

North Wall.

The Question.

Recent years have seen a huge rise in the number of abnormal weather events. These have included droughts, flooding, and even a number of unexpected tornados. Meteorologists agree that these exceptional conditions are signs that Global Climate Change is happening already. Scientists agree that the most likely cause of the changes are man-made emissions of the so-called "*Greenhouse Gases*" that can trap heat in the earth's atmosphere in the same way that glass traps heat in a greenhouse. Although there are six major groups of gases that contribute to Global Climate Change, the most common is Carbon Dioxide (CO₂).

Like our day-to-day weather, climate change is a very complex subject. The media provides us with reports about global warming but it can be difficult to form an objective opinion when other scientists put forward what look like opposing views.

What we need to understand is that these views are just other climate change scenarios and nothing is set in stone. The latest thinking is that the world is warming up, but how this will affect us in the future is difficult to qualify. All scientists agree that the world is warming- the debate is centred on how much is due to human activity.

SOUTH WALL.

WHAT IS GLOBAL WARMING ?

The weather elements at a given location will vary from day to day and from year to year, but generally are expected to remain within set limits over a long time period. This is known as our climate. This natural variability ensures we have cold and warm years.

When we talk about global warming, we talk about the 'greenhouse effect'. This is actually a natural and essential feature of our atmosphere without which our planet would be uninhabitable. This process works by the principle that certain atmospheric gases, (or greenhouse gases) allow short wave radiation from the sun to pass through them unabsorbed, while at the same time absorbing some of the long wave radiation reflected back to space. The net result; more heat is received from the sun than is lost back to space, keeping the earth's surface some 30 to 35C warmer than it would otherwise be.

EAST WALL.

HUMAN INFLUENCE

The problem is that man is adding to and changing the levels of the gases responsible for the greenhouse effect and is therefore enhancing this warming.

Globally 1998 was the warmest year ever recorded and eight of the ten warmest years fell in the last decade. Global ice sheets have decreased, so has global snow cover. During the earth's history there have been warmer periods, millions of years ago. However this is the most rapid rise in temperature since the end of the last ice age. So evidence is mounting that we, mankind are affecting the global climate, and the current warming has exceeded the natural fluctuations.

Carbon dioxide (CO₂) is the gas most significantly enhancing the greenhouse effect. Plant respiration and decomposition of organic material release more than 10 times the CO₂ than released by human activities, but these releases have generally been in balance during the centuries leading up to the industrial revolution. Since the industrial revolution amounts have increased by 30%. Other greenhouse gases include Methane, Nitrous oxide, CFC's (manmade) and Ozone. One major problem is that these gases can remain in the atmosphere for decades.

WEST WALL

THE PREDICTIONS

The combustion of fossil fuel (oil, natural gas and coal) by heavy industry and other human activities, such as transport and deforestation, are the primary reasons for increased emissions of these gases.

So far model simulations point to global temperature rises of approximately 3 degree C in the next 100 years, which doesn't sound much. Consider however that the difference between average global temperatures now and the last ice age (not strictly correct but sounds better!) some 20,000 years ago is only around 6 to 8C.

Climate models also predict changes in rainfall and continued rise in sea level. Sea level rises will be due to thermal expansion of the ocean along with the melting glaciers and mountain snow and ice. The best estimate is 50cm by 2100, but this will vary considerably with location. Think about Bangladesh where 37% of the land lies below 3 metres and the effect of storm surges.