

# AMAZONIA

NATIONAL GEOGRAPHIC

Vital and Fragile



The heart of Amazonia is its vast rivers and forests, home to thousands of plant and animal species. They all exist in a delicate balance that has evolved over millions of years—a balance that's increasingly threatened by deforestation and other human activity. As the forest diminishes, so does its ability to serve as a massive carbon warehouse for the world.

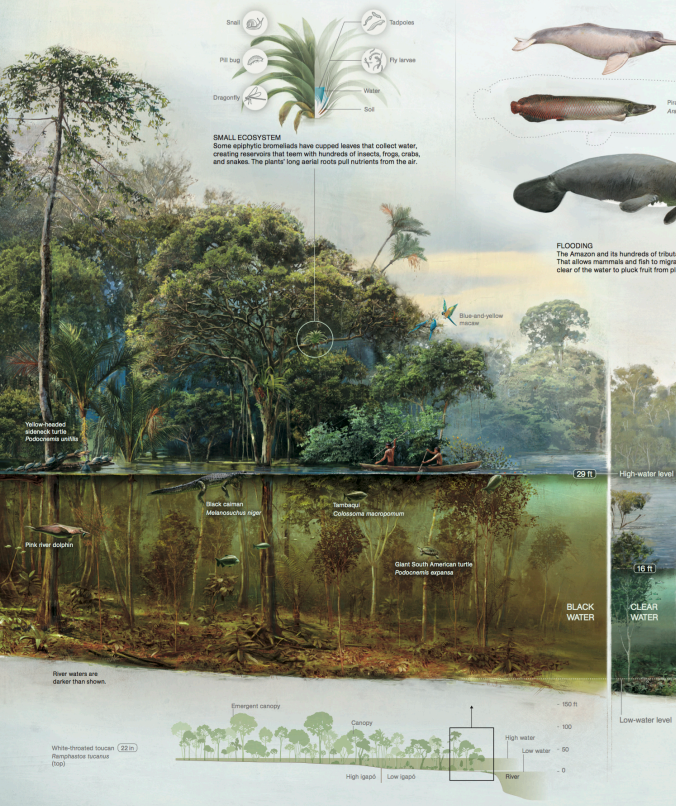
## THREE MAIN TYPES OF RAIN FOREST

Half the world's tropical rain forests are found in Amazonia, and more than three-fourths of the Amazon is rain forest. The temperature hovers between 70 to 85 degrees Fahrenheit, and at least 80 inches of rain fall every year. Three major types of forest—igapó, várzea, and terra firme—flourish here.



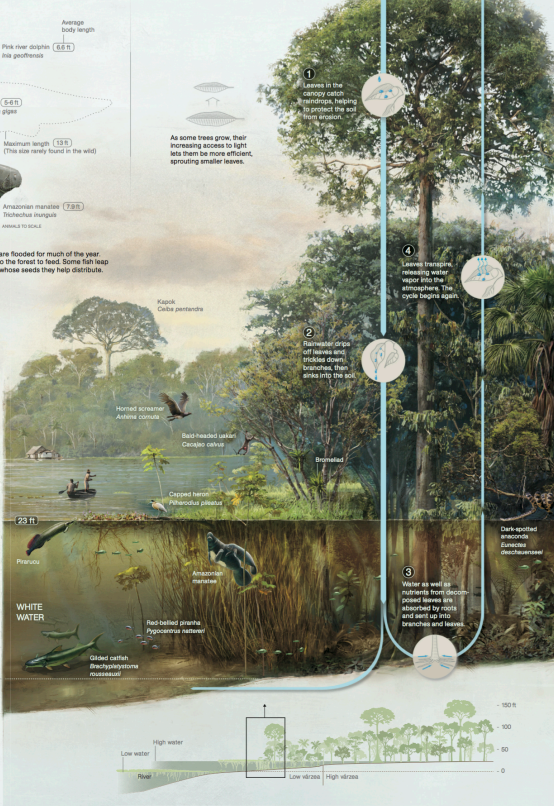
### 1. Igapó Forest

Laced with clear- and black-water rivers, igapó forests are filled with flowering plants even though they're flooded over half the year. Some plants have adapted by growing aerial roots above the flood line. Others hold on to their leaves, continuing photosynthesis underwater despite the low light.



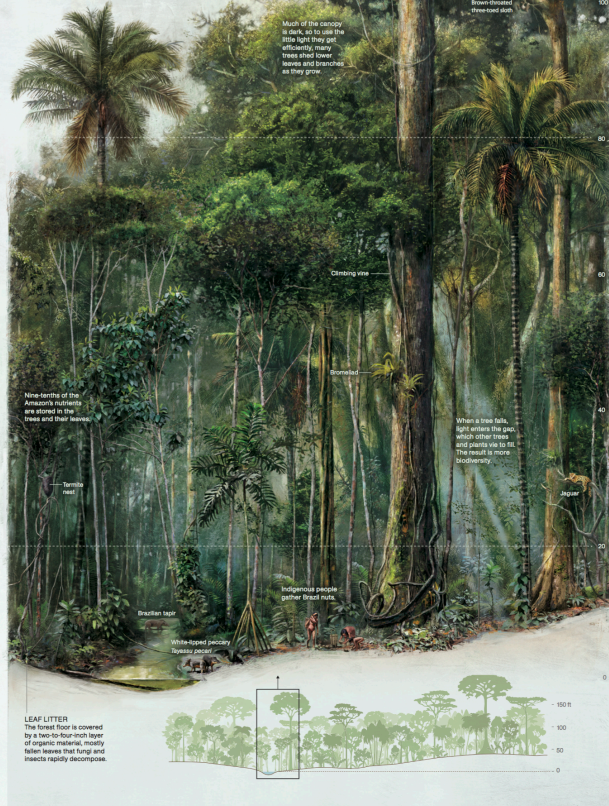
### 2. Várzea Forest

White-water rivers flood várzea forests for up to 230 days a year. When water levels are high, nutrient-rich sediments build up, creating fertile ground. Many rivers and lakes in these forests are flanked by floating meadows that provide habitat and food for fish and other animals.



### 3. Terra Firme Forest

Terra firme forests are located at a higher elevation than igapó and várzea forests. There's little seasonal flooding but plenty of hospitable habitat for land animals. Veined by small streams, these forests—generally the densest in the Amazon—contain the region's tallest trees.



## BIRTH OF A RIVER

As tectonic plates shifted millions of years ago, the Andes rose, transforming South America's drainage basins. The east-flowing Amazon River that we know today took shape 10.5 million years ago. The river and its tributaries now flow through three major types of forest. In two of them, igapó and várzea, the rivers can be divided into three types: black, clear, and white.

**BLACK WATER** Acidic and low in nutrients, these waters are stained dark by decomposing plants.

**CLEAR WATER** These rivers are low in sediments because they drain ancient shields of rock.

**WHITE WATER** Nutrient-rich sediments flow from the Andes, clouding these rivers.

## FLOODING season



Much of Amazonia's water stays in Amazonia. Winds from the east blow moist ocean air over the forest, and plant transpiration circulates more than half the rainfall back into the atmosphere—a cycle that repeats four or five times, moving from the Atlantic to the Andes. A shrinking forest threatens to interrupt the cycle.

## WATER AND NUTRIENT CYCLE

In all three types of forest:

1. Leaves in the canopy catch raindrops, helping to protect the soil from erosion.

2. As some trees grow, their increasing access to light lets them be more efficient, growing smaller leaves.

3. Water as well as nutrients from decomposed leaves sink into the soil and seep up into branches and leaves.

4. Leaves transpire, releasing water vapor into the atmosphere. The cycle begins again.

## FOREST STRATA

Temperature, sunlight, and moisture levels vary by zone within the canopy—as do the creatures that live there.

## EMERGENT CANOPY

The tallest trees in Amazonia—forest giants like kapok and Brazil nut—can reach heights of 200 feet. Though hot and moisture dry, this upper layer sustains many birds and insect species and shades lower strata.

## CANOPY

Teeming with life and shadowing the strata below, the canopy creates a forest ceiling of closely spaced branches and leaves. Animals and insects can move around on the highway of branches and leaves.

## UNDERSTORY

Thick with insects, the understory is also home to many species that rely on camouflage to survive. Vegetation can be dense or sparse, depending on the type of forest. Predators, including jaguars, hunt and the smaller trees and understory.

## FOREST FLOOR

Though it's dark-as-little as 2 percent of the sunlight penetrates to the ground—the forest floor is covered with seedlings, ferns, and other plants. It's also hot and humid, with little breeze.



Harpy eagle  
Harpia harpyja



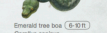
Blue and yellow toucan  
Anas anserina



Brown-throated three-toed sloth  
Bradypus variegatus



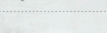
Emerald tree toad  
Craugastor



Red tamarin  
Leontideus rosalia



Blue morpho  
Morpho menelaus



Green iguana  
Iguana iguana



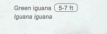
Jaguar  
Panthera onca



Brazilian tapir  
Tapirus domingensis



Harpy eagle  
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Blue and yellow toucan  
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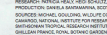
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