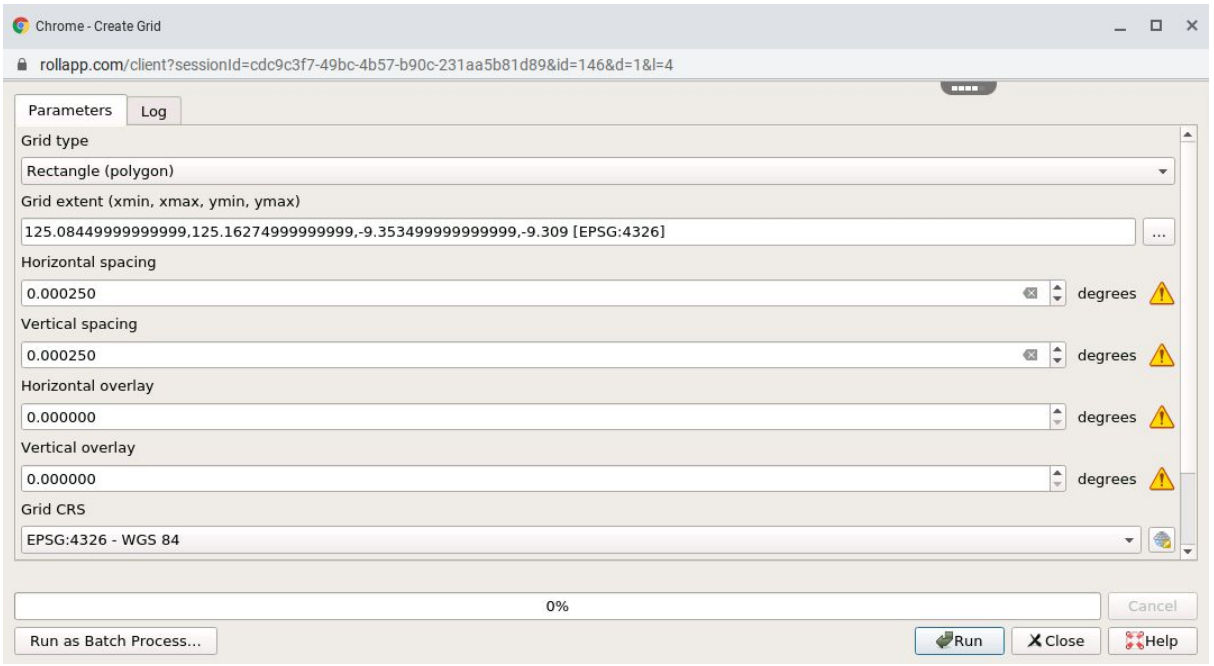
How to Develop 10-Year Harvest Maps

1. Plan the harvest over a number of years. This example will use 10 years. It will also harvest the landscape in equal sized land strips (so not timber volume).
    a. Strips serve our purpose for now: As explained for reforestation before, areas that have the same conditions (soil, climate zone, species, etc.), the emissions outcomes for the harvest are only dependent on the size of the reforested area not on the shape of the area.
    b. The approach below can also be used if the shape of the area does matter. The selection of such a shape is described in the reforestation explanation.

2. If you have not created a vector-grid of the project area yet, follow the steps below. Otherwise, use the existing vector grid and go to step 6 below.

3. Load the latest historical observation called year_clip.TIF

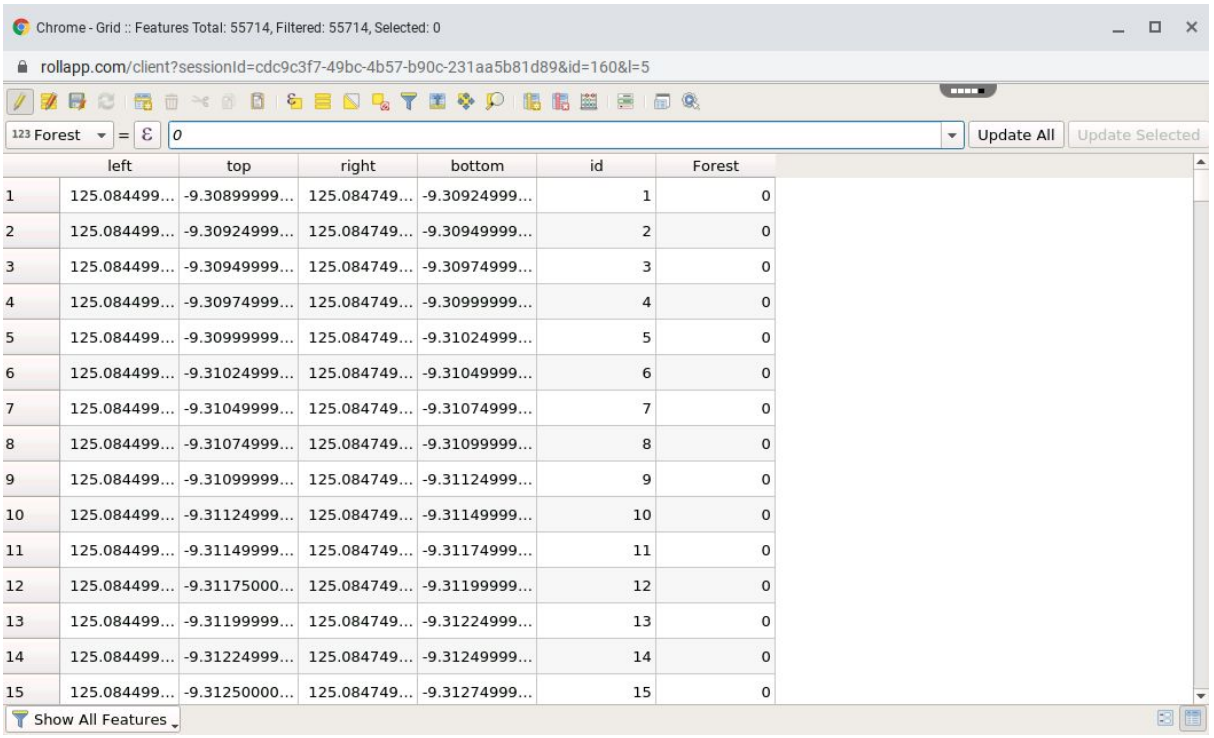
4. Click Processing > Toolbox > Vector Creation > Create Grid



    a. Create a vector grid
    b. Ensure at least one map of the area is uploaded onto the workspace (like 2018 East Timor forest cover)
    c. Search and select “Create Grid” under “vector creation” toolbox
    d. Grid type = Polygon
    e. Grid extent = “use layer extent” and select the forest cover 2018 map
    f. Horizontal spacing and vertical spacing are pixel size: i.e. 0.00025
    g. Horizontal and Vertical Overlay = 0.000000
    h. Grid CRS = Should automatically select same projection as the layer you chose for extent (should be EPSG:4326 – WGS 84)

i. Grid = >save as a file

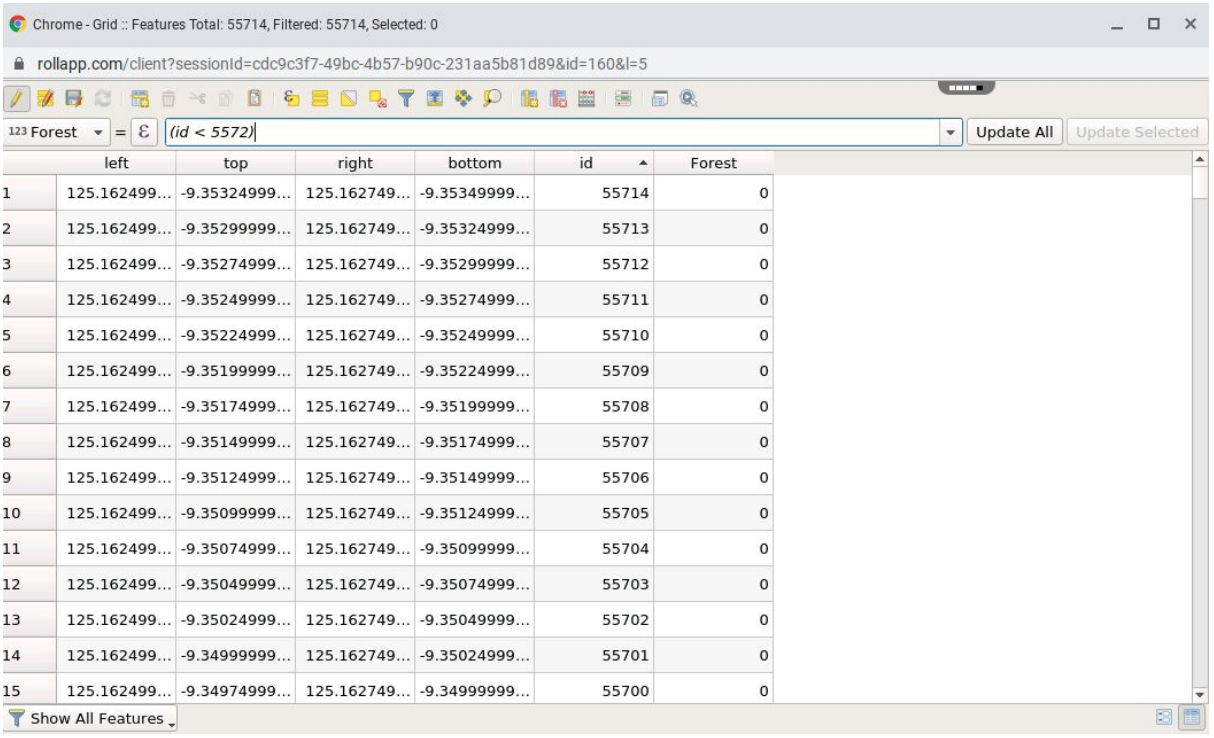
5. Create a Forest feature in the grid



	left	top	right	bottom	id	Forest
1	125.084499...	-9.30899999...	125.084749...	-9.30924999...	1	0
2	125.084499...	-9.30924999...	125.084749...	-9.30949999...	2	0
3	125.084499...	-9.30949999...	125.084749...	-9.30974999...	3	0
4	125.084499...	-9.30974999...	125.084749...	-9.30999999...	4	0
5	125.084499...	-9.30999999...	125.084749...	-9.31024999...	5	0
6	125.084499...	-9.31024999...	125.084749...	-9.31049999...	6	0
7	125.084499...	-9.31049999...	125.084749...	-9.31074999...	7	0
8	125.084499...	-9.31074999...	125.084749...	-9.31099999...	8	0
9	125.084499...	-9.31099999...	125.084749...	-9.31124999...	9	0
10	125.084499...	-9.31124999...	125.084749...	-9.31149999...	10	0
11	125.084499...	-9.31149999...	125.084749...	-9.31174999...	11	0
12	125.084499...	-9.31175000...	125.084749...	-9.31199999...	12	0
13	125.084499...	-9.31199999...	125.084749...	-9.31224999...	13	0
14	125.084499...	-9.31224999...	125.084749...	-9.31249999...	14	0
15	125.084499...	-9.31250000...	125.084749...	-9.31274999...	15	0

a. Right click the new grid in navigation bar on left > open attribute table
b. Toggle editing (click on pencil in corner)
c. Select “create field”
d. Name = Forest
e. Type = Whole number (integer) (and wait for it to load)
f. Type 0 into the expression area and “Update All” > This will make the whole grid = 0
g. Click edit button (little pencil) and save changes
h. Exit attribute table

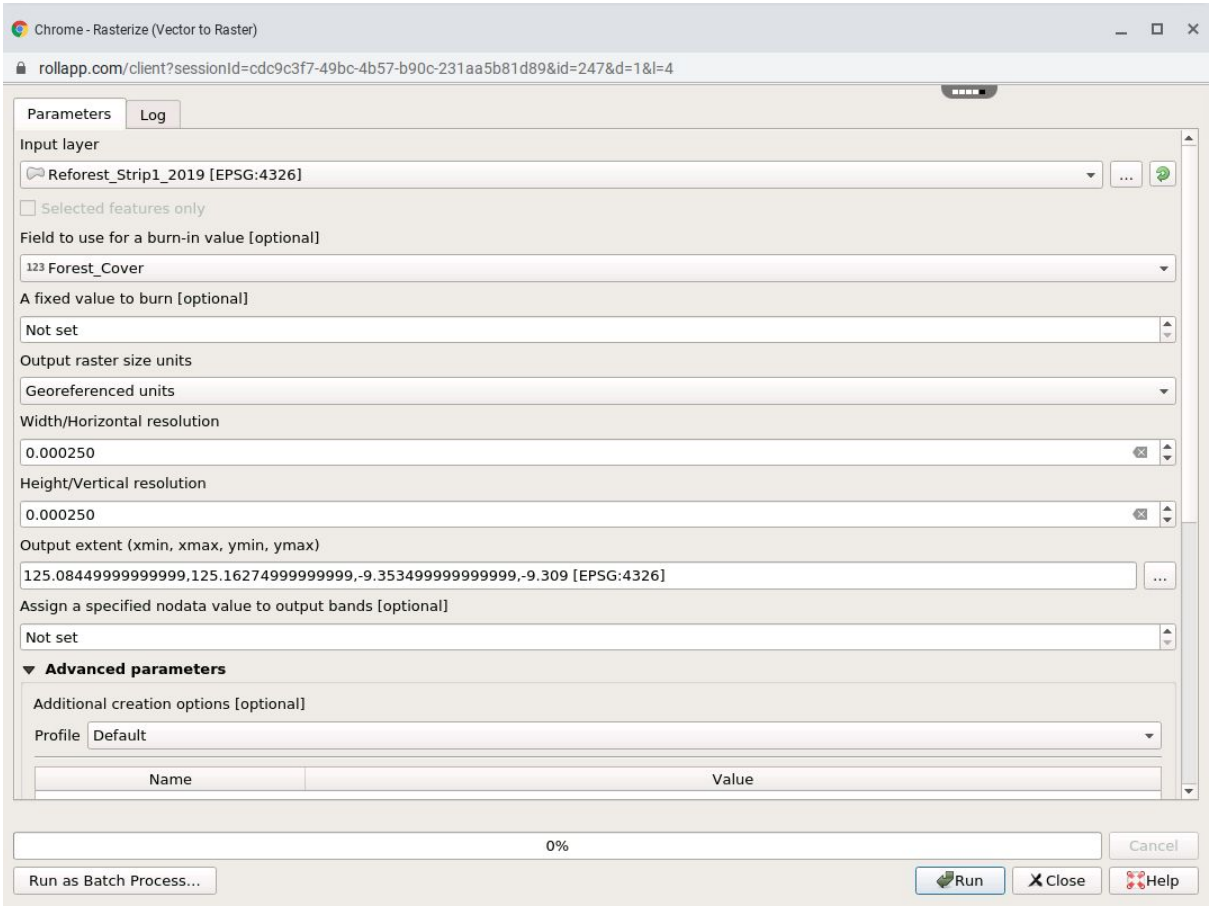
6. Below harvest is based on strips of 10 % of total area:



	left	top	right	bottom	id	Forest
1	125.162499...	-9.35324999...	125.162749...	-9.35349999...	55714	0
2	125.162499...	-9.35299999...	125.162749...	-9.35324999...	55713	0
3	125.162499...	-9.35274999...	125.162749...	-9.35299999...	55712	0
4	125.162499...	-9.35249999...	125.162749...	-9.35274999...	55711	0
5	125.162499...	-9.35224999...	125.162749...	-9.35249999...	55710	0
6	125.162499...	-9.35199999...	125.162749...	-9.35224999...	55709	0
7	125.162499...	-9.35174999...	125.162749...	-9.35199999...	55708	0
8	125.162499...	-9.35149999...	125.162749...	-9.35174999...	55707	0
9	125.162499...	-9.35124999...	125.162749...	-9.35149999...	55706	0
10	125.162499...	-9.35099999...	125.162749...	-9.35124999...	55705	0
11	125.162499...	-9.35074999...	125.162749...	-9.35099999...	55704	0
12	125.162499...	-9.35049999...	125.162749...	-9.35074999...	55703	0
13	125.162499...	-9.35024999...	125.162749...	-9.35049999...	55702	0
14	125.162499...	-9.34999999...	125.162749...	-9.35024999...	55701	0
15	125.162499...	-9.34974999...	125.162749...	-9.34999999...	55700	0

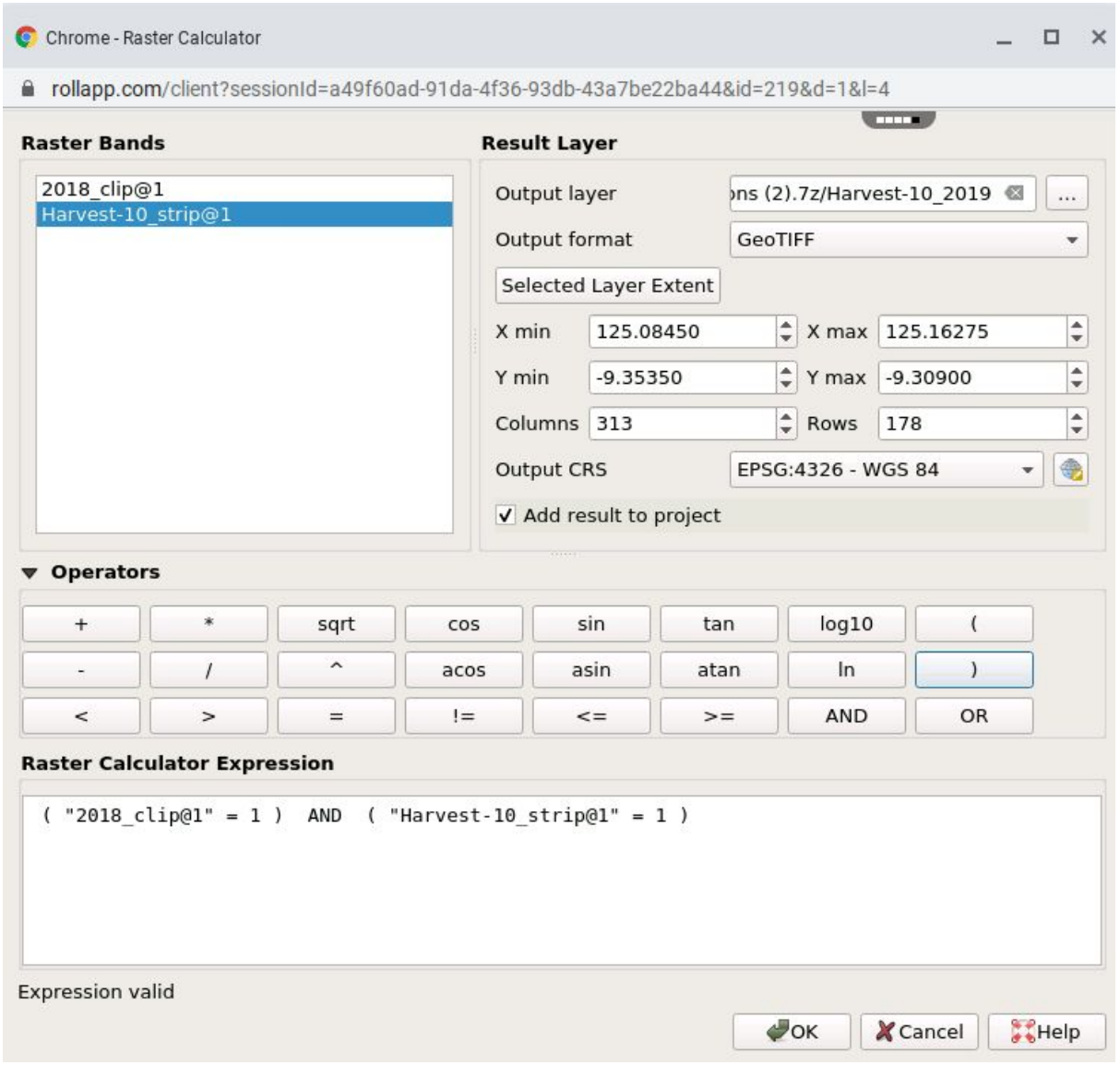
a. For a total harvest over 10 years, 10 strips of 10% of the area need to be harvested. There are 55’714 pixels. So each year 5’571 pixels need to be harvested.
b. For the first 10% use the following expression in the calculation bar: (id > 5571) and click Update All

7. Transfer Vector Grid to TIFF Raster Toolbar>Raster>Conversion>Rasterize

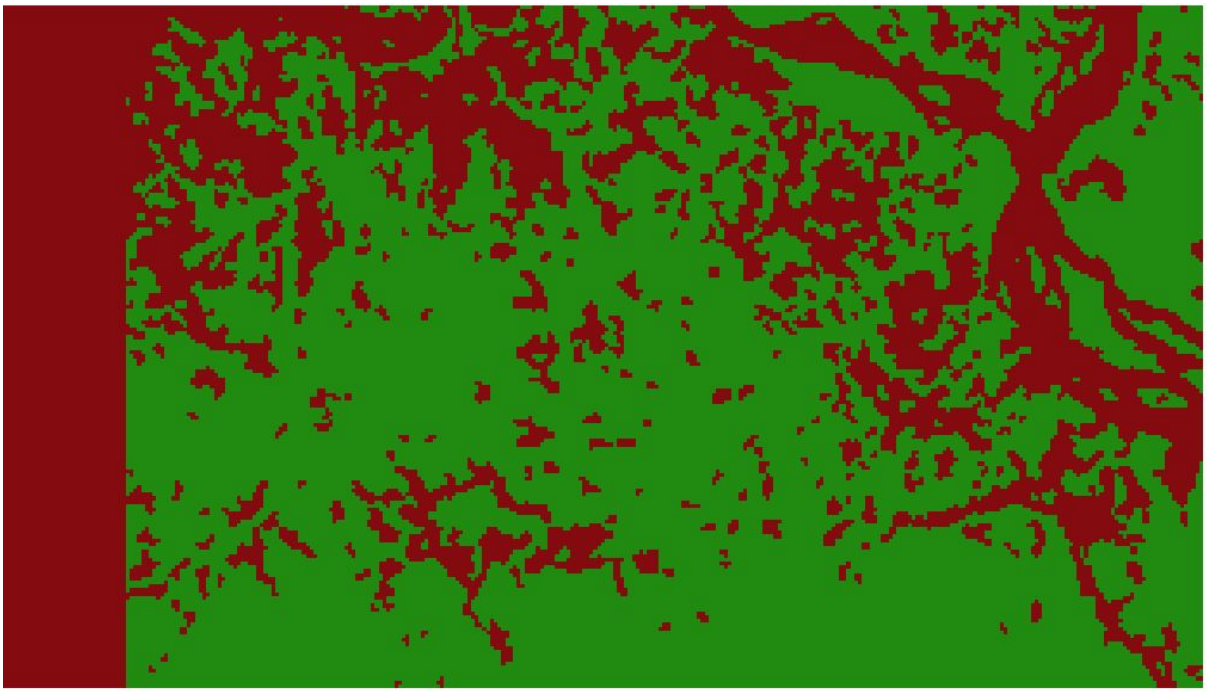


a. Input layer = your grid
b. Field to use as burn in value = Forest (or Forest_Cover or whatever you named the reforested area.)
c. Use fixed value to burn = click delete and “Not Set” should appear as the value
d. Raster size units = georeferenced units
e. Resolution is same pixel size i.e. 0.00025
f. Output extent is the same as original TIFF map e.g. 2018_clip.tif
g. Nodata value should be “Not Set”
h. Click Run

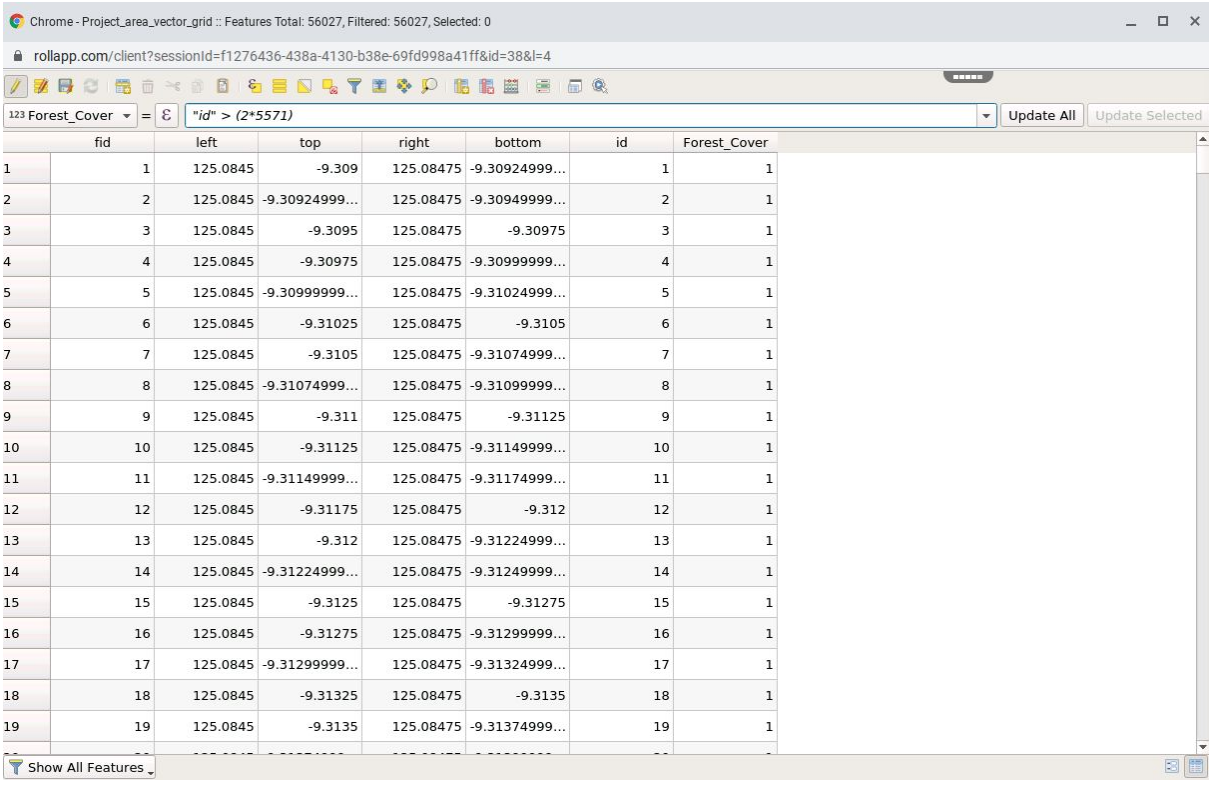
8. Combine the harvest area with the existing situation from 2018



9. The resulting map looks like this:

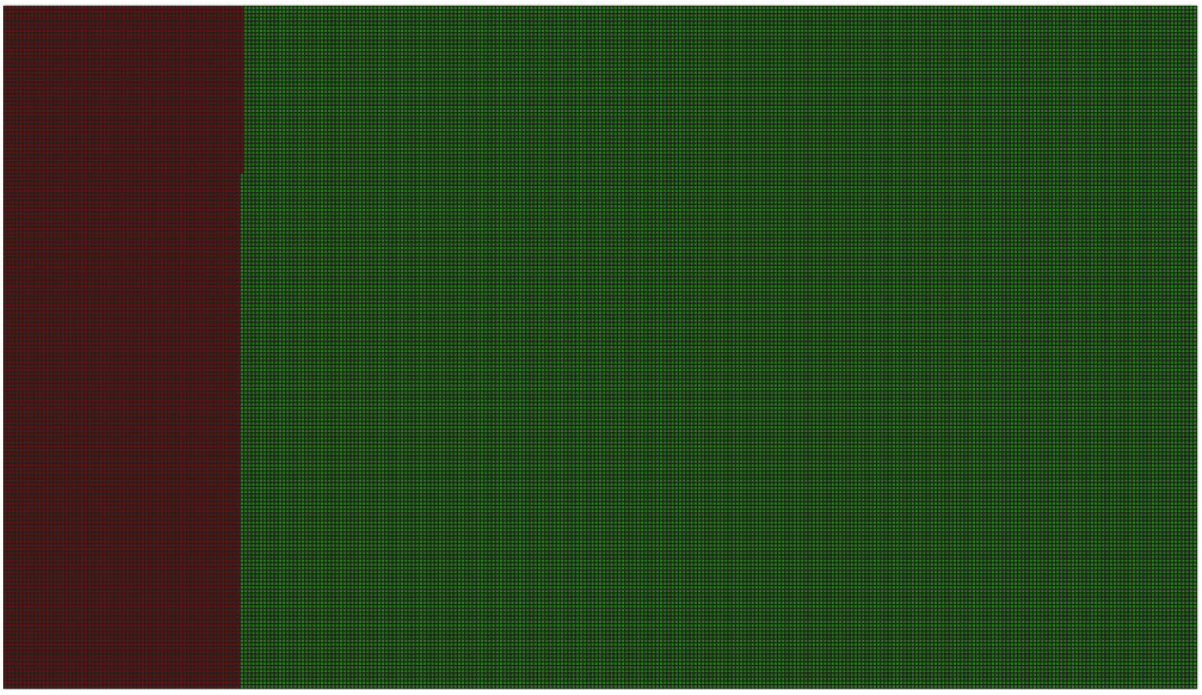


10. Use the following raster: i.e. Harvest of the next 10%:
    a. Right click the harvest vector grid in navigation bar on the left > open attribute table
    b. Toggle editing (click on pencil in corner)
    c. Use the following expression in the calculation bar: (id > (2 * 5571)) and click Update All.



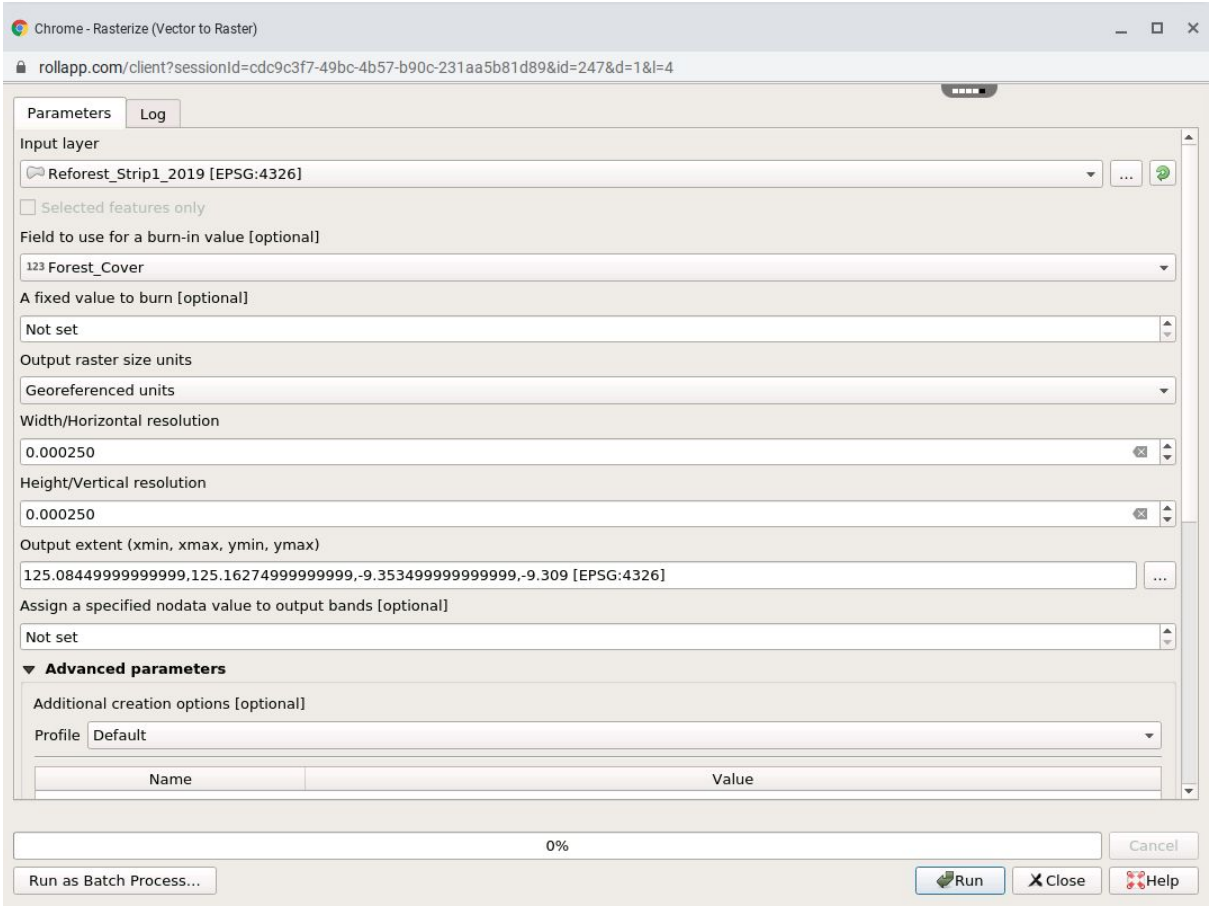
	fid	left	top	right	bottom	id	Forest_Cover
1	1	125.0845	-9.309	125.08475	-9.30924999...	1	1
2	2	125.0845	-9.30924999...	125.08475	-9.30949999...	2	1
3	3	125.0845	-9.3095	125.08475	-9.30975	3	1
4	4	125.0845	-9.30975	125.08475	-9.30999999...	4	1
5	5	125.0845	-9.30999999...	125.08475	-9.31024999...	5	1
6	6	125.0845	-9.31025	125.08475	-9.3105	6	1
7	7	125.0845	-9.3105	125.08475	-9.31074999...	7	1
8	8	125.0845	-9.31074999...	125.08475	-9.31099999...	8	1
9	9	125.0845	-9.311	125.08475	-9.31125	9	1
10	10	125.0845	-9.31125	125.08475	-9.31149999...	10	1
11	11	125.0845	-9.31149999...	125.08475	-9.31174999...	11	1
12	12	125.0845	-9.31175	125.08475	-9.312	12	1
13	13	125.0845	-9.312	125.08475	-9.31224999...	13	1
14	14	125.0845	-9.31224999...	125.08475	-9.31249999...	14	1
15	15	125.0845	-9.3125	125.08475	-9.31275	15	1
16	16	125.0845	-9.31275	125.08475	-9.31299999...	16	1
17	17	125.0845	-9.31299999...	125.08475	-9.31324999...	17	1
18	18	125.0845	-9.31325	125.08475	-9.3135	18	1
19	19	125.0845	-9.3135	125.08475	-9.31374999...	19	1

    d. The vector grid looks like this



e. Toggle editing (i.e. turn off) and save change

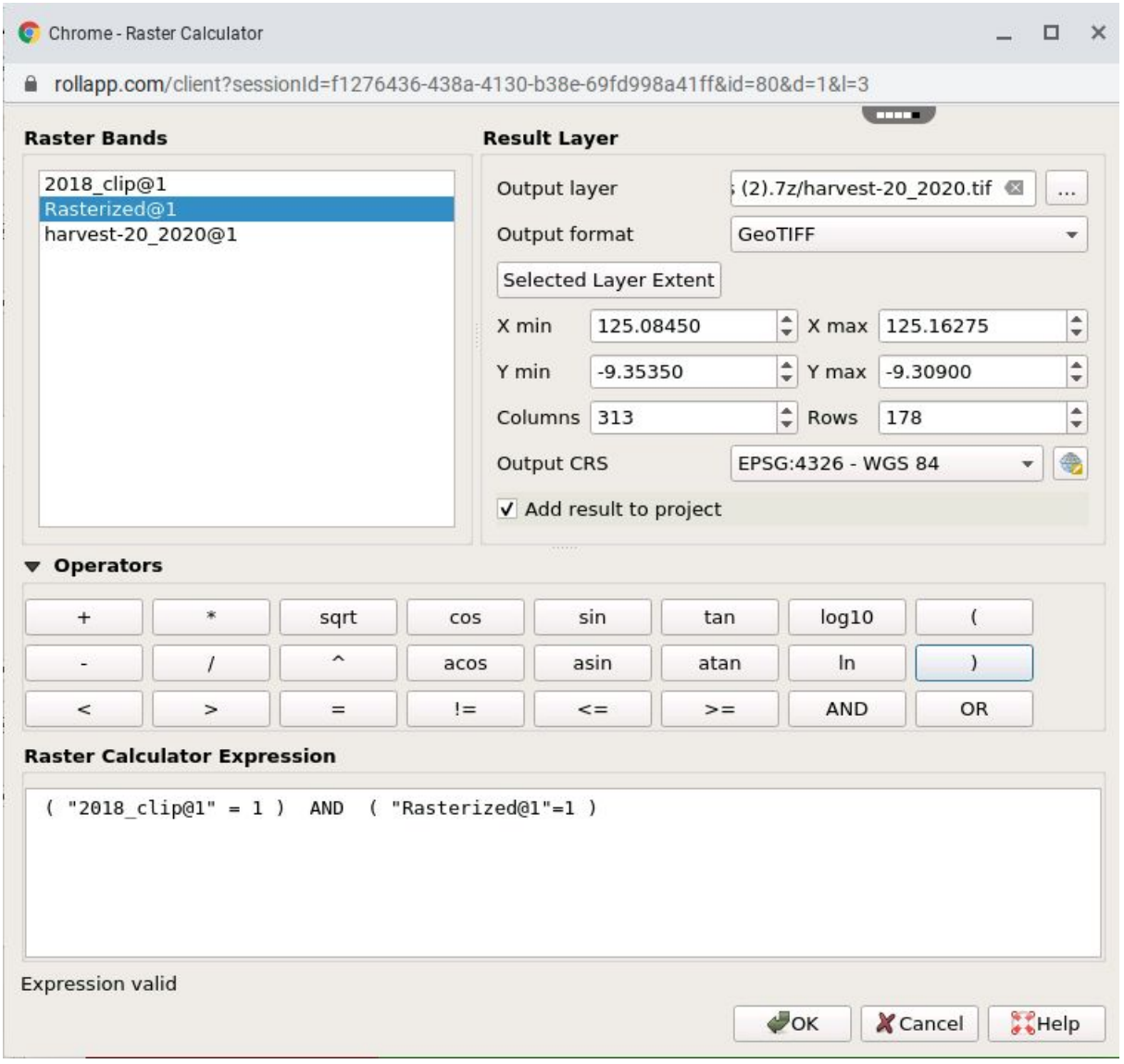
11. Transfer Vector Grid to TIFF Raster Toolbar>Raster>Conversion>Rasterize

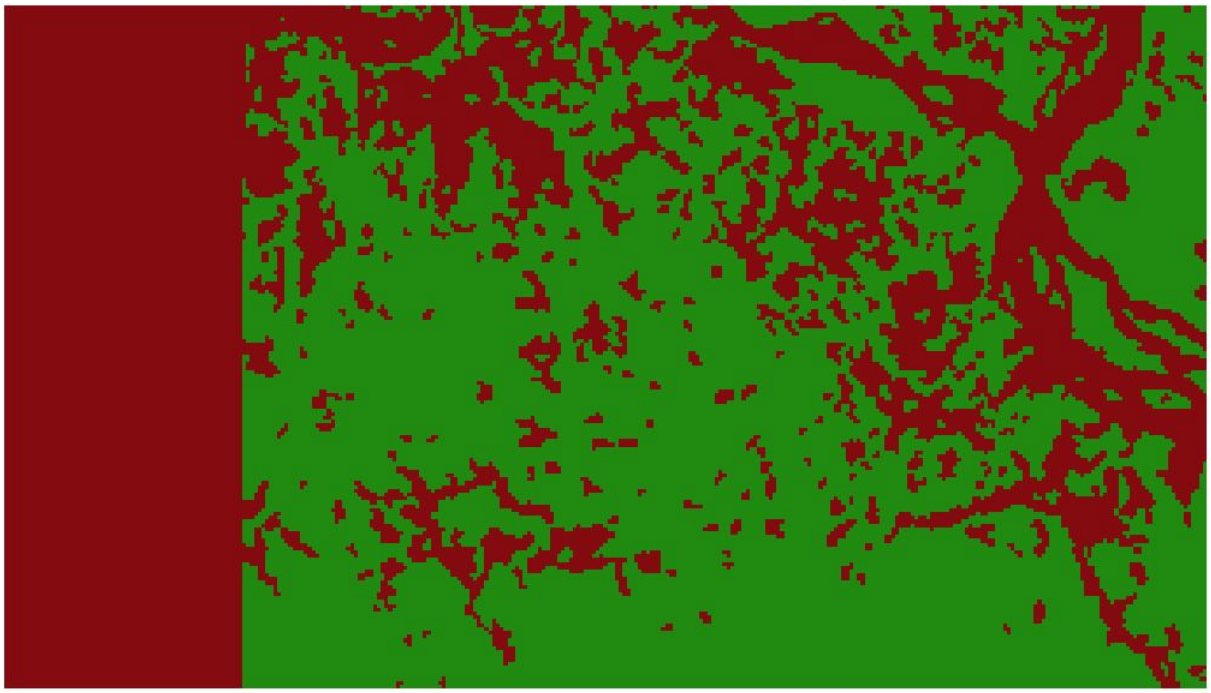


a. Input layer = your grid

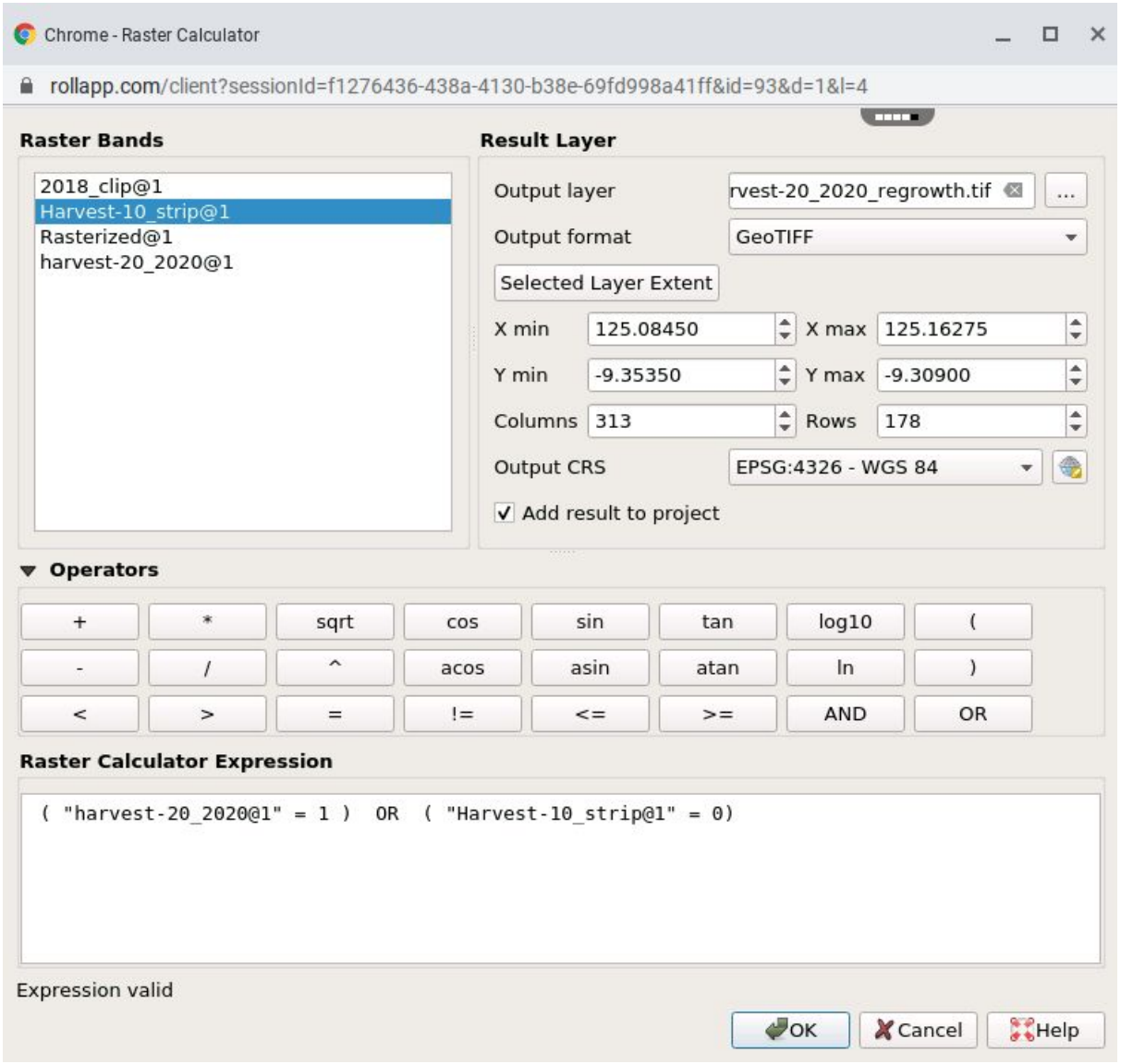
b. Field to use as burn in value = Forest (or Forest_Cover or whatever you named the reforested area.)
c. Use fixed value to burn = click delete and “Not Set” should appear as the value
d. Raster size units = georeferenced units
e. Resolution is same pixel size i.e. 0.00025
f. Output extent is the same as original TIFF map e.g. 2018_clip.tif
g. Nodata value should be “Not Set”
h. Click Run

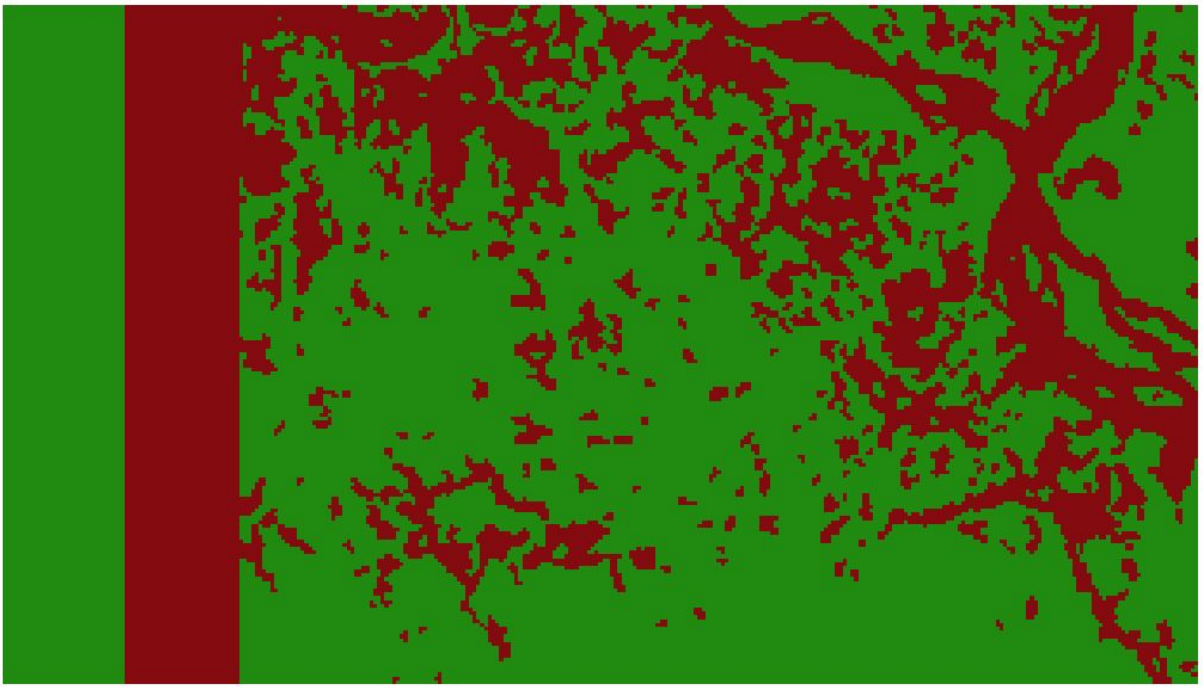
12. Combine with the previous harvest map using the raster calculator


Chrome - Raster Calculator
rollapp.com/client?sessionId=f1276436-438a-4130-b38e-69fd998a41ff&id=80&d=1&l=3
Raster Bands
2018_clip@1
Rasterized@1
harvest-20_2020@1
Result Layer
Output layer
(2).7z/harvest-20_2020.tif
Output format
GeoTIFF
Selected Layer Extent
X min
125.08450
X max
125.16275
Y min
-9.35350
Y max
-9.30900
Columns
313
Rows
178
Output CRS
EPSG:4326 - WGS 84
Add result to project
Operators
+
*
sqrt
cos
sin
tan
log10
(
-
/
^
acos
asin
atan
ln
)
<
>
=
!=
<=
>=
AND
OR
Raster Calculator Expression
("2018_clip@1" = 1) AND ("Rasterized@1"=1)
Expression valid
OK
Cancel
Help



13. Turn the previous strip into regrowing forest.


Chrome - Raster Calculator
rollapp.com/client?sessionId=f1276436-438a-4130-b38e-69fd998a41ff&id=93&d=1&l=4
Raster Bands
2018_clip@1
Harvest-10_strip@1
Rasterized@1
harvest-20_2020@1
Result Layer
Output layer
rvest-20_2020_regrowth.tif
...
Output format
GeoTIFF
Selected Layer Extent
X min
125.08450
X max
125.16275
Y min
-9.35350
Y max
-9.30900
Columns
313
Rows
178
Output CRS
EPSG:4326 - WGS 84
Add result to project
Operators
+
*
sqrt
cos
sin
tan
log10
(
-
/
^
acos
asin
atan
ln
)
<
>
=
!=
<=
>=
AND
OR
Raster Calculator Expression
("harvest-20_2020@1" = 1) OR ("Harvest-10_strip@1" = 0)
Expression valid
OK
Cancel
Help



14. Repeat for each year until the whole harvest plan for 10 years is complete. After that the area will be considered to remain completely reforested so up to 2050 there will be no changes.