

# Paper 1 section B Weather Hazards and Climate Change

## Weather and Climate key words:

**Global circulation** – the movement of hot air from areas of surplus (lots of heat) to deficit (less heat) within the Hadley, Ferrel and Polar cells

**Coriolis force** - a force that causes the air to bend creating winds.

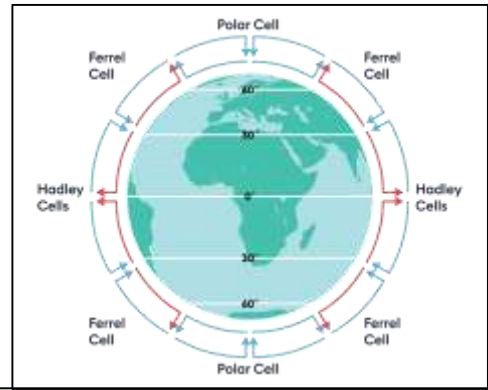
**Tropics** – 30° north and south latitude

**Equator** – an invisible line that runs across the centre of the earth marking the area of the earth that receives the most solar energy. It marks 0° latitude

**Natural hazard** - a potential threat to lives, the economy and the environment that is caused by the climate or tectonic activity.

**Social, economic and environmental impacts** – social = relating to people, economic = relating to money/wages, environmental = to do with natural processes.

## What causes global and UK climate? The global atmospheric circulation and ocean currents

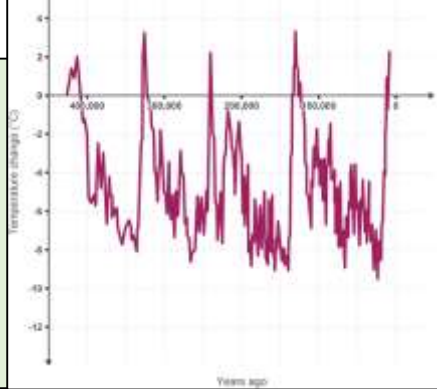


The local factors that affect climate are; altitude, relief

## Climate change

**Global temperature has always fluctuated** in the last 2000 years. There have been **glacial** and **inter glacial periods**.

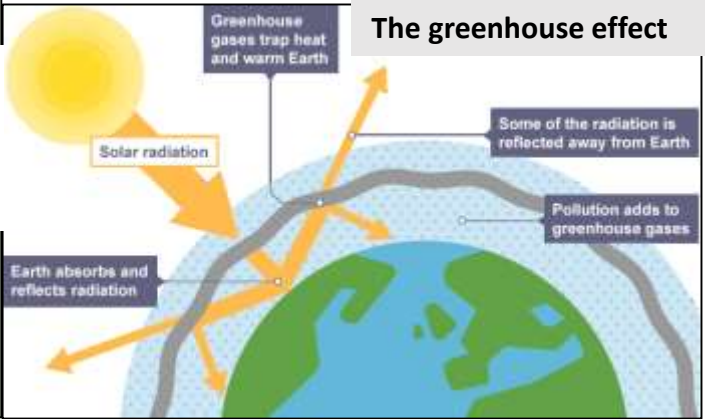
**Natural causes of climate change:**  
Volcanic eruptions, Sunspots, Milankovitch cycles



**Evidence** for past climate change is:  
Tree rings, pollen records, historical records, ice cores

### Human causes of climate change:

- burning fossil fuels in industry and transport
- agriculture
- energy production
- deforestation



Which all release greenhouse gases such as carbon dioxide and methane. This contributes to the **enhanced greenhouse effect**.

### Impacts of climate change world wide

- Retreating glaciers
- Reducing crop yields (food shortages)
- Rising sea levels

### UK's climate affected by climate change:

- Less snow in Scotland so reduced tourism
- More flooding in the east of England due to sea level rising
- More rainfall/flooding in places like Sheffield due to more evaporation
- Heatwaves



### Ways to reduce the impact of climate change

- Renewable energy
- Government agreements

## Tropical Storm Key words

**Track** – the path (e.g. of a tropical storm)

**Frequency** – the number (e.g. of tropical storms)

**Distribution** – where something is

**Eye wall** – the area immediately outside the eye of the hurricane associated with tall clouds, heavy rainfall and high winds

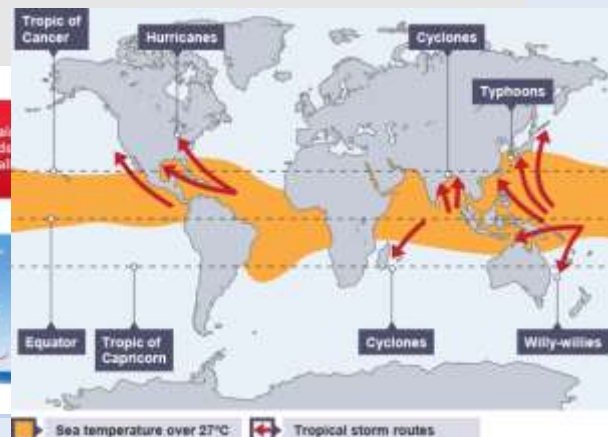
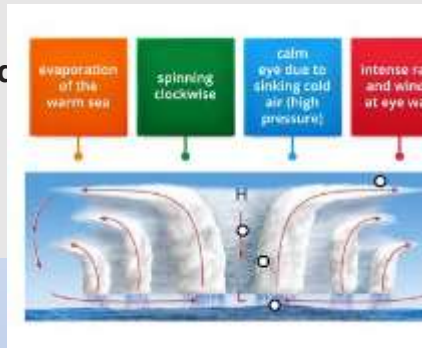
**Diameter** – a straight line passing from side to the centre of something (e.g. a tropical storm)

**Magnitude** – the size/extent of something (e.g. tropical storm)

**Storm surge** – a series of large waves caused by storms.

## Tropical storms form

- Between 5° and 30° latitude
- **Ocean temp** of 27°C
- **Winds** cause the storm to spiral (Coriolis effect)



## Case studies: Tropical Storms

### Hurricane Irma, USA. Developed country

**Causes of tropical storm:** warm wet air rising (low pressure), Coriolis force causing the air to spin, warm oceans 25-27°C. 100mph winds

#### Impact of tropical storm:

1.2 million people affected  
Power was cut off  
\$70 billion of damage.

**Responses/management:** 10,300 people provided temporary housing  
Emergency shelters were opened up and schools were closed

### Typhoon Haiyan, Philippines, Developing country.

**Causes of tropical storm:** winds of 313 km/h. In some areas, 281.9 mm of rainfall was recorded, storm surges of up to 7 m in height battered the coast.

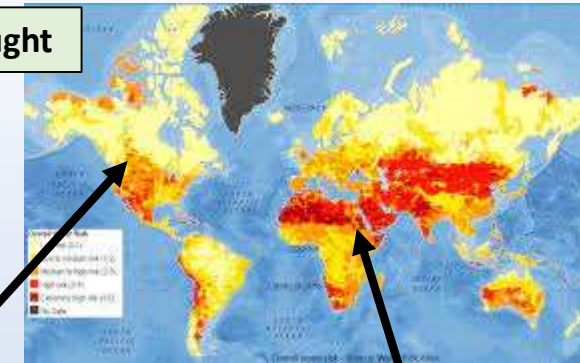
#### Impact of tropical storm:

\$5.8 billion (£3.83 billion).  
Six million workers lost their sources of income.  
Tacloban's city airport was severely damaged  
300,000 fishing boats were destroyed  
More than 7,000 people were killed  
1.9 million people were left homeless  
There were outbreaks of disease  
Floods damaged homes and businesses in coastal areas.

#### Response

UK promised to send £32 million in emergency aid

## Case studies: drought



### California, USA. Developed country

**Causes of drought: Hydrological drought-** an unusual lack of water caused by a reduction in water stores (e.g. reservoirs, ground water stores). Water was over abstracted here.

**Impact of drought:** wildfires are regular, subsidence caused by a lack of water in the ground stores below, sea water flows into the empty aquifers, further damaging the fresh water supplies.

#### Responses/management:

Water transfer from nearby Colorado river  
Hose pipe bans  
Desalination (turning sea water into fresh water by treating it). – this is expensive and bad for the environment as the salt is pumped back into the sea which damages marine ecosystems.

### Sudan, Sahel, Developing Country.

**Causes of drought:** meteorological drought – an unusual lack of water caused by a lack of precipitation

Agriculture also wastes water. Deforestation reduces the amount of transpiration.

#### Impact of drought:

Conflict, 8.5 million people affected, most people work in farming – so to lose crops is to lose income, Famine, Typhoid – caused by drinking dirty water

#### Responses/management:

Magic stones – circles of stones are placed on the ground to hold water on the soil rather than let it run quickly across the surface.  
Planting trees – increasing transpiration, creating rain

# Paper 1 Section B Weather Hazards and Climate Change

## Key skills

Integrated skills: (1) Use the line graphs/bar charts to explain how and why global temperature has changed since 1860.

(2) Use the GIS to track the movement of tropical cyclone, can you describe its path?

(3) Use the weather and storm surge data to calculate Saffir-Simpson magnitude. Which is the highest category of tropical storm?

(4) Use of social media source, satellite images and socio-economic data to assess impact. What features of a tropical storm can you see here?

(5) Use the climate chart to describe the rainfall trend in that place.

(6) Use and interpretation of socio-economic data

Extra Q: Using the Saffir Simpson scale to monitor the magnitude of tropical storms. Irma's wind speed was 100mph so what category would it be in?



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WEATHER SAFFIR-SIMPSON HURRICANE WIND SCALE		
CATEGORY	WINDS (MPH)	DAMAGE
1	74-95	SOME
2	96-110	EXTENSIVE
3	111-129	DEVASTATING
4	130-156	CATASTROPHIC
5	157+	CATASTROPHIC

