Amazon rainforest

The Amazon rainforest (Portuguese: Floresta Amazônica or Amazônia; Spanish: Selva Amazónica, Amazonía or usually Amazonia; French: Forêt amazonienne; Dutch: Amazoneregenwoud), also known in English as Amazonia or the Amazon Jungle, is a moist broadleaf forest that covers most of the Amazon basin of South America. This basin encompasses 7,000,000 square kilometres (2,700,000 sq mi), of which 5,500,000 square kilometres (2,100,000 sq mi) are covered by the rainforest. This region includes territory belonging to nine nations. The majority of the forest is contained within Brazil, with 60% of the rainforest, followed by Peru with 13%, Colombia with 10%, and with minor amounts in Venezuela, Ecuador, Bolivia, Guyana, Suriname and French Guiana. States or departments in four nations contain "Amazonas" in their names. The Amazon represents over half of the planet's remaining rainforests, and comprises the largest and most biodiverse tract of tropical rainforest in the world, with an estimated 390 billion individual trees divided into 16,000 species.

Following the Cretaceous–Paleogene extinction event, the extinction of the dinosaurs and the wetter climate may have allowed the tropical rainforest to spread out across the continent. From 66–34 Mya, the rainforest extended as far south as 45°. Climate fluctuations during the last 34 million years have allowed savanna regions to expand into the tropics. During the Oligocene, for example, the rainforest spanned a relatively narrow band. It expanded again during the Middle Miocene, then retracted to a mostly inland formation at the last glacial maximum. However, the rainforest still managed to thrive during these glacial periods, allowing for the survival and evolution of a broad diversity of species.

During the mid-Eocene, it is believed that the drainage basin of the Amazon was split along the middle of the continent by the Purus Arch. Water on the eastern side flowed toward the Atlantic, while to the west water flowed toward the Pacific across the Amazonas Basin. As the Andes Mountains rose, however, a large basin was created that enclosed a lake; now known as the Solimões Basin. Within the last 5–10 million years, this accumulating water broke through the Purus Arch, joining the easterly flow toward the Atlantic.

There is evidence that there have been significant changes in Amazon rainforest vegetation over the last 21,000 years through the Last Glacial Maximum (LGM) and subsequent deglaciation. Analyses of sediment deposits from Amazon basin paleolakes and from the Amazon Fan indicate that rainfall in the basin during the LGM was lower than for the present, and this was almost certainly associated with reduced moist tropical vegetation cover in the basin. There is debate, however, over how extensive this reduction was. Some scientists argue that the rainforest was reduced to small, isolated refugia separated by open forest and grassland; other scientists argue that the rainforest remained largely intact but extended less far to the north, south, and east than is seen today. This debate has proved difficult to resolve because the practical limitations of working in the rainforest mean that data sampling is biased away from the center of the Amazon basin, and both explanations are reasonably well supported by the available data.

NASA's CALIPSO satellite has measured the amount of dust transported by wind from the Sahara to the Amazon: an average 182 million tons of dust are windblown out of the Sahara each year, at 15 degrees west longitude, across 1,600 miles (2,600 km) over the Atlantic Ocean (some dust falls into the Atlantic), then at 35 degrees West longitude at the eastern coast of South America, 27.7 million tons (15%) of dust fall over the Amazon basin, 132 million tons of dust remain in the air, 43 million tons of dust are windblown and falls on the Caribbean Sea, past 75 degrees west longitude.

For a long time, it was thought that the Amazon rainforest was only ever sparsely populated, as it was impossible to sustain a large population through agriculture given the poor soil. Archeologist Betty Meggers was a prominent proponent of this idea, as described in her book Amazonia: Man and Culture in a Counterfeit Paradise. She claimed that a population density of 0.2 inhabitants per square kilometre (0.52/sq mi) is the maximum that can be sustained in the rainforest through hunting, with agriculture needed to host a larger population. However, recent anthropological findings have suggested that the region was actually densely populated. Some 5 million people may have lived in the Amazon region in

AD 1500, divided between dense coastal settlements, such as that at Marajó, and inland dwellers. By 1900 the population had fallen to 1 million and by the early 1980s it was less than 200,000.

The first European to travel the length of the Amazon River was Francisco de Orellana in 1542. The BBC's Unnatural Histories presents evidence that Orellana, rather than exaggerating his claims as previously thought, was correct in his observations that a complex civilization was flourishing along the Amazon in the 1540s. It is believed that the civilization was later devastated by the spread of diseases from Europe, such as smallpox. Since the 1970s, numerous geoglyphs have been discovered on deforested land dating between AD 0–1250, furthering claims about Pre-Columbian civilizations. Ondemar Dias is accredited with first discovering the geoglyphs in 1977 and Alceu Ranzi with furthering their discovery after flying over Acre. The BBC's Unnatural Histories presented evidence that the Amazon rainforest, rather than being a pristine wilderness, has been shaped by man for at least 11,000 years through practices such as forest gardening and terra preta.

Terra preta (black earth), which is distributed over large areas in the Amazon forest, is now widely accepted as a product of indigenous soil management. The development of this fertile soil allowed agriculture and silviculture in the previously hostile environment; meaning that large portions of the Amazon rainforest are probably the result of centuries of human management, rather than naturally occurring as has previously been supposed. In the region of the Xingu tribe, remains of some of these large settlements in the middle of the Amazon forest were found in 2003 by Michael Heckenberger and colleagues of the University of Florida. Among those were evidence of roads, bridges and large plazas.

The region is home to about 2.5 million insect species, tens of thousands of plants, and some 2,000 birds and mammals. To date, at least 40,000 plant species, 2,200 fishes, 1,294 birds, 427 mammals, 428 amphibians, and 378 reptiles have been scientifically classified in the region. One in five of all the bird species in the world live in the rainforests of the Amazon, and one in five of the fish species live in Amazonian rivers and streams. Scientists have described between 96,660 and 128,843 invertebrate species in Brazil alone.

The biodiversity of plant species is the highest on Earth with one 2001 study finding a quarter square kilometer (62 acres) of Ecuadorian rainforest supports more than 1,100 tree species. A study in 1999 found one square kilometer (247 acres) of Amazon rainforest can contain about 90,790 tonnes of living plants. The average plant biomass is estimated at 356 ± 47 tonnes per hectare. To date, an estimated 438,000 species of plants of economic and social interest have been registered in the region with many more remaining to be discovered or catalogued. The total number of tree species in the region is estimated at 16,000.

The rainforest contains several species that can pose a hazard. Among the largest predatory creatures are the black caiman, jaguar, cougar, and anaconda. In the river, electric eels can produce an electric shock that can stun or kill, while piranha are known to bite and injure humans. Various species of poison dart frogs secrete lipophilic alkaloid toxins through their flesh. There are also numerous parasites and disease vectors. Vampire bats dwell in the rainforest and can spread the rabies virus. Malaria, yellow fever and Dengue fever can also be contracted in the Amazon region.

Deforestation is the conversion of forested areas to non-forested areas. The main sources of deforestation in the Amazon are human settlement and development of the land. Prior to the early 1960s, access to the forest's interior was highly restricted, and the forest remained basically intact. Farms established during the 1960s were based on crop cultivation and the slash and burn method. However, the colonists were unable to manage their fields and the crops because of the loss of soil fertility and weed invasion. The soils in the Amazon are productive for just a short period of time, so farmers are constantly moving to new areas and clearing more land. These farming practices led to deforestation and caused extensive environmental damage. Deforestation is considerable, and areas cleared of forest are visible to the naked eye from outer space.

Between 1991 and 2000, the total area of forest lost in the Amazon rose from 415,000 to 587,000 square kilometres (160,000 to 227,000 sq mi), with most of the lost forest becoming pasture for cattle. Seventy

percent of formerly forested land in the Amazon, and 91% of land deforested since 1970, is used for livestock pasture. Currently, Brazil is the second-largest global producer of soybeans after the United States. New research however, conducted by Leydimere Oliveira et al., has shown that the more rainforest is logged in the Amazon, the less precipitation reaches the area and so the lower the yield per hectare becomes. So despite the popular perception, there has been no economical advantage for Brazil from logging rainforest zones and converting these to pastoral fields.

The needs of soy farmers have been used to justify many of the controversial transportation projects that are currently developing in the Amazon. The first two highways successfully opened up the rainforest and led to increased settlement and deforestation. The mean annual deforestation rate from 2000 to 2005 (22,392 km2 or 8,646 sq mi per year) was 18% higher than in the previous five years (19,018 km2 or 7,343 sq mi per year). Although deforestation has declined significantly in the Brazilian Amazon between 2004 and 2014, there has been an increase to the present day.

Environmentalists are concerned about loss of biodiversity that will result from destruction of the forest, and also about the release of the carbon contained within the vegetation, which could accelerate global warming. Amazonian evergreen forests account for about 10% of the world's terrestrial primary productivity and 10% of the carbon stores in ecosystems—of the order of 1.1 × 1011 metric tonnes of carbon. Amazonian forests are estimated to have accumulated 0.62 ± 0.37 tons of carbon per hectare per year between 1975 and 1996.

One computer model of future climate change caused by greenhouse gas emissions shows that the Amazon rainforest could become unsustainable under conditions of severely reduced rainfall and increased temperatures, leading to an almost complete loss of rainforest cover in the basin by 2100. However, simulations of Amazon basin climate change across many different models are not consistent in their estimation of any rainfall response, ranging from weak increases to strong decreases. The result indicates that the rainforest could be threatened though the 21st century by climate change in addition to deforestation.

As indigenous territories continue to be destroyed by deforestation and ecocide, such as in the Peruvian Amazon indigenous peoples' rainforest communities continue to disappear, while others, like the Urarina continue to struggle to fight for their cultural survival and the fate of their forested territories. Meanwhile, the relationship between non-human primates in the subsistence and symbolism of indigenous lowland South American peoples has gained increased attention, as have ethno-biology and community-based conservation efforts.

The use of remote sensing for the conservation of the Amazon is also being used by the indigenous tribes of the basin to protect their tribal lands from commercial interests. Using handheld GPS devices and programs like Google Earth, members of the Trio Tribe, who live in the rainforests of southern Suriname, map out their ancestral lands to help strengthen their territorial claims. Currently, most tribes in the Amazon do not have clearly defined boundaries, making it easier for commercial ventures to target their territories.

To accurately map the Amazon's biomass and subsequent carbon related emissions, the classification of tree growth stages within different parts of the forest is crucial. In 2006 Tatiana Kuplich organized the trees of the Amazon into four categories: (1) mature forest, (2) regenerating forest [less than three years], (3) regenerating forest [between three and five years of regrowth], and (4) regenerating forest [eleven to eighteen years of continued development]. The researcher used a combination of Synthetic aperture radar (SAR) and Thematic Mapper (TM) to accurately place the different portions of the Amazon into one of the four classifications.

In 2005, parts of the Amazon basin experienced the worst drought in one hundred years, and there were indications that 2006 could have been a second successive year of drought. A July 23, 2006 article in the UK newspaper The Independent reported Woods Hole Research Center results showing that the forest in its present form could survive only three years of drought. Scientists at the Brazilian National Institute of Amazonian Research argue in the article that this drought response, coupled with the effects of

deforestation on regional climate, are pushing the rainforest towards a "tipping point" where it would irreversibly start to die. It concludes that the forest is on the brink of being turned into savanna or desert, with catastrophic consequences for the world's climate.

In 2010 the Amazon rainforest experienced another severe drought, in some ways more extreme than the 2005 drought. The affected region was approximate 1,160,000 square miles (3,000,000 km2) of rainforest, compared to 734,000 square miles (1,900,000 km2) in 2005. The 2010 drought had three epicenters where vegetation died off, whereas in 2005 the drought was focused on the southwestern part. The findings were published in the journal Science. In a typical year the Amazon absorbs 1.5 gigatons of carbon dioxide; during 2005 instead 5 gigatons were released and in 2010 8 gigatons were released.

Which name is also used to describe the Amazon rainforest in English

also known in English as Amazonia or the Amazon Jungle,

How many square kilometers of rainforest is covered in the basin

5,500,000 square kilometres (2,100,000 sq mi) are covered by the rainforest.

How many nations control this region in total

This region includes territory belonging to nine nations.

How many nations contain "Amazonas" in their names

States or departments in four nations contain "Amazonas" in their names.

What percentage does the Amazon represents in rainforests on the planet

The Amazon represents over half of the planet's remaining rainforests

What is the Dutch word for the Amazon rainforest

Amazoneregenwoud

What rainforest covers the majority of the Amazon basin in South America

The Amazon rainforest

In what country can most of the Amazon rainforest be found

Brazil

The Amazon rainforest makes up what amount of Earth's rainforests

over half

How many species of trees can be found in the Amazon rainforest

16,000

What kind of forest is the Amazon rainforest

moist broadleaf forest

How many square kilometers is the Amazon Basin

7,000,000 square kilometres (2,70

How many nations are within the Amazon Basin

nine nations

Which nation contains the majority of the amazon forest

Brazil

What is the estimate for the amount of tree species in the amazon tropical rain forest

16,000 species

Which type of climate may have allowed the rainforest to spread across the continent

the wetter climate may have allowed the tropical rainforest to spread out across the continent.

What has allowed for the Savanna region to expand into the tropics

Climate fluctuations during the last 34 million years have allowed savanna regions to expand into the tropics.

During what time did the rainforest spanned a narrow band

During the Oligocene, for example, the rainforest spanned a relatively narrow band.

When did it retract to a inland formation

It expanded again during the Middle Miocene, then retracted to a mostly inland formation at the last glacial maximum.

Did the rainforest managed to thrive during the glacial periods

However, the rainforest still managed to thrive during these glacial periods, allowing for the survival and evolution of a broad diversity of species.

What may have caused rainforests to grow across South America

the extinction of the dinosaurs and the wetter climate

How many degrees south did the Amazon rainforest reach from 66-34 Mya

45

What has caused savanna regions to grow into the South American tropics in the last 34 million years

Climate fluctuations

During which period in history was the Amazon rainforest a narrow band of forest

Oligocene

What did the Amazon rainforest do during the Middle Miocene

It expanded

What extinction event might have created some conditions

allowing the expansion of the amazon rainforest

Cretaceous–Paleogene extinction event

Beginning how many years ago did the amazon rainforest extend 45 degrees south

66–34 Mya

After the Oligocene period, under what period did the amazon rainforest begin to expand

Middle Miocene

The amazon rainforest became a mostly inland forest around which global event

last glacial maximum

Savannah areas expanded over the last how many years

34 million years

In which point did the drainage basin of the Amazon split

During the mid-Eocene, it is believed that the drainage basin of the Amazon was split along the middle of the continent by the Purus Arch.

In which direction did the water on the eastern side flow

Water on the eastern side flowed toward the Atlantic,

What is the name of the basin that was created from a enclosed lake

Solimões Basin

How long ago was it when the water broke through the Purus Arch

Within the last 5–10 million years

Where did it join in the direction of its flow

joining the easterly flow toward the Atlantic.

When was the drainage basin of the Amazon believed to have split in the middle of South America

During the mid-Eocene

Where did water to the east of the Amazon drainage basin flow towards

the Atlantic

Where did water to the west of the Amazon drainage basin flow towards

the Pacific

What did water that flowed towards the Pacific have to flow across during the mid-Eocene

Amazonas Basin

What basin was formed when the Andes Mountains rose

the Solimões Basin

During what period the drainage basin of the Amazon likely split

the mid-Eocene

Near where in the continent is it believed that the Amazon basin split

Purus Arch

Where did water on the eastern side of the

amazon basin travel after the split

the Atlantic

Where did the water in the Amazon Basin flow towards when moving west

the Pacific

What is the lake known as which was created by the rise of the Andes Mountains

Solimões Basin

What does LGM stands for

Last Glacial Maximum

What did the analysis from the sediment deposits indicate

rainfall in the basin during the LGM was lower than for the present

What are some of scientists arguments

the rainforest was reduced to small, isolated refugia separated by open forest and grassland

How has this debate been proven

This debate has proved difficult

How are the explanations supported

explanations are reasonably well supported

There have been major changes in Amazon rainforest vegetation over the last how many years

21,000

What caused changes in the Amazon rainforest vegetation

the Last Glacial Maximum (LGM) and subsequent deglaciation

What has been analyzed to compare Amazon rainfall in the past and present

sediment deposits

What has the lower rainfall in the Amazon during the LGM been attributed to

reduced moist tropical vegetation cover in the basin

Many changes in the vegetation of the amazon rainforest took place since the Last Glacial Maximum, which was how many years ago

21,000

Analysis of what kind of deposits from the Amazon Fan indicates a change in rainfall in the Amazon basin

sediment deposits

Changes in rainfall reduced what kind of vegetation cover in the Amazon basin

moist tropical vegetation cover

Scientists disagree with how the Amazon rainforest changed over time with some arguing that it was reduced to isolated refugia seperated by what

open forest and grassland

Why is it difficult to resolve disagreements about the changes in the Amazon rainforest

data sampling is biased away from the center of the Amazon basin

What is the name of the satellite that measured the amount of dust

CALIPSO

How many tons of dust are blown from the Sahara each year

182 million tons

How many miles does the dust travels over the Atlantic Ocean

1,600 miles

Which basin does the dust falls over into

Amazon basin

How many tons of dust remains in the air

132 million tons

What tool has measured the amount of dust that travels from the Sahara to the Amazon

NASA's CALIPSO satellite

How much dust is blown out of the Sahara each year

182 million tons

How much Saharan dust falls over the Amazon basin each year

27.7 million tons

How much Saharan dust remains in the air over the Amazon each year

132 million tons

How much Saharan dust is blown and falls upon

the Caribbean Sea each year

43 million tons

A satellite that measured the amount of dust going to the Amazon was named what

CALIPSO

What organization runs the satellite that measured dust that landed on the Amazon

NASA

How much windblown dust leaves the Sahara each year

182 million tons

How many miles across the Atlantic Ocean does Saharan dust travel

1,600 miles

How many tons of Saharan dust falls on the Amazon Basin each year

27.7 million tons

What is the name of the book written by Archeologist Betty Meggers

Man and Culture in a Counterfeit Paradise

What is the maximum square miles did Betty Meggers claim that can be sustained in the rainforest

0.52/sq mi

What would be needed to host a larger population

agriculture

Which findings suggested that the region was densely populated

anthropological

How many people may have lived in the Amazon region during AD 1500

5 million

What feature of the Amazon made people believe it couldn't have many inhabitants

the poor soil

What well-known archeologist believed the Amazon didn't have many inhabitants

Betty Meggers

How many inhabitants did Betty Meggers believe could occupy each square kilometre of the Amazon

0.2

In what book did Betty Meggers describe the idea of the Amazon being sparsely populated

Amazonia: Man and Culture in a Counterfeit Paradise

Which archaeologist proposed the idea that the Amazon rainforest couldn't sustain large populations

Betty Meggers

Which book discussed the theory about low populations in the Amazon rainforest

Amazonia: Man and Culture in a Counterfeit Paradise

What was the theorized maximum population density per square kilometre for the Amazon rainforest

0.2 inhabitants per square kilometre

In 1500 AD how many people were believed to have lived in the Amazon region

5 million people

In the 1980s what was the population of the amazon region

200,000.

Who was the first European to travel the Amazon River

Francisco de Orellana

During what time did civilization in the Amazon was flourishing when Orellana made his observations

1540s

What was believed to be the cause of devastation to the civilization

diseases from Europe

How long since it's been that geoglyphs were first discovered on deforested land

1970s

What time period did the geoglyphs date back to

AD 0–1250

Who was the first European to travel the entire length of the Amazon River

Francisco de Orellana

In what year did the first European travel the entire length of the Amazon River

1542

Geoglyphs dating to what period were found in deforested land along the Amazon River

AD 0–1250

Who is given credit for discovering geoglyphs along the Amazon River

Ondemar Dias

For how many years was evidence shown that humans shaped the the Amazon

11,000 years

What is terra preta called

black earth

How much is terra preta distributed over the Amazon forest

large areas

What did the development of this fertile soil provide in hostile environment

agriculture and silviculture

In which region tribe were large settlements discovered

Xingu tribe

Who discovered this and where did they come from

Michael Heckenberger and colleagues of the University of Florida

What type of soil is considered a product of soil management by indigenous peoples in the Amazon Forest

Terra preta (black earth)

The development of Terra Preta allowed for what to happen in the Amazon Forest

agriculture and silviculture

In lands attributed to what tribe are found remains of large settlements

Xingu tribe

Who is credited with finding evidence of large settlements in the Amazon forest

Michael Heckenberger and colleagues

Evidence for what types of structures were found in 2003

roads, bridges and large plazas

How many species of insects are known in the region

2.5 million

What portion of bird species make up the world's total live in the rainforest

One in five

How many plant species make up the total in the rainforest

40,000

What is the total make up of fish species living in the Amazon

one in five

How many invertebrate species are known in Brazil alone

96,660 and 128,843

The Amazon region is home to how many species of insect

2.5 million

How many species of bird and mammals are there in the Amazon region

2,000

How many plant species are estimated to be in the Amazon region

40,000

How many reptiles have been discovered in the Amazon region

378

What amount of bird species on earth are found in the Amazon rainforest

One in five

How many kilometers of acres of the Ecuadorian rainforest is supported

62 acres

How many tree species are in the rainforest

1,100

How many tons of living plants are in the rainforest

90,790

What is the average plant biosmass

356 ± 47 tonnes per hectare

What is the number of plant species in economics and social interest

438,000

Where does the Amazon region rate among the entire earth for its amount of biodiversity

highest on Earth

How many tree species were found in one square kilometer of Ecuadorian rainforest in 2001

1,100

How many tons of live plants were found to live in one square kilometer of the Amazon rainforest in 1999

90,790 tonnes

What is the average weight of the biomass per hectare in the Amazon

356 ± 47 tonnes

How many plant species are of interest to society and manufacturers exist in the amazon rainforest

438,000

Which animal that lives in the Amazon river may

produce a deadly shock

electric eels

Large predators of the Amazon rainforest include the jaguar, cougar, and anaconda, what is one other example

black caiman

What fish living in the Amazon river is known to bit humans

piranha

What are dart frogs are known to secrete

lipophilic alkaloid toxins

What type of bat that lives in the Amazon rainforest can spread rabies

Vampire bats

What is the process of removing trees from a forest known as

Deforestation

Acessing the Amazon rainforest was restricted before what era

the early 1960s

What method was used to clear forest for crop cultivation in the amazon forest

slash and burn method

What are two factors that made it difficult for colonists to the Amazon forest to survive

loss of soil fertility and weed invasion

What is notable about the Amazon forest when it is seen from space

areas cleared of forest are visible to the naked eye

How many square kilometres of the Amazon forest was lost by 1991

415,000

In the year 2000 how many square kilometres of the Amazon forest had been lost

587,000

What is most of the cleared land in the Amazon region used for

pasture for cattle

Where is Brazil ranked globally in soybean production

second-largest global producer

What percentage of the land cleared in the Amazon is used for growing livestock

91%

Highways built in the Amazon rainforest were built primarily for what kind of farmers

soy farmers

What did creating highways in the Amazon rainforest lead to

increased settlement and deforestation

The rate of clearing of forest from 2000 to 2005 was how many

square miles per year

8,646 sq mi

How much higher was the rate of deforestation in 2000, to 2005 compared to 1995 to 2000

18% higher

What happened to the rate of deforestation in the Amazon region of Brazil between 2004 and 2014

deforestation has declined

What are environmentalists concerned about losing in the Amazon forest

loss of biodiversity

The loss of biodiversity may be the result of what, according to environmentalists

destruction of the forest

What are environmentalists concerned about having released from the Amazon region

carbon contained within the vegetation

What amount of the worlds carbon is stored in the Amazon forest

10% of the carbon stores

How many metric tons of carbon are believed to be stored in the Amazon forest

1.1 × 1011 metric tonnes

What change in conditions may make the Amazon rainforest unsustainable

reduced rainfall and increased temperatures

A complete loss of rainforest cover may be caused by what type of emissions

greenhouse gas emissions

If one computer model turns out correct, by what year would there be a nearly complete loss of rainforest in the Amazon basin

2100

How long may the Amazon rainforest be threatened, according to some computer models

though the 21st century

What are the main threats facing the Amazon rainforest in the current century

climate change in addition to deforestation

What kind of territories are being destroyed by ecocide in the Amazon

indigenous territories

What type of conservation effort is gaining attention in the Amazon

community-based conservation

Indigenous territories are largely being destroyed in what two ways

deforestation and ecocide

The Peruvian Amazon indigienous people are one group struggling in the Amazon, what is another group

Urarina

There is growing interest in what indigenous group in the Amazon

lowland South American

What kind of sending technology is being used to protect tribal lands in the Amazon

remote sensing

What tribe uses GPS devices to map lands

Trio Tribe

Tribal members living in the rainforests of what region are using Google Earth

southern Suriname

What do tribes use Google Earth and GPS for

to help strengthen their territorial claims

Why do some tribes use remote sensing technology

to protect their tribal lands from commercial interests

Classifying the stages of what is important to mapping aspects of the Amazon

tree growth

The classification of aspects of the Amazon forest is important for mapping what type of emission

carbon related emissions

Who organized the trees of the Amazon into four categories

Tatiana Kuplich

In what year did one individual suggest classifying the trees of the Amazon into four categories

2006

What type of radar was used to classify trees into four categories

Synthetic aperture radar (SAR)

In what year did the Amazon experience its worst drought of recent history

2005

What organization predicted that the Amazon forest could survive only three years of drought

Woods Hole Research Center

What organization argued that drought, among other effects, could cause the Amazon forest to reach a "tipping point"

Brazilian National Institute of Amazonian Research

Along with drought, what is one other factor that is pushing the Amazon rainforest towards a tipping point

deforestation

What might the Amazon forest become if it passes the tipping point and starts to die

savanna or desert

In what year did the Amazon experience a drought that may have been more extreme than in 2005

2010

How many square miles large was the region impacted by the 2010 drought

1,160,000

How many areas were impacted by the the death of vegetation in the 2010 drought

three epicenters

The southern part of the Amazon forest was mainly impacted by drought in what year

2005

How many tons of carbon are absorbed the Amazon in a typical year

1.5 gigatons