

# Detection of Change in Waterbodies in Sindhudurg District

## Introduction :

Sindhudurg is an administrative district in the state of Maharashtra in India. The district occupies an area of 5207 sq.km out of which 28.634 sq.km area of waterbody has been plotted by us. The Map includes plotting of waterbodies like lakes, dams, and reservoirs of the Sindhudurg district in 2012 and 2018, respectively. The detection of change in waterbodies was performed between these two years.

## Source :

The data used for the map created for the detection of change in waterbody in the Sindhudurg district are as follows:

District Boundary: [https://static.fossee.in/mapathon/Mapathon2020\\_Data](https://static.fossee.in/mapathon/Mapathon2020_Data)

Imagery 2012: <https://bhuvan-app1.nrsc.gov.in/bhuvan2d/bhuvan/bhuvan2d.php>

Imagery 2018: <https://bhuvan-app1.nrsc.gov.in/bhuvan2d/bhuvan/bhuvan2d.php>

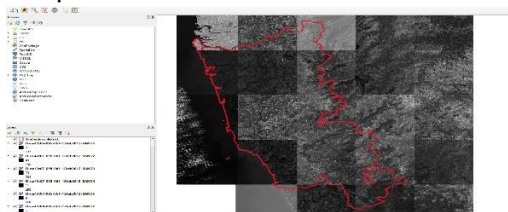
Reference: <https://vedas.sac.gov.in/vcms/en/home.html>

[https://bhuvan.nrsc.gov.in/bhuvan\\_links.php](https://bhuvan.nrsc.gov.in/bhuvan_links.php)

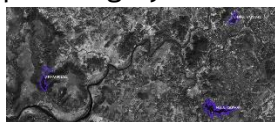
Tool: QGIS

## Methodology :

- Team has chosen Detection of change in Waterbodies / Reservoirs / Wetlands as problem statement for this Marathon.
- For the above problem statement, Sindhudurg District of Maharashtra was selected to work on from ISRO data ([https://static.fossee.in/mapathon/Mapathon2020\\_Data](https://static.fossee.in/mapathon/Mapathon2020_Data))
- Image files of year 2012 & 2018 from ISRO data were downloaded (<https://bhuvan-app1.nrsc.gov.in/bhuvan2d/bhuvan/bhuvan2d.php>)
- Once all the required data was ready, the image files of 2012 ,2018 & Sindhudurg District Boundary shapefile was loaded in QGIS.



- Team created polygons of water bodies in Sindhudurg District for year 2012 & 2018 respectively as per imagery loaded with their names.

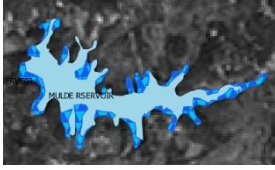


Polygons plotted using 2012 imagery



Polygons plotted using 2018 imagery

- After the polygons were added and the shape files for both years were completed the difference between 2012 & 2018 year data in terms of their shapes, existence & boundaries were created.



*Difference in the waterbodies between 2012 and 2018*

- And the detection of change in water bodies from 2012 - 2018 years were highlighted with pattern in QGIS.

### Challenges Faced :

- Initially finding a source of data that can act as imagery reference in the shapefile format was difficult and hence, we decided to go with the available files i.e Image files which could be downloaded.
- The Image Files that had to be downloaded from <https://bhuvan-app1.nrsc.gov.in/bhuvan2d/bhuvan/bhuvan2d.php> has a restriction of downloading 20 image files per day which delayed in the process of map creation.
- The clarity of the Image files was not to par due to which we decided to stick to only creation of stagnant waterbodies like lakes, dam, and reservoirs and not rivers, canal, and backwaters.

### Application & Use of this Map :

The map created consists of waterbodies of Sindhudurg district that comprises of lakes, dams, and reservoirs. This map shows the existence of waterbodies in 2012 and 2018 and also shows the changes occurred in the waterbodies from 2012-2018. As a necessary part of the earth's water cycle, urban aquatic ecosystem such as reservoirs, and lakes water is an integral component of the ecosystem which plays a significant role to influence climate system and global ecosystem. Therefore, understanding managing water resources and by monitoring and analyses of the hydrology process of the urban aquatic ecosystem and mapping their spatial distribution is essential since monitoring the change of surface water and delivering the information on the dynamics of surface water body can be used as a decision-making process. Also by using remote sensing data with Geographic Information System (GIS) to monitor and measure the change of urban surface water bodies is essential because it can be utilized in automatic or semi-automatic water body extraction and mapping.

### Observation:

- Various water conservation schemes implemented by Government Of India like Jalyukta Shivar Abhiyan etc. has resulted in the increase of Water conservation level.
- Mentioned below are the few areas of concern :
  - Evaporation : Due to global warming and change in the climate, more amounts of surface water and ground water is being evaporated due to excessive heat. There is a decline in the level of water in the reservoir and dams due to evaporation.
  - Pollution : Most of the industrial waste water are dumped to these water sources. This in turn pollutes and contaminates water. This can be avoided by water recycling process.
  - Agriculture : Agricultural activities steadily increasing by the day which means more water is pumped for use. For agricultural use more ground water is pumped because it's free of cost. This can be done by fixing a bore well.