This document contains the following things.

1. Results when SEVIRI images rather than google earth engine images are used to find the existence of clouds over a particular rain gauge station.

1. Image intensity of a cropped region over a particular period.

1. Intensity distribution of colors in cropped regions.

1. It contains the test AUC plots for all stations, for approach 2, for all areas.

The following images show the the intensity of the cropped region.

Area 0.1 = 22 kilometer square with center at rain gauge.

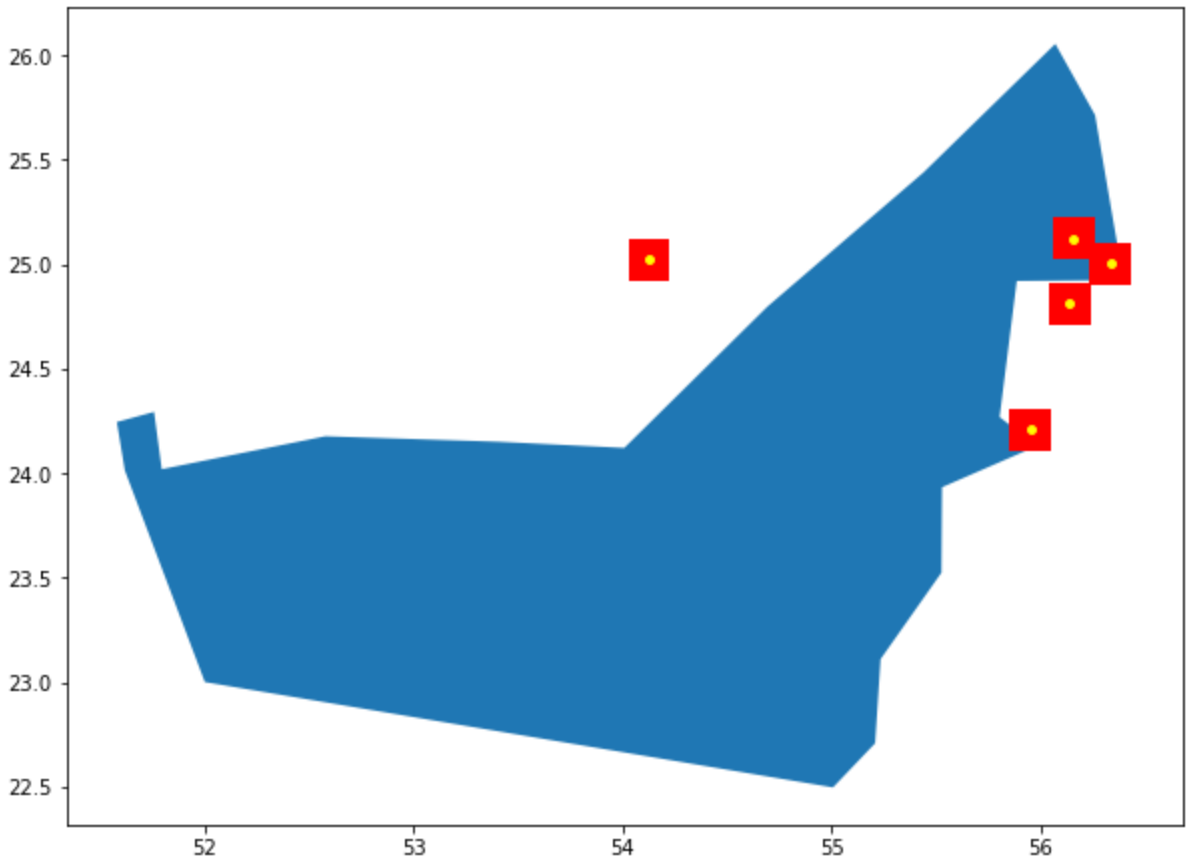
Area 0.3 = 67 kilometer

Area 0.5 = 111 kilometer

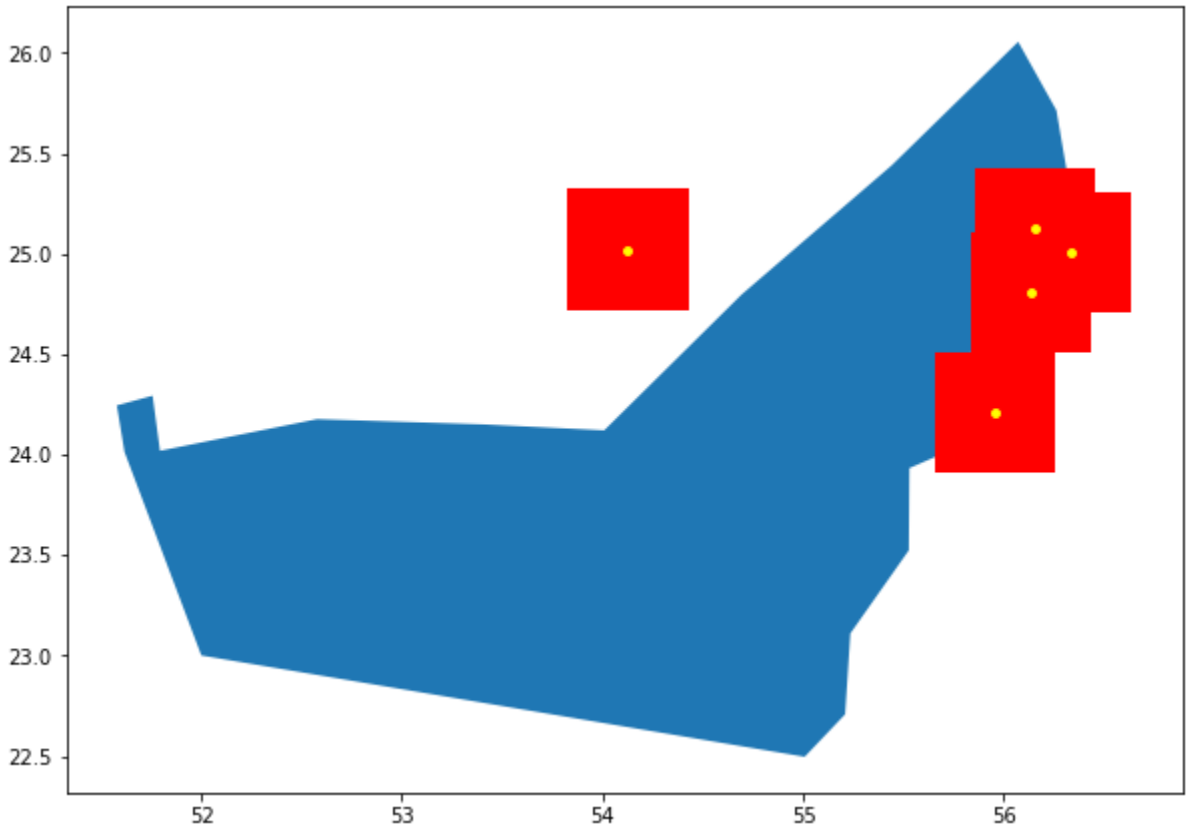
Area 1.0 = 222 kilometer

The yellow dot shows the position of the rain gauge.

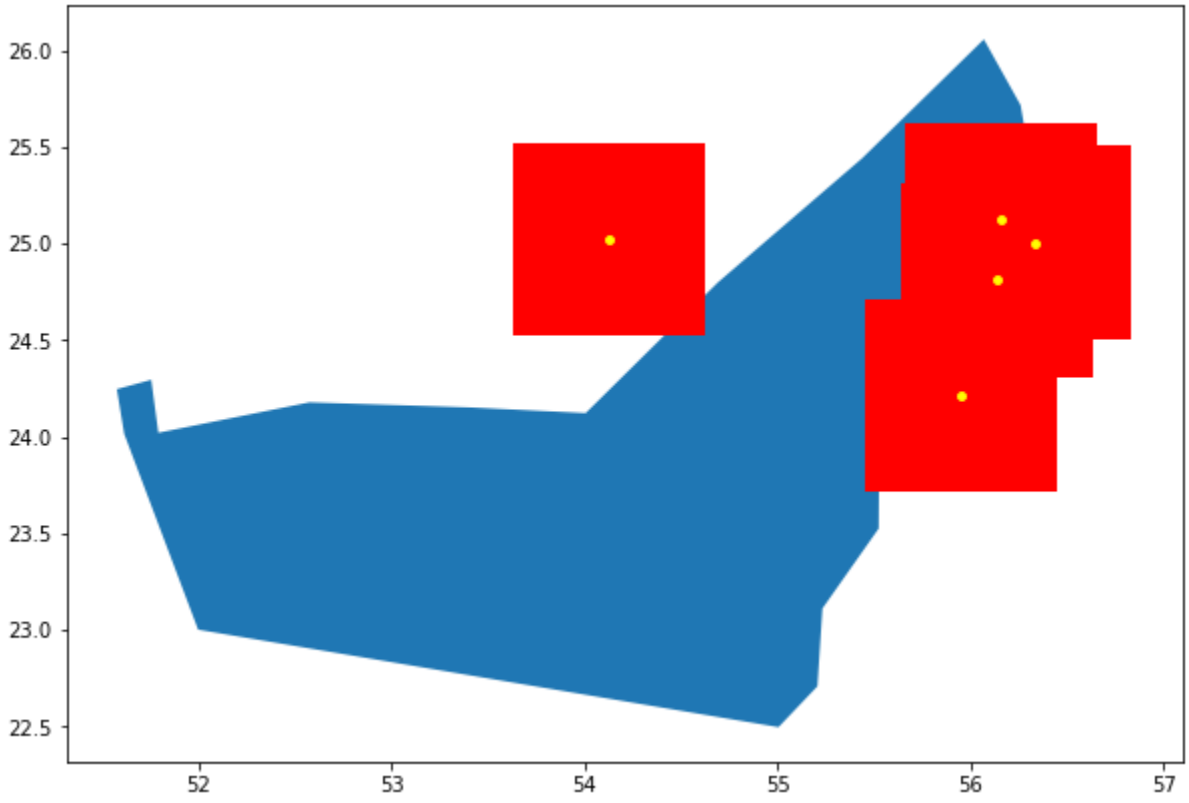
Area = 0.1



Area = 0.3



Area = 0.5



Area = 1.0

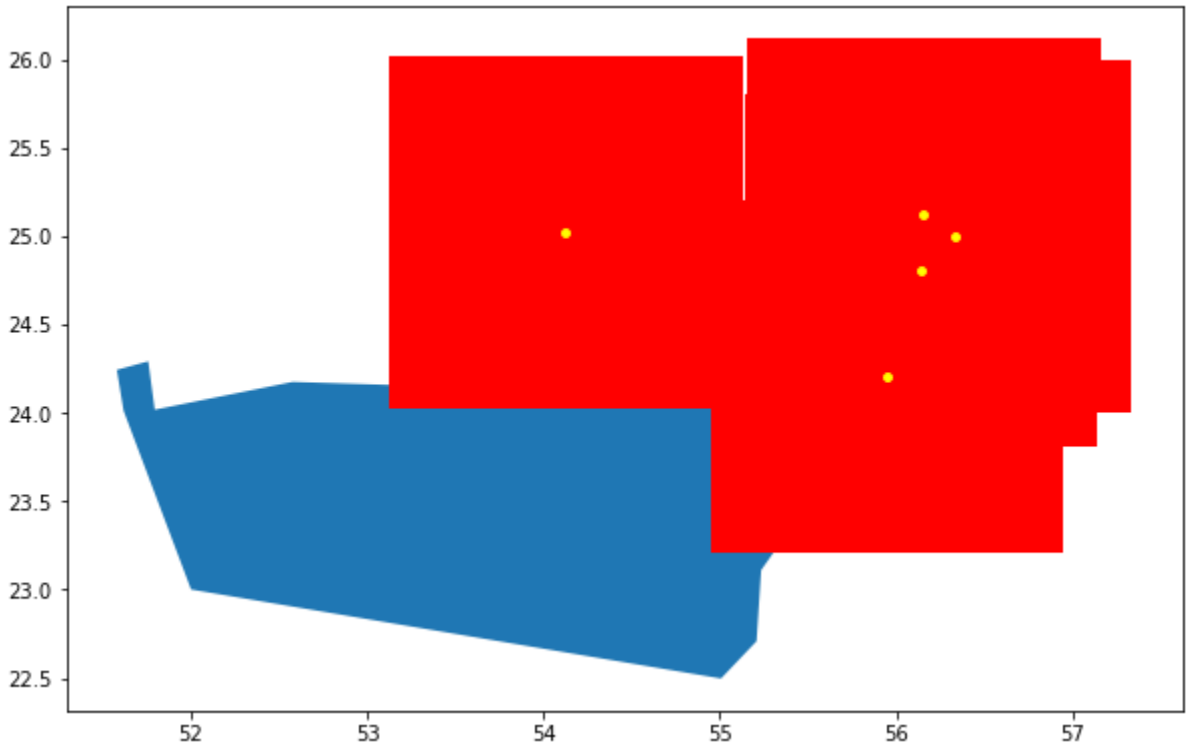
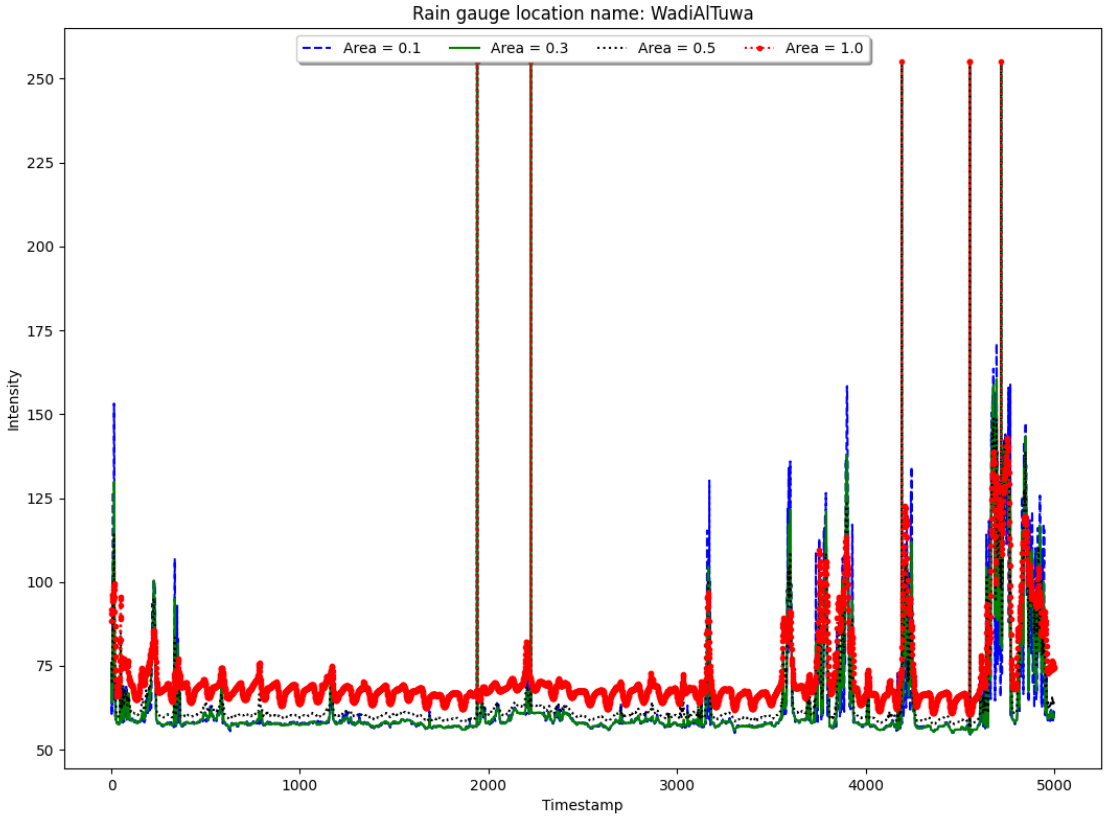
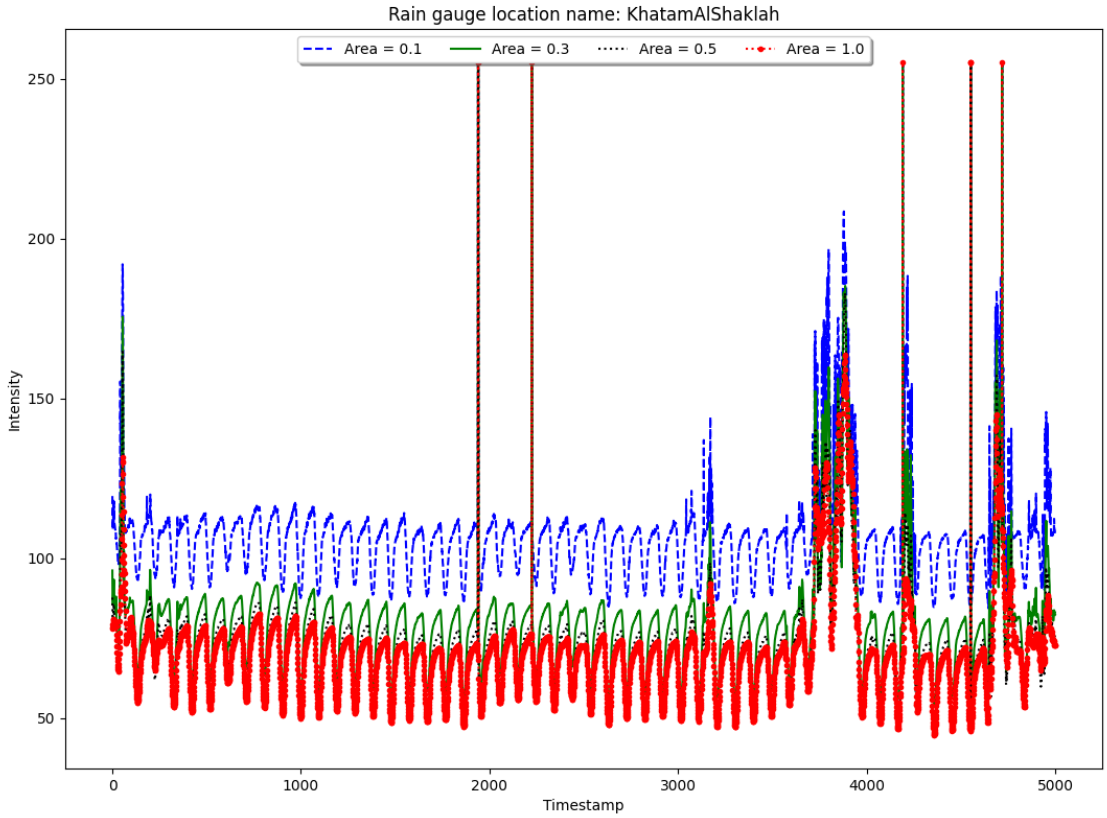
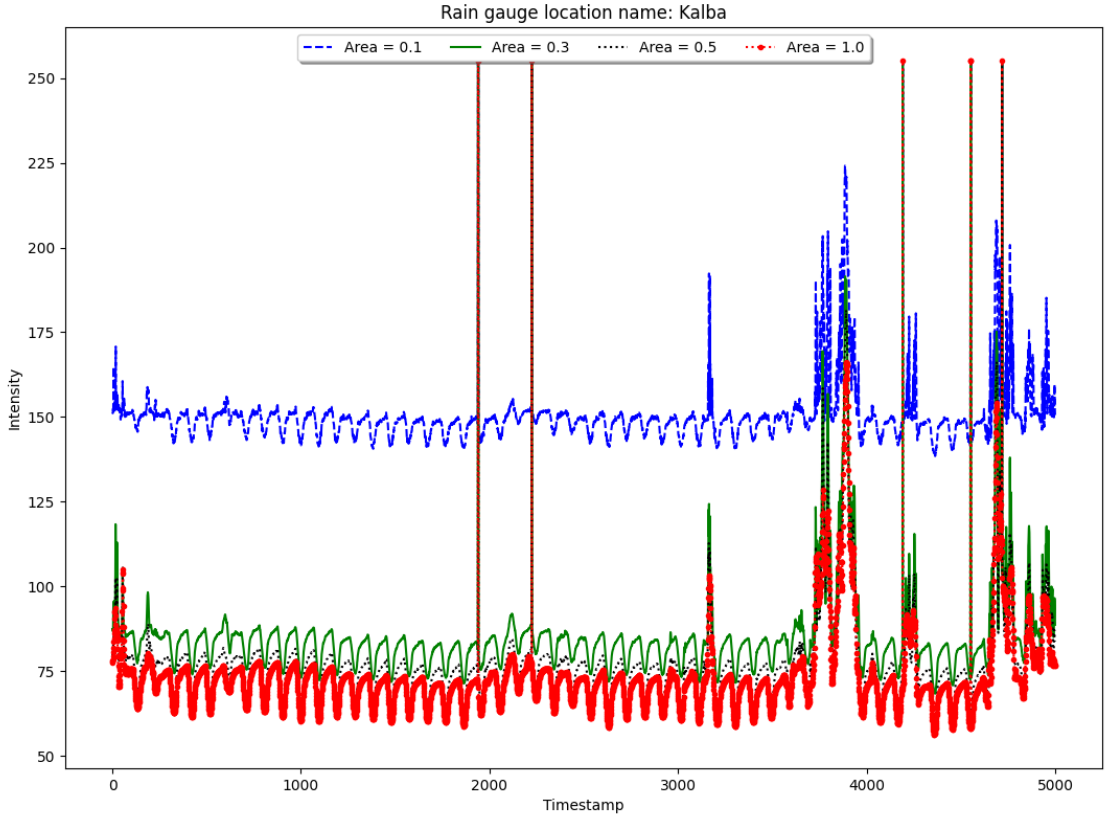
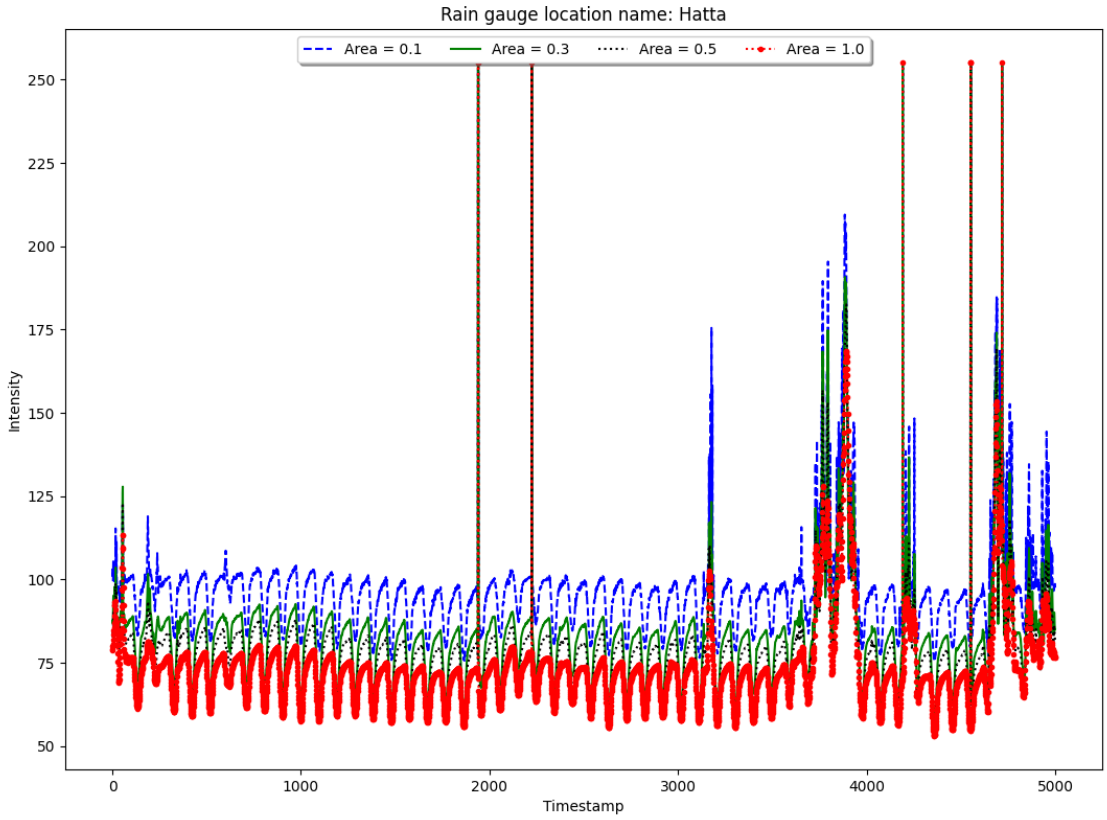


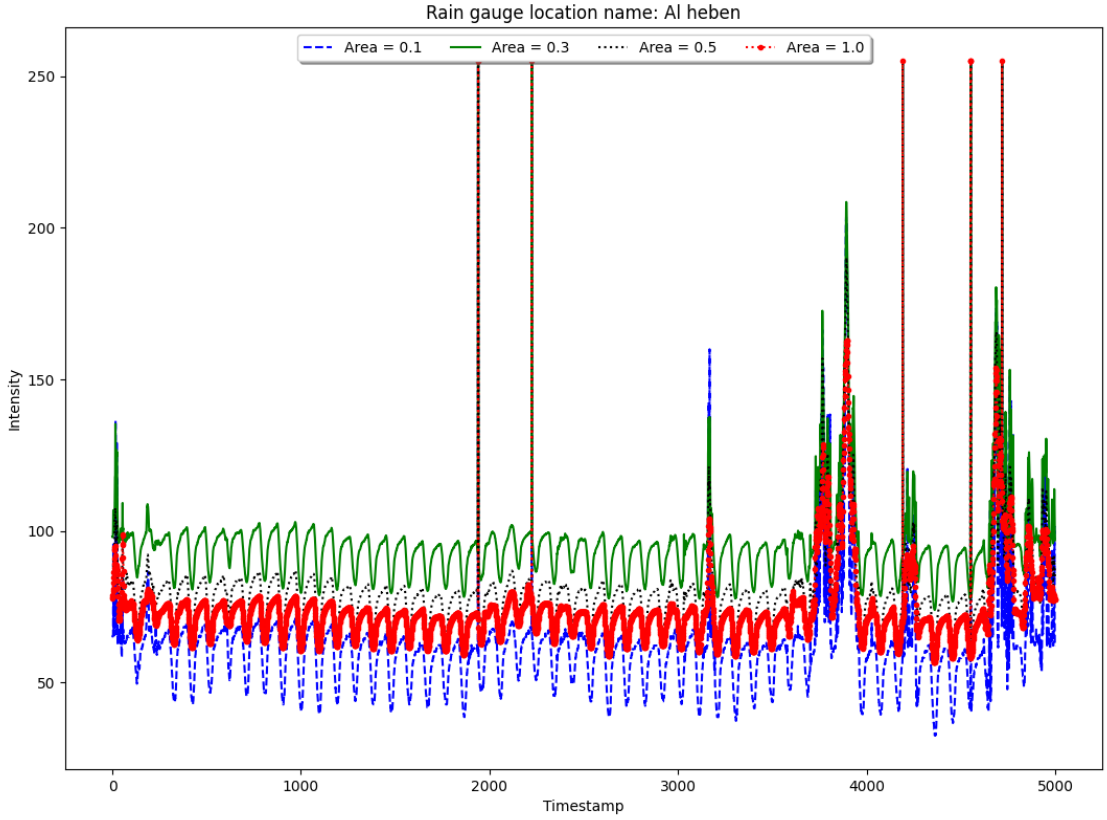
Image intensity of a cropped region over a particular period.



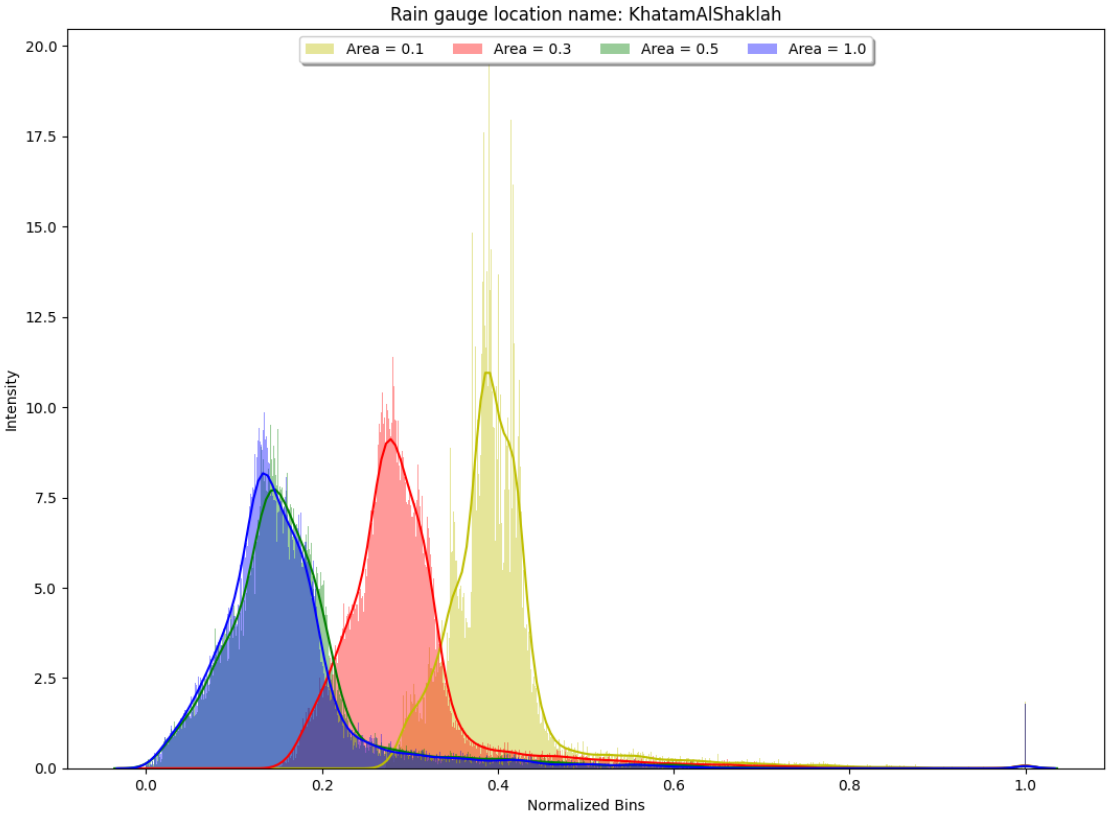

Rain gauge location name: KhatamAlShaklah
Area = 0.1
Area = 0.3
Area = 0.5
Area = 1.0
Intensity
Timestamp
250
200
150
100
50
0
1000
2000
3000
4000
5000

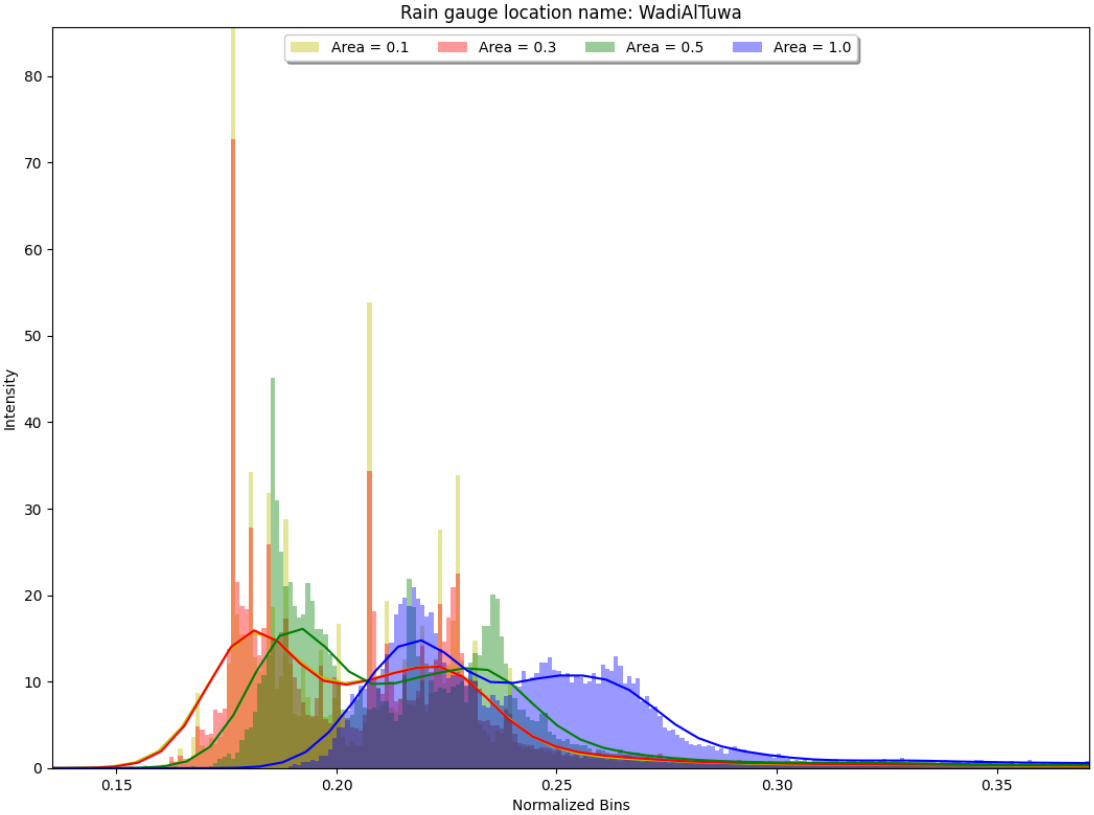

Rain gauge location name: Kalba
Area = 0.1
Area = 0.3
Area = 0.5
Area = 1.0
Intensity
Timestamp
250
225
200
175
150
125
100
75
50
0
1000
2000
3000
4000
5000

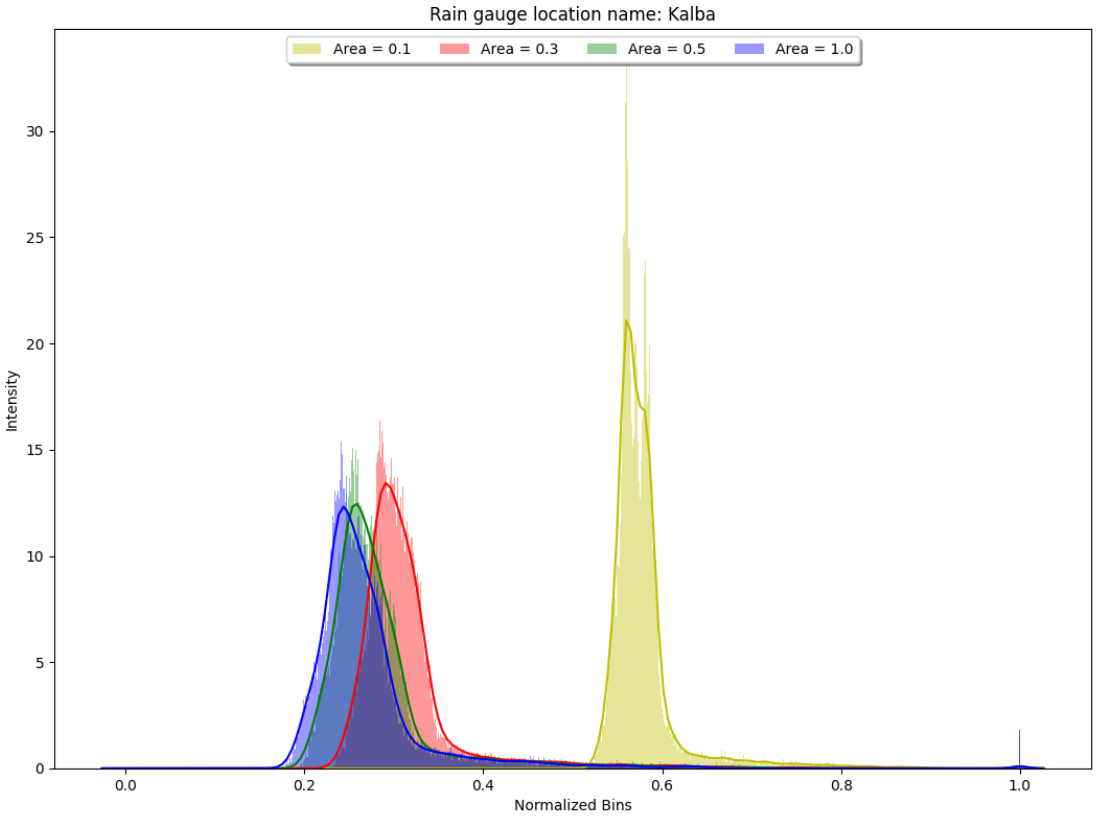


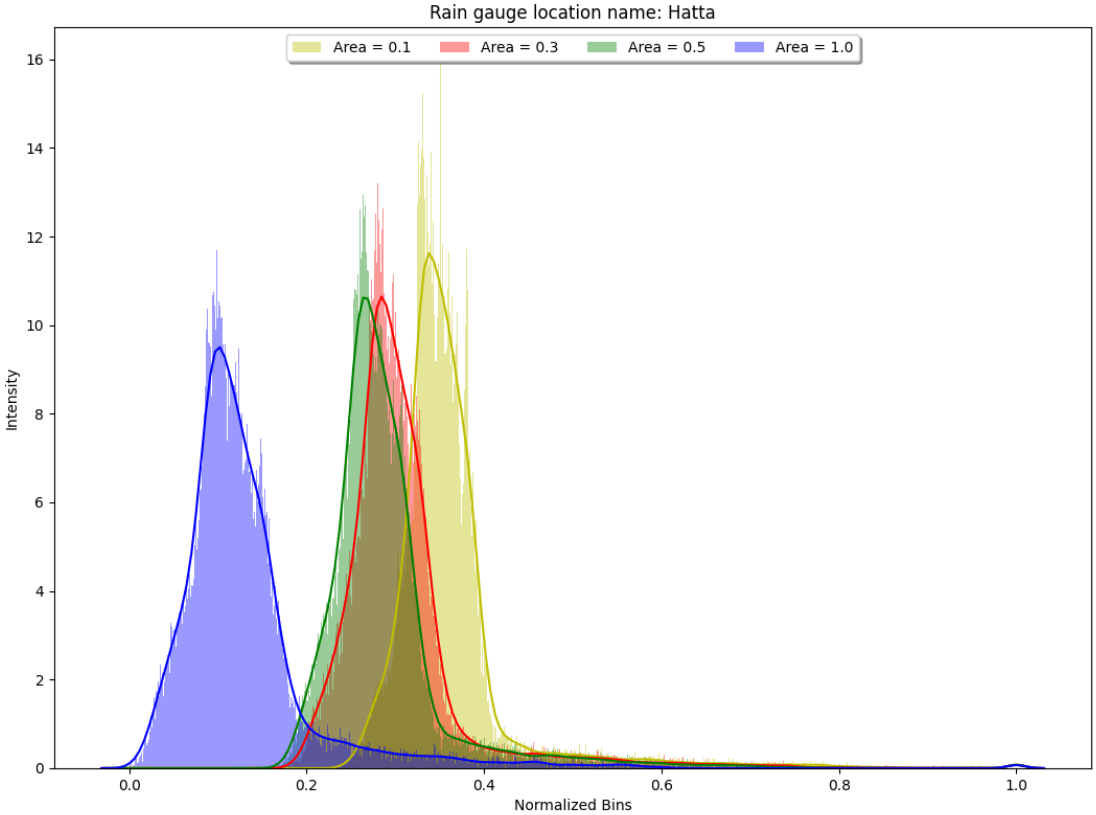


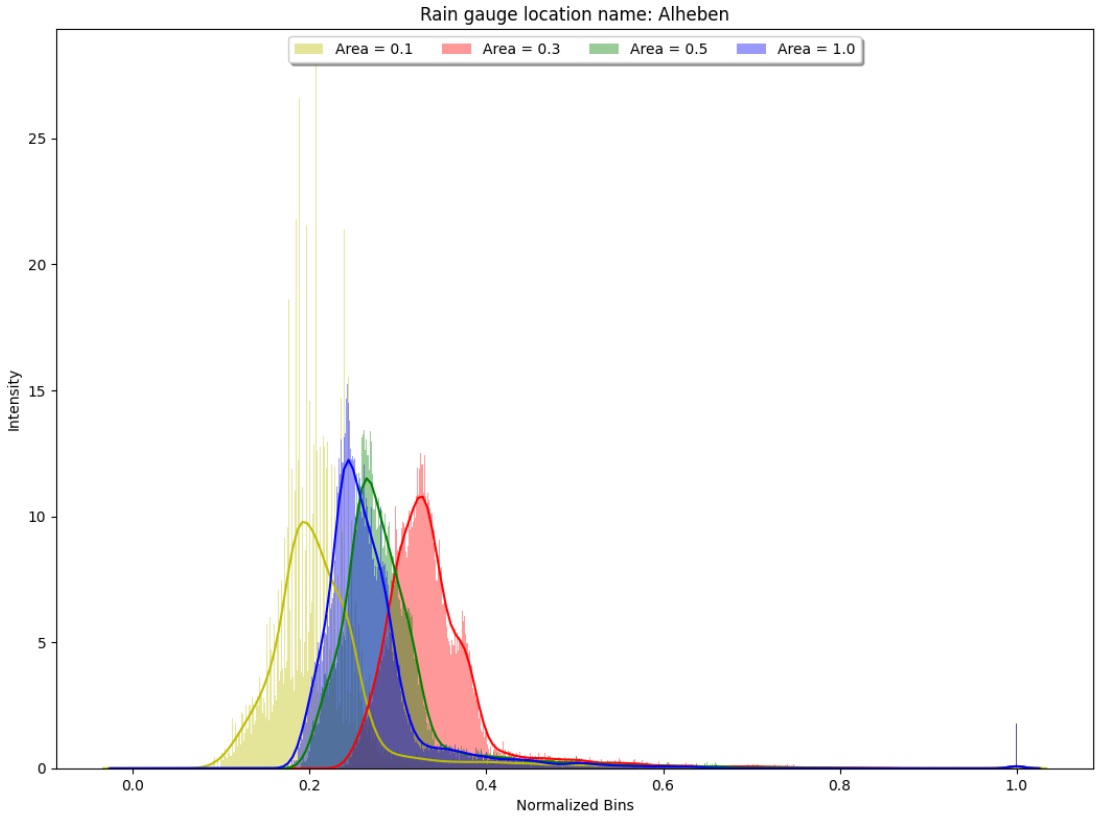
Intensity distribution of colors in cropped regions.


Rain gauge location name: KhatamAlShaklah
Area = 0.1
Area = 0.3
Area = 0.5
Area = 1.0
Intensity
Normalized Bins
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
0.0
0.2
0.4
0.6
0.8
1.0

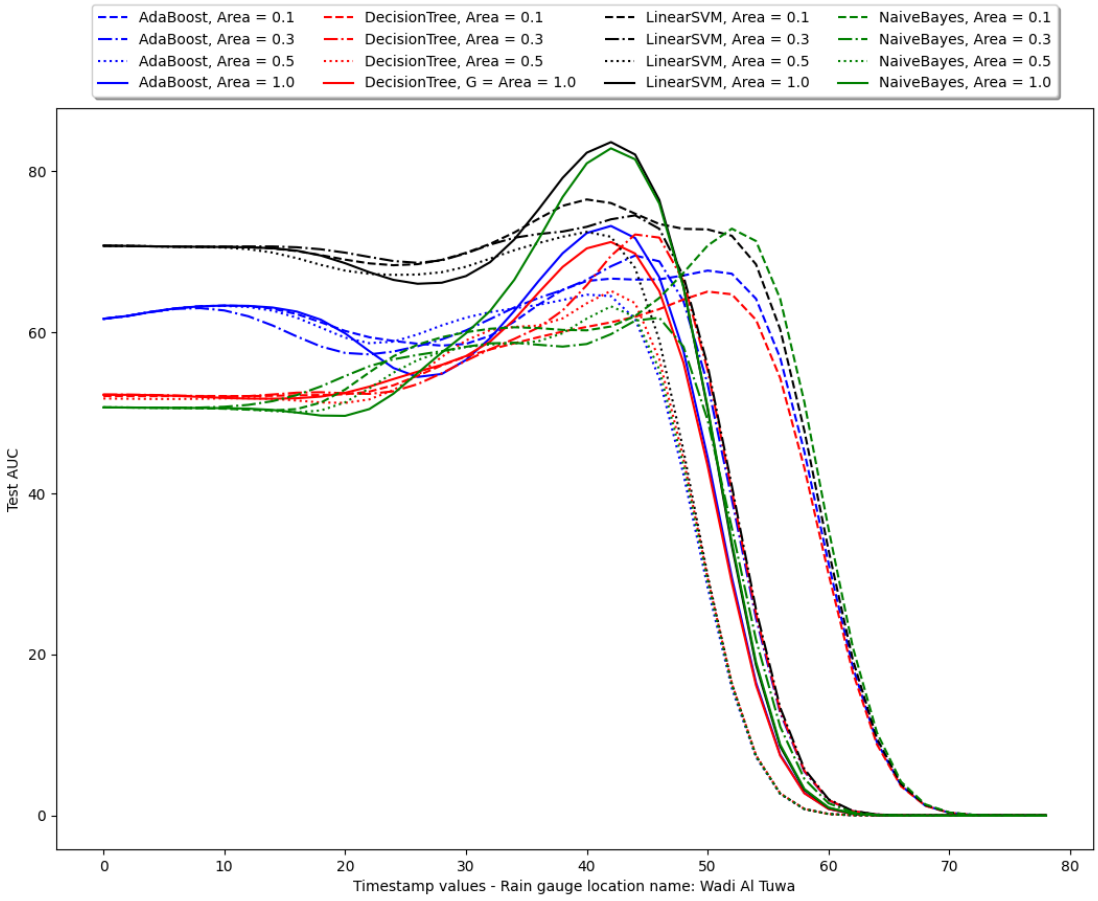

Rain gauge location name: WadiAlTuwa
Area = 0.1
Area = 0.3
Area = 0.5
Area = 1.0
Intensity
Normalized Bins
0
10
20
30
40
50
60
70
80
0.15
0.20
0.25
0.30
0.35

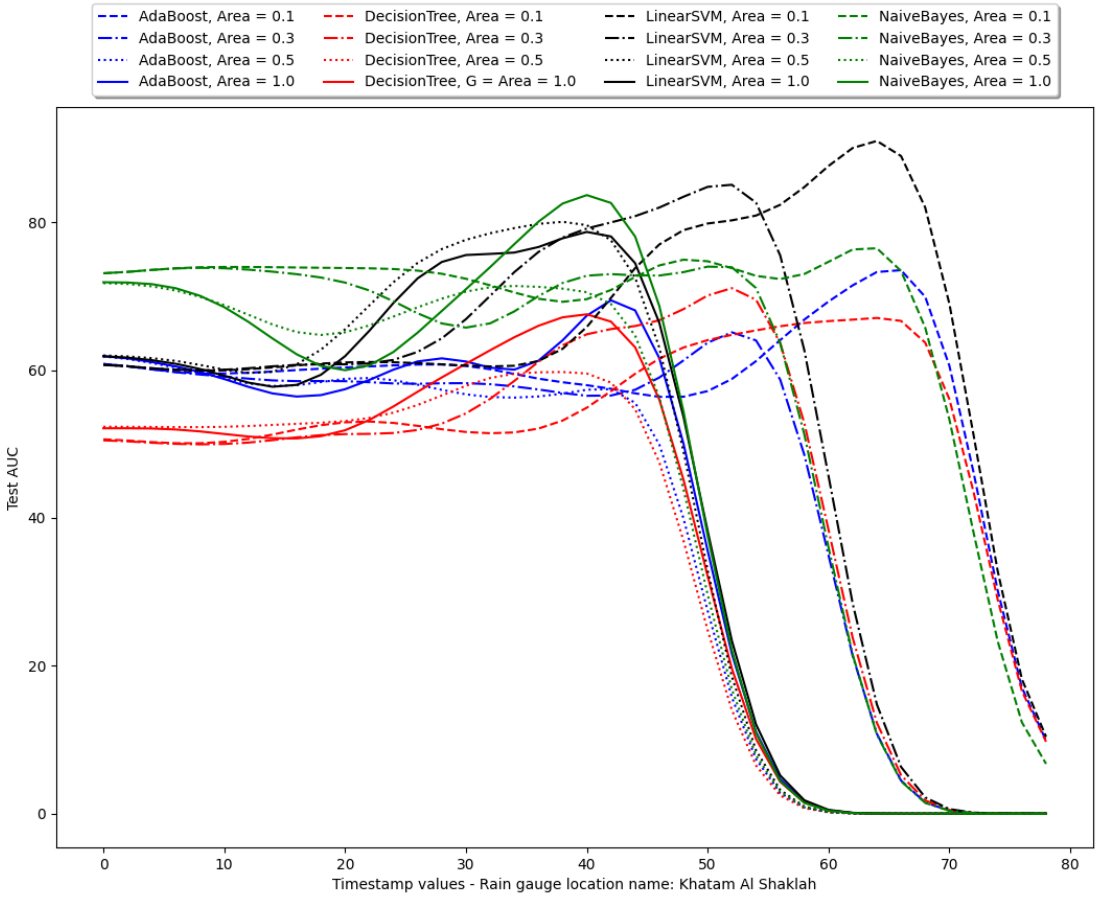

Rain gauge location name: Kalba
Area = 0.1
Area = 0.3
Area = 0.5
Area = 1.0
Intensity
Normalized Bins
0
5
10
15
20
25
30
0.0
0.2
0.4
0.6
0.8
1.0

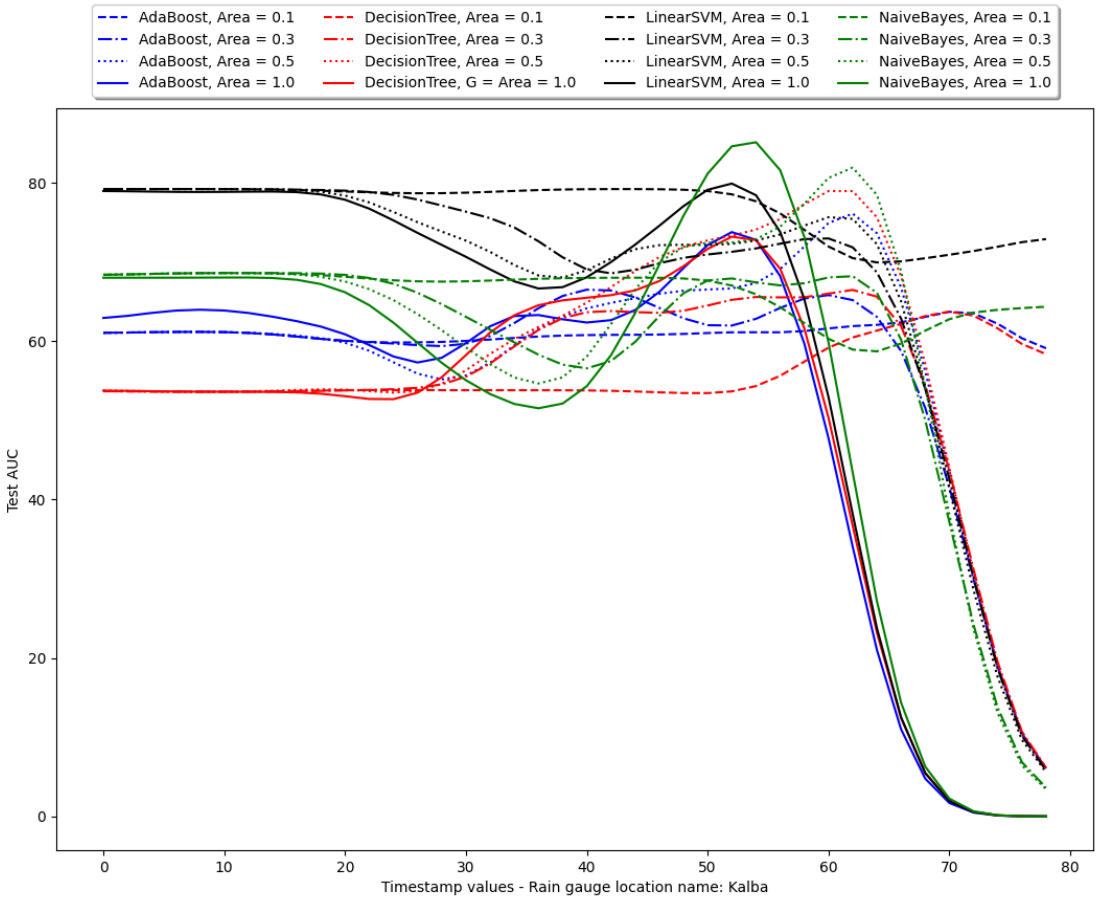

Rain gauge location name: Hatta
Area = 0.1
Area = 0.3
Area = 0.5
Area = 1.0
Intensity
Normalized Bins
0
2
4
6
8
10
12
14
16
0.0
0.2
0.4
0.6
0.8
1.0

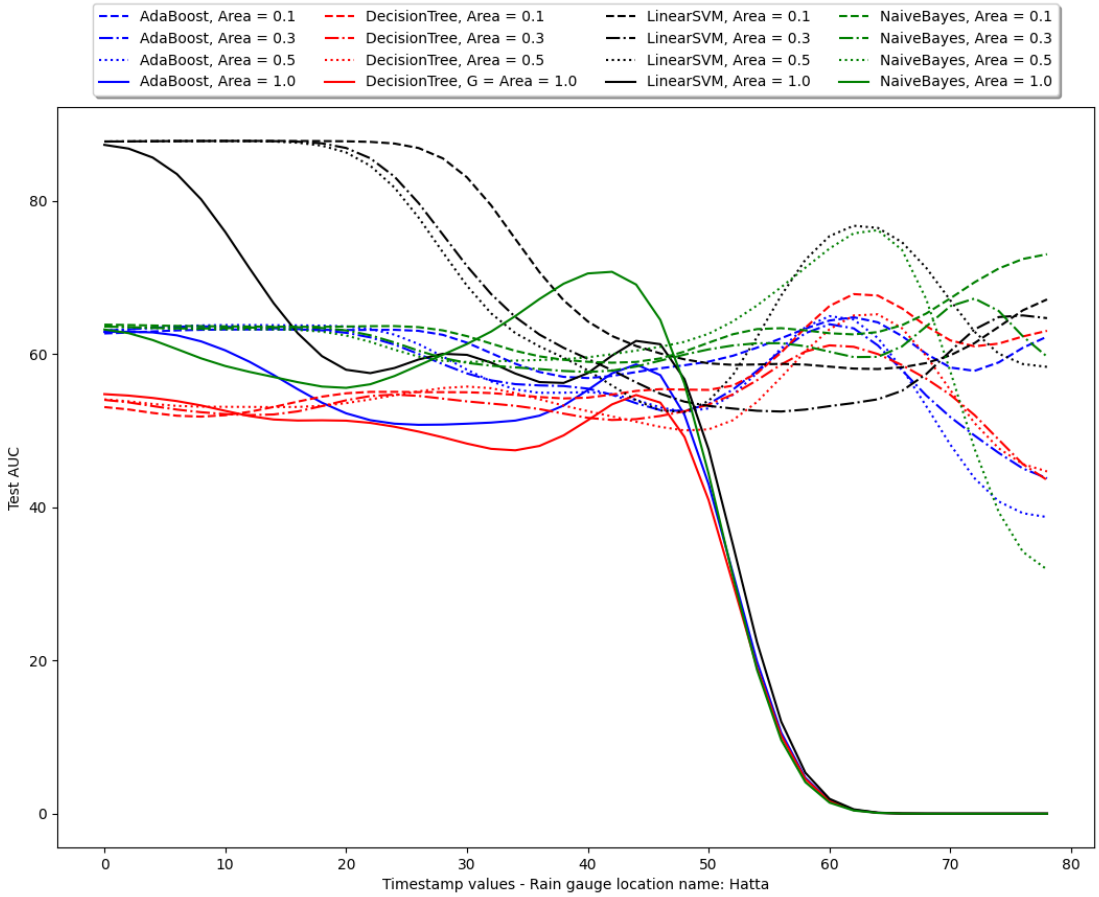

Rain gauge location name: Alheben
Area = 0.1
Area = 0.3
Area = 0.5
Area = 1.0
Intensity
Normalized Bins

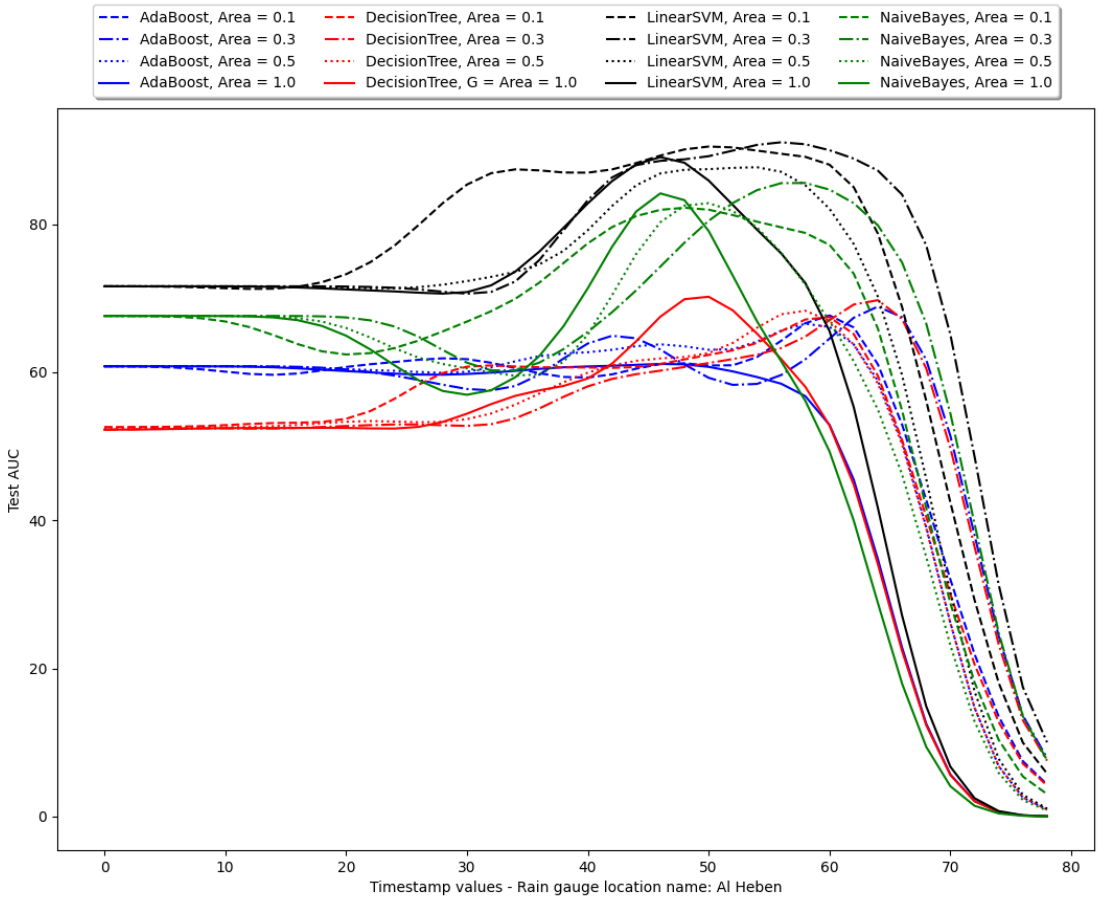
Test AUC


AdaBoost, Area = 0.1
AdaBoost, Area = 0.3
AdaBoost, Area = 0.5
AdaBoost, Area = 1.0
DecisionTree, Area = 0.1
DecisionTree, Area = 0.3
DecisionTree, Area = 0.5
DecisionTree, G = Area = 1.0
LinearSVM, Area = 0.1
LinearSVM, Area = 0.3
LinearSVM, Area = 0.5
LinearSVM, Area = 1.0
NaiveBayes, Area = 0.1
NaiveBayes, Area = 0.3
NaiveBayes, Area = 0.5
NaiveBayes, Area = 1.0
Test AUC
Timestamp values - Rain gauge location name: Wadi Al Tuwa


AdaBoost, Area = 0.1
AdaBoost, Area = 0.3
AdaBoost, Area = 0.5
AdaBoost, Area = 1.0
DecisionTree, Area = 0.1
DecisionTree, Area = 0.3
DecisionTree, Area = 0.5
DecisionTree, G = Area = 1.0
LinearSVM, Area = 0.1
LinearSVM, Area = 0.3
LinearSVM, Area = 0.5
LinearSVM, Area = 1.0
NaiveBayes, Area = 0.1
NaiveBayes, Area = 0.3
NaiveBayes, Area = 0.5
NaiveBayes, Area = 1.0
Test AUC
Timestamp values - Rain gauge location name: Khatam Al Shaklah


AdaBoost, Area = 0.1
AdaBoost, Area = 0.3
AdaBoost, Area = 0.5
AdaBoost, Area = 1.0
DecisionTree, Area = 0.1
DecisionTree, Area = 0.3
DecisionTree, Area = 0.5
DecisionTree, G = Area = 1.0
LinearSVM, Area = 0.1
LinearSVM, Area = 0.3
LinearSVM, Area = 0.5
LinearSVM, Area = 1.0
NaiveBayes, Area = 0.1
NaiveBayes, Area = 0.3
NaiveBayes, Area = 0.5
NaiveBayes, Area = 1.0
Test AUC
Timestamp values - Rain gauge location name: Kalba





Results for: Khatam Al Shaklah X: NaiveBayes0.0.csv Accuracy: 71.6 Cloud Threshold 0

Results for: Khatam Al Shaklah X: NaiveBayes0.0.csv Accuracy: 71.6 Cloud Threshold 0

Results for: Khatam Al Shaklah X: NaiveBayes0.0.csv Accuracy: 71.6 Cloud Threshold 0

Results for: Khatam Al Shaklah X: NaiveBayes0.0.csv Accuracy: 71.6 Cloud Threshold 0

Results for: Kalba X: LinearSVM0.0.csv Accuracy: 79.2 Cloud Threshold 0

Results for: Kalba X: LinearSVM0.0.csv Accuracy: 79.2 Cloud Threshold 0

Results for: Kalba X: LinearSVM0.0.csv Accuracy: 79.2 Cloud Threshold 0

Results for: Kalba X: LinearSVM0.0.csv Accuracy: 79.2 Cloud Threshold 0

Results for: Wadi Al Tuwa X: LinearSVM0.0.csv Accuracy: 71.0 Cloud Threshold 0

Results for: Wadi Al Tuwa X: LinearSVM0.0.csv Accuracy: 71.0 Cloud Threshold 0

Results for: Wadi Al Tuwa X: LinearSVM0.0.csv Accuracy: 71.0 Cloud Threshold 0

Results for: Wadi Al Tuwa X: LinearSVM0.0.csv Accuracy: 71.0 Cloud Threshold 0

Results for: Hatta X: NaiveBayes0.0.csv Accuracy: 64.2 Cloud Threshold 0

Results for: Hatta X: LinearSVM0.0.csv Accuracy: 87.6 Cloud Threshold 0

Results for: Hatta X: LinearSVM0.0.csv Accuracy: 87.6 Cloud Threshold 0

Results for: Hatta X: LinearSVM0.0.csv Accuracy: 87.6 Cloud Threshold 0

Results for: Al Heben X: NaiveBayes0.0.csv Accuracy: 67.6 Cloud Threshold 0

Results for: Al Heben X: LinearSVM0.0.csv Accuracy: 71.6 Cloud Threshold 0

Results for: Al Heben X: LinearSVM0.0.csv Accuracy: 71.6 Cloud Threshold 0

Results for: Al Heben X: LinearSVM0.0.csv Accuracy: 71.6 Cloud Threshold 0

Detailed results at this link.

https://github.com/MuhammadMuneeb007/Approach-2---Rain-prediction-using-climate-data-and-cloud-presence-information-from-SERVIR-images

area0.1 contains the results for all stations when the cropped region is 22-kilometer square.

area0.3 contains the results for all stations when the cropped region is 67-kilometer square.

area0.5 contains the results for all stations when the cropped region is 111-kilometer square.

area1.0 contains the results for all stations when the cropped region is 222-kilometer square.

Each file has the following format.

Threshold: Cloud threshold (ranges from 0 to 100 with an interval of 5).

TrainAUC: Training Area under the ROC Curve (With 4-fold stratified cross-validation).

TestAUC: Test Area under the ROC Curve (With 5-fold stratified cross-validation).

Test CM: Test confusion matrix (Average of 5-folds). If the confusion matrix for the particular row is missing, then it means after the cloud threshold, there is only one category left.

Train CM: Training confusion matrix (Average of 5-folds). If the confusion matrix for the particular row is missing, then it means there is only one category left after the cloud threshold.

NoRain_NoCloud: Number of samples for no rain and no cloud for a particular cloud threshold.

NoRain_Cloud: Number of samples for no rain and cloud for a particular cloud threshold.

Rain_NoCloud: Number of samples for rain and no cloud for a particular cloud threshold.

Rain_Cloud: Number of samples for rain and cloud for a particular cloud threshold.

S0train: Number of instances of class NoRain_Cloud in training data.

S1train: Number of instances of class Rain_Cloud in test data.

S0test: Number of instances of class NoRain_Cloud in test data.

S1test: Number of instances of class Rain_Cloud in test data.