

## **Dire Predictions: Understanding Global Warming**

Michael E. Mann and Lee R. Kump  
New York: DK Publishing, 2008  
208 pp., \$25.00, paperback  
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**D**ire Predictions is an illustrated guide to the conclusions of the latest global-warming report from the United Nations' Intergovernmental Panel on Climate Change. The U.N. body of 3,000 worldwide scientists won the Nobel Prize in 2007 for their work, sharing it with former U.S. Vice-President Al Gore for his global-warming movie, "An Inconvenient Truth." Like that movie, this illustrated guide is a useful tool for the non-scientist to understand the basic parameters of climate change facts. Its heavy use of attractive graphics will appeal to the younger electronic generation, making *Dire Predictions* a highly-recommended book for libraries and great tool for educators.

*Dire Predictions* outlines global warming science and its forecasts for the 21st century, according to U.N. panel's 2007 Fourth Assessment Report. The panel has concluded that global average temperatures, under the most aggressive prevention scenarios, still will rise at least by 1 degree Celsius during the 21st century due to extra carbon dioxide already built up in the atmosphere (CO<sub>2</sub>). This average temperature rise will be seen in a range of changing local climates, potential sea-pattern changes, rising sea levels, crop productivity changes, and other alterations of life.

The book places global warming in the context of evolutionary history, and deepens the terms used in the media. The effect is informative and shocking. The last major glacial age on earth occurred about 21,000 years ago, and this book discusses the last ice age to provide context for how carbon dioxide's (CO<sub>2</sub>) heat-trapping nature in our atmosphere helps make the earth a warm, livable planet. Of course, this time-span also provides context for how affecting the CO<sub>2</sub> balance will change things.

According to scientific samplings of air from those glacial days that remain trapped in arctic ice, the last glacial age featured less carbon dioxide in its more frigid air, which makes sense. During the last glacial age, there was 180 ppm CO<sub>2</sub> in the Earth's atmosphere, compared to 280 ppm CO<sub>2</sub> before the industrial revolution, and 386 ppm CO<sub>2</sub> in 2008. In fact, air samples show that CO<sub>2</sub>,

methane, and nitrous oxide all remained relatively stable in the air over the last 10,000 years, until industrial times, when they began rising exponentially.

Global climate data, placed in evolutionary context, shows a dramatic increase of CO<sub>2</sub> in the atmosphere, due to releasing CO<sub>2</sub> trapped in fossil fuels and from harvesting and burning forests. The rise of CO<sub>2</sub> is what is called the global warming effect, rooted in global climate science, a distinction this book makes clear. Scientific evidence shows that increasing atmospheric CO<sub>2</sub> will increase the earth's temperature, and the panel notes that it only can predict a range of potential effects. The U.N. panel recommends that we stabilize this modern trend, rather than let scientific uncertainty about effects paralyze action, because certainly there will be effects.

The last major glacial age was around 5 degrees Celsius colder than today, globally speaking. As the book stresses, this number refers to global average temperature, which means that local temperatures can range. If the last ice age was only 5 average degrees colder than today, than an increase of temperature of just 2 degrees in the 21st century (a number often talked about in the media) would have dramatic effect.

The U.N. panel says that predictions about global warming's effects also depend upon what the world does — or does not do — to change the amount of CO<sub>2</sub> pumped into the atmosphere. An average rise of temperature above 2 degrees globally will trigger catastrophic events. A rise of 2.9 degrees Celsius would result in 21 percent to 52 percent of all species becoming extinct, while a 4 degrees Celsius rise would kill at least 40 percent of world species and destroy most ocean coral beds.

*Dire Predictions* does a good job of discussing the basics of scientific computer modeling, and how scientists conclude using ranges of temperature predictions, to account for scientific uncertainty, and for the many climate variables beyond the scope of this review. "Scientific uncertainty," notes the book, is part of scientific discourse, and cannot be translated literally into its common-sense term. Rather, the panel is certain about the climate science behind global warming, just not about what exactly will come. NASA scientist James Hansen's 1988 models of rising temperature from global warming, for instance, so far have proven accurate.

The U.N. panel concludes that even under an "aggressive emissions scenario" for reducing atmospheric CO<sub>2</sub>, "the predicted increase in global average temperature from 2000 to 2100 is roughly" between "1–3 degree degrees Celsius." A "middle of the road" global reduction of CO<sub>2</sub> output will result in a "1.4–4.5 degree C" rise. With even less action, it gets worse. Carbon dioxide and other greenhouse gases do filter out of the atmosphere over time, so acting now will have lesser short-term and greater long-term effects. The sooner industrial societies reduce CO<sub>2</sub> output, the less CO<sub>2</sub> will linger in the atmosphere to trap the sun's heat on Earth.

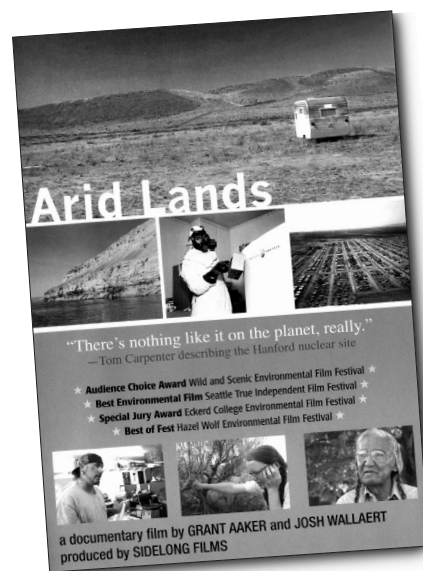
Looking back on the 21st century's first decade, we one day may look at the trillions of dollars wasted on war and tax

cuts, when it could have been invested in more environmentally sound, "green" future. Instead — what distraction, what cost. While some claim there is no money for green investments, recent history shows that money is there, but it is being used for other priorities. If I had to quibble about this book, I would liked inclusion of an appendix with more detailed science; an appendix would have not interfered with its aim of reaching a curious, unscientific audience. The book is co-written by Dr. Michael E. Mann, the lead author for the U.N. panel's 2001 previous report, and organized in easy-to-read, digestible chapters, with graphics that wow. It will benefit anyone who wants a thorough, but shorthand overview of climate change facts and challenges.

— GREGG MOSSON

Gregg Mosson is an activist and author of *Season of Flowers and Dust* (Goose River Press), a book of nature poetry.

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## **Arid Lands**

Grant Aaker & Josh Wallaert, Sidelong Films LLP  
Oley, PA: Bullfrog Films  
98 minutes; buy: \$295, rent: \$95 (reduced rates for activists and grassroots organizations);  
DVD (includes study guide)  
ISBN: 1-59458-656-X

**A**rid Lands is a documentary film by Grant Aaker and Josh Wallaert about the history of land and people of the Columbia Basin in southeastern Washington state. This area is the home of the Hanford Site — created in 1943 as part of the Manhattan Project, home of the B Reactor that created the plutonium for use in the first atomic bombs. The Hanford Site became an integral part of the Cold War effort, expanding the number of facilities onsite to nine nuclear reactors and five reprocessing centers, which produced enough plutonium to create an estimated 60,000 nuclear weapons. A major part of Hanford's legacy is the 53 million gallons of high-level radioactive waste that remain at the site, which represents 2/3 of the total U.S. volume of high-level radioactive waste. (The Savannah River Site in South Carolina and the Idaho National Lab have the remainder.)

Hanford is now being cleaned up, and is currently the largest and most expensive reclamation effort in the world.

*Arid Lands* is a history lesson for the various peoples who have occupied the area — from the original Native American tribes (like the Yakama), the original white settlers, and later scientists and staff with the federal government. The Yakama had made access to the Hanford area (and their food sources and medicinal plants) a condition of the treaty that forced them onto reservations, but when the Manhattan Project came about, their treaty rights were rejected for "the war effort." The white settlers worked to subdue this desert landscape to suit their needs, starting with the first basic irrigation systems to the first of many dam-building projects in 1933 along the Snake, Columbia and Yakima rivers. The grandchildren of these settlers were forcibly moved from their land (the federal government appropriated approximately 670 square miles) as part of the creation of the Hanford Site.

The documentary focuses on various issues currently dominating the Tri-Cities of Richland, Kennewick, and Pasco that are near Hanford. From Hanford's legacy of nuclear weapons production, and its waste; to the U.S. Army Corps of Engineers dam-building; the rise of urban sprawl; and lastly, its economic future. Interviewing more than 25 people, from activists, scientists, and locals, the directors look at how the decisions of the past now affects its future. Using the voices from the communities, the directors look at the contradictions of the Columbia Basin — the native arid grasslands surrounding farmland, orchards, and housing developments with water-greedy green grass. In addition, the rivers are laden with contamination from agriculture, mining waste from Canada, and nuclear waste from Hanford. But these rivers are also home to the Chinook salmon, which is endangered due to the numerous dams in the Basin.

In 2000, President Clinton established by Presidential Proclamation the Hanford Reach National Monument, created from the security area buffering the Site (the areas not directly managed by the U.S. Department of Energy). Untouched by agriculture or development since 1943, this area of sagebrush, bitterbrush, and bunchgrass lands is home to a wide variety of plants and animals. Forty-eight species of threatened or endangered plants and animals have made this area their home.

The directors took a neutral tone in *Arid Lands*, allowing the people interviewed for the documentary to be the emphasis. This approach showed the diversity of opinions about the future of the area. From activists, scientists (government and university), fishermen, farmers, and business owners, each had something to say about their community. I would hope that this documentary spurred a discussion among the various groups to do some forward thinking about the future of the Hanford area.

— ANNETTE AGUAYO

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