DMT – Disaster Management Tool

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Overview of the space based solutions used in disaster management

Satellite communi-cations help connecting a disaster zone to the world outside.

Images from **earth observing satellites** help assessing the damage caused by disasters.

Global navigation satellite systems enable obtaining position information.

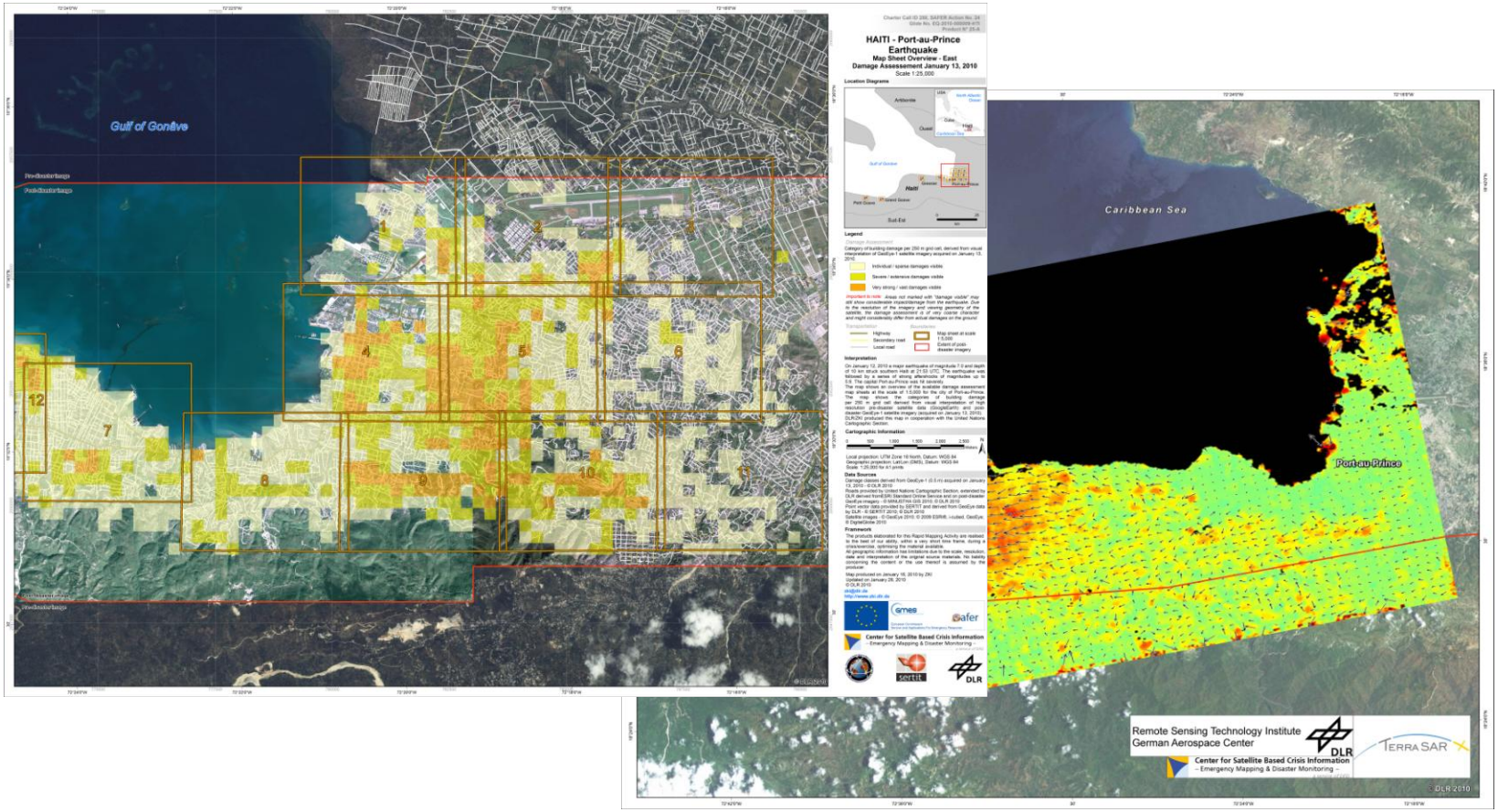
Products examples

Satellite optical image for the 2009 Greek's forest fires

Products examples
Flooding aerial images

Products examples

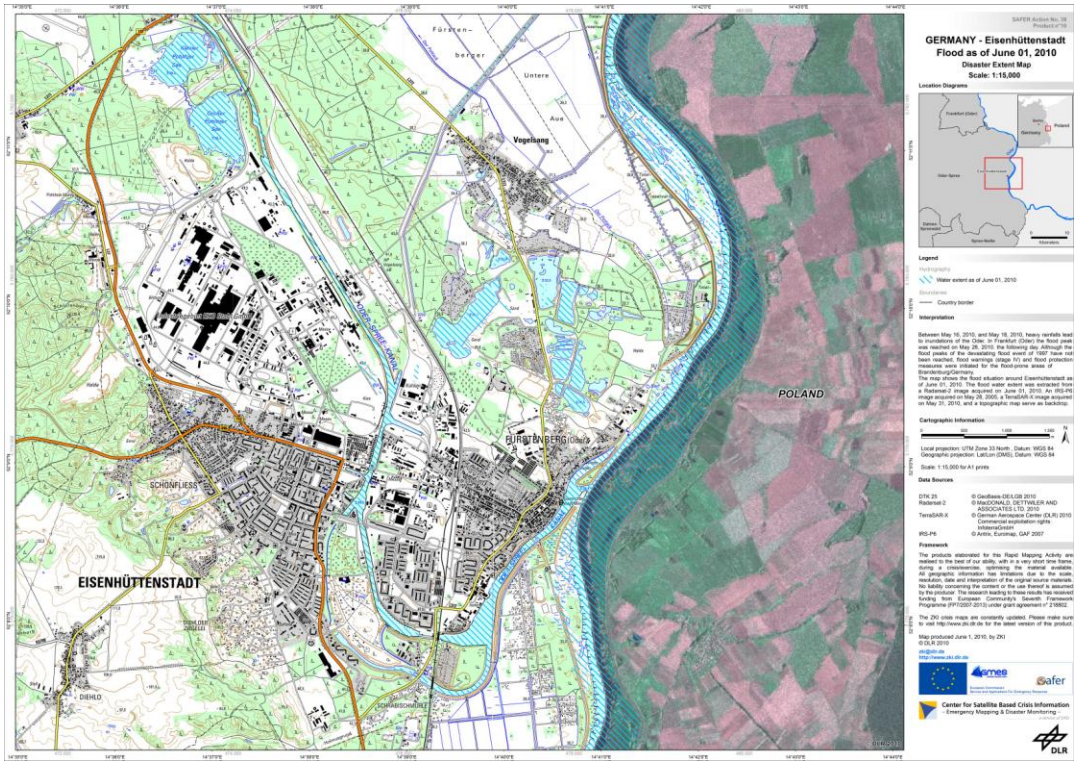
Damage assessment maps
Earthquake Haiti, January 2010

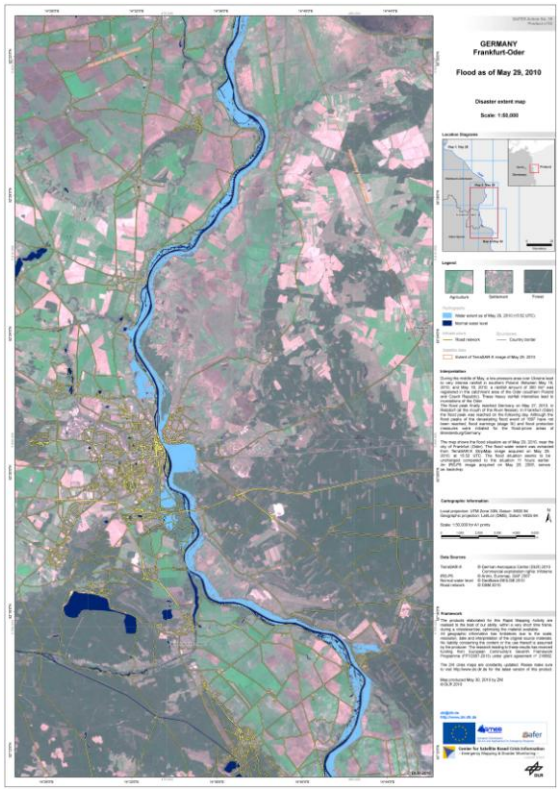


Products examples

Disaster extent maps

Oder Floodings, Germany,June 2010





Many useful products and technologies, but several challenges remains…

- How to get information to the user in the field?
- How to distribute information between the users?
- How to get information from the field back to other users or decision makers (map producers, control centers)

Our expertise in **communication**, **navigation** and **earth observation** motivated us to build a system that provides the benefit of three technologies and solve the pre-mentioned challenges

Our methodology

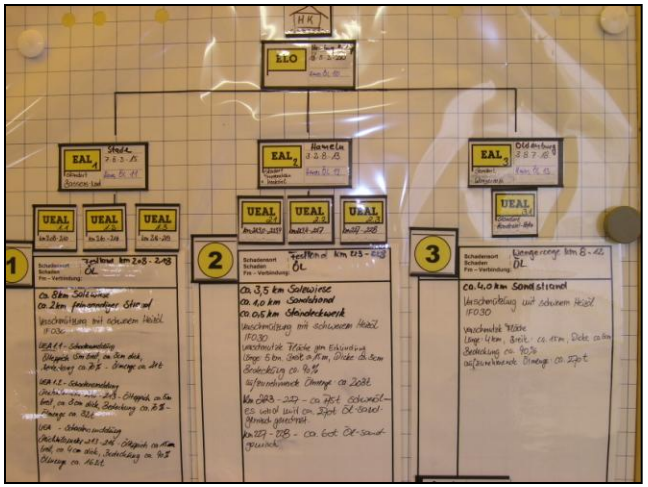
- A close cooperation with the user
  - Participation in exercises
  - Participation in missions
  - End user trainings
- Involve national and international agencies
  - German Federal Agency for Technical Relief (THW)
  - Johanniter International Assistance
  - EU Civil Protection Mechanism Training Program
  - Cooperations during EU projects

Several missions and exercises were attended in order to find what is available and what is needed…

Information distribution today

- Telephones, radio transmissions, emails,... are used.
- Information travels through many hubs and is delayed and filtered on it‘s way
- Information collection is done manually and influenced by the individual disaster expert

Situation maps today



ICT use today

- The adaption of IT technology is common and pragmatic
  - Users are trained in using satellite communication and navigation in the field
  - Users employ available tools like Google Earth or office products like Word, Excel, Power Point or Groove
  - Data exchange is done via Email, Groove or USB sticks
  - Web Portals like OpenStreetMap or Sahana are used more and more
- No integration of the components
- No or not sufficient adaption to the workflow and the conditions in disaster management operations

Information management today

- Increasing International Cooperation
  - Mixture of governmental and non-governmental, local and foreign organizations
  - EU Civil Protection Mechanism
  - Coordination needs cooperation which needs communication
- Increasing information Overload
  - Lots of valuable information is available
  - Amount is increasing vastly during operations
- Tools for information management have the potential to support relief workers

Collected Functional Requirements

- Data Management
  - The system has to handle geo-referenced information (maps, vector data) or other data like text documents, assessment templates or status information of other involved units
- User Interface
  - 3D globe with basic GIS functionality is required
  - Access to additional information should be possible
- Device Control
  - The system is responsible for device control and data fusion
- Synchronization
  - All data has to be synchronized between different instances of the system

Collected Non-functional Requirements

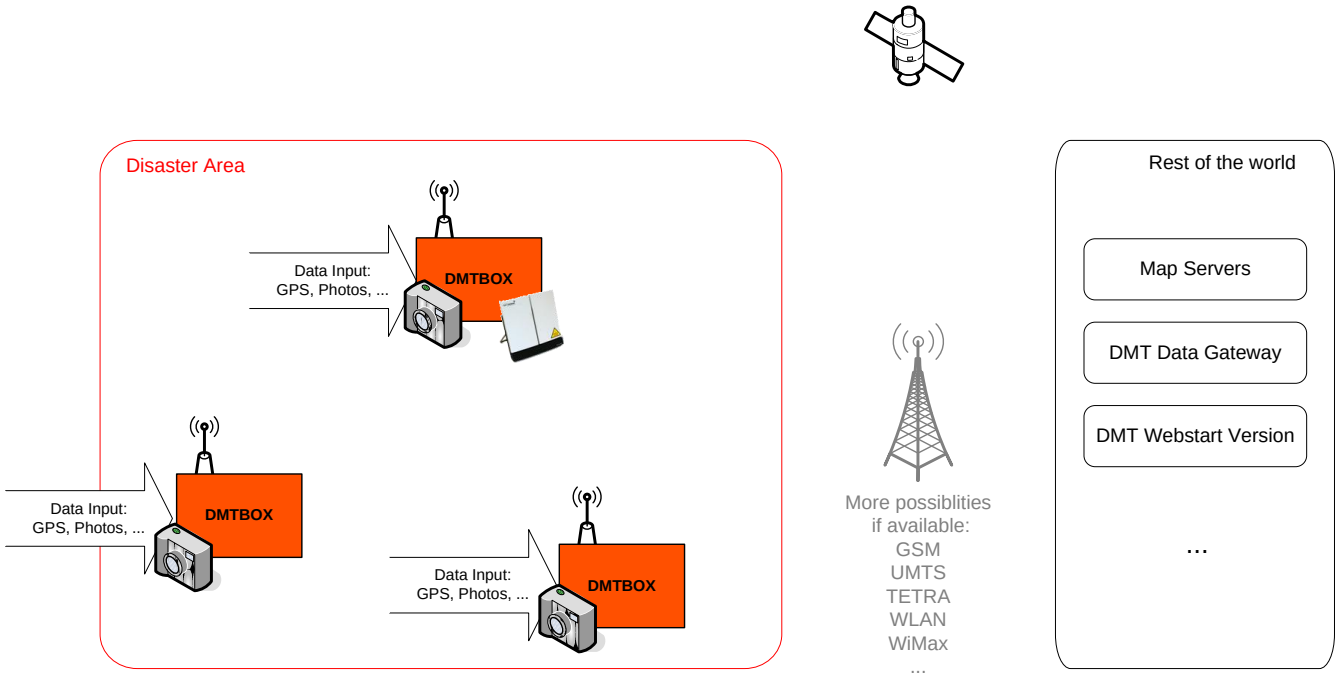
- Usability
  - Keep it simple!
- Autonomy
  - Unpredictable availability of local infrastructure
- Reliability
- Integrity
  - Quality of the data has to be outlined
- Interoperability
  - Import and Export with other systems
- Frugality
  - Cope with limited resources (money, power, communication means, time)
  - Environmental influences, form factor

Implementation: DMT (Disaster Management Tool)

- A box that allows field workers and control center officers to interactively enter and retrieve information about the areas of interest.
- It uses sensors (like GPS receivers) for automatic data collection
- It allows an easy and fast flow of the situation information, also across organizational and jurisdictional boundaries
- It provides a dynamic and interactive situation map and reliable data storage

Data distribution

- All data is synchronised between the users using different networks
  - Ad hoc and infrastructured networks
  - No dependency on possibly unreliable networks



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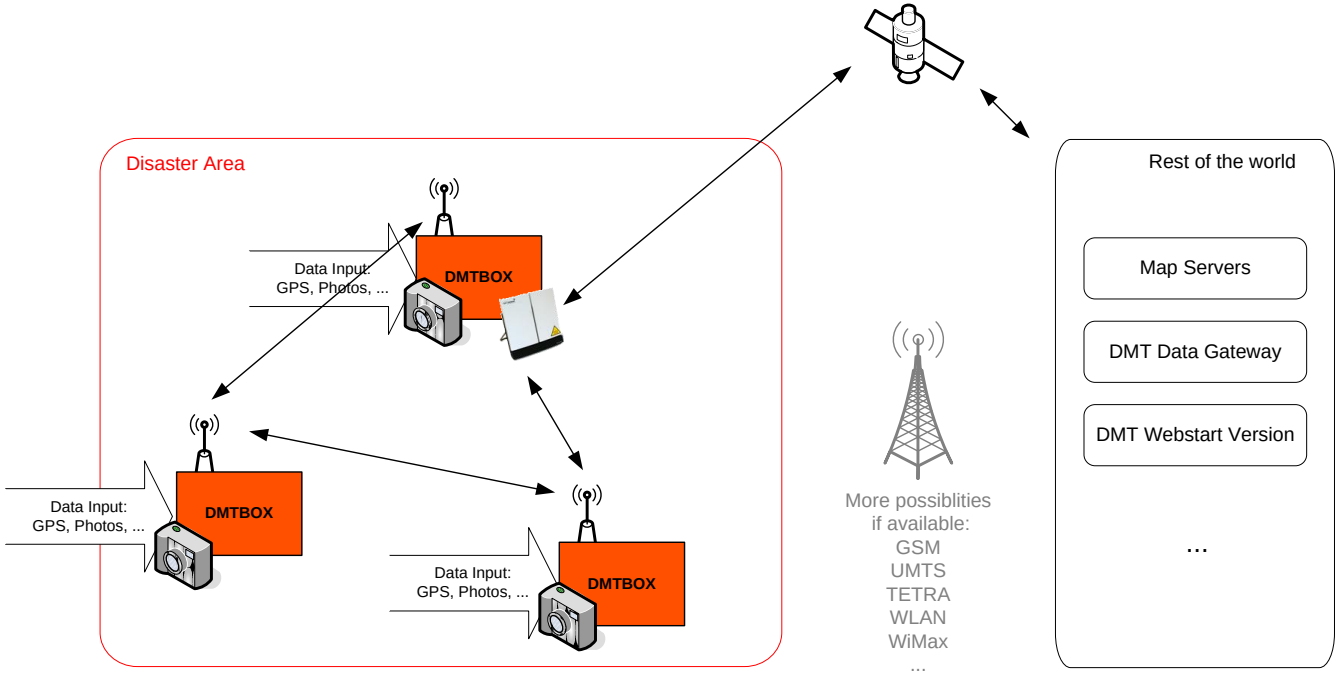

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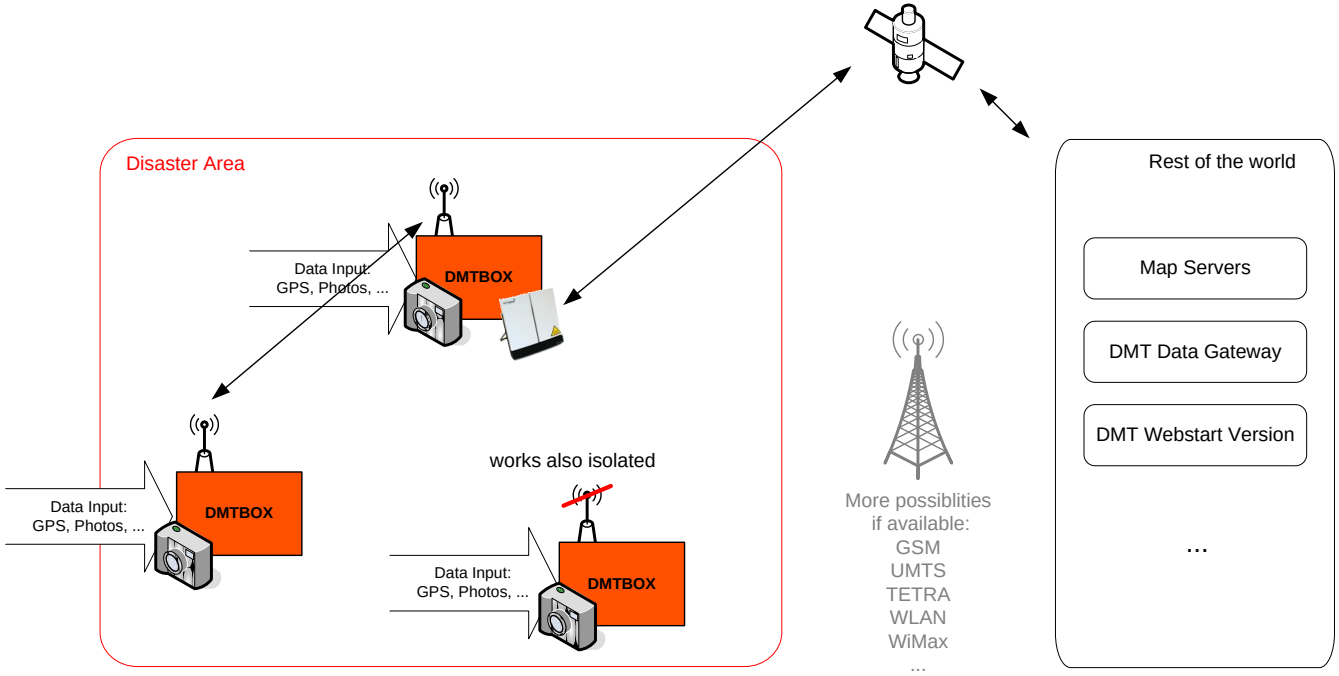
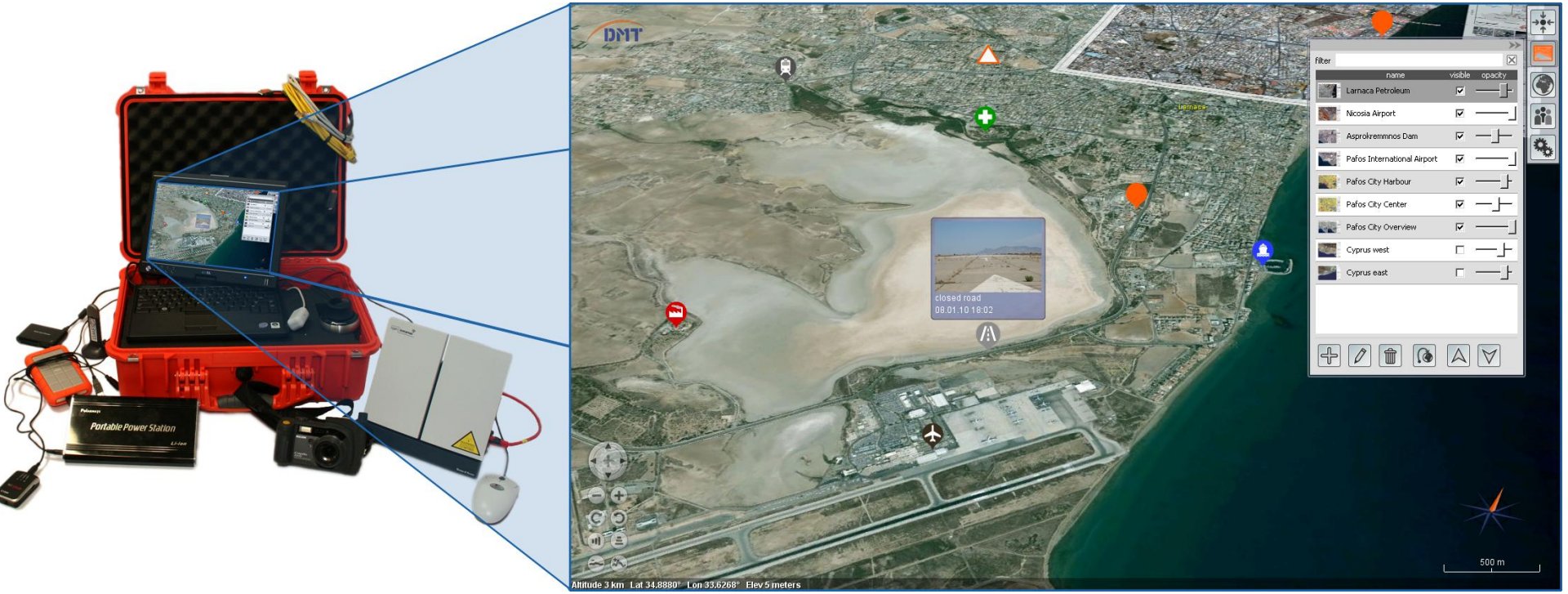


DMT 2007 (Assessment mission course - Cyprus 2007)

DMT 2010


Portable Power Station
DMT
filter
name
visible
opacity
Larnaca Petroleum
Nicosia Airport
Asprokremmnos Dam
Pafos International Airport
Pafos City Harbour
Pafos City Center
Pafos City Overview
Cyprus west
Cyprus east
closed road
08.01.10 18:02
500 m
Altitude 3 km Lat 34.8880° Lon 33.6268° Elev 5 meters

Use Case – Navigation

Use Case – Warehouse Assessment

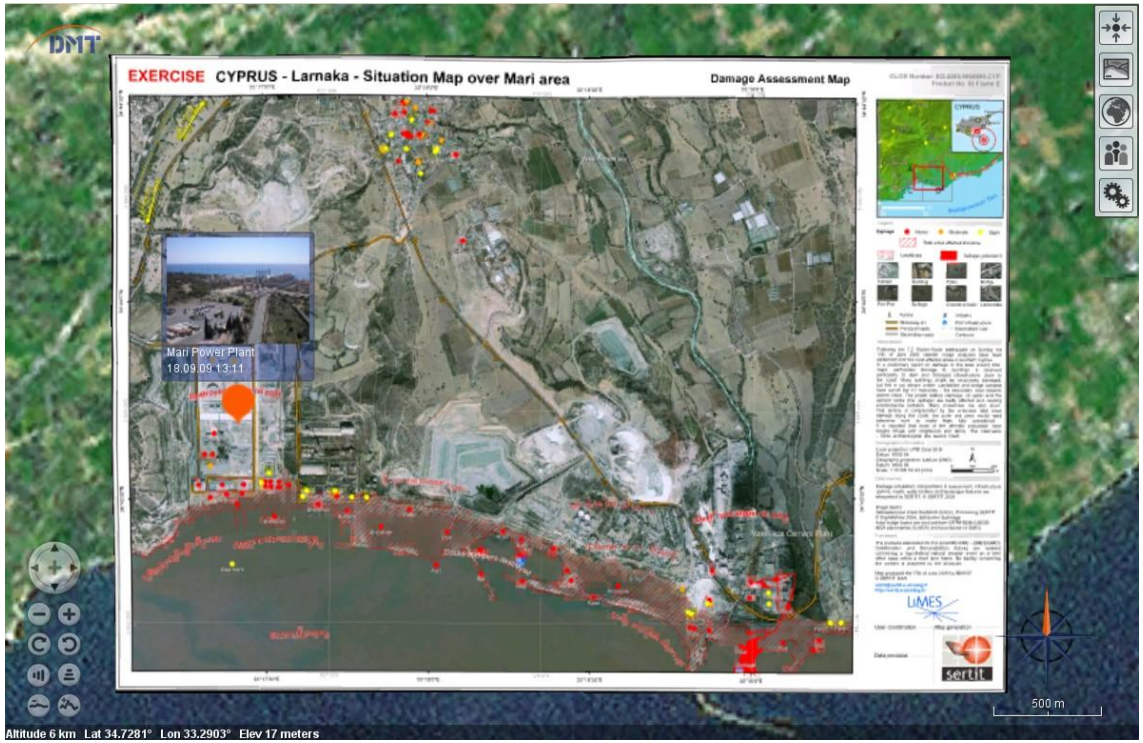
- Can the old, abandoned warehouse be used as a storage facility ?

Use Case – Airport Assessment

- What is the current status of the airport?

Use Case – Power Plant Assessment

- What is the current status of the power plant?



Short Live Demo

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