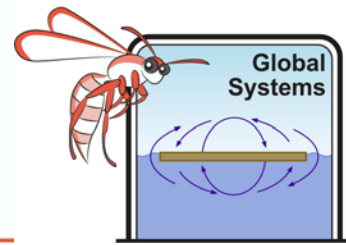


Climate Change and Sea Levels – Teachers Notes



Satellite photographs show us that both Arctic and Antarctic ice is melting at an increasing rate. Ice that was bound up in ice caps, glaciers and sea ice is melting, as is the ice in high altitude mountain glaciers.

Melting ice itself does not directly contribute much to an increase of ocean volume. Ocean water expands because of heat held within the atmosphere.



Using your knowledge of kinetic energy, explain why water expands when it is heated.

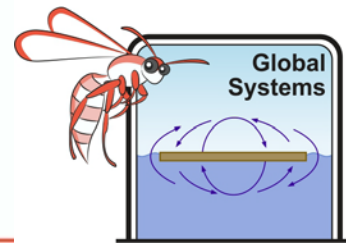
Cold ocean currents flow from the poles and warm ocean currents flow from the equator. Water cycles around the globe in currents mixing and transferring heat. The Global Conveyor Belt distributes heat around the world affecting climate, agriculture and disease control. Anything that interferes with its regular flow can cause problems.

What drives the Global Conveyor Belt, a major group of interacting currents that circle the planet? *Hint: There are two drivers*



Recent flows of cold meltwater from the Greenland Ice Cap are slowing the passage of northward flowing water of the North Atlantic Drift. The "Cold Blob" as it is called is affecting the passage of warmer water. This current from the equator is responsible for keeping most of northern Europe's coastline warmer than it would otherwise be and is very important to agriculture. Farmers near the coast can have crops ready two months earlier than those inland. If the warm current is halted most of northern Europe will experience a climate much like that of Siberia.

Climate Change and Sea Levels – Teachers Notes



Watch the YouTube video, “What the Earth would look like if all the ice melted”. The video only lasts 2m 45s and you will find out what London, Dakar, Calcutta, Miami and Beijing have in common!

In many countries, economic infrastructure such as roads, railways and ports lie at the edge of the ocean. London has already built major barriers to counter the effect of rising sea levels over the last twenty years. Our northern iron ore towns of Port Hedland and Karratha lie on the coast. They were built on the flat coastal plain and already have some defences erected to protect the towns from past cyclonic storm surges. Would it be easy to build these ports further inland?

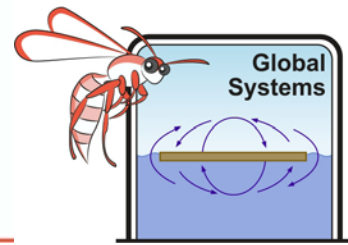


The independent and sovereign Republic of Kiribati is an island nation lying in the Central Pacific to our northeast. It is composed of 33 coral atolls most of which lie less than 1m above sea level. The population depends on their gardens for most of their food supplies and on shallow aquifers for fresh water. Recent storms surges have soaked their gardens in salt water, which killed the coconut palms and papaya trees. Scientists predict that their risk of flooding will have increased 200 times by 2080 if the present rate of temperature increase continues. Most islanders are not rich and cannot afford to build sea defences or desalinate salt water for drinking.

What effects will a slight rise in sea level have on the people of Kiribati?

Should Australia accept these climate change refugees? Explain your answer.

Climate Change and Sea Levels – Teachers Notes



Lose your albedo and you will have lost your cool!

Melting ice from glaciers will also have an effect on Earth's **ALBEDO**. What is "albedo" and how can this change the temperature of our land and ocean?

How can we use the albedo effect to reduce our air conditioning bills without cladding the house in ice?

Barefoot Australian children have used this knowledge to use road crossings and not get hot feet. How did they do this?