

Hands on exercise for uploading training data set using Seagrass Trainer

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Hands on practice on Day 1

1. Download sample training data sets from the following link

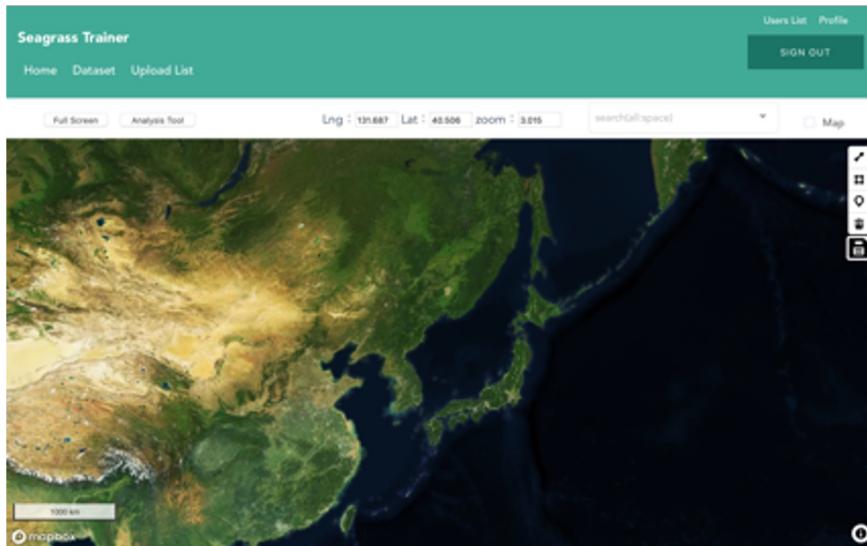
<https://u.pcloud.link/publink/show?code=kZhaoIXZg9Hswpf1JluOhLy4d9Txxjf6Fekk>

2. Upload downloaded sample data along with Seagrass Trainer User's manual page 19 to 24

https://mapseagrass.org/wordpress/wp-content/uploads/2021/06/Manual_SeagrassTrainer_eng_ver1.pdf

Roles of Seagrass Trainer and Seagrass Mapper

Seagrass Trainer



Seagrass Mapper

A screenshot of the Seagrass Mapper interface. On the left, there's a sidebar with "Earth Engine Apps" and "Experimental" status. It has sections for "lead Asset", "Satellite Image Upload" (set to "Sentinel-2 MSI L1-C"), "Duration" (set to "Change Mode"), "Search Session" (set to "all"), "Cloud Coverage (%)" (set to 20), "Land ID" (checkboxes for G, B, and NIR), "Atmospheric Correction (ATC)" (checkboxes for "Convert To TOA Reflectance", "Mask for Land", "Mask for Dark Pixel", "Execute ATC", and "ATC Method: DarkPixel"), "Average Filter Size" (set to 1), "Water Depth Correction" (checkboxes for "Depth Data Upload", "Use Minus Data", and "Mask for Deep Area: 25 m"), and a "Google" watermark at the bottom. To the right of the sidebar is a map of the same region as the Seagrass Trainer screenshot, showing the same satellite imagery and green/yellow seagrass indicators.

Registering training data
for Seagrass Mapper

Mapping seagrass using
Google Earth Engine

Seagrass Trainer and Seagrass Mapper

	Seagrass Trainer	Seagrass Mapper
Cloud platform	Amazon Webservice and Google Cloud Platform	Google Cloud Platform
Accessibility	Can be used in any countries	Cannot be used in China
Input files	Vector : csv, shape, kml/kmz Raster : GeoTiff	Vector : csv and shape Raster : GeoTiff
Output files	GeoTiff, csv	
Classification algorithm	Supervised classification: Random Forest, Decision Tree, SVM and Maxtent Non supervised classification: WEKA K-means	
Other features	Non interactive (order based)	Interactive mapping

Necessary data for mapping seagrass with Seagrass Mapper and Seagrass Trainer (1/2)

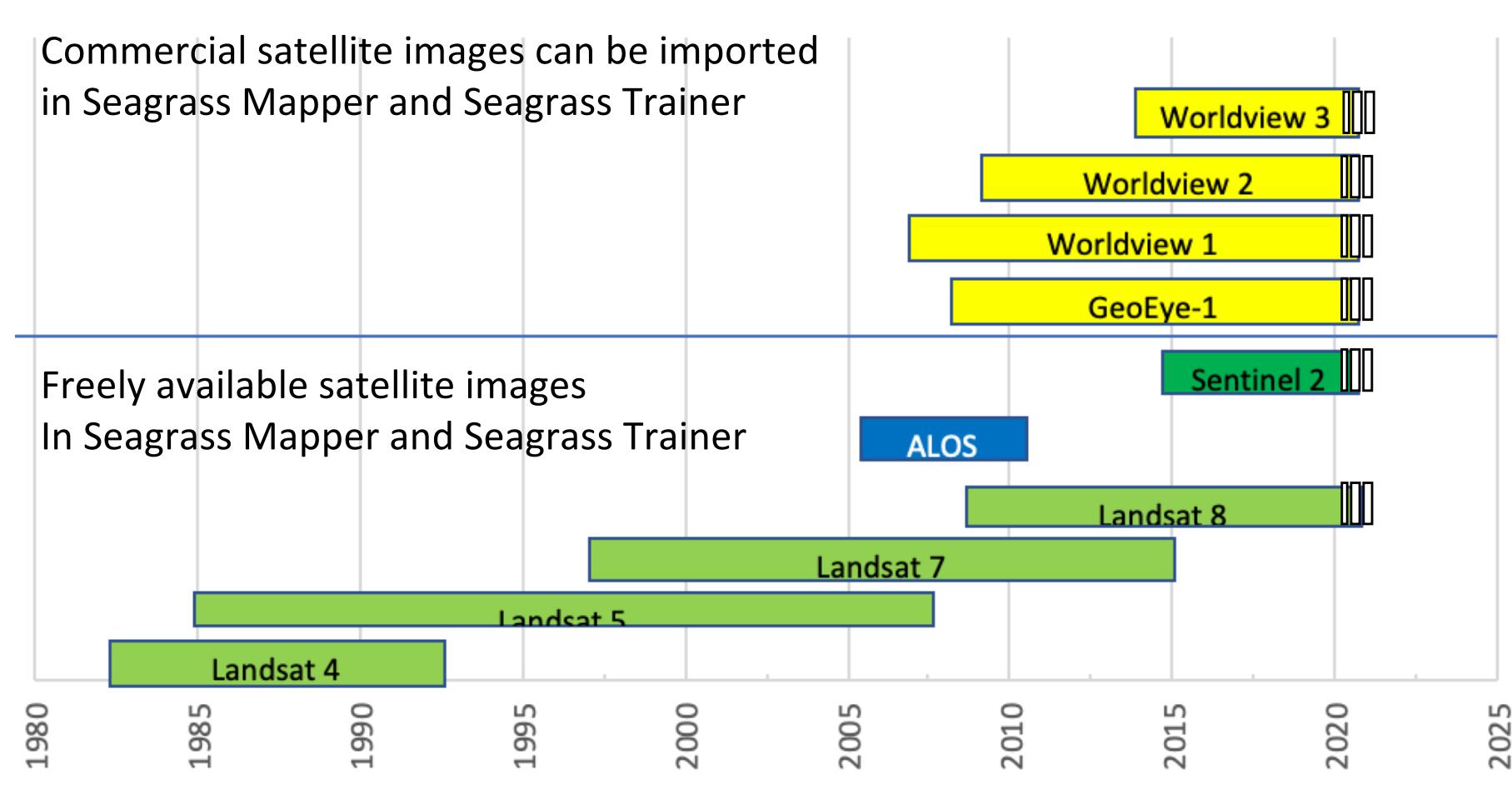
Data kind	Information	Data type	File format	Necessary or not	Can be prepared with Seagrass Trainer
Satellite Image	satellite images	raster	tif	required	Yes
Satellite Metadata	metadata of satellite images	of metadata which comes with satellite image	file xml, imd	required when uploading satellite images	Yes
AOI	data for area of interest (AOI)	vector (polygon)	shp, kmz, geojson	kml, csv,	required
Training for ATC	training data for atmospheric correction (ATC)	vector (polygon)	shp, kmz, geojson	kml, csv,	required for ATC, land masking, and/or dark pixel masking

Necessary data for mapping seagrass with Seagrass Mapper and Seagrass (2/2)

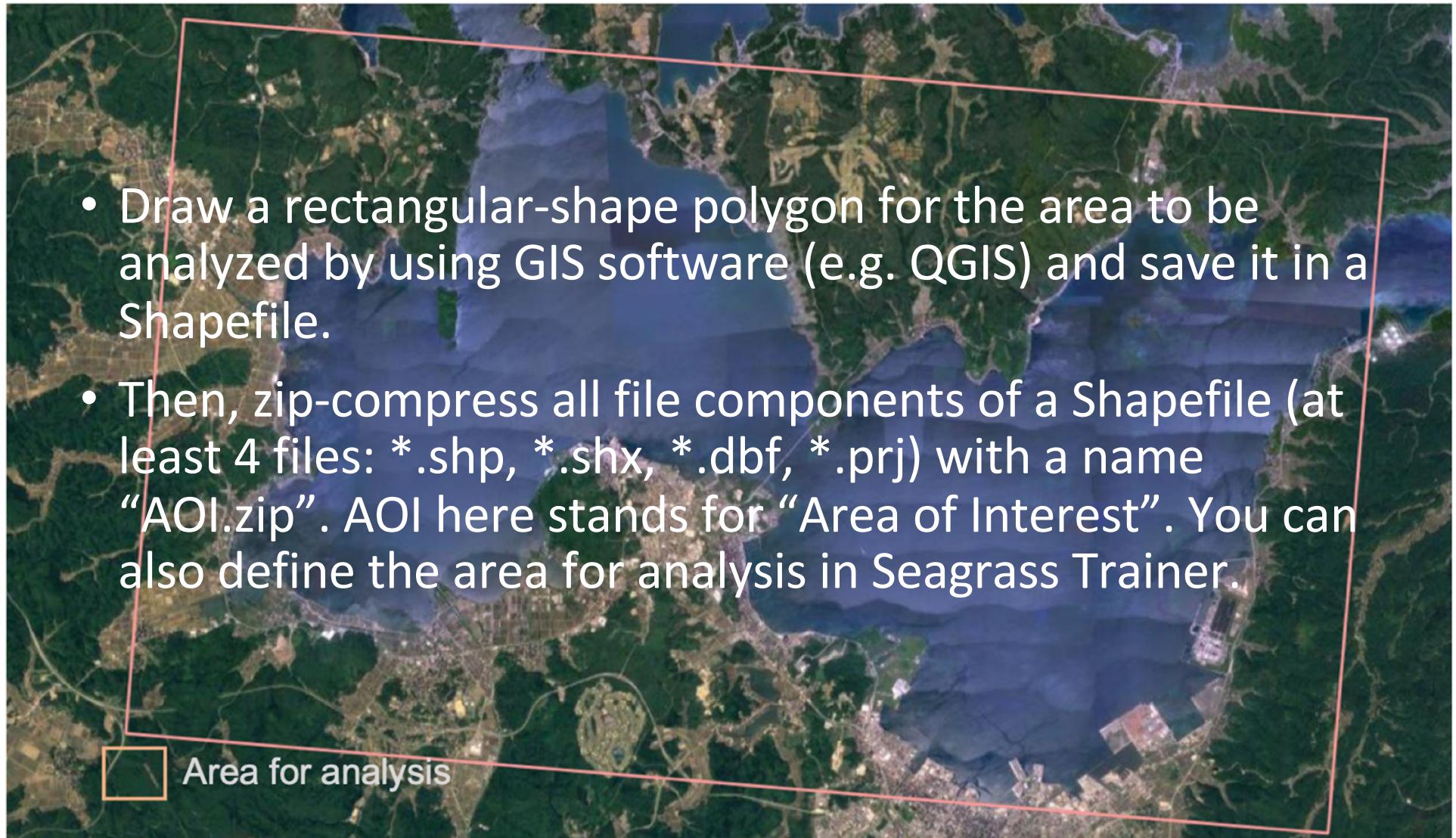
Data kind	Content	Data type	File format	Necessary or not	Can be prepared with Seagrass Trainer
Training for WCC	training data for column correction (WCC) water	vector (polygon)	shp, kmz, geojson	required for WCC.	Yes
Training for Classification	training data for supervised classification	vector (polygon) or point	shp, kmz, geojson (separate file for each class)	required for classification	Yes
Depth / Bathymetry	water depth / bathymetry	raster	tif	required for WCC (BRI method), water depth correction, and/or masking by water depth	
Tidal level	Tidal level	text	csv	required for tidal level correction with user's own data ^{*3}	

Satellite images can be used for mapping seagrass using Seagrass Trainer and Seagrass Mapper

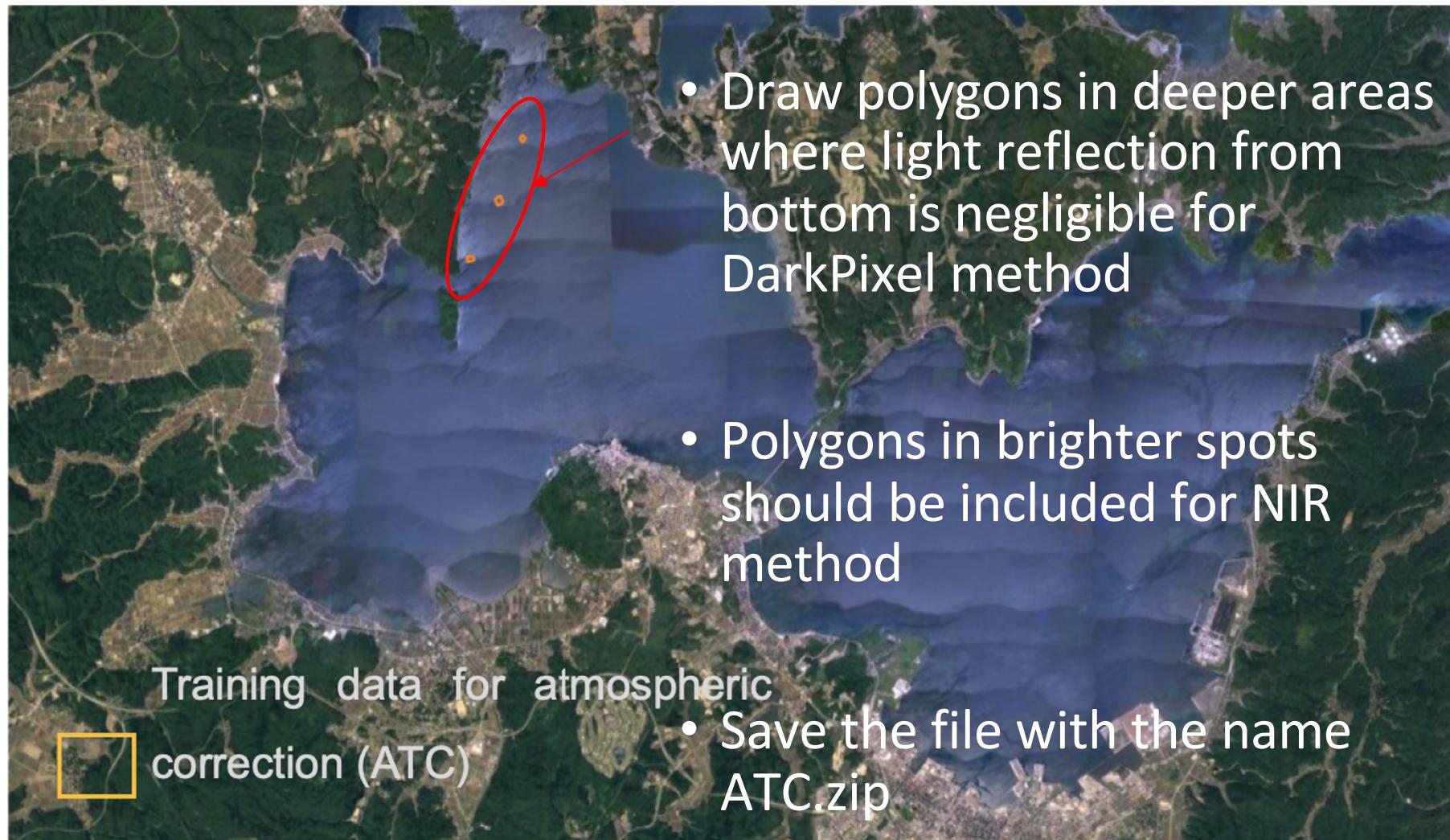
Commercial satellite images can be imported in Seagrass Mapper and Seagrass Trainer



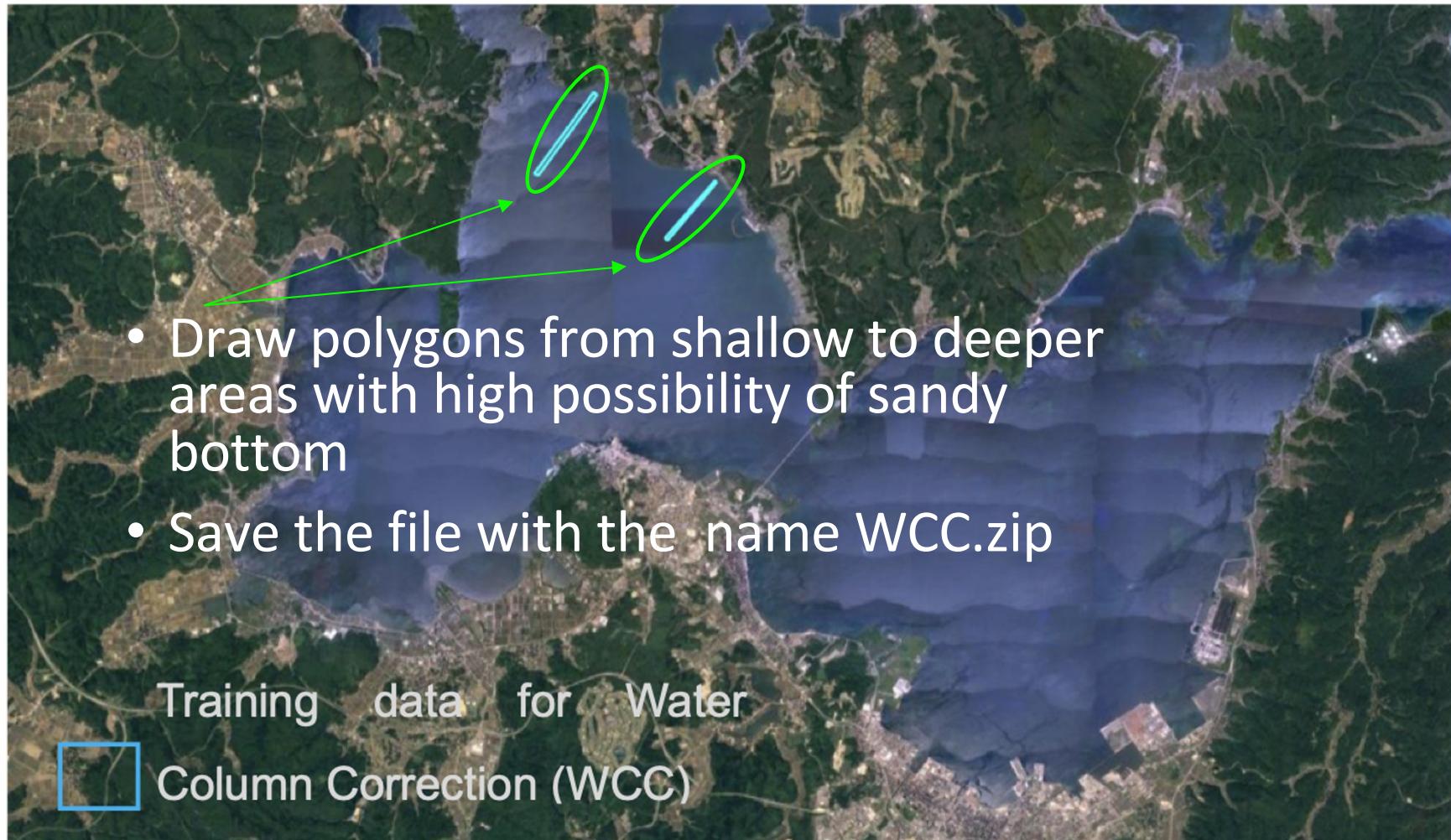
How to prepare AOI data



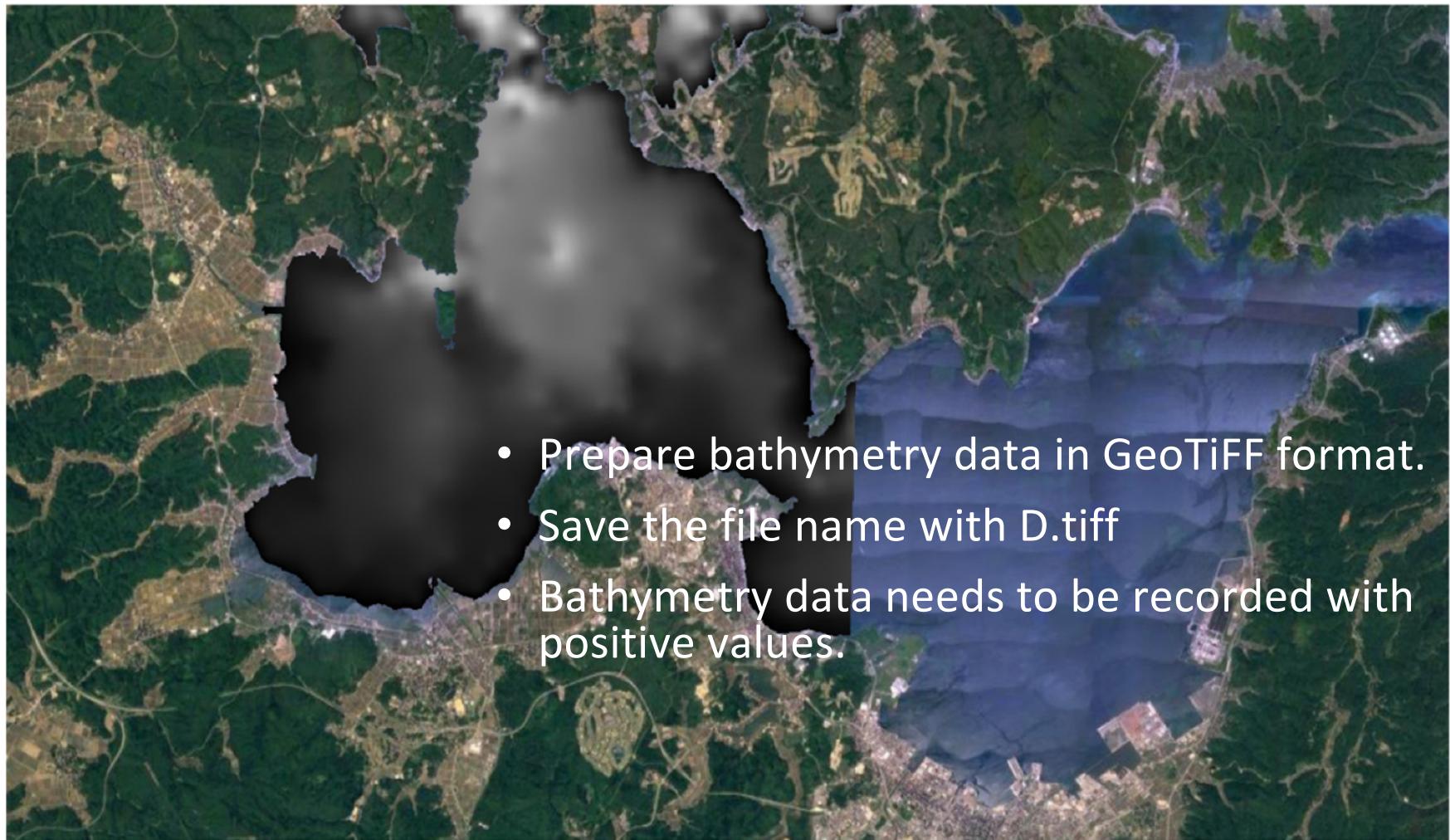
How to prepare training data for atmospheric correction



How to prepare training data for water column correction



Preparing bathymetry data



Defining areas for estimating size of seagrass habitats

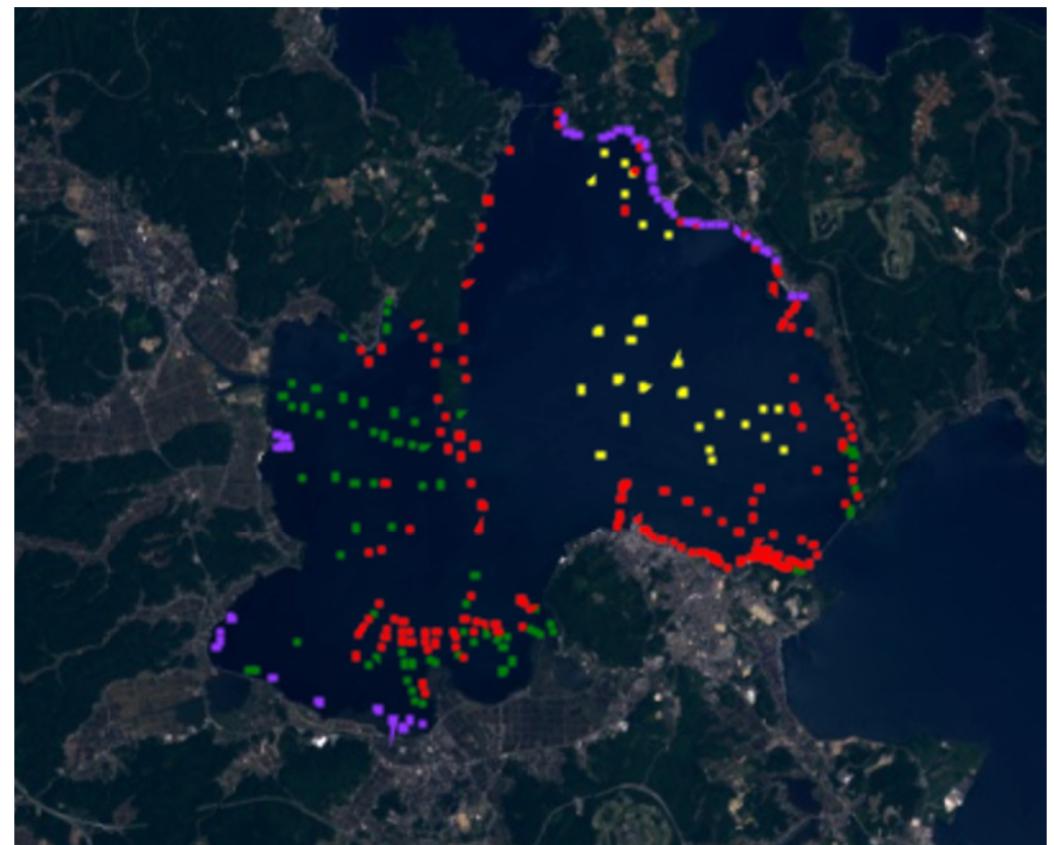
- Draw a polygon for the area to calculate each substrate class by using GIS software (e.g. QGIS) and save it in a Shapefile.
- Save the file with the name Area.zip

(Currently not available in Seagrass Trainer)



Preparing data for supervised classification

- Prepare data for each seafloor substrate class with different file names Train_CLS# (# = numbers)
- For instance,
 - Train_CLS1 = Dense Seagrass
 - Train_CLS2 = Seaweed
 - Train_CLS3 = Sand



How Seagrass Mapper reads training data

Earth Engine Apps Experimental

Search places

⋮

Seagrass Mapper

Read Asset
(prepare asset here or specify your asset path)

Enter your asset name Load Assets

--- Satellite Image ---

Use Satellite Image Uploaded

Sensor Name **Sentinel-2 MSI L1-C**

Duration

From To

Search Season

Cloud Coverage (%)

Search

Band ID

R G B NIR

--- Atmospheric Correction (ATC)---

Convert To TOA Reflectance

Mask for Land

Mask for Dark Pixel

Execute ATC

ATC Method

Average Filter Size

Asset = a person or thing that is valuable or useful to somebody/something (Oxford Learner's Dictionaries)

Seagrass Mapper asset is associated with "mapseagrass@gmail.com" Google account

Google

画像 ©2021 NASA, TerraMetrics | 1000 km | 利用規約

<https://mapseagrass.users.earthengine.app/view/seagrassmapper>

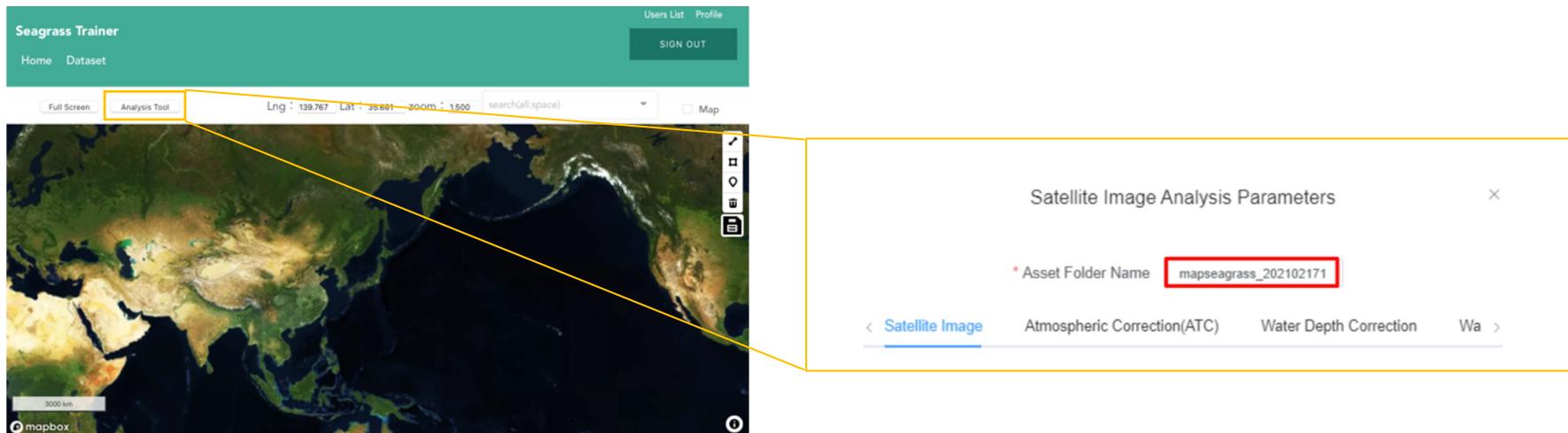
Registering training data by Seagrass Trainer

- Prepare training data in shp, kml, kmz, csv and geojson data format
- Accessing [Seagrass Trainer](#)
- Uploading training data

The image shows the Seagrass Trainer web application interface. On the left, there is a map of the world with a green header bar containing the text "Seagrass Trainer". Below the header, there are two buttons: "Home" and "Dataset", with "Dataset" being highlighted by a yellow box and a yellow arrow pointing from the list item above. At the top of the map interface, there are buttons for "Full Screen" and "Analysis Tool", and input fields for "Lat": 35.681, "Lng": 139.767, and "zoom": 1.500, along with a search bar. A scale bar indicates "3000 km". The Mapbox logo is at the bottom left. On the right, the main content area has a dark header "Seagrass Trainer" with "Home" and "Dataset" links. The "Dataset" section is currently active, showing a "Key" dropdown menu. To the right, a modal window titled "Input File Upload" is displayed, also with a yellow border. It contains a "Click to upload" button, a note about GeoTIFF file size (8GB or less), and a "Select Input Data" section with several radio button options: "AOI", "Satellite Image", "Satellite Metadata", "Depth / Bathymetry", "Training for ATC", "Training for WCC", and "Training for Classification". The "Training for Classification" option is checked. At the bottom of the modal, there is a note: "provide 'Training for Classification' data" followed by a checked checkbox: "for improvement of Seagrass Trainer".

Checking asset folder name to read in Seagrass Mapper

- Training data will be registered into folders called “asset”
- After uploading all prepared data, press “Analysis tool” to check asset name
- asset folder name is automatically created as “User ID_YYMMDDHHMMSS” (indicating the year/month/day/hour/minute/second of signing in).



HOW asset information look like inside Seagrass Mapper

The screenshot shows the Google Earth Engine interface. At the top, there is a search bar with the placeholder "Search places and datasets..." and a user profile icon. Below the search bar, the navigation menu includes "Scripts", "Docs", and "Assets". The "Assets" tab is selected, displaying a list of dataset names:

- restest4_20211124184548
- restest5_20210911215449
- sagawa_tatsuyuki_20211125091647
- sample_himi_1807
- sample_kokubu_190621
- sample_nanao_1506
- sample_nanao_1510
- sample_nanao_1906
- sample_nanao_1910
- sample_nanao_2006
- sample_toyama
- seagrassstrainer_npec_20210909151929
- shkim2817_20210930151602
- test0100_20210913174113
- test0100_20210917093204
- test0100_20210917115223
- test0100_20211014142627
- test0100_20211027143925

A modal window is open on the right side, showing the user's email address "mapseagrass@gmail.com" and a "Sign out" button. Below these, there is a section titled "Choose a Cloud Project" and a note: "Earth Engine with Google Cloud Projects! Use the Account menu in the top right to select a project or [click here](#) to learn more."

At the bottom of the interface is a map of the United States, centered on the Great Lakes. The map includes state boundaries and labels for major cities like Los Angeles, Las Vegas, Chicago, and New York. There are also various icons and controls for interacting with the map.