

## MID TERM REPORT SUBMISSION FOR:

### Flood Assessment for India using Multi-Sensor Google Earth Engine Workflows

After deep diving into the topic, we found out that we will narrow down our focus to WESTERN AND EASTERN GHATS along with the coastal areas since there exists a huge elevation gradient & closeness to oceans and seas and also the DECCAN PLATEAU.

These areas are primarily most vulnerable to floods.

Even the eastern ghats are less vulnerable to floods as compared to western due to following factors:

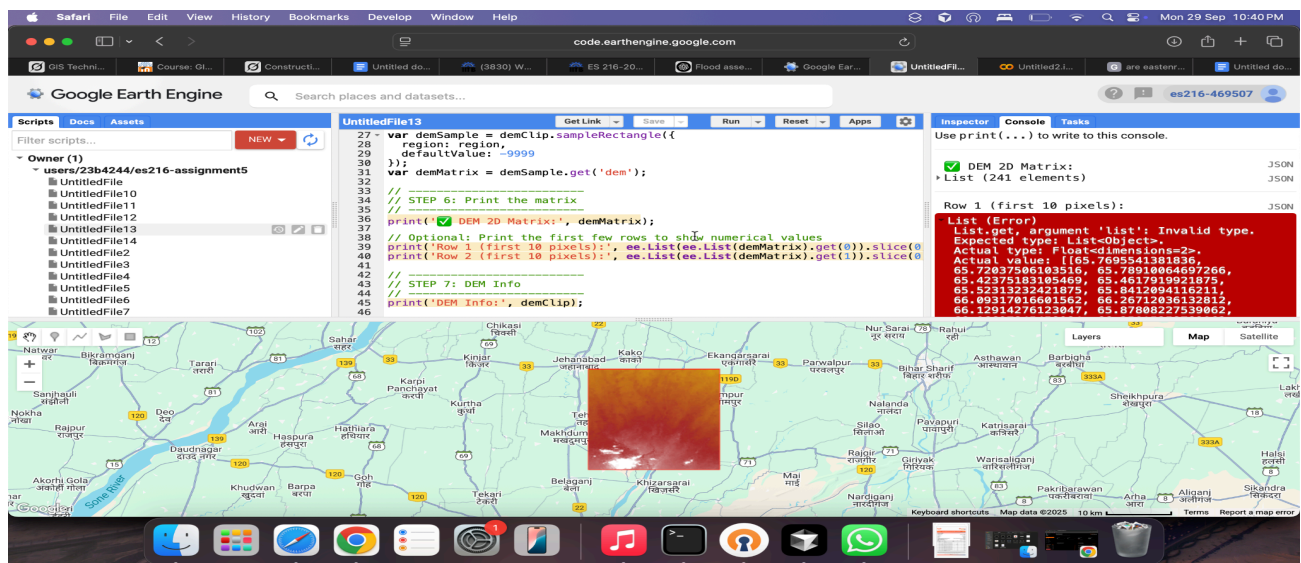
HIGHER ELEVATION

HIGHER RAINFALL(PRECIPITATION) INTENSITY

UPDATED TOPIC:

### Flood Assessment for India(WESTERN GHATS) using Multi-Sensor Google Earth Engine Workflows

1)Firstly we will analyse the **DEM** dataset on **GOOGLE EARTH ENGINE**:



The dataset we used is [MERIT/DEM/v1\\_0\\_3](#).

Some features of the datasets are:

Spatial resolution: 3arc seconds( 90m at equator)

Attributes: Elevation in meters, referenced to EGM96 geoid

Baseline DEMs used: NASA SRTM3 v2.1, JAXA AW3D (30 m), Viewfinder  
Panoramas DEM

What this essentially means:

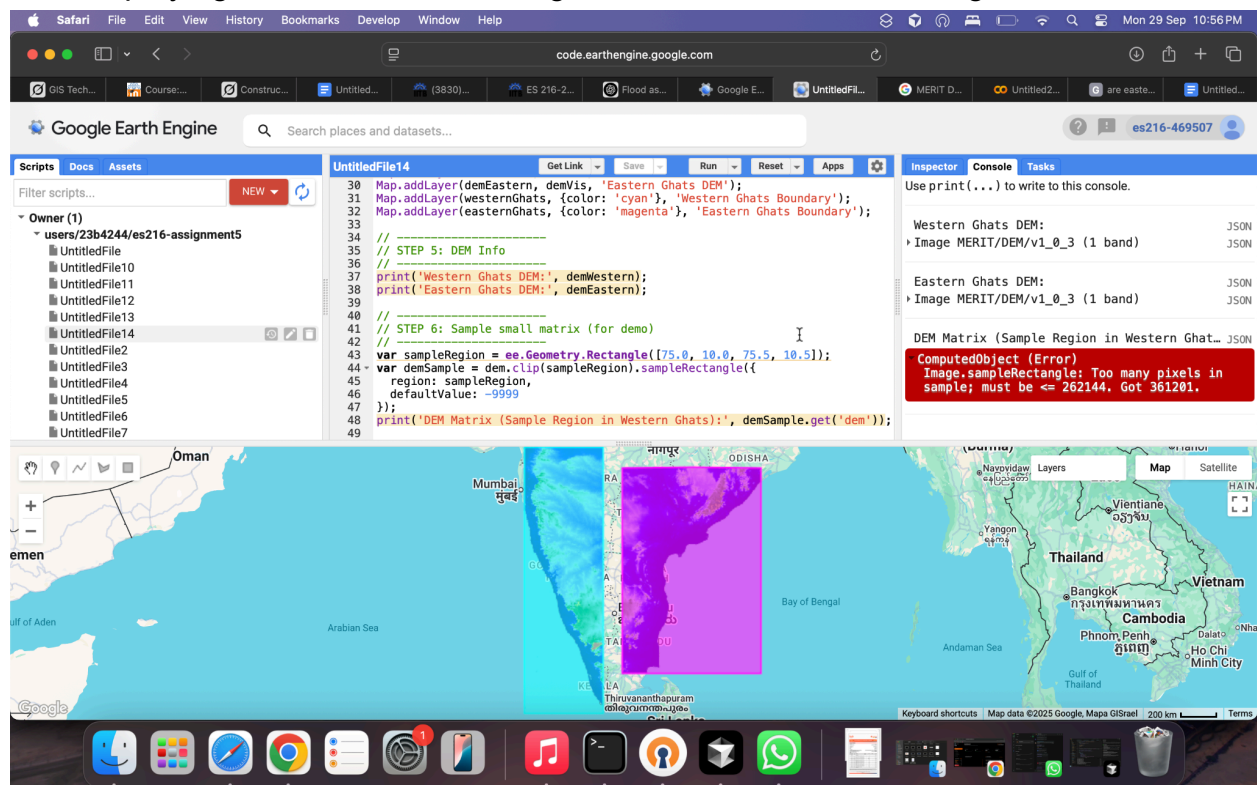
Every 90x90 m<sup>2</sup> area on the map has 1 z(elevation value in meters)

So the dataset is a 2d matrix containing: z values for every x and y coordinates

Its a function of  $f(x,y) \rightarrow z$

In the figure we plotted a 20kmx20km area in bihar to demonstrate a square grid, showing elevations in the logs of the terminal. Darker red areas represent more elevated lands.

Now displaying the dataset for our region in western and eastern ghats:



We notice that western ghats are more elevated than eastern ghats, which might be a possible cause for more flood prone area to exist in western ghats, which helps us narrow down our topic to the western coasts.

## 2)Precipitation Data

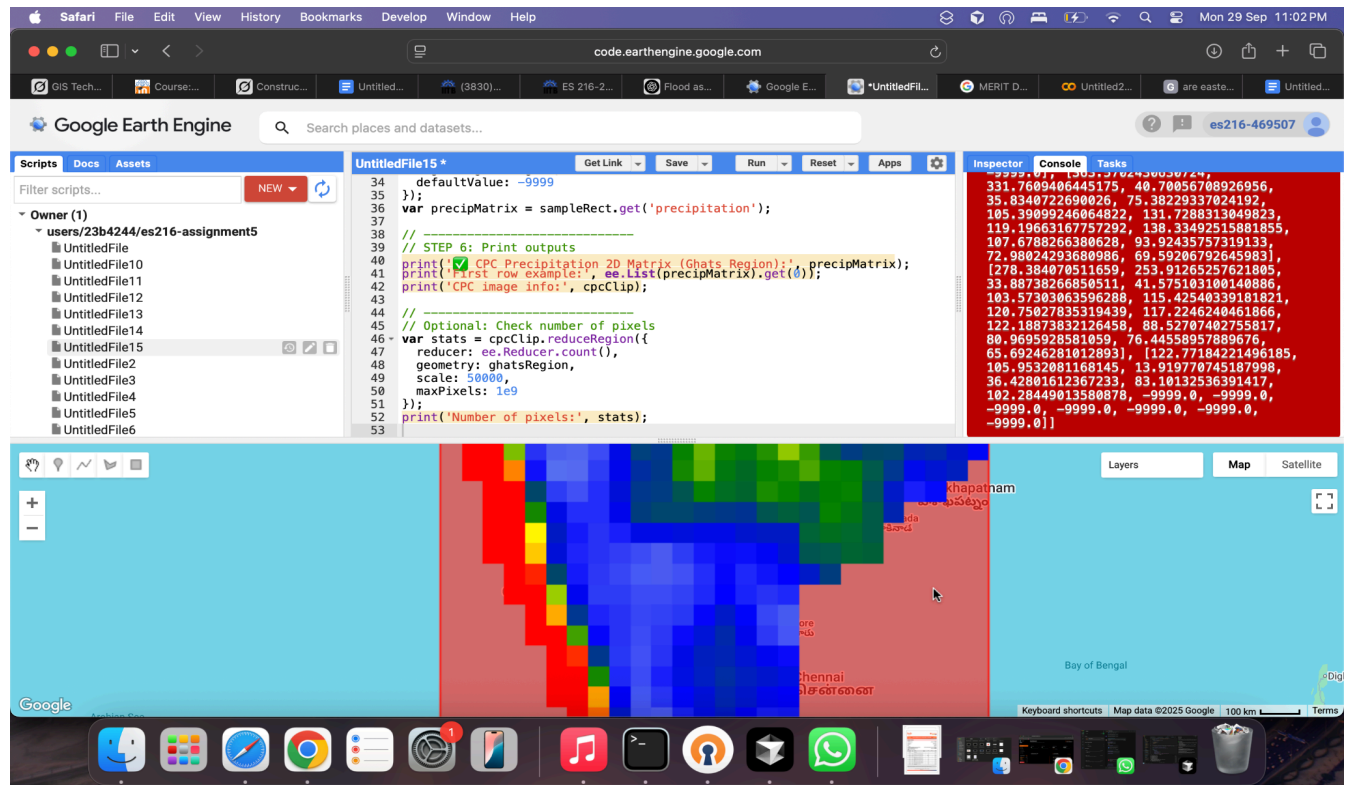
The dataset we used is NOAA/CPC/Precipitation.

Some features of the dataset is:Dataset Availability

2006-01-01T00:00:00Z–2025-09-27T00:00:00Z

**Spatial resolution:  $0.5^{\circ} \times 0.5^{\circ}$  ( $\approx 55$  km grid spacing)**

So essentially this dataset gives us a value of precipitation for every x and y coordinate per 55km grid spacing with time.

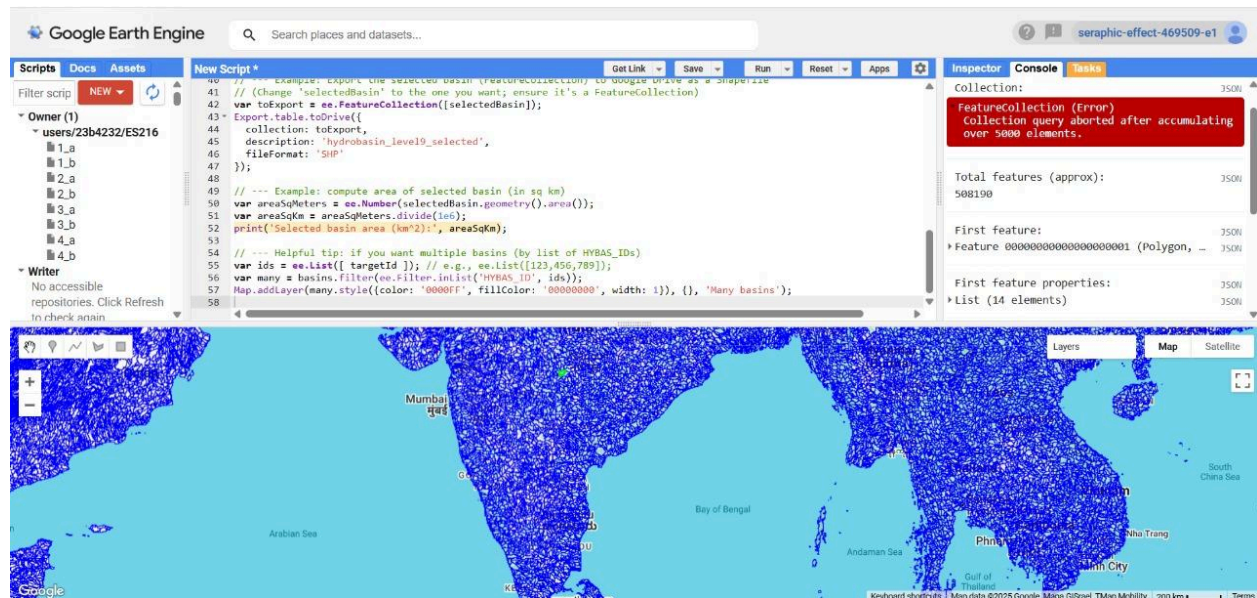


As we see the western coast, is more precipitated, and another reason for us to niche on the western ghats and western coasts.

### 3) HYDROSHED Basins

The hydrosheds help us navigate the waterflow.

The screenshot is attached below:



The features of the dataset are:

WWF/HydroSHEDS/v1/Basins/hybas\_9

Dataset Availability

2000-02-11T00:00:00Z–2000-02-22T00:00:00Z

The following dataset has lots of attributes, we might or might not use it when we actually move to the modelling part.

So as for now:

We have 2 datasets to work on, excluding the hydroshed dataset.

Hence planning on to the approach

We will Follow a simple Linear Regression strategy to predict the floods occurred in the past using the dataset:

GLOBAL\_FLOOD\_DB/MODIS\_EVENTS/V1

It has the attribute to map a binary distribution

1 for flooded area

And 0 for not flooded,

We map a logistic regression with the final output and map our predicted regions with the expected output.