



UNOSAT

satellite imagery for all

**Integrating telecommunication and geopositioning
functions to deliver better and faster the satellite
imagery to disaster managers**

Alain Retière, UNOSAT Director

Content

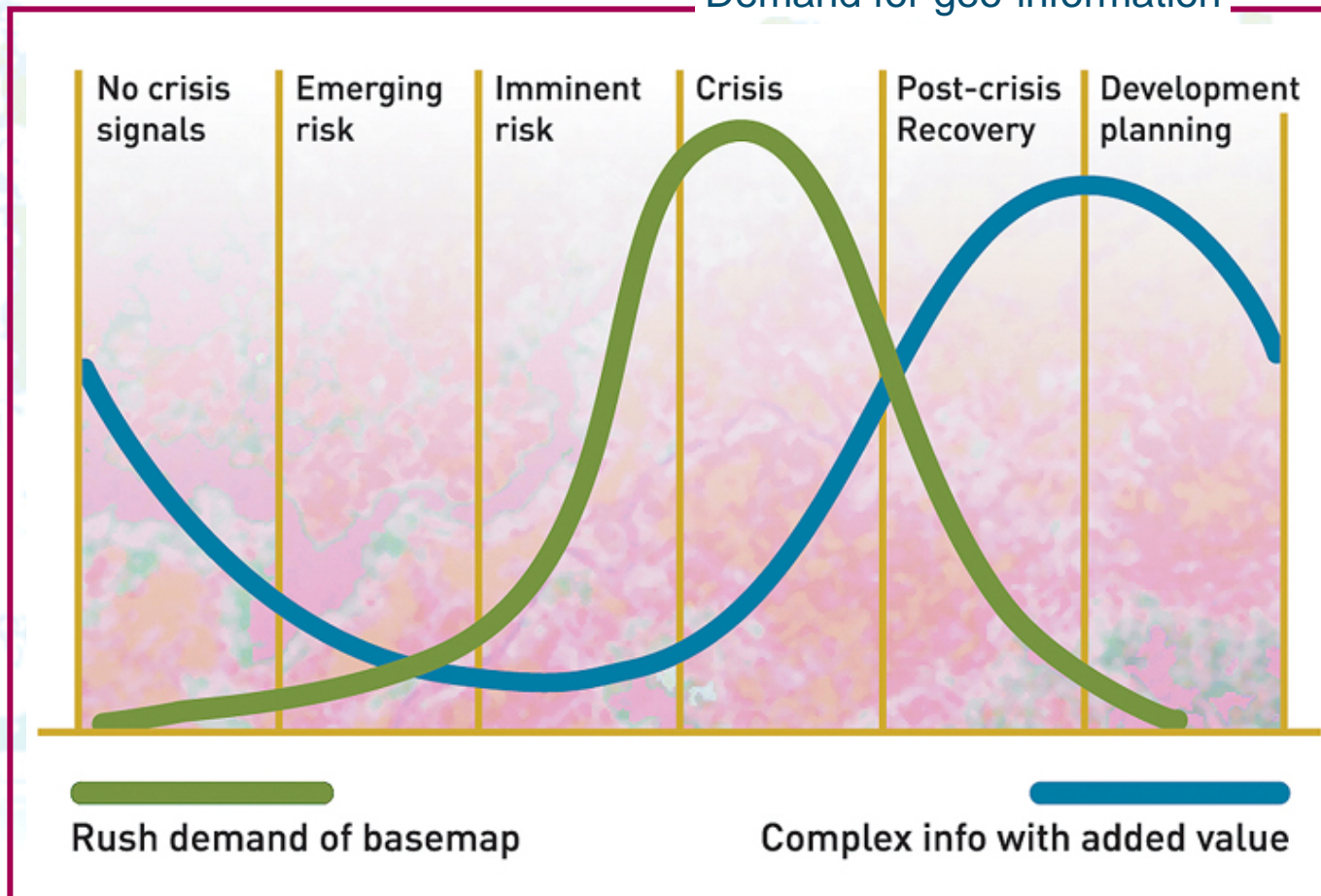
1. What is UNOSAT, what we do, how we do it
2. Telecom and Navigation functions within UNOSAT: What for?
3. Partnership approach for a global service platform integrating space applications for disaster management
4. Recommendations

What is UNOSAT

1. The United Nations Institute for Training and Research (UNITAR) Operational Satellite Applications Programme - a unique UN programme entirely dedicated to providing satellite based solutions to the UN, local governments, international organizations and NGOs.
2. Supports early warning, crisis response, sustainable recovery, vulnerability reduction and local capacity building
3. Countries in the south are UNOSAT's main beneficiaries
4. UNOSAT is the main implementing agency within the UN for the International Charter "Space and Major Disasters"
5. Has evolved into a mature UN service with global outreach and supported by a network of partners world wide
6. Diversifying the offer of satellite & IT based services and adapt it to specific user needs of the international community
7. UNOSAT works always upon request of at least one major organization directly or indirectly involved in field operations and validated by relevant UN coordination mechanisms

UNOSAT promotes the UN Reform by making satellite imagery affordable

Demand for geo-information



Basic Service Platform

Procurement Service

- Satellite imagery procurement
- Orthorectification chain

Mapping Service

- Humanitarian and Conflict Mapping
- Environmental Mapping
- Rapid Mapping
- Vulnerability Reduction Services

IT and Web Service

- Information dissemination (ImageWebServer)
- Data hosting
- User website development

Training Service

- Project-based (operational)
- On-line modules: GIS and RS
(**New!!**)

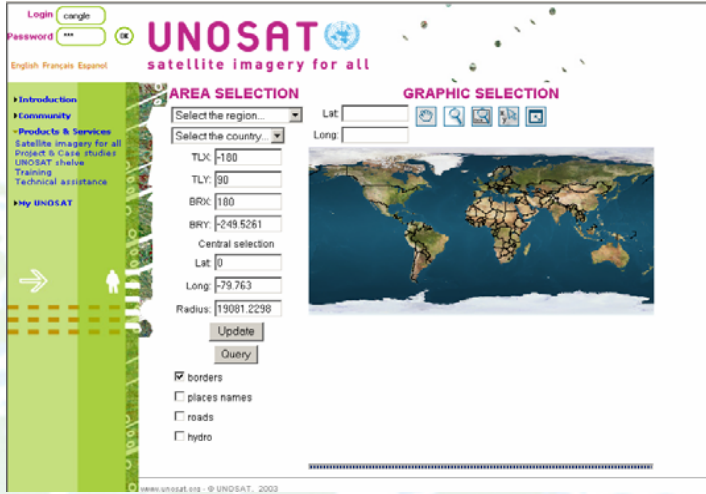
Advisory Service

- Support to resource mobilization
- Project implementation

Public Relations

- Humanitarian awareness
- Technologies dissemination
- Financial assistance to users

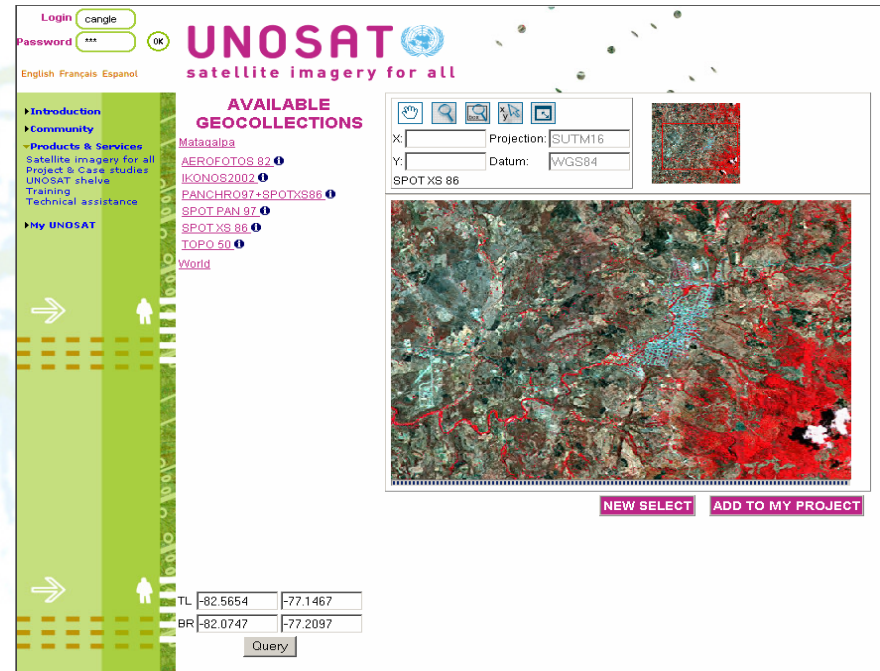
www.unosat.org



Area selection



Product Metadata
(DIMAP file)



Available products (UNOSAT archive)

A powerful on-line data catalogue hosted at CERN, accessible from anywhere

UNOSAT open partnership



GENÈVE, SUISSE
GENEVA, SWITZERLAND



ULB



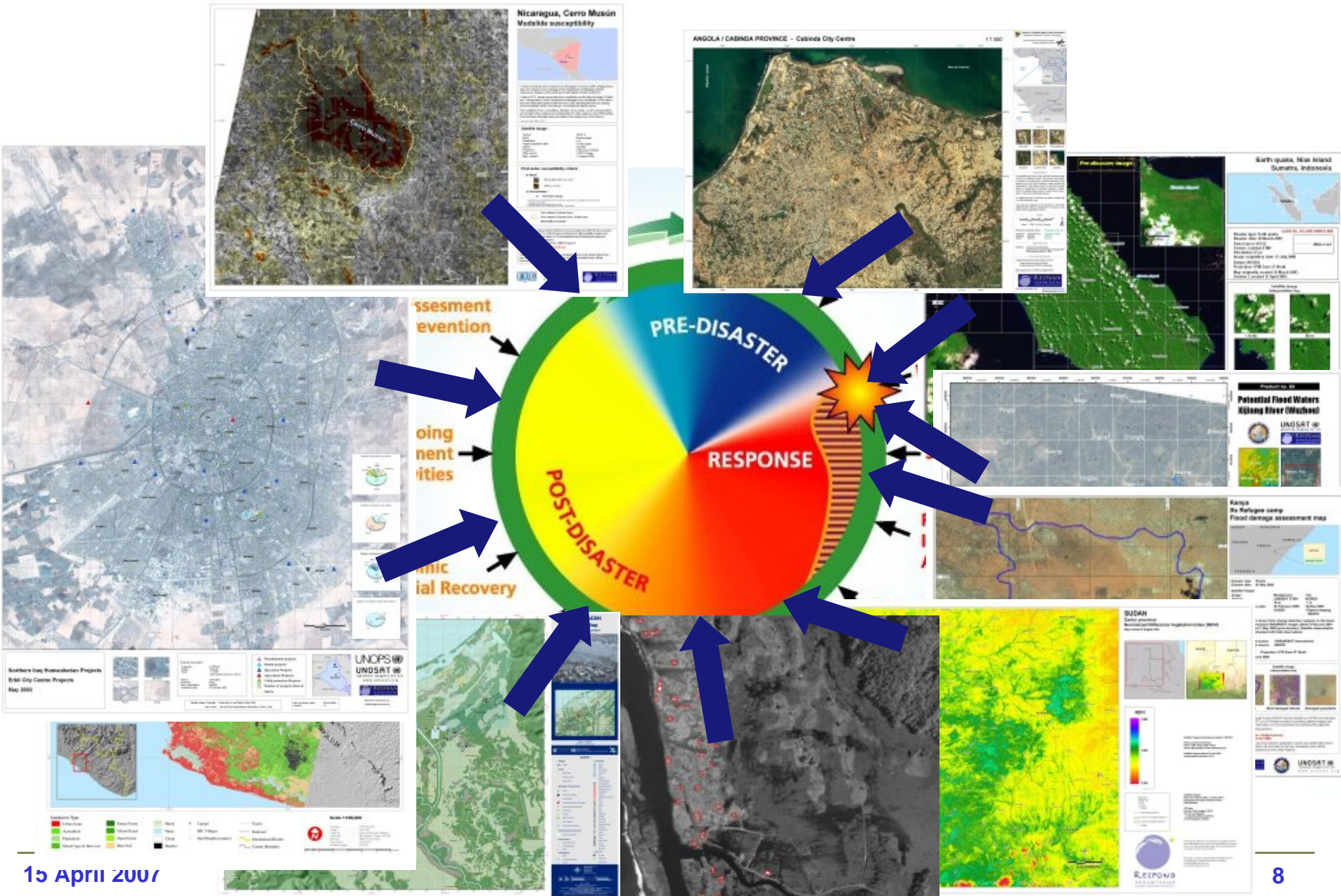
satellite imagery for all



SPOT
IMAGE



EO and the disaster cycle

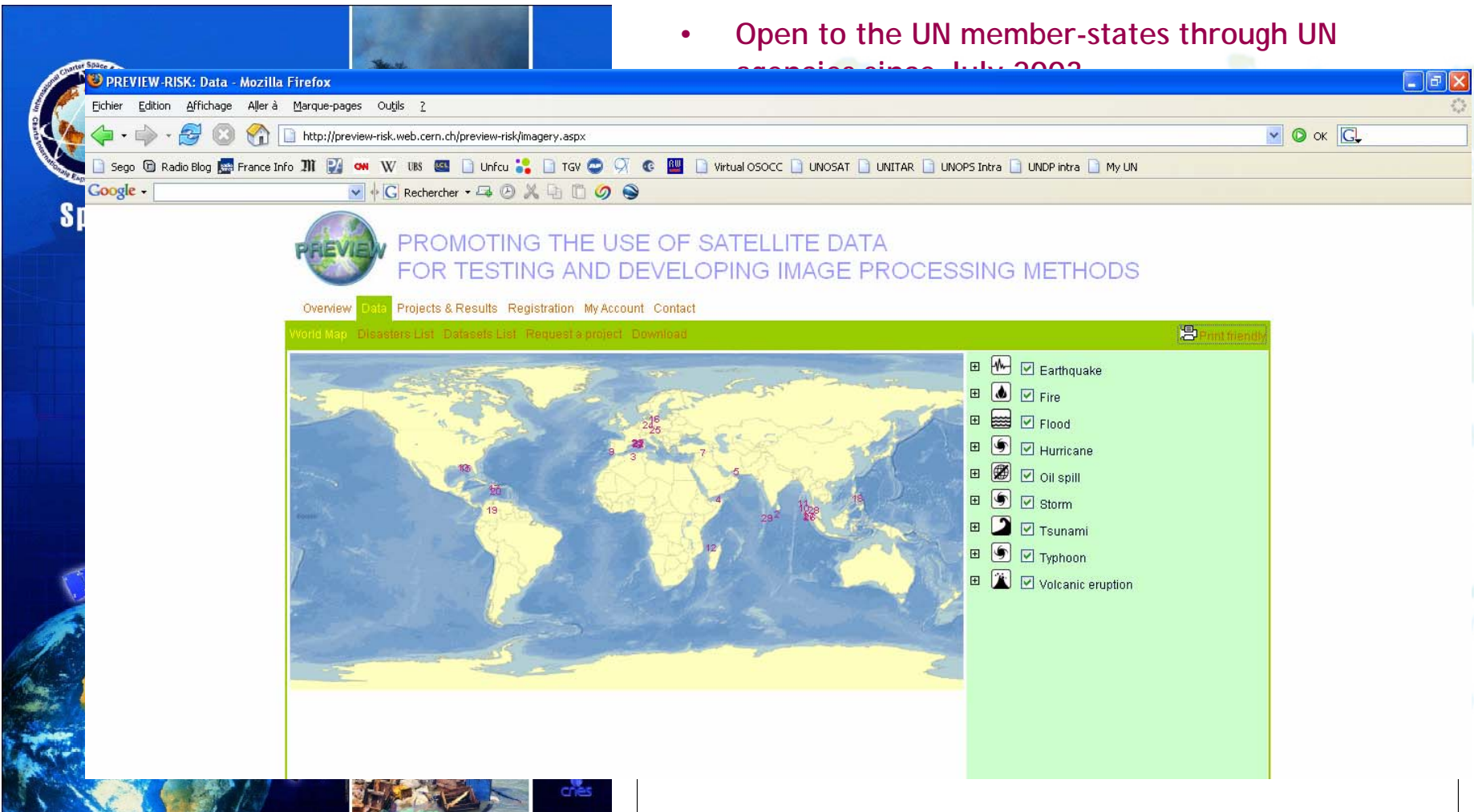


Criteria for selecting space telecom and navigation technology

- Common standard for all agencies
- Rapid deployment
- Low installation and operation cost
- Robust systems
- Highly transferable to host-countries

International Charter on Space and Disasters

- Open to the UN member-states through UN agencies since July 2003



PREVIEW-RISK: Data - Mozilla Firefox

http://preview-risk.web.cern.ch/preview-risk/imagery.aspx

PREVIEW PROMOTING THE USE OF SATELLITE DATA FOR TESTING AND DEVELOPING IMAGE PROCESSING METHODS

Overview Data Projects & Results Registration My Account Contact

World Map Disasters List Datasets List Request a project Download Print friendly

- Earthquake
- Fire
- Flood
- Hurricane
- Oil spill
- Storm
- Tsunami
- Typhoon
- Volcanic eruption

The pioneer partnership with OCHA and TSF:

we finished that map at 10 pm in Geneva, it was available at 6am on the Muzaffarabad airfield ...






Muzaffarabad, Pakistan
aster map

Earthquake
: October 8, 2005 at 06:42:31 (UTC)
: EO 2005-000174-PAK

Source: AlertNet

River Roads

duced by the UNOSAT service headed by UNITAR and executed
T is a UN-Private consortium providing satellite imagery and
information to UN humanitarian and development agencies
ing partners.
ion: info@unosat.org
76 487 4998
use of boundaries, geographic names and related data shown
anted to be error free nor do they necessarily imply official
ceptance by the United Nations.

UNOSAT 
satellite imagery for all

Example: Before-after image comparison, Guningkelir, Bawqukan Satu and Tegalrejo villages in Pleret subdistrict



11 July 2003



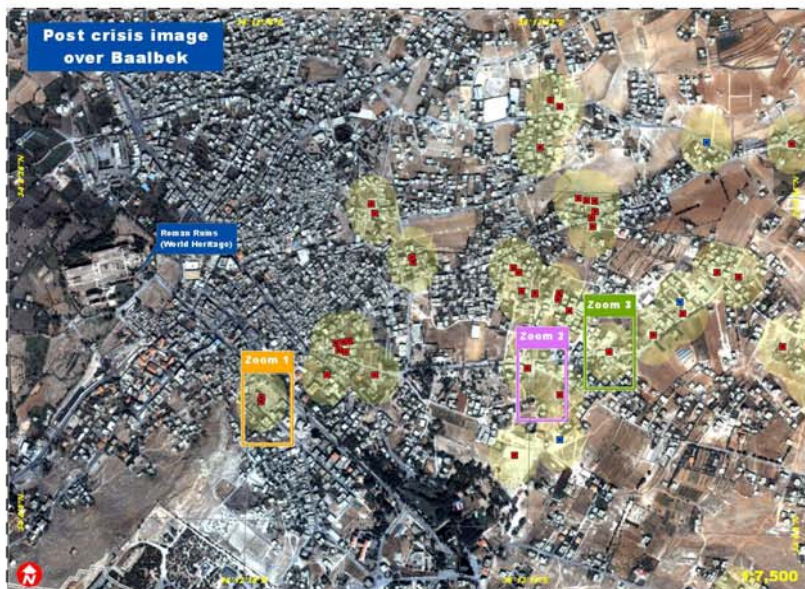
31 May 2006

Image copyright: Digital Globe distributed by EURIMAGE

Ground Verification of Satellite Damage Identification in Baalbek, Lebanon 2 November 2006

Post-Crisis Ikonos Satellite Imagery Recorded on 10 September 2006

Version 1.0



Results of ground verification process

Figure A + B: Complete destruction of a former 3 story building. The building was situated where now there is the debris cone in Figure A. The adjacent building in Figure B has been severely damaged as well. This attack point has not been identified. Reason: The destroyed building could not be seen clearly due to its missing shadow. However, at the time of image acquisition, the ground has already been cleared. In this case, it was not possible to distinguish between an ordinary demolition that might have taken place. Following a conservative approach the site has not been marked as being bombed.

Figure C + D: Complete destruction of a four story building. The building's dimensions contained 9 apartments and 15 garages. This attack point has clearly been identified on the historic map.

Date of photo acquisition: October 2006



Crisis Background Information

Following the 12 July 2006 abduction of two Israeli soldiers by Hezbollah, the Israeli Defense Force (IDF) launched a large scale military operation in Lebanon. Simultaneously, Hezbollah launched rocket attacks into Israel. This crisis resulted in hundreds of deaths and injuries on both sides, massive population displacement and extensive damage to urban infrastructure.

In support to the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA), UNOSAT activated its 24/7 Rapid Mapping service to quickly provide the international humanitarian community and local actors with detailed satellite map updates and damage assessments of key affected villages.

Map Information

Damage assessment has been done using photo-interpretation of pre and post-conflict Ikonos satellite imagery recorded 20 July 2005 and 10 September 2006 respectively.

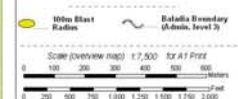
Results of the damage assessment have been verified in the field for a selected number of sites. This map references photos taken at damage sites to the corresponding pre and post satellite imagery. It discusses completeness and quality of the remote sensing based damage assessment approach for three examples.

Principal results of investigation on these and further examples are:

- Damage identified had a slight tendency to be under estimated
- Practically no damage over-estimation has been identified
- High importance of ground ground verification and post image acquisition due to site clearing

The depiction and use of boundaries, geographic names and related data shown here are not warranted to be error-free nor do they imply official endorsement or acceptance by the United Nations. This map was produced by the United Nations Institute for Training and Research (UNITAR) Operational Satellite Applications Programme (UNOSAT).

Map Legend		Site locations of identified damage	
■	Bridge	■	Road
■	High rise apartment building	■	Agricultural building
■	Building (general)	■	Field (cultivated)
■	Irrigation canal	■	Field (uncultivated)
■	Industrial building	■	Field (pastureland)



Scale	Resolution	Projection	UTM Zone
1:7,500	10m	UTM Zone 18N	18N
1:150,000	250m	UTM Zone 18N	18N
1:300,000	500m	UTM Zone 18N	18N
1:600,000	1000m	UTM Zone 18N	18N
1:1200,000	2000m	UTM Zone 18N	18N



Results of ground verification process

Figure A: Complete destruction of a four story building. Destruction has been unambiguously identified in the satellite image.

Figure B: This building is at about 20 meters distance of the identified bomb attack point. It is found to be severely damaged.

Figure C + D: In the foreground, another four story building has been completely destroyed. The soil has already been partly cleared. Buildings in the back at an approximate distance of 50 meters exhibit moderate to severe damage.

Date of photo acquisition: October 2006



Results of ground verification process

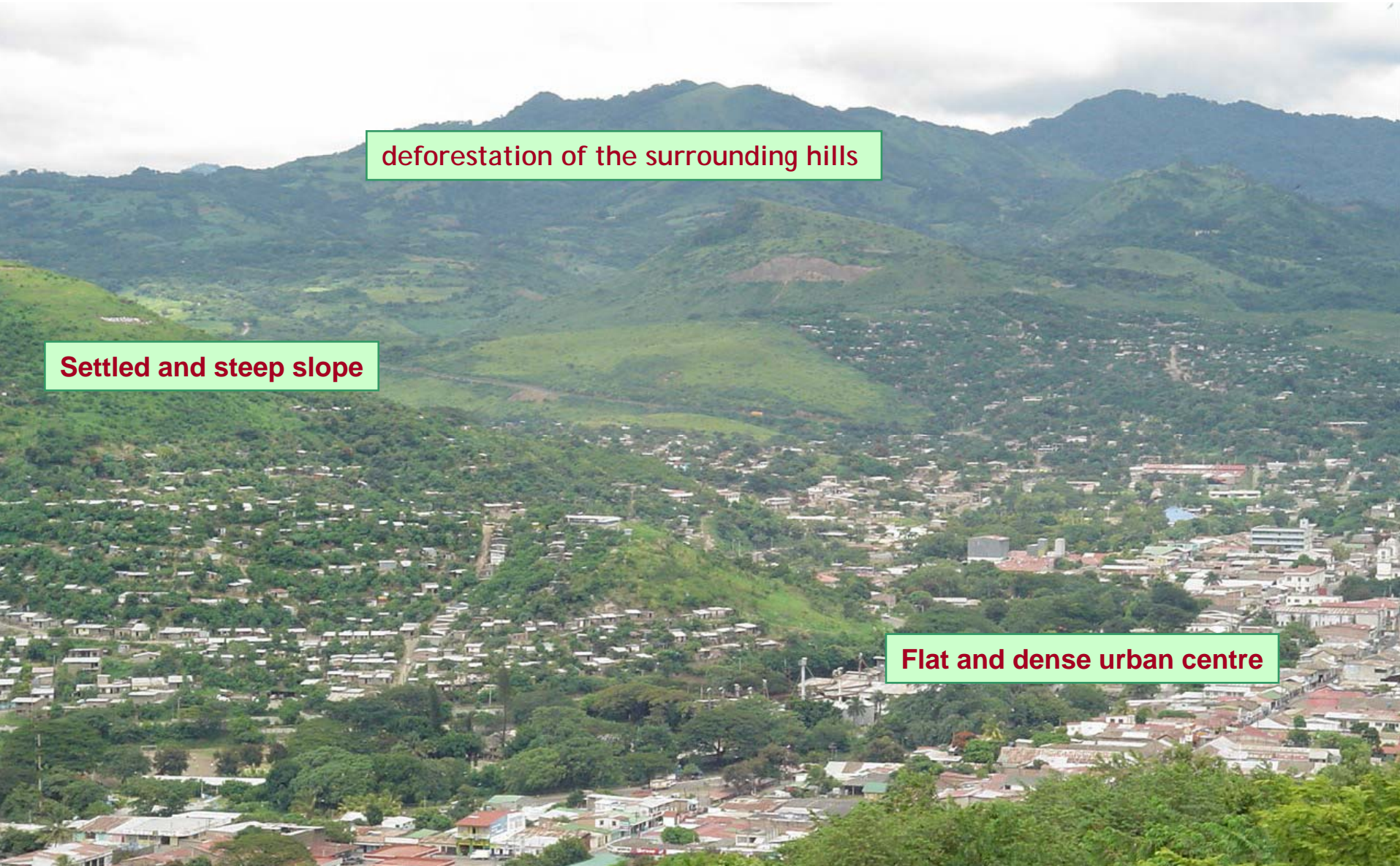
Figure A: This former three floor building next to the road has been completely destroyed. The destruction has been clearly identified using pre post image comparison.

Figure B: The adjacent building surprisingly shows minor to moderate damage only. Most probably, refurbishment has already been performed at the time of photo acquisition.

Figure C: This two story building is at about 20 meters distance from the bombed site D. It has been severely damaged.

Figure D: A three floor building has been completely destroyed. The destruction has not been identified as the shadows drawn by the remaining wall permit to be restorable.

Date of photo acquisition: October 2006



deforestation of the surrounding hills

Settled and steep slope

Flat and dense urban centre

1. Deforestation due to urban growth

2. Steep Slopes

3. Terrain stability

4. Pollution

5. Buildings almost inside the river channel or in flood prone areas



6. Typical Urban Drainage System

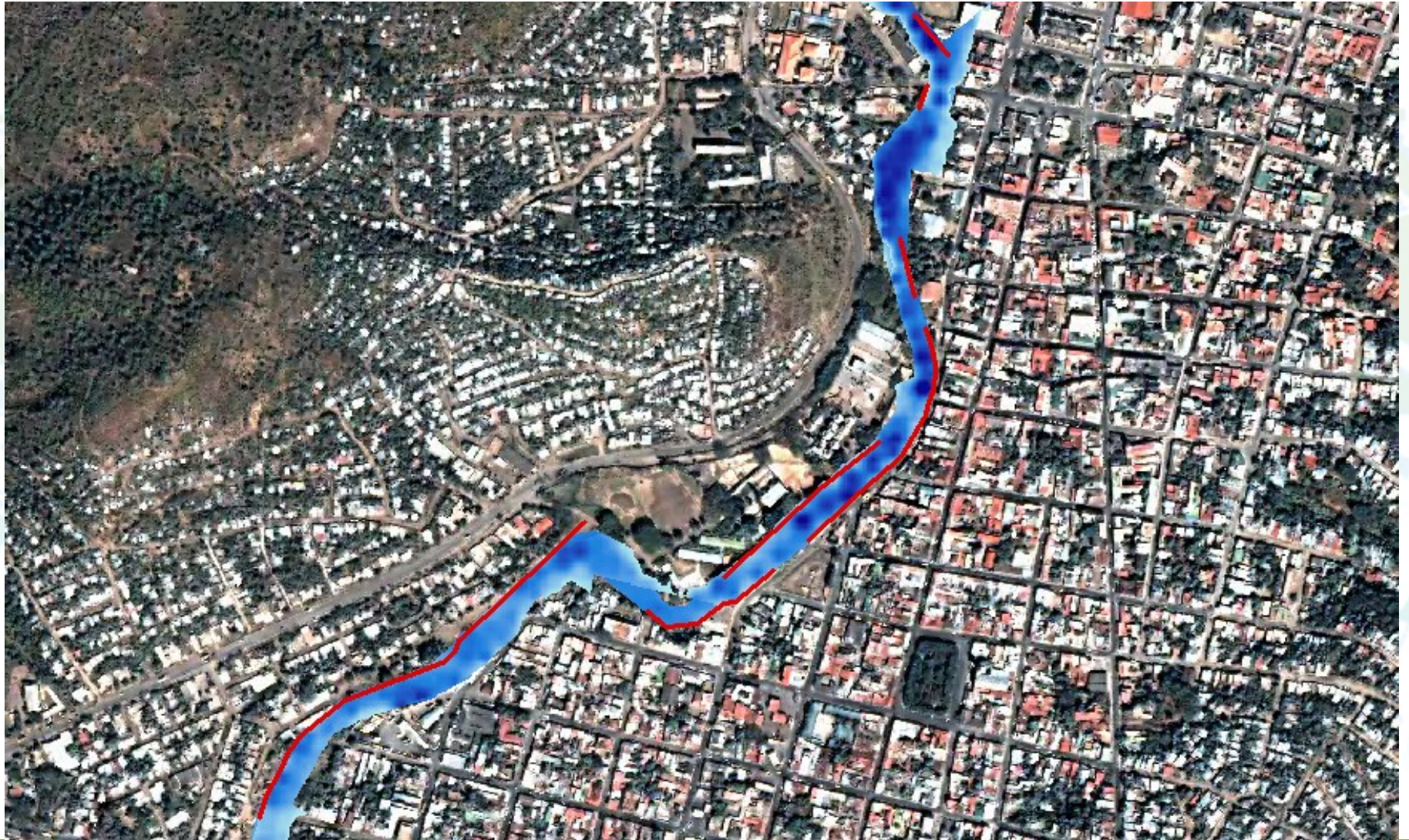
7. Drainage Canals and Culverts



Barrio Rodolfo Lopez: Flood scenario without gabions



Barrio Rodolfo Lopez: Flood scenario with gabions (for a given discharge rate)



Fleet Management Project



satellite tracking and data capture for all

Examples of on board equipment

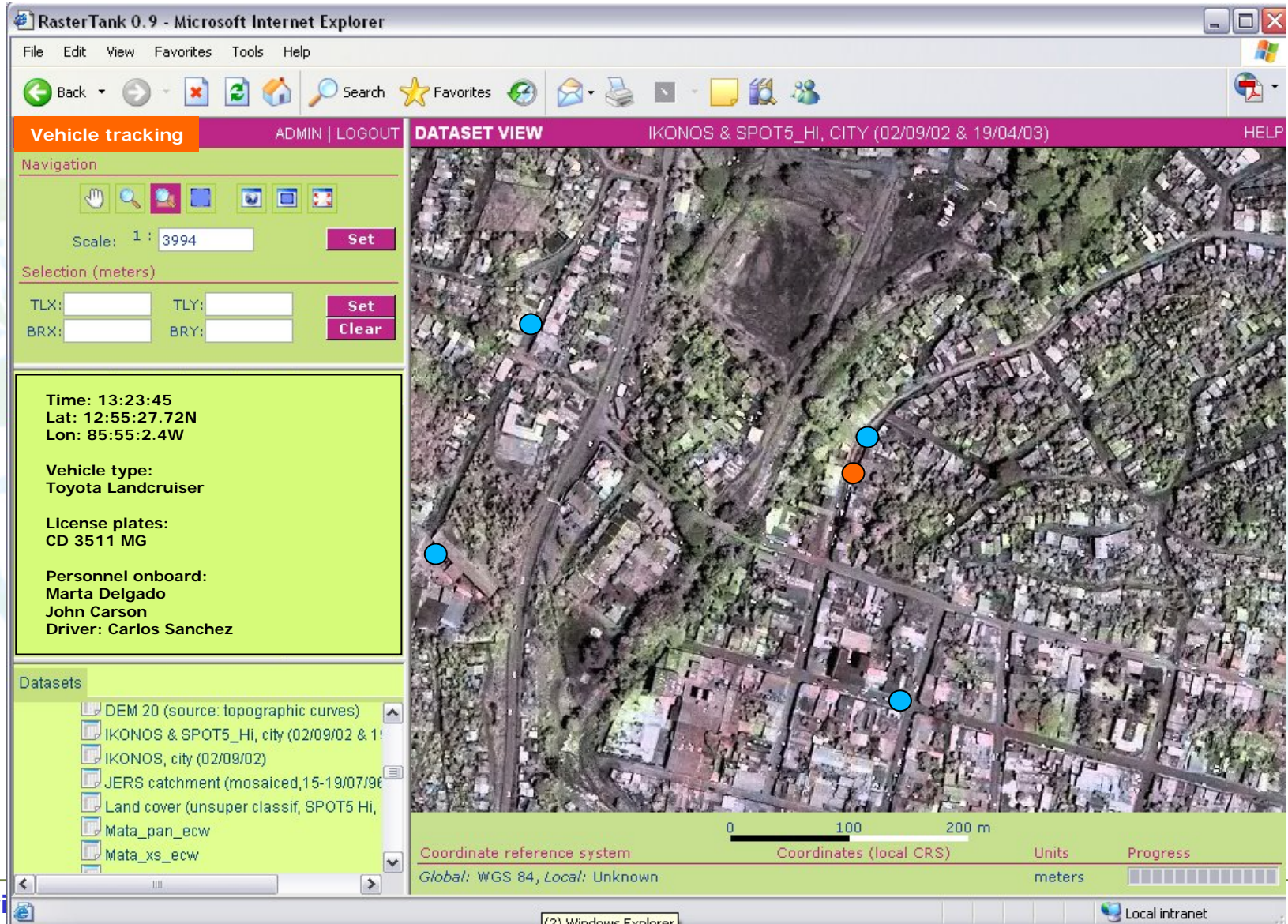


Screwed
Magnetic stand



In cab

Vehicle exact position on a satellite image



RasterTank 0.9 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Vehicle tracking ADMIN | LOGOUT **DATASET VIEW** IKONOS & SPOT5_HI, CITY (02/09/02 & 19/04/03) HELP

Navigation

Scale: 1 : 3994 **Set**

Selection (meters)

TLX: TLY: **Set**
BRX: BRY: **Clear**

Time: 13:23:45
Lat: 12:55:27.72N
Lon: 85:55:2.4W

Vehicle type:
Toyota Landcruiser


License plates:
CD 3511 MG

Personnel onboard:
Marta Delgado
John Carson
Driver: Carlos Sanchez

Datasets

- DEM 20 (source: topographic curves)
- IKONOS & SPOT5_HI, city (02/09/02 & 19/04/03)
- IKONOS, city (02/09/02)
- JERS catchment (mosaic, 15-19/07/98)
- Land cover (unsuper classif, SPOT5 HI, 02/09/02)
- Mata_pan_ecw
- Mata_xs_ecw

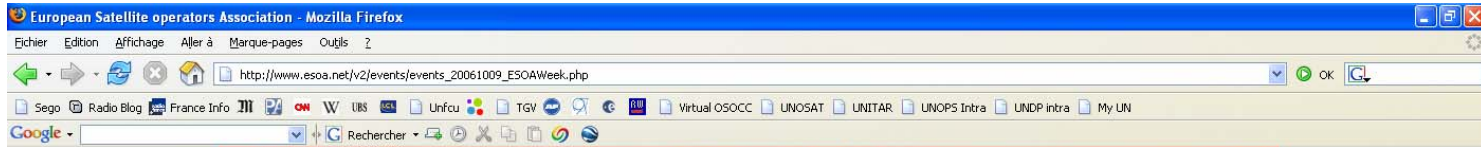
0 100 200 m

Coordinate reference system: Global: WGS 84, Local: Unknown
Coordinates (local CRS):
Units: meters
Progress: 

15 April (2) Windows Explorer Local intranet 21



Emerging cooperation with sat telecom operators (MoU ESOA-UNOSAT)



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EUROPEAN SATELLITE OPERATORS ASSOCIATION

ABOUT ESOA * MEMBERSHIP * WORKING GROUPS * EVENTS * DOWNLOADS

Events

ESOA Week

Brussels, Oct 9-11 2006

ESOA held 3 days of high level meetings with the United Nations and Members of the European Parliament, with the presence of European Commission officials and representatives of Member States and the European Space Agency. The theme for the three days was 'The Value of Satellite Communications' with specific presentations on Satellites for Aid & Emergency and Satellites for Development and Africa.

ESOA also participated in the annual MEP Awards, sponsoring the award for outstanding work in the field of Development policy. This year, the ESOA Chairman presented the award to MEP Luisa Morgantini, chair of the European Parliament's Development Committee.

Downloads:

- [Press Release](#)
- [ESOA Presentation on Development and Africa](#)
- [ESOA Presentation on Aid and Emergency](#)
- [Presentation by the World Food Organisation](#)
- [Speech by MEP Deva on Information and Communication Technology for Africa](#)
- [Photos from ESOA Week](#)

Conference Newsletters:

Click on the images to view the conference newsletters



Satellite Communications For Aid And Emergency



Satellite Communications For Sustainable Development

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Recommendations

1. Internet is the key vector for new technologies, digital divide a burden
2. Space is the best alternative to bridge digital divide despite the high cost
3. Charter « space and major disasters » is a successful partnership that can be extended for food security
4. Same mechanisms should apply for telecoms and navigation services
5. Micro satellite technology offer affordable solutions for emerging countries
6. Interoperability of systems must be ensured and strengthened

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www.unosat.org

Thank you for your attention

Merci de votre attention