Ecosystem—a natural system made up of **living things** (animal/plants) and **non-living things** (air/soil/water) and how they interact.

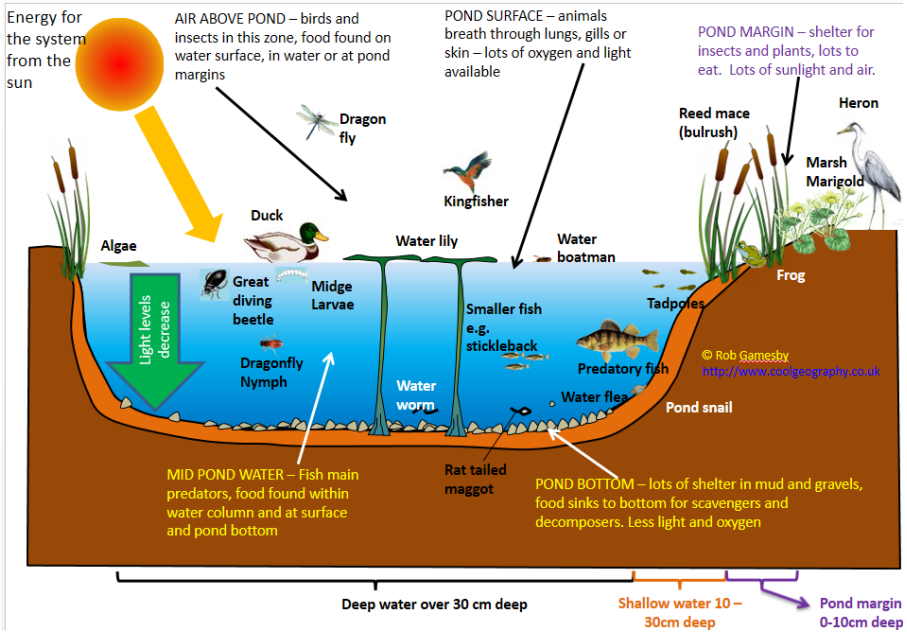
Biome—A **Large-scale** ecosystem covering whole continents in some cases.

Climate Zone – a large area of land sharing a similar climate and therefore vegetation

Food Chain: Simple diagram showing links from producer to consumer (1 line)

Food Web: Complex diagram showing more links between consumers and producers (several lines).

Food chains/webs and Ecosystems are delicate. If one link is changed or removed it will affect EVERYTHING above it in the system.



The Diagram above shows a **simple UK ecosystem**.

Ecosystems are **delicate systems**. When one part is **removed** it would have large impacts on the other parts.

For example:

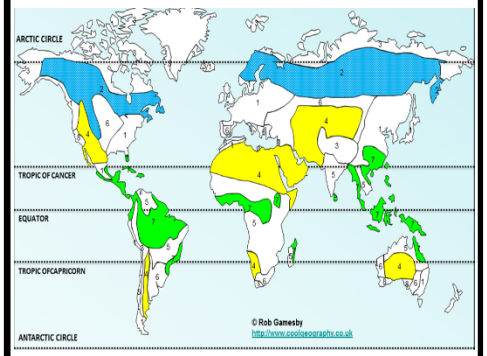
If the Kingfishers were **removed**, this would leave more smaller fish in the pond. This in turn would mean they eat more midge larvae, leaving less food for other creatures.

Location of Tropical Rainforests:

1. They are found along the equator
2. They are found in South America, Africa and Oceania.
3. The biggest is the Amazon Rainforest in Brazil

Location of Hot Deserts:

1. They are found along the Tropic of Cancer and Capricorn.
2. They are found on all continents (except Europe)
3. The biggest is the Sahara Desert in North Africa.



Why are they located here?

Tropical Rainforests:

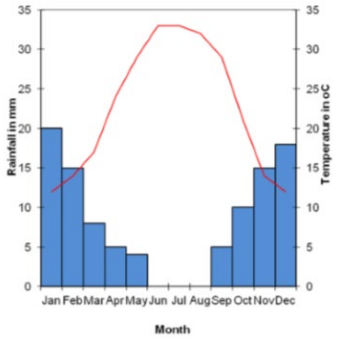
Here due to **low Pressure** belts. They are **hot all year and very wet**.

Hot Deserts:

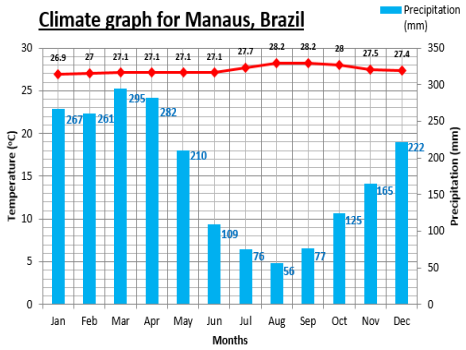
Here due to **high pressure** belts. They are Hot during the day and cold at night. But always **VERY** dry.

Tropical Rainforests & Hot Deserts—What are they like?

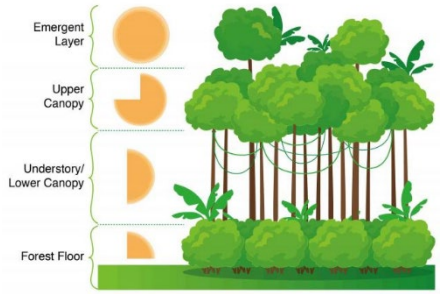
Hot Deserts are Very dry. They get less than 250mm of rain per year. Below is a climate graph showing the climate for the Thar Desert.



Tropical Rainforests are hot and wet all year. The get more than 2000mm of rain in a year and more than 12 hours of sun every day.



Rainforest Layers of Vegetation



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GEOGRAPHY

Year 10 | Half-term 1: Living world

Ecosystem—a natural system made up of **living things** (animal/plants) and **non-living things** (air/soil/water) and how they interact.

Tropical Rainforest Case Study—Malaysia

Deforestation: The cutting down of trees on a large scale.

Causes:

1. **Logging—**Malaysia was the biggest exporter of wood in the 1980's
2. **Farming—**Malaysia is the biggest exporter of Palm Oil—used in chocolate and cosmetics.
3. **Population growth**—a rapid growth in population means more space is needed for housing.
4. **Energy —** the Bakun Dam flooded huge areas of rainforest.

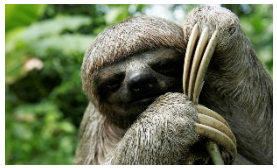
Impacts:

1. **Soil Erosion—**Once the trees have gone the soil is washed away meaning the forest can never recover.
2. **Loss of animals—**Animals become endangered—the Orang-utan is critical.
3. **Climate Change**—More CO_2 is generated resulting in Global Warming.
4. **More money**—it has produced more jobs and therefor more money.

Sustainable Development:

1. **Selective Logging—**This is where only specific trees are chosen and cut down—this reduces tree loss and allows the rainforest to grow back.
2. **Conservation**—this is where large areas are protected from logging. It is made illegal to cut the trees down with large fines if they do.
3. **Ecotourism**—This aims to introduce people to the natural world to benefit the local community. It is small scale and keeps the profits with the locals.
4. **International agreements**—the FSC (Forestry Stewardship Council) tries to stop the use of hardwoods like Mahogany.
5. **Debt reduction**—some counties debt is reduced or wiped out in exchange for protecting their rainforest.

This Sloth has ADAPTED to the rainforest in many ways. Long finger like claws to climb with. Very slow moving to preserve energy from poor diet. Plus many more.



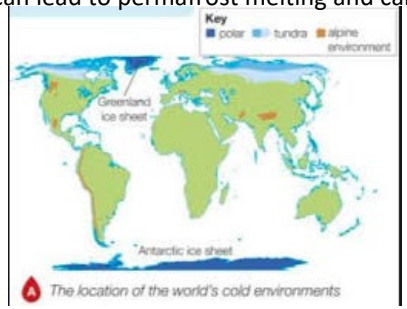
Cold environment case study – Alaska/Svalbard

Opportunities:

1. **Mineral extraction—** Alaska was well known for reserves of gold and copper which helped to bring wealth into the region. Svalbard has large reserves of coal which could be a boost to the local economy.
2. **Oil drilling** — Oil accounts for a massive percentage of Alaska's income and the trans-Alaska pipeline allows oil to be transported across the state.
3. **Tourism**—Both Alaska and Svalbard are becoming increasingly popular with tourists wishing to visit these unique regions. Whale watching, cruises and mountaineering bring in many visitors.

Challenges:

1. **Low temperatures**—Humans working and living here are at risk from frostbite and hypothermia, working in such conditions can be very dangerous.
2. **Construction –** Building on the frozen ground can lead to permafrost melting and can make buildings unstable.
3. **Remote—**Accessing these areas is very Complex. Only one major airport services Svalbard. Bringing in goods and services Is a challenge as water and sewage pipes must be kept off the ground.



The location of the world's cold environments

Polar bears:

1. **Thick fur—** traps air to provide insulation and acts as camouflage.
2. **Hollow fur –** also traps heat
3. **Large feet—**grip on ice and large surface area to distribute weight.
4. **Layers of body fat—** protects from temperatures as low as -40C
5. **Small ears-** reduces heat loss.

Arctic poppy:

1. **Hairy stem—**traps air for insulation.
2. **Tracks the sun—** maximises exposure to sunlight - Heliotropic.
3. **Short growing season—** grows during short summer.
4. **Cup shaped flowers—**Encourages pollination.

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GEOGRAPHY

Year 10 | Half-term 1: Living world

Key Terms:

Resource: A stock or supply of something that has a value or a purpose.

Food – Something you eat to provide nourishment.

Water – H2O, vital to human survival

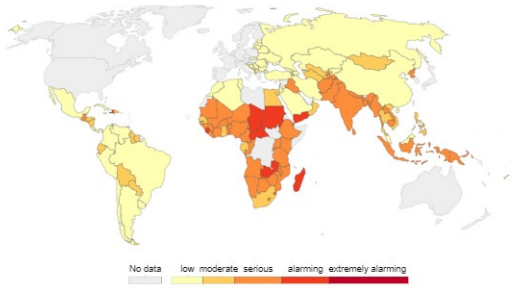
Energy – Energy usually refers to electricity.

Deficit – not enough of a resource, Demand exceed supply.

Surplus – more than enough, Supply exceeds demand

Global Distribution of resources is uneven:

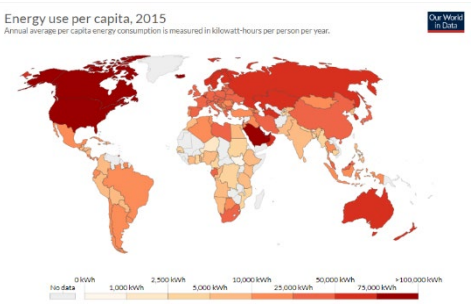
Food – Your health is affected by how much food you eat and the food's nutritional value. The WHO states that an average human needs 2000-2400 calories per day. More than 1 billion people eat less than this.



Global Distribution of resources is uneven:

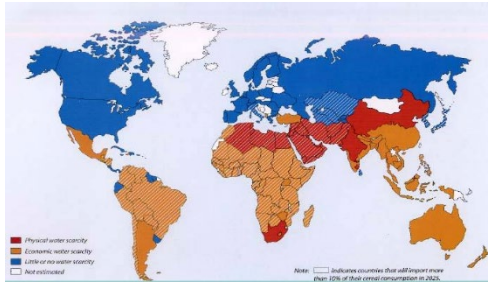
Energy - Energy/Electricity is used in everyday life from the minute you wake in the morning to the second before bed.

Some places use much more than others in the world



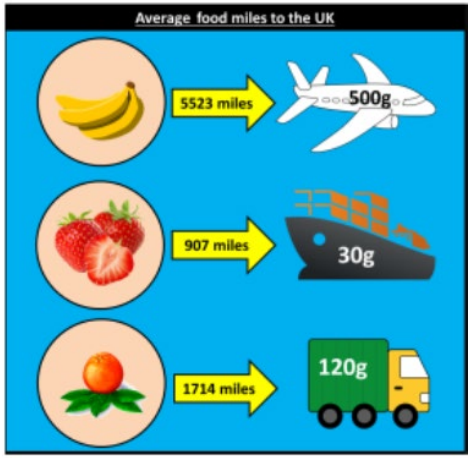
Global Distribution of resources is uneven:

Water - Water is the most vital resource for life. Water is also used in many everyday activities. It is also vital for food supply too, energy production and industry. There is a huge imbalance in water supply in the world. Mainly due to climatic conditions.



UK Food Supply

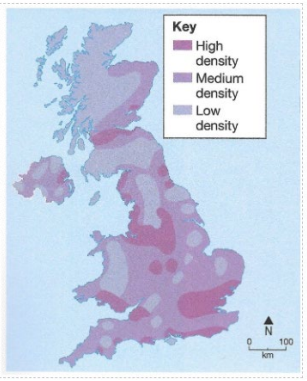
Attitudes to food in the UK have changed dramatically since the early 1900's. We now demand "out of Season" products like Strawberries all year round. We also import much of our food from other countries, increasing our Food Miles and therefore our Carbon Footprint. Also due to a growing population we have and to increase the intensity of our farming putting more and more pressure on the natural landscape.



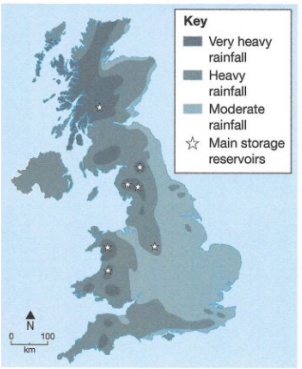
UK Water Supply

In the UK the highest population density also happens to be where the lowest rainfall is. This means that UK water supply is uneven

UK Population density



UK rainfall



Water transfer

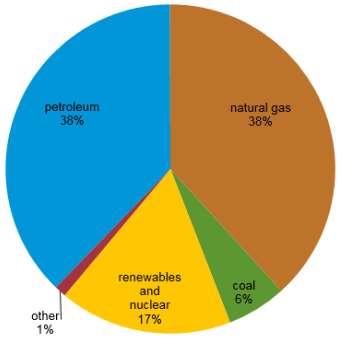
In 2006 the government proposed to establish a water grid to transfer water from areas of water surplus to areas of water deficit. The enormous cost of the project stopped it from happening. Currently, water is only transferred via the Rivers Tyne, Derwent, Wear and Tees to as far south as Yorkshire, but there is a growing need to transfer water. There is large-scale opposition because of:

- The effect on land and wildlife
- The high costs involved
- The greenhouse gases released in the process of pumping water over long distances

UK Energy Supply

This graph shows where the energy in the UK comes from. Traditional sources (fossil fuels) are declining and renewables are on the increase. This is because people are more concerned about the environment than ever before.

Oil and Gas are still the main sources.



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GEOGRAPHY

Year 10 | Half-term 2: Resources

A Sustainable Future? Freiburg is a sustainable city in Germany:

Designing homes	Workplaces and transport for sustainability	Demand reduction	Use of technology to increase efficiency in the use of fossil fuels
While a typical home in Germany squanders 220 kilowatt hours of energy a year for each square metre of floor space, the ones in Freiburg waste just 15kWh/m2 a year. They are described as a 'passive house' where no active system is needed to maintain a comfortable temperature. Super-insulated with foam and lagging up to 30cm thick, the flats are triple-glazed and externally sealed.	Freiburg devised an integrated traffic management plan and cycle path network. The plan improves mobility while reducing traffic and benefitting the environment. It prioritizes traffic avoidance and gives preference to environment-friendly modes of transport such as walking, cycling, and public transit. Traffic avoidance is achieved in conjunction with urban planning that makes Freiburg a city of "short distances"—a compact city with strong neighbourhood centres where people's needs are within walking distance.	In 1992, Freiburg's building design standards were amended to require that all new houses built on city land (or land sold by the city) use no more than 65 kilowatt-hours of heating energy per square meter per year, compared to the national standard of 75 kWh/m2/yr. This adds about 3% to the cost of the house, but the energy savings make it worthwhile in a short time. It is estimated that the standard reduces heating oil consumption from 12-15 litres to 6.5 litres per square metre.	The efficient technologies developed in Freiburg include combined heat and power (CHP) which produces both electricity and heat by capturing the waste heat from electricity production to generate more electricity and useful heat, e.g., for district heating systems. About 50% of Freiburg's electricity is now produced with CHP. There are 14 large-scale CHP plants and about 90 small-scale CHP plants (e.g., at the city theatre and indoor swimming pools). The two large-scale plants located near landfills use landfill gas as fuel. The others use natural gas, biogas, geothermal, wood chips, and/or heating oil.

Renewable energy Disadvantages:

They are very **inefficient** compared to traditional methods (fossil fuels). It takes around 250 wind turbine to match the output of 1 coal power station.

They are **ugly** people don't want these on their doorsteps.

HEP **damages huge areas of land** as it has to be flooded to make the dam.

Nuclear produces **radioactive waste**, which is hard to dispose of.

What the Frack?

Fracking is a way of extracting shale gas – natural gas that is trapped underground in shale rock. Liquid is pumped into the shale rock at high pressure. This causes rock to crack (fracture), releasing the gas, which is then collected as it comes out of the well.

It has both positives and negatives:

There appears to be lots of shale gas available in the UK. Fracking increases the **energy security** in the UK as supplies of other fossil fuels start running out.	It uses lots of water (a limited resource).
Gas is not a sustainable energy source. Its non-renewable and releases CO^2 when its burned – contributing to global warming.	It is known to cause small earthquakes.
Gas is less polluting than other fossil fuels. It releases half the CO^2 of coal.	The technology has already been tested in the USA and shown to work, unlike some renewable sources.
There is a risk of pollution of groundwater, drinking water and air.	It's an issue that people feel strongly about. Public opposition has stopped it from being used yet in the UK.
Fracked gas is a cheaper source than some renewables – although it can cost more to extract than gas from some other sources.	Investment in fracking may slow down the investment in renewable energy.

Renewable energy:

Renewable energy is a fuel or source that is not going to run out. They are usually lower or zero carbon emissions too:

HEP – Hydro-Electric Power – using the force of a river to turn a turbine and generate electricity.

Nuclear – although not strictly "renewable" it basically is as there is enough fuel to last for millions of years.

Solar - Harnessing the light/heat from the sun to generate electricity.

Wind – Wind turbines transform the wind kinetic energy into electricity.

These all have **advantages** and **disadvantages.**

Advantages:

Low Carbon emissions, cheaper/free fuel, sustainable (lasts forever)

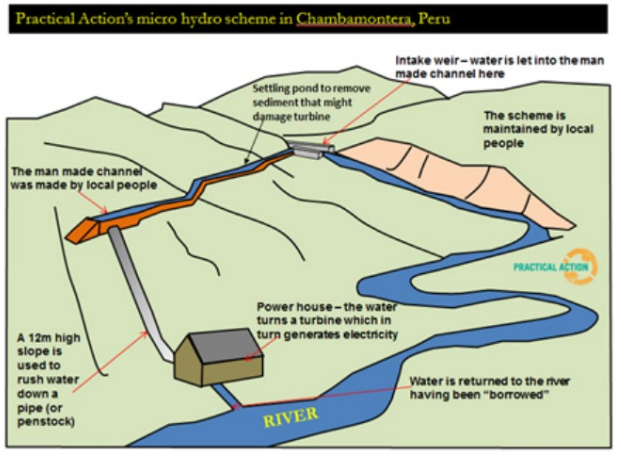
Demand for energy resources is rising globally but supply can be insecure, which may lead to conflict.

Impacts of energy insecurity:

- Energy supply problems - exploration of difficult and environmentally sensitive areas. Consider how oil exploitation in the Niger Delta has led to problems.
- Economic and environmental costs. What will the costs of extracting oil in the Arctic be? It will be expensive to collect the energy and the environmental impact of accidents will be terrible.
- Food production

Chambamontera – A Micro-Hydro Scheme

Chambamontera is an isolated community in the Andes Mountains of Peru. It is more than two hours' drive on a rough track from Jaen, the nearest town. The solution to Chambamontera's energy deficit involved the construction of a micro-hydro scheme supported by the charity Practical Action. The high rainfall, steep slopes and fast flowing rivers make this area ideal for exploiting water power as a renewable source of energy.



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GEOGRAPHY

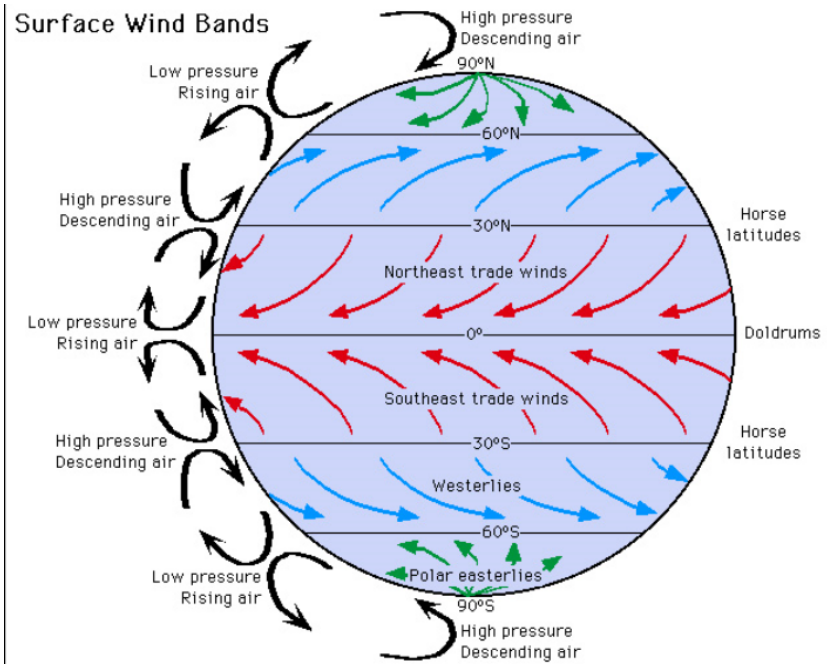
Year 10 | Half-term 2: Resources

Global atmospheric circulation– the movement of air around the world to balance out heat.

Tropical Storm – A large, revolving storm found between 5-15 degrees N/S of the equator.

Climate Change – The average global weather conditions changing from the long term average.

This is the Atmospheric Circulation Model. It shows how air moves around the planet. It dictates the type of weather we get and the type of biome present.



Saffir-Simpson Hurricane Wind Scale

Category	Sustained Wind
1	74-95mph, 64-82kt
2	96-110mph, 83-95kt
3	111-129mph, 96-112kt
4	130-156mph, 113-136kt
5	157+mph, 137+kt

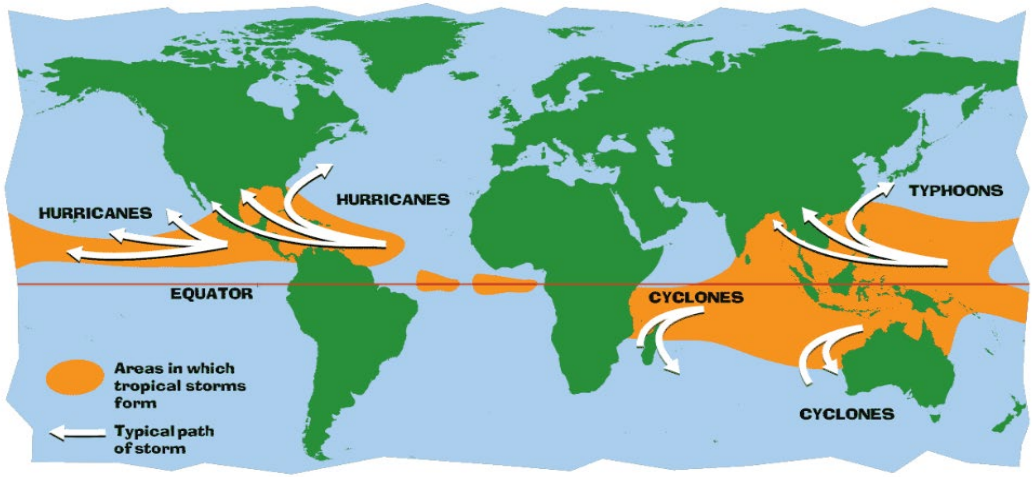
Tropical storms

Where? Tropical storms form along a belt between 5 and 15 degrees either side of the equator. Also known as hurricanes, typhoons and cyclones.

How do they form?

1. The sun heats up an area of ocean in summer and autumn. Some of this water evaporates and this warm air rises.
2. Once the ocean reaches >26 degrees C this rising air creates an area of low pressure and eventually a thunderstorm.
3. The earths rotation combined with winds blowing around the world causes the storm to spin.
4. Once the wind speed reaches 74 mph this is officially a tropical storm.
5. Cool air sinks in the centre of the storm creating an eye. The conditions here are very calm.
6. When the storm reaches land it has its power supply cut off and begins to lose energy.

Management of Tropical Storms	
Protection Preparing for a tropical storm may involve construction projects that will improve protection.	**Education** Teaching people about what to do in a tropical storm.
Prediction Constant monitoring can help to give advanced warning of a tropical storm	**Planning** Involves getting people and the emergency services ready to deal with the impacts.



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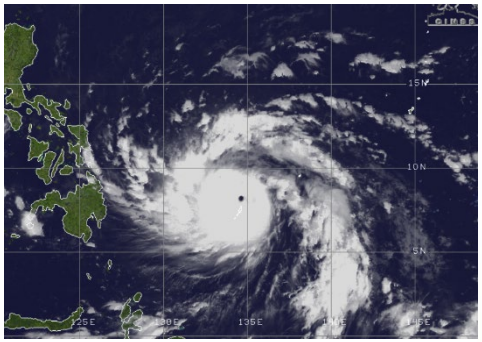
GEOGRAPHY | Year 9 | Half-term 4: Natural Hazards

Case Study: Typhoon Haiyan 2013

Causes

Started as a tropical depression on 2rd November 2013 and gained strength. Became a Category 5 "super typhoon" and made landfall on the Pacific islands of the Philippines.

Effects	Responses
Almost 6,500 deaths. 130,000 homes destroyed. Water and sewage systems destroyed had caused diseases. Emo-	The UN raised £190m in aid. USA & UK sent helicopter carrier ships deliver aid remote areas. Education on typhoon preparedness.

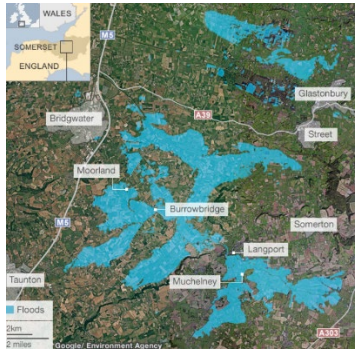


Case Study: The Somerset Floods 2014, Extreme weather UK

Causes

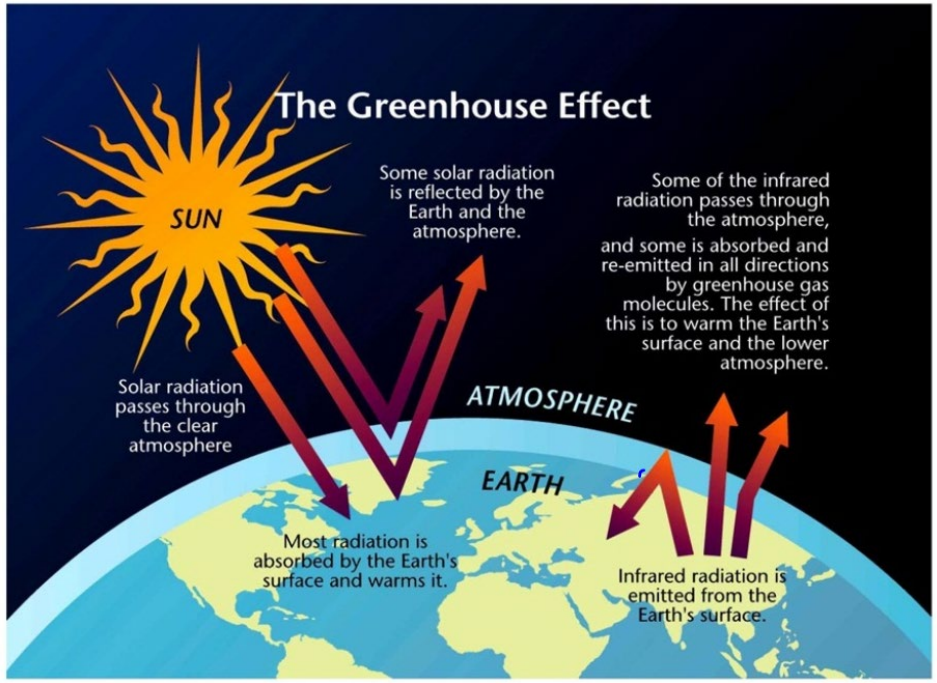
Large amounts of heavy rain in the winter of 2013 and early 2014.The ground could not absorb any more water. The rivers had not been dredged so were clogged with sediment.

Effect	Responses
600 home affected. Road closures = longer journey times for locals. Local businesses lost trade. Reports of increased crime.	Royal Marines sent in to help with flood relief. A £20m flood action plan has been drawn up. UK Government promised at least £30m to help with repairs .



The Greenhouse Effect

Humans burn fossil fuels. These fossil fuels (coal, oil. Gas) release greenhouse gasses (carbon dioxide) when burned. These gasses create a thick layer in the atmosphere. This thick layer traps the suns energy within our atmosphere. The thicker the layer the more energy is trapped and the warmer our atmosphere becomes.



Recent Evidence for climate change.	
Global temperature	Average global temperatures have increased by more than 0.6°C since 1950.
Ice sheets & glaciers	Many of the world's glaciers and ice sheets are melting. E.g. the Arctic sea ice has declined by 10% in 30 years.
Sea Level Change	Average global sea level has risen by 10-20cms in the past 100 years. This is due to the additional water from ice and thermal expansion.

Managing Climate Change

International Agreements Countries aim to cut emissions and agree targets.	Planting Trees = more CO2 removed from the atmosphere.	Renewable Energy Replacing fossil fuels based energy with clean/natural sources of energy like wind or solar power.

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GEOGRAPHY | Year 9 | Half-term 4: Natural Hazards

Key Terms:

Erosion: the break up and removal of rock involving transportation.

Weathering: The break up of rock in situ (in one place)

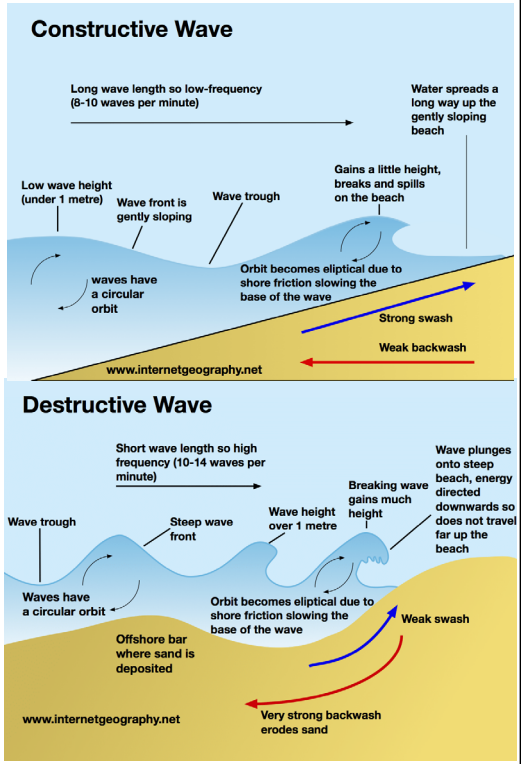
Waves: Waves can be constructive and destructive.

Constructive waves are gentle and DEPOSIT material on the beach.

Waves are driven by the wind. The **fetch** is the distance the wave has travelled. The greater the fetch the bigger and more destructive the waves are.

Prevailing winds are the usual direction of the waves. In the UK these mainly come from the south west, giving the waves a massive fetch of 4000 miles from Brazil.

Destructive waves are rough and ERODE material from the beach.



Erosion: Both Rivers and Coasts

Attrition—This is the smashing together of rocks. They break up into smaller rocks.

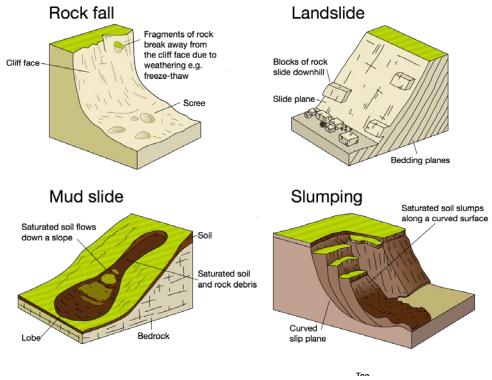
Abrasion—This is the rubbing and scrapping of rocks on the bed/banks. It results in rocks becoming smooth and less angular.

Hydraulic Action—This is the sheer force of the water breaks up rocks.

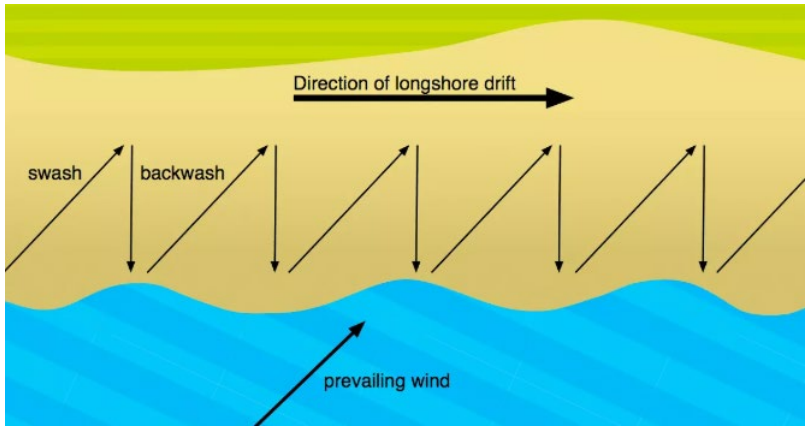
Corrosion/Solution—This is acid erosion where certain rocks are dissolved by water (chalk/Limestone etc…)

Mass Movement—this is when cliffs collapse in different ways due to weathering and erosion.

This happened in Scarborough in 1993, when the Holbeck Hall Hotel collapsed into the sea live on TV. The cliff face was weakened at the base by the pounding of the sea and weathering loosened the rocks at the top of the cliff, causing it to slump into the sea.



Longshore Drift—the "zig-zag" movement of material along the coastline.



This process forms some of the landforms on the next page, but also causes problems for people at the coast.

The negatives of this are:

1. Beaches are washed away—this means that tourists might stop coming to the area and therefore people will loose money.

2. If the beach is washed away then the cliff is exposed to the full force of the wave and coastal erosion can occur.

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GEOGRAPHY

Year 10 | Half-term 3: Coasts

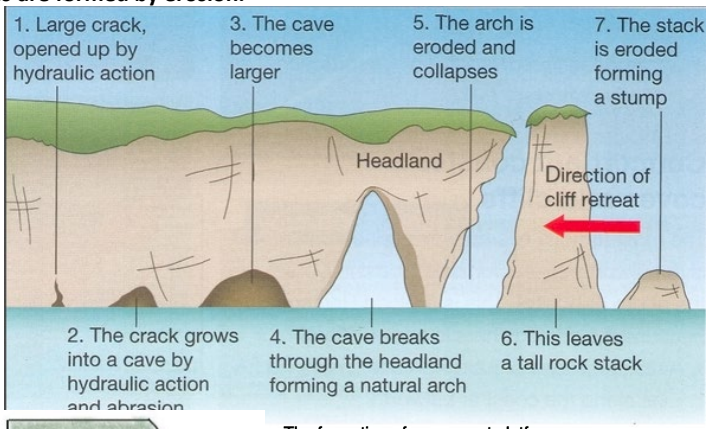
The Diagrams below show how the main landforms are formed by the sea. These are all formed by erosion and/or deposition. The most important thing to remember is the SEQUENCE of events.

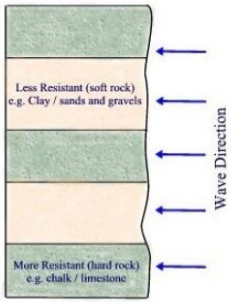
Stacks, stumps, arches and caves are formed by erosion.

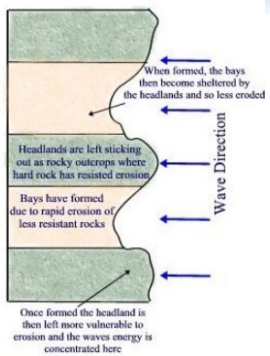
Bays and headlands are formed by erosion—then beaches are deposited in the bays.

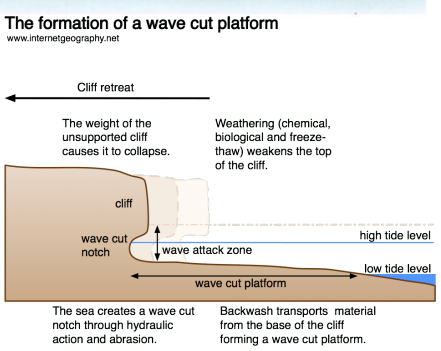
Wave-cut platforms are formed by erosion.

Spits and bars are formed by longshore drift and deposition.

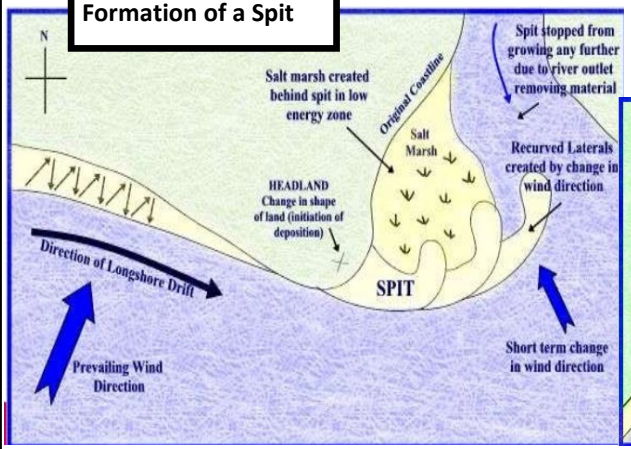




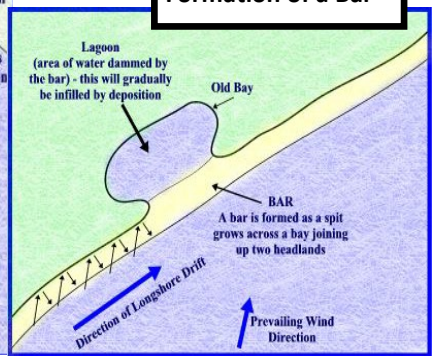




Formation of a Spit



Formation of a Bar



The Holderness Coast is an example of a coastline with ALL of the features and management strategies seen here.

Coastal Management—Hard and Soft Engineering

Hard Engineering—This involves building a physical barrier or structure to stop erosion/flooding.

Sea Walls		1. Completely stop erosion 2. Makes walkway/ promenade	1. VERY expensive—£10,000 per m. 2. Unnatural looking 3. High maintenance costs
Rock Armour		1. Cheap 2. Easy to maintain 3. Looks more natural	1. Dangerous 2. Expensive if not local 3. Ugly?
Gabions		1. Cheap 2. Improves drainage 3. Stops erosion	1. Very ugly 2. only last 5-10 years
Groynes		1. stops longshore drift 2. Not too expensive	1. Interrupts spits/bars further down the coast. 2. Ugly

Soft Engineering—This involves managing the conditions and doesn't involve building.

Beach Nourishment/ replenishment		1. Cheap in the short term. 2. very natural looking	1. Very expensive in the long term.
Managed retreat		1. Cheap 2. Allows natural processes to occur.	1. Compensation needs paying to local residents if land is lost.

Kettlethorpe HIGH SCHOOL

GEOGRAPHY

Year 10 | Half-term 3: Coasts