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Visualizing Carbon Storage in Earth's Ecosystems

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Carbon Storage in Earth's Ecosystems

Achieving net-zero by 2050 depends on the Earth's natural carbon sinks.

Forests play a critical role in regulating the global climate. They absorb carbon from the atmosphere and then store it, acting as natural carbon sinks.

Where is Carbon Stored?

There are various carbon pools in a forest ecosystem.

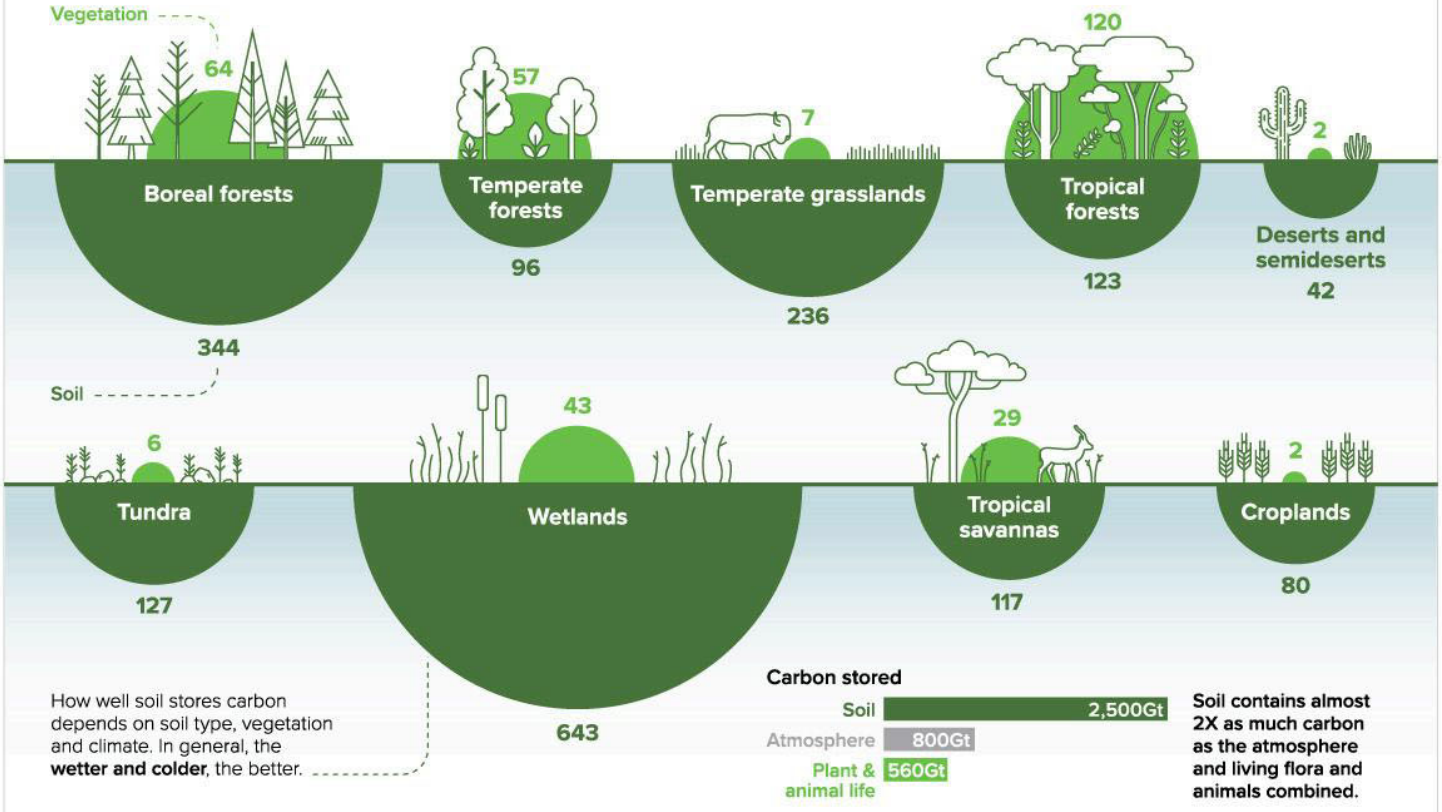
- **Living Biomass** — Leaves, twigs, roots of trees, trunk & branches
- **Dead Biomass** — Woody debris, leaf litter
- **Soil**

Carbon Storage

Tonnes of Carbon

The world's forests absorb around **15.6 gigatonnes** of CO_2 each year. That's around 3X the annual CO_2 emissions of the United States.

However, around **8.1 gigatonnes of CO_2 leaks back into the atmosphere** due to deforestation, fires and other disturbances.



How well soil stores carbon depends on soil type, vegetation and climate. In general, the **wetter and colder**, the better.

Carbon stored

Soil contains almost 2X as much carbon as the atmosphere and living flora and animals combined.

Average stored carbon in tonnes per hectare at a ground depth of one meter

Sources: IPCC; NASA

Carbon Streaming is protecting the Earth's natural carbon sinks with carbon credit streams across the following **REDD+ projects**:

Rimba Raya
Borneo, Indonesia
~47,000 hectares

Cerrado Biome
Brazil
~11,000 hectares

Magdalena Bay Blue Carbon
Baja California Sur, Mexico
~22,000 hectares

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Visualizing Carbon Storage in Earth's Ecosystems

Each year, the world's forests absorb roughly **15.6 billion** tonnes of carbon dioxide (CO_2).

To put it in perspective, that's around **three times** the annual CO_2 emissions of the U.S. or about 40% of global CO_2 emissions. For this reason, forests serve as a vital tool in regulating the global temperature and achieving net-zero emissions by 2050.

In this graphic sponsored by Carbon Streaming Corporation, we look at the Earth's natural carbon sinks, and break down their carbon storage

Carbon Storage by Ecosystem

Forests contain several carbon sinks, from living biomass such as roots and leaves to soil. In fact, soil contains nearly twice as much carbon than the atmosphere, plant, and animal life combined.

- **Soil:** 2,500 gigatonnes (Gt)
- **Atmosphere:** 800 Gt
- **Plant & animal life:** 560 Gt

The soil type, vegetation, and climate all affect how carbon is stored. For example, colder and wetter climates promote the most effective carbon storage in soil.

Global Carbon Storage* (Tonnes of carbon per hectare)	Vegetation	Soil
Wetlands	43	643
Boreal forests	64	344
Temperate grasslands	7	236
Tundra	6	127
Tropical forests	120	123
Tropical savannas	29	117
Temperate forests	57	96
Croplands	2	80
Deserts and semideserts	2	42

*Average stored carbon in tonnes per hectare at a ground depth of one meter
Source: IPCC

Wetlands are substantial reservoirs of carbon. Despite occupying only 5-8% of the Earth's land surface, they hold between **20 to 30%** of all estimated organic soil carbon.

Risks to Natural Carbon Sinks

Around **8.1 billion** tonnes of CO_2 leaks back into the atmosphere each year.

Over the last 20 years, the world has lost about 10% of its tree cover, or 411 million hectares (Mha). The main causes behind this are forestry (119 Mha), commodity-driven deforestation (103 Mha), and wildfires (89 Mha). What's more, research suggests that Amazon rainforests emit more carbon than they absorb due to record levels of fires, many of which are deliberately set to clear for commodity production.

With the increasing frequency of wildfires and deforestation, the world's forests are at risk of releasing carbon. Protecting and preserving

Given the risk of losing critical carbon sinks, carbon credits play an important role in preserving these ecosystems.

Carbon credits can help finance projects that reduce or remove GHG emissions from the atmosphere. From improved forest management to reforestation, there are a number of different types of carbon projects across wetlands, grasslands, and various forests:

- Reforestation and Afforestation
- Avoided Deforestation
- Natural forest management
- Wetland restoration

For instance, a carbon credit project may preserve endangered tropical lowland peat swamp forests spanning thousands of hectares, such as the Rimba Raya Biodiversity Reserve Project in Indonesia, one of the projects that Carbon Streaming has a carbon credit stream.

Through this project, forests are prevented from being converted into palm oil plantations to reduce and avoid **130 million tonnes** of GHG emissions during the 30 years of the project.

Another example would be the Cerrado Biome Project in Brazil, another carbon offset project where Carbon Streaming has a stream agreement. This project is protecting and preserving native forests and grasslands from being converted to commercial agriculture.

Importantly, these projects would not be economically viable without the sale of carbon credits.

Protecting Stored Carbon

To prevent further loss of stored carbon, government policies, NGO-led initiatives, and the financing of carbon offset projects are gaining momentum. Taken together, they offer the critical intervention needed to preserve the earth's carbon vaults.

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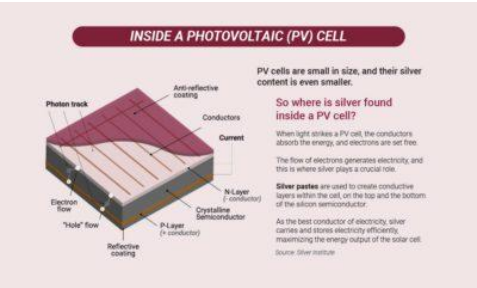

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