

More on Natural Feedbacks.

As the temperature rises this of itself brings into play natural phenomena which may either increase or reduce the change in the atmosphere. These effects are called feedback effects (or feedbacks). There is a great deal of carbon, CO_2 and other greenhouse gases which are currently locked up in the environment but the rising temperature may well destabilise these giving rise to the natural release of additional greenhouse gases. The atmosphere contains about 2,500 billion tons of CO_2 , this figure should be borne in mind when considering the numbers which follow.

We have previously mentioned the problem of CO_2 locked in the frozen Tundra. There is about 4,500 billion tons of CO_2 locked into tundra and peat bogs. Rising temperatures is likely to increase the release of this. The temperature in Alaska, one of the regions of extensive permafrost, has already risen by $6^\circ C$ leading to extensive thawing of the frozen ground. Some recent research has also suggested that rising CO_2 levels in the atmosphere also rather surprisingly cause an increased rate of emission.

There are huge quantities (120,000 billion tons) of CO_2 dissolved in the Oceans rising temperatures reduce the solubility of water for CO_2 so that this is another source of potential feedback.

As well as CO_2 there are also problems with methane, which is a very much more powerful (55 times more) greenhouse gas than CO_2 . Methane is also produced by the decomposition of plant material and of its residues in the soil. Raising the temperature is likely to increase the production of methane. In addition there is the methane locked in the form of methane hydrates on the sea bed, there is a great deal of this (how much??); rising sea temperatures may reach the point where these become un-stable releasing huge additional quantities of methane into the atmosphere.

Yet another potential major feedback is the problem of rising temperatures causing the forests to die. Each species of tree can only survive at temperatures within a limited range. Raising the temperature may well cause extensive areas of temperate forest to die (and then to burn) releasing a further load of CO_2 into the atmosphere.

No-one knows either at what temperature or to what extent these potential feedbacks will cut in, but the gut feeling of many climate scientists is that many of these effects may already have started and that if they really take off it will be very difficult or impossible to stop them.

That is why:-

"It ***IS*** time to panic".

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