Philippine Space Agency

BAGONG PILIPINAS

Regional Knowledge Exchange on Harnessing Digital Innovations for Space: Experiences and Insights

A side event at the 29th session of the Intergovernmental Consultative Committee (ICC-29) on Regional Space Applications Programme for Sustainable Development (RESAP) in Asia and the Pacific

ARIEL C. BLANCO, D.Eng.
Director
Space Information Infrastructure Bureau
Philippine Space Agency
Philippines

Republic Act No. 11363 "The Philippine Space Act"

Republic Act No. 11363
or the **Philippine Space Act**, signed into law on **August 8, 2019,** established the **Philippine Space Policy** and **PhilSA**.
It is the **central government agency in the Philippines** addressing **all national issues** & **activities** in **space S&T applications (SSTA)**.



PhilSA is an attached agency of the **Office of the President** for purposes of **policy and program coordination**, to ensure **alignment in national policies and priorities**

Office of the President



Philippine Space Council

Philippine Space Agency (PhilSA)

Key Development Areas





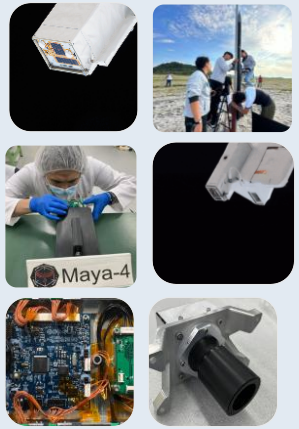
"The Philippines is preparing for the future by laying the governance framework that will allow us to … pursue digital solutions towards a more modern economy, ***and expand our presence in outer space*** *… we need to start by* ***defining the norms of responsible behavior in cyberspace and outer space****..."*

Pres. Ferdinand R. Marcos Jr.
77th UN General Assembly

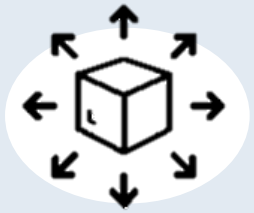
The Space Value Chain

Capacity to Develop Upstream Infrastructure





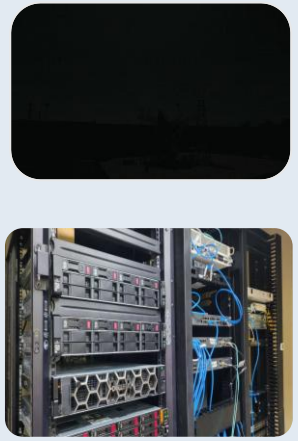
Accessibility and Suitability of Services





Capacity to Bring Services to the Ground





Capacity to Generate Insights





Ability to Mobilize and Act





Socio-Economic Value Realized and Measured





Supporting the chain:

- **Research and Development**
- **Education and Capacity-Building**
- **Public Outreach**
- **Policy, Planning and International Cooperation**

Adapted from: Current and future value of earth and marine observing to the Asia-Pacific region, Australian Government | Asia-Pacific Economic Cooperation

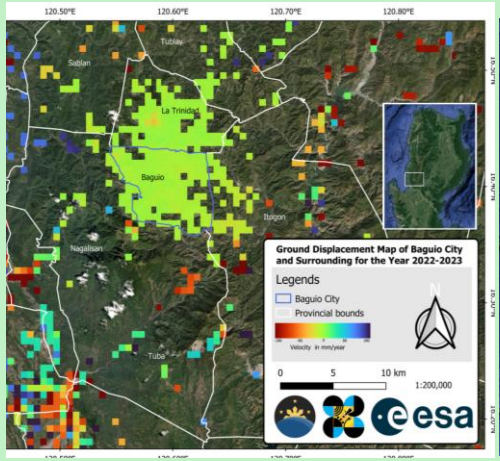
National Copernicus Capacity Support Action Programme for the Philippines (CopPhil)



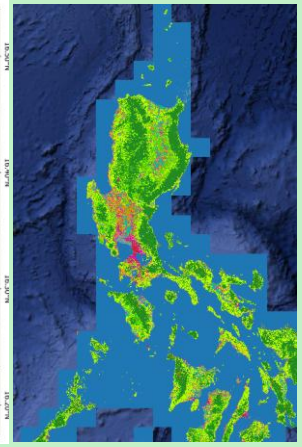
Ursula von der Leyen
European Commission President

"We're currently setting up a so-called **Copernicus data mirror site within the Philippine Space Agency**. And we have just signed an agreement **to boost the flow on Earth observation data between us.**
This is very important for early warning, for example, for extreme weather phenomenon and to improve the climate resilience. **This is a first in space cooperation in Asia.**"

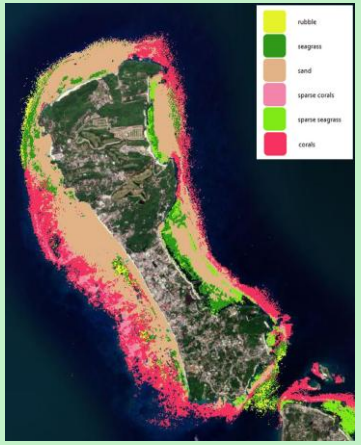
CopPhil Pilot Projects



Ground Motion Monitoring



Land cover (LC) and Forest Mapping Service



Benthic Habitat Monitoring Service



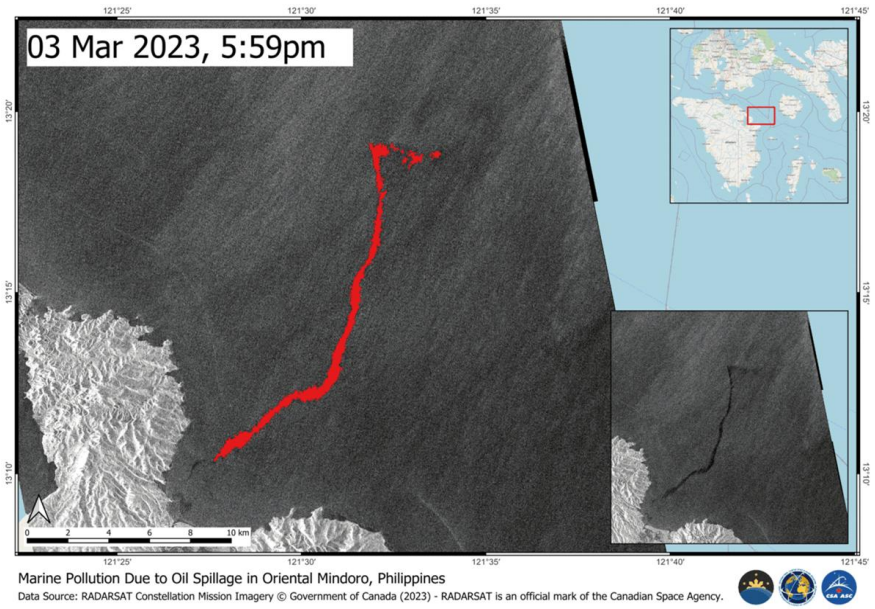


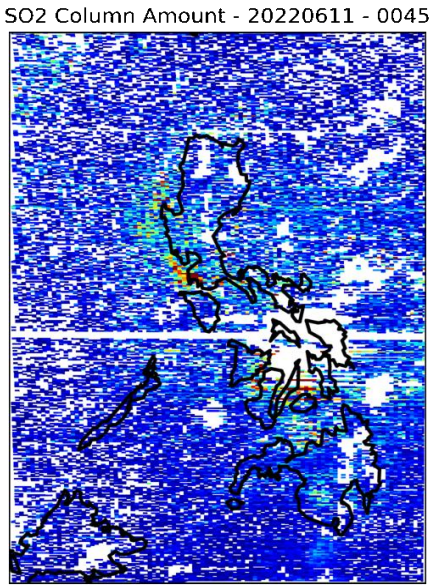
PhilSA – European Commission Copenicus Administrative Arrangement



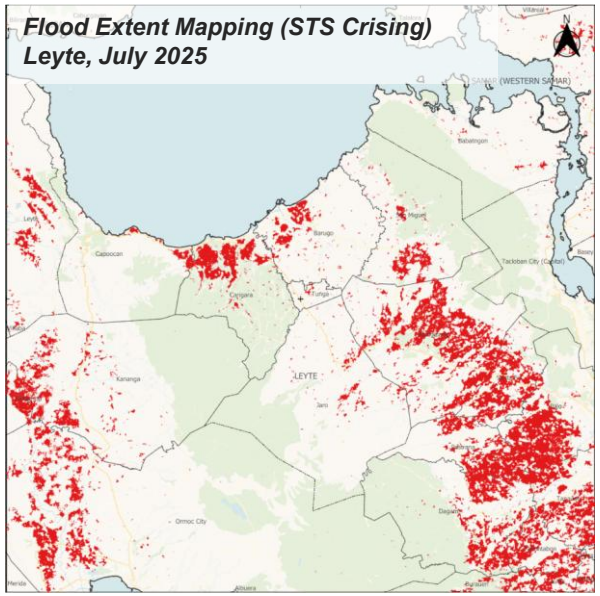
PhilSA – ESA Copernicus Technical Operating Agreement

4 Capacity to Analyze and Generate Insights





Air Quality Monitoring
Sulfur Dioxide Amount During Mt. Bulusan Eruption (June 2022)



Since 2022

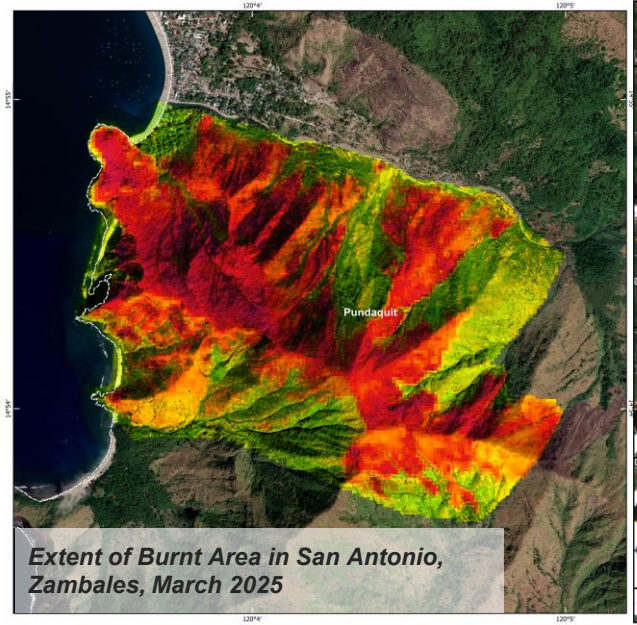
62,152
Maps produced across various applications

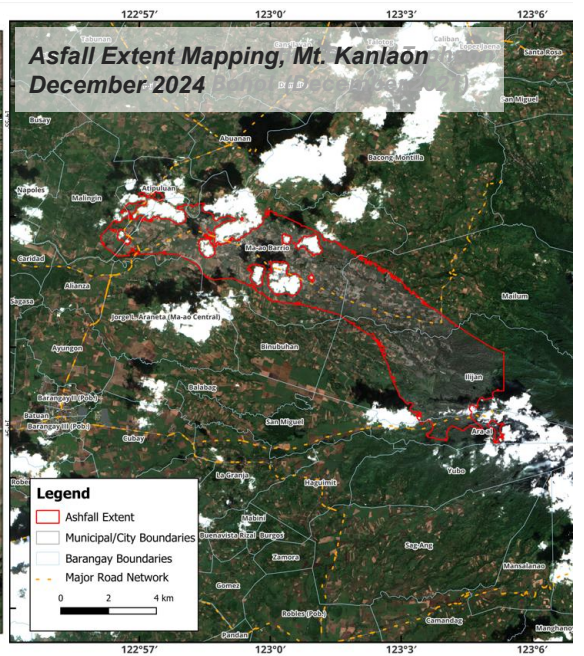
92 capacity-building engagements benefitting

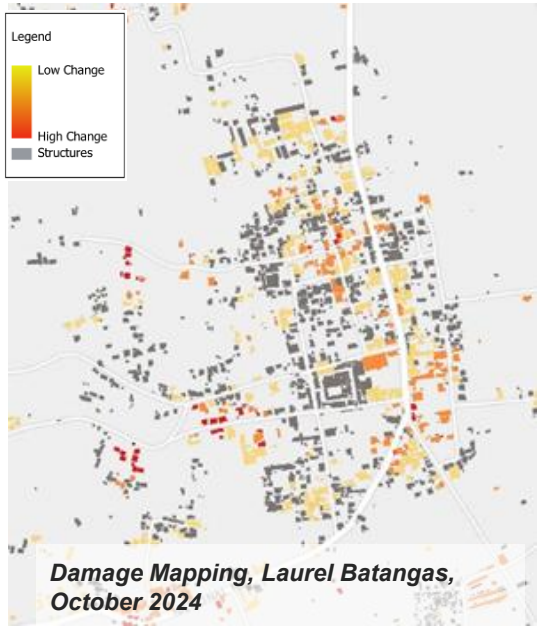
140,648
total person-hours of training











4 Capacity to Analyze and Generate Insights

Validation initiatives in partnership with the Department of Environment and Natural Resources





Generated through Artificial Intelligence using Sentinel-2 and ALOS-2 satellite images







5

Ability to Mobilize and Act

- National Greening Program
  National Resource Accounting Program
- Land Use and Human Settlement Monitoring
- Accelerated Electrification Plan
- CopPhil Copernicus Administrative Arrangement
- CopPhil Copernicus Technical Operating Arrangement
- Digital Agri Project
- Application of Japanese ALOS2/PALSAR2 Satellite Data for Environmental Monitoring Environment and Natural Disaster
- Mindanao Socio-Economic Development
- Protection and Management of Fisheries and Marine Environment
- Community, Conservation, and Natural Climate Solutions
- Air Quality Monitoring through PAPGAPI Pan Project
- Analytics for Agri-Financing
- Maritime Monitoring
- Digital Information for Monitoring and Evaluation

16 Agreements signed

COMING SOON!

PhilSA

Challenges Still Remain!

Space technology and GIS applications continue to be underutilized primarily because of the lack *or insufficiency* of:

- **capacity** in terms of **human, scientific, technological, organizational and institutional resources**;
- **access to high resolution data**;
- **expertise for the operational applications** of these technical tools
- **data sharing**; and
- **appropriate policies**.

Source: UN ESCAP



ARTICLE

“Geospatial data is still not being used sufficiently to improve people’s lives”

Interview with Dr Nadine Alameh, CEO, Open Geospatial Consortium (OGC)

By Lynn Radford • October 31, 2022

The Plan of Action

- **“Ensuring access and ease of use of relevant satellite data for government: The Philippine Space Data and Geospatial Information System (PhilSpace+)”**



PhilSpace+ is envisioned to be a **system of systems enabling institutions and citizens to access *and utilize* space + geospatial data and information** for **various applications**.

The Action Points

PhilSA

Strengthen research, development, and innovation

Improve absorptive capacity for geospatial information

Enhance the system of feedbacks and responses

Know the landscape.

Develop policy framework and strategic directions

Establish and sustain a network of networks

Build and maintain infrastructure

Increase private sector engagement

5 Ability to Mobilize and Act

Establishment of Network of Space Data Users in the Philippines through the PhilSA Integrated Network for Space-Enabled Actions towards Sustainability (PINAS)





Space Data Application Lecture

Note:
If you are interested in conducting PINAS workshops in your province, feel free to contact us via email at **pinas@philsa.gov.ph**
cc: princess.young@philsa.gov.ph

UNOOSA identified contributions of Space data and technology to the attainment of SDGs as:

SPACE4SDGS

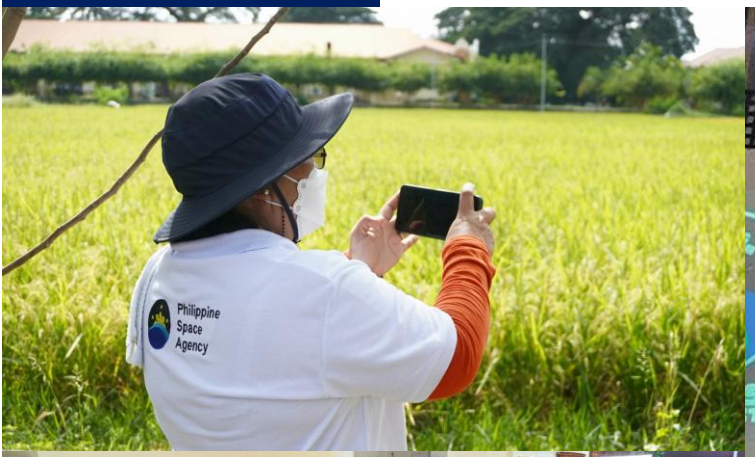
PhilSA proliferates awareness on the Space4SDGs through PINAS Workshops

Workshop Participants

1. Local Government Units
2. National Government Agencies
3. Universities
4. Civil Society Organizations
5. Private Enterprises
6. Citizen Scientists

PhilSA Integrated Network for Space-Enabled Actions towards Sustainability

Envisioned to be an active network of institutions and people working together towards sustainability using space data and information

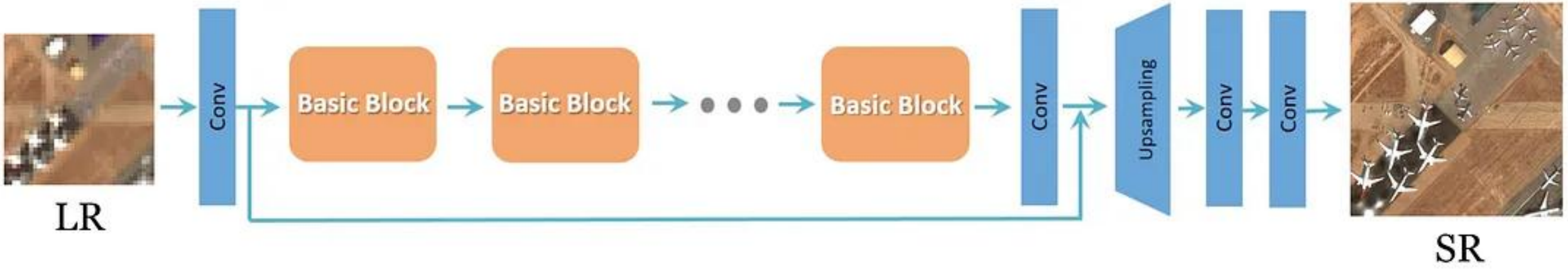






Super-resolution Mapping

- S2DR3: Effective 12-Band 10x Single Image Super-Resolution for Sentinel-2
- Specifically optimized to preserve subtle spectral variations of soil and vegetation across all 12 multi-spectral bands of Sentinel-2 L2A and is capable to accurately reconstruct objects and textures with individual spatial features down to 3m
- **A viable source of high-revisit rate, radiometrically calibrated, high-resolution satellite imaging data that is suitable for practical analytical applications?**



Farm-to-Market Roads (FMR)

Sentinel-2 Super Resolution / Very High-Resolution Image



S2DR3; April 6, 2024
Spatial resolution: 10m
Spectral Resolution: MSI



Blacksky; June 1, 2024
Spatial resolution: 1m
Spectral Resolution: RGB



Pleiades Neo; Spatial resolution: 0.15m
Spectral Resolution: RGBNir

Philippine Space Agency

DEPARTMENT OF AGRICULTURE

Farm-to-Market Roads (FMR)

Sentinel-2 Super Resolution / Very High-Resolution Image



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Blacksky; June 1, 2024
Spatial resolution: 1m
Spectral Resolution: RGB



Pleiades Neo; Spatial resolution: 0.15m
Spectral Resolution: RGBNir

Philippine Space Agency

FMR Monitoring: On-going FMR

Using Sentinel-2 Super Resolution Product of S2DR3



Philippine Space Agency

Super-resolution Mapping: ADB TA

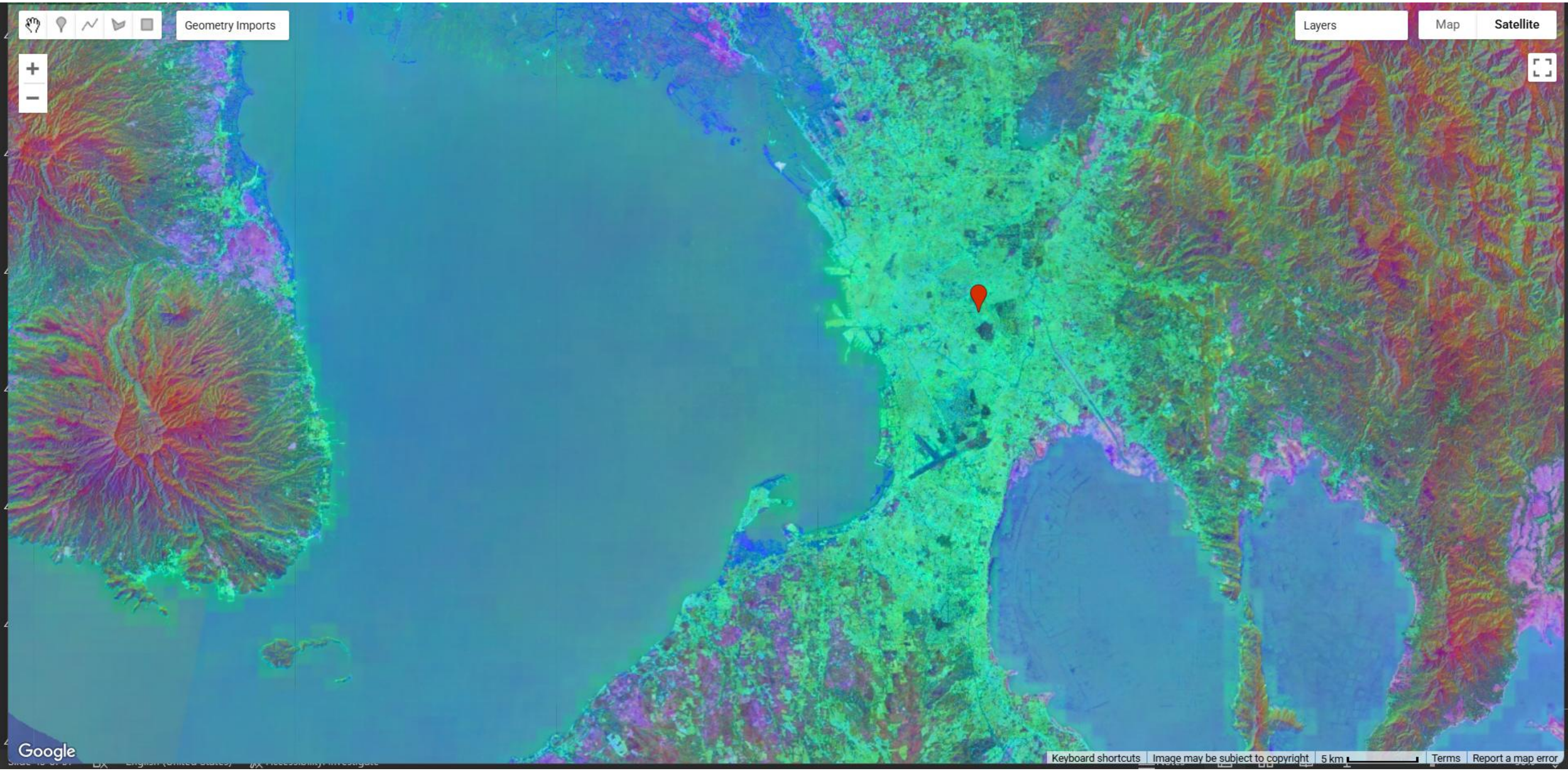


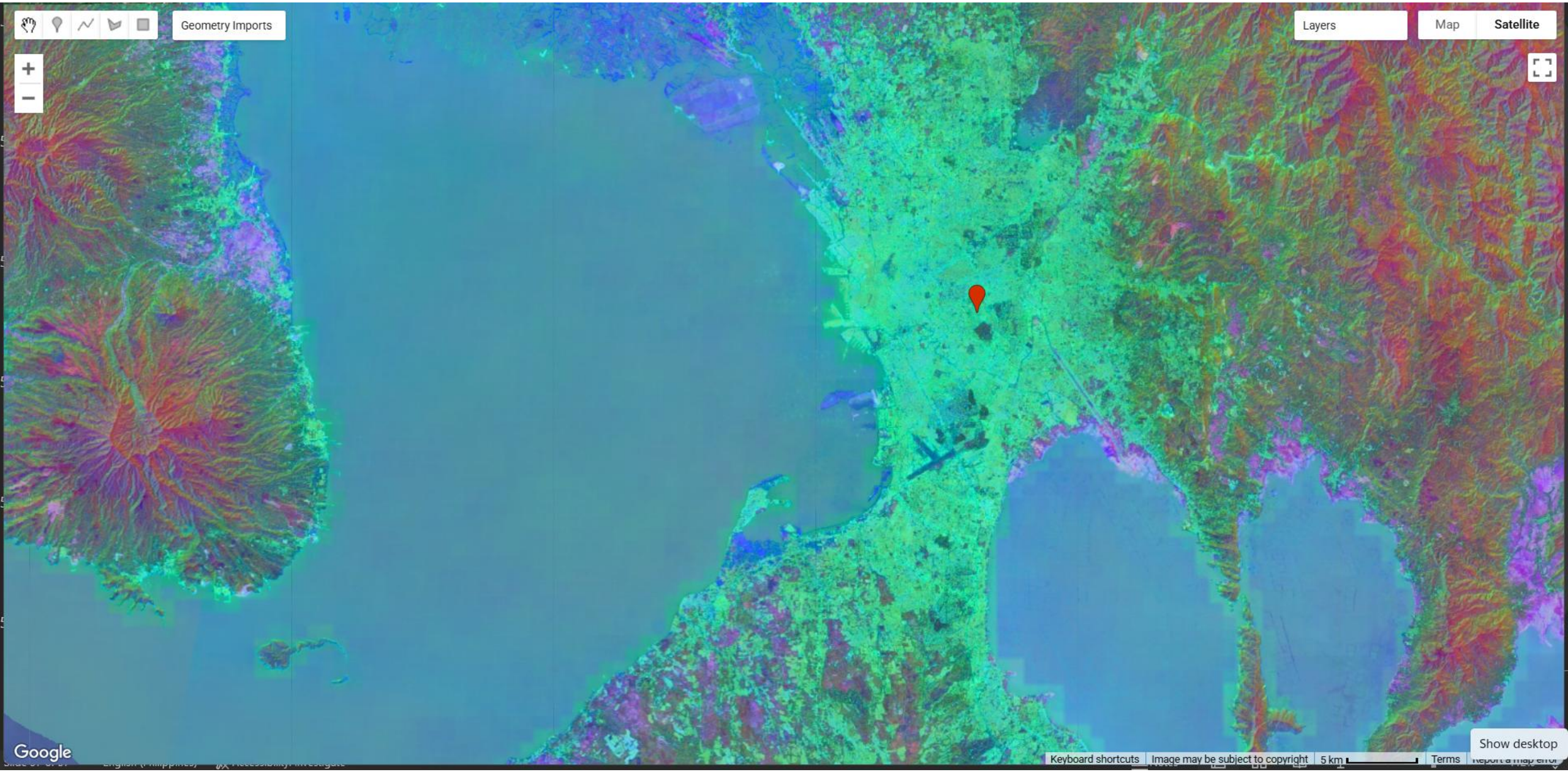
Satellite Embedding in GEE

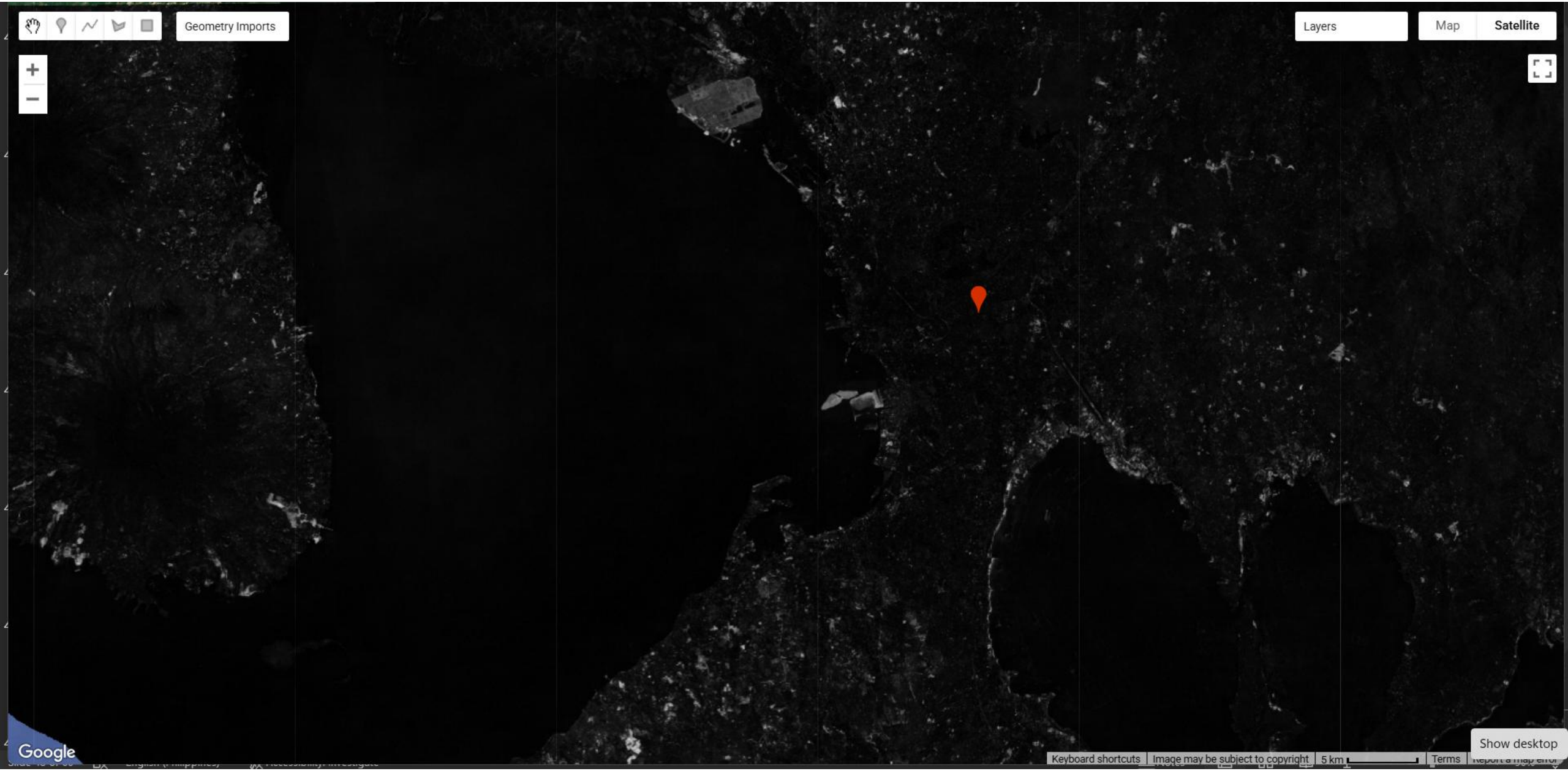


3D visualization of Earth Engine's new Satellite Embedding dataset generated by Google DeepMind's new AlphaEarth Foundations model.

- First-of-its-kind dataset
- Generated using **AlphaEarth Foundations**, Google DeepMind's new geospatial AI model
- Assimilates observations across diverse sources of geospatial information, including optical and thermal imagery from **Sentinel-2** and **Landsat** satellites, **radar data** that can see through clouds, **3D measurements** of surface properties, global **elevation models**, **climate information**, **gravity fields**, and **descriptive text**.
- Unlike traditional deep learning models that require users to fine-tune weights and run their own inference on clusters of high-end computers, AlphaEarth Foundations was designed to **produce information-rich, 64-dimensional geospatial "embeddings"** that are suitable for use with Earth Engine's built-in ML classifiers and other pixel-based analysis.
- Analysis-ready; no need for atmospheric correction, cloud masking, spectral transformations, speckle filtering, or other featurization techniques.


Geometry Imports
Layers
Map
Satellite
Google
Keyboard shortcuts
Image may be subject to copyright
5 km
Terms
Report a map error


Geometry Imports
Layers
Map
Satellite
Google
Keyboard shortcuts
Image may be subject to copyright
5 km
Terms
Show desktop


Geometry Imports
Layers
Map
Satellite
Google
Keyboard shortcuts
Image may be subject to copyright
5 km
Terms
Show desktop

ASIA PACIFIC

'So hot you can't breathe': Extreme heat hits the Philippines



A pedestrian cools himself with a folding hand fan as he waits for a ride along a road in Manila on Wednesday, as extreme heat hit the Philippines. | AFP-JIJI

BY CECIL MORELLA
AFP-JIJI

SHARE Apr 24, 2024

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0:00 / 3:30 1X

MANILA – Extreme heat scorched the Philippines on Wednesday, forcing thousands of schools to suspend in-person classes and prompting warnings for people to limit the amount of time spent outdoors.

The months of March, April and May are typically the hottest and driest in the archipelago nation, but conditions this year have been exacerbated by the El Nino weather phenomenon.

"It's so hot you can't breathe," said Erlin Tumaron, 60, who works at a seaside resort in Cavite province, south of Manila, where the heat index reached 47 degrees Celsius on Tuesday

WHAT'S TRENDING | EDITORS' PICKS

Russia sends waves of troops to the front in a brutal style of fighting



Why it feels like everyone in the world is heading to Japan right now



Mount Fuji begins charging entrance fees as overtourism prevention measure



Japan to offer average of ¥2,125 per month in subsidies for utility bills



Guiding Japan through the challenges of overtourism



LONGFORM



Guiding Japan through the challenges of overtourism
BY ALEX K.T. MARTIN

OUR PLANET



Japan looks farther out to sea for overdue wind power boost
BY ERIC MARGOLIS

AIR POLLUTION

As dire as vog: Car-fueled smog in Metro Manila shows gaps in air quality, transport policies

SEP 27, 2023 10:00 AM PHT

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HOW DOES THIS MAKE YOU FEEL?
REACT NOW
JOIN CHAT

Smog from cars turns Metro Manila skylines gray on both World Car-Free Day on September 22 and International Day of Clean Air for Blue Skies on September 7

A Coupled Digital Twin and Urban Climate Modelling System for Smart and Resilient Urban Environments



University of the Philippines

Department of Geodetic Engineering and

Training Center for Applied Geodesy and Photogrammetry

Conceptual Framework

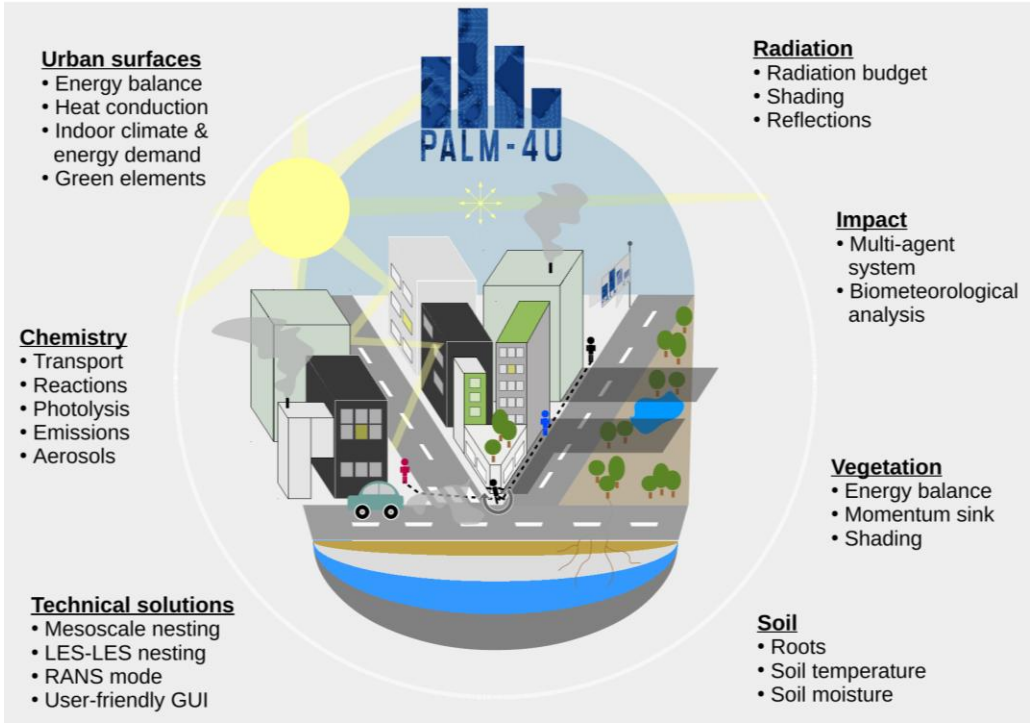
Field Data Acquisition

Satellite Images

Sensor Network and Meteorological Data

Other Data (e.g. Energy Consumption, Vehicle Statistics, Public Health)

Modelling and Simulation



Stochastic Modelling

Deep Learning/AI

ABM/MAS (Agents)

Assessments

Forecasting

Projections and Scenarios

Impact Analyses

Data and Information Sharing in aid of Decision and Policy Making
(WebGIS and Mobile Application)

Thank you.

Philippine Space Agency

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