



High Quality Labeling

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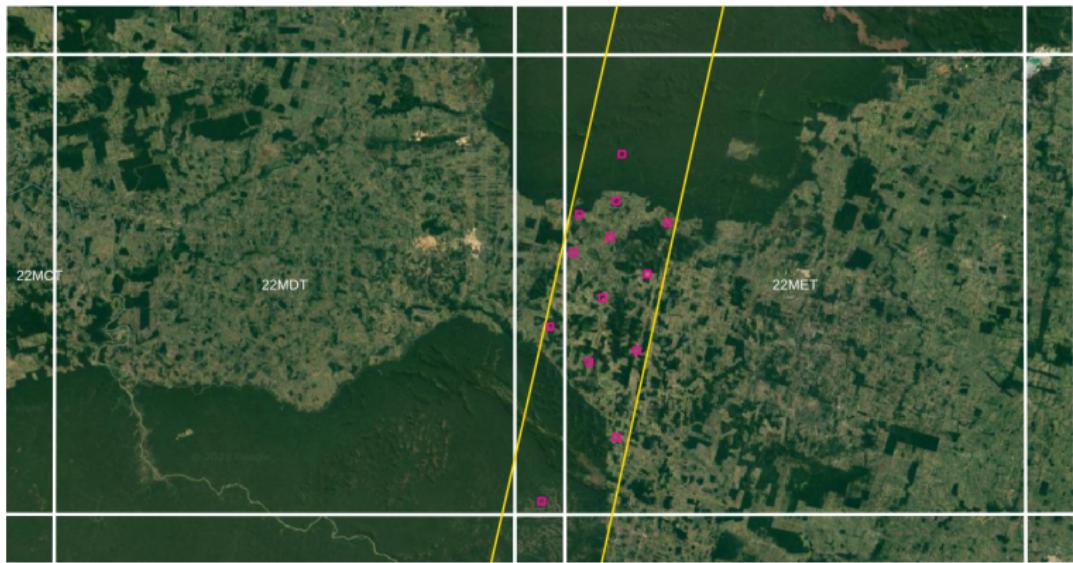


Figure 1: All polygons over area of interest: 22MET overlap.

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		Classes
Tiles	22MET	Fully Cloudy
Number of polygons	12	PC
Time range	2021-05-01	Full Shadow
	2021-09-30	Partly Shadow
Total number observations	61	PS
Number with HQ observations	34	Low quality
Number of spectral bands	12*	Medium quality
Number of features	13 (bands + ndvi)	High quality

*All spectral bands except B10

Table 1: Description of the dataset.

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

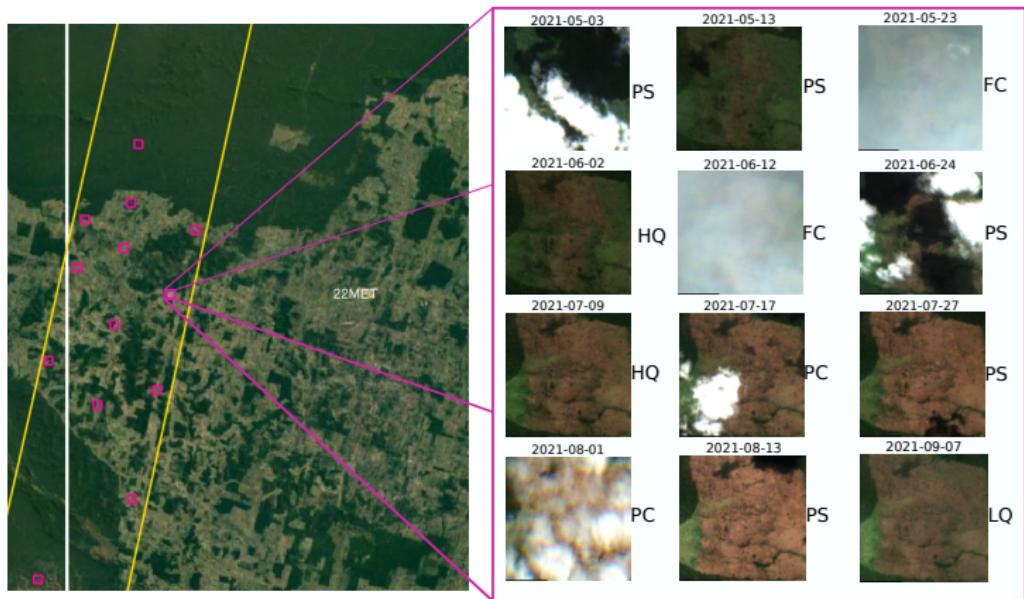


Figure 2: Polygon 1. Examples of some observation/labels.

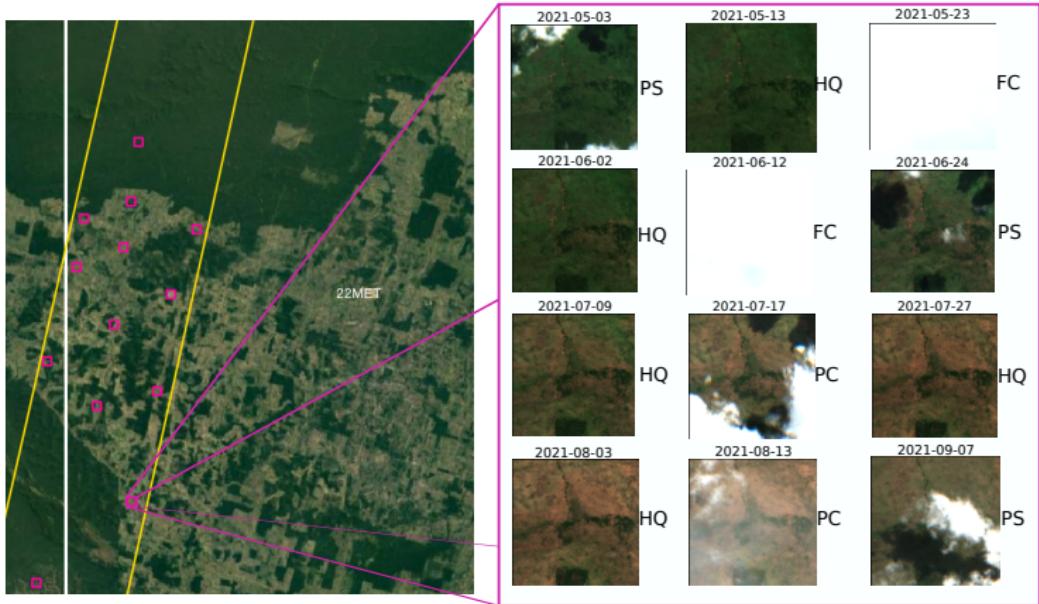


Figure 3: Polygon 2. Examples of some observation/labels.

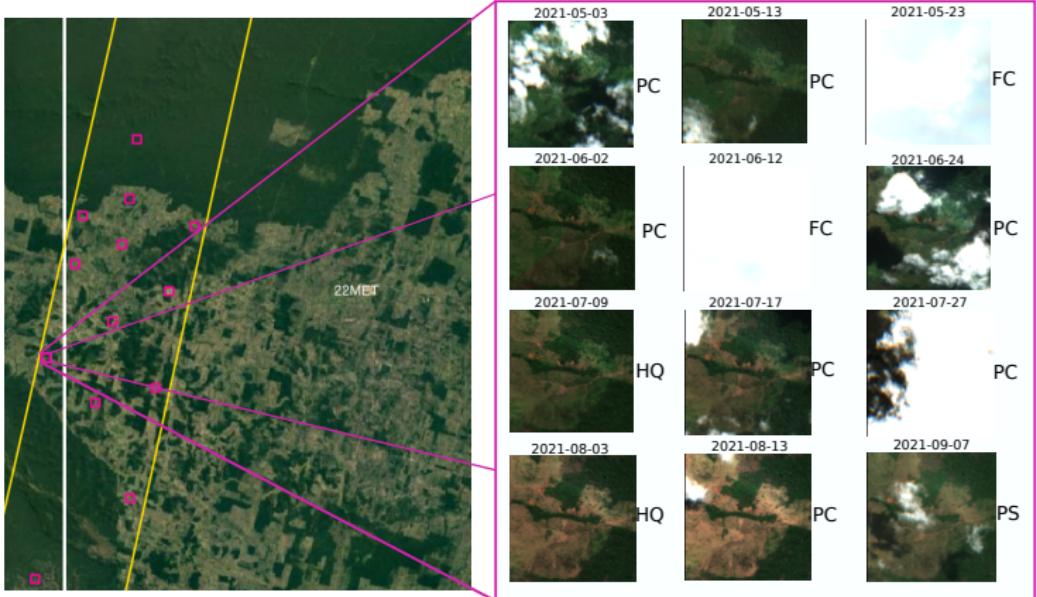


Figure 4: Polygon 3. Examples of some observation/labels.

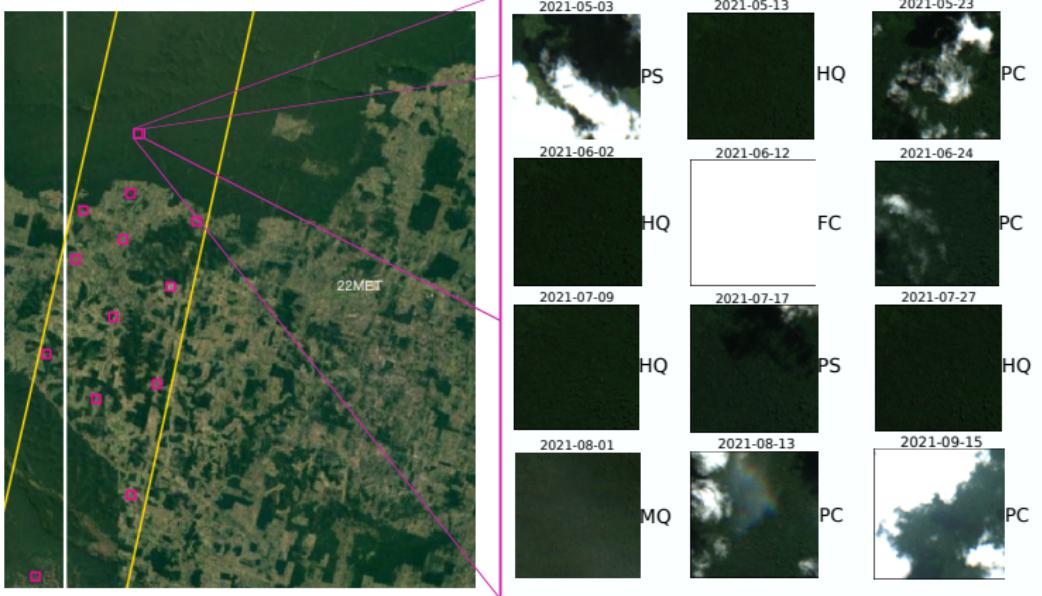


Figure 5: Polygon 4. Examples of some observation/labels.

An aerial satellite 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 terrain, with a prominent highway running along the coast on the right. In the lower-left foreground, there is a cluster of buildings, including several large industrial or institutional structures with red roofs. The coastline is visible on the far right, showing a sandy beach and the blue sea. The word "Training" is overlaid in white text in the center of the image.

Training

Implementation details of the AE

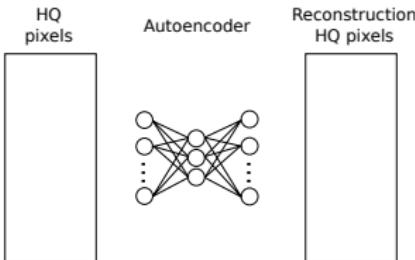


Figure 6: Workflow of training.

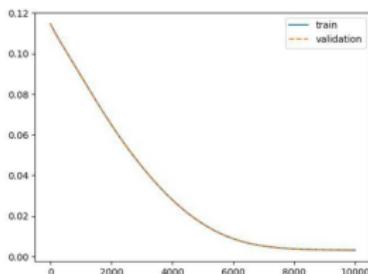


Figure 7: Loss function.

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

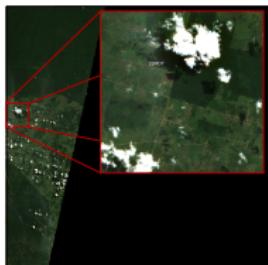
Table 3: Setting up of the Autoencoders hyperparameters.

An aerial satellite photograph of a coastal region. The landscape is a mix of green agricultural fields, some brown and dry land, and a network of roads. A large industrial or construction site with several large buildings and parking lots is visible in the lower-left foreground. To the right, a long stretch of coastline features a sandy beach and a line of buildings, possibly a resort or residential area. The water is a deep blue.

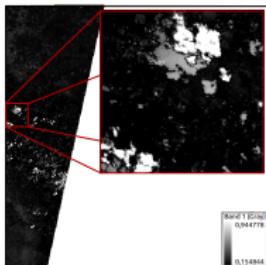
Results

Date: 2021-05-13

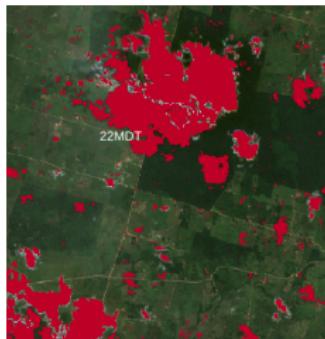
TCI



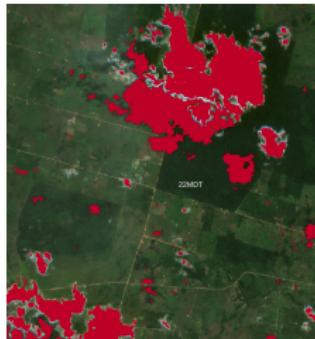
Error map



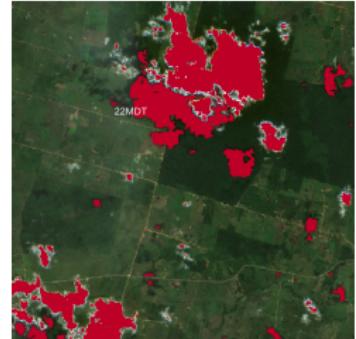
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Binary masks
threshold = 0.4



threshold = 0.5



Cinvestav



BOKU



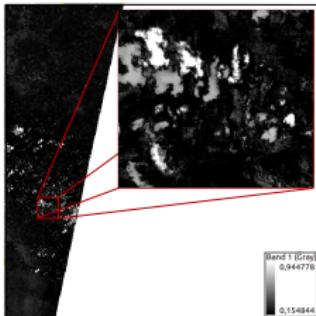
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Date: 2021-05-13

TCI



Error map

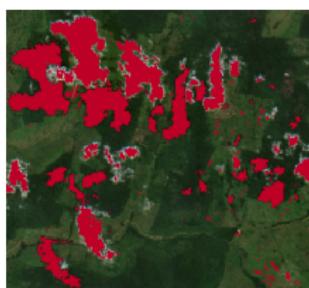


Binary masks

threshold = 0.3



threshold = 0.4



threshold = 0.5

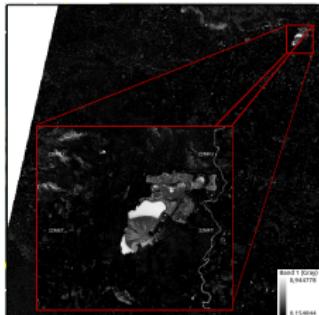


Date: 2021-05-25

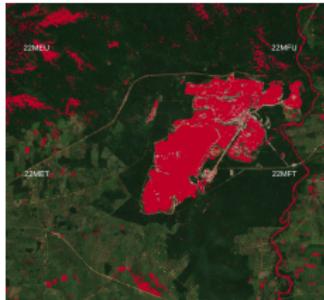
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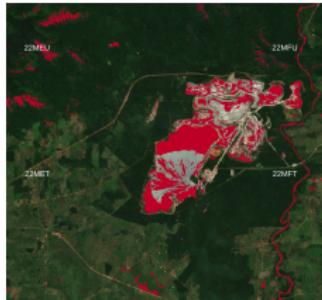
Error map



threshold = 0.3



threshold = 0.4



threshold = 0.5



Cinvestav



BOKU



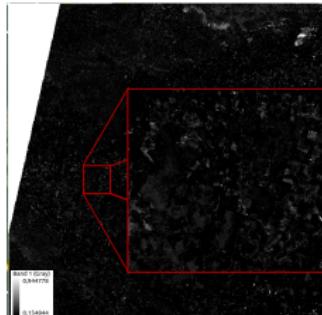
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Date: 2021-05-25

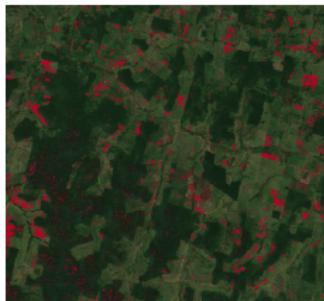
TCI



Error map



threshold = 0.3



Binary masks
threshold = 0.4

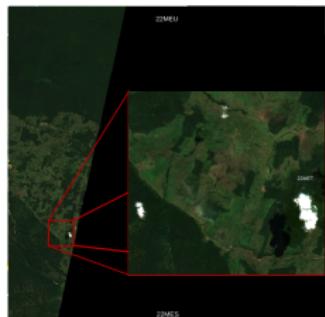


threshold = 0.5

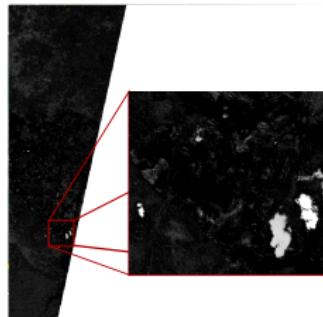


Date: 2021-05-28

TCI



Error map



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Binary masks
threshold = 0.4



threshold = 0.5

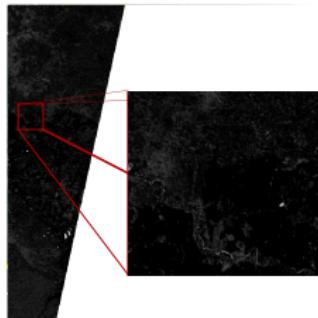


Date: 2021-05-28

TCI



Error map



threshold = 0.3



Binary masks
threshold = 0.4



threshold = 0.5

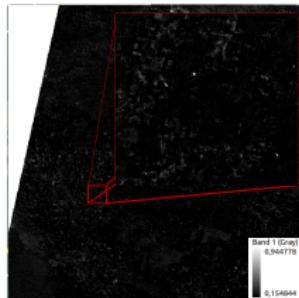


Date: 2021-05-30

TCI



Error map



threshold = 0.3



Binary masks
threshold = 0.4



threshold = 0.5



Date: 2021-05-30

TCI



Error map



threshold = 0.3



Binary masks
threshold = 0.4



threshold = 0.5

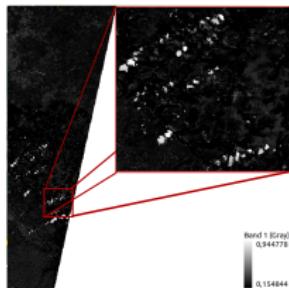


Date: 2021-06-02

TCI



Error map



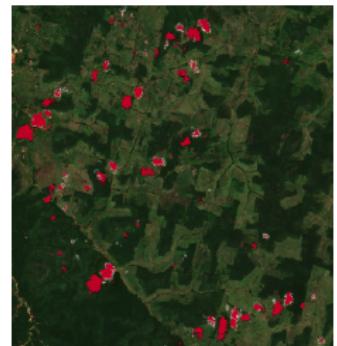
threshold = 0.3



Binary masks
threshold = 0.4



threshold = 0.5



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Date: 2021-06-02

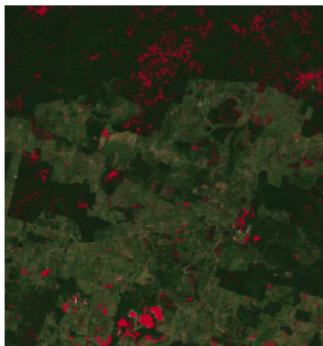
TCI



Error map



threshold = 0.3



Binary masks
threshold = 0.4



threshold = 0.5

