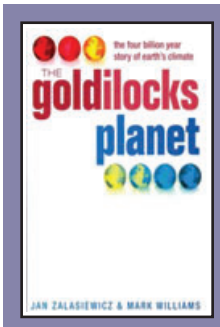

The Goldilocks Planet: The Four Billion Year Story of Earth's Climate

Jan Zalasiewicz and Mark Williams
Oxford University Press, 2012
Hardback £16.99
336 pp
ISBN 978-0199593576

Geologists are reported to be particularly dismissive of the anthropogenic influence on climate. In a recent survey, only 47% of economic geologists said they thought human activity was a significant contributing factor in changing mean global temperatures, compared to 82% of Earth scientists overall (Doran and Zimmerman, 2009). For this reason, I was initially hesitant when invited to review *The Goldilocks Planet*, which was written by two geologists. Fortunately, my hesitation turned out to be unwarranted.

The book provides an informative commentary on the history of Earth's climate, from the birth of the planet to the present day. This is a formidable achievement. Indeed, the authors themselves calculate in the prologue that in order to describe nearly five billion years of history in a 90 000-word book, each word has to represent 50 000 years. Despite this challenge, the book is comprehensive and readable. The central message is that the benign climate of the Holocene is unusual in the geological record, and is not guaranteed to last in perpetuity. Technical descriptions of eukaryotes and mass-dependent fractionation are interlaced with entertaining anecdotes about the personal lives of the scientists. For example, on page 270, Bunsen is said to have missed his own wedding because he was too busy working in his laboratory.

Tabloid-style metaphors abound throughout the book. Readers with a science background might feel they are over-used, and even general readers might feel underestimated in places. For example, we are told that foraminifera are up to a thousand times larger than bacteria, but do we really need to be told that this is more than the difference in size between a person and the Empire State Building (page 113)? Or that a particular extinct genus of mammal looked like a hippopotamus retouched by Walt Disney (page 88)? Or that reconstructing the climate of the distant past is like reading a burnt copy of *War and Peace* (page 21)?

Meteorologists might take exception to a couple of the passages. The British weather prediction centre is referred to as the 'Hadley Centre' (page 141), not the Met Office. Heat is said to be redistributed around the Earth's surface by 'convection' (page 10), but meteorologists would probably refer to advection and eddy diffusion, reserving 'convection' for vertical buoyancy-driven transport. The statement that the European heat wave of 2003 cannot unequivocally be attributed to climate change (page 255), although strictly true, is to my mind missing a qualifying statement that human influence may have doubled the risk of such a heat wave (Stott *et al*., 2004). Finally, Bunsen's first name was Robert, not Joseph (page 12).

On balance, these minor problems are outweighed by the book's enormous scope and impressive clarity. I would recommend this book to anyone who is interested in learning about the evolution of Earth's climate on geological timescales

References

Doran PT, Zimmerman MK. 2009. Examining the scientific consensus on climate change. *EOS* **90**(3): 2–23.

Stott PA, Stone DA, Allen MR. 2004. Human contribution to the European heatwave of 2003. *Nature* **432**: 61–614.

Paul Williams

Climate Forcing of Geological Hazards

Bill McGuire and Mark Maslin
Wiley-Blackwell, 2013
Hardcover £75
326 pp
ISBN 978-0470658659

Earth science involves overlapping disciplines, and that is what this book is about. The trigger is the increase of heat in the atmosphere and ocean, but the result may be increased volcanic activity and other lithospheric disturbances. Apart from the first two chapters (setting out the long-term changes in the atmosphere), and one chapter about the ENSO phenomenon, there is precious little mainstream meteorology here. It is more about how the warming of the atmosphere and ocean is changing the lithospheric processes (volcanoes, subaerial and submarine slope instabilities, stability of methane clathrates, etc). As such, the book will appeal to meteorologists having an interest in geology, but I urge those not having that interest to examine this book, so as to explore the effect of climatology on other Earth Sciences. I would wish for a similar, but slimmer, book (or an additional chapter in this book) describing emissions from volcanoes, which have such a huge effect on absorption of solar energy.

Technically, the book is very similar to *Understanding the Earth System* (reviewed in February 2013's *Weather*) and should be very durable. A copious bibliography is included at the end of each chapter, and a comprehensive index at the end of the book.

Useful webpage: http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0470658657.html

Martin Hutchins

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helen.roberts@metoffice.gov.uk.

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