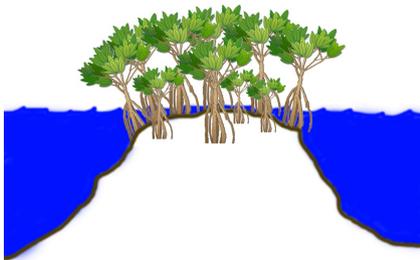
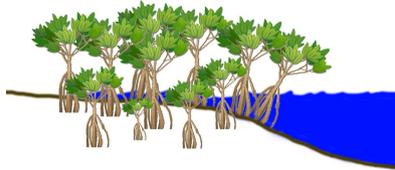


Mangroves are often a huge community of trees and shrubs of different mangrove species. Floating seeds and propagules mangroves have been able to conquer large areas along coasts and depressions in countless countries and islands.

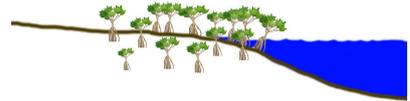
Mangrove forests have been divided as follows:



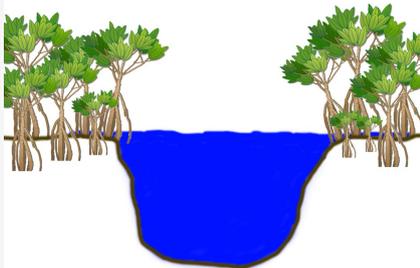
overwashed mangrove forests



fringe mangrove forests



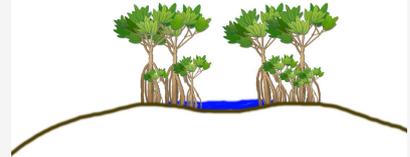
dwarf mangrove forests



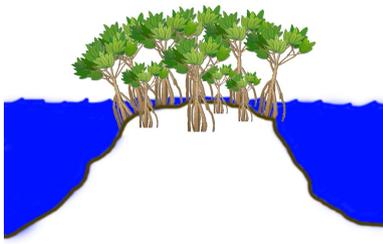
riverine mangrove forests



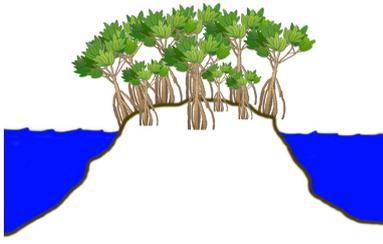
basin mangrove forests



hammock mangrove forests

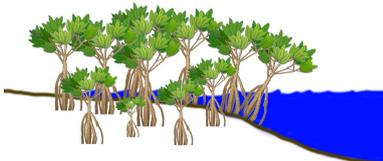


high tide

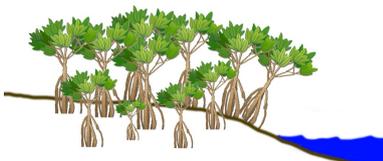


low tide

Overwashed mangrove forests are islands frequently washed over by tides and therefore wash away organic matter. The islands are small and narrow extensions of larger landmass. Normally these islands are dominated by Rhizophora species but also other very salt tolerant mangrove species can be found as Avicennia for example. As the mangroves develop more roots sediment and biomass will get stuck and caught. Mangroves on growing in overwashed mangrove forests normally reach a height between 2 to 7 meters.



high tide



low tide

Fringe mangrove forests are the typical and classic mangrove zonation pattern. They grow as a relatively thin fringe along the coast. Fringe mangrove forests are directly exposed to the tides and sea waves and therefore exposed to storms and strong winds with high energy.

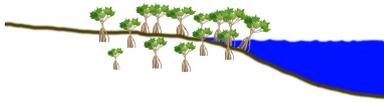
Because the mangroves growing in fringe mangrove forests are flushed daily by tides and do not receive the amount of nutrients as mangroves in riverine mangrove forests do and therefore most of the time do not exceed an height of 10 to 12 meters. Dominated by Avicennia, Rhizophora and Sonneratia.



Philippines



Philippines



high tide



low tide

Dwarf mangrove forests are fringe mangrove forests appearing in colder climates. They grow in sediments with little amount of nutrients. Most of the time dwarf mangrove forests can be found in the very north and very south of mangrove habitats.

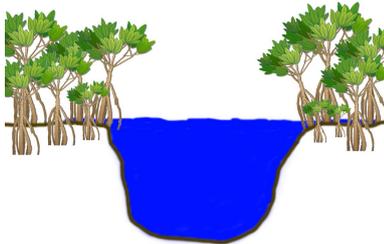
The colder climate and shorter days with less intense sunlight make it hard for mangroves to grow and develop. So, in these regions, temperatures rarely reach above 10°C and the mangroves are covered in snow. Only *Avicennia marina* and *Sonneratia* are able to survive under these conditions. Dwarf mangrove forests do not occur in tropical areas where the sediments do not provide enough nutrients. Mangroves growing in dwarf mangrove forests can grow higher than 1.5 meters.



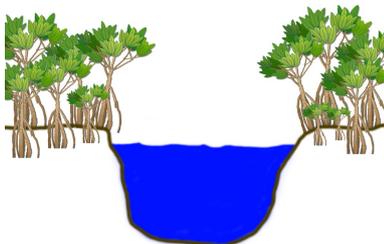
cold climate



lack of nutrients



high tide



low tide

Riverine mangrove forests are flooded mangrove forests that grow along flowing waters such as rivers and creeks which are flooded at high tides and dry up at most low tides. Mangrove growth can extend several kilometers inland from the coast. Salinity varies between different seasons such as dry season and wet season.

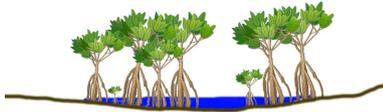
The growing conditions are perfect for mangroves, the freshwater runoff from the uplands, the large amount of terrestrial fluvial nutrient influx, the daily flushing of the sheltered areas where mangroves are exposed to sea waves and storms, and the warm conditions provide a perfect combination which can lead to luxuriant and rapid growth of mangroves and enable mangroves to reach a height up to 35 meters. More than 100 mangrove species can be found in



Caribbean



Costa Rica



wet season



dry season

Basin mangrove forests are in an impounded depression which are flooded occasionally during dry season and during wet season. During dry season, the water level in the basin like a pond can decrease very slowly caused by groundwater flow discharging to the open sea due to water level difference between the basin and the open sea, therefore the soil is high.

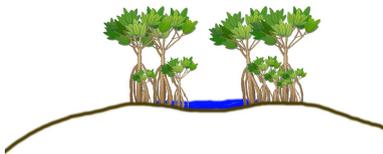
Mangroves growing in basin forests are stunted and are often located in intertidal swamps or drainage depressions. The water in basin forests is stagnant or just slowly flowing. Most of the time, basin mangrove forests are dominated by *Avicennia* and *Rhizophora* species.



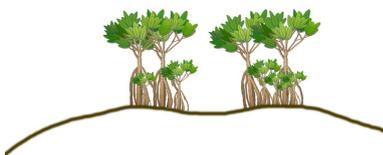
Queensland (Australia)



Avicennia basin



wet season



Hammock mangrove forests are different from basin mangrove forests, the difference is that hammock mangrove forests are elevated than basin mangrove forests, therefore more often isolated but still receive tidal influences. During dry season, the water level in the basin like a pond can decrease slowly caused by the groundwater flow discharging to open sea due to water level difference between the basin and open sea, therefore the salinity here is higher. When the water level decreases a little bit faster than basin mangrove forests as the distance to groundwater is longer and the water flows quicker.

Mangroves growing in hammock forests



Queensland (Australia)



