



SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH (SCAR)

Press Release

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ANTARCTICA, RAPID CLIMATE CHANGE AND SEALEVEL RISE

During the Antarctic Treaty Consultative Meeting the international Scientific Committee on Antarctic Research (SCAR) drew attention to new findings on rapid climate change in Antarctica, and implications for coastal populations.

Professor Chris Rapley, President of SCAR, reminded the meeting that earlier this year the Intergovernmental Panel on Climate Change, in their latest 5 yearly report, had agreed that it now seems unequivocal that the world is warming due to the burning of oil, gas and coal, which adds carbon dioxide to the atmosphere. The atmosphere already contains small amounts of this odourless, colourless gas, which acts like the glass in a greenhouse by preventing radiation from the Earth's surface from escaping to the stratosphere. This 'greenhouse effect' is quite natural and thankfully from the human perspective keeps the earth around 30 degrees centigrade warmer than it would otherwise be. However, common sense shows that adding to the carbon dioxide in the atmosphere by burning fossil fuel strengthens the greenhouse effect, making the planet warmer still. Since 1900 the Earth has warmed by around 0.7 degrees centigrade. This global warming signal is not distributed uniformly. It is massively amplified in the polar regions, where increases of up to 5 degrees centigrade in the past 50 years are not uncommon, notably in the Antarctic Peninsula (which is the part of the continent closest to the tropics). The rest of Antarctica, which is closer to the pole, has remained cool.

This recent warming has led to the retreat of 87% of the glaciers in the Peninsula, and the collapse of several floating ice shelves. Those ice shelves formerly buttressed glaciers discharging into the Weddell Sea, which have now speeded up as a result. Professor Rapley also noted that glaciers discharging from West Antarctica into the Amundsen Sea have also speeded up.

More rapid glacier flow supplies more icebergs to the ocean. Melting and glacier retreat supply more water to the ocean. Both processes therefore contribute to a slow rise in sealevel. Sea level is also rising because the ocean is becoming warmer and hence expanding. The rise in sealevel from these various causes was around 2 millimetres per year for much of the last century. It has now speeded up to 3 millimetres per year. Bearing these various points in mind the Intergovernmental Panel on Climate Change (IPCC) forecast a rise in sealevel of just under one metre by the year 2100. However, Professor Rapley noted that that forecast was based on an inadequate understanding of the way in which ice sheets can decay not just by melting, but also through mechanical break up. He noted that several of the IPCC's forecasts anticipated that the continuing rise in carbon dioxide in the atmosphere would cause a rise of 2 degrees centigrade in global temperature in the next 100 years, and observed that the last time global temperatures were that high, 125,000 years ago, sealevel rose to 2 to 4 metres above present levels. He suggested that bearing in mind the evidence from the past, and the fact that our present models of ice sheet degradation were inadequate, we could be looking at a 2-4 metre rise in sealevel over the next 100

years. Such a change would pose significant problems for the 25% of the world's population that lives within 50 kilometres of the coast, especially those living in coastal megacities, including London.

Professor Rapley declared himself a techno-optimist, and drew attention to several means by which we could reduce our reliance on fossil fuels, and to mechanisms for carbon dioxide sequestration from power plants, all of which would stabilise emissions of this gas at present levels. If we were not able to do so, then all countries would find themselves living in a world very different from that of today. Nobody is immune from the problem; it is not a national matter. The costs of addressing the problem collectively now would be significantly less than the costs of trying to remedy the problem later when it had reached crisis proportions.

Finally he reminded attendees that the gradual accumulation of small changes caused by global warming might well lead to a tipping point beyond which the rate of change in ice sheet decay and sealevel rise might increase significantly. Anything we could do to avoid such a rapid shift would seem worth doing.

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