

Lab 8: Tropical deforestation

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Due Date: 1130 am, 11/13

Welcome to your eighth SDL lab. This lab is intended to introduce you to thinking about the loss of forest cover globally, and specifically introduce you to the devastating impact that oil palm cultivation is having on tropical forests globally. If you answer your questions inline in this word document, **please do so in red ink**. This lab is composed of two sections:

Section 1: Global Forest Change

Please answer the following questions using this website:

<https://earthenginepartners.appspot.com/science-2013-global-forest>

Directions

Click the drop-down menu to the right, below “Data Products”, and select Loss/Extent/Gain. To get a feel for what you are seeing, read the legend captions and explore the other products in this drop-down menu. When are you zoomed in to a location, you can switch the background imagery to “Satellite” (top left of screen), and then vary the transparency of the data product layer using the sliding bar just below the original dropdown menu.

1. What time scale does the deforestation map cover? What time scale does the reforestation map cover?

Forest Loss 2000 – 2017 & Forest Gain 2000 – 2012

2. Search for Cocobolo, Costa Rica. The map will zoom in. Cocobolo appears to be ringed by forest. What is it actually ringed by? Hint: you may have to use Google Earth and the ground Photos to puzzle it out. Close Google Earth afterwards.

Banana Trees

3. What does Cocobolo’s “forest” cover tell us about the Global “Forest” Change map? It is a great map, but it is actually mapping something else—what is it? Hint: Look up the scientific paper that created the map (linked in main screen), and look at the Technical Comments, to the right.

Tree Cover (flesh out later)

4. Zoom all the way out to the global scale. In the temperate/boreal zone, in what three countries/regions is most of the deforestation happening? Boreal forests have very low species diversity, with just a couple dozen tree species found across the Arctic.

Eastern Russia, Alaska, and Northern Canada are losing a lot of tree coverage.

5. What is happening in the southeastern U.S., to make it turn pink? Why is this occurring? Zoom in and check it out, and ask me if you get stuck.

There's a lot of pine forestry farming there, requiring the trees there to be repeatedly grown and harvested leading to an area of both gain and loss.

6. Back out at the global scale, where in the tropics (between the Tropic of Cancer and the Tropic of Capricorn) is most of the deforestation occurring (red and pink)?

Guatemala is having severe deforestation with neighboring areas in Mexico losing some cover as well. Brazil is being cut pretty severely at the edges of the Amazon and in the south. Southwest Africa is losing a ton of tree cover (Countries like Sierra Leone, Cote d'Ivoire & Ghana.) South Central Africa is bleeding tree cover in Mozambique, Madagascar, & Angola. South Asia has lost tree cover in Vietnam & Cambodia.

7. In the bottom right menu, click on Kalimantan Oil Palm Plantations, under Example Locations, and Zoom to area. Investigate areas in pink and red, and toggle the satellite imagery. In this region, oil palm plantations are clearly distinguishable by the grid of roads and their uniformity. Given the history of this part of Kalimantan, red is clearly loss of old-growth rainforest. Use the Forest Loss Year map to find recent deforestation. What has replaced the rainforest? Please post three screenshots of different areas, showing deforestation mostly transparent.



Section 2: Tracking commodity impacts

Once a commodity begins to be A) valuable and B) make a significant environmental impact, partisans emerge on both sides to defend and attack the commodity's production. Paid consultants do "green-washing", while scientists and non-profits are accused of "attack jobs." But actual data on a commodity's overall impact has often been hard to come by. For example, until recently it has been difficult to hold companies large and small to account for the deforestation committed by farmers in their supply chain. Nutella production is dependent on oil palm, as are many shampoo producers like L'oreal. Are the farms they are buying from located on older degraded pasture land, or on recently deforested rainforest land? Some companies try to hide the truth and don't want you to know; others are using new tools to aggressively hold their own suppliers to account. One such platform, to support companies that want to manage their commodity chain, uses the Global Forest Change data and other sources. This is the free version:

<https://www.globalforestwatch.org/>

Directions

Click on "Map" to get the global map. The menus at the top will allow you to display the known oil palm mill locations (you may need to turn off the forest cover and Hansen tree cover loss data (pink) to see all mills.

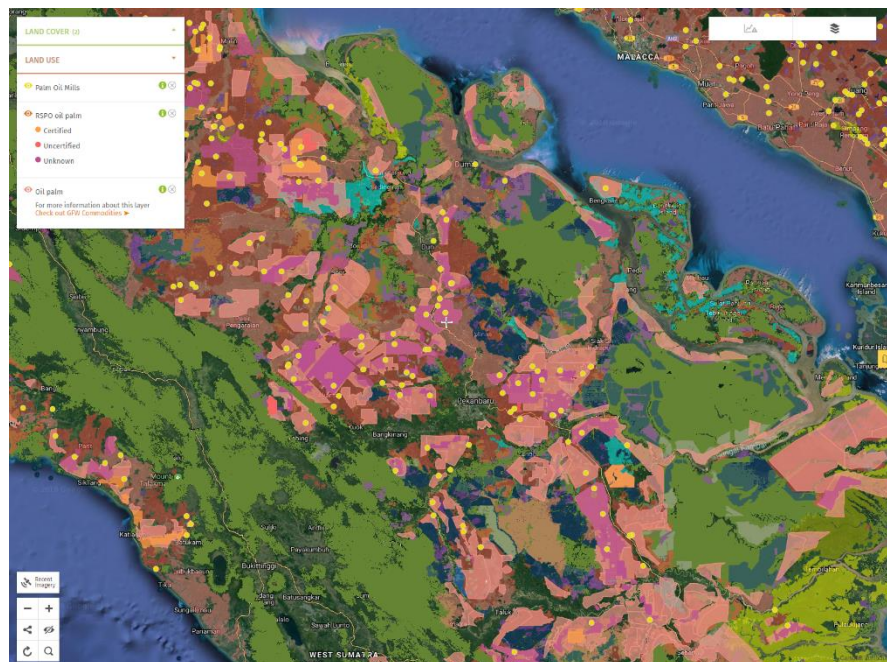
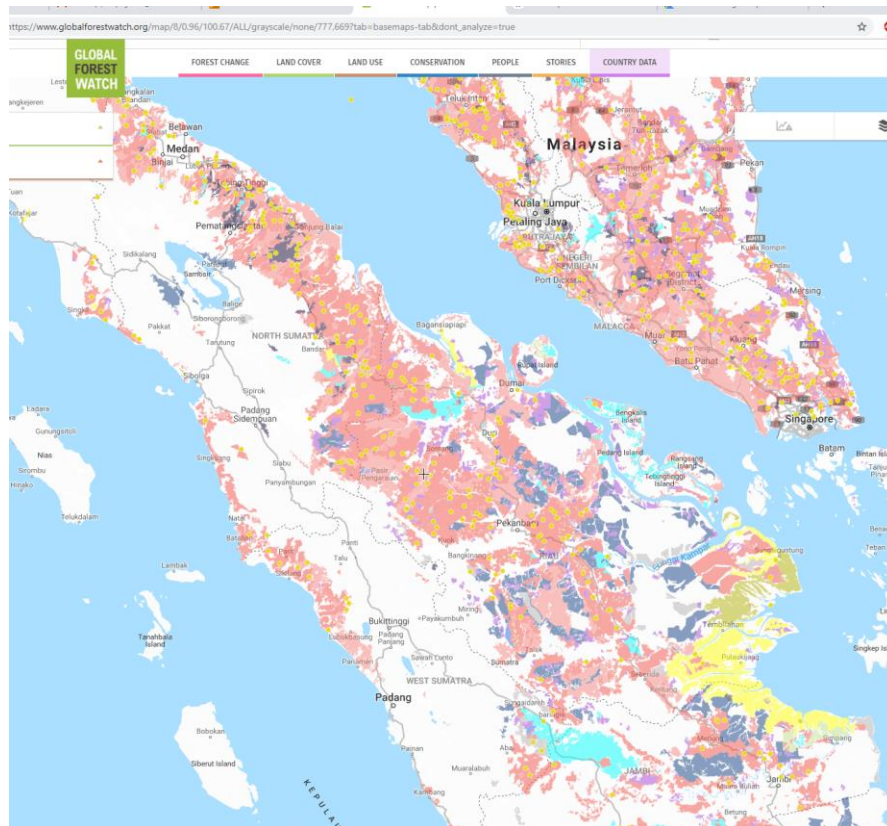
8. At the global scale, what regions have oil palm mills (this is just their database)?

Theres a ton in Indonesia, some in Papua New Guinea, and some in Central America + Colombia.

More directions:

This particular website is annoying because a) color scheme and b) the GIS layers can't be rearranged or made transparent—they have an order for display. Let me know if you figure out how to fix that, but in the meantime, do the following. Zoom to the island of Sumatra, the large long island to the west of Singapore. Click on "Forest Change" and turn off the Forest Change layer. Click on "Land Cover", and turn on the Tree Plantations layer (by species, not type). Zoom a little into an area (you should still see ocean on both sides) that has Oil Palm and Recently Cleared land uses. Take a screen shot. Now click on Land Cover and select Primary Forests, which shows you the status of primary forests in 2000 in Indonesia. Now let's see what has happened to them in the last two decades. Click on Land Use and toggle the Oil Palm and Sustainable Oil Palm concession layers. They appear underneath the forest layer, so you may have to click and unclick the forest and concession layers to answer the questions below. Finally, click on the small Layers symbol to the right (Change Base Map), and enable imagery.

9. Take another screen shot of the primary forest and oil palm concessions, and post both screen shots here.



10. How common are RSPO (Sustainable Palm oil) concessions in this database?
 Maybe half as common as the regular palm oil concessions. RSPO Palm oil exists in enclaves while un-sustainable palm oil is dominant.

11. Click back and forth, and find three specific places where current oil palm concessions appear to overlap with primary forest in 2000. Zoom into those places, unclick your layers, and use the imagery to determine if forest is still present there.
- What has happened to forest in your first location? Include a screen shot.

Here the forests near the river have been taken by new concessions due to being edge-forests.



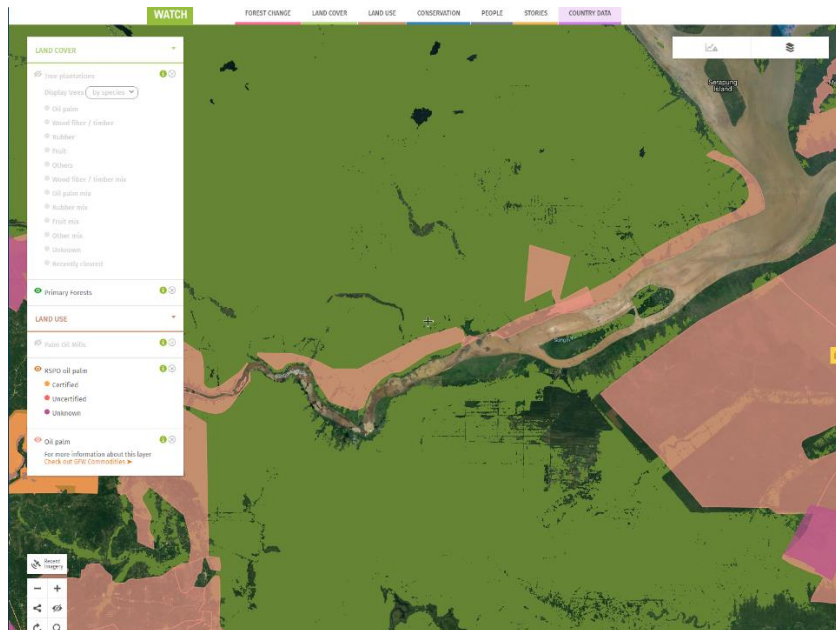
- What has happened to forest in your second location? Include a screen shot.

More edge forests were cut as well as forests near existing agriculture and urban areas.



- What has happened to forest in your third location? Include a screen shot.

Forests were cut along the river banks, perhaps make use of potential agricultural space accessible along the water.



Open a new tab in your browser and go the Map tab for

<http://commodities.globalforestwatch.org>

Click on Production Suitability menu, Custom Suitability map, and click on the WRI suitability choices to start (it will load slowly). In the menu that pops up to the left, lots of these choices are determined by oil palm's biology. Do not touch the choices, and simply look at this map once loaded.

12. What color is associated with suitable oil palm growing area? Go back to your other map (GFW, the original one), and use your knowledge of how to look at tree plantations, forest cover, and forest loss to answer this question: how much suitable oil palm growing area is currently covered by forest? That's a hard question to answer without zooming in to one, but try to answer it using screenshots, and feel free to mark on the screen shots with arrows/circles. Be patient, the commodities map is slow because that website is just an old demo for customers.

Palm growing area is associated with the purple.

13. Based on your answers to 9 through 11, is oil palm cultivation going to stay outside primary forest areas, like this suitability map suggests they should?

Maybe not. The cultivation appears to encroach on the conservation area without crossing it. The people growing oil palm here generally appear to be following the intended guidelines.

14. Go back to your GFW map: are there any other countries outside SE Asia where oil palm is impacting forest cover?

Liberia, Guatemala, and Honduras.

Section 3: You

“A lot of people go straight from denial to despair without pausing in the middle and doing something about it.”—Al Gore

Go to the following website from the Union of Concerned Scientists, which ranks companies on their commitment to deforestation-free oil palm supply chains.

<http://www.ucsusa.org/global-warming/stop-deforestation/palm-oil-scorecard-2015#.WCHDlySVmUQ>

15. Which scores surprised you?

Dunkin Donuts' high score of 70 and Whole Foods' low-ish score of 30.

16. Pick one company and tell me why they received the score they did. The Methodology link has a PDF with a by-company breakdown table of why they received their score.

Yum foods received a score of 0 which is likely due to not making any stance committing to forest protection, peatland protection, traceability, transparency, or verifying their current or potential sources of palm oil.

17. How important is it to you, as a consumer, that the companies you frequent purchase deforestation free oil palm products? Maybe you should let them know that. What's the most effective way to express this desire, in today's world?

It's preferable but not a dealbreaker to my consumption of their products. The quality of their products slightly supercedes the ethics behind their acquisition. I believe the most effective way to tell a company you don't stand by their practices is to boycott or stop consuming their product.