

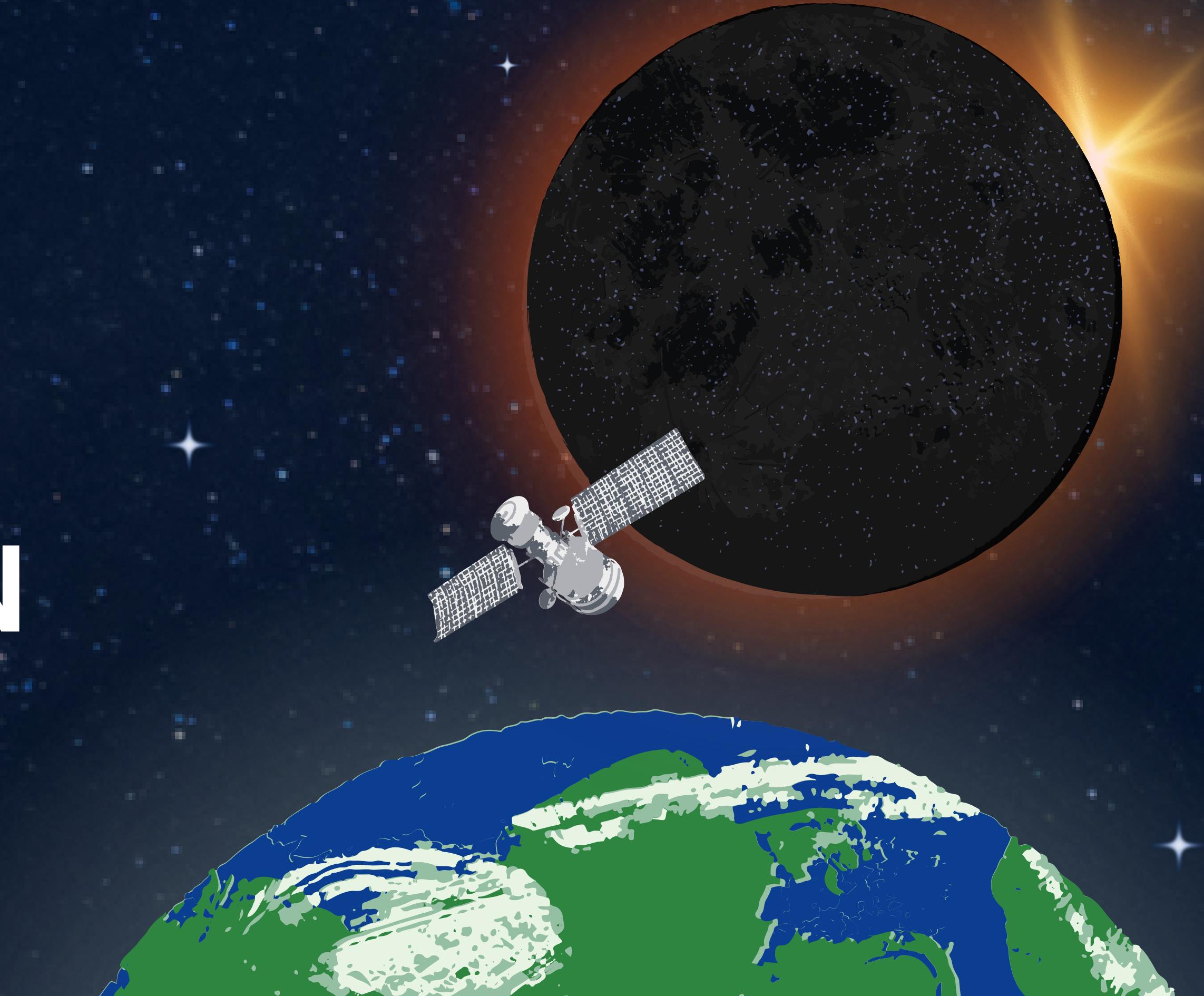


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TEAM GEEKCHAINS

PSID : 1518

CHANGE  
DETECTION  
DUE TO  
**HUMAN  
ACTIVITIES**





# OUR APPROACH

1

Trained a U-net model using labelled data to segment data into classes

2

Using the previous model labelled other procured Sentinel-2 and LISS-4 dataset

3

Subtracted data from two different timeline and highlighted changes

# Procedure

## Segmentation

The data provided is divided into patches that are being masked and labels are given according to different landmass

## Masking

The segmented patches are merged again to create a final masked image

## Change Detection

Change in the temporal images is detected by looking at change in labels

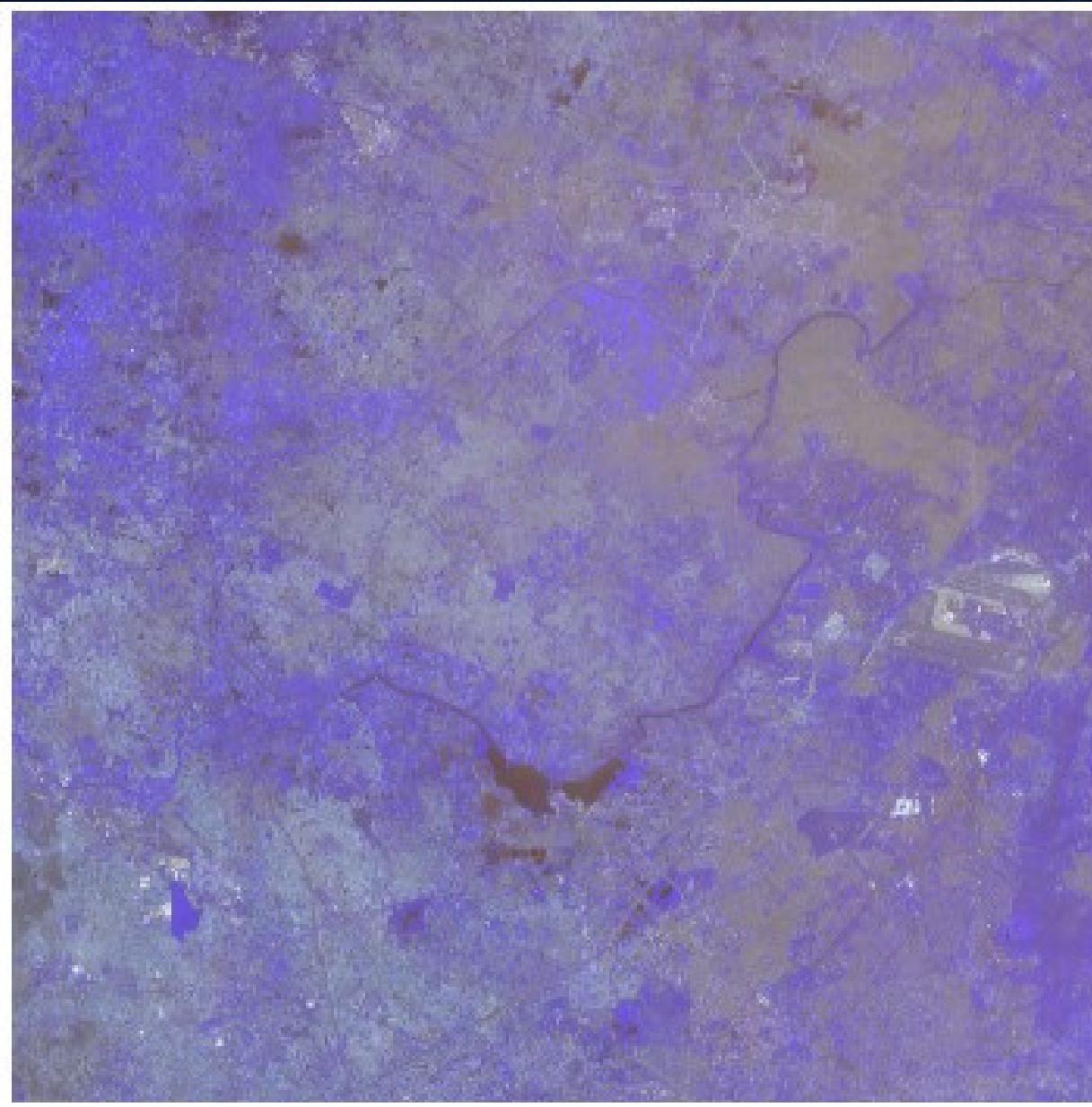
## Final Image

The labels changed due to human activities are coloured and final image representing the difference is obtained

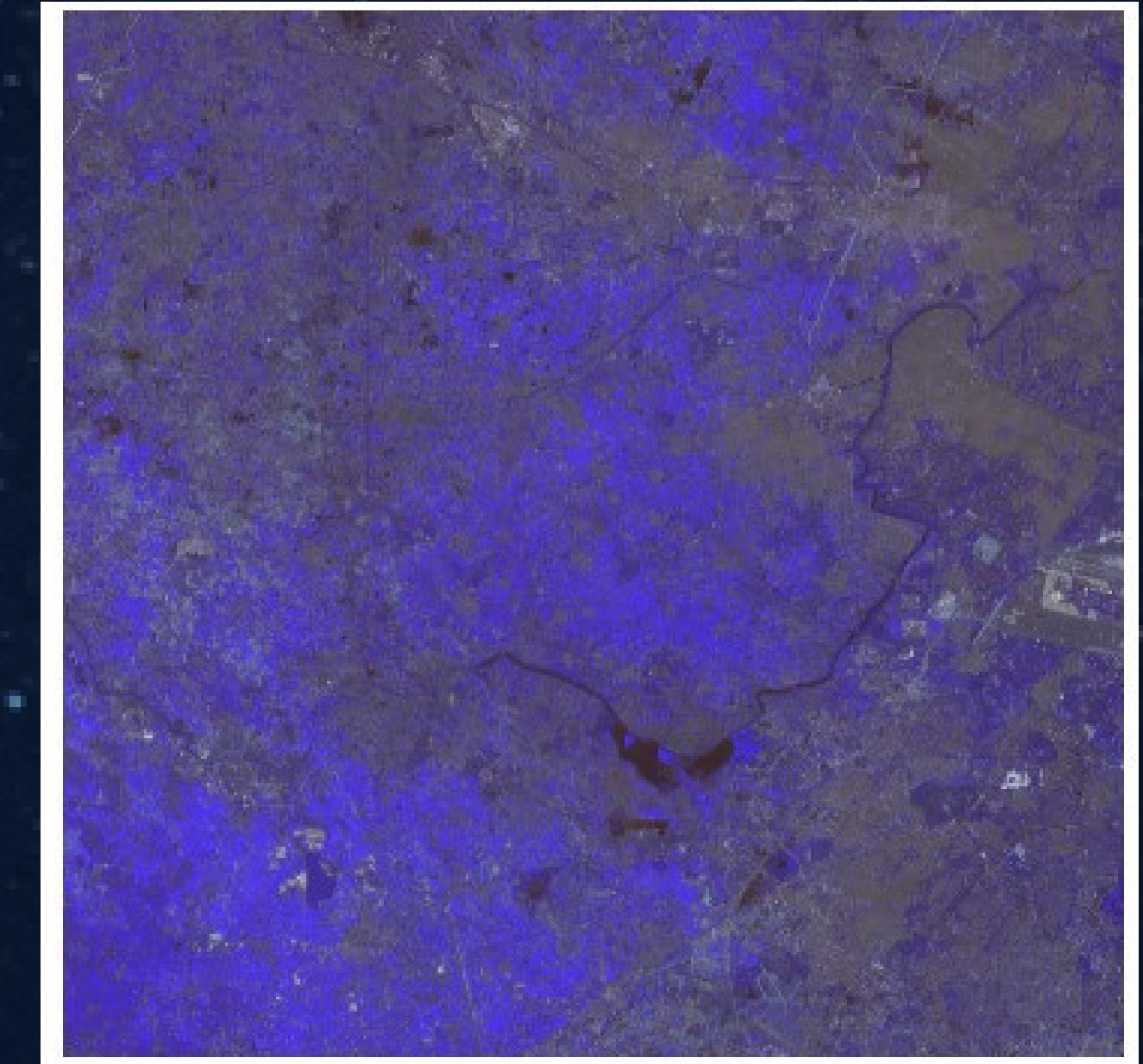


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# Segmented Images of LISS-4



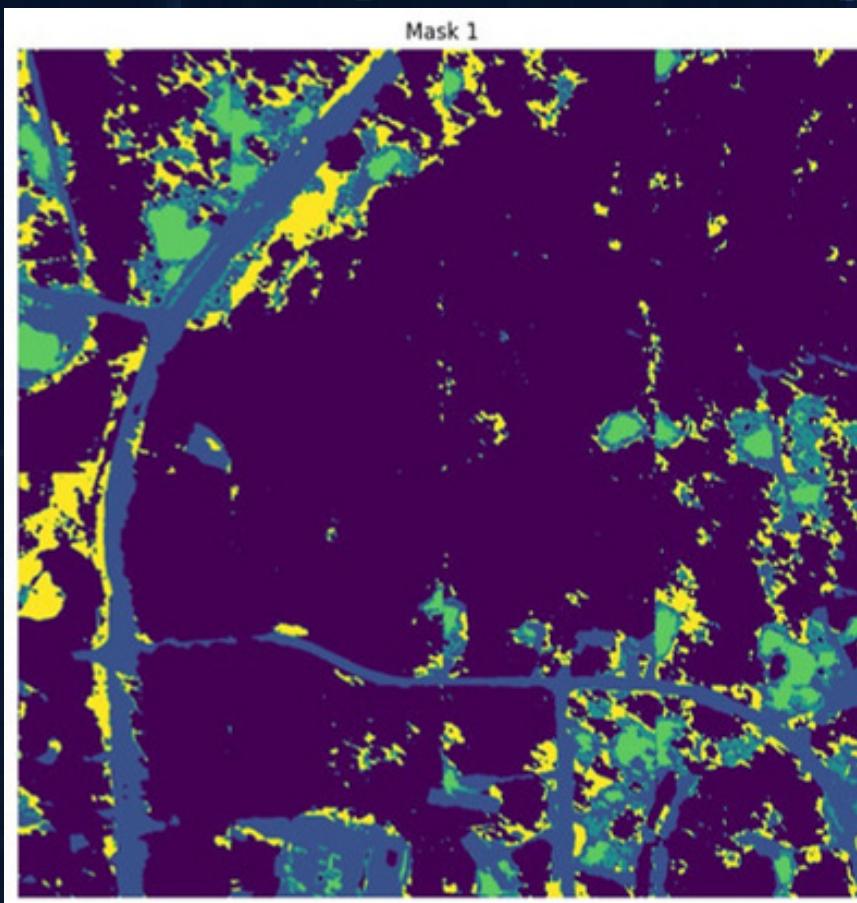
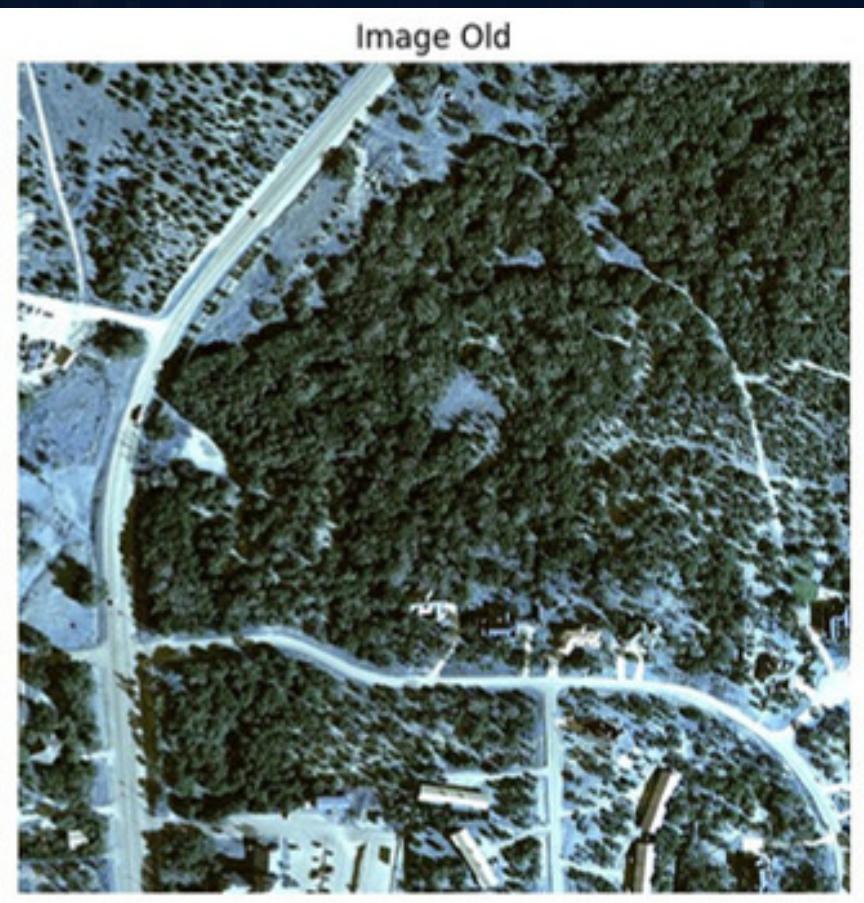
Patched Image - Delhi  
22.632, 77.856 -- Sept 2023



Segmented Image



# Image Segmentation-1



Labelling old image

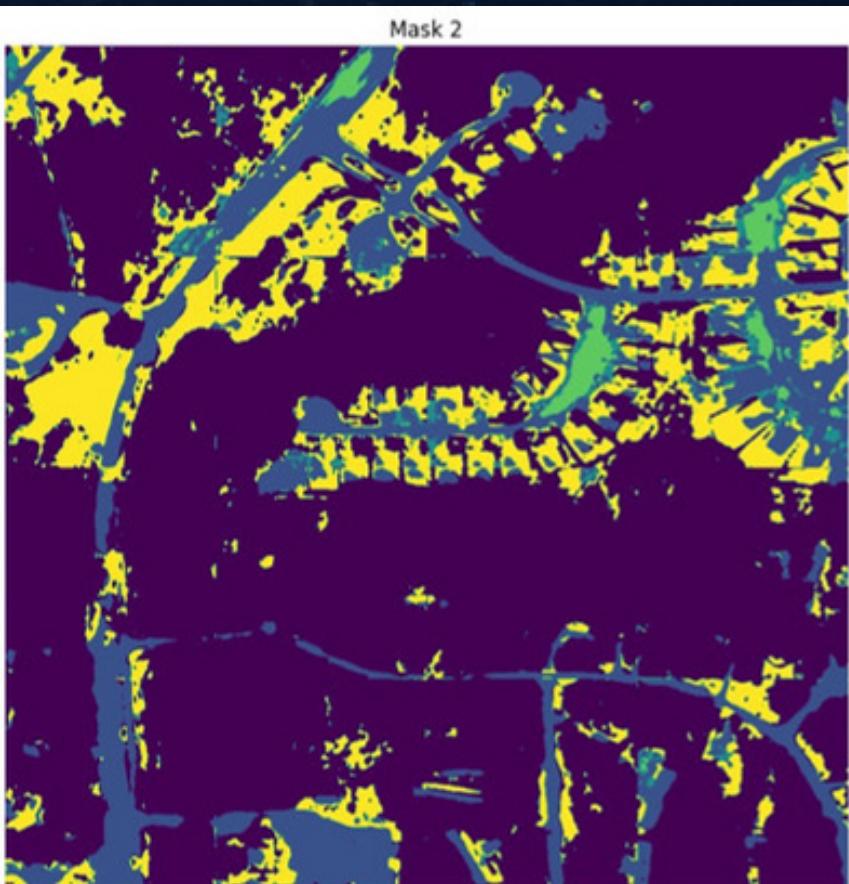
Barren Land

Vegetation

Buildings

Road

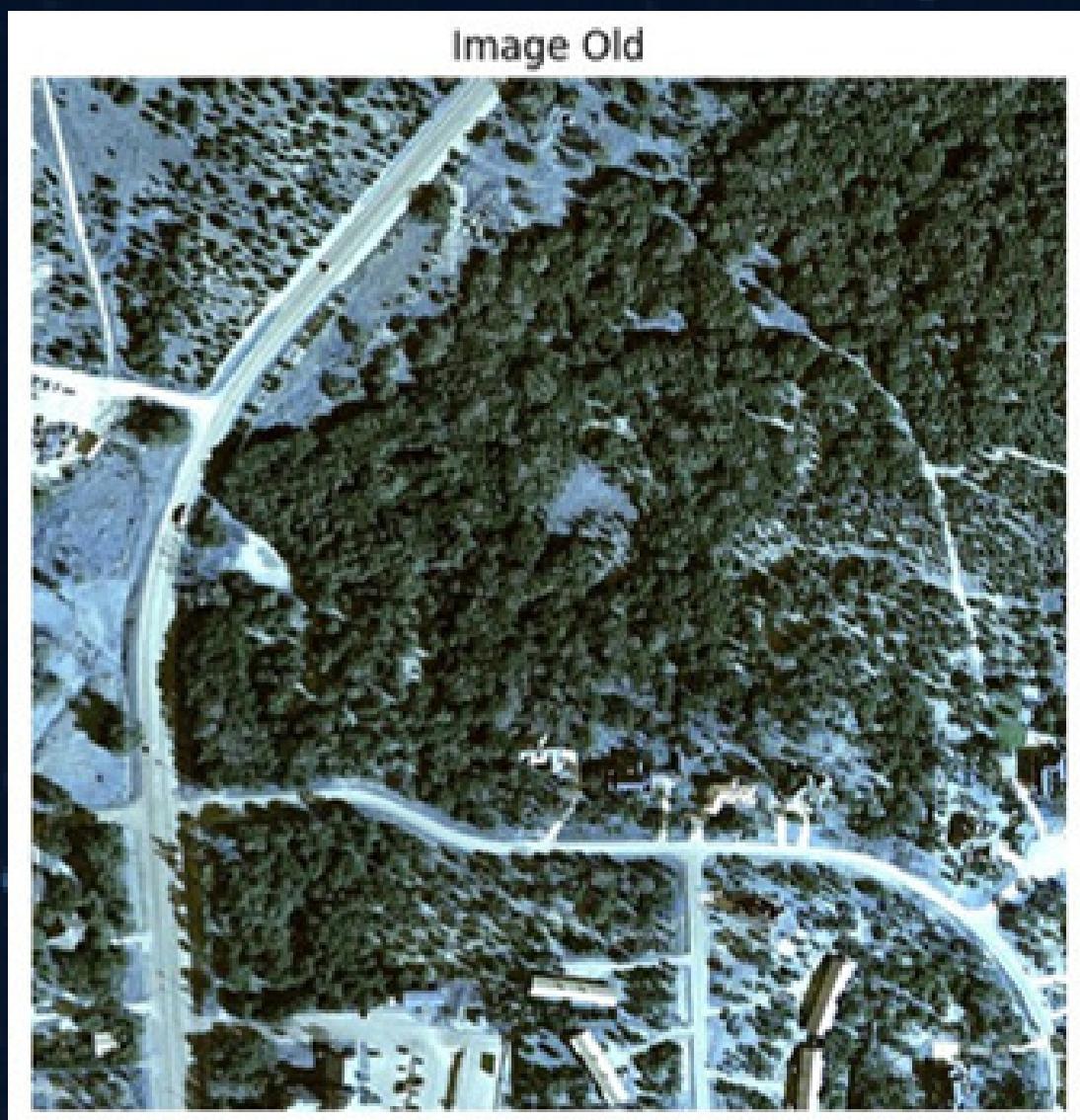
Labelling new image





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# Current Output :1



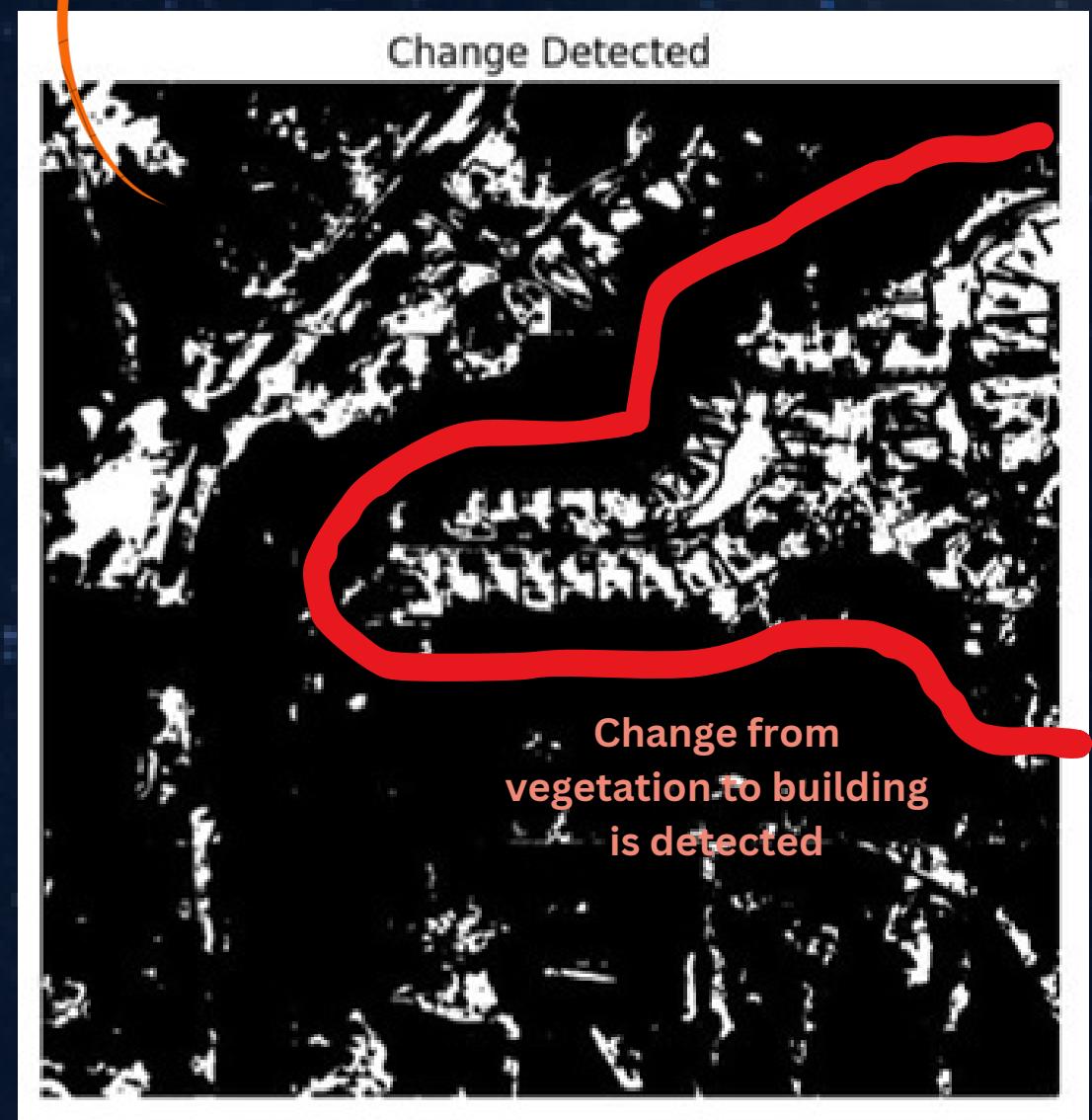
Old Image

(Temporal Aerial Data)



New Image

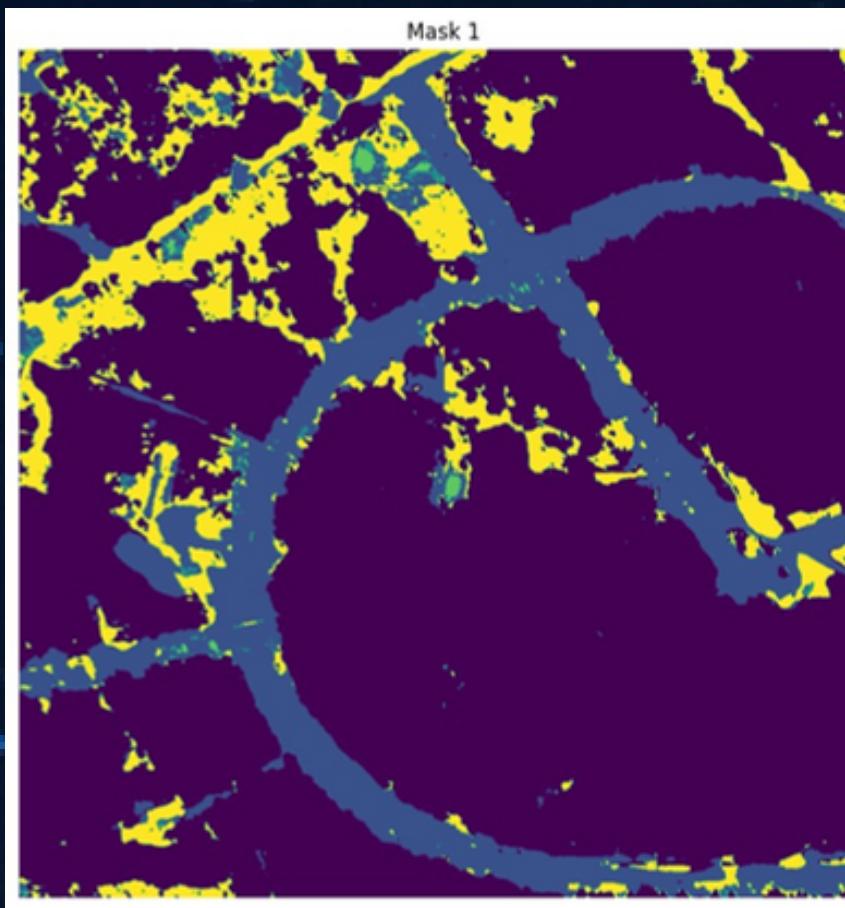
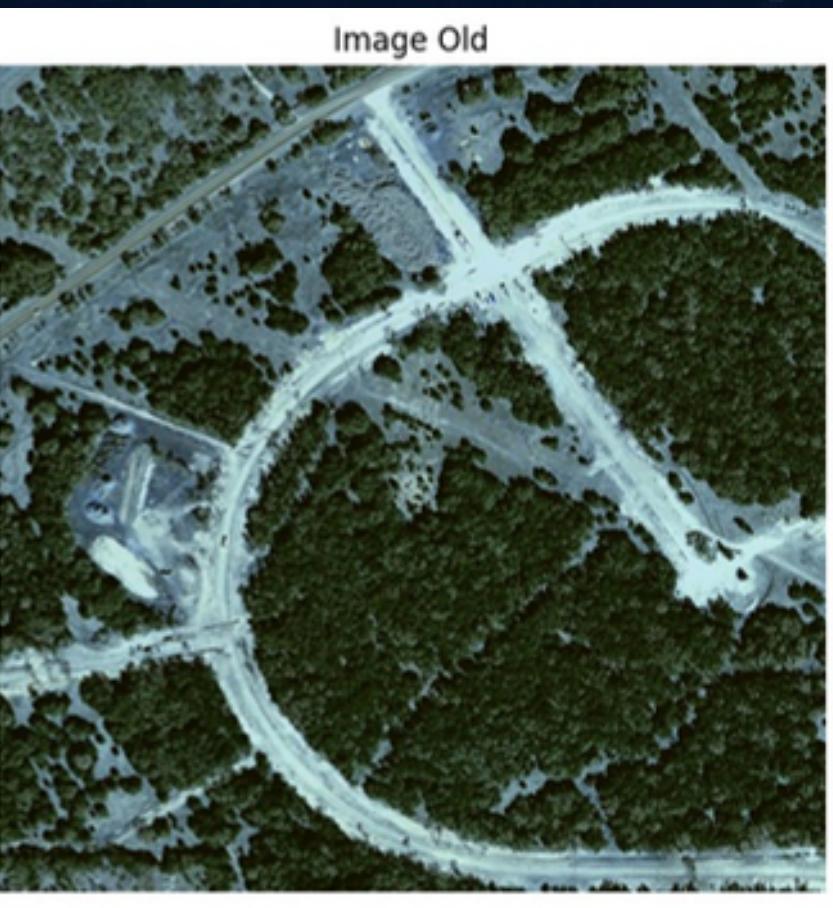
Slight Changes(Removal of trees , small road)



Changes detected



# Image Segmentation-2



Labelling old image

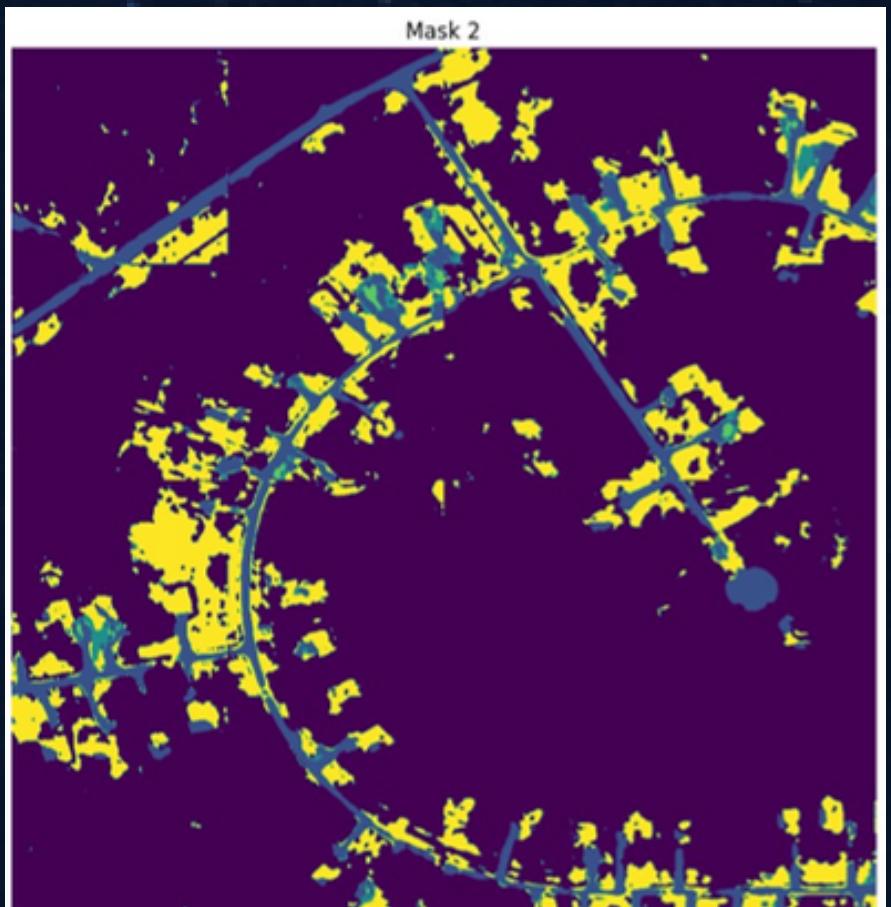
Barren Land

Buildings

Vegetation

Road

Labelling new image





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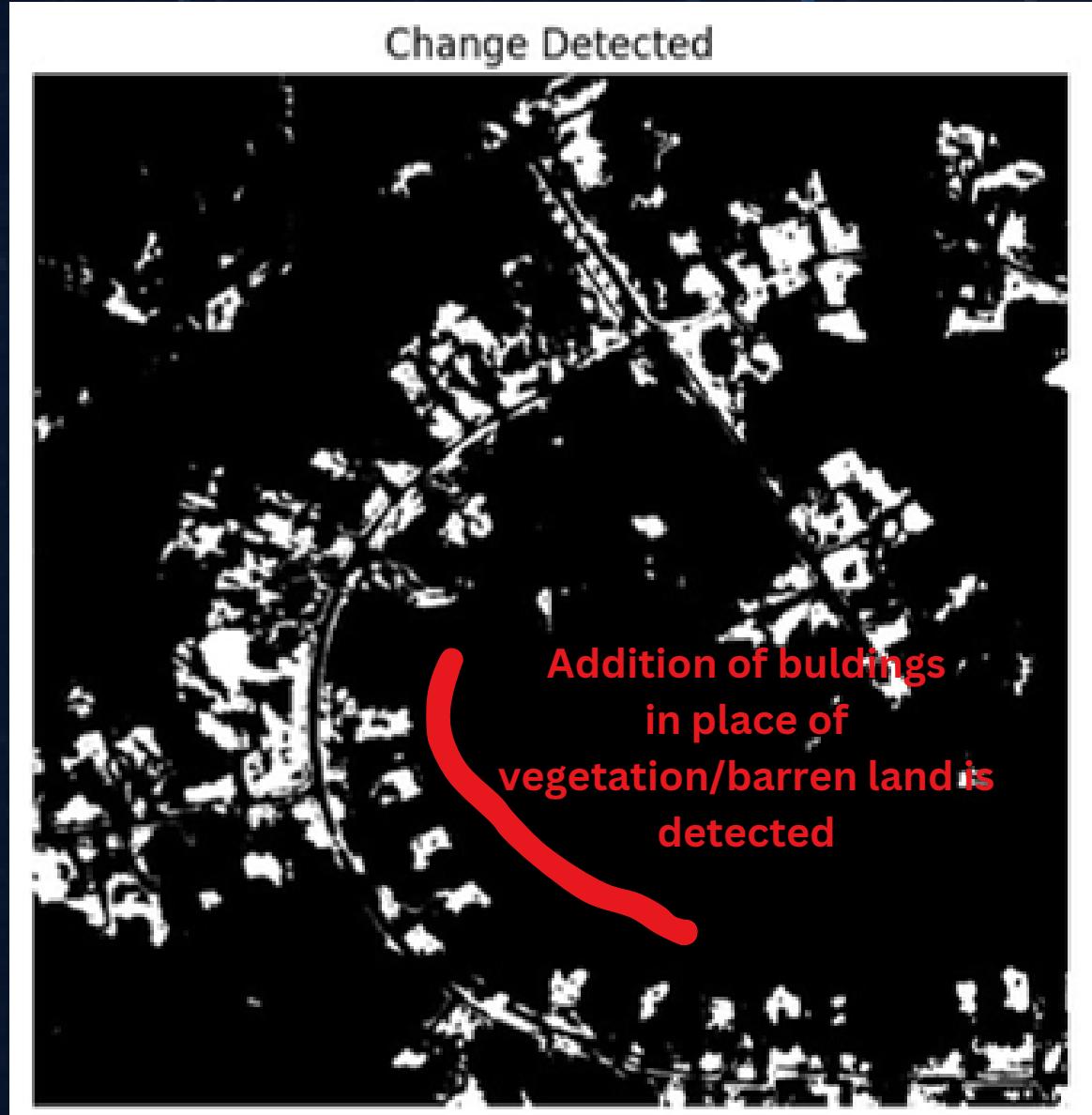
# Current Output : 2



Old Image

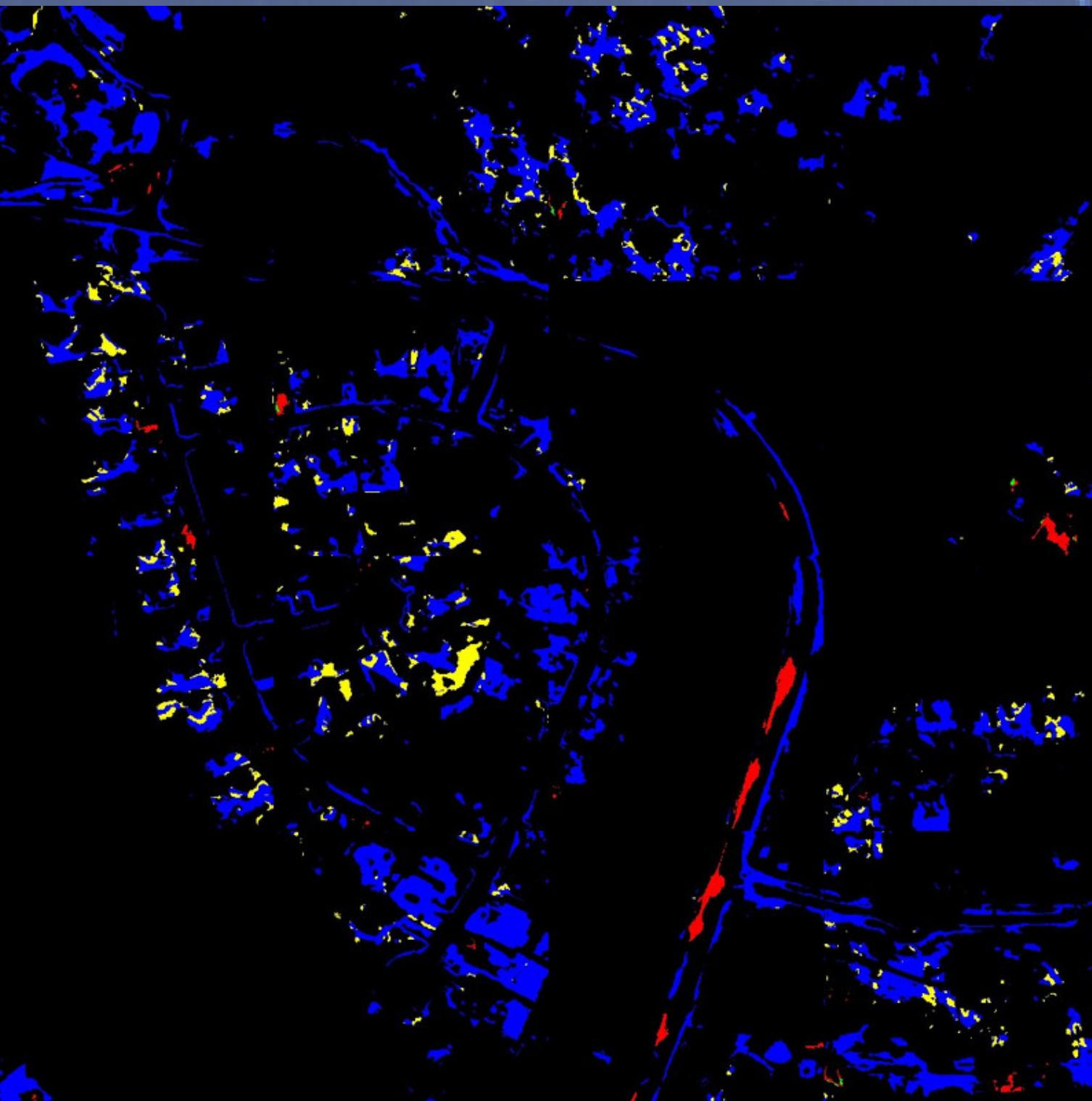


New Image



Changes detected

# Changes Detected



- Water to building
- Water to road
- Land to road
- Land to building
- Vegetation to building
- Vegetation to road

# Challenges faced:

1

The temporal data has variations in lighting due to capturing of the images at different seasons and/or time of the day, which leads to wrong segmentation

2

Procuring and downloading sentinel data of feasible download size

3

Hardware : Satellite data is usually very large and requires high processing power , we can only test so much with our machines or cloud machines



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# Challenges faced:

4

Sentinel 2 gave data with 10 m resolution hence detection of minor changes is difficult in this case

5

Due to continuous motion of satellite, the temporal data obtained for a given marked area is shifted.  
Hence overlapping area is to be considered to determine changes

6

Hardware : Satellite data is usually very large and requires high processing power , we can only test so much with our machines or cloud machines



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# USE CASES

1



MILITARY

2



AGRICULTURE

3



DISASTER  
RESPONSE

4



ENVIRONMENTAL  
MONITORING

# Thank You !

