

Memanfaatkan GeoServer untuk Aplikasi Kebencanaan

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Latar Belakang

- Saat bencana alam dibutuhkan sebuah sistem informasi geografis yang dapat membantu pengambilan keputusan
- perangkat lunak server untuk mempublikasikan data geospasial



Latar Belakang

- perangkat lunak desktop untuk mengolah data geospasial,
- kemampuan pemrograman (js, python dsb),
- Basis data yang dapat menyimpan dan merepresentasikan data posisi



Latar Belakang

- Piliannya adalah perangkat lunak proprietary yang mahal (misal ArcGIS, Mapinfo dll) atau perangkat lunak opensource (GeoServer) dengan kemampuan yang mendekati. Pengalaman implementasi, mahalnnya perangkat lunak proprietary membuat sistem tidak terawat. Kurangnya kemampuan penguasaan opensource juga mengakibatkan hal yang sama



Latar Belakang

- Untuk kebutuhan kebencanaan maka membuat sistem *fault tolerant* dan *high available* adalah keharusan.
Biaya akan berlipat
- Pilihan tempat apakah *on-premise* atau *cloud based*.
Jika *on-premise* maka bangunan harus tahan gempa,
jika *cloud based* maka koneksi internet harus tidak putus saat bencana



Map Viewer

- Simple project that very helpful if we want to showing our spatial map data like :
 - Point
 - Polyline
 - Polygon
 - or Raster Data



What we need before

- Server requirement :

- openSUSE_Leap_15.0 / openSUSE_Leap_42.2 openSUSE_Leap_42.3
- Geoserver : an open source server for sharing geospatial data
- Postgresql with Postgis Extension (*for geom data type*)
- Node js for base webapp

- Example Spatial Data from :

- | | |
|--|------------------------|
| - Digital Globe (https://www.digitalglobe.com) | Disaster Data |
| - NOAA (https://www.noaa.gov) | Tsunami Data |
| - VONA (https://magma.vsi.esdm.go.id/vona/) | Eruption Data |
| - USGS (https://earthquake.usgs.gov) | Earthquake Data |



Preparing Data From GeoJSON

Example



Start the query Data Earthquake

Search Earthquake Catalog x +

https://earthquake.usgs.gov/earthquakes/search/#%7B%22feed%3A%22%3A%221538464490794%22%22sort%3A%22newest%22%22mapposition%3A%22%3A%22%7D

USGS
science for a changing world

Earthquake Hazards Program

← Earthquakes

Latest Earthquakes

Earthquake Lists, Maps & Statistics

Search Earthquake Catalog

Real-time Feeds & Notifications

Information by Region

ANSS ComCat Documentation

Errata for Latest Earthquakes

Earthquakes

Hazards

Data & Products

Search Earthquake Catalog

Search results are limited to 20,000 events. To get URL for a search, click the search button, then copy the URL from the browser address bar.

- [Help](#)
- [ANSS Comprehensive Earthquake Catalog \(ComCat\) Documentation](#)
- [Developer's Corner - bulk access to catalog, tools for obtaining specific products](#)
- [Significant Earthquakes Archive](#)

Basic Options

Magnitude	Date & Time	Geographic Region
<input type="radio"/> 2.5+	<input type="radio"/> Past 7 Days	<input type="radio"/> World
<input type="radio"/> 4.5+	<input type="radio"/> Past 30 Days	<input type="radio"/> Conterminous U.S. ¹

<https://earthquake.usgs.gov/earthquakes/search/>

Inspect Network and Find GeoJSON Data

The screenshot shows the USGS Earthquake Map interface. The main map displays a world map with earthquake locations marked by yellow and orange circles. A list of earthquakes is visible on the left side of the map. The Network panel is open on the right, showing a list of requests. The request `query.geojson?startti...` is highlighted with a blue box.

USGS Latest Earthquakes

Magnitude	Location	Time (UTC)	Distance
5.1	39km SW of Moudzaki, Greece	2018-10-26 05:48:37	10.0 km
4.5	36km S of Lithakia, Greece	2018-10-26 04:00:48	10.0 km
4.2	43km NE of `Alaqahdari-ye Kiran ...	2018-10-26 03:54:49	103.0 km
4.7	63km NNW of Otrada, Russia	2018-10-26 03:14:36	10.0 km
3.3	65km SSW of Kaktovik, Alaska	2018-10-26 03:10:19	16.1 km
5.6	63km NW of Otrada, Russia	2018-10-26 03:04:53	10.0 km
4.7	33km SSW of Lithakia, Greece	2018-10-26 02:36:06	10.0 km
4.5	52km SSW of Lithakia, Greece	2018-10-26 02:28:43	10.0 km
4.7	43km SSW of Lithakia, Greece	2018-10-26 02:17:31	10.0 km

Network Panel:

Name	Waterfall
data:image/jpg;base...	
data:image/png;base...	
usgs-logo.svg	
0.jpg	
0.jpg	
1.jpg	
1.jpg	
0.png	
1.png	
0.png	
1.png	
query.geojson?startti...	
www-widgetapi.js	
collect?v=1&_v=j71&...	
collect?v=1&_v=j71&...	
6xKydsBYKcSV-LCoe...	
Inject.js	
favicon.ico	

35 requests | 4.6 KB transferred | Fini...

<https://earthquake.usgs.gov/earthquakes/search/>

Preparing the DB table by attribute + geom

The screenshot shows a web browser at <https://earthquake.usgs.gov/fdsnws/event/1/query.geojson?starttime=2018-10-26%2023%3A59%3A59&minmagnitude=2.5&orderby=time>. The page displays a list of earthquakes, with the first one highlighted: "M 4.6 - 36km SW of Lithakia, Greece".

Below the browser window, the raw JSON data is shown, with a green box highlighting the first feature. A red box highlights the spatial data (Point) and a blue box highlights the attribute data.

RAW DATA

```
{
  "type": "FeatureCollection",
  "metadata": {
    "generated": 1540540896000,
    "url": "https://earthquake.usgs.gov/fdsnws/event/1/query.geojson?starttime=2018-10-26%2023%3A59%3A59&minmagnitude=2.5&orderby=time",
    "title": "USGS Earthquakes",
    "status": 200,
    "api": "1.5.8",
    "count": 329
  },
  "features": [
    {
      "type": "Feature",
      "properties": {
        "mag": 4.6,
        "place": "36km SW of Lithakia, Greece",
        "time": 1540536248310,
        "updated": 1540537254040,
        "tz": 60,
        "url": "https://earthquake.usgs.gov/earthquakes/eventpage/us1000hhfr",
        "detail": "https://earthquake.usgs.gov/fdsnws/event/1/query?eventid=us1000hhfr&format=geojson",
        "felt": null,
        "cdi": null,
        "mmi": null,
        "alert": null,
        "status": "reviewed",
        "tsunami": 0,
        "sig": 326,
        "net": "us",
        "code": "1000hhfr",
        "ids": "us1000hhfr",
        "sources": "us",
        "types": "geoserve,origin,phase-data",
        "nst": null,
        "dmin": 2.3,
        "rms": 1,
        "gap": 132,
        "magType": "mb",
        "type": "earthquake",
        "title": "M 4.6 - 36km SW of Lithakia, Greece"
      },
      "geometry": {
        "type": "Point",
        "coordinates": [20.5358, 37.4834, 10]
      },
      "id": "us1000hhfr"
    }
  ]
}
```

Spatial Data (Point)

```
geometry: {
  type: "Point",
  coordinates: [20.5358, 37.4834, 10]
}
```

Attribute Data

```
properties: {
  mag: 4.6,
  place: "36km SW of Lithakia, Greece",
  time: 1540536248310,
  updated: 1540537254040,
  tz: 60,
  url: "https://earthquake.usgs.gov/earthquakes/eventpage/us1000hhfr",
  detail: "https://earthquake.usgs.gov/fdsnws/event/1/query?eventid=us1000hhfr&format=geojson",
  felt: null,
  cdi: null,
  mmi: null,
  alert: null,
  status: "reviewed",
  tsunami: 0,
  sig: 326,
  net: "us",
  code: "1000hhfr",
  ids: "us1000hhfr",
  sources: "us",
  types: "geoserve,origin,phase-data",
  nst: null,
  dmin: 2.446,
  rms: 1.06,
  gap: 132,
  magType: "mb",
  type: "earthquake",
  title: "M 4.6 - 36km SW of Lithakia, Greece"
}
```

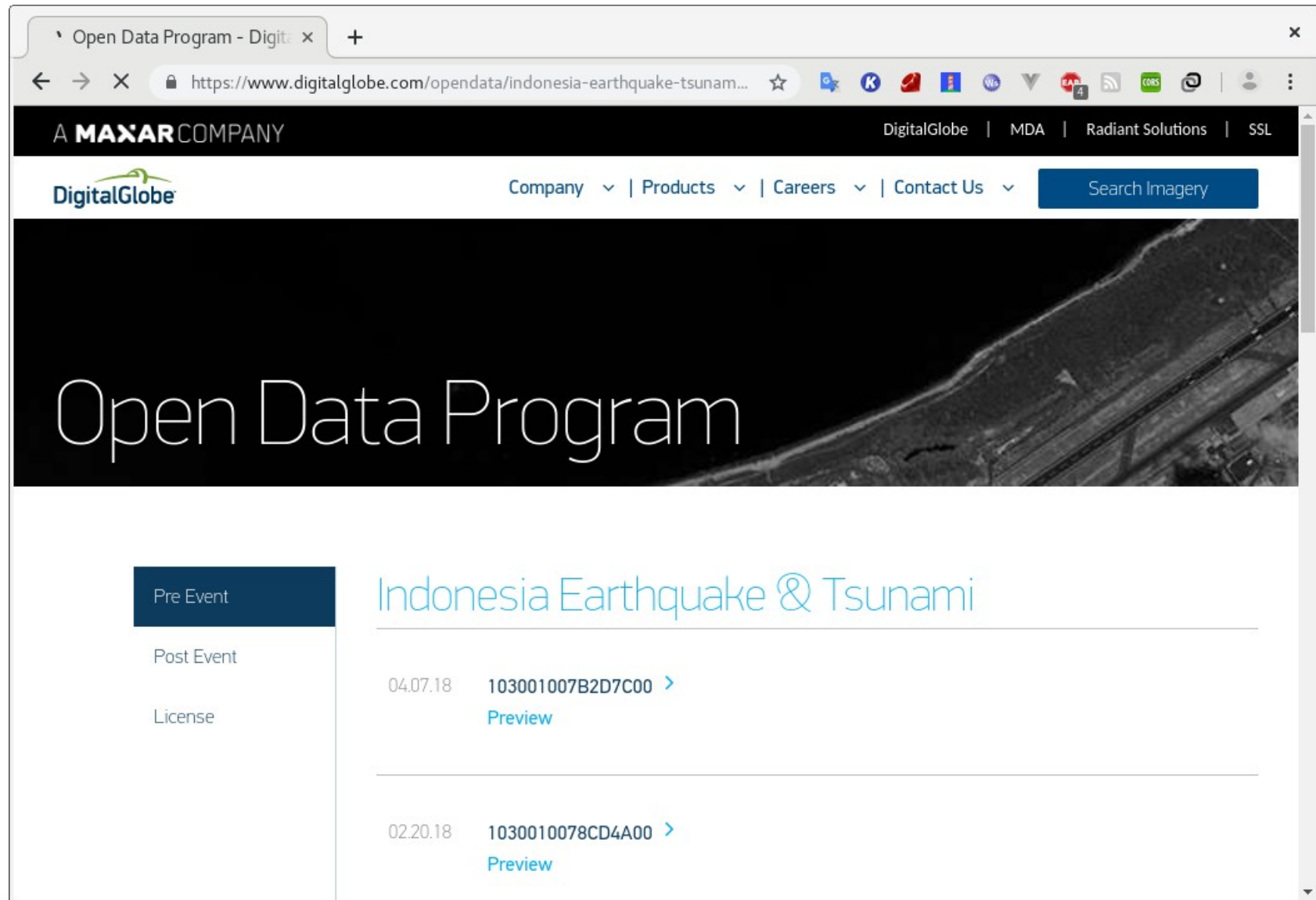
<https://earthquake.usgs.gov/earthquakes/search/>

Preparing Data From GeoTIFF

Example

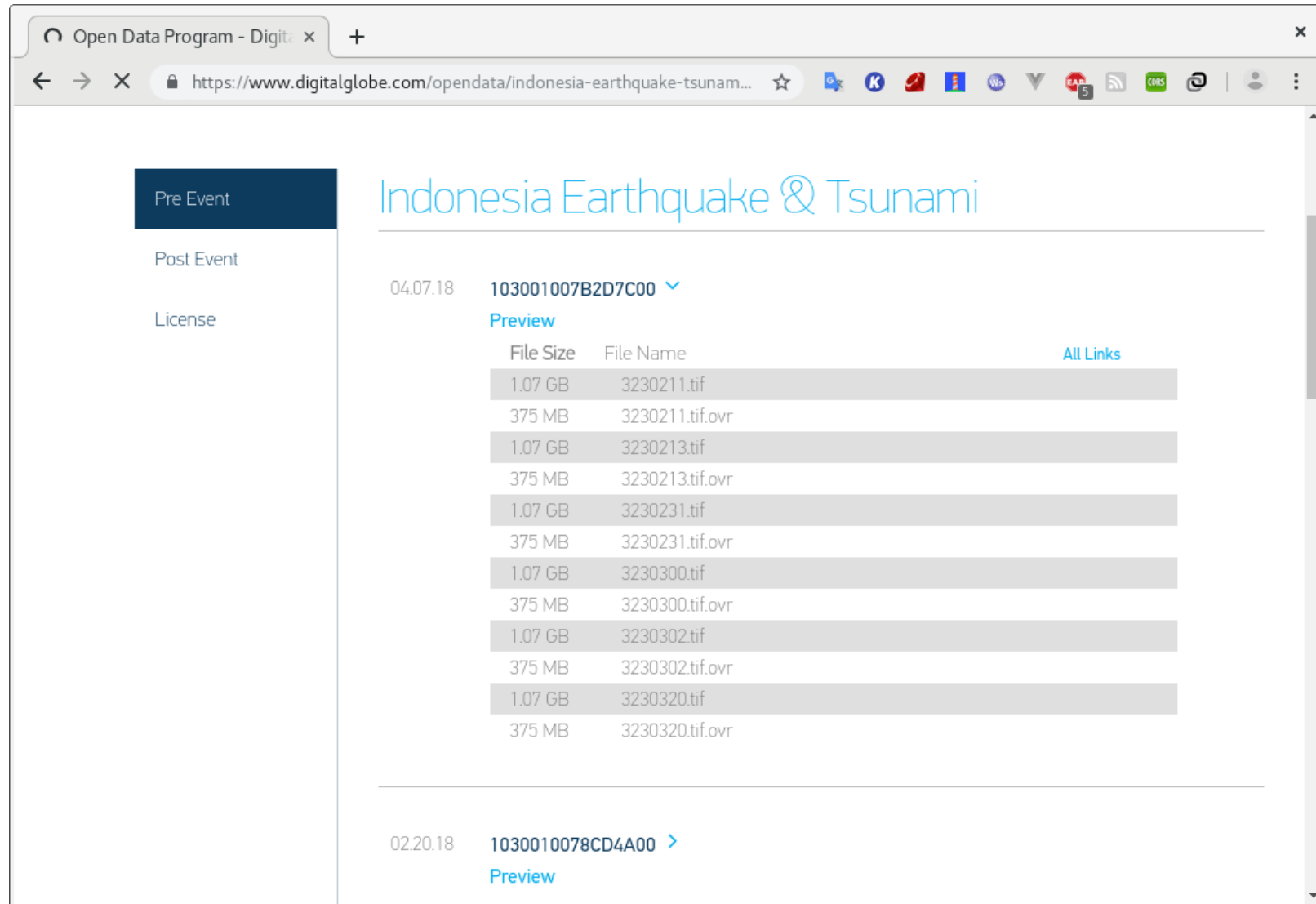


Open Data Digital Globe Website



<https://www.digitalglobe.com/opendata/indonesia-earthquake-tsunami>

Choose what you want and DOWNLOAD it



Open Data Program - Digit: x

https://www.digitalglobe.com/opendata/indonesia-earthquake-tsunami...

Indonesia Earthquake & Tsunami

04.07.18 103001007B2D7C00 ▾

[Preview](#)

File Size	File Name	All Links
1.07 GB	3230211.tif	
375 MB	3230211.tif.ovr	
1.07 GB	3230213.tif	
375 MB	3230213.tif.ovr	
1.07 GB	3230231.tif	
375 MB	3230231.tif.ovr	
1.07 GB	3230300.tif	
375 MB	3230300.tif.ovr	
1.07 GB	3230302.tif	
375 MB	3230302.tif.ovr	
1.07 GB	3230320.tif	
375 MB	3230320.tif.ovr	

02.20.18 1030010078CD4A00 >

[Preview](#)

<https://www.digitalglobe.com/opendata/indonesia-earthquake-tsunami>

Installing **Geoserver** package

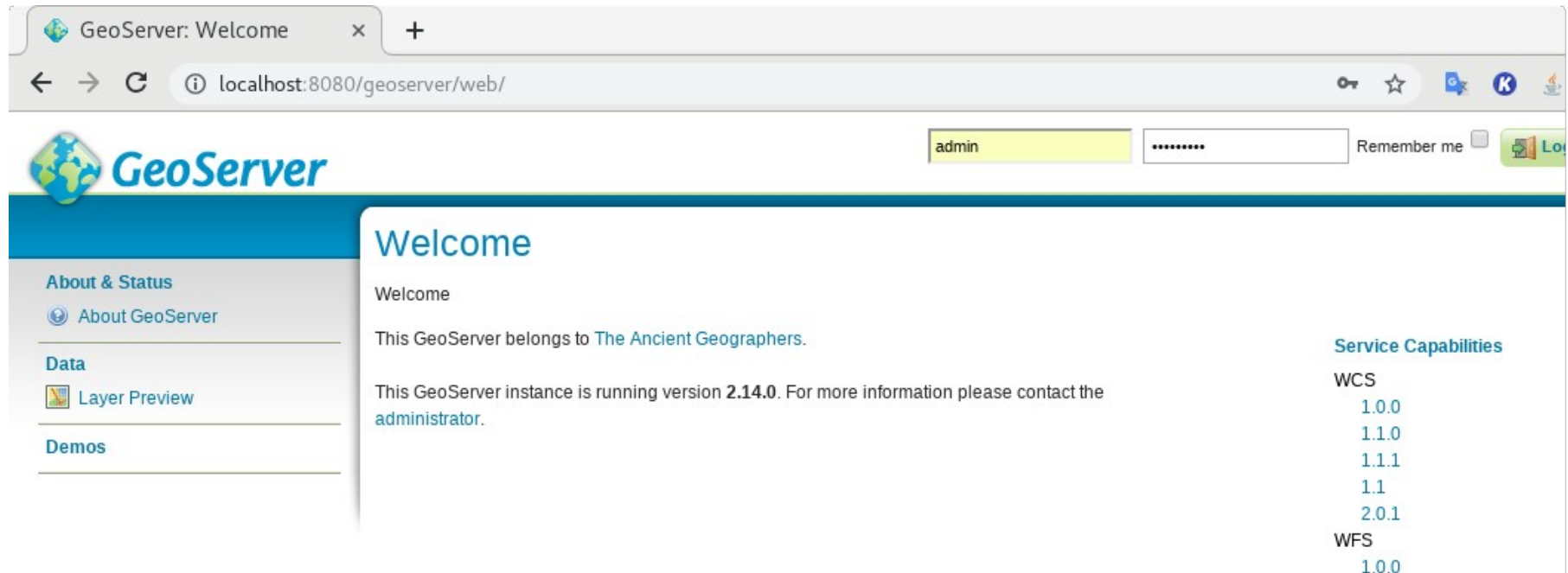


Installing Geoserver

- Add repository from
`http://download.opensuse.org/repositories/home:/medwin/BASE_OPENSU
SE_VERSION`
- `$ sudo zypper update`
- `$ sudo zypper install geoserver`
- `$ sudo systemctl start geoserver`
- Check in browser at <http://localhost:8080/geoserver>



Geoserver Page



Default account is **admin** with password is **geoserver**

Common Geoserver Structure



Workspace



Store

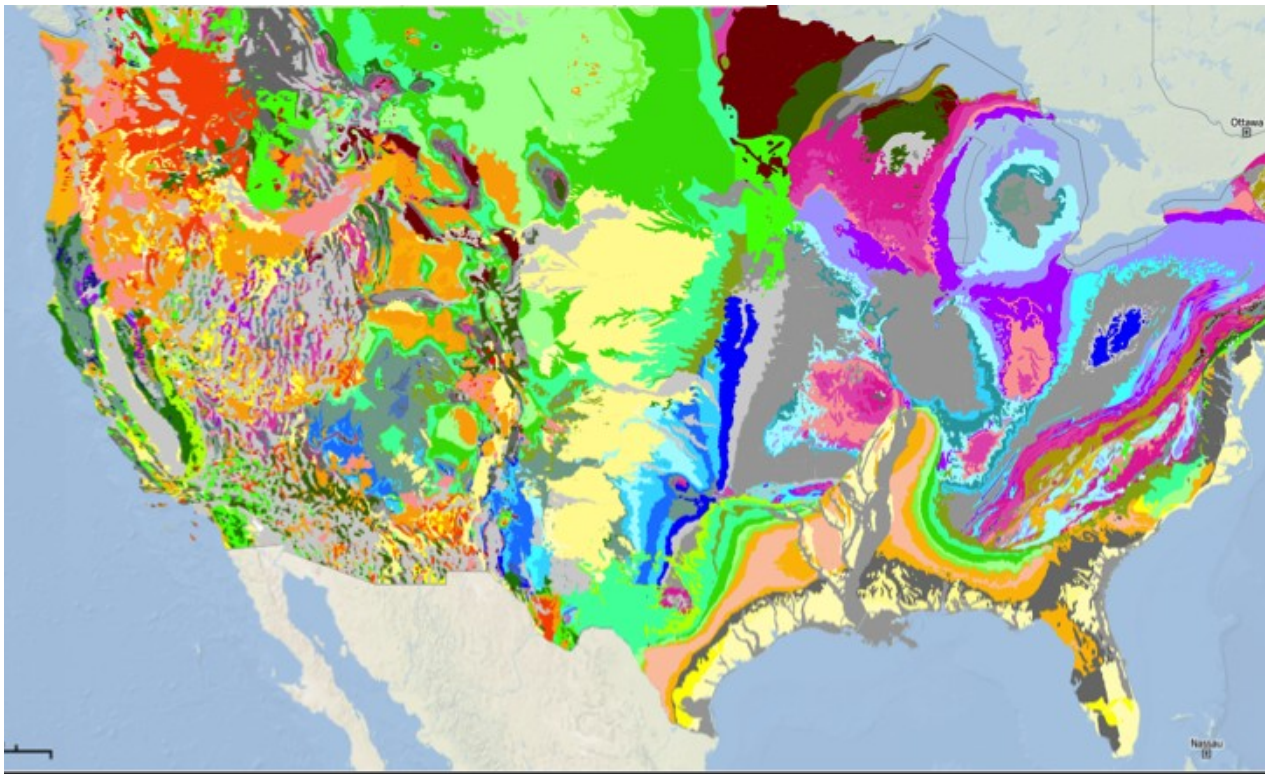


Layer

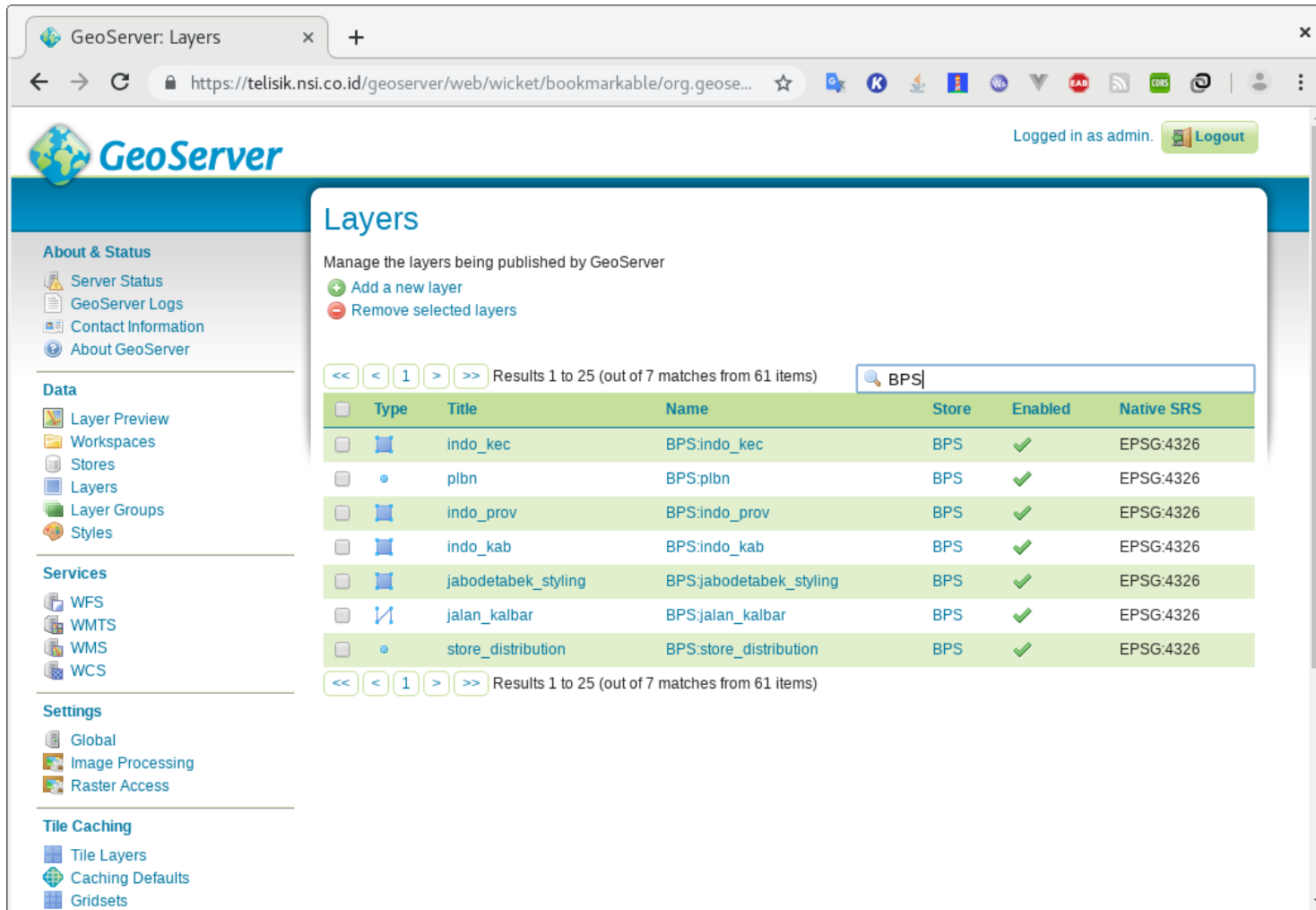


Publish With WMS

A Web Map Service (WMS) is a standard protocol developed by the Open Geospatial Consortium in 1999 for serving georeferenced map images over the Internet.



Spatial Vector Layer



GeoServer: Layers

https://telisik.nsi.co.id/geoserver/web/wicket/bookmarkable/org.geose...

Logged in as admin. [Logout](#)

Layers

Manage the layers being published by GeoServer

[Add a new layer](#)

[Remove selected layers](#)

Results 1 to 25 (out of 7 matches from 61 items)

Type	Title	Name	Store	Enabled	Native SRS
<input type="checkbox"/>	indo_kec	BPS:indo_kec	BPS	✓	EPSG:4326
<input type="checkbox"/>	plbn	BPS:plbn	BPS	✓	EPSG:4326
<input type="checkbox"/>	indo_prov	BPS:indo_prov	BPS	✓	EPSG:4326
<input type="checkbox"/>	indo_kab	BPS:indo_kab	BPS	✓	EPSG:4326
<input type="checkbox"/>	jabodetabek_styling	BPS:jabodetabek_styling	BPS	✓	EPSG:4326
<input type="checkbox"/>	jalan_kalbar	BPS:jalan_kalbar	BPS	✓	EPSG:4326
<input type="checkbox"/>	store_distribution	BPS:store_distribution	BPS	✓	EPSG:4326

Results 1 to 25 (out of 7 matches from 61 items)

About & Status

- Server Status
- GeoServer Logs
- Contact Information
- About GeoServer

Data

- Layer Preview
- Workspaces
- Stores
- Layers
- Layer Groups
- Styles

Services

- WFS
- WMTS
- WMS
- WCS

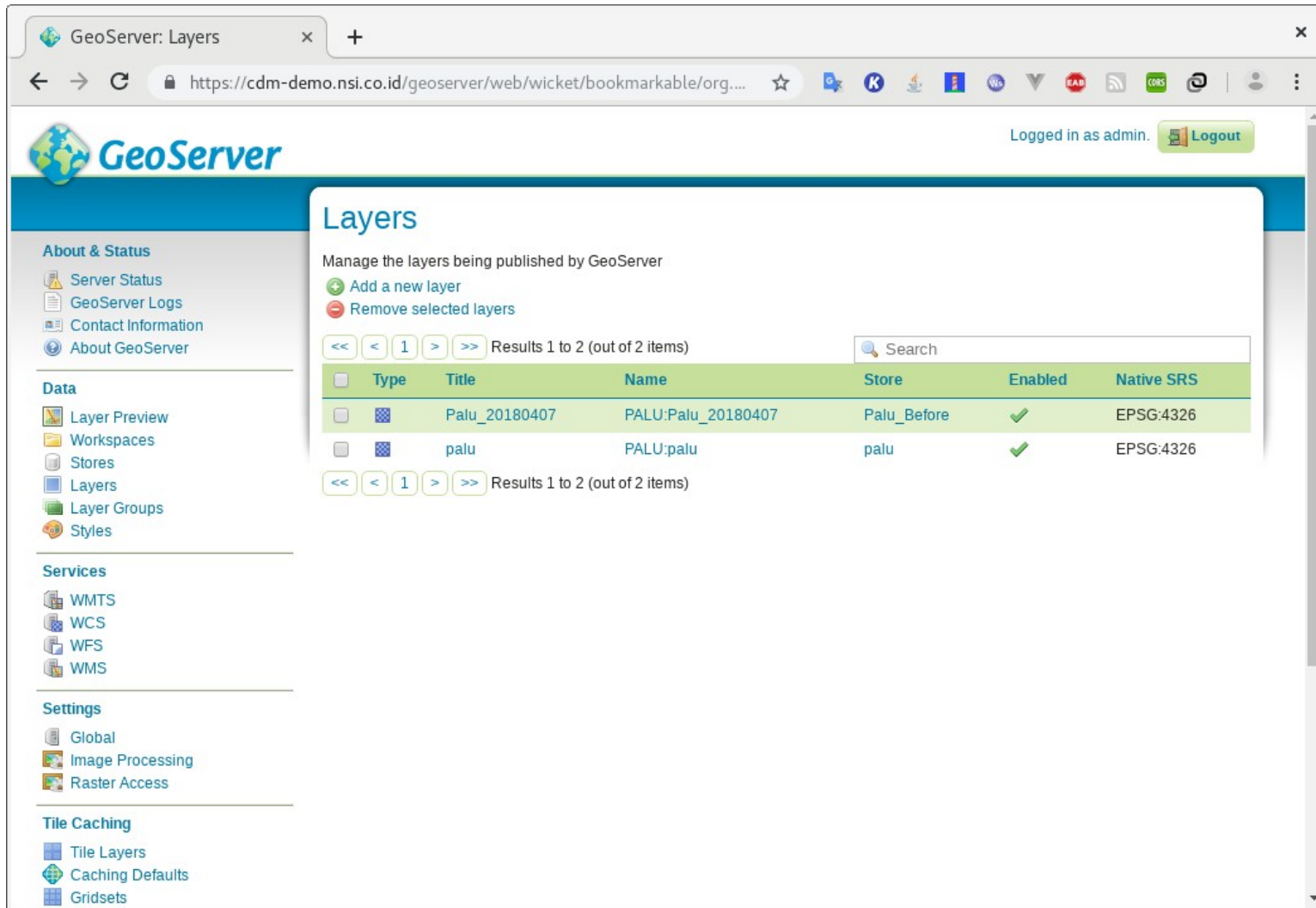
Settings

- Global
- Image Processing
- Raster Access

Tile Caching

- Tile Layers
- Caching Defaults
- Gridsets



Spatial Raster Layer



The screenshot shows the GeoServer web interface in a browser. The page title is "GeoServer: Layers". The URL is "https://cdm-demo.nsi.co.id/geoserver/web/wicket/bookmarkable/org...". The user is logged in as "admin" and can click "Logout".

The main content area is titled "Layers" and contains the text "Manage the layers being published by GeoServer". There are two links: "Add a new layer" and "Remove selected layers".

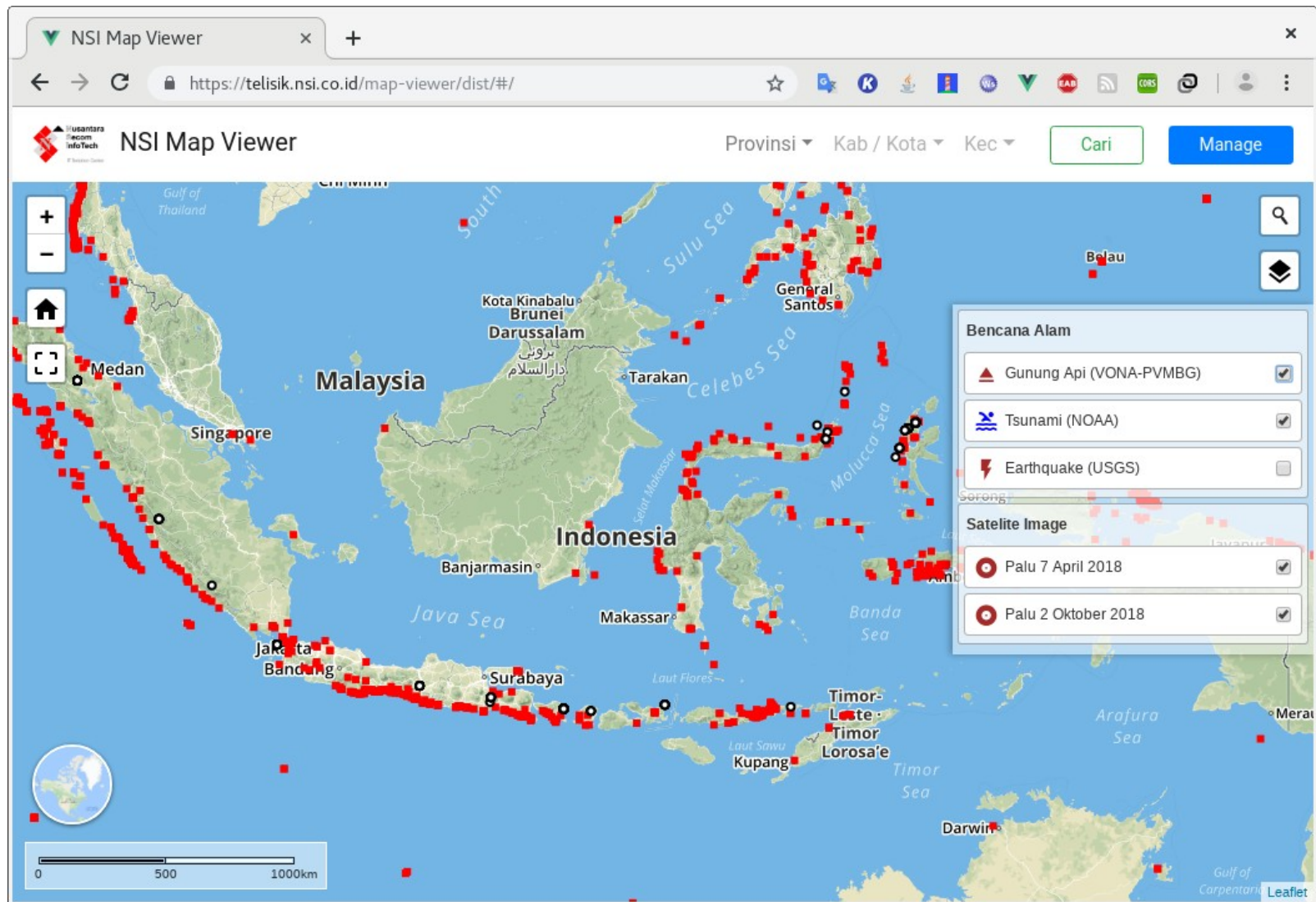
Below the links is a table of layers. The table has columns: Type, Title, Name, Store, Enabled, and Native SRS. There are two layers listed:

Type	Title	Name	Store	Enabled	Native SRS
	Palu_20180407	PALU:Palu_20180407	Palu_Before	✓	EPSG:4326
	palu	PALU:palu	palu	✓	EPSG:4326

The left sidebar contains a navigation menu with the following sections:

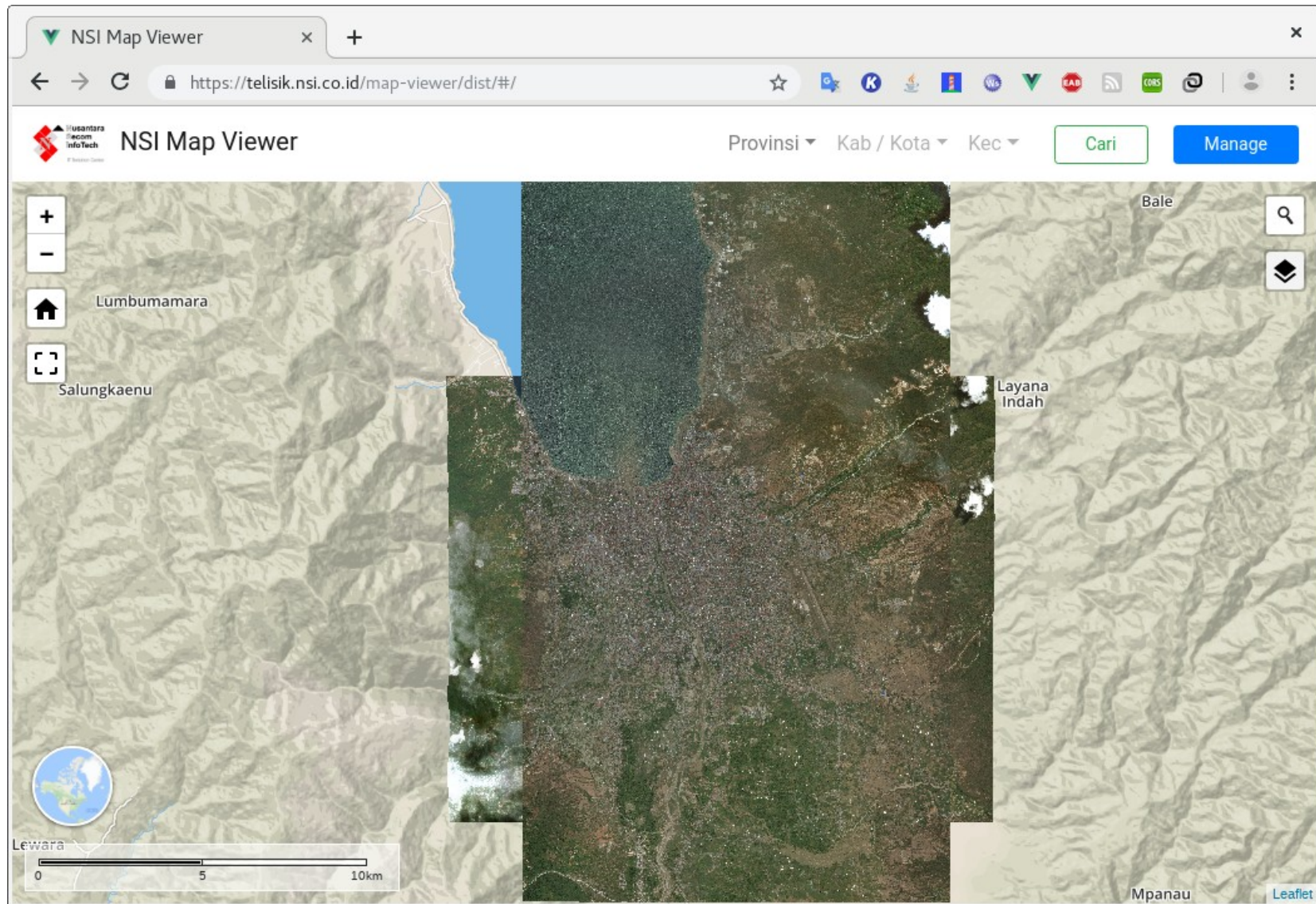
- About & Status
 - Server Status
 - GeoServer Logs
 - Contact Information
 - About GeoServer
- Data
 - Layer Preview
 - Workspaces
 - Stores
 - Layers
 - Layer Groups
 - Styles
- Services
 - WMTS
 - WCS
 - WFS
 - WMS
- Settings
 - Global
 - Image Processing
 - Raster Access
- Tile Caching
 - Tile Layers
 - Caching Defaults
 - Gridsets

Result



<https://telisik.nsi.co.id/map-viewer/dist>

Result



<https://telisik.nsi.co.id/map-viewer/dist>

Terima kasih / Thank you !

