Rapid estimation and location of past deforestation

Use of Global Forest Watch data

Training from the FORAE Project

Marie Nourtier – 25-07-18

Why accounting for deforestation?

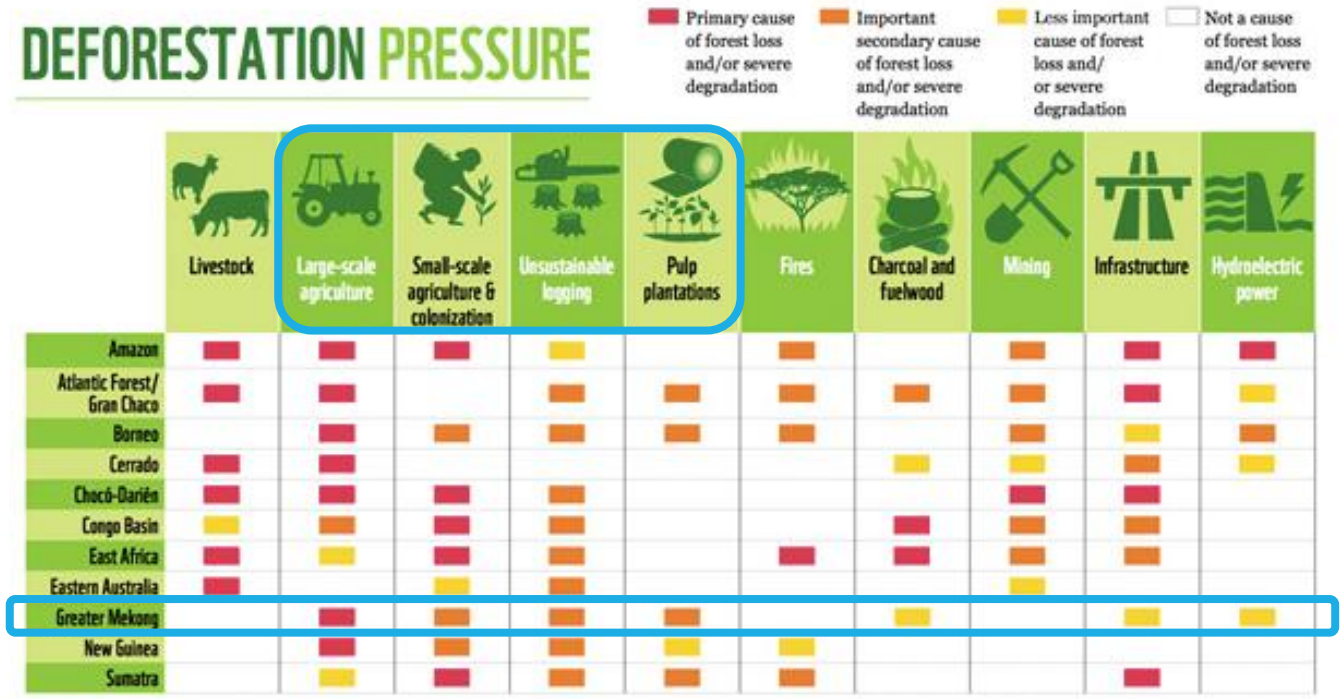
Forest matters for

- Biodiversity
  - Conservation purposes – iconic species
  - NTFP - hunting
- Water & soil
  - Control of erosion ➔ impact on agriculture
  - Control of water flows ➔ control of local floods or droughts
  - Control of global water cycle ➔ rain seasonality, frequency and abundance
- Climate regulation
  - Deforestation is a main contribution to climate change
  - Local climate regulation
- Tourism & recreation

Aerial view of erosion in western Madagascar

Why accounting for deforestation?

- Main causes of deforestation
  - Generally, a social impact also

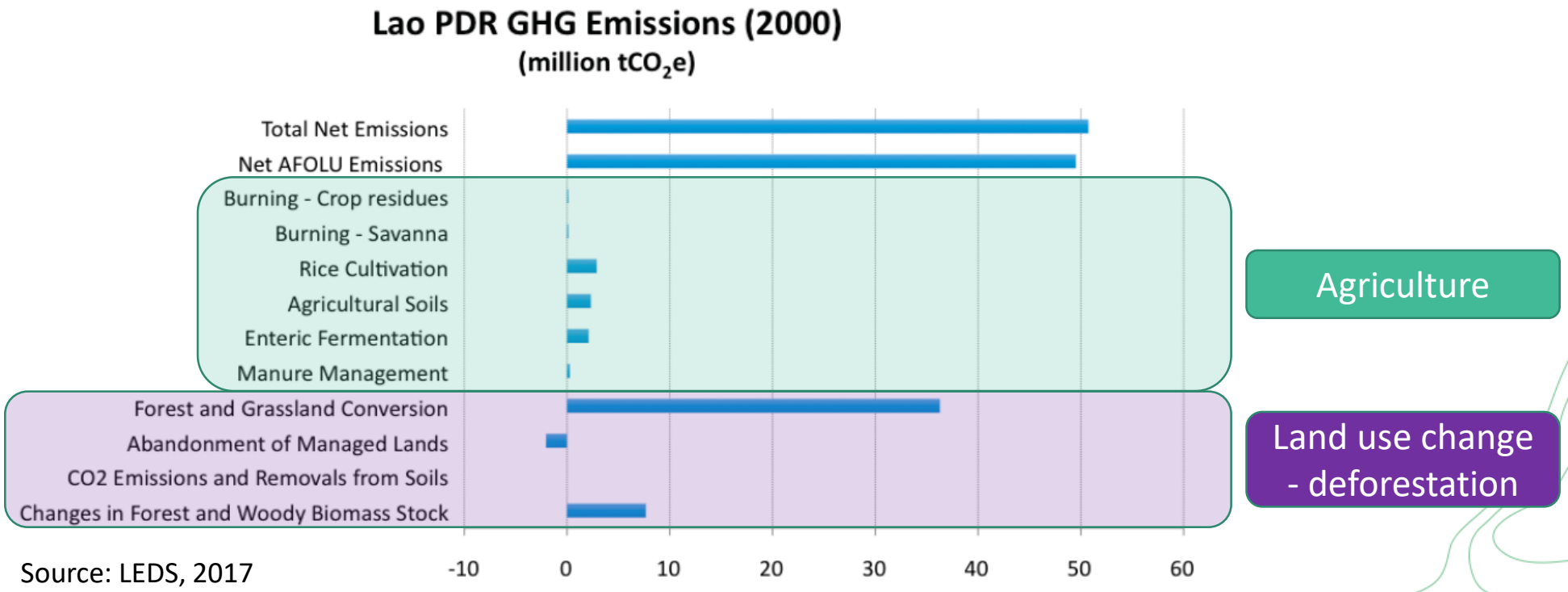


Deforestation for rubber in Laos.

Source: Mongabay News. Deforestation Fronts Revealed

Why accounting for deforestation ?

- Deforestation is a main source of GHG contributing to Climate Changes



Source: LEDS, 2017

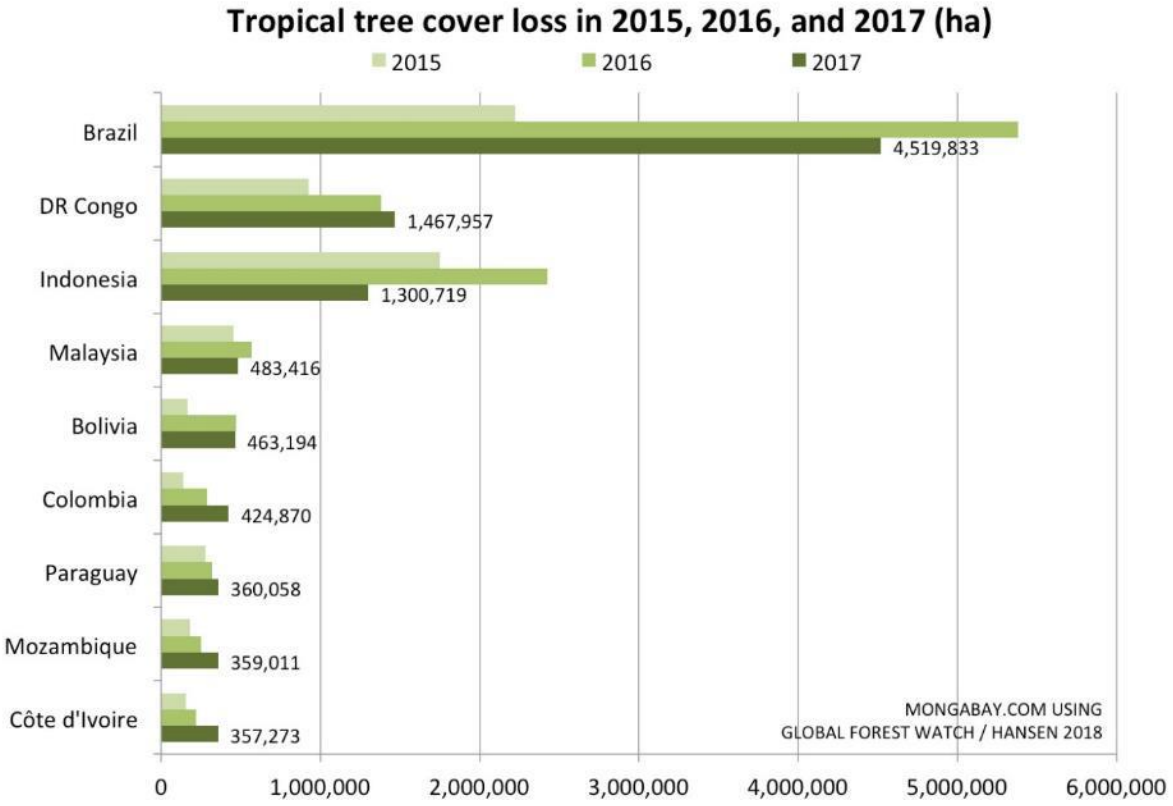
Why accounting for deforestation?

- And Climate Change threatens food security

Source: FAO, 2016

Location and historic of deforestation?

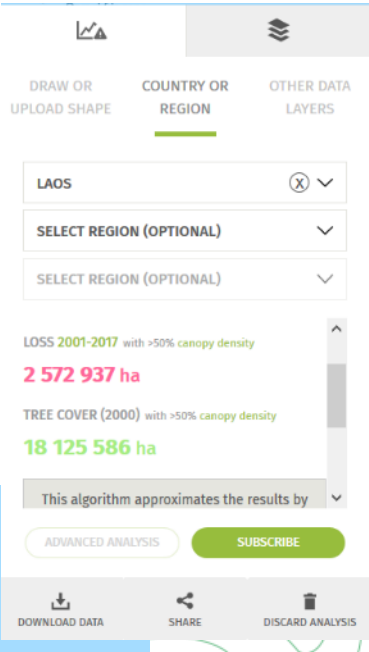
- Main locations for deforestation

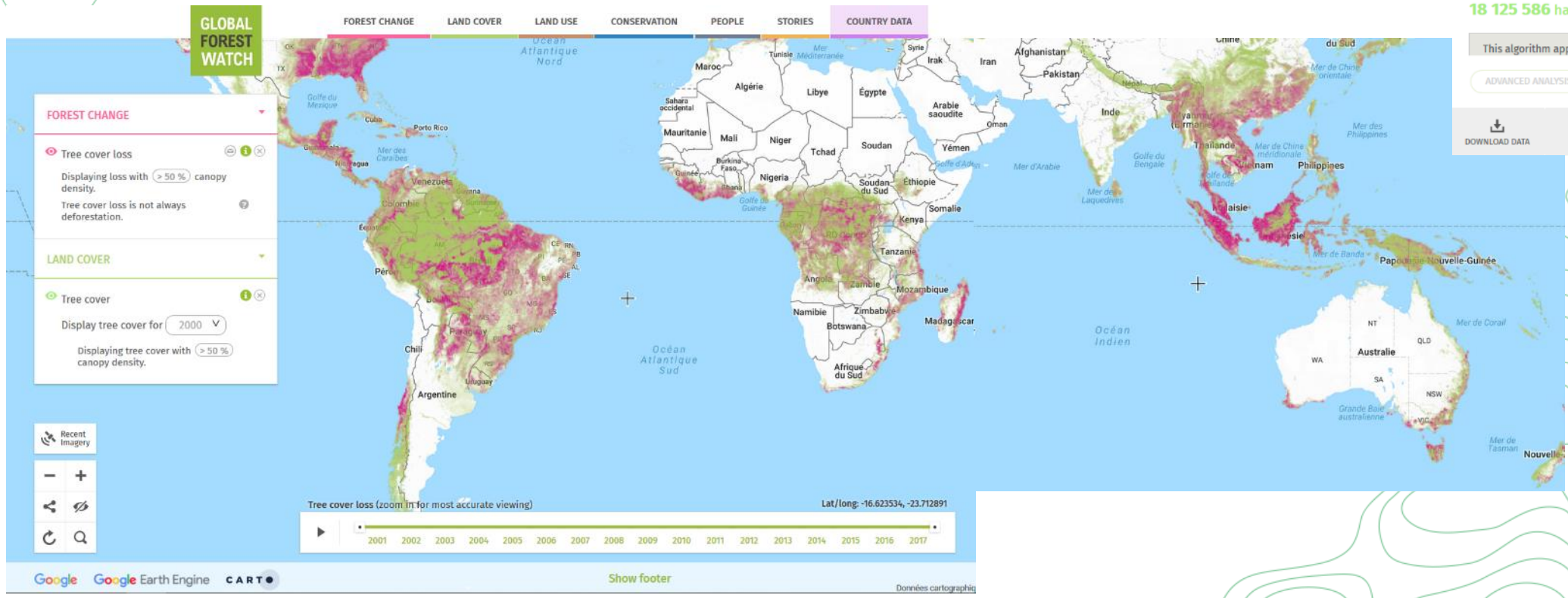


Source: CGIAR, 2016

Location and historic of deforestation?

- Main locations for deforestation



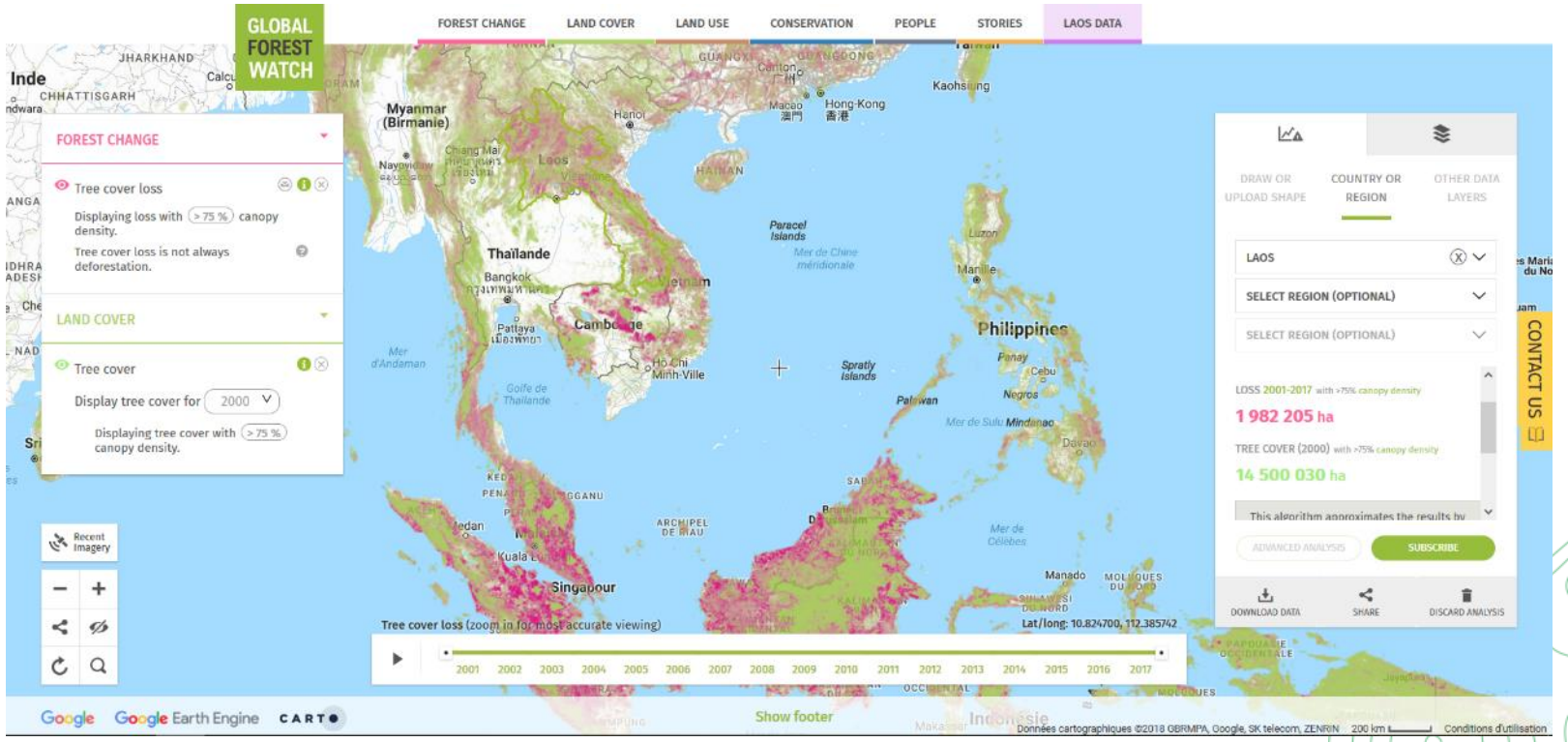


Location and historic of deforestation?

- Global Forest Watch tool
  - Developed by a partnership between University of Mariland (Hansen team) and Google Earth Engine
  - Online platform showing annual deforestation
    - 2001 – 2017 but actualization every year
  - Free data of tree cover, tree loss, tree gain and data on conservation
    - Tree cover can be converted in forest cover (approximative estimation) by choosing a percentage of cover (30 to 75 %)
    - Can be downloaded and analyzed ➔ exercise
  - You can subscribe to weekly alert on deforestation on your area of interest

Location and historic of deforestation?

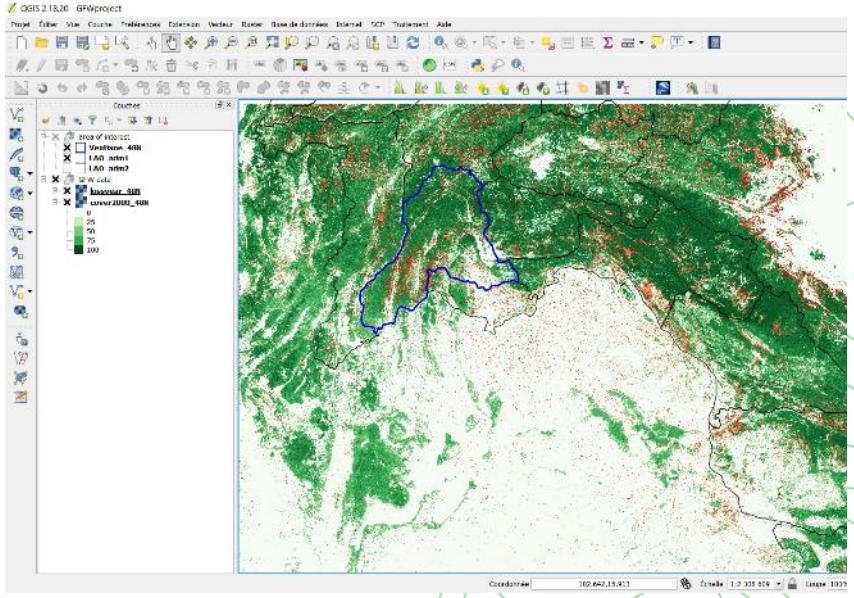
- Global Forest Watch tool
  - Demo : www.globalforestwatch.org



Questions before an exercise with tree loss data?

Exercise

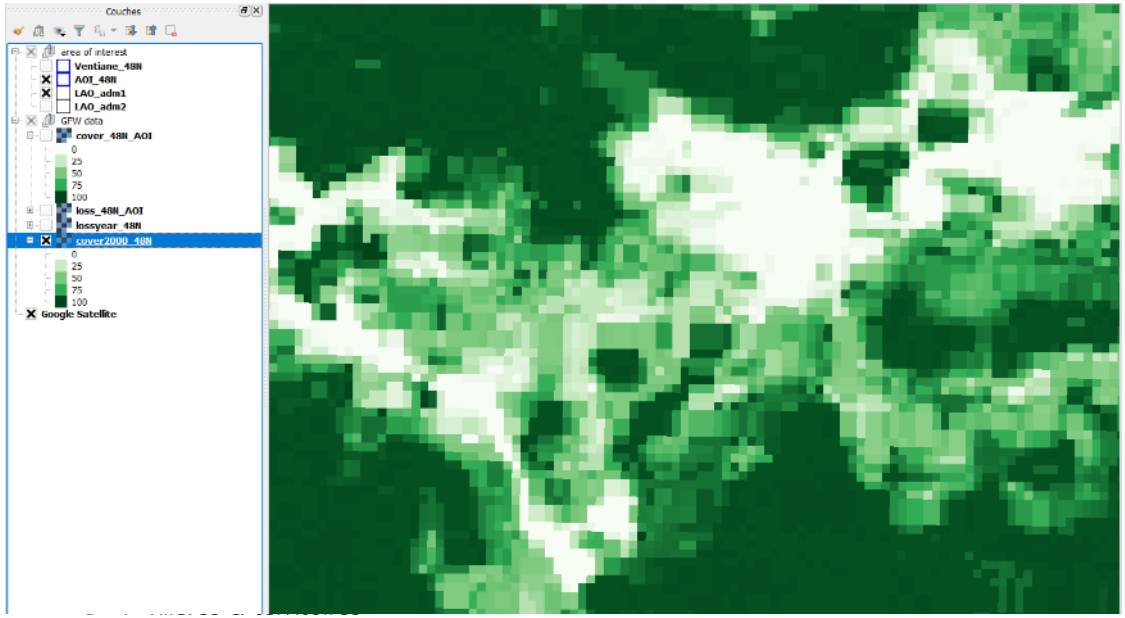
- Download your tree cover and loss data : https://earthenginepartners.appspot.com/science-2013-global-forest
- Prepare your data on QGIS
  - Projection – SCR: WGS84 UTM 48N for Laos
  - Visualization with appropriate color scale
  - Extraction on your area of interest



Exercise

Definition raster and shapefile ok ?

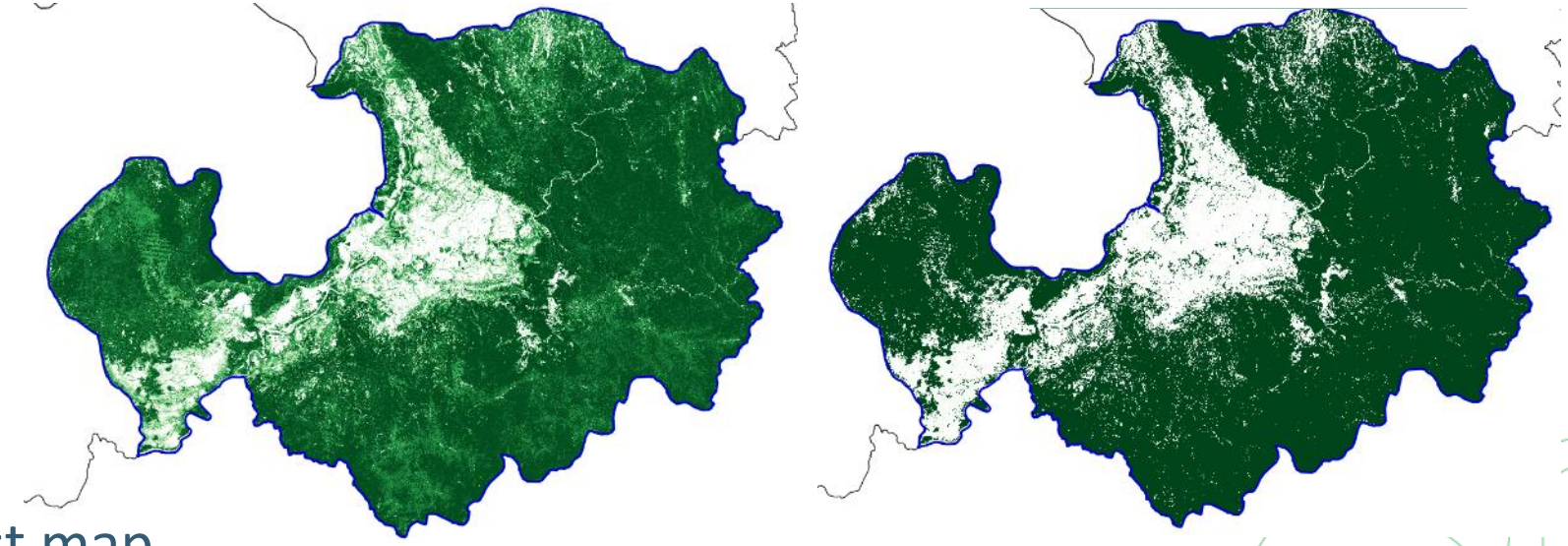
- Cut your GFW rasters with your shapefile of area of interest
- Prepare a forest/non-forest map
  - ➔ comparison to google earth to decide on a cover threshold
  - Be conservative



We choose 75%

Exercise

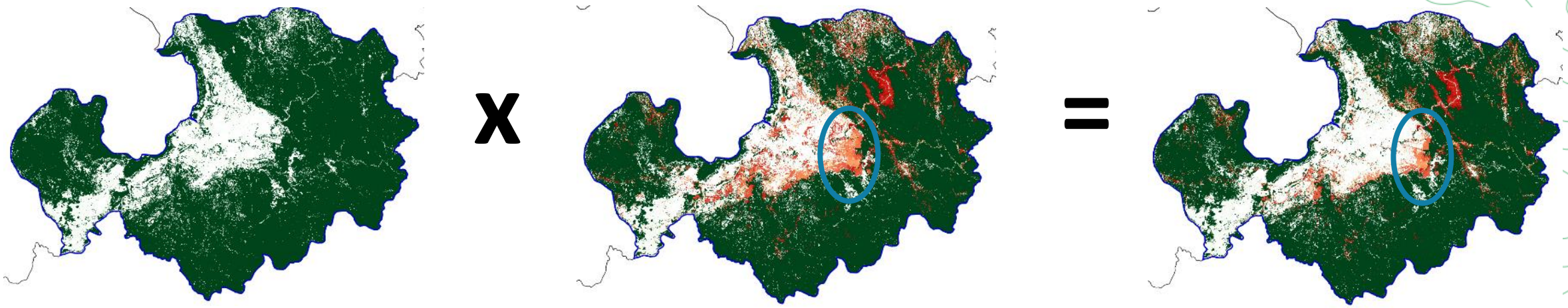
- Cut your GFW rasters with your shapefile of area of interest



- Prepare a forest/non-forest map
  - ➔ comparison to google earth to decide on a cover threshold
  - Be conservative
  - Raster calculator : map of 0 and 1

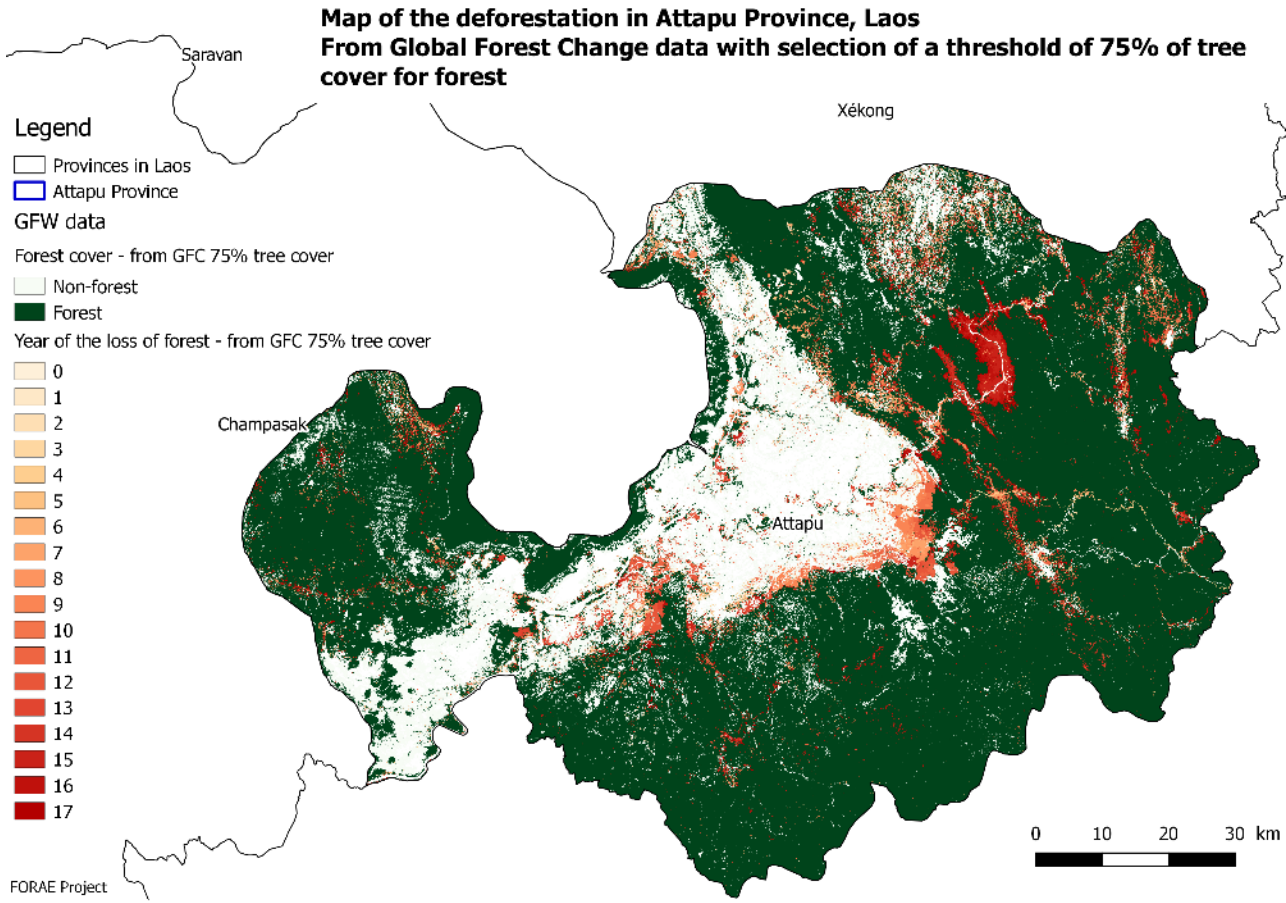
Exercise

- Cut your GFW rasters with your shapefile of area of interest
- Prepare a forest/non-forest map
- Cross with cover loss year
  - = Selection of tree loss on areas with more than 75% cover = deforestation



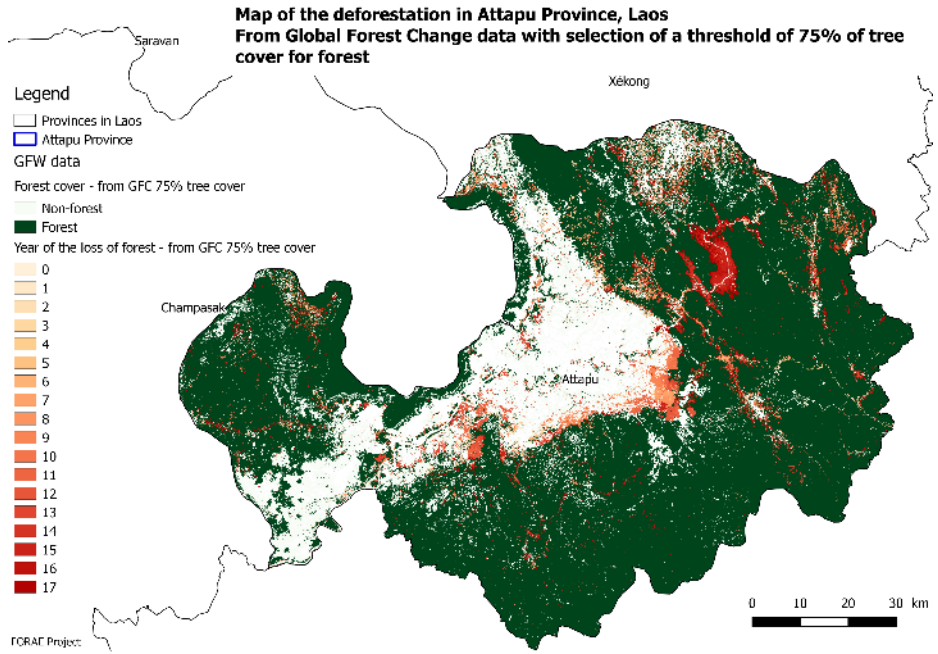
Exercise

- Cut your GFW rasters with your shapefile of area of interest
- Prepare a forest/non-forest map
- Cross with cover loss year
- Extract and report on forest & deforestation areas
  - R.report GRASS tool
  - Edit a map on QGIS
  - Analysis on Excel

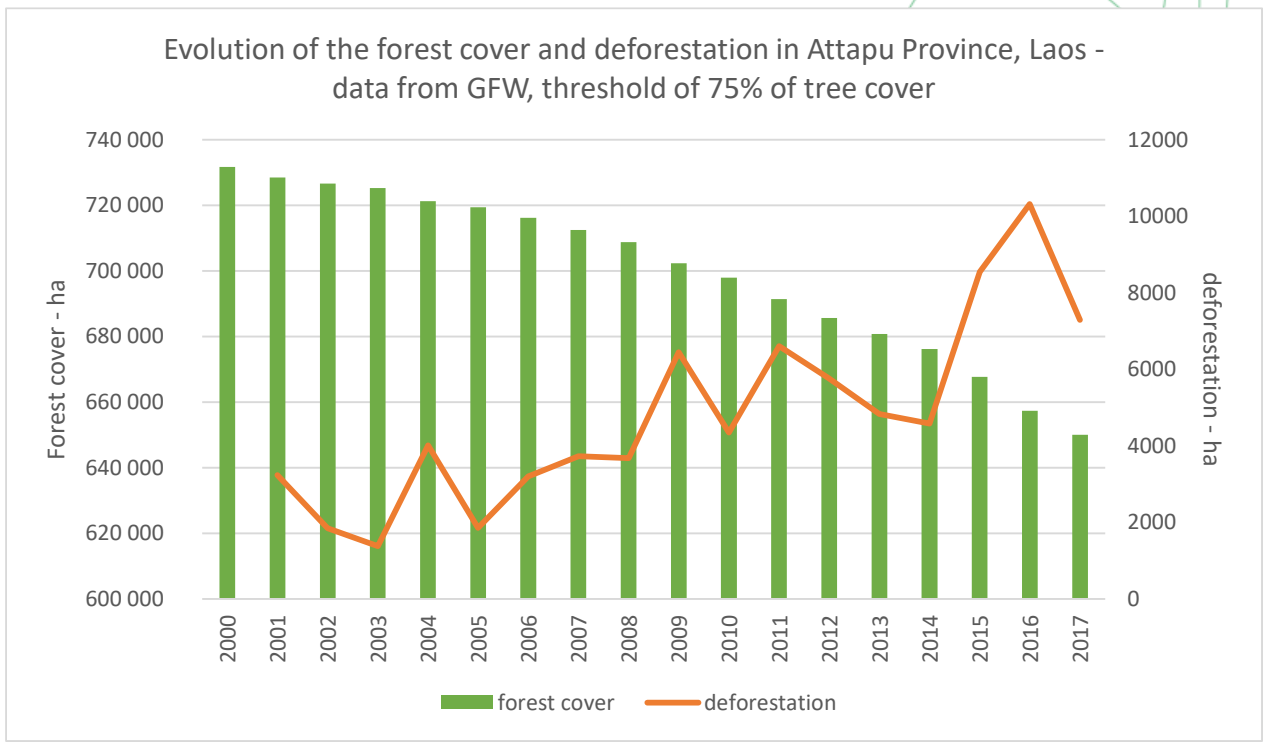


Exercise

deforestation rate	ha/yr	%/yr
2001-2005	2 463	0.31%
2005-2010	4 279	0.64%
2010-2017	6 847	1.03%
2001-2017	*4 802*	*0.71%*



- Cut your GFW rasters with your shapefile of area of interest
- Prepare a forest/non-forest map
- Cross with cover loss year
- Extract and report on your areas
- Interpret your results and plan
  - Explain deforestation evolution
  - Plan project activities on hot spots of deforestation



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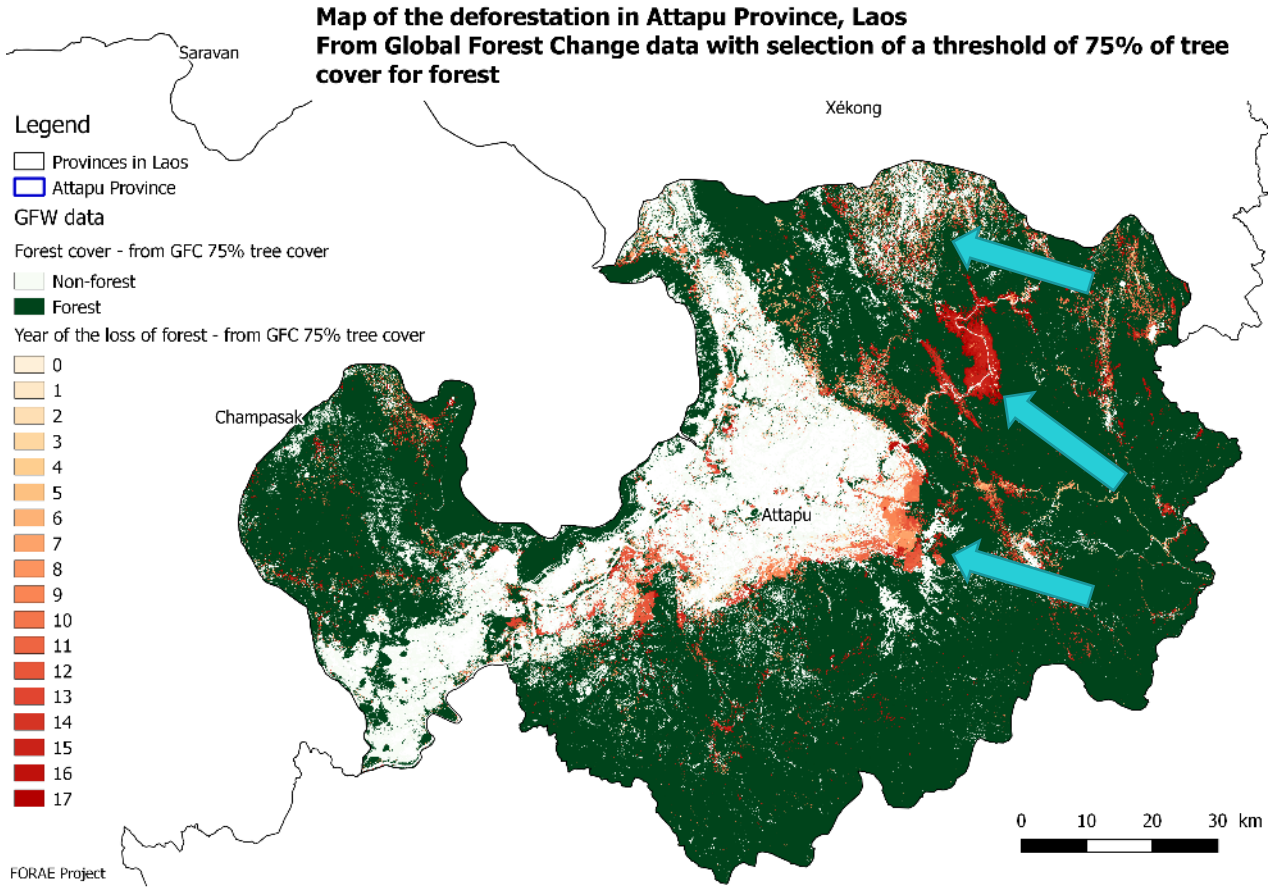
Exercise

- Interpret your results and plan
  - What is going on hot spots of deforestation?
    - Go in the field
    - Check on google earth (be careful to dates)
  - What can the project do about that?
    - Legislation evolution
    - Alternative for small scale agriculture
    - Influence on private sector
  - Compared with Land Use plan
- And then monitor
  - Field survey
  - Deforestation alerts from GFW



To go forward

- You can build a 0-1 map of deforestation and sum up pixels of deforestation on several parts of your shape (AOI)
  - Use zonal statistics
- Calculate emissions from deforestation if useful
- You will have greater flexibility by doing analysis with R
- Validation with collection of points in the field or on high resolution images
  - GFW is not locally validated
  - It gives approximate results to have a raw idea of deforestation on your area
- Build your own deforestation map with detection of changes

Thank you for your attention

Questions?

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