



## How to better manage information obtained from space to help the United Nations enhance its coordination of international disaster response?

By cooperating with International Charter “Space and Major Disasters”





## Pioneer role of the UN-Charter partnership


- Since the United Nations is cooperating agency of the Charter in July 2003, UN has triggered it Charter 22 times.
- All beneficiary and participating organizations have unanimously appreciated the data provided by the Charter and the services brokered by UNOSAT.
- The Charter has had a direct impact on the way the United Nations now works during natural and man-made disasters: staff working in UN-coordinated emergency relief operations is now aware of the Charter and how it can be used.
- The experience gained points to ways of improving the Charter and better meeting the needs of the humanitarian community.

## Some statistics

### Free maps for download at [www.unosat.org](http://www.unosat.org):

-  **2004: 37,847** Charter value added maps downloaded (**41.7%** of total maps downloaded)
-  **2005 (end July): 321,202** Charter value added maps downloaded (**83.1%** of total maps downloaded). Out of these, **267,944 (83%)** were for the Indian Ocean Tsunami.

### Imagery Bank (Indian Ocean Tsunami raw data archive hosted by UNOSAT):

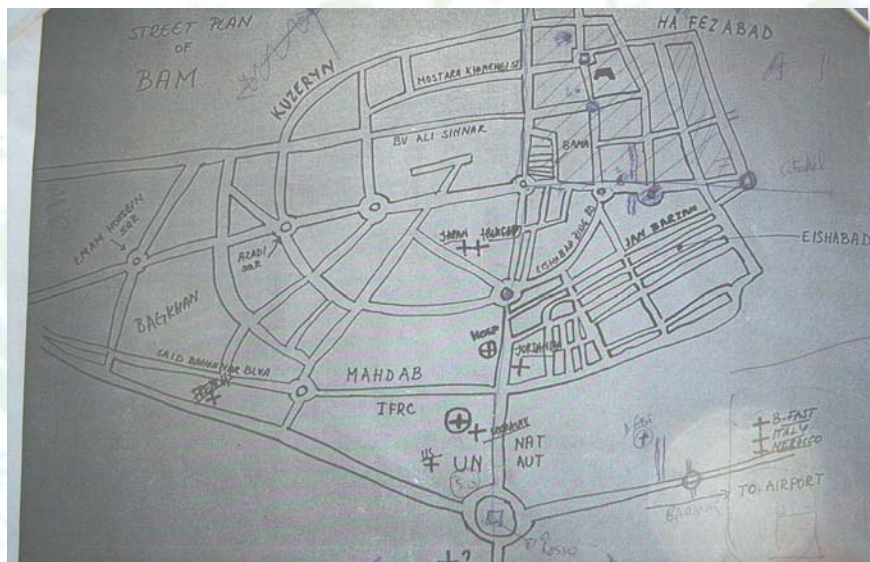
-  **2,464** files downloaded of which **235 (9.5%)** are from sensor falling under the Charter. **90.5%** of the data are very high resolution data (Ikonos and QuickBird)

## Comments

- UNOSAT has so far channeled to UNOOSA 22 requests for Charter activation and acted as Charter PM 16 times.
- In addition: for Gonaives (Haiti), Georgetown (Guyana) and Kerman (Iran) UNOSAT supported the Charter PM and distributed the end-products to the field.
- Most UN AUs do not have the necessary expertise to convert the raw data into value added products, at least not in short timeframe.
- Thus, when appointed PM, UNOSAT pools resources to provide value added products are always to the AU.
- Most UN users clearly prefer ready-to-use products,
- But, lately some have requested GIS ready data – both raster and vector.



Map used for practical purposes by  
several key actors  
(hand-drawn after walking around in the disaster zone)



Feedback from these users while looking at charter-derived map is:  
*"We would have loved to have such a map!"*

Our challenge is thus to ensure that Charter products make it the last mile

# NEPAL floods – August 2003

## Background:

In August 2003, flooding and landslides due to the heaviest monsoon rains in 30 years, hit 54 of Nepal's 75 districts. Thousands of people were forced from their homes and thousands of acres of crops were washed away. The UN Office for the Coordination of Humanitarian Affairs (UN OCHA) and the UN Development Programme (UNDP) in Nepal were among those who responded to this disaster.

## UNOSAT services provided :

In support of their need for updated geographical information, UNOSAT through the International Charter on Space and Major Disasters prepared customised up-to-date maps of the flooded areas using several types of satellite imagery (Spot 5, Envisat and Radarsat).

The maps were provided directly to UNDP Kathmandu and used by the local emergency response teams.

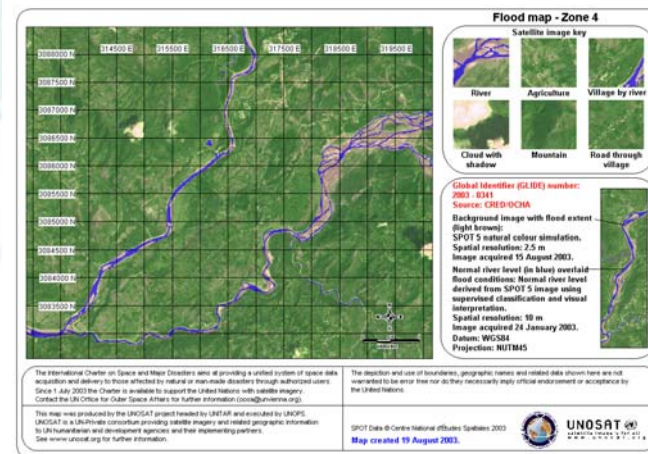
## User feedback :

"The maps were very useful in locating the present floods and landslide areas and also to see how the rivers are changing their courses. We strongly believe that such information is very useful in future planning for designing development and disaster mitigation activities"

"Many thanks for your offer. We are extremely pleased by your pro-active approach."

**Users:** UN OCHA and UNDP

**Sensors:** SPOT5, ENVISAT, RADARSAT





# Cibao Valley floods, Dominican Republic – November 2003

## Background:

The Charter was triggered on 27 November 2003 by UNOSAT on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe floods in Dominican Republic. International Federation of Red Cross and Red Crescent Societies have also expressed their interest. After a quick co-ordination with UN OCHA's Field Support Unit in New York, to make sure there were no duplications of effort, UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

## UNOSAT services provided :

In support of their need for updated geographical information, UNOSAT through the International Charter on Space and Major Disasters prepared customised up-to-date maps of the flooded areas using satellite imagery (Radarsat and Landsat)

Data analyses were carried out by SERTIT, French value added company. Flood/water detection was carried out using Radarsat images (archive and up to date images). SERTIT change detection processing chain has been used in order to extract flooded areas and soil with water saturation from Radarsat images. The information extracted from the analysis of the radar images was then inserted in the optical Landsat image used as background.

7 spacemaps were created.

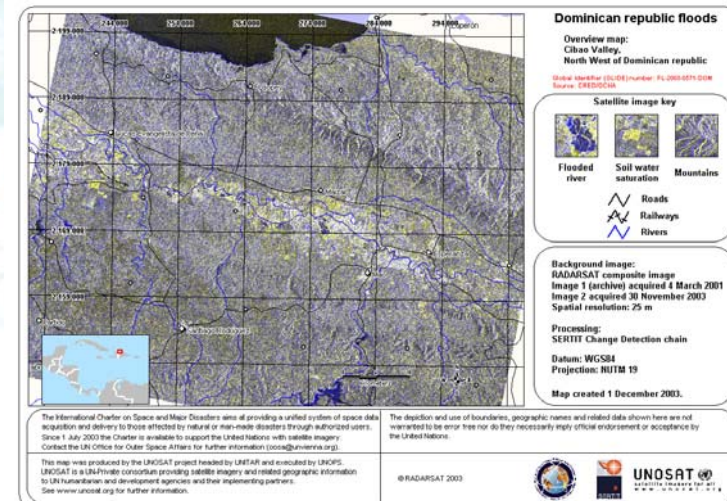
## User feedback :

"From my personal point of view these images constitute a great tool for impact assessment as well as logistics. If other layers of information such as road network and population density could be incorporated by combining satellite imagery with GIS, the maps would be greatly enhanced and its scope of use broadened significantly."

UN OCHA

**Users:** UN OCHA and IFRC

**Sensors:** RADARSAT, LANDSAT



## Leyte Island landslides, Philippines – December 2003

### Background:

The Charter was triggered on 21 December 2003 UNOSAT on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe landslides in Philippines. International Federation of Red Cross and Red Crescent Societies have also expressed their interest.

UNOSAT contacted UN OCHA in Geneva to assess the need for satellite derived products. UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

### UNOSAT services provided :

Data analyses, based on Radarsat imagery were carried out by SERTIT, partner of UNOSAT project.

Landslides detection was carried out using Radarsat images (archive and up to date images). SERTIT change detection processing chain has been used in order to extract damaged areas From Radarsat images.

But, it has not been possible to extract damaged areas for the following reasons:

Very difficult (impossible) to process automatic change detection using those 2 data:

- Archive is too old: 5 years between the 2 acquisitions (crisis acquisition and archive). It means that land cover changes are not necessary linked to the landslides
- Difficult to use ascending and descending orbit over an area with strong relief. The effects prevail and are not décorréable
- Overlapping area is very small (1/4 scene max!)

### User feedback :

No maps produced, and no user feedback

**Users:** UN OCHA and IFRC

**Sensors:** RADARSAT



# Al Hoceima earthquake, Morocco – February 2004

## Background:

A 6.5 magnitude earthquake hit Morocco at 06:28 GMT 24 February 2004. The epicenter of the earthquake was close to the city of Al Hoceima on the Mediterranean coast. According to OCHA Situation Report No. 6 (Ref: OCHA/GVA - 2004/0039), a total of 628 people lost their lives and 926 were injured. More than 15,000 people were left homeless after a total of 2,539 homes, of which nearly 2,500 in rural areas, were destroyed.

The Charter was triggered four hours later by UNOSAT on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) Disaster Assessment Coordination (DAC) Team in Geneva.

## UNOSAT services provided :

In support of their need for updated geographical information, UNOSAT through the International Charter on Space and Major Disasters prepared customised up-to-date maps of the damaged areas using SPOT 5 imagery

The maps were provided directly to UNOCHA DAC team and used by other international emergency response teams. 20 spacemaps were created.

## User feedback :

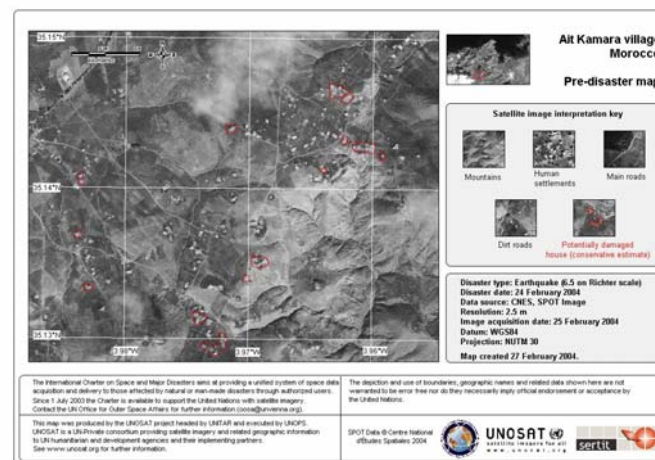
“The German Joint Information and Situation Centre (GMLZ) has the main task, to give such information to those organizations, which are involved in the operation/employment. Therefore I can give you concerning this question no direct answer but cause of my experiences in operations I am sure, that the images are very useful to this organizations.”

German Civil Security

**Users:** UN OCHA – DAC team

German Civil Security

**Sensors:** SPOT 5



# Nabire earthquake, Irian Jaya, Indonesia – February 2004

## Background:

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA) on 6 February 2004 on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) Indonesia desk in Geneva to respond to the earthquake that struck the Irian Jaya region in Indonesia on 5 February at 21:05 UTC.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

The earthquake magnitude was measured to 6.8 on the Richter scale. The location in focus was Nabire town, located at 135° 30' 20" East, 3° 21' 58" South

## UNOSAT services provided :

UNOSAT, in collaboration with Sertit, produced value added products based on analyses of SPOT 4 (pre-disaster) and SPOT 5 (post-disaster) data.

The following final product types were distributed :

Change detection map of Nabire based on analysis of SPOT 4 data acquired 24 May 2000 and 11 February 2004

Population distribution map based on Landsat 2002 data

Natural colours high resolution space map of Nabire based on 14 February SPOT 5 data.

Natural colours high resolution space map of zoomed part of Nabire based on 14 February SPOT 5 data.

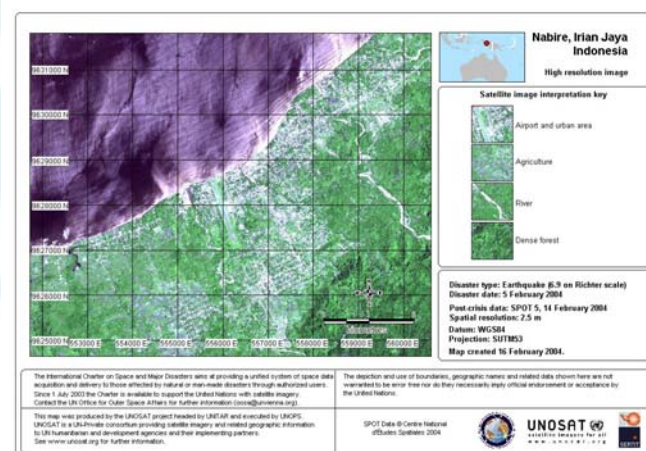
5 spacemaps were created.

## User feedback :

“Yes, I found them very useful. Particularly for the possibility of depicting changes to existing buildings. This gives you an overall idea of the potential extent of physical damages, which might assist in assessing potential requirements for emergency shelter and humanitarian assistance in general. Off course, in the case of earthquakes, timeliness is of essence. If provided within the first 24-36 hours after the event, these maps can be a great support tool to humanitarian agencies in the decision making process.”

UNOCHA

|                 |                       |
|-----------------|-----------------------|
| <b>Users:</b>   | <b>UN OCHA</b>        |
| <b>Sensors:</b> | <b>SPOT 4 &amp; 5</b> |



The International Charter on Space and Major Disasters aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through authorized users. Since 1 July 2003 the Charter is available to support the United Nations with satellite imagery. Contact the UN Office for Outer Space Affairs for further information: [www.unoos.org](http://www.unoos.org)

This map was produced by the UNOSAT project headed by UNITAR and executed by UNOSAT. UNOSAT is a UN-Private consortium providing satellite imagery and related geographic information to UN humanitarian and development agencies and their engineering partners. See [www.unosat.org](http://www.unosat.org) for further information.

The depiction and use of boundaries, geographic names and related data shown here are not warranted to be error free nor do they necessarily imply official endorsement or acceptance by the United Nations.

SPOT Data © Centre National d'Etudes Spatiales 2004



# Caprivi region floods, Namibia – March 2004

## Background:

The Charter was triggered on 31 March 2004 by UNOSAT on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe floods in Namibia. International Federation of Red Cross and Red Crescent Societies have also expressed their interest.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

## UNOSAT services provided :

In support of their need for updated geographical information, UNOSAT through the International Charter on Space and Major Disasters prepared customised up-to-date maps of the flooded areas using satellite imagery (Radarsat and Landsat)

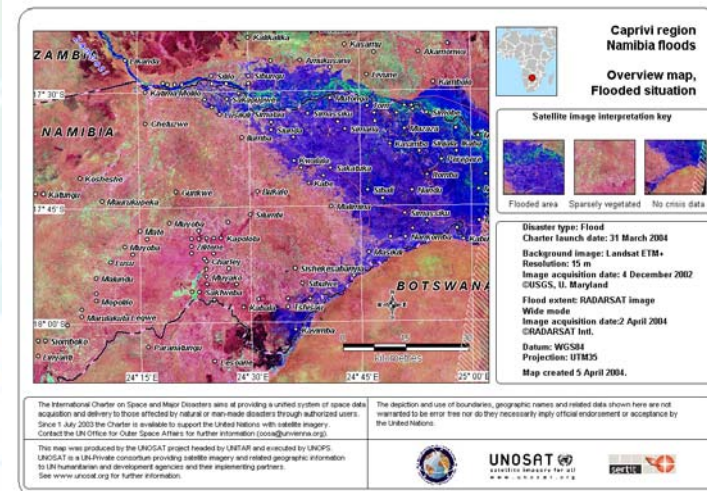
Space maps were created with pre-flood conditions highlighted on top of current flood conditions. Landsat image, used as background image, was provided in near natural colors. Flood extent was generated from RADARSAT archive and crisis images.

7 spacemaps were created.

## User feedback :

“I am writing you from ReliefWeb. I'm afraid my answers may not be very helpful, since we are not an operational organization. Instead we try to provide the response community with the information and tools needed to do their job. That is why we are always happy to receive UNOSAT maps. We feel that they can be very useful to those in the field, in trying to visualize the extent of the damage. It should also be noted that in many cases, UNOSAT (in conjunction with the Space Charter) is the ONLY source of hi-resolution satellite imagery/maps available for a given disaster.”

John Marinos - Relief Web



**Users:** UN OCHA

**Sensors:** RADARSAT, LANDSAT



## Hindu Kush region earthquake, Afghanistan – April 2004

### Background:

The Charter was triggered on 31 March 2004 by UNOSAT on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe floods in Namibia. International Federation of Red Cross and Red Crescent Societies have also expressed their interest.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

### UNOSAT services provided :

AIMS, end user for this event, has got all the facilities to process EO data in its premises. UNOSAT role, as PM for that activation, was only to deliver raw EO data requested as soon as possible to the end user.

### User feedback :

**“Please find attached the Technical report (from our Technical Team) of the images provided as a result of the 6 April 2004 earthquake in Afghanistan that prompted the triggering of the Charter. We are pleased to inform you these products were distributed to the humanitarian community immediately the image processing was completed and they found it very useful. We are sorry sending the report late, we will definitely improve our turn around time next time. These products will be posted on our website in the coming days. We thank you for the support received and we hope it will continue as we continue to serve vulnerable communities. Regards”**

**Joseph Maada Korsu Kandeh**

**Field Coordinator, NE Afghanistan**

**Users: UN OCHA - AIMS**

**Sensors: SPOT 1 & 2, IRS-P6, SAC-C**

# Ryongchon blast, Democratic Peoples Republic of

## Background: **Korea – April 2004**

On 22 April 2004 a large explosion ripped through the train station in the city of Ryongchon, Democratic Peoples Republic of Korea (North Korea), close to the border with China. The explosion was caused by an electrical short-circuit during the track switching of wagons loaded with ammonium nitrate fertilizer and tanker wagons (Source: South Korea Central News Agency, 24 April). According to Reuters (5 May), at least 161 people were killed and 1,300 injured, mostly children. The blast destroyed 1,850 homes and damaged a further 6,250 (Source: IFRC, 2 June).

UNOSAT received an SMS notification from UN OCHA Virtual OSOCC at 11:45 the 23rd of April stating the North Korea was likely to officially request international assistance during the day. Based on that, UNOPS UNOSAT immediately triggered the Charter.

## UNOSAT services provided :

UNOPS UNOSAT produced in-house the value adding products sent to the humanitarian relief community, including UN Special Representative of the Secretary General, UN OCHA ReliefWeb and Virtual OSOCC (all operational Governmental and Non-Governmental Organizations involved in OCHA coordinated activities), the UN Geographic Information Working Group (UNGIWG), IFRC, EC Joint Research Centre, AlertNet, German Red Cross, German Foreign Ministry through German Technisches Hilfswerk (THW).

Quick Bird (pre-disaster image) and SPOT 5 (2.5m, post-disaster image) analyses were carried out using ERMMapper software and final maps were produced using MapInfo Professional. Damage interpretation was carried out by UNOSAT using photo interpretation techniques.

## User feedback :

Feedback from personal interaction and phone conversation with end users on value added products was very positive. The very detailed QuickBird baseline map was timely delivered as was the damage assessment information to OCHA in New York, although higher details would further increase the value of the product, according to the users.

Both focal points were most grateful for the available Charter products and further distributed these within their teams and partners.

**Users: UN OCHA Virtual OSOCC**

**Sensors: SPOT 1 & 2, IRS-P6, SAC-C**



# Grenada island floods – September 2004

## Background:

Services (UNOPS) and the UNOSAT project on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to huge floods in Grenada island.

WFP has requested UNOSAT to trigger the Charter.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

Following Charter activation, Mr Einar Bjorgo, has been nominated PM

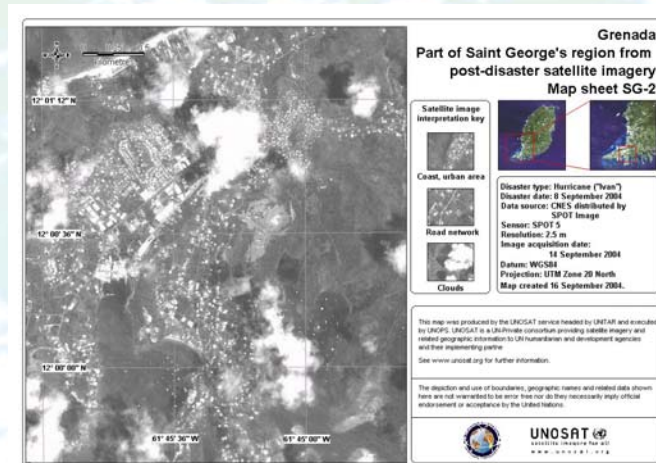
## UNOSAT services provided :

Based on Landsat and SPOT images, 20 maps have been produced by UNOSAT: 5 pre-disaster maps, and 13 post-disaster maps + 1 flyover.

## User feedback :

**Users:**            **WFPF**

**Sensors:**        **SPOT , LANDSAT**





## Gonaives floods, Haiti – September 2004

### Background:

The Charter was triggered on 27 May 2004 by the United Nations Office for Project Services (UNOPS) and the UNOSAT project on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe floods in Haiti and Dominican Republic. International Federation of Red Cross and Red Crescent Societies have also expressed their interest.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

Following Charter activation, Mr Jean Claude Favard, CNES, has been nominated PM for this event. Even if UNOSAT was not PM, its action has been the same as UNOSAT was the sole actor to have field contacts during the operation. UNOSAT has coordinated the relation between end users and Charter PM in charge of VA products

### UNOSAT services provided :

UNOSAT has disseminated 21 maps on its web site (2 made by UNOSAT, and 19 made by SERTIT)

UNOSAT has been in charge of all the contacts with humanitarian community in the field

### User feedback :

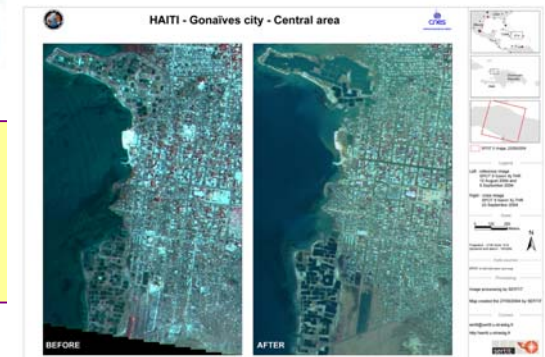
" ... Pour votre information, nous travaillons ici avec un organisme, l'UTSIG, basé au sein du Ministère de la Planification. Leur souhait serait de pouvoir intégrer les images dans leur base de données pour faire des analyses croisées. A terme, leur travail serait exploité pour fournir des plans d'aménagement du territoire en intégrant la dimension réduction du risque. Etant donné qu'ils sont l'organisme de référence en Haïti et qu'ils ont une bonne connaissance du terrain, nous pensons qu'il serait intéressant de pouvoir développer un partenariat avec eux... Il ne nous reste que quelques heures pour finaliser la rédaction de l'appel d'urgence des Nations Unies. Je retourne donc à ma tâche.

Un grand merci pour votre appui."

Michel Matera, PNUD Haiti

**Users:** UN OCHA - PNUD

**Sensors:** SPOT , RADARSAT, ENVISAT, LANDSAT



## Luzon region floods, Philippines – November 2004

### Background:

The continuous monsoon rains brought by Tropical Depression “Winnie” during the last week of November 2004 triggered massive flooding in the low-lying areas of the northern and central part of the Philippines. According to official data, the floods caused 182 persons dead, 27 injured, 37,418 families (168,214 persons) affected in 114 barangays of 31 municipalities.

The Government requested international assistance. OCHA Geneva received a very cooperative call from the Australian PM in Geneva informing that bilateral donors such as Australia, New Zealand, US, Spain, South Korea, Germany and Japan provided assistance.

The Charter was triggered 1 December to support the UN Office for the Coordination of Humanitarian Affairs (UN OCHA) with their coordination efforts to support the Government of the Philippines.

### UNOSAT services provided :

UNOSAT was assigned Project Manager (PM) on 1 December. UNOSAT outsourced almost all value added products to Sertit of France. End products were disseminated to the specific end users, as well as other users identified, including NDCC , UN Special Representative of the Secretary General, UN OCHA ReliefWeb, UNEP, WFP, IFRC, European Commission JRC, AlertNet, Italian Civil Protection Department and German Technisches Hilfswerk (THW).

All in all, UNOSAT had 23 value added products produced (3 internally and 20 outsourced). Value added products were based on SPOT 4 and SPOT 5, Landsat, DMC, SRTM DEM and LandScan 2002 data and Geographic Information System (GIS) database from Global Insight. An animation was made based on SRTM and Landsat data using Geolmage SpaceEyes software.

### User feedback :

Based on an interview with a representative from NDCC during the Global Disaster Alert System symposium organized by UN OCHA in Geneva mid-December 2004, the end users in the field, both

international community, local non governmental organizations

and the Philippine Government (through NDCC) was extremely

Pleased with the maps provided by the Charter. This was one of

the first times they were exposed to such direct and *timely* use of

EO data during disasters in the Philippines. Several of the maps

were used in daily briefings to the Philippine President (Ms Gloria Macapagal-Arroyo).

**Users:** UN OCHA–WFP–UNEP–  
JRC-IFRC-Civil protections

**Sensors:** SPOT , DMC, LANDSAT



## Asian tsunami – December 2004

### Background:

The Charter was triggered on 27 December 2004 by the United Nations Office for Project Services (UNOPS) and the UNOSAT project on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe earthquake and tsunami in Banda Aceh, Sumatra, Phuket Thailand and Maldives. UNOCHA and many other UN agencies have expressed their interest. UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

### UNOSAT services provided :

Following Charter activation, Mr Alain Retiere has been nominated PM for the three locations requested. As value added products were not produced by the Charter, the Project Manager (PM) initiated such production by UNOSAT based on analyses of LANDSAT, SPOT, RADARSAT and ENVISAT ASAR, DMC, IKONOS, QUICK BIRD images. Data analyses and map processing were carried out by UNOSAT. Due to the huge affected areas (thousand kilometers of coastal areas affected by the tsunami), UNOSAT has hosted on its web site many maps processed by other partners, such as SERTIT, WFP, UNEP-GRID, UNJLC, DLR, METRIA... More than 96 maps have been posted on UNOSAT web site.

In addition, UNOSAT has developed **IMAGERY Bank** for the benefits of all the humanitarian community. This secured database has been developed in less than one week, and is hosting more than 650 images. Imagery bank is available for any Humanitarian organization, and will be maintained by UNOSAT.

### User feedback :

A report realized in January 2005 by Institut Euro Mediterranéen des Risques Majeurs from Universita Di Corsica Pasquale Paoli, explain the interest of EO value added products for the coordination of such rescue actions.

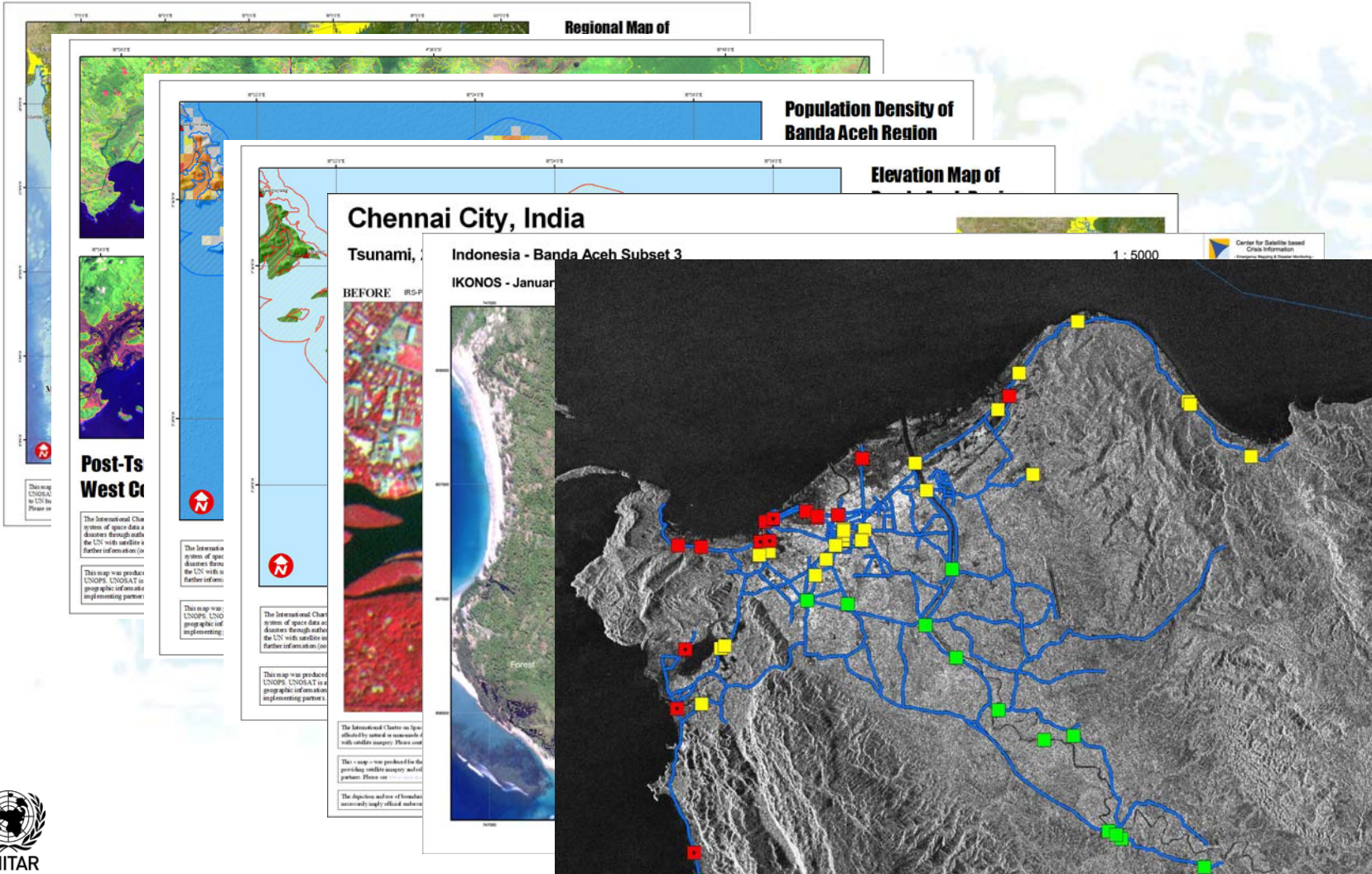
**Users:** UN Agencies, National Governments, NGOs...

**Sensors:** SPOT , ENVISAT, RADARSAT,DMC, IRS,  
LANDSAT, QUICK BIRD, IKONOS, ...

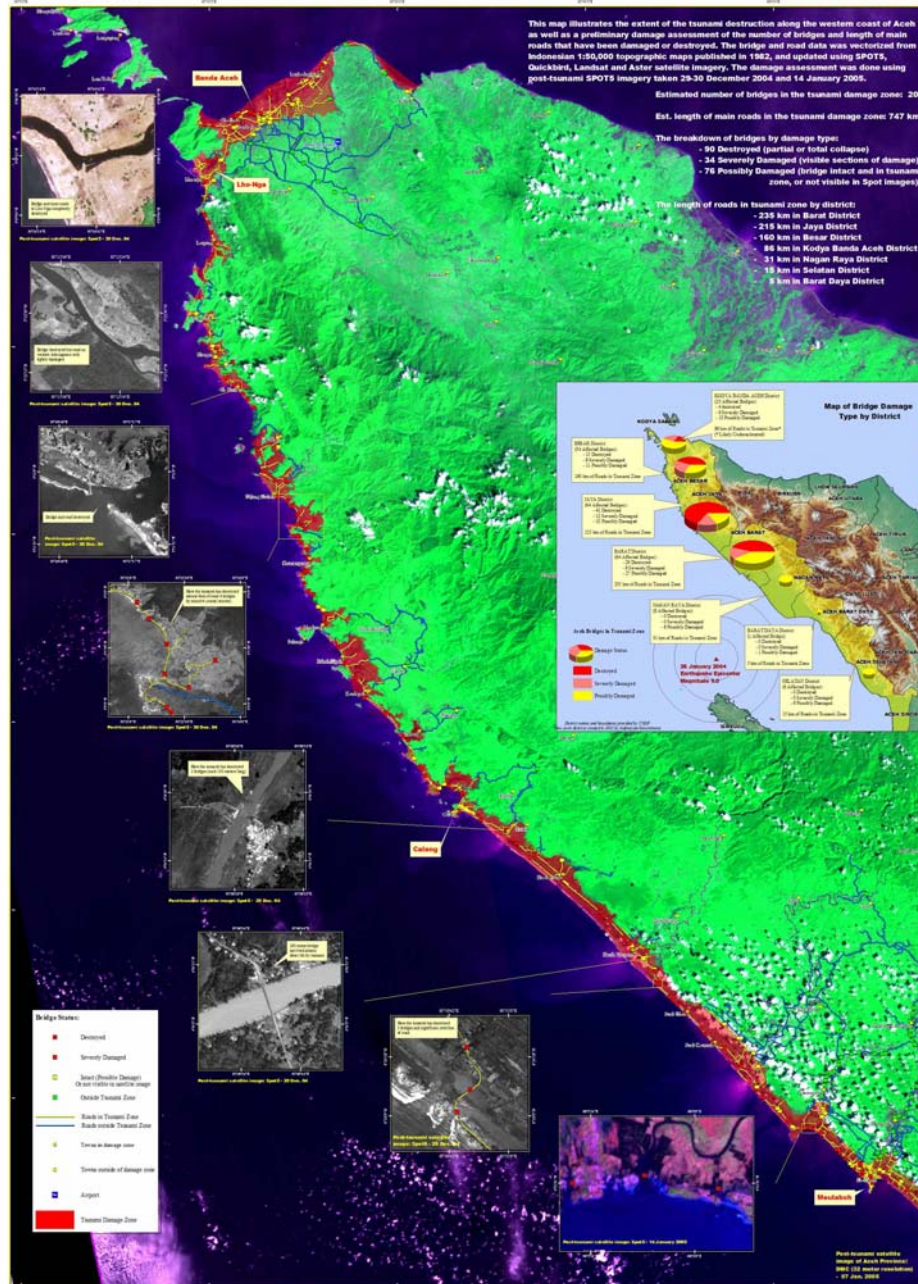


# From Rapid Mapping to Capacity Building (1)

*Sharing important knowledge during emergencies*







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## Georgetown floods, Guyana – January 2005

### Background:

Services (UNOPS) and the UNOSAT project on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to huge floods in Guyana.

WFP has requested UNOSAT to trigger the Charter.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

Following Charter activation, Mr Einar Bjorgo has been nominated PM for this event.

### UNOSAT services provided :

Based on SPOT and ASTER data, 2 maps of the area have been produced. But it is only pre-disaster maps, as no crisis data has been acquired over the affected area.

### User feedback :

No user feedback because no crisis data have been provided.

**Users:** UNOCHA, WFP

**Sensors:** LANDSAT, ASTER



# Shakidor Dam, Pasni Baluchistan, Pakistan – February 2005

## Background:

The Charter was triggered on 14 February 2005 by the United Nations Office for Project Services (UNOPS) and the UNOSAT project on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to dam burst in Pakistan.

WFP has requested UNOSAT to trigger the Charter.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

Following Charter activation, Mr Einar Bjorgo has been nominated PM for this event.

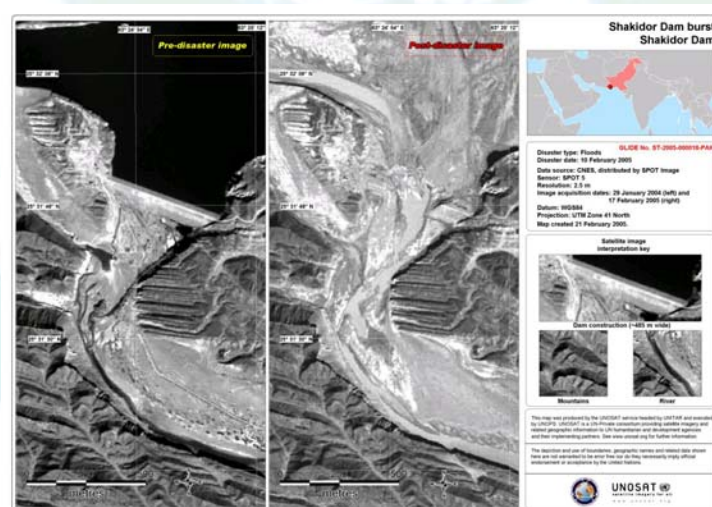
## UNOSAT services provided :

Based on SPOT data, UNOSAT has produced 8 maps of the area (pre-disaster and post-disaster) and a Flyover. These products have been disseminated through UNOSAT web site.

## User feedback :

**Users:** UNOCHA

**Sensors:** SPOT



## Ogaden region floods, Ethiopia – April 2005

### Background:

The Charter was triggered on 6 May 200 by the United Nations Office for Project Services (UNOPS) and the UNOSAT project on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe floods in Ethiopia.

WFP has requested UNOSAT to trigger the Charter.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

Following Charter activation, Mr Olivier Senegas has been nominated PM for this event.

Project Manager (PM) has coordinated its action with RESPOND consortium for the processing of value added products.

DLR, member of RESPOND consortium, was in charge of Value Added processing.

### UNOSAT services provided :

Project Manager (PM) has coordinated its action with RESPOND consortium for the processing of value added products. DLR, member of RESPOND consortium, was in charge of Value Added processing, using available data: Landsat, SPOT, ENVISAT and Radarsat sensors.

The PM received good support from the ECO and various focal points on the data provider side. The technical setup on the UN side, coordinated by UN OOSA, worked very well. As no value added products were provided by the Charter, the cost of developing these VA products were covered by UNOSAT, and DLR from RESPOND consortium.

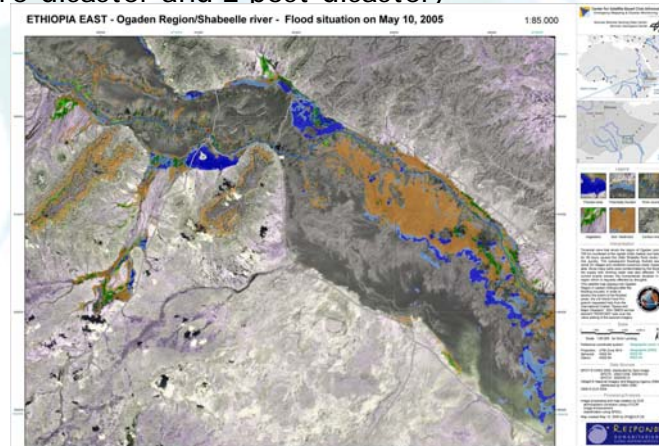
Based on SPOT, ENVISAT ASAR and RADARSAT images, 3 maps were produced (1 pre-disaster and 2 post-disaster)

### User feedback :

Not received yet

**Users:** UNOCHA, WFP

**Sensors:** SPOT, ENVISAT, RADARSAT





# IFO refugee camp floods, Kenya – May 2005

## Background:

The Charter was triggered on 4 May 2005 by the United Nations Office for Project Services (UNOPS) and the UNOSAT project on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe floods in IFO refugee camp, Kenya.

UNHCR has requested UNOSAT to trigger the Charter.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

Following Charter activation, Mr Einar Bjorgo has been nominated PM for this event.

## UNOSAT services provided :

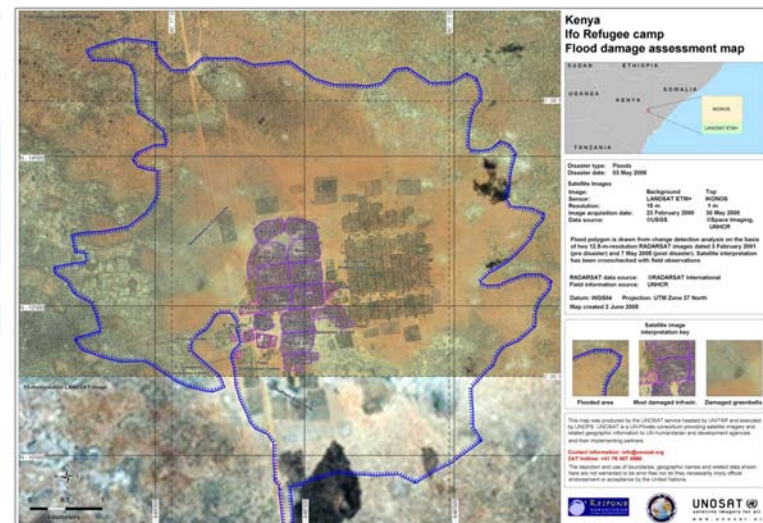
Based on Landsat, IKONOS and RADARSAT data, 2 maps of the area have been produced: pre-disaster and post-disaster. Due to data quality and time of acquisition, flood assessment has been difficult to map.

## User feedback :

During the processing, UNOSAT has been in close contact with HCR Geneva and Nairobi. But we are still waiting for final feedbacks

**Users:** UNHCR

**Sensors:** SPOT, LANDSAT





## Wuzhou Xijiang river floods, China – June 2005

### Background:

The Charter was triggered on 4 May 200 by the United Nations Office for Project Services (UNOPS) and the UNOSAT project on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) in Geneva, to respond to severe floods in IFO refugee camp, Kenya.

UNHCR has requested UNOSAT to trigger the Charter.

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA).

Following Charter activation, Mr Einar Bjorgo has been nominated PM for this event.

### UNOSAT services provided :

Based on Landsat, IKONOS and RADARSAT data, 2 maps of the area have been produced: pre-disaster and post-disaster. Due to data quality and time of acquisition, flood assessment has been difficult to map.

### User feedback :

During the processing, UNOSAT has been in close contact with HCR Geneva and Nairobi. But we are still waiting for final feedbacks

**Users:** WFP

**Sensors:** SPOT, LANDSAT

# Hurricane Stan, Central America – October 2005

## Background:

The United Nations Office for Project Services (UNOPS) and the UNOSAT project triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA) on 7 October 2005 on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) to respond to floods and landslides that struck the Central America following hurricane Stan that occurred on 3 October 2005.

UNOSAT has been nominated PM for Guatemala and Chiapas, Mexico

## UNOSAT services provided :

In support of their need for updated geographical information, UNOSAT through the International Charter on Space and Major Disasters prepared customised up-to-date maps of the damaged areas using RADARSAT and LANDSAT imagery acquired before and after the hurricane.

The maps were provided directly to UNOCHA and UNDP

10 space maps over Chiapas, Mexico, and 19 space maps over Guatemala were produced

## User feedback :

Feedbacks not yet received

**Users:** UN OCHA, UNDP

**Sensors:** RADARSAT, LANDSAT



# Muzaffarabad earthquake, Pakistan – October 2005

## Background:

UNOSAT triggered the Charter through the UN Office for Outer Space Affairs (UN OOSA) on 9 October 2005 on behalf of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) to respond to the earthquake that struck Kashmir region in Pakistan.

The earthquake magnitude 7.6 occurred at 34.43N, 3.54E on 8 October at 03:50 UTC (08:50 local time) in Pakistan.

The epicentre was at 95 km NNE of Islamabad (pop 524,000), 115 km ESE of Mingaora (pop 174,000), and 125 km WNW of Srinagar, Kashmir (pop 894,000).

## UNOSAT services provided :

UNOSAT, in collaboration with RESPOND Consortium, produced value added products based on analyses of SPOT, IKONOS, ENVISAT data.

The following final product types were distributed :

Accurate spacemaps of the most affected cities, based IKONOS, SPOT, LANDSAT, ENVISAT

data acquired before and after the earthquake

Population distribution map based on Landsat 2002 data

Landslide maps

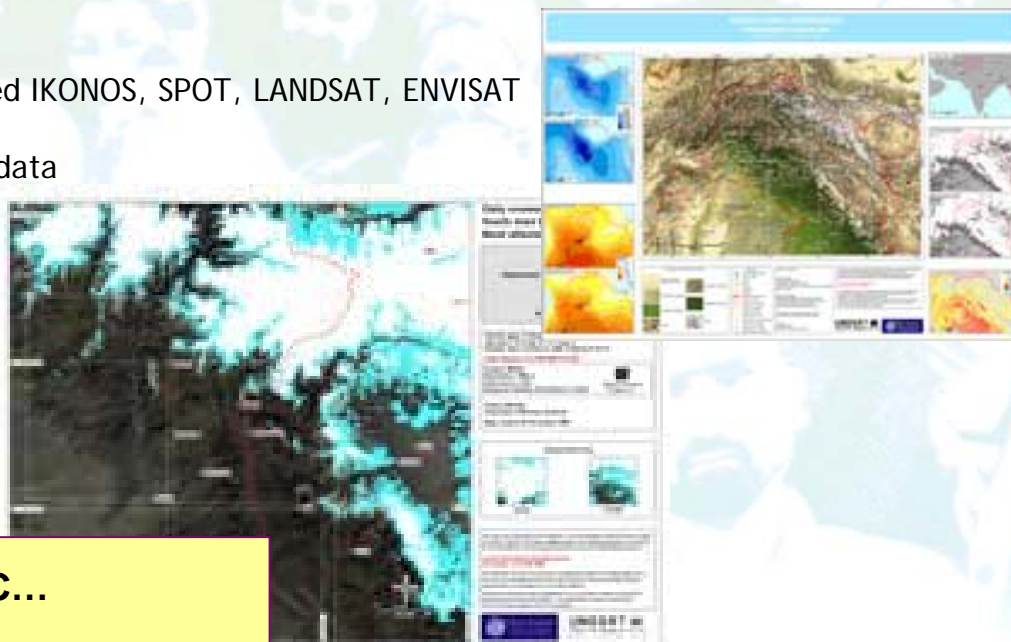
Snow cover maps (every 2 days)

More than 40 spacemaps were created.

## User feedback :

**Users:** UN OCHA, UNDP, WFP, RC...

**Sensors:** ENVISAT, SPOT, IKONOS, LANDSAT...





# Karthala volcano eruption, Comoros – November 2005

## Background:

Following Karthala eruption, Grande Comore, on 24<sup>th</sup> of November, 2005, UNOCHA as well as UNDP and the French Red Cross have requested up to date and accurate geographic information in order to estimate areas covered by ashes. 2/3 of the population of Grande Comore have been affected by the pollution of drinking water networks.

The Charter was triggered Friday 3 December by UNOSAT/OOSA on behalf of UN OCHA, UNDP, and RC.

## UNOSAT services provided :

In support of their need for updated geographical information, UNOSAT through the International Charter on Space and Major Disasters prepared customised up-to-date maps of the damaged areas using SPOT 4 and 5 imagery acquired before and after the eruption.

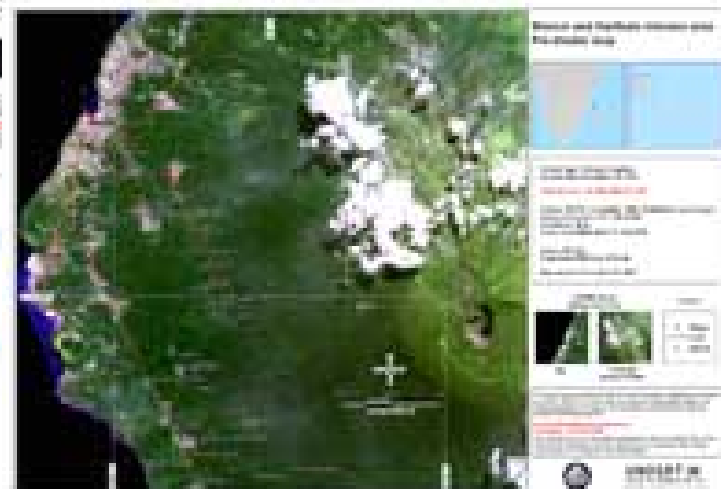
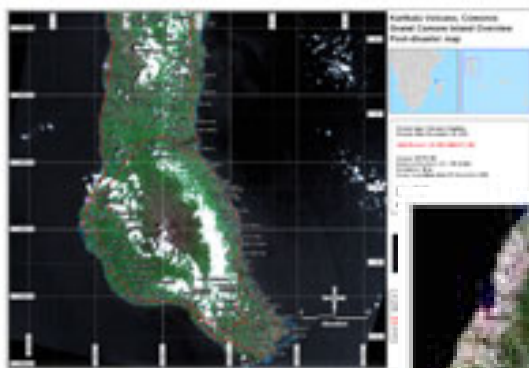
The maps were provided directly to UNOCHA, UNDP and French Red Cross.

8 spacemaps were created.

## User feedback :

Last maps on-line 14<sup>th</sup> December 2005

Feedbacks not yet received



**Users:** UN OCHA, UNDP, French RC

**Sensors:** SPOT 4 & 5, RADRASAT

# About systematic outreach mechanisms

- Information about the Charter is a standard part of UNOSAT general presentations, since July 2003.
- A main element is the Virtual On Site Operations Coordination Centre (Virtual OSOCC), a closed website used operationally by the humanitarian relief community.
- The Virtual OSOCC was first published in July 2000. Since then, 1934 discussions have facilitated the exchange of information by 2597 emergency managers from 598 Governments and disaster relief organizations.
- The Virtual OSOCC was activated in 80 emergencies, including natural disasters and complex emergencies, in which 3383 comments were provided by 817 experts from 220 countries and organizations.
- The Virtual OSOCC contains a contacts directory of 4182 persons from countries and organizations, 3965 of which are registered as users and have access privilege to the information on the Virtual OSOCC
- UNOSAT routinely posts Charter products inside Virtual OSOCC to ensure these are easily available to the staff involved in individual disasters (UNDAC team, disaster managers etc).





# Other outreach and dissemination channels

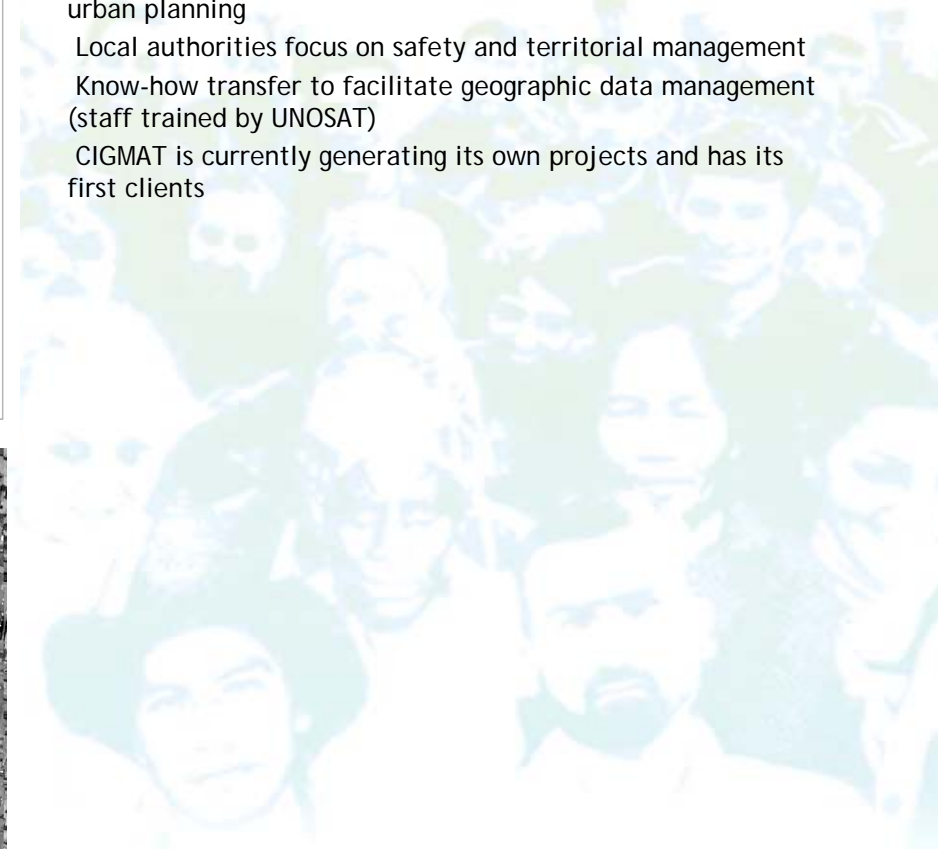
The image shows three overlapping web browser windows. The top window is Reuters AlertNet, displaying a 'Mapping Update - Indonesia' article from January 10, 2005, with a satellite map of Indonesia. The middle window is ReliefWeb, showing a 'Philippines: Disaster area overview' page with a satellite image and a list of recent updates from various sources like USAID and DFO. The bottom window is the Disaster Management Information System (DMIS) website, featuring a 'Special focus: Asia earthquake and tsunami Indonesia - Maps' section with a table of map resources.

| Name                                                                                        | Source    | Format | Size   | Thumbnail |
|---------------------------------------------------------------------------------------------|-----------|--------|--------|-----------|
| Damaged Roads and Bridges Along the Western Coast of Aceh Province- Updated 2 February 2005 | UNOSAT    | [JPEG] | 853 KB |           |
| Post-Tsunami Image along West Coast of Aceh Province                                        | UNOSAT    | [JPEG] | 309 KB |           |
| Indonesia: Districts affected by earthquake and tsunami                                     | Reliefweb | [PDF]  | 283 KB |           |
| Damaged primary roads and bridges along the western coast of Aceh Province                  | UNOSAT    | [JPEG] | 626 KB |           |

# Implementation of a GIS resource center - CIGMAT

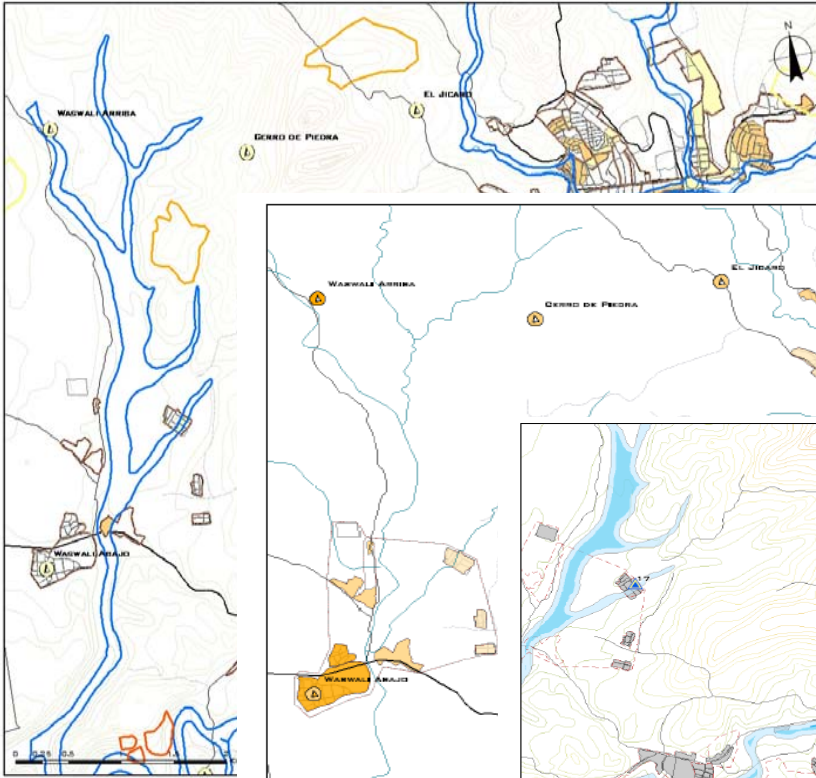


- Establishment of GIS office for improved risk assessment and urban planning
- Local authorities focus on safety and territorial management
- Know-how transfer to facilitate geographic data management (staff trained by UNOSAT)
- CIGMAT is currently generating its own projects and has its first clients

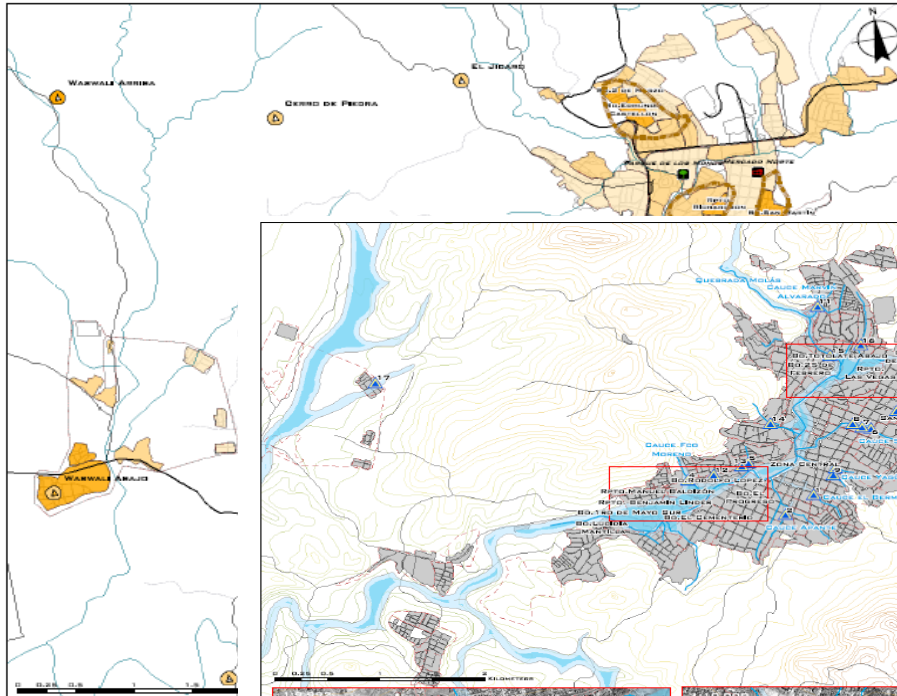




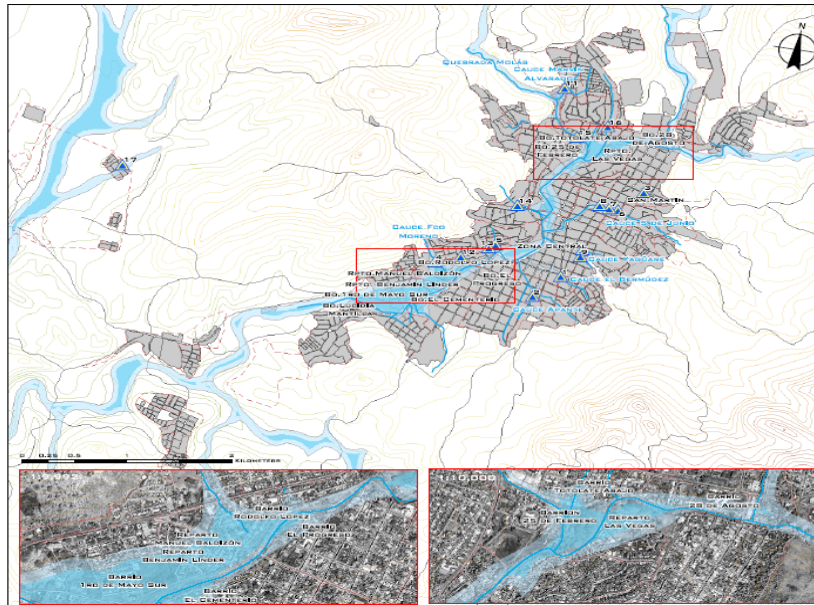
# Risk identification at local level



PLAN DE DESARROLLO URBANO  
**ALMATAT**  
ALCALDIA MUNICIPAL DE MATAGALPA  
**PPT** OFICINA DE PLANIFICACIÓN TERRITORIAL  
EVALUACIÓN DE RIESGOS DE ORIGEN NATURAL



PLAN DE DESARROLLO URBANO  
**ALMATAT**  
ALCALDIA MUNICIPAL DE MATAGALPA  
**PPT** OFICINA DE PLANIFICACIÓN TERRITORIAL  
EVALUACIÓN DE LA VULNERABILIDAD GLOBAL



PLAN DE DESARROLLO URBANO  
**ALMATAT**  
ALCALDIA MUNICIPAL DE MATAGALPA  
**PPT** OFICINA DE PLANIFICACIÓN TERRITORIAL  
AMENAZA DE INUNDACION

**LEYENDA**

LLANURA DE INUNDACION / AMENAZA BAJA  
LLANURA DE INUNDACION / AMENAZA MEDIA  
PUNTO CRITICO / AMENAZA ALTA

**LEYENDA**

1. MONTAÑA: ZONA QUE SE DESARROLA DE MANERA REGULADA EN EL MARCO D. PLANEA  
2. AVANTE: TERRENO CON RIESGO QUE SE TIENE QUE MANTENER SIN DESARROLLAR POR EL MOMENTO  
3. SAN MARIN: MANEJO INDETERMINADO  
4. FRONTERA: ZONA DE CONTACTO CON DESARROLLO URBANO  
5. EL YABURU: ZONA DE CONTACTO INDETERMINADO FALTA UNOS METROS PARA EL RIEGO  
6. EL JICARO: CALLES QUE ATAVAN EN EL CENTRO DE LA URBANIZACION DE SAN MARIN QUE ROZAN POR EL DISEÑO DE SAN MARIN, ADEMAS ESTA CONVENCION POR APERTURA Y CALIDAD  
7. YABURU: CALLES QUE ROZAN LA CALLE QUE RECIBEN LA SUFICIENCIA DE SUFICIENCIA  
8. LA PERROTA: CALLES QUE ROZAN LA CALLE QUE RECIBEN LA SUFICIENCIA DE SUFICIENCIA  
9. MARIN: CALLES QUE ROZAN LA SUFICIENCIA DE SUFICIENCIA  
10. MONTAÑA: ZONA QUE SE DESARROLA DE MANERA REGULADA EN EL MARCO D. PLANEA  
11. AVANTE: TERRENO CON RIESGO QUE SE TIENE QUE MANTENER SIN DESARROLLAR POR EL MOMENTO  
12. SAN MARIN: MANEJO INDETERMINADO  
13. FRONTERA: ZONA DE CONTACTO CON DESARROLLO URBANO  
14. EL YABURU: ZONA DE CONTACTO INDETERMINADO FALTA UNOS METROS PARA EL RIEGO  
15. EL JICARO: CALLES QUE ATAVAN EN EL CENTRO DE LA URBANIZACION DE SAN MARIN QUE ROZAN POR EL DISEÑO DE SAN MARIN, ADEMAS ESTA CONVENCION POR APERTURA Y CALIDAD  
16. YABURU: CALLES QUE ROZAN LA CALLE QUE RECIBEN LA SUFICIENCIA DE SUFICIENCIA  
17. LA PERROTA: CALLES QUE ROZAN LA CALLE QUE RECIBEN LA SUFICIENCIA DE SUFICIENCIA  
18. MARIN: CALLES QUE ROZAN LA SUFICIENCIA DE SUFICIENCIA

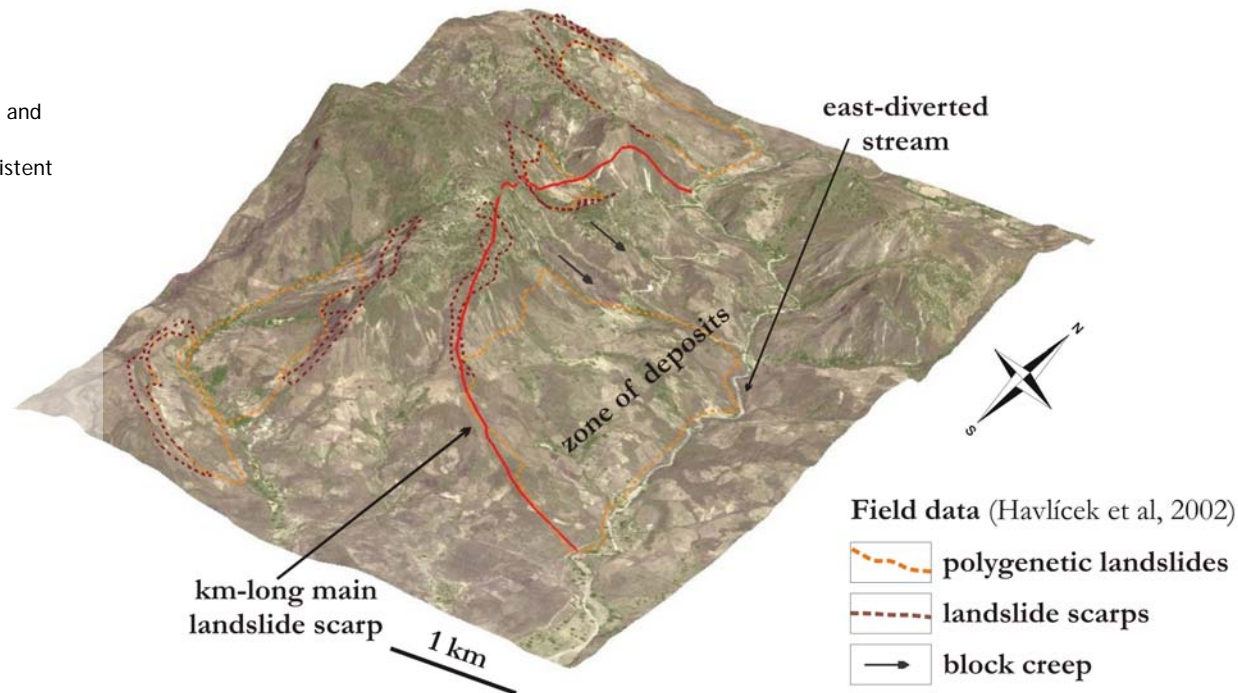
ELABORADO POR: MUEL J. MORALES - PPT  
FECHA: 12.01.2004

**10**

Matagalpa flood preparedness

# Risk identification at local level: Matagalpa landslide risk assessments using 3D analysis tool

Tailored for detection of landslides and recent debris and mud flows at scales up to 1:25'000 (master plan)  
 Satellite image detected hazard phenomena are consistent with field observations  
 Qualitative monitoring of landslide activity through vegetation disturbance  
 Senior geologist interpreter required



## The suggested way forward from UN perspective (1)

1. Acknowledge that many disasters go un-noticed in international media and the potential for EO services to support such “hidden disasters” is critical and therefore **systematically accept the Charter activations requests recommended by the United Nations Office for Humanitarian Affairs** when considering the deployment of UNDAC teams.
2. Recognize the considerable need for EO data during complex emergencies, in support to un-armed civilian populations affected by internal or international conflicts, even when natural disasters emergency are taking place and therefore **positively consider request of Charter activations** conveyed by UNOOSA and UNOSAT at the request of UN Authorized Users, **when approved by UN OCHA and/or concerned UN Humanitarian Coordinator(s)** in case of complex emergencies.



## The suggested way forward from UN perspective (2)

3. **Consider the need for very high resolution data** extending what is possible from SPOT 5 and the IRS series and follow-up EO programs as well as from other commercial sources, i.e. Ikonos and QuickBird level of details in the meantime.
4. Acknowledge the need for **covering an area much wider than the standard 60 km by 60 km** currently offered through the Charter. Should funding limitations be an obstacle to such an expansion and if deemed appropriate by the Charter Board, the UN can offer contributing to a joint resource mobilization effort.
5. Recognize that even though in some cases products are delivered timely, there is a strong need to receive information in the field much quicker than what is currently the case for the average Charter activation. **The Charter signatory organizations should therefore consider the improvements measures suggested in the presentation:** single focal point, single repository and the immediate delivery of archive data

## The suggested way forward from UN perspective (3)

6. Consider adopting a wider definition of disaster management, systematically **authorizing the use of the raw data beyond the emergency phase** until full completion of recovery needs of affected populations.
7. Recognize the overall usefulness of the geographic information generating thanks to the Charter activations at the field level of operational disaster management, acknowledge the current limitations faced in distributing the information and therefore **consider extending the Charter scope to space applications others than Earth Observations**, in particular system devoted to telecommunication and navigation, in the context of emergencies.

## UNGIWG TG3 - 2006 Work plan

1. Several TG3 activities have been successfully implemented during the last year. **It is important to follow up and consolidate services.**
2. **Each organization dedicates a focal point** for updating the UNGIWG VHR meta-database in order to complete it and mainstream it.
3. Based on successful successive pilot projects carried out so far, UNTG3 – RS will engage in **Grid technologies applications** in view of leveraging slow/instable connectivity problems faced by field users in access RS/GIS resources served through the Web.
4. UNGIWG should endorse the establishment under TG3 – RS of a **USER FOCUS GROUP (UFG)** with key UN humanitarian agencies/partners to negotiate wider membership within the Charter “Space and Major Disasters” and increase weight in GMES (RESPOND) and GEOSS.
  - **First meeting of UFG proposed to be held in Geneva, before end of March date to be determined**