Satellite Tool Getting Started Guide

The satellite-version BLB damage assessment tool (hereafter referred to as Satellite Tool or simply as tool) is a tool for estimating BLB damage intensity related to rice color information (spectral reflectance and vegetation index) obtained from Sentinel-2 satellite images. Satellite Tool has 6 functions: Download Data, Satellite Data preprocessing, Growth Stage Estimation, Training Data Creation, Damage Estimate Formulation, Damage Estimation.

Before using Satellite Tool, it is necessary to prepare in advance five data sets:

1. Netrc file
   Ex: C:¥Users¥satreps¥.netrc
2. Field observation data
   Ex: C:¥Users¥satreps¥Work¥Field_Data¥Current¥Block-2A¥Excel_File¥Block-2A_2022-03Mar-26.xls
   ※ If a field observation data is stored under
   C:¥Users¥satreps¥Work¥Field_Data¥Current
   with the following file name, it will be automatically renamed to the above file name when the survey block name/survey date is set.
   Ex: 26.03.2022 2a.xls, CIHEA - 2 A (20220326).xls, Block-2A_2022-03Mar-26.xls, 2A_2022-03-26.xls, 2A-2022.Mar.26.xls
3. Damage estimation formula
   Ex: C:¥Users¥satreps¥Work¥Sentinel-2_Analysis¥Current¥formula¥pm_formula_score_mean.csv
4. Parcel data of the plots
   Ex: C:¥Users¥satreps¥Work¥Shapefile¥All_area_polygon_20210914¥All_area_polygon_20210914.shp
5. WorldView satellite data for geometric correction reference
   Ex: C:¥Users¥satreps¥Work¥WorldView¥wv2_180629_mul.tif

When using the Satellite tool with default settings, after preparing the necessary data, enter the data period on the main screen, check the check boxes for the required processing items (Download Data, Geometric Correction, Calculate Indices, Parcellate Data, Atmospheric Correction, Interpolate Data, Estimate Growth Stage, Extract Indices, Make Formula, Estimate Damage), check the download flag for the required data on the detailed setting screen of Download Data, and click the Run button, then everything will be processed automatically.

Here are some typical uses, as well as the data and processing items they require:

1. Preprocess satellite data
   Data: Netrc file, Parcel data of the plots, WorldView satellite data for geometric correction reference
   Download flag: L2A
   Processing item: Download Data, Geometric Correction, Calculate Indices, Parcellate Data, Atmospheric Correction, Interpolate Data
2. Estimate BLB damage at the time of damage assessment for each field using an existing damage estimation formula
   Data: Netrc file, Damage estimation formula, Parcel data of the plots
   Download flag: planting, interp, tentative_interp
   Processing item: Download Data, Estimate Growth Stage, Estimate Damage
3. Estimate BLB damage at a specific satellite-image acquisition date using an existing damage estimation formula
   Data: Netrc file, Damage estimation formula, Parcel data of the plots
   Download flag: atcor
   Processing item: Download Data, Estimate Damage
4. Create training data using interpolated data
   Data: Netrc file, Field observation data, Parcel data of the plots
   Download flag: planting, interp, tentative_interp
   Processing item: Download Data, Estimate Growth Stage, Extract Indices
5. Create training data using specific satellite image
   Data: Netrc file, Field observation data, Parcel data of the plots
   Download flag: atcor
   Processing item: Download Data, Extract Indices
6. Create BLB damage estimation formula from the training data
   Data: Processing results of Extract Indices (It is desirable to have more than 30 fields.)
   Download flag:
   Processing item: Make Formula