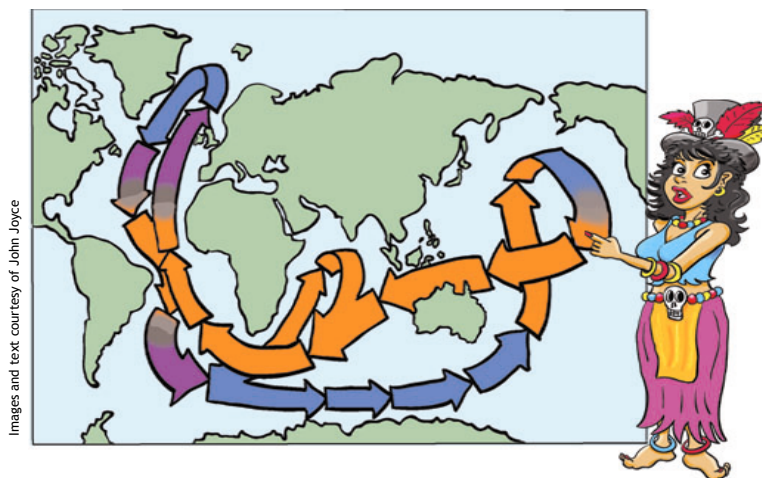


# Black John the Bogus Pirate

## Third Principle of Ocean Literacy

**A**vast there, Mateys! Today I'm going to hand over to an important member of my crew - Zelda the trainee Voodoo witch to talk about the Third Principle of Ocean Literacy which says that "The Ocean is a major influence on weather and climate" . . . and here's how . . . .



**B**ecause the Ocean covers over 70% of planet Earth's surface, its waters absorb most of the radiated heat reaching Earth from the Sun. This heated water is less dense than colder water and rises to the surface, moving north and south from the Equator as ocean currents. At the North and South Poles seawater becomes very cold. Cold water is denser than warmer water and sinks to the bottom of the Ocean at the Poles, to be replaced by warmer water moving in from the Equator. The cold water then flows back to the Equator as a deep ocean current, where it warms and rises again.

The Ocean also releases heat back into the atmosphere as water vapour, which falls back as rain upon the land and the Ocean. Heat released from the Ocean also drives the circulation of air as winds and even tropical storms.



The overall climate of the world is influenced by the amount of carbon dioxide in the atmosphere. This is because carbon dioxide absorbs heat from the Sun, so the more carbon dioxide there is in the air, the hotter Earth will become, leading to rapid climate change. This is why carbon dioxide is called a 'Greenhouse Gas'. The Ocean is vitally important in protecting us against rapid climate change because of the tiny, tiny plants (called 'phytoplankton') that live there. These tiny plants absorb about half of the carbon dioxide in the atmosphere and convert it to oxygen. This is why it is so vitally important to protect the Ocean against pollution because, if these tiny phytoplankton stop absorbing carbon dioxide, then life on Earth could become unbearable.



**Tropical storms can occur when seawater temperatures rise above 27 °C.** This causes seawater to evaporate into water vapour which rises into the air, cools (releasing heat) and condenses into enormous cumulonimbus clouds. Inside these clouds, the water droplets collide with each other and eventually fall as rain. The rising water vapour at the centre of the cloud creates an area of low atmospheric pressure which also pulls in air at sea level, creating high wind speeds. This process keeps feeding on itself to create a towering tropical storm around a central calm area (the 'eye' of the storm) and spun by the gravitational forces north and south of the Equator (known as the 'Coriolis Force'). Storms like this lose their power and die out when they reach land and cannot suck up any more water vapour.



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