

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 08 February 2016

Africa

Mali complex emergency – GLIDE number: CE20120731MLI

Several years after the start of conflict in Mali, insecurity continues to force civilians to flee in search of refuge. As of October 2015, approximately 34,000 Malians had crossed the border into Burkina Faso since 2012 looking for shelter. UNITAR-UNOSAT produced maps of the Mentao and Goudoubou refugee camps, respectively located in the Sahel and Seno provinces of Burkina Faso. Using satellite imagery acquired 14 October 2015, UNITAR-UNOSAT identified a total of 2,417 camp structures in Mentao, including 2,117 tent shelters, 201 improvised shelters, and 99 administrative structures. The Mentao refugee camp is situated roughly 50 kilometers south of the Mali border and covers a total area of 327 hectares. Analysis of 30 October 2015 satellite imagery revealed a total of 2,669 structures in Goudoubou, of which 476 camp were infrastructure buildings, 385 improvised shelter structures, and 1,808 tent shelters. Located in northeastern Burkina Faso, the Goudoubou refugee camp covers an area of approximately 235.5 hectares. 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/MLI>

West Africa dust storm – GLIDE number: TBD

A dust storm from the Western Sahara, Mauritania, and Senegal traveled over the Atlantic Ocean in late January 2016. The NASA Earth Observatory acquired 26 January 2016 satellite imagery of the storm and produced an overview map. As of this date, the dust was visible spreading off the coast of Western Africa over the Atlantic Ocean. The easternmost Cape Verde Islands could be seen covered by the dust as well. Approximately 70 percent of the world's dust comes from Africa. In addition to impacting the atmosphere and climate, the airborne mineral dust is a source of nutrients for the land and ocean. Scientists have discovered that such dust provides a necessary fertilizer for distant vegetated areas such as the Amazon. 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=87406&eocon=home&eoci=nh>

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Asia

India fires – GLIDE number: TBD

The largest landfill in the Indian city of Mumbai occupies an area of 132 hectares and caught on fire in January 2016. The Deonar dumping ground is situated in an eastern suburb and acquires over 3,700 metric tons of trash each day. On 27 January 2016, satellite sensors started to detect smoke and fires at the landfill. The fire burned for four days and the smoke released from them caused air pollution to reach its highest recorded level since the start of air quality data monitoring in June 2015. The NASA Earth Observatory collected 28 January 2016 satellite imagery of the fires and created an overview map. As of this date, the fires could be seen burning at the Deonar dumping ground with large smoke plumes emanating from them and moving in a southwestern direction toward a neighborhood called Baiganwadi. These fires can be challenging to extinguish due to the highly flammable substances through which they burn such as plastic and methane. 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=87429&eocn=home&eoci=nh>

South Korea snowfall – GLIDE number: TBD

In late January 2016 unusually cold weather settled in eastern Asia, causing more than 65 deaths and disturbing transportation. Temperatures in South Korea were measured at minus 18 degrees Celsius, the lowest since 2001, and 12 centimeters of snow fell on Jeju Island. This represents the heaviest snowfall in the area since 1984 and it prompted the shutdown of the airport which stranded roughly 86,000 travelers. The NASA Earth Observatory acquired 25 January 2016 satellite imagery of the snowfall and produced an overview map. At this time, the southwestern portion of South Korea was visibly blanketed in snow, as well as a southwestern part of North Korea. Clouds obscured Jeju Island which is situated south of the mainland. In addition to South Korea, Taiwan, mainland China, western and central Japan also experienced snowfall during this period. 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=87402&eocn=home&eoci=nh>

Central America

Mexico volcanic eruption – GLIDE number: TBD

Popocatepetl is one of Mexico's most active volcanoes and has been erupting since January 2005. The eruptions typically consist of an almost constant venting of volcanic gases, as well as some

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minor emissions of steam and ash. The NASA Earth Observatory collected satellite imagery over the volcano on 25 January 2016 and created an overview map. As of this date, a long plume of smoke was visible streaming out of Popocatepetl and drifting in a northeastern direction towards the Gulf of Mexico. Standing at 5,426 meters high, the volcano is situated between the large population centers of Mexico City to the northwest and Puebla to the east. As a result of the latest eruption, an airport in Puebla was temporarily shut down and ash had to be cleared from the runway. 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=87414&eocn=home&eoci=nh>

Europe

England floods – GLIDE number: EMSR150*

Following a series of heavy rainfall in late December 2015, the Yorkshire area of England experienced widespread flooding. The Copernicus Emergency Management Service produced several maps of flood waters in the Bradford, Cross Hills, Harrogate, Hebden Bridge, Leeds, Selby, Shipley, and York areas. Using satellite imagery acquired 29 and 31 December 2015, Copernicus identified a total flooded area of 4,242.7 hectares, 3,157 hectares of impacted land use, 12.73 kilometers of affected transportation networks, and 5,560 affected inhabitants in these areas. Selby had the most flooded area (2,450.4 ha) followed by York (678.3 ha), Cross Hills (483.7 ha), Leeds (337 ha), Harrogate (193.8 ha), Shipley (69.9 ha), Hebden Bridge (18.6 ha), and Bradford (11 ha). 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: Copernicus Emergency Management Service

Link: <http://emergency.copernicus.eu/mapping/list-of-components/EMSR150>

Ireland floods – GLIDE numbers: EMSR154*, EMSR151*, EMSR149*

Heavy rainfall from storms in Ireland over the past few months has caused flooding in many parts of the country. The Copernicus Emergency Management Service has monitored the situation and produced maps of different affected areas in the county of Roscommon, Northern Ireland, and locations along the Shannon River including the cities of Limerick, Athlone and Carrick on Shannon. Satellite imagery acquired on various dates in December 2015, January 2016, and February 2016 was used in the creation of these maps. In the county of Roscommon, the Copernicus Emergency Management Service identified a total flooded area of 1,075.3 hectares and 245 affected inhabitants. In Northern Ireland, a total flooded area of 4,381.6 hectares and 2,581 impacted residents were found. Along the Shannon River, a total flooded area of 15,458.8 hectares and 6,754

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affected inhabitants were identified in various locations. 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

Links: <http://emergency.copernicus.eu/mapping/list-of-components/EMSR154>

<http://emergency.copernicus.eu/mapping/list-of-components/EMSR151>

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

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 cities, towns and villages. UNITAR-UNOSAT published damage assessment maps for Ramadi, as well as a web map illustrating damage in both the Ramadi and Sinjar areas. Using satellite imagery collected 19 December 2015 compared with pre-crisis imagery from 06 July 2014, UNITAR-UNOSAT identified 846 destroyed structures, 597 severely damaged structures, and 1,056 moderately damaged structures within the downtown part of Ramadi. A wider analysis of the Ramadi area revealed a total of 1,451 destroyed structures, 1,127 severely damaged structures, and 1,990 moderately damaged structures. Destruction was visible in certain areas of Ramadi prior to 06 July 2014 as well. Static map products are available for download as PDFs and the web map can be viewed online 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>

North America

United States floods – GLIDE number: TBD

Continuous heavy rainfall in the United States over a period of three days resulted in widespread flooding in the states of Illinois, Missouri, Oklahoma, Arkansas and Mississippi. Thousands of people were evacuated and 31 died from the floods. The International Charter on Space and Major Disasters was activated on 03 January 2016 by the United States Geological Survey (USGS) on behalf of the Federal Emergency Management Agency (FEMA). In an effort to monitor the situation, ROSCOSMOS produced a flood map using satellite imagery acquired 17 January 2016. The map

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depicts extensive flooding along part of the Mississippi River which traverses the Louisiana and Mississippi border. Inhabited areas in very close proximity to the flood waters include Canebrake, Argent, Waterproof, and Hedgeland. The NASA Earth Observatory also created maps of flooding along a portion of the Mississippi River based on satellite imagery from 03 January 2016. As of this date, flooded areas were visible in different parts of Missouri, Illinois, Kentucky, Arkansas and Tennessee. The cities of St. Louis, Cape Girardeau, Evansville and Memphis were located near to flooded areas, and Miller City appeared to be engulfed by flood waters. Map products are available for viewing and/or download in various formats on their respective websites. Links to additional resources for this event are also provided on the International Charter on Space and Major Disasters website.

Sources: International Charter on Space and Major Disasters, ROSCOSMOS, NASA Earth Observatory

Links: <https://www.disasterscharter.org/web/guest/-/flood-in-united-states>

<http://earthobservatory.nasa.gov/IOTD/view.php?id=87265>

Oceania

Australia bushfires – GLIDE number: TBD

Northwestern Tasmania experienced dozens of bushfires caused by lightening in January 2016. On 14 January 2016 satellites started to detect the region's increase in fires. Over the next few weeks the fires had burned through tens of thousands of hectares. Portions of the Tasmanian wilderness, a World Heritage Site, were affected by the fires. The NASA Earth Observatory acquired 21 and 30 January 2016 satellite imagery of the fires and created two overview maps. As of 21 January 2016, several fires situated southeast of Cradle Mountain were visible burning in forested areas. Large smoke plumes could be seen emanating from the fires and moving in an eastern direction. On 30 January 2016 an active fire was visible east of Granville Harbor with a sizeable smoke plume moving to the south. A large burn scar was also observed to the west of the active fire. 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=87439&eocn=home&eoci=nh>

South America

Argentina floods – GLIDE number: FL-2016-000003-ARG

Argentina experienced heavy rainfall beginning in early December 2015 which particularly affected the provinces of Entre Rios and Corrientes. Approximately 25,000 people were evacuated in

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Argentina, though the widespread nature of the flooding impacted the region between Argentina, Paraguay, Uruguay and Brazil. In response to this event, the International Charter on Space and Major Disasters was activated by the National Directorate for Civil Protection on 28 December 2015, and project management was assumed by the National Commission on Space Activities (CONAE). Using satellite imagery from various dates in December 2015 and January 2016, CONAE produced 28 maps of the flooding in many locations in Argentina, as well as some in Paraguay and Uruguay. This event, which was reportedly caused by El Niño, has been referred to as the worst flooding to hit South America in 50 years. Map products are available for online viewing and download in JPEG format on the website of the International Charter on Space and Major Disasters.

Sources: International Charter on Space and Major Disasters, CONAE

Link: <https://www.disasterscharter.org/web/guest/-/flood-in-argenti-3>

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:

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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.*