

***Center for Spatial Information Science and Systems
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CropScape for Nepal User's Guide

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1. Introduction

The "CropScape for Nepal" is a web service-based and rich internet application that handles large volumes of data, intensive computation, concurrent access and spatial-temporal intensity. The portal supports online visualization, geospatial navigation and querying, reformatting and transformation, delineation of area of interest, on-the-fly data analysis, data processing, and dissemination, into an NDVI and VCI application for Nepal area based on distributed geospatial services and components. The portal uses intuitive building of the end user's skills and experiences to design a user interface that is effective for both beginners and advanced users. The scalability, reusability, interoperability, performance, and efficiency are balanced in the application of a Service-Oriented Architecture (SOA), and in the implementation of Web services.

2. Overview

2.1 The Portal Layout

The CropScape for Nepal portal is a web application, and you can access the portal as the following URL with your portal server IP:

```
http://{portal_host}/CropScapeNepal
```

The, you can see the following web page shown in Figure 1. The initial web page consists of a few sections:

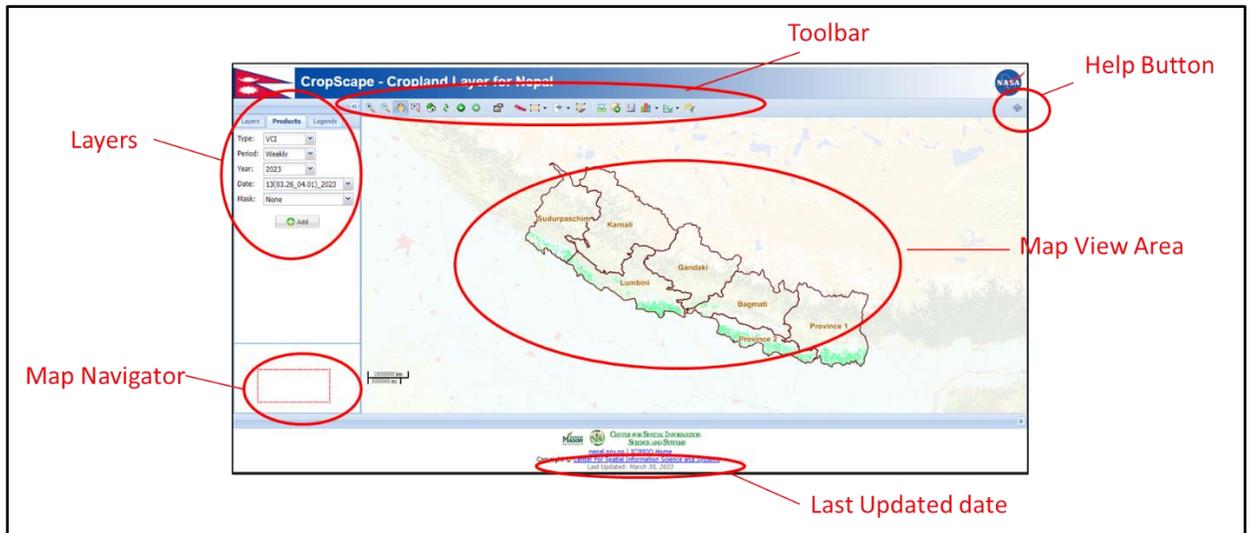


Figure 1. User Interface Layout of the portal

- **Map View Area:** an area to show desired map images over a base map
- **Toolbar:** A collection of useful functions as a button array
- **Side menu** for Layers/Products/Legends: Add desired map image on the Map View area
- **Map Navigator:** Small area for moving Map View area quickly
- **Help Button:** Invoking online user manual
- **Last Updated date:** Showing the last modified date of the portal application

2.2 Conventions

This document provides screen capture and corresponding narrative to describe how to use the CropScape for Nepal portal.

When an action is required on the part of reader, it is indicated by a line beginning with the word "Action:". For example,

Action: Click on OK button

Note: The term "user" is used throughout this document to refer to a person who launches a web browser with accessing CropScape for Nepal portal website.

AOI – Area of Interest

ESRI – Environmental Systems Research Institute

GIS – Geographic Information System

GML – Geography Markup Language

NDVI – Normalized Difference Vegetation Index

VCI – Vegetation Condition Index

3. User Interface

3.1 Toolbar Icons

The CropScape for Nepal has a toolbar at the top of Map View area.

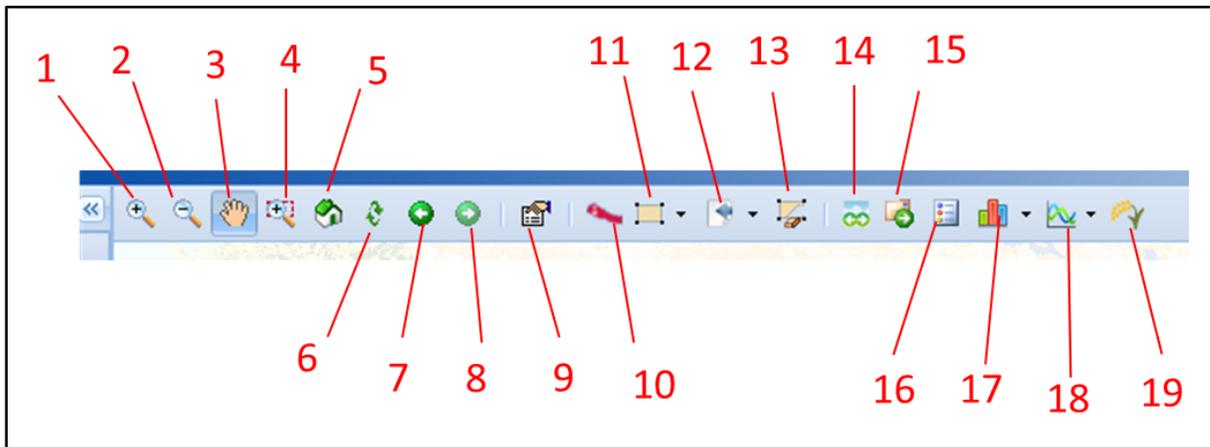


Figure 2. Toolbar icons

properties are required in an object:

No	Name	Description
1	Zoom in	Zoom into the center of the image
2	Zoom out	Zoom out from the center of the image
3	Pan	Click and drag within the map to move layers around the display
4	Drag Zoom	Click to define a rectangular area to zoom to
5	Home	Return to the default view of the country
6	Refresh	Click to refresh the data
7	Previous View	Click to go to previous views
8	Next View	Click to go to the next views
9	Identify Pixel Value	Identify category, value, and color associated with a certain pixel
10	Define Area of Interest	Use this tool to focus on a particular province, district, county, or combination of province and district or county
11	Define an Area of Interest	Click and drag to define an area of interest. <ul style="list-style-type: none"> ▪ Rectangle - Click and drag to define rectangular area of interest ▪ Polygon - Define area of interest by clicking around boundary of interest. Double click to complete polygon ▪ Circle - Click to define center of circle and drag to define size

12	Import/Export a Vector File	<p>Import or export a vector file for an Area of Interest</p> <ul style="list-style-type: none"> Import Area of Interest - Click to import the vector file (in GML or ESRI Shapefile format) to define area of interest Export Area of Interest - Click to export the current area of interest to a GML or ESRI Shapefile file
13	Clear Defined Area	Click to erase the selected area of interest.
14	Swipe Layer Images	Swipe layer images to compare them in details
15	Download	Download an image of the defined area of interest for the specified product
16	Show/hide Product Legend	Show or hide a legend image of the specified product.
17	Statistics	<p>Generate table of pixel counts and acreage totals within the area of interest</p> <ul style="list-style-type: none"> Statistics of top layer for a single AOI - Generate table of pixel counts and acreage totals for a single area of interest
18	Generate Profile	<p>Generate table of pixel counts and acreage totals within the area of interest.</p> <ul style="list-style-type: none"> Generate Profile at Point of Interest - Generate table of pixel counts and acreage totals for a single area of interest. Generate Profile at Latitude-longitude Coordinate - Generate table of pixel counts and acreage totals for multiple polygon area of interests Generate Profile at Area of Interest - A checkbox for enabling two selected layers for a single AOI function
19	Yield Prediction	A yield prediction information for regional Nepal area

3.2 Side Menu

A side menu of the CropScape for Nepal consists of three tabs: Layers, Products, and Legends.



Figure 3. Tabs in the Side Menu

- **Layers:** Small area for moving Map View area quickly
- **Products:** Invoking online user manual
- **Legends:** Showing the last modified date of the portal application

3.2.1 Layers

The “Layers” tap is for managing image layers over base map. There are 3 preset layer groups in the portal.

- Basic Layers: Base map image of the map view area
- Rice Map: Reference rice map and cropland map images
- Boundaries: provinces, districts, and counties boundaries in the country

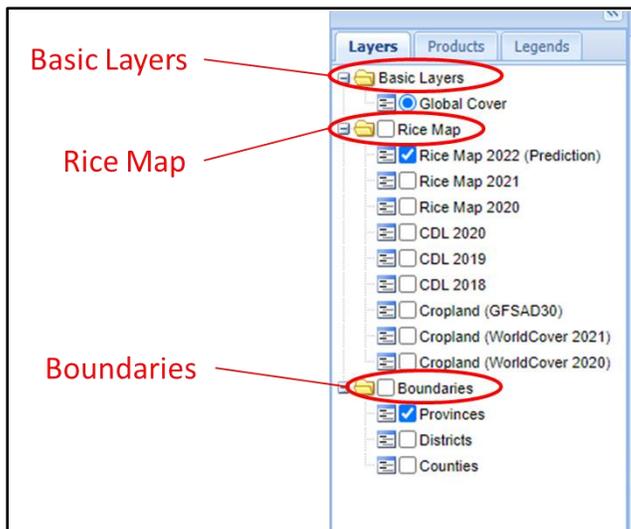


Figure 4. Layers Side Menu

3.2.1.1 Basic Layers

- Global Cover - Global Land Cover for South Asia area. A visual background image. Including the Global Cover will not affect any calculations or analysis.

3.2.1.2 Rice Map

- Rice Map 2022 (Prediction) - Rice Map Prediction Data layer for year 2022
- Rice Map 2021 - Rice Map Data layer for year 2021
- Rice Map 2020 - Rice Map Data layer for year 2020
- CDL 2020 - Cropland Data layer for year 2020
- CDL 2019 - Cropland Data layer for year 2019

- CDL 2018 - Cropland Data layer for year 2018
- Cropland (GFSAD30) - Cropland Data layer from NASA Global Food Security-Support Analysis Data at 30 m (GFSAD30)
- Cropland (WorldCover 2021) - Cropland Data layer from ESA WorldCover global land cover products at 10 m resolution for year 2021
- Cropland (WorldCover 2020) - Cropland Data layer from ESA WorldCover global land cover products at 10 m resolution for year 2020

3.2.1.3 Boundaries

- Provinces – boundary shapes of provinces in the country
- Districts – boundary shapes of all districts in the country
- Counties – boundary shapes of all counties in the country

3.2.2 Products

The “*Products*” tap is for adding product image layers over base map. The following are supported products.

- VCI, weekly (Year 2000 – Presents)
- VCI, biweekly (Year 2000 – Presents)
- NDVI, daily (Year 2000 – Presents)
- NDVI, weekly (Year 2000 – Presents)
- NDVI, biweekly (Year 2000 – Presents)

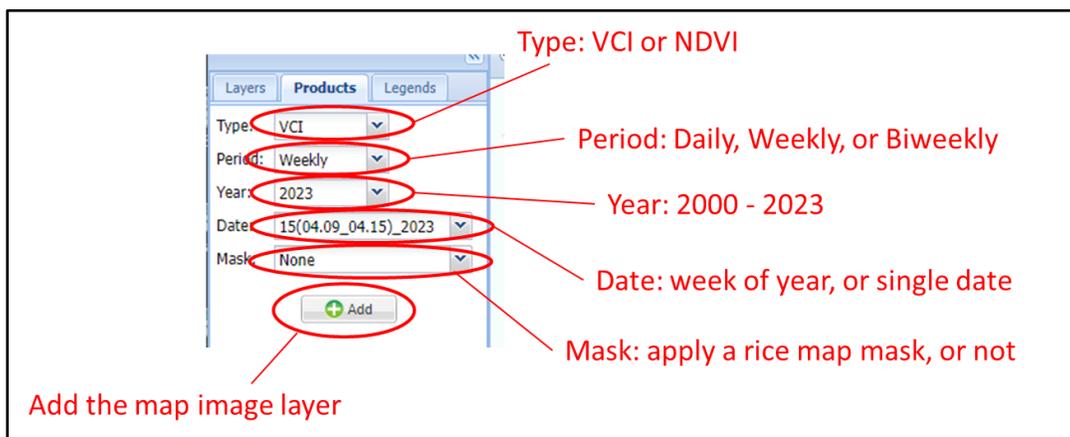


Figure 5. Products Side Menu

3.2.3 Legends

The "Legends" tab shows the value range of the products, NDVI and VCI.

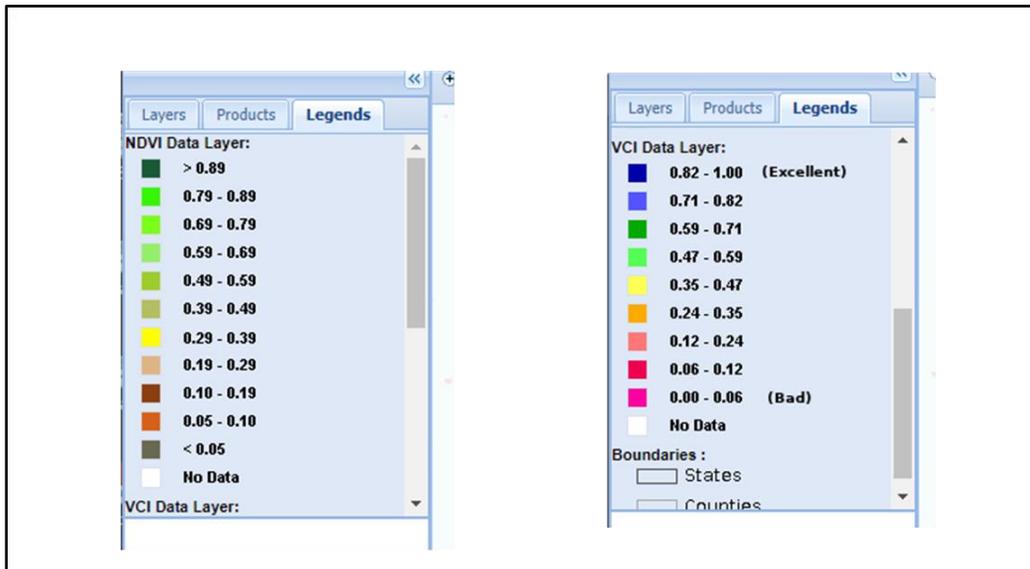


Figure 6. Legend Side Menu

4. Example Analysis

4.1 Identify Pixel Value

Each pixel within a VCI or NDVI image has a category range, category value, and a defined color. The color and category name are also available within a Legend popup dialog and/or the Legend tab next to the Layer selection.

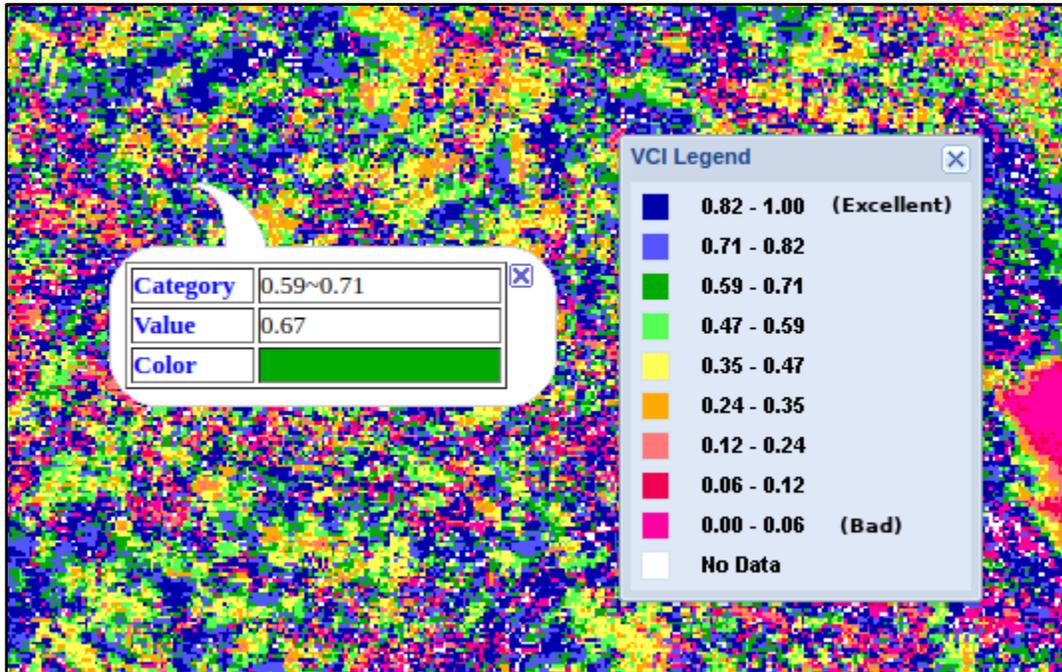


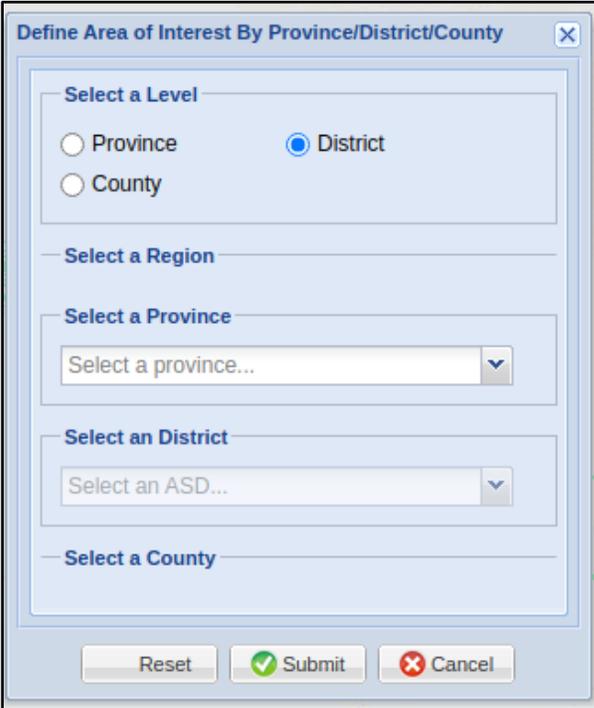
Figure 7. Identify Pixel Value

4.2 Define Area of Interest

It is necessary to define an Area of Interest (AOI) in order to perform any analysis. There are four ways to select an AOI.

4.2.1 By Province/District/County

You can select an AOI by state, by Agricultural Statistics District within a state, or by County within a state. You can only select districts or counties within one state at a time. The selected area of interest will be highlighted.



Define Area of Interest By Province/District/County

Select a Level

Province District County

Select a Region

Select a Province

Select a province...

Select an District

Select an ASD...

Select a County

Reset Submit Cancel

Figure 8. AOI by Province/District/County

4.2.2 By Rectangle

Click and drag to define rectangular AOI.

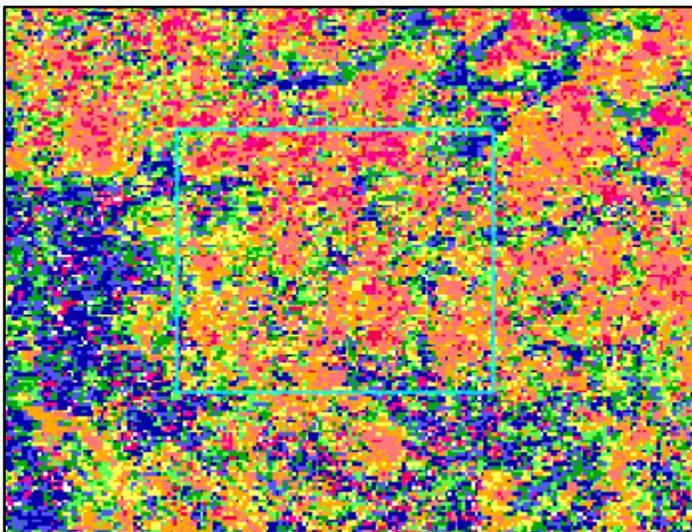


Figure 9. AOI by Rectangle

4.2.3 By Polygon

To define a polygon area of interest, click around the boundary of the area. Double click to finish AOI.

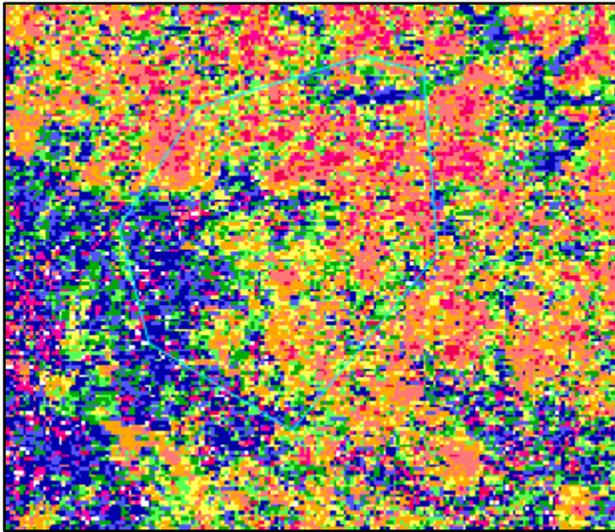


Figure 10. AOI by Polygon

4.2.4 By Circle

Start by clicking in the center of the circle and dragging outward.

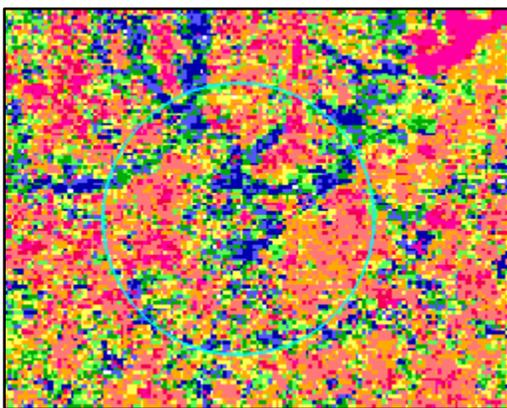


Figure 11. AOI by Circle

4.3 Generating Statistics for Area of Interest

Once an Area of Interest is selected, click on the Generate Statistics button to generate a table of categories within the AOI, the pixel counts of each category, and the resulting acreage calculated from the pixel count.

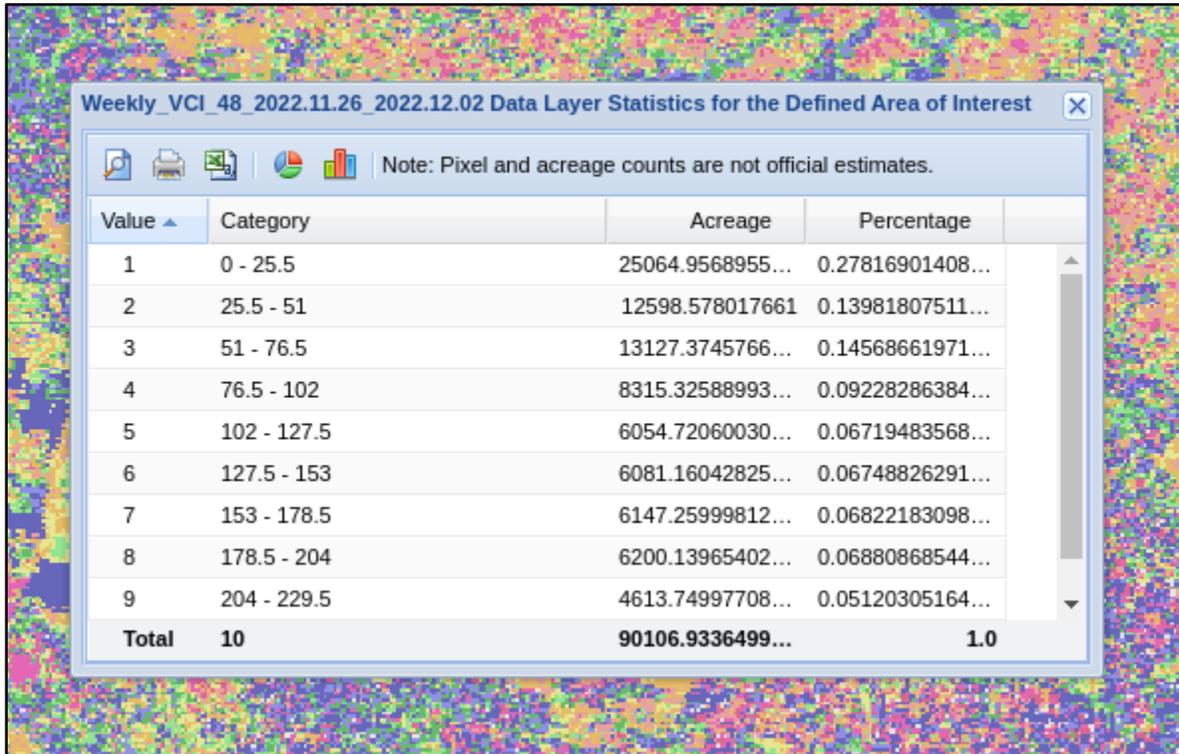


Figure 12. Data Statistics for the AOI

For a visual representation of the table data click on the Pie Chart icon or the Histogram icon.

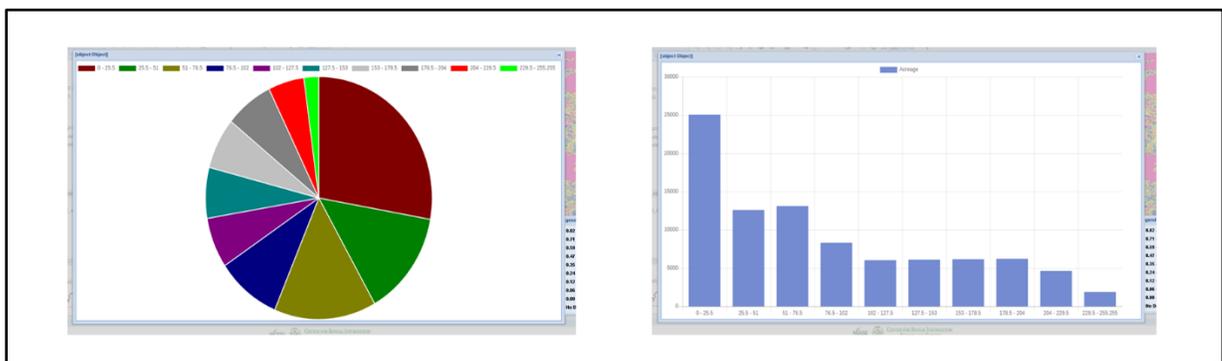


Figure 13. Pie Chart and Histogram for the Statistics

4.4 Download Defined Area Data for Area of Interest

Download a compressed file of the defined area data.

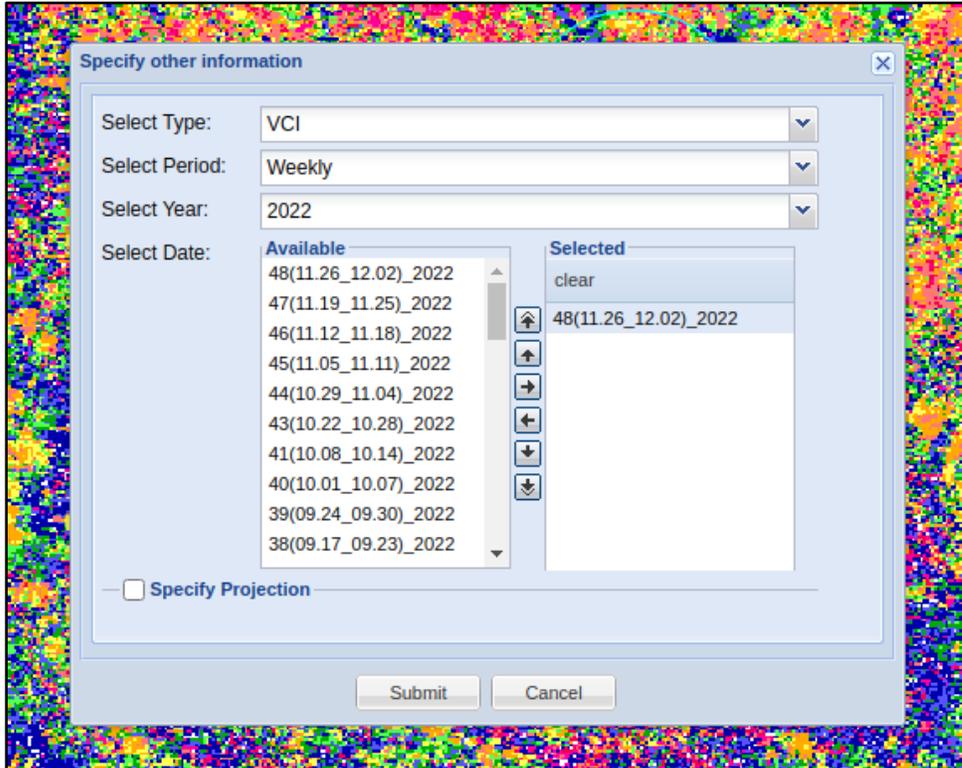


Figure 14. Set Download Information

Click Submit to select Downloading options.

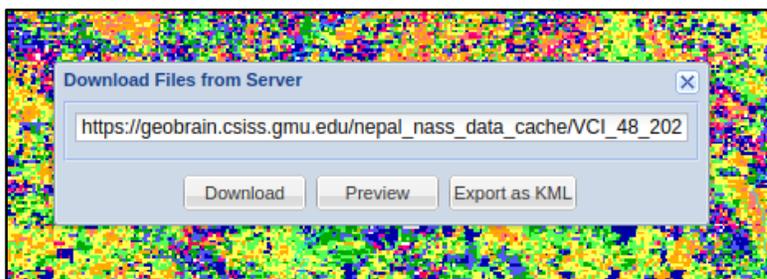


Figure 15. Download Popup Window

To preview the image, click "Preview" at the top of the window.

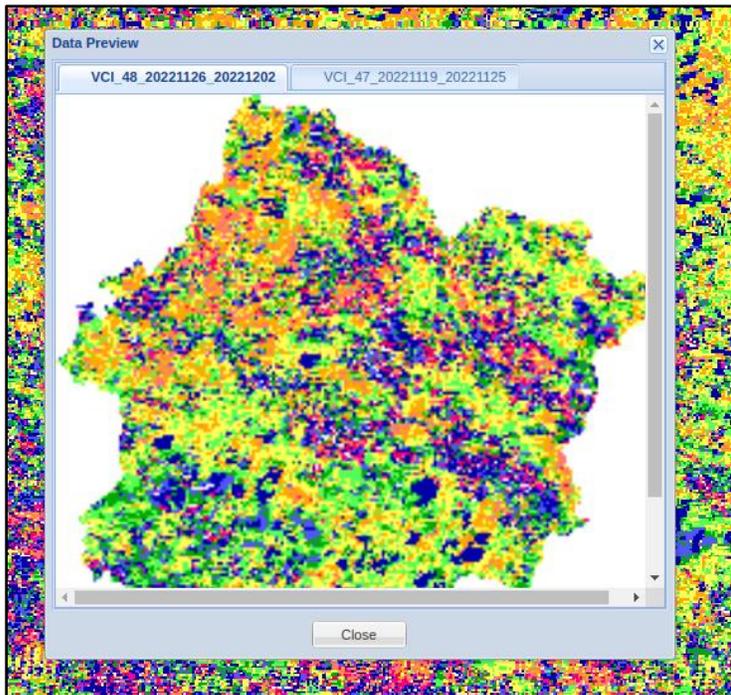


Figure 16. Preview Images Window

To import into Google Earth, click "Export as KML" to download the .kml file required to load into Google Earth.

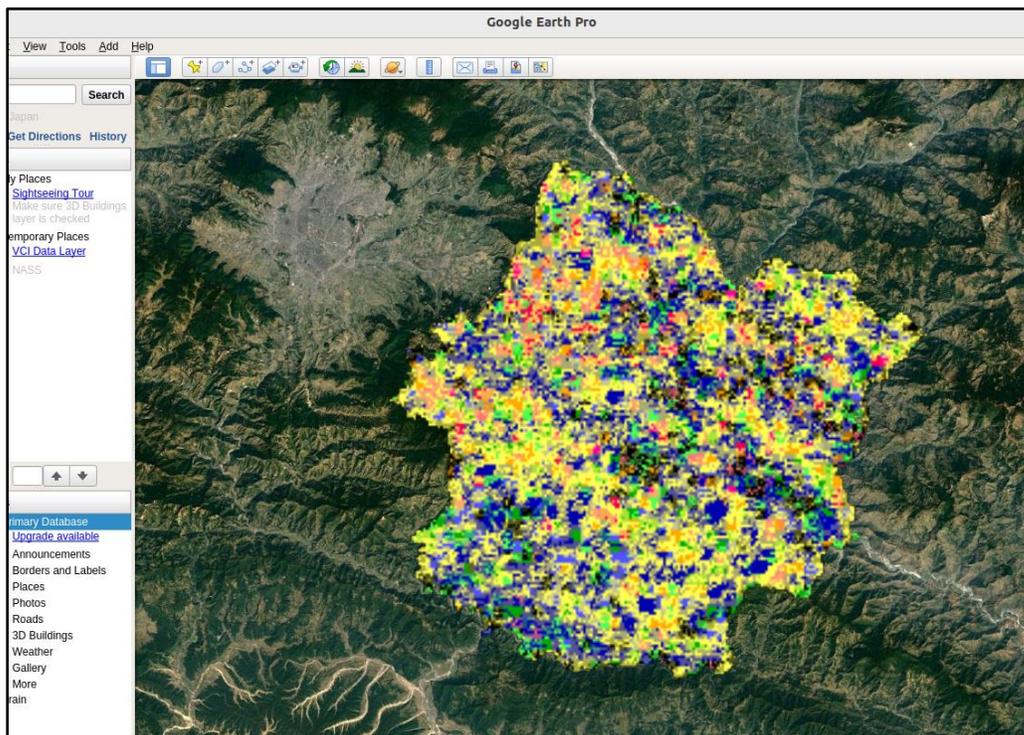


Figure 17. Import the KML file into the Google Earth Application

5. Limits/Disclaimer

5.1 Pixel Counting

The CropScape for Nepal will allow for pixel counting at the province, district, and county levels. Counting pixels and multiplying by the area of each pixel will result in biased area estimates and should be considered raw numbers needing bias correction.

5.2 Limited to 2 million square kilometer display

The CropScape for Nepal allows users to analyze areas less than 2,000,000 square kilometers. If an Area of Interest is larger than the limit the following warning will appear:

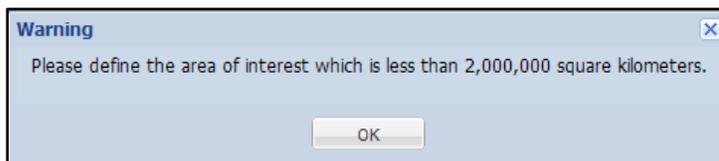


Figure 18. The Warning Popup Window

6. Revisions

Date	Author	Description
19 April 2023	Gil Heo	Initial Document