

*This service summarizes current satellite mapping activities of interest to GDACS stakeholders. It is issued weekly and based on contributions from map-producing entities and GDACS partners.*

## Satellite mapping overview

As of 20 October 2014

### Middle East

#### **Syria complex emergency – GLIDE number: CE20130604SYR**

Following violence in the Syrian town of Kobani, UNITAR/UNOSAT published a report that provides an overview of the situation. High resolution satellite imagery from 15 October 2014 and 06 September 2014 was reviewed and compared for indicators of damage and destruction, as well as signs of ongoing fighting such as fortifications, active fires, and craters. Analysis revealed widespread damage consisting of many destroyed and severely damaged structures. Craters resulting from munitions impacts were also identified, as were roadblocks and a significant absence of vehicle traffic. Additionally, trenches and fortified fighting lines were detected on the eastern side of Kobani. Despite the absence of vehicular circulation within the town, hundreds of vehicles were visible on the Syrian side of border crossing points with Turkey. A newly created refugee camp on the Turkish side of the border was also identified. While informative, this analysis is not comprehensive as the satellite imagery utilized featured significant cloud cover. This report is available on the UNITAR/UNOSAT website for download as a PDF.

Source: UNITAR/UNOSAT

Link: <http://www.unitar.org/unosat/node/44/2078>

### Africa

#### **West Africa infectious disease – GLIDE number: ID20141010LBR**

Due to an outbreak of Ebola in western Africa, the World Health Organization (WHO) declared an international health emergency in August 2014. In response to a worsening situation, the International Charter for Space and Major Disasters was activated on 09 October 2014 by the USGS on behalf of the National Geospatial Agency and by UNITAR/UNOSAT on behalf of the WHO Operations Center. As Project Manager, UNITAR/UNOSAT is currently working with the USGS to obtain and disseminate high resolution satellite imagery of the most heavily affected areas. Satellite imagery depicting the situation prior to and following the Ebola outbreak is accessible online through the USGS Hazards Data Distribution System (HDDS) RSS feed and website. At present no maps have been published to the International Charter for Space and Major Disasters' website.

Sources: International Charter for Space and Major Disasters, USGS

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Links: <https://www.disasterscharter.org/web/guest/-/other-in-sierra-leone>

[http://dds.cr.usgs.gov/ee-data/rss/events/201410\\_Ebola\\_Africa.rss](http://dds.cr.usgs.gov/ee-data/rss/events/201410_Ebola_Africa.rss)

### **Ethiopia refugee camps – GLIDE number: RC20140228ETH**

Ethiopia provides shelter and protection to hundreds of thousands of refugees from more than 13 countries, the majority of which originate from Sudan, South Sudan, Somalia, and Eritrea. In response to a request by the UNHCR, UNITAR/UNOSAT used satellite imagery to produce three elevation maps for camp planning purposes in the areas of Sherloke and Bench Maji, as well as the Gambella region. The refugee camps depicted in these maps include Sherkole, Ashura, Okugo, Burebiey, Leitchuor, Nip, Pagak, Kule, and Fugnido. Previous UNITAR/UNOSAT maps of inundations and swamps near refugee camps in Ethiopia demonstrate the importance of elevation data for camp planning. All three elevation maps are available for download as PDFs on the UNITAR/UNOSAT website.

Source: UNITAR/UNOSAT

Link: <http://www.unitar.org/unosat/maps/29>

## **Asia**

### **India cyclone – GLIDE number: TBD**

On 12 October 2014, cyclone Hudhud made landfall in India's Andhra Pradesh State. Described by EUMETSAT as the strongest tropical cyclone of 2014 in the North Indian Ocean, the ISRO activated the International Charter for Space and Major Disasters that same day on behalf of the DMSP, ISRO HQ, Bangalore. The activation is currently under the management of the NRSC. Although map products are not yet available on the International Charter for Space and Major Disasters website, the Copernicus Emergency Management Service has released reference and delineation maps of Hudhud's impact on the Viraghattam, Yellamanchili, Dwaraka Nagar, Anakapalle, and Thagarapuvalasa regions of Andhra Pradesh. In addition to these products, the NASA Earth Observatory used satellite imagery acquired 09 and 12 October 2014 to make maps illustrating Hudhud's extent and progression from the Bay of Bengal to India, Nepal, and China. NASA also produced a flyby rainfall analysis of Hudhud's path and subsequent flood potential using data acquired by the Tropical Rainfall Measuring Mission satellite from 07 to 14 October 2014. An animation of Hudhud's transformation from a tropical storm to a cyclone over the Bay of Bengal was also created by EUMETSAT using satellite imagery acquired 06 October 2014. Pre and post event satellite imagery can be viewed through the USGS Hazards Data Distribution System RSS feed.

Sources: International Charter for Space and Major Disasters, Copernicus Emergency Management Service, NASA, EUMETSAT, USGS

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Links: <https://www.disasterscharter.org/web/guest/activations/-/article/cyclone-in-india>  
<http://emergency.copernicus.eu/mapping/list-of-components/EMSR104/ALL/ALL>  
<http://earthobservatory.nasa.gov/NaturalHazards/event.php?id=84534>  
<http://www.nasa.gov/content/goddard/hudhud-northern-indian-ocean/#.VEFheRZRlJF>  
[http://www.eumetsat.int/website/home/Images/ImageLibrary/DAT\\_2354888.html](http://www.eumetsat.int/website/home/Images/ImageLibrary/DAT_2354888.html)  
[http://dds.cr.usgs.gov/ee-data/rss/events/201410\\_Typhoon\\_HudHud\\_India.rss](http://dds.cr.usgs.gov/ee-data/rss/events/201410_Typhoon_HudHud_India.rss)

### **Japan typhoon – GLIDE number: TBD**

A super typhoon named Vongfong swept across mainland Japan on 13 October 2014. Classified as a category five typhoon on 07 October 2014, Vongfong was characterized as the strongest storm to hit Japan in 2014. By 14 October 2014 Vongfong had been downgraded to a post-tropical typhoon. The NASA Earth Observatory acquired satellite imagery of the typhoon on 08 and 09 October 2014 as it moved across the Philippine Sea. Two maps were subsequently published and illustrate the enormity of the storm, including a clearly defined eye wall of 25 miles. These map products are available for online viewing and download on the NASA Earth Observatory website in JPEG format.

Source: NASA Earth Observatory

Link: <http://earthobservatory.nasa.gov/NaturalHazards/event.php?id=84518>

### **Japan typhoon – GLIDE number: TBD**

On 06 October 2014 a category one typhoon called Phanfone made landfall in southern Japan. The NASA Earth Observatory acquired pre-event satellite imagery from 29 September 2014 as well as imagery leading up to and following the typhoon on 03, 05, and 06 October 2014. Four maps were subsequently produced by the NASA Earth Observatory in order to track the storm's magnitude, progression, and aftermath. An image comparison tool allows for two of these maps, which contain pre and post event imagery from 29 September 2014 and 06 October 2014, to be viewed side by side. Typhoon Phanfone's heavy rainfall and resulting runoff caused large sediment plumes to form in Suruga Bay. While the Suruga Bay coastline appears relatively calm on 29 September 2014, by 06 October 2014 these plumes are strikingly visible along the western and northern portions of the coastline. These map products are available for online viewing and download on the NASA Earth Observatory website in GeoTIFF and/or JPEG format.

Source: NASA Earth Observatory

Link: <http://earthobservatory.nasa.gov/NaturalHazards/event.php?id=84511>

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## Europe

### **Italy landslide – GLIDE number: EMSR105\***

Beginning on 09 October 2014, Italy experienced four consecutive days of heavy rainfall that resulted in floods in Genoa's city center and landslides in the central-eastern part of Liguria. The Copernicus Emergency Management Service subsequently produced two reference maps of the affected area and aims to assess landslide damage in support of the Italian Civil Protection Department. Although grading and delineation maps with information pertaining to the extent and severity of the event have not yet been released, the reference maps indicate that there is an estimated population of 1,460 inhabitants residing within the overview area of interest. Potential exposure within this area also includes 1,121 settlements, 10 bridges, approximately 27.5 kilometers of road, as well as 912 hectares of woodlands and 9.5 hectares of grasslands. Reference map products and data for this event are available in JPEG, PDF and TIFF formats as well as a downloadable zipped vector package. Data can be accessed in GeoTIFF, GeoPDF, GeoJPEG and vector (shapefile and KML) formats.

Source: Copernicus Emergency Management Service

Link: <http://emergency.copernicus.eu/mapping/list-of-components/EMSR105>

## North Atlantic Ocean

### **Bermuda hurricane – GLIDE number: TBD**

Forecasters expect the trajectory of a category four hurricane named Gonzalo to pass very close to Bermuda on 17 October 2014. In anticipation of the storm's potentially adverse effects, the International Charter for Space and Major Disasters was activated on 15 October 2014 by the U.K. Cabinet Office CSS on behalf of the Bermuda Government Emergency Management Organization. This activation is currently being managed by the Government of Bermuda's Department of Land Surveys and Registration. Although satellite-derived activation mapping products are not yet available on the International Charter for Space and Major Disasters website, the USGS Hazards Data Distribution System RSS feed has provided pre-event satellite imagery available for download as GeoTIFFs and EUMETSAT has created an animation of the hurricane using satellite data. Additionally, the NASA Earth Observatory has published two maps with satellite imagery depicting the hurricane on 16 and 17 October 2014. These map products can be accessed for online viewing and download in JPEG format on the NASA Earth Observatory website. A time-lapse animation showing Gonzalo's evolution from 15 to 17 October 2014 is also available for viewing on the NASA Earth Observatory website. The Copernicus Emergency Management Service has published reference maps of south-west and north-east Bermuda as well. Grading maps of these areas are currently in production.

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Sources: International Charter for Space and Major Disasters, USGS, EUMETSAT, NASA Earth Observatory, Copernicus Emergency Management Service

Links: <https://www.disasterscharter.org/web/guest/activations/-/article/cyclone-in-bermuda>

[http://dds.cr.usgs.gov/ee-data/rss/events/201410\\_Hurricane\\_Gonzalo.rss](http://dds.cr.usgs.gov/ee-data/rss/events/201410_Hurricane_Gonzalo.rss)

[http://www.eumetsat.int/website/home/Images/ImageLibrary/DAT\\_2358699.html](http://www.eumetsat.int/website/home/Images/ImageLibrary/DAT_2358699.html)

<http://earthobservatory.nasa.gov/NaturalHazards/event.php?id=84577>

<http://emergency.copernicus.eu/mapping/list-of-components/EMSR106/ALL/ALL>

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*This summary is compiled by the GDACS mapping & satellite imagery coordination mechanism, operated by the UNITAR Operational Satellite Applications Programme (UNOSAT).*

*When referring to this summary, please credit: GDACS, UNITAR/UNOSAT.*

*For comments, questions and to submit information on satellite image derived products, please contact: [maps@gdacs.org](mailto:maps@gdacs.org)*

*Sources indicate satellite analysis production entities and imagery providers. The products referenced in this summary are based on remote satellite imagery and may not be validated in the field prior to release, in which case findings are based only on what is observed in the satellite imagery.*

*\*Not an official GLIDE number, as event has no entry in GLIDE database, but used by GDACS for seamless information integration.*