



The International Charter Space and Major Disasters NEWSLETTER

May 2022 / Issue 24

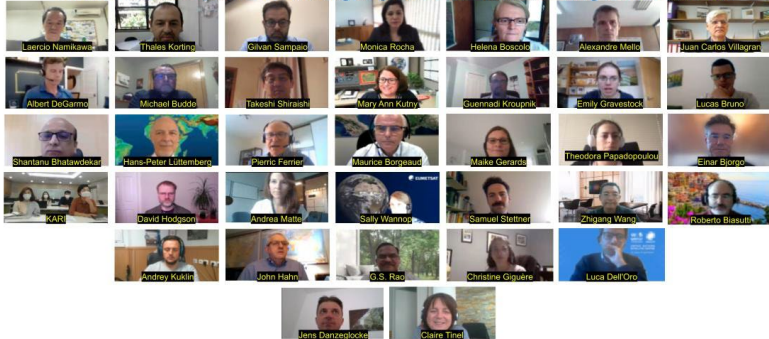


Activations on map



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Charter members on the 46th Lead Agency Handover Online Meeting on October 2021



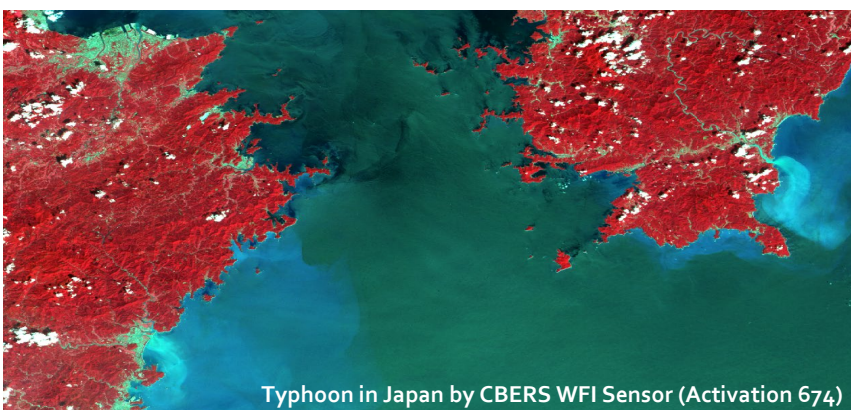
National Institute for Space Research (INPE) – Charter Leadership

Brazil's National Institute for Space Research (INPE) took the responsibility of the Charter leadership in October 2021.



Twenty years of saving lives from space: how space agencies are contributing to relief efforts through the Charter

Charter members participated in the 72nd International Astronautical Congress.



Typhoon in Japan by CBERS WFI Sensor (Activation 674)

WFI sensors from CBERS and AMAZONIA-1 satellites

Data from the WFI sensors on the CBERS and AMAZONIA-1 satellites are contributing to the Charter.



SATELLITE DATA TO SUPPORT DISASTER RESPONSE WORLDWIDE

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National Institute for Space Research (INPE) – Charter Leadership

Brazil's National Institute for Space Research (INPE), a member of the Disasters Charter since November 2011, took the responsibility of the Charter leadership in October 2021 from the Indian Space Agency (ISRO). Due to the prevailing COVID-19 situation worldwide, meetings continued to be organized online, and the 46th meeting of the Charter was held in this format. All Agencies participated in the meetings, with the National Academy of Sciences (NAS) from Belarus taking part only in the Executive Secretariat meeting due to the challenging conditions to conclude NAS full membership.

Some highlights during the current INPE leadership period are:

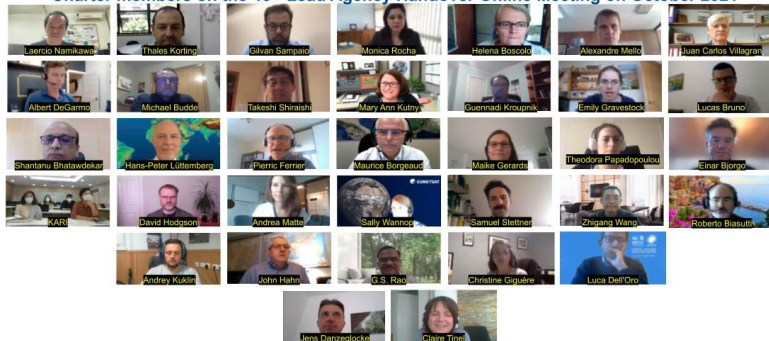
- Availability of a new tool for Project Managers and Value Adders in COS-2: a Charter Mapper to help with visualization and selection of images.
- National Academy of Sciences (NAS) from Belarus became a Charter Member.
- Inclusion of five new Universal Access Authorized Users: South Africa, Armenia, Mongolia, Gambia and Nicaragua.

The leadership of the Charter rotates every six months. The next lead - beginning May 2022 - will be a partnership between the two United States members, the United States Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA).



Principal Concierge - INPE
Photo credit: INPE

Charter members on the 46th Lead Agency Handover Online Meeting on October 2021



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Training course for the use of International Charter 'Space and Major Disasters' in Central America

Professionals from the National Commission for Space Activities (CONAE) and INPE provided a training course in Guatemala to form a regional support group for emergencies with satellite information. One of CONAE's objectives since it became a member of the Charter in 2004 is to motivate the use of the charter in Latin American countries, to strengthen their own disaster management capabilities and create more collaborative ties among them.

Within the framework of this work, in Guatemala, from November 30 to December 2, 2021, CONAE and INPE provided a training course on the use of the International Charter, with participants from Costa Rica, El Salvador, Honduras, Panama, Guatemala, Nicaragua, the Dominican Republic and Mexico. The main purpose of the course was to form a regional working group to manage and collaborate during activations of the International Charter and with emergencies at the local level. The Central America region and the Dominican Republic present high levels of risk to natural and man-made disasters due to their geography. In 2020 alone, more than 20 hydrometeorological phenomena occurred, including two category 5 hurricanes, with loss of material and human life.

The course was organized by the United Nations Platform for Space-Based Information for Management Disaster and Emergency Response (UN-SPIDER); the Coordination Center for the Prevention of Natural Disasters in Central America and the Dominican Republic (CEPREDENAC) and the International Charter 'Space and Major Disasters'.



Representatives of some countries of Central America during training course in Guatemala

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COP26 and the Disasters Charter

COP26 was the 26th UN Climate Change Conference, which took place between 1 and 12 November 2021, in Glasgow. The summit was hosted in partnership between the UK and Italy.

COP stands for Conference of the Parties, and the summit was attended by the countries that signed the United Nations Framework Convention on Climate Change (UNFCCC). COP26 was critical because it was the first moment where countries set out more ambitious goals for ending their contribution to climate change under the Paris Agreement.

The climate crisis is already playing a role in natural disasters, linking to increased frequency and intensity around the world. Therefore, during several sessions across the conference, the Disaster Charter was named and discussed.

One of the highlight sessions was 'In Space We Trust: Powering Inclusive Local Climate Action with Space Technology & Human Connections'. With keynote speaker Dr Paul Bate, CEO of UK Space Agency, and moderator Davis Adieno, Director of Programs at the Global Partnership for Sustainable Development Data, and also including UKSA senior leaders from the International Partnership Programme and Earth Observation on the panel.

Similarly, other mentions of the Charter at this conference, emphasized the high level of international cooperation it takes on to achieve its task. This level of cooperation was recognized as a standard many should take for helping the climate crisis - working together rapidly, with one mission in mind.

COP26 provided an international platform for the Charter to raise awareness. This awareness was also seen across digital media, having increased visits to [the UK Space Agency Disaster Charter 20th Anniversary blog](#) and also receiving several questions and admiration posts from followers.

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Haiti disaster story

Sitting at the juncture of two tectonic plates, the Republic of Haiti occupies the western third of the Caribbean island of Hispaniola in a region of the globe regularly exposed to natural and climate hazards affecting several million people and hindering the nation's economic and social development.

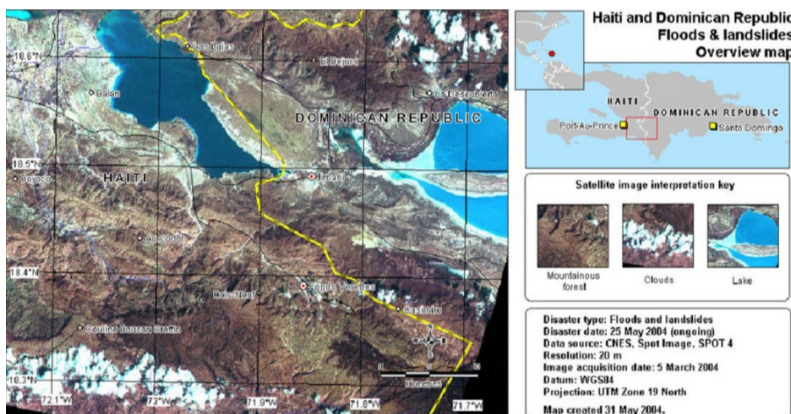
Since its inception in October 2000, the International Charter Space and Major Disasters has been activated nine times for Haiti. That equates to a disaster roughly every two years, hitting the population and wrecking the nation's infrastructures, each episode proving increasingly deadly in terms of lives lost and people missing.

The Charter was called into action for the earthquakes of May 2010 (magnitude 7.0) and August 2021 (magnitude 7.2), hurricanes Sandy (2014), Matthew (2016) and Irma (2018), the severe ocean storm of September 2014 and several flood events in May 2004, August 2021 and September 2021.

The Republic of Haiti is a country of sheer mountains, small coastal plains and remote river valleys. Given such geographical and geological constraints, satellite remote-sensing technologies are vital to precisely map the extent of human and material damage, and to identify camp sites for displaced populations or refugees and relief stations. Thus it was in 2004 that the United Nations Office for Outer Space Affairs (UNOOSA), as an authorized user, activated the Charter for the first time for Haiti at the request of its government and international humanitarian organization UN OCHA/Red Cross. At that time, only Charter members and UN authorities had clearance to activate it directly. With the adoption of the universal access principle in 2012, more than 60 countries—among them Haiti—can now activate the Charter themselves. The only requirement for national disaster management agencies is that they be trained in the Charter's activation mechanisms and possess the digital technologies needed to receive and process damage maps delivered free of charge to users—mainly civil protection teams—to enable fast emergency response for disaster victims. Haiti's Civil Protection Directorate was thus able to activate the Charter and benefit from these services after the August 2021 earthquake.

In 17 years, more than 40 satellites—out of the 61 operating for the Charter in 2022—have provided optical and radar imagery to compile damage maps vital for relief teams in the field and disaster-hit populations in Haiti. These include Komsat-2, GeoEye-1, QuickBird-2, Envisat, RADARSAT, Landsat-7, SPOT 4, SPOT 5, TerraSAR-X, Pleiades and Sentinel-2.

The images below show how quality has improved since 2004. Thanks to satellites' agility, it is now possible to task and acquire imagery very quickly for very precise regions of interest, and compare it with archive data to release maps at short notice highlighting the extent of damage to buildings, houses, bridges, roads and other infrastructures, or to identify refugee camps and other settlements.



Haiti and Dominican Republic Floods and Landslides – Overview map

Image credit: SPOT-4 © CNES 2004 - Distribution: Spot Image S.A., all rights reserved. Map produced by UNITAR/UNOSAT



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“On 14 August 2021, after the earthquake that devastated the southwest of Haiti, the country’s Civil Protection Directorate activated the Charter to obtain rapid satellite imagery of the many lines of communication cut off by landslides. The Directorate and the CNIGS national geospatial information centre worked closely with CNES and the SERTIT regional image processing and remote sensing department in France to task satellites and generate value-added products,” says Claire Tinel, at that time CNES’s representative to the Charter’s Executive Secretariat.

Working through the Committee on Earth Observation Satellites (CEOS), the Charter’s actions can be extended by reconstruction observatories via the Recovery Observatory (RO) project led by CNES. The goal is to support reconstruction efforts in the aftermath of major disasters using satellite imagery, assuring continuous acquisitions to enable early damage estimates, assist reconstruction planning and monitor and assess progress.

The first RO pilot project was undertaken in Haiti to support recovery after Hurricane Matthew, which left a trail of destruction across the southwest of the country in October 2016. A major effort was engaged to acquire satellite imagery and derive numerous map products specified by the Haitian government. This mechanism was again activated in August 2021 at the request of international partners—the World Bank, the United Nations Development Programme (UNDP) and the European Union—to aid reconstruction following the earthquake and Tropical Storm Grace, with a contribution from CNES and many other CEOS space agencies (ESA, DLR, ASI, NASA, NOAA and Copernicus).

Remote-sensing data thus supplied key data impossible to obtain from other sources for the Post-Disaster Needs Assessment (PDNA) and Recovery Framework regarding impacts on the environment—particularly in the Pic Macaya National Park—and agriculture.



Haiti earthquake – Damaged structure observed

Image credit: WorldView-3 © DigitalGlobe Inc. (2021), Pleiades material © CNES (2021), Distribution Airbus DS. Map produced by UNITAR/UNOSAT



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Twenty years of saving lives from space: how space agencies are contributing to relief efforts through the Charter

On 25-29 October 2021, Charter members participated in the 72nd International Astronautical Congress (held in Dubai, United Arab Emirates) by the invitation of the Earth Observations Committee of the International Astronautical Federation in recognition of the 21st anniversary of the Charter.

During the Plenary Panel, the senior representatives of the three original signatories of the Charter – ESA, CNES, and CSA (Mr. Josef Aschbacher, Mr. Philippe Baptiste, and Mrs. Lisa Campbell, respectively) delivered very inspiring talks and gave outstanding credit to the work done by the Charter members, aimed to save lives and reduce human suffering in major disasters. The Charter objectives, the breadth of the applications and their relationship to societal benefit, and the benefits in both saving of lives and assessment of property loss were widely discussed.

On 29 October a dedicated Technical Session "21st Anniversary of the Disaster Charter: History, Status, and Future of this Powerful and Productive International Cooperation" was held to introduce the Charter's current efforts to support disaster relief organizations and share its success stories of space data and value added products delivery during the Charter activations for major disasters all over the world.

ESA (Mr. Maurice Borgeaud and Mr. Roberto Biasutti) presented the Charter operational system (COS-2) and the Charter Mapper – modern tools to support call management and satellite information delivery to the Charter End Users.



Mr. Maurice Borgeaud (ESA)



Mr. Roberto Biasutti (ESA)

Dedicated Technical Session "21st Anniversary of the Disaster Charter: History, Status, and Future of this Powerful and Productive International Cooperation"



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Russian ROSCOSMOS State Space Corporation (Mr. Andrey Kuklin) reported how the disaster mitigation in Russia has improved since its inception to the Charter in August 2013 and shared its experience on how the Charter End Users are benefiting from the Russian Kanopus-V and Resurs-P satellite data.

The Charter partner UNOOSA (Mr. Juan Carlos Villagran de Leon, head of UN-SPIDER's office in Germany) presented their outstanding efforts to facilitate the link between the Charter and the Disaster management community.

CNES (Mr. Pierric Ferrier) highlighted significant milestones of the Charter Universal Access policy and current efforts to raise disaster awareness.

NOAA (Mr. Alberto DeGarmo) recalled the utility of the Charter satellite imagery during the 2010 Deepwater Horizon oil spill.

The high-level Plenary event and Technical Session were very well attended by the audience, the Charter partners, and cooperating bodies. Several members of the Charter Board and Executive Secretariat were also present.

The 73rd International Astronautical Congress will be held in 2022 in Paris. Centre National d'Etudes Spatiales welcomes all the Disaster Charter members and community to participate in the event.



Mr. Juan Carlos Villagran de Leon (UN-SPIDER) and Mr. Andrey Kuklin (ROSCOSMOS)



Mr. Pierric Ferrier (CNES)



Mr. Alberto DeGarmo (NOAA)

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WFI sensors from CBERS and AMAZONIA-1 satellites

The Wide Field Imaging (WFI) sensor was developed in partnership between the Brazilian industry and INPE and is on board the China-Brazil Earth Resources Satellite (CBERS) series and the AMAZONIA-1 satellite. The latest versions of this sensor have made a significant improvement in their technical characteristics in relation to the sensors on board of the first CBERS.

The spectral bands of WFI cover the Blue, Green, Red and Near InfraRed ranges, with spatial resolution from 55 to 64 meters (depending on the satellite operating altitude). The wide side of the sensor has a swath of 680 Km to 866 Km (also depending on satellite). The other great specs the nominal revisit of 5 days and the digitalization at 10 bits, being able to provide revisit with three satellites (CBERS-4, CBERS-4A and AMAZONIA-1) of less than two days, which is useful to monitor most dynamic regional environmental phenomena.

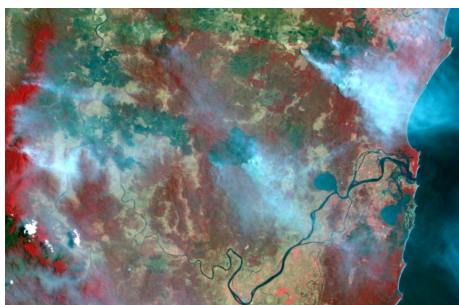
Among the many applications we have: generation of national or state mosaics; generation of vegetation index; monitoring of dynamic phenomena, such as agricultural crops and persistent fires; a warning system, in which the WFI image may serve as an indication for the acquisition of higher spatial resolution images. In the case of disasters, WFI can be used in the response to wildfires, large area floods and oil spills.

Access to the WFI images of the CBERS and AMAZONIA-1 series satellites is open to the public through the catalog (www2.dgi.inpe.br/catalogo/explore). INPE's free data policy guarantees free access, only asking interested users to register before selecting and downloading WFI images. More details about INPE's image catalogs are available at www.dgi.inpe.br.

Some images with the WFI sensor provided to the Disasters Charter assistance can be seen as follows:



Typhoon in Japan on September 2020
by CBERS WFI Sensor (Activation
674 - Disasters Charter)
Image credit: INPE



Wildfires in Australia on November 2019 by
CBERS WFI Sensor (Activation 631 - Disasters
Charter)
Image credit: INPE

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