



Philippine Space Agency

Space Data Usage and Applications for Disaster Risk Reduction and Management (DRRM) in the Philippines

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Space Data Mobilization and Applications Division (SDMAD)

Space Information Infrastructure Bureau (SIIB)

The Philippine Space Agency

Building an integrated and sustainable national space program



08 August 2019

Signed by the President

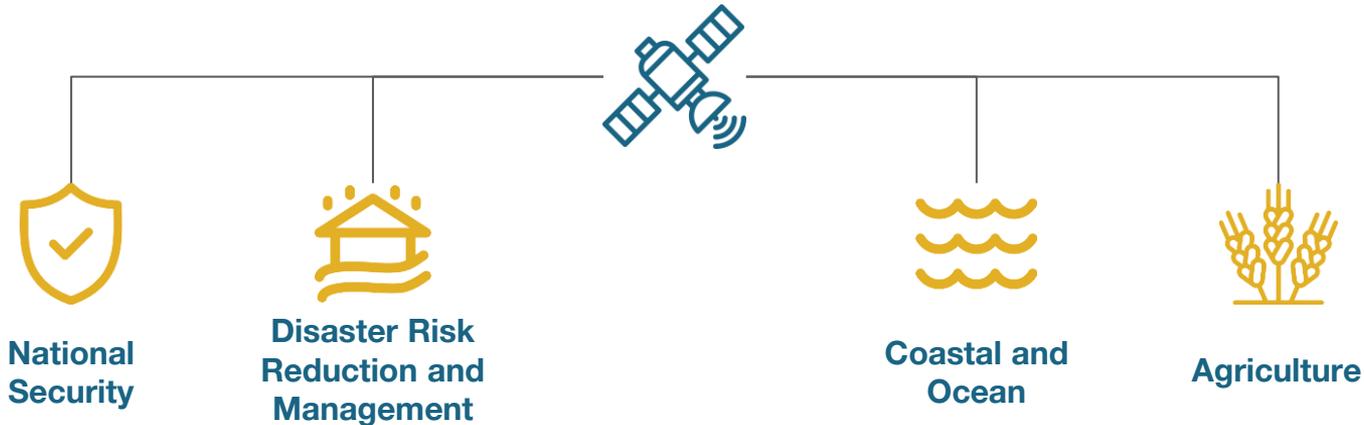
03 September 2019

Effectivity of Philippine Space Act
R.A. 11363



Data Analytics Technologies and Operations Systems for Space Data (DATOS)

The PhilSA aims to further the development and application of remote sensing, artificial intelligence (AI), machine learning (ML), data science and other methodologies in producing space-enabled information to support the operations of various government agencies.



Enabling Timely Disaster Response

Rapid disaster response in Naga, Cebu
landslide (21 September 2018)

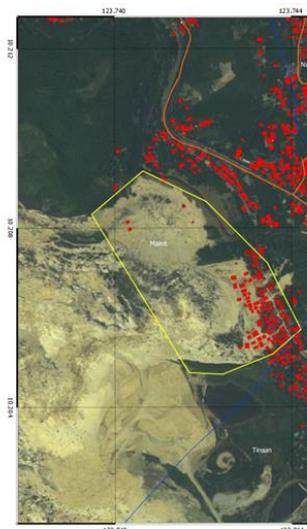
The images show the areas before and after the landslide event in Naga, Cebu. The map layout was immediately sent a team on the ground. The ability to generate this [map] information in a timely manner was crucial.

It enabled rescuers to prioritize areas for search and rescue.

NAGA CEBU LANDSLIDE - SEPT 21, 2018
NAGA, CEBU

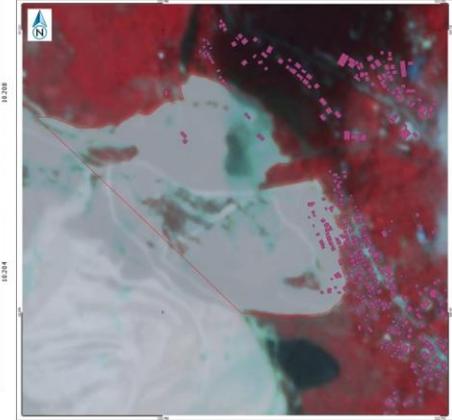


ESRI BASEMAP
PRE-LANDSLIDE



KOMPSAT 3 - SEPT 21, 2018
POST-LANDSLIDE

Satellite: KOMPSAT-3
Accessed via: DOST-ASTI PEDRO
Center
Capture date: September 21, 2018
Payload: Optical
Resolution: 0.5 m
Basemap: ESRI (Pre-landslide)

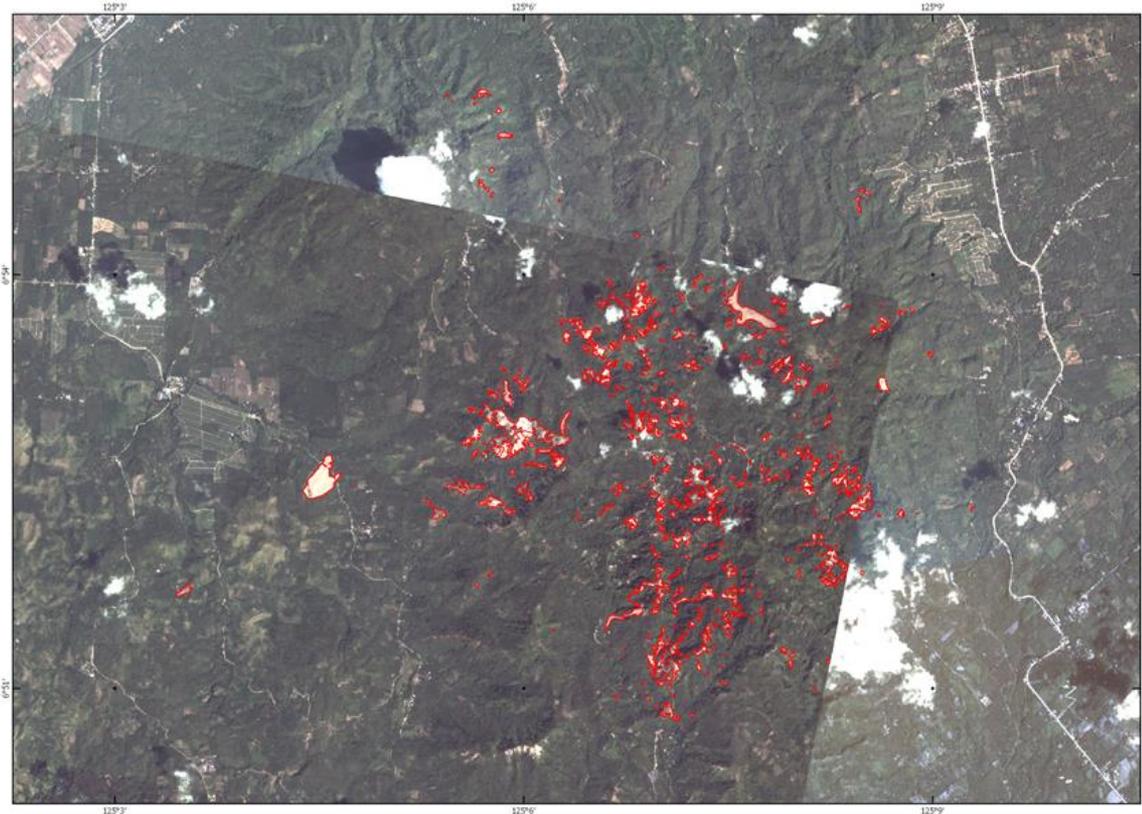


Assessing Earthquake Damage

Rapid detection and mapping of earthquake-induced landslides in Makilala, Cotabato

The image shows the areas potentially affected by earthquake-induced landslides in Makilala, Cotabato. Artificial Intelligence (AI) models were used to predict the bare soil and vegetation cover from PlanetScope satellite images.

Areas with changes from vegetation to bare soil are interpreted as the potential landslide areas. **The hazard event was triggered by multiple quakes that hit large parts of Mindanao in 29-31 October 2019.**

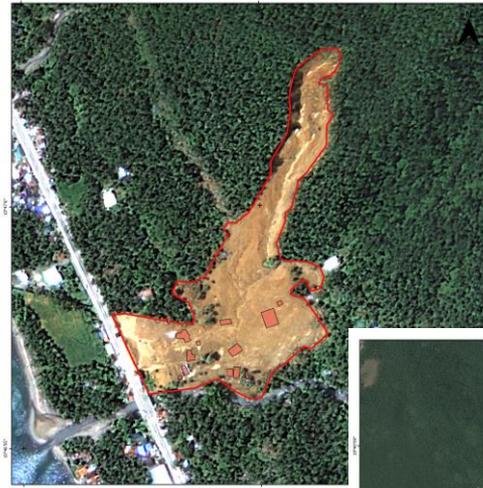
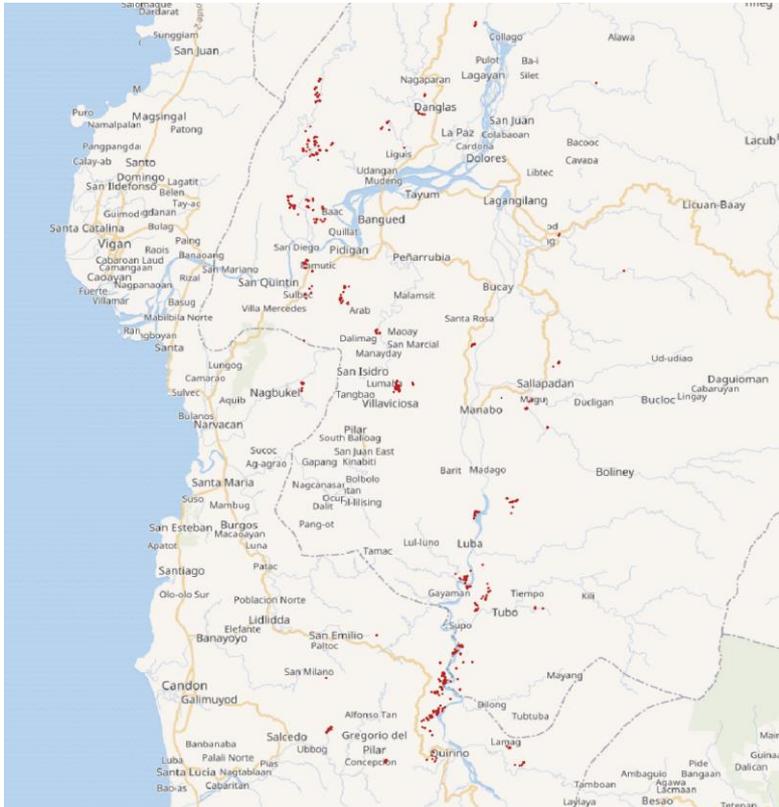


This image was shared with Philippine Institute of Volcanology and Seismology (PHIVOLCS) and the Cotabato LGU.

Satellite: PlanetScope
Accessed via: DOST-ASTIPEDRO
Center
Capture date: November 8, 2019
Resolution: 3m



Assessing Landslide Damage



Assessing Landslide Damage Itogon Benguet

Dataset:

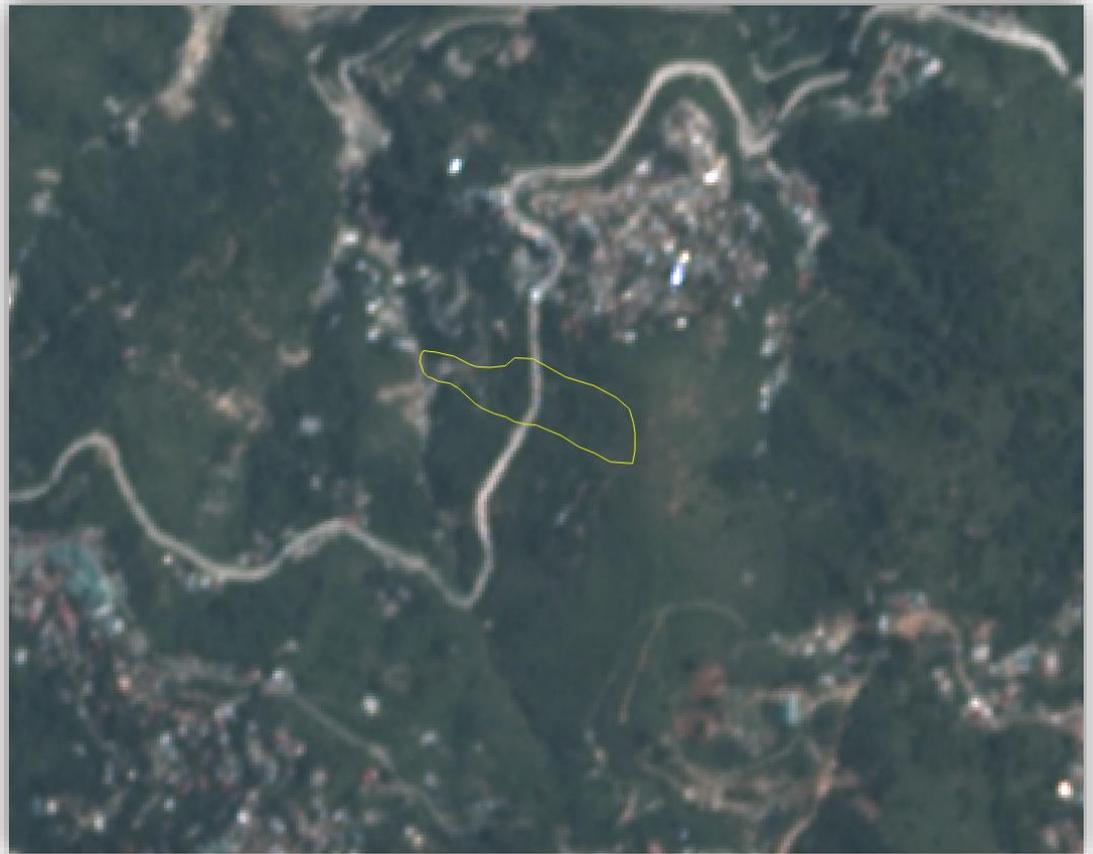
Planet (Dove Constellation)

Processing Time

~ 2 minutes

Released to:

- Office of Civil Defense
- DOST Regional Offices
- Social Media
- Others



*Natural Color of Planet Image (RGB:
321)
As of June 4, 2018*

Assessing Landslide Damage Itogon Benguet

Dataset:

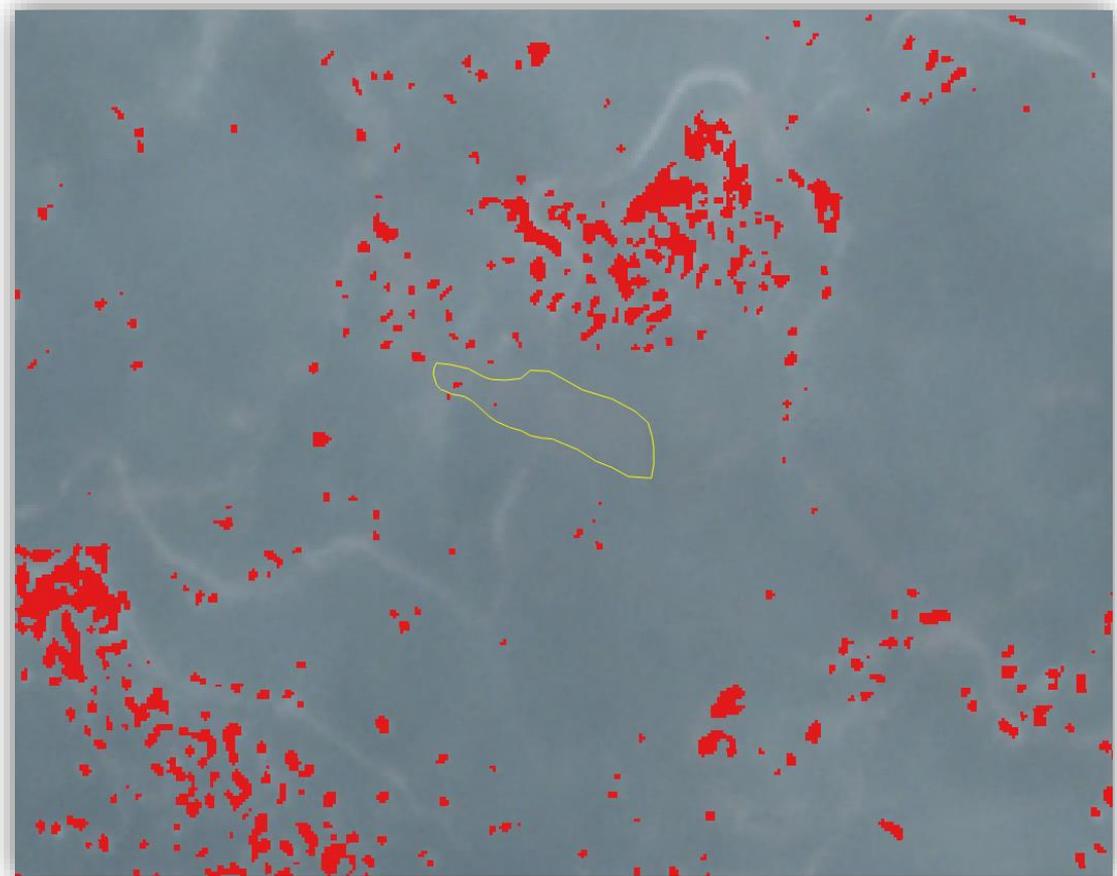
Planet (Dove Constellation)

Processing Time

~ 2 minutes

Released to:

- Office of Civil Defense
- DOST Regional Offices
- Social Media
- Others



*Natural Color of Planet Image (RGB: 321)
Red areas are Artificial Intelligence (AI)-predicted built-up areas.
Red areas are inside the landslide areas
September 18, 2018*

Detecting Damages

Tagging Typhoon-damaged Buildings using Disaster Charter Imagery

Damage tagging using satellite imagery is important in assessing the damages caused by disasters. In this example, damaged buildings caused by Super Typhoon Rai (Odette) in Carcar City, Cebu were tagged through. This shows the expanse and devastation the Super Typhoon left in its wake.

The red dots shows buildings with evident damages as seen from the optical image, as orange dots represents buildings with uncertain damages which needs to be confirmed on the ground.

1

Optical Image

Satellite: Pleiades-1

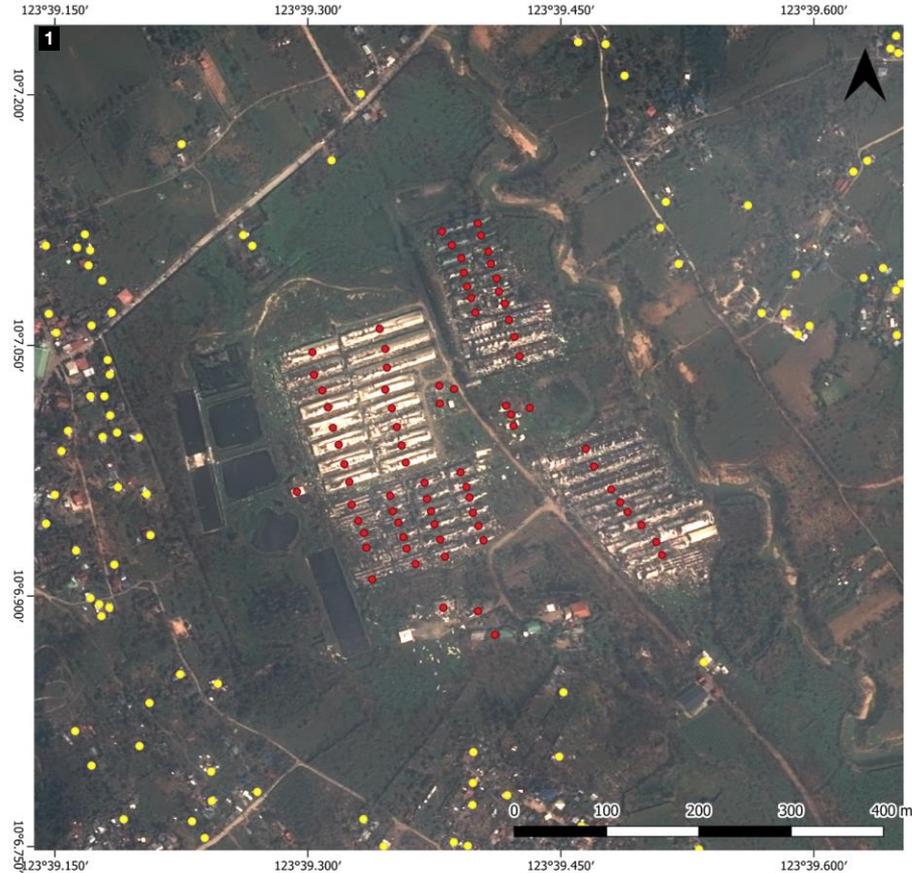
Accessed via: Disaster Charter

Capture date: 22 December 2021

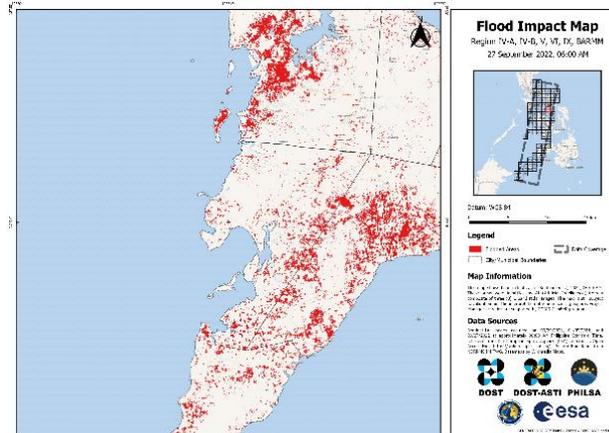
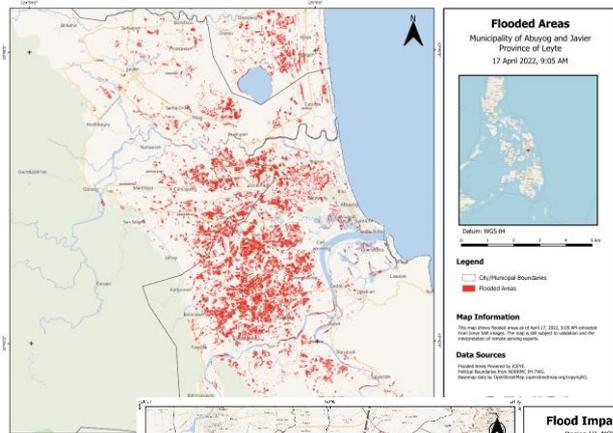
Resolution: 0.5m

Legend:

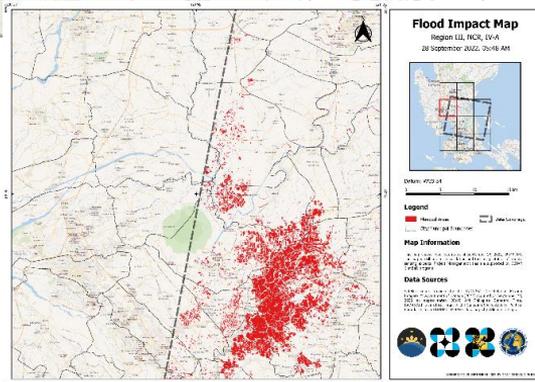
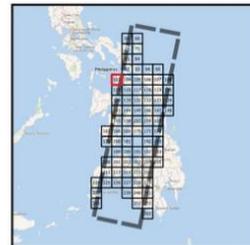
- Damaged Buildings
- Potentially Damaged Buildings



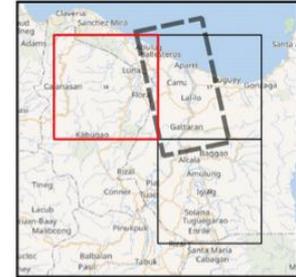
Assessing Flood Impacts



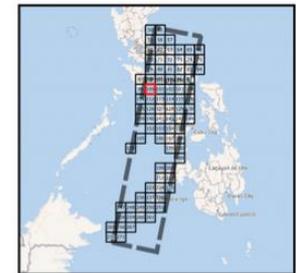
Flood Impact Map
Region V, VII, VIII, IX, X, XII, BARMM
28 October 2022, 06:00 AM



Flood Impact Map
Province of Cagayan
01 November 2022, 01:49 AM



Flood Impact Map
Region IV-A, IV-B, V, VI, IX, BARMM
02 November 2022, 06:00 AM



Common Satellite Data Sources in the Philippines

Sovereign
Satellites owned, operated, and tasked by the Philippines.

Diwata-2 NovaSAR*

Commercial
Satellites with paid subscription.

*Komsat-5 *GeoEye-1 *Iceye**

*Komsat-3, 3A TerraSAR-X *Dove & *Skysat**

*Worldview-2,3,4 *Plelades Neo** SPOT-6, 7

Open
Satellite images that are free to use and download.

Terra and Aqua Landsat-8, 9 Suomi-NPP

Sentinel-1A, 1B Sentinel-3 Sentinel-5P

Disaster Charter-Activated
Satellite images shared through the International Charter: Space and Major Disasters for rapid response to major disasters

RCM-2** SAOCOM-1A

Goafen-2 Kanopus-V

Different satellite data and products are **being mobilized and shared to different stakeholders** for several environmental applications, i.e. utilization of images for disaster response and risk assessment

Disaster Information Flow



Disaster Incidence ODK



Disaster Incidence

Event Name
(Typhoon name, Disaster location, etc.)

Disaster Incidence

*** Type of Incident**
Select the incident classification of the event.

- Flood
- Landslide
- Earthquake
- Damages
- Others

Disaster Incidence

Remarks
Additional information about the incident.

Disaster Incidence

*** Location**
Click start GeoPoint and wait for your device to detect your gps location.

Start GeoPoint

Add "Add a photo.?"

Do not add Add

Disaster Incidence

Add a photo. > 1

*** Photo**
Take a picture of the incident.

Take Picture

Choose Image

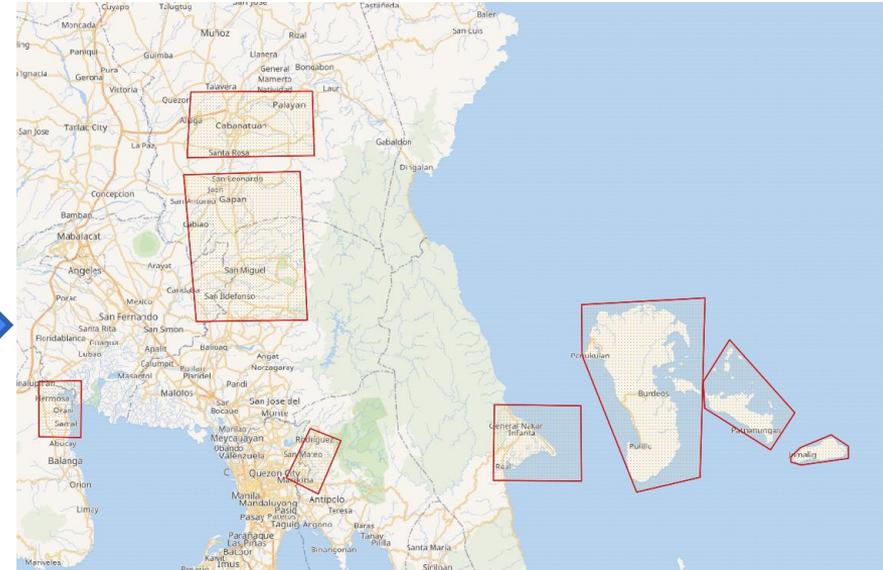
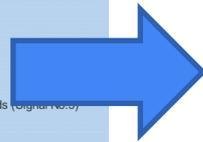
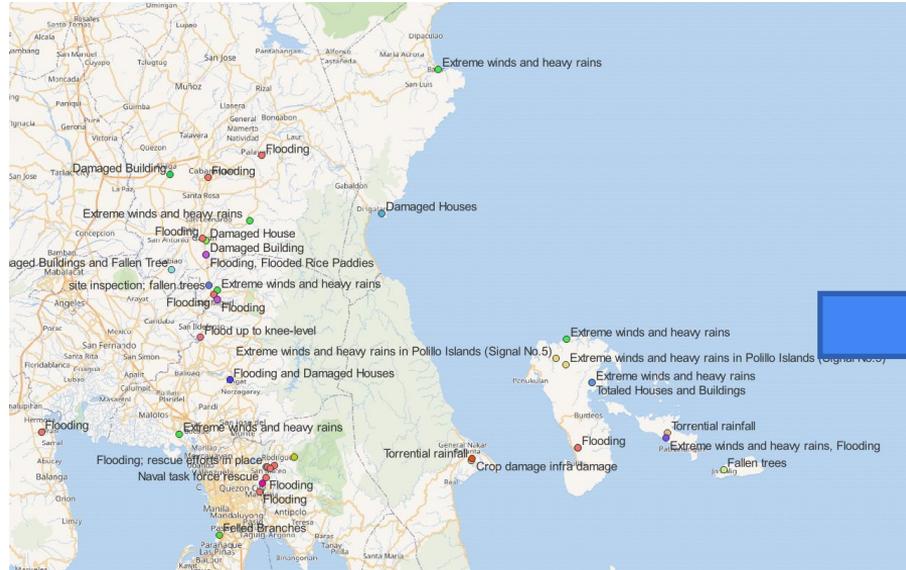
You are at the end of Disaster Incidence.

Name this form
Disaster Incidence

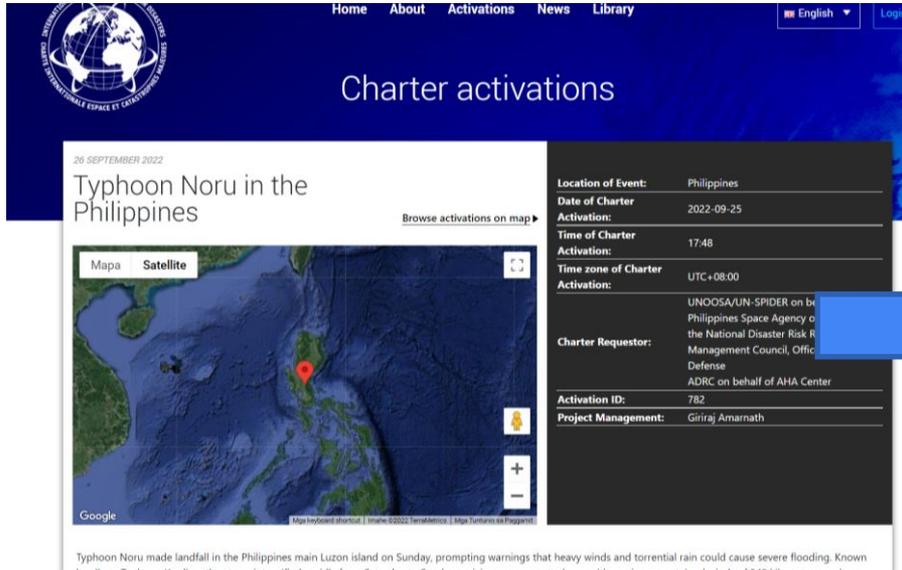
Mark form as finalized

Save Form and Exit

The reports are plotted and used to create AOIs



AOIs are submitted to the International Charter Space and Major Disasters for Disaster Charter activation



Home About Activations News Library English Login

Charter activations

26 SEPTEMBER 2022

Typhoon Noru in the Philippines

[Browse activations on map](#)

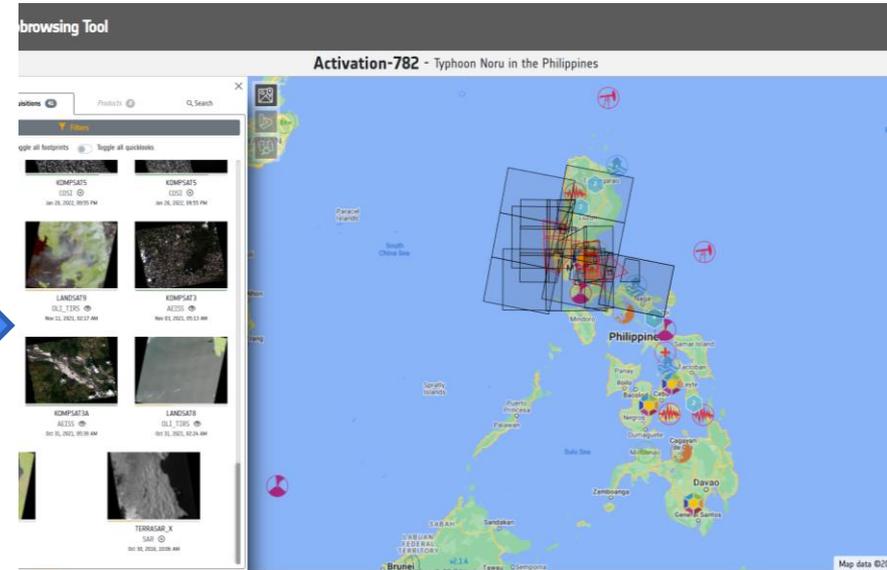
Mapa Satellite

Google

Map keyboard shortcuts | © Inmap 2022 TerraMetrics | Mapa Tuntunan BRPagsangin

Typhoon Noru made landfall in the Philippines main Luzon island on Sunday, prompting warnings that heavy winds and torrential rain could cause severe flooding. Known

Location of Event:	Philippines
Date of Charter Activation:	2022-09-25
Time of Charter Activation:	17:48
Time zone of Charter Activation:	UTC+08:00
Charter Requestor:	UNOOSA/UN-SPIDER on behalf of Philippines Space Agency of the National Disaster Risk Management Council, Office of Defense
	ADRC on behalf of AHA Center
Activation ID:	782
Project Management:	Giriraj Amarnath



browsing Tool

Activation-782 - Typhoon Noru in the Philippines

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Q Search

Filter

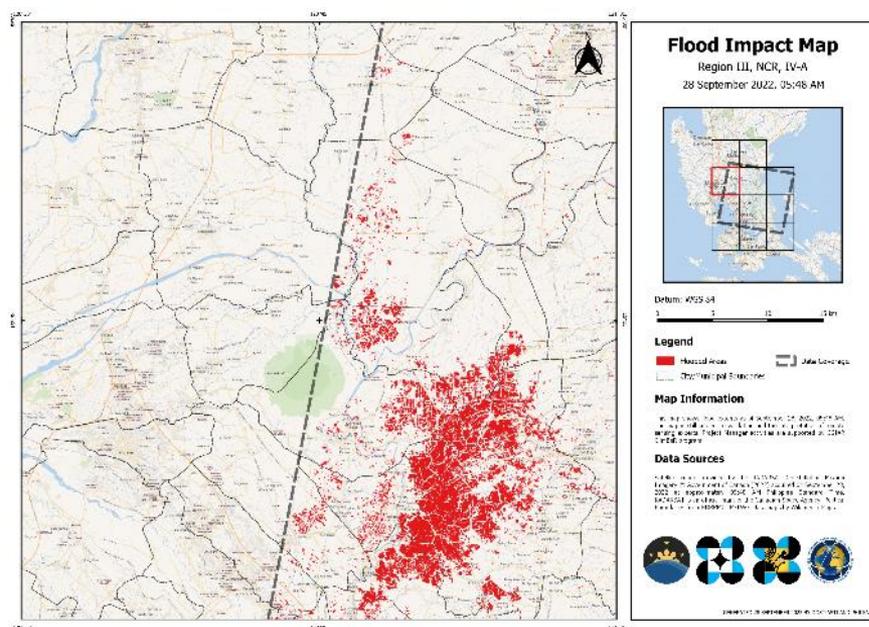
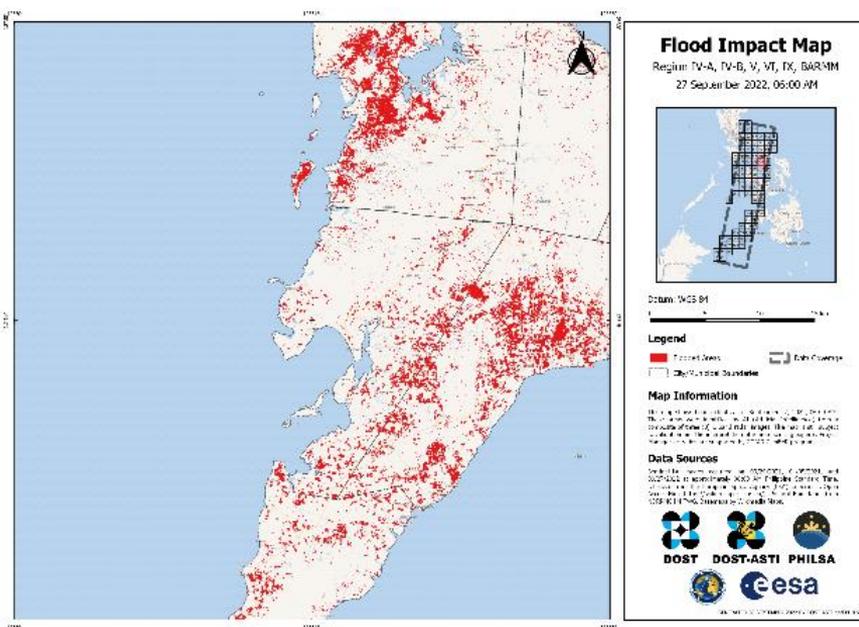
Toggle all footprints

Toggle all quicklinks

View all footprints

- KOMPASAT ISSI 01 Nov 02, 2022, 00:05 PM
- KOMPASAT ISSI 01 Nov 02, 2022, 00:10 PM
- LANDSAT 8 L1_TIRS A025 01 Nov 02, 2022, 02:27 AM
- KOMPASAT ISSI 01 Nov 02, 2022, 00:23 AM
- KOMPASAT ISSI 01 Nov 02, 2022, 00:24 AM
- KOMPASAT ISSI 01 Nov 02, 2022, 00:24 AM
- LANDSAT 8 L1_TIRS A025 01 Nov 02, 2022, 02:24 AM
- TERRASAR-X SAR 01 Nov 02, 2022, 00:08 AM

Map data ©2022



#KardingPh FLOOD IMPACT MAPS Inbox x

P drmm@philsa.gov.ph 11:38 AM (16 minutes ago) ☆ ↻ ⋮
 to Ryan, ocd, ooddamonilla, ocd.operationsservice, ndrmmoc, ncr, civiledefensencr, region3, ocdregion3, region4a, jbpatalinjuglii, ncr, records, dost4a, mipablay, official, dost.ro5ord, do

The [Philippine Space Agency](#) and [DOST-ASTI](#)'s DRR Teams have generated flood impact maps from the recent onslaught of #KardingPh. The maps show potentially flooded areas extracted from [RadarSat](#) and [Sentinel](#) satellites captured on 27 and 28 September 2022, respectively.

Please be advised that the thematic accuracy of the flood maps might be lower in urban and forested areas due to inherent limitations of the SAR analysis technique, hence, this is still subject to the validation and interpretation of remote sensing experts.

You can download the maps and shape files on these folders:

- Sentinel: <https://bit.ly/3E2m3k8>
- RadarSat: <https://bit.ly/3Rog01n>

Please use and disseminate these maps and data as you see fit. If you have any questions, please do not hesitate to respond to this email, cc: datos@asti.dost.gov.ph.

You may also visit the Facebook pages of [DATOS](#) and [PhilSA](#) for near real time updates of our weather monitoring efforts.

Thank you very much!

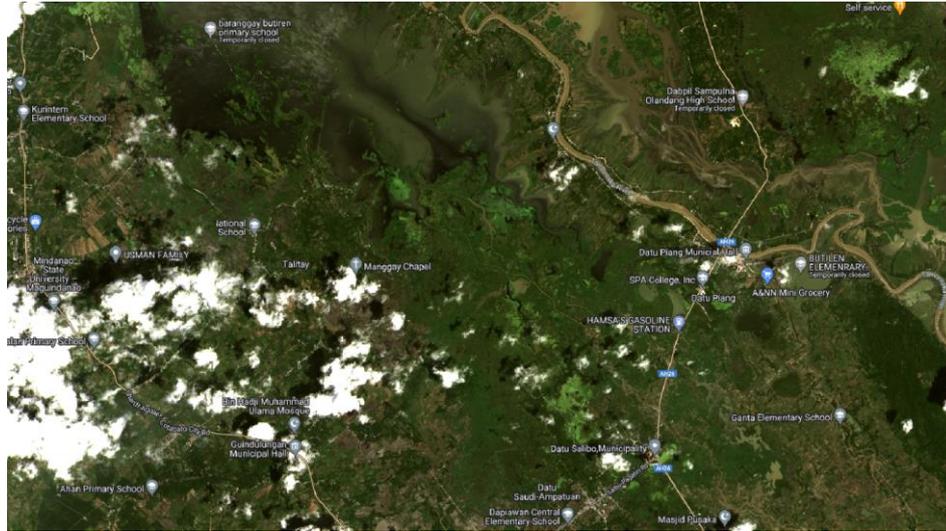
The value-added products are distributed to mandated agencies and other stakeholders **for free**, through email and social media.



Salibo-Pagati Maguindanao Area | AOI 4

14 October 2022

30 October 2022



Siltation and flooding on agricultural and built-up areas as seen on Landsat 9 imagery.



Malagak – Northern Kabuntalan Maguindanao | AOI 5



14 October 2022

30 October 2022



Siltation and flooding on agricultural and built-up areas as seen on Landsat 9 imagery.



Contact the Philippine Space Agency



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