

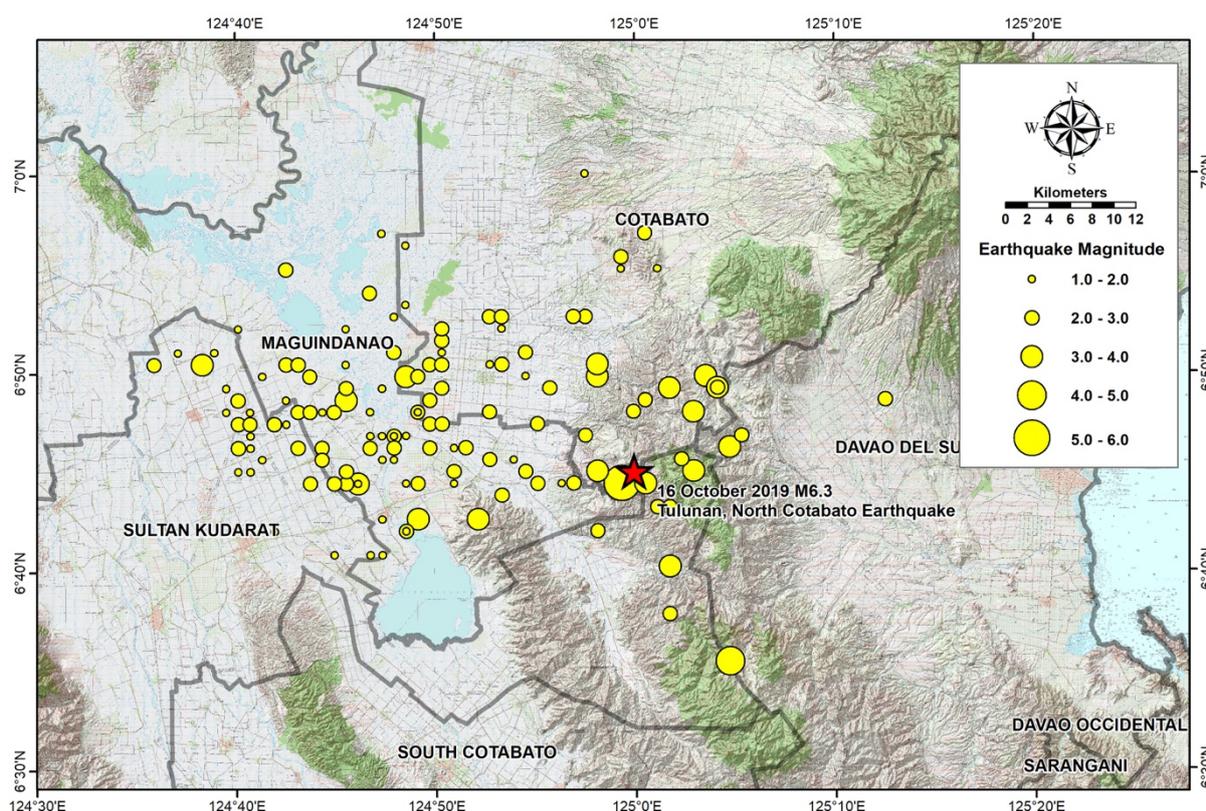


## PRIMER ON THE 16 OCTOBER 2019 MAGNITUDE 6.3 TULUNAN, COTABATO EARTHQUAKE

Update as of 17 October 2019

### What is happening in Cotabato and vicinity?

At 7:37 PM Philippine Standard Time (PST) of 16 October 2019 (Wednesday), a strong earthquake of Magnitude (M) 6.3 shook the province of Cotabato (also known as North Cotabato) and vicinity. This earthquake has an epicenter located 22 kilometers southeast of Tulunan, Cotabato, and a depth of 8 kilometers. The earthquake was generated by the movement of a northwest-trending strike-slip fault in the area. Small to strong magnitude earthquakes followed afterwards, and as of 3:00 PM PST of 17 October 2019, 314 aftershocks have been recorded by the DOST-PHIVOLCS seismic monitoring network.



\*Minor earthquakes: 3 to 3.9; Light earthquakes: 4 to 4.9; Moderate earthquakes: 5 to 5.9; Strong earthquakes: 6 to 6.9; Major earthquakes: 7 to 7.9; Great earthquakes: 8.0 and above.

Using the PHIVOLCS Earthquake Intensity Scale (PEIS), the ground shaking based on preliminary intensity reports are summarized below.

Province	Intensity (PEIS)		
	VII (Destructive)	VI (Very strong)	V (Strong)
Cotabato	Tulunán, M'Lang, Kidapawan City	Tacurong City	Pikit, Pres. Roxas
South Cotabato		Sto. Niño	Lake Sebu, Polomolok, Tampakan, Tupi, Koronadal City
Davao del Sur		Digos City	
Sultan Kudarat			Kalamansig, Lebak, Palimbang
Sarangani			Alabel, Malungon
Independent/ Chartered cities			Davao City, General Santos City

Province	Intensity (PEIS)			
	IV (Moderately strong)	III (Weak)	II (Slightly felt)	I (Scarcely perceptible)
Sarangani	Kiamba			
Zamboanga del Norte		Dipolog City		
Agusan del Norte			Butuan City	
Agusan del Sur	Esperanza, Rosario	San Josefa		
Bukidnon	Kalilangan, Quezon, Kadingila, Damulog			
Compostela Valley	Mawab			
Maguindanao	Barira, Matanog, Sultan Kudarat			
Surigao del Sur				Hinatuan
Independent/ Chartered cities	Cotabato City	Iligan City	Zamboanga City	

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## **Have large to moderate magnitude earthquakes affected Cotabato in the past?**

At least four onshore earthquakes ranging from M5.0 to M7.6 occurred in Cotabato and vicinity from 1924 to present based on the SEASEE Report and PHIVOLCS Earthquake Catalog. Small-magnitude earthquake swarms (less than Magnitude 4.0) were also recorded in April to May 1993, and August 2007.

The most recent event that affected Cotabato is the 9 July 2019 M5.6 Earthquake. The maximum intensity of this event was felt in Makilala, Kidapawan City, Matalam, M'lang, Antipas and Tulunan in Cotabato at PEIS VI.

## **Why do earthquakes occur in Cotabato?**

Central Mindanao (SOCCSKSARGEN Region), which includes Cotabato, is one of the seismically active areas in the country because of the presence of the western extension of the Mindanao Fault (Cotabato-Sindangan Fault). This active fault traverses Sarangani province to northwest of Zamboanga Peninsula. Cotabato Trench is also a major source of earthquakes which can affect the region. In addition, there are other nearby local faults, some of which may be covered by recent deposits, and could be sources of small to strong magnitude earthquakes.

## **Can this earthquake indicate volcanic activity?**

No. Although the nearest active volcanoes from the epicenter are Matutum Volcano (~44 km) and Parker Volcano (~78 km), the M6.3 earthquake and aftershocks are tectonic in origin. However, as part of DOST-PHIVOLCS monitoring procedures for moderate to large earthquakes occurring near active volcanoes, the Institute will closely monitor earthquake events in relation to any activity that may be associated with Matutum and Parker Volcanoes.

## **What can we expect from the current earthquake activity?**

The current seismic trend indicates that the M6.3 earthquake on 16 October 2019 is the main shock, which caused the initial destructive ground shaking. The succeeding small- to moderate-sized magnitude earthquakes are the aftershocks. The aftershocks may continue to occur for several days to weeks, some of which may be felt. However, the probability of an earthquake higher than M6.3 to occur from the same source is low.

## **Aside from strong ground shaking, what other seismic hazards are life-threatening?**

Landslides, rock falls, and other types of mass movements may occur on mountainous or hilly areas. Liquefaction, manifested by subsidence, sand boils or lateral spreads may affect low-lying, water-saturated, sandy areas, often near banks and shore lines.

## **Can this recent earthquake event trigger a destructive tsunami?**

No. The epicenter of the earthquake is inland. Cotabato is also landlocked, hence it is safe from tsunami. Based on the current Active Faults and Trenches Map of PHIVOLCS, the tsunami threat for Sultan Kudarat, Sarangani and adjacent coastal areas in SOCCSKSARGEN Region would come from the movement of the Cotabato Trench, located west of this region. Also, the tsunami threat for Davao Region would come from the movement of the Philippine Trench or other offshore active faults, located east of this region.

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## **What should be done by the affected communities?**

People are reminded to be cautious of structures visibly weakened or with signs of damage caused by the 16 October 2019 earthquake, as these may be further damaged by aftershocks. In case of houses and other buildings with visible damage, it is best to contact the Municipal/City Engineering Office for advice. Engineers from the local government, other agencies and organizations should inspect buildings and infrastructures to determine their integrity, and recommend appropriate actions to the affected groups or individuals. Affected building should not be reoccupied unless certified by the engineers.

Slopes should be checked for tension/incipient cracks that may have resulted from the strong ground shaking. Tension cracks may render slopes more susceptible to landslides. These areas should be avoided.

The best course of action is preparedness. In case of another strongly felt earthquake, it is recommended that people protect themselves by doing the “**drop, cover and hold.**” In homes and offices, heavy furniture should be strapped to the walls, and appliances be secured to prevent them from toppling and causing injuries to persons.

## **What is the role of DOST-PHIVOLCS?**

DOST-PHIVOLCS operates and maintains a network of 104 seismic stations spread across the Philippines. Twenty-six of these seismic stations are located in Mindanao, nine of which are staffed-controlled and are located in Kidapawan City, Cotabato City, Davao City, Cagayan De Oro City, Bislig City, Surigao City, Dipolog City, Zamboanga City, and General Santos City. DOST-PHIVOLCS also has 17 remote-telemetered seismic stations located in Pikit in Cotabato, Bacolod in Lanao del Norte, Marawi City, Valencia in Bukidnon, Bagumbayan in Sultan Kudarat, Talacogon in Agusan del Sur, Butuan City, General Luna in Surigao del Norte, Tandag in Surigao del Sur, Loreto in Dinagat, Don Marcelino in Davao del Sur, Mati City and Cateel in Davao Oriental, Laak in Compostela Valley, Pagadian City and Ipil in Zamboanga Peninsula, and Bongao in Tawi-Tawi. Data from the seismic stations are used to determine the location, magnitude and other characteristics of earthquakes. The closest seismic stations to Cotabato are the Kidapawan City Seismic Station (staff-controlled) in Kidapawan City (Cotabato), and remote-telemetered seismic station in Pikit (Cotabato).

Aside from monitoring the occurrences of earthquakes, DOST-PHIVOLCS also provides information and services such as hazards analyses and assessments. DOST-PHIVOLCS works hand-in-hand with other government agencies in mitigating the damaging effects of earthquakes. Furthermore, DOST-PHIVOLCS immediately deploys Quick Response Teams in areas affected by strong and damaging earthquakes to assess impacts and conduct information dissemination campaigns to allay the fears of the public.

Please visit our website at [www.phivolcs.dost.gov.ph](http://www.phivolcs.dost.gov.ph), and our Facebook (/PHIVOLCS) and Twitter (@phivolcs\_dost) accounts for earthquake bulletins, volcano updates, hazard maps, and other information on earthquakes and volcanoes. Earthquake observations may also be reported to DOST-PHIVOLCS at telephone numbers (02) 8929-9254 and (02) 8426-1468 to 79, local 307 and 308.

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