



CCOP Geoinformation Sharing Infrastructure (GSi) Project and the PNG Geoscience Web Portal

58th Annual Surveyors Congress

VILLAGE INN, WEWAK, EAST SEPIK PROVINCE,
Friday 5th June 2026

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Presentation Outline

1. CCOP Overview
2. Geoinformation Infrastructure Sharing (GSi) Project
3. Technical Framework and Implementation
4. Data Management
5. PNG GSi Web Portal & Snapshots
6. Data Policy

1. CCOP Overview

- **Coordinating Committee for Geoscience Programmes in East and Southeast Asia**
- Intergovernmental organization in the region dealing with all the geoscientific issues of the region by international partnership
- Created to promote regional cooperation in geoscience among East and Southeast Asian countries
- Initiated under the **United Nations Economic Commission for Asia and the Far East (ECAFE)** (*now Economic and Social Commission for Asia and the Pacific - ESCAP*)
- Established in 1966
- There are 16 Member countries to CCOP and 14 Cooperating countries to CCOP
- PNG joined CCOP in 1966 as a founding member and is among the original signatories to CCOP

1. CCOP Overview

Purpose

- To coordinate geoscience programmes among member countries
- To support sustainable development of mineral, energy, and water resources
- To enhance technical cooperation and knowledge sharing in geology, geophysics, and related fields
- To act as a platform linking governments, research institutions, and international partners

Goals

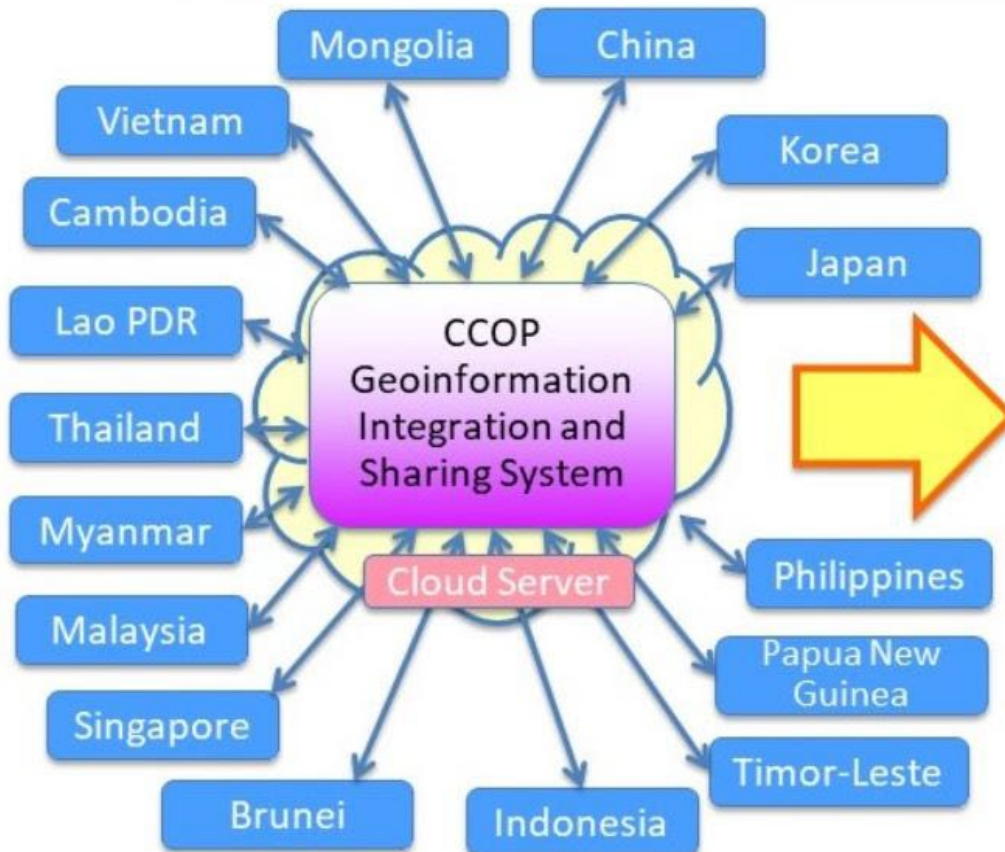
- Strengthen regional collaboration in geoscience research and data sharing
- Promote capacity building and training for geoscientists
- Encourage joint projects and information exchange across countries
- Support resource exploration and management (minerals, groundwater, geothermal, etc.)
- Contribute to disaster risk reduction (e.g., earthquakes, landslides, volcanic hazards)
- Advance sustainable use of natural resources in the region

Vision

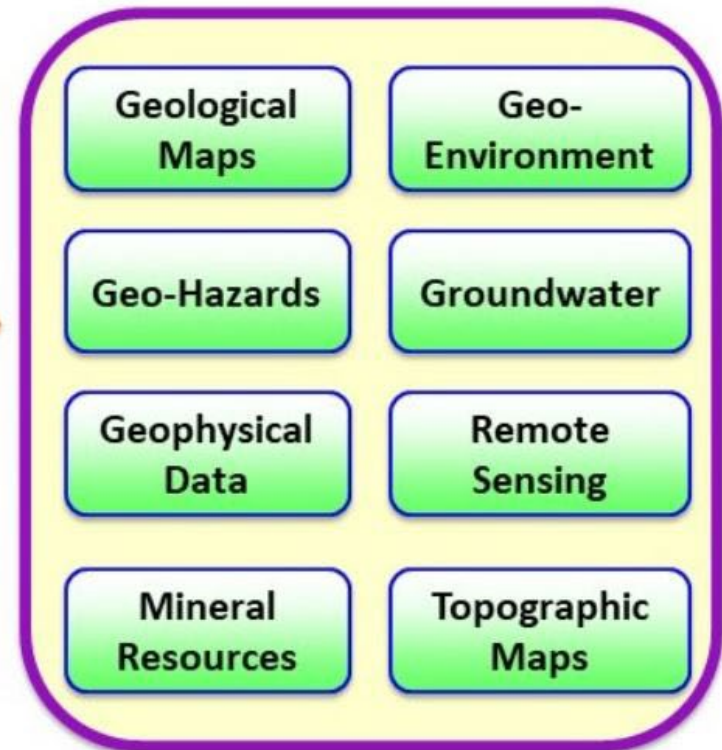
- A region where geoscience knowledge is effectively shared and applied
- To support sustainable economic development and environmental protection
- To build a strong network of collaborating geoscience institutions
- To ensure resilient communities through better understanding of Earth systems and hazards

2. Geoinformation Infrastructure Sharing (GSi) Project

Develop a new geoinformation integration and sharing system using international standards and free and open-source software among CCOP countries



Geoinformation in CCOP Countries



2. Geoinformation Infrastructure Sharing (GSi) Project



✓ 1. Lead Institutions

- Geological Survey of Japan (GSJ, AIST)
- CCOP (Coordinating Committee for Geoscience Programmes in East and Southeast Asia)

👉 The project is a joint initiative, but:

- GSJ is the main technical leader and developer
- CCOP provides the regional coordination platform

📌 Evidence:

- The GSi project is implemented by GSJ in collaboration with CCOP gsj
- GSJ has played a leading role in CCOP projects, including GSi gsj

✓ 2. Project Leader (Head)

- Dr. Shinji Takarada (GSJ, Japan)

👉 Role:

- Overall project head/lead
- Oversees development and direction of the GSi system

📌 Evidence:

- The GSi project is headed by Dr. Shinji Takarada gsj

2. Geoinformation Infrastructure Sharing (GSi) Project

✓ 3. System Developer (Technical Lead)

- Dr. Joel C. Bandibas (GSJ, Japan)

👉 Role:

- Principal system architect and developer
- Designed and built the WebGIS platform and infrastructure

📌 Evidence:

- The GSi information system was developed by Dr. Joel Bandibas

✓ 4. Supporting Structure

- CCOP Technical Secretariat
 - Provides coordination, management, and support
- Member Countries (including PNG)
 - Contribute geoscience data and content
- GSJ/AIST
 - Provides funding, technical innovation, and system development



3. Technical Framework & Implementation of GSi Portal



✓ 1. Overall Framework: Spatial Data Infrastructure (SDI)

- Built using a Spatial Data Infrastructure (SDI) model
- Integrates:
 - Data
 - Metadata
 - Standards
 - Policies
 - Web services
- Enables **regional sharing and interoperability of geoscience data**

👉 Key idea:

SDI provides the backbone for organizing, managing, and sharing geospatial data across countries.

✓ 2. Core Technology: Web-Based GIS (WebGIS)

- The GSi portals are **web-based GIS platforms**
- Users can:
 - View maps online
 - Analyze spatial data
 - Upload/download datasets
 - Create customized WebGIS portals

👉 The system supports **interactive spatial analysis and visualization.** gsj

3. Technical Framework & Implementation of GSi Portal

✓ 3. Software Approach: Free and Open Source Software (FOSS)

- Built mainly using Free and Open Source Software
- Benefits:
 - Cost-effective
 - Scalable across many countries
 - Flexible for customization

👉 This makes it suitable for developing countries and regional collaboration. gsj

✓ 4. Interoperability Standards: OGC Web Services

The system uses Open Geospatial Consortium (OGC) standards, including:

- WMS (Web Map Service) – for map visualization
- WPS (Web Processing Service) – for spatial analysis and processing

👉 These services allow:

- Different systems to communicate
- Easy integration of data from multiple countries

3. Technical Framework & Implementation of GSi Portal

✓ 5. Database Infrastructure

- Uses open-source database technologies:
 - PostgreSQL
 - PostGIS (spatial extension)

👉 Functions:

- Store and manage geospatial data
- Enable spatial queries and analysis

✓ 6. Web Services & Data Sharing Architecture

- Data is accessed through **web service architecture**
- Users interact by sending requests to:
 - Map services (WMS)
 - Processing services (WPS)

👉 Supports:

- Real-time data access
- Distributed data sharing across CCOP countries



3. Technical Framework & Implementation of GSi Portal

✓ 7. System Capabilities

The GSi portal infrastructure allows:

- Integration of **multi-country geoscience databases**
- Hosting of **geohazard, mineral, groundwater, and geological data**
- **User-defined access control** (data sharing permissions)
- Creation of **custom WebGIS portals per country or project**

✓ 8. Cloud/Web Infrastructure Concept

- Built as an **open web-based platform**
- Accessible globally via the internet
- Designed as a **regional geoscience data repository and portal system**

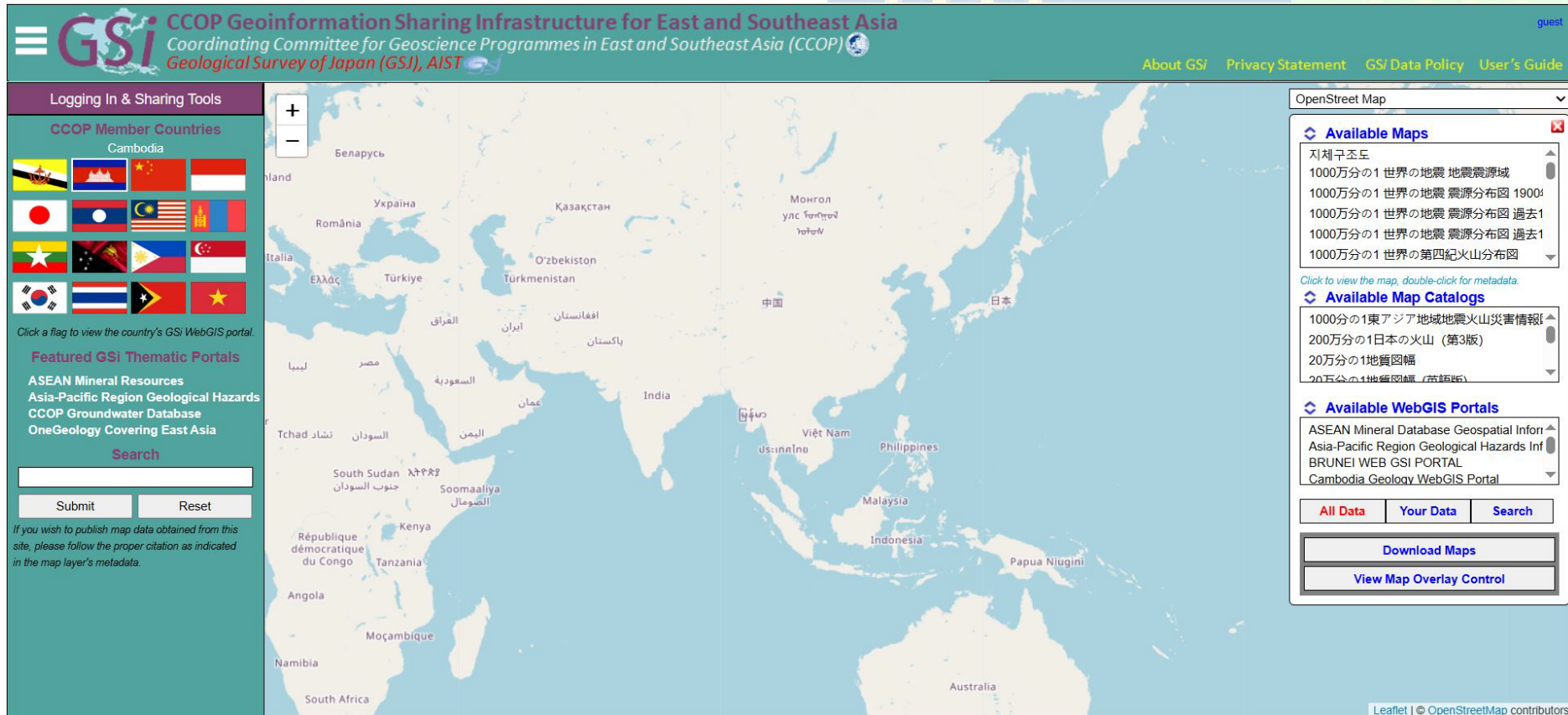
👉 Goal:

Provide a **centralized but distributed geospatial data infrastructure** for East and Southeast Asia.

4. Data Management



<https://geohazards-info.gsj.jp/main/>



The screenshot shows the GSI CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia website. The header includes the GSI logo and the text "CCOP Geoinformation Sharing Infrastructure for East and Southeast Asia" and "Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP)". The main content area features a map of East and Southeast Asia with various country labels in multiple languages. On the left, there is a "Logging In & Sharing Tools" section with "CCOP Member Countries" (Cambodia) and a grid of flags. Below the flags, there are "Featured GSI Thematic Portals" including ASEAN Mineral Resources, Asia-Pacific Region Geological Hazards, CCOP Groundwater Database, and OneGeology Covering East Asia. A search bar is also present. On the right, there is a sidebar with "Available Maps" and "Available Map Catalogs" sections, each containing a list of map titles in Japanese and English. At the bottom right, there are buttons for "All Data", "Your Data", "Search", "Download Maps", and "View Map Overlay Control".

4. Data Management



Portal Creation and User Login

- Upload Data
- Register External WMS
- Satellite Data
- Web Map Service (WMS)
- Map Catalog
- WebGIS Portal Creation
- View and Edit Data
- Data Access Privileges
- Add External WMS
- Users Group Registration
- Login or Register
- Main

Search

Submit Reset

If you wish to publish map data obtained from this site, please follow the proper citation as indicated in the map layer's metadata.

Portal Creation Form

Your Portal Title:

Web Server Folder Name:

Your WebGIS Portal URL:

Site Description:

[Take note of your WebGIS Portal URL before submitting the form.](#)

Submit Close

User's Login

User ID: Password:

Login [Forgot Password](#)

Register Close

4. Data Management

Loading Vector, Raster and Attribute Data



- Upload Data
- Register External WMS
- Satellite Data
- Web Map Service (WMS)
- Map Catalog
- WebGIS Portal Creation
- View and Edit Data
- Data Access Privileges
- Add External WMS
- Users Group Registration
- Login or Register
- Main
- Search

Submit Reset

If you wish to publish map data obtained from this site, please follow the proper citation as indicated in the map layer's metadata.

Map Data Upload to Server

Data Type
ArcGIS Shapefile

Upload Shape File (*.shp, *.dbf, *.shx)

Choose File | No file chosen

Choose File | No file chosen

Choose File | No file chosen

Choose Image File (*.gif, *.tif, *.jpg, *.png)

Choose File | No file chosen

Choose CSV File (Must be Encoded in UTF-8)

Choose File | No file chosen

Upload

Data to PostGIS Form

Close

Satellite Web Map Service (WMS) Generator

Please visit the satellite data source site for the data source 'Term of Use' details.

ASTER Landsat Sentinel Others

List of Registered ASTER Data

ASTER(ASTB250215023616)	2025-02-15 07
ASTER(ASTB250215023607)	2025-02-15 01
ASTER(ASTB250215023558)	2025-02-15 02
ASTER(ASTB250215023550)	2025-02-15 03
ASTER(ASTB250215023541)	2025-02-15 04
ASTER(ASTB250205023201)	2025-02-05 05
ASTER(ASTB250205023152)	2025-02-05 06
ASTER(ASTB240204035240)	2024-02-04 Taungup, Myanmar
ASTER(ASTB240204035232)	2024-02-04 West of Mindon, Myanmar
ASTER(ASTB240204035223)	2024-02-04 Ngape, Myanmar
ASTER(ASTB240204035214)	2024-02-04 Salin Minbu, Myanmar

View Details/Update Delete

Single Band WMS Color Composite WMS Upload Satellite Data

4. Data Management

Creating Web Map Services (WMS)



- Upload Data
- Register External WMS
- Satellite Data
- Web Map Service (WMS)
- Map Catalog
- WebGIS Portal Creation
- View and Edit Data
- Data Access Privileges
- Add External WMS
- Users Group Registration
- Login or Register
- Main

Search

Submit
Reset

If you wish to publish map data obtained from this site, please follow the proper citation as indicated in the map layer's metadata.

Metadata Capture and Web Map Service Formulation

Map Title:

Service URL:

Map ID:

Data ID:

Map Data Entry and Spatial Feature Classification Settings

Available Databases:

Available Tables:

Class Item:

Discription Column:

Data Type:

Image File Name:

Image Extent:

Map Projection (EPSG): Click for the list of EPSG Values

Projection (EPSG) List:

GetCapabilities
GetMap / Preview Map
Download Mapfile

REGISTER WMS
Reset Form
Close

Map Layer to Map Catalog Registration

Available Map Catalog List

Base Map
Field Capture
Other
PNG Geochemistry

All Catalogs
Your Catalogs
Search

Selected Catalog's Map Layers

- PNG Cobalt (Co) Rock Chip Samples
- PNG Cobalt (Co) Soil Samples
- PNG Cobalt (Co) Stream Samples
- PNG Copper (Cu) Rock Chip Samples
- PNG Copper (Cu) Soil Samples
- PNG Copper (Cu) Stream Samples
- PNG CRITICAL MINERALS: Hafnium (ppm)

Remove Map Layer

Available Map Layers

- PNG 100K GEOMAP: Bundi
- PNG 100K GEOMAP: Double
- PNG 100K GEOMAP: Goroka
- PNG 100K GEOMAP: Hagen
- PNG 100K GEOMAP: Ialibu
- PNG 100K GEOMAP: Jimi

Add Map Layer

4. Data Management



Map Catalog

- Upload Data
- Register External WMS
- Satellite Data
- Web Map Service (WMS)
- Map Catalog
- WebGIS Portal Creation
- View and Edit Data
- Data Access Privileges
- Add External WMS
- Users Group Registration
- Login or Register
- Main

Search

Submit
Reset

If you wish to publish map data obtained from this site, please follow the proper citation as indicated in the map layer's metadata.

Map Catalog Creation and Registration

Catalog Title:

Description:

Keywords:

Submit
Close

Map Catalog to WebGIS Portal Registration

Available WebGIS Portals

Papua New Guinea WebGIS Portal

All Portals
Your Portals
Search

Selected Portal's Map Catalogs

- Base Map
- Other
- PNG Geochemistry
- PNG Geohazards
- PNG Geology
- PNG Geothermal
- PNG Mineral Deposits

Available Map Catalogs

- Base Map
- Field Capture
- Other
- PNG Geochemistry
- PNG Geohazards
- PNG Geology

All Catalogs
Your Catalogs
Search

Remove Map Catalog
Add Map Catalog

4. Data Management



Data Editing & Data Access Privileges

- Upload Data
- Register External WMS
- Satellite Data
- Web Map Service (WMS)
- Map Catalog
- WebGIS Portal Creation
- View and Edit Data
- Data Access Privileges
- Add External WMS
- Users Group Registration
- Login or Register
- Main

Search

Submit
Reset

If you wish to publish map data obtained from this site, please follow the proper citation as indicated in the map layer's metadata.

View and Edit Data

Information Access Category

WebGIS Portal

Map Catalog

Map Layer

Original Map Data

Users Group

Registered Users

Map Layer List

Active Exploration Licenses, October 2020

Application Exploration Licenses, October 2020

ASTER(TIR12) 2018-06-24 POM 1

ASTER(VNIR3N-VNIR2-VNIR1) 2019-03-05 Port Moresby1

PNG 100K GEOMAP: Aiome

PNG 100K GEOMAP: Bundi

PNG 100K GEOMAP: Double

PNG 100K GEOMAP: Goroka

All Data
Your Data
Search

Edit / View More Information

Delete Item

Users and Data Access Privileges

Information Access Category

Map Layer

Map Layer List

PNG Cobalt (Co) Stream Samples

PNG Copper (Cu) Rock Chip Samples

PNG Copper (Cu) Soil Samples

PNG Copper (Cu) Stream Samples

PNG CRITICAL MINERALS: Hafnium (ppm)

Users	Permission Level ?
Admin, The	Secret
Moi, Wilfred	Data Owner
The General Public	5

Add New User or Group

Remove Selected User

Apply Permission Level Change

Close

geohazards-info.gsj.jp/GSiPortal-2.1/user2si...

geohazards-info.gsj.jp/GSiPortal-2.1/user2siteaddition/...

Core Permission Numbers

4 ---> Read

2 ---> Write

1 ---> Download

All Permission Levels (0-7)

7 (4+2+1) ---> All privileges. Read, write and download.

6 (4+2) ---> Read and write but can't download.

5 (4+1) ---> Read and download but can't write.

4 ---> Read only.

3 (2+1) ---> Write and download but can't read.

2 ---> Write only.

1 ---> Download Only.

0 ---> No privilege.

4. Data Management



Adding Web Map Services (WMS)

Upload Data
Register External WMS
Satellite Data
Web Map Service (WMS)
Map Catalog
WebGIS Portal Creation
View and Edit Data
Data Access Privileges
Add External WMS
Users Group Registration
Login or Register
Main
Search
<input type="text"/>
Submit
Reset

If you wish to publish map data obtained from this site, please follow the proper citation as indicated in the map layer's metadata.

External Web Map Service (WMS) Registration

External WMS Information

WMS URL:

Get WMS Information | Clear URL Field

Service URL:

Service Title:

Data Owner:

Organization:

Address:

Telephone:

Email Address:

Data Owner ID:

Projection/EPSS List:

Service Map Extent:

Data Abstract:

Access Constraints:

Keywords:

WMS Layers:

Download GetCap Response in XML | Download GetCap Response in JSON

REGISTER WMS to GSI | Reset Form | Close

External Web Map Service

https://geohazards-info.gsj.jp/ows/dynamic_wms/2020/M_portal_maps_papua_geology

Get WMS Information | Clear URL Field

Web Map Service Information

Service Title:

Service URL:

Service Info:

SRS:

Layer

[Click a layer to view the map.](#)

View Legend | View Using OpenLayers

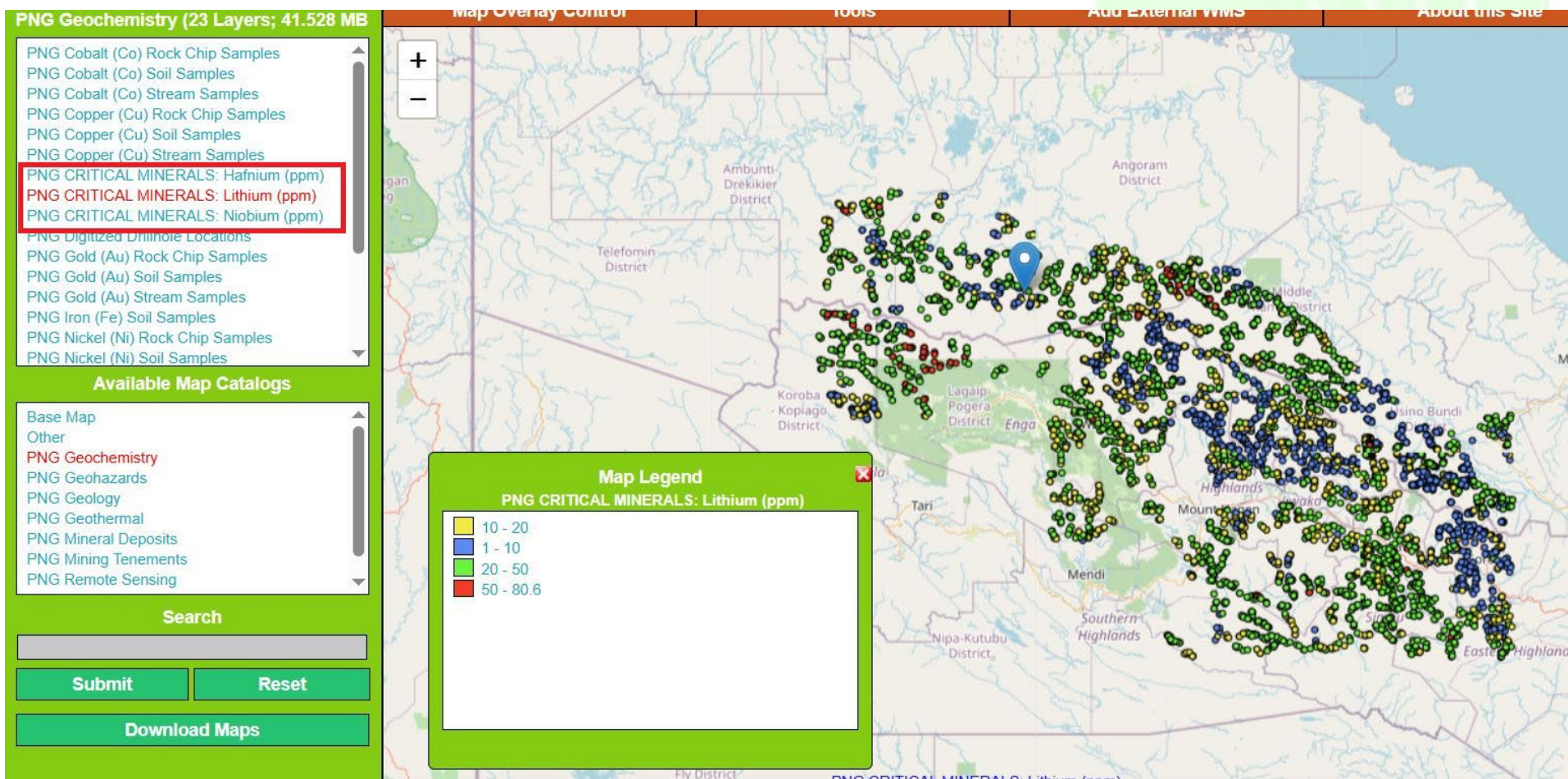
Download GetCap Response in XML | Download GetCap Response in JSON

Reset | Close

5. PNG GSi Web Portal & Snapshots



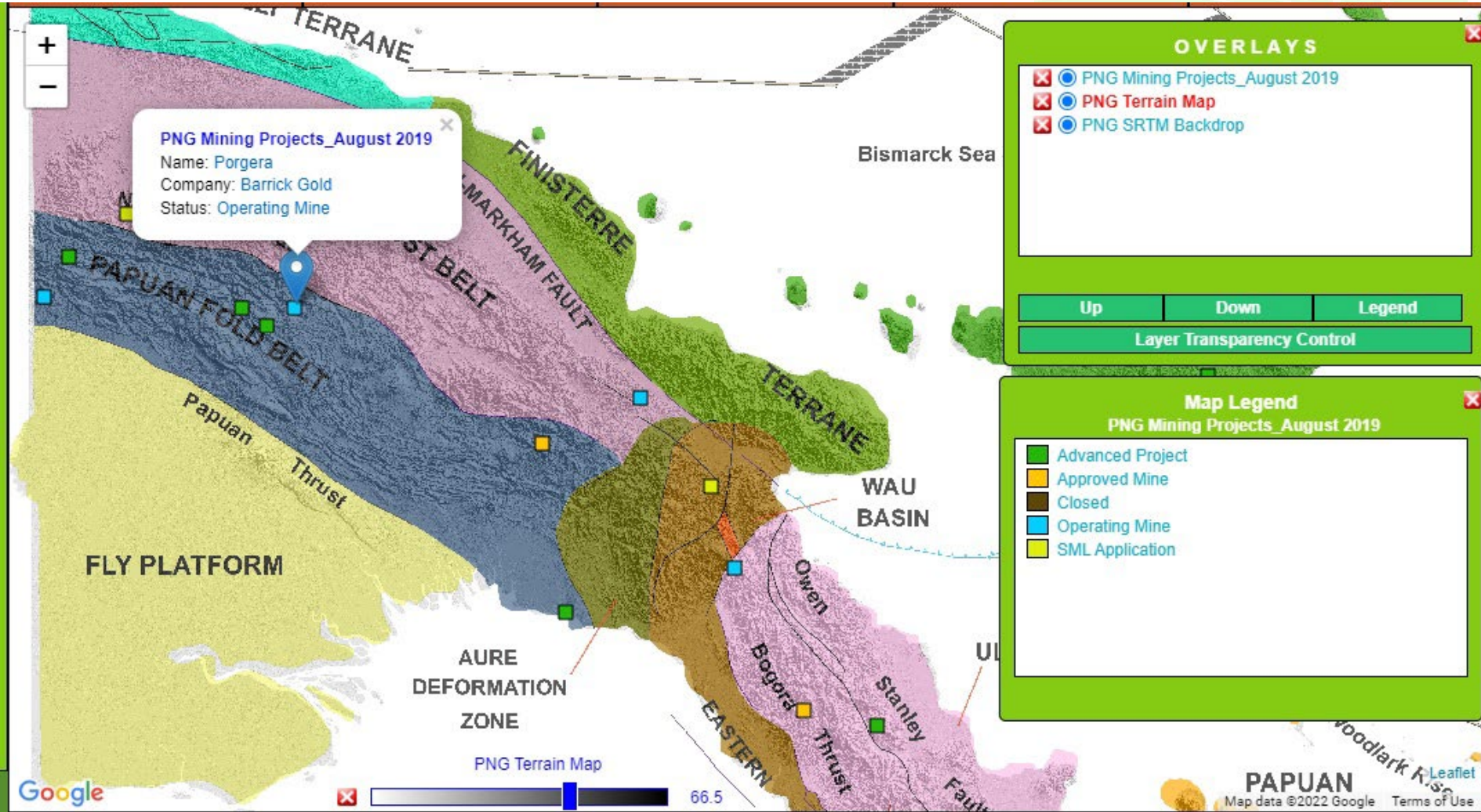
Snapshots: Lithium Critical Minerals With Legend



5. PNG GSi Web Portal & Snapshots



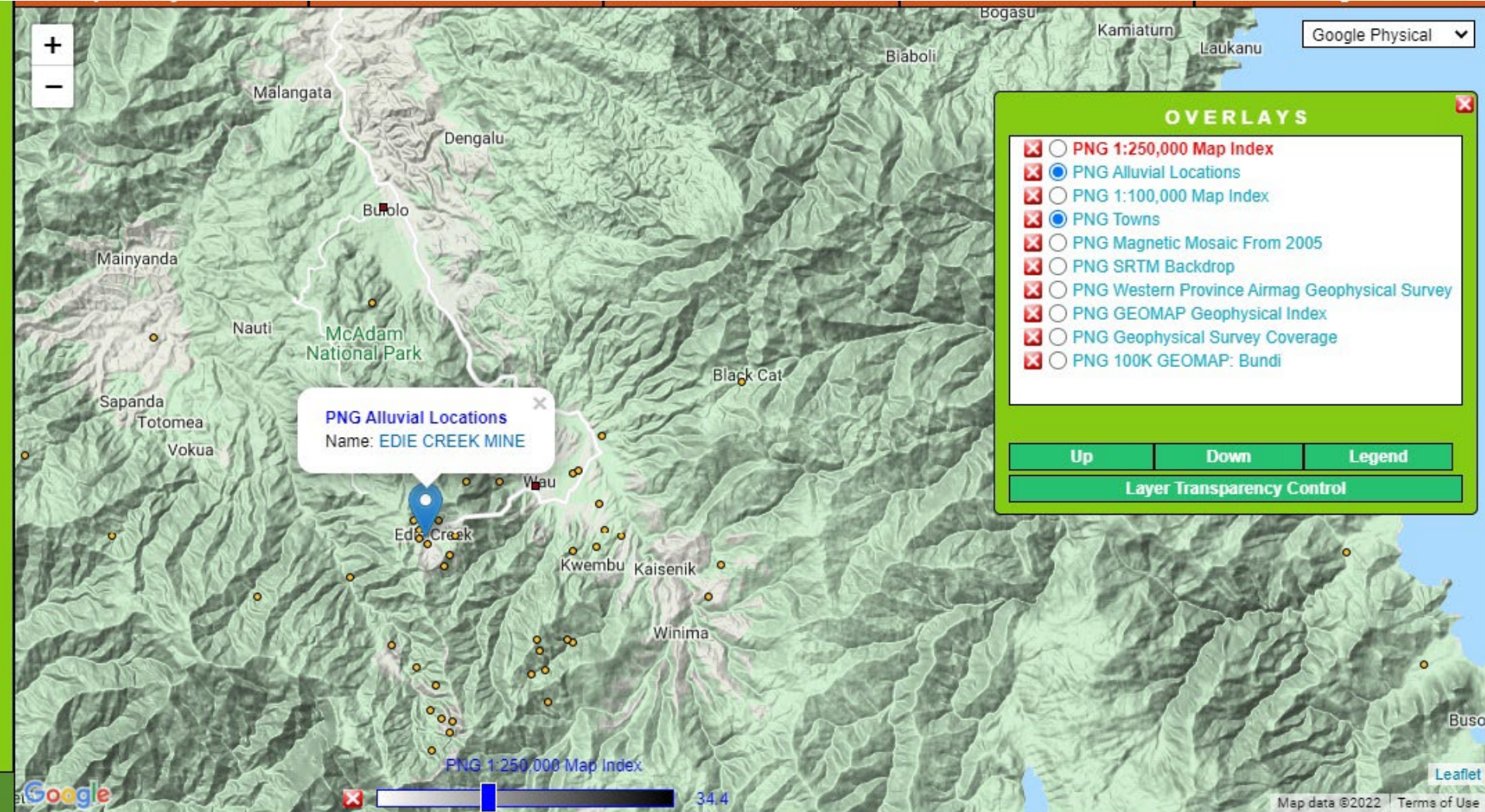
Snapshots: PNG Terrain, Mine Projects with SRTM and Transparency



5. PNG GSi Web Portal & Snapshots



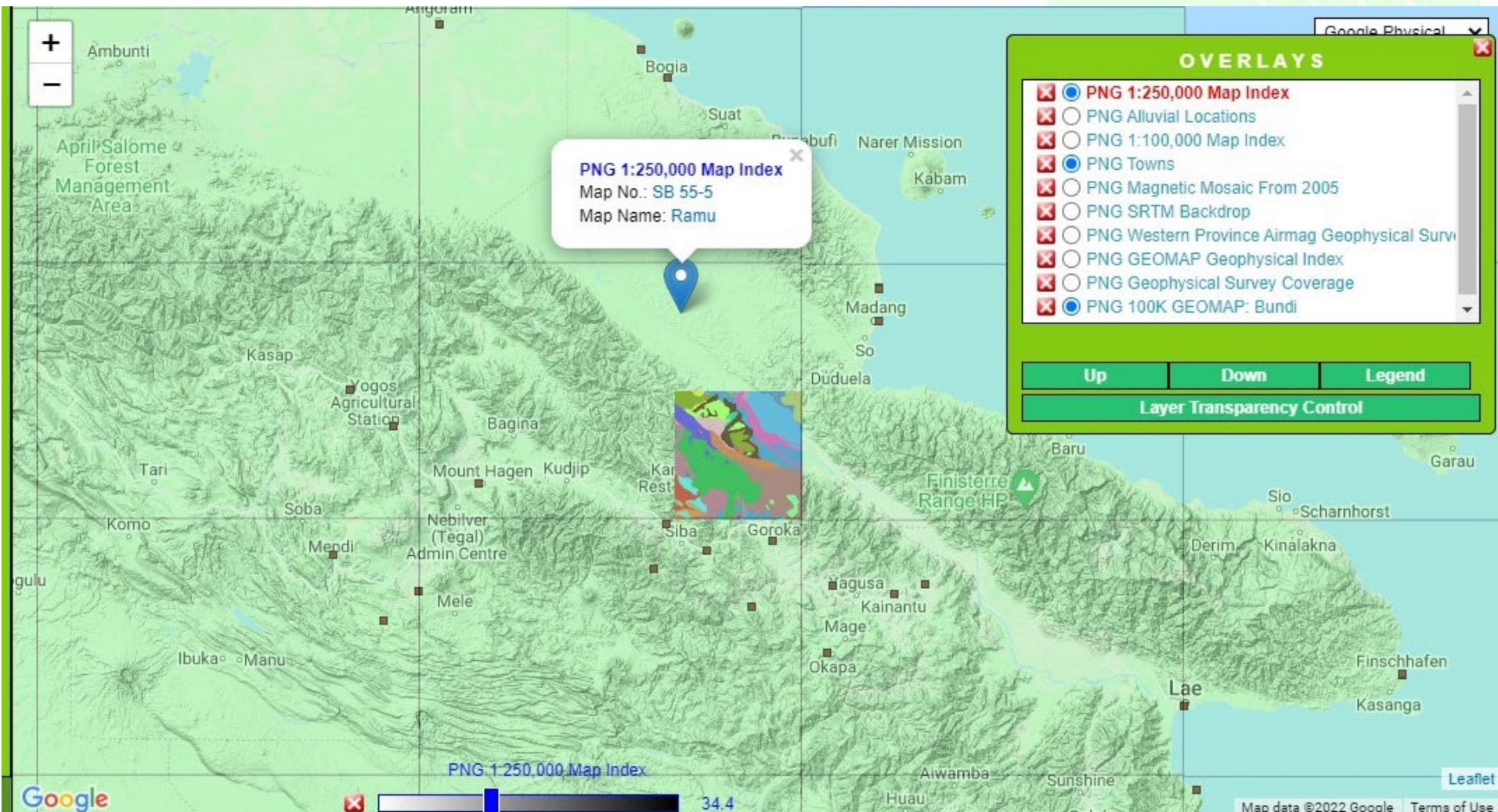
Snapshots: Google Physical Backdrop with Alluvial Locations



5. PNG GSi Web Portal & Snapshots



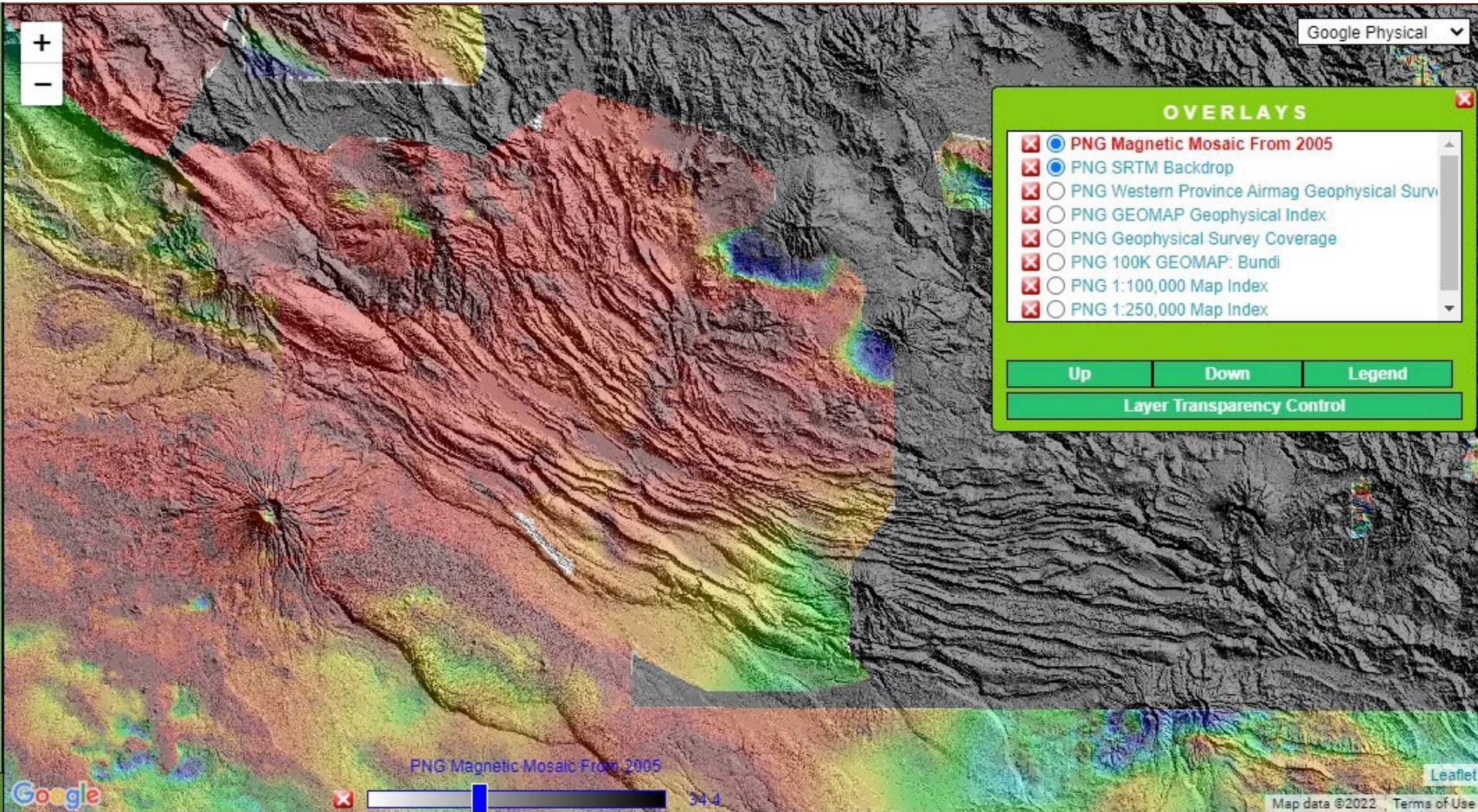
Snapshots: 250K Geological Index with 100K Bundi Map



5. PNG GSi Web Portal & Snapshots

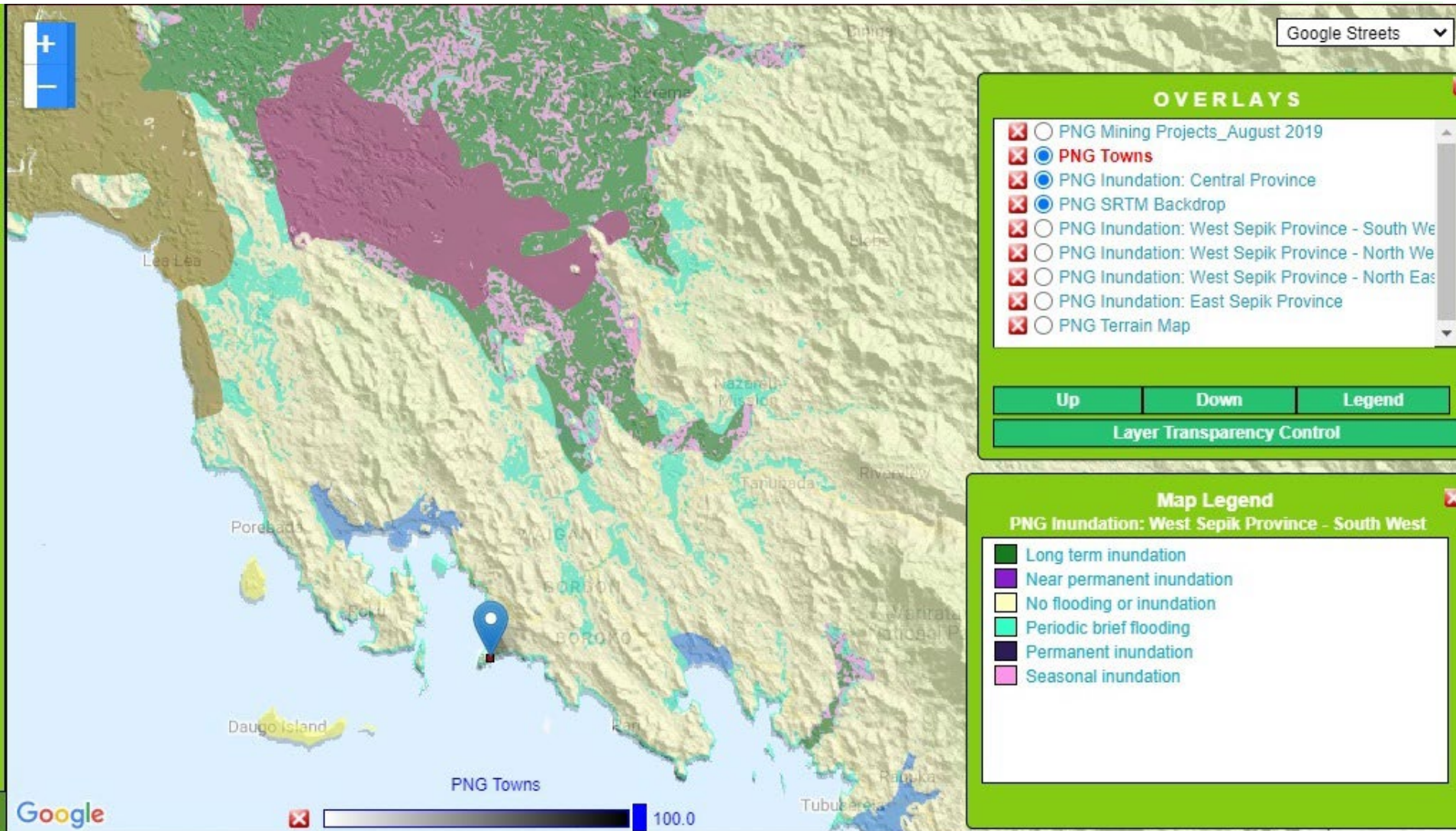


Snapshots: Magnetic Mosaic Transparency over SRTM Backdrop



5. PNG GSi Web Portal & Snapshots

Snapshots: Inundation Transparency over SRTM



5. PNG GSi Web Portal & Snapshots



Snapshots: Layer Overlays with Information

The screenshot displays the PNG GSi Web Portal interface. At the top, there are navigation tabs: "Map Overlay Control", "Tools", "Add External WMS", "About this Site", and "Login". The main map area shows a colorful geological map of Papua New Guinea with various overlays. A central information panel provides details for three selected layers:

- PNG Mining Projects_August 2019**
Name: Wafi-Golpu
Company: Newcrest Mining
Status: SML Application
- PNG Landform: Morobe Province**
Description: Back swamps
- PNG 1:250,000 GEOLOGY**
Map Symbol: Qha
Description: Gravel, sand, silt, clay, organic remains: alluvium and swamp deposits

On the right side, an "OVERLAYS" panel lists the active layers with checkboxes and a legend icon:

- PNG Towns
- PNG Roads
- PNG Mining Projects_August 2019
- PNG Landform: Morobe Province
- PNG 1:250,000 GEOLOGY
- PNG SRTM Backdrop

Below the overlays list are buttons for "Up", "Down", and "Legend", and a "Layer Transparency Control" section. The map includes a scale bar at the bottom showing 100.0 units and a "PNG 1:250,000 GEOLOGY" label. The bottom right corner of the map area contains the text "Leaflet | © OpenStreetMap contributors".

5. PNG GSi Web Portal & Snapshots



Snapshots: Adding WMS from other Portal

The screenshot displays the PNG GSi Web Portal interface. At the top, there are navigation tabs: "Map Overlay Control", "Tools", "Add External WMS", "About this Site", and "Login". The "Add External WMS" tab is active, showing a map of Papua New Guinea with various geological layers overlaid. A pop-up window displays the title "IDN GAI 1:100K Geological Map of Papua" and the description "Older Swamp Deposits".

Map Overlay Control

- Map Overlay Control
- Tools
- Add External WMS
- About this Site
- Login

Available Map Catalogs

- Base Map
- Other
- PNG Geochemistry
- PNG Geohazards
- PNG Geology
- PNG Geothermal
- PNG Mineral Deposits
- PNG Mining Tenements
- PNG Remote Sensing

Search

Submit Reset

Download Maps

OVERLAYS

- IDN GAI 1:100K Geological Map of Papua
- PNG 1:250,000 GEOLOGY

Up Down Legend

Layer Transparency Control

OpenStreetMap

Leaflet | © OpenStreetMap contributors

6. Data Policy

GSi Data Policy

Policy: Data contribution

1. Data in GSi system are owned by the organizations that originally produce the data.
2. Data in the GSi system are used for browsing, visualization, data queries, and web processing.
3. Data download using the GSi system will be decided by the data uploader/owner.

Policy: Data use

4. If a user wants to use original data of other institute/country, the user must obtain permission from the owner of the data.
5. GSi system will provide access control of each data. By default, only the data owner has the right to edit and delete his own data, and change his own data's access constraints.
6. To encourage responsible use, and to improve the database and utilities, portal information can be accessed by country admin.
7. Citation of data from GSi system shall be indicated by owners(s) in the data in the data abstract (metadata).
8. Accessing data using the GSi System is free.



Thank you

GSI Project, 25-27 February 2025, Subic, Zambales, Philippines