

# Forest and Carbon Change Tool

*Release 1.0.7*

**Conservation International**

**Jul 15, 2021**

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- Objective: Learn how to compute forest cover, forest loss, above and below ground biomass and emissions from deforestation in raster format and tabular outputs with areas estimated.
- Estimated time of completion: 20 minutes
- Internet access: Required

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Note: [Download this page as a PDF for offline use](#)

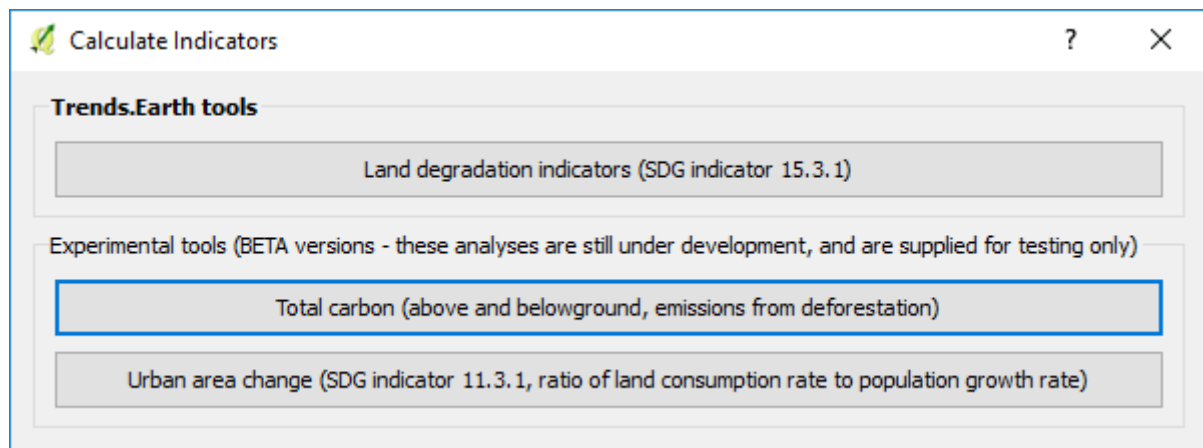
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## 1 Compute and download forest and biomass data

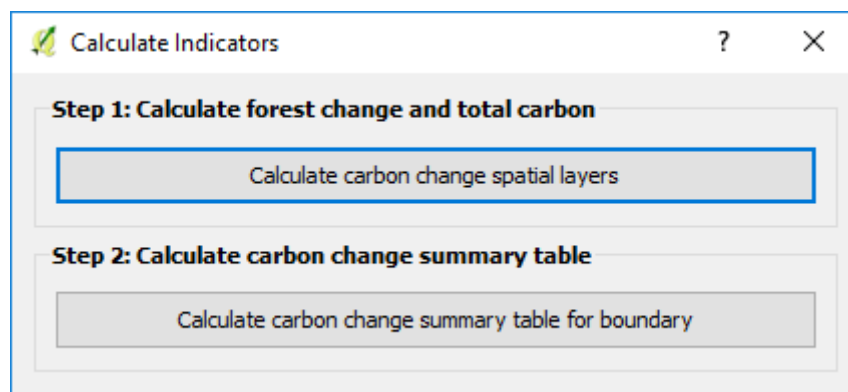
1. Select the Calculate icon () from the Trends.Earth plugin in QGIS.



2. The Calculate Indicators menu will open. In that window, click on Calculate carbon change spatial layers button.



3. A window will appear with two steps: Step 1 is to Calculate carbon change spatial layers, and Step 2 is to Calculate carbon change summary table for boundary. Step 1 will be addressed first. If the user has already completed this process, skip to step 14 in the guide.



4. After selecting Step 1, the user will fill out the desired parameters in the Forest Definition tab.

Calculate Change in Total Carbon

Forest Definition

Method

Area

Options

☒ Hansen et. al. Global Forest Change product (30 m resolution)

Period

Initial year:

2000

Target year:

2017

Percent forest cover considered forest

30%

☐ Custom forest cover dataset

Initial layer (initial year)

Import

Load existing

Final layer (target year)

Import

Load existing

Previous

Next

Calculate

- Next, select the desired aboveground biomass dataset and the method for calculating the root to shoot ratio.

**Calculate Change in Total Carbon**

Forest Definition   **Method**   Area   Options

**Aboveground biomass dataset**

- ☒ Default Woods Hole Research Center (30 m resolution, tropics only)
- ☐ GEOCARBON (1 km resolution, global)
- ☐ Custom dataset - COMING SOON!

**Method for calculation of root to shoot ratio**

- ☒ IPCC
- ☐ Mokany et al. 2006

6. In the Area tab define the area of analysis. There are two options:

- Use provided country and state boundaries: If you want to use this option make sure the Administrative area option is highlighted, and then select the First Level (country) or Second Level (state or province depending on the country).

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**Note:** The [Natural Earth Administrative Boundaries](#) provided in Trends.Earth are in the [public domain](#). The boundaries and names used, and the designations used, in Trends.Earth do not imply official endorsement or acceptance by Conservation International Foundation, or by its partner organizations and contributors.

If using Trends.Earth for official purposes, it is recommended that users choose an official boundary provided by the designated office of their country.

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- Use your own area file: If you want to use your own area of analysis, make sure the Area from file option is highlighted. Then click Browse and navigate to the folder in your computer where you have the file stored.

When you have selected the area for which you want to compute the indicators, click Next.

**Calculate Change in Total Carbon**

Forest Definition   Method   **Area**   Options

Area to run calculations for

☒ Country / region

First level: Uganda

Second level: All regions

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☐ Area from file

Click "Browse" to choose a file... Browse

Previous Next

Calculate

7. In the Options tab you can define the Task name and make some Notes to identify the analysis you are running. What information to indicate is optional, but we suggest noting:
- Area of analysis
  - Dates
  - Indicators run

Calculate Change in Total Carbon

Forest Definition Method Area Options

Metadata

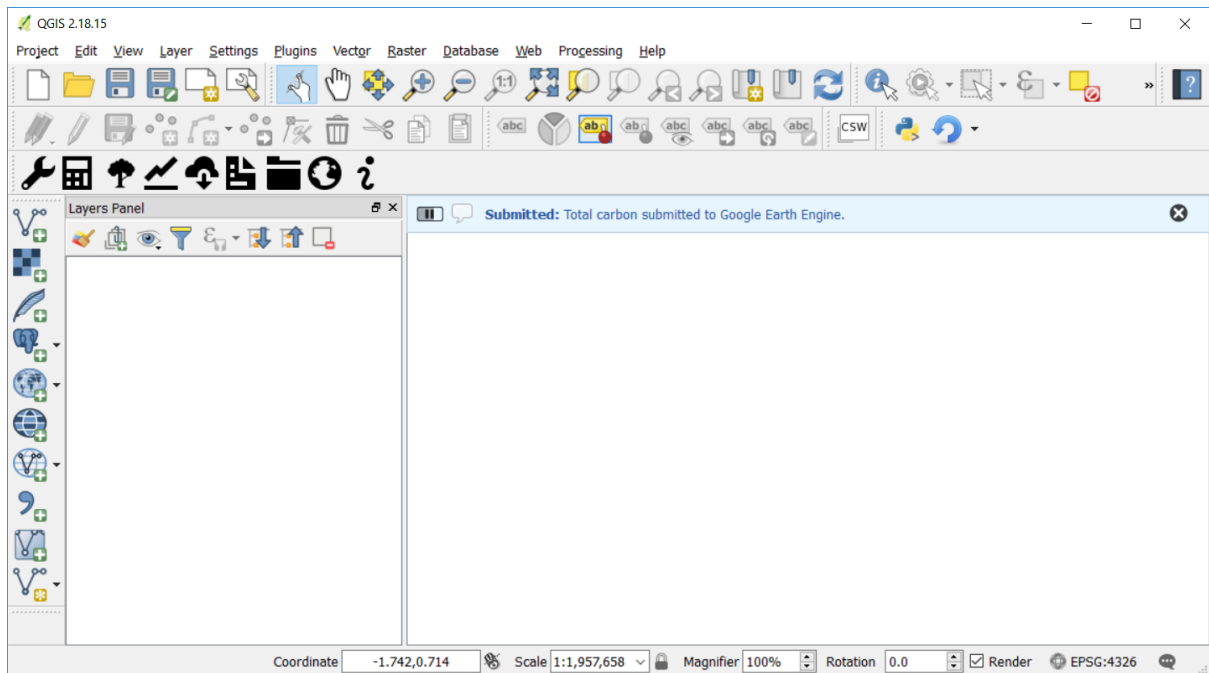
Task name:

uganda\_forest\_carbon\_change\_2000\_2017

Notes:


Previous Next Calculate

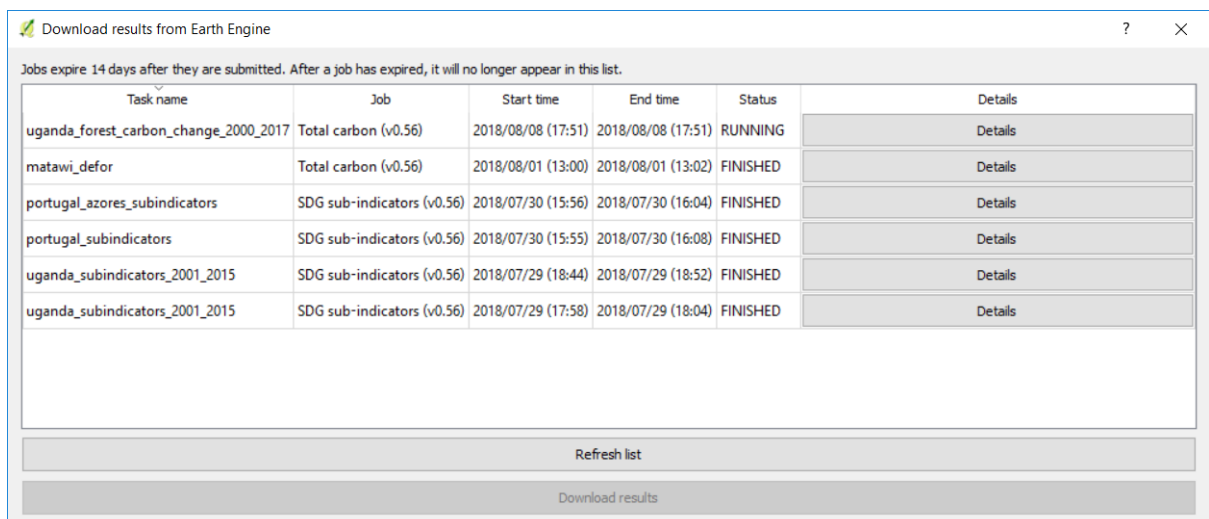
8. When done, click Calculate and the task will be submitted to Google Earth Engine for calculations. You will notice that the Calculate Change in Total Carbon window will disappear and you will be brought back to QGIS.
9. A light blue bar will temporarily show, indicating that the task was successfully submitted. The analysis will be run in Google servers and could take between 5 and 15 minutes depending on the size of the study area (larger areas tend to take longer).



Note: Refer to the task\_download tutorial for detailed information on how to check the status of the tasks submitted and for downloading results from Trends.Earth.



10. To view the Google Earth Engine (GEE) tasks you have running, and to download your results, select the cloud with the arrow facing down icon () . This will open up the Download results from Earth Engine dialog box. Select Refresh list to show the task.



11. The task will state: RUNNING under the Status column if it is still processing. When the task is complete, it will say FINISHED after selecting Refresh List again.

Download results from Earth Engine

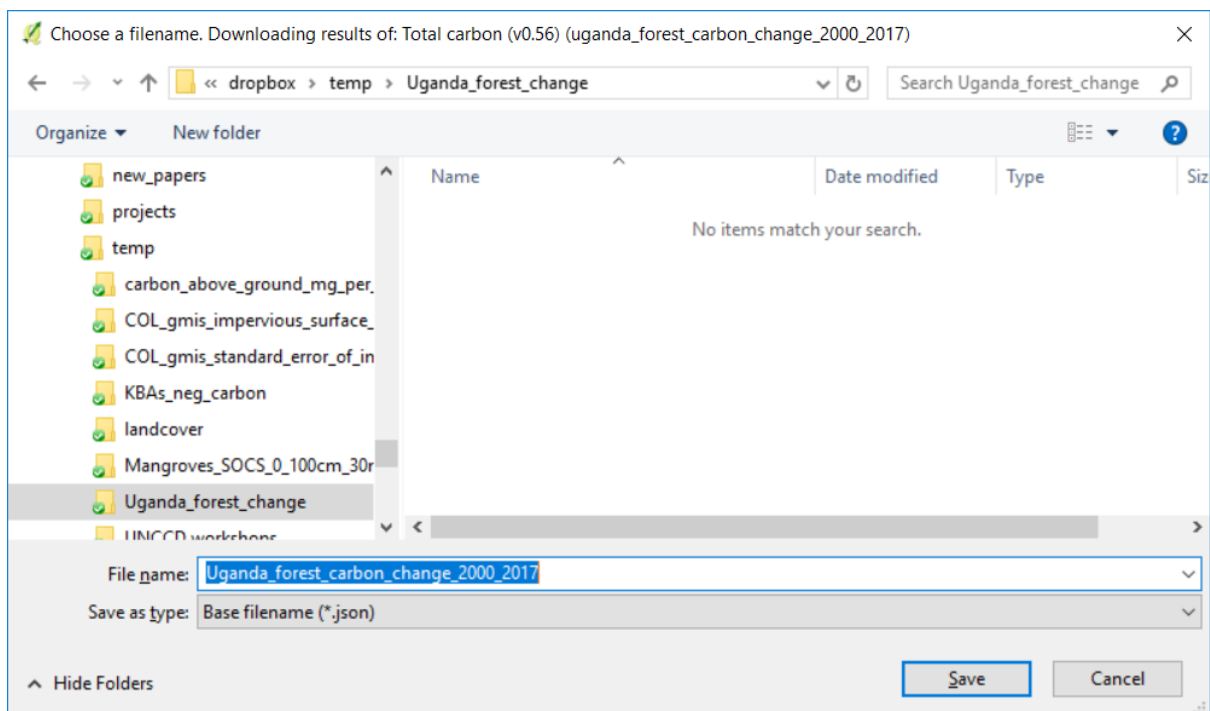
Jobs expire 14 days after they are submitted. After a job has expired, it will no longer appear in this list.

Task name	Job	Start time	End time	Status	Details
uganda_forest_carbon_change_2000_2017	Total carbon (v0.56)	2018/08/08 (17:51)	2018/08/08 (18:02)	FINISHED	Details
matawi_defor	Total carbon (v0.56)	2018/08/01 (13:00)	2018/08/01 (13:02)	FINISHED	Details
portugal_azores_subindicators	SDG sub-indicators (v0.56)	2018/07/30 (15:56)	2018/07/30 (16:04)	FINISHED	Details
portugal_subindicators	SDG sub-indicators (v0.56)	2018/07/30 (15:55)	2018/07/30 (16:08)	FINISHED	Details
uganda_subindicators_2001_2015	SDG sub-indicators (v0.56)	2018/07/29 (18:44)	2018/07/29 (18:52)	FINISHED	Details
uganda_subindicators_2001_2015	SDG sub-indicators (v0.56)	2018/07/29 (17:58)	2018/07/29 (18:04)	FINISHED	Details

Refresh list

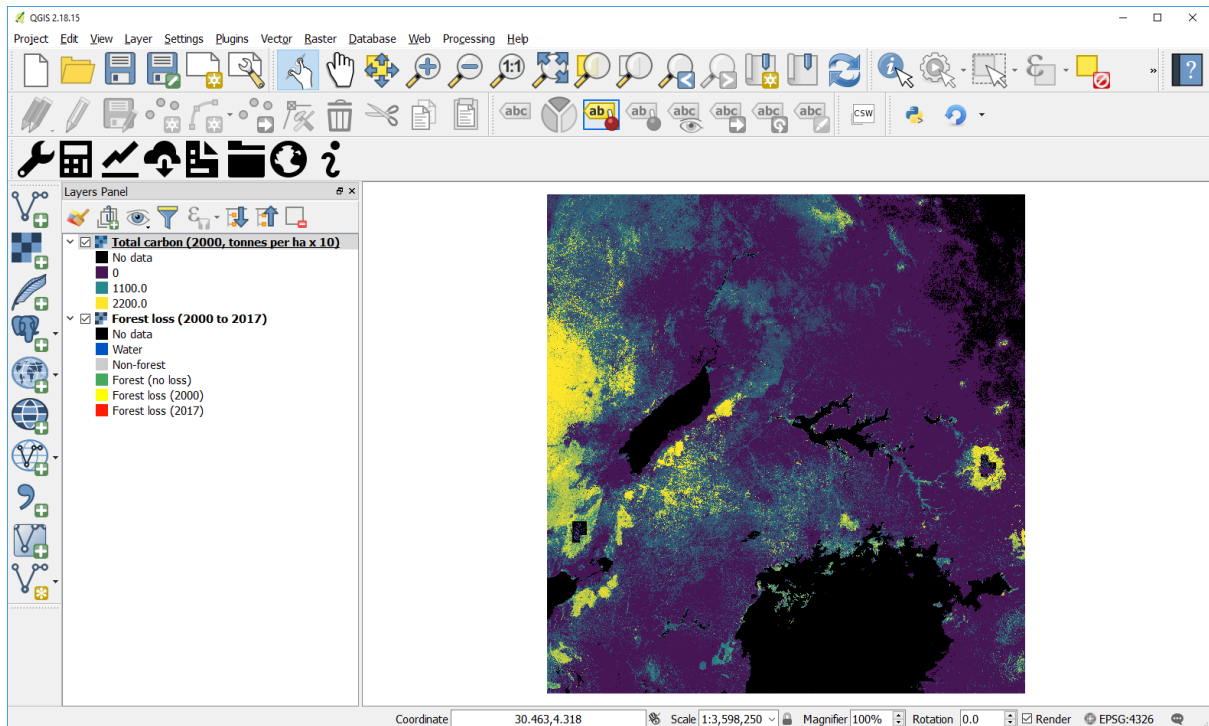
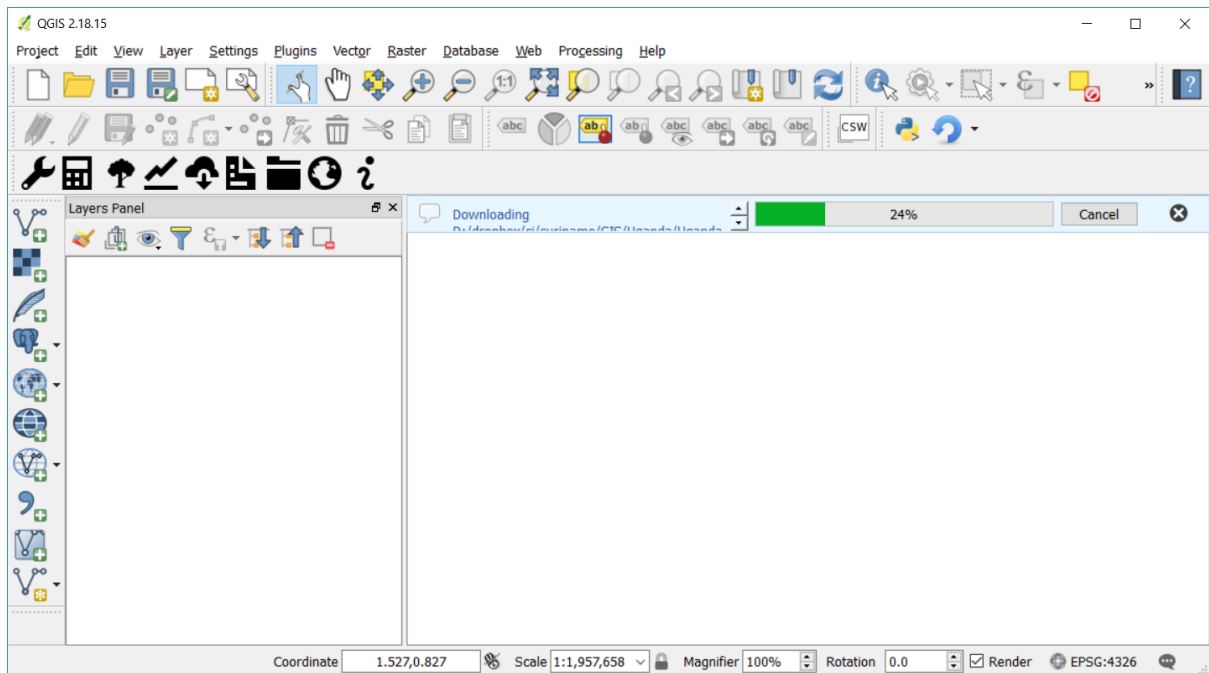
Download results

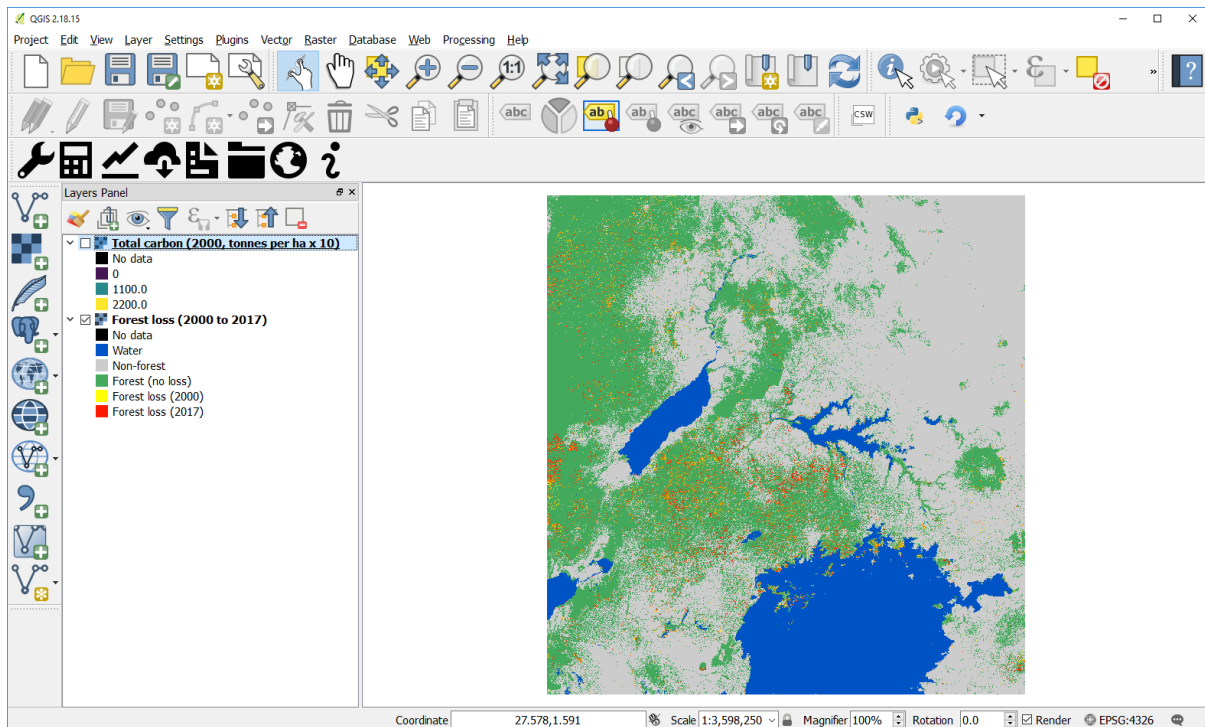
Once the task is FINISHED running, highlight the completed task and select Download Results. Save the task.



- You will see a message indicating the task is downloading. Once it is complete there will be a Total carbon (2000, tonnes per ha) and Forest loss (2000 to 2017) outputs in the QGIS window.








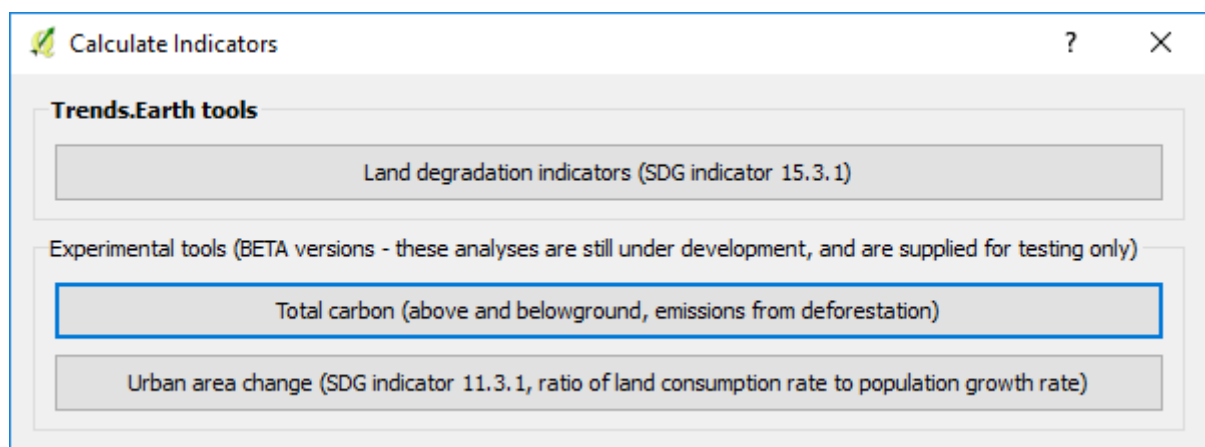
If you want, you can add some context information (e.g. country boundaries, roads, and main cities). Refer to the `tut_load_data` tutorial for detailed information on loading a basemap.

## 2 Compute summary table

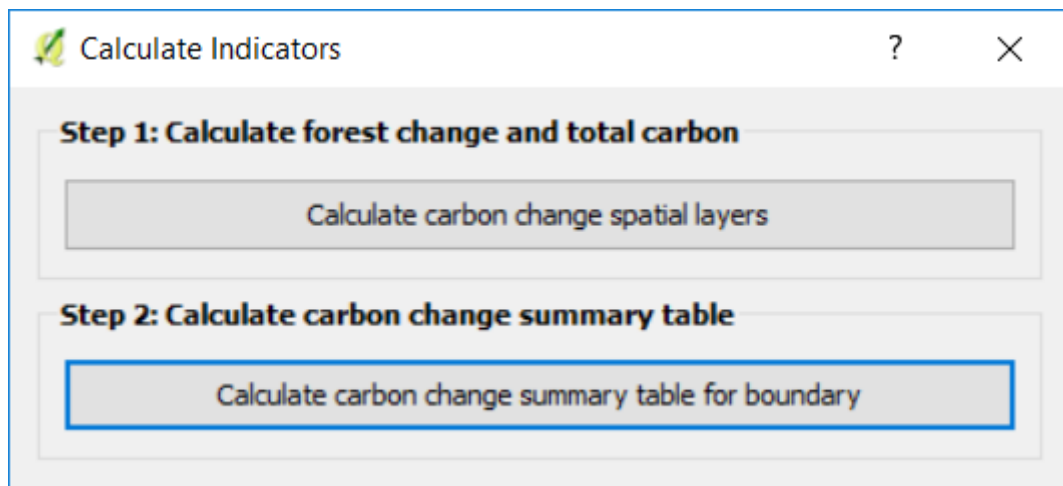
1. Select the Calculate icon () from the Trends.Earth plugin in QGIS.



2. The Calculate Indicators menu will open. In that window, click on Calculate Calculate carbon change spatial layers button.



3. Select Step 2: Calculate carbon change summary table for boundary.



**Calculate Indicators**

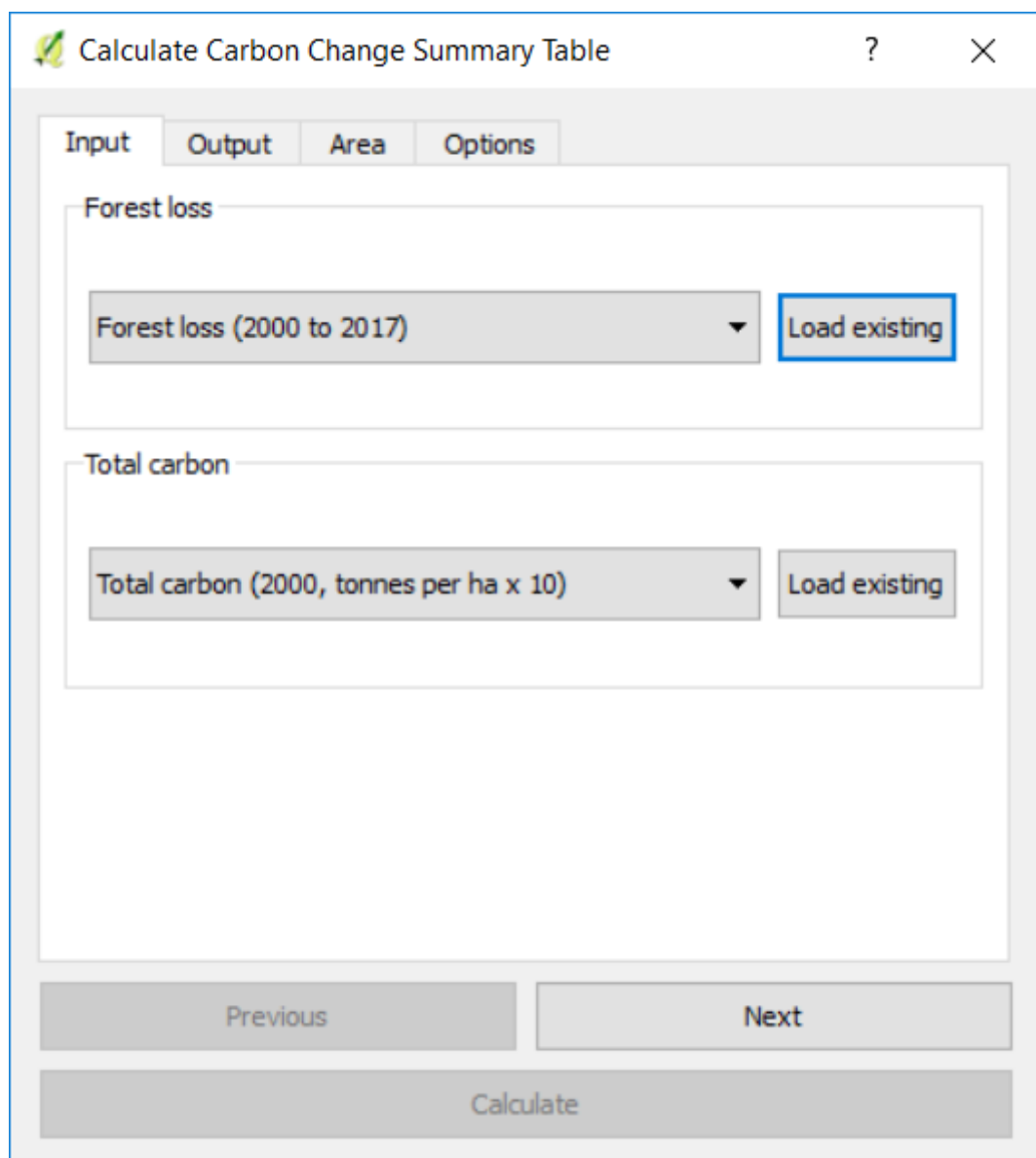
**Step 1: Calculate forest change and total carbon**

Calculate carbon change spatial layers

**Step 2: Calculate carbon change summary table**

Calculate carbon change summary table for boundary

4. Within the Input tab, select an output folder and file name.



**Calculate Carbon Change Summary Table**

Input Output Area Options

**Forest loss**

Forest loss (2000 to 2017) Load existing

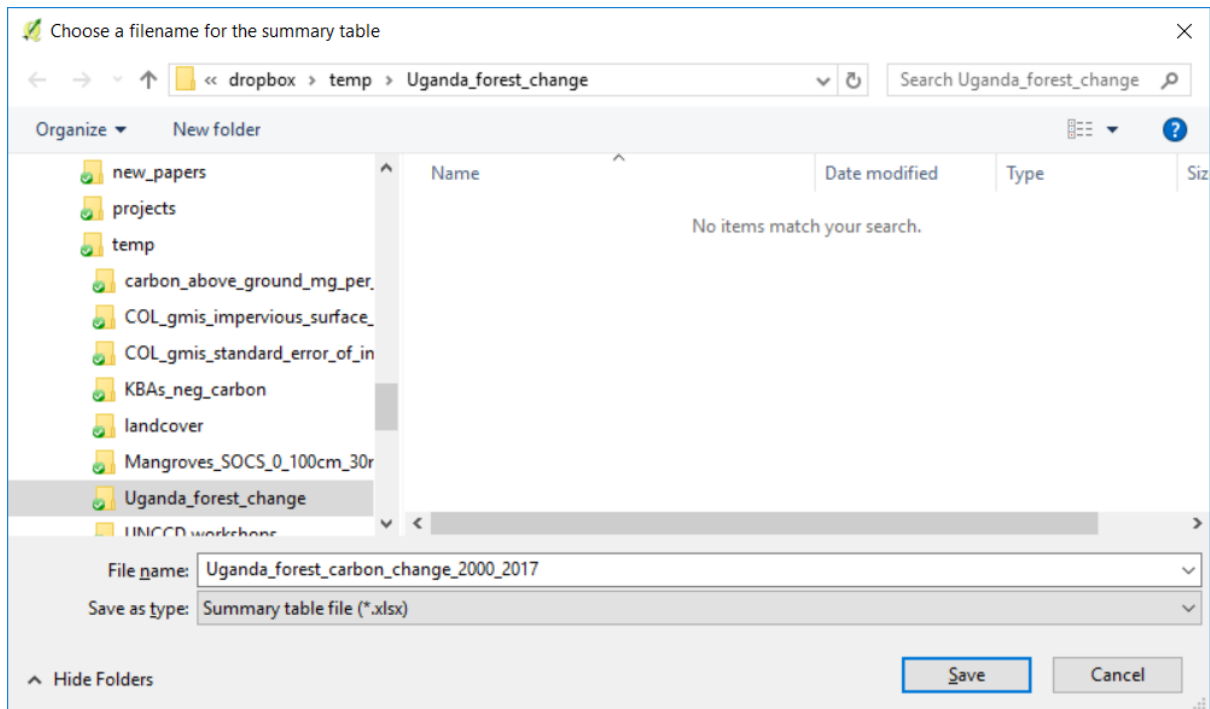
**Total carbon**

Total carbon (2000, tonnes per ha x 10) Load existing

Previous Next

Calculate

5. Within the Output tab, select Browse to list an output folder and file name.



6. In the Area tab define the area of analysis. There are two options:

- Use provided country and state boundaries: If you want to use this option make sure the Administrative area option is highlighted, and then select the First Level (country) or Second Level (state or province depending on the country).
- Use your own area file: If you want to use your own area of analysis, make sure the Area from file option is highlighted. Then click Browse and navigate to the folder in your computer where you have the file stored.

When you have selected the area for which you want to compute the indicators, click Next.

**Calculate Change in Total Carbon**

Forest Definition   Method   **Area**   Options

Area to run calculations for

☒ Country / region

First level: Uganda ▼

Second level: All regions ▼

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☐ Area from file

Click "Browse" to choose a file... Browse

Previous Next

Calculate

7. In the Options tab you can define the Task name and make some Notes to identify the analysis you are running. What information to indicate is optional, but we suggest noting:
- Area of analysis
  - Dates
  - Indicators run

Calculate Carbon Change Summary Table

Input Output Area Options

Metadata

Task name:

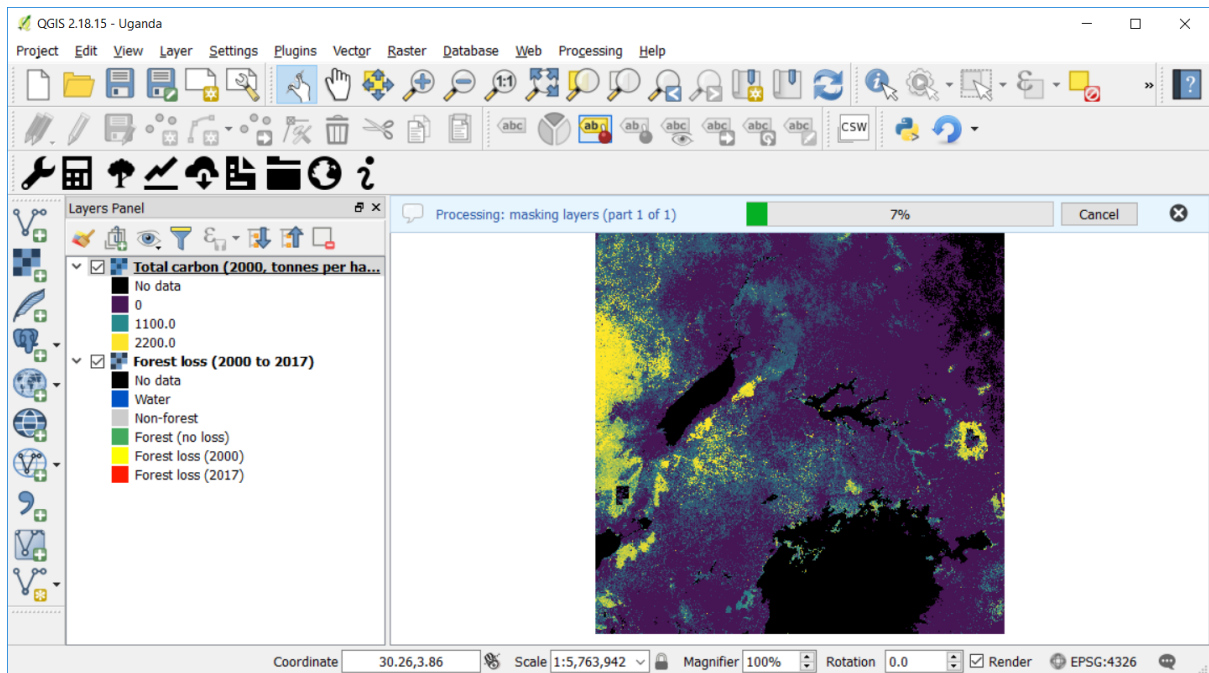
uganda\_forest\_carbon\_change\_2000\_2017

Notes:

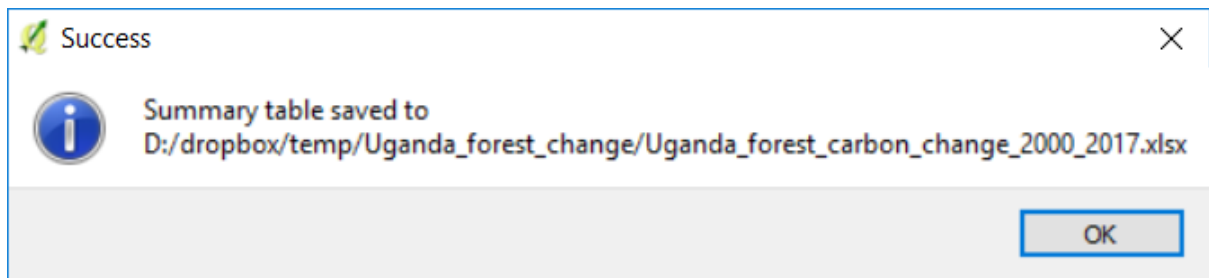
Previous Next

Calculate

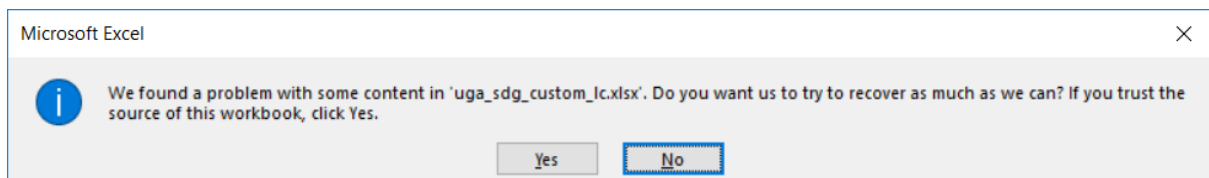
8. When done, click Calculate and the task will be submitted to your computer locally. You will notice that the Calculate carbon change summary table for boundary window will disappear and you will be brought back to QGIS. A light blue bar will appear in the QGIS window. This is running locally on your computer. DO NOT select x or Cancel until the task is finished!



9. A window will appear when the summary is complete. Select OK.



10. If an error window appears, select the Yes and the summary will proceed to open.



11. The summary table will appear.

AutoSaveOff

Uganda\_forest\_carbon\_c...Mariano Gonzalez-Roglich

FileHomeInsertPage LayoutFormulasDataReviewViewHelpTell meShare

A3

Summary of carbon change

	A	B	C	D	E	F	G
1	Trends.Earth carbon change summary table				TRENDSEARTH		
2					tracking land change		
3	Summary of carbon change						
4							
5			Area (hectares)	Percent of total area			
6		Initial forest area:	7,802,521	27.3%			
7		Initial non-forest land area:	12,722,163	44.6%			
8		Water area:	3,660,401	12.8%			
9		Missing data:	4,356,894	15.3%			
10		Total area:	28,541,979				
11							
12		Forest change over period (hectares):	-697,277				
13		Total carbon emissions over period (tonnes of CO2 equivalent):	265,041,116				
14							
15	Carbon change from baseline to target						
16							
17	Year	Total Forest (ha)	Forest Change (ha)	Total Biomass (tonnes of C)	Carbon Change (tonnes of C)	Carbon Emissions (tonnes of CO2 equivalent)	
18	2000	7,802,521		572,041,623			
19	2001	7,772,715	-29,806	568,208,187	-3,833,437	14,068,712	
20	2002	7,761,882	-10,833	567,109,968	-1,098,219	4,030,462	
21	2003	7,749,868	-12,014	565,626,252	-1,483,716	5,445,238	
22	2004	7,731,600	-18,268	563,406,407	-2,219,845	8,146,832	
23	2005	7,702,285	-29,315	559,728,308	-3,678,098	13,498,621	
24	2006	7,673,542	-28,743	556,368,685	-3,359,623	12,329,818	
Total Carbon Summary Table							

Ready

Display Settings

80%