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

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Americans now accept “fact” of global warming

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
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...

- 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.”

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$^\circ$ 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 \( \text{CO}_2 \) 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.”

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.”

Global temperature change


*National Aeronautics and Space Administration Goddard Institute for Space Studies, **Case Western Reserve University, **The Aerospace Corporation, **Jet Propulsion Laboratory, NASA

Published by the National Academy of Sciences

Global surface temperature has increased ~0.6°C per decade in the past 30 years, similar to the warming rate predicted in the 1970s in Initial global climate model simulations with special emphasis on greenhouse gas changes. Warming is largest in the Western Hemisphere, where temperatures have increased by 1°C over the past century, and we suggest that the increased West-East temperature gradient may have increased the likelihood of strong El Niño events, such as those of 1982 and 1983. Comparison of measured sea-surface temperatures in the Western Pacific with palaeoclimate data suggests that the eastern equatorial region, and probably the entire Pacific, is more sensitive to changes in the El Niño-Southern Oscillation than to changes in the global mean temperature. We estimate that global warming of more than ~1°C relative to 2000 will constitute "dangerous" climate change as judged from likely effects on one event and extrapolation of other events.

1.988 Things Heat Up

- 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

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 consistent in climate models. If the model results are reliable, we expect higher temperatures, and thus higher climate change, to occur in the Western and Indian Oceans, which provide a good indication of global climate change.

The Global Temperature Change Global temperature change in the last century is accompanied by an increase in the Earth’s natural greenhouse gases, and a decrease in solar radiation. Emissions from human activities have increased over the past century, and we estimate that global warming of more than 1°C above 1990 will be dangerous to human health and ecosystems. We refer to this as "dangerous" climate change, and we believe that we are more than 99% certain that global warming is occurring.

References


2. Hansen, J., D. Sato, M. Minnella-Eliche, M. Minnella-Eliche, K. Lo, D. Lanz, and M. Minnella-Eliche (2007). Global surface temperature has increased ~0.6°C per decade in the past 30 years, similar to the warming rate predicted in the 1970s in Initial global climate model simulations with special emphasis on greenhouse gas changes. Warming is largest in the Western Hemisphere, where temperatures have increased by 1°C over the past century, and we suggest that the increased West-East temperature gradient may have increased the likelihood of strong El Niño events, such as those of 1982 and 1983. Comparison of measured sea-surface temperatures in the Western Pacific with palaeoclimate data suggests that the eastern equatorial region, and probably the entire Pacific, is more sensitive to changes in the El Niño-Southern Oscillation than to changes in the global mean temperature. We estimate that global warming of more than ~1°C relative to 2000 will constitute "dangerous" climate change as judged from likely effects on one event and extrapolation of other events.

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
- CATO Institute
- Competitive Enterprise Institute
- 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
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.
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
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:

\[ \text{CO}_2 \text{ would enhance agricultural productivity: “greener Earth”} \]
Who were the Western Fuels Association?
• Cooperative of Western coal producers, mostly in Powder River Basin (Wyoming and Montana)

• Supply coal to electrical utilities
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 experts 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. What 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—then it's your chance to get some facts.

Call the Information Council for the Environment, 1-800-366-3336 extension 330. 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.
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 21 years of its "Plant Hardiness Report"—determined that on both coasts of this country, winter temperatures are 5 to 10 degrees colder 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 fit 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 end them all—now is your chance to get more facts.

Call the Information Council for the Environment, 1-800-546-6219 tomorrow 9:30. We'll send you a free packet of information on global climate change. Or just mail in the coupon below.

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

Information Council for the Environment

[Address and phone number]
Who told you the earth was warming...
Chicken Little?

Chicken Little's hysteric 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 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 58202.
Some say the earth is warming.

Some also said the earth was flat.

Over the course of history, mankind has come up with some far-fetched 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. One of the primary causes is non-existent. Climate models cannot accurately predict future global change. And the underlying physics of climate 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 1313, Grand Forks, North Dakota 58206 or call 1-700-746-4575. We'll send you today's facts on global warming.
How much are you willing to pay to solve a problem that may not exist?

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.

But's the reason for this tax? Some believe that the world's production and use of energy is not 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 last update to its Plant Hardiness Report—described 1987 as one of the coldest winters since 1934, when temperatures were 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 wine grapes and in a survey of farms that lost crops to a severe growing season in some parts of the South.

In addition, average temperature records show that Minneapolis has actually gotten colder over the past 50 years. There's also a cooling trend at many New York City sites that were the warmest in the U.S. (more than 80 years) of continuous daily temperature records.

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

Which leads us back to Congress. If a new energy tax really occurred, given the facts, what would it be worth? Before we support more taxes—which may have devastating economic effects—let's first gain a better understanding of the Earth's defense balance.

It will be your decision.
Call the Information Council for the Environment.
1-800-145-6559 extension 533. 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.
FARGO MARKET

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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. Brunsom said the advertisements are 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," Brunsom wrote.

The advertisements also are drawing fire from the national front.

An aide for U.S. Rep. Fortney Pete Stark of California on Wednesday rebuked the group's claims, calling global warming "a serious 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
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…)}
Atttitude 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.
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”
Bulk of remainder of video is other technical experts, mostly group from U.S. Department of Agriculture
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 CO₂

• Computer terminals
  – Computer models simulate increases in soy bean “dry matter accumulation and seed yield” in response to 660 ppm CO₂

• 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?
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%?

- Approximately 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


• Archives of the American Meteorological Society