

***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 18 December 2015

### Africa

#### **Mali complex emergency – GLIDE number: CE20120731MLI**

Almost four years after the start of conflict in northern Mali, insecurity continues to force civilians to flee in search of refuge elsewhere. At present, approximately 48,000 Malian refugees reside in Mbera camp in Mauritania, located about 50 kilometers from the border with Mali. UNITAR-UNOSAT recently released a map of satellite-detected shelters and other buildings within this camp, which covers an area of roughly 415.01 hectares. Using satellite imagery acquired 14 August 2015, UNITAR-UNOSAT identified a total of 11,327 structures, consisting of 497 administrative buildings, 2,968 improvised shelters, and 7,862 tent shelters. A variety of clinics, nutrition centers, schools, and other important features are also indicated in the map, based on information from the UNHCR. This map product is available for download as a PDF on the UNITAR-UNOSAT website. Accompanying data in ESRI shapefile and geodatabase format is also accessible on this website.

Source: UNITAR-UNOSAT

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

### Asia

#### **China haze – GLIDE number: TBD**

China recently experienced its most severe air pollution of the year. On 08 December 2015 a red alert was issued for the city of Beijing as air pollution was ten times higher than the World Health Organization's recommended levels. The NASA Earth Observatory acquired 07 December 2015 satellite imagery of the smog in part of China and produced an overview map. As of this date, the thick haze was visible enveloping eastern China. It extended southwest from Beijing for hundreds of kilometers and was especially dense in low-lying parts of the Guanzhong Plain close to Xi'an. Due in large part to industrial coal burning, the dangerous air quality caused in the cessation of many everyday activities. According to news reports, restrictions were put on car usage, schools closed, and some factories shut down temporarily. As of 18 December 2015, a second red alert was issued for Beijing in anticipation of heavy smog in the city from 19 to 22 December 2015. This map product is available for online viewing or download in JPEG format on the NASA Earth Observatory website.

Source: NASA Earth Observatory

Link: <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=87129&eocn=home&eoci=nh>

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**India floods – GLIDE number: TC-2015-000163-IND**

Heavy rainfall caused widespread flooding in southeastern India in early December 2015. According to one estimate from satellite data, the total precipitation reached up to 400 millimeters over a period of 48 hours. In response to this event, the International Charter on Space and Major Disasters was activated on 02 December 2015 by ISRO. The NASA Earth Observatory acquired 21 October 2015 and 08 December 2015 satellite imagery of a region in Andhra Pradesh, approximately 200 kilometers northwest of Chennai, and produced two overview maps. While conditions were normal on 21 October 2015, by 08 December 2015 many flooded areas were visible. The Penna River appeared to swell and Somasila Reservoir was enlarged as well. According to a 02 December 2015 news report, the Somasila Reservoir received almost 1,000 cubic meters of water per second. Map products are available for online viewing or download in JPEG format on the NASA Earth Observatory website. An image comparison tool is also provided to help visualize the situation prior to and following this event.

Source: NASA Earth Observatory

Link: <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=87158&eocn=home&eoci=nh>

**Philippines typhoon – GLIDE number: TC-2015-000168-PHL**

On 14 December 2015, typhoon Melor first made landfall over Northern Samar in the Philippines with maximum sustained winds of 150 kilometers per hour. In anticipation of the typhoon, over 720,000 people were evacuated from their homes. Melor gained strength on 15 December 2015 and reached the equivalent of a Category 4 hurricane with maximum sustained winds of 230 kilometers per hour. The NASA Earth Observatory acquired 14 December 2015 satellite imagery of the typhoon over the eastern Philippines and produced an overview map. As of this date, Melor was visible hovering mainly over the central Philippines islands with its eye near Northern Samar. The typhoon made landfall five different times before dissipating in the South China Sea on 18 December 2015. Damage and destruction resulted from heavy rainfall, storm surge, and high winds. At least four people were killed, many schools closed, transportation disrupted, and power cut. As of 18 December 2015, the Philippines was on the watch for another tropical rainstorm approaching the country that could cause additional flooding. This map product is available for online viewing or download in GeoTIFF and JPEG format on the NASA Earth Observatory website.

Source: NASA Earth Observatory

Link: <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=87162&eocn=home&eoci=nh>

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## Central America

### **Nicaragua volcanic eruption: GLIDE number: TBD**

Nicaragua's Momotombo volcano began to erupt on 30 November 2015 for the first time in more than a century, and continued activity was observed at the site through 10 December 2015. During the initial eruption, it spewed a plume of ash roughly 1,000 meters high. Located on the shores of Lake Managua, Momotombo is a stratovolcano whose last confirmed eruption was recorded in January 1905. The NASA Earth Observatory acquired satellite imagery of the volcano on 04 December 2015 and produced two overview maps. As of 04 December 2015, a large stream of fresh lava was visible flowing from the volcano in a northeast direction. An ash plume emanating from the volcano could also be seen moving west and southwest. Nearby communities experienced ash fall as a result of this activity. Although schools in the region were evacuated, the most significant effects of Momotombo fortunately occurred in sparsely populated areas. Map products are available for online viewing or download in GeoTIFF and JPEG format on the NASA Earth Observatory website.

Source: NASA Earth Observatory

Link: <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=87134&eocon=home&eoci=nh>

## Europe

### **Italy volcanic eruption – GLIDE number: EMSR148\***

On 03 December 2015, Sicily's Mount Etna volcano erupted after a two year hiatus. According to scientists, the eruption was the most violent from Mount Etna in the last two decades. Ash was spewed about 3,048 meters into the sky and lava reached heights nearing approximately 1.6 kilometers. Three more explosions occurred in the following days, the effects of which affected different areas in Sicily and the Calabria Region. In response to this event, the Copernicus Emergency Management Service published several reference, grading, and delineation maps of the area. Using satellite imagery acquired 03 and 12 December 2015, the Copernicus Emergency Management Service did not detect any adversely affected areas or inhabitants in Castiglione and Linguaglossa, nor near the summit and fractured parts of the volcano. Mount Etna is the tallest active volcano in Europe at 3,329 meters high and is estimated to have erupted for the past 2.5 million years. Map products are available for download in TIFF, PDF, and JPEG formats on the Copernicus Emergency Management Service website. Accompanying zipped vectors packages are also provided on the website.

Source: Copernicus Emergency Management Service

Link: <http://emergency.copernicus.eu/mapping/list-of-components/EMSR148>

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### **Ireland floods – GLIDE number: EMSR149\***

Heavy rainfall during the month of December 2015 caused flooding to occur in the central parts of Ireland. The locations of Athlone, Castleconnel, Corofin, Ennis, and Limerick were particularly affected by this event. In an effort to aid Ireland’s National Directorate for Fire and Emergency Management, the Copernicus Emergency Management Service released a series of maps depicting the situation in the six aforementioned localities on different dates. Recent analysis of satellite imagery acquired 15, 16, 17, and 18 December 2015 revealed a total flooded area of 3,956.8 hectares in all locations. Approximately 3,917.6 hectares of land use areas were affected, as well as 11.7 hectares of settlements, and 7,803 inhabitants. The most flooded area was detected in Corofin (1,662 ha), followed by Ennis (629 ha), Athlone (625.3 ha), Limerick (532.5 ha), Castleconnel (297.5), and Carrick on Shannon (210.5 ha). Map products are available for download in TIFF, PDF, and JPEG formats on the Copernicus Emergency Management Service website. Accompanying zipped vectors packages are also provided on the website.

Source: Copernicus Emergency Management Service

Link: <http://emergency.copernicus.eu/mapping/list-of-components/EMSR149>

### **United Kingdom floods – GLIDE number: EMSR147\***

In early December 2015, heavy rainfall from severe weather caused flooding in the northwest counties of Cumbria and Lancashire, England. The Copernicus Emergency Management Service recently produced monitoring maps for the affected towns of Carlisle, Appleby, Kendal, and Cockermouth in Cumbria. Analysis of 12 December 2015 satellite imagery revealed 5,736.5 hectares of flooded area, 7.9 hectares of affected settlements, 22.7 kilometers of impacted transportation networks, and 375 affected inhabitants. This represents an increase of overall flooded area by 1,738.5 hectares since the previous Copernicus analysis of 07 December 2015 satellite imagery. As of 12 December 2015, Kendal had the most flooded area (3,166.7 ha), followed by Appleby (1,057.3 ha), Carlisle (1,054.6 ha), and Cockermouth (457.9 ha). Additionally, one bridge was affected by the flooding in Carlisle, as well as 9.1 hectares of quarry in Kendal and Cockermouth. Map products are available for download in TIFF, PDF, and JPEG formats on the Copernicus Emergency Management Service website. Accompanying zipped vectors packages are also provided on the website.

Source: Copernicus Emergency Management Service

Link: <http://emergency.copernicus.eu/mapping/list-of-components/EMSR147>

## **Middle East**

### **Iraq complex emergency – GLIDE number: OT-2014-000074-IRQ**

Ongoing conflict in Iraq has caused significant structural damage and destruction to some of the country’s towns and cities. UNITAR-UNOSAT published maps of damage in six villages within Sinjar

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District, as well as an updated damage assessment of the general Sinjar area in Nineveh Province, Iraq. Analysis of satellite imagery acquired 18 and 28 November 2015, as well as 30 December 2014 and 07 August 2014, revealed a total of 215 potentially affected structures in the villages of Shkaftat Sharqy, Shkaftat Gharby, Kany Sark, Gundy Hamy, Al-Sabbahiya, and Ramboosi Sharqi. In the overall analyzed area of Sinjar, a total of 2,383 potentially affected structures were found. Approximately 810 of these were destroyed, 685 severely damaged, 519 moderately damaged, and 369 possibly damaged. Map products are available for download as PDFs on the UNITAR-UNOSAT website. Accompanying data in ESRI shapefile and geodatabase format is also accessible on this website.

Source: UNITAR-UNOSAT

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

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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.*