



# **International Charter 'Space and Major Disasters'**

**space-based information in support of relief efforts after  
major disasters.**

**Jean-Claude Courteille  
CNES**



**Worldwide, millions of people live in areas prone to major disasters.**

**Earth-observing satellites can help mitigate the effects of disasters on human lives and property.**



# History

Following UNISPACE III, the **Centre National d'Études Spatiales** (CNES) and the **European Space Agency** (ESA) initiated the International Charter.



© ESA – S. Corvaja

The **Canadian Space Agency** CSA signed the Charter on October 20, 2000.

**Charter declared operational** as of November 1, 2000

Now composed of **15 member agencies** from 12 countries + Europe.



# Charter Members

*CSA*  
**Canada**

*NOAA  
USGS*  
**USA**

*INPE*  
**Brasil**

*CONAE*  
**Argentina**

*UKSA/DMC*  
**UK**

*CNES*  
**France**

*DLR*  
**Germany**

*ESA - 2000  
EUMETSAT*  
**Europe**

*ROSCOSMOS*  
**Russia**

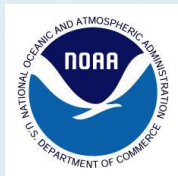
*ISRO*  
**India**

*CNSA*  
**China**

*KARI*  
**Korea**

*JAXA*  
**Japan**

**15 members in 2015**



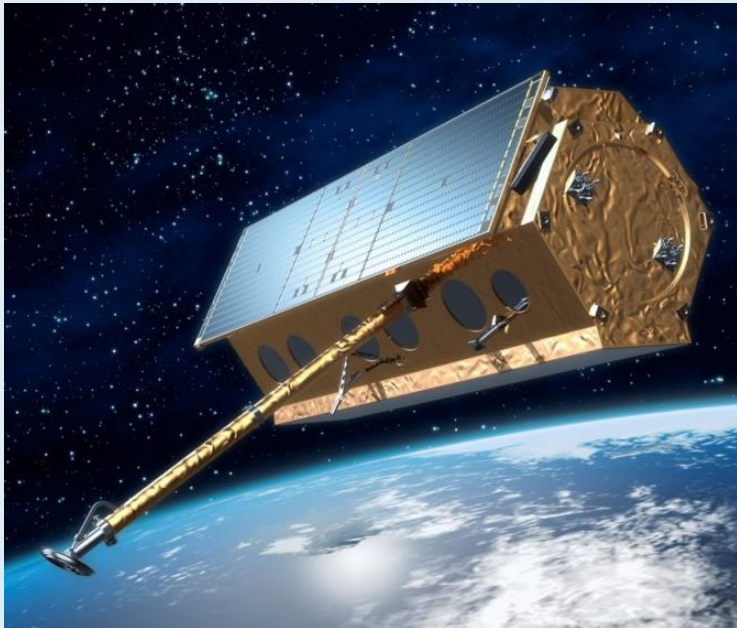
## What is the Charter?

An International agreement among participating Agencies to provide space-based data and information in support of relief efforts during emergencies caused by major disasters.



## What is the Charter?

The Charter brings together new and efficient space-based technologies to support disaster management.



Space agencies contribute

- **Priority satellite tasking**
- Archive retrievals
- Organisation of map production

# Disaster Types Supported



## Natural events

Earthquakes  
Fires  
Floods  
Ice jams  
Landslides  
Tsunamis  
Ocean storms  
Volcanic eruptions

## Man-made events

Oil spills  
Industrial accidents

**A major disaster is a large, often sudden event with high impact in terms of lives and/or infrastructure & environment.**

(slow-onset disasters, such as droughts, are not covered by the Charter)





# Limited mandate of the Charter



## THE DISASTER RISK MANAGEMENT CYCLE



**DISASTER RISK MANAGEMENT CYCLE (DRMC) DIAGRAM**

**Definitions:**

**Mitigation/Prevention:**

Activities which eliminate or reduce the chance of occurrence or the effects of a disaster.

**Preparedness:**

Planning on how to respond to disasters should they occur. This includes the provision of legislation, trained personnel

The Charter only supports the **phase of immediate response** to a disaster.

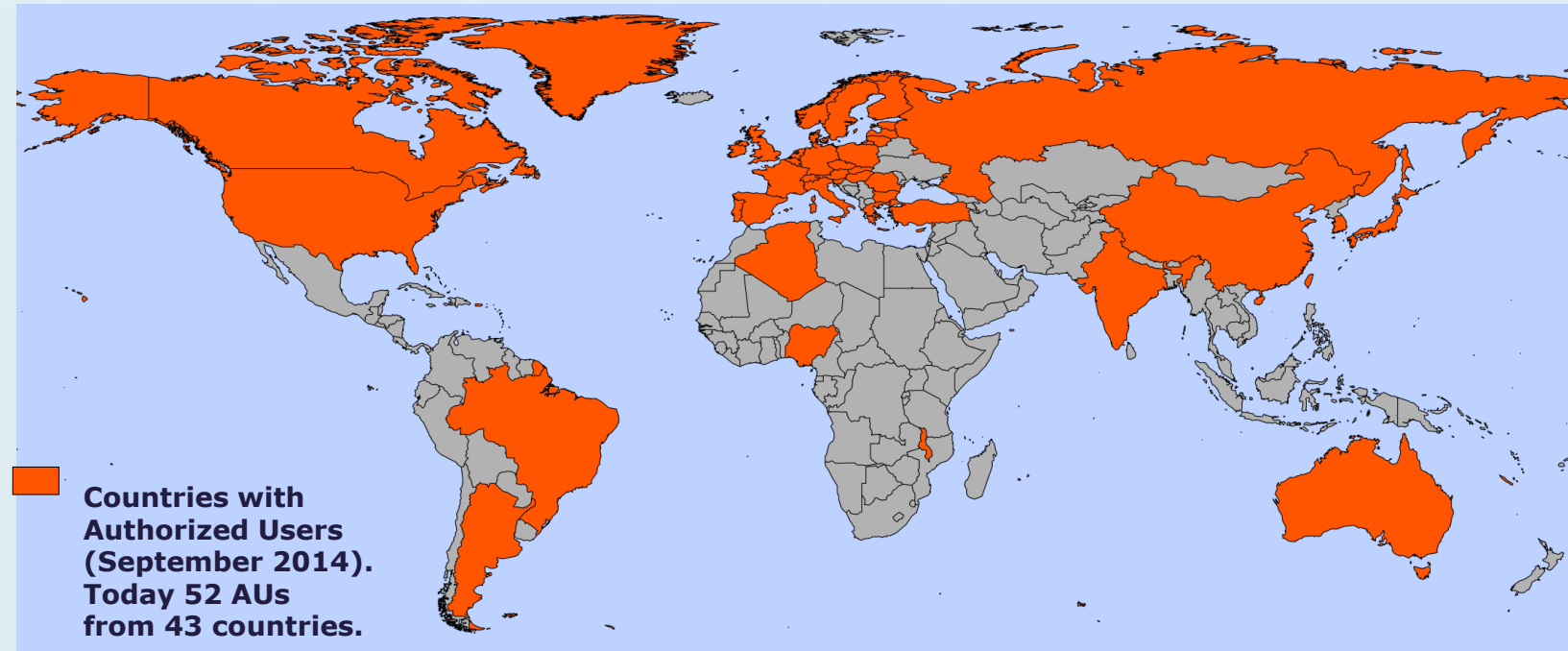
Charter activations generally last for about **1-4 weeks**.





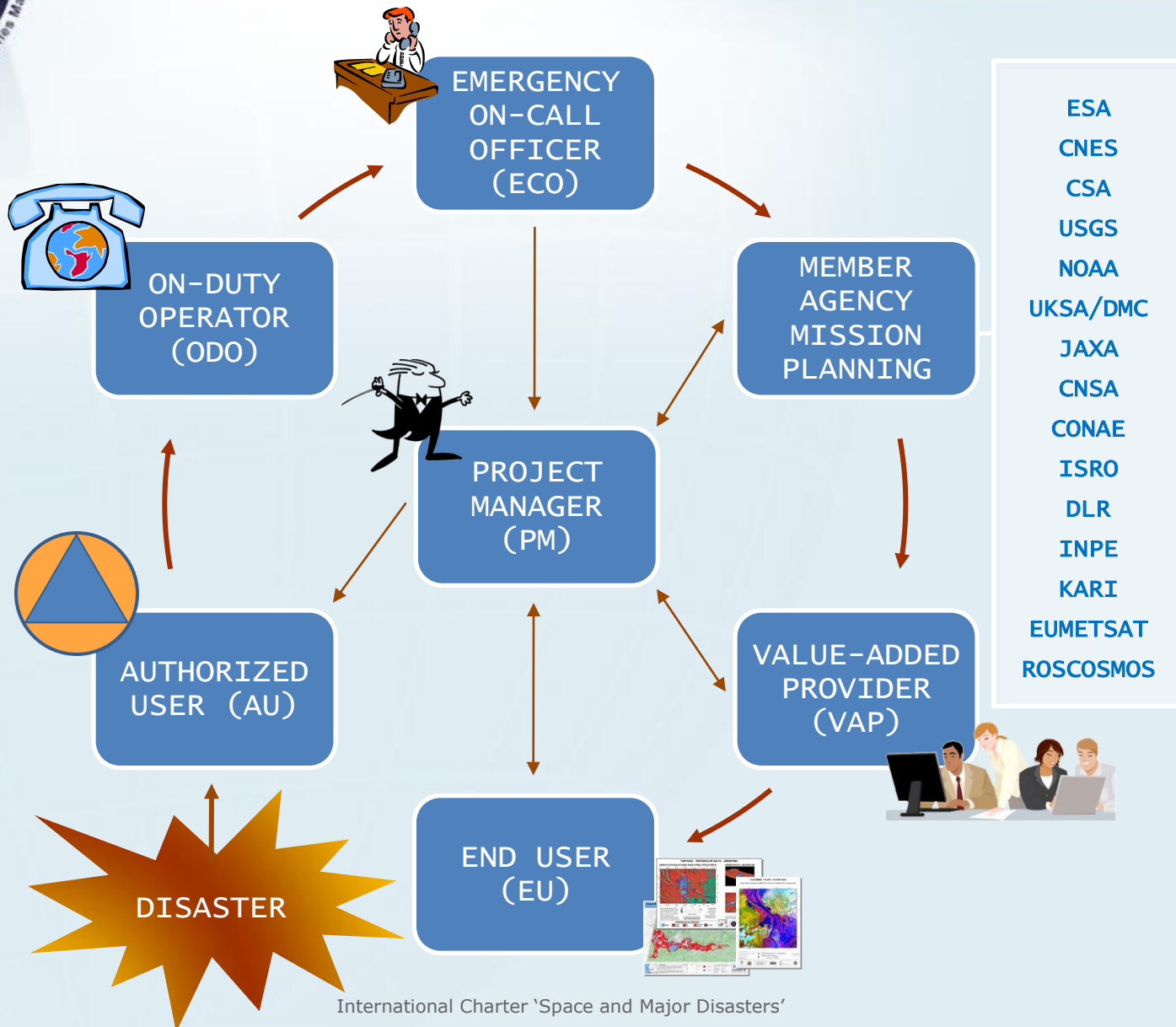
# Mechanisms to Activate the Charter

- **Direct activation (by the Authorized Users)**
- **Activation via an Authorized User on behalf of a user from another country without AU**
- **Activation via the UN for UN users**
- **Activation for Asia Pacific users via Sentinel Asia:**

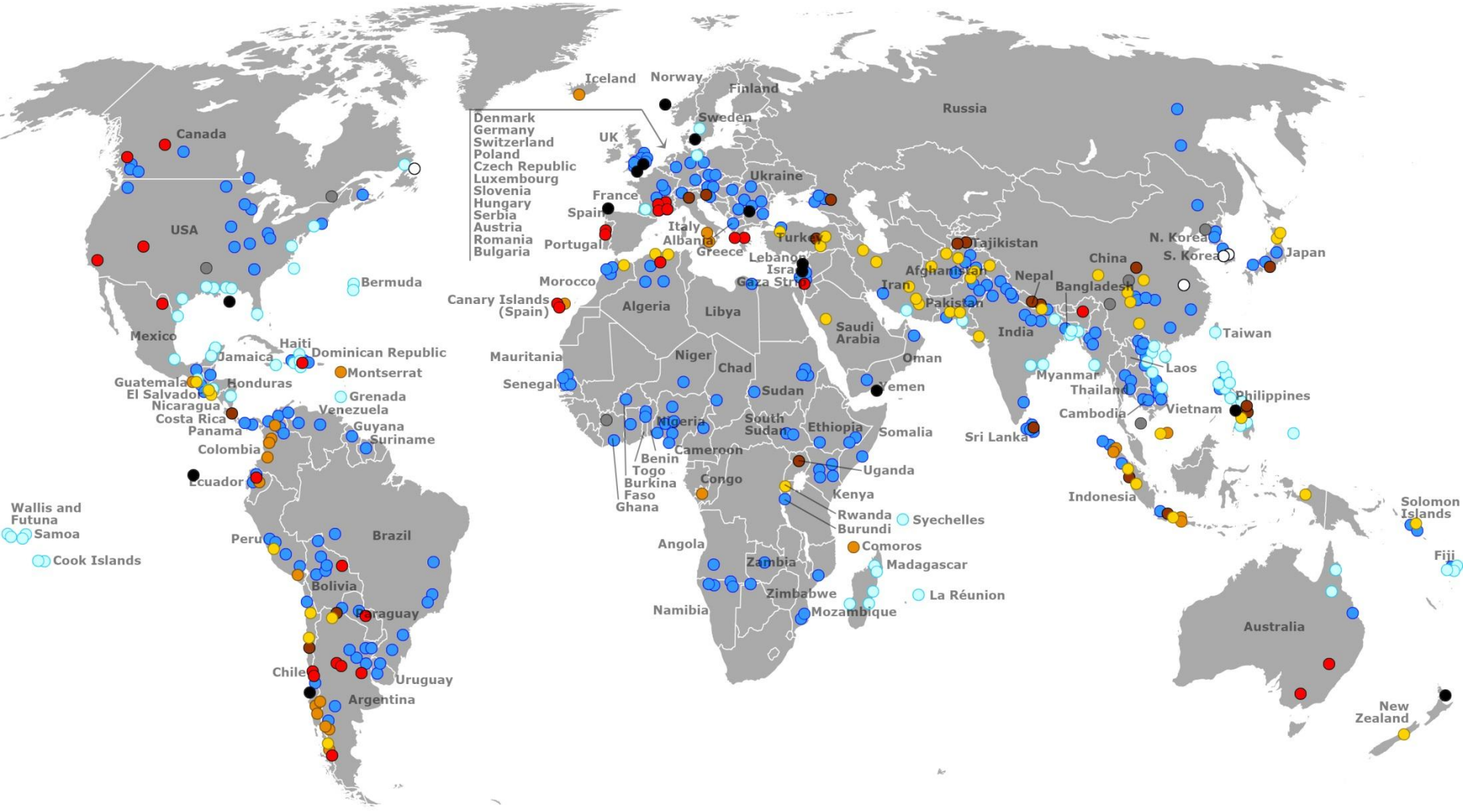




# Charter Operational Loop



# Activation Distribution

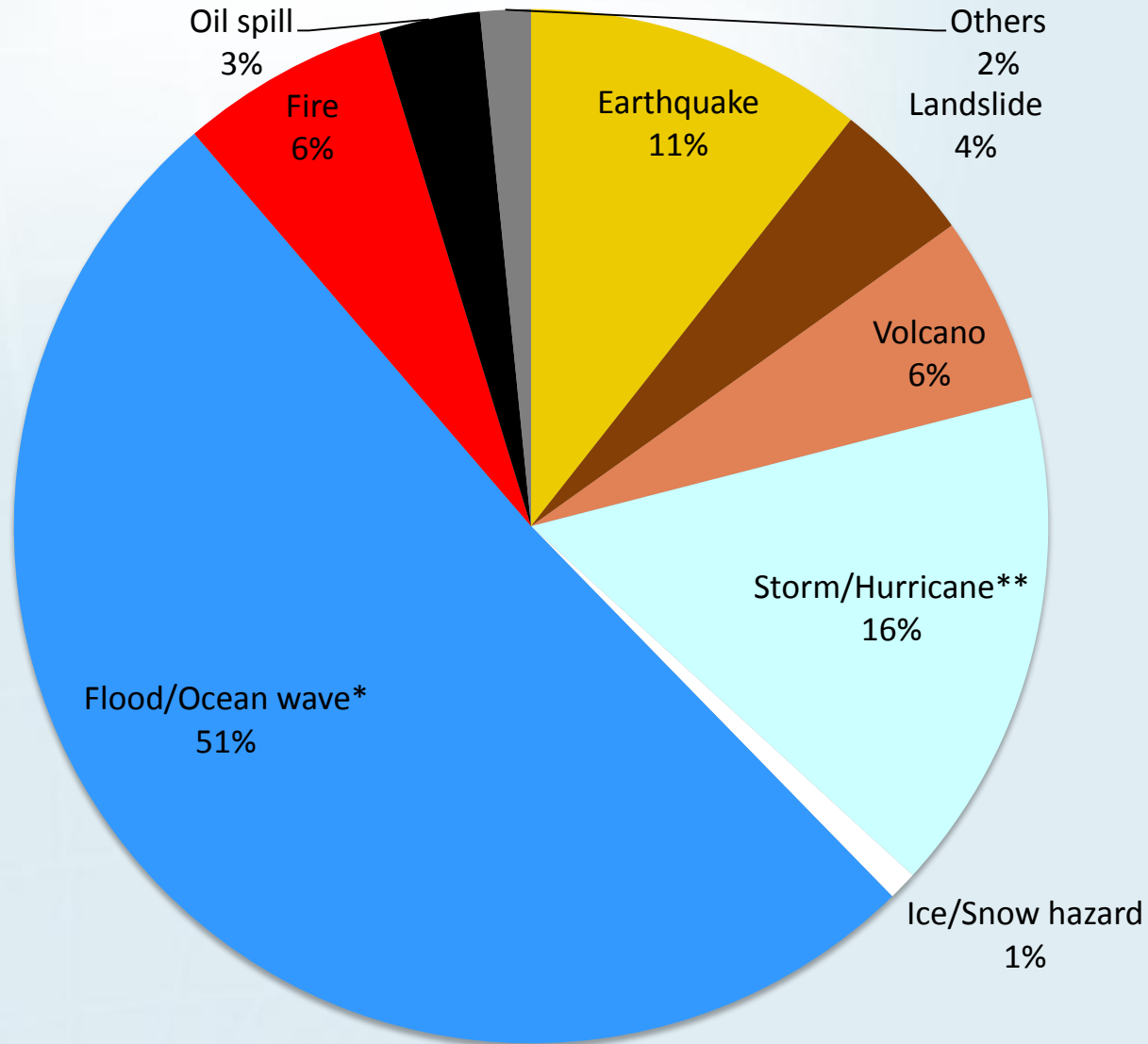


**Legend:** ● Earthquake ● Landslide ● Volcano ● Storm/hurricane ● Flood/ocean wave ○ Ice/snow hazard ● Fire ● Oil spill ● Other

**As of January 2, 2015 – 443 Activations**



# Activations by Disaster Type

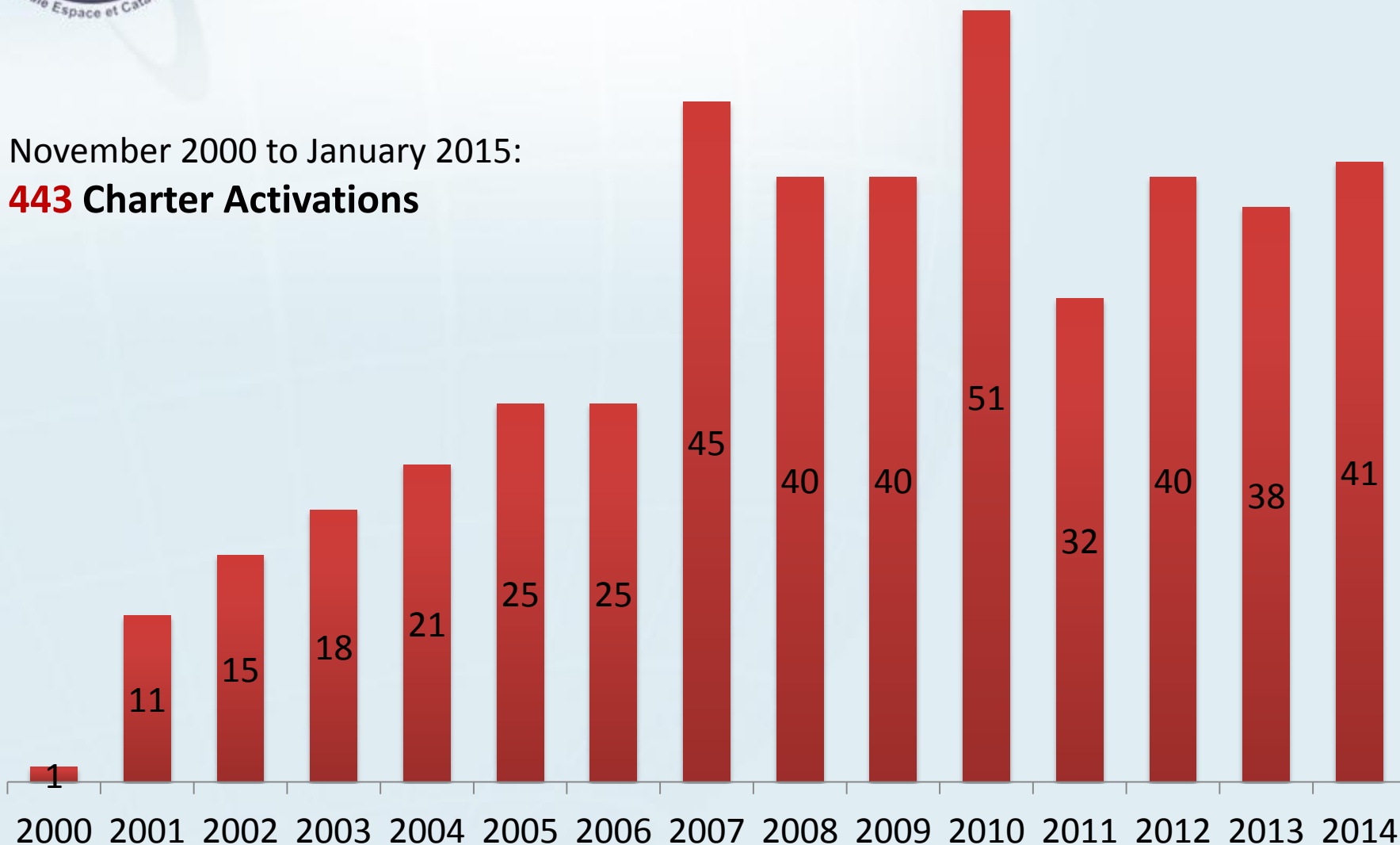




# Number of Activations

November 2000 to January 2015:

**443** Charter Activations



# Universal Access

Launched in September 2012

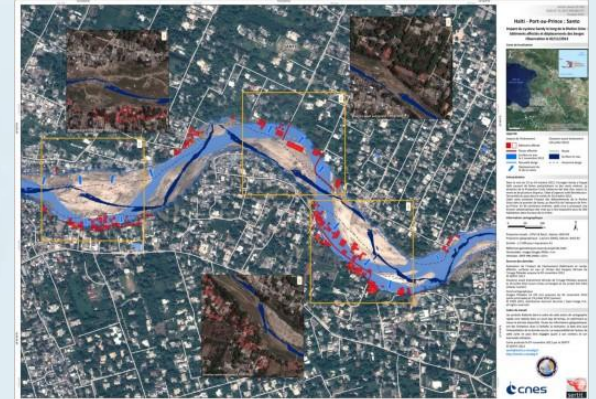
Any **national disaster  
management authority**  
can apply to become a  
Charter Authorised User



# Conditions for becoming an Authorised User



1. be a **national disaster management authority** or its delegated agency in that country
2. have the **capacity to download and use maps**
3. be able to **submit and pursue an activation request in English**





# Registration

A registration form\* is available for national authorities to express interest in becoming a Charter Authorised User.

1. The candidate fills in the questionnaire providing all required information.
2. The questionnaire, *with an official cover letter from the organisation*, must be sent to:  
[ExecutiveSecretariat@disasterscharter.org](mailto:ExecutiveSecretariat@disasterscharter.org)
3. The request is assessed by the Charter members.

\*The form **may be downloaded** together with the **UA Information brochure** from the Charter website:

<https://www.disasterscharter.org/web/guest/activating-the-charter>







# Charter website: UA Documents

<https://www.disasterscharter.org/web/guest/activating-the-charter>

You are here [Home](#) > [Activating the Charter](#)

## - Activating the Charter

There are several [mechanisms to activate the Charter](#). It is based on a pre-defined list of appointed users, known as 'Authorized Users' (AUs). Until now AUs are typically disaster management authorities, from countries of Charter member agencies, able to request Charter support for emergencies in their own country, or in a country with which they cooperate for disaster relief.

Since its inception, the Charter has demonstrated a strong commitment to expanding its number of users. Initiatives include collaboration with UNITAR/UNOSAT and UN OOSA, active in many countries and who can submit requests to support in-country UN relief agencies, and Sentinel Asia, a regional network for Earth observation-based Emergency Response in 32 countries.

## Universal Access

Building on a decade of success in making satellite data available for disaster response, the International Charter is now opening its doors even wider. The Charter Members have adopted the principle of Universal Access to further strengthen the Charter's contribution to disaster management worldwide. Any national disaster management authority will be able to submit requests to the Charter for emergency response. Proper procedures will have to be followed, but the affected country will not have to be a Charter member.

Universal Access benefits national disaster management authorities in countries beyond those of the Charter members, previously unable to make direct requests to the Charter.

A registration process is in place for national authorities interested in participating in the Charter as an "Authorized User". This process will validate the ability of national authorities to access and use Charter assets for disaster response, in accordance with Charter operational procedures. Steps and applicable conditions are explained in the Charter's [Universal Access Information Brochure](#) available together with its [Registration form](#).

# Landslide in Indonesia, December 2014



RESPON TANGGAP DARURAT BENCANA BERBASIS DATA SATELIT  
SPACE-BASED DISASTER EMERGENCY RESPONSE

**TANAH LONGSOR**  
LANDSLIDE  
KECAMATAN KARANGKOBAR, KABUPATEN BANJARNEGARA, PROVINSI JAWA TENGAH  
KARANGKOBAR SUBDISTRICT, BANJARNEGARA DISTRICT, CENTRAL JAVA PROVINCE

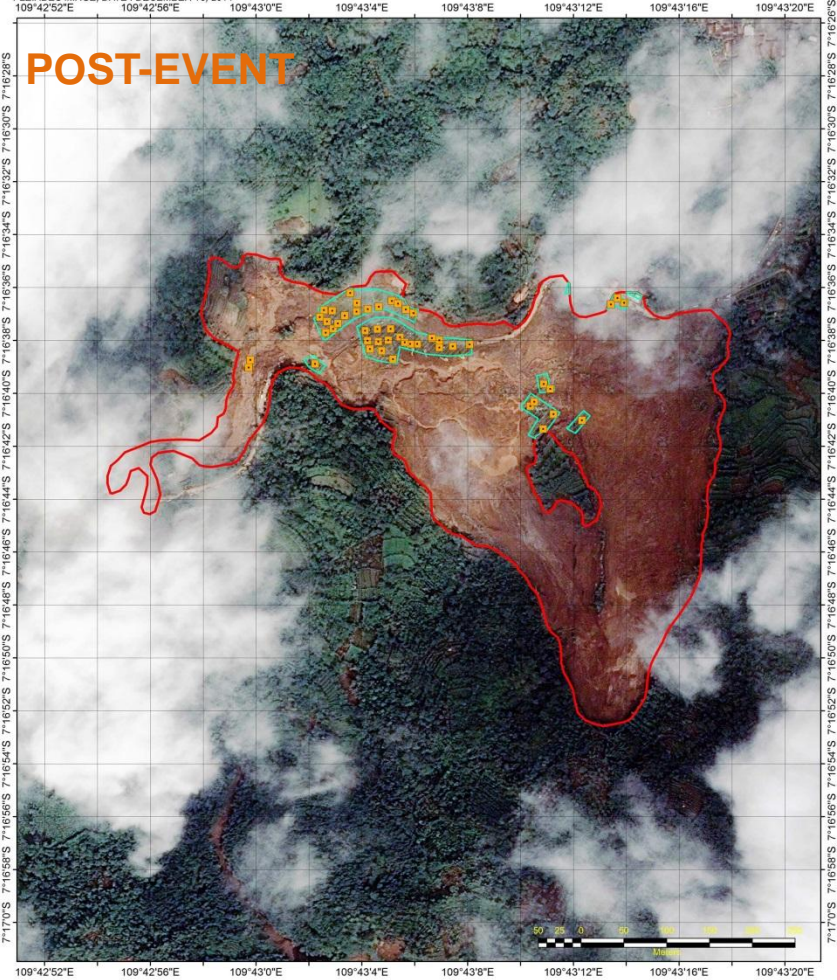
PROYEKSI GEODETIK  
Projection Geodetic  
DATUM WGS 84  
Datum WGS 84

CITRA PLEIADES TANGGAL : 18 APRIL 2014  
PLEIADES IMAGE, DATE : APRIL 18, 2014

SEBELUM LONGSOR  
BEFORE LANDSLIDE

CITRA PLEIADES TANGGAL : 16 DESEMBER 2014  
PLEIADES IMAGE, DATE : DECEMBER 16, 2014

SETELAH LONGSOR  
AFTER LANDSLIDE



Wilayah Longsor  
Landslide region

Daerah permukiman terkena longsor  
Settlement areas affected by landslide

Titik lokasi rumah terkena longsor  
Location of the houses affected by landslide

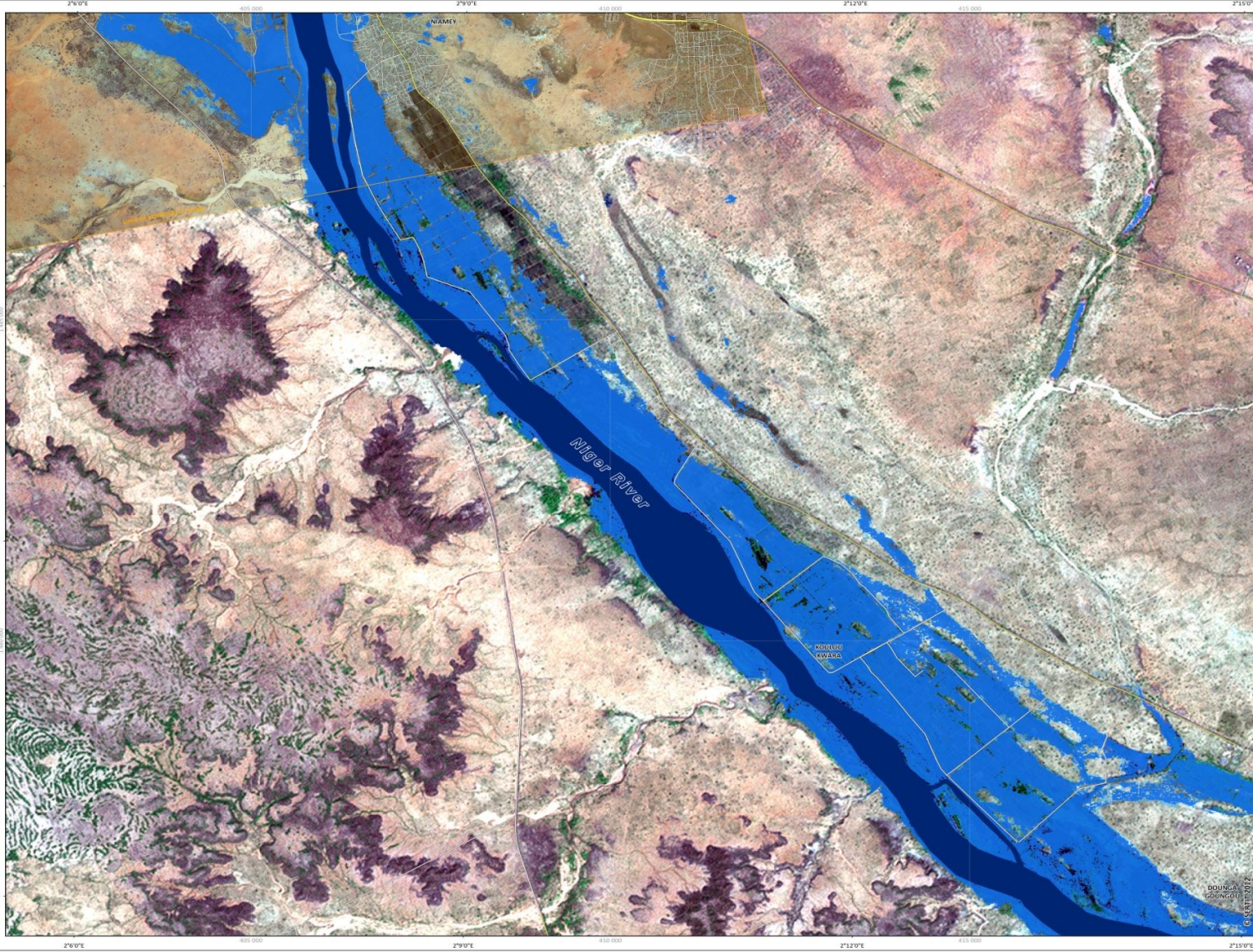
PLEIADES © CNES 2014, Distribution Airbus DS

Pemutakhiran, kompilasi & interpretasi data : 17 Desember 2014.  
Data updating, compilation and interpretation : December 17, 2014.

LPN\_QR\_TL\_BANJARNEGARA\_20141217\_Release\_2H



# Niger. Floods. September 2012. Map produced based on radar data (Radarsat-2 and TSX)



Charter Call 405  
Glide No. FL-2012-000141-NER  
Product No. 11

### NIGER - Downstream of Niamey Flood dynamic map - Detail

Niger River  
Observations the 29/08 and the 01/09/2012

**Location Diagrams**

**Legend**

**Hydrography**

- Water extent the 01/09/2012
- Wet season river bed
- Water extent the 29/08/2012

**Infrastructure**

- Primary road
- Residential road
- Secondary road

**Interpretation**

Flooding in Niger has caused many deaths, destroyed houses, and displaced populations. With the humanitarian situation critical, the international community is responding with France sending civil security emergency rescue teams who accordingly triggered the International Charter.

This crisis map shows the flood situation in the Niamey area, as detected from Radarsat-2 (01/09/2012), compared to the TerraSAR-X flood extent (29/08/2012). None important variation in terms of water location is observed between the two dates. Most of the flooded area correspond to cultural area (paddy fields) where water level would be much higher than during a (normal) raining season. In this area, the accessibility to small villages is probably difficult. This map should be used with precaution, exhaustivity is not guaranteed, particularly in urban areas.

**Cartographic Information**

0 0.5 1 km

Local projection: UTM Zone 31 North, Datum: WGS 84  
Geographic projection: Lat/Lon (DMS), Datum: WGS 84  
Scale: 1:25 000 for A1 prints  
Geometric references:  
Horizontal: Bing Maps and Landsat-7 ETM+, EarthSat Ortho GeoCover, RMSe 50m; Vertical: SRTM, max 16m spec.

**Data Sources**

Water bodies detected from Radarsat-2 (6.25m) and TerraSAR-X (3.25m) images acquired respectively the 01/09/2012 and the 29/08/2012. The wet season river bed layer is derived from TerraSAR-X image acquired the 12/08/2012.  
© SERTIT 2012

**Background layers**

KOMPASAT-2 image (1m) acquired the 18/04/2009 - © KARI 2009  
Landsat-7 ETM+ (14.25m) acquired the 02/12/1999  
© USGS 1999, distribution Maryland GLCF  
Other thematic layers & toponymy  
© SERTIT 2012, CSA, Google Maps

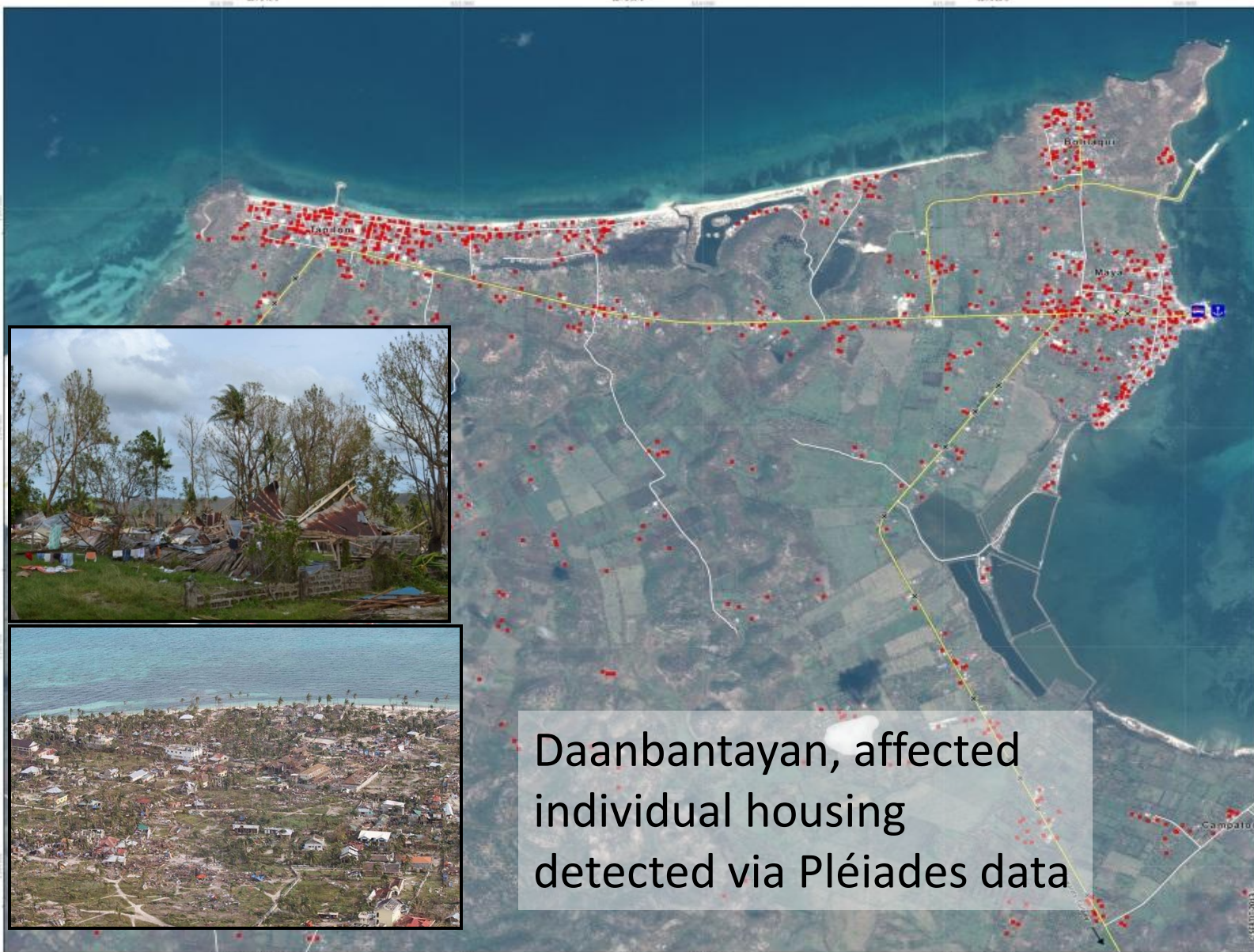
**Framework**

The products elaborated for this Rapid Mapping Activity are realised to the best of our ability, within a very short time frame, during a crisis/evidence, optimising the material available. All geographic information has limitations due to the scale, resolution, date and interpretation of the original source material. No liability concerning the content or the use thereof is assumed by the producer.

Map produced the 02 09 2012 by SERTIT  
© SERTIT 2012  
sertit@sertit.u-strasbg.fr <http://sertit.u-strasbg.fr>

Product created by SERTIT based on radar data (Radarsat-2 and Terrasar-X)

# Super typhoon Haiyan, Philippines November 2013



Philippines - Daanbantayan  
Maya area  
Potentially affected building structures  
Observed the 14/11/2013



- Legend**
- Potentially affected building structures
  - Roof infrastructure
  - Potential obstruction
  - Occlusion in crisis data
  - Primary road
  - Secondary road/path
  - Points of interest
  - Bus terminal
  - Port

**Interpretation**  
Typhoon Haiyan hit Daanbantayan, Cebu Island, the 26th of November, associating heavy rainfall and very strong winds. A Pléiades-1B image was acquired the 14th of November 2013 over Maya. Analysis highlights many destroyed buildings particularly in areas close to trees, and much debris on the ground, especially along the sea front. Many trees have been flattened by the strong winds and some roads could be blocked. However, considering the lack of reference data, the cloud coverage, the reduced visibility in cloud shadows, and the extreme change in tree cover, this interpretation of highly damaged building structures cannot be exhaustive and hence is more indicative.

**Cartographic information**  
Scale: 0 250 500 m  
Local projection: UTM 51 North, Datum: WGS 84  
Geographic projection: Lat/Lon (WGS), Datum: WGS 84

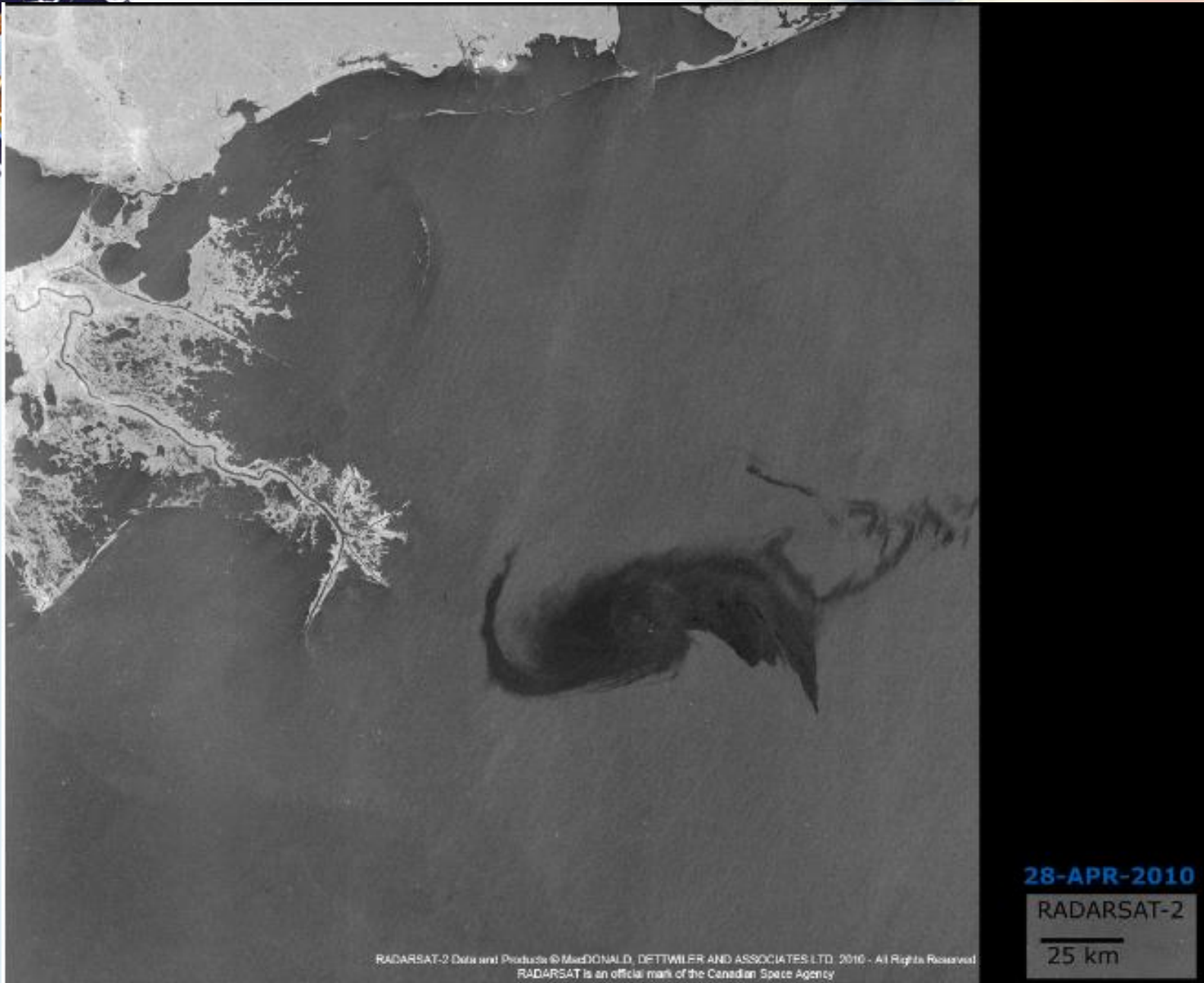
**Data Sources**  
Crisis layers:  
Potentially affected building structures © SERTIT 2013  
Pléiades-1B image (0.50m) acquired the 14/11/2013 © CNES 2013 - distribution Airbus Services/Spot Image, SA, France, all rights reserved  
Geometry & post-processing SERTIT  
Reference layers:  
Road network © SERTIT 2013  
Toponymy © OpenStreetMap

**Framework**  
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Map produced the 26th of November 2013 by SERTIT © SERTIT 2013



Daanbantayan, affected individual housing detected via Pléiades data

# Oil Spill in Mexico, April 2010



Product based on RADARSAT Satellite

# Conclusion



- The Charter is an **agreement** among participating space agencies.
- Its “satellite constellation” can deliver **key information** that brings benefit to **disaster relief operations**.
- The Charter is focused on the immediate response phase.
- It is growing: **443** disasters have been covered since 2000 in over **110** countries worldwide.
- Building on a decade of success in making satellite data available to users for disaster response, the Charter is now opening its doors even wider with **Universal Access**.
- **The Universal Access initiative benefits national users, that were previously unable to make direct requests to the Charter during emergency situations.**