Hands on materials for mapping seagrass using Seagrass Mapper / Seagrass Trainer

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Hands on practice on Day 3

1. Load sample training data sets of June 2015 in Nanao Bay
   sample_nanao_1506

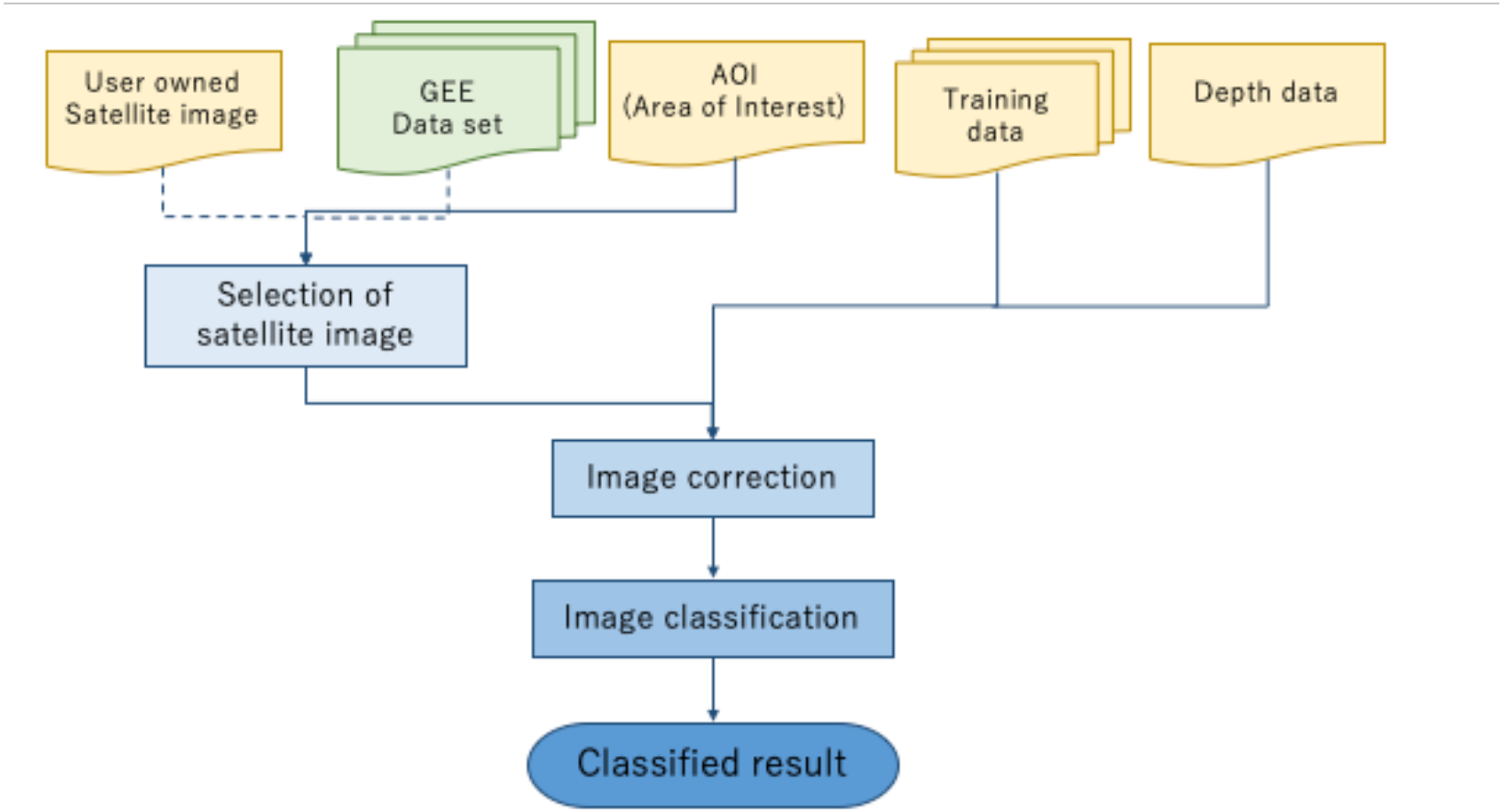
2. Run classification with Seagrass Mapper's User's manual page 18 to 23

https://mapseagrass.org/wordpress/wp-content/uploads/2021/05/Manual_SeagrassMapper_eng_ver1.pdf

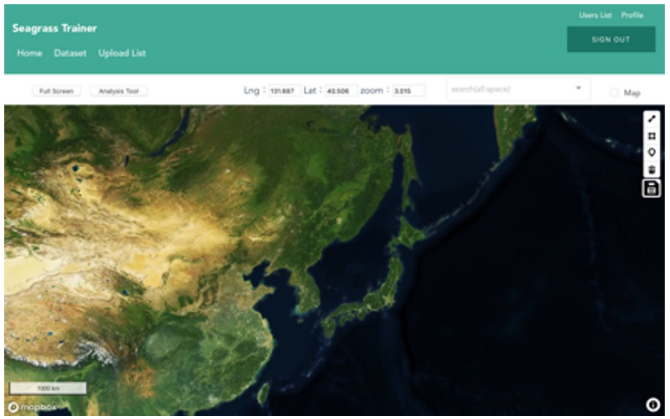
3. Run classification with Seagrass Trainer's manual page 36 to 48

https://mapseagrass.org/wordpress/wp-content/uploads/2021/05/Manual_SeagrassMapper_eng_ver1.pdf

Procedure of satellite image analysis in Seagrass Mapper



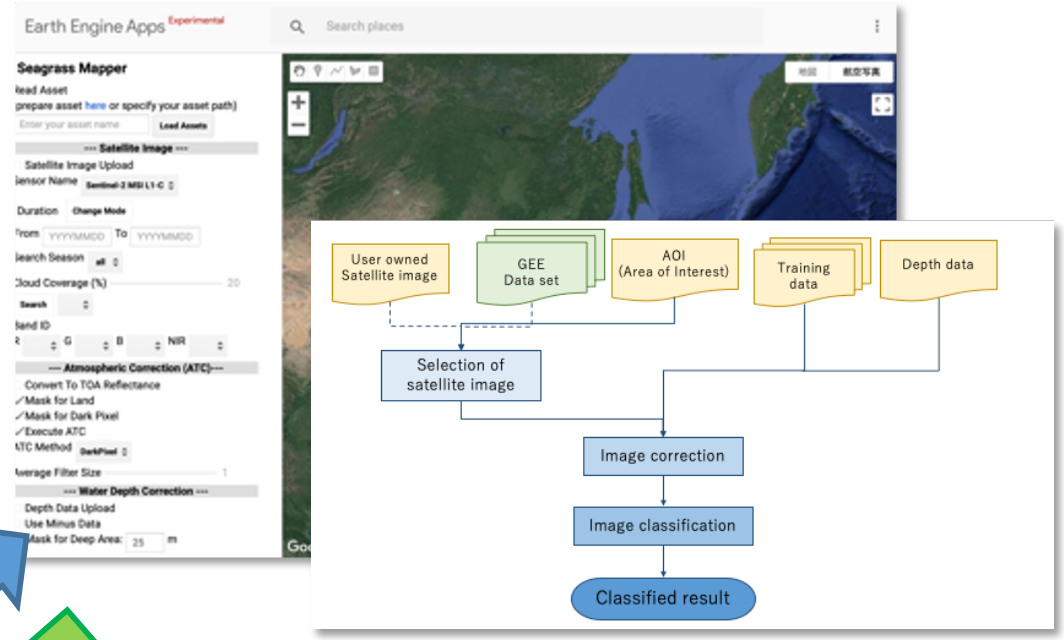
Procedure of satellite image analysis in Seagrass Trainer with Seagrass Mapper



Seagrass Trainer

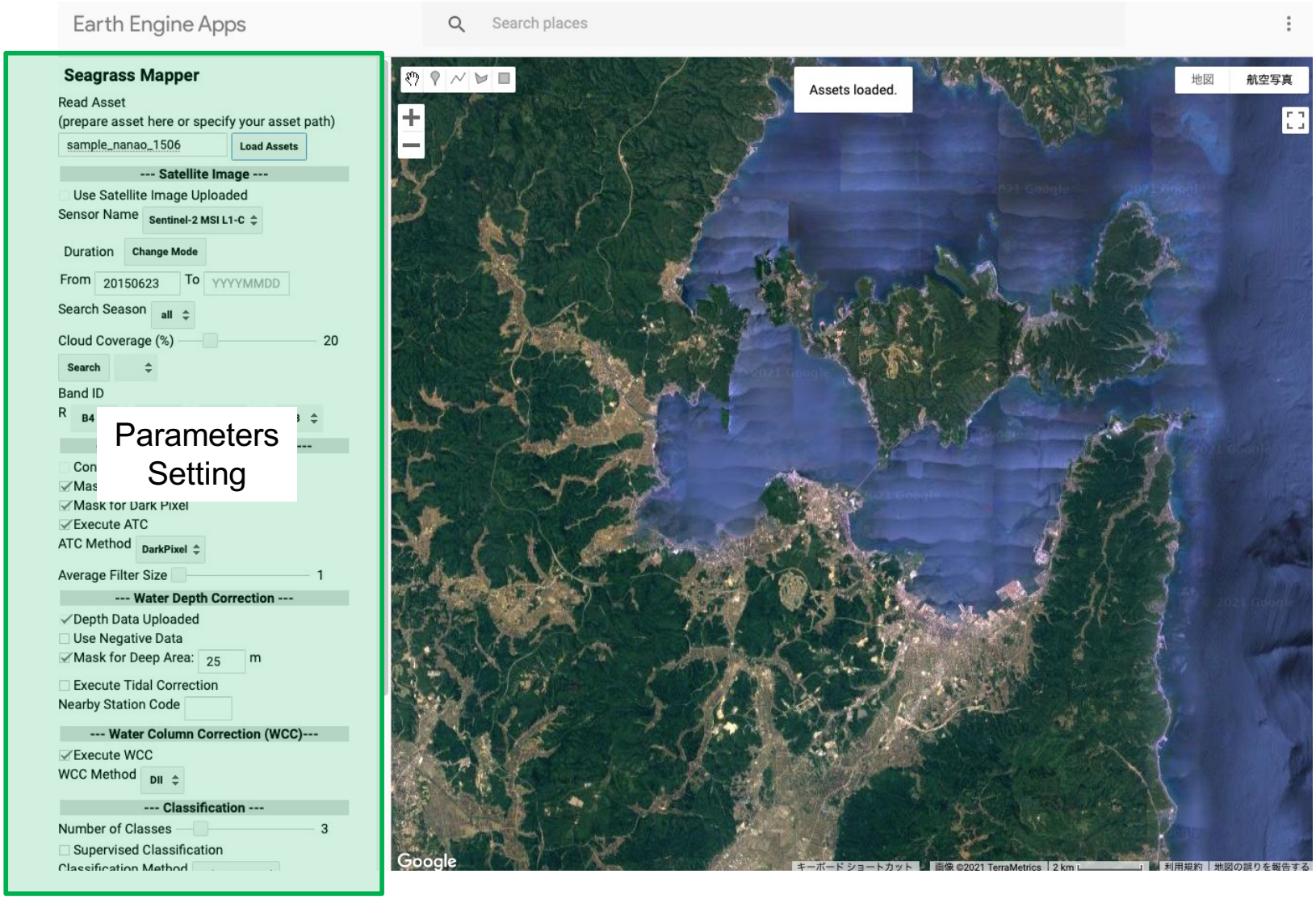
Order

Return

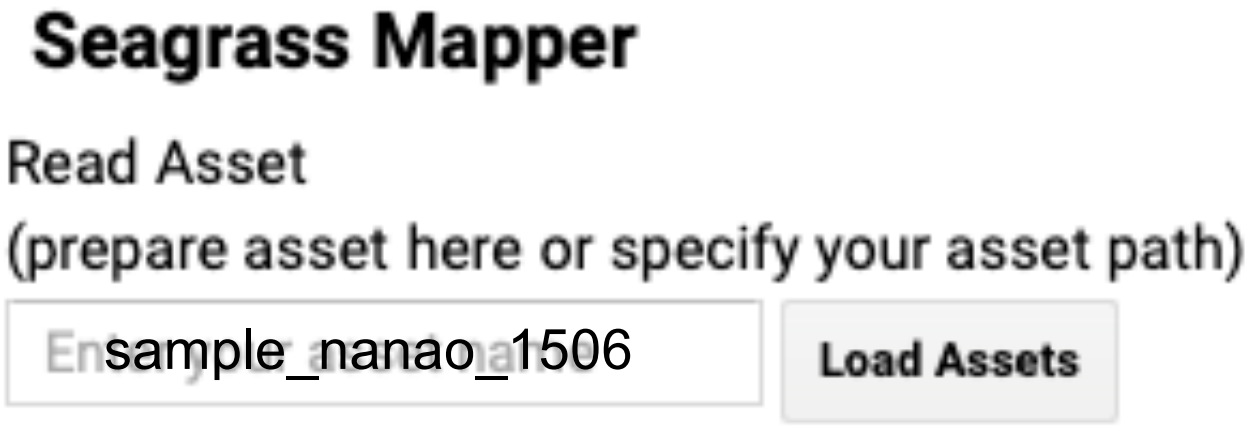


Seagrass Mapper

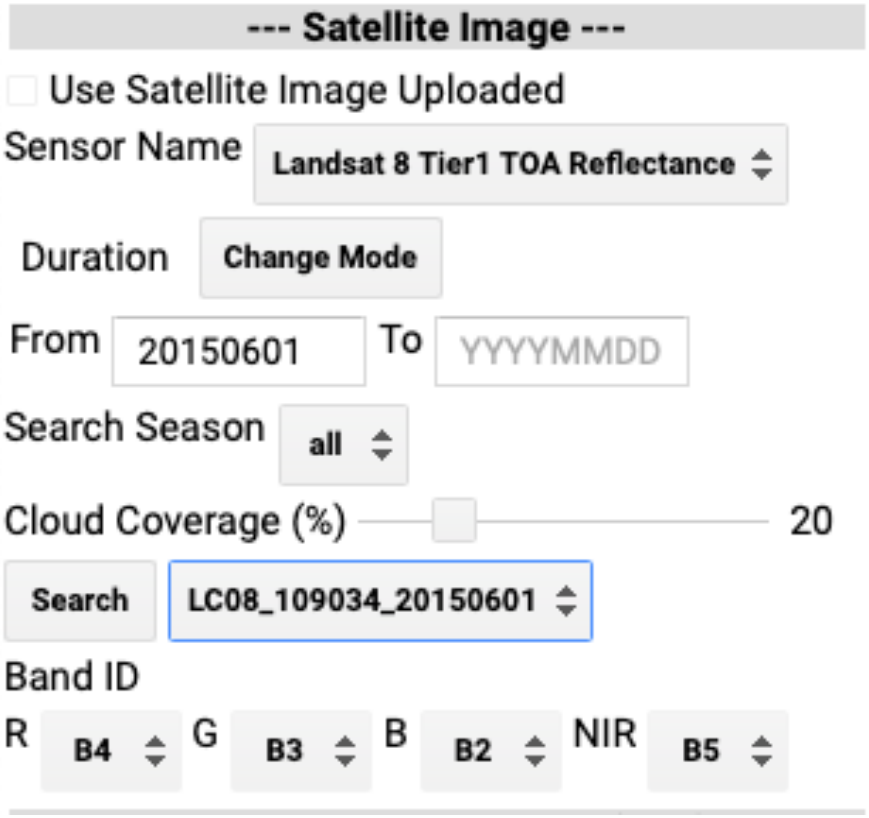
Setting parameters for classifying satellite images

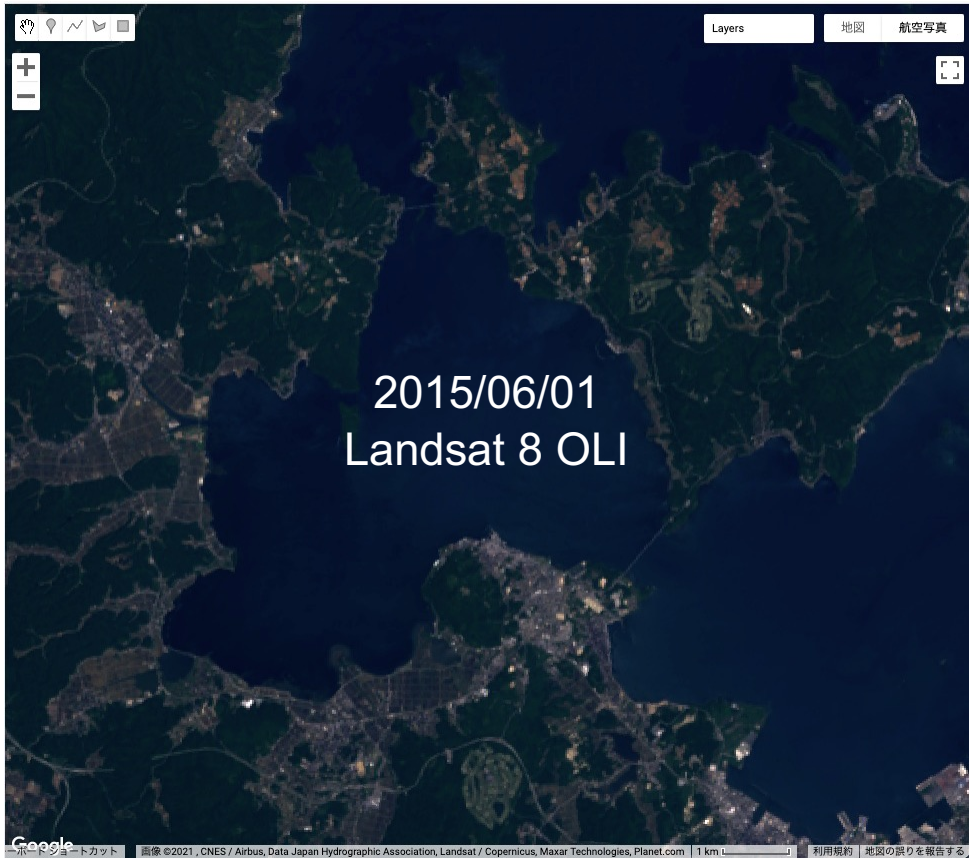


Reading asset in Seagrass Mapper

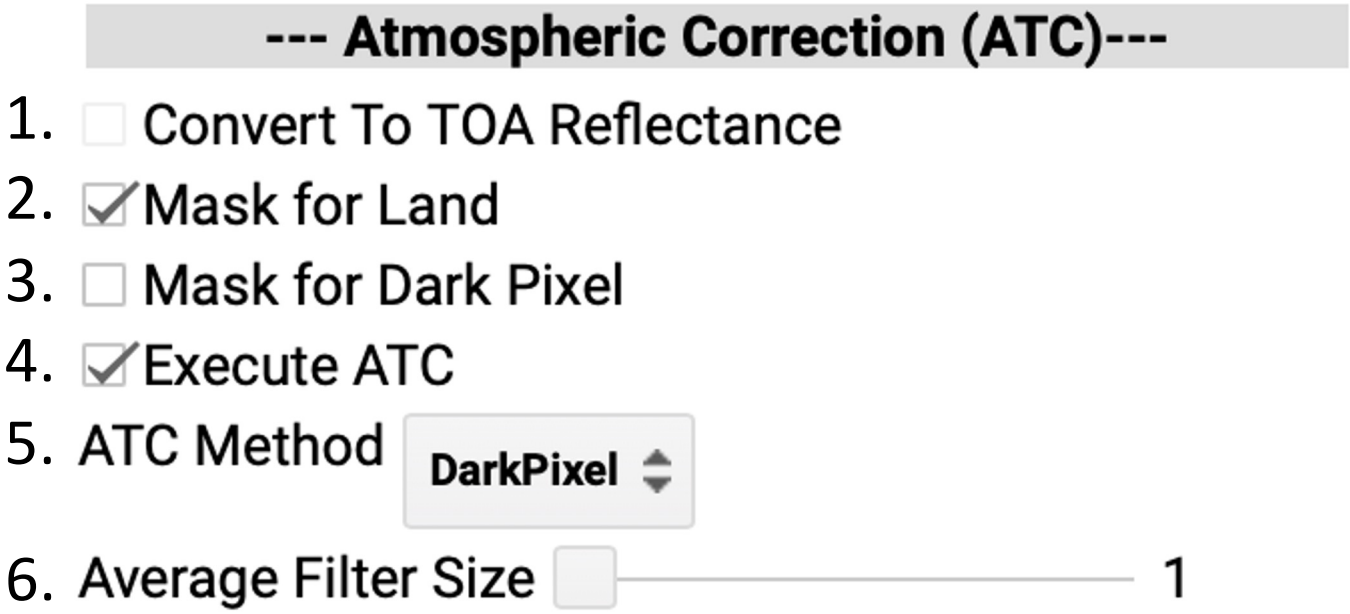


Finding satellite images timely close to training data



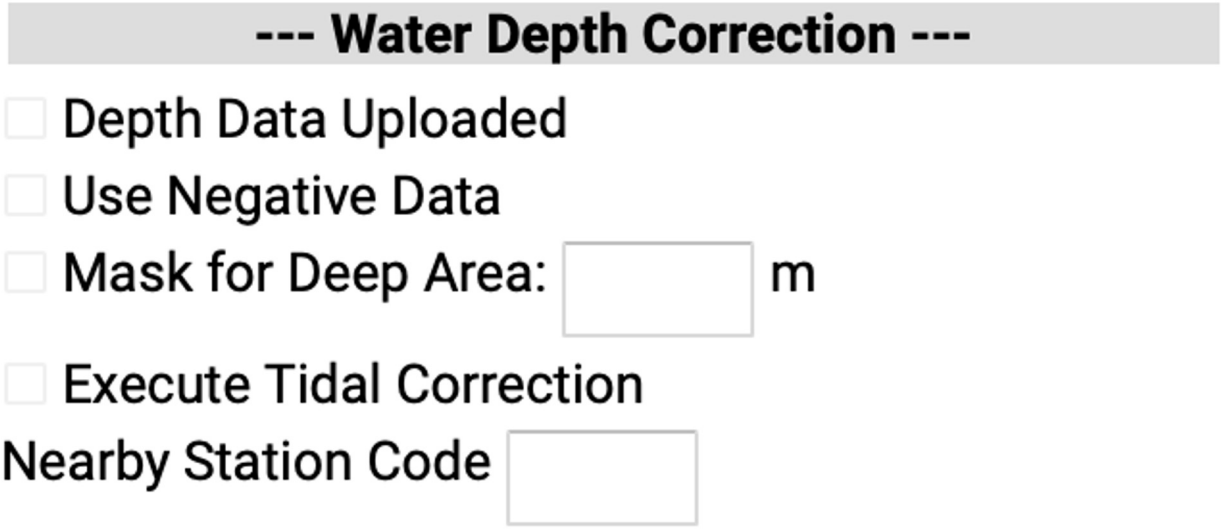


Setting atmospheric correction parameters



1. Tick if you want to convert your own prepared data to top of atmospheric data
2. Tick if you wan to mask land
3. Tick if you want mask dart pixels (recommend to test)
4. Tick if you want to apply atmospheric correction (ATC)
5. Choose ATC method from DarkPixel or NIRModel method
   (Usually DarkPixel method is recommended, but if image has some brighter spots it is recommend to use NIRModel method)
6. Choose average filter size in pixel for smoothing.

Setting water depth correction parameters

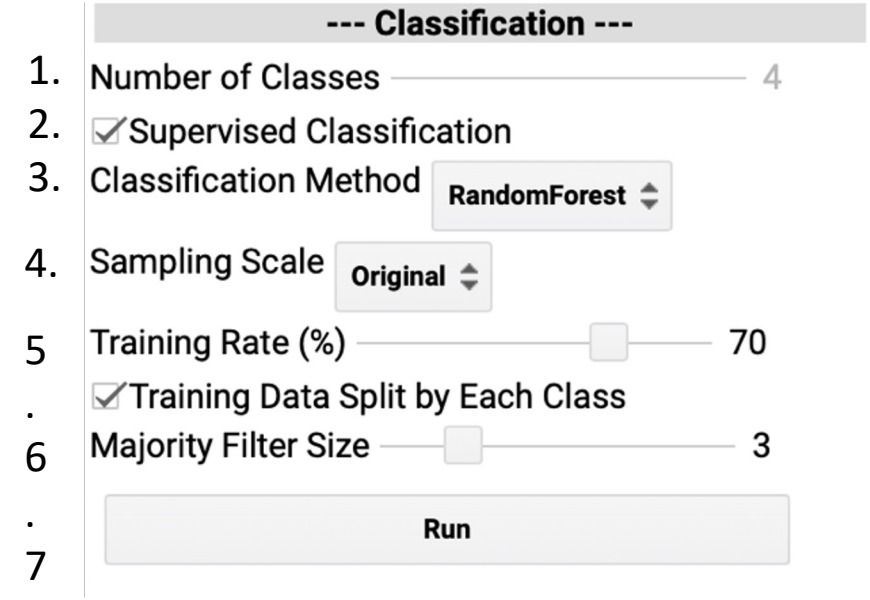


1. Tick if you are using depth data uploaded
2. Use if your depth data include negative values
3. Specify depth for masking image
4. Tick if you are executing tidal correction
5. Specify station code for tidal correction
   (Choose from Japan Metrological Agency station code or specify your own prepared station name)

Setting water column correction parameters

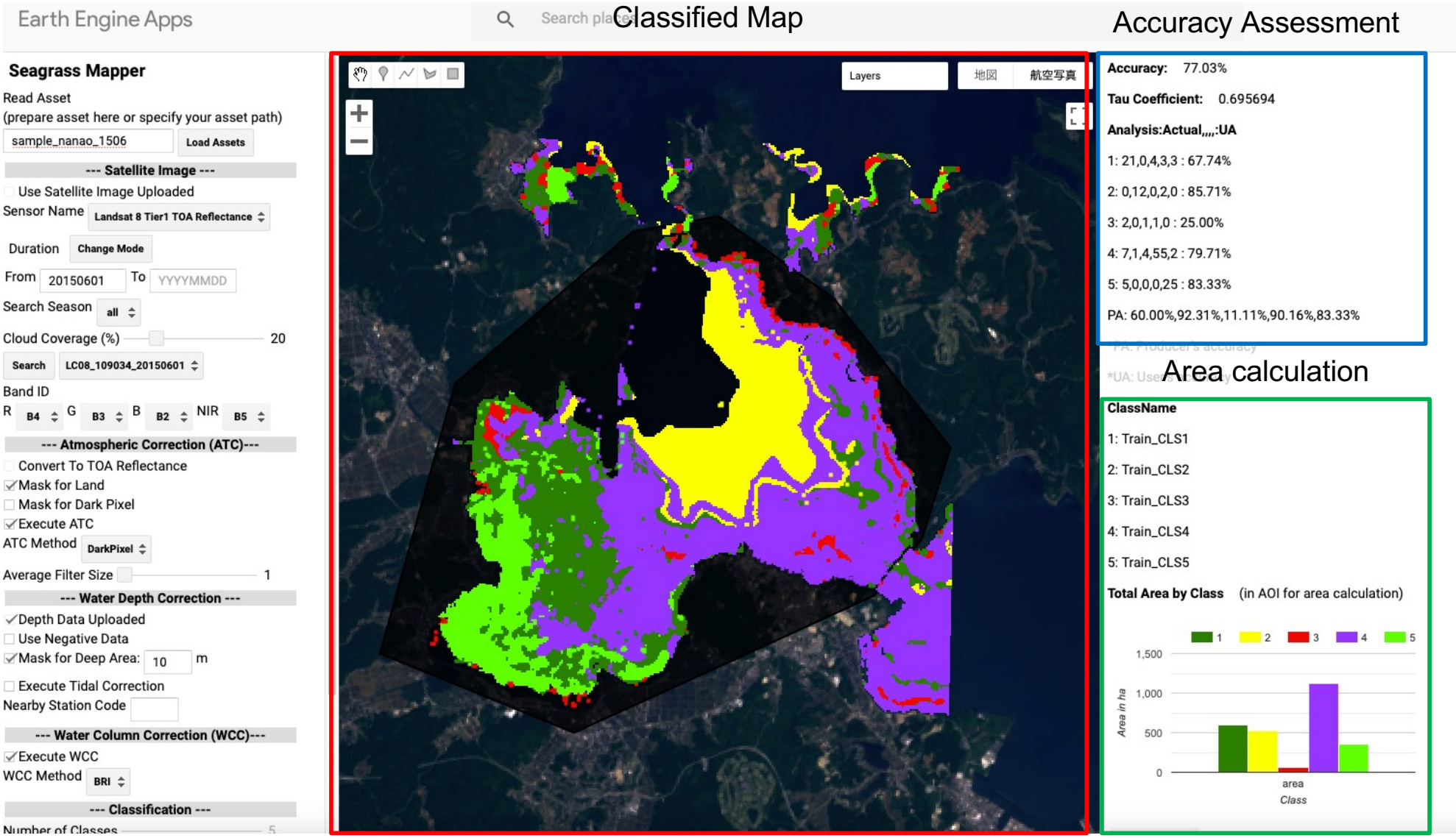
1. Tick if you are executing water column correction (WCC)
2. Choose the WCC method from DII (depth invariant index) method or BRI (Bottom Reflectance Method)

Setting image classification parameters



1. Specify number of class from your prepared training data for supervised classification
2. Tick if you are using your training data for supervised classification
3. Choose classification method from Random Forest, Decision Tree, Support Vector Machines or MaxEnt matching your training data. In case no supervised classification is chosen, WekaKMeans method will automatically applied.
4. Set sampling scale for reading training data. Usually Original is recommended.
5. Set ratio to use training data for classification in percentage.
6. Tick if the same sampling rate is applied by each class
7. Set majority filter size for smoothing

Checking classified image on Seagrass Mapper



Accuracy assessment

Confusion matrix

	Class determined from trainining data (acutual data)				
Class determined from mapping result (predicted by model)	Class	Seagrass	Sandy bottom	Seaweed	Total
	Seagrass	68	48	10	126
	Sandy bottom	68	169	10	247
	Seaweed	2	7	7	16
	Total	138	224	27	389

Imagine two different maps in your head; real world and predicted. Diagonals represent pixels classified correctly according to training data and off-diagonals indicates mis-classified pixels.

- Overall accuracy: overall ratio of correctly classified pixel in training data. In this example, overall accuracy is 62.72%; (68 + 169 +7) / 389 x 100.
- Tau coefficient: reliability index for overall accuracy

Accuracy assessment

	Class determined from trainining data (acutual data)				
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- Producer's Accuracy: How well can the situation on the seafloor be mapped?

  Seagrass 68 / 138 x 100 = 49.28%, Sandy bottom 169/ 224 x 100 = 21.43%, Seaweed 7/27 x 100 = 37.4%

- User's accuracy : How well the predicted class matches on the seafloor.

  Seagrass 68 / 126 x 100 = 53.97%, Sandy bottom 169/ 247 x 100 = 27.53%, Seaweed 7/16 x 100 = 12.5%

Hands on practice Day 2

- 1. Read sample asset folder (sample_nanao_1506) and run classification in Nanano Bay with different parameters set up

- 2. Read your uploaded asset folder and run classification with different parameters setting