



The Tropical Climate Zone



What are temperatures like in tropical climates?

Temperatures in tropical areas, also known as the tropics, are always high. The maximum (highest) temperature is usually around 35°C and the minimum (lowest) temperature is normally around 22°C. There is as little as 2°C (3.6°F) between the highest and lowest temperatures at midday in an entire

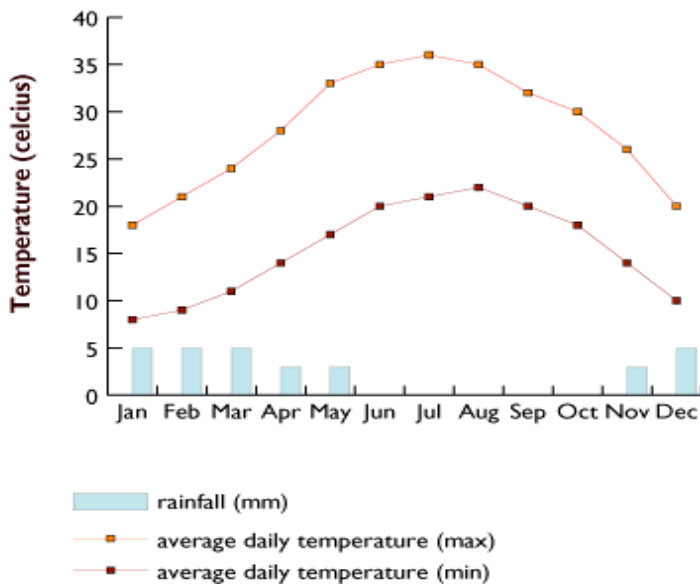


Fig. 1: Climate in an average desert area

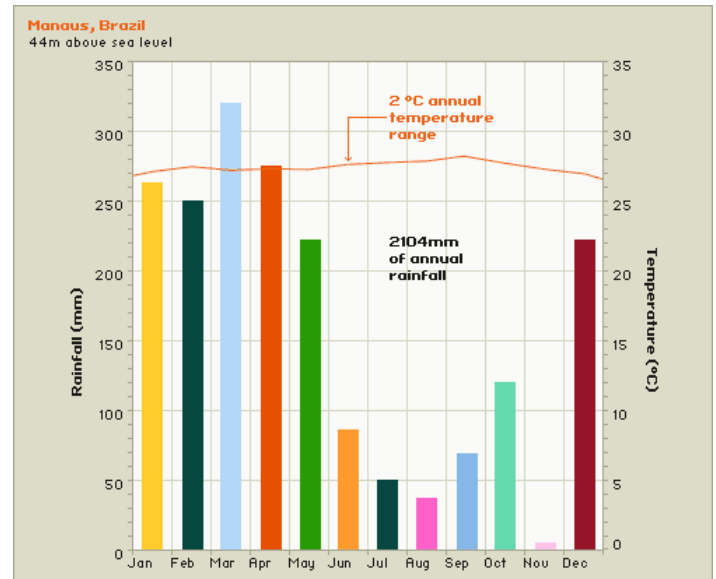


Fig. 2: Climate in an average tropical area

year! (see fig. 2). Even though tropical areas are at the same sort of latitudes as desert climates (near the equator - see fig. 3) the range (the difference between the maximum and the minimum) temperatures is very different. See how big the gap between the temperature lines on fig. 1 is. Deserts have a maximum temperature of roughly 45°C, 10°C higher than tropical areas, because in the tropics much of the sun's heat is used up in evaporation. Evaporation is when water turns from a liquid into a gas, like when a puddle is there but disappears when the sun comes out. The minimum night-time temperature in desert areas can be as low as freezing (0°C), a full 22°C lower than in the tropics! This is because there is lots of cloud in tropical skies which prevents heat escaping at night, whereas the lack of cloud in deserts allows the heat to escape. Imagine if your classroom had no roof, would the heat stay in the room?

Is there a difference between rainfall in deserts and rainfall in the tropics?

Whereas deserts are dry, the tropics receive more rainfall than any other type of climate: see how much taller the bars on fig. 2 are than on fig.1. Rain, often very heavy downpours and thunderstorms, is likely to occur every day more or less at the same time. The combination of plentiful rain and high temperatures makes the air humid (humid means there is lots of moisture, or water, in the air). The days begin sunny and hot, as with the tropics situated near the equator the sun is directly overhead. As the day wears on the heat causes the humid air to rise. When the air has risen enough it cools and clouds form causing showers in the late afternoon, which usually clear to give a fine evening.

Where exactly do you find the tropics?

The tropical zone is between the Tropic of Capricorn (23° south of the equator) and the Tropic of Cancer (23° north of the equator). The best-known tropical areas are the Amazon rain forest in South America (which is fed by the huge Amazon River) the Congo basin in Central Africa, Malaysia, Indonesia and southern Vietnam. On the map these are green areas.



Fig. 3: Map showing areas with a tropical climate

If tropical regions are hot and wet all year round they don't have any seasons, right?

There are no real seasons in the tropics. Indeed it is said that night-time is the winter of the tropics, and even that is not cold! Instead you can tell the seasons apart, so far as they do exist, by changes in rainfall and cloudiness. Greatest rainfall occurs when the sun is overhead - at midday. On the equator this occurs twice a year in March and September; consequently there are two wet and two dry seasons. Further away from the equator, the two rainy seasons merge into one, and the climate becomes more monsoonal, with one wet season and one dry season.

What plants and animals live in tropical regions?

The plentiful rainfall and sunshine make the tropical climates an ideal habitat for many plants and animals. Tropical areas have the richest biodiversity of all the climates, which means that there are more different types of plants and animals than anywhere else in the world. The tropics are naturally covered in thick, lush jungle or rain forest where these plants and animals live. Animals like monkeys, jaguars and multi-coloured birds live in these jungles. There are even a large number of plants that have yet to be properly named and studied.



Fig. 4: A jaguar

How do people impact on the tropical regions?



Fig. 5: Deforestation

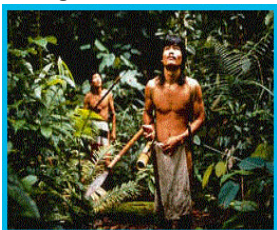


Fig. 6: Tribes-people

Similarly to polar areas, only traditional tribes with specialist knowledge actually live in the rainforests themselves, but other people have a big impact on the areas. The forests are cut down because their hardwood trees, such as mahogany and teak are worth a lot of money. Furthermore just like people in temperate areas cut the trees to create farmland in the past, people in the tropics are doing the same today. Trees absorb carbon dioxide and replace it with oxygen. Additionally the burning of the forests releases the carbon dioxide that is stored in the trees and plants. Carbon dioxide causes global warming. Yet another issue is that without the trees and plants there is less rain and desertification takes place because the trees and plants help hold the soil together and protect it from the wind. Finally, the trees and plants are the rainforest animals' habitats and without them they cannot survive.

Summary

The tropics are found close to the equator, are wet and hot all year round and have the highest biodiversity of all climates. However, rainforests are under threat from people clearing them, resulting in the loss of habitat, desertification and increasing global levels of carbon dioxide.

References and sources

Text

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http://www.ace.mmu.ac.uk/eae/Climate/Older/Tropical_Climate.html

Images

Fig. 1: Climate in an average desert

http://www.bbc.co.uk/weather/world/city_guides/results.shtml?tt=TT000180

Fig. 2: Climate in an average tropical area

<https://biomee.wikispaces.com/Tropical+Rainforest>

Fig. 3: Map showing areas with a tropical climate

<https://biomee.wikispaces.com/Tropical+Rainforest>

Fig. 4: A jaguar

http://dpatterson.blogspot.com/2008_01_01_archive.html

Fig. 5: Deforestation

<http://nksandeep.wordpress.com/2009/03/>

Fig. 6: Tribes-people

<http://store.wildernesscommittee.org/campaigns/historic/WILD/reports/Vol09No>

Date

T: understand a report on tropical climates

- 1) Why are the tropics warmer at night than deserts at night?
- 2) Why are deserts warmer during the day than the tropics?
- 3) Why do you think people might clear rainforest even though they know it releases carbon dioxide and destroys animals' habitats?
- 4) Why do tropical areas have so many plants whereas deserts have so few, even though they are at the same latitude?
- 5) Why might the people in the picture (fig. 6) not be wearing many clothes?
- 6) Why might people in tropical areas not respond positively if people in temperate areas ask them to stop clearing forest?
- 7) What can you tell by comparing the two graphs?
- 8) How are changes in seasons in the tropics different from changes in seasons in temperate areas?
- 9) Why has the writer compared 'clouds preventing the heat escaping, with the roof in your classroom doing the same thing' and explained evaporation in rainforests as being, 'like a puddle disappearing when the sun comes out'?
- 10) How is the destruction of the rainforests linked to the melting of ice in polar areas?
- 11) Why is it surprising that deserts and the tropics have such different temperatures?
- 12) Why is it warmest on the equator?
- 13) When rainforests are cut down to export hardwoods to wealthy people it is done with huge machinery (saws, lorries, cranes and so on). Do you think the tribes do this? Why / why not? If not, who do you think does it?

Date

T: understand a report on tropical climates

- 1) Clouds trap the heat
- 2) In the tropics the sun's heat is used in evaporation
- 3) They need the money from selling wood / they need the food from farming
- 4) Tropical areas have rain which plants need
- 5) It is warm / they don't have the technology to make them easily / they can't afford them / it is their culture
- 6) Because people in temperate areas already cut down all the forest that covered their land
- 7) Deserts have a wider range of temperatures and less rainfall / Tropical areas have a smaller range of temperatures and more rainfall
- 8) Tropical seasons are wet and dry whereas temperate seasons change from warm to cold
- 9) Because it helps you to understand / relate a difficult idea to your every-day life
- 10) Deforestation leads to increased carbon dioxide, which leads to global warming, which causes the ice cap to melt
- 11) Because they are at the same latitude / both near the equator
- 12) The sun shines more directly on the equator
- 13) Not the tribes people because they don't have / can't afford / wouldn't know how to work that kind of technology.
Wealthy / technologically educated people who can afford the technology and would know how to work it