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Special report

CHARTER Call 220/222

HURRICANES IN HAITI

Space agencies signed up to the International Charter on Space and Major Disasters in 2000 to provide free, priority access to satellite Earth observation data in support of relief efforts in the event of natural or man-made disasters threatening the safety of lives and property. This charter translates strong commitment across the space sector to help make the world a safer place.

SERTIT provides timely maps for French civil protection teams

Despite their intentions, the first activations of the charter soon came up against a stumbling block in supplying satellite data to first responders: it proved difficult, if not impossible, for non-specialists to actually exploit the data, since there is a big difference between raw satellite data and information in a form usable by disaster relief agencies.

The process of adding value to raw data currently involves a number of stages that complement the charter mechanisms. For example, besides its key role in creating the charter, the French space agency CNES supports this process through a framework con-

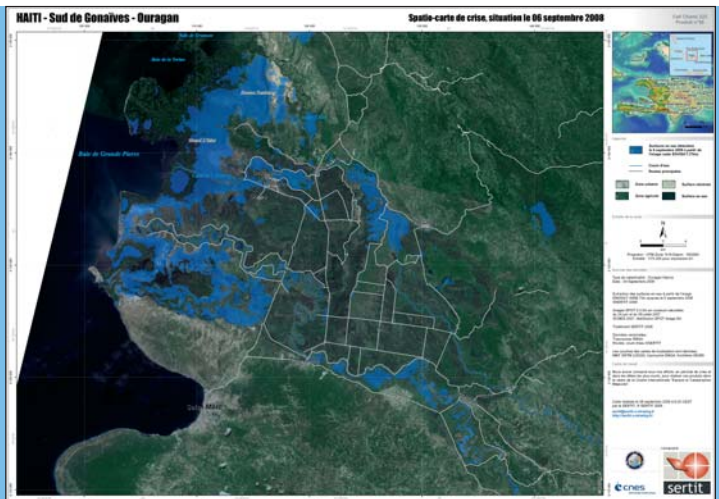
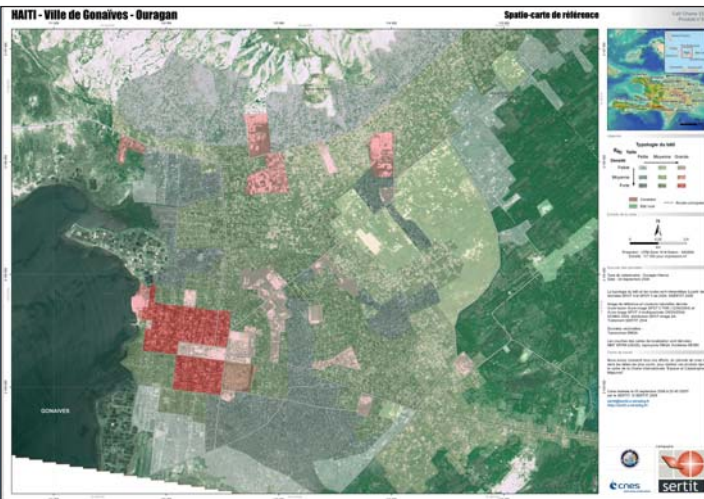
tract with the SERTIT¹ regional image processing and remote sensing department in Strasbourg, which provides rapid mapping services. The European Space Agency (ESA) supports production of satellite data for crisis management through GSE² programmes like RISK-EOS and Respond. Last but not least, emergency response is one of the fundamental service elements of the Global Monitoring for Environment and Security programme (GMES).

1) *Service Régional de Traitement d'Image et de Télédétection, at Strasbourg University*

2) *GMES Service Elements*

A month of tropical storms

Between 15 August and 15 September, two tropical storms and two hurricanes slammed into Haiti, leaving a trail of major wind and flood damage. On 26 August, category 1 Hurricane Gustav battered the island's south-west coast. Ten days later, tropical storm Hannah brought more destruction. And to cap it all, three days after that category 3 Hurricane Ike left yet more devastation in its wake. As is often the case in Haiti, it was the torrential rains, mostly during Hannah, >>>



Satellite basemap

derived from SPOT 4 and SPOT 5 data in September 2004 showing building types and roads around Gonaïves.

Map of surface water detected

on 6 September 2008 from an Envisat WSM radar image (75 m).



SERTIT SHOWS THE WAY FOR RAPID MAPPING

The vocation of SERTIT's rapid mapping department is to produce and disseminate geospatial information from multisource Earth-observation satellites in response to natural disasters. It aims to deliver relevant information to users less than six hours after raw satellite data are received, in the form of digital maps generated on the fly from disaster and reference imagery, then merged with other accessible georeferenced data. SERTIT supplies location maps, disaster extent and intensity maps, impact maps and detail maps. Its rapid mapping department began operating in 2001, since when it has been mobilized on 60 occasions, mostly for the International Charter on Space and Major Disasters.

http://sertit/SITE_Charte/RMS/RMS_accueil_2008_V4.html



that caused most of the damage, particularly in the town of Gonaïves, where witnesses reported flood waters rising to five metres in certain streets.

France springs into action

On 5 September, the French government decided to send relief teams to the hard-hit Gonaïves region. The interministerial operational crisis management centre (COGIC³) in Paris, the authorized charter user for France,

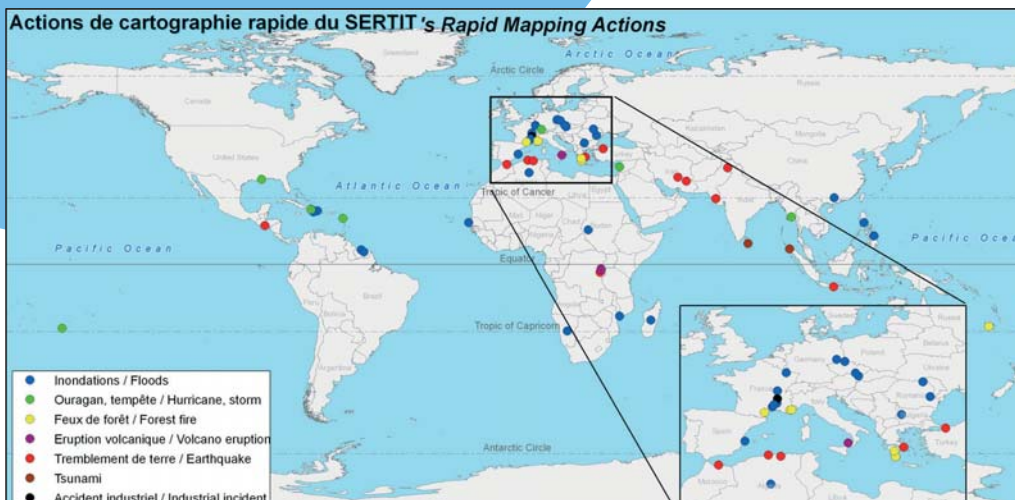
3) *Centre Opérationnel de Gestion Interministérielle des Crises*

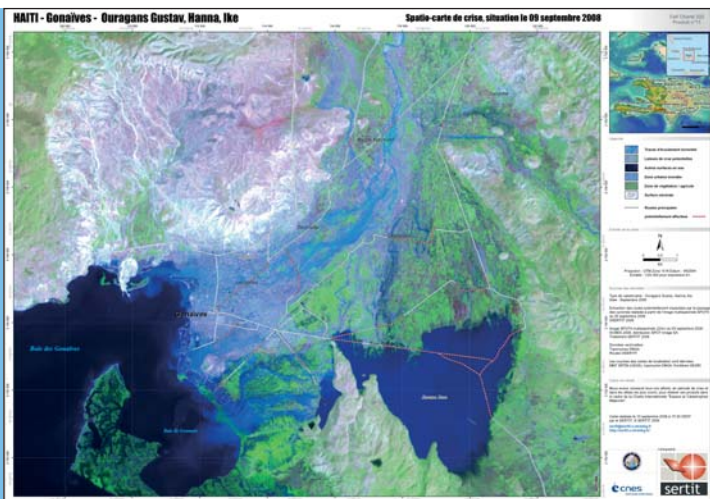
quite logically activated the charter to plan deployment of field teams. French emergency response agencies answered the call and CNES provided rapid mapping support to civil protection teams through SERTIT, while also closely monitoring operations. Spot Image tasked its satellites to acquire imagery of the disaster zone and searched its archive for recent imagery to enable pre- and post-disaster comparison.

15 map products in 6 days

The user request form (URF) used by civil protection agencies to activate the charter details exactly what kind of geospatial information is needed. For example, what is the status of communications and infrastructures, how badly damaged are buildings and what are the conditions for populations? SERTIT provided the first satellite imagemap of the area less than six hours after charter activation, followed three hours later by two maps showing building types and communications around Gonaïves at scales of 1:7 500 and 1:15 000.

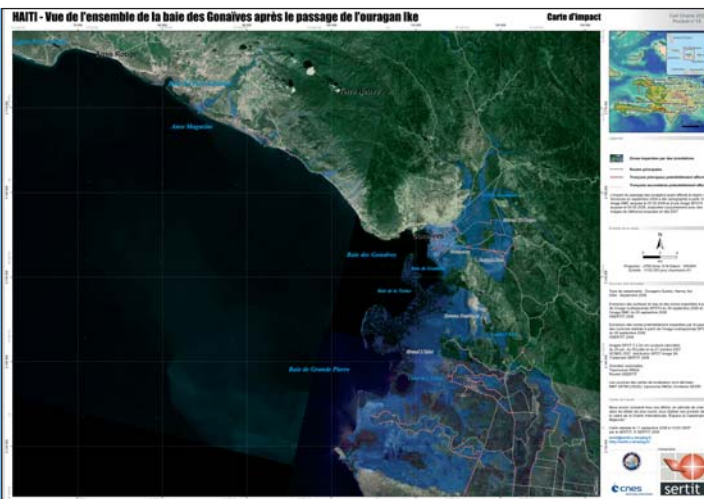
SERTIT rapid mapping actions since 2001.





Satellite imagemap

of Gonaives, Haiti, showing the situation on 9 September 2008, derived from a SPOT 4 colour image (20 m) acquired on 9 September 2008.



Impact map

of the Gonaives region, Haiti, highlighting affected areas and infrastructure draped over a basemap generated from SPOT 5 HRG 2.5-m natural colour imagery acquired on 24 June, 9 July and 21 October 2007.

These maps were updated throughout the weekend using recent SPOT 5 archive data to compile a reference cartographic database of the areas where French relief teams would be operating.

During the night of Sunday to Monday, a map of the disaster was released showing the extent of the floods around the Desdunes area to the south of Gonaives, based on Envisat and SPOT 5 imagery. This map was the first in a series of six products derived from SPOT 4 and SPOT 5 data, com-

plemented by other imagery of the disaster from Envisat in WSM mode and from the DMCII constellation. In all, 15 map products were delivered to civil protection teams in six days, as well as to field teams through the SERTIT and charter Web servers. (http://sertit/SITE_Charte/2008/06_charte_haiti_2008/06_charte_haiti_2008.html).

MORE INFORMATION:

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- <http://sertit.u-strasbg.fr>

Well-oiled response mechanisms

The rapid response to the wave of hurricanes in Haiti proved once again France's effective rapid mapping capability. From charter activation through to release of disaster information, civil protection teams, space agencies, imagery and geospatial information providers working in the crisis information supply chain have forged close ties and acquired experience over the last seven years of charter operation to integrate geospatial data production into disaster response. ■



FRANCE TAKES OVER AT HELM OF INTERNATIONAL CHARTER ON SPACE AND MAJOR DISASTERS

At the meeting of the Board of the International Charter on Space and Major Disasters in Toulouse, France, in October, CNES officially became the charter chair on behalf of France for the next six months.

The charter is an agreement between space agencies to make their Earth-observation satellites available in the event of a natural or man-made disaster. The signatory agencies offer a unified system to acquire and deliver satellite imagery of a disaster area anywhere in the world to local authorities in charge of relief operations on the ground.

■ Formed in 2000 by CNES and the European Space Agency (ESA), the International Charter today has nine members: ESA, CNES, CSA (Canada), NOAA/USGS (USA), ISRO (India), CONAE (Argentina), JAXA (Japan), BNSC (United Kingdom) and CNSA (China). The charter is chaired on a rotating basis.

Charter members cooperate voluntarily without exchanging funds and commit to making their resources available to the charter free of charge.

■ Since it began operating in November 2000 to 16 October 2008, the charter has been activated 193 times: 45 in 2007 and 32 since the start of this year. Used to monitor natural disasters all over the world, chiefly after weather, earthquake and volcano events, the charter is a fine example of how space supports relief teams during a crisis.