



Global Partnership for Sustainable Development Data

September 2017 Mexico Earthquake Response

The purpose of this case study is to better understand the Global Partnership for Sustainable Development Data's (GPSDD) contribution to and the impact of the call for satellite data to respond to the September 19, 2017 earthquake in Mexico.

The contents for this case study include direct inputs via questionnaires and key informant interviews with representatives from Open Data Office of the President of Mexico, the European Space Agency, Humanitarian OpenStreetMap Team (HOTOSM), ChinaGEOSS, and the GPSDD Secretariat, as well as secondary information gathered through reports and documents noted in the annex.

Key GPSDD Contributions

- Leveraging partner network to request and provide emergency data
- Facilitating connections between relevant partners and individuals quickly

Key Impacts

- Faster activation of the International Charter – Space and Major Disasters
- Access to partners' satellite data
- Increased collaboration and coordination in emergency response

Introduction: September 2017 Mexico Earthquakes

In September 2017, a series of three earthquakes hit Mexico, triggering the need for rapid disaster response and relief efforts. On September 19th, 2017 at 13:14:40 hours a powerful 7.1 magnitude earthquake hit Central Mexico. The epicenter of the earthquake was near Puebla state, about 76 miles southeast of Mexico City. Mexico City suffered almost half of the casualties with many people trapped under collapsed buildings. This earthquake was preceded by an 8.1 magnitude earthquake, the strongest in a century, which struck southern Mexico (Chiapas and Oaxaca states), killing 90 people. On September 23rd a third earthquake (6.2 magnitude) again hit southern Mexico, further disrupting rescue efforts from the previous ones.¹

GPSDD Contribution

Hours after the September 19th earthquake, the General Director of Open Data in the Coordination of National Digital Strategy of the Office of the President of Mexico sent a message to the Global Partnership for Sustainable Development Data (GPSDD). The message, sent at 3:08 PM, called specifically for “high quality satellite images” to help the Mexican government to map and understand the degree of damage. Two hours later, at 5:02PM, the message was circulated to the GPSDD Partners listserv of approximately 440 individuals from partner organizations representing diverse geographies, sectors, and communities. This call to action was an exercise to test the value of creating a network

¹ <https://disasterscharter.org/web/guest/-/earthquake-in-mexico-activation-553-> and https://wiki.openstreetmap.org/wiki/2017_Mexico_Earthquakes



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bound by the spirit of collaboration and service to improving data ecosystems for sustainable development data.

Within minutes of the email being circulated, GPSDD partners engaged with each other and the Mexican government by forwarding the message, connecting directly with the Mexican government, and offering solutions and resources. In this sense, GPSDD played a key role in connecting the data users with the data providers. While this is not an exhaustive list of all the partners who engaged with the call to action, this table provides a list of the partners that the GPSDD Secretariat was able to track via e-mail and phone exchanges:

United Nations Population Fund (UNFPA) – International and Mexican teams	OpenStreetMap Community – Latin America and Colombia	Sustainable Development Solutions Network
UK Department of International Development	Group on Earth Observations (GEO), Asia-Oceania GEOSS Initiative (AOGEOSS) and ChinaGEOSS Data Portal	Center for International Earth Science Information Network (CIESIN)
GeoCensos		Esri
Humanitarian OpenStreetMap	European Space Agency	BlackShore
OpenStreetMap Mexico	INDEX: Design to Improve Life	Arthur’s Legal
Flowminder	Tableau	Catapult

Impacts

The two key impacts identified as a result of GPSDD’s response to the call for satellite data are timing and access, which are demonstrated through the three partner responses illustrated below.

Activation of the International Charter – Space and Major Disasters

“The Charter is an international collaboration between the owners and operators of Earth observation missions to provide rapid access to satellite data to assist rescue authorities in the event of a natural or manmade disaster.”² While there are several ways in which the charter can be activated, it must be done through the official process, after which satellite data is made available to the requesting government. Please refer to Figure 1 for more information on the workflow process from activation to data-dissemination.

In response to GPSDD’s circulation of the call for satellite data, the European Space Agency (ESA) responded within two hours, with the notification that the appropriate channels had been tapped into

² <https://disasterscharter.org/web/guest/about-the-charter>



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to start the official process for activation. ESA is currently the chair for the Charter. The charter was officially activated on September 20, 2017 at 3:00 UTC by UNITAR-UNOSAT³, on behalf of UNOCHA⁴.

In addition, ESA also facilitated the activation of Copernicus Emergency Management Service which provides “information for emergency response in relation to different types of disasters, including meteorological hazards, geophysical hazards, deliberate and accidental man-made disasters and other humanitarian disasters as well as prevention, preparedness, response and recovery activities.”⁵

Direct Provision of Satellite Data

In response to the GPSDD circulated e-mail, the Group on Earth Observations (GEO) forwarded the call for satellite data to the members of their network and got a response from ChinaGEOSS. ChinaGEOSS harvests and integrates remote sensing data from China’s satellite operators and provides data response services to users globally. ChinaGEOSS was then connected directly to the Director of Open Data, Mexico, to obtain the area of interest in the disaster area and provide the relevant data.

This interaction demonstrates how the gap between the data user and the provider was connected, and how high-resolution satellite images were delivered rapidly in response to an urgent request. In the information and value chain, both GPSDD and GEO served as brokers. ChinaGEOSS, as a consortium of China satellite operators and with Disaster Data Response Mechanism in place, organized observation in targeted areas and provision of data.

Similarly, Humanitarian OpenStreetMap (HOTOSM) responded to the e-mail within three hours indicating that they were checking with their satellite imagery partners on resources they could provide and offering to ask their volunteers to digitize detailed building footprints in priority areas to be used as a base for future damage analysis. Within 48 hours of that communication, OpenStreetMap México followed up with a confirmation that their partner Digital Globe had provided the images, closing the loop with the Director of Open Data, HOTOSM, and GPSDD.

Humanitarian Mapping for Disaster Response

In parallel with GPSDD’s circulation of call for assistance, OpenStreetMap Mexico connected directly with the Director of Open Data within an hour of the earthquake to offer humanitarian mapping support and collaborate on identifying and mapping target areas. The OpenStreetMap Mexico Team, and volunteers within the Mexican community of HOTOSM were already in the process of crowdsource mapping the areas affected by the first earthquake. The crowdsourced geographical open data created by HOTOSM volunteers is available in real time. In response to the second earthquake on September 19, OpenStreetMap México put out a call via social media for volunteers to help in visualization and data

³ United Nations Institute for Training and Research (UNITAR)– UNITAR’s Operational Satellite Applications Programme (UNOSAT)

⁴ United Nations Office for Coordination of Humanitarian Affairs

⁵ <http://emergency.copernicus.eu/>



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analysis. This resulted in the group growing from 11 people to more than 150 people creating maps and data analysis in a few days.⁶

Collaboration and Coordination

Based on the disaster management experiences of the September 2017 earthquakes, the primary stakeholders in Mexico identified a need to strengthen coordination and collaboration around the use of open data and technology in disaster response. As a result, the National Coordination of Civil Protection, the National Center for Disaster Prevention (CENAPRED), and the National Digital Strategy Coordination (CEDN) of the Office of the Presidency, organized a Dialogue Tables event that brought together more than 40 representatives from the government, private sector, and civil society who were involved in the support and rescue tasks of the September earthquakes.⁷ One of the key outcomes of this exercise was the identification of the need to create a permanent Working Group within the National Emergency Committee to establish an official multi-stakeholder collaboration mechanism on data and technology issues in cases of disaster, inside the National Committee of Civil Protection. In addition, the discussion identified the need to create a unique information system that allows to identify, standardize, and maintain priority data in an updated manner. As a response, the data portal datos.gob.mx was established as a platform to publish and share strategic data in open formats and in real time.

⁶ <http://www.openstreetmap.mx/2017/10/mexico-earthquakes17/>

⁷ <https://datos.gob.mx/blog/gobierno-industria-privada-y-sociedad-civil-conversan-sobre-el-uso-de-datos-abiertos-y-tecnologia-en-caso-de-desastre?category=noticias&tag=energia-y-medio-ambiente>



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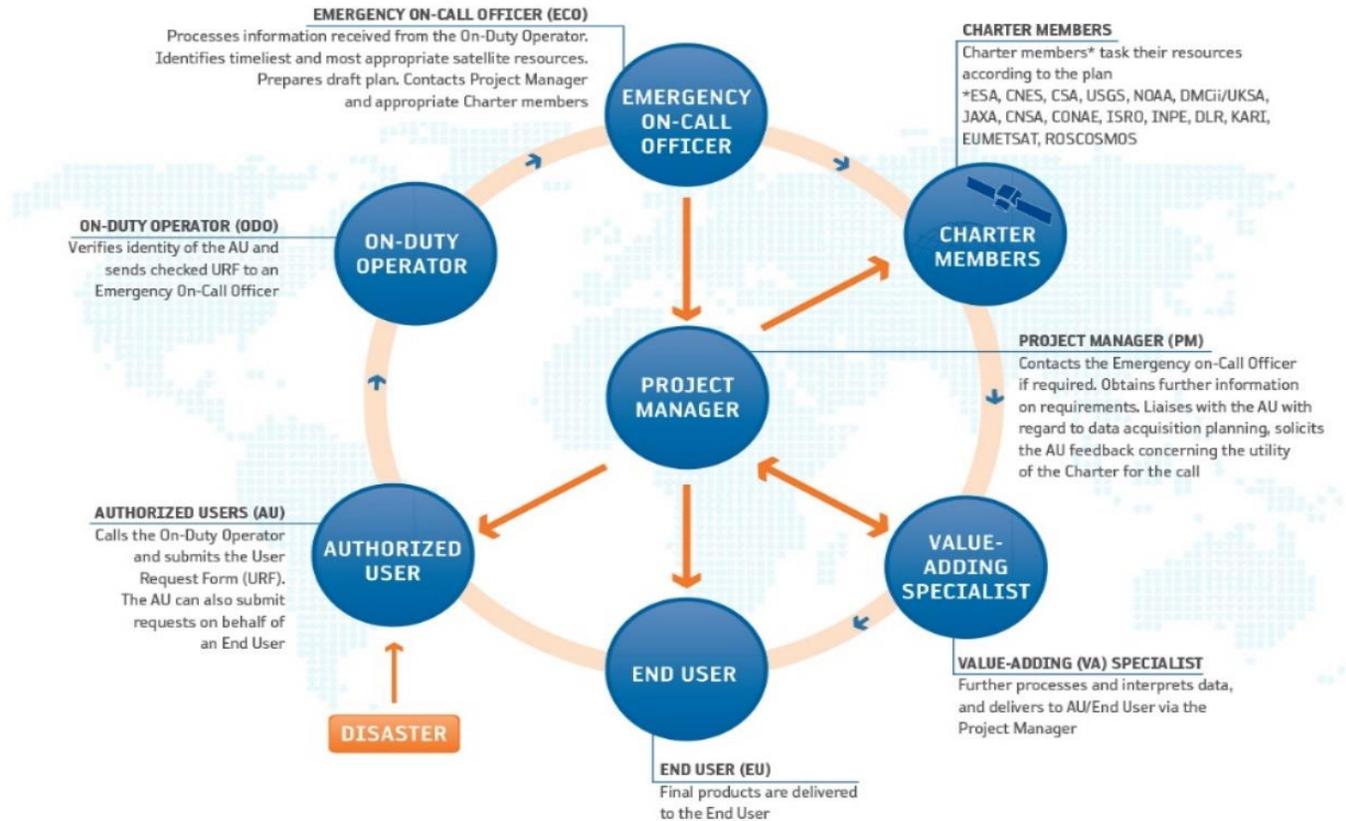


Figure 1: Charter Operational Loop⁸

⁸ <https://disasterscharter.org/web/guest/activating-the-charter>



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Humanity Road Report on Mexico Earthquake: <https://www.humanityroad.org/situation-reports/mexico/m71-earthquake-puebla-mexico>

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https://wiki.openstreetmap.org/wiki/2017_Mexico_Earthquakes