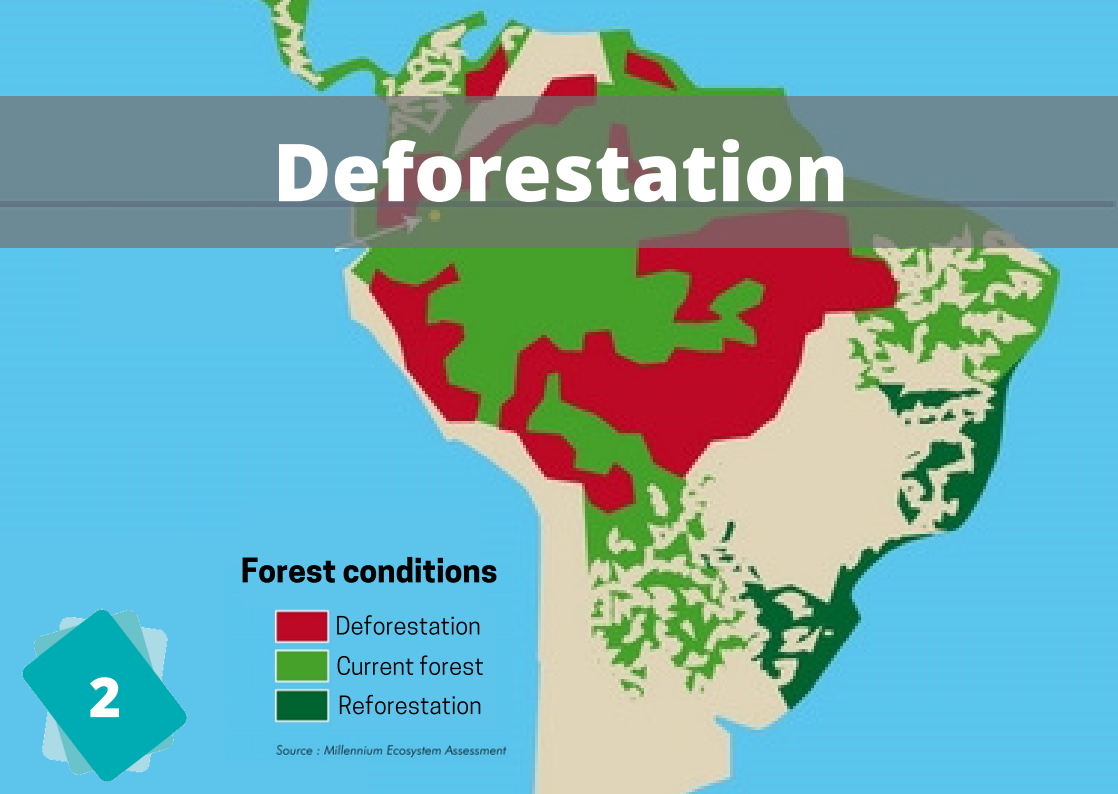
Deforestation



2

2

CL!MATE FRESK

According to Brazil's National Institute for Space Research (INPE), **13,235 km2** of Amazonian forest was deforested in the year 2020/2021.

This intensive deforestation is mainly due to **extensive livestock farming** and the **intensive agriculture.**

Deforestation impacts one of the most important hydrological phenomena of the tropical forest : the **evapotranspiration.**

Set 1

Agriculture and intensive livestock farming

3

3

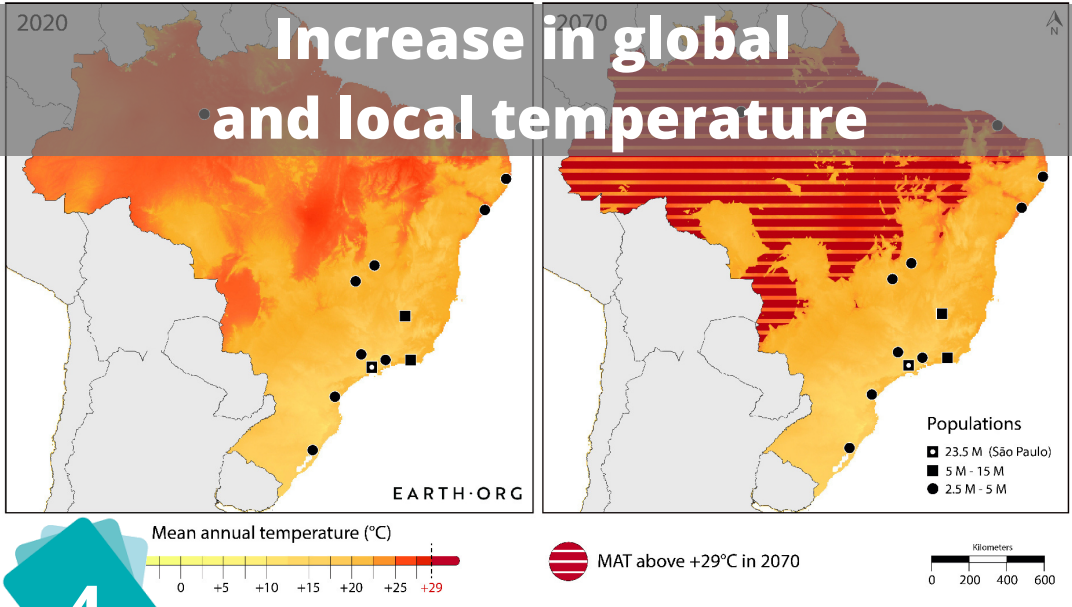
CL!MATE FRESK

Brazil is the world's largest **exporter of soya** (120 million tonnes exported in 2018) and has the **largest cattle population** with 200 million animals.

The creation of these pastures is responsible for **60/70% of the deforestation** of the Amazon rainforest and cattle farming emits 369.31 Mt CO2eq/year.

Set 2

Increase in global and local temperature



4

4

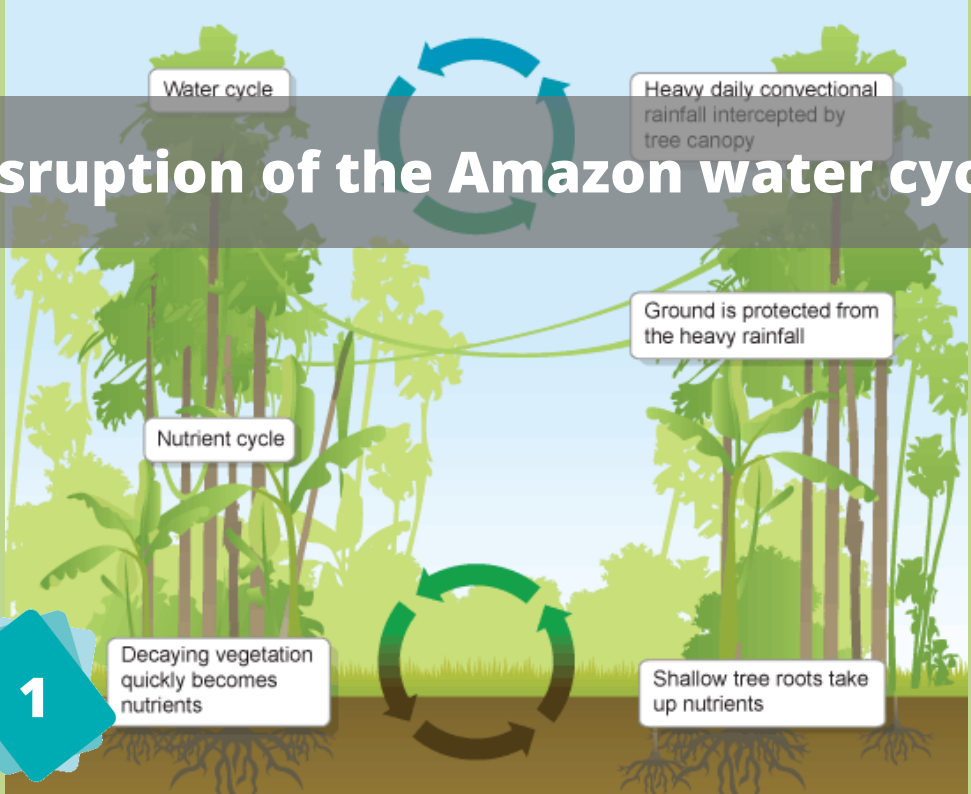
CL!MATE FRESK

Between 1979 and 2018, the **average temperature** has been recorded that rose about **1º Celsius** (1.8°F) in the Amazon basin and 1.5ºC (2.7°F) in some areas.

Moreover, without vegetation cover, the **Amazon carbon sink** becomes **unstable** and influences **global temperature**.

Set 1

Disruption of the Amazon water cycle



1

1

CL!MATE FRESK

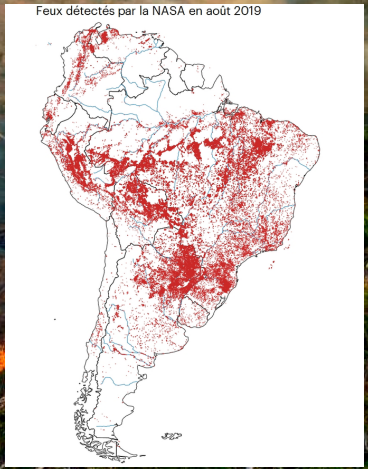
The hydrological regime of the Amazon is quite particular: its water cycle is based on its own ecosystem. **50-80% of the moisture** comes from the trees, through evapotranspiration.

Without trees, the **concentration of water** in the atmosphere decreases, **rainfall decreases** and **extreme weather events** such as floods and droughts become more and more frequent.

Rising temperatures also disrupt this cycle.

Set 1

Fire forest



8

8

CL!MATE FRESK

Researchers' findings show that **higher fire activity** in 2005, 2007, and 2010 was linked to the **dry and warm climate circumstances**. In addition, farmers are practicing **slash-and-burn agriculture** to obtain more land.

About **~85,000 km2** of primary forest burned between 2000 and 2009. In 2019, forest fires have exploded in Brazil, Paraguay, Bolivia and Peru, with more than **40,000 fires reported.**

Set 1

Lower rainfall in the Amazon basin

5

5

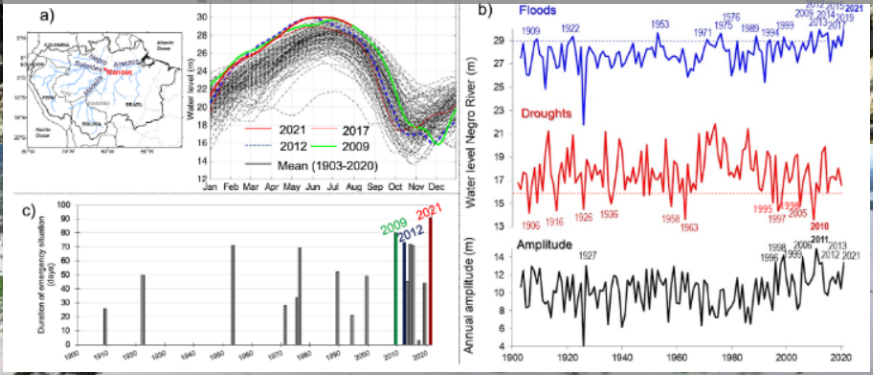
CL!MATE FRESK

Through the evapotranspiration, Amazon supplies about **50-80% of its own rainfall**. While deforestation results to decrease rain clouds and fire forest impact the **cloud formation** due to the emission of **aerosols**.

As per researchers' findings, the average annual rainfall in the Amazon will decrease to around **8% by 2050**. This significant decrease in rainfall will result in **negative effects** on **ecosystems** and **wildlife** all around the Amazon region.

Set 2

Climate variability



6

6

CL!MATE FRESK

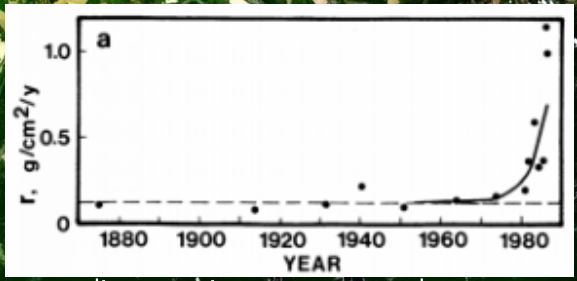
The Amazon is now experiencing many **opposite extreme events** that alternate with each other. In 2009, a very **large flood** was followed by an **extreme drought**.

Droughts reduce **evapotranspiration** and increase **forest fires**.

This alternation of climatic events also has an impact on biodiversity.

Set 2

Soil erosion



sedimentation rate r over the years

10

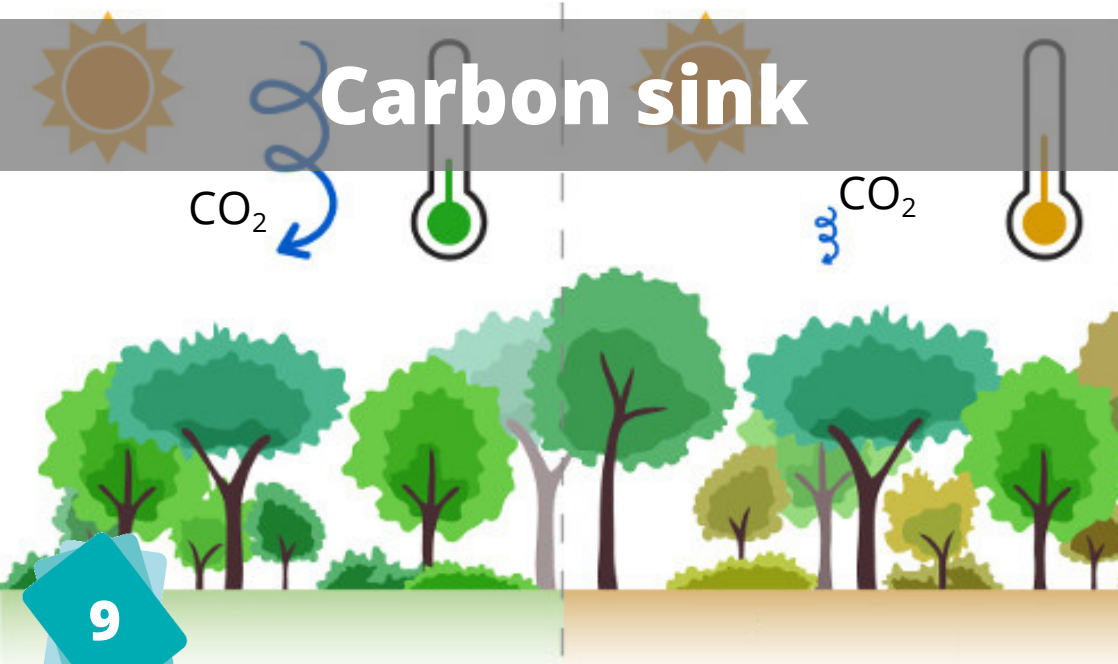
CL!MATE FRESK

Amazonian soils are actually very **thin**. Without vegetation, they **erode**, further weakening the forest and its inhabitants.

Rainwater eventually washes away this soil as well as **nutrients** useful for biodiversity, creating an imbalance in sediment transport for the Amazon watershed.

Set 3

Carbon sink



9

CL!MATE FRESK

The Amazon rainforest is estimated to store **1.2 billion tonnes of CO2/year**. However, according to scientists, due to **deforestation** and **droughts**, the Amazon could release between 55.5 billion and 96.9 billion tonnes of carbon dioxide by 2030.

This instability could have a global influence on **CO2 storage** (and therefore on global temperature).

Set 3

Loss of biodiversity

11

11

CL!MATE FRESK

Up to **43% of tree species** in the Amazon could disappear by the end of the 21st century. Indeed, **40% of the rainforest** is sensitive to a **decrease in rainfall**. In some regions, a tipping point has been reached where the Amazon could turn into savannah.

The Amazon is home to between **10 and 20%** of the world's **plant** and **animal species**. In addition, between 77 and 85% of species classified as threatened have been impacted by fires

Set 3

Evapotranspiration

7

7

CL!MATE FRESK

An essential process in the hydrological cycle of the Amazon forest is **evapotranspiration**.

This **biophysical process** transfers water contained in the **soil** (by evaporation) and water contained in **plants** (by transpiration) to the atmosphere.

Set 2