

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 05 October 2015

Asia

Indonesia fires – GLIDE number: TBD

In late September 2015, Indonesia experienced uncontrollable fires caused by slash and burn agriculture and exacerbated by large peat deposits. Vast expanses of smoke drifting over the country led to air quality alerts and health warnings in Indonesia and its neighboring countries. The NASA Earth Observatory acquired 24 September 2015 satellite imagery of the situation and created overview maps. At this time, smoke plumes were visible enveloping large areas of Indonesia and dozens of actively burning fires were identified by the NASA Earth Observatory. Scientists are concerned that the situation will worsen as a result of a longer dry season this year due to El Niño. From the start of the fires until 22 September 2015, it is estimated that they released greenhouse gases equivalent to roughly 600 million tons. This figure is comparable to annual carbon emissions in Germany. Map products are 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=86681&eocn=home&eoci=nh>

Myanmar floods – GLIDE number: FL-2015-000089-MMR

Torrential rainfall at the onset of the monsoon season caused severe flooding in several parts of Myanmar. The western regions of Chin, Magway, Sagaing and Rakhine were declared disaster zones by the government. In an effort to aid disaster response, UNITAR-UNOSAT began work for this event on 13 July 2015 and triggered the International Charter on Space and Major Disasters on 05 August 2015 on behalf of the UNDP Myanmar. Following reports of a landslide induced dam that ruptured on 28 August 2015, UNITAR-UNOSAT produced an overview map of the situation and a damage assessment for the town of Tuikhingzang, located in the Chin region of Myanmar. Analysis of satellite imagery acquired 16 September 2015 revealed the presence of a landslide over a mountainous area in Tonzang township and 34 hectares of land covered by water. UNITAR-UNOSAT also identified a total of 141 destroyed structures and 48 severely damaged structures in the town of Tuikhingzang that were affected by a mudslide. As of 16 September 2015, large expanses of agricultural land appeared to be impacted and the town of Tuikhingzang was partially covered by mud. Local roads were affected and a bridge was completely destroyed as well. Additionally, two IDP settlements with a total of 260 possible tent shelters were identified between one and three kilometers northeast of the town. These map products are available for download as PDFs on the

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UNITAR-UNOSAT website. Accompanying data in shapefile and ESRI geodatabase format are also provided there.

Sources: UNITAR-UNOSAT, International Charter on Space and Major Disasters

Links: <http://www.unitar.org/unosat/maps/MMR>

<https://www.disasterscharter.org/web/guest/-/flood-in-myanmar>

Russia wildfires – GLIDE number: TBD

In late July and early August 2015 a heat wave triggered more than one hundred wildfires in the Russian Republics of Buryatia and Irkutskaya. The International Charter on Space and Major Disasters was activated on 13 August 2015 by ROSCOSMOS/EMERCOM. Many fires burned near the shores of Lake Baikal, the world’s largest freshwater body. Lake Baikal is currently at its lowest level in more than 30 years and its waters are expected to continue dropping. As a result of lower water levels these past few months, peat reserves have dried and made the area more prone to wildfires. The NASA Earth Observatory acquired satellite imagery over Lake Baikal on 13 September 2015 and produced an overview map. As of this date, a few actively burning fires and long smoke plumes drifting in a northeast direction were visible along the shoreline. A large area of charred vegetation could also be seen to the west of the smoke plumes. Map products are 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=86641&eocn=home&eoci=nh>

Taiwan typhoon – GLIDE number: TC-2015-000133-TWN

A powerful super typhoon named Dujuan made its way through Taiwan in late September 2015. Taiwan, which experiences an average of 3.5 typhoons each year, evacuated thousands of its citizens prior to the storm’s arrival. The NASA Earth Observatory acquired 28 September 2015 satellite imagery of Dujuan and produced an overview map. As of this date, the super typhoon could be seen approaching Taiwan with its eye still hovering over the Pacific Ocean. On 29 September 2015, the eye of Dujuan made landfall over the mountainous northeast coast of Taiwan, close to the town of Nan’ao. When it struck, the storm had sustained winds of 225 kilometers per hour, the intensity of which is typical of a category four hurricane. Upon making contact with the mountainous terrain of Taiwan, Dujuan weakened substantially. 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=86707&eocn=home&eoci=nh>

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Caribbean

Bahamas hurricane – GLIDE number: TBD

The third hurricane of the 2015 Atlantic season, known as Joaquin, developed in late September 2015. The NASA Earth Observatory acquired satellite imagery of the hurricane on 29 September 2015 and 02 October 2015. In subsequent overview maps, Joaquin can be seen on 29 September 2015 as a tropical storm located roughly 650 kilometers east of the northwestern Bahamas. By 30 September 2015, Joaquin had become a category one hurricane with maximum sustained winds of 80 miles per hour. A map of the hurricane on 02 October 2015 shows it hovering over the Bahamas, at which time Joaquin had strengthened to a category four hurricane with maximum sustained winds of 132 miles per hour. Joaquin continued to gain strength on 03 October 2015 with winds surpassing 165 miles per hour. Additional satellite data collected by the NASA Earth Observatory from 01 to 05 October 2015 revealed intense rainfall endured by the Bahamas and parts of the eastern United States, particularly South Carolina. Rainfall totals exceeded 600 millimeters in areas of that state, constituting what some local authorities referred to as a 1,000-year event. Map products are available for online viewing or download in GeoTIFF and JPEG format on the NASA Earth Observatory website.

Source: NASA Earth Observatory

Links: <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=86714&eocn=home&eoci=nh>

<http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=86729&eocn=home&eoci=nh>

<http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=86736&eocn=home&eoci=nh>

Dominica tropical cyclone – GLIDE number: TC-2015-000119-DMA

On 28 August 2015, the passage of tropical cyclone Erika caused significant damage to the Caribbean island nation of Dominica. In response to this event, UNITAR-UNOSAT recently published a map of satellite-detected landslide areas in the southeast part of Dominica. Using satellite imagery from 03 September 2015, UNITAR-UNOSAT identified a total of approximately 700 landslides in the analyzed areas. The map produced by UNITAR-UNOSAT depicts one of the most affected zones due to Erika's adverse effects on the region's populated areas and agricultural lands. An inset image within the map shows some of these landslides and their impact of razing vegetation near Galba. Due to heavy cloud cover, some parts of the island were not analyzed. Despite the substantial damage caused by Erika, the tropical cyclone had already dissipated near the north coast of eastern Cuba by 29 August 2015. This map product is available for download as a PDF on the UNITAR-UNOSAT website. Accompanying data in KML, shapefile, and ESRI geodatabase format are also provided there.

Source: UNITAR-UNOSAT

Link: <http://www.unitar.org/unosat/maps/114>

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Europe

France floods – GLIDE number: EMSR139*

The French island of Corsica experienced torrential rainfall and subsequent flash floods on 01 October 2015. At the request of French Civil Protection authorities, the Copernicus Emergency Management Service recently published several grading and delineation maps of affected areas. Analysis of satellite imagery acquired 02, 03 and 04 October 2015 revealed 3.1 hectares of coastal submersion in Cap Corse Bastia on 02 October 2015, as well as 231 hectares of flood affected land and 75 impacted inhabitants in the whole of Corsica 03 October 2015. As of 03 October 2015, one landslide and three hectares of mudflow were identified in Cap Corse Bastia, and 33 hectares of mudflow were found in Borgo Vescovato. By 04 October 2015, 300.4 hectares of flooded land and 90 affected inhabitants were detected in Borgo Vescovato. Map products are available in TIFF, PDF, and JPEG formats on the Copernicus Emergency Management Service website. Accompanying data in shapefile and KML formats are also accessible on this website.

Source: Copernicus Emergency Management Service

Link: <http://emergency.copernicus.eu/mapping/list-of-components/EMSR139>

Italy floods – GLIDE number: EMSR136*

Heavy rainfall occurred in the Liguria and Emilia Romagna regions of Italy on 13 and 14 September 2015. Severe floods and landslides resulted in the province of Piacenza and hundreds of inhabitants were evacuated. In response to this event, the Copernicus Emergency Management Service produced several grading maps for the areas of Bettola, Bobbio, Farini, Ferriere, Ottone, Piacenza, Ponte dell'Olio, and Salsominore. Analysis of satellite imagery acquired 18, 19 and 21 September 2015 revealed a total of approximately 121.8 hectares of flood affected area, 43 landslides, 82.1 hectares of mudflow, 22 road blocks, 6.47 kilometers of impacted transportation routes, 158.4 hectares of affected land use, and 261 impacted inhabitants. Additionally, more than 25.2 hectares of settlements were affected. Map products are available in TIFF, PDF, and JPEG formats on the Copernicus Emergency Management Service website. Accompanying data in shapefile and KML formats are also accessible on this website.

Source: Copernicus Emergency Management Service

Links: <http://emergency.copernicus.eu/mapping/list-of-components/EMSR136>

<http://emergency.copernicus.eu/mapping/list-of-components/EMSR138>

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North America

United States wildfires – GLIDE number: WF-2015-000125-USA

In 2015 more than 8.8 million acres of land burned as a result of wildfires in the United States. This figure represents approximately 3 million more than the normal amount at this time of the season. Currently, dozens of large wildfires continue to burn across the western part of the country. The NASA Earth Observatory recently released maps of the northern California valley fire and the southern Oregon national creek complex fire. An overview map of the California valley fire shows large burn scars near the communities of Harbin Springs, Anderson Springs, and Middletown, which were detected by satellite imagery on 20 September 2015. The valley fire necessitated the evacuation of thousands of residents and caused the destruction of 1,910 structures as well as three deaths. According to the California Department of Forestry, as of 22 September 2015 the valley fire had burned 76,067 acres and was 75 percent contained. Satellite imagery acquired 13 September 2015 was used to create an overview map of the southern Oregon national creek complex fire. As of this date, smoke plumes were visible emanating from fires northwest of Crater Lake and moving in a south-southwest direction. Described as the largest fire on record in Crater Lake National Park, the national creek complex fire has burned through roughly 21,000 acres of land. Map products are available for online viewing or download in GeoTIFF and JPEG format on the NASA Earth Observatory website.

Source: NASA Earth Observatory

Links: <http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=86663&eocn=home&eoci=nh>

<http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=86614&eocn=home&eoci=nh>

South America

Chile earthquake – GLIDE number: EQ-2015-000128-CHL

On 16 September 2015, an 8.3 magnitude earthquake struck central Chile and one million people were evacuated from coastal areas as a tsunami warning was issued. Dozens of aftershocks followed and a tsunami caused waves of 4.7 meters to occur in areas close to the epicenter off the coast of Coquimbo Province. The International Charter on Space and Major Disasters was subsequently activated by ONEMI on 17 September 2015. The Copernicus Emergency Management Service produced a series of reference and grading maps to illustrate the aftermath in areas near the earthquake's epicenter. Using satellite imagery acquired 17 and 19 September 2015, Copernicus identified 46 damaged settlements, 1,000 affected inhabitants, 4.5 hectares of debris, 79 hectares of mudflow, 0.8 hectares of flooded area, and 15.72 kilometers of transportation affected in La Herradura, Santa Florencia, San Ramon, La Pampa, La Serena, and Los Vilos. Vast areas along the eastern coast of the city of Coquimbo experienced significant damage and destruction as well. The

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NASA Earth Observatory and the European Space Agency also created maps for this event with satellite imagery from 17 September 2015. Their map products depict the extent to which the land surface shifted before and after the earthquake. The earthquake is estimated to have caused a displacement of 1.4 meters mainly in a vertical direction near the coast and potentially 0.5 to 2 meters horizontally. Map products are available for viewing in various formats on the websites of their respective sources.

Sources: International Charter on Space and Major Disasters, Copernicus Emergency Management Service, NASA Earth Observatory, European Space Agency

Links: https://www.disasterscharter.org/web/guest/-/ocean_wave-in-chile

<http://emergency.copernicus.eu/mapping/list-of-components/EMSR137>

<http://earthobservatory.nasa.gov/IOTD/view.php?id=86703>

http://www.esa.int/spaceinimages/Images/2015/09/Chile_earthquake_on_the_radar

Ecuador volcano - GLIDE number: VO-2015-000111-ECU

During August 2015, the Cotopaxi volcano in Ecuador experienced its first major eruption in over 70 years. Cotopaxi is one of the most active volcanoes in Ecuador and stands as the second highest peak (5,897 meters) after the Chimborazo. Situated only 50 kilometers south of Quito, Cotopaxi's activity caused the cancellation of some flights and 350,000 people residing close to the mountain were presumed to be at risk of rock and mud flows. The NASA Earth Observatory acquired 15 September 2015 satellite imagery of the volcano and produced an overview map. At this time, Cotopaxi was still active with airborne volcanic ash and gas visibly moving in a westward direction. The western flank of the volcano could also be seen as darker in color than its eastern counterpart due to volcanic debris. As of 18 September 2015, the volcano was reported to exhibit low to moderate activity without ash fall present. 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=86618&eocn=home&eoci=nh>

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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:

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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.*