SPACE FOR CIVIL PROTECTION
WORKSHOP

The state of Space based solutions for Disaster Management in Hungary

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Department of GIS and Telecommunication

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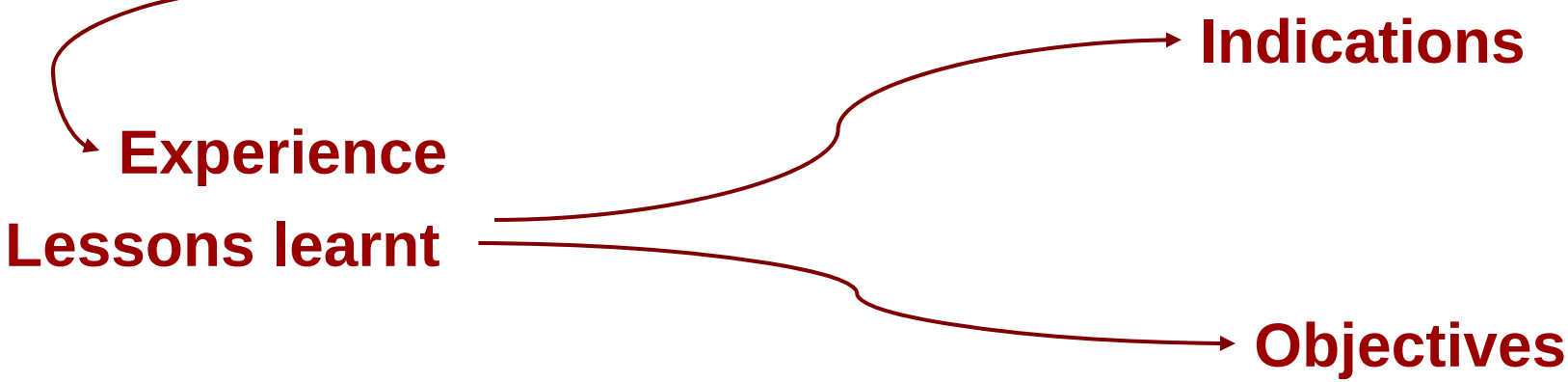
National Directorate General for Disaster Management
Department of GIS and Telecommunication

- recently formed department
- there was a department for telecommunication but not for GIS
- on stakeholders' demand our GIS needs to be updated and developed, jointly with Telecommunications
- specialized national focal point of international programs and projects (ex. GMES ERS)
- the participation in data service and support for the counties' directorates
- decision-making support
- trainings

TOC

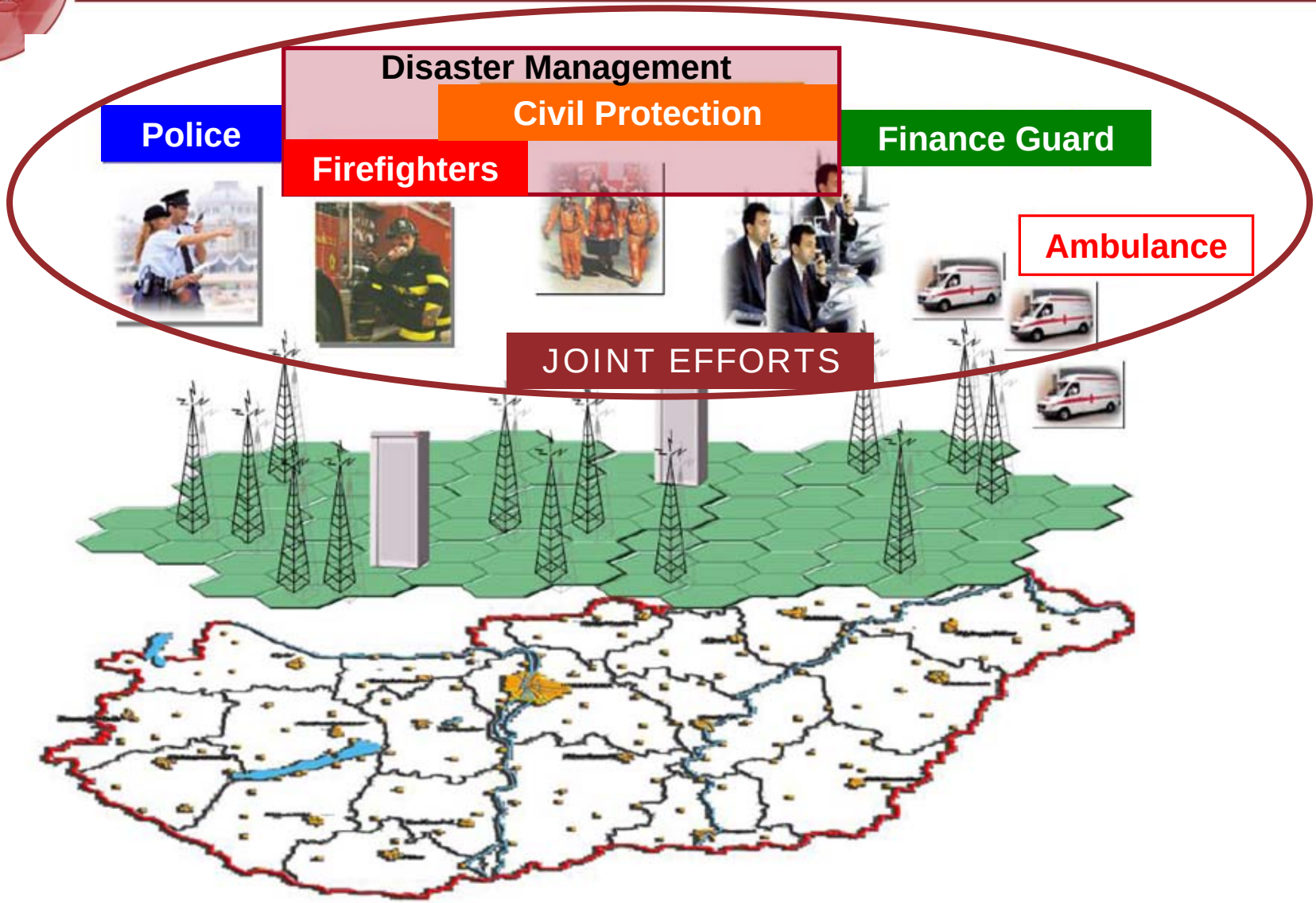
- What do we have?
- What do we wish for?



Our Telecommunication system I.

i. **EDR / TETRA system (Promobil):**
   - **Coherent system**
     - **due to unobstructed communication between the users**
     - **crucial to have a stable, effective telecommunication system**
     - **essential for command and control**
   - **Users: (first) responders & law enforcement units**
     - **diasaster management, police, emergency services etc.**
   - **Platform**
     - **common infrastructural background**
     - **terrestrial, digital**
   - **Centralized governmental management**
     - **enables effective joint response**

Users of the TETRA system



Our Telecommunication devices I.

i. TETRA radios

NOKIA THR 880i

SEPURA SRH3800s

NOKIA TMR 880

SEPURA SRG 3500 Gateway

Our Telecommunication system II.

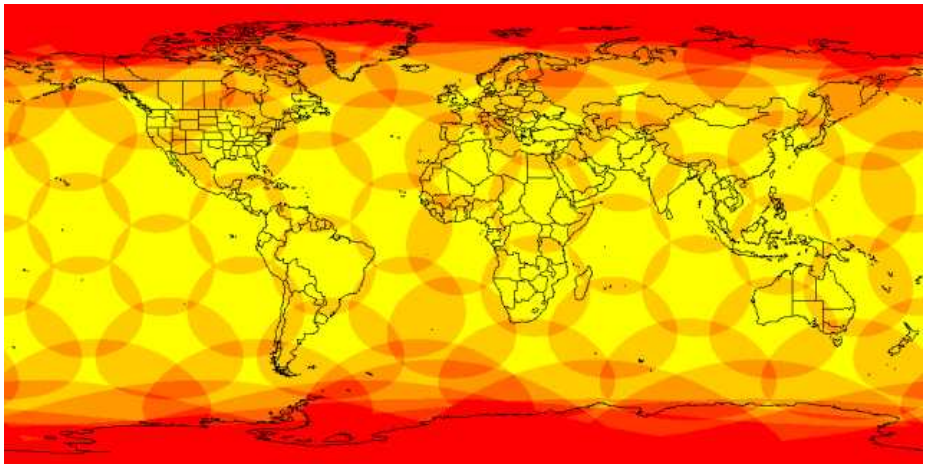
ii. Space based system

- **Service is expensive, not affordable**
- **Therefore:**
  - **complementary solution**
  - **lack of experience in using the system**
  - **a very few owned devices (used mainly for international missions)**
  - **the community of law enforcement units and responders uses the same system defined by the government, which is a terrestrial system (less costly)**

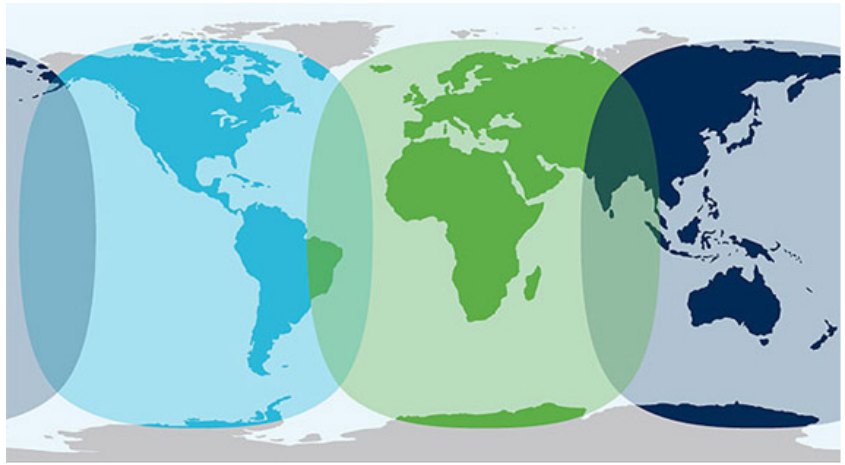
Our Telecommunication system II.

ii. **Space based system**
   - **Iridium satellite phone sevices**
     - **for sound transfer (phones)**
   - **Inmarsat BGAN**
     - **for data transfer (modems)**

Iridium



Inmarsat BGAN



Our Telecommunication devices II.

i. Satellite devices

Our GIS system I.

i. GIS solutions

- **mainly vector data**
- **system's development is under progress**
- **satellite based services are expensive**
- **GMES ERS**
- **UN-SPIDER**

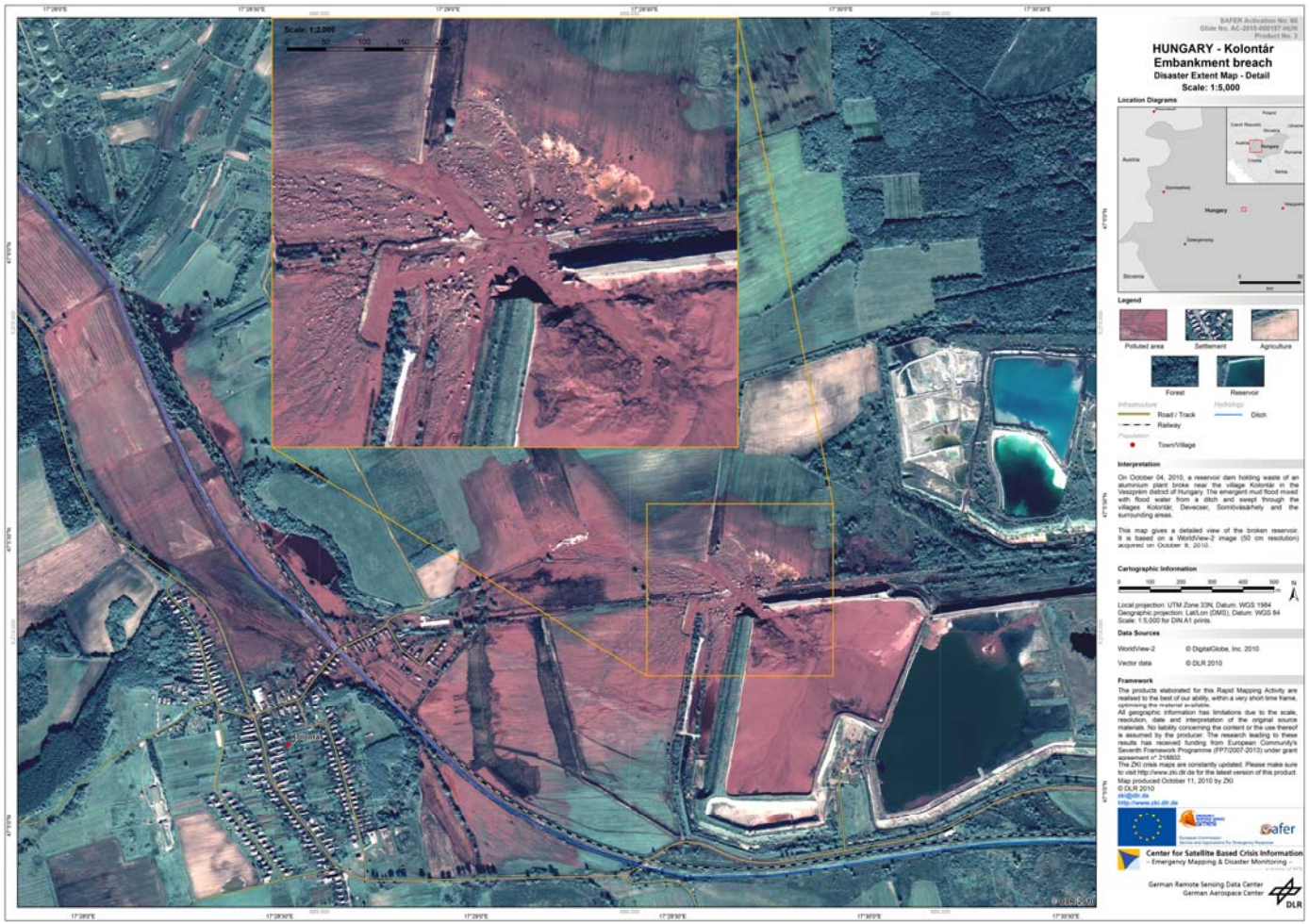
- **The Emergency Management Geographical Information System (KATIR) is operated by NDGDM**
  - **the goal of establishing KATIR was the creation and operation of GIS, which facilitates the accurate and automatic flow of geographical data**
  - **capable of providing information for decision-making in a short time for emergency management**
  - **KATIR is not a separated IT system**
  - **ArcGIS platform**

GIS for space solutions

- **GMES ERS**
  - **useful services**
  - **supports decision making and all phases of disaster management (from prevention to recovery)**
  - **ready-to-go products (analysis is included, not just raw data)**
  - **coherent system, available for the MSs**
  - **great information source in case of an international mission**

GIS for space solutions

- **GMES ERS (SAFER)**



GIS for space solutions

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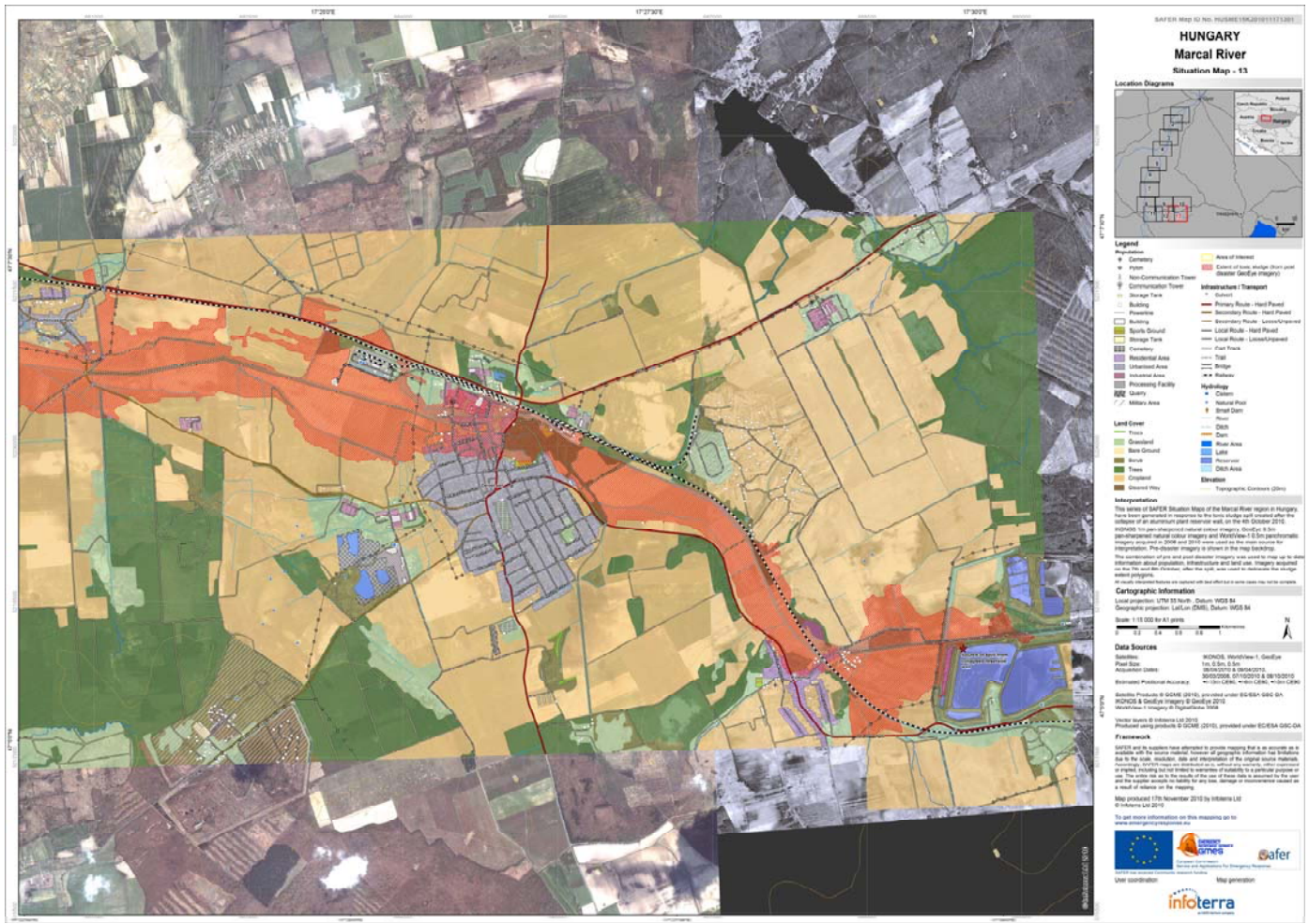

GIS for space solutions

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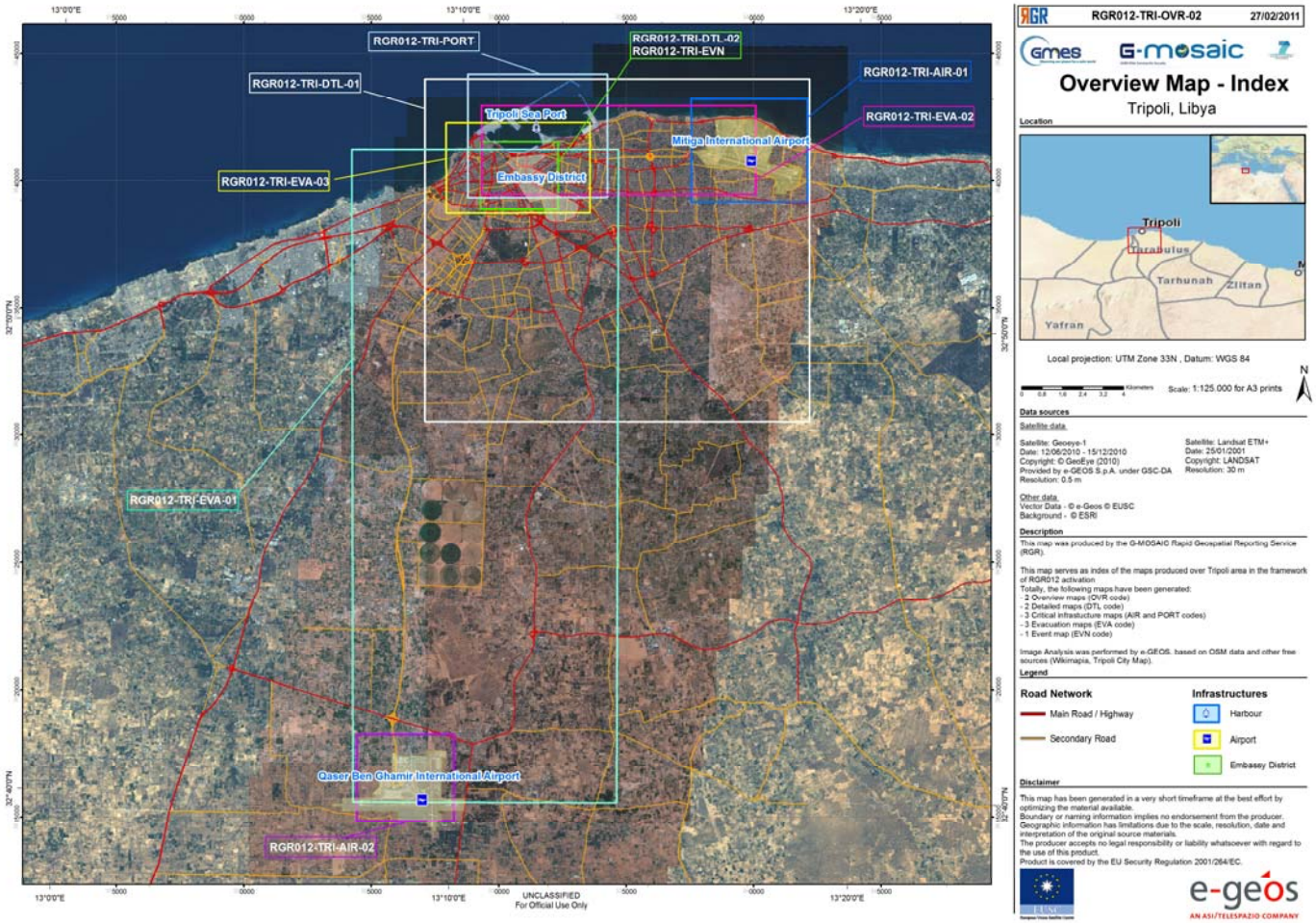

GIS for space solutions

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GIS for space solutions

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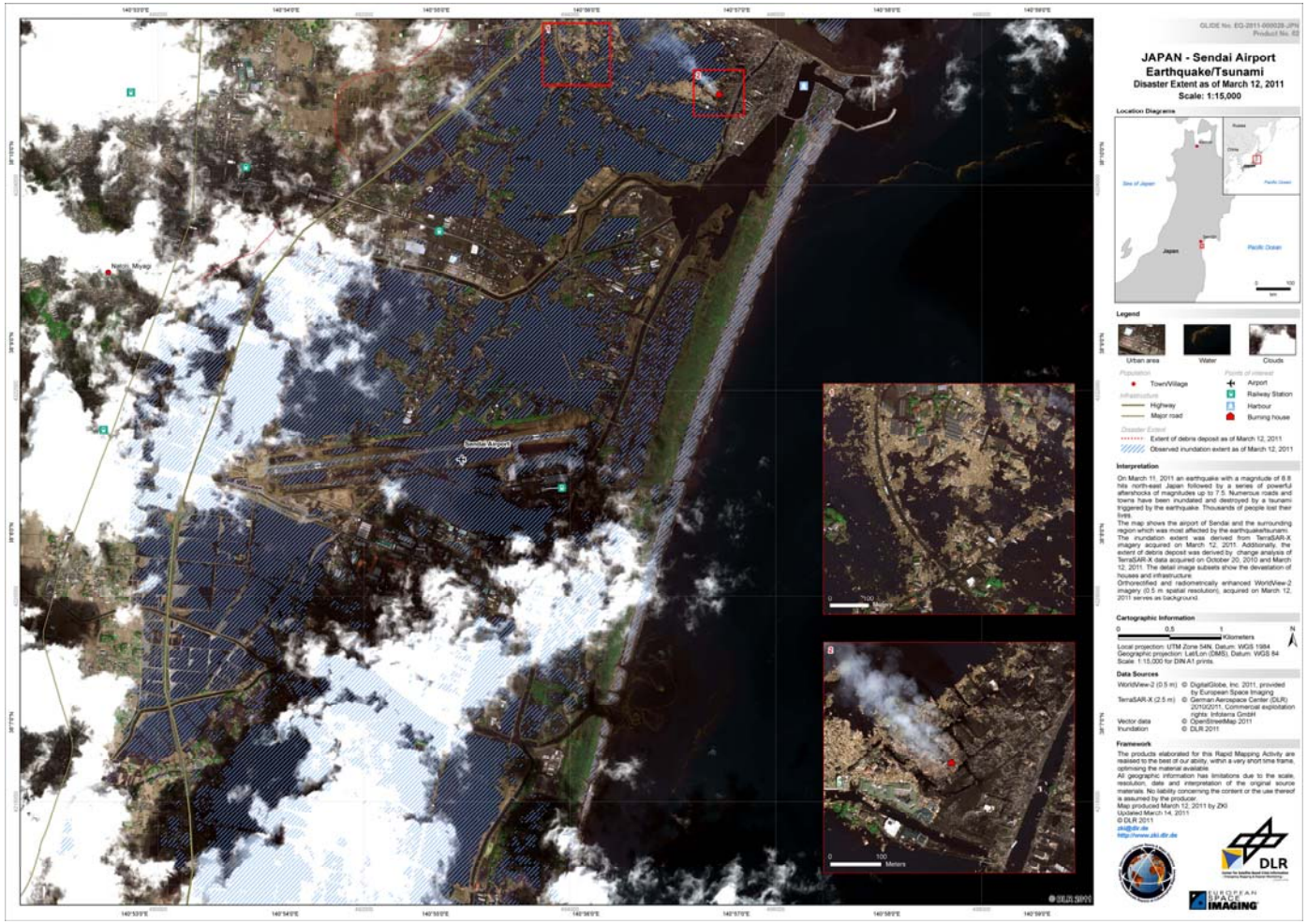
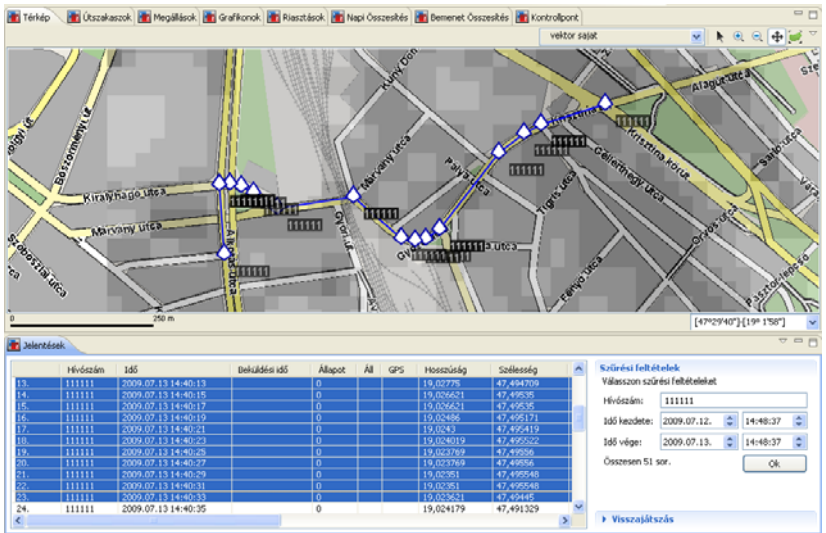


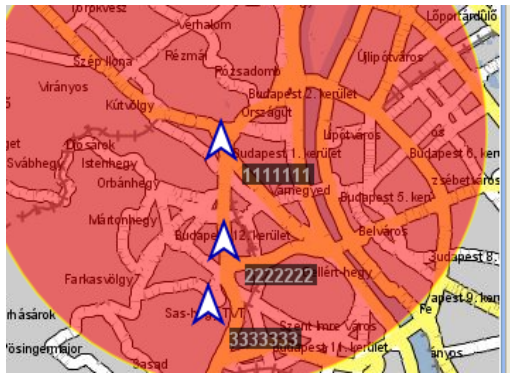
GIS for space solutions

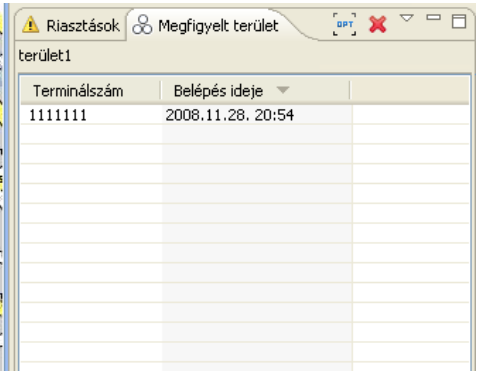
- **UN-SPIDER**
  - **support for Civil Protection Community**
  - **Knowledge Portal http://www.un-spider.org**

GIS & Telecommunication

i. **GPS tracking system based on TETRA system**
   - **Closed system – security**
   - **Data compatibility issues**
   - **Difficulties with data import and export**
   - **Unutilized capacity of the system**
   - **Command&Control**
   - **Poor GIS solutions – only display functions, no option for analysis**







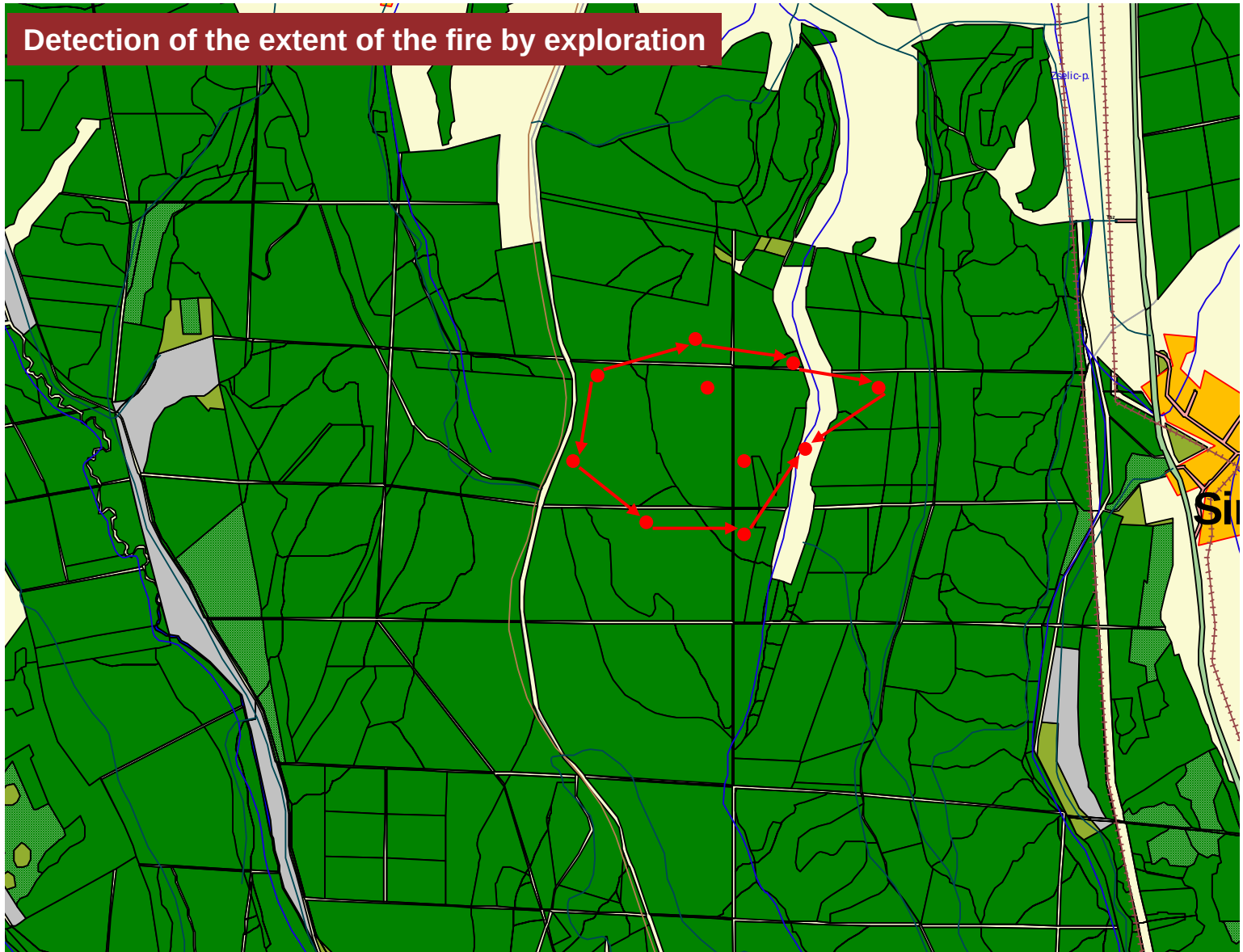
Exercises and case studies I.

i. **Promobil vehicle positioning system in command and control Somogy County – Exercise for firefighters (2010)**
   - **orthophoto – visual identification of objects**
   - **search for address, coordinate and POI**
   - **archive functions: route check, site check**
   - **displaying other vehicles**
   - **map-caching**
   - **creating operational groups**
   - **personalization – displaying only chosen data**
   - **exporting real-time or archived data**
   - **creating unique filters and colour schemes**
   - **mobile Promobil: overview on site**
   - **position sending – every 30 seconds per radio**

Exercises and case studies I.

i. **Promobil vehicle positioning system in command and control Somogy County – Exercise for firefighters (2010)**
   - **What can the system do? – Control Options**
     - **assign the site,**
     - **direct the unit to the site,**
     - **control several units,**
     - **redirection,**
     - **circumscribe areas,**
     - **area calculation,**
     - **defining fire spread estimations,**
     - **defining expected deployment points,**
     - **displaying tactical situation**

i. Promobil vehicle positioning system in command and control in Somogy County – Exercise for firefighters (2010)



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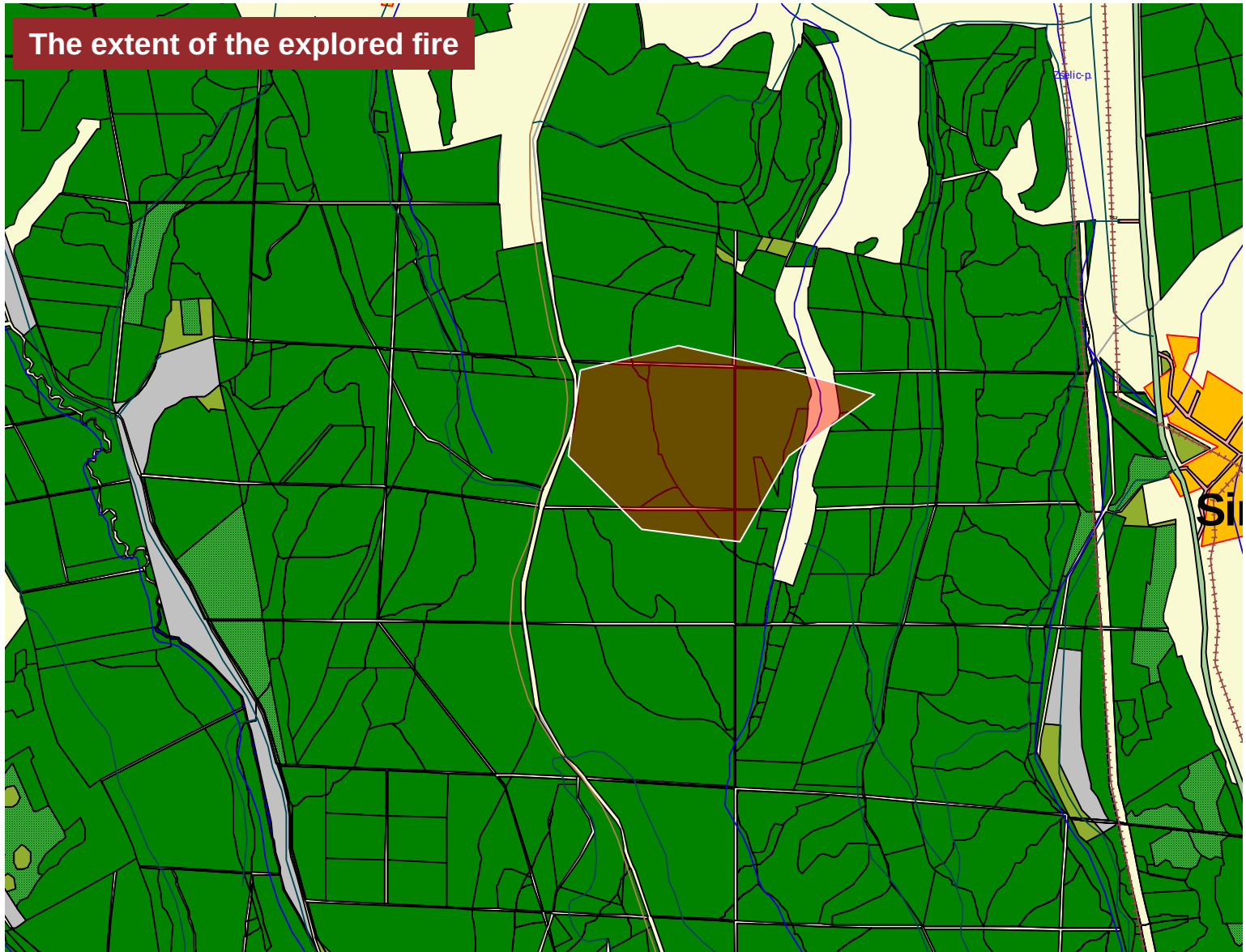

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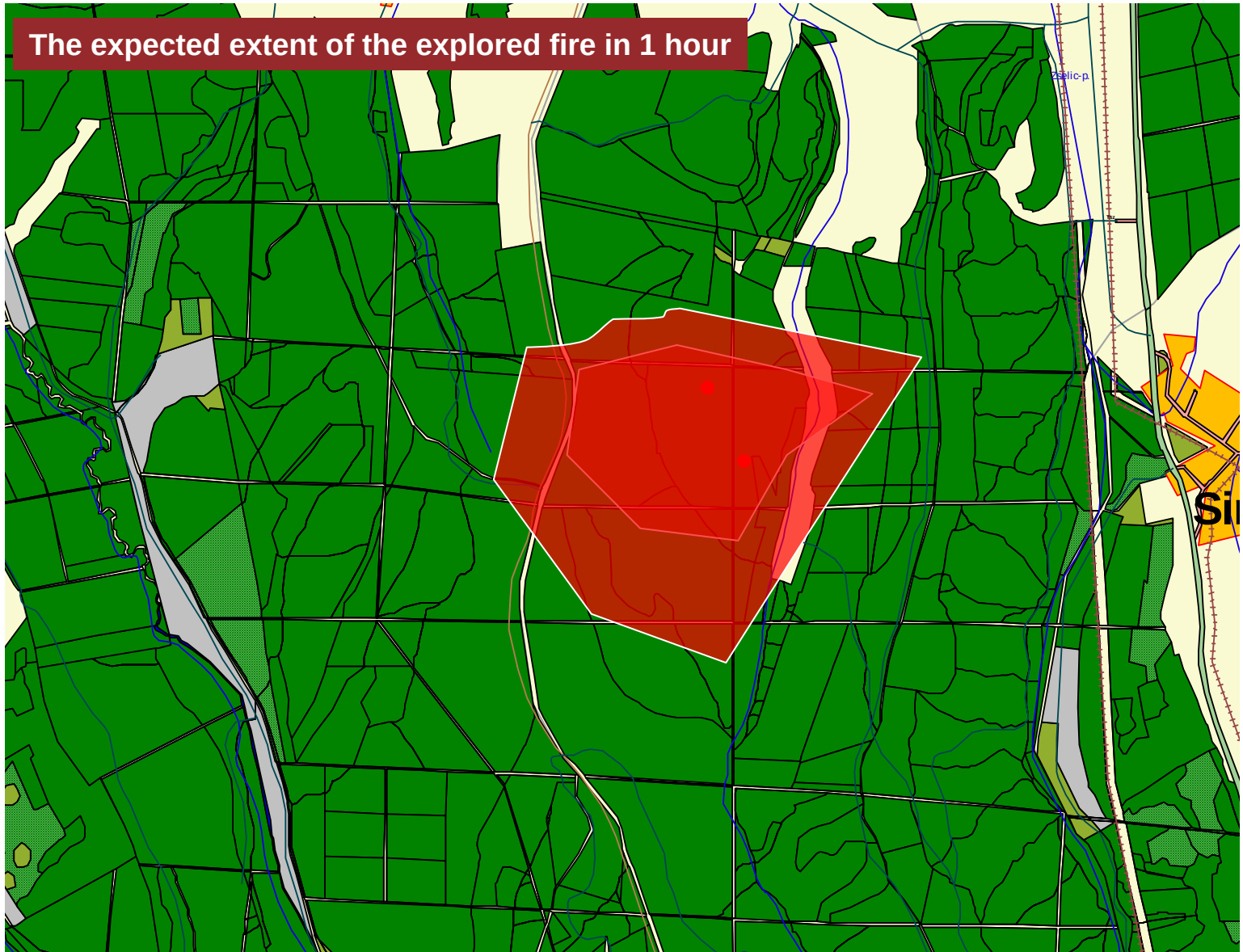

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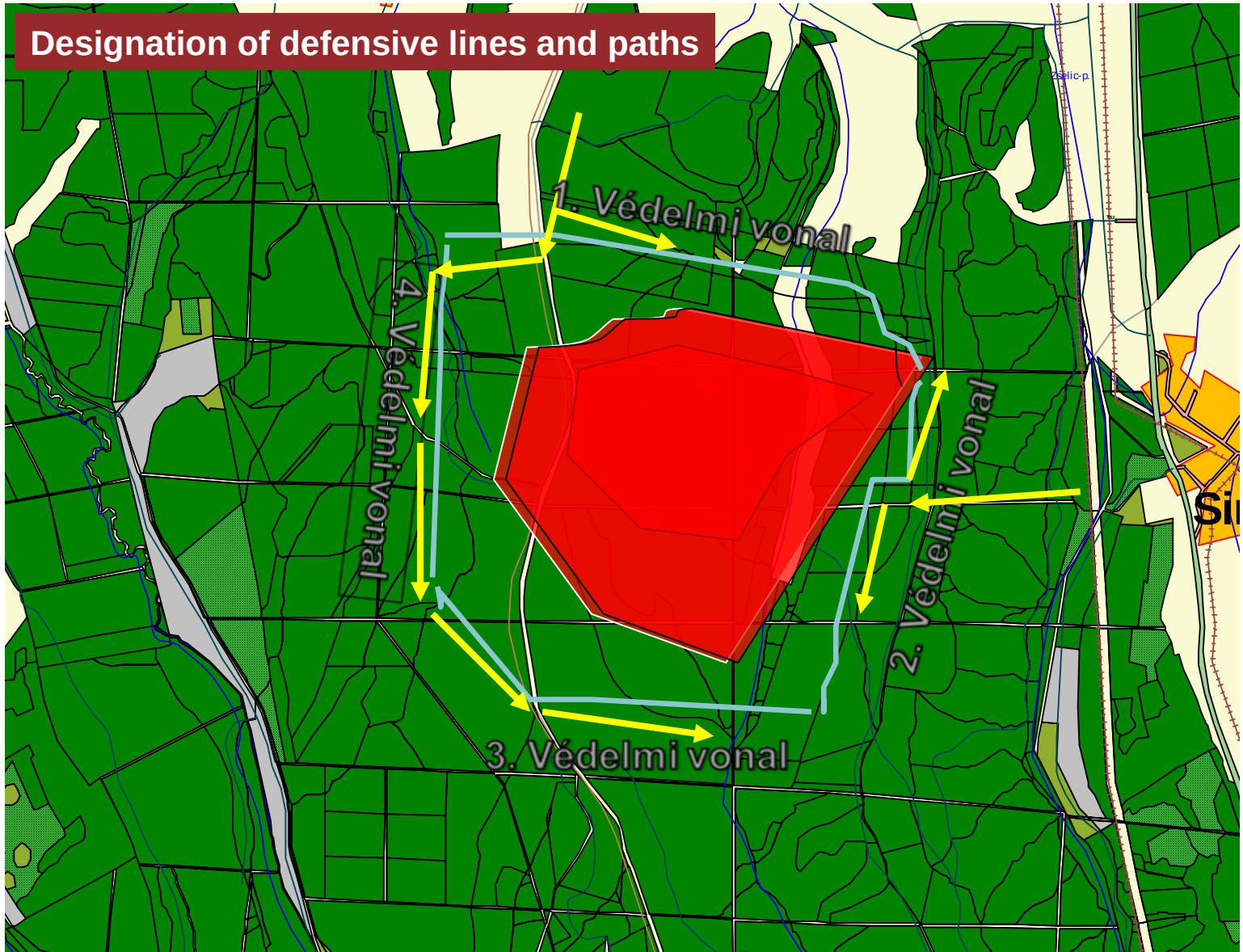


i. Promobil vehicle positioning system in command and control in Somogy County – Exercise for firefighters (2010)

Mobile - Promobil

Exercises and case studies II.

ii. Flooding in Borsod county (2010)

- **emergency response in 848 settlements;**
- **5 259 people evacuated;**
- **25 000 responders in peak times;**
- **5.7 M sandbags used out of NDGDM reserves**

Exercises and case studies II.

ii. Flooding in Borsod county (2010)

- **Satellite services were used during the crisis**
- **Live video connection was set to provide up-to-date status report, so supporting command&control**

Exercises and case studies III.

iii. HUROMEX Exercise (2008)

- **In the framework of the Civil Protection Mechanism of the European Union and with the support of the European Commission, a civil protection EU project "EU-HUROMEX-2008" was implemented, with the topic "Preparation, performance and evaluation of a full scale civil protection simulation exercise on the interventions in case of major floods and consequent reconstruction of the damages to the critical infrastructure".**
- **Hungary and Romania + 8 countries at the exercise *(Austria, Bulgaria, Croatia, Lithuania, Poland, Slovakia, Slovenia and Moldova; teams of 20 persons each)***

Exercises and case studies III.

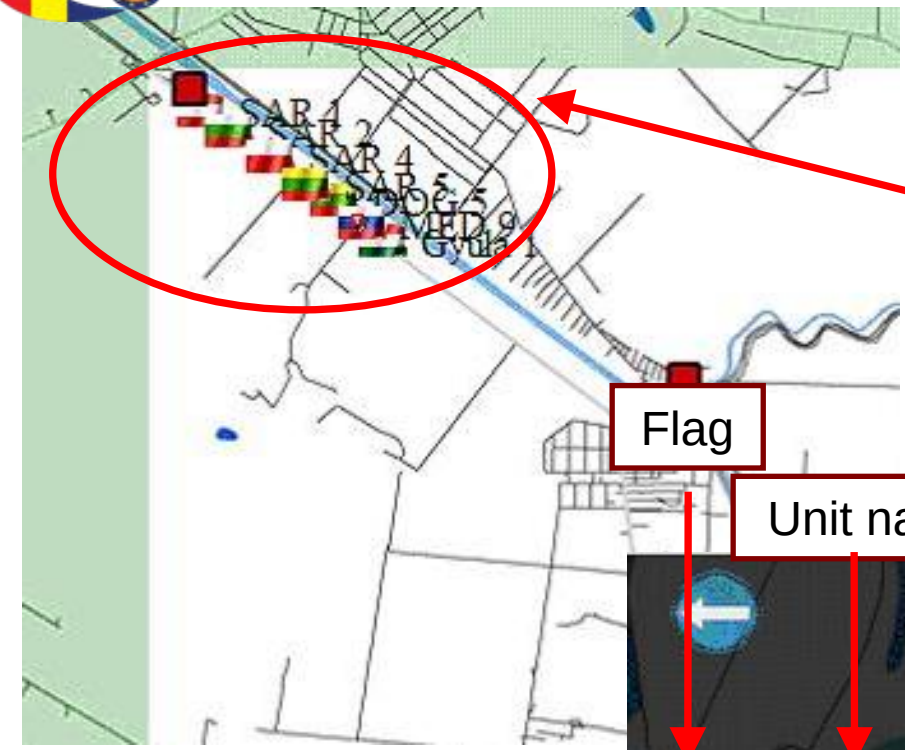
iii. HUROMEX Exercise (2008)

- **Due to successful implementation of the exercise, the certain conditions had to be established within KATIR**
  - **compiling a digital map containing the exercise locations,**
  - **input and storage of the ID and position data of the teams by time,**
  - **displaying the position data and the exercise locations on digital map for the decision-making bodies (e.g. LEMA)**
  - **tracking of team movements during the evaluation of the exercise.**

iii. HUROMEX Exercise (2008)

Digital map with the units

Different nations, different flags



Flag

Nation

Action

Unit name

Type

Date

Information window

SZEKTOR I. (SZOLNOK)

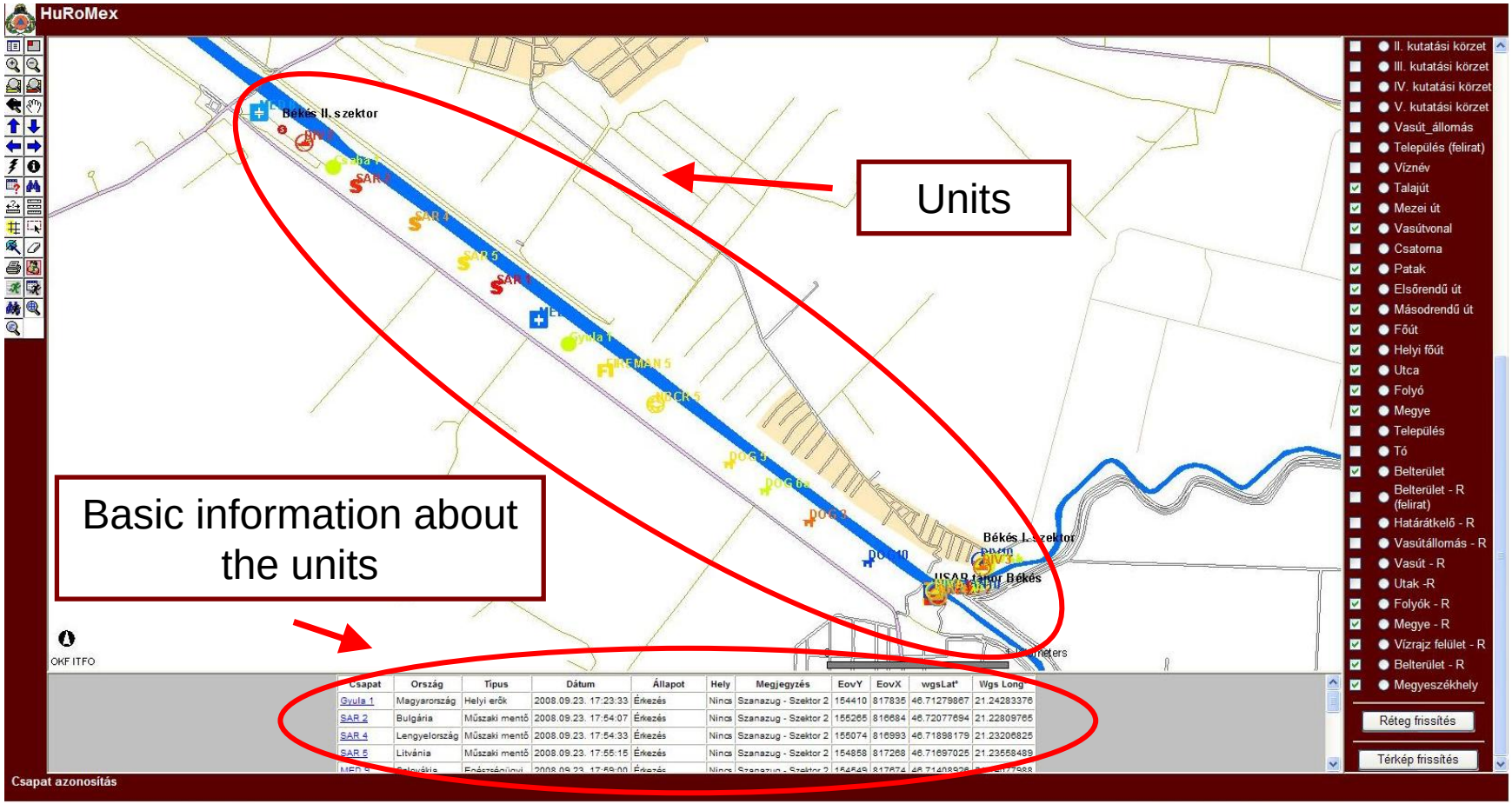
CSAPATMOZGÁS INFORMÁCIÓ

Frissítés 10 másodpercenként

Zászló	Csapat neve	Ország	Típus	Cselekvés	Dátum
	Szolnok 1	Magyarország	Helyi erők	Bevetés kezdete	2008.09 10:01:08
	Szolnok Bázis daru	Magyarország	Helyi erők	Bevetés kezdete	2008.09 10:01:19

iii. HUROMEX Exercise (2008)

Displaying the status of the units in KATIR



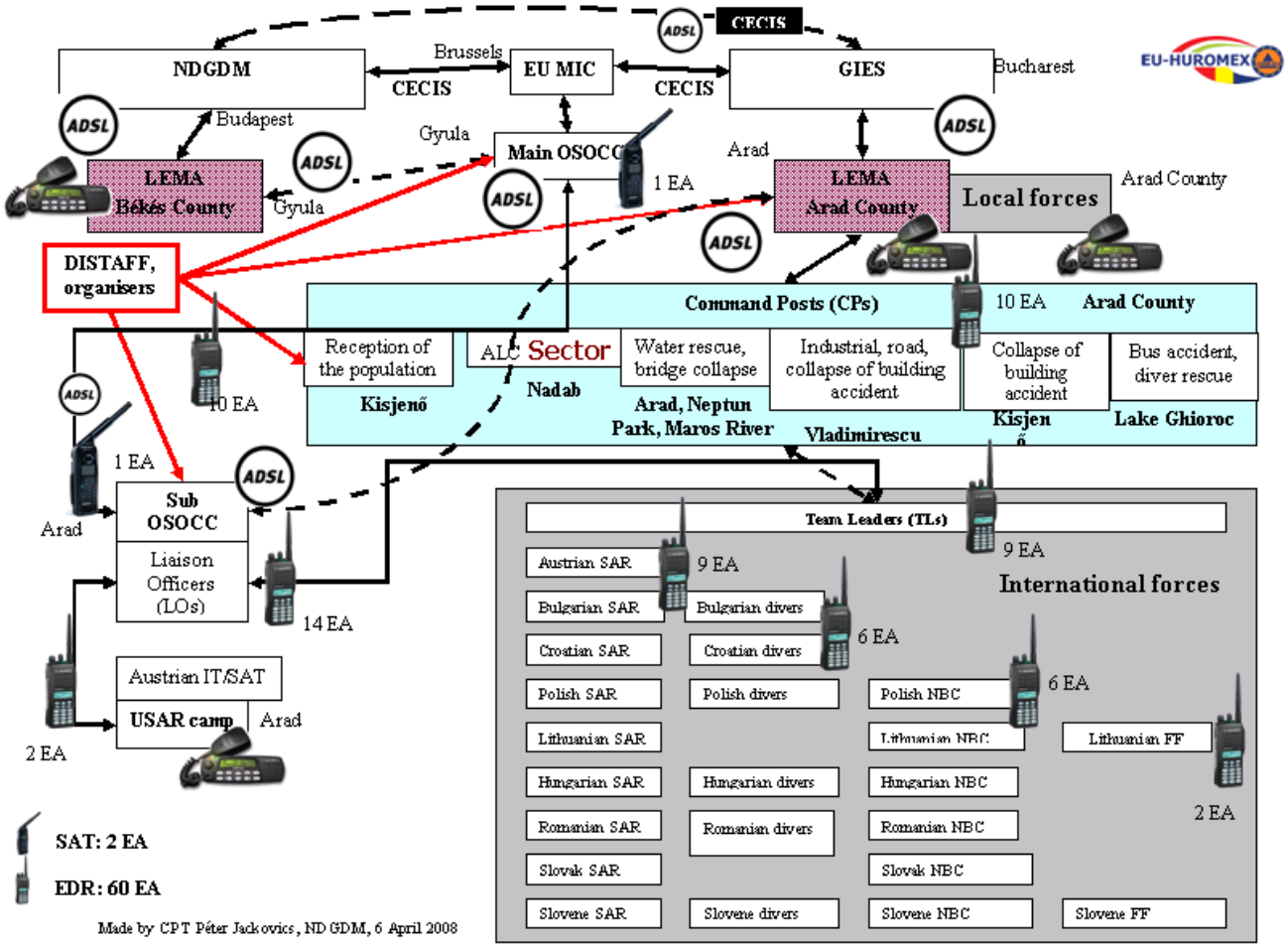
Exercises and case studies III.

iii. HUROMEX Exercise (2008)

- **Connection methods of international communication during the exercise**
  - **Between LEMA – EU MIC: Internet (CECIS)**
  - **Between EU MIC – OSOCC: Internet (e-mail)**
  - **Between OSOCC – Teams: radio**
  - **Between main OSOCC – sub OSOCC: telephone, e-mail (satellite phone)**
  - **Within teams: own radio communication equipment (frequency setting)**
  - **In Hungary almost 60 TETRA radios were distributed**

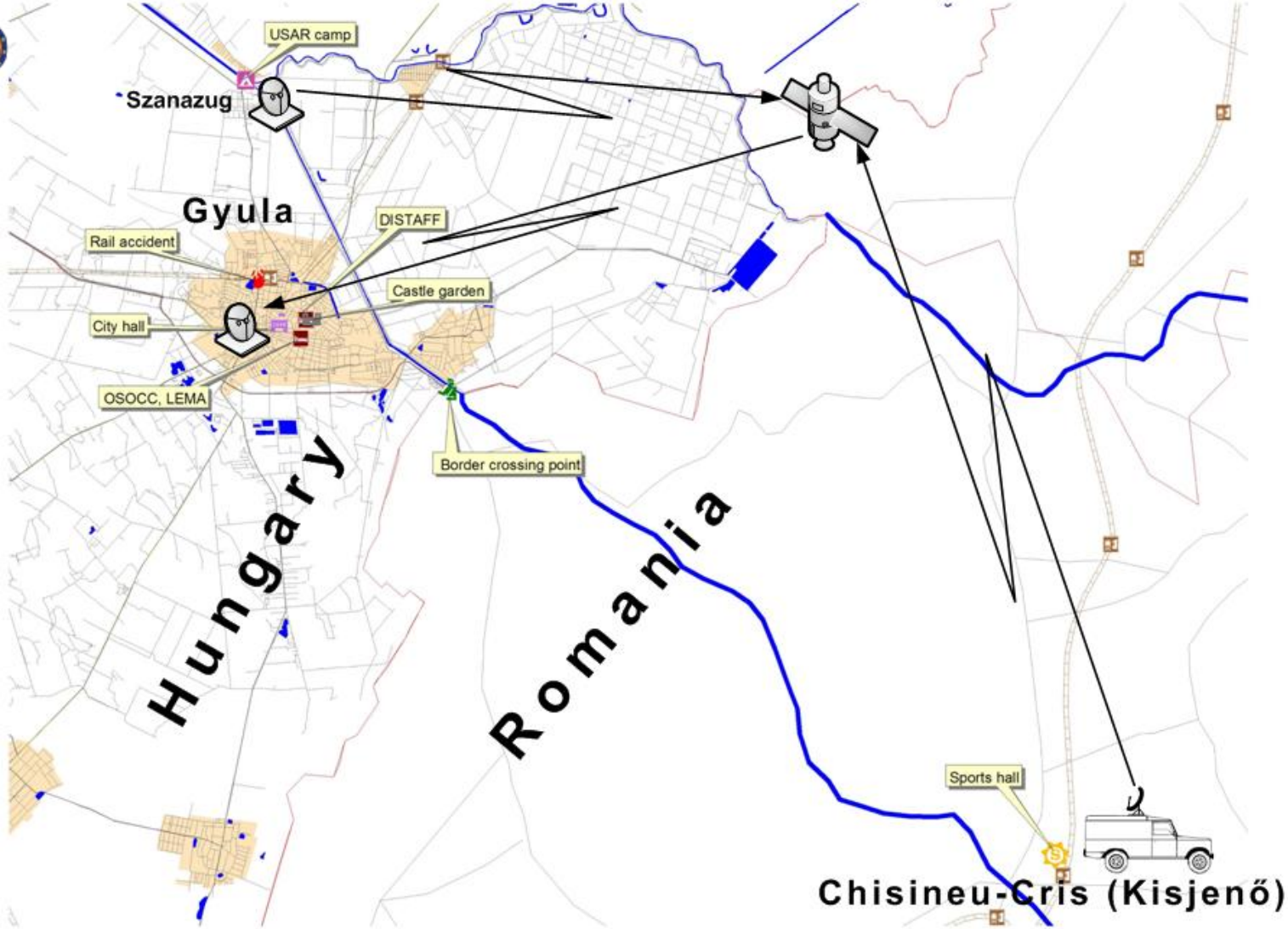
Exercises and case studies III.

Scheme of the Communication Network



Exercises and case studies III.

Satellite Scheme



iii. HUROMEX exercise (2008)

Indications&Objectives

i. **Close the gap between GIS & Telecommunication with**
   - **eliminating compatibility issues;**
   - **developing extensions for the control software in order to improve analysis capability;**
   - **establishing training material and advisory group to support disaster management;**
   - **joint, orientated trainings and courses.**

ii. **Increase the availability by**
   - **decreasing the expenses of the services;**
   - **trainings in handling the devices and the system;**
   - **technical support system.**

iii. **Support disaster management with**
   - **implementation of effective systems and best practices;**
   - **common system: application- and data-harmonization;**
   - **user-friendly platform for commanders and responders.**

Thank you for your kind attention!

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