



## REVIEW

### *Global Weirdness: Severe Storms, Deadly Heat Waves, Relentless Drought, Rising Seas, and the Weather of the Future*

by Climate Central

New York: Pantheon, 2012. 240 pages

reviewed by **Anne U Gold**

With an average temperature of 12.9°C (55.3°F) for 2012, the National Oceanic and Atmospheric Administration (NOAA) recently announced that 2012 was officially the warmest year on record in all contiguous 48 states based on 118 years of temperature records dating back to 1895. The year was also notable for droughts in the Midwest, destructive wildfires in the West, and Hurricane Sandy in the Northeast. Americans across the nation are experiencing these changing weather patterns and the associated extreme events—patterns that have been predicted by climate scientists as a result of increasing carbon dioxide concentrations in the atmosphere.

The evidence is convincing, but many struggle when asked to explain climate change in simple words or have difficulty holding their ground in discussions with climate change deniers. The book *Global Weirdness*, produced by Climate Central, a non-partisan, non-profit organization of leading scientists and journalists, was written to address these situations. It explains the basic climate system, the greenhouse effect, and the consequences of a changing climate, as well as solutions and adaptation strategies, in sixty simple, easy-to-understand, and concise essays. Most are two to three pages long with compelling titles like “Carbon dioxide is like a planetwide sweat suit (sort of).” The authors of the book, Emily Elert and Climate Central’s staff science writer Michael Lemonick, lay out the current state of knowledge about climate change, with explanations of the underlying science based on peer-reviewed publications and reports. The scientific facts were checked by five Climate Central staff scientists and twenty-two outside scientists with expertise spanning the breadth of climate science.

The book, including its title, was inspired by Thomas Friedman’s 2010 *New York Times* column “Global weirding is here,” in which he encouraged the scientific community to produce a report about the reality of climate change that could be titled “What we know” and that was accessible to sixth graders. Climate Central has taken on this task, and the result is impressive. The authors have deliberately chosen a non-alarmist tone (the subtitle “Severe Storms, Deadly Heat Waves, Relentless Drought, Rising Seas and the Weather of the Future” is probably among the most alarmist phrases in the book).

The authors avoid jargon and explain technical terms (“anthropogenic climate change, from the Greek words for ‘man’ and ‘caused’”) and processes in an easy-to-understand way, using simple comparisons. For instance:

To understand the difference [between weather forecasting and climate modeling], think about trying to predict whether a coin flip will come up heads or tails. It's impossible to do that for a single flip (which is something like the weather forecast for next month). But you can safely predict that if you repeat the coin toss a thousand times, you will get about five hundred heads and five hundred tails. (p 127)

Similarly, the authors use plain language and references to people's lives (ocean acidity is likened to carbonated soda drinks). Facts are not cited in the text, and instead a twelve-page reference list is included. Only in a few key places do the authors directly cite the source of their information, like John Tyndall's work which proved the existence of a greenhouse effect in the late nineteenth century, or key reports like the National Research Council's *America's Climate Choices*.

The authors are cautious in their presentation of material about which climate scientists are not certain; they explain the reason for the uncertainty, making the facts that scientists do know even more convincing. Occasionally, their non-alarmist language feels somewhat out of place given the dramatic content the authors are describing. However, the choice to avoid bias will likely serve the book well and allow it to actually be used in sixth-grade classrooms. The book is not a call to action but a great introduction to the facts around climate change.

The sixty short essays are organized in four sections, starting with the background "What the science says," containing chapters on past climate change, the greenhouse effect, misconceptions about the ozone hole, the role of the sun and volcanoes, ocean acidification, and sea level rise, among others topics. Using a similarly careful, well-researched style, the authors turn in the second section to "What's actually happening" and describe present CO<sub>2</sub> levels compared to the geological past, a sea level rise of 20 cm (8 inches) since 1900, a temperature increase of 0.7°C (1.3°F) since 1900, increased growing seasons, extreme weather events, and coral bleaching, among other measurable impacts. The section "What's likely to happen in the future" starts out with an explanation of climate modeling and its strengths and limitations, and then discusses sea level rise predictions, storm surges, hurricanes (likely to be fewer but more powerful), health effects (such as deaths due to heat waves and respiratory problems because of ultraviolet concentrations), species extinction, fresh water and food scarcity, and related security issues, among other topics. The last section is solution-oriented ("Can we avoid the risks of climate change?"), adding some hope after the previous discussion of our changing climate. The authors summarize different renewable energy sources and discuss nuclear energy, ethanol fuel, and carbon sequestration (unfortunately, they use the popular euphemism "clean coal" even though there is no such thing as clean coal), before discussing carbon taxes and futuristic technologies to address global warming. The book finishes off with an epilogue that explains the Intergovernmental Panel on Climate Change (IPCC), its statute, its mission, the working groups, and the review process.

The authors don't shy away from placing famous controversial topics in the debate about climate change—like the hockey stick graph, stolen e-mails, and mistakes in the IPCC report—into an appropriate context. They also explain in plain language the exact meaning of terms like "global warming" and "climate change," terminologies from the IPCC report (such as "likely"), and why the year 2100 is typically used for climate predictions. They

sprinkle interesting tidbits throughout the book, such as the fact that polar bears were the first animal to be put on the endangered species list just because of future predictions of changes in its habitat (melting Arctic sea ice) and anticipated dramatic consequences for polar bear populations, instead of actual numbers of population reduction.

Unfortunately, the book includes neither a table of contents nor an index, which makes it difficult to use as a reference or for looking up topics as they arise in discussions. The ten figures included in the book are presented with small-font and hard-to-read black-and-white graphics. They form a drastic contrast to the simple and intriguing language of the written text and are a disappointment.

My biggest concern with the book is that it lacks a clear target audience. Climate experts may be unlikely to read the book because it lacks new information, despite the fact that they may be intrigued by the simple explanations of complex topics. Teachers might not use the book in the classroom because it lacks sufficient structure to organize lessons on the topics (such as a table of contents), despite the fact that the material presented is easy to grasp and scientifically robust. And I am skeptical that climate change deniers will pick up this book, despite the fact that the material would challenge their beliefs.

Despite this concern, there is no question that *Global Weirdness* is an interesting read for readers of all ages and backgrounds. The fast-reading chapters are perfect for the bedside (or bathroom); they would make good homework assignments for middle-or high-school students; and if you can get your climate skeptic relatives to read the second section of the book, “What the science says,” that might be a first step towards their rethinking their positions.

In summary, this is an important book that helps the climate science community talk about their work using understandable and compelling language.

### **ABOUT THE AUTHOR**

Anne U Gold completed a doctoral degree in paleoclimatology. The focus of her work is on understanding regional variability of climate patterns and reconstructing Quaternary climate change. She has taught many undergraduate and graduate earth science classes. She is now working in the Education and Outreach Group at the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado, Boulder, on various climate education projects.

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