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BOOK REVIEW

The Climate Crisis: An introductory guide to climate change

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Cambridge University Press 2010, 249 pp Hardback ISBN 978-0-521-40744-1, $90;
*Paperback 978-0-521-*73255-0, $29.9

Human-induced climate change, sometimes called "global warming" has, unfortunately, become a "hot' topic, embroiled in controversy, misinformation, claims and counter claims. It should not be this way because there are many scientific facts that provide solid information on which to base policy. There is a very strong observational, theoretical and modeling base in physical science that underpins current understanding of what has happened to our climate and why, and what the prospects are for the future under certain assumptions. Moreover, these changes have impacts on the environment and human society which are apt to grow. To avoid or reduce these impacts and the economic and human effects of undesirable future climate change requires actions that are strongly opposed by vested interests in the status quo, some of whom have funded misinformation campaigns that have successfully confused the public and some politicians, leading to paralysis in political action. Without mitigation of climate change, one would suppose that at least we would plan sensibly for the changes already happening and projected, but such future adaptation plans are also largely in limbo. The implication is that we will suffer the consequences.

All of these aspects are addressed in this informative and attractive book which is written for a fairly general but technically informed reader. The book is strongly based upon the 2007 Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) and therefore has a solid scientific basis. Many figures, graphs and maps come from the three IPCC Working Group reports, although the captions often do not explain the detail shown. Given the nearly 3000 IPCC pages, to distill the material down to 249 pp for a complex subject is no mean task and the authors have succeeded quite well.

The organization of the book follows the IPCC reports by dealing firstly with the physical science: the agents of change, the observed changes in climate, the roles of snow and ice, and oceans, the paleoclimate perspective, and prospects for the future. The impacts chapter details effects of climate change on plants, animals and humans, our ability to adapt to the changes and how effects are compounded by other human activities, such as managed landscapes. It discusses vulnerability and how loss of a favorable environment adversely affects ecosystems potentially leading to loss of biodiversity as the resilience thresholds for species are exceeded. Water and food security are dealt with along with regional aspects of climate change. Options for avoiding or reducing climate change, such as energy efficiencies, changing the mix of fuels, and renewable energy, are succinctly dealt with before discussing climate policy. Each chapter opens with a summary of what it is about and concludes with an excellent discussion of the main findings and their implications. The book mostly follows the IPCC approach of being policy relevant but not policy prescriptive while pointing out some fairly obvious conclusions and major challenges. It is balanced in explaining what is known with confidence and what is not, and the uncertainties.

Although the book is a lot more readable than the full IPCC reports, and therefore valuable, a lot of concepts are assumed known and several are not well introduced. Examples include climate "forcing", the boundary layer, scattering of light by aerosols, the cause of the urban heat island, and climate modeling.

It belatedly notes that "climate is not just temperature" and misses the opportunity to adequately link global warming (heating), referred to as "radiative forcing" by IPCC and the book, to evaporation, precipitation and the hydrological cycle. Natural variability is dealt with and El Niño Southern Oscillation (ENSO) is called out, but other important patterns of natural variability are, unfortunately, skipped over yet deserve emphasis to forestall expectations of relentless warming year after year.

Although published in 2010, the material stems from prior to early 2008, and thus no consideration is given to "climategate" or the failure of negotiations in Copenhagen in December 2009. Moreover, spurious decadal variations in ocean heat content are now understood to arise from erroneous assumptions in fall rates of expendable bathythermographs , and loss of oxygen and increasing dead spots in the ocean were not included in the ocean chapter (but are mentioned briefly in the impacts chapter). Occasionally a first person style intervenes but on the whole the book is well written and I found only a few minor errors. This book should be read by anyone interested in climate change but who does not have the time or commitment to read the IPCC reports.

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