



# High Quality Labeling

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Mantle Labs

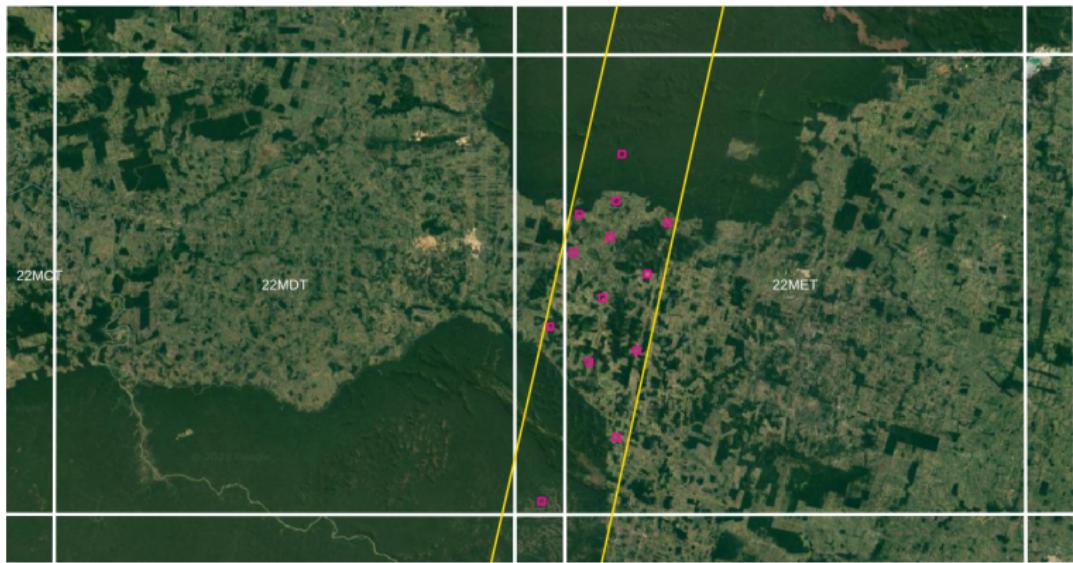


Figure 1: All polygons over area of interest: 22MET overlap.



An aerial satellite photograph of a coastal region. The landscape is a mix of green agricultural fields, some with distinct grid patterns, and brown, undeveloped land. A network of roads cuts through the terrain, with a major highway running along the coast on the right. In the lower center, there's a cluster of industrial or institutional buildings with red roofs and large parking lots. To the far right, a strip of coastline meets a dark blue sea. The word "Dataset" is overlaid in white text in the upper central area.

Dataset

# Dataset

Dataset	
Tiles	22MET
Number of polygons	12
Time range	2021-05-01 2021-09-30
Total number observations	61
N° with HQ observations	34
N° of spectral bands	12*
N° of features	14 (bands + ndvi + BI)

\*All spectral bands except B10

Table 1: Description of the dataset.

Classes
Fully Cloudy
Partly Cloudy
Full Shadow
Partly Shadow
Low quality
Medium quality
High quality

Table 2: Description of labels.



An aerial satellite photograph of a coastal region. The landscape is a mix of green agricultural fields, some with irrigation patterns, and brown, dry land. A network of roads cuts through the terrain, with a prominent highway running along the coast. On the right side, there's a developed area with several buildings, including what looks like a resort or industrial complex. The coastline is visible on the far right, showing the transition from land to sea.

Labeling

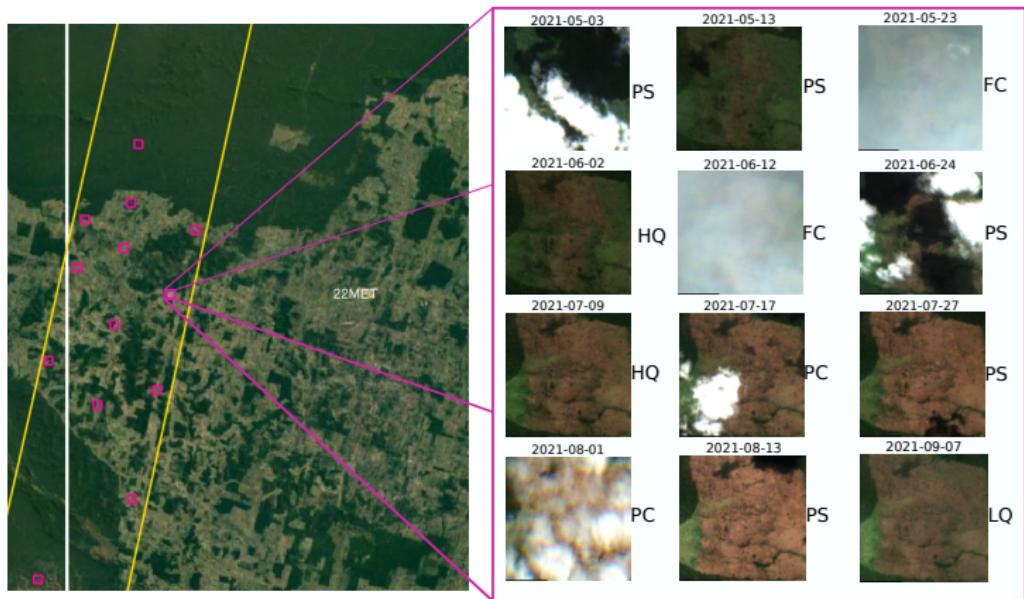


Figure 2: Polygon 1. Examples of some observation/labels.

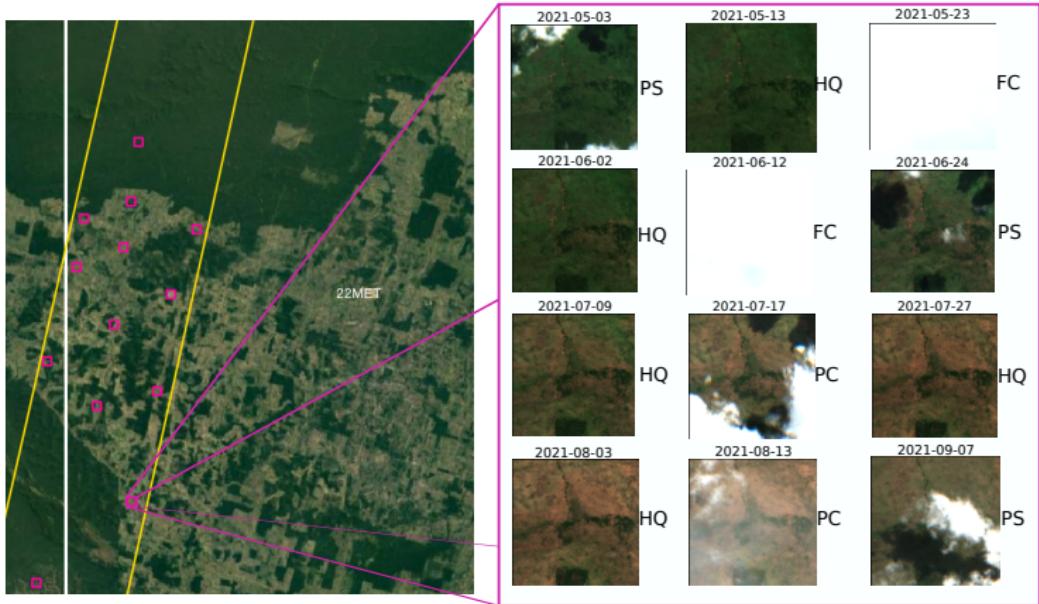


Figure 3: Polygon 2. Examples of some observation/labels.

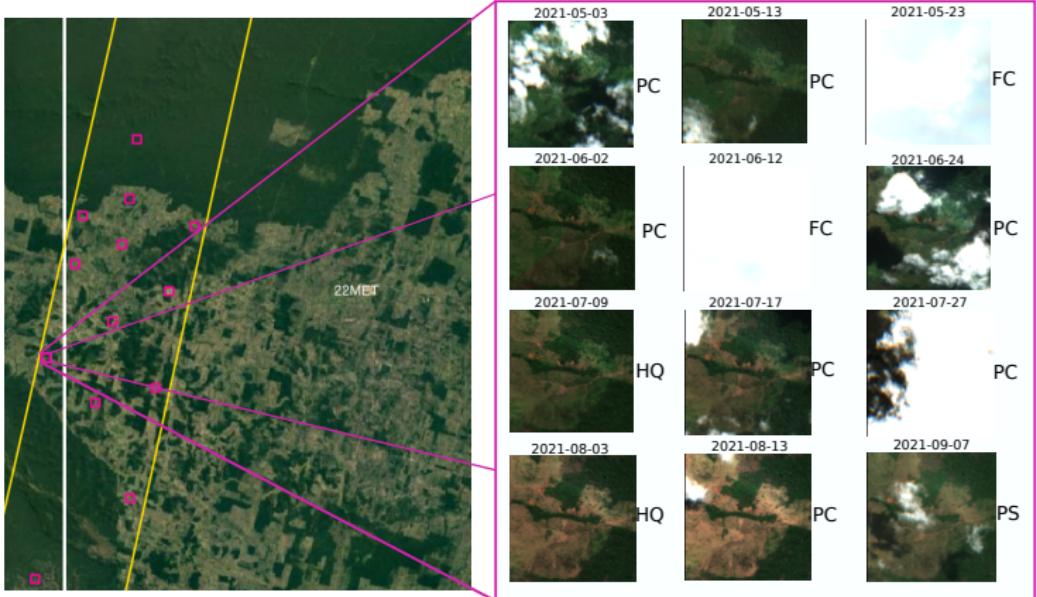


Figure 4: Polygon 3. Examples of some observation/labels.

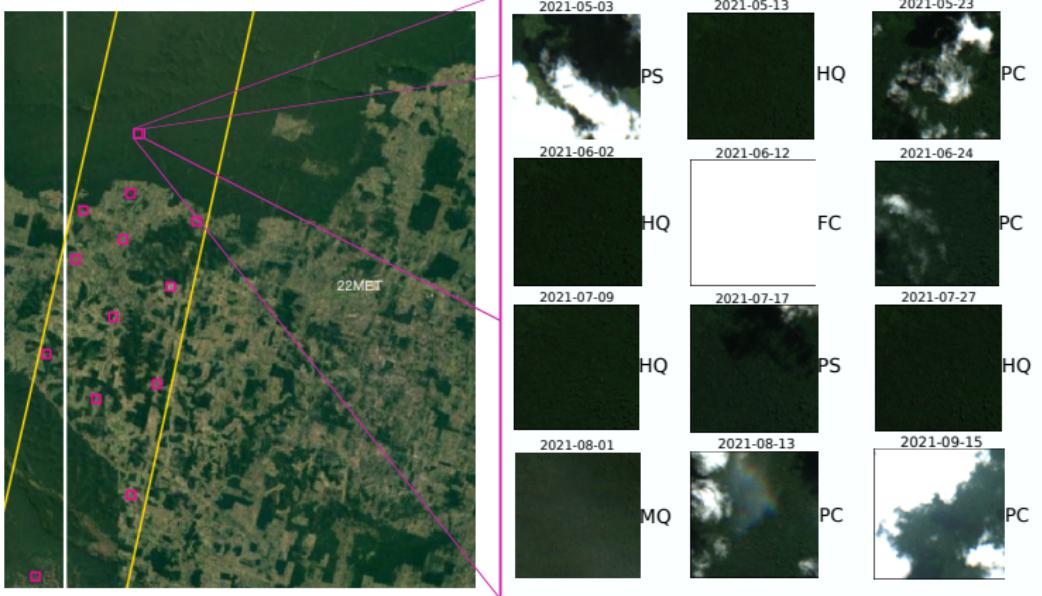


Figure 5: Polygon 4. Examples of some observation/labels.

An aerial photograph of a coastal region. The landscape is a mix of green agricultural fields, some with grid patterns, and brown, undeveloped land. A network of roads cuts through the area, with a prominent highway running along the coast on the right. In the lower-left foreground, there's a cluster of buildings, possibly a industrial or residential complex, with several large tanks or reservoirs nearby. The coastline is visible on the far right, showing a sandy beach and the blue sea.

Training

# Implementation details of the AE

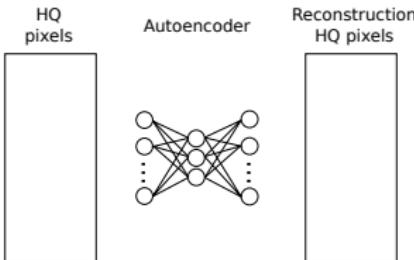


Figure 6: Workflow of training.

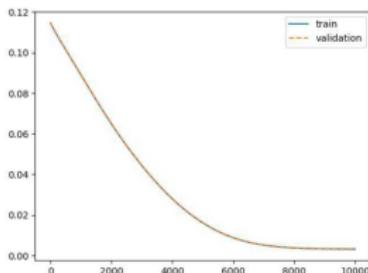


Figure 7: Loss function.



Hyperparameters	
Training size	90%
Validation size	10%
Epochs	10000
Batch size	0.1
Units in hidden layers	3
Learning rate	1e-5
Optimizer	Adam
Loss	MSE

Table 3: Setting up of the Autoencoders hyperparameters.

An aerial satellite photograph of a coastal region. The landscape is a mix of green agricultural fields, some with distinct grid patterns, and brown, less vegetated areas. A network of roads cuts through the land, with a prominent highway running along the coast on the right. In the lower center, there's a cluster of industrial or institutional buildings with red roofs and large parking lots. To the far right, the dark blue ocean is visible. The overall scene is a blend of rural and urban development.

Previous results

True  
color

First  
version  
error  
map

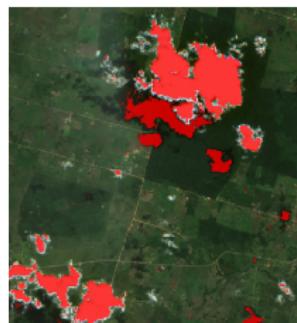
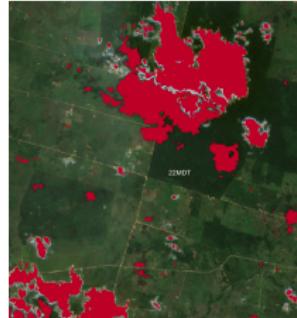
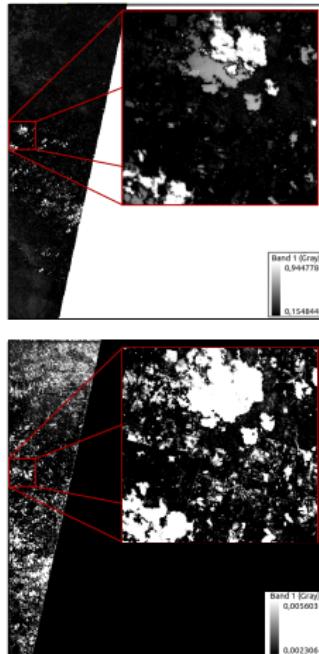
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version  
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map

First  
version  
binary  
mask

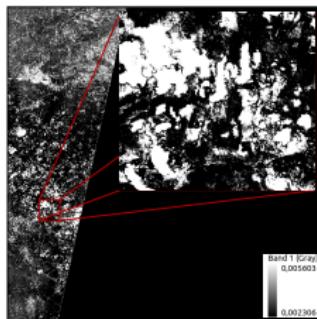
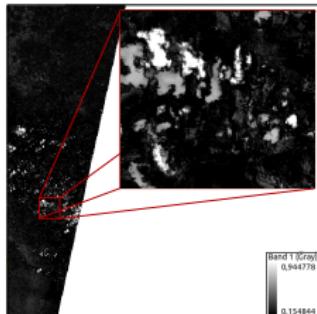
Second  
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binary  
mask



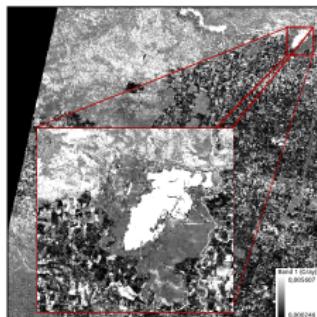
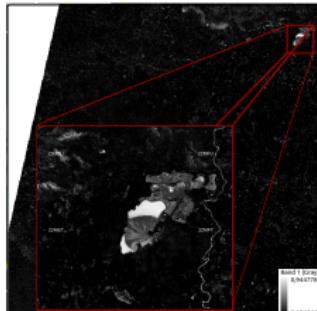
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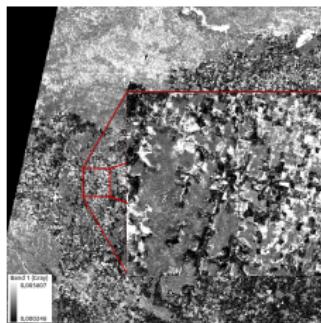
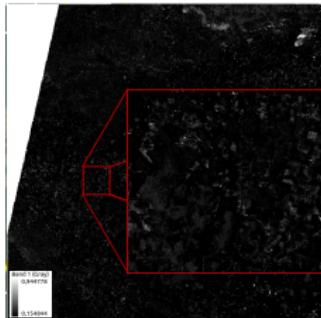
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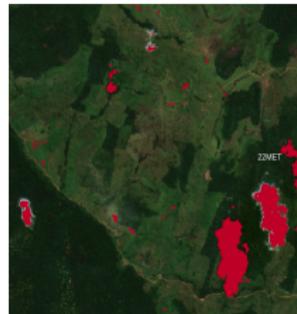
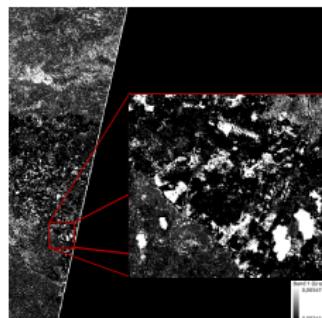
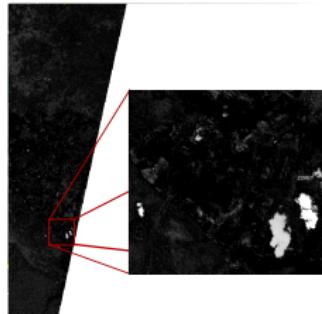
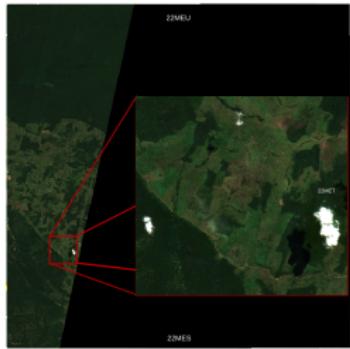
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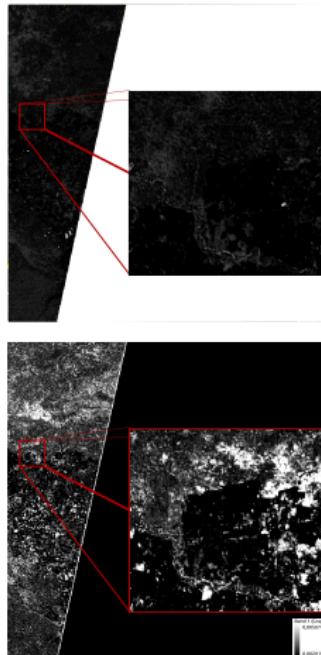
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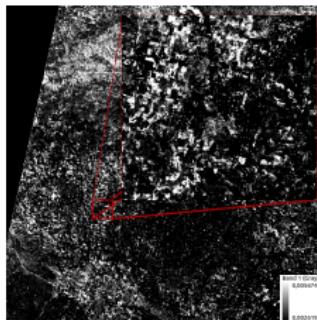
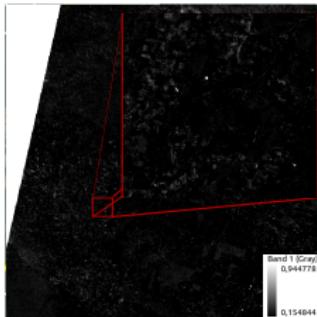
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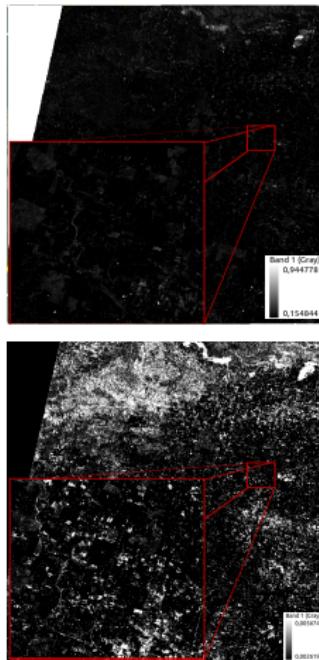
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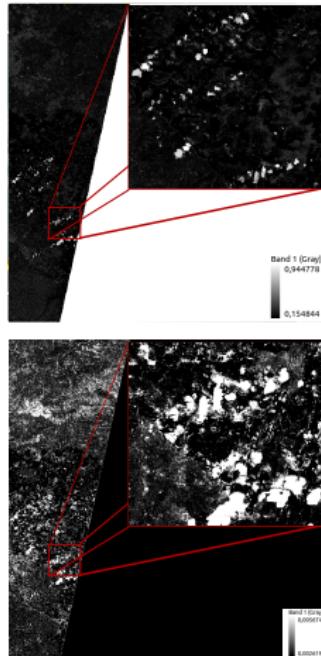
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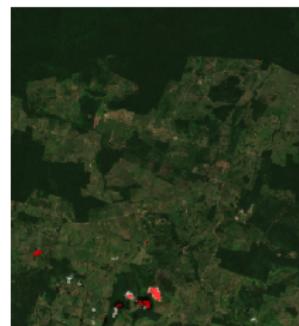
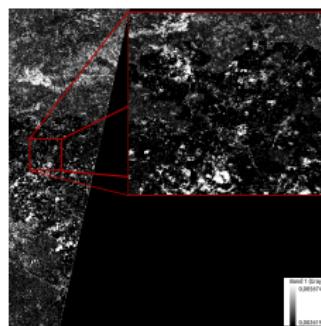
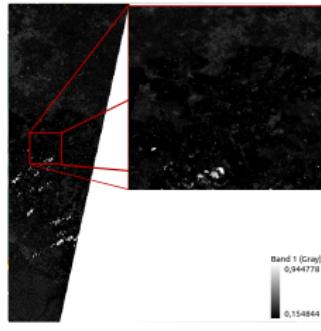
# Date: 2021-05-30



# Date: 2021-06-02



# Date: 2021-06-02



# Updates

- Computed the Brightness Index.
- Computed the error with Euclidean distance.



# Brightness Index (BI)

This index results from the following equation:

$$BI = \sqrt{\frac{(Red^2/Green^2)}{2}} \quad (1)$$

where Red is the Band 4 and Green is the Band 3. The index is sensitive to the brightness of soils. High soil brightness is linked with soil humidity and the presence of salts in the soil.



# Brightness Index

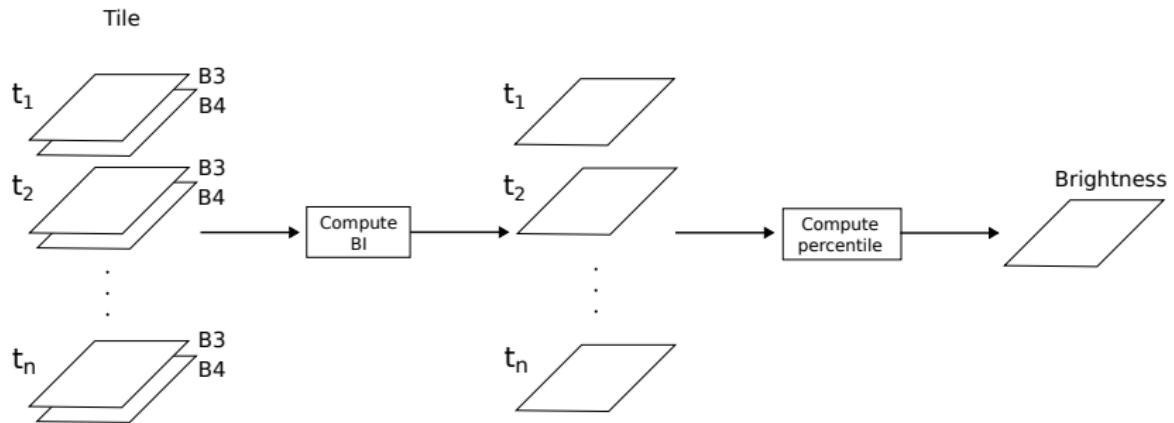


Figure 8: Workflow of the compute of BI.



# Brightness Index

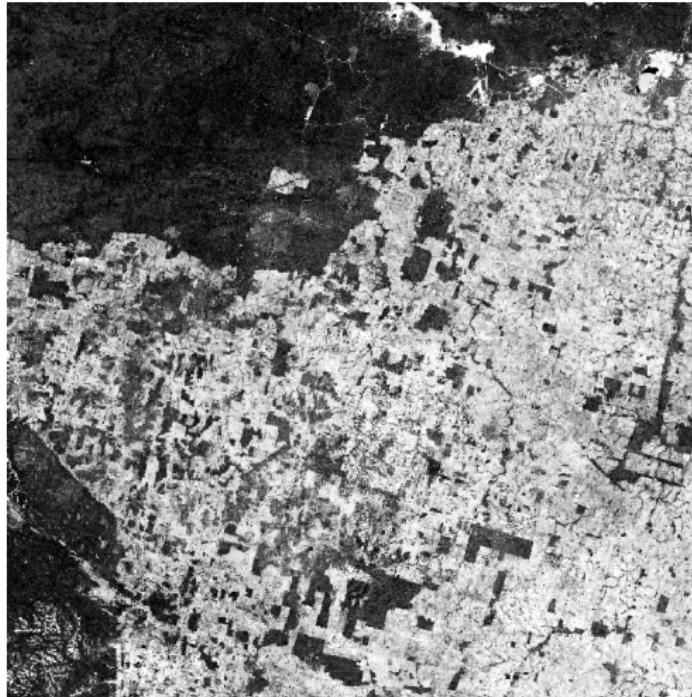


Figure 9: Brightness Index (percentile 20) of Tile 22MET.



An aerial satellite photograph of a coastal region. The landscape is a mix of green agricultural fields, some with distinct grid patterns, and brown, less vegetated areas. A network of roads cuts through the land, with a prominent highway running along the coast on the right. In the lower-left foreground, there's a cluster of buildings, possibly a industrial or residential complex, with several large tanks or reservoirs nearby. The coastline is visible on the far right, showing the transition from land to the dark blue sea.

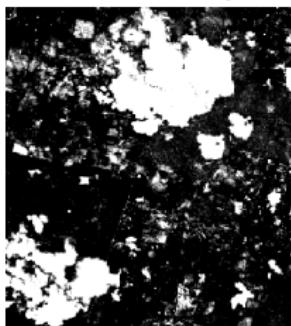
New results

# Date: 2021-05-13

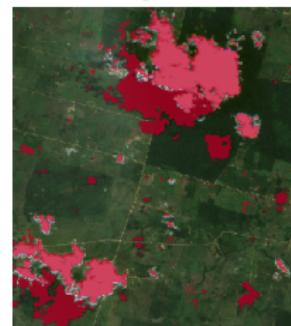
True color



Error map



Binary mask

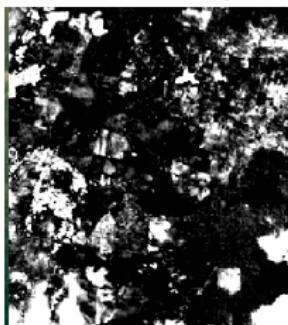


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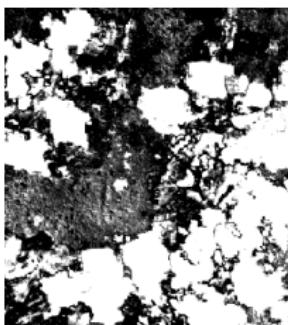
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Error map



Binary mask



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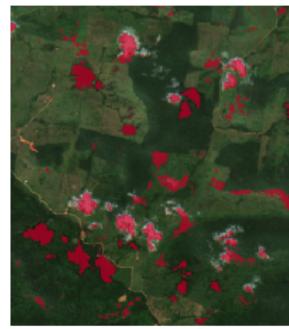
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Error map



Binary mask



# Date: 2021-05-25

True color



Error map



Binary mask

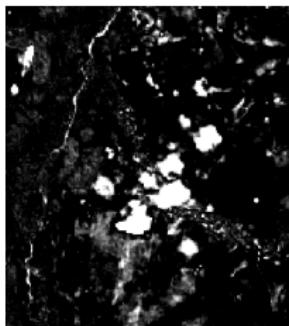


# Date: 2021-05-25

True color



Error map

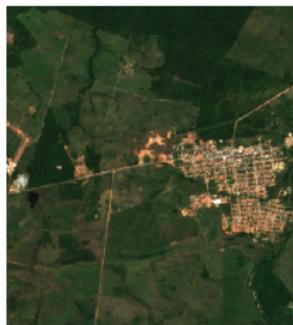


Binary mask



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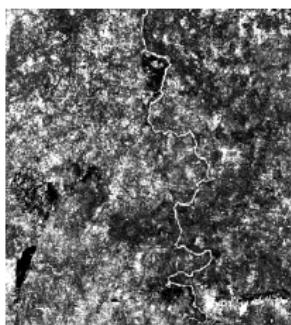
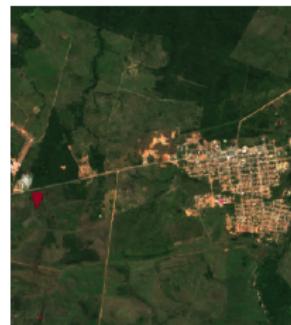
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Error map



Binary mask

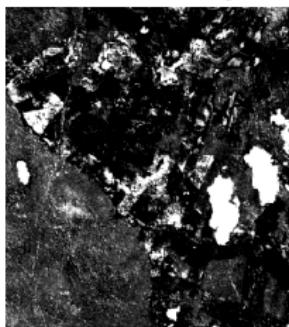


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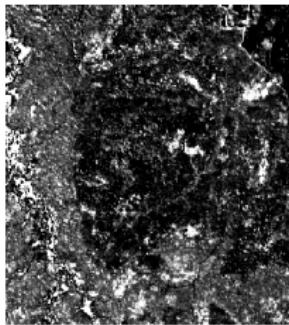
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Error map



Binary mask



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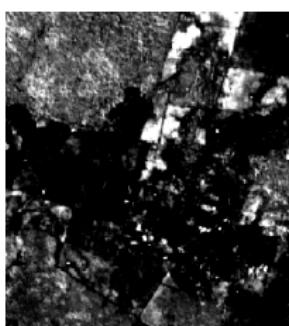
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Error map

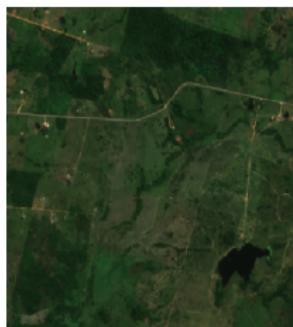


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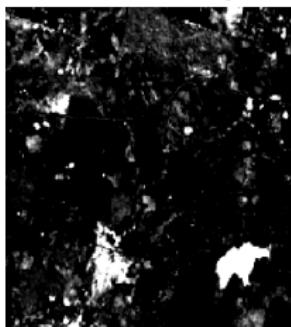


# Date: 2021-05-28

True color



Error map

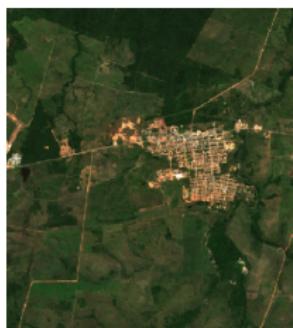


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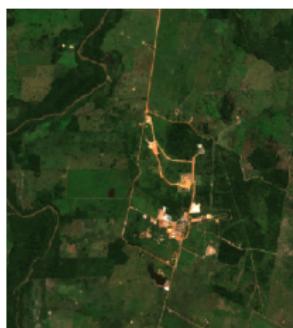
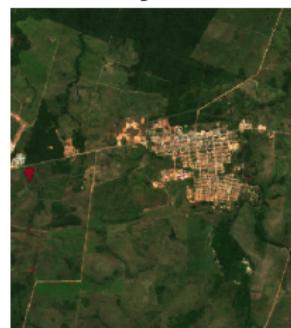
True color



Error map



Binary mask

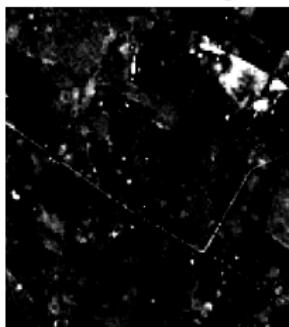


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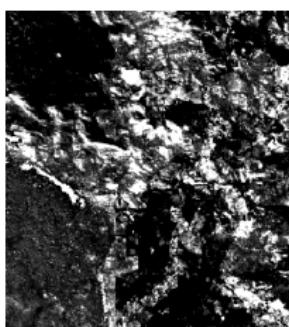
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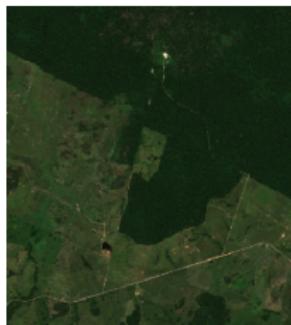


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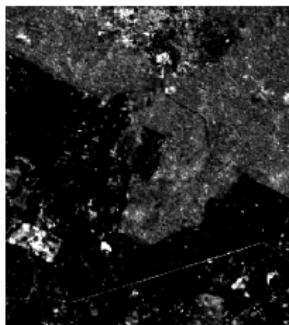


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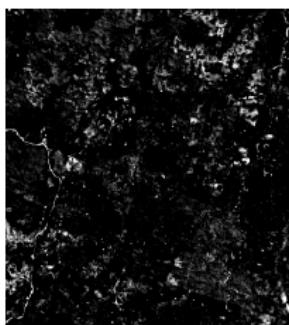
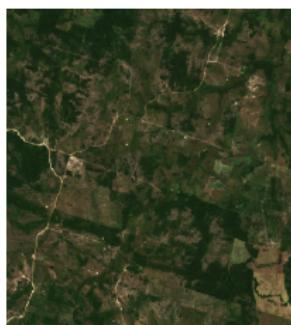
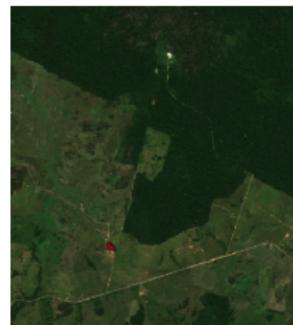
True color



Error map



Binary mask

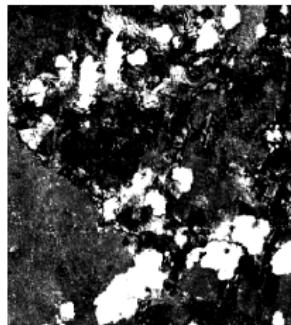


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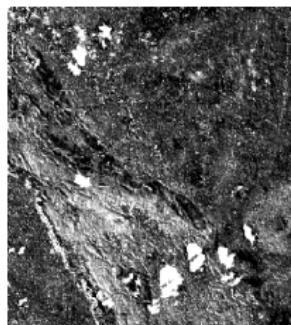
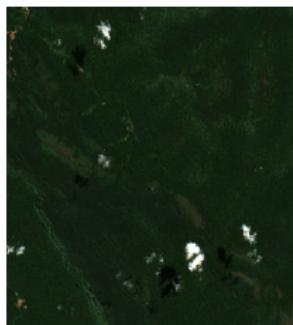
True color



Error map



Binary mask

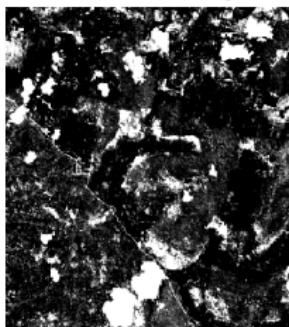


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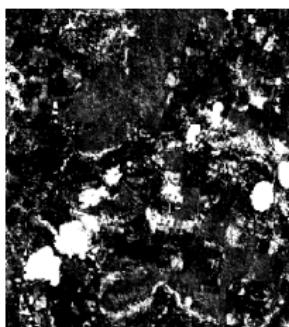
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Error map

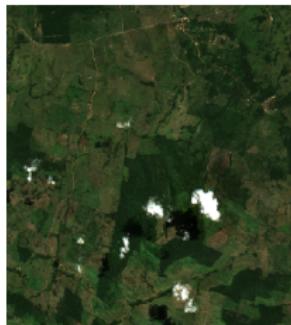


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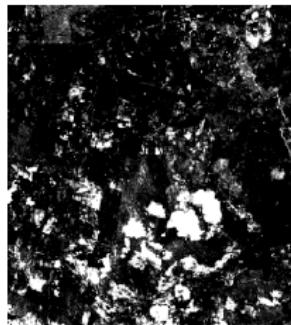


# Date: 2021-06-02

True color



Error map



Binary mask

