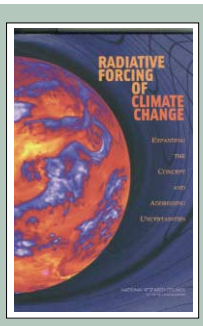
Book reviews



Radiative forcing of climate change: expanding the concept and addressing uncertainties

By the National Research Council (NRC)
National Academies Press,
Washington DC, USA, 2005
207 pp.
Paperback £22.99

This is a thorough, interesting and well-presented discussion of the state of knowledge and uncertainties concerning radiation in the climate system and how this is likely to affect future climate change during the current century. The book is divided into several coherent and well-contained sections: 'State of scientific understanding', 'Radiative forcing over Earth's history', 'Rethinking of the global radiative forcing concept', 'Uncertainties associated with future climate forcings', 'Research approaches to furthering understanding' and 'Recommendations'. An exhaustive reference list, brief biographical sketches and useful glossary follow at the end, together with the NRC Committee's 'Statement of task' which would have been better placed at the beginning of the book. The book is well-illustrated with some attractive colour maps and graphs that help explain the scientific concepts. The general message of the book is that the existing concept of radiative forcing (i.e. global mean top of atmosphere) widely used in climate models is too simplified and needs a radical overhaul to include such factors as the vertical structure and regional variation of radiative forcing. Non-radiative forcings, including modifications of the water cycle and vegetation by aerosols, land-use and land-cover changes, also urgently need more attention. For example, a recent global climate modelling study suggests that phytoplankton discernibly warm the global ocean surface through their effect on albedo. The book surmises that post-industrial aerosol forcing may have offset 50–75% of greenhouse gas forcing; yet the clearly (forgive the pun!) identified global dimming now seems to have reverted to a global brightening for the past decade or so (Wild *et al.*, 2005). It is indeed ironic that improving air pollution controls might have exacerbated the global warming problem! Climate models need to be improved to better represent interactions of aerosols with clouds, and land–atmosphere interactions. However, this is no mean task, as even fundamental parameters, such as emissions, chemical composition and variety of aerosols, remain poorly known. Monitoring solar radiation through a succession of satellite sensors over 25 years has not yet yielded sufficiently accurate data to answer the question of long-term solar variation (above and beyond the 11-year sunspot cycle). There are similar uncertainties regarding satellite soundings of troposphere temperatures. The presentation of material is rather detailed in places, and despite being pretty up-to-date certainly manages to convey the complexities – and our limitations of understanding – of some of the climatic feedback mechanisms! Nevertheless, it is only through adequately tackling observational and modelling challenges to answer questions like those above that we will be able to better attribute causes, and consider implications, of decadal-to-centennial timescale climate change.

Reference

Wild M, Gilgen H, Roesch A, Ohmura A, Long CN, Dutton EG, Forgan B, Kallis A, Russak V, Tsvetkov A. 2005. From dimming to brightening: decadal changes in solar radiation at Earth's surface. *Science*, **308**: 847–850.

Edward Hanna

doi: 10.1002/wea.8

Weather – spectacular images of the world's extraordinary climate

By Storm Dunlop

Cassell Illustrated, London, 2006

288 pages with over 250 colour images
Hardback £30.00.

ISBN 1-84403-395-3

Never judge a book by its cover. Or so the saying goes, but in this case, I think it is fair to do so. The cover mentions 'spectacular images' and 'weather' and is placed on top of the image of a lightning strike.

When I see a book like this, I just have to open the cover to see what amazing gems it has inside, and I was not disappointed. Pictures of ice-crystals, Arctic sea smoke, weird and wonderful clouds and optical phenomena leap out of the page to a chorus of "ooh" from anyone close enough to see. This book is one to show off to your friends.

The book is split into nine themes, grouping the images into weather types (showers, visibility, cold etc.), climates and optics. Alternatively, you can find your favourite image in the index at the back where there is also a glossary explaining some of the technical terms used in the book. The climate sections are not just pictures of sand dunes and ice caps, although these are here, too. There are pictures of things that have the potential to contribute to a change in the climate – paddy fields, termite mounds and erupting volcanoes.

You don't need to be a meteorologist to appreciate this book. Each picture is accompanied by a title and a paragraph of explanation. The pictures vary in size from a quarter-page to the full, double-page spread; and no page, apart from the index, is

The National Research Council (NRC) is an American nonprofit, non-governmental organization.Â The National Research Council performs its studies and workshops through seven major divisions; Division of Behavioral and Social Sciences and Education, Division of Earth and Life Studies, Division of Engineering and Physical Sciences, Health and Medicine Division, Policy and Global Affairs Division, Transportation Research Board, and the Gulf Research Program.[12]. The NRC is currently[when?] administered jointly by the National Academy of Sciences (NAS), the National Academy of Engineering (NAE), and the National Academy of Medicine (NAM), and its work is overseen by a Governing Board and a Washington, D.C., was the most gentrified city by percentage of eligible neighborhoods that experienced gentrification; New York City was the most gentrified by sheer volume. Neighborhoods were considered to be eligible to gentrify if in 2000 they were in the lower 40 percent of home values and family incomes in that metropolitan area.Â Measuring gentrification and displacement is fraught with controversy, since people who are impacted by the economic and social transition of their neighborhoods feel the disruption of community ties directly. This study measured gentrification and displacement using empirical methods and data, which has its own flaws and limitations. The National Research Council was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of further knowledge and advising the federal government. The Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. Chairs. 1916-18, George Ellery Hale. Publisher. Washington, DC : National Academies Press. Collection. inlibrary; printdisabled; internetarchivebooks.Â 1 online resource (xiv, 207 pages) : Includes bibliographical references (pages 159-190). Print version record.Â Associated-names. National Research Council (U.S.). Committee on Radiative Forcing Effects on Climate. Boxid. IA1909213.