



National
Center for
Science
Education

Analysis of Climate Change in Proposed Social Studies Textbooks for Texas Public Schools

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Introduction

The Texas State Board of Education is set this fall to adopt new textbooks for social studies classes in the Lone Star State's public schools. This is the first adoption of social studies textbooks in Texas since 2002. The new textbooks could be in Texas classrooms for nearly a decade, beginning in the fall of 2015. How textbooks cover science topics such as climate change has been a source of debate in past social studies adoptions, particularly regarding textbooks on world geography. The National Center for Science Education examined online textbooks that publishers submitted in April for adoption by the state board.

Books That Had Problems

McGraw-Hill Education, World Cultures & Geography [Teacher Version] (Grade 6)

Overall Description: This book has a deeply concerning section comparing the Heartland Institute with the Intergovernmental Panel on Climate Change (IPCC) in relation to climate change. This misleads students as to good sources of information, pitting an ideologically driven advocacy group (Heartland Institute) that receives funding from Big Tobacco and polluters against a Nobel Peace Prize-winning scientific body (IPCC). The IPCC reports utilize hundreds of scientific experts and reviewers, as well as thousands of peer-reviewed articles. The Heartland Institute has no such expertise nor do they utilize the depth of research available in this area. Independent of the content area, this is a completely inappropriate presentation of the information or comparison of sources.

Specific Areas of Concern: Teach and Assess

“Is Global Warming a Result of Human Activity?”

Scientists agree that Earth's climate is changing. They do not agree on what is causing the change. Is it just another natural warming cycle like so many cycles that have occurred in the past? Scientists who support this position cite thousands of years' worth of natural climatic change as evidence. Or is climate change anthropogenic—caused by human activity?

Scientists who support this position cite the warming effect of rapidly increasing amounts of greenhouse gases in the atmosphere. Greenhouse gases occur naturally, but they also result from the burning of fossil fuels. Which side's evidence is more convincing?

‘The Intergovernmental Panel on Climate Change (IPCC), an agency of the United Nations, claims the warming that has occurred since the mid-twentieth century “is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.” Many climate scientists disagree with the IPCC on this key issue.

Scientists who study the issue say it is impossible to tell if the recent small warming trend is natural, a continuation of the planet's recovery from the more recent “Little Ice Age,” or unnatural, the result of human greenhouse gas emissions. Thousands of peer-reviewed articles point to natural sources of climate variability that could explain some or even all of the warming in the second half of the twentieth century. S. Fred Singer and Dennis Avery documented natural climate cycles of approximately 1,500 years going back hundreds of thousands of years.’

—Joseph Bast and James M. Taylor, “Global Warming: Not a Crisis,” The Heartland Institute”

Chapter 28: Antarctica Chapter Opener Place and Time Lesson 1 Lesson 2 Feature

AI AIA ?

FEATURE
What Do You Think?

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No!

PRIMARY SOURCE

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Pop-out in Spanish ▲ 1 2 R

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AI AIA ?

FEATURE
What Do You Think?

Yes!

PRIMARY SOURCE

"It is very unlikely that the 20th-century warming can be explained by natural causes.... Palaeoclimatic reconstructions show that the second half of the 20th century was likely the warmest 50-year period in the Northern Hemisphere in the last 1300 years. This rapid warming is consistent with the scientific understanding of how the climate should respond to a rapid increase in greenhouse gases like that which has occurred over the past century, and the warming is inconsistent with the scientific understanding of how the climate should respond to natural external factors such as variability in solar output and volcanic activity. Climate models provide a suitable tool to study the various influences on the Earth's climate. When the effects of increasing levels of greenhouse gases are included in the models, as well as natural external factors, the models produce good simulations of the warming that has occurred over the past century. The models fail to reproduce the observed warming when run using only natural factors."

—Contribution of Working Group I: The Physical Science Basis to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007

Climate Change 2007: The Physical Science Basis. Working Group I Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, FAQ 9.2, p. 702. Cambridge University Press

Pop-out in Spanish ▲ 1 2 R

What's the problem?

This entire section is misleading. Scientists do not disagree about what is causing climate change, the vast majority (97%) of climate papers and actively publishing climatologists (again 97%) agree that human activity is responsible. Relevant citations:

- o Quantifying the consensus on anthropogenic global warming in the scientific literature: <http://iopscience.iop.org/1748-9326/8/2/024024>
- o Examining the Scientific Consensus on Climate Change http://tiger.uic.edu/~pdoran/012009_Doran_final.pdf

Pearson, Social Studies K-5 (English)

Overall Description: There was one specific area of concern in the 5th grade book that appears to be driven by a genuine misunderstanding of how scientists evaluate evidence and how we know what we know about climate change.

Specific Areas of Concern: On Page 712

In the 5th grade book, page 712, the book says:

"Burning oil to run cars also releases carbon dioxide into the atmosphere. Some scientists believe that this carbon dioxide could lead to a slow heating of Earth's overall climate. This temperature change is known as global warming or climate change. Scientists disagree about

what is causing climate change. Many people, however, worry that climate change might cause environmental problems, such as increased storm activity and rising sea levels."

What is the problem?

Scientists do not disagree about what is causing climate change, as mentioned earlier the vast majority (97%) of climate papers and actively publishing climatologists (again 97%) agree that human activity is responsible. Relevant citations:

- o Quantifying the consensus on anthropogenic global warming in the scientific literature:
<http://iopscience.iop.org/1748-9326/8/2/024024>
- o Examining the Scientific Consensus on Climate Change
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Social Studies School Service, Social Studies Grade 6 & 8 (They were combined on site)

Overall Description: Only one problematic area in a PowerPoint that depicts a common misconception, confusing global warming and the ozone hole.

Specific Areas of Concern: ENVIRONMENT AND SOCIETY (ACTIVITY) (for grades 6-12th)

From PowerPoint: "Fossil fuel emissions have also caused a hole in the ozone layer over Antarctica."

What is the problem?

This is a common misconception, and is scientifically inaccurate. Fossil fuel emissions do not lead to a hole in the ozone layer – this is related to CFCs, which are not emitted by fossil fuel combustion. Suggested references for more information on the difference between the ozone hole and climate change:

- o NASA Climate Change FAQ:
<http://climate.nasa.gov/climatechangeFAQ/#Q3>
- o What does the ozone hole have to do with climate change?
<http://www2.ucar.edu/climate/faq/what-does-ozone-hole-have-do-climate-change>

Studies Weekly Publications, Social Studies K-5 (English and Spanish)

Overall Description: Has inaccurate information about scientists predicting a cooling trend.

Specific Areas of Concern:

One mention of climate change/global warming. "Scientists believe the Earth is absorbing more of the sun's harmful rays....Some scientists say it is natural for the Earth's temperature to be higher for a few years. They predict we'll have some cooler years and things will even out."

What's the problem?

We are not aware of any currently publishing climatologists who are predicting a cooling trend where "things will even out." We wonder what the source of this information was. Suggested references for more information on scientifically valid projections:

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- o U.S. National Climate Assessment: <http://nca2014.globalchange.gov/highlights/report-findings/future-climate>
 - o IPCC: http://www.climatechange2013.org/images/figures/WGI_AR5_FigFAQ12.1-1.jpg
 - o IPCC: http://www.climatechange2013.org/images/report/WG1AR5_Chapter12_FINAL.pdf

WorldView Software, Economics

Overall Description: The author seems to confuse the relationship between the ozone hole and climate change. This is a common misconception.

Specific Areas of Concern:

“Scientists and environmentalists are concerned about deforestation. The burning of the forests has been a factor in the developing greenhouse effect. The forest burning and the burning of fossil fuels (coal, oil, gasoline) release carbon dioxide into the atmosphere. Holes in the ozone layer allow sunlight to come through and be trapped beneath airborne pollution. The sunlight is absorbed, warming the earth’s atmosphere.”

What’s the problem?

The reference to the ozone layer and its relationship to airborne pollution is inaccurate. This appears to be rooted in a misunderstanding of what the problem with the ozone hole is and how the sun’s radiation interacts with the Earth system. A reference to help understand the ozone hole and climate: What does the ozone hole have to do with climate change? <http://www2.ucar.edu/climate/faq/what-does-ozone-hole-have-do-climate-change>

(Screenshot on following page.)



ECONOMICS

TEKS Linking Document
ELPS Linking Document

Search Results ozone x Project Problem Solving x

Gather Information

Information on the destruction of the rain forest may be gathered from many sources: books, magazines (e.g., "National Geographic"), newspaper articles (e.g., "The Miami Herald"), and the Internet (e.g., World Wildlife Organization's web site).

Study the Information and List Possible Solutions

Deforestation is taking place in many areas of the world, including West Africa, Thailand, Indonesia, and Brazil. When cleared, forest land could be used to provide landless farmers with their own farms. These areas, especially in Brazil, are also considered to contain great mineral wealth and are attracting mining companies and individual miners hoping to gain wealth. Tropical rain forests continue to be cut down, bulldozed, and burnt down to provide land for people to use. In Brazil, farms, cattle ranches, and mining projects are being created. New highways and towns are being built.

Scientists and environmentalists are concerned about deforestation. The burning of the forests has been a factor in the developing greenhouse effect. The forest burning and the burning of fossil fuels (coal, oil, gasoline) release carbon dioxide into the atmosphere. Holes in the ozone layer allow sunlight to come through and be trapped beneath airborne pollution. The sunlight is absorbed, warming the earth's atmosphere. Also endangered are the millions of species of plants and animals. It is believed that many of the plants may be used successfully in the treatment of diseases such as cancer. People living in the rain forest will also be adversely affected. Their traditional way of life will be destroyed and they will become the victims of land-hungry developers and the new diseases introduced by these developers.

The options are to act, to stop, or slow deforestation, or to do nothing.



Chapters



Resources



Themes



Search



Progress



Help



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