

Observação da Terra para Gerenciamento de Desastres

TerraMA2

International Charter on Space and Major Disasters

UN Office for Outer Space Affairs - UNOOSA

UN Platform for Space-based Information for Disaster

Management and Emergency Response - UN-

SPIDER

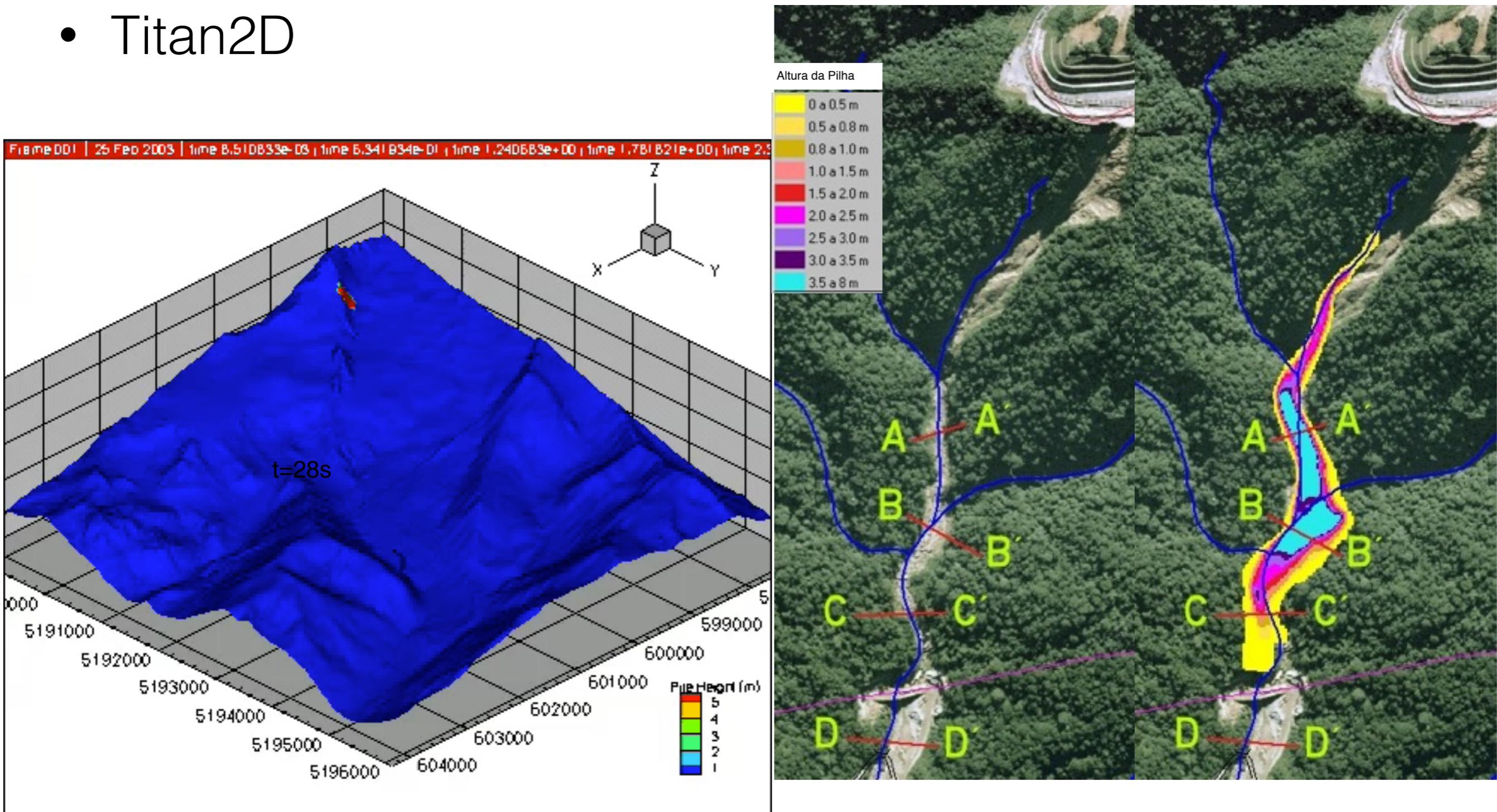
UN Office for Disaster Risk Reduction - UNISDR

CEOS Working Group on Disasters

GEO

2006

- Titan2D



TerraMA2

- 2006: PRÉ-PROJETO PARA O DESENVOLVIMENTO DE UM SISTEMA SEMI-AUTOMÁTICO DE PREVISÕES E INFORMAÇÕES HIDROMETEOROLÓGICAS E AMBIENTAIS EM APOIO AO GERENCIAMENTO DE DESASTRES NATURAIS

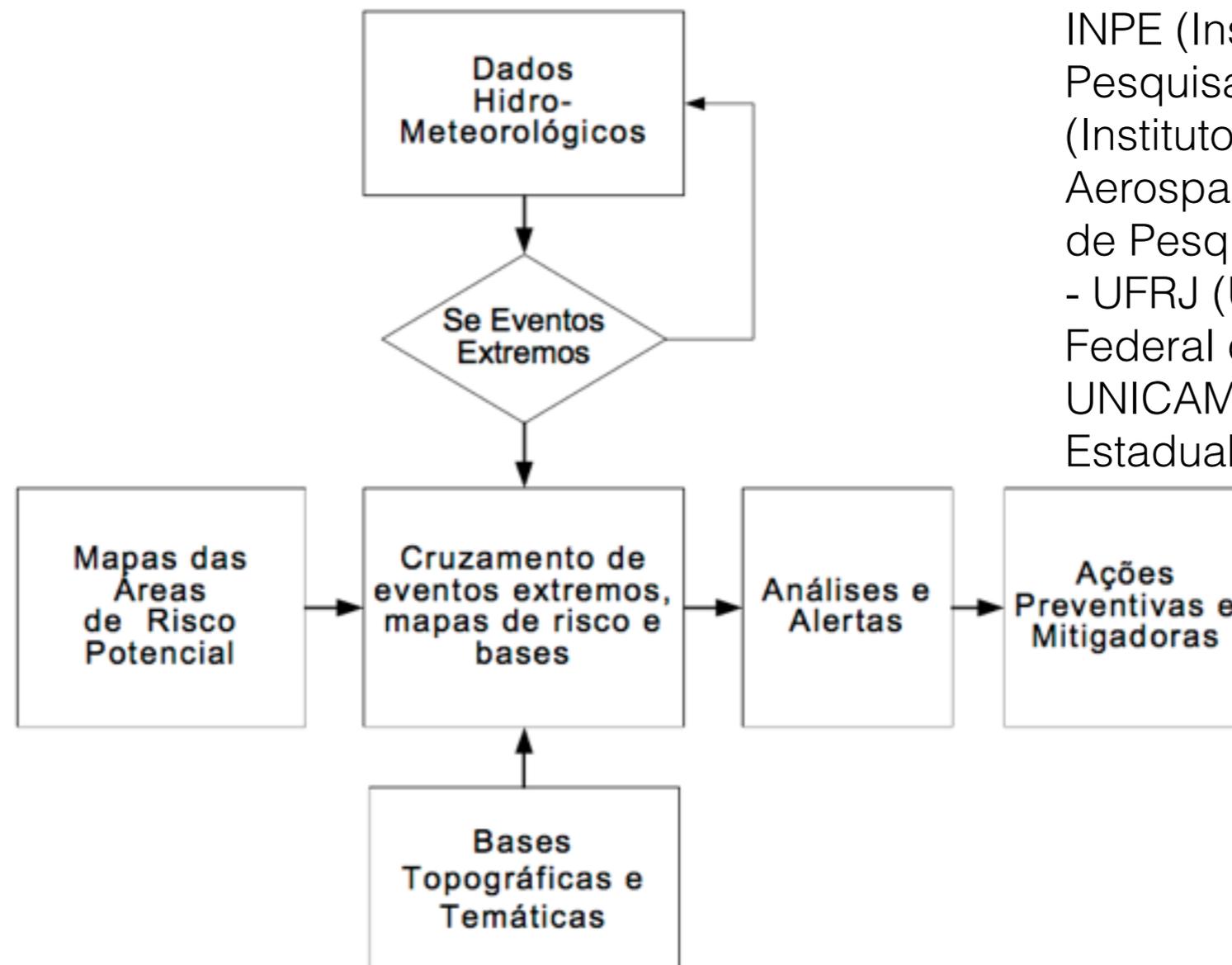
Sistema Semi-Automático de Previsões e Informações Hidrometeorológicas e Ambientais em Apoio ao Gerenciamento de Desastres Naturais, com Aplicações para a Defesa Civil, Controle Ambiental e Saúde Pública



TerraMA2

- 2006: ESTUDOS DA PREVISIBILIDADE DE EVENTOS METEOROLÓGICOS EXTREMOS NA SERRA DO MAR

- . Desenvolvimento de um Sistema Semi-Automático de Previsões e Informações Hidrometeorológicas em Apoio ao Gerenciamento de Riscos de Desastres Ambientais na Serra do Mar

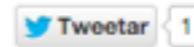


INPE (Instituto Nacional de Pesquisas Espaciais) - ITA (Instituto Tecnológico Aeroespacial) - IPT (Instituto de Pesquisas Tecnológicas) - UFRJ (Universidade Federal do Rio de Janeiro) - UNICAMP (Universidade Estadual de Campinas)

Notícias > Tecnologias verdes

Software prevê tempestades e pode salvar SP

Por INFO Online • segunda, 19 de abril de 2010



Alexandre Battibugli



Eymar Lopes: nova versão do software irá prever aumento do nível dos rios

<http://www.dpi.inpe.br/terrama2>

Rede Risco

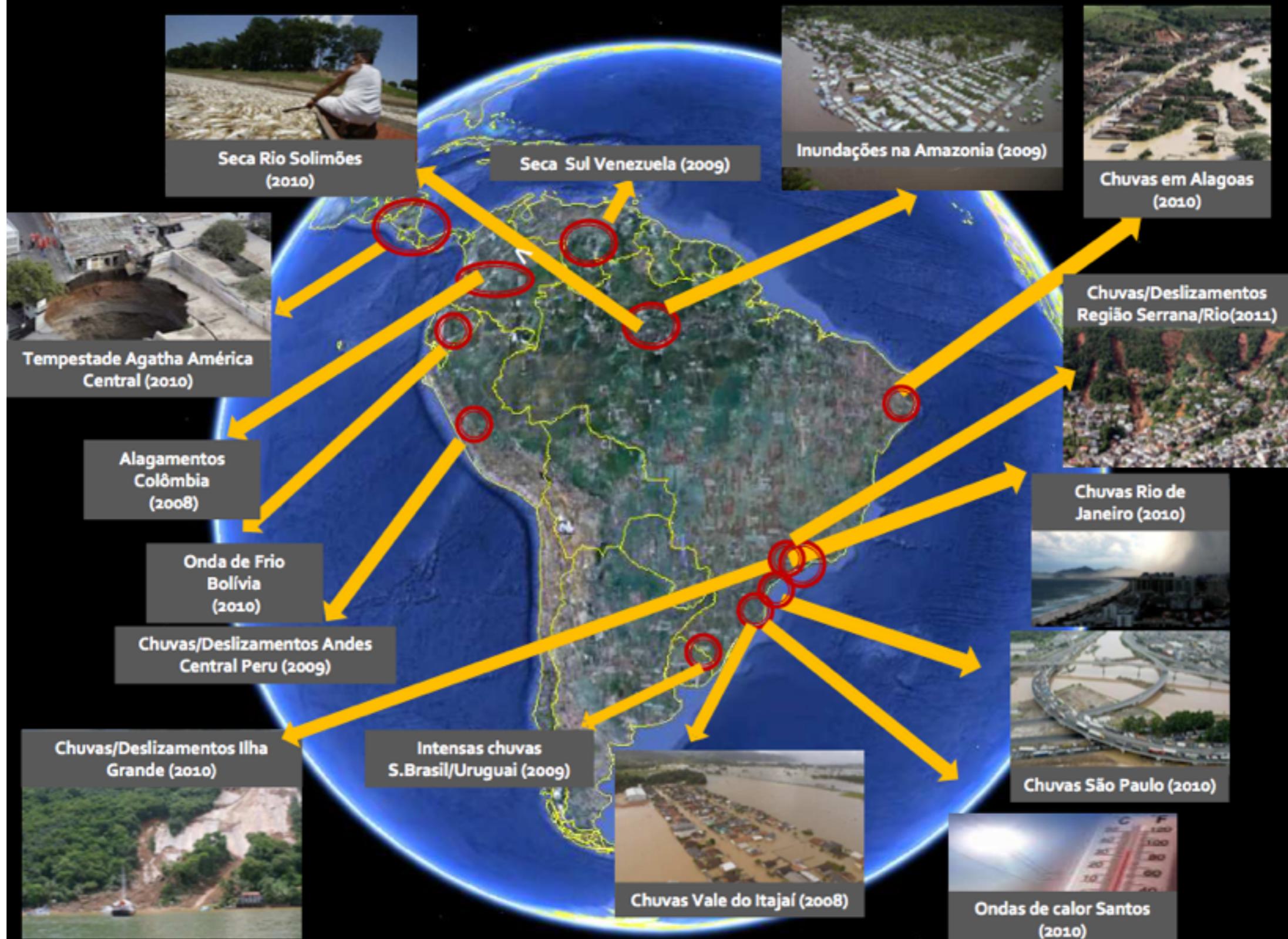
- IBGE - Rio de Janeiro
- Agosto de 2007
- IBGE, IG, IBAMA, CPRM, MMA, Integração, Saúde, ANA, Marinha, COPPE, INPA, FGV, Cidades

Observatório de Alertas sobre Desastres Naturais

- Junho 2010
- GSI, MMA, INEMET, ANA, Aeronáutica, Exército e Marinha
- Grupo Técnico instituído pelo GSI

2011 CEMADEN

Alguns eventos extremos inusuais durante 2007-2011-América do Sul



Março 2011
British Embassy



**International Disaster
Management Courses
2011**

International Disaster Management Courses 2011

Providing world class
training and expert
technical assistance

WEEK 1	0900 - 0945	0955 - 1040	1100 - 1145	1155 - 1240	1330 - 1415	1425 - 1510	1530 – 1615	Evening / Remarks
Mon 07 Mar	Opening Briefing & Introductions RG	Introduction to Disaster Management ME	Principles and Objectives of Sound Disaster Management RG		Disasters and Development RG	Risk Analysis Including short exercise ME		
Tue 08 Mar	Risk Analysis & Risk Reduction Discussion RG	Hazard Mapping Techniques & Applications Andy Ford	Problem Analysis and Integrated Planning ME		Exercise Surge Briefing ME	Evacuation Planning and management RG		Complete Ex Surge <i>11am – 1pm Visit by Chinese Civil Defence Delegation</i>
Wed 09 Mar	Models of Major Incident Response Management RG		Dealing with Mass Casualties ME	Casualty Information ME	Disaster Victim Identification RG	Discuss Exercise Surge ME		Read Adriatica Fact File Read Ex Blue Light papers <i>3 – 3.30pm RG to meeting in DG-02</i>
Thu 10 Mar	Issues of Media Management and Communication for Disaster Managers RG		Investigating Disasters ME	International Assistance: Overview of key agencies Coordination Issues RG		Crowd Safety Fixed sites & Moving events RG	Briefing Exercise Blue Light ME	Prepare Exercise Blue Light
Fri 11 Mar	Military Planning and Response for National Disasters (Regional Liaison Structures) Sqn Ldr Gordon Summers		Exercise Blue Light A National Level Planning Exercise including scenarios, roles, systems and wider issues ME/RG					

WEEK 2	0900 - 0945	0955 – 1040	1100 - 1145	1155 – 1240	1330 - 1415	1425 - 1510	1530 – 1615	Evening / Remarks
Mon 14 Mar	<u>Climate Change</u> : What Disasters Managers need to know DA		Hurricanes & Sea Surge for Disaster Managers ME	Hurricanes DM Issues – Recent Case Studies ME	Floods for Disaster Managers DA	Floods DM Issues – Recent Case Studies ME	Wild Fires for Disaster Managers DA	
Tue 15 Mar	Earthquakes for Disaster Managers DA	Earthquakes DM Issues – Recent Case Studies RG	Urban Hazards and Mega Cities DA	Introduction to Human Made Disasters ME	<u>Case Study</u> Buncefield Fire RG		Myths and Trends in Disaster Management DA	Read Exercise Black Box
Wed 16 Mar	Transport Accidents (Land-Based and Maritime) ME / RG	Early Warning Systems ME	London 7/7 Lessons for Civil Protection DA	Principles of Effective Impact Assessment DA	Transport Accidents (Air) Contingency Planning – Video: Are You Prepared? ME		Exercise Black Box Briefing ME	
Thu 17 Mar	Exercise Black Box A major air accident (Exercise Phase) ME/RG				Visit to Hampshire Police Casualty Bureau, Gold & Silver Command, Briefing from Emergency Planning Officer All			
Fri 18 Mar	Ex Black Box Presentations, discussion and media debrief All	Hyogo Framework for Action - Integrating Travel and Tourism RG	Evaluating National Plans & Systems ME	Course Critique & Certification All	Course Disperses by 2pm			

Seminário Internacional sobre “Gestão Integrada de Riscos e Desastres – Uma nova perspectiva para a Defesa Civil Nacional”

- Abril/2011 - Brasília

CEMADEN

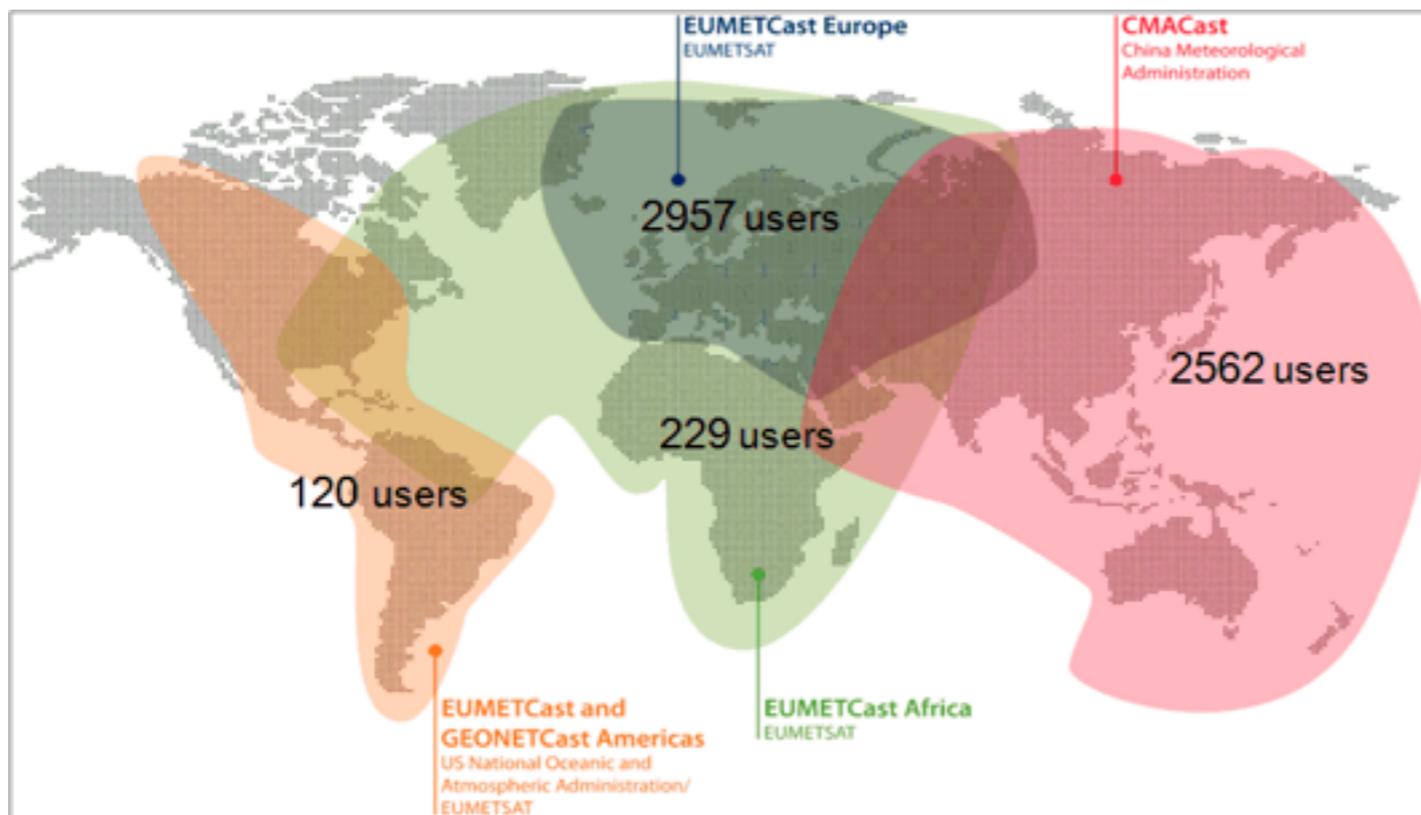
- Agosto 2011
- Reunião no INPE com Dr.Fuck (CEMADEN) e Regina Alvará

GEO

Group on Earth Observations

GEONETCast: global network of low-cost, satellite-based dissemination systems

THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS



GEO

Geohazard Supersites and Natural Laboratories (GSNL)

Event Supersite: M 7.8 Earthquake in Central Nepal

Data and other resources

Type of data	Data provider	How to access	Type of access
TerraSAR-X	 DLR	https://supersites.eoc.dlr.de/	Registered for Supersite community
Cosmo-SkyMed	 ASI	To be opened soon	Registered for Supersite community
RADARSAT-2	 CSA	waiting for endorsement	Registered for Supersite community
Sentinel-1	 ESA	https://scihub.esa.int/dhus/	Registered public
Landsat 8	 NASA	link	Open unregistered
ALOS-2	 JAXA	Not provided to GSNL, only to CEOS Seismic Pilot	
GPS	 UNAVCO	Various UNAVCO Event Page	Depends on data
Seismic	 IRIS	Various IRIS Special Event Page	Open unregistered

CEOS WGDisasters The Working Group on Disasters

- Flood Pilot
- Seismic Pilot
- Volcano Pilot
- Recovery Observatory

WGDisasters-3:

The 3rd Meeting of the CEOS Working Group on Disasters:

March 10th - 12th, 2015

Japan Aerospace Exploration Agency (JAXA): Tokyo, Japan

Hilc3ea Ferreira: Distance Education Course – Remote Sensing for DRM ,

WGCapD & WGDisasters Distance Education Course

- <https://moodle.dpi.inpe.br/course/view.php?id=15>
- Webinar Series on Remote Sensing Technology for Disaster Management
- Concepts and applications of internet GIS and Sensor Web (network of sensors) for disaster management. Example of an open source tool (TerraMA2 - computational platform for developing Monitoring, Analysis and Alert systems)

WGCapD

Cursos

- CEOS WGCapD/RCMRD DEM Workshop - Quênia
Maio/2013 - TerraHydro/TerraMA2/TerraView/
SPRING - Laércio/Sérgio Rosim
- WGCapD Higher Resolution SRTM Data & Flood
Modelling Workshop - África do Sul Março/2015
TerraHydro/HAND
- WGCapD Higher Resolution SRTM Data & Flood
Modelling Workshop - Mexico Maio/2015 -
TerraHydro/HAND - Sergio Rosim

International Charter on Space and Major Disasters

Article II - Purpose of the Charter

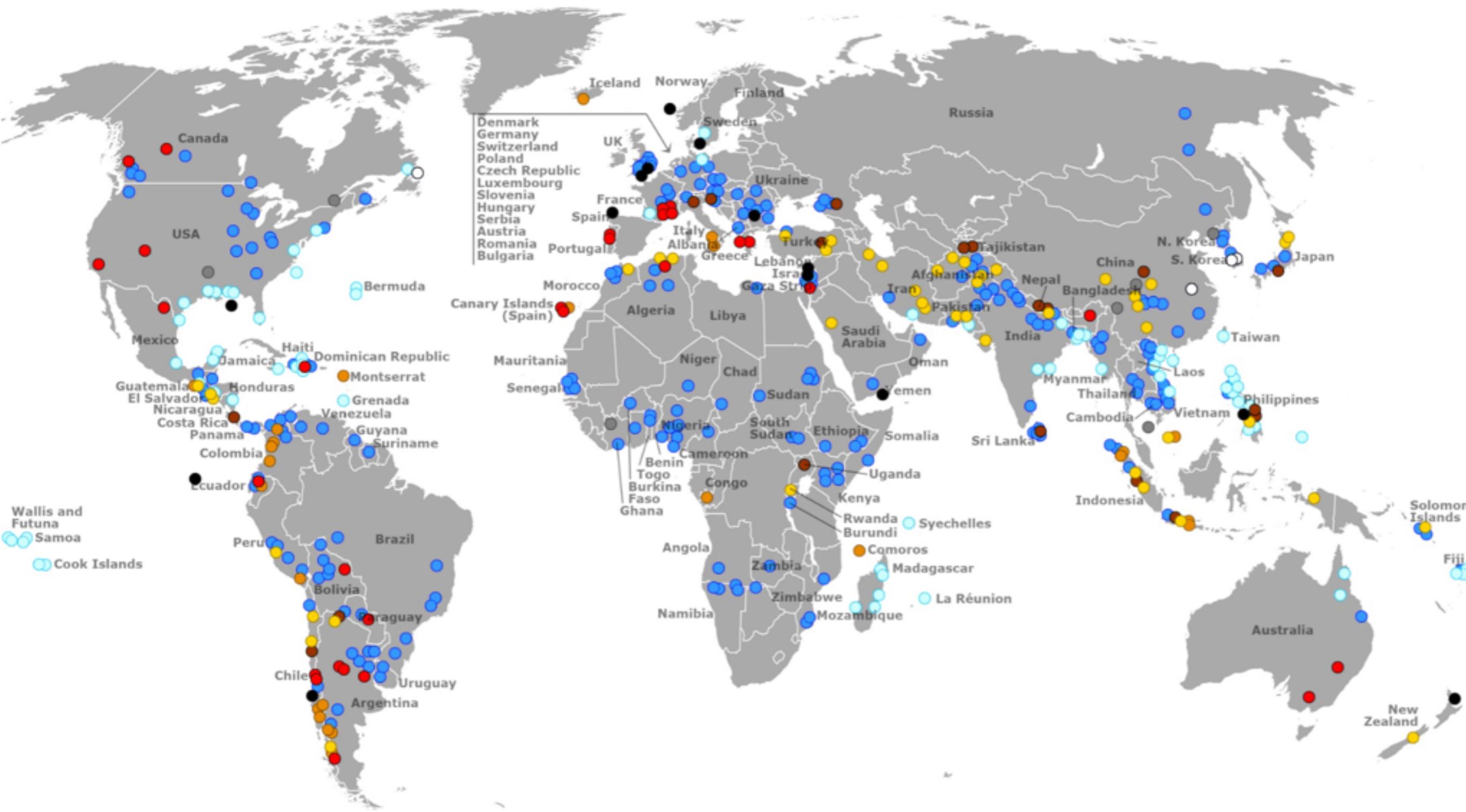
- In promoting cooperation between space agencies and space system operators in the use of space facilities as a contribution to the management of crises arising from natural or technological disasters, the Charter seeks to pursue the following objectives:
 - - supply during periods of crisis, to States or communities whose population, activities or property are exposed to an imminent risk, or are already victims, of natural or technological disasters, data providing a basis for critical information for the anticipation and management of potential crises;
 - - participation, by means of this data and of the information and services resulting from the exploitation of space facilities, in the organisation of emergency assistance or reconstruction and subsequent operations.

International Charter on Space and Major Disasters and UN

- The Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space; Space benefits for the 21st century - UNISPACE III - Vienna, Austria in July 1999
- ESA e CNES, CSA em Outubro 2000
- NOAA, CONAE, JAXA, USGS, ISRO, DMC, CNSA, DLR, KARI, INPE, EUMETSAT, ROSCOSMOS



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

Charter - Brasil

- ~470 Ativações totais, no Brasil: 8 (2008 SC, 2011 RJ, 2012 MG, 2014 Março/RO - Junho/PR - Julho/RS, 2015 - Fev/AC Junho/AM)

BRAZIL JOINS THE INTERNATIONAL CHARTER 'SPACE AND MAJOR DISASTERS'



Signing ceremony

10 November 2011 In the year that severe flooding and landslides claimed over 800 lives in Brazil's Rio de Janeiro state, Brazil has joined the international space organisation that makes timely satellite data available to rescue authorities during disasters.

Brazil's National Institute for Space Research – INPE – formally became the newest member of the International Charter 'Space and Major Disasters' on 8 November.

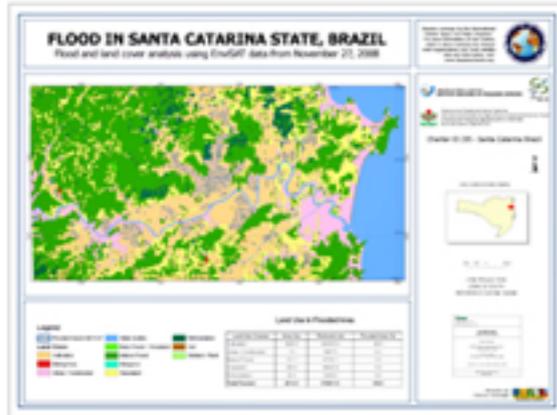
Founded by ESA and the French and Canadian space agencies, the Charter is an international collaboration between the owners and operators of Earth observation missions to provide rapid access to satellite data to help disaster management authorities in the event of a natural or man-made disaster.

Charter Requestor: CONAE

Project Management: INPE

Description of the event

Heavy rainfall caused severe flooding and landslides in the southern Brazilian state of Santa Catarina over the last two months. The number of deaths rose to 84 on Tuesday 25 November. The flooding has left more than 20,000 people homeless.



Flood in Santa Catarina State, Brazil

Source: SRTM/NASA 2004, ENVISAT1-SAR 2008
Acquired: 27/11/2008

Copyright: ESA, NASA .Image processing, map created by INPE.

[Higher resolution version](#)

Flood in Santa Catarina State, Brazil.

Source: ENVISAT1-ASAR, resolution 14.8m
Acquired: 27/11/2008

Copyright: ESA. Image processing, map created by INPE.



Flood in Santa Catarina State, Brazil.

Source: ALOS-PalSAR, resolution 100m
Acquired: 29/11/2008

Copyright: JAXA, METI. Image processing, map created by INPE.



Charter Requestor:

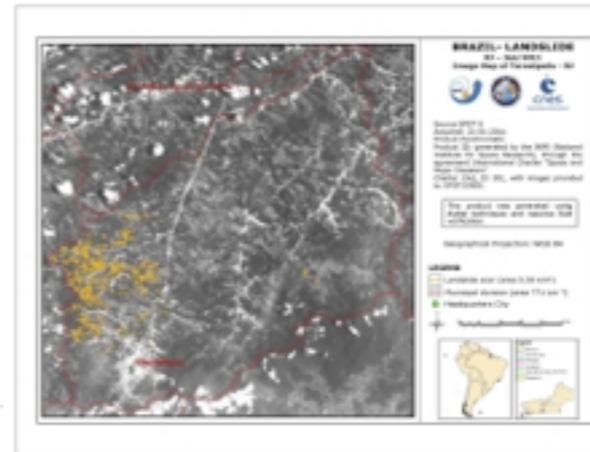
National Institute of Space Research

Project Management:

INPE - Instituto Nacional de Pesquisas Espaciais

Description of the event

Brazil, Rio de Janeiro, has been hit by severe floods in 44 years. Brazilian officials have confirmed that more than 500 lives have been lost in the floods. Rescuers had to reach affected areas on foot because vehicles cannot cross blocked roads.



Landslide in Brazil

Source: SPOT-5
Acquired: 21/01/2011

Copyright: Generated by the INPE with images provided by SPOT/CNES

[Higher resolution version](#)

Flood and landslide in Brazil

Source: GeoEye
Acquired: 20/01/2011

Copyright: Generated by the INPE, images provided by USGS



<https://www.disasterscharter.org/web/guest/-/floods-in-brazil-belo-horizonte-campos-dos-goitacazes>

Charter Requestor: Brazilian Disaster and Risk Management National Centre (CENAD)

Project Management: INPE

Description of the event

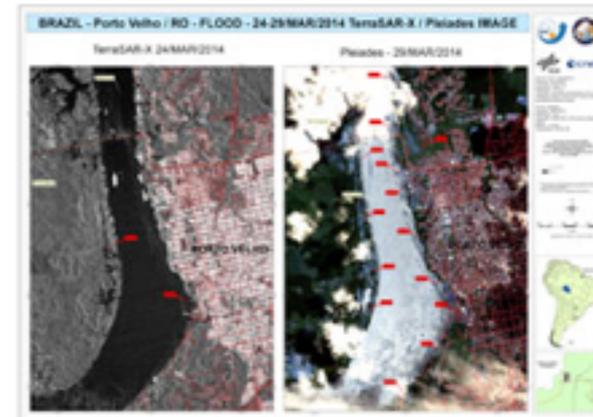
Heavy rain in the northern regions of Brazil have resulted in flooding along the Madeira River since February 2014. Thousands of people have been evacuated, and the flooding is gradually growing worse as the water levels rise. The Madeira River is a tributary of the Amazon River and the flooding is located in Rondonia, a state in northern Brazil on the border with Bolivia (which is also suffering from flooding). Water levels have risen to record levels as of 19 March, reaching 19 metres above the normal level, and it is forecast that it will continue to rise until the end of the month.

A state of emergency was declared in February and 22,000 homes have been evacuated in the area. Many villages along the river were flooded and roads inundated by the flood waters. It is estimated that the affected areas stretch from Porto Velho to Mutum-Parana. No casualties have been reported and this has been attributed to the quick evacuation of the area.

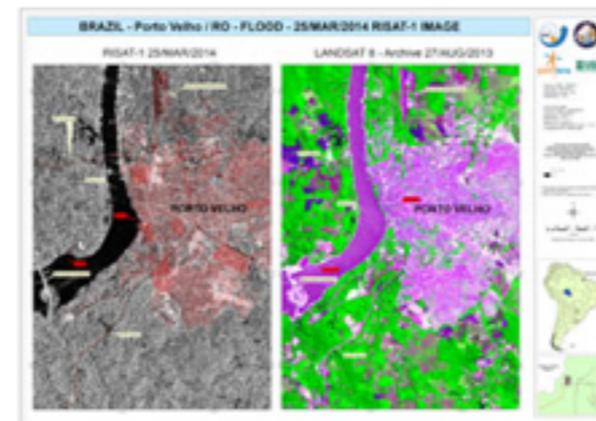
Flood map covering Porto Velho, Rondônia District

Source: TerraSAR-X / Pleiades
Acquired: TerraSAR-X: 24/03/2014
Pleiades: 29/03/2014

Copyright: TerraSAR-X © German Aerospace Center (DLR), 2014 Airbus Defence and Space / Infoterra GmbH
Pleiades © CNES 2014 - Distribution: Airbus Defence and Space, all rights reserved
Map produced by INPE



[Higher resolution version](#)

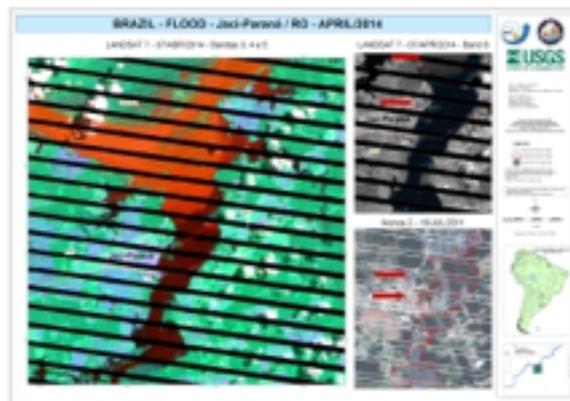


Flood map covering Madeira River at Porto Velho, Rondônia District

Source: RISAT-1 / Landsat-8
Acquired: RISAT-1: 25/03/2014
Landsat-8: 27/08/2013

Copyright: RISAT-1 data and products © NRSC (2014) - All rights reserved
Landsat-8 data and products © USGS (2013) - All rights reserved
Map produced by INPE

[Higher resolution version](#)



Flood map covering the town of Jaci Paraná, Rondônia District

Source: Ikonos 2 / Landsat-7
Acquired: Ikonos 2: 16/07/2011
Landsat-7: 07/04/2014

Copyright: Ikonos 2: Copyright © 2001-2013 DigitalGlobe
Landsat-7 data and products © USGS (2014) - All rights reserved
Map produced by INPE

[Higher resolution version](#)

Flood map covering the town of Jaci Paraná, Rondônia District

Source: Ikonos 2 / RADARSAT-2
Acquired: Ikonos 2: 16/07/2011
RADARSAT-2: 25/03/2014

Copyright: Ikonos 2: Copyright © 2001-2013 DigitalGlobe
RADARSAT-2 Data and Products © MacDonald, Dettwiler and Associates Ltd. (2014) - All Rights Reserved. RADARSAT is an official trademark of the Canadian Space Agency.
Map produced by INPE

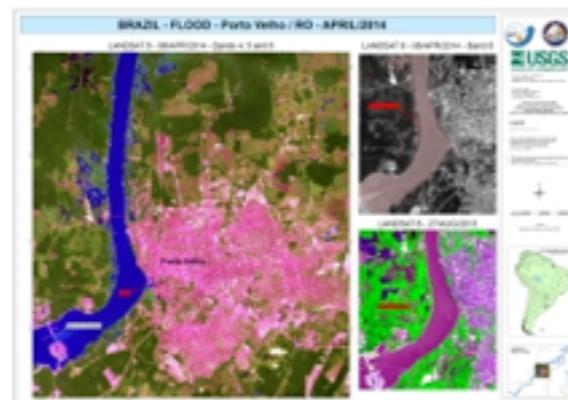


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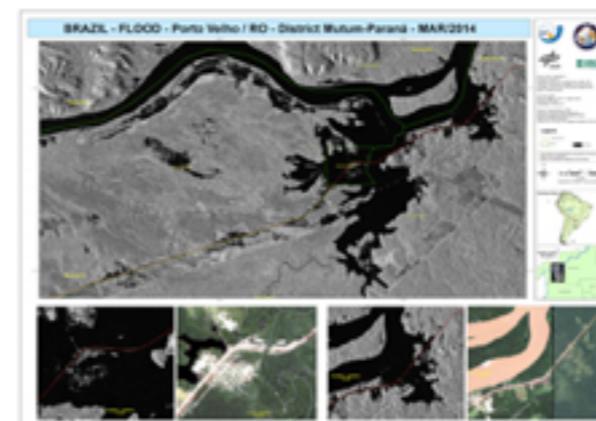
Flood map covering Porto Velho, Rondônia District

Source: Landsat-8
Acquired: Pre-disaster: 27/08/2013
Post-disaster: 08/04/2014

Copyright: Landsat-8 data and products © USGS (2014) - All rights reserved
Map produced by INPE



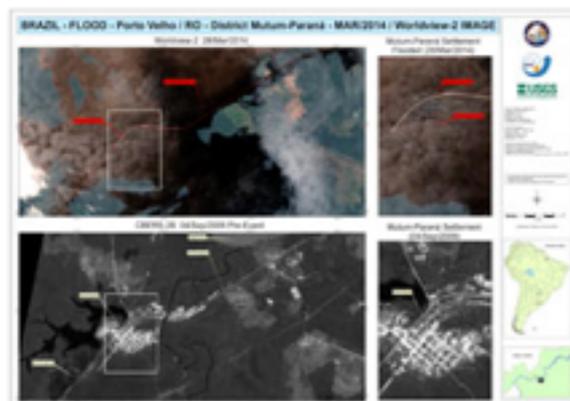
[Higher resolution version](#)



Flood map covering the town of Porto Velho, Mutum-Parana District

Source: Ikonos 2 / TerraSAR-X
Acquired: Ikonos 2: 25/05/2011
TerraSAR-X: 23/03/2014

Copyright: Ikonos 2: Copyright © 2001-2013 DigitalGlobe
TerraSAR-X: © German Aerospace Center (DLR), 2014 Airbus Defence and Space / Infoterra GmbH
Map produced by INPE



Flood in Porto Velho, Mutum-Paraná district

Source: WorldView-2 / CBERS-2B
Acquired: WorldView-2: 28/03/2014
CBERS-2B: 04/09/2009

Copyright: WorldView-2 © DigitalGlobe 2014
CBERS-2B © INPE
Map produced by INPE

Description of the event

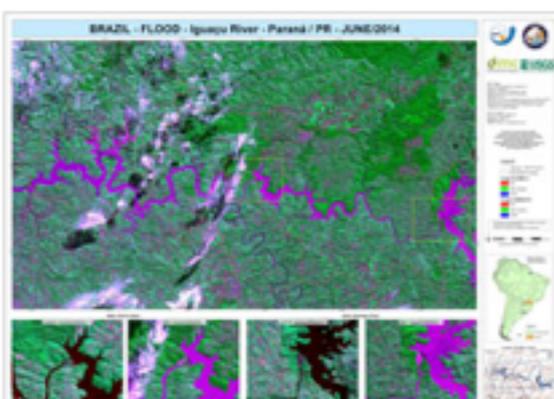
Torrential rainfall, between 07 and 10 June 2014, has caused flooding in southern Brazil where it is estimated that approximately half a million people have been affected.

The weather followed a cold front that passed over the states of Santa Catarina and Paraná, which brought strong winds with the rain. Paraná state has been the worst affected, where ten people have been killed and six were reported missing. Over 130 cities have been affected by the disaster and it was estimated that 40,000 people were evacuated.

Of particular concern was the Paraná River, which burst its banks in places. The rising water level on the river also caused flooding in neighbouring [Argentina](#), and the floodgates at the Yacyreta Dam were opened on 11 June to help control the floodwaters. The dam is located on the border of Argentina, and it was reported that record levels of water passed through the dam.

Floodwaters and landslides have blocked some roads and destroyed bridges, cutting off easy access to some of the affected towns.

The rain was forecast to finish on 15 June, leaving emergency workers with the task of recovering from the flooding.



Iguaçu River Dams, Paraná

Source: UK-DMC2 / Landsat 8
Acquired: UK-DMC2: 22/06/2014
Landsat 8: 09/06/2013

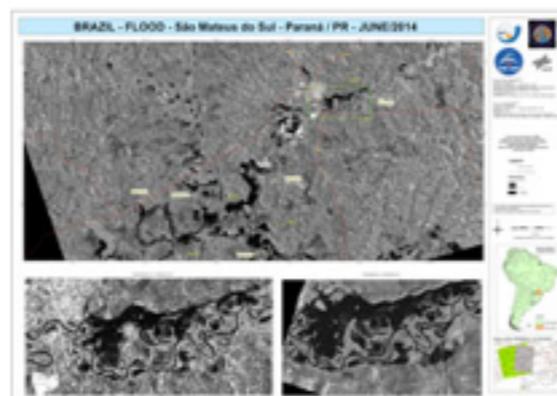
Copyright: UK-DMC2 © 2014 DMC International Imaging (DMCii)
Landsat 8 data and products © USGS (2014) - All rights reserved
Map produced by INPE

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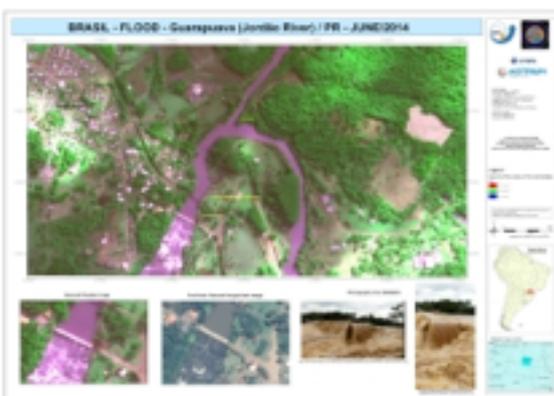
Flood on Iguazu River near Sao Mateus do Sul, Paraná state

Source: RADARSAT-2 / TerraSAR-X
Acquired: RADARSAT-2: 19/06/2014
TerraSAR-X: 16/06/2014

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TerraSAR-X © German Aerospace Center (DLR), 2014 Airbus Defence and Space / Infoterra GmbH
Map produced by INPE



[Higher resolution version](#)



Damaged bridge near Guarapapuava, Jordão River, Paraná state

Source: Pleiades
Acquired: 16/06/2014

Copyright: Pleiades © CNES 2014 - Distribution: Airbus Defence and Space, all rights reserved
Map produced by INPE

Description of the event

Torrential rain in Rio Grande do Sul, Brazil, has caused flooding which has led to two deaths and an estimated 20,000 people evacuated.

Rio Grande do Sul is Brazil's most southern state, and borders Uruguay and Argentina. A state of emergency was declared in the state on 4 July 2014, following over a week of rain which began on 26 June. So far 115 towns and cities have been affected by the flooding across the state, which includes the state capital, Porto Alegre.

It is believed that the weather has been caused by the El Niño effect, which warms the Pacific Ocean and usually results in hot and wet summers for South America.

This latest flood follows on from another batch of torrential rain which affected [southern Brazil](#), and particularly Rio Grande do Sul's nearby states of Santa Catarina and Paraná, in early June. The prolonged rainfall is expected to harm the area's agricultural production, due to saturated ground conditions. The Institute of Meteorology has reported that this was the wettest winter Brazil has experienced since 1983.



Flooding at São Marcos (Uruguiana) in Rio Grande do Sul State

Source: Sentinel-1
Acquired: 08/07/2014

Copyright: Copernicus 2014
Map produced by CENAD (Brazilian National Risk and Disaster Management Center)

[Higher resolution version](#)

Flooding at Porto Xavier, in Rio Grande do Sul State

Source: KOMPSAT-2
Acquired: 09/07/2014

Copyright: KOMPSAT-2 © KARI 2014
Map produced by CENAD (Brazilian National Risk and Disaster Management Center)



[Higher resolution version](#)



Flooding at Itaquí, in Rio Grande do Sul State

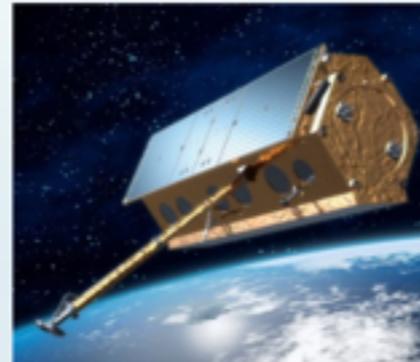
Source: Sentinel-1
Acquired: 08/07/2014

Copyright: Copernicus 2014
Map produced by CENAD (Brazilian National Risk and Disaster Management Center)



what is the Charter?

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



The Charter's capacities can be activated through a **single access point** which is available 24 hours, seven days a week.

Space agencies contribute

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



Universal Access

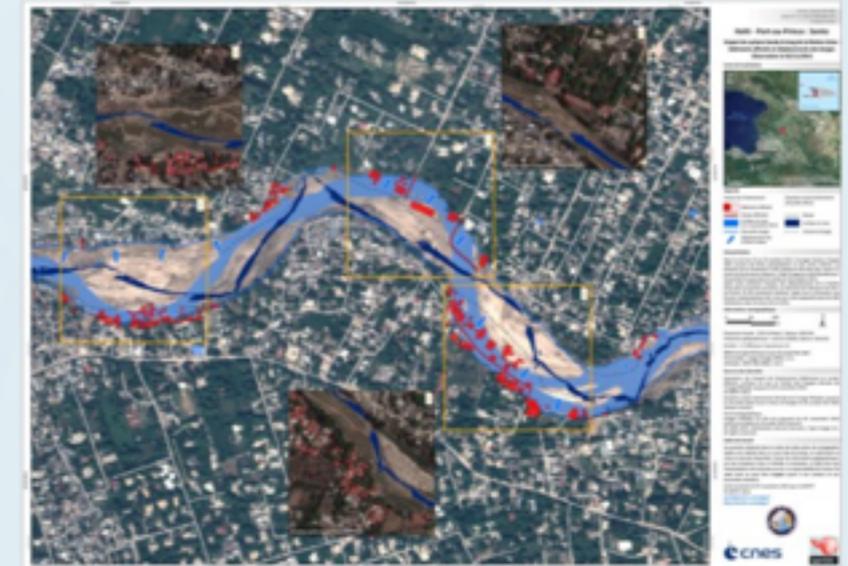


Since September 2012, any national disaster management authority can become an Authorised User, if it meets few basic criteria!



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**

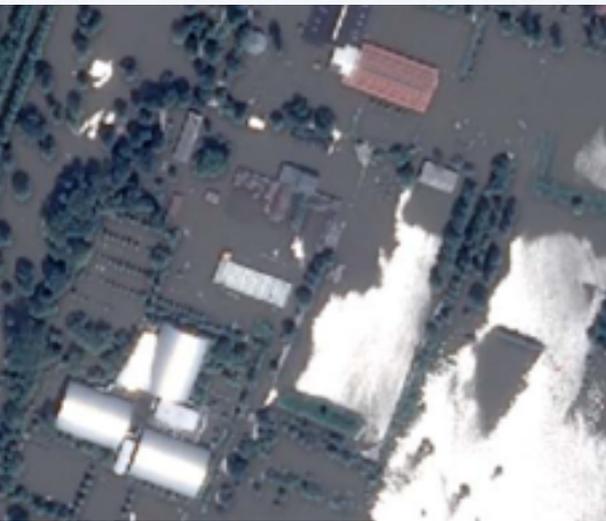




Charter operational loop

Authorised User sends a request for Charter activation

Direct link to the user/response community who will use the maps



~3hrs



~6/8hrs

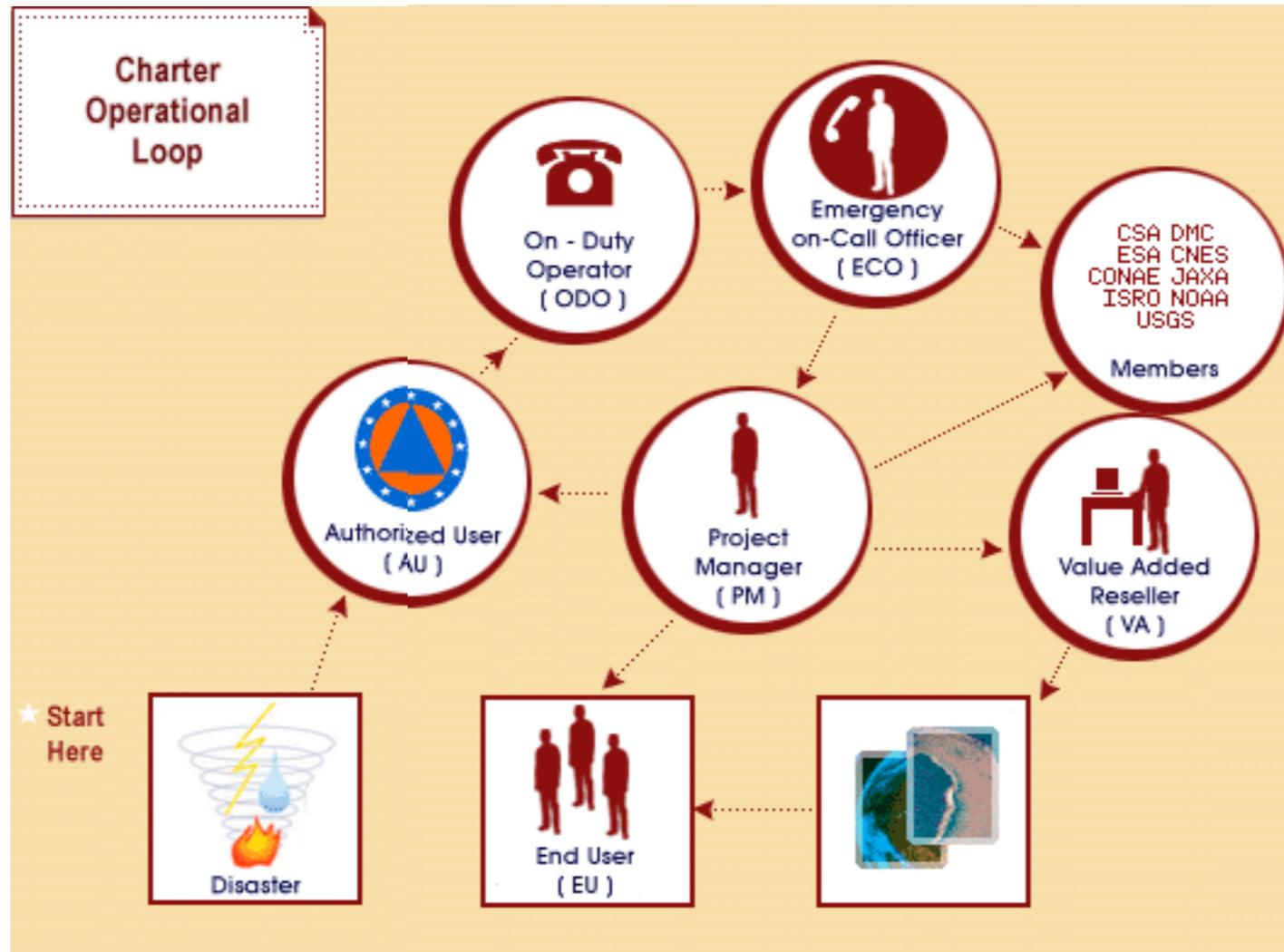


24/7 operators respond to requests by quickly tasking satellites

~24/48hrs



Satellite images received and turned into useful maps



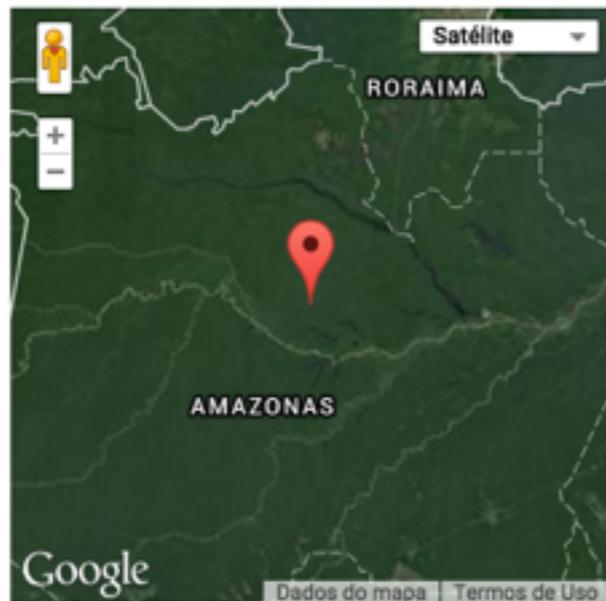
An **Authorized User** can *call* a single number *to request the mobilization of the space and associated ground resources* associated with Charter members in order to obtain data and information on a disaster occurrence.

A 24-hour **on-duty operator** receives the call, *checks* the identity of the requestor and *verifies* that the User Request form, sent by the Authorized User, is correctly completed.

The **operator** *passes* the information to an **Emergency On-Call Officer** who analyzes the request and the scope of the disaster with the Authorized User, and *prepares an archive and acquisition plan using available satellite resources*.

Data acquisition and delivery takes place on an emergency basis, and a **Project Manager** (Identified by **Executive Secretariat** when Charter is activated), who is qualified in data ordering, handling and application, assists the user throughout the process.

Conexões



Flood in Brazil

Thursday, 11 June 2015

Major floods in Brazil have now affected over 250,000 people and as many as 39 cities have been flooded.

It is regarded as one of the most extensive floods Brazil has experienced in recent years.

[Read More](#)

[Next](#)

- Latest News

ISRO takes over the chairmanship of the International Charter 'Space and Major Disasters'

Friday, 17 April 2015

The 33rd Executive Secretariat and Board meeting was held at Hyderabad, India from 14 to 17 April 2015. At the meeting, ISRO (Indian Space Research Organisation) took the lead agency role for the next six-month period until October 2015.

[Read More](#)

CEOS WGCapD Distance Education Course

Wednesday, 25 March 2015

The CEOS (Committee on Earth Observation Satellites) Working Groups on Capacity Building and Data Democracy (WGCapD) Distance Education Course will take place from 6 April to 29 May 2015. The International Charter: Space and Major Disasters will be represented at this course, with information on how the Charter contributes to remote sensing for disaster management.

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- [Presentation of the Charter](#)
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The Charter has been activated for [#flooding](#) in [#Brazil](#) which has now affected over 250,000 people: bit.ly/1L5jX1u

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UNOSAT
@UNOSAT

10 Jun

[@GDACS](#) overview released. [#Japan](#) [#volcano](#), [#Yemen](#) emergency, [#Guiana](#) algae bloom & more bit.ly/1KUEBOW [@NASA](#) [@DisastersChart](#) [@UNITAR](#)

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Disasters Charter
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8 Jun



Limited mandate of the Charter

THE DISASTER RISK MANAGEMENT CYCLE



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

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

If needed, the Charter can be activated **in advance (1-2 days)**.

United Nations

UN Office for Disaster Risk Reduction
(UNISDR)

UN Office for Outer Space Affairs (UNOOSA)

UN Platform for Space-based Information for
Disaster Management and Emergency
Response (UN-SPIDER)

UNISDR

- Hyogo Framework for Action - 2005-2015 -*Building the Resilience of Nations and Communities to Disasters*, 10-year plan to make the world safer from natural hazards
- Sendai Framework for Disaster Risk Reduction - 2015-2030
- Shift from disaster management to disaster risk management

Sendai Framework for Disaster Risk Reduction 2015-2030 Priorities for Action

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response, and to “Build Back Better” in recovery, rehabilitation and reconstruction

Sendai - Priority 1

Understanding disaster risk

National and Local Levels

- To achieve this, it is important to:
 - ... (c) Develop, update periodically and disseminate, as appropriate, *location-based disaster risk information*, including **risk maps**, to decision makers, the general public and communities at risk to disaster *in an appropriate format by using*, as applicable, **geospatial information technology**;
 - ... (f) *Promote real-time access to reliable data, make use of space and in situ information, including **geographic information systems (GIS)***, and use information and communications technology innovations to enhance measurement tools and the collection, analysis and dissemination of data;

Sendai - Priority 1

Understanding disaster risk

Global and Regional Levels

- To achieve this, it is important to:
 - ... (c) **Promote and enhance**, through international cooperation, including technology transfer, *access to and the sharing and use of non-sensitive data, information, as appropriate, communications and geospatial and space-based technologies* and related services. **Maintain and strengthen in situ and remotely-sensed earth and climate observations.**; ...
 - ... (g) **Enhance** the **scientific and technical work** on disaster risk reduction and its mobilization through the coordination of existing networks and scientific research institutions at all levels and all regions with the support of the UNISDR Scientific and Technical Advisory Group **in order to**: strengthen the evidence- base in support of the implementation of this framework; promote scientific research of disaster risk patterns, causes and effects; **disseminate risk information with the best use of geospatial information technology**; provide guidance on methodologies and standards for risk assessments, *disaster risk modelling and the use of data*; identify research and technology gaps and set recommendations for research priority areas in disaster risk reduction; ...

Sendai - Priority 4

Enhancing Disaster Preparedness

- To achieve this, it is important to:
 - National level:
 - ... (b) **Invest in, develop, maintain and strengthen** people-centred multi-hazard, multi-sectoral **forecasting and early warning systems**, disaster risk and emergency communications mechanisms, social technologies and hazard-monitoring telecommunications systems
 - Global level:
 - ... (a) **Develop and strengthen**, as appropriate, coordinated regional approaches and **operational mechanisms to prepare for and ensure rapid and effective disaster response** in situations that exceed national coping capacities;

United Nations Office for Outer Space Affairs

- The Office implements the decisions of the General Assembly and of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS);
- Performs functions of substantive Secretariat of the Committee on the Peaceful Uses of Outer Space and its Scientific & Technical Subcommittee and Legal Subcommittee;
- Coordinates the inter-agency coordination within the United Nations on the use of space technology (UN-SPACE);
- Maintains coordination and cooperation with space agencies and intergovernmental and non-governmental organizations involved in space-related activities;
- Implements the United Nations Programme on Space Applications;
- Is responsible for the implementation of the **United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER)** programme;
- Maintains the Register of Objects Launched into Outer Space as per the Convention on Registration of Objects Launched into Outer Space which was enacted in 1976.

UNOOSA Issues

- United Nations Conference on Sustainable Development (Rio+20) - Efforts to promote the use of space-based applications to:
 - Monitor the environment (land, oceans)
 - Development in urban / rural areas
 - Applications in agriculture, ecosystems, etc
- Climate Change COP21
 - Efforts to promote the use of space-based applications in:
 - Essential climate variables (ECVs)
 - Mitigation
 - Adaptation
 - Loss and Damage
 - And to contribute to monitor the implementation of the new climate change

UN Platform for Space-based Information for Disaster Management and Emergency Response - UN-SPIDER Mission statement

Ensure that all countries have access to and develop the capacity to use all types of space-based information to support the full disaster management cycle - General Assembly Resolution 61/110 (2006)



UN-SPIDER



Knowledge Portal

The UN-SPIDER Knowledge Portal is a web-based tool for information, communication and process support



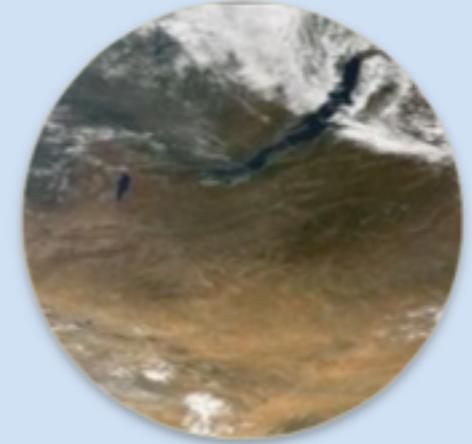
Fostering Cooperation

UN-SPIDER fosters alliances and creates forums where both space and disaster management communities can meet



Capacity Building

UN-SPIDER facilitates capacity building and institutional strengthening, including the development of curricula and an e-learning platform (e-SPIDER)



Technical Advisory Support

UN-SPIDER provides support to countries in assessing national capacity and in evaluating disaster and risk reduction activities, policies and plans

and many more...



Network of Regional Support Offices (RSOs)



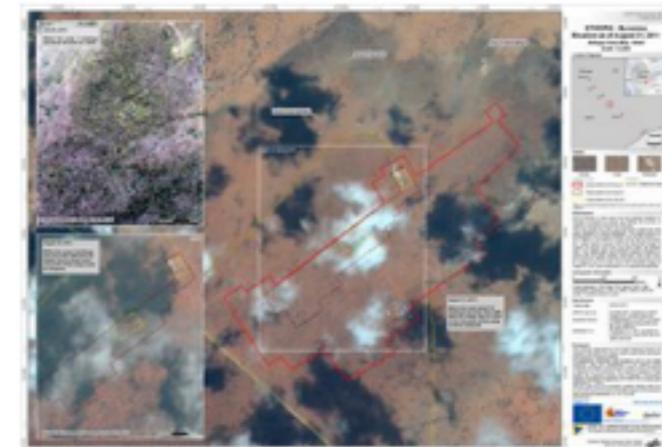
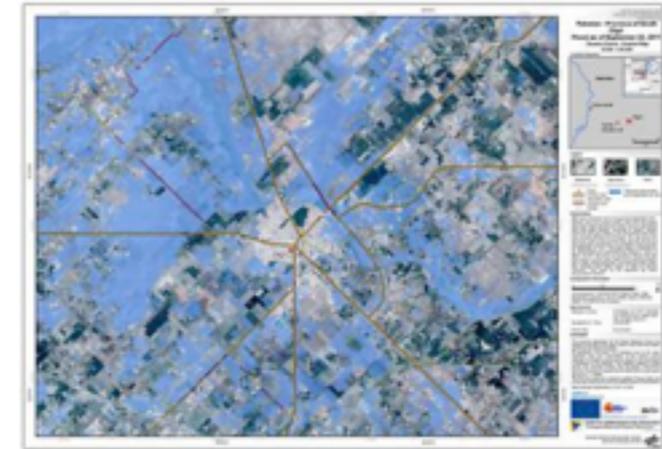


Technical Advisory Missions (2008 – 2014)



DLR Center for Satellite Based Crisis Information (ZKI)

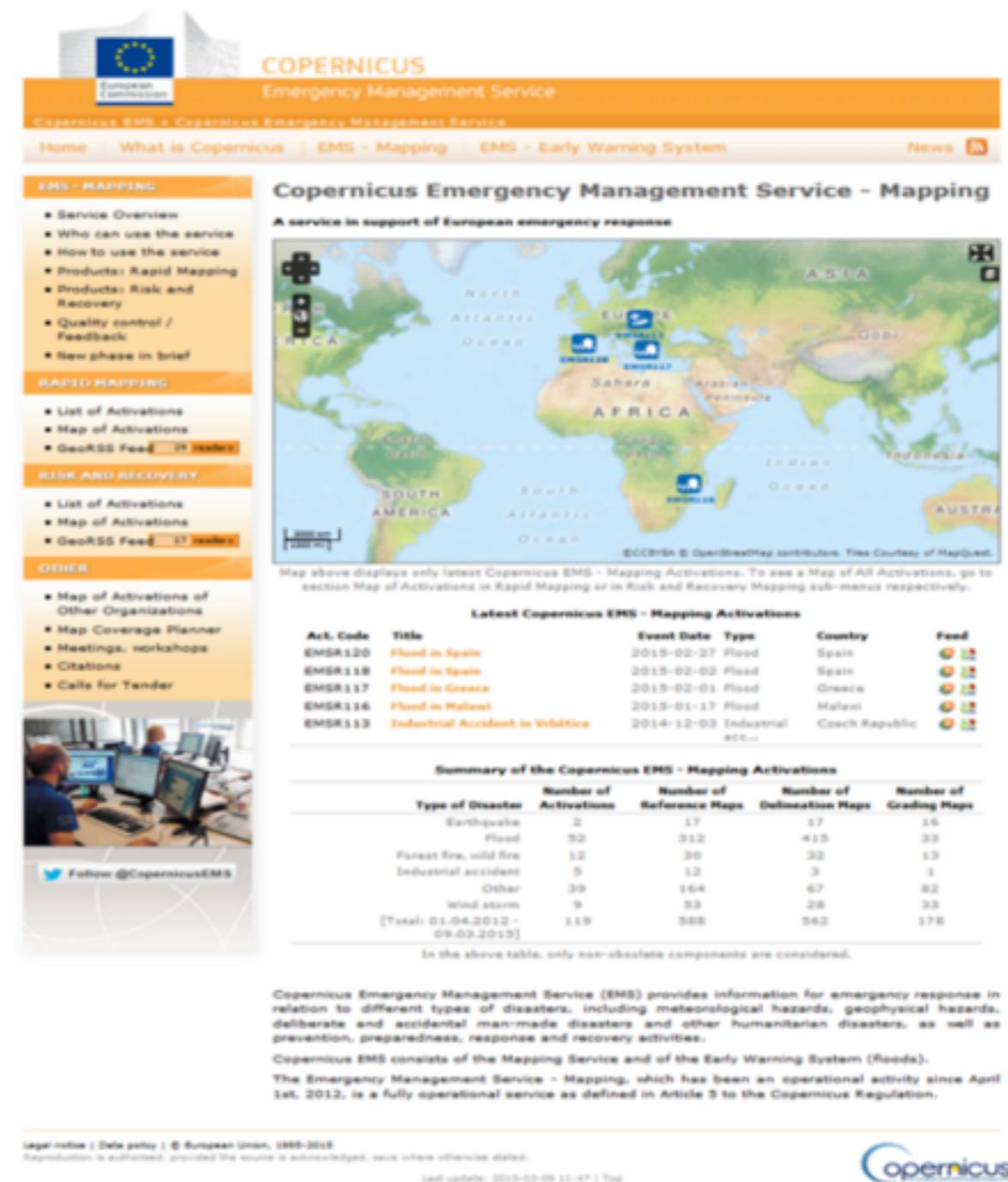
- ... provides 24/7 service for
 - rapid mapping and damage assessment
 - monitoring crisis situations
 - reference mapping for disaster preparedness



Emergency Management Service (EMS)

- ★ Operational since April 2012
- ★ 24/7 addressing natural and man-made disasters globally
- ★ Provides disaster management information based on space data combined with other information
- ★ Focal point for users is the Emergency Response Coordination Centre at DG ECHO (ERCC)
- ★ Coordination by DG ECHO, DG GROW, DG JRC
- ★ Two components: Mapping and Early Warning System (EWS)
- ★ For some events EMS Mapping is supported by EWS
- ★ Standard delivery: raster and vector maps

Space



COPERNICUS
Emergency Management Service

Copernicus EMS - Copernicus Emergency Management Service

Home | What is Copernicus | EMS - Mapping | EMS - Early Warning System | News

Copernicus Emergency Management Service - Mapping

A service in support of European emergency response

Map above displays only latest Copernicus EMS - Mapping Activations. To see a Map of All Activations, go to section Mapping Map of Activations in Rapid Mapping or in Risk and Recovery Mapping sub-menus respectively.

Act. Code	Title	Event Date	Type	Country	Feed
EMSR120	Flood in Spain	2015-02-27	Flood	Spain	📍📍
EMSR118	Flood in Spain	2015-02-02	Flood	Spain	📍📍
EMSR117	Flood in Greece	2015-02-01	Flood	Greece	📍📍
EMSR116	Flood in Malawi	2015-01-17	Flood	Malawi	📍📍
EMSR113	Industrial Accident in Vrbítice	2014-12-03	Industrial etc...	Czech Republic	📍📍

Summary of the Copernicus EMS - Mapping Activations				
Type of Disaster	Number of Activations	Number of Reference Maps	Number of Delineation Maps	Number of Grading Maps
Earthquake	2	17	17	16
Flood	92	312	415	33
Forest fire, wild fire	12	30	32	13
Industrial accidents	5	12	3	1
Other	39	164	67	82
Wind storm	9	33	28	33
(Total: 01.04.2012 - 09.03.2015)	119	588	562	178

In the above table, only non-obsolete components are considered.

Copernicus Emergency Management Service (EMS) provides information for emergency response in relation to different types of disasters, including meteorological hazards, geophysical hazards, deliberate and accidental man-made disasters and other humanitarian disasters, as well as prevention, preparedness, response and recovery activities.

Copernicus EMS consists of the Mapping Service and of the Early Warning System (EWS).

The Emergency Management Service - Mapping, which has been an operational activity since April 1st, 2012, is a fully operational service as defined in Article 5 to the Copernicus Regulation.

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Copernicus Emergency Management Service

Which contribution can Risk and Recovery mapping make?

Provides on-demand geospatial information supporting emergency management activities not related to the immediate response. It addresses prevention, preparedness, disaster risk reduction and supports the recovery phase.

Product delivery phase: 35 days (15 + 20)

MAP TYPE	CONTENT	DELIV. TIME
REFERENCE	Detailed status of the territory and assets. <ul style="list-style-type: none"> E.g. Topographic features and specific information, e.g. land use zoning plans, mitigation measures 	20d (#)
PRE - DISASTER	Relevant info to help planning for contingencies on vulnerable areas <ul style="list-style-type: none"> E.g. Hazard exposure to hazardous events; Vulnerability / resilience of settlements and buildings; Risk status for population and assets; Evacuation plans; Forecasts; Alerts 	20d (#)
POST - DISASTER	Relevant thematic information, beyond the immediate response phase <ul style="list-style-type: none"> E.g. Hazard exposure to hazardous events; Vulnerability / resilience of settlements and buildings; Risk status for population and assets; Post disaster needs assessment; Recovery plans; Reconstruction / rehabilitation monitoring; IDP monitoring (IDP camps, IDP movements). 	20d (#)

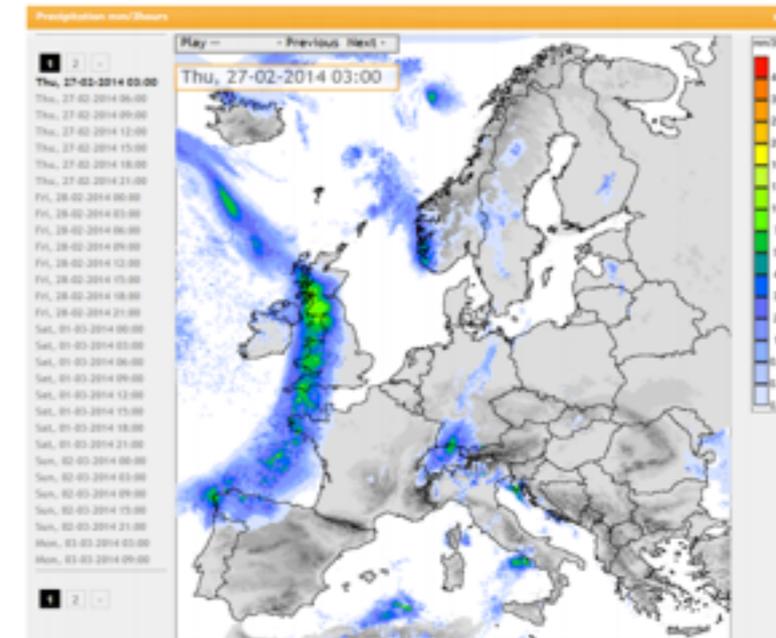
(#) working days after signature of a specific contract, which may require normally 15 days after the service request

European Flood Awareness System (EFAS), the early warning system for floods

★ EFAS fully operational: under development at JRC since 2002 and fully operational since September 2012 under the Copernicus Emergency Management Service.

★ Objectives of EFAS:

- ✓ Provide complementary flood forecasting information to national services
- ✓ Provide European scale overview to the ERCC/ECHO
- ✓ Pre-alerting Copernicus EMS Mapping



- EFAS partners: national/regional hydrometeorological authorities; currently more than 35 partners (EU & non-EU)

Integration of UAS in Copernicus Emergency Management Service (EMS)

- Pilot activities on role of (un) manned aerial platforms will be launched in 2015 in complement or alternative to satellite sensors during specific disasters
- Assessment of UAS deployment mechanisms and legislation and regulation will be addressed
- Integration of UAS in Copernicus EMS will be tested for potential scale-up after 2015

Contract specifics

- ★ Deliverables within 48 Hr after activation request (EU countries)
 - Raw data (picture + geotag) + camera details
 - UAV GPS track
 - Digital Surface Model
 - Fully Ortho rectified imagery
 - Post processing report
 - Ground Control Point information

- ★ Study report :
 - On the procedure to follow related to permit requests and regulations in EU Countries