



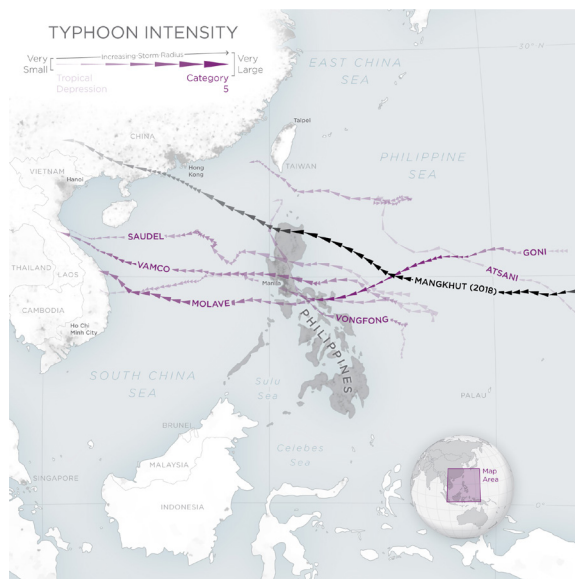
Natural Disaster Monitoring in the Philippines

Earthquake Damage, Batanes Island • July 29, 2019

A GEOSPECTRUM CASE STUDY

Typhoons are one of the frequent phenomena of the Philippines. For the past two years, the Department of Science and Technology (DOST-ASTI) has been looking at the paths of typhoons and predicting what areas could be affected. DOST-ASTI connected with Geospectrum to improve upon disaster management and monitoring.

Map of Typhoons that made landfall in the Philippines during the 2020 typhoon season. The opacity of the typhoon path corresponds to the intensity of the storm, while the width indicates the relative radius of the storm.



CHALLENGE

A GROWING ISSUE

The Philippines is located along the typhoon belt in the Pacific along the Ring of Fire, an area including parts of the Pacific Ocean, the West Philippine Sea, and the Philippine Archipelago (with the exception of Tawi-Tawi province). Given this geographical location, the Philippines is visited by an average of 20 typhoons every year, five of which are typically destructive, taking a toll not only on infrastructure but also on human life.

About Geospectrum

Geospectrum Marketing Services is a Filipino-owned business entity that caters to the growing need for accurate, up-to-date, and timely information to support decision-making and planning activities. Geospectrum distributes high-resolution satellite imagery and value-added products that address a wide range of applications.

The Advanced Science and Technology Institute is an agency of the **Department of Science and Technology (DOST-ASTI)** mandated to undertake research and development activities aimed at strengthening and modernizing Information and Communications Technology and microelectronics. The DOST - ASTI continues to dedicate itself to delivering technology solutions in support of a productive and resilient Filipino society.

About Planet Labs

Planet is the leading provider of global, near-daily satellite imagery data and insights. Planet is driven by a mission to image all of Earth's landmass every day, and make global change visible, accessible and actionable. Founded in 2010 by three NASA scientists, Planet designs, builds, and operates the largest earth observation fleet of satellites, and provides the online software, tools and analytics needed to deliver data to users.

To learn more visit www.planet.com and follow us on Twitter at [@planetlabs](https://twitter.com/planetlabs)

Being situated in the Pacific Ring of Fire makes the Philippines vulnerable to other natural disasters including frequent earthquakes and volcanic eruptions. Its geographical location paired with its physical environment also contribute to its high-susceptibility to tsunamis, sea-level rise, storm surges, landslides, flooding, and drought. Without access to images or data provided by satellite imagery, when natural disasters struck, DOST-ASTI relied on information they could extract from the ground level. However, this information had a long latency, therefore causing delays in getting timely information to the top-level decision-makers.

After years of manual monitoring, DOST-ASTI was looking for a better way to monitor typhoons and to help inform natural disaster policies.

“We recognized that if we could add in the information provided by satellite imagery into our workflows, this would provide us a more accurate perspective on what really happened at the ground level. When we ventured into space activities we had subscriptions to commercial satellites, but these presented new challenges, the main one being the long temporal revisit. For example, if we wanted to capture images in the area we had, we had to wait several days before we could get the capture. This was not sufficient for effective disaster response and environmental monitoring we required.

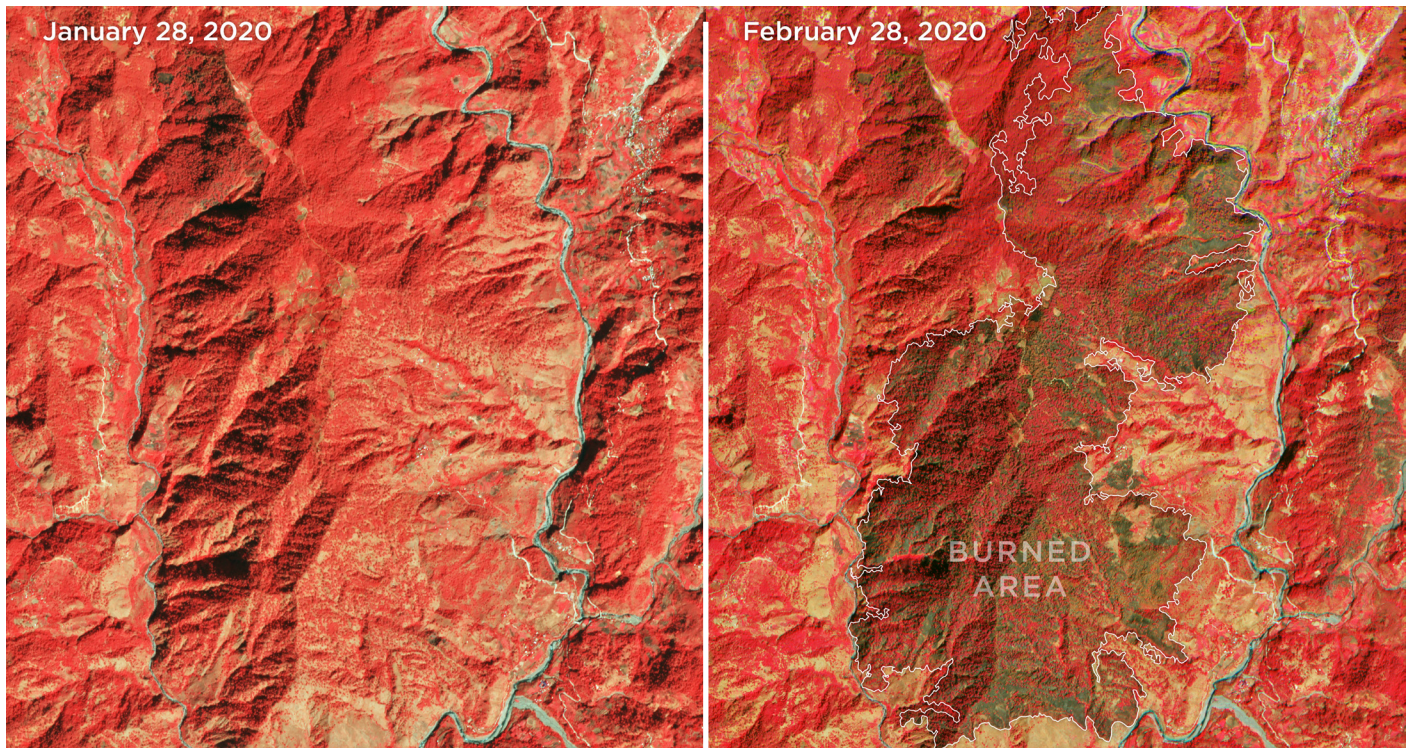
HAROLD BRYAN S. PALER

Senior Science Research Specialist at DOST-ASTI

SOLUTION

A SUSTAINABLE APPROACH

DOST-ASTI recognized the need for timely and accurate information, especially in the wake of natural disasters, and connected with Geospectrum to access Planet Data. “In terms of natural disasters this is what you would need to be informed as quickly as possible in order to make timely decisions and this is what Planet provides. You don’t have to wait for a satellite to pass by an area of interest (AOI) because you know that every day Planet will capture images of the area. This is the biggest advantage of Planet - its high-cadence and high-temporal resolution,” said Harold Bryan S. Paler, Senior Science Research Specialist at DOST-ASTI.



These false color images, captured a month apart, show the aftermath of a forest fire in the municipality of Kabayan, Benguet in the Philippines.

Prior to satellite images becoming available for this post-disaster monitoring required a lot of manual labor. Today, the applications of satellite imagery in monitoring pre-typhoon and post-typhoon incidents and how to manage the response to and the impact of these natural disasters offer a more timely and accurate analysis of the damage for agencies to make informed decisions on how to best respond to these incidents.

“There’s really a constant clamor among our clients for cloud-free and up to date imagery at reasonable prices and I think Planet has all of that in-store. With the high cadence of Planet products, for example, there’s a high probability and greater possibility that cloud-free and up-to-date images could be acquired. This is really an advantage to our customers here in the Philippines.

GEOSPECTRUM MARKETING SERVICES

After a typhoon hits, DOST-ASTI is able to assess the damage that has occurred by using Planet’s satellite imagery. With this information, monitoring enables particular benefits to the Philippine population and is helping the government form policies based on the research studies using satellite information. “Today, If there is an incoming typhoon we are able to check all the pre-disaster images of the area that are likely to be affected and then compare these images to assess the magnitude of the damage the typhoon has caused. Because of Planet’s high temporal resolution, we are able to get the images as soon as possible and then proactively send them to different government units and disaster management councils who require this information,” said Harold Bryan S. Paler, Senior Science Research Specialist at DOST-ASTI. This disaster management and response can be applied to all natural disasters in the Philippines.

MICRO STORY

TYPHOON OMPONG LANDSLIDE

On September 15, 2018, Typhoon Mangkhut, also known as Ompong in the Philippines, made landfall in the north-eastern the Philippines, bringing with it flash floods, storm surges, and landslides. With sustained wind speeds greater than 205 km/hr, the typhoon was catastrophic.

The typhoon and its after-effects took the lives of 127 people in the Philippines, mostly in landslides that were triggered by the heavy rains, with the majority in Benguet province.

When DOST-ASTI heard about the landslide in Benguet, they accessed a pre-existing image from Planet of the AOI from June 4, 2018, and an image from after the landslide. Using Planet data, they overlapped the imagery to assess the damage and where the greatest areas of need were.



Typhoon Ompong Landslide from September 6, 2018 (top) and September 19, 2018 (bottom)

“When we heard about the landslide we were able to access Planet imagery immediately. The timeliness and availability of this image allowed us to assess the extent of the landslide and take action. Fortunately, we used Planet datasets to train the AI model to detect the buildings, roads, and infrastructure. After reviewing the images we sent the information directly to the office of civil defense and other agencies.” - ASTI. Upon gathering this information, DOST-ASTI was able to send an accurate and informed analysis of the damage in a timely manner to local response teams, providing information on where to prioritize excavation and which areas to focus on first.

RESULTS

AN EXPANDING IMPACT

Today, Planet's images are used for a wide variety of applications that meet Geospectrum's customers' needs. "From forest fires and earthquake monitoring to landslides and environmental monitoring, the possibilities are endless," said Harold Bryan S. Paler, Senior Science Research Specialist at DOST-ASTI.

The wide variety of applications satellite imagery enables has become even more important during this unprecedented time. "Since the pandemic, we are constrained more to deploy physical assets on the ground to perform studies and surveys. Using satellite imagery has helped us address concerns and challenges faced by our customers. We see Planet as a perfect complement to the work that customers are doing and need," said Virgilio Santos, General Manager at Geospectrum.



Earthquake damage, Batanes Island from July 25, 2019 (left) and July 29, 2019 (right). The earthquake triggered large scale landslides in the coastal area and the damage is clearly visible in the post-disaster image.

"We were also drawn to Planet's dedication to developing new satellite applications for its platform. Planet continuously innovates to address ever-changing customer requirements and the fact that there is always something new and fresh allows us to improve upon what we can offer our customers.

VIRGILIO SANTOS

General Manager at Geospectrum

Learn more about Geospectrum Marketing Services

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