The International Charter Space & Major Disasters

August 30th 2018 - CEMADEN - INPE/Brazil

Laércio Namikawa - INPE

Purpose

An International agreement among EO mission owners/operators to support with space-based data and information relief efforts in the event of emergencies caused by major disasters.

- Disaster response
- Multi-satellite data acquisition planning
  - Fast data turn-around – priority acquisition
- Archive retrievals and spacecraft tasking
- Data processing at pre-determined level
- Space Agency contribution in image/data
- Space Agency initiative for value-added-data fusion

The International Charter

A unified system of space data acquisition and delivery in case of natural or human-made disasters - **34 Satellites**

Now composed of 17 members. (New UAESA)

Data delivery to civil protection agencies, emergency & rescue services; Also available to Humanitarian Aid actors of the UN since 2003.

Operational : 24/7 on-duty-operator

Charter activations: +/-40 events/ year

583 disasters covered to date in 125 countries worldwide (as of Aug/30/2018)

Charter Partners

Organisations that provide disaster monitoring services for specific regions of the world

Data providers for additional satellite data

Value added providers produce maps based on the satellite data for use in interpreting and assessing disaster situations.

Disasters Types Supported

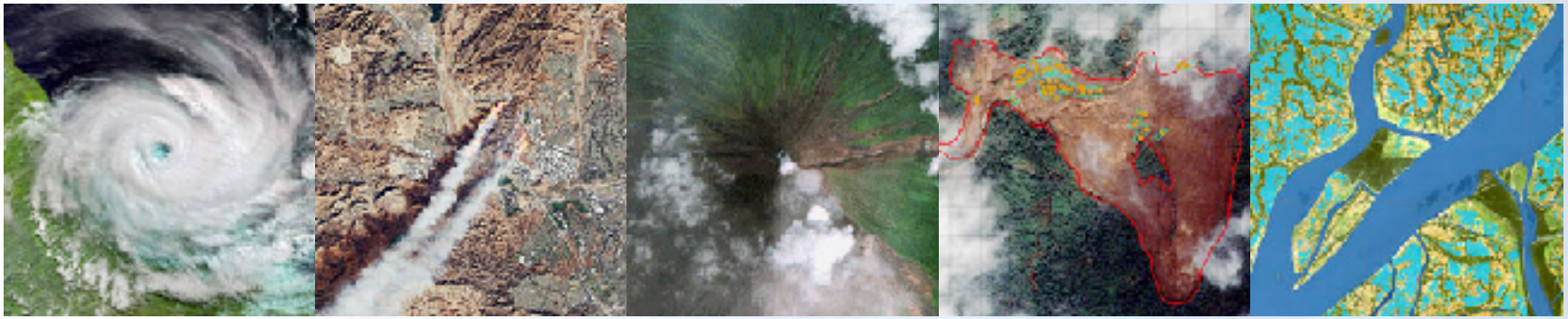
The International Charter executes priority tasking of different EO missions in a rapid fashion; it is designed to address requests concerning major disasters caused by:

Natural events

- Earthquakes
- Fires
- Floods
- Ice jams
- Landslides
- Tsunamis
- Ocean storms
- Volcanic eruptions

Man-made events

- Oil spills
- Industrial accidents



Disasters Types Supported

Following **UNISPACE III** in Vienna in **July 1999**, ESA (European Space Agency) and CNES (Centre national d'études spatiales) initiated the International Charter in July 1999.

CSA (Canadian Space Agency) signed the Charter on October 20, 2000.

Charter declared operational as of November 1, 2000 after formal rehearsals and qualification tests.

Charter Members

Activating the Charter: Authorized Users (AU)

The only bodies authorized to directly request the Charter to be activated are the Authorized Users - AUs (typically civil protection agencies, governmental relief organizations, or other authorities with a mandate related to disaster management).

Countries with Authorized Users (July 2018).

Activating the Charter: Authorized Users (AU)

Direct activation: The only bodies authorized to directly request the Charter to be activated for a disaster occurring in their country are the '**Authorized Users**' (AUs).

Civil protection agencies, governmental relief organizations, or other authorities with a mandate related to disaster management.

Activation **via an Authorized User on behalf of a user from another country without AU**: Authorized Users can access the Charter to request support for a disaster in another country with which they cooperate for relief purposes.

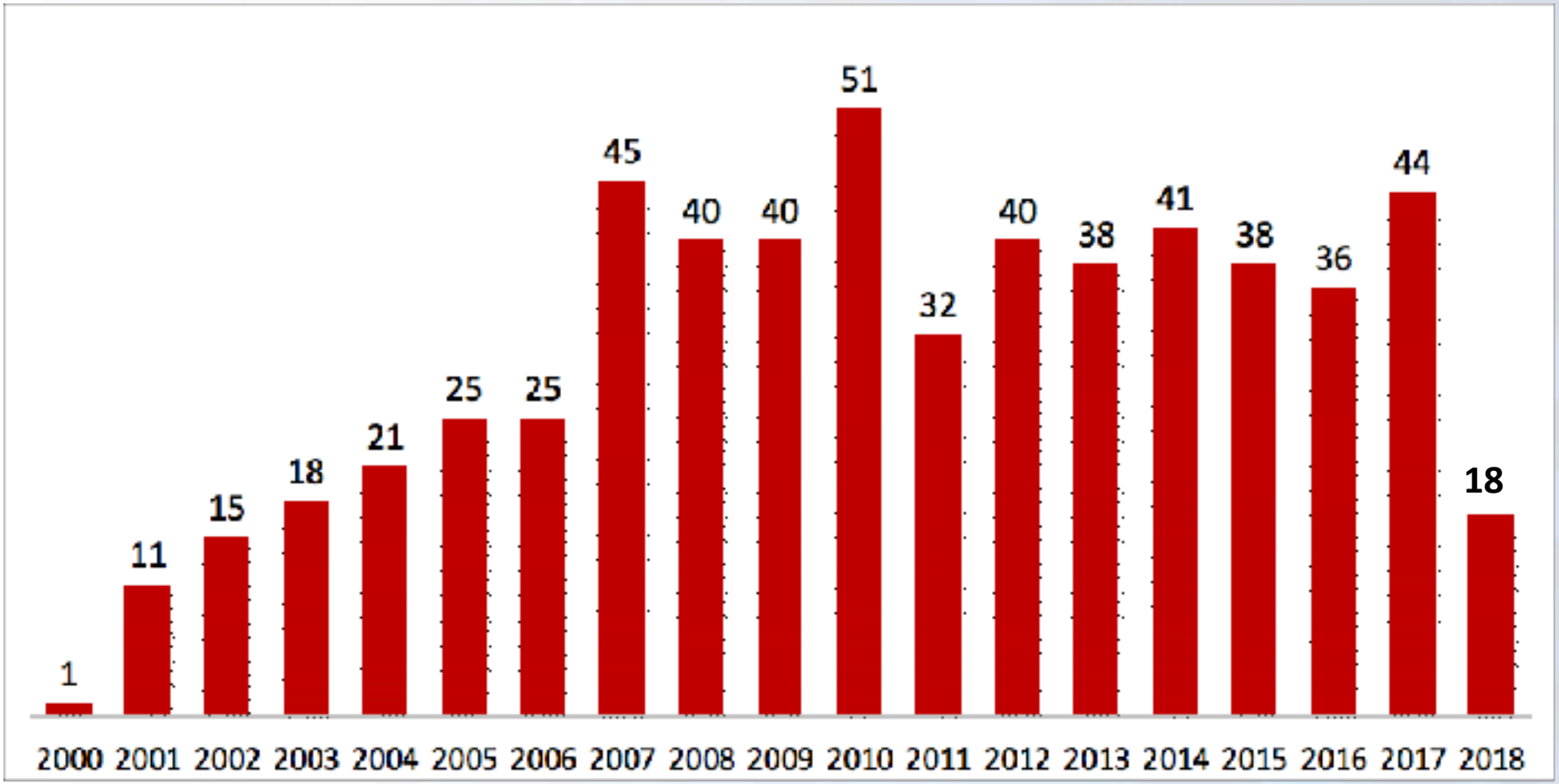
Activation **via the UN for UN users**: The Charter has an agreement with UN OOSA (Vienna) and UNITAR/UNOSAT (Geneva) to provide support to UN agencies. UN OOSA and UNITAR/UNOSAT may submit requests on behalf of users from the United Nations.

Activation for Asia Pacific users **via Sentinel Asia**: Sentinel Asia is a regional collaboration for satellite based emergency response in Asia Pacific. Since 2009 the Charter has granted the Asian Disaster Reduction Centre the right to submit activation requests on behalf of national users of Sentinel Asia.

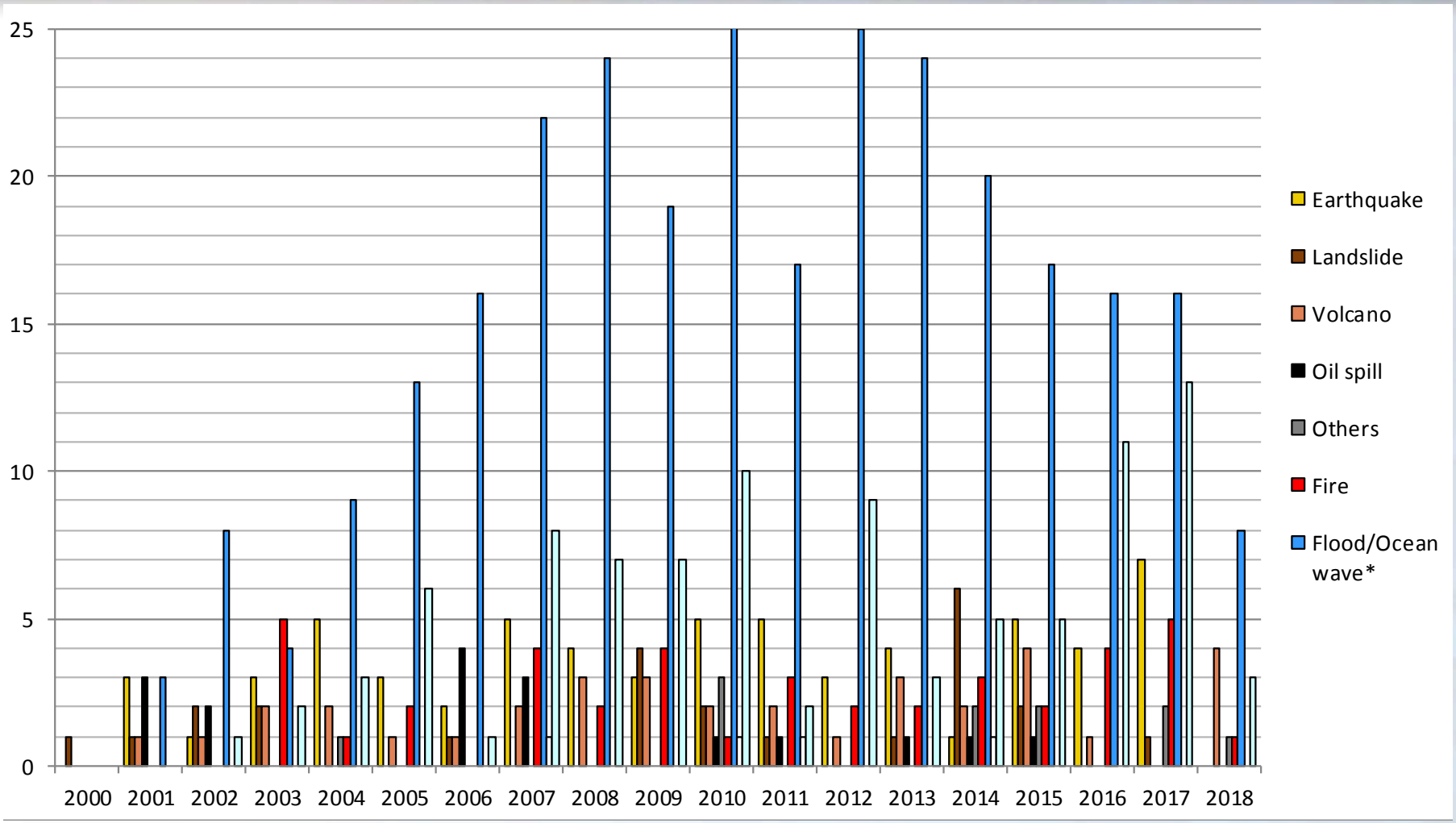
Charter Functional Units

- Authorized Users (AUs)
- On-Duty Operator (ODO)
- Emergency on-Call Officer (ECO)
- Project Manager (PM)
- Data processing and distribution facilities
- Value-Adding Providers (VAPs)

Number of Activations
579 (Nov/2000-Aug/2018



2000-2017 Distribution of Activations by Hazard Type



*Includes solid earth related phenomenon of a tsunami.
**Includes all wind type storms (hurricane, cyclone, typhoon and tornado).

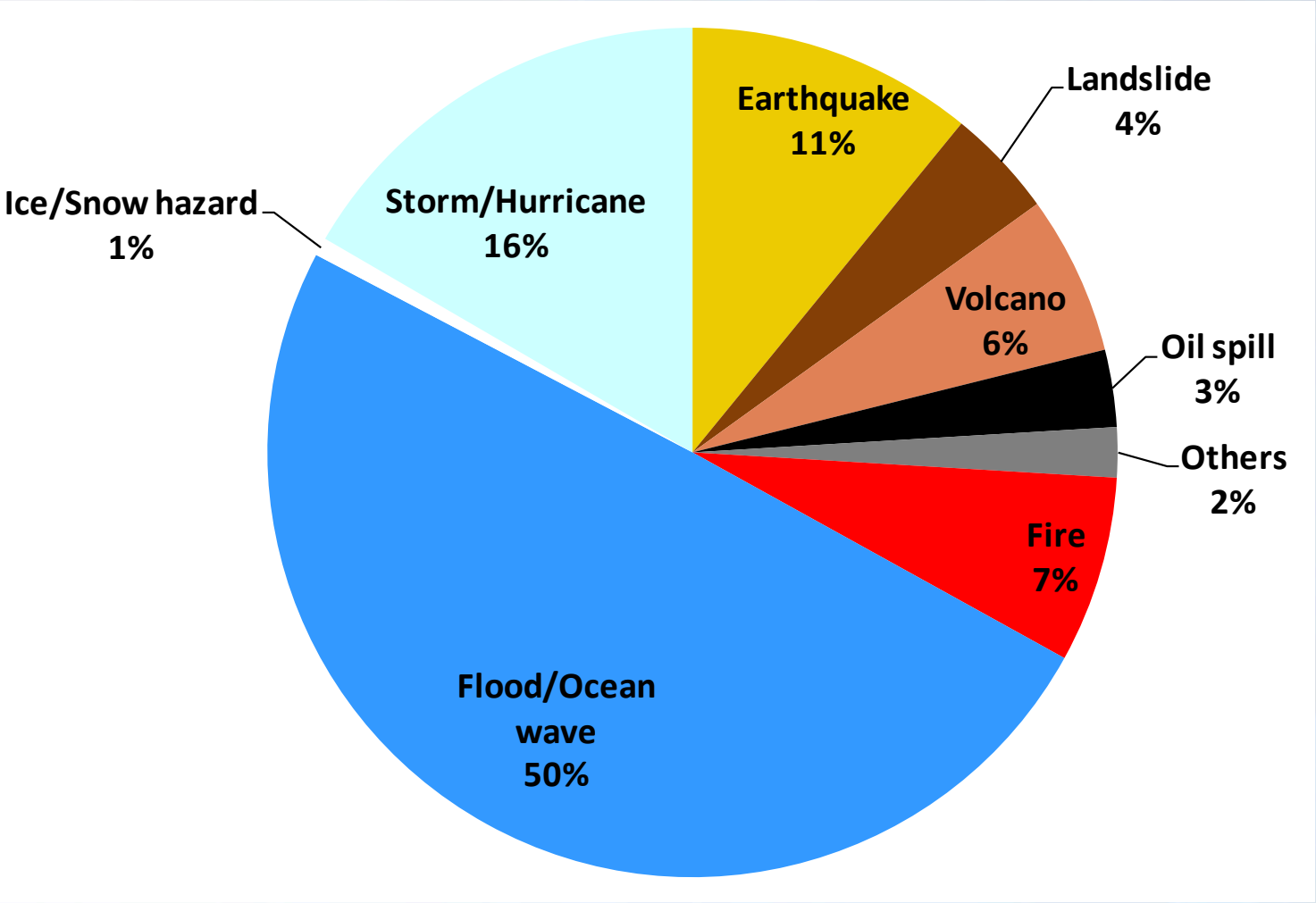
As of July 24, 2018 – 578 Charter Activations

Number of Activations
579 (Nov/2000-Aug/2018

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Sub-totals	
Solid Earth	Earthquake		3	1	3	5	3	2	5	4	3	5	5	3	4	1	5	4	7	1	63	
	Landslide	1	1	2	2			1			4	2	1		1	6	2		1		*24*	123
	Volcano		1	1	2	2	1	1	2	3	3	2	2	1	3	2	4	1		4	*35*	
Technological	Oil spill		3	2				4	3			1	1		1	1	1				*17*	
	Others					1						3				2	2		2	1	*11*	**28**
Weather / Atmospheric	Fire				5	1	2		4	2	4	1	3	2	2	3	2	4	5	1	*41*	
	Flood/Ocean wave*		3	8	4	9	13	16	22	24	19	26	17	25	24	20	17	16	16	8	*287*	**428**
	Ice/Snow hazard								1			1	1			1					*4*	
	Storm/Hurricane**			1	2	3	6	1	8	7	7	10	2	9	3	5	5	11	13	3	*96*	
	Total / year	**1**	**11**	**15**	**18**	**21**	**25**	**25**	**45**	**40**	**40**	**51**	**32**	**40**	**38**	**41**	**38**	**36**	**44**	**17**		
	TOTAL																					**579**

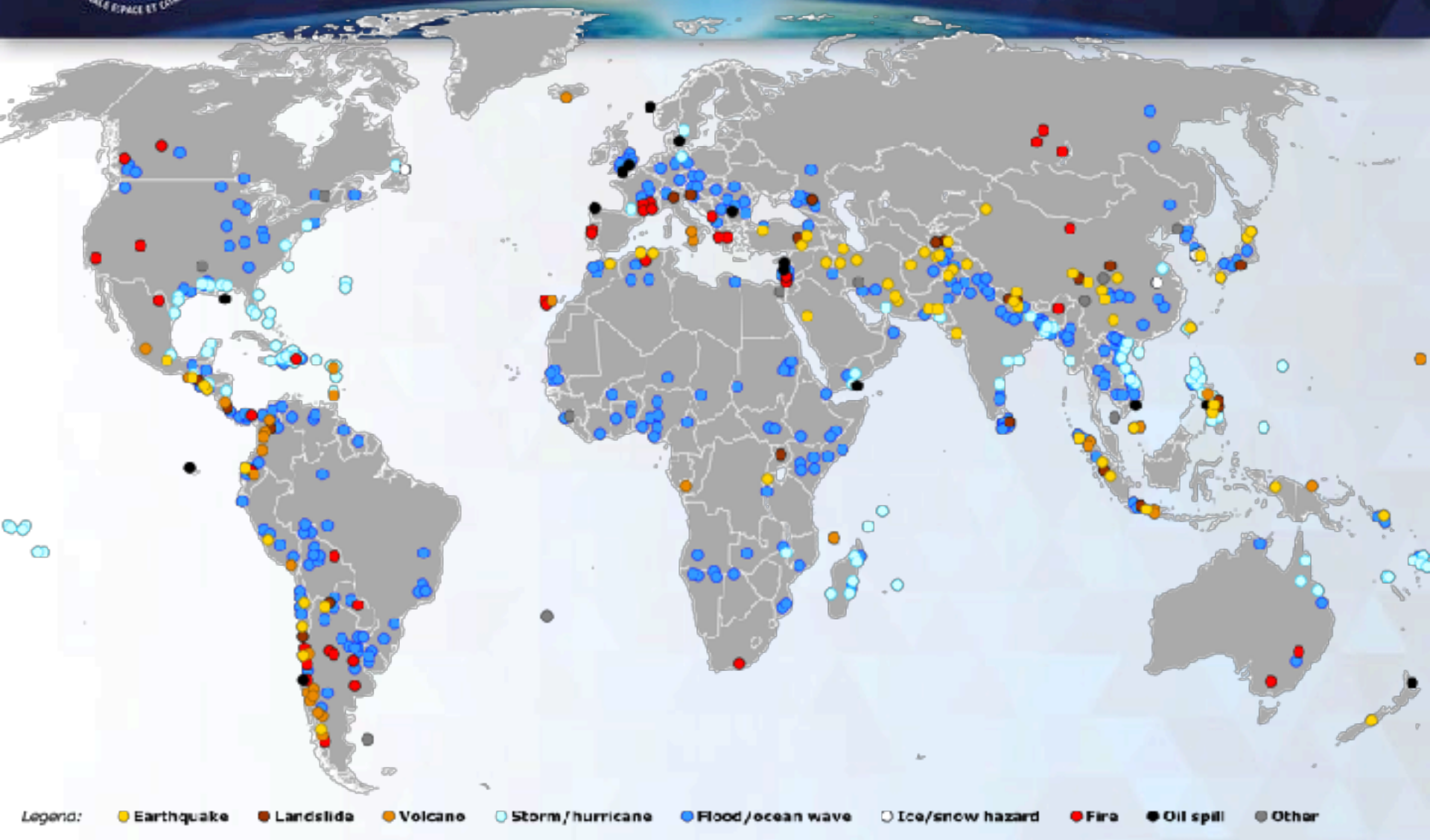
*Includes solid earth related phenomenon of a tsunami.
**Includes all wind type storms (hurricane, cyclone, typhoon and tornado).

Activations by Disaster Type



* As of July24, 2018 – 578 Charter Activations

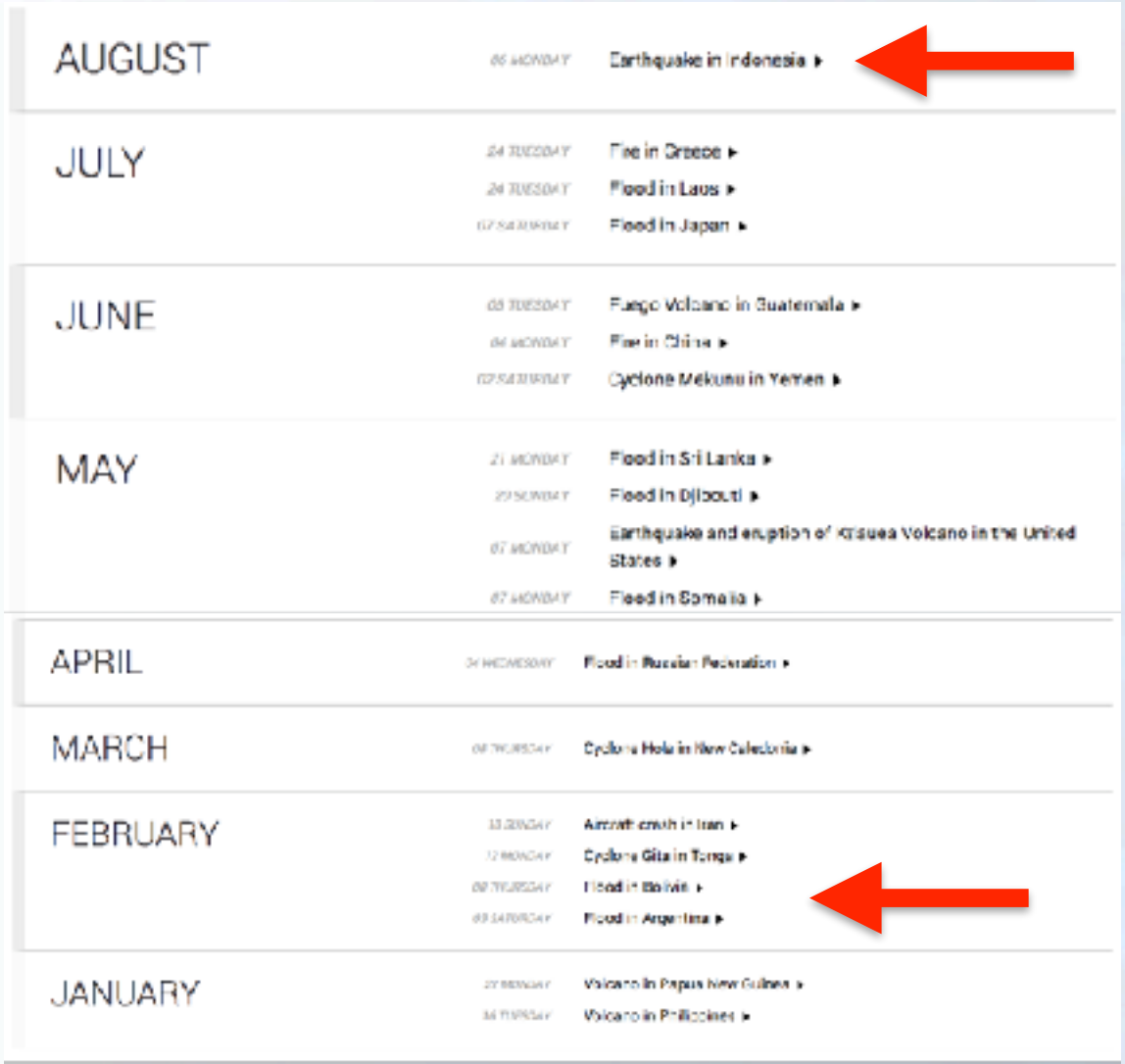
Activations Breakdown



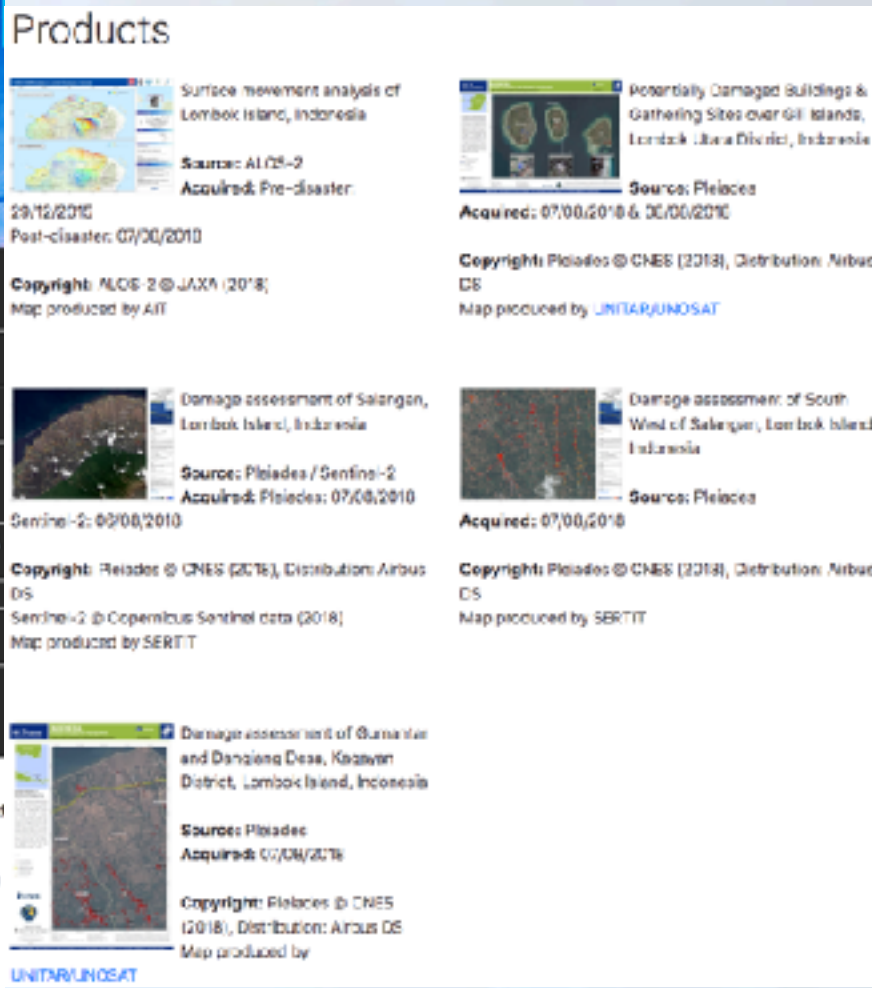
Activations Americas

Activations Americas

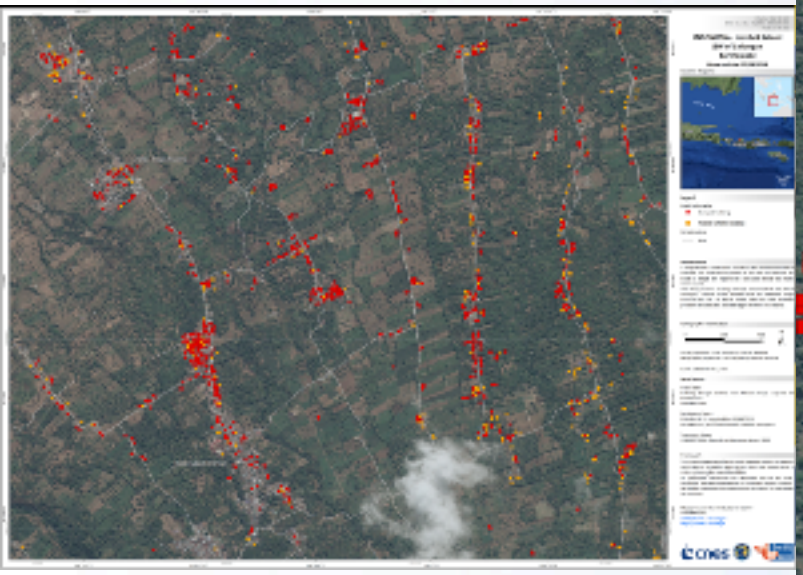
Some examples of recent activations

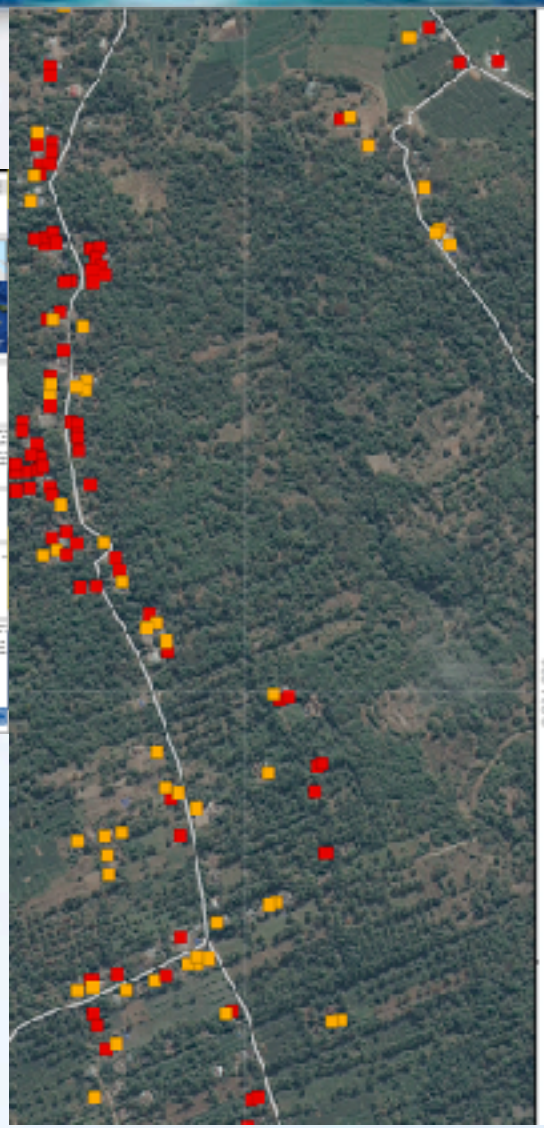


Earthquake in Indonesia
06 August 2018



Earthquake in Indonesia
06 August 2018





Legend

Crisis information

- Damaged building
- Probably affected building

Infrastructure

- Road

Interpretation

A magnitude 6.9 earthquake has struck the Indonesian island of Lombok. The neighbouring island of Bali was also affected. At least 91 people are reported to have been killed with many more injured.
This map presents building damage assessment to the SW of Selangan, Lombok island, derived from the Pléiades image acquired the 7th of August 2018. There are 268 buildings probably affected and 1033 damaged detected in the area.

Cartographic information

0 200 400 m

N

Local projection: UTM Zone 50 S, Datum: WGS 84
Geographic projection: Lat/Lon (DMS), Datum: WGS 84

Scale: 1:5 000 for A1 prints

Data Sources:

Crisis layers
Building damage derived from Pléiades image acquired the 07/08/2018
© SERTIT 2018

Background layers
Pleiades-1B 1A acquired the 07/08/2018
© CNES 2018, distribution Airbus Defense and Space

Earthquake in Indonesia
06 August 2018

Fuego Volcano in Guatemala
05 June 2018

Home About Activations News Library English

Charter activations

05 JUNE 2018

Fuego Volcano in Guatemala

Browse activations on map

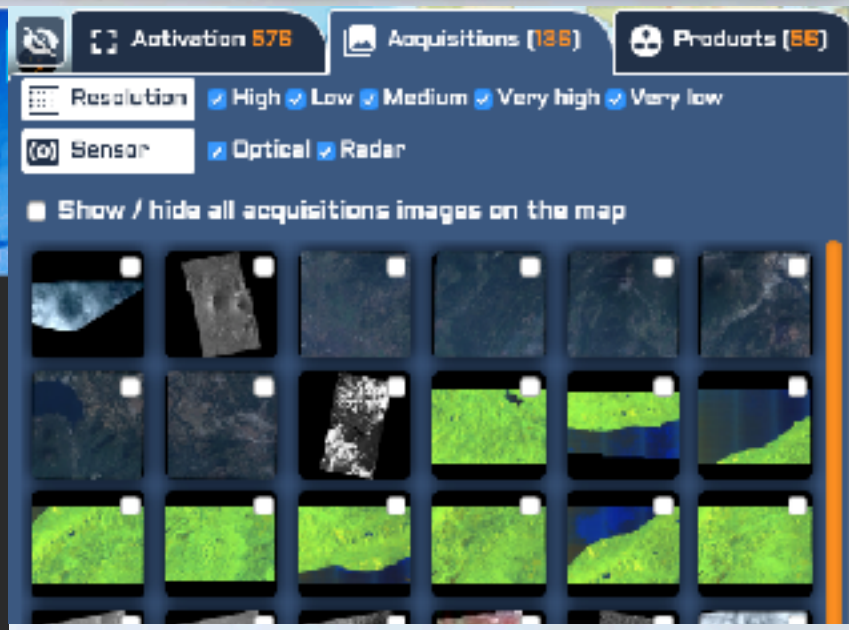
Type of Event:	Volcano
Location of Event:	Guatemala
Date of Charter Activation:	2018-06-05
Time of Charter Activation:	09:12
Time zone of Charter Activation:	UTC+02:00
Charter Requestor:	CONRED
Activation ID:	576
Project Management:	DLR

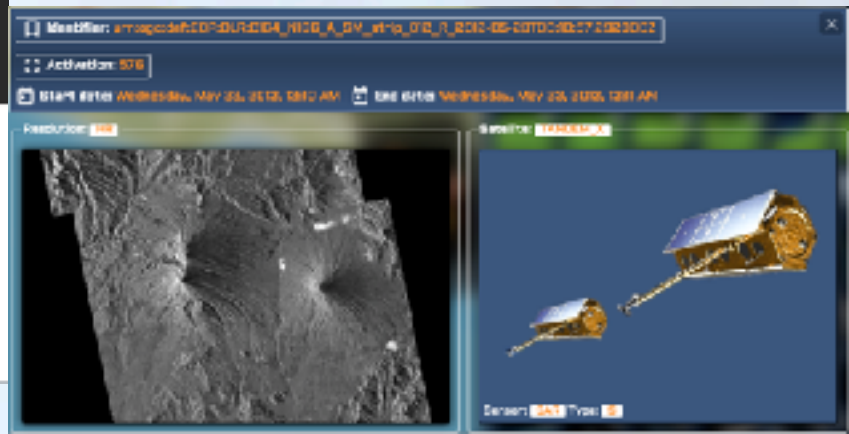
Guatemala's Fuego volcano has erupted, covering villages in volcanic ash and debris during its most powerful eruption in over 100 years. Local reports confirm at least 68 people have been killed with many more still missing.

A state of emergency was declared as 3,000 people living near the volcano were evacuated to temporary shelters. The town of El Rodeo was worst affected, with rescuers still trying to reach the other nearby towns of Alotenango and San Miguel Los Lotes.

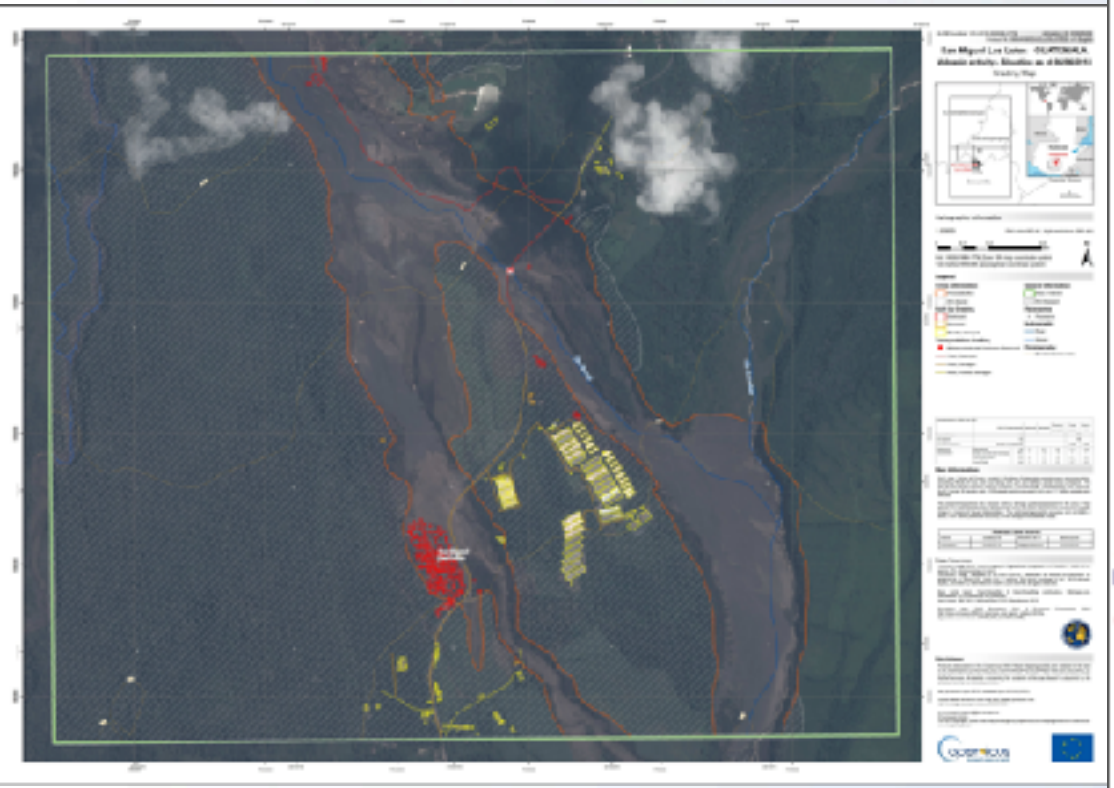
The eruption closed Guatemala's main international airport as columns of ash and smoke rose 10km into the air. The falling ash and rock has also covered the villages and coffee farms which sit on the slopes of the volcano.

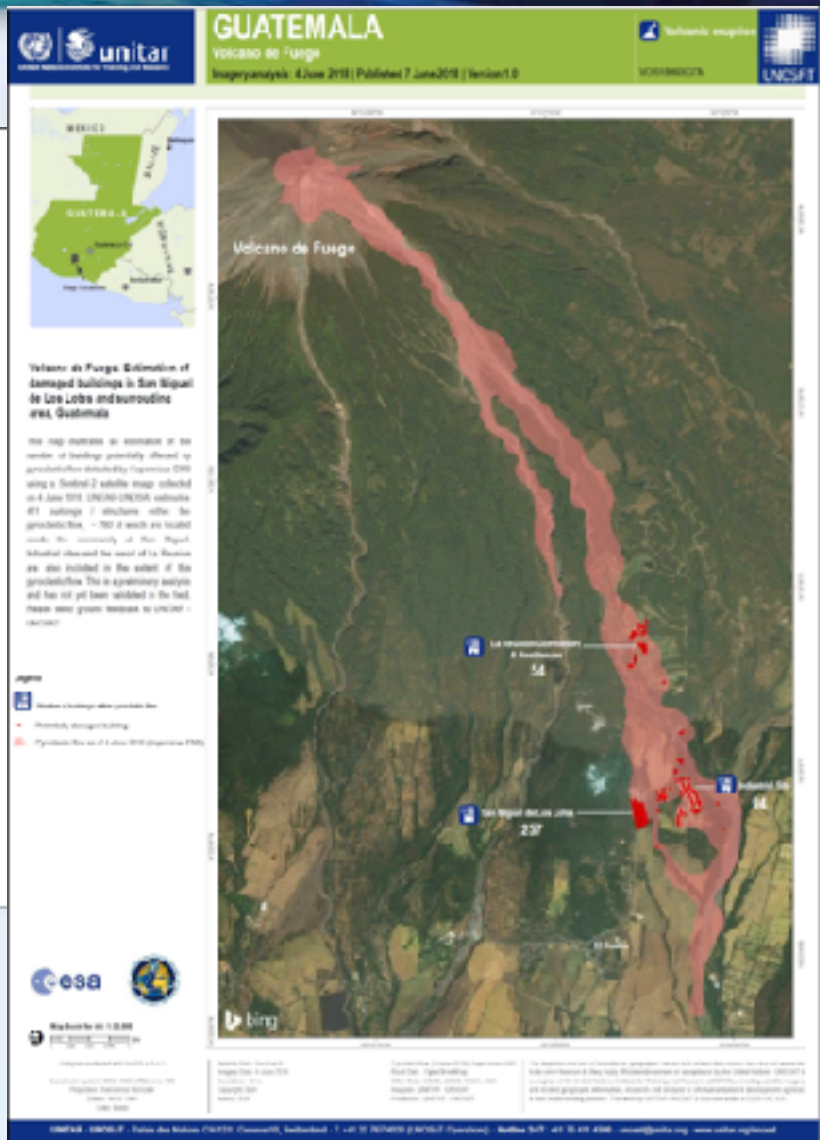
Soldiers and firefighters assisting emergency workers are still searching for missing people in the dense covering of ash, mud and rock with at least 10 people being pulled from the lava flows by helicopter.





Fuego Volcano in Guatemala
05 June 2018





Flood in Bolivia
08 February 2018

Home About Activations News Library English

Charter activations

08 FEBRUARY 2018

Flood in Bolivia

Browse activations on map

Type of Event:	Flood
Location of Event:	Bolivia
Date of Charter Activation:	2018-02-08
Time of Charter Activation:	2212
Time zone of Charter Activation:	UTC+01:00
Charter Requestor:	UCS/SINAGER/VIDECI
Activation ID:	565
Project Management:	ABAE

Record rainfall in southern Bolivia has caused severe flooding with local authorities declaring a state of emergency

Seven of the nine departments in the country have been affected, and authorities have reported that 50,000 people have been forced from their homes.

The floods follow days of heavy rain and particularly affect the southern part of the nation along the border with Paraguay and Argentina; which is also experiencing floods.

The rain caused the Tupiza River to overflow, flooding the city which shares the same name and affecting an estimated 1000 people. Reports indicate flood waters reached as high as 3 metres in some places.

Due to the flood conditions, some roads in the affected regions have been inundated, making them impassable for relief efforts.

Products

Flood at Tupiza in Potosi Department

Source: Pelicko
Acquired: 08/02/2018

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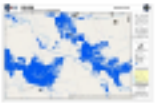
Map produced by ABAE



Flooding on the Kaka River, La Paz Department

Source: TerraSAR-X
Acquired: 12/02/2018

Copyright TerraSAR-X © DLR e.V. 2018, Distribution Airbus DS Geo GmbH
Map produced by ABAE

Canoas in urban Volcan at Yolosa Range, La Paz Department

Source: Pelicko
Acquired: 20/02/2018

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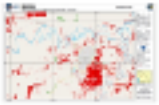
Map produced by ABAE



Satellite detected waters at Santa Ana Del Yacuma

Source: RADARSAT-2
Acquired: 12/02/2018

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Map produced by ABAE

Satellite detected waters over El Beni department

Source: RADARSAT-2
Acquired: 12/02/2018

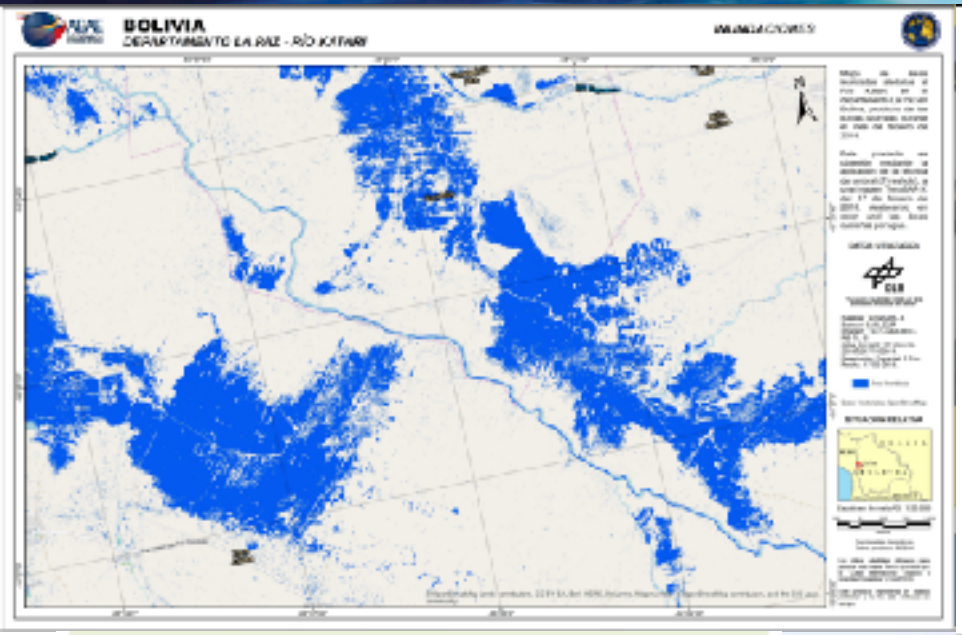
Copyright: RADARSAT-2 Data and Products © Maxar Technologies Ltd. (2018) - All Rights Reserved. RADARSAT is an official trademark of the Canadian Space Agency.
Map produced by UNITAR/UNOSAT

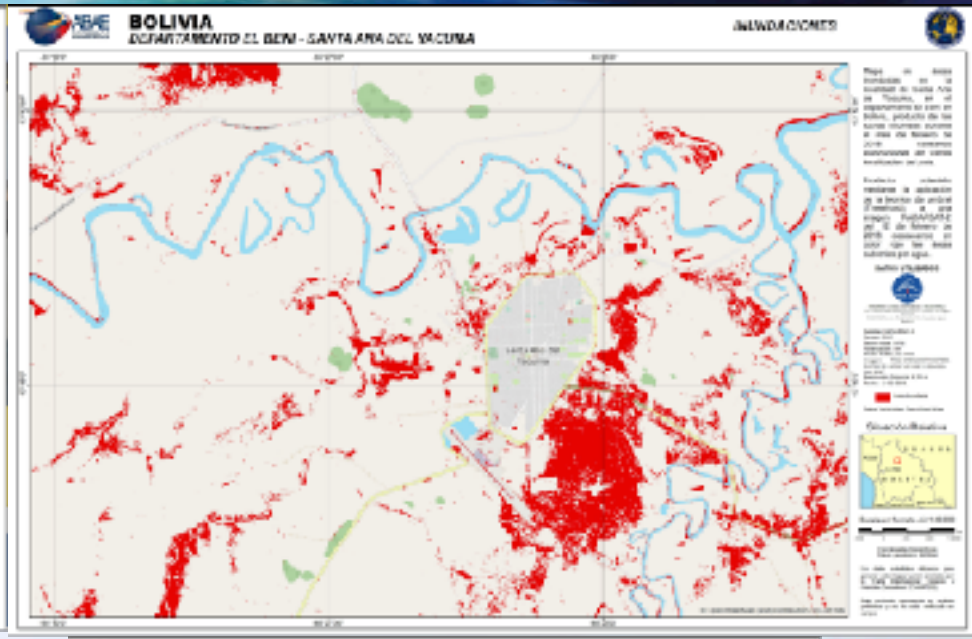
Satellite detected waters over Cochabamba department

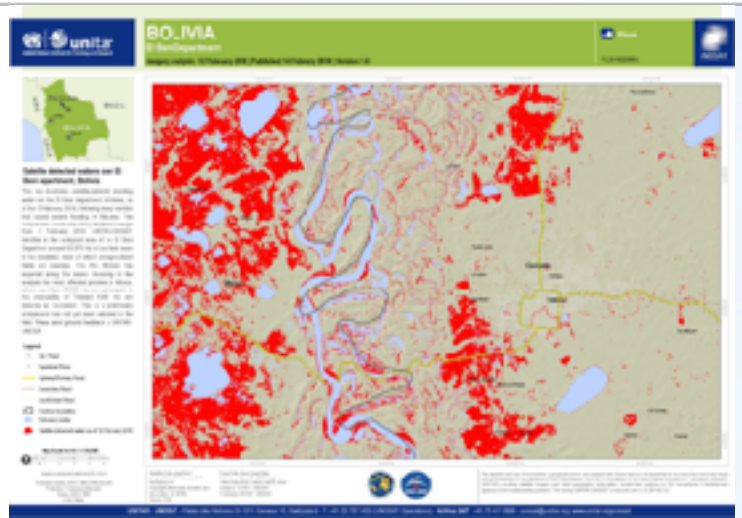
Source: Sentinel-1 / RADARSAT-2
Acquired: Sentinel-1: 03/02/2018 and 12/02/2018

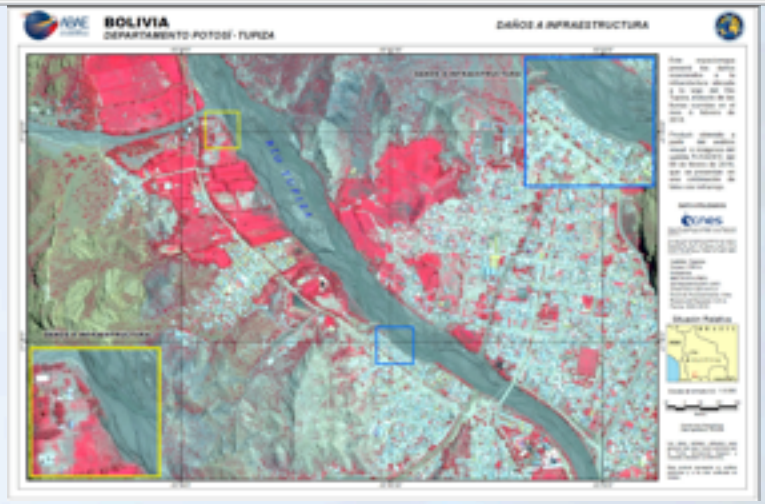
Copyright Sentinel-1 © Copernicus Sentinel data (2018) RADARSAT-2 Data and Products © Maxar Technologies Ltd. (2018) - All Rights Reserved. RADARSAT is an official trademark of the Canadian Space Agency.
Map produced by UNITAR/UNOSAT

Flood in Bolivia
08 February 2018









Flood in Argentina
03 February 2018

Home About Activations News Library English

Charter activations

03 FEBRUARY 2018

Flood in Argentina

Browse activations on map

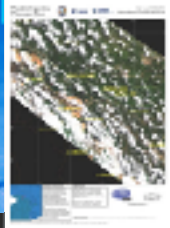
Type of Event:	Floods
Location of Event:	Argentina
Date of Charter Activation:	2018-02-03
Time of Charter Activation:	04:51
Time zone of Charter Activation:	UTC+0100
Charter Requestor:	Sec. Nacional de Protección Civil Argentina – Ministerio de Seguridad – SIFEM - ARGENTINA
Activation ID:	564
Project Management:	CONAE

Heavy rains across Argentina and Bolivia have caused widespread damage with authorities activating emergency operations to evacuate residents and provide aid.

Over 10 thousand residents were evacuated from villages along the Pilcomayo River, northwest Argentina. The floodwaters washed away homes and cars as heavy rains persisted for days.

In the town of Salta residents were airlifted to safety after the Pilcomayo river rose over 6 metres. Officials said the water is expected to rise further over the coming days.

Products



Flooding on the Pilcomayo River

Source: SPOT 6
Acquired: 03/02/2018

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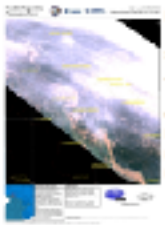
Map produced by CONAE



Flooding on the Pilcomayo River

Source: SPOT-7
Acquired: 18/01/2018

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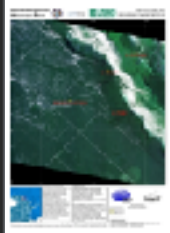
Map produced by CONAE



Flooding on the Pilcomayo River at Dorrego La Represe

Source: WorldView-3
Acquired: 03/02/2018

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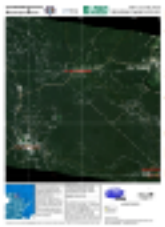
Map produced by CONAE



Flooding on the Pilcomayo River at La Vara Pereda

Source: WorldView-3
Acquired: 18/01/2018

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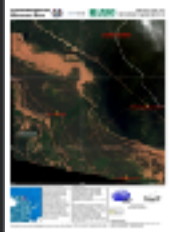
Map produced by CONAE



Flooding on the Pilcomayo River at El Chaguel

Source: WorldView-3
Acquired: 03/02/2018

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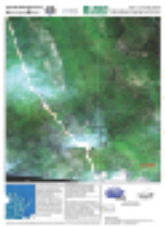
Map produced by CONAE



Flood on the Pilcomayo River at San Ramón

Source: WorldView-3
Acquired: 18/01/2018

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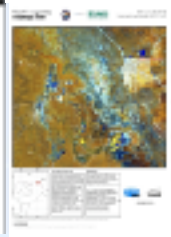
Map produced by CONAE



Flooding on the Pilcomayo River at Santa Victoria

Source: WorldView-3
Acquired: 03/02/2018

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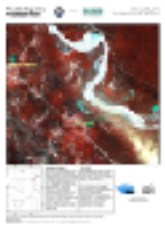
Map produced by CONAE



Floods at Santa Victoria, Argentina

Source: WorldView-3
Acquired: 03/02/2018

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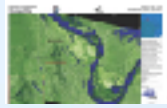
Map produced by CONAE



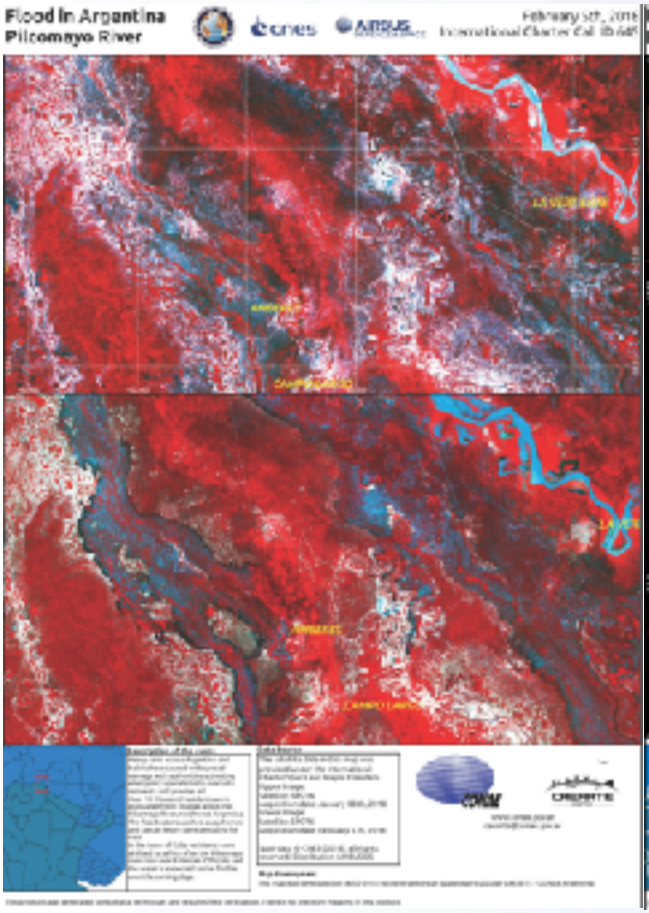
Flooding on the Pilcomayo River at Santa María

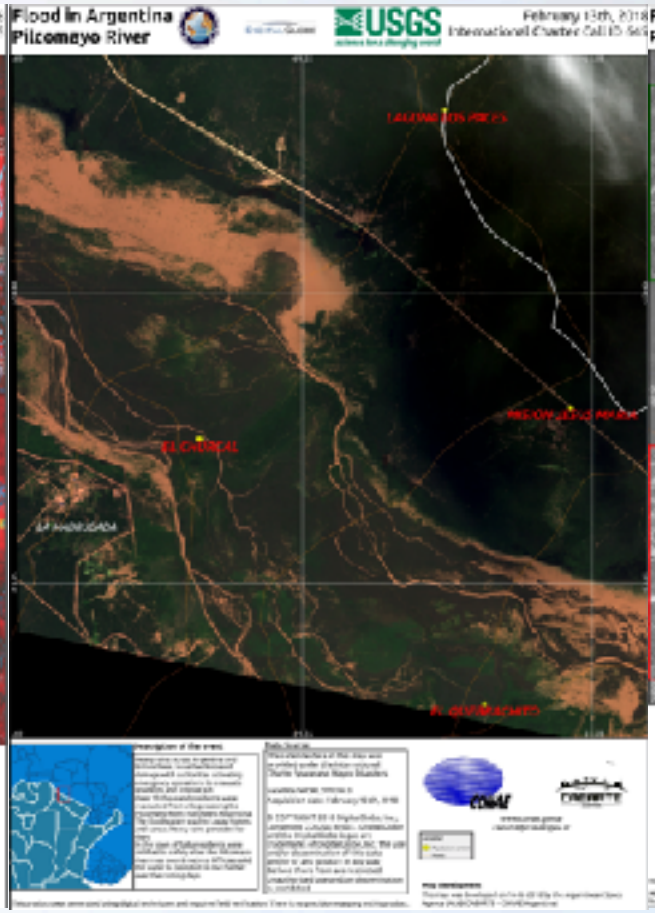
Source: Terra/MODIS
Acquired: 03/02/2018

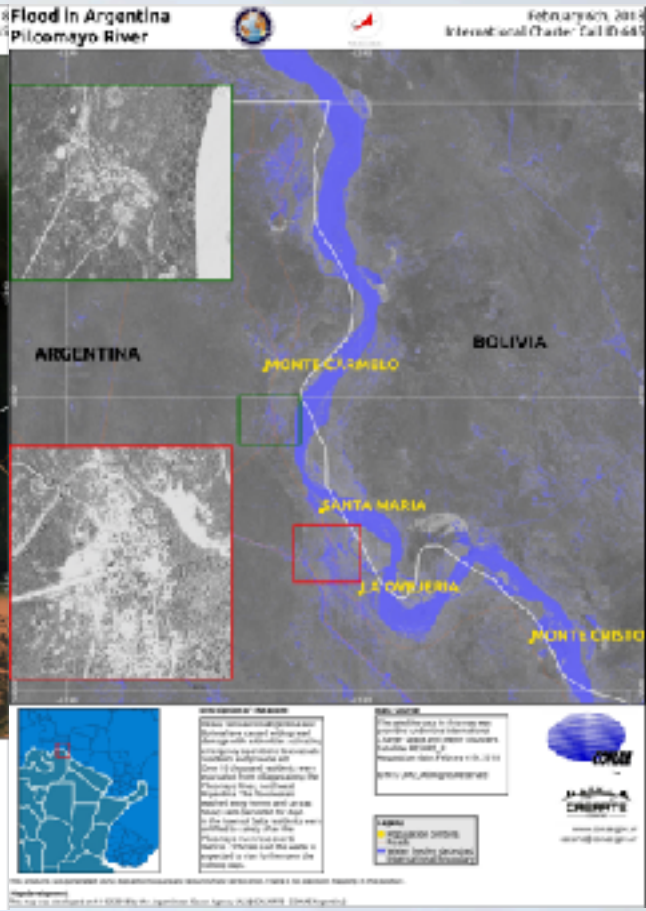
Flooding on the Pilcomayo River at Aricaya

Source: SPOT-6
Acquired: Pre-disaster 03/01/2018

Flood in Argentina
03 February 2018







Universal Access

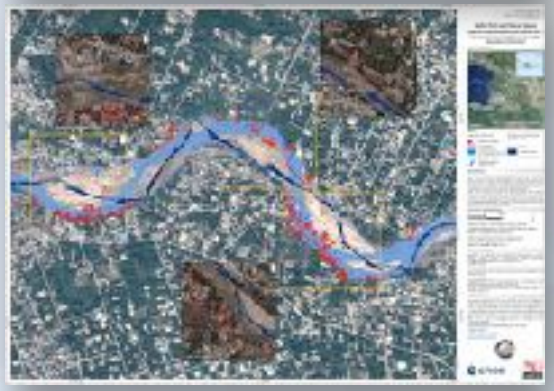
launched in September 2012

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

Authorized Users

Must be a national disaster management authority or its delegated agency in that country

Must have the capacity to download and use maps



Must be able to submit and pursue an activation request in English

Registration

A registration form* (in English, French and Spanish) is available for national authorities to express interest in becoming a Charter Authorized User:

The candidate fills in the questionnaire providing all required information.

The questionnaire, with an official cover letter from the organisation, must be sent to:

ExecutiveSecretariat@disasterscharter.org

The request is assessed by the Charter members.

*The form may be downloaded together with the Information brochure from the Charter website:
www.disasterscharter.org/web/guest/activating-the-charter
or **www.disasterscharter.org/web/guest/home**

Conclusion

Space technologies can deliver key information that brings benefit to the definition, planning, implementation, monitoring & assessment of disaster relief operations.

The Charter is focused on the immediate response phase and services of national disaster management centres and the International Humanitarian community (e.g. UN).

It is growing: 583 disasters covered since 2000 in 125 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.

Universal Access benefits national users in countries beyond those of the Charter members, who were previously unable to make direct requests to the Charter during emergency situations.

Currently, there are 20 AUs nominated thanks to the UA process in the following countries: Australia, Belarus, **Bolivia**, **Chile**, **Colombia**, **Costa Rica**, **Dominican Republic**, **Ecuador**, **El Salvador**, **Guatemala**, Iraq, Madagascar, Malawi, Myanmar, New Caledonia, Pakistan, **Paraguay, Peru,** Sri Lanka and **Uruguay** and the list is growing.

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webmaster@disasterscharter.org

International Charter
Space and Major Disasters

www.disasterscharter.org

Thank You!

Emergency enquiries from users requiring direct access to Charter resources should be addressed to:

ExecutiveSecretariat@disasterscharter.org

General requests for information should be addressed to

webmaster@disasterscharter.org

Disasters Course

The course will present digital image processing techniques for identifying damages and producing maps in support of disaster response, as well as, the use of **Sentinel data and ESA tools for Disaster mapping**.

TerraView and SPRING, INPE free and open source tools, and ESA toolboxes **GEP (Geohazards Exploitation Platform)** and **SNAP (Sentinel Application Platform)** will be used during hands-on activities.

By the end of the course, the participants will be able to:

- Select and obtain appropriate images for disaster applications
- Perform some skills of image processing: registration and geometric correction, image mosaic, enhancement and export