

Book Reviews

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Climate Change 2001: The Scientific Basis. Contribution of Working Group 1 to the Third Assessment report of the Intergovernmental Panel on Climate Change.

JT Houghton, Y Ding, DJ Griggs, M Noguer, PJ van der Winden, X Dai. Cambridge: Cambridge University Press, 2001, pp. 881, £34.95 (HB) ISBN: 0-21-01495-6; £90.00 (HB) ISBN: 0-521-80767-0.

This authoritative report builds on past assessments and summarizes new results from the past 5 years of research on climate change. It represents the views of many hundreds of scientists from countries who participated in its preparation and extensive review. For those public health professionals who are interested in the impacts of climate change on biological and geophysical systems, as well as on human health, the report of Working Group 2 may be more relevant. However, for those who want to learn more about the science underpinning our understanding of the climate system and how it is responding to increasing concentrations of greenhouse gases in the atmosphere, this report is obligatory reading.

Science has progressed considerably since the release of the Second Assessment Report in 1996 and the panel makes a number of important conclusions. Over the 20th century the increase in global average surface temperature has been $0.6 \pm 0.2^\circ\text{C}$. This is substantially larger, by about 0.15°C , than that estimated in the Second Assessment Report, owing to relatively high temperatures that were experienced in the subsequent years and improved methods of data processing. It is now very likely that the 1990s was the warmest decade since 1861 when instrumental recording began. Perhaps even more importantly, the increase in temperature in the Northern Hemisphere in the 20th century is likely to have been the largest of any century during the past 1000 years. Snow cover and the extent of ice have decreased and there has been widespread retreat of mountain glaciers in the non-polar regions during the 20th century, accompanied by about a 40% decline in Arctic sea ice thickness during late summer to early autumn in recent decades. As a consequence largely of thermal expansion of oceans, average sea level rose between 0.1 and 0.2 m during the 20th century.

Changes in climate are not restricted to temperature, and rainfall has increased over most mid and high latitudes of the Northern Hemisphere continents, together with a somewhat smaller increase in rainfall over tropical land areas, although in

the sub-tropics there appears to have been a decrease in rainfall. Over the 20th century there were relatively small increases in global land areas experiencing severe drought or severe wetness. Much of this may have been due to the more frequent, persistent and intense episodes of the El Niño Southern Oscillation phenomenon over the last 25 years or so compared with the previous 100 years. Nevertheless, some aspects of climate have not changed, such as the frequency of tornadoes, thunder days or hail events.

The panel documents how human activities have resulted in increasing concentrations of carbon dioxide and other greenhouse gases, largely due to fossil fuel burning. The present atmospheric concentration of carbon dioxide has probably not been exceeded during the past 20 million years. Worryingly, temperature increases projected over the period up to 2100 are likely to be greater than those in the Second Assessment Report and a range of 1.4 to 5.8°C is given, based on a range of assumptions about economic and population growth, and a number of climate models. Many greenhouse gases are long-lived in the atmosphere and therefore have a lasting effect on climate, which may span several centuries. Thus our decisions will have repercussions for many future generations.

This book is extensively referenced and accessible to non-climatologists. It provides potent evidence for a precautionary approach extending well beyond the targets agreed by the industrialized nations under the Kyoto protocol. Unfortunately, it seems that future generations will look back and wonder why contemporary policymakers did not act more vigorously to reduce greenhouse gas emissions. In summary, this is an important book which deserves to be more widely read, and acted upon.

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Also received:

Climate Change 2001: Impacts, Adaptation, and Vulnerability: Contribution of Working Group 2 to the Third Assessment Report of the Intergovernmental Panel on Climate Change.

James T McCarthy, Osvaldo F Canziani, Neil A Leary, David D Dokken and Kasey S White. Cambridge: Cambridge University Press, 2001, pp. 1042, £34.95 (PB) ISBN: 0-521-01500-6; £90.00 (HB) ISBN: 0-521-80768-9.