

Do Now

Presentations

You will now present your extreme weather in the UK work that you completed for homework



Aim

- To understand that climate change is occurring

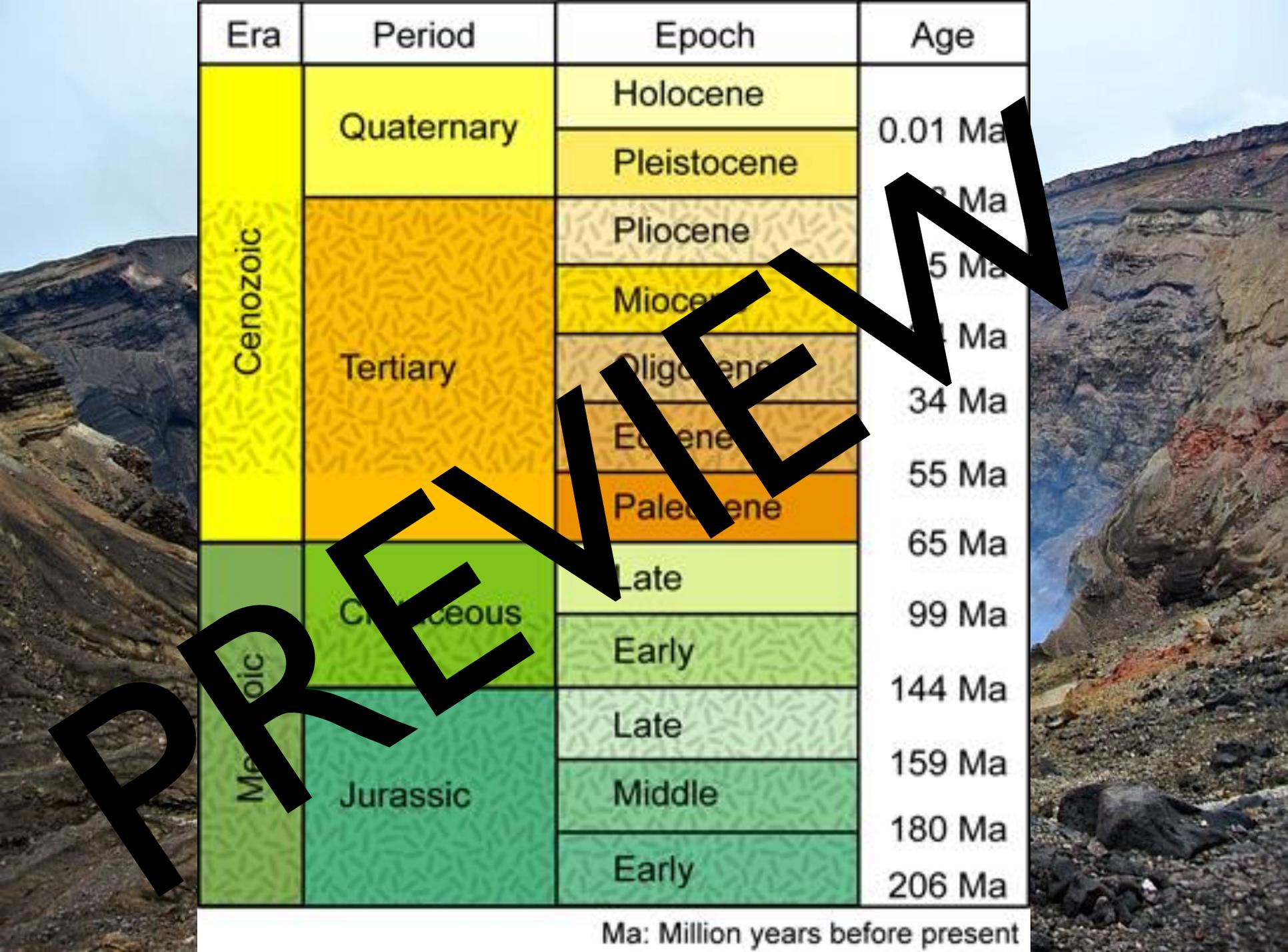
Human and natural reasons for change

I. Copy the definitions below;

- **Climate change** – the large-scale, long-term shift in the planet's weather patterns or average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years. ([Met Office](#))
- **Global warming** – A gradual increase in the **overall temperature** of the earth's atmosphere generally attributed to the **greenhouse effect** caused by increased levels of carbon dioxide, CFCs, and other pollutants. ([Oxford dictionaries](#))
- **Quaternary period** – the current **geological period** dating from 2.6 million years ago to the present day. We live in the Holocene epoch of the Quaternary period, which covers the last 12,000 years since the end of the last ice age.

Era	Period	Epoch	Age
Cenozoic	Quaternary	Holocene	0.01 Ma
		Pleistocene	
	Tertiary	Pliocene	3 Ma
		Miocene	5 Ma
		Oligocene	23 Ma
		Eocene	34 Ma
		Paleocene	55 Ma
		Cretaceous	65 Ma
Mesozoic	Cretaceous	Late	99 Ma
		Early	144 Ma
	Jurassic	Late	159 Ma
		Middle	180 Ma
		Early	206 Ma

Ma: Million years before present



<https://www.youtube.com/watch?v=HGekXQx9dP0>

PREVIEW



Task

What is the difference between global warming and climate change?



Evidence for climate change:

- **Climate has always fluctuated** – during the last Ice Age 10,000 years ago, average temperatures were 9°C cooler than present day.
- The **climate began to warm after the Ice Age** and this trend has continued – however there have been some variations.
- The '**Little Ice Age**' occurred between the **mid 1500s** to around 1800. During this period the glaciers froze regularly. Average sea surface temperatures in the Central Atlantic estimated at 1°C cooler than present average (radiocarbon sediment cores).
- The **medieval warm period between 800 and 1300** was 1°C warmer than today by the same measure. The Vikings used this warm period to settle the ice free shores of Greenland.
- The **Holocene climatic optimum** around 7500-5000 BP was a warm period – minor increases at the equator but up to 4°C average increase at the poles – this led to the spread of vegetation across northern Europe.

The Greenhouse effect

- Carbon dioxide allows short wave solar radiation to pass and warm the Earth.
- This heat is radiated and reflected back by the Earth's surface as longer wave radiation which cannot pass as easily through the greenhouse gases in the troposphere.
- This is the **Greenhouse effect** and is a **natural process which actually makes the Earth habitable**. – we would be about 30°C colder without this effect.
- Greenhouse gases are water vapour, carbon dioxide, CFCs, methane, nitrous oxide and ozone.

Sources of CFCs –

Sources of Carbon Dioxide –

- Sources of Methane -

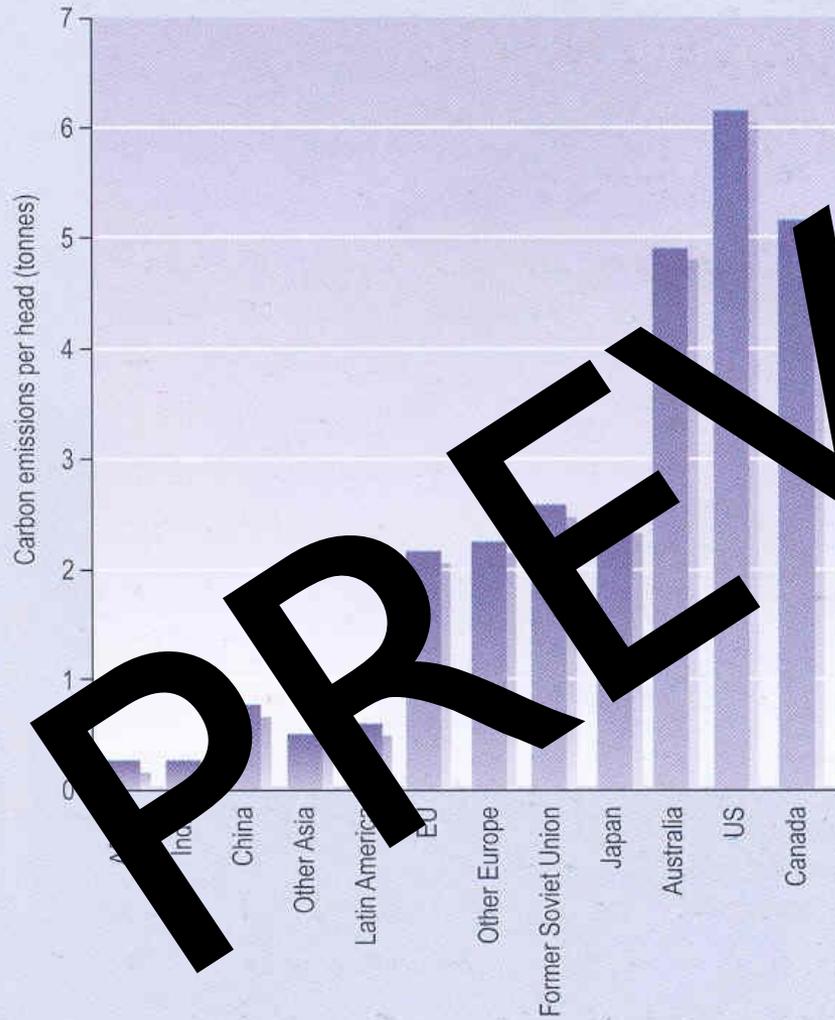
Human influenced greenhouse effect?

- As long as gas concentrations and solar activity remain constant then Earth's temp. remains stable.
- However CO₂ concentrations have increased by 15% in the last 100 years
- Current rate of increase is at 0.4% per year despite international attempts to halt increases.
- This is alleged to have caused an increase in global temperature and hence 'global warming'.

Major causes of emissions

- **Fossil fuel consumption** – burning releases CO₂. The industrialised nations, especially the US have traditionally been worst culprits, however industrialisation of China and India is now a major issue as they fell outside of the Kyoto protocol.
- **Deforestation** – trees act as a carbon sink. Burning them to clear land releases CO₂ and further use of the land for cattle farming releases methane. Particularly a problem in tropical rainforests.

Carbon emission per head

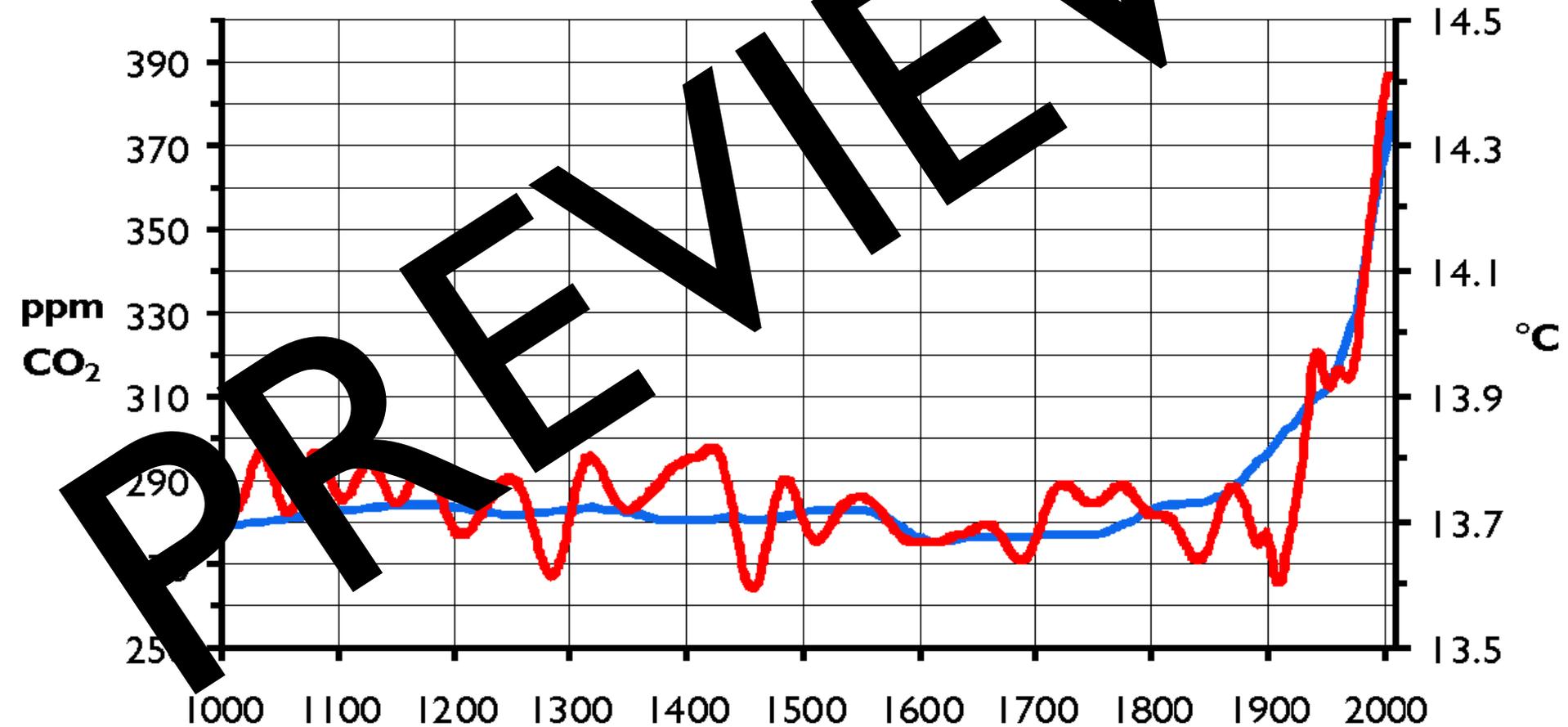


Which countries are making the greatest contribution to climate change?

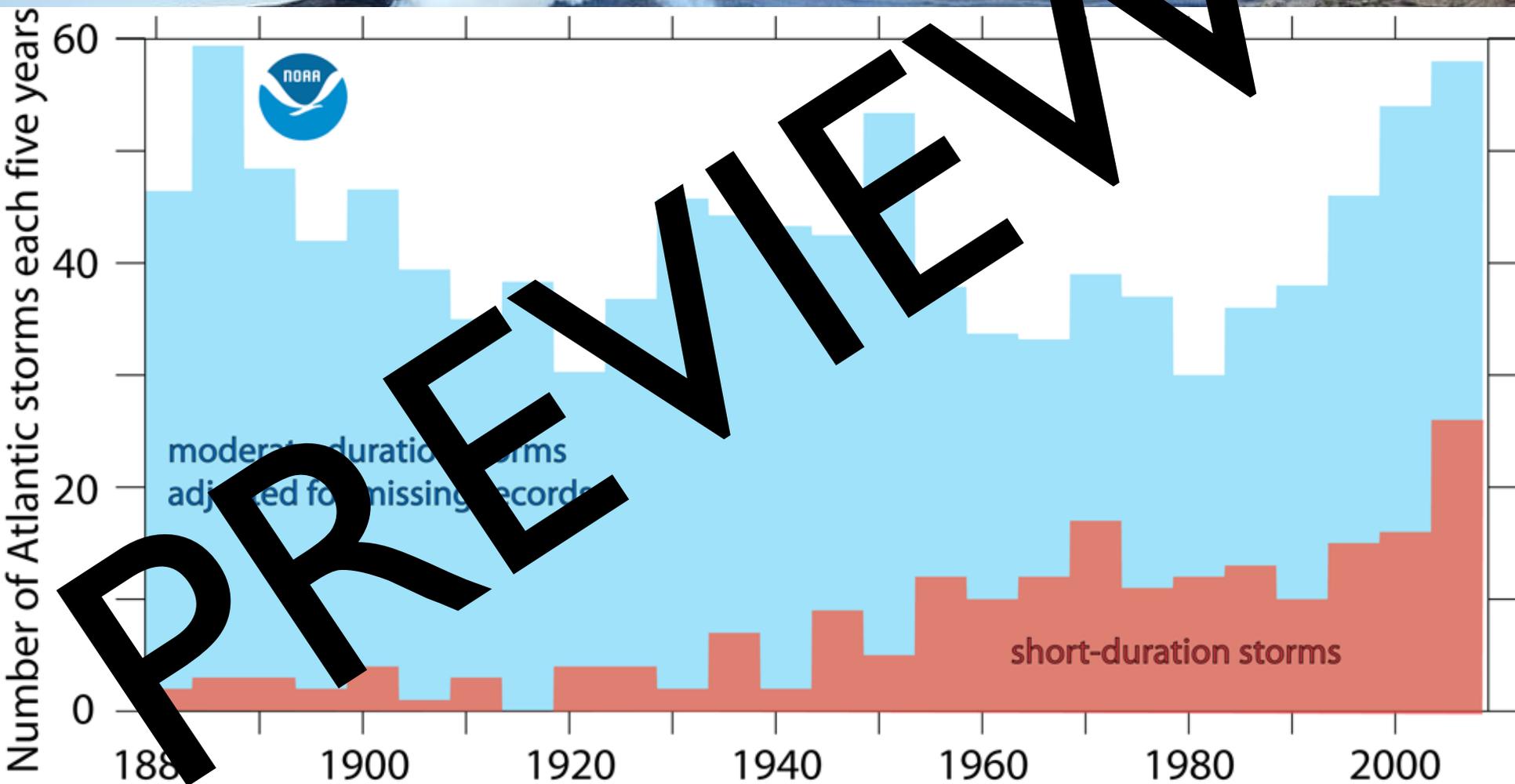
PREVIEW

Ext – Which areas of the world will be most affected by climate change?

Look at the graph below. Describe the trend occurring in the graph. Does this graph provide strong evidence for global warming?



Look at the graph. Describe what is happening to global temperatures



What have we learnt today?

Aim

- To understand that climate changes are occurring

What we will learn next...

- Managing climate change

