You *Can* Argue with the Facts: The Denial of Global Warming

Naomi Oreskes

Professor of History and Science Studies

Adjunct Professor of Geosciences

University of California, San Diego

Americans now accept "fact" of global warming

AMERICAN OPINIONS ON GLOBAL WARMING

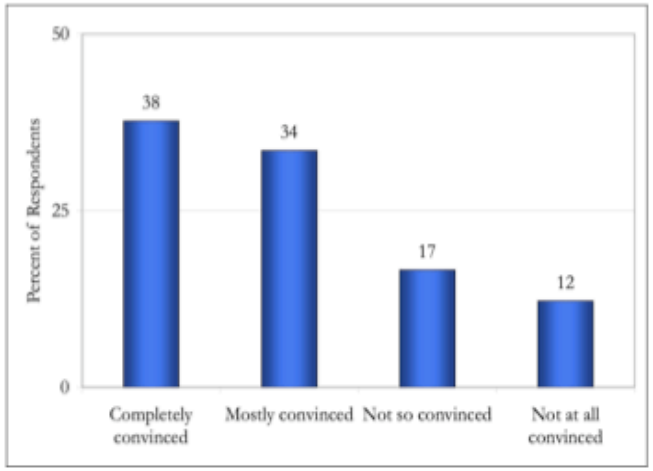
A Yale University / Gallup / ClearVision Institute Poll

Principal Investigator:
Dr. Anthony Leiserowitz
School of Forestry & Environmental Studies
Yale University
(203) 432-4865 (ofc)
anthony.leiserowitz@yale.edu

SURVEY RESULTS

Figure 1: Personally Convinced

"How convinced are you that global warming is happening -- would you say you are -- completely convinced, mostly convinced, not so convinced, or not at all convinced?"



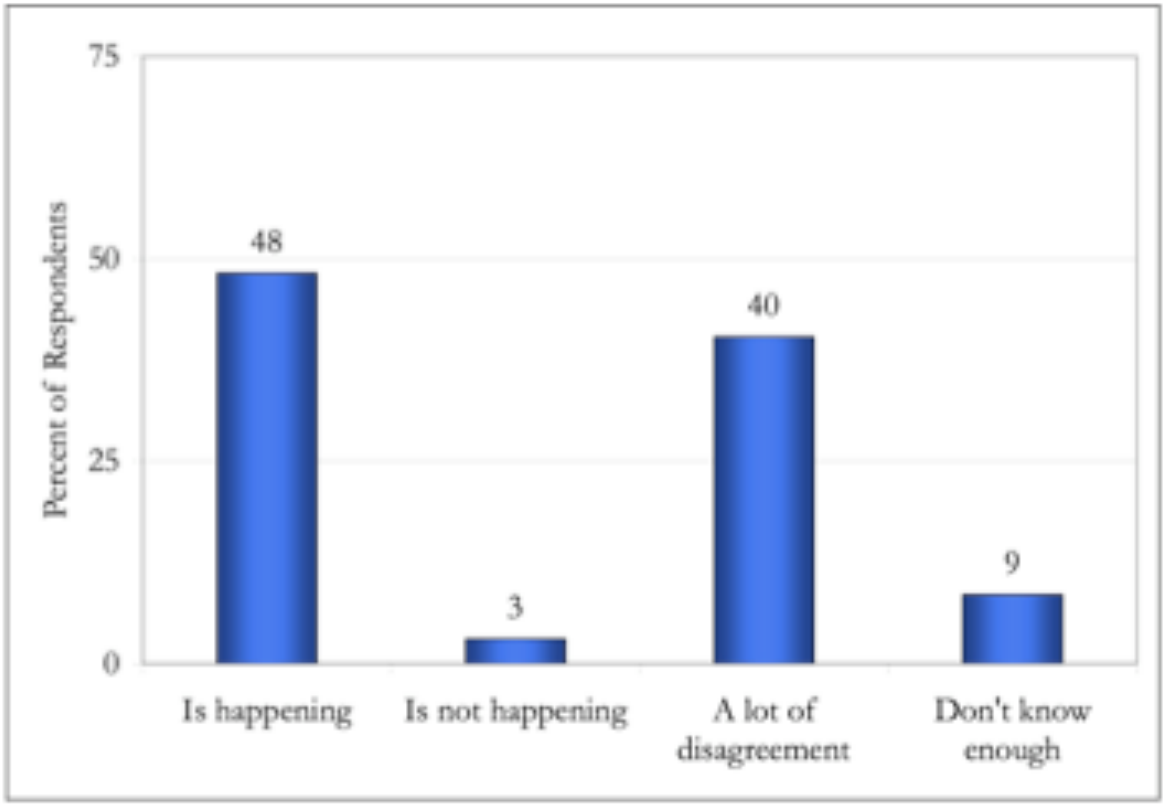
Yale Project on Climate Change/ Gallup / Clear Vision Institute, 2007

72 % of Americans completely or mostly convinced that global warming is happening

Many Americans also think scientists do *not*

Figure 2: Scientific Consensus

"Which comes closer to your own view -- most scientists think global warming is happening, (or) most scientists think global warming is not happening, or there is a lot of disagreement among scientists about whether or not global warming is happening, or do you not know enough to say?"



A strange result…

- On one hand, "facts" by definition imply generality of acceptance, and detachment from source.
- Wouldn't expect average person to know much about sources.
- Abundant evidence (Anthony Leiserowitz, Jon Krosnick) public opinion formed by many sources; scientific evidence may be least salient

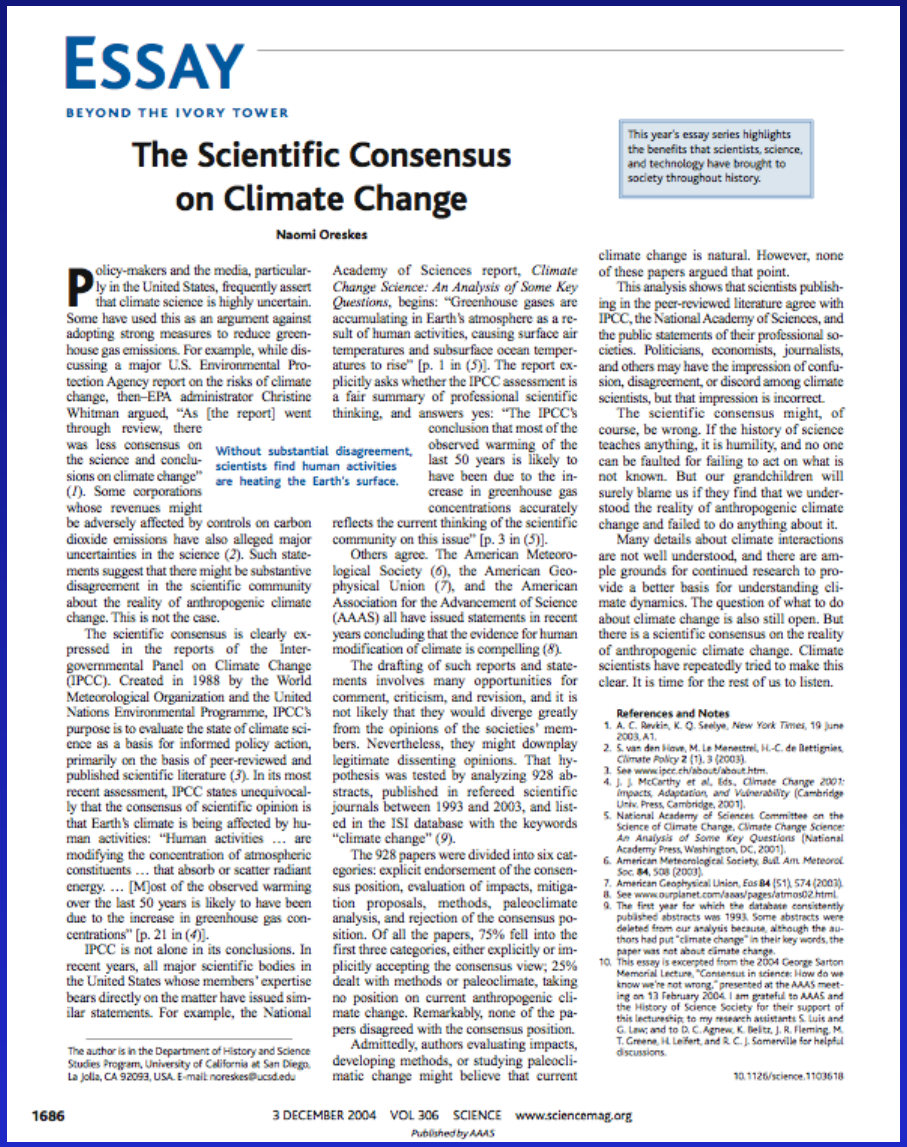
On other hand…

If the evidence of global warming is *scientific* evidence (analysis of temperature records, simulation models, ice cores, CO_2 measurements) and if scientists are still arguing about it, the how can it *be* a fact?

- What kind of a fact do lay persons think it is (if not scientific fact)?

- Why do people think scientists are still arguing about it?

Scientists are not arguing…



ESSAY

BEYOND THE IVORY TOWER

The Scientific Consensus on Climate Change

Naomi Oreskes

This year's essay series highlights the benefits that scientists, science, and technology have brought to society throughout history.

Policy-makers and the media, particularly in the United States, frequently assert that climate science is highly uncertain. Some have used this as an argument against adopting strong measures to reduce greenhouse gas emissions. For example, while discussing a major U.S. Environmental Protection Agency report on the risks of climate change, then–EPA administrator Christine Whitman argued, "As [the report] went through review, there was less consensus on the science and conclusions on climate change" (*1*). Some corporations whose revenues might be adversely affected by controls on carbon dioxide emissions have also alleged major uncertainties in the science (*2*). Such statements suggest that there might be substantive disagreement in the scientific community about the reality of anthropogenic climate change. This is not the case.

Without substantial disagreement, scientists find human activities are heating the Earth's surface.

The scientific consensus is clearly expressed in the reports of the Intergovernmental Panel on Climate Change (IPCC). Created in 1988 by the World Meteorological Organization and the United Nations Environmental Programme, IPCC's purpose is to evaluate the state of climate science as a basis for informed policy action, primarily on the basis of peer-reviewed and published scientific literature (*3*). In its most recent assessment, IPCC states unequivocally that the consensus of scientific opinion is that Earth's climate is being affected by human activities: "Human activities … are modifying the concentration of atmospheric constituents … that absorb or scatter radiant energy. … [M]ost of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations" [p. 21 in (*4*)].

IPCC is not alone in its conclusions. In recent years, all major scientific bodies in the United States whose members' expertise bears directly on the matter have issued similar statements. For example, the National Academy of Sciences report, *Climate Change Science: An Analysis of Some Key Questions*, begins: "Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise" [p. 1 in (*5*)]. The report explicitly asks whether the IPCC assessment is a fair summary of professional scientific thinking, and answers yes: "The IPCC's conclusion that most of the observed warming of the last 50 years is likely to have been due to the increase in greenhouse gas concentrations accurately reflects the current thinking of the scientific community on this issue" [p. 3 in (*5*)].

Others agree. The American Meteorological Society (*6*), the American Geophysical Union (*7*), and the American Association for the Advancement of Science (AAAS) all have issued statements in recent years concluding that the evidence for human modification of climate is compelling (*8*).

The drafting of such reports and statements involves many opportunities for comment, criticism, and revision, and it is not likely that they would diverge greatly from the opinions of the societies' members. Nevertheless, they might downplay legitimate dissenting opinions. That hypothesis was tested by analyzing 928 abstracts, published in refereed scientific journals between 1993 and 2003, and listed in the ISI database with the keywords "climate change" (*9*).

The 928 papers were divided into six categories: explicit endorsement of the consensus position, evaluation of impacts, mitigation proposals, methods, paleoclimate analysis, and rejection of the consensus position. Of all the papers, 75% fell into the first three categories, either explicitly or implicitly accepting the consensus view; 25% dealt with methods or paleoclimate, taking no position on current anthropogenic climate change. Remarkably, none of the papers disagreed with the consensus position.

Admittedly, authors evaluating impacts, developing methods, or studying paleoclimatic change might believe that current climate change is natural. However, none of these papers argued that point.

This analysis shows that scientists publishing in the peer-reviewed literature agree with IPCC, the National Academy of Sciences, and the public statements of their professional societies. Politicians, economists, journalists, and others may have the impression of confusion, disagreement, or discord among climate scientists, but that impression is incorrect.

The scientific consensus might, of course, be wrong. If the history of science teaches anything, it is humility, and no one can be faulted for failing to act on what is not known. But our grandchildren will surely blame us if they find that we understood the reality of anthropogenic climate change and failed to do anything about it.

Many details about climate interactions are not well understood, and there are ample grounds for continued research to provide a better basis for understanding climate dynamics. The question of what to do about climate change is also still open. But there is a scientific consensus on the reality of anthropogenic climate change. Climate scientists have repeatedly tried to make this clear. It is time for the rest of us to listen.

The author is in the Department of History and Science Studies Program, University of California at San Diego, La Jolla, CA 92093, USA. E-mail: noreskes@ucsd.edu

References and Notes

1. A. C. Revkin, K. Q. Seelye, *New York Times*, 19 June 2003, A1.
2. S. van den Hove, M. Le Menestrel, H.-C. de Bettignies, *Climate Policy* **2** (1), 3 (2003).
3. See www.ipcc.ch/about/about.htm.
4. J. J. McCarthy *et al.*, Eds., *Climate Change 2001: Impacts, Adaptation, and Vulnerability* (Cambridge Univ. Press, Cambridge, 2001).
5. National Academy of Sciences Committee on the Science of Climate Change, *Climate Change Science: An Analysis of Some Key Questions* (National Academy Press, Washington, DC, 2001).
6. American Meteorological Society, *Bull. Am. Meteorol. Soc.* **84**, 508 (2003).
7. American Geophysical Union, *Eos* **84** (51), 574 (2003).
8. See www.ourplanet.com/aaas/pages/atmos02.html.
9. The first year for which the database consistently published abstracts was 1993. Some abstracts were deleted from our analysis because, although the authors had put "climate change" in their key words, the paper was not about climate change.
10. This essay is excerpted from the 2004 George Sarton Memorial Lecture, "Consensus in science: How do we know we're not wrong," presented at the AAAS meeting on 13 February 2004. I am grateful to AAAS and the History of Science Society for their support of this lectureship; to my research assistants S. Luis and G. Law; and to D. C. Agnew, K. Belitz, J. R. Fleming, M. T. Greene, H. Leifert, and R. C. J. Somerville for helpful discussions.

10.1126/science.1103618

- Consensus on reality of anthropogenic effect established by mid 1990s
- IPCC Second Assessment 1995 "The balance of evidence suggests a discernible human impact on global climate."

"The scientific evidence forcefully points to a need for a truly international effort. Make no mistake, we have to act now. And the longer we procrastinate, the more difficult the task of tackling climate change becomes."

Robert May, "Scientists Demand Action on Climate," *The Scientist* 19 (July 2005): 47.

Natural Variability?

"The observed widespread warming of the atmosphere and ocean, together with ice mass loss, support the conclusion that it is *extremely unlikely* that global climate change of the past fifty years can be explained without external forcing…."

IPCC Fourth Assessment Report, 2007,

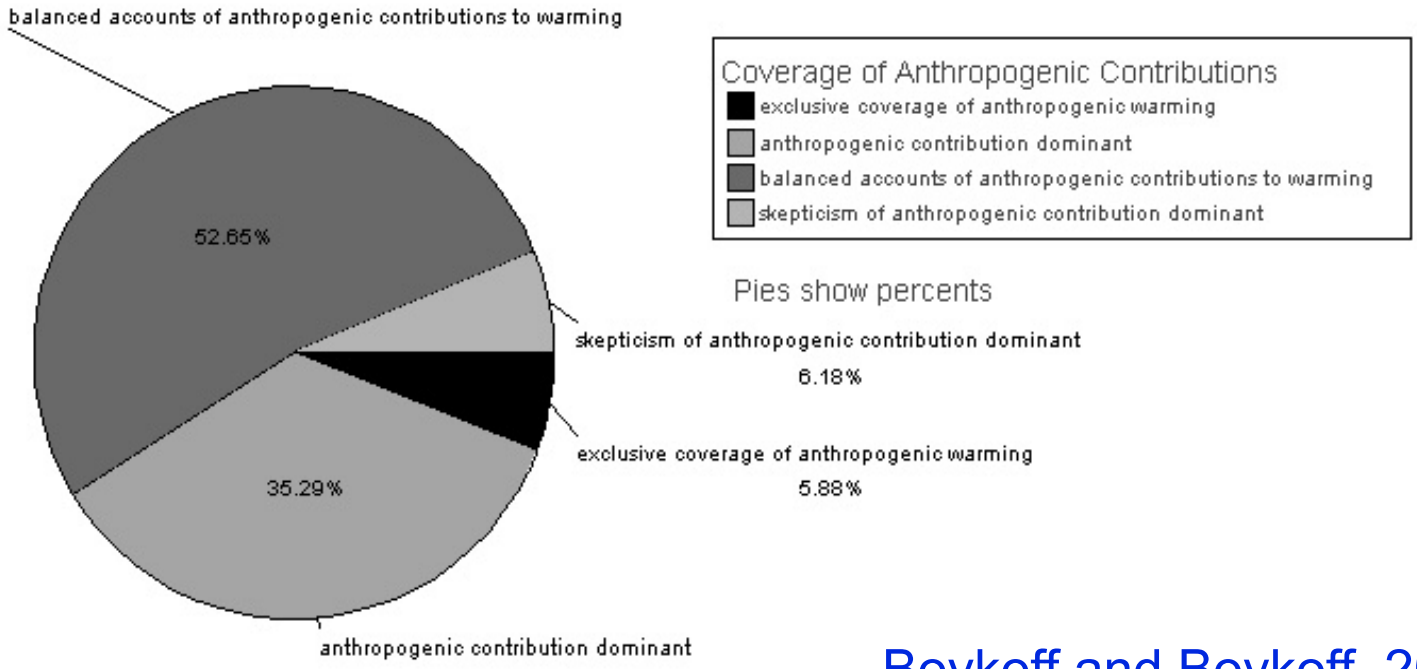
Summary for Policymakers, p. 10

Why *do* Americans think scientists are still arguing?

One reason:
Press coverage of global warming

Figure 1: U.S. Prestige-Press Coverage of Existence of Anthropogenic Contributions to Global Warming

1988-2002; n = 340



Boykoff and Boykoff, 2004

Where have the press gotten their “sources” for the “other side”?

Brief history of climate science

- 1988 IPCC established to evaluate climate science and suggest possible policy action on global warming.

- Various scientific reports in 1970s, US and Europe, suggested warming would occur from increased atmospheric CO_2 from burning fossil fuels. Big question was when.

Differences of opinion on timing & severity

- Most scientific papers and reports in 1970s and 1980s suggested doubling of CO_2, with associated 2-3° C increase and 50-70 cm sea level rise, in first half of 21st century. Large uncertainties.
- Many noted that some effects might be noticed sooner before end of century.
- Some suggested changes probably already occurring

1981, John Perry, US NAS Climate Research Board

"Physically a doubling of CO_2 is no magic threshold. If we have good reason to believe that a 100 per cent increase in carbon dioxide will produce significant impacts on climate, then we must have equally good reason to suspect that even the small increase we have already produced may have subtly altered our climate…[O]ur inability to verify such changes reliably is no proof that they do not exist...."

"Thus climate change is not a matter for the next century, we are most probably doing it right now."

John Perry, "Energy and Climate: Today's Problem, Not Tomorrow's" *Climate Change* 3 (1981): 223-225, on 223-224

NRC Committee headed by economist Thomas Schelling had concluded that biggest problem was large uncertainties, hoped that we could "learn faster than the problem can develop."

Perry concluded: "The problem is already upon us: we must learn very quickly indeed."

Perry,1981 "Energy and Climate: Today's problem, Not Tomorrow's" Climate Change 3: 223-225. On p 225.

1988 Things Heat Up

Global temperature change

James Hansen*†‡, Makiko Sato*†, Reto Ruedy*§, Ken Lo*§, David W. Lea¶, and Martin Medina-Elizade¶

*National Aeronautics and Space Administration Goddard Institute for Space Studies, †Columbia University Earth Institute, and ‡Sigma Space Partners, Inc., 2880 Broadway, New York, NY 10025; and ¶Department of Earth Science, University of California, Santa Barbara, CA 93106

Contributed by James Hansen, July 31, 2006

Global surface temperature has increased ≈0.2°C per decade in the past 30 years, similar to the warming rate predicted in the 1980s in initial global climate model simulations with transient greenhouse gas changes. Warming is larger in the Western Equatorial Pacific than in the Eastern Equatorial Pacific over the past century, and we suggest that the increased West–East temperature gradient may have increased the likelihood of strong El Niños, such as those of 1983 and 1998. Comparison of measured sea surface temperatures in the Western Pacific with paleoclimate data suggests that this critical ocean region, and probably the planet as a whole, is approximately as warm now as at the Holocene maximum and within ≈1°C of the maximum temperature of the past million years. We conclude that global warming of more than ≈1°C, relative to 2000, will constitute "dangerous" climate change as judged from likely effects on sea level and extermination of species.

climate change | El Niños | global warming | sea level | species extinctions

Global temperature is a popular metric for summarizing the state of global climate. Climate effects are felt locally, but the global distribution of climate response to many global climate forcings is reasonably congruent in climate models (1), suggesting that the global metric is surprisingly useful. We will argue further, consistent with earlier discussion (2, 3), that measurements in the Western Pacific and Indian Oceans provide a good indication of global temperature change.

We first update our analysis of surface temperature change based on instrumental data and compare observed temperature change with predictions of global climate change made in the 1980s. We then examine current temperature anomalies in the tropical Pacific Ocean and discuss their possible significance. Finally, we compare paleoclimate and recent data, using the Earth's history to estimate the magnitude of global warming that is likely to constitute dangerous human-made climate change.

Modern Global Temperature Change

Global surface temperature in more than a century of instrumental data is recorded in the Goddard Institute for Space Studies analysis for 2005. Our analysis, summarized in Fig. 1, uses documented procedures for data over land (4), satellite measurements of sea surface temperature (SST) since 1982 (5), and a ship-based analysis for earlier years (6). Estimated 2σ error (95% confidence) in comparing nearby years of global temperature (Fig. 1*A*), such as 1998 and 2005, decreases from 0.1°C at the beginning of the 20th century to 0.05°C in recent decades (4). Error sources include incomplete station coverage, quantified by sampling a model-generated data set with realistic variability at actual station locations (7), and partly subjective estimates of data quality problems (8). The estimated uncertainty of global mean temperature implies that we can only state that 2005 was probably the warmest year.

The map of temperature anomalies for the first half-decade of the 21st century (Fig. 1*B*), relative to 1951–1980 climatology, shows that current warmth is nearly ubiquitous, generally larger over land than over ocean, and largest at high latitudes in the Northern Hemisphere. Our ranking of 2005 as the warmest year depends on the positive polar anomalies, especially the unusual Arctic warmth. In calculating the global mean, we give full weight to all regions based on area. Meteorological stations are sparse in the Arctic, but the estimated strong warm anomaly there in 2005 is consistent with record low sea ice concentration and Arctic temperature anomalies inferred from infrared satellite data (9).

Our analysis includes estimated temperature anomalies up to 1,200 km from the nearest measurement station (7). Resulting spatial extrapolations and interpolations of temperature anomalies usually are meaningful for seasonal and longer time scales at middle and high latitudes, where the spatial scale of anomalies is set by Rossby waves (7). Thus, we believe that the unusual Arctic warmth of 2005 is real. Other characteristics of our analysis method are summarized in *Supporting Text*, which is published as supporting information on the PNAS web site.

Independent analysis by the National Climate Data Center (www.ncdc.noaa.gov/oa/climate/research/2005/ann/global.html), using a "teleconnection" approach to fill in data sparse regions, also finds 2005 to be the warmest year. The joint analysis of the University of East Anglia and the Hadley Centre (www.met-office.gov.uk/research/hadleycentre/obsdata/globaltemperature.html) also yields high global temperature for 2005, but a few hundredths of a degree cooler than in 1998.

Record, or near record, warmth in 2005 is notable, because global temperature did not receive a boost from an El Niño in 2005. The temperature in 1998, on the contrary, was lifted 0.2°C above the trend line by a "super El Niño" (see below), the strongest El Niño of the past century.

Global warming is now 0.6°C in the past three decades and 0.8°C in the past century. It is no longer correct to say "most global warming occurred before 1940." A better summary is: slow global warming, with large fluctuations, over the century up to 1975, followed by rapid warming at a rate ≈0.2°C per decade. Global warming was ≈0.7°C between the late 19th century (the earliest time at which global mean temperature can be accurately defined) and 2000, and continued warming in the first half decade of the 21st century is consistent with the recent rate of +0.2°C per decade.

The conclusion that global warming is a real climate change, not an artifact due to measurements in urban areas, is confirmed by surface temperature change inferred from borehole temperature profiles at remote locations, the rate of retreat of alpine glaciers around the world, and progressively earlier breakup of ice on rivers and lakes (10). The geographical distribution of warming (Fig. 1*B*) provides further proof of real climate change. Largest warming is in remote regions including high latitudes. Warming occurs over ocean areas, far from direct human effects, with warming over ocean less than over land, an expected result for a forced climate change because of the ocean's great thermal inertia.

Early Climate Change Predictions. Manabe and Wetherald (11) made the first global climate model (GCM) calculations of warming due

Author contributions: D.W.L. and M.M.-E. contributed data; J.H., M.S., R.R., K.L., D.W.L., and M.M.-E. analyzed data; and J.H. wrote the paper.

The authors declare no conflict of interest.

Freely available online through the PNAS open access option.

Abbreviations: SST, sea surface temperature; GHG, greenhouse gas; EEP, Eastern Equatorial Pacific; WEP, Western Equatorial Pacific; DAI, dangerous anthropogenic interference; BAU, business as usual; AS, alternative scenario; BC, black carbon.

‡To whom correspondence should be addressed. E-mail: jhansen@giss.nasa.gov.

www.pnas.org/cgi/doi/10.1073/pnas.0606291103

- 1988, NASA climate modeler James Hansen declared in U.S Congress he was "99%" certain anthropogenic change occurring
- Same year, IPCC established to assess scientific evidence of change and suggest remedies

U.N. Framework Convention of Climate Change (1992)

Called on world leaders to translate the written document into "concrete action to protect the planet."

Almost immediately, various individuals and organizations began to challenge scientific basis.

In the decade to follow, organizations included

- George C. Marshall Institute
- http://www.marshall.org/subcategory.php?id=9
- CATO Institute
- http://www.cato.org/subtopic_display_new.php?topic_id=27&ra_id=4
- Competitive Enterprise Institute
- http://www.cei.org/sections/subsection.cfm?section=3
- Heartland Institute
- http://www.heartland.org/Article.cfm?artId=10488

All conservative or libertarian groups

Committed to laissez-faire economics, opposing regulation, ‘excessive’ government interference in private sector

“The tobacco strategy”

For decades, tobacco industry challenged scientific evidence of adverse health effects of tobacco.

These groups similarly argued against scientific evidence of adverse environmental effects of fossil fuels.

The tobacco road to global warming

Several of the same individuals who challenged knowledge of anthropogenic climate change also challenged evidence of hazards of tobacco smoke.

Arguments over evidence of climate change followed several strategies

- "No proof" strategy: science is uncertain
- Argue over significance of facts (we can adapt)
- Argue against credibility of environmentalists
  - Hysterical (Chicken Little)
  - Communists ("Watermelons", George Will: "Green trees with red roots")
  - Anti-Christian
- Argue whether facts are facts
- Supply alternative facts

Western Fuels Association

Early 1990s

Major campaign to challenge scientific knowledge regarding global warming

Strategies

1. Reposition global warming as theory (not fact).
2. Target print and radio media for maximum effectiveness.
3. Achieve broad participation across the entire electric utility industry.
4. Start small, start well, and build on early successes.
5. Get the test concepts developed and implemented as soon as possible.
6. "Test market" execution in early 1991.
7. Build national involvement as soon as "test market" results are in hand — summer 1991.
8. Go national in the late fall of 1991 with a media program.
9. Use a spokesman from the scientific community.

1) Argue whether facts were facts:

"Reposition global warming as theory not fact"

"Just a theory…"

Supplying alternative facts to support suggestion that global warming would be good:

CO_2 would enhance agricultural productivity: "greener Earth"

Who were the Western Fuels Association?

- Cooperative of Western coal producers, mostly in Powder River Basin (Wyoming and Montana)
- Supply coal to electrical utilities

Article in Range Magazine, Fall 2000 ("The Cowboy Spirit on America's outback)

RANGE
THE COWBOY SPIRIT ON AMERICA'S OUTBACK

THE GREENING OF PLANET EARTH

A scientist said, "Climate modelers have been cheating for so long it's almost become respectable."

Story © Ned Leonard. Photos © Bruce Wagman.

During what is called the "Giant Power Era" of the mid-to-late 1960s federal hydropower administrators traveled the land preaching a gospel of self-sufficiency. No more federal dams would be built and few, if any, additions could or would be made to existing facilities. If farmers and ranchers in Montana, Wyoming and the Dakotas needed more electricity to meet their rapidly growing demand, they would have to find a way to supply it themselves.

The mandates of "giant power" quickly intersected President Jimmy Carter's Project Energy Independence. The Middle Eastern oil crises of the early 1970s triggered a series of federal energy policies that forbade the use of natural gas in industrial processes and encouraged electric utilities to make use of either abundant domestic reserves of coal or to rely upon nuclear power generation in building new power plants.

As energy costs soared, so too did interest rates. Even with the ability to draw upon the federal Rural Electrification Administration (REA) to help finance power plant construction, rural America

General Manager and Chief Executive Officer Fred Palmer"…determined to defend the coal-fired power plants from an assault launched by professional environmentalists, the United Nations, our own government, and the nation's economic competitors."

Protect interests of western coal producers by challenging fears and negative messages about global warming…

…by challenging presumption that warming was *bad*.

I. Mass Media Campaign

- 1991, WFA provided funding for organization "Information Council for the Environment" (ICE)
- Mission: "…to develop an effective national communications program to help ensure that action by the Administration and/or Congress on the issue of global warming is based on scientific evidence."
- Specific goal: to determine the best way to influence public opinion, by testing different approaches in different markets and evaluating results

Documents preserved in files of American Meteorological Society…

- Budget of $510,000 for a “test market” project in February -August 1991
- To spread message in selected radio and print media environments, to test potential for “attitude change” in listeners.
- Four cities: Chattanooga TN, Champaign, IL, Flagstaff, AZ, Fargo, ND

Objectives

1) "Demonstrate that a consumer-based media awareness program can positively change the opinions of a selected population regarding the validity of global warming;

2) "Begin to develop a message and strategy for shaping public opinion on a national scale;

3) "Lay the ground work for a unified national electric industry voice on global warming."

Three criteria for chosen markets

a) "Market derives majority of electricity from coal;

b) "Market is home to a member of the [U.S.] House Energy & Commerce Committee or House Ways and Means Committee;

c) "Market [has low] media costs."

“Program strategies”

- To find receptive population and pre-test strategies
- To use focus groups to test the ICE name and “creative concepts”
- “If successful, implement program nationwide.”

Potential Program Names

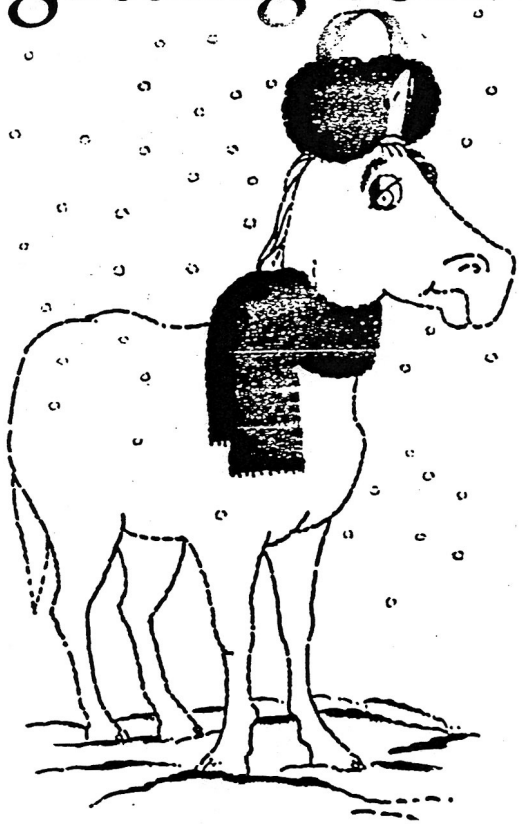
- Information Council for the Environment
- Informed Citizens for the Environment
- Intelligent Concern for the Environment
- Informed Choices for the Environment

Details of “Creative strategy”

- “The radio creative will directly attack the proponents of global warming by relating irrefutable evidence to the contrary, delivered by a believable spokesperson …”

- “The print creative will attack proponents through comparison of global warming to historical or mythical instances of gloom and doom. Each ad will invite the listener/reader to call or write for further information, thus creating a data base.”

If the Earth is getting warmer, why is Kentucky getting colder?



Some scientists say the Earth's temperature is rising. They say that catastrophic global warming will take place in the years ahead.

Yet, average temperature records show Kentucky has actually gotten colder over the past 70 years. And there's also a cooling trend in Albany, New York—the U.S. city with the longest history (over 160 years) of continuous daily temperature records.

Now, most of us aren't climatologists. But facts like these simply don't jibe with the theory that catastrophic global warming is taking place. Which seems to say we need more research. And more evidence about this environmental phenomenon before we take any action.

If you care about the Earth—but want to keep a cool head about it—now is your chance to get more facts.

Call the Information Council for the Environment, 1-800-346-6269 extension 510. We'll send you a free packet of information on global climate change. Or just mail us the coupon below.

Because the best environmental policy is a policy based on fact.

Please send me your FREE information packet on global climate change

NAME _____

ADDRESS _____

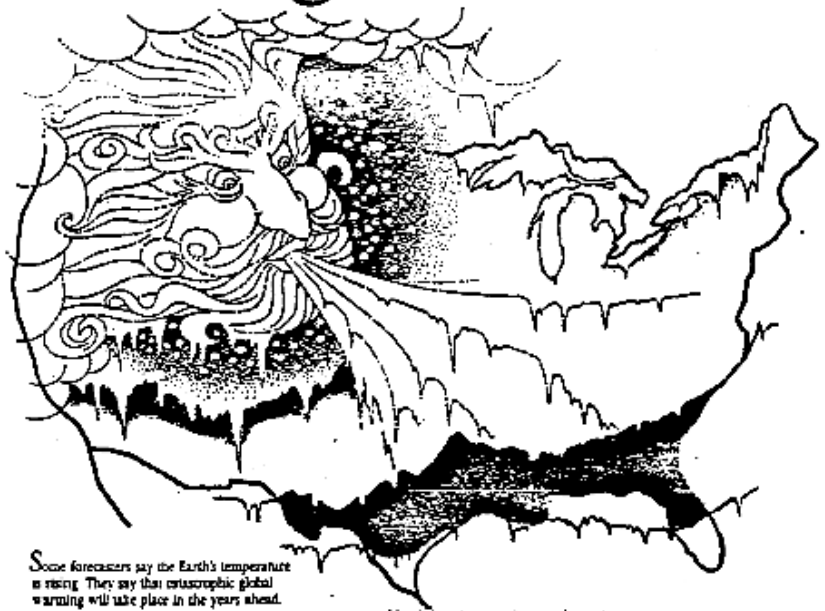
CITY _____

STATE _____ ZIP _____

Mail to:
Information Council for the Environment
PO Box 419558 / Kansas City, MO 64141-9558

Information
Council
for the Env
1-800-346-6269

If the Earth is getting warmer, why is the frost line moving south?



Some forecasters say the Earth's temperature is rising. They say that catastrophic global warming will take place in the years ahead.

But the U.S. Department of Agriculture—in the first update in 25 years of its "Plant Hardiness Report"—determined that on both coasts of this country, winter temperatures are 5 to 10 degrees cooler than previously reported.

The evidence can be seen in the increase in cold damage to Florida orange groves and California eucalyptus. And in a moving frost line that has led to a shorter growing season in some parts of the South.

Now, most of us aren't climatologists. But facts like these simply don't jibe with the theory that catastrophic global warming is taking place. Which seems to say we need more research. And more evidence about this environmental phenomenon before we take any action.

cool head about it—now is your chance to get more facts.

Call the Information Council for the Environment, 1-800-346-6269 extension 528. We'll send you a free packet of information on global climate change. Or just mail us the coupon below.

Because the best environmental policy is a policy based on fact.

Please send me your FREE information packet on global climate change.

name _____

address _____

city _____

state _____ zip _____

Information Council for the Environment

Who told you the earth was warming... Chicken Little?

Chicken Little's hysteria about the sky falling was based on a fact that got blown out of proportion.

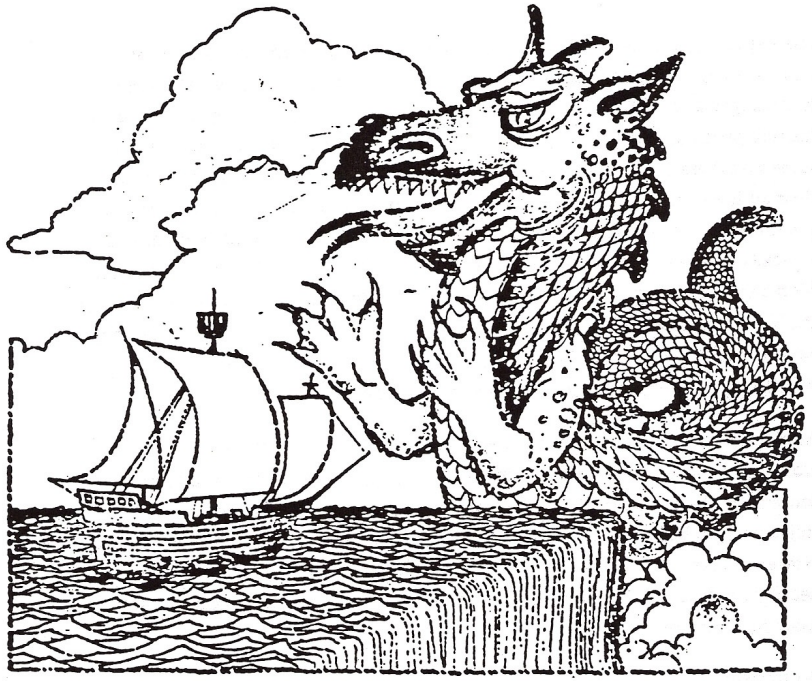
It's the same with global warming. There's no hard evidence it is occurring. In fact, evidence the Earth is warming is weak. Proof that carbon dioxide has been the primary cause is non-existent. Climate models cannot accurately predict far-future global change. And the underlying physics of climatic change are still wide open to debate.

If you care about the earth, but don't want your imagination to run away with you, make sure you get the facts.

Write Informed Citizens for the Environment, P.O. Box 1513, Grand Forks, North Dakota 58206

Some say the earth is warming.

Some also said the earth was flat.



Over the course of history, mankind has come up with some farfetched explanations for phenomena they couldn't explain. Eventually the truth was uncovered, which was a lot less frightening than their imaginations.

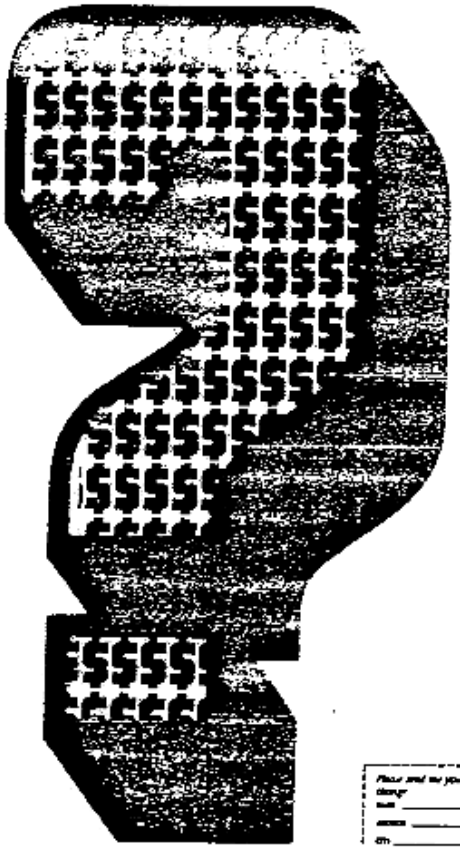
It's the same with global warming. There's no hard evidence it is occurring. In fact, evidence the Earth is warming is weak. Proof that carbon dioxide has been the primary cause is non-existent. Climate models cannot accurately predict far-future global change. And the underlying physics of climatic change are still wide open to debate.

If you care about the earth, but don't want to be chasing dragons, make sure you get the facts.

Write Informed Citizens for the Environment, P.O. Box 1513, Grand Forks, North Dakota 58206 or call 1-700-746-4573. We'll send you today's facts on global warmir

Informed Citizens

How much are you willing to pay to solve a problem that may not exist?



Congress is considering a new tax.

Right now, Congress is considering another new tax. A tax that would raise your cost of living. You'd be paying more for the gasoline in your car, the electricity and natural gas you need to light and heat your home; and virtually all of the goods and services you buy.

What's the reason for this tax? Some believe that the world's production and use of energy is tied to global warming. But let's look at the facts.

Is catastrophic global warming really taking place?

The U.S. Department of Agriculture—in the first update in 25 years of its "Plant Hardiness Report"—determined that on both coasts of this country, winter temperatures are 5 to 10 degrees cooler than previously reported.

The evidence can be seen in the increase in cold damage to Florida orange groves and California eucalyptus. And in a moving frost line that's led to a shorter growing season in some parts of the South.

In addition, average temperature records show Minneapolis has actually gotten colder over the past 50 years. There's also a cooling trend in Albany, New York—the city with the longest history in the U.S. (more than 160 years) of continuous daily temperature records.

Let's not pay for a problem that may not exist.

Which leads us back to Congress. Is a new energy tax really justified, given this much uncertainty? Before we impose more taxes—which may have devastating economic effects—let's first gain a better understanding of the Earth's delicate balance.

It will be your decision.

Call the Information Council for the Environment, 1-800-346-6265 extension 532. We'll send you a free packet of information on global climate change. Or just mail us the coupon below.

Because the best environmental policy is a policy based on fact.

Please send me your FREE information packet on global climate change.

Name _____

Address _____

City _____

FARGO MARKET

May 1991

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
Forum: Minneapolis 12	KVOX FM 6x WDAY FM 5x KLTA FM 7x KQWB FM 3x KQWB AM 3x WDAY AM 4x 13	KVOX FM 6x WDAY FM 5x KLTA FM 7x KQWB FM 3x KQWB AM 3x WDAY AM 4x 14	Forum: Frost KVOX FM 6x WDAY FM 5x KLTA FM 7x KQWB FM 3x KQWB AM 3x WDAY AM 4x 15	KVOX FM 6x WDAY FM 5x KLTA FM 7x KQWB FM 3x KQWB AM 3x WDAY AM 4x 16	Forum: Pick-up Minneapolis KVOX FM 6x WDAY FM 5x KLTA FM 6x KQWB FM 3x KQWB AM 3x WDAY AM 4x 17	18
Forum: Pick-up Frost 19	KVOX FM 5x WDAY FM 4x KLTA FM 6x KQWB FM 3x KQWB AM 3x WDAY AM 4x 20	KVOX FM 5x WDAY FM 4x KLTA FM 6x KQWB FM 3x KQWB AM 3x WDAY AM 4x 21	Forum: Minneapolis KVOX FM 5x WDAY FM 4x KLTA FM 5x KQWB FM 3x KQWB AM 3x WDAY AM 4x 22	KVOX FM 5x WDAY FM 4x KLTA FM 5x KQWB FM 3x KQWB AM 3x WDAY AM 4x 23	KVOX FM 5x WDAY FM 4x KLTA FM 5x KQWB FM 3x KQWB AM 3x WDAY AM 4x 24	Forum: Serious Problem 25
Forum: Pick-up How Much 26	KVOX FM 4x WDAY FM 3x KLTA FM 5x KQWB FM 3x KQWB AM 3x WDAY AM 4x 27	KVOX FM 4x WDAY FM 3x KLTA FM 5x KQWB FM 3x KQWB AM 3x WDAY AM 4x 28	Forum: Pick-up Serious Problem KVOX FM 4x WDAY FM 3x KLTA FM 5x KQWB FM 3x KQWB AM 3x WDAY AM 4x 29	KVOX FM 4x WDAY FM 3x KLTA FM 5x KQWB FM 3x KQWB AM 3x WDAY AM 4x 30	Forum: How Much KVOX FM 4x WDAY FM 3x KLTA FM 6x KQWB FM 3x KQWB AM 3x WDAY AM 4x	

PUBLIC RELATIONS TOUR

TUESDAY MAY 14, 1991

10:45 a.m.	Appearance on WBKO-TV's "Midday" hosted by Beverly Kirk.
1:00 p.m.	Meet with editors and writers at the Bowling Green Daily News.
2:30 p.m.	Tape appearance on WKYU-TV's "Outlook" hosted by Barbara Deeb. Tape will also be broadcast on WKYU-FM's "Midday Edition."

Hot debate: Bowling Green now battleground in heated global warming dispute

By DAVID C.L. BAUER
Daily News Staff Writer

Bowling Green is one of three cities nationwide becoming a battleground in the increasingly heated global warming debate.

The Information Council for the Environment, a coalition of utilities and energy issue-related organizations, has targeted Bowling Green, Flagstaff, Ariz., and Fargo, N.D., for a $500,000 advertising blitz to test the water on global warming beliefs among residents.

"Within the scientific community there is a split on this," ICE representative Ivan Brandon said today. "Nobody disagrees that global warming exists, but the disagreement within the scientific community is over whether it is catastrophic" or even as much a worry as many assert.

The advertisements, several of which have appeared in the Daily News, dispute the impact of global warming.

Global warming deals with the effect of carbon-dioxide pollution — such as from automobile and industry emissions — and the trapping of these gases in the atmosphere. When heated by the sun, they cause the Earth's temperature to increase. Some scientists believe increased emissions are causing a warming effect on the Earth.

"Some scientists say the Earth's temperature is rising," one of ICE's advertisements contends. "They say that catastrophic global warming will take place in the years ahead. Yet, average temperature records show Kentucky has actually gotten colder over the past 70 years. ..."

The advertisements include coupons for information on global warming provided by ICE.

Brandon said there were 100 responses to the advertisements in the first week, but he could not break down those requests by cities. He said he has been pleased with the response so far.

But while ICE may be winning some believers, the advertisements are raising the ire of others.

In a letter to the editor published Tuesday in the Daily News, Western Kentucky University Associate Professor Barry W. Brunson said the advertisements use shaky arguments.

"It is like saying that inflation doesn't happen if the prices of baby carriages and broccoli go down, or like saying that it is too soon to worry about a patient who is at risk for cancer if, after all, the patient's left leg and nose appear to be healthy," Brunson wrote.

The advertisements also are drawing fire from the national front.

An aide for U.S. Rep. Fortney Pete Stark of California on Wednesday rebutted the group's claims, calling global warming "so serious a threat we need to take action now."

Stark deals with a number of global warming issues.

"Global warming is one of the most serious environmental problems facing not just the United States but the entire globe," Stark told members of Congress.

"... A few in industry would say that global warming is not happening or is not significant," he said. "... The scientific level of certainty on global warming is 100 percent with the vast majority of scientists believing that the

Continued Back Page
Column 5, This Section

Hot debate

From Page 1

greenhouse effect will cause climate changes posing great risks to society and to the natural world."

Brandon reiterated ICE is not claiming global warming is not happening, simply that it is not as gloom and doom as some claim.

According to the Washington, D.C.-based publication The Energy Daily, the three cities were chosen because they are relatively inexpensive markets in which to advertise and also have diverse geographic and demographic compositions.

Brandon said the advertisements, which began in early May, will continue for several weeks.

After the advertisements end, residents will be polled about their beliefs on global warming. The results of the polls will be used to decide whether to carry the message to other cities, he said.

Global warming now a “debate”

Conclusions from test campaign (1)

- Audiences trusted “technical sources” most, activists and government officials in middle, and industry least
- Find scientists to serve as spokesmen
- “Information Council on Environment” was best name, because best for positioning ICE as a “technical source”

Conclusions from test campaign (2)

Two possible target audiences identified, with different messages for each.

Target 1: “Older, less educated males”

Receptive to “messages describing the motivations and vested interests of people currently making pronouncements on global warming--for example, the statement that some members of the media scare the public about global warming to increase their audience and their influence….” (ICE report, AMS archives, p. 4)

Target 2: younger, lower-income women

"… These women are more receptive .. to factual information concerning the evidence for global warming. They are likely to be "green" consumers, believe the earth is warming, and to think the problem is serious. However, they are also likely to soften their support for federal legislation after hearing new information…"

- ICE report, AMS archives, p. 4

Public not confident evaluating scientific claims…

- …members of the public feel more confident expressing opinions on others motivations and tactics than they do expressing opinions of scientific issues.”

(Suggests value of either impugning motivations or providing alternative scientific claims…)

Attitude change

- Study concluded, overall, that people were receptive to attitude change
- Many different types of people were supportive of more research (and less supportive of legislation) after hearing materials presented by interviewer.
- If presented with credible facts by technical spokespersons.

This conclusion incorporated into a video produced by WFA the following year…

1992:

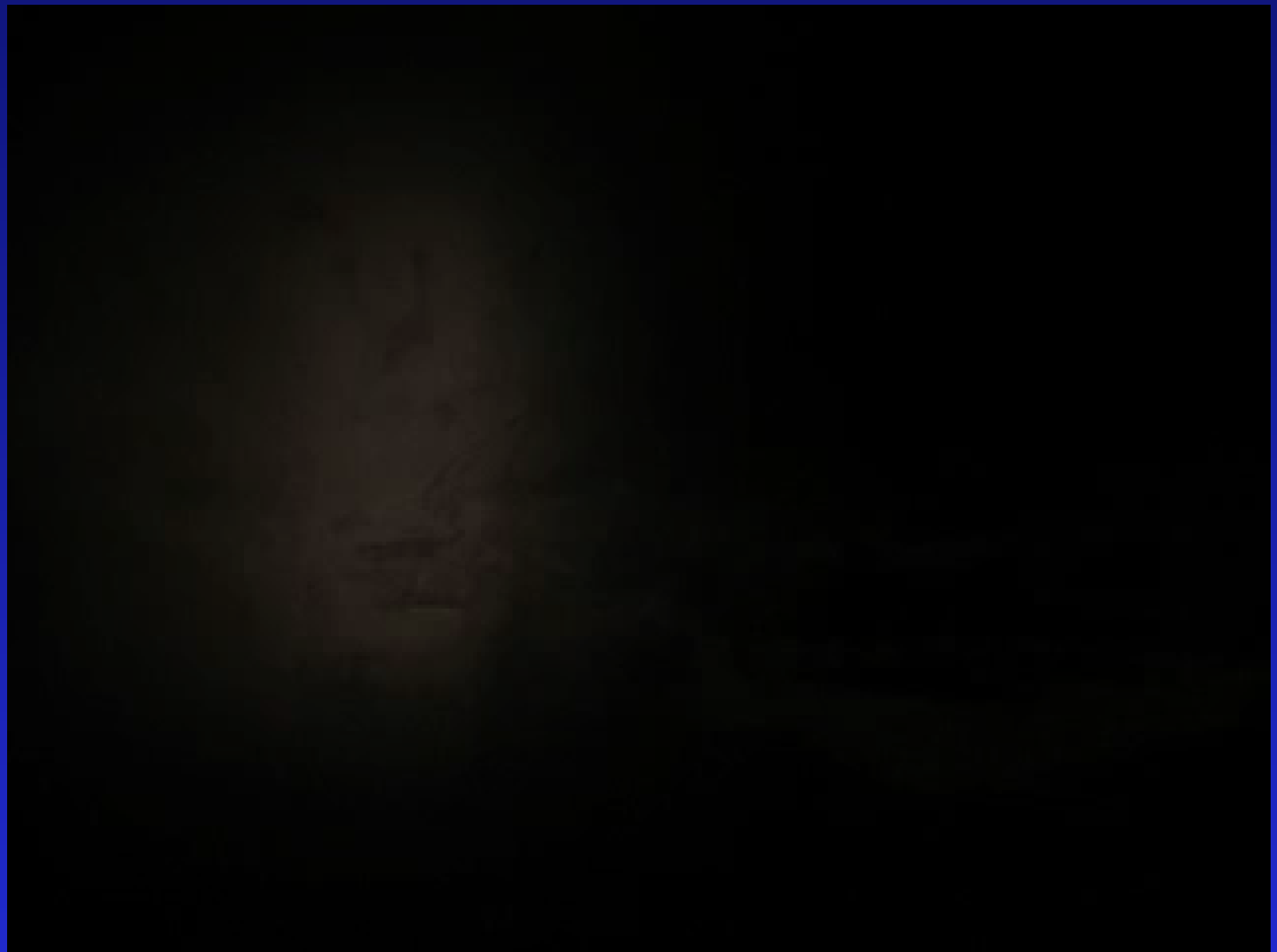
"The Greening of Planet Earth:
The Effects of Carbon Dioxide on the Biosphere"

Released under name of the Greening Earth Society, funded by WFA.

The Greening of Planet Earth: The Effects of Carbon Dioxide on the Biosphere

Is carbon dioxide a harmful air pollutant, or is it an amazingly effective aerial fertilizer? Explore the *positive* side of the issue in this half-hour documentary -- *The Greening of Planet Earth* - yours free today with a qualifying tax deductible donation of $12 plus shipping and handling.

“The Greening of Planet Earth”



Sherwood Idso, Greening of Planet Earth

Bulk of remainder of video is other technical experts, mostly group from U.S. Department of Agriculture

…making making technical claims, abundant reference to experimental data

- Crop plants “30-40% more than they are currently producing.
- Cotton “yields that are 60% and more greater”
- Decreased water demands, as crops grow more efficiently

- Pictures of greenhouses.
  - "Controlled environment chambers"
  - C3 plants respond "quite nicely"--up to 30-40% increased yields in response to doubled CO_2
- Computer terminals
  - Computer models simulate increases in soy bean "dry matter accumulation and seed yield" in response to 660 ppm CO_2
- Maps and Charts, to illustrate the greener world

Were there facts actually facts (scientifically tested and confirmed?)

Yes and No

Some of "technical claims" clearly went beyond the experimental evidence…

- Bruce Kimball asserts that a CO_2 enhanced world is "one that plants will enjoy… a lot more. They have been, in effect, eating the CO_2 out of the air for a long time and they' re rather starved for CO_2…."

- "The increase in atmospheric CO_2 is a benefit that will occur around the globe, regardless of where you are located."

And other claims not false.

Many C3 plants *do* grow more abundantly in CO_2 enhanced environments at least initially, and when other nutrients are fully available.

Refutation by distraction

Focus on something true, but does not refute central claims of climate science

(Cf. Tobacco: other causes of cancer)

Tied together by rhetorical sleights of hand

Narrator describes the greenhouse effect as "a phenomenon in which CO_2 *plus* harmful greenhouse gases trap the heat escaping into the atmosphere and send it back to Earth."

Gerd-Rainer Weber (meteorologist)

“…Our world will be a much better one.”

How many people saw this video?

Widely distributed to libraries

What effect does the burning of fossil fuels and the resulting emission of carbon dioxide have on the earth's biosphere? This question is posed to a number of leading scientists in *The Greening of Planet Earth*, an enlightening documentary that examines one of the most misunderstood environmental phenomena of the modern age.

--http://osulibrary.oregonstate.edu/video/met4.html

Other campaigns…

- Press releases
- Legal challenges to local environmental laws
- Public speeches to sympathetic audiences
  - Taking scientific evidence out of context.
  - Misrepresenting the scientific evidence
  - Impugning motivations of environmentalists and scientists (to scare you, to get more money for research)
  - Accusing environmentalists of being anti-American, anti-Christian, etc.

Effect?

Yale/Gallup Poll, 2007

- 50% of Americans worried " a great deal" or "a fair amount"
  - But what about the other 50%?
- Approximate 80% support legislation of some kind to address it
  - Legislation on greenhouse gases has been pending in the US Congress since late 1970s…
- US federal government continues to oppose international action

While most people accept global warming as a fact

They don't accept its origins in scientific consensus.

They think that scientists are still arguing about it.

This suggests that resistance campaigns were effective in creating a lasting impression of scientific disagreement, discord, and dissent.

"In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual." --Galileo

“Galileo evidently was too good-natured to ask whether that single humble individual was being funded by petroleum money.”
--Craig Callender

References

- Yale Project on Climate Change/ Gallup / Clear Vision Institute, 2007
- Ross Gelbspan, Boiling Point, 51-52 and Heat is On, Appendix, A Scientific Critique of Greenhouse Skeptics
- John Perry 1981, Energy and Climate: Today's problem, Not Tomorrow's Climate Change 3: 223-225.
- Archives of the American Meteorological Society