Biosphere

Sunderbans, Bangladesh

Biology 110
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The Sunderbans Biosphere, located in Bangladesh India, is part of the world’s largest active delta. A delta is a network of rivers, channels, creeks, mudflats, islands, and dunes that are constantly changing due to the impact of the ocean tides. The entire area of the Sunderbans mangrove forest would be completely submerged by water if the sea level rose by just a few feet (Thakur, 2009). This explains why, during the high tides, the layout of the Sunderbans is constantly changing. The geography of the region is completely at the hands of the tidal currents. There are two tides that occur every 24 hours, the incoming tide and the tide going back out. The incoming tide brings in silt and deposits in areas forming the mudflats and islands. These mudflats are held together by

(Wikipedia.com)
the trees that grow out of the water forming the mangrove forest; which is the Sunderbans most notable feature. Throughout the mangrove forest the soil types vary, but most of them are very loose, sandy types. Most of the forest floors, where water is not present, consist of a swampy, marsh style with lots of peat deposits. This explains for the ever changing landscapes of the mangrove forest. Of the 50 mangrove species in the world, about 35 of them are found in Sunderbans. Some of the more prominent species of mangrove found in Sunderbans are the Kala Bean, Krippa, Keora, and Golepata (Bose, 2004). The mangrove forest acts as a natural shelter for many of the aquatic species that live in Sunderbans. The mangrove roots provide a habitat for many shrimp, shellfish, crustaceans, and fish. Above the water lives an even greater diversity of animals. Many of these animals such as jungle cats, rhesus monkeys, multiple species of snakes, crocodiles, migratory birds, and perhaps the most sought out animal; the Royal Bengal Tiger (BoI, 2009).

**Human Impact**

The mangrove forest also has a large impact on the human survival in the Sunderbans. There are approximately 500,000 human inhabitants of the Sunderbans biosphere. The mangrove forest acts as a windbreak from the ocean winds as well as providing the building materials for the inhabitant’s homes (Bose, 2004). Many of the humans that live in the Sunderbans are hunter/gatherers, due to the very rural setting and the highly dispersed population. However, the humans are not at the top of the food chain in the Sunderbans, this is the only place where humans are an everyday source of food for the many predators that live there such as the Royal Bengal Tiger and the crocodiles (Ghosh, 2009).
However, the human impact overtime is having a large effect on the layout of the land of the Sunderbans. Due to the fragile structure of the land in this area, every movement made by the humans has a magnified effect on the land. Destruction of forest due to housing in the area is making the erosion of the soil happen at an increased rate resulting in less and less land mass (Fitzgerald, 2009). Also because fishing is the main source of food for the inhabitants, the balance of the food web is becoming disrupted and some of the species are becoming overpopulated while others are diminishing rapidly. Over the past two centuries, over 5,000 square km of the Sunderbans land has been reclaimed by humans leaving only one small portion on the Malta River in its natural, true form (Fitzgerald, 2009).
History

(Wikipedia.com)

The Sunderbans as it is today is very much different from how it originally started. Not until after the 7th century did Sunderbans become the largest, below sea level delta region. Prior to this time the area which is now the Sunderbans consisted of large stretches of grassland with many tropical wetlands making up one of the largest biodiversity-rich forests; the Bengalian Rainforest (BoI, 2009). The first settlers of the area arrived in the later part of the 5th century but were soon forced out due to increasing sea levels and the lands closing in on them (Thakur, 2009). However, the human inhabitants soon adapted to the new living style with the loose, silt like soil and more and more inhabitants appeared. Once more and more people began to inhabit the area the destruction of the forest became more and more prominent. This type of living carried on for many centuries to come until the land was claimed by British rule in 1765. Once Britain took control deforestation was greatly increased. Britain saw this area an endless source of material and stripped the land of many of its resources, resulting a huge decrease of biodiversity in the area (BoI, 2009). Not until 1862 was the
deforestation looked upon and action took place. In 1875 the British government declared un-leased forest reserved, and placed this land in control of the Forest Department, which formed what is known today as the Sunderbans forest. In 1977 the Sunderbans was declared a Wildlife Sanctuary and some parts of it became a National Park in order to help preserve it (BoI, 2009). Since then, the efforts of conservation have been increasing every year in order to protect the area and preserve it in its current form.

**Location**

The Sunderbans is located in the south western part of Bangladesh. It is in the district of Greater Khulna. The Sunderbans spans the Hooghly and the Teuila River in west Bengal. It falls south of the Tropic of cancer between latitude 21degree 31' - 22 degree 40' North and longitude 88 degree 05' - 89 degree 06' (Bose 1)
To the south of the Sunderbans is the Bay of Bengal. Lastly, to the far west of the Sunderbans is India. On the opposite east side, the Sunderbans is bordered by the Baleswar River.

**Ecosystem**

The Sunderbans has a very interesting Ecosystem. Out of all the forests in the world, this is one of the largest mangrove forests. It has a very rich variety of flora and diverse fauna (Bose 1). The Sunderbans is a cluster of islands with an approximate area of 240 square miles or 3600 square kilometers (betelco 1). The world famous Royal Bengal Tiger is one of the many types of animals that prosper in the Sunderbans Forest. (Picture permission pending). Along with the Royal Bengal Tiger are spotted deer, crocodiles, jungle fowl, wild boar, lizards, rhesus monkey, and an innumerable amount of beautiful birds (betelco 1).

The Sunderbans ecosystem however, has been hit with a threat. Poaching is a big problem for the ecosystem. Also, out of control falling trees is a large problem. Tigers keep the forest protected because they keep the humans away and they keep the forest from being destroyed.

In the Sunderbans, there is also a lot of reptile and aquatic life. Some aquatic life would include the Olive Ridley sea turtle, and the hard shelled terrapin. In the forest,
a lot of reptile life exists. Some of these reptiles would include snakes, such as a python or a king cobra, and also many types of lizards (Bose 4). Lastly, there are a lot of crocodiles located in the Sunderbans. There are no roads in the Sunderbans so most of the travel occurs on the rivers; therefore it is very likely that a crocodile will be seen in there.

**Tourism**

Located in Western Bengal of this biosphere is Sunderbans National Park which consists of the National Park, Tiger Reserve, UNESCO World Heritage Site and a Biosphere Reserve. In this area, the world’s largest estuarine sanctuary which is called the Wildlife Sanctuary, is two thousand and eighty-five square kilometres. Outside the Wildlife Sanctuary there are a number of hotels, forest lodges, wildlife resorts, and jungle camps that can accommodate tourism (touristplacesinindia.com). Most of the transportation around the sanctuary is by boat. A tourist needs no permission first to explore outside the sanctuary. But, if one wants to visit the estuarine delta area they would need to obtain a permit (journeymart.com). Tour packages are available for tourists who would like to explore the wildlife sanctuary. With this package, one can see many different kinds of animals that call the sanctuary their home and even the royal Bengal tiger, if you get lucky. The tourism in this biosphere mainly consists of animal lovers, bird-watchers, and those who love to explore. In some parts, there are watch towers so one can watch as many different kinds of species roam and feed below them.
Geography

Our biosphere, Sunderbans, stretches over both India and Bangladesh. The part of this biosphere that lies in India is called Western Bengal. Along with eastern Bangladesh, Western Bengal makes up the linguistic region of Bengal. Sunderbans is made up of the two countries, India and Bangladesh, but it also stretches out to fifty-four islands. Sunderbans, as a whole, lies in the mouth of Ganges, one of the major rivers of India which empties into the Sunderbans delta. This delta is where the Ganges, Brahmaputra, and Meghna rivers all meet the Bay of Bengal (chillibreeze.com). There are two major parts of this oasis called Sunderbans are deep mangrove forests along with these rivers. These mangrove forests, which are numerous kinds of trees and plants that survive in very high salt concentrated water, make up over half of the world’s mangrove population (NWE, 2008). The Sunderbans forest range is divided into the east and the west. East Sunderbans is made up of the Sharonkhola and Chanpai forest ranges and under the West are the forest ranges of Satkhira and Khu Climate

Climate

The climate of this biosphere does not have a wide range. The temperature varies from around sixty degree to the mid nineties. Sunderbans receives rainfall almost all the months of the year also containing high humidity close to eighty percent due the location near the Bay of Bengal (Eofearth, 2009). From the high humidity, the air is almost always thick and moist. But there is a period in which Sunderbans experiences dry season. Also, there is a period where monsoons occur frequently, that ranging from June to September. Sunderbans also endures cyclones in specific times
during the year in which tidal waves can reach up to eight meters high (NWE, 2008). When there are high tides, there is a great chance of the Sunderbans Delta flooding. When it does flood, though, it provides a very solid climate condition for the plants in the surrounding areas. The most comfortable, in terms of weather, is between November to March.
Works Cited

123IndiaTravel. Web. <http://www.123indiatravel.com/images/wildlife-tours-of-india/sundarbans/sundarbans-maps.jpg>. This picture is of a map that goes along with what animals tourists can see in different areas of Sunderbans. PERMISSION PENDING.

"Birds of India: History of the Sundarbans." Birds of India: Birding and birdwatching in India, ornithology India, bird photography. Web. 04 Nov. 2009. <http://www.kolkatabirds.com/sunderhistory.htm>. This article talks about the history of how the Sunderbans was formed throughout the years into the form that it is in today. The article also talks about the various governments that had control of the Sunderbans and how it gained the status of a National Park.


Ellison, Aaron M., Barid B. Mukherjee, and Ansarul Karim. *Testing Patterns of Zonation in Mangroves: Scale Dependence and Environmental Correlates in the Sundarbans of Bangladesh.* 5th ed. Vol. 88. British Ecological Society. Print. This journal gave us descriptions of the patterns of species distribution in Sundarbans. It also explained the different types of plants that are located in this area. This source gave us a general view of what kind of environment is located here, both animal and plant life.


<http://www.touristplacesinindia.com/sunderbans/accommodation.html>. This source gave us information on what the facilities and tourist attractions are like when visiting Sunderbans. It showed that you can stay in a hotel, wildlife resorts, and jungle camps. Tourist Places in India mainly supplied us with information on the tourism aspect of our biosphere.

http://geotourism.changemakers.com/en-us/node/22523 (permission pending)

(Picture of the map was used in my paper)
http://sdinfiniti.wordpress.com/tag/sundarbans/ permission pending

(Picture from this website was used in my paper. The picture of the tiger)

Http://images.google.com/imgres?imgurl=http://westnakhalpara.com/Tours/khulna-district1.jpg&imgrefurl=http://westnakhalpara.com/khulna%2520%26%2520sylhet.html &usg=__OSS_HZeOli2CD7F5T9Ch-KjYgKQ=&h=600&w=800&sz=166&hl=en&start=1&tbnid=YWBOs_gLDmvYsM:&tb nh=107&tbnw=143&prev=/images%3Fq%3Dsundarbans,%2Bbangladesh%2Bwestnak halpara.com%26gbv%3D2%26hl%3Den%26client%3Dfirefox-a%26rls%3Dorg.mozilla:en-US:official. Web. <westnakhalpara.com>. This picture is that of a part of the mangrove forest that exists in Sunderbans. PERMISSION PENDING.

Indialine. Web. <http://www.indialine.com/travel/images/sunderbans-royal-bengal-tiger.jpg>. This site provided a picture of a Royal Bengal Tiger. When in Sunderbans a tourist my be lucky enough to see one of these vicious animals. PERMISSION PENDING.

The tidal waves that were hitting Sunderbans were beginning to become so high that many of the villages were becoming cut off from the outside world and stranded on the islands that were forming. The low lying areas were beginning to become surrounded by water. The destruction from the incoming waves was becoming greater and greater.


This document talks about a man’s trip to the Sunderbans Mangrove forest. He speaks about the daily routines that the 500,000 people who live there participate in. He also speaks about the vast wildlife such as tigers, crocs, poisonous snakes, etc. that inhabit the Sunderbans. The narrator speaks about the respect that the inhabitants of Sunderbans have for the wildlife and the environment in which they live.


This article talks about how the inhabitants of Sunderbans are constantly on the lookout for the tigers that roam the area. The article talks about how tiger’s usually only hunt
humans if they are provoked or feel like their cubs are in danger, however, in Sunderbans, humans are a normal prey for the tigers just like any other animal.

National Institute of Technology, Durgapur, India. Web.

<http://www.nitdgp.ac.in/Wb2/westbengal_files/map%20of%20wb.gif>. This picture shows all the districts of Western Bengal. PERMISSION PENDING.

"Picture." Web. 10 Oct. 2009. This is a picture of the mangroves in Sunderbans, Bangladesh. The picture is used to help portray the climate category of our biosphere. PERMISSION PENDING.


<http://www.betelco.com/bd/sundar/sundar.html#life>. This site goes into detail on many different aspects of Sundarbans such as Life Inside the Forest, Forest Area, Boundries and Climate, and just general information about the wildlife there. It explains what types of animals live in this forest in Bangledesh. It explains how this certain area is that of a moderate climate.

The encyclopedia of Earth gave very good information containing many aspects of our biosphere. Just a few of those include geography and climate. Just an example, it specified what temperatures are reached in Sunderbans throughout the year.


This article focuses on primarily the two most sought out creatures that reside in the Sunderbans forest; the Crocodile and the Tiger. For most visitors to the forest, these are the main creatures that they wish to see. This article describes some of the species scene in the throughout their travels of the mangrove forest.