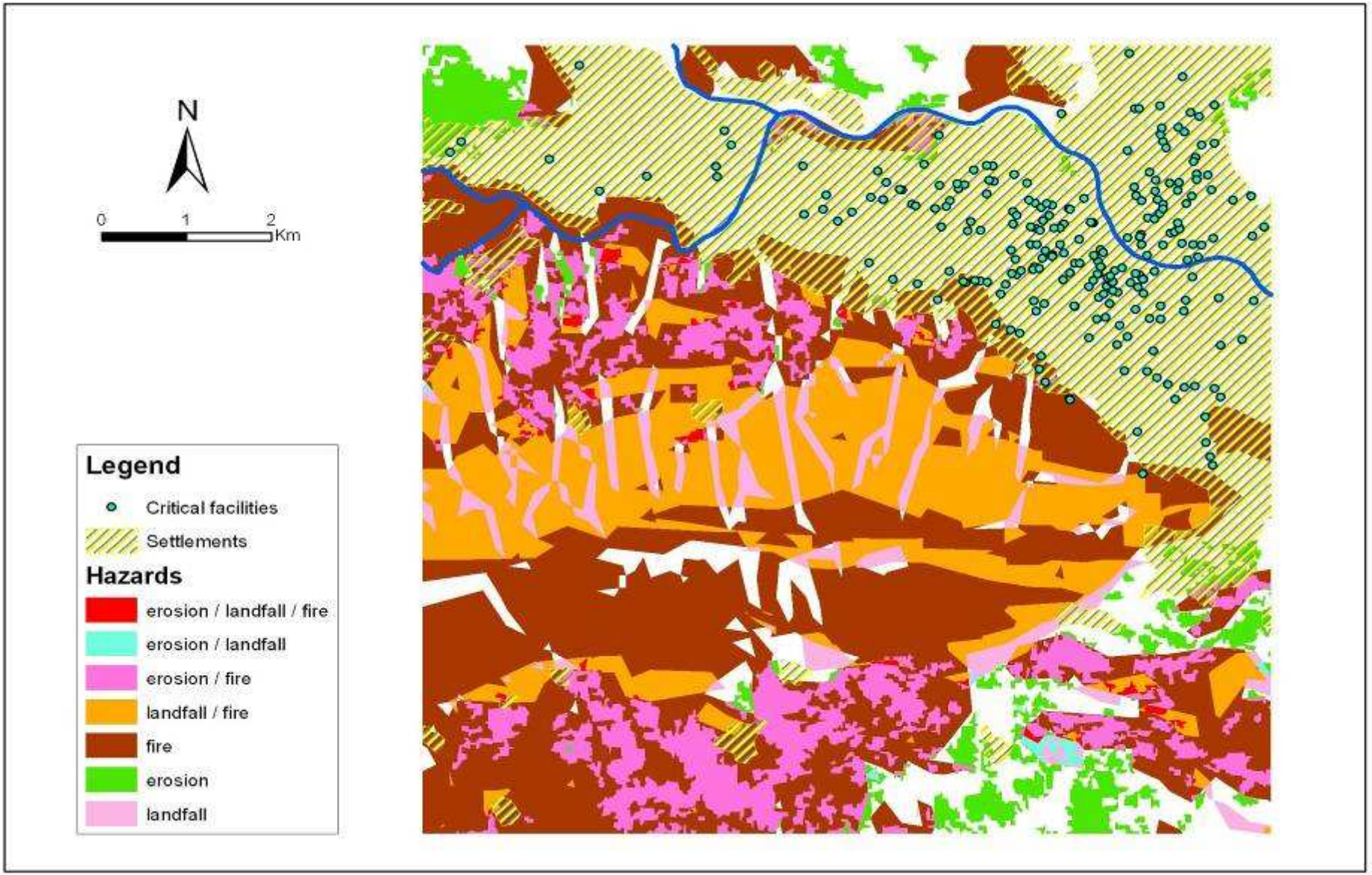
RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Weighing of the impact

- Natural resources
- Residential areas
- Critical infrastructure

RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Multi hazard map



RIMADIMA
RISKMANAGEMENT/DISASTERMANAGEMENT

Conclusion

Concept of multi hazard mapping

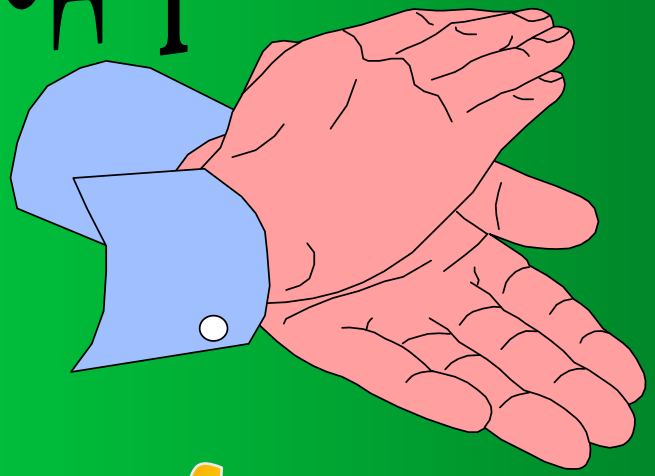
- Put together different hazards
- Estimate the impact of each hazard separately
- Integral approach in observing the problem
- Integration of all the hazards in one map on one hand and estimation of the impacts on the environment
- Multi hazard maps as an input in SDSS and as base for further planning purposes

RimaDama
RISK MANAGEMENT • DISASTER MANAGEMENT

INTERREG IIIB CADSES

An EU-funded project managed by the European Agency for Reconstruction

Благодарам на вниманието



Thank you for your attention