

Notes on the Physical Geography of Belize

Belizean Studies Environment Strand

L.O. 1.3 Describe the physical geography of Belize in terms of the features of its basic geology, land, inland water bodies, coastal and marine areas.

L.O. 1.4 Describe the ecological, climatic, tectonic and other regions that Belize is a part of.

Key terms:

Weather – atmospheric conditions at a particular time

Climate – long term atmospheric conditions

Elements of Weather and Climate – the factors that influence weather and climate include temperature, air pressure, winds, humidity, clouds and precipitation

Geology –

Coral reef - an offshore ridge of mainly calcium carbonate that is formed by the secretions of small marine animals known as coral polyps that grow in warm (21-30°C), clean (too much sediments, nutrients or toxins kill corals), shallow (for sunlight to penetrate), well aerated water (oxygen for photosynthesis of algae), with the right amount of salt

Terrestrial – of or relating to the land or its inhabitants

Ecosystem – a community of plants and animals within a particular physical environment, which is linked by a flow of materials through the non-living as well as the living sections of the system

Components of Ecosystems – the components of an ecosystem include inputs, producers, primary consumers, secondary consumers, tertiary consumers, decomposers

Climatic Regions

The location of a country (latitude) determines the type of climate and ecosystems it will have. What is Belize's coordinates? Refer to the diagram on the website that shows tropical climates and ecosystems to identify Belize's climate.

about Belize has a tropical marine climate and a tropical marine ecosystem. Given Belize's immediate location to the sea, much of its climatic conditions are affected by the sea and our prevailing winds (the North East trade winds). When North East trade winds and South East trade winds meet, there are strong updraughts, thick clouds and heavy rainfall. This is known as the Inter-Tropical Convergence Zone (ITCZ). When the ITCZ is pushed north by the South East trades it brings heavy rainfall that ushers in rainy season. During the rainy season tropical waves may develop when there is a wave-like disturbance in the North East trades. However when the ITCZ is pushed south by the Northerners (cold continental air) and North East trades it is then that less rain falls which may usher in the dry season. You can further direct students to <http://www.hydromet.gov.bz/climatology/climate-summary> to develop questions based on the climatic features of the entire country or of select areas.

Ecological Regions

Have you ever been a forested area and wondered why it so rich with vegetation of so many different shapes and sizes? Have you wondered why plants and animals have certain features and these features vary as you go from one area to the next?

Belize has a tropical marine climate so our terrestrial vegetation is adapted to seasonal drought. This drought does not mean no rainfall any at all, but means that there is less rainfall than normal.

Though areas of broadleaf forests experience relief rainfall that helps with the abundant growth of vegetation, it is important to note that there are areas of the country where rainfall is limited thus forcing plants to adapt to a dry season. The types of ecosystems in Belize are all influenced by the local climatic conditions, soil, vegetation and relief of the area. Study the different ecosystems below and their

characteristics by visiting the following website <http://belizeinfocenter.org/ecosystems/terrestrial-ecosystems/>

Terrestrial Ecosystems in Belize:

- **Tropical Rainforest** – these areas have high temperature and rainfall all year round. Plants have special adaptations to survive the heavy rains. Trees have tall, straight trunk with no leaves or branches for most of its length. Leaves near the ground are useless because it is too shady there for photosynthesis to occur. Trees have a well-defined crown where all the leafy growth is concentrated. Leaves are dark green and leathery to protect them from the intense sunshine. Leaves also have drip tips to drain off water quickly after heavy rain so transpiration and photosynthesis can occur more efficiently. The bark is smooth and thin to allow water to drain down quickly. Taller emergent trees have plank buttresses/buttress roots that provide extra support for their height. Trees would have epiphytes/bromeliads that live on the branches of other plants but have thick leaves that form a container for water and nutrients. Stranglers send their roots to the forest floor which may eventually tighten around the host tree and kill it. Rainforests usually have 4 layers: A layer/ Emergent trees (30-45m) are trees rising above B-Layer. B-Layer/Canopy trees (18-27m) are trees with rounded canopies packed together where epiphytes, parasites, birds, insects and mammals (monkeys) are common. C-Layer/Lower-Storey (8-14m) is where less light would penetrate but epiphytes, parasites, birds, mammals and insects are still very common in this area. Shrub Layer and Forest Floor is where there is very little light for photosynthesis so few plants grow. Plants that manage to grow do so among the tree trunks, plank buttresses and the stems of the lianas.
- **Savanna** – Given the variation of rainfall received across the country, areas that receive less rainfall must adapt to periods when there is lack of moisture. Pine trees and grasslands are common in these areas because they have special adaptations to either make good use of limited water during the dry season or to stunt their growth during the dry season. Plants such as craboo have thick, fire-resistant barks to survive forest fires that may be started due to natural or human causes. Grasses grow in clumps to help them capture moisture such as dew. Plants usually have thick barks (if it is swollen then it is to also store water) and small, leathery or spiny leaves to reduce loss of water via transpiration. Deep roots of plants allow access to water far below the surface.
- **Mangroves** – Mangroves grow along the coastlines where the soil is waterlogged, mud is disturbed by tidal currents and where the water is too salty for most plants. Mangroves have stilt roots which extend above the water line to breathe, while some have breathing roots which project upwards from the mud. Mangrove seeds germinate and develop roots while they are still on the tree, so they can grow as soon as they fall to the mud below. It is important for us to remember the ecological and economic importance of mangroves in providing a nursery for juvenile fishes, its wood that can be used to make charcoal, they stabilise mud deposits from erosion and protect the coastline from erosion. Refer to the link for an informative video on the threats and importance of Belize's mangroves. <https://vimeo.com/130758322> Statistics show that almost 90% of all mangrove clearings between 1980 and 2010 occurred in the Belize City area (including surrounding cayes), (ii) the Placencia peninsula and surrounding cayes, (iii) Ambergris Caye and nearby islands, and (iv) the Dangriga area and nearby cayes, more than half of all mangrove clearings from 1980-2010 occurred near Belize City.
- **Coral Reef** – Refer to the 'Key Terms' for the conditions necessary for the growth of coral reefs. Coral reefs are important landforms not only because they serve as tourist attractions as underwater gardens, but because they also act as nurseries for juvenile fishes, supply material for beach sand and reduce the energy of waves as they approach the shore. All three types of coral

reefs can be found in Belize with the barrier reef being the most dominant type. Rocky Point in Ambergris Caye is a fringing reef because it develops in the sea next to a low-lying coastline where a narrow lagoon separates the mainland from the fringing reef. Turneffe Reef Atoll, Lighthouse Reef Atoll and Glover's Reef Atoll are all referred to as coral atolls because the reef grows in a circular pattern. The following link explores the wonders of this marine ecosystem: <https://vimeo.com/ondemand/belizebarrierreef/214460736> and these other two provide general information on our coral reef <http://www.banyanbay.com/belize-barrier-reef/> and <https://www.belizehub.com/belize-barrier-reef/> (Links are from tourist websites because those websites offer more simplistic information that students can comprehend.)

- **Rivers** – Rivers are important ecological features that are essential to the sustenance of life. Rivers were used by our indigenous and colonial predecessors as means of transportation and for the acquisition of marine life for dietary needs. Forming communities along the banks or mouth of rivers is a common practise. In fact it is interesting to note that many communities in Belize got their names from the logging industry that was Belize's mainstay during its colonial history. Settling the banks of rivers was important to transport the logs to the coast where they would be processed and then loaded unto waiting ships for export. Names with Landing/Bank meant that was the area first settled; Walk meant that the area was being developed which is marked by the continuous cultivation of crops; Pen meant an area that specialized in keeping oxen for pulling the logs to the rivers; Boom is a location where a chain ran across the river to collect the floating logs. Some riverside communities got their names from the first settlers eg Flowers Bank (Adam Flowers), Scotland Half Moon (Scottish slave owners) etc. If you speak to community elders of such communities they can share stories of travelling to town by dorey to attend school and even of tragic tales of those who perished in flood waters. For a detailed information of the characteristics of southern vs northern rivers please visit the following link: <http://belizeinfocenter.org/wp-content/uploads/2016/03/Rivers.pdf>