



World EcoTouch



By

John Bolla

Brandon Manzanares

Raphael Quejado

Carl Ronquillo

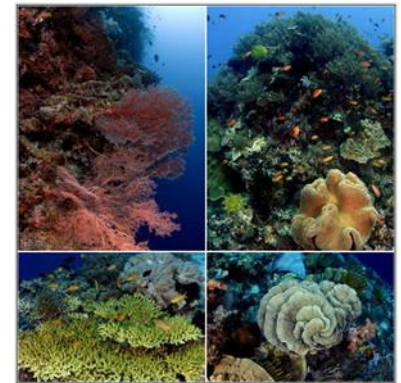
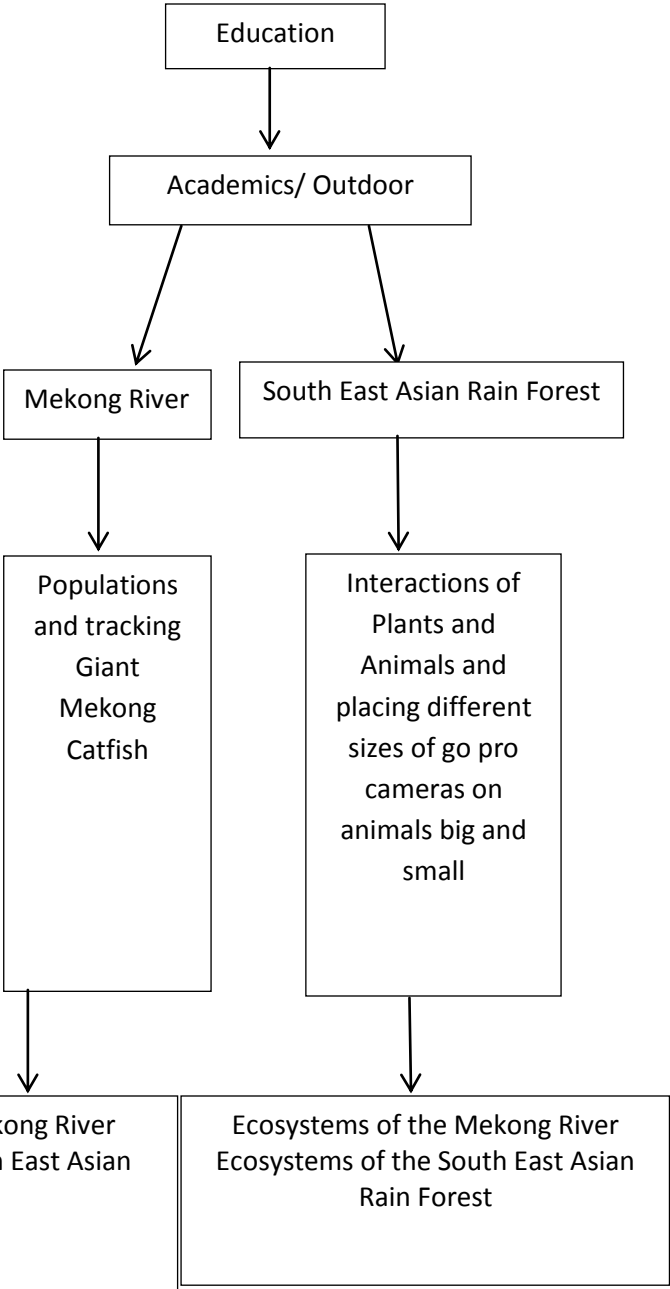
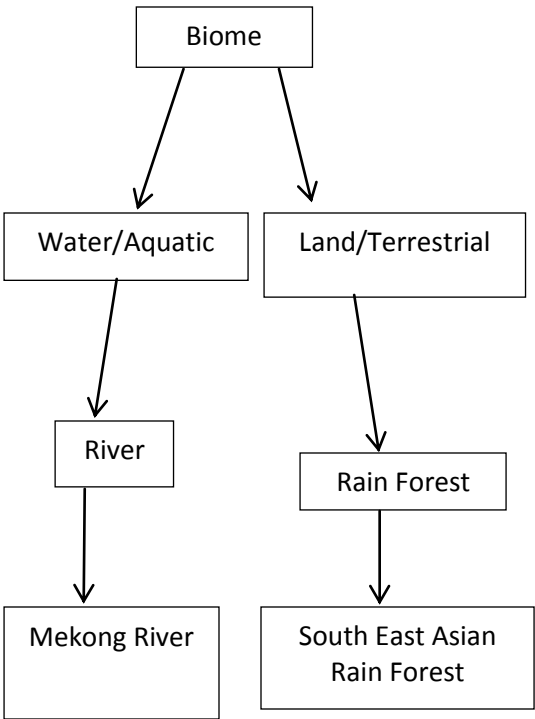


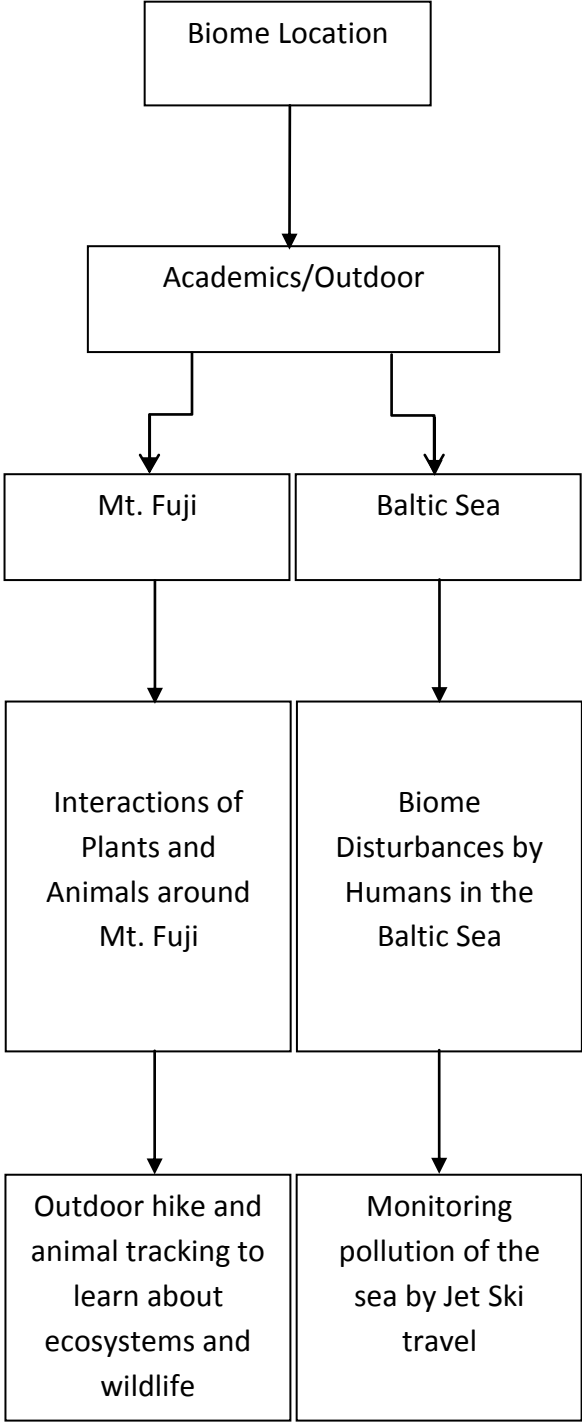
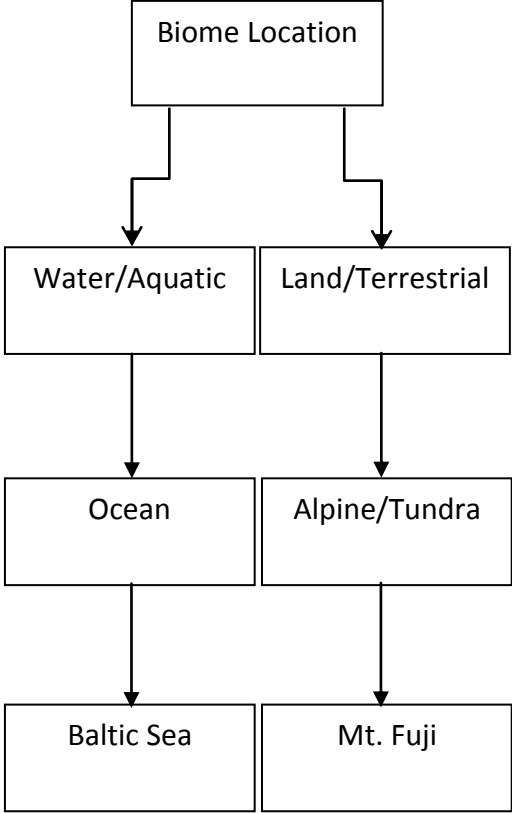
Table of Contents

1. Cover Page
2. Table of Contents
3. John Bolla's Flowchart
4. Brandon Manzanares's Flowchart
5. Raphael Quejado's Flowchart
6. Carl Ronquillo's Flowchart
- 7-8. John Bolla's lesson 1 Interaction of Plants and Animals in the Southeast Asian Rain Forest
- 9-10. Brandon Manzanares's lesson 1 Interaction of Plants and Animals in Mt. Fuji
- 11-12. Raphael Quejado's Lesson 1 Climate Change on Miyake Island
- 13-14. Carl Ronquillo's lesson 1 Climate Change in the African Savana
- 15-16. John Bolla's lesson 2 Population of Mekong Giant Catfish
- 17-18. Carl Ronquillo's lesson 2 Population of New Caledonia Barrier Reef
- 19-20. Brandon Manzanares's lesson 2 Biome Disturbances in the Baltic Sea
- 21-22. Raphael Quejado's lesson 2 Biome Disturbances in the Philippine Coral Reef
23. John Bolla's 15 plants and animals of the Mekong River and Southeast Asian Rain Forest
24. Brandon Manzanares's 15 plants and animals of Mt. Fuji and the Baltic Sea
25. Raphael Quejado's 15 plants and animals of Miyake Island and Philippine Coral Reef
26. Carl Ronquillo's 15 plants and animals of the African Savana and the New Caledonia Barrier Reef
- 27-28. John Bolla's Food webs of the Mekong River and Southeast Asian Rain Forest
- 29-30. Brandon Manzanares's Food webs of Mt. Fuji and the Baltic Sea
- 31-32. Raphael Quejado's Food webs of Miyake Island and the Philippine Coral Reef
- 33-34. Carl Ronquillo's Food webs of the African Savana and the New Caledonia Barrier Reef
- 35-37. John Bolla's Seasonal Variation + Temperature Charts of the Mekong River and the Southeast Asian Rain Forest
- 38-39. Brandon Manzanares's Seasonal Variation + Temperature Charts of Mt. Fuji and the Baltic Sea
- 40-41. Raphael Quejado's Seasonal Variation + Temperature Charts of Miyake Island and Philippine Coral Reef
- 42-43. Carl Ronquillo's Seasonal Variation + Temperature Charts of the African Savana and the New Caledonia Barrier Reef
- 44-48. Glossary
- 49-54. Reference Pages

World Ecotouch



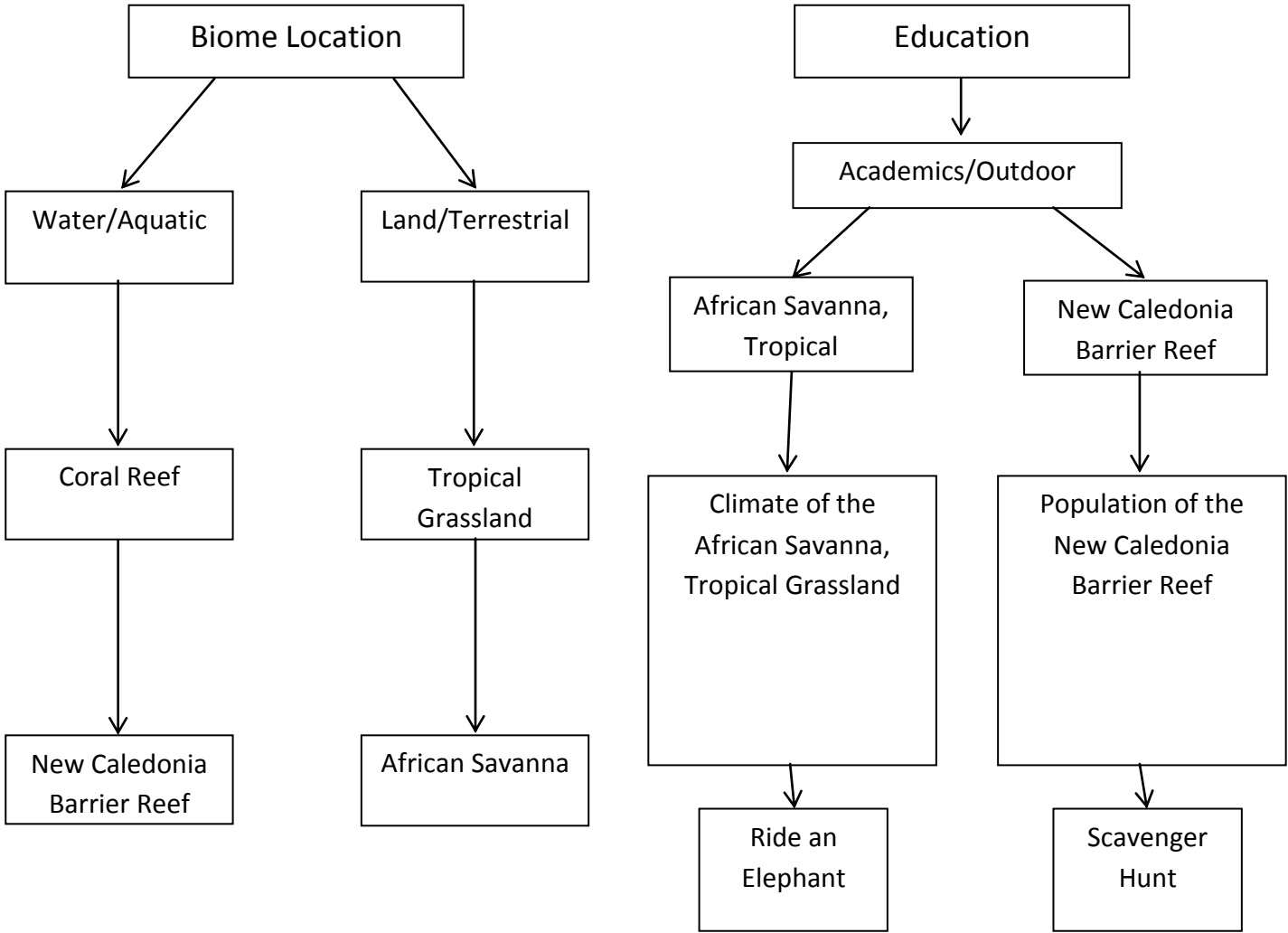
World EcoTouch



WORLD ECOTOUCH



World Eco Touch



John Bolla's Lesson 1

South East Asian Rainforest



Title: Gopro Camera Southeast Asian Rainforest Project

Opening: We shall trek through the forest with bush crafting blades such as machetes, axes, knives. There is quite an amount of biomass to cut through. The climate shall be expected to be full of rain of course. Though we will cut through vegetation we shall try to practice balanced conservation of the environment. We shall focus on ecology and the ecosystem of the forest. Interaction of plants and animals shall be our studies. Our research shall be done by placing different sizes of gopro cameras on different animals so as to study the interactions. We shall take advantage of the biodiversity of the forest putting cameras on animals ranging from tigers to dragonflies. Through the cameras we will see how the food webs and how the food chains go in action. This project may even bring about the discovery of the locations of endangered species!

Objective: Students will study the ecology of the Southeast Asian Rainforest by studying the food web in action through the gopro cameras.

Materials: survival gear (serious outdoor survival kits, knives, axes, etc.), survival and bush crafting blades (knives, axes, saws, machetes, etc.), food, water, rain gear (clothes), suitable clothes, tents, gopro cameras, waterproof laptops, tranquilizers, guns (just in case we have to deal with an angry lethal animal)

Background Skills: Students ought to have attended outdoor survival courses, bush crafting courses, or courses like those. They must be experienced with using blades for bushcrafting for this is a rainforest expedition. They must be able to run at least a 7 minute mile for this mission will take a lot of stamina.

Procedure/Instructions:

1. Students will be tested on their survival and outdoor knowledge
2. Students will study what the rain forest is like so as to know what to expect
3. Students will then fly to the Southeast
4. We shall trek through dense vegetation going from one point of the forest to the other
5. Along the way we shall place the go pro cameras on the different animals, tranquilizers may occasionally be employed
6. We shall reach the point of destination and track the interactions of plants and animals there with our computers
7. Students will fly back home and write a paper of what they have learned on their rainforest expedition

Classroom Management: Students shall be guided and supervised by outdoor field guides and teachers. They will conduct themselves in a good civilized manner and shall be industrious. Anger outbursts shall not be tolerated, if a student displays that they shall be sent home and no refunds shall be given.

Assessment: Students shall write up reports along the way of the expedition concerning the ecology of the Southeast Asian Rainforest. They will also write about the pros and cons of using the gopro cameras on expeditions like these. A big portion of their grades shall be based on the quality of their reports.

Homework: Students shall hand draw a food web for the Southeast Asian Rainforest.

Closure: Students shall give good powerpoint presentations to the school.

Brandon Manzanares's Lesson 1

Mt. Fuji



Title: Ecosystem of Mt. Fuji, Japan

Opening: Mount Fuji is the tallest mountain in Japan located in the temperance zone. It is an active volcano and the single most popular tourist site in Japan. More than 200,000 people climb to the summit every year, and now we are going to as well. Students are going to go to Japan and observe the interactions of plants and animals or ecology in the area of Mt. Fuji. From deciduous trees to narcissus flycatchers, students will collect data on species diversity and the number of herbivores, carnivores, and omnivores in the biome.

Objectives: Students will learn about the ecosystems of Mt. Fuji and the area around it and how humans affect it as well as weather conditions in the area.

Materials: notebook, pen or pencil, map of Shizuoka and Yamanashi Prefecture of Japan, binoculars, food, water, clothes.

Background Skills: Student will prepared to hike for long hours.

Procedure/instructions:

1. The class will arrive in Haneda Airport, Japan and will then take a bus ride to Fujiyoshida, Yamanashi Prefecture, Japan.
2. Once there we will check into our hotel and head out to Mt. Fuji by bus through the Mt Fuji toll road.
3. For two weeks students will hike down Mt Fuji observing animals and plants taking data on their lifestyle.
4. At the end of the second week the class will move to Fujinomiya, Shizuoka Prefecture, Japan where they will continue their research of wildlife on the other side of Mt. Fuji for another two weeks.
5. At the end of the month the class shall return from Japan and will write a reflection on their experience and prepare for an in-class presentation.

Classroom Management: The students will be supervised and are required to follow all instructions and stay with the group. They are to stay away from all animals as possible and observed them from afar. When leaving an area be sure to keep it clean.

Assessment: Student will be questioned while presenting.

Homework: Student will have to prepare to give a presentation on what they learned on the trip.

Closure: Students will present their findings to the class.

Raphael Quejado's Lesson 1

Miyake Island



Title: Atmospheric Measurements on Miyake Island

Opening: During the summer, Students will travel to Miyake Island in Japan via a hydrogen fuel cell airplane. Miyake Island is situated in the temperate zone and was formed from the volcano Mount Oyama. Miyake Island also contains many coniferous trees. The active volcano results in deforestation and later population by pioneer species. It is also a protected bird sanctuary and is home to many endangered species of birds. Students will take atmospheric readings above Miyake Island by utilizing the instruments onboard the airplane. Afterwards students will parachute towards the base of the Island's volcano, Mount Oyama. We will then set up one campsite near the volcano and another in a nearby town. From these research sites, students will continue to monitor the atmospheric data of Miyake Island for a month. During this time, students will analyze the effects of the volcano on the climate of Miyake Island.

Objective: Students will compare the effects of natural pollutants from Mount Oyama and the effects of human produced pollutants on the atmosphere of Miyake Island, and determine which of the following potentially contributes the most to Global Warming and Climate Change.

Materials: sun photometer, money, ozone pillows, ozone meter, weather station, thermometer, cloud chart, clipboard, pen, data sheets, tents, food, water, and clothing

Background Skills: Students will be trained on the operation of the instruments for atmospheric measurements. Also, Students are to be instructed on parachuting. They will also be instructed on evacuation procedures should the volcano erupt. Students must follow all instructions and be able to synthesize the atmospheric data into graphs.

Procedure/Instructions:

1. Students will demonstrate their understanding of the instruments during a field test. Students will also receive 1-2 weeks of parachute training prior to the trip.
2. Students will set up a campsite to do their research.
3. One group of students will analyze the atmospheric data on Miyake Island from the volcano.
4. Another group will take readings in the nearby towns.
5. After the one month period, students will combine their data to determine which source of Greenhouse Gases, the towns or the volcano, affects the climate of Miyake Island and the world most. They will do this by producing a data table and a graph from their readings.

Classroom Management: Students will be supervised during their field work. Students will be expected to stay on task and to be as accurate as possible with their readings. Serious and constant misbehavior will result in the omission of the trip from the student's college application. Students will also be expected to leave the biome and the towns un-disturbed.

Assessment: Students will be asked questions as they perform their tasks. They will also be asked to draw comparisons between the data from the volcano and the nearby town.

Homework: Students will write a half page reflection on their experiences.

Closure: Students will present their findings to the school during the next school year.

Carl Ronquillo's Lesson 1

African Savanna Grassland



Title: Climate of the African Savanna

Opening: The African Savanna grassland consists of many different countries with different climates depending on which hemisphere it is on. The consumption of fossil fuels by humans has been increasing the carbon dioxide in the atmosphere. This increase has shifted the vegetation of plants, giving less nutrients to the plants and animals. Herbivores have also been grazing on the grass, turning the savannas into deserts. It is important to know the climate of these biomes, as it indicates the health of the plants and animals that live in them. We will divide the students into groups. Each group will be assigned a country to do their research on. They will start off by riding an elephant to their assigned country. Once they arrive, they will measure the climate.

Objectives: Students will measure Africa's climate. They will also do observations on Africa's skies and its surroundings.

Materials: Elephant, sun photometer, cloud chart, rain gage, map, food, water, clipboard, paper, and pencil.

Background Skills: Students will be taught to ride the elephant. They also need to know how to use the equipment that we will be using to measure Africa's climate.

Procedure/Instructions:

1. Get into your groups.
2. Get on an elephant.
3. Travel to your assigned destination.
4. Measure temperature.
5. Make observations of the cloud cover.
6. Measure precipitation.

Classroom Management: Students must respect the animals and the rules of the locals. Do not leave trash on the ground. They must pick up after themselves.

Assessment: Students will be asked what influences the climate and how to keep it steady.

Homework: Each group will keep data on the climate of the African savanna. Then they will compare the information they gathered from their country.

Closure: By keeping a record of the climate, we will be able to indicate the health of the environment. We can then use the information we gathered to create a plan for a healthier environment in the future.

John Bolla's Lesson 2

Mekong River



Title: Giant Mekong Catfish Tracking

Opening: Students shall build a base camp along the river. They shall study the population of the Giant Mekong Catfish. Studies will be conducted concerning their population density as well. We shall study their possible routes of immigration and emigration. Electronic tracking devices shall be employed as well as fishing techniques.

Objectives: Students shall learn how to track down big fish like the Giant Mekong Catfish. They will also learn the art of how to properly track big species without causing them significant pain.

Materials: good and complete outdoor survival kits, survival blades (machetes, axes, knives, etc.), tents, waterproof laptops, aquatic tracking equipment, food, water, clothing suited for Mekong River locations, motor boats, row boats, heavy duty fishing gear, aquatic sonic fish tracking gear (used on the boats)

Background Skills: Students should be experienced in the outdoors (meaning they've gone camping before, or hiking, or another lengthy outdoor activity). They should also know how to operate a computer well.

Procedure/Instructions:

1. Base camp shall be set
2. Students shall start scouting for the Mekong Giant Catfish
3. On the boat students shall use the aquatic sonic fish tracking equipment
4. Students will fish for the Giant Mekong Catfish
5. If a Mekong giant is caught it shall be tagged with aquatic tracking equipment with the goal of giving the fish as less stress as possible when tagging
6. Of course the Mekong Giants shall be released and will be tracked by waterproof computers
7. Students shall try to tag as much Mekong Giants as they can with their given time period
8. After their time period has ended students shall fly home and write a report concerning their experiences trying to track the Mekong Giant Catfish

Classroom Management: Students shall treat all life forms in a humane manner. The Mekong Giants shall be treated with great respect and care. Students must understand that the stress that the fish receives from being tagged by them should be kept to a minimum. If the students treat any life forms inhumanely they shall be sent home, no refund.

Assessment: As the students are at the Mekong River they shall keep a journal on their successes and challenges about the Mekong River Project assigned to them. The journal shall be written on a daily basis. They shall be graded on the quality of their reports from the journal.

Homework: Students shall write a 2 - 5 page report on the rewards and challenges of trying to track the Mekong Giant Catfish.

Closure: The students shall tell the school about their experience in the Mekong River.

Carl Ronquillo's Lesson 2

New Caledonia Barrier Reef



Title: Population of New Caledonia Barrier Reef

Opening: New Caledonia's coral reef has an enormous species diversity, but many of its species are yet to be named because new species are being discovered. For our journey, we will ride a boat to New Caledonia's coral reef to scuba dive and do a scavenger hunt on the dugong. Dugongs are known to have a large population in New Caledonia, but there is no knowledge of the dugong's exact population and its behaviors. We will be spread throughout the coral reef, covering a wide range of water and listing down the number of dugongs that we see.

Objectives: Students will determine a species population. They will also determine its location and the possible reasons for its choice of habitation.

Materials: Boat, scuba diving gear, sun screen, clipboard, paper, pencil

Background Skills: Students must know how to swim. They will learn how to determine a species population.

Procedure/Instructions:

1. Ride a boat to the coral reef.
2. Put scuba gear on and dive in.
3. Spread throughout the coral reef.
4. List down the dugongs you see.

Classroom Management: Respect the animals in the coral reef. Do not leave any trash behind and keep the water clean. They will be informed about what species to avoid and the emergency procedures if someone gets injured.

Assessment: Students will be asked why it is important to keep information about a species population and what it can indicate about their behaviors.

Homework: Students need to keep track of the dugongs they see and compare it to other student's data.

Closure: Based on the information of a species population, we can take early actions to help keep them from extinction and avoid damaging their waters in the future.

Brandon Manzanares's Lesson 2

Baltic Sea



Title: Biome pollution of the Baltic Sea

Opening: They will travel to Aland Islands which is located in the center of the baltic sea. This sea has a large biodiversity of organisms. There they will observe the area for signs of human disturbance of the ecosystem of the baltic sea. The algal bloom in the sea is important for some organisms that live in the biome. Many of the islands are connected by a bridge so traveling from island to island will not be an issue.

Objectives: Students will learn about the ecosystem of the baltic sea and how humans affect the biomes.

Materials: notebook, pen or pencil, map of baltic sea region, binoculars, food and water.

Background Skills: Jet Ski operation

Procedure/instructions:

1. The class will arrive in Mariehamn Airport, Åland.
2. Once there we will check into our hotel and head out to the coast of the islands.
3. For one week students will collect data on the coasts of the island for any signs of disturbance in the biome of the Baltic Sea.
4. Then for another week students will travel out to the sea on Jet Skis to look for any disturbance in the sea.
5. At the end of the second week the class will move to Gotland, where they will continue their research of the biome for another two weeks.
6. At the end of the month the students shall return from the Baltic Sea and will present their findings on biome disturbances to the class.

Classroom Management: The students will be supervised and are required to follow all instructions and stay with the group. They are to stay away from all animals as possible and observe them from afar. When leaving an area be sure to keep it clean.

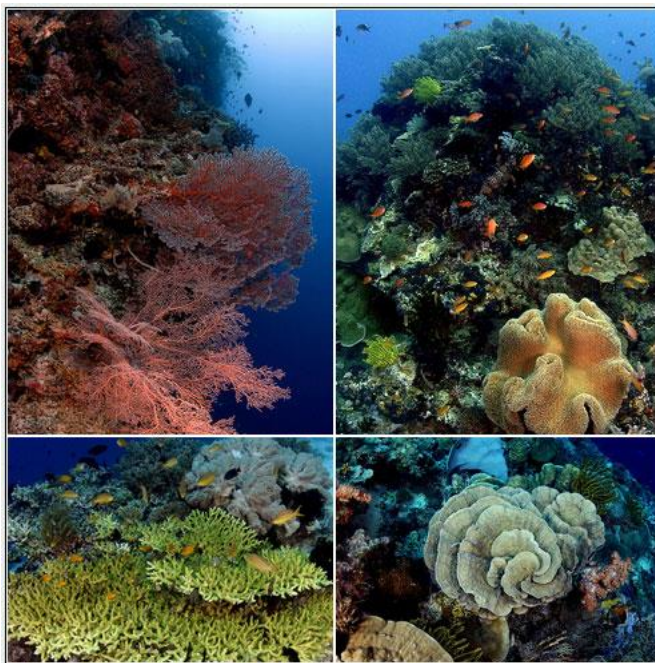
Assessment: Student will be questioned while presenting their information.

Homework: Student will have to prepare to give a presentation on what they learned on the trip.

Closure: Students will share ideas on how to preserve.

Raphael Quejado's Lesson 2

Philippine Coral Reef



Title: Biome Disturbances by Humans on the Philippine Coral Reefs

Opening: Students will establish a base camp at one of the coastal towns in Visayas. They will then board several carbon-fiber amphibious cars, in order to travel to one of the myriad of coral reefs in the Philippine Coral Reef. From the vehicle, they will closely monitor the effects of Humans on the coral reefs, such as cyanide fishing, which results in biological magnification. They will do so during a one month period without disturbing the biome, or interfering with the human activity around the reef.

Objectives: Students will observe and record the effects humans on the coral reef, without interfering with the humans or the communities within the ecosystem.

Materials: amphibious vehicles, money, pens, pencils, paper, clipboard, camera, food, clothing, and water

Background skills: Students must be trained on aquatic survival techniques. They must also be proficient in swimming. Students must also be able to accurately record observations and follow all instructions.

Procedure/Instructions:

1. Students will be tested on their knowledge of aquatic survival techniques prior to the trip.
2. Students will be positioned at an optimal vantage point to conduct their observations.
3. Students will then observe the populations, keystone species, and ecology of the coral reef.
4. Students will also observe how humans affect the above through actions such as aquaculture, artificial selection, and destructive forms of fishing.
5. Students will then share their findings to the local fishing and resort companies.

Classroom Management: Horseplay will be prohibited onboard the vehicles and during observations. Students who do not follow instructions will be asked to stay at the base camp.

Assessment: Students will be asked to name the organisms they have observed at random times during their observations.

Homework: Students will type a 300+ word report on their observations and submit the report to the teacher.

Closure: Students will present their findings to the local fisheries, resort businesses, and the school.

Mekong River & Mekong Basin

Animals

1. Great Snakehead
2. Giant Mottled Eel
3. Common Carp
4. Pangas Catfish
5. Isok Barb
6. Chinese seerfish
7. Wallago
8. Irrawaddy Dolphin
9. Siamese Crocodile
10. Mekong Giant Catfish
11. Giant Ibis
12. White-Shouldered Ibis
13. Sarus Crane
14. White-Winged Wood Duck
15. River Terrapin

Plants

1. Mekong River Palm (Note: this plant grows around the Mekong River)
2. Algae

Southeast Asian Rainforest

Animals

1. Assassin Bug
2. Bengal Tiger
3. Bufo Marinus
4. Caecilians
5. Chameleon
6. Chubby Frog
7. Crocodile
8. Crocodile Monitor
9. Douc Langur
10. Dragonfly
11. Dung Beetle
12. Earthworm
13. Flying Squirrel
14. Fruit Bat
15. Gibbons

Plants

1. Bengal Bamboo
2. Kapok Tree
3. Mangrove Forests
4. Durian
5. Jambu
6. Tualang
7. Rafflesia
8. Strangler Figs

Baltic Sea

Animals:

- Grey Seals
- Ringed Seals
- Harbor Seals
- Harbor Porpoise
- Zooplankton
- Baltic Herring
- Baltic Sprat
- Cod
- Flounder
- Sand Goby
- Sand Eels
- Shorthorn Sculpin
- Longspined Bullhead
- Fourhorn Sculpin
- Viviparous Blenny

Plants:

- Cryptophyceae
- Dinoflagellates
- Diatoms
- Euglenids
- Prasinophytes
- Blue-green algae
- Haptophyte algae
- Golden algae
- Silicoflagellate algae
- Green algae
- Brown Algae
- Green Algae
- Red Algae
- Charophytes
- Sphacelaria Arctica

Alpine Tundra Mt. Fuji, Japan

Animals:

- Japanese serow
- Eurasian bullfinch
- Spotted nutcracker
- Japanese deer
- Chestnut tiger
- Red-flanked bluetail
- Raichou (Rock Ptarmigan)
- Japanese foxes
- Asiatic black bears
- Blue and white flycatcher
- Japanese paradise flycatcher
- Eastern crowned warbler
- Ural owl
- Narcissus flycatcher
- Arctic warbler

Plants:

- Arabis serrata
- Cirsium purpuratum
- Japanese azalea
- Astragalus adsurgens
- Cowberry
- Beech
- Maple
- Bamboo grasses
- Japanese cedar
- Hinoki cypress
- Nikko fir
- Gold birch
- Japanese larch
- Moss
- Mizuna

Miyake Island Animal List:

- Izu Thrush
- Pleskes Grasshopper-warbler
- Izu Leaf-warbler
- Japanese Murrelet
- Japanese Wood-pigeon
- Oriental Turtle-dove
- Brown Hawk-owl
- Bull-headed Shrike
- Japanese Bush-warbler
- Streaked Shearwater
- Japanese Robin
- Pacific Golden Plover
- Northern Pika
- Japanese Dormouse
- Bat

Plant List:

- Japanese Chinquapin tree
- shima-hotaru-bukuro
- Bracted Hydrangea
- Japanese knotweed
- Japanese Evergold
- Broad leaved yasha fushi
- Japanese spiketails
- Japanese Formosan snowbell
- Japanese Evergreen
- Japanese Persea
- Japanese Cedar
- Lichen
- Cherry Blossoms
- Japanese Hydrangea
- Japanese Chrysanthemum

Philippine Coral Reef Animal List:

- Foxface Rabbit Fish
- Palette Tang
- Blue-spine unicorn fish
- Staghorn Coral
- Plate Coral
- Moon Coral
- Brain Coral
- Leather Coral
- Dolphin
- Whale Shark
- Leatherback sea turtle
- Sea anemone
- Flase clown anemone fish
- Manta Ray
- Moon Jellyfish
- Shrimp

Plant List:

- Philippine Mangrove
- Seagrass
- Sea Sponge
- Phytoplankton
- Zooxanthellae
- Green Algae
- Red Algae
- Seaweed

African Savanna

Animals:

- Lions
- Cheetahs
- Leopard
- African Wild Cat
- Serval
- Elephant
- Giraffe
- Hippopotamus
- Impala
- Hyena
- Rhinoceros
- Zebra
- Ostrich
- Anteater
- Wildbeast

Plants:

- Baobab
- Mopane
- Acacia Tree
- Elephant Grass
- Candelabra Tree
- Jackalberry Tree
- Umbrella Thorn Acacia
- Whistling Thorn
- Bermuda Grass
- Manketti Tree
- River Bushwillo
- Heather Plant
- Jarrah Tree
- African Teak
- Okra

New Caledonia Barrier Reef

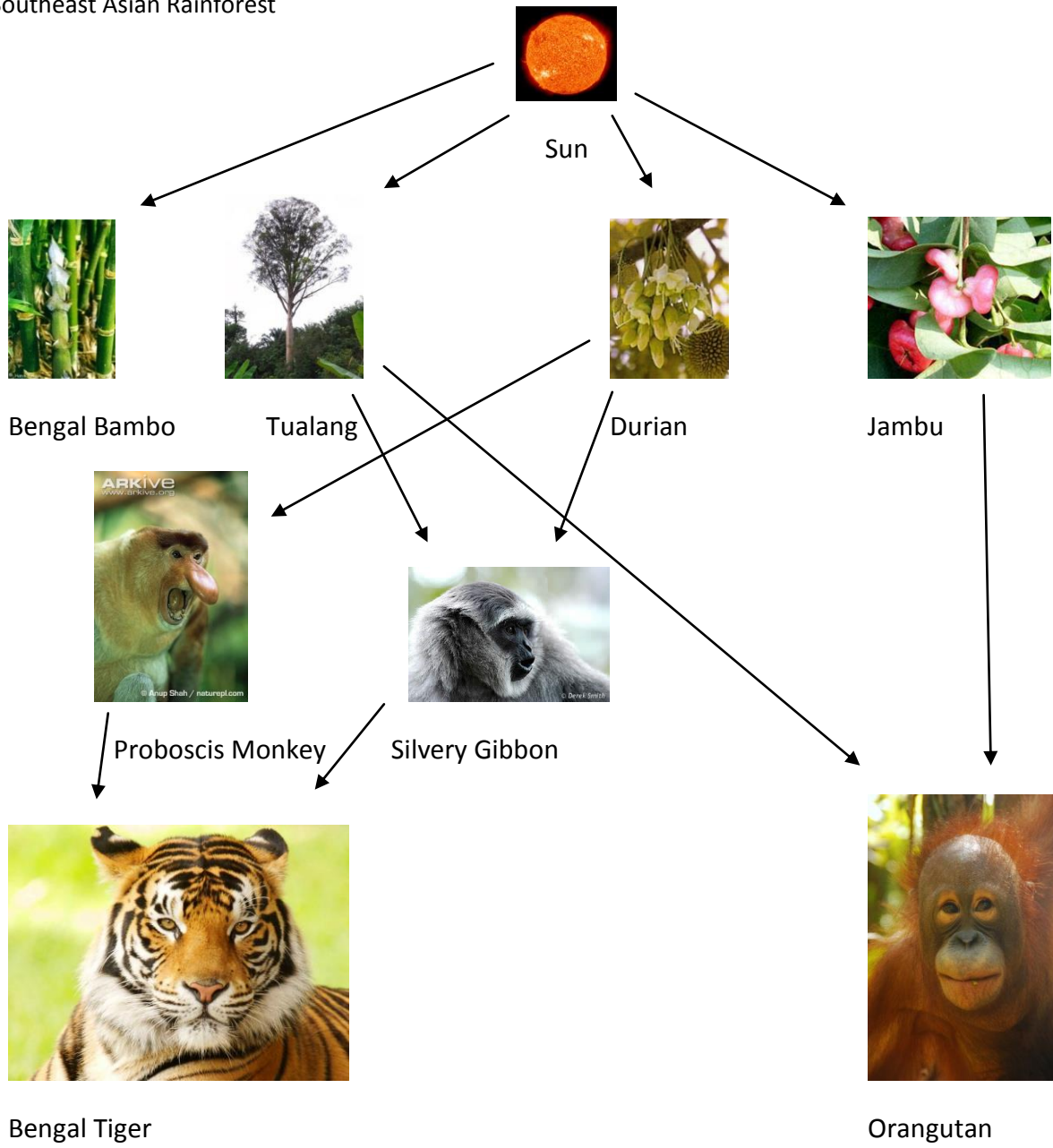
Animals:

- Luzonichthys Williamsi
- Baleen Whales
- Sponges
- Mollusks
- Crustaceans
- Crown of Thorns
- Green Turtles
- Hawksbill Turtle
- Loggerhead Turtle
- Leatherback Turtle
- Sea Bass
- Amphipod
- Palaemonine Shrimp
- Giant Clams
- Crabs

Plants:

- Sea Grass
- Algae
- Cladophora Mamillata Leliaert
- Gymnophlaea Gracilis
- Red Octocoral

Southeast Asian Rainforest



Mekong River



Sun



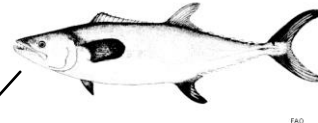
Algae



Isok Barb



Mekong Giant Catfish



Chinese Seerfish



Giant Mottled Eel



Wallago

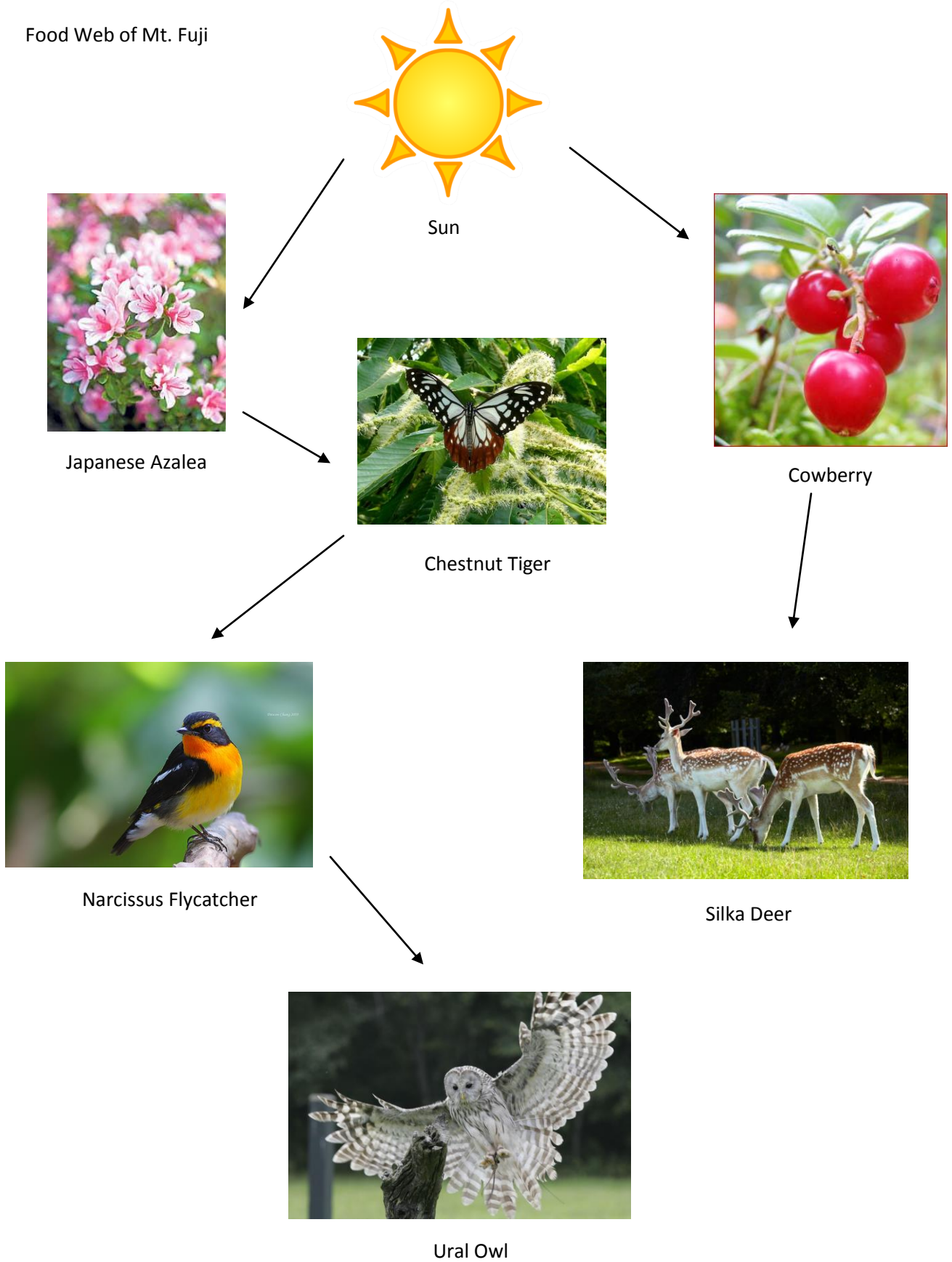


Great Snakehead

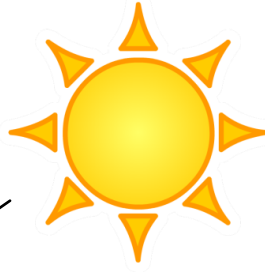


Siamese Crocodile

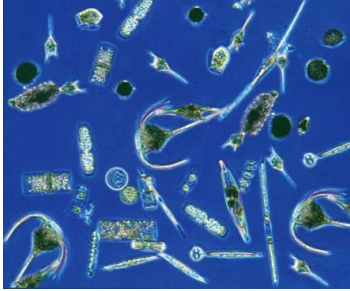
Food Web of Mt. Fuji



Food Web of the Baltic Sea



Sun



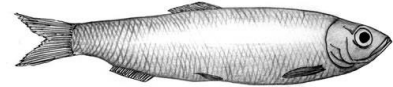
Phytoplankton



Zooplankton



Baltic Herring



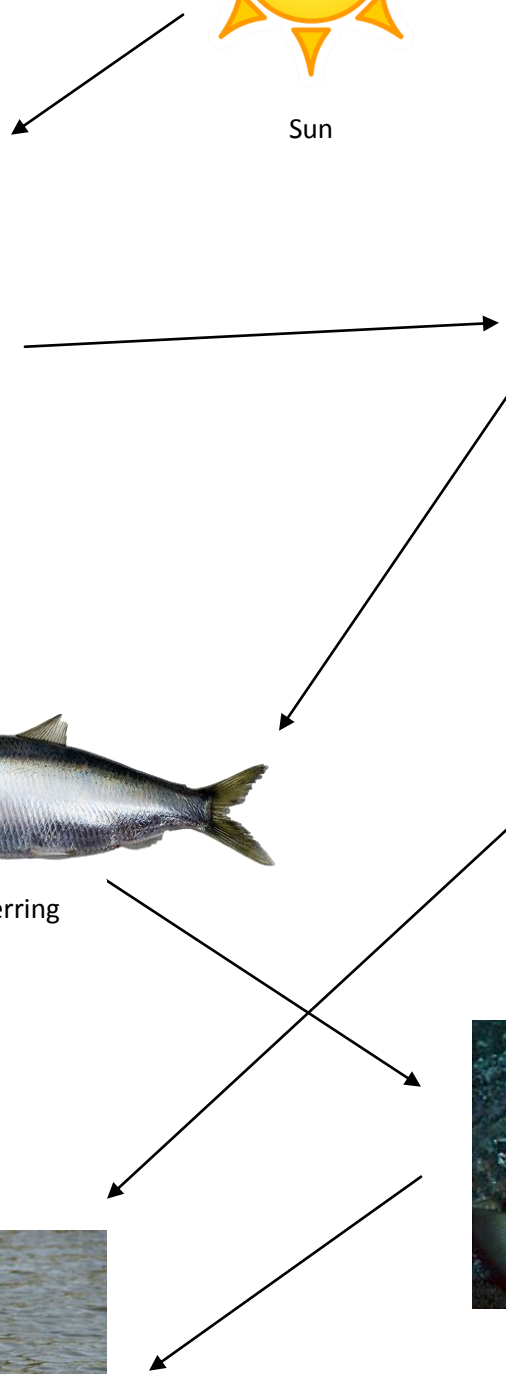
Sprat



Baltic Seal

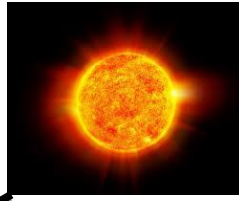


Baltic Cod

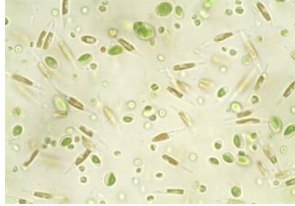


Philippine Coral Reef Food Web

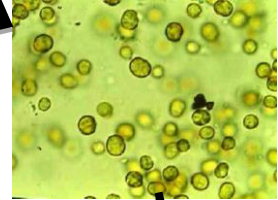
Sun



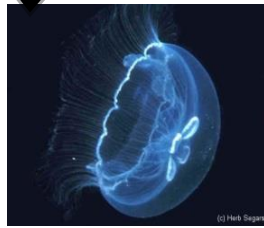
Phytoplankton



Dinoflagellate algae



Brain Coral



Moon Jellyfish



Whale Shark



Reef Clam



Leatherback Sea Turtle



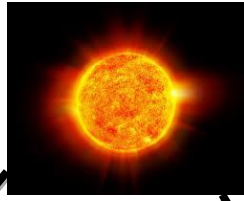
Octopus



Dolphin

Miyake Island Food Web

Sun



Japanese Hydrangea



Japanese knotweed



Japanese Formosan snowbell



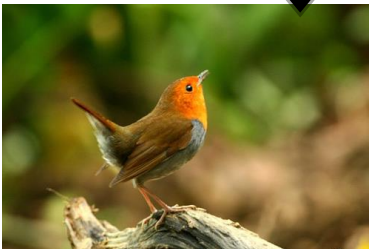
Japanese Beetle



Japanese Silkmoth Caterpillar



Japanese Robin

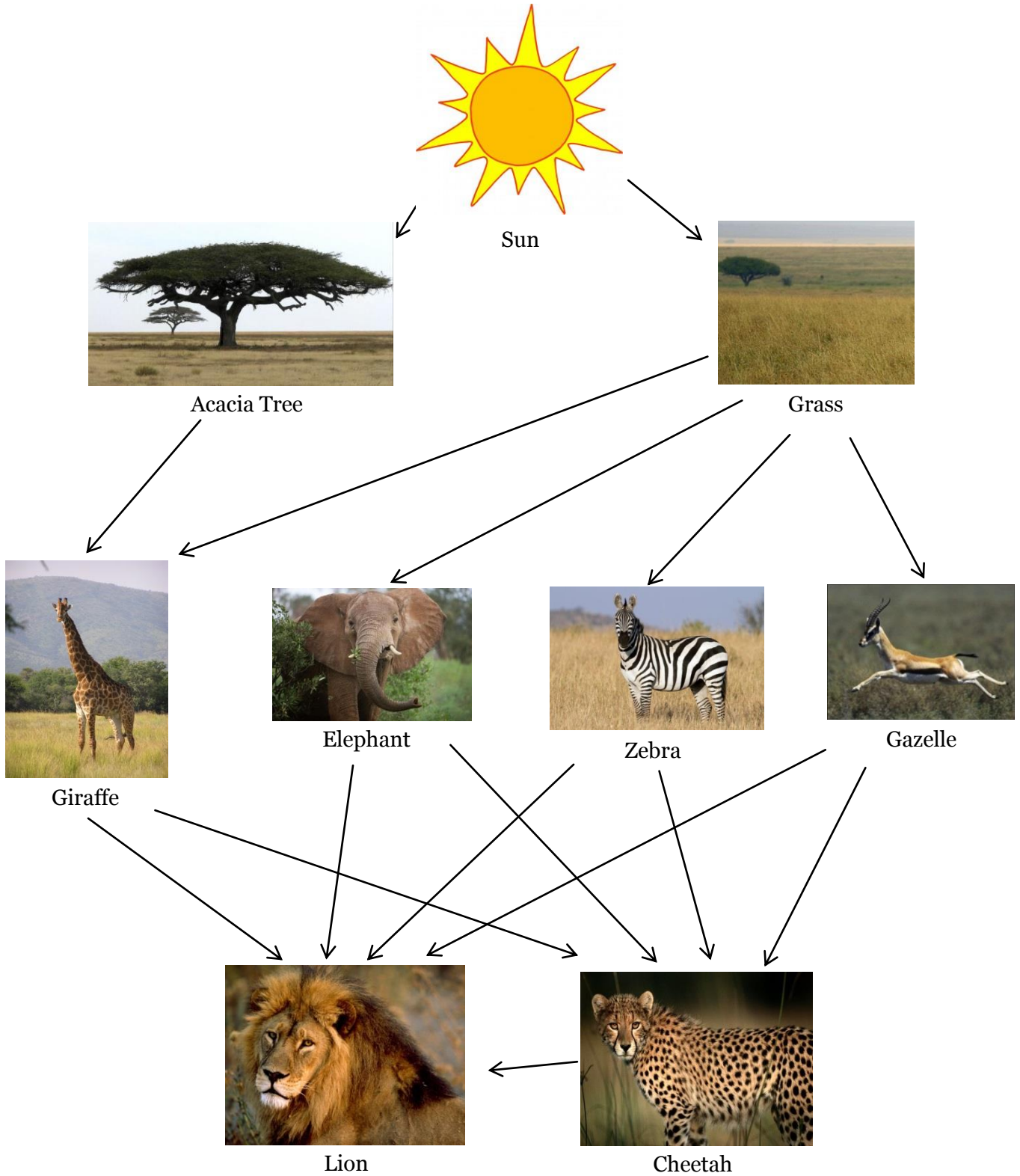


Izu Thrush



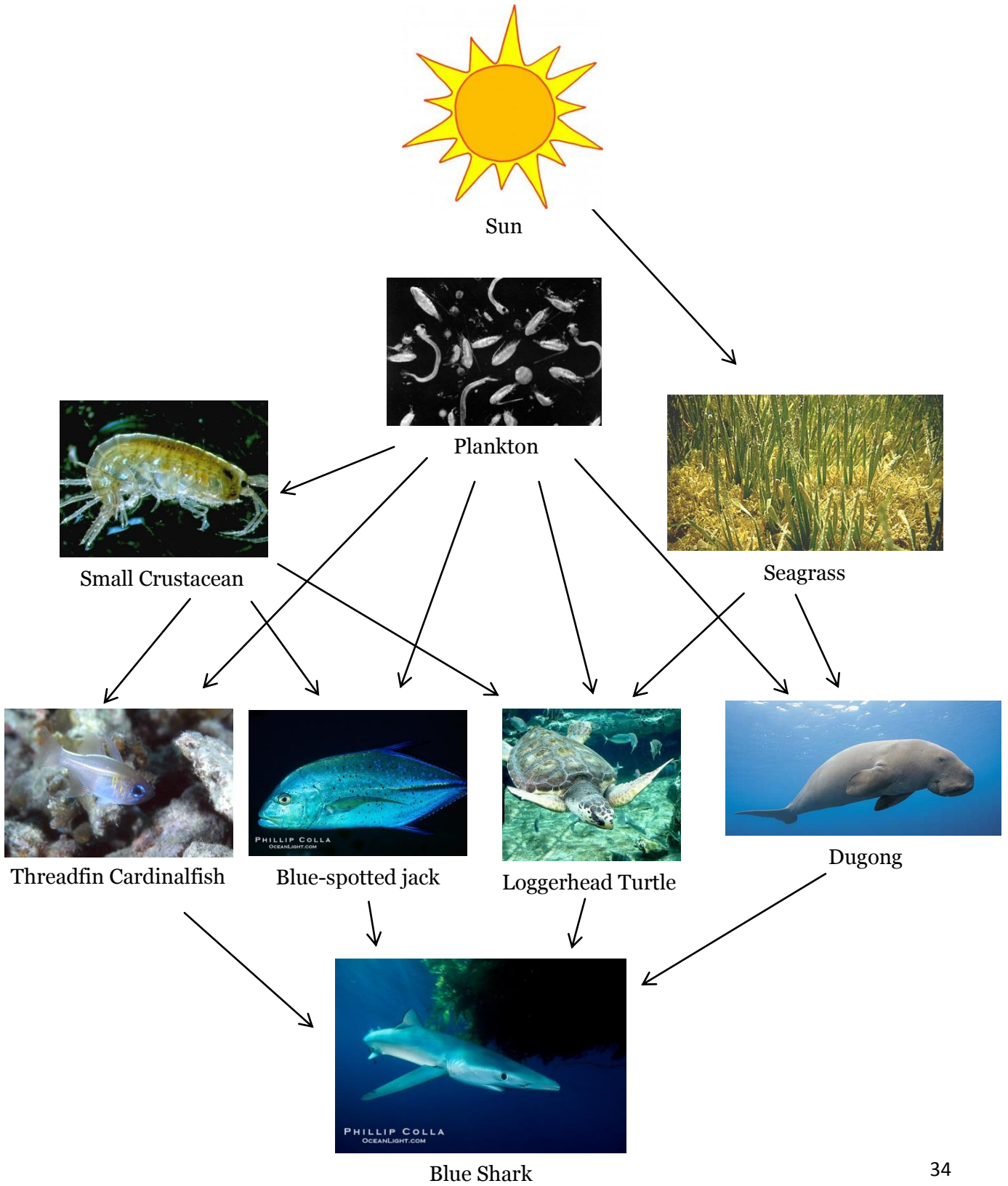
African Savanna

Food Web



New Caledonia Barrier Reef

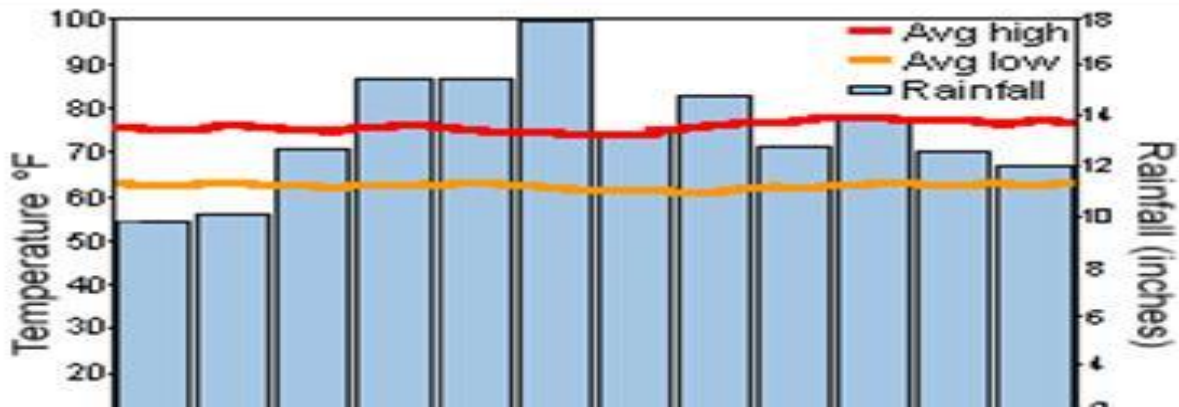
Food Web



Seasonal Variations

Southeast Asian Rainforest Seasonal Variation

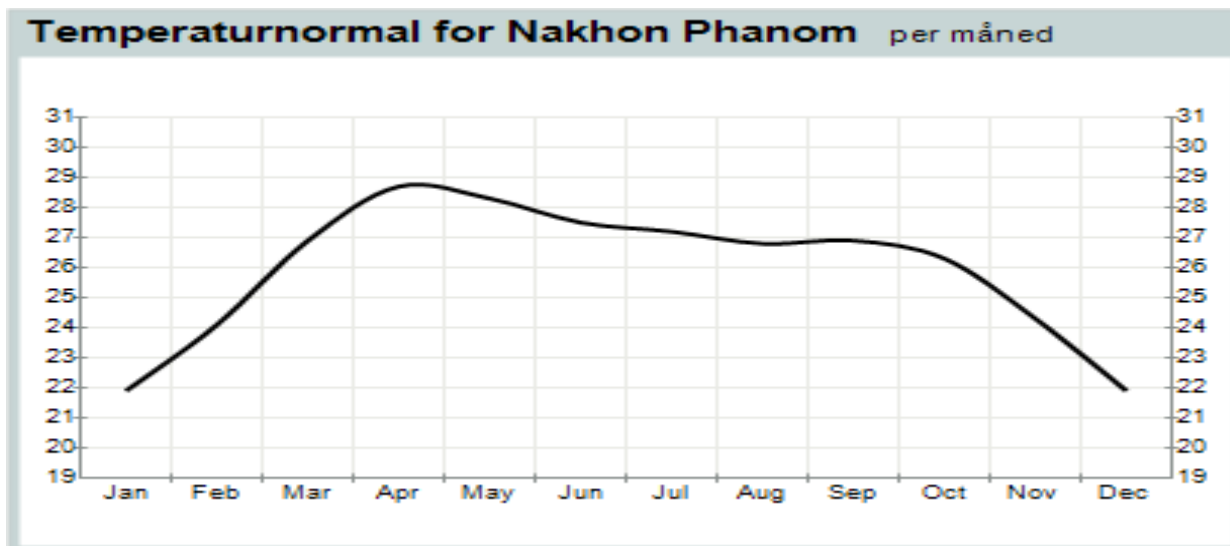
Location: Rainforests



In rainforests the average temperature is about 77 degrees Fahrenheit. It holds about the same temperature year round. The temperature never or rarely drops below 60. They hold this kind of weather for rainforests are found near the equator, the equator takes in quite an amount of radiation from the sun. Annual precipitation numbers score around 150 cm. In a single month, 4 inches of rainfall could add up. The rainforests are obviously rainy in all its months and have a relatively constant temperature throughout the year. Seasonal variation is not very great when it comes to rainforests.

Mekong River Seasonal Variation

Location: Ban Pakxé, Savannakhet (Laos)

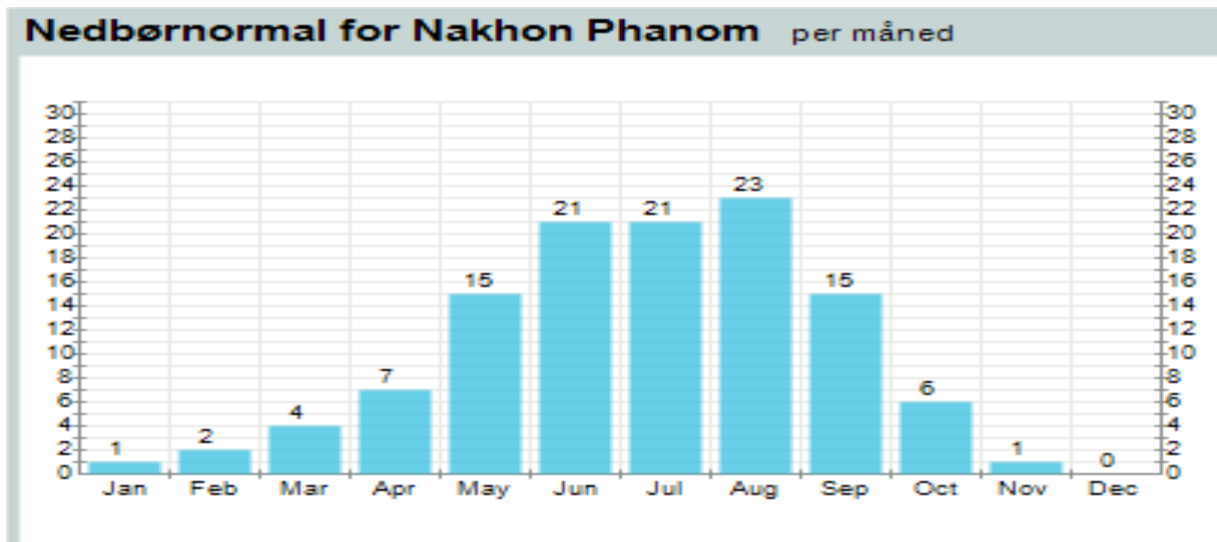


The title means average temperature for Nakhon Phanom per month. The temperature is measured in celsius

The graph came from a Norwegian website, named www.yr.no.

This graph is part of the weather statistics for Ban Pakxé, Savannakhet (Laos). Though the weather station seems to be the Nakhon Phanom weather station which is 45.0 km from Ban Pakxé. Ban Pakxé is a populated location near the Mekong River. Thus we could get somewhat of a general picture of how the temperature is for the Mekong River.

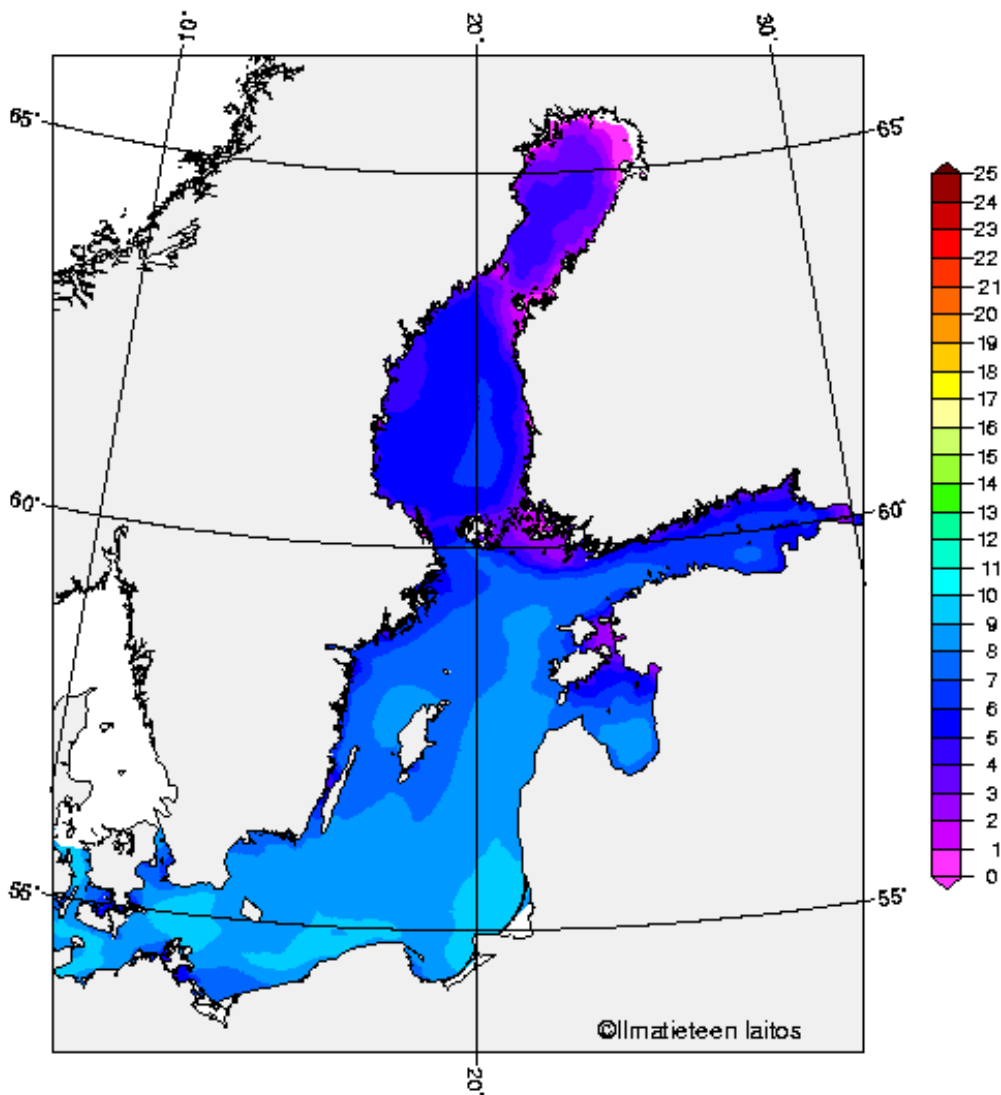
In the months of December and January the average temperature is about 22 degrees celsius. In the spring it hits about 28 for an average. Then to the summer it goes about 27 for its average. Interestingly the spring at some points is actually hotter than the summer. Fall season brings about 26 for an average. There seems to be a small seasonal variation for this location concerning temperature.



The title means average days with precipitation for Nakhon Phanom per month.

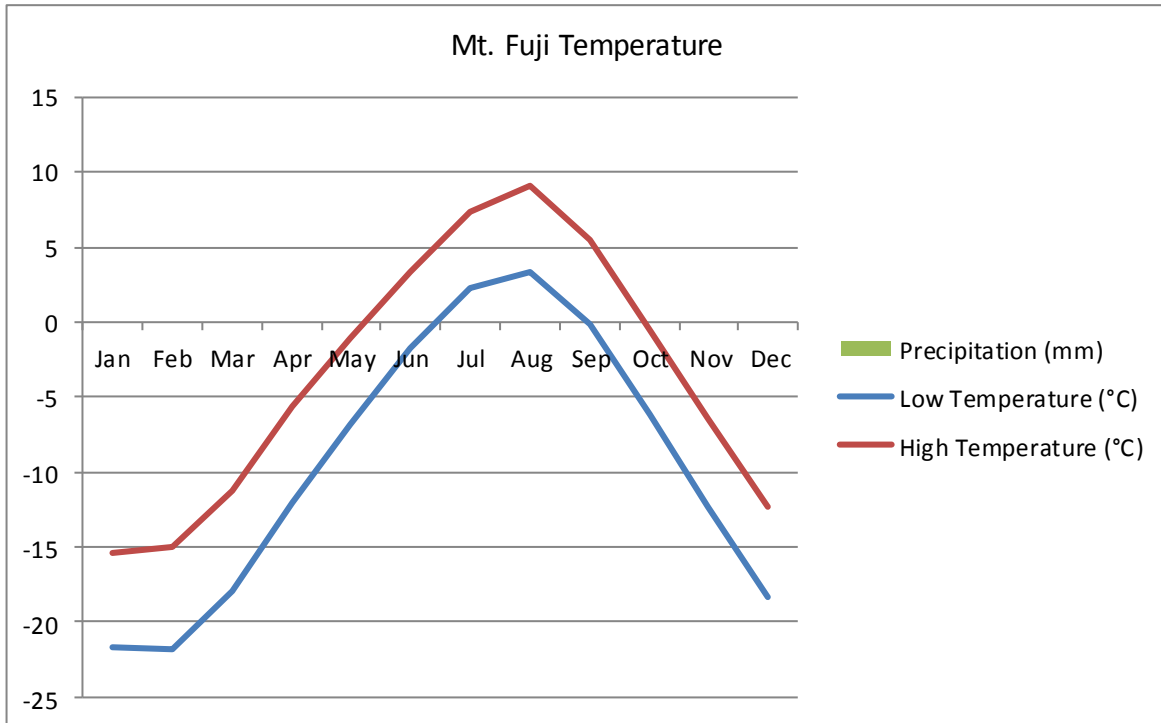
This graph shows a significant seasonal variation concerning precipitation. The winter has few days with precipitation. In the spring the activity really picks up as the ending month of it, May hits 15 days with precipitation on average. In summer the numbers hit the higher end of its range for the area, with a majority of the month's days having precipitation. As fall comes along the average numbers drop; in November the average number becomes 1 day. Much precipitation activity is present in the summer months.

Baltic Sea Seasonal Variation



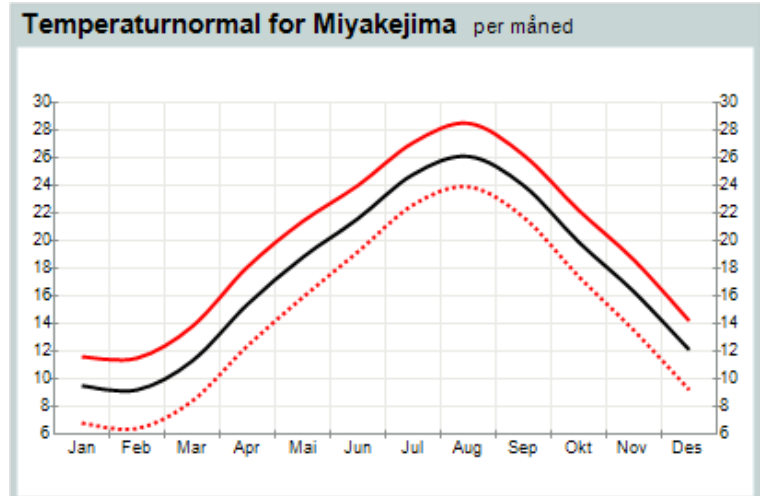
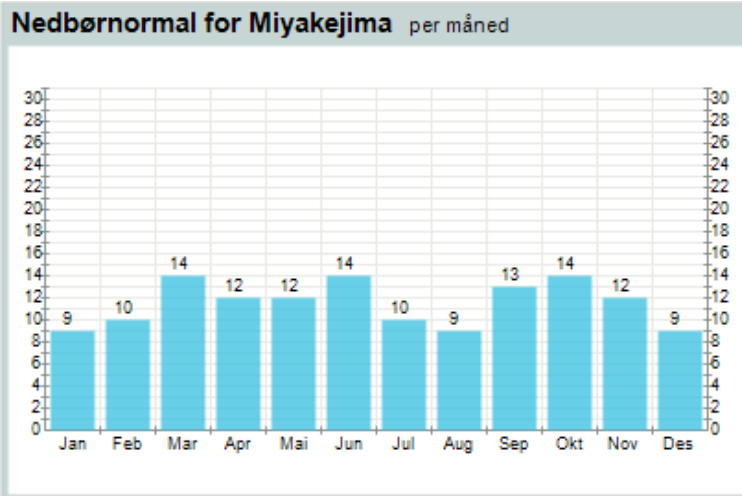
The Baltic Sea is full of relatively salty cold water up to a depth of 50-60 m. In the winter the temperature can vary from just under zero up to about 4 degrees. In the spring the surface water warms up and becomes less dense. This warmer, lighter water does not mix with the colder underlying water, leading to thermal stratification of the water. During the spring and summer the surface water warms up continuously but is also mixed by the wind. The temperature reaches a maximum of about 20 degrees at the beginning of August and the surface layer reaches its maximum thickness of about 30 m.

Mt. Fuji Seasonal Variation



The official climbing season of Mt. Fuji begins July 1 and runs through the end of August. Because of the weather, convenient transportation, and accommodation options, it's best to climb Mt. Fuji during these two months. Average monthly temperatures around the summit of the mountain are below the freezing point from fall to spring, and temperatures can drop below the freezing point all year round, including summer months. There are huge temperature differences between the foot of mountain and higher elevations. In addition, harsh, strong winds often blow around the summit.

Seasonal Variation of Miyake Island



■ Average precipitation(mm)

Nedbornormal: Precipitation

Temperaturnormal: temperature

Per måned: Per Month

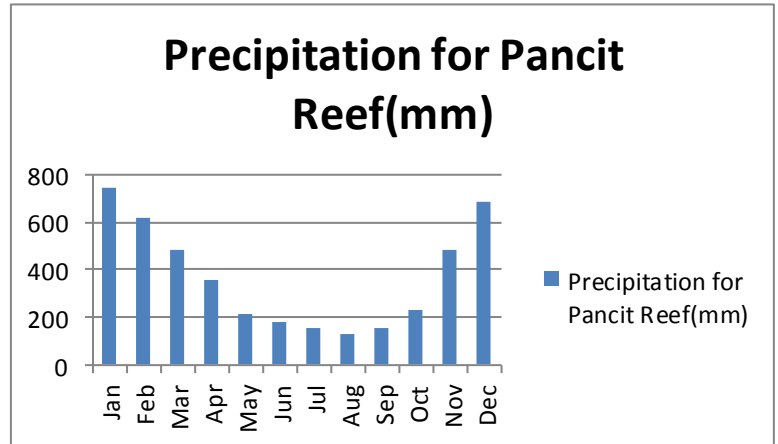
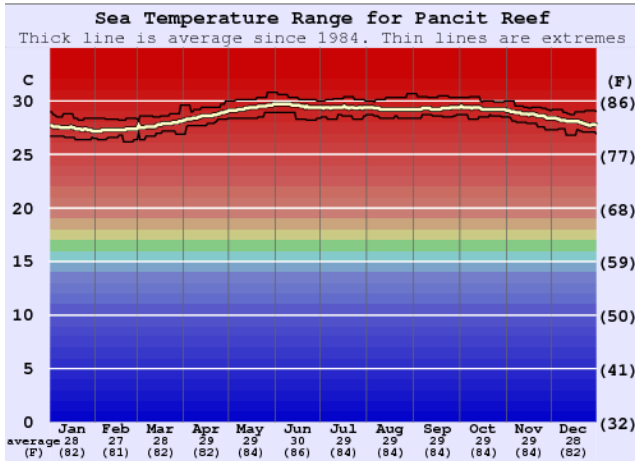
— Maximum Temperature(Celsius)

— Average Temperature(Celsius)

..... Minimum Temperature(Celsius)

The average temperature for Miyake Island increases in the months from March to September, peaking in the month of August. The temperature peaks at around 29°C, while the lowest temperature is around 6°C. The wet season of Miyake Island occurs during the winter, however seasonal rainfall varies very slightly throughout the year. Moreover, during the winter season, the Izu Thrush travels on its seasonal migration pattern to Miyake Island. The least amount of rainfall occurs in the months of January, August, and December.

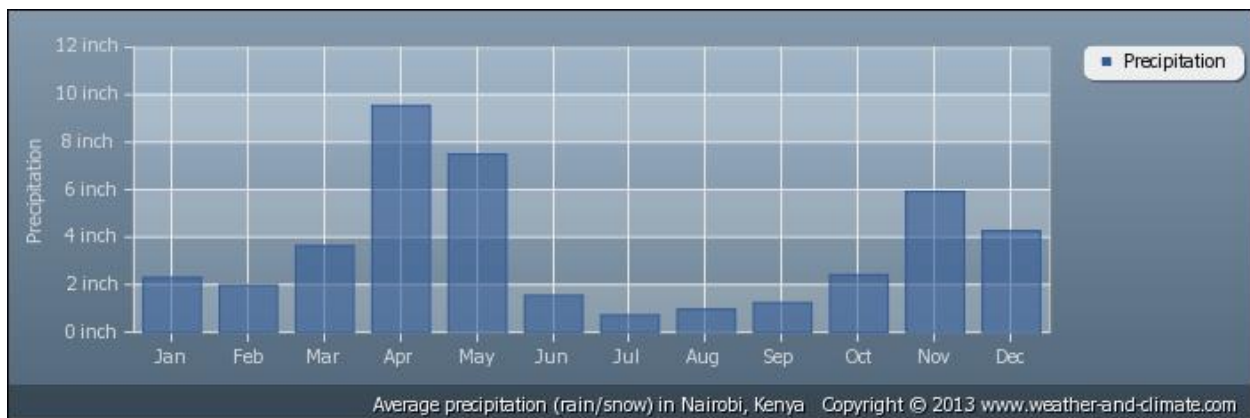
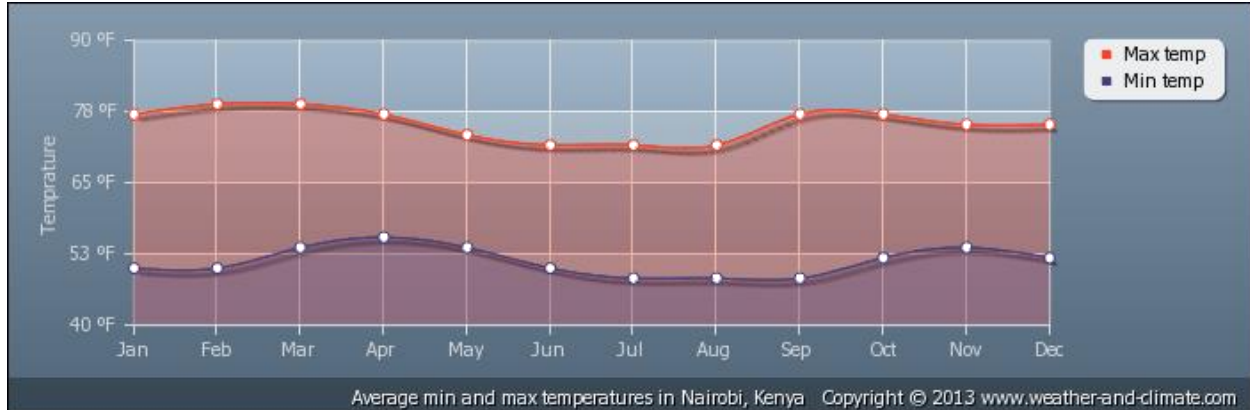
Seasonal Variation of Pancit Reef(Philippine Coral Reef)



The temperature of the water around Pancit Reef is at its highest during the months of March to June. The maximum temperature is around 30°C. During this time, surfers are a common sight in the waters around Pancit Reef. Furthermore, Precipitation is highest during the wet season, which occurs from November to March. This is prior to the surfing season. In addition, the biome is less disturbed during this time.

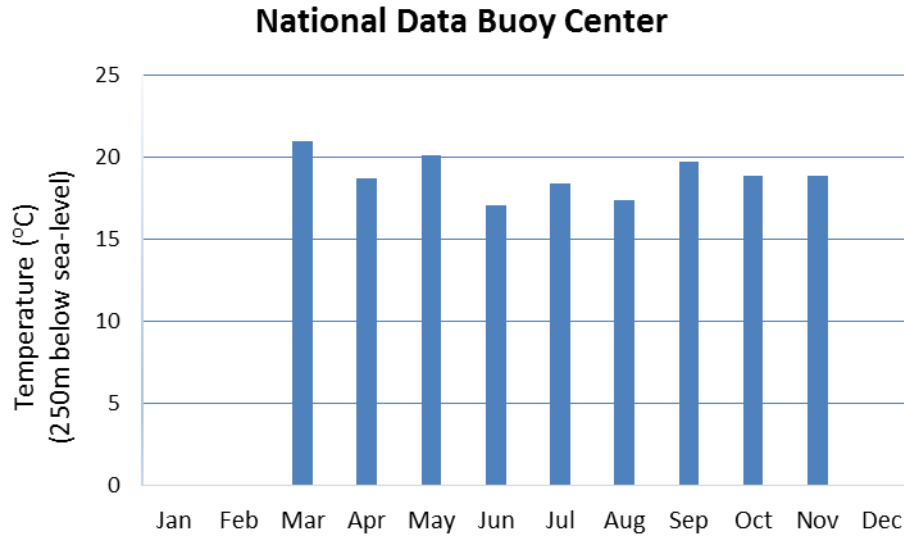
Seasonal Variation

Nairobi, Kenya, Africa



The African savanna grassland has long dry seasons beginning from May to November. The dry season in the northern hemisphere occurs from April to September and in the southern hemisphere, it occurs from October to March. The savanna of Nairobi, Kenya has two types of rainy seasons. One type is the long rainy season that ranges from March to May. And the other rainy season is the short rainy season, ranging from October to December. The average temperature is usually about 68° to 78°F. During the summer, the temperature goes up to 78° to 86°F.

New Caledonia Barrier Reef



2011

New Caledonia Barrier Reef is off the coast of New Caledonia, located in Southwest Pacific Ocean. New Caledonia's lagoon temperatures varies between 22° and 30°C. The chart above, recorded March 4 to November 15, 2011 by the National Data Buoy Center, represents the temperature of the body of water surrounding New Caledonia. Within the depth of 250 meters below sea-level, the temperature is highest at the beginning of the year starting above 20°C and decreases towards the middle of the year and then increases again by the end of the year.

Glossary

Abiotic Factor: Physical or nonliving factor that shapes ecosystem

Acid Rain: Rain containing nitric and sulfuric acids

Adaption: A heritable trait that increases the likelihood of an individual's survival and reproduction

Age Structure: The relative number of organisms of each age within a population; also called *age distribution*

Age-structure Diagram: Graph of the number of males and females within different age

Agriculture: The practice of farming

Algal Bloom: An immediate increase in the amount of algae and other products that results from a large input of a limiting nutrient

Aphotic Zone: permanently dark layer of the oceans below the photic zone

Aquaculture: Raising of aquatic animals for human consumption

Artificial Selection: A human-controlled process to produce individuals with certain traits

Autotroph: Plants, algae, and certain bacteria that can capture energy from sunlight or chemicals and use that energy to produce food

Benthos: Organisms that live attached to or near the ocean floor

Biodiversity: Biological diversity: the sum total of the variety of organisms in the biosphere

Biogeochemical Magnification: Increasing concentration of a harmful substance in organisms at higher trophic levels in a food chain or food web.

Biomass: The total amount of living tissue within a given trophic level

Biome: A group of ecosystems that have the same climate and similar dominant communities

Biosphere: Contains the combined portions of the planet in which all life exists, including land, water, and air or atmosphere

Biotic Factor: Biological influences on organisms within an ecosystem

Biotic Potential: The growth rate of a population under ideal conditions

Canopy: Leafy tops of tall trees extending from 50 to 80 meters above the forest floor forming a dense covering

Carnivore: Organisms that obtain energy by eating only animal

Carrying Capacity: Largest number of individuals of a population that a given environment can support

Cellular Respiration: The process by which organisms use oxygen to release the chemical energy of sugars, producing carbon dioxide and water

Chemosynthesis: Process by which some organisms, such as certain bacteria, uses chemical energy to produce carbohydrates

Climate: Average year-after-year condition of temperature and precipitation in a particular region

Coastal Ocean: Marine zone that extends from the low-tide mark to the end of the continental shelf

Coevolution: The process by which two species evolve in response to changes in each other

Commensalism: One member of the association benefits and the other is neither helped nor harmed

Communities: Assemblages of different populations that live together in a defined area

Competitive exclusion principal: No two species can occupy the same niche in the same habitat at the same time

Coniferous: Trees that produce seed-bearing cones and most have leaves shaped like needles

Conservation: Wise management of natural resources, including the preservation of habitats and wildlife

Consumer: Organisms that rely on other organisms for their energy and food supply (also known as a heterotroph)

Coral Reef: Diverse and productive environment named for the coral animal that make up its primary structure

Deciduous: Tree that sheds its leaves during a particular season each year.

Decomposers: Organisms that break down organic matter

Deforestation: Loss of forests

Demographic transition: Change in a population from high birth and death rates to low birth and death rates

Demography: Scientific study of human populations

Denitrification: The process of soil bacteria that converts nitrates into nitrogen gas

Density-Dependent Factor: A limiting factor whose influence changes with population density; includes competition, predation, and disease

Density-Independent Factor: Limiting factor that affects all populations in similar ways regardless of population size

Desertification: A combination of farming, and drought that turns once productive areas into deserts

Detritivores: Feed on plant and animal remains and other dead matter. (Type of decomposer)

Detritus: Particles of organic material that provide food for organisms at the base of an estuary's food web

Ecological Pyramid: A diagram that show the relative amounts of energy or matter contained within each trophic level in a food chain or food web

Ecological Succession: Series of predictable changes that occurs in a community over time

Ecology: Scientific study of interactions among organisms and between organisms and their environment or surroundings

Ecosystem Diversity: Variety of habitats, living communities, and ecological processes in the living world

Ecosystem: Scientific study of interactions among organisms and between organisms and their environment or surroundings

Emigration: Movement of individuals out of an area

Endangered Species: Species whose population size is rapidly declining and will become extinct if the trend continues

Estuary: Wetlands formed where rivers meet the ocean

Evaporation: Process by which water changes from a liquid into an atmospheric gas

Evolution: In general terms, change over time

Exponential Growth: Growth pattern in which the individuals in a population reproduced at a constant rate

Extinction: Disappearance of a species from all parts of its geographical range

Fitness: The degree to which an organism can reproduce successfully in its environment

Food Chain: A series of steps in which organisms transfer energy by eating and by being eaten

Food Web: Feeding relationships among the various organisms in an ecosystem that form a network of complex relations

Gene: A sequence of DNA that codes for a particular trait

Genetic Drift: Biological evolution that occurs by chance

Genetic Diversity: Sum total of all the different forms of genetic information carried by all organisms living on earth today

Global Warming: Increase in the average temperatures on Earth

Green Revolution: The development of highly productive crop strains and the use of modern agricultural techniques to increase yields of food crops

Greenhouse Effect: Natural situation in which heat is retained by this layer of greenhouse gases

Habitat: The specific environment in which an organism lives

Habitat Fragmentation: Splitting of ecosystems into small fragments

Herbivore: An Animal that feeds on plants

Herbivory: The act of feeding on a plant

Heterotroph: Organisms that rely on other organisms for their energy for their food supply

Humus: A material from decaying leaves and other organic matter that makes soil fertile

Immigration: Movement of individuals into an area occupied by an existing population

Invasive Species: Plants and animals that have migrated to places where they are not native

Kelp Forest: Coastal ocean community named for its dominant organism-kelp, a giant brown alga

Keystone Species: A species that has a strong or wide-ranging impact on a community

Limiting Factor: The factor that causes the growth of a population to decrease

Limiting Nutrients: Single nutrient that either is scarce or cycles very slowly, limiting the growth of organisms in an ecosystem

Logistic Growth: Growth pattern in which a population's growth rate slows or stops following a period of exponential growth

Mangrove Swamp: Coastal wetland dominated by mangroves, salt-tolerant woody plants

Microclimate: The climate in a small area that differs from the climate around it

Monocultural: Farming strategy in which large fields are planted with a single crop, year after year

Mutation: A change in DNA

Mutualism: Both species benefit from the relationship

Natural Selection: The process by which traits that improve an organism's chances for survival and reproduction are passed on more frequently to offspring than those that do not

Niche: Full range of physical and biological conditions in which an organism lives and the way in which the organism uses these conditions

Nitrogen Fixation: When bacteria that live in soil and on the roots of plants called legumes convert nitrogen gas into ammonia

Nonrenewable Resource: Resource that cannot be replenished by natural process

Nutrients: All the chemical substances that an organism needs to sustain life

Omnivore: Organisms that obtain energy from both plants and animals

Ozone Layer: Atmospheric layer in which ozone gas is relatively concentrated

Parasitism: One organism lives on or inside another organism and harms it

Permafrost: A layer of permanently frozen subsoil

Photic Zones: Well-lit upper layer of the oceans

Photosynthesis: Process by which plants and some other organisms use light energy to convert water and carbon dioxide into oxygen and high energy carbohydrates such as sugars and starches

Phytoplankton: Population of algae and other small, photosynthetic organisms found near the surface of the ocean and forming part of plankton

Pioneer Species: the first species to populate an area

Plankton: General term for the tiny, free floating organisms that live in both freshwater and saltwater environments

Polar Zone: Cold areas where the sun's rays strike earth at a very low angle

Pollutant: Harmful material that can enter the biosphere through the land, air or water

Populations: Groups of individuals that belong to the same species and live in the same area

Population Density: Number of individuals per unit of area

Population Distribution: How organisms are arranged within an area; sometimes called *population dispersion*

Population Size: The number of individual organisms present in a population at a given time

Predation: Interaction in which organisms capture and feed on another organism

Predator-Prey Relationship: Mechanism of population control in which a population is regulated by predators

Primary Producer: An organism that can capture energy from the sun or from chemicals and store it: also called autotroph

Primary Productivity: The rate at which organic matter is created by producers

Primary Succession: Succession that occurs on surfaces where no soil exists

Producers: Organisms that can capture energy from sunlight or chemicals and use it to produce food from inorganic compounds

Renewable Resource: Resource that can regenerate quickly and that is replaceable

Resource: Any necessity of life, such as water, nutrients, light, food, and or space

Resource Partitioning: A process that allows different species to share common resources

Salt Marsh: Temperate-zone estuary dominated by salt-tolerant grasses above the low-tide line and by sea grasses underwater

Secondary Succession: When the disturbance is over, community interactions tend to the restore the ecosystems to its original condition

Sex Ratio: the proportion of males to females in a population

Smog: A mixture of chemicals that occurs as a grey-brown haze in the atmosphere

Soil Erosion: The wearing away of surface soil by water and wind

Speciation: The process by which new species are generated

Species Diversity: Number of different species in the biosphere

Species: A group of organisms so similar to one another that they can breed and produce fertile offspring

Succession: A somewhat predictable series of changes over time in a community

Survivorship Curve: A graph showing the likelihood of survival within a group or population by age

Sustainable Development: A way of using natural resources without depleting them and of providing for human needs without causing long-term environmental harm

Symbiosis: Any relationship in which two species live closely together

Taiga: Biome that is along the northern edge of the temperate zone that have dense evergreen forests of coniferous trees

Temperate Zones: Sit between polar zones and the tropics

Transpiration: The process of water evaporating from the leaves of plants into the atmosphere

Tolerance: The ability to survive and reproduce under changing environmental conditions

Trophic Level: Each step in a food chain

Tropical Zone: Near the equator between 23.5° North and 23.5° South

Understory: Second layer of shorter trees and vines

Weather: Day-to-day condition in which water either covers the soil or is present at or near the surface of the soil for at least part of the year

Zonation: Prominent horizontal banding of organisms that live in a particular habitat

Zooplankton: Tiny animals that form part of the plankton

References

Research:

- (1996) Introduction to the rich natural environment of Mount Fuji,. http://www.pref.shizuoka.jp/kankyoku/ka-070/fujisanpage/mt_fuji/nature.html
- (2000). Elephant Grass. Blueplanetbiomes.org. Retrieved November 21, 2013, from http://www.blueplanetbiomes.org/elephant_grass.htm
- (2000). Whistling Thorn. Blueplanetbiomes.org. Retrieved November 21, 2013, from http://www.blueplanetbiomes.org/whistling_thorn.htm
- (2001). Jackal Berry Tree. Blueplanetbiomes.org. Retrieved November 21, 2013 from http://www.blueplanetbiomes.org/jackalberry_tree.htm
- (2002). Bermuda Grass. Blueplanetbiomes.org. Retrieved November 21, 2013, from http://www.blueplanetbiomes.org/bermuda_grass.htm
- (2007) Why Anilao. Coralrealm.com. <http://www.coralrealm.com/diving/anilaointro.asp>
- (2008) Japanese Tree Flowers. Prof. Summer's Web Garden. <http://treeflower.la.coocan.jp/Betulaceae/Alnus%20sieboldiana/Alnus%20sieboldiana.htm>
- (2009) Mt. Fuji as a Cultural Heritage Site,. http://www.fujisan-3776.jp/english/natural_world/natural_world.html
- (2010) Bird Sanctuary Miyake Nature Center, Akakokko Station. Wild Bird Society of Japan. <http://www.wbsj.org/en/miyake/birds.html#list>
- (2010) Mt.Fuji-san Temperature, <http://www2m.biglobe.ne.jp/ZenTech/English/Climate/Japan/Mt-Fujisan.htm>
- (2011) Baltic sea countries do not live up to commitments: WWF,. <http://phys.org/news/2011-08-baltic-sea-countries-commitments-wwf.html>
- (2011) Tear of Nature,. <http://geography-mountfujii.blogspot.com/>
- (2012) Coral Reefs. Biomes of the World Department of Geospatial Science, Radford University. https://php.radford.edu/~swoodwar/biomes/?page_id=837
- (2013) Japanese Beetle Pest Profile. CDFA. http://www.cdfa.ca.gov/plant/pdep/target_pest_disease_profiles/japanese_beetle_profile.html
- (2013) Japanese Knotweed. SCNWCB. <http://www.co.stevens.wa.us/weedboard/other%20weeds/HTM%20pages/japanese%20knotweed.htm>
- (2013) Miyakejima Island in the Izu Shoto Island Chain of the Tokyo Islands. digi-joho Tokyo. <http://tokyo.digi-joho.com/tokyo-islands/miyakejima-2.html>
- (2013) Pancit Reef Water Temperature. Surf-forcast.com. <http://www.surf-forecast.com/breaks/Pancit-Reef/seatemp>
- (2013) Pandorea Pandorana(Wanga-wonga vine). T.E.R.R.A.I.N. <http://www.terrain.net.nz/friends-of-te-henui-group/weeds/pandorea-pandorana-wonga-wonga-vine.html>
- (2013) Stachyurus praecox. Royal Horticultural Society. <http://www.rhs.org.uk/Gardens/Hyde-Hall/About-HydeHall/Plant-of-the-month/March/Stachyurus-praecox>

(2013) *Styrax formosanus* var. *formosanus*. Plant database.
http://www.plantdatabase.co.uk/Styrax_formosanus_var_formosanus

African Savanna Grasslands. African Facts Interesting-Africa-Facts.com. Retrieved November 21, 2013, from <http://interesting-africa-facts.com/Africa-Landforms/African-Savanna-Grasslands.html>

Average Water Temperature [°C]. National Data Buoy Center. Retrieved December 5, 2013, <http://tao.noaa.gov/refreshed/measurement.php?site=56&dep=2061&sen=9677&measurement=30|250&sy=2011&smon=03&sd=04&ey=2011&emon=11&eday=15>

Basin. 2002. In Dictionary.com. <http://dictionary.reference.com/browse/basin?s=t>

Bates, P. (2003). River Bushwillow. Blueplanetbiomes.org. Retrieved November 21, 2013, from http://www.blueplanetbiomes.org/river_bushwillow.htm

Beau M. (2003). Manketti Tree. Blueplanetbiomes.org. Retrieved November 21, 2013, from <http://www.blueplanetbiomes.org/manketti.htm>

Biodiversity in New Caledonia: Land Animals and Flora. Retrieved November , 2013, from http://www.croixdusud.info/eng/bio_eng/zoo_eng.php

Blalteberg, A. Emily, M. Jahi. Coral Reefs. Virtualclassroom.org. Retrieved November 21, 2013, from <http://winners.virtualclassroom.org/0814/aquaticlife/coral.html>

Cardinalfish. Blue Zoo Aquatics. Retrieved November 21, 2013, from <https://www.bluezooaquatics.com/productDetail.asp?did=1&cid=27&pid=687>

Carex Oshimensis "Evergold." Missouri Botanical Garden.
<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=s140>

Children of the Sun. Afrocyberpunk. <http://www.afrocyberpunk.com/archives/children-of-the-sun/>

Colla, P. List of Fish Species-Fish Photos. Oceanlight.com. Retrieved November 21, 2013, from <http://www.oceanlight.com/fish.html>

Cruz, t., Torres, A. G. Mekong Giant Catfish. FishBase.
http://www.fishbase.org/Country/CountrySpeciesSummary.php?c_code=418&id=6192

Current Human Impacts: The Good, the Bad, The Ugly. African Savannah. Retrieved November 21, 2013, from <http://africansavannah.blogspot.com/2011/12/current-human-impacts-good-bad-ugly.html>

Eli. (2007). List of Freshwater Fishes for Lao People's Dem. Rep. Mongabay.com
<http://fish.mongabay.com/data/Laos.htm>

Fish,. The Baltic Sea Portal
http://www.itameriportaali.fi/en/tietoa/elama/elioryhmat/elaimet/kalat/en_GB/kalat/

History of the Philipines Coral Reef. Philippine Coral Reef.
<http://philippinescoralreefs.wikispaces.com/Home->

Japan Guide: Mt.Fuji,. <http://www.japan-guide.com/e/e2172.html>

Japan's huge bay tree, *Machilus thunbergii*. BotanyBoy. <http://botanyboy.org/japans-huge-bay-tree-machilus-thunbergii/>

Marine mammals of the Baltic Sea., The Baltic Sea Portal.
http://www.itameriportaali.fi/en/tietoa/yleiskuvas/en_GB/mammals/

Martinez 3B Orangutans. EcoCheeta Wiki.
<http://ecocheeta.wikispaces.com/Martinez+3B+Orangutans>

Miyake-jima (Japan). Yr.no. <http://www.yr.no/place/Japan/Other/Miyake-jima/statistics.html>

Morgan, L. Animals and Plants in the Mekong River. eHow.
http://www.ehow.com/list_7367375_animals-plants-mekong-river.html

Mt. Fuji,.<http://gojapan.about.com/od/weathergeography/ig/Japan-Weather-Charts/Mt--Fuji-Weather.htm>

New Caledonia Barrier Reef, About the Area. WWF Global. Retrieved November 13, 2013, from
http://wwf.panda.org/about_our_earth/ecoregions/newcaledonia_barrier_reef.cfm

Nirvana, H. (2000). Baobab. Blueplanetbiomes.org. Retrieved November 21, 2013, from
<http://www.blueplanetbiomes.org/baobab.htm>

Nirvana, H. (2000). Candelabra Tree. Blueplanetbiomes.org. Retrieved November 21, 2013,
 from http://www.blueplanetbiomes.org/candelabra_tree.htm

Phytoplankton – single-celled primary producers, The Baltic Sea Portal
http://www.itameriportaali.fi/en/tietoa/elama/elioryhmat/kasvit/en_GB/kasviplankton/

Savanna Background Information. Retrieved November 21, 2013, from
<http://teacherlink.ed.usu.edu/tlresources/units/byrnesafrica/anggla/SavannahBackground.htm>

Savannah Animal Printouts. Enchanted Learning. Retrieved November 06, 2013, from
<http://www.enchantedlearning.com/biomes/savanna/savanna.shtml>

Siargao Island Climate. <http://www.weather2travel.com/climate-guides/philippines/siargao-island.php>

Southeast Asia Rainforest Animals. Animals of the Rainforest.
<http://www.heathwood.org/simpson/quicklinks/animalsoftherainforest/animalmap9.htm>

Stachyurus: Spring Spiketails. The Scott Arboretum’s Garden Seeds.
<http://blogs.scottarboretum.org/gardenseeds/2012/04/stachyurus/>

The Baltic, MarBEF Educational Pull-out issue 2,.
http://www.marbef.org/outreach/downloads/baltic_pullout.pdf

The Izu Islands. Wild Watch Japan. <http://wildwatchjapan.com/node/89>

The Savanna. Journey through the Biomes of Africa. Retrieved from November , 2013, from
<http://www.uvm.edu/~inquiryb/webquest/sp09/lstacey/The%20Savanna.html>

Wagner, Nancy. (Demand Media). Plants of the African Savanna. USA Today. Retrieved November, 2013, from <http://traveltips.usatoday.com/plants-african-savanna-61383.html>

Wetlands. Agriculture, Irrigation, Wetlands, and
 Forestry.http://ns1.mrcmekong.org/RAK/html/1.14.3a_wetlands.html

Zachary, C. (2002). Bengal Bamboo. South East Asian Rainforest Plants.
http://www.blueplanetbiomes.org/se_asian_rnfrstplant_page.htm

References

Images:

- (2006). Rainforest [Chart]. Tropical Rainforests. <http://yup23.webs.com/climate.htm>
- (2009) Fraser's dolphin (*Lagenodelphis hosei*) in the Philippines-female or juvenile. WoRMS. <http://www.marinespecies.org/photogallery.php?album=680&pic=22012>
- (2011) Baltic Herring,. <http://www.poland-fish.com/?pageId=61&fs=7>
- (2012) Leatherback Sea Turtle found in the Shubenacadie River, Ns. <http://www.healthywildlife.ca/?p=1502>
- (2013) Brain Coral (*Platygyra daedalea*). Arkive. <http://www.arkive.org/brain-coral/platygyra-daedalea/>
- (2013) Coral Triangle. WWf.org. <http://worldwildlife.org/places/coral-triangle>
- (2013) Image:What Lives in Sea,. <http://www.who.edu/page.do?pid=51334&tid=441&cid=121461&ct=61&article=83408>
- (2013) Japanese Beetle Pest Profile. CDFA. http://www.cdfa.ca.gov/plant/pdep/target_pest_disease_profiles/japanese_beetle_profile.html
- (2013) Phytoplankton are Microscopic Marine Plants. NOAA.gov. <http://oceanservice.noaa.gov/facts/phyto.html>
- (2013) Schizophragma hydrangeoides. Crocus. http://www.crocus.co.uk/plants/_/schizophragma-hydrangeoides/classid.4374/
- (2013) World Maps, US Maps and Atlases for More than Twenty Years. Maps.com. <http://www.hdwallpapersdj.com/wp-content/uploads/2013/10/Large-World-Map1.gif>
- [Photograph of a Dugong]. Animal National. Retrieved November 21, 2013, from <http://www.animalnational.com/dugongs/>
- [Photograph of a Giraffe]. Red Orbit. Retrieved November 21, 2013, from http://www.redorbit.com/education/reference_library/science_1/mammalia/2577450/giraffe/
- [Photograph of Orangutan]. Tropical Rainforest Foodweb. Biomesfirst. [http://www.orangutan.org/wp-content/uploads/wpsc/product_images/Reisner-\(3\)-POSTER.jpg](http://www.orangutan.org/wp-content/uploads/wpsc/product_images/Reisner-(3)-POSTER.jpg)
- Aborn, K. Berbine, J. African Savanna [Photograph]. Biomes Wiki. Retrieved December 6, 2013, from <http://biomea.wikispaces.com/Grassland>
- Algea [Photograph]. http://www.ewater.com.au/h2othinking/?q=system/files/images/Eutrophication-on-Lake-Tai-by-Corey-Bradshwaw.img_assist_custom-270x360.jpg
- Amanda. (2011). Loggerhead Turtle [Photograph]. Apple Guardians. Retrieved November 21, 2013, from <http://appleguardians.blogspot.com/2011/09/loggerhead-sea-turtle-gets-protection.html>
- Benders-Hyde, E. (2002). Durian flower [Photograph]. Southeast Asian Rainforest Plants http://www.blueplanetbiomes.org/images/durian_flower.jpg

Benders-Hyde, E. (2002). Jambu [Photograph]. Blue Plant Biomes.org.
<http://www.blueplanetbiomes.org/images/jambu3.jpg>

Bengal Tiger [Photograph]. WWF.
http://assets.worldwildlife.org/photos/1620/images/carousel_small/bengal-tiger-why-matter_7341043.jpg?1345548942

Children of the Sun. Afrocyberpunk. <http://www.afrocyberpunk.com/archives/children-of-the-sun/>

Colla, P. (Photographer). Blue Shark [Photograph]. National History Photography. Retrieved November 21, 2013, from <http://www.oceanlight.com/spotlight.php?img=01078>

Colla, P. (Photographer). Blue Spotted Jack [Photograph]. Natural History Photography Retrieved November 21, 2013, from <http://www.oceanlight.com/spotlight.php?img=07092>

Coral Reefs [Photograph]. Animals and Nature. Retrieved November 21, 2013, from <http://maricarjacobemultidev.weebly.com/ocean.html>

Cruise Europe,. <http://www.cruise-europe.org/gallery/All?page=74>

FAO. (Photographer). Chinese Seerfish [Photograph].
http://www.fishbase.org/images/species/Scsin_u1.gif

Flickriver. Photos Tagged with Bird. <http://www.flickriver.com/photos/dotcool/tags/bird/>

Freyhof, J. (Photographer). Isok Barb [Photograph].
http://www.fishbase.org/images/species/Prjul_u3.jpg

Gaffney, D. (2008). [Photograph of Crustacean]. UNSW Australia Science. Retrieved November 21, 2013, from <http://www.science.unsw.edu.au/news/heavy-metal-link-mutations-declining-growth-low-fertility-parramatta-river-crustaceans-study>

Gaurav, P. (Photographer). (2005). Arrival of the King [Photograph]. HBMT. Retrieved November 21, 2013, from <http://hbmt.wordpress.com/water/>

Harasti, D. (Photographer). Barrier Reef Anemonefish [Photograph]. Scuba Equipment USA Retrieved November 21, 2013, from [http://www.scuba-equipment-usa.com/marine/MAY05/Barrier_Reef_Anemonefish\(Amphiprion_akindynos\)2.html](http://www.scuba-equipment-usa.com/marine/MAY05/Barrier_Reef_Anemonefish(Amphiprion_akindynos)2.html)

Harrison, Tara. (2012). [Photograph of New Caledonia]. Travel Weekly. Retrieved December 6, 2013, from <http://www.travelweekly.com.au/holidays/destinations/new-caledonia/10-reasons-to-visit-new-caledonia>

Heine, G. (Photographer). Cheetah Stalking [Photograph]. Geo Heine Photography. Retrieved November 21, 2013, from <http://www.geroheine.com/gallery.html?gallery=Africa++Cheetahs%2C+Hyenas%2C+etc.&folio=Portfolio#/0>

Helias, J. F. (Photographer). Great Snake Head [Photograph].
http://www.fishbase.org/images/species/Chmar_uf.jpg

Hill, K. (2002). [Photograph of Seagrass]. Smithsonian Marine Station at Fort Pierce. Retrieved November 21, 2013, from http://www.sms.si.edu/IRLspec/Seagrass_Habitat.htm

Japanese Vegeration. Photographic Book.
http://www.voyagesphotosmanu.com/japanese_vegetation.html

Jean. (2012). Summer Sun, Radiation and Chemo. Boston Bakes for Breast Cancer. [Image of a sun]. Retrieved November 20, 2013, from <http://www.bostonbakesforbreastcancer.org/summer-sun-radiation-and-chemo/>

Johns, C. (Photographer). National Geographic. Retrieved November 21, 2013, from <http://animals.nationalgeographic.com/animals/mammals/african-lion/>

Mekong Giant Catfish [Photograph]. <http://graphics8.nytimes.com/images/2005/08/26/international/26thai583.jpg>

Nedbormal for Nakhon Phanom [Chart]. <http://www.yr.no/stasjon/wmo/48357/graf/nedboer.eng.png>

Nichols, M. (Photographer). [Photograph of an Elephant]. National Geographic. Retrieved November 20, 2013, from <http://news.nationalgeographic.com/news/2010/12/101222-african-elephants-two-species-new-science/>

Ocean Currents, <http://www.seos-project.eu/modules/oceancurrents/oceancurrents-c04-p03.html>

Philippine Coral Reef Webcam. California Academy of Sciences. <http://www.calacademy.org/webcams/coral-reef/>

Prexioso, J. (Photographer). Plankton [Photograph]. NOAA. Retrieved November 21, 2013, from <http://na.nefsc.noaa.gov/plankton.html>

Rodenburg, W. F. (Photographer). (2013). South East Asian Rainforests [Photograph]. http://www.blueplanetbiomes.org/se_asian_rnfrst.htm

Ryan, P. (Photographer). Apogon Leptacanthus Threadfin Cardinalfish [Photograph]. Ryan Photographic. Retrieved November 21, 2013, from <http://www.ryanphotographic.com/apogonidae.htm>

Sea Surface Temperature, http://www.itameriportaali.fi/en/itamerinyt/en_GB/pintalampoennuste/

Seow, Joanna. (2013) New Lava Lamp? No, It's my pet jellyfish. Columbia News Service. <http://columbianewsservice.com/2013/03/new-lava-lamp-no-its-my-pet-jellyfish/>

Shah, A. (Photographer). Proboscis Monkey [Photograph]. <http://cdn2.arkive.org/media/92/92860425-6611-4D78-9FEA-1B4EFF8C9123/Presentation.Large/Male-proboscis-monkey.jpg>

Smith D. (Photographer). Calling Gibbon [Photograph]. <http://silvery.org.au/wp-content/uploads/2011/12/callinggibbon.jpg>

Tanner, D. (Photographer). Tanner, J. (Photographer). The Acacia Tree Has Found A Way To [Photograph]. World is Round. Retrieved November 21, 2013, from <http://www.worldisround.com/articles/357678/photo36.html>

Temperaturnormal for Nakhon Phanom [Chart]. <http://www.yr.no/stasjon/wmo/48357/graf/temperatur.eng.png>

Trolle, M. (Photographer). Zebra in the Grasslands of the Serengeti at dawn, Tanzania, East Africa [Photograph]. Live Science. Retrieved November 21, 2013, from <http://www.livescience.com/27443-zebras.html>

Tualang [Photograph]. The Tualang Tree or Koompassia Excelsa. <http://www.rainforestjournal.com/wp-content/uploads/2011/07/tualang-mengaris-tree-225x300.jpg>

Wallago [Photograph]. http://www.fishbase.org/images/species/Waatt_u9.jpg

Warren T. (Photographer). Giant Mottled Eel [Photograph]. http://www.fishbase.org/images/species/Anmar_u0.jpg