Global scares, subjective science, and climatologists

4.1 GLOBAL SCARES

Global-warming alarmism can be viewed from the broader perspective of global scares as one in a series of panics that rise and often fall; global warming is still in the rise period. Booker and North (2007) documented the details of the rise and fall of various global scares ranging from a wide variety of food scares, to mad cow disease, to dioxins, to the millennium bug, to lead and asbestos, to passive smoking, and finally to global warming. (They failed to cover excessive quarantine of returning astronauts or depletion of the ozone layer by sea-surface temperatures (SSTs). In the introduction to their book Seared to Death, Booker and North defined the unifying characteristics of global scares:

“Each was based on what appeared at the time to be scientific evidence that was widely accepted. Each has inspired obsessive coverage by the media. Each has then provoked a massive response from politicians and officials, imposing new laws that inflicted enormous economic and social damage. But eventually the scientific reasoning on which the panic was based has been found to be fundamentally flawed. Either the scare originated in some genuine threat that had then become wildly exaggerated, or the danger was found never to have existed at all.”

By now, however, the damage has been done. The costs have amounted in some cases to billions, even hundreds of billions, of pounds, imposing an enormous hidden drain on the economy. Yet almost all of this money has been spent, it turns out, to no purpose.

What does it say about the psychology of our time that such an extraordinary thing can happen, not just once, but again and again? When we examine the pattern behind these scares, we find further elements that each has in common:

- The source of the supposed danger must be something universal, to which almost anyone in the population might be exposed, such as eggs or beef, asbestos, or climate change.
• The nature of the danger it poses must be novel—a threat that has never appeared in this form before.
• While the scientific basis for the scare must seem plausible, the threat must also contain a powerful element of uncertainty. It must in some way be ill-defined, maximizing the opportunity for alarmist speculation as to the damage it might cause.
• Society’s response to the threat must be disproportionate. It is this more than anything which defines a true “scare”; that, even where the threat is not wholly imaginary, the response to it is eventually seen to have been out of all proportion to its reality.

In Ionescu’s play Rhinoceros, written for the theater of the absurd, he explores the pressures on people to conform to trends and adopt expanding belief systems. As more and more people turn into rhinos, the pressure to conform by doing likewise becomes intense. Today, we witness just such a pressure on politicians, scientists, and the public to jump on the global-warming bandwagon. Even George W. Bush, who in his tenure as President of the United States had opposed every single effort to legislate even the most mild and moderate steps to improve or protect the environment, began to weaken on global warming in 2007. Former Vice-President Gore led a national campaign to raise consciousness about the dangers of global warming, based heavily on the hockey stick model. His efforts netted him the Nobel Peace Prize. The United Nations, through its Inter-governmental Panel on Climate Change (IPCC), has similarly taken an alarmist position, also dependent on the hockey stick. The Union of Concerned Scientists, and a number of U.S. governmental agencies have taken similar positions. In addition, quite a large number of scientists have also become very concerned regarding the potential impacts of global warming.

Matt Ridley wrote an essay on the history of apocalyptic predictions. He said:

“Best-selling economist Robert Heilbroner in 1974: ‘The outlook for man, I believe, is painful, difficult, perhaps desperate, and the hope that can be held out for his future prospects seem to be very slim indeed.’ Or best-selling ecologist Paul Ehrlich in 1968: ‘The battle to feed all of humanity is over. In the 1970s [‘and 1980s’ was added in a later edition] the world will undergo famines—hundreds of millions of people are going to starve to death in spite of any crash programs embarked on now . . . nothing can prevent a substantial increase in the world death rate.’ Or Jimmy Carter in a televised speech in 1977: ‘We could use up all of the proven reserves of oil in the entire world by the end of the next decade’.

‘Predictions of global famine and the end of oil in the 1970s proved just as wrong as end-of-the-world forecasts from millennialist priests. Yet there is no sign that experts are becoming more cautious about apocalyptic promises. If anything, the rhetoric has ramped up in recent years. Echoing the Mayan

1 Ridley, Matt. (2012) “Apocalypse not”, www.rationaloptimist.com/blog/apocalypse-not.aspx.
calendar folk, the Bulletin of the Atomic Scientists moved its Doomsday Clock
one minute closer to midnight at the start of 2012, commenting: ‘The global
community may be near a point of no return in efforts to prevent catastrophe
from changes in Earth’s atmosphere’.

“Over the five decades since the success of Rachel Carson’s Silent Spring in
1962 and the four decades since the success of the Club of Rome’s The Limits to
Growth in 1972, prophecies of doom on a colossal scale have become routine.
... The past half century has brought us warnings of population explosions,
global famines, plagues, water wars, oil exhaustion, mineral shortages, falling
sperm counts, thinning ozone, acidifying rain, nuclear winters, Y2K bugs, mad
cow epidemics, killer bees, sex-change fish, cell-phone-induced brain-cancer
epidemics, and climate catastrophes.”

Ridley described exaggerated predictions of catastrophe due to synthetic
pesticides, DDT in particular, air pollution, acid rain, loss of the ozone layer, 1976
swine flu panic, mad cow disease, Ebola, SARS, a virus from civet cats, 2005 bird flu,
famine and overpopulation, resource depletion: oil and gas, metals, and species
extinction.

Ridley concluded: “Over the past half century, none of our threatened eco-
pocalypses have played out as predicted. Some came partly true; some were averted
by action; some were wholly chimerical. This raises a question that many find
discomforting: With a track record like this, why should people accept the
cataclysmic claims now being made about climate change?” He quoted Rajendra
Pachauri, head of the IPCC, who said in 2007 that “if there’s no action before 2012,
that’s too late ... This is the defining moment”.

He went on to say:

“So, should we worry or not about the warming climate? It is far too binary a
question. The lesson of failed past predictions of ecological apocalypse is not
that nothing was happening but that the middle-ground possibilities were too
frequently excluded from consideration. In the climate debate, we hear a lot
from those who think disaster is inexorable if not inevitable, and a lot from
those who think it is all a hoax. We hardly ever allow the moderate
‘lukewarmers’ a voice: those who suspect that the net positive feedbacks from
water vapor in the atmosphere are low, so that we face only 1 to 2 degrees
Celsius of warming this century; that the Greenland ice sheet may melt but no
faster than its current rate of less than 1 percent per century; that net increases in
rainfall (and carbon dioxide concentration) may improve agricultural produc-
tivity; that ecosystems have survived sudden temperature lurches before; and
that adaptation to gradual change may be both cheaper and less ecologically
damaging than a rapid and brutal decision to give up fossil fuels cold turkey.”
4.2 DEALING WITH SUBJECTIVE SCIENCE

4.2.1 Nature of subjective science—emergence of consensus

There are many phenomena in nature that, for one reason or another, are not susceptible to verification by independent testing. These typically include events that either occurred a long time ago or that occurred at distant sites not accessible to us, or both. Examples include the expansion of the universe after the Big Bang, the variations in climate of the Earth in the past or in the future, the origin of life on the Earth, putative existence of life elsewhere in the universe, the evolution of species on the Earth, continental drift, and other such topics. There is no way to go back into the past or travel great distances to directly verify hypotheses. Although the remnants of the past may be discernible to some extent in proxies that exist in the present, these tend to have significant limitations. For such phenomena that occurred long ago and/or in distant locations, scientists create hypotheses that would "explain" how these processes might have occurred in conformity with the known laws of science. If these hypotheses provide a reasonable explanation of phenomena and are in conformity with scientific laws, they acquire the elevated status of a theory. Such a theory is typically not unique and represents one viewpoint. It provides one possible explanation for events that cannot be directly verified. Scientists are put in the position of detectives trying to solve a crime by piling up circumstantial evidence. In the case of evolution and continental drift, the circumstantial evidence is very strong and any sensible person would accept that these theories are almost certainly valid.

Unfortunately, the foundations of almost every subjective aspect of climate change are weak. Conjecture for things improvable is a safe venture—no one can ever prove you wrong. It is far more dangerous to predict tomorrow’s weather than it is to predict the climate 100 years from now—tomorrow’s weather is subject to practical test. I call this kind of science "subjective science". It is not amenable to direct verification in the manner of say, the laws of motion.

Scientists do not seem to be able to shrug their shoulders and admit that we just don’t know the answers to some questions. What happens is that one of the unprovable hypotheses in a subjective science gains popularity amongst scientists and is regarded by the majority as the most credible alternative. When a significant number of scientists agree, a consensus evolves. The consensus acts like a gigantic gravitational field, drawing in more and more scientists. Eventually, the consensus gels, and ultimately hardens into a belief system—an orthodoxy. The foundations are often weak, and not understood by the public. The emergence of the consensus as the essence of reality in science has replaced scientific skepticism, and, as Lindzen (2008) has noted: “... simulation and programs have replaced theory and observation, where Government largely determines the nature of scientific activity”. As Lindzen (2008) emphasized, “the bulk of the educated public is unable to follow scientific arguments; ‘knowing’ that all scientists agree relieves them of any need to do so.” Taking issue with the consensus “serves as a warning to scientists that the topic at issue is a bit of a minefield that they would do well to avoid”. It should also be noted that many
climatological publications are so full of jargon and so obscure that they are unreadable except to a very few narrow specialists. So, not only the general public, but even much of the science community is unable to digest these abstruse treatises.

The consensus acquires legitimacy in proportion to the number and prominence of the scientists and institutions that subscribe to it. As the consensus becomes firmly imbedded in culture, it acquires the respect usually accorded to fact. However, as Crichton (2003) said:

“Let’s be clear: the work of science has nothing whatever to do with consensus. Consensus is the business of politics. Science, on the contrary, requires only one investigator who happens to be right, which means that he or she has results that are verifiable by reference to the real world. In science consensus is irrelevant. What is relevant is reproducible results. The greatest scientists in history are great precisely because they broke with the consensus. There is no such thing as consensus science. If it’s consensus, it isn’t science. If it’s science, it isn’t consensus. Period.”

Actually, he is not quite right here. There is nothing fundamentally wrong with forming a consensus of opinion on a subjective science topic. What is wrong is when the consensus hardens into an orthodoxy with inadequate scientific support.

Curry and Webster\(^2\) wrote a review of the notion of consensus in science, with particular regard to climate change. The report by Curry and Webster follows two paths. One is the “consensus findings” of the IPCC regarding the role of greenhouse gases on warming over the past century, and the other is a review of philosophical views of consensus in science. They reviewed a number of philosophical questions regarding the role of consensus in science. They concluded:

“Arguing from consensus to enforce conclusions does not work with the extended peer community. What is needed are serious attempts to engage the extended peer community with the modes of expert reasoning used to reach those conclusions.”

There seems to be quite a bit of confusion in the world of climate science as to what the consensus is consenting to. For example, Curry and Webster focused on a IPCC conclusion that warming in the 20th century was primarily caused by anthropogenic generation of greenhouse gases. There might be considerable variability in the extent of widespread consensus on several beliefs as shown below (degree of consensus shown in brackets: 5 = greatest consensus; 1 = least consensus):

1. The Earth’s climate would have been steady and constant, were it not for the impact of anthropogenic activity on the climate system. [4]
2. The climate of the mid-19th century was ideal. [3]
3. The global average of Earth temperatures rose over the past ~120 years. [5]
4. Rising concentrations of greenhouse gases warm the Earth’s climate. [5]

\(^2\) Curry, J. A. and Webster, P. J. (2012), “Climate change: No consensus on consensus”, http://judithcurry.com/2012/10/28/climate-change-no-consensus-on-consensus/.
(5) Since the climate warmed over the past ~120 years, it must have been due to emissions of greenhouse gases by human activity. [4]

(6) Continued emission of greenhouse gases in the future will lead to further warming. [5]

(7) Global climate models, while not perfect, are good enough to predict future global temperature rise due to future increases in greenhouse gas concentrations. [2]

(8) The impacts of future temperature rise at any level are well understood. [3]

(9) The impacts of future temperature rise will be disastrous to the world unless we immediately drastically reduce the world rate of carbon emissions. [3]

(10) We can immediately drastically reduce the world rate of carbon emissions by a combination of introducing green energy, sequestration, and energy conservation at a more rapid rate, without severely impacting the world economy. [1]

There is no accurate way to estimate the degree of consensus on each of these relevant issues. Subjectively, my impression from reading papers, blogs, various press releases, and conversations with individuals is as follows. On a scale from 1 to 5, where 5 is the most widespread consensus of belief, and 1 is the least widespread consensus of belief, my impression is as given in brackets in the above list.

Let us consider these issues one by one.

(1) The Earth’s climate would have been steady and constant, were it not for the impact of anthropogenic activity on the climate system. [4] There seems to be a fairly widespread belief in this postulate that the Earth’s climate is steady unless acted upon by an outside influence. This is parallel to Newton’s law of motion that a body remains at rest or in uniform motion unless acted upon by an outside force. This does not allow for changes in the Sun–Earth relationship that can produce major climate changes due to innate variability of the Sun, as well as variations in the Earth’s orbit relative to the Sun. A problem with this belief is that the Earth is a very complex system with many feedback effects. Weather, ocean currents, and other aspects of the Earth system can vary widely, triggering feedbacks that produce longer-term variations (i.e. internally generated climate change). The historical record shows that, over hundreds of thousands of years, we have had Ice Ages and interglacials without human influence. More to the point, we have had small but significant climate fluctuations within our current interglacial period over the past couple of millennia. The alarmists have tried unsuccessfully to dispute this via the hockey stick picture of millennial climates.

(2) The climate of the mid-19th century was ideal. [3] I don’t think that most people have really thought about this very much and the degree to which there might be consensus on this point is uncertain. But there seems to be widespread concern that we are presently warmer than they were the mid-19th century, which seems to imply that they wish we were back in the Little Ice Age. We can either argue that it is warmer now, or it was colder then. The majority seem to favor that we are warmer now.

(3) The global average of Earth temperatures rose over the past ~120 years. [5] This is very widely believed and it is a matter of fact.
(4) **Rising concentrations of greenhouse gases warm the Earth’s climate.** [5] This is very widely believed and it is a matter of fact.

(5) **Since the climate warmed over the past ∼120 years, it must have been due to emissions of greenhouse gases by human activity.** [4] This is a fairly widespread belief. But it is too digital. In retrospect, it seems likely that rising greenhouse gas concentrations contributed to warming over the past 120 years, but it also seems likely that natural fluctuations in climate (e.g., pulling out of the Little Ice Age) may have contributed as well. The degree to which each factor influenced the climate is unknown.

(6) **Continued emission of greenhouse gases in the future will lead to further warming.** [5] This is very widely believed and it is almost certainly correct.

(7) **Global climate models, while not perfect, are good enough to predict future global temperature rise due to future increases in greenhouse gas concentrations.** [2] I am under the impression that this is not widely believed. However, it is widely believed that there is a reasonable chance that the models provide us with a worst-case scenario.

(8) **The impacts of future temperature rise at any level are well understood.** [3] I am under the impression that this is believed to the extent of perhaps 50%. However, it is widely believed that the analyses at least provide us with a worst-case scenario.

(9) **The impacts of future temperature rise will be disastrous to the world unless we immediately drastically reduce the world rate of carbon emissions.** [3] I am under the impression that this is believed to the extent of perhaps 50%. However, it is widely believed that the analyses provide a worst-case scenario.

(10) **We can immediately drastically reduce the world rate of carbon emissions by a combination of introducing green energy, sequestration, and energy conservation at a more rapid rate, without severely impacting the world economy.** [1] I think that this is only believed by a limited number of rabid “greenies”. I am under the impression that the overwhelming majority wish that this were so, but are very uncertain of its practicality.

While the role of greenhouse gases in warming over the past 100 years is somewhat relevant to the issue, the real issue we face is: For various future scenarios of world energy consumption by sector and fuel, what are the expected environmental consequences? Assuming that the more the future resembles business as usual, the environmental impacts are greater, what is the technical feasibility and cost of shifting from future scenarios with greater environmental impact to scenarios with lesser environmental impact? Is there a consensus that we know the answers to these questions? I think not.

Ward (2008) discussed the scientific method, for which he emphasized: “No hypothesis is considered proven until it has undergone rigorous scientific review and testing, and other scientists must be able to replicate the tests or experiments and achieve the same results.” Unfortunately, his notion of scientific rigor seems to be that it is supported by a consensus. His report emphasizes the necessity of repeatability in the scientific method; for example, it says: “A scientist tells how he or
she arrived at a conclusion in enough detail so that another investigator can follow the same trail, examine the same data, and get the same answer.” Yes, repeatability is necessary, but not sufficient. If the method of processing the data is arbitrary or possibly improper, successive investigators can reproduce the results but they will be just as arbitrary or inaccurate as they were before they were replicated. Ward (2008) mixes up two requirements of the scientific method. There is a huge difference between, on the one hand, applying a hypothesis to a large array of independent phenomena vs. on the other hand, applying a hypothesis to a single case (with adjustable parameters) in such a manner that those who follow can duplicate the results by repeating the same steps. The problem with climate change is that very little in this field of endeavor is “proven” and most of the “accumulated advances in understanding of climate change” over the past 20 years range from arbitrary (climate model results) to improper (the so-called hockey stick result).

4.2.2 How consensus becomes orthodoxy

Orthodoxy is a belief system. Thus, in regard to global warming, we have believers (alarmists) and non-believers (skeptics). Otherwise intelligent people often discuss whether or not they “believe in global warming”.

But, like any religion, scientific orthodoxies cannot tolerate disagreement with the orthodoxy. Therefore, the alarmists have politicized the science of climatology to enforce their views. Lindzen (2008) described the politicalization of climate science:

“All such organizations, whether professional societies, research laboratories, advisory bodies (such as the national academies), government departments and agencies (including the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA), NSF, etc.), and even universities are hierarchical structures where positions and policies are determined by small executive councils or even single individuals. This greatly facilitates any conscious effort to politicize science via influence in such bodies where a handful of individuals (often not even scientists) speak on behalf of organizations that include thousands of scientists, and even enforce specific scientific positions and agendas.

“The temptation to politicize science is overwhelming and longstanding. Public trust in science has always been high, and political organizations have long sought to improve their own credibility by associating their goals with ‘science’—even if this involves misrepresenting the science.”

Occasionally, a counter-argument is published as, for example, the New York Times article\(^3\) of Freeman Dyson’s opposition to the orthodoxy on global warming, but this only serves to confuse the public a bit.

The world of science seems to have lost its foundation of skepticism. Instead of

\(^3\) www.nytimes.com/2009/03/29/magazine/29Dyson-t.html?_r=1&scp=1&sq=freeman%20dyson &st=cs.
doubt and dialectic opposition, science has adopted orthodoxy and consensus. Scientists, like the public at large, seem unable to shrug their shoulders and simply admit that we just don’t know the answers. The fierce competition for funding in an environment dominated by orthodoxy pressures scientists to bias their viewpoints. We note a significant rise in the number of news releases and papers by scientists with phrases such as “there might be . . .,” or “it is possible that . . .”. What science cannot seem to do these days is accept that:

“Sometimes there is no alternative to uncertainty except to await the arrival of more and better data.” (Wunsch, 1999).

It seems likely that scientific (or economic) progress in climatology will be impeded by the fact that data and models are routinely biased to adhere to a belief system. The IPCC has led the way with a plethora of conclusions and predictions regarding the role of CO₂ emissions on the Earth’s climate and the potential impact on humanity. These represent mainly political, not scientific, conclusions. The majority of recognized climatologists have aligned like weather vanes to the prevailing wind, making it all but impossible to get contrary views published in journals. As a result, there has arisen a blogopolis in which contrary views are available on websites but not in the literature. While many of these blogs are populated by moronic entries, a few contain detailed analysis and data that you cannot find in the journals.

4.2.3 Counting adherents to the orthodoxy

To further the ends of the alarmists, some academicians have carried out counting studies where they sum up the number of scientists who subscribe to the alarmist persuasion. Oreskes (2004) built her argument in favor of anthropogenic global warming based on a list of who supports the hypothesis, rather than the scientific basis for it. She emphasized that the IPCC, the National Academy of Sciences, the American Meteorological Society, the American Geophysical Union, 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”. In a study of 928 abstracts published in refereed scientific journals between 1993 and 2003, she did not “find one paper that disagreed with the consensus position.” However, at the end, she provided an escape clause:

“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 . . . 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.”

Three years later, she concluded that global warming due to greenhouse gases “is an established scientific fact” (Oreskes, 2007a). In 2007, she gave a presentation of 109 slides to the American Meteorological Society (Oreskes, 2007b). That a social scientist would have 109 slides’ worth of information to convey about climate change speaks to
the role of consensus as a force in science. Her first slide quoted no less an expert on climatology than Arnold Schwarzenegger. The *Terminator* said “the debate is over” (pun intended). Her second slide proclaimed: “There is a scientific consensus over the reality of anthropogenic global warming.” Here she deals with belief #5 in my previously given list of 10 beliefs relevant to consensus. She then proceeded to quote various authorities to show that a consensus exists. Unfortunately for her, she ventured briefly into the science of climate change where she got in well over her head. Using the “hockey stick” result, she concluded that carbon dioxide as the cause of warming in the 20th century is “not just a correlation—it’s a confirmation of a prediction—the scientific method”. It is not clear which scientific method she refers to—certainly none that I am aware of. Of course, the real issue is not whether anthropogenic generated CO$_2$ contributed to warming in the past ~ 100 years; the real issue is what will be the consequence of further emissions in the 21st century? That is a totally different and more difficult question. I refer to Miyagi in the film *The Karate Kid*: “Answer only matter if ask right question.” For the sake of argument, we might blandly accept beliefs #1 though #9 in my previously given list, but we are stuck with belief #10 with little evidence that it is true.

Oreskes, Conway, and Shindell (2008) wrote a 70-page treatise on CO$_2$ as the putative cause of global warming in which the entire argument is based on a comparison of the number and credentials of those who believe in it vs. the number and credentials of those who disbelieve it. It is worth noting that the issue here has degenerated down to what opposing camps believe rather than a question of what the data tell us. The discussion was highly biased. For example, the authors refer disparagingly to “challenges to climate science” as if those of the alarmist persuasion are climate scientists whereas the challengers are something other than climate scientists. These authors are social scientists rather than experts in the science of global warming. As it turns out, the majority of paleoclimatologists do accept the thesis widely promulgated by Al Gore, the U.N., NOAA, the National Academy of Sciences, and other predominant professional organizations, that CO$_2$ emissions were the cause of global warming in the 20th century, and this warming will increase in the 21st century in proportion to further emissions, causing great misery for humanity (beliefs #8 and #9). This is the orthodox institutional viewpoint that is taught to schoolchildren and widely promulgated by academia. As institutions and organizations continue to dominate over individuals in these matters, a consensus builds up on each topic.4

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4 An anecdote illustrates the point. At a recent NSF workshop, Reversing Global Warming: Chemical Recycling and Utilization of CO$_2$ I presented a talk showing why the hockey stick representation of past temperatures was incorrect. A representative of the NSF raised a question at the end of my talk. She asked: “Why should I believe you when the National Academy of Sciences says otherwise?” She was relying on the institution over the individual. Ignoring the data that I presented, she fell back on reliance on the consensus. The issue was no longer whether my data and analysis were accurate, but rather, whether more prestigious organizations took a contrary position. Ayn Rand must be turning over in her grave! While I was giving my talk, one attendee of the alarmist persuasion stomped out of the meeting hall, audibly cursing.
However, the degree of consensus has been exaggerated (Schulte, 2008). It is also noteworthy that a number of prominent European and Russian climatologists and scientists have aligned themselves with the skeptics.

The French journal *La Meteorologie* criticized a French scientist for taking “an opposing stance” to “the prevailing ideology”. The French scientist said, “The term ‘consensus’, a term often employed by the IPCC, implies only that the ‘good’ keepers of the true faith are in the majority, meaning that mere weight of numbers (not necessarily synonymous with better quality) may control and dismiss discordant voices from publications and papers.” Kondratyev et al. (2003) describe the IPCC Report as “less than scientific, speculative opinions” and describe climate models as being “forced to fit the observational data” through adjustment of parameters. They claim that reductions of greenhouse gas emissions based on such models “are senseless”. Bischof (2000) said:

“The reader should understand that in science, as in other sectors of public life, the outcome of a study is often guided, if not determined, by an *a priori* idea, a tenet. In the case of global warming, this belief was that, if enormous amounts of greenhouse gases are released into the atmosphere, a temperature rise must occur. This prior assumption has guided scientific thinking and triggered a true deluge of investigations all desperately trying to prove just that.”

### 4.2.4 Climate science and determinism

Embedded in the concept of *cause and effect* is a belief in *determinism*: that events in a system are uniquely determined by the elements in the prior state of the system and its surroundings. We may say that some elements of the previous state “caused” the current state.

The following is excerpted from *Wikipedia*:

“The philosophical analysis of causality extends over millennia. The deterministic world-view is one in which the universe is no more than a chain of events following one after another according to the law of cause and effect. We can distinguish between necessary and sufficient causes:

**Necessary causes:**
If $x$ is a necessary cause of $y$, then the presence of $y$ necessarily implies the presence of $x$. The presence of $x$, however, does not imply that $y$ will occur.

**Sufficient causes:**
If $x$ is a sufficient cause of $y$, then the presence of $x$ necessarily implies the presence of $y$. However, another cause $z$ may alternatively cause $y$. Thus the presence of $y$ does not imply the presence of $x$.”

In addition, *Wikipedia* mentions “*Contributory causes:* A cause may be classified as a *contributory* cause, if the presumed cause precedes the effect, and altering the cause alters the effect. A contributory cause may be neither necessary nor sufficient but it must be contributory.”
It is common amongst non-scientific folk to attribute causes to many effects in their lives based on insufficient data. Most people I know are continually making assertions that “this caused that” in their lives in a totally unscientific way, with only one or two experiences to support the assertion. Most of the systems that govern our lives are complex, and it is impossible to separate out one factor as a cause (e.g., “Taking vitamin pills gave me good health”).

Some complex systems are exceedingly sensitive to initial conditions, and it is technically impossible to pin down the initial conditions precisely enough to make deterministic predictions of the outcome in the future. The system appears to behave chaotically, as if it changes in ways that are unpredictable and erratic. Yet, random events may appear to have a pattern—for a limited time period. For example, if one tosses a coin repeatedly five times, there is a 1 out of 32 chance that you will get five heads in a row. If, while you are tossing the coin, you stand on one foot, you might think that standing on one foot caused the coin toss to be heads. The book Fooled by Randomness by Nicholas Taleb is:

“...about luck disguised and perceived as non-luck (that is, skills) and, more generally, randomness disguised and perceived as non-randomness (that is, determinism). It manifests itself in the shape of the lucky fool, defined as a person who benefited from a disproportionate share of luck but attributes his success to some other, generally very precise, reason. Such confusion crops up in the most unexpected areas, even science, though not in such an accentuated and obvious manner as it does in the world of business. It is endemic in politics, as it can be encountered in the shape of a country’s president discoursing on the jobs that ‘he’ created, ‘his’ recovery, and ‘his predecessor’s’ inflation. We are genetically still very close to our ancestors who roamed the savannah. The formation of our beliefs is fraught with superstitions—even today (I might say, especially today). Just as one day some primitive tribesman scratched his nose, saw rain falling, and developed an elaborate method of scratching his nose to bring on the much-needed rain, we link economic prosperity to some rate cut by the Federal Reserve Board, or the success of a company with the appointment of the new president ‘at the helm’.” (Emphasis added)

We all fall prey to superstition at times. Taleb tells of a time when his futures trading was doing poorly. He arrived at work in a downpour of rain, and went quickly through the back door to avoid getting soaked walking around to the front door. He had the best day in months. After that, he never went in the front door again.

In general, most effects observed in climate appear to be highly chaotic and probably derive from a multitude of potential causes. The major challenge for climatologists is to ferret out which causes are most significant, and derive mathematical relationships between the putative causes and the observed effects. Implicit in this process is the belief that the system is deterministic and is not obscured by chaotic factors. However, there is typically no proof that the climate systems are deterministic. Even if they are deterministic, they may still be determined by so many conflicting contributing causes that attribution of the role of each
putative cause is always very difficult, if not impossible. Most climatological analyses end up with a scatter plot in which the X–Y space is mostly filled with data points, and only a climatologist could believe that a valid trend could be extracted from this mess. Climatological analysis seems to almost always involve the challenge of resolving a putative signal from a very low signal-to-noise system.

The evangelists for climate alarmism continually use the phraseology that the skeptics are “attacking climate science”, and all the evangelists want to do is “communicate the science” to the public. All of this presupposes that the alarmists have a lock on “climate science”, and the skeptics are not scientists and their analyses do not constitute “climate science”. However, there does not seem to be a succinct summary of just what “climate science” is. Maybe the latest IPCC Report might qualify in this regard but it is very diffuse and fragmented and does not present a cohesive summary of “climate science”. Most climate scientists are specialists in one narrow area of climate science; that is required to succeed in academia. Not very many of them have a synoptic view of the whole field from one end to the other. It would be of great help to everyone if the evangelists for climate alarmism would put out a summary of exactly what “climate science” is. My understanding is that “climate science” constitutes mainly two things: (1) the hockey stick and (2) climate models, leading to the conclusion that most of the observed climate warming of the past ~120 years was due to increased greenhouse gas concentrations, and most of the greenhouse gas effect was due to rising CO₂.

The argument of the hockey stick goes something like this. It is claimed that the analysis of temperature proxies leads to evidence that the global average temperature of the Earth did not change much over the past 2,000 years. Yet, we observe that the temperature rose significantly in the past 120 years—a period when greenhouse gas concentrations were rising. Hence it is assumed that greenhouse gases made the difference between the past 120 years and the previous 2,000 years—and thus it is concluded that greenhouse gases caused the temperature rise of the past 120 years. As more than a few have put it: “What else could have caused this temperature increase?” There are several problems with this argument. The first is most important. Do the proxies work? Do they provide accurate renditions of the global average temperature over the past 2,000 years? There is considerable evidence that proxies are affected by many more variables than temperature, and, in the important case of tree rings, this is a particular problem. In general, proxies do not seem to be anywhere as good as they are claimed to be by their proponents. The prevailing implicit belief system in the work of Mann, Bradley, Jones, et al. is that proxies provide accurate renditions of temperature change at each locality. When one attempts to integrate large numbers of different proxies at various locations, the belief is that the measured temperature change at any locality is given by:

\[ T_M = T_G + T_L \]

in which \( T_M \) is the measured temperature change at any locality, \( T_G \) is the average global temperature change, and \( T_L \) is the variation of the local temperature change from the global temperature change. \( T_G \) is presumed to be the same for all localities. The belief system is that \( T_L \) varies randomly from site to site, sometimes being >0
and sometimes being < 0. The belief system further assumes that, when one adds up $T_M$ for many sites, the values of $T_G$ will reinforce, but the sum of $T_L$ will add up to zero due to cancellation of + and—values. As far as this writer knows, this belief system has never been demonstrated with data. If the measurements do not accurately reflect temperature changes, this procedure will not yield $T_M$. But if, regardless of how inaccurate the values of $T_M$ are, they tend to be roughly equally distributed about zero, the end result of adding multiple proxies will be close to zero. Figures 2.9 and 2.16 show typical assortments of proxies. It is apparent that there is a wide diversity of patterns and there is no evidence of a consistent signal buried within the noise. Paleoclimatologists have used sophisticated statistical methods to extract a trend for $T_G$ from such noisy data. However, there is no evidence for the assumption that these measurements of $T_M$ include a consistent $T_G$ plus a random distribution of $T_L$. What seems more likely, at least for temperature changes under 1°C over many centuries, is that all the data are representative of at least several factors, the signal due to temperature is inaccurate, and adding up these seemingly random patterns will always result in an almost flat profile. Figure 4.1 shows a cartoon of how adding random patterns produces a flat profile. As the number of patterns increases, the net result approaches null. It appears to this writer that a similar effect occurred in the work of Mann, Bradley, Jones, et al. Tacking on a rising measured $T_G$ in the 20th century to a flat profile of noisy proxies for past centuries produces a hockey stick. We must ask ourselves why these various proxies are so widely divergent in form from one another. Are they (as paleoclimatologists would have you believe) true representations of local temperatures? If they are, it seems clear that local climates vary extremely widely, and there is no a priori reason to believe that they fit the $T_M = T_G + T_L$ paradigm. Local temperatures appear to be controlled by forces that are difficult to comprehend. It seems more likely, however, that these widely divergent results indicate that proxies are measuring something in addition to temperature. Either way, there is no reason to believe that a consistent signal for $T_G$ can be extracted from such a set of proxies.

![Figure 4.1. Cartoon showing several random patterns (thin lines) and their average (heavy line). The average of multiple random patterns is relatively flat.](image-url)
Aside from the question of whether combining multiple proxies involves mainly adding up noise, there is considerable anecdotal evidence that there have been significant fluctuations in the Earth’s climate over the past 1,000 years or so.

Unlike some skeptics, I do think that increasing CO$_2$ is worrisome, and we should try to understand its effects to better plan for the future. The problem is that the world economy is so deeply imbedded in fossil fuels that it will take many decades to bring about a significant reduction in CO$_2$ generation without a major world financial crisis. Meanwhile, CO$_2$ will continue to grow. If the alarmists like Hansen are correct that even 350 ppm is dangerous, there is no way to avoid the danger. Armour and Roe (2011) emphasized the lingering effects of equilibration of ocean warmth with the atmosphere, the longevity of CO$_2$ in the atmosphere, and the fact that reduction in production of aerosols will produce a short-term heating effect of unknown magnitude. We might as well just give up. Fossil fuels will gradually become depleted as the century wears on, the world population grows, and the developing nations industrialize. The world will do its best to incorporate solar and wind energy and, hopefully, nuclear as well. But there does not seem to be any way to get through the 21st century without continued use of fossil fuels and a consequent significant rise in CO$_2$. Even more worrisome is the 22nd century. What will 10 billion industrialized people use for energy?

### 4.2.5 Implications of uncertainty and extreme events

On Judith Curry’s web log “Climate etc.”\(^5\) discussion threads were opened up on the case for global-warming alarmism based on the so-called “fat tail” of estimates of future increases in global average temperature predicted for the 21st century and beyond (e.g., see Figure 6.36) by alarmists. The argument has been phrased that the very uncertainty of future climate change dictates that we should act now to mitigate it. Whether a risk is worth insuring against depends on four things: (1) the probability of the event occurring (the uncertainty), (2) the cost if the event occurs, (3) the cost to insure against the event, and (4) the ability to pay the cost of insurance. The more uncertain a future catastrophe is, the smaller is the need to mitigate it. On the other hand, if the cost is extremely high for a low-probability event, it may still be worth insuring against. One thing is clear. If one insures, there will definitely be a cost—the cost for purchasing insurance. If one cannot afford that cost, one may be forced to forego purchasing insurance and hope for the best. A simplistic approach is to define a risk parameter as the probability times the cost of consequences if the event occurs.

The fat tail issue is mainly a matter of how rapidly the probability falls off in the outlying tail of major consequences of climate change. Nicholas Taleb discussed this in his books *The Black Swan* and *Fooled by Probability*. The question is whether the probability of an event falls off faster than the consequences rise in the tail of the

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\(^{5}\) [http://judithcurry.com/2011/10/12/the-case-for-climate-change-alarmism/#comments](http://judithcurry.com/2011/10/12/the-case-for-climate-change-alarmism/#comments) and also [http://judithcurry.com/2011/05/28/uncertainty-risk-and-inaction/](http://judithcurry.com/2011/05/28/uncertainty-risk-and-inaction/).
probability distribution. A fat tail distribution falls off slowly enough that relatively improbable events still have enough residual probability that the risk parameter may be large for extremely costly outcomes. This simple argument can be elaborated with fancy mathematics but the problem remains that we don’t know the probabilities and we don’t know the costs of occurrences. In fact, we don’t even know the cost of insurance and, indeed, in regard to climate change, it seems likely that insurance might not be technically or economically feasible.

Where does the uncertainty derive from? The uncertainty derives from several sources. One source is uncertainty in estimating future use of fossil fuels in the 21st century. This depends on the world levels of economic activity, the development of higher-efficiency energy systems, and the gradual addition of renewable and nuclear energy to the energy mix. Nevertheless, reasonable estimates can be made of future CO₂ emissions for the remainder of the 21st century under several scenarios and, for scenarios in which significant fossil fuel usage persists in the 21st century, the uncertainty in estimation of emissions is not very great.

Another source of uncertainty is climatic effect of rising CO₂ levels. Here, the real uncertainty is not the spread of predictions by climate models. Rather, it is the fact that climate models don’t have a clue as to how humidity, clouds, aerosols, and other effects result from rising greenhouse gas concentrations. Even if all of the models agreed on a single curve of temperature vs. CO₂, the uncertainty would more or less remain the same.

A third source of uncertainty is the cost to humanity (nation by nation) of putative climate changes induced by rising greenhouse gas concentrations.

A fourth source of uncertainty is whether it is technologically feasible and affordable to immediately ramp down CO₂ emission in a draconian fashion. What will be the cost, and what can we afford? The world is a poor place. Much of the world lives in poverty. The U.S. is a poor place. The census bureau reports that 46.2% of Americans live below the poverty line. The U.S. federal debt is now about $50,000 per man, woman, and child in America. Our expenses outweigh our incomes and we can’t stop spending. Even so, many of our government programs are underfunded and in trouble. If the world stops using fossil fuels, won’t it enter a depression far worse than the 1930s? If we depend on renewable energy, won’t we be beset by continual outages, and won’t it take so long to establish renewable energy that CO₂ will build up in the interim? And who, pray tell, is going to get China, India, and the other Asian countries to stop using fossil fuels? It is not clear what the alarmist agenda is for dealing with their hypothesized future crisis, so it is not simple to estimate its cost. Yet, whatever it costs, it seems likely that, since we are a poor country in a poor world, we can hardly afford it.

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6 For example, Martin L. Weitzman (2009) on modeling and interpreting the economics of catastrophic climate change, “Fat-tailed uncertainty in the economics of catastrophic climate change”, The Review of Economics and Statistics, 91, 1–19; also www.economics.harvard.edu/faculty/.../REEP2011%2Bfat-tail.pdf.
7 www.nytimes.com/2011/09/14/us/14census.html?pagewanted=all.
4.2 Dealing with Subjective Science

Global warming is the “goose that laid the golden egg” for agencies, social scientists, and economists. Even defense analysts seek a piece of the action:

“Rather than justifying a lack of response to climate change, the emphasis on uncertainty enlarges the risk and reinforces the responsibility for pursuing successful long-term mitigation policy.”

4.3 HYPERBOLE ON IMPACTS OF GLOBAL WARMING

One of the favorite tactics used by alarmists is to focus on a short-term upward trend and predict doomsday from extrapolation of this trend into the future. Usually, the trend turns out to be an upward lobe of an oscillation. The warming induced by the great El Niño of 1997–1998 provided grist for this mill and the alarmists were in their glory in the aftermath of that year, predicting wildly increasing temperatures and debilitating environmental consequences. As it turned out, the global average temperature remained essentially constant over the 15-year period starting in 1998 (see Figure 3.28).

Michael and Balling (2009) (pp. xii and 127) provide good examples of selective presentation of short-term data to create the impression of a climatic trend.

Alarmists tend to see long-term danger in all short-term variations. In 1974, Time Magazine ran an article9 entitled “Another Ice Age?” in which it was stated that:

“... when meteorologists take an average of temperatures around the globe they find that the atmosphere has been growing gradually cooler for the past three decades. The trend shows no indication of reversing. Climatological Cassandras are becoming increasingly apprehensive, for the weather aberrations they are studying may be the harbinger of another ice age.”

The article goes on to state that “the atmosphere has been gradually cooling for three decades”. It cites expanding pack ice and snow cover, and changing polar winds. Ironically, it claims that humans may be involved in the cooling trend via dust released into the atmosphere from farming and fuel burning. Twenty years later, alarmists completely reversed their worries.

On April 26, 2007, James E. Hansen (perhaps the most well-known global-warming alarmist) gave testimony on the dangers of global warming to the Select Committee of Energy Independence and Global Warming of the U.S. House of Representatives. Hansen provided the case for alarmists in considerable detail. Only a few quotations are given here.

According to Hansen, the greatest near-term danger is sea-level rise. He said that “sea level is already rising at a rate of 3.5 cm per decade and the rate is

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8 Romig, A.D., Jr., Backus, G.A. and Baker, A.B., “A deeper look at climate change and national security”, Sandia Report SAND2011-0039, March 2010.
9 www.time.com/time/magazine/article/0,9171,944914,00.html.
accelerating” due primarily to “ice sheet disintegration”. He said that “there is increasing realization that sea level rise this century may be measured in meters if we follow business-as-usual fossil fuel emissions,” and that “adaptation to a continually rising sea level is not possible”. Hansen concluded that “increasingly rapid changes on West Antarctica and Greenland … are truly alarming”.

One of the major slow feedback processes that Hansen identified is “the effect of warming on emissions of long-lived greenhouse gases”, caused by the “melting of tundra in North America and Eurasia,” which “is observed to be causing increased ebullition of methane from methane hydrates”.

Hansen said that “continued business-as-usual greenhouse gas emissions threaten many ecosystems,” and that “very little additional [climate] forcing is needed … to cause the extermination of a large fraction of plant and animal species”.

He also said that “Earth’s history shows that climate is remarkably sensitive to global forcings” and that “positive feedbacks predominate”, causing “the entire planet to be whipsawed between climatic states”.

Summarizing, Hansen said that “The dangerous level of CO₂ is at most 450 ppm, and it is probably less … Ignoring the climate problem at this time, for even another decade, would serve to lock in future catastrophic climatic change and impacts that will unfold during the remainder of this century and beyond”. The Earth “is close to dangerous climate change, to tipping points of the system with the potential for irreversible deleterious effects … The planet is on the verge of dramatic climate change”. We “are forced to find a way to limit atmospheric CO₂ more stringently than has generally been assumed … We cannot shrink from our moral responsibilities … to preserve the planet for future generations”.

Idso and Idso (2007) reviewed this testimony and provided a skeptical commentary and critique.

Alarmists have found it rewarding to engage in a contest of “Can you top this?” by issuing a constant barrage of press releases about what supposedly “may”, “might”, or “could” happen in the future as a result of putative global warming. If you go to Google and punch in “global warming”, you get thousands of responses predicting disaster from global warming. These include claims such as:

1. the role of obese people in contributing to global warming by requiring extra resources;
2. “climate change may be century’s greatest health threat”;
3. “pets may be the latest victims”;
4. “climate change may halve South Africa”;
5. “increased incidence of tropical diseases, food shortages, natural disasters and heat waves threaten global …”;
6. “climate change may drive refugees to Australia”;
7. “how climate change may be threatening national parks”; and
8. “climate change will overload humanitarian system”.

—with many more like this.
In technical press releases, there is a strong bias to portray data in the worst possible light. Temperatures have meandered since the hot year of 1998 induced by a huge El Niño. As it turns out, 2008 was an unusually cold year in which much of the warming of the previous 20 years (or more) was mitigated. But, in early 2009, the U.S. National Weather Service (NWS) published a news release that said that “2008 was the 39th warmest year since 1895”. Of course, 1895 was a very cold baseline year. Since 1930, 39 out of 79 years were warmer than 2008—hardly a basis for alarm. Yet the NWS made it seem as if 2008 was an exceptionally hot year! Similarly, the NOAA website reports the 2009 temperature as “the nth warmest year on record out of 130 years”, where n is typically in the range 6 to 9. But the six to nine years that were warmer than 2009 all occurred since the hot year of 1998 induced by a huge El Niño; hence 2009 is stacking up as a relatively cold year compared with the previous decade!

In a situation where the global average temperature has obviously risen to a new level, continued mention that recent years are the sixth warmest, or the third warmest, or whatever, since records began adds absolutely nothing but alarm to the discussion. The fact is that we have been on a temperature plateau for the past 15 years and any and all of those years are among the warmest since the Little Ice Age. It is akin to the cartoon showing a mature person with height marks on the wall made while he was growing up, saying “This is one of the tallest years of my life”. Hansen et al. (2008) now claim that:

“If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO₂ will need to be reduced from its current 385 ppm to at most 350 ppm.”

In order to reduce the CO₂ content of the atmosphere to below 350 ppm in the 21st century, such draconian measures would be needed that it would imply the end of a modern technological world.

4.4 SPREADING THE GOSPEL

Ward (2008) reported on a series of workshops dealing with communication of science results to the public, with particular emphasis on climate change in which it was claimed that “the nation’s top climate scientists and leading science and environmental journalists [met] together to discuss media coverage and communication of climate change science”. The principal funder of the workshops project and its report was the Paleoclimate Program, Division of Atmospheric Sciences, National Science Foundation. Some financial support was also provided by grants from the U.S. Environmental Protection Agency’s Office of Air Programs, and limited in-kind support was provided by the National Centers for Coastal and Ocean Science (NCCOS), the scientific research arm of the National Oceanic and Atmospheric Administration’s National Ocean Service (NOAA/NOS) in the U.S. Department of Commerce, and by the NASA. David Verardo, Ph.D., of the National Science Foundation, was the primary person who enabled this science/
journalism project. While this report is portrayed as an effort to promote better communication on climate change, its real intent seems to be to promote the alarmist viewpoint. For example, it begins:

“Climate scientists were frustrated by what they saw as a failure of the general public to understand and appreciate the seriousness of the climate change issue [i.e., the grave dangers according to the alarmist viewpoint]. Many scientists said they were frustrated that the accumulated advances in understanding of climate change over more than two decades of research had not led to a better-informed public [i.e., the use of climate models to predict large temperature increase in the 21st century]. ... The workshops focused in particular on what scientists call ‘anthropogenic climate change’—that caused by human activities and not part of a natural cycle.”

Like (“Fair and Balanced”) Fox News on TV, this report suggests:

“The preponderance of scientific evidence had since accumulated to a point where responsible reporters should give the scientific consensus on anthropogenic climate change much greater weight than dissenting claims challenging the mainstream scientific conclusions. The journalistic tenet of accuracy now demands that the established science be given total or near total prevalence in coverage of certain aspects of climate change science.” (Emphasis added)

In other words, only the prevailing orthodoxy should be reported by the media. This attempt to muzzle the opposition is outrageously anti-scientific and anti-American. The report goes on to say:

“Many participating reporters said they were having trouble convincing their editors of the virtues of reporting in an accurate and fair [i.e., alarmist], rather than quantitatively balanced fashion [i.e., roughly equal time to both sides]. Their reporting on new scientific findings often met with an editor’s insistence that they also report the perspectives of climate science contrarians who lack comparable scientific expertise and standing, as if covering a political campaign or a public policy dispute [i.e., contrarians are thereby characterized as uneducated and occupying positions of less knowledge and importance compared with alarmists].”

This viewpoint was echoed by Curry et al. (2006), who said:

“Boykoff and Boykoff (2004) demonstrated that superficial balance in coverage of global warming by the U.S. “prestige press” (e.g., New York Times, Washington Post, Los Angeles Times, Wall Street Journal) can actually be a form of informational bias. Boykoff and Boykoff state that by giving equal time to opposing views, the major newspapers are significantly downplaying scientific understanding of the role humans play in global warming. Pitting what ‘some scientists have found’ against what ‘skeptics contend’ implies a roughly even division within the scientific community. In the media debate on global warming and hurricanes, greenhouse-warming deniers (which, in addition to scientists,
includes lawyers and others with at best minimal scientific credentials) are set side by side with scientists who have actually done the work and published papers on the subject.”

Note that Curry et al. (2006) said that Boykoff and Boykoff “demonstrated” their claim. Curry et al. describe skeptics as “greenhouse-warming deniers” and are said to include some with “at best minimal scientific credentials”. But intelligent skeptics do not deny the greenhouse effect. They merely doubt that we can quantitatively affirm feedback effects based on present knowledge. Furthermore, there are a great many strong supporters of climate alarmism who are clearly lacking in “scientific credentials”. Naomi Oreskes, who has written articles and books and made presentations in favor of alarmism, is a prime example. In addition, the fact that a climate scientist may have done work and published papers means little in most cases. Most scientists are narrow specialists and do not have a synoptic view of the field. Many are immersed in their narrow slice of the pie. In fact, as Curry et al. (2006) emphasized in their paper, several of the logical fallacies that they attribute to deniers of the relation between SST and hurricanes, are the very same fallacies utilized over and over again by alarmists: scientific credentials, appeal to authority, appeal to motive, begging the question, hasty generalization, and fallacy of the single cause.

Now there is an entire website dedicated to improving communicating climate change and climate science to the public (i.e., the alarmist view of climate change).10

As climate change has evolved into a big business with plenty of funding, more and more peripheral (typically non-scientific) organizations have sought a piece of the action, introducing economic, social science, and communication aspects. A common theme of some studies (such as that of Ward, 2008) is to seek better ways of communicating the climate science (of the orthodoxy) to the public. For example, the Carsey Institute11 posed the following three questions in a survey under the heading: “What do you personally believe?” Hence they framed the issue as a belief system:

“[O]n the issue of global warming or climate change, how much do you feel you understand about this issue—would you say

- a great deal,
- a moderate amount,
- only a little, or
- nothing at all?

Which of the following two statements do you think is more accurate?

- Most scientists agree that climate change is happening now, caused mainly by human activities.

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10 http://talkingclimate.org/guides/communicating-climate-science/.
11 Carsey Institute Issue Brief No. 26, “Climate change partisanship, understanding, and public opinion” www.carseyinstitute.unh.edu.
There is little agreement among scientists whether climate change is happening now, caused mainly by human activities.

Which of the following three statements do you personally believe?

- Climate change is happening now, caused mainly by human activities.
- Climate change is happening now, but caused mainly by natural forces.
- Climate change is not happening now.”

But these are all silly questions. Climate change has always occurred and is always occurring. Regardless of the beliefs of the public, human activity is contributing to climate change. The real questions are how additional emissions of greenhouse gases will affect the climate in the future quantitatively, what will be the impact on humanity, and what can we do about it? These questions are rarely posed and, indeed, there are no clear answers.

George Mason University and Yale University also conducted a similar study asking: “Do you think that global warming is happening?” and similar questions. They categorized the public into six groups: alarmed, concerned, cautious, disengaged, doubtful, and dismissive in accordance with their “beliefs”. They managed to fill up 57 pages with detailed breakdowns of belief systems.

Even the Catholic Church has gotten the message. They urge their brethren to: “Contact your members of Congress and urge greater U.S. leadership to address climate change, especially its disproportionate impact on poor and vulnerable people here and abroad”. The National Association for Advancement of Colored People (NAACP) has a paid-for listing on Google urging combating global warming, under the belief that global warming increase the prevalence of strong hurricanes that impact colored people.

An organization that calls itself “Transparency International—The Global Coalition Against Corruption” wrote a 400-page report entitled “Global corruption report: Climate change” with support from an investment bank and the German Ministry for Economic Development. They began with:

“We stand at the threshold of a global challenge: climate change. Governance lies at the heart of this challenge. Implemented with integrity and transparency, policies on climate change will make it possible for people around the world to understand, support and own the changes that will be required of them.”

The message seems to be that we need more governance, more regulations, more policies, and, above all, more bureaucracies. The funny aspect of all this is that almost all of the corruption we have witnessed in regard to climate change was committed by noted alarmists.

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12 George Mason University, “Climate change in the American mind Americans’ global warming beliefs and attitudes in May 2011”, environment.yale.edu/climate/files/Climate BeliefsMay2011.pdf, environment.yale.edu/climate/files/SixAmericasMay2011.pdf.
13 United States Conference of Catholic Bishops, “Global climate change”, February 2011.
14 www.transparency.org/whatwedo/publications/doc/ger/.
4.5 CLIMATOLOGISTS

The field of climatology, by its nature, deals with phenomena and data spread across the globe in vastly different environments. Much of these data are complex, and it is difficult to resolve cause–effect relationships because of so many confusing cross-factors. Furthermore, climate data needs to be long-term, typically 100 years or more, and most direct data are far shorter. Proxies are beset with a variety of problems. In this situation, it has come to pass, that climatologists tend to draw definitive conclusions from this checkerboard of inadequate, noisy data. A subtle compact has evolved whereby climatologists accept the results of one another, regardless of how flimsy the support base might be. Members of the club preserve this outward aura of scientific rigor, which in most cases is not justified. With the

| Extraversion | Intraversion |
|--------------|--------------|
| Think out loud in discussions, talk more than listen | Process information internally, listen more than talk |
| Share ideas immediately | Share ideas after careful reflection |

**Sensing**
- Focus on experience
- Build carefully and logically towards conclusions
- Want details
- Anchored in the present, relate to the past
- Prefer step-by-step information or instructions
- Ask “what” and “how” questions
- Look for facts
- Prefer practical, plain language to symbols, metaphors, theories, or abstractions

**Intuition**
- Focus on theories
- Follow hunches to reach conclusions
- Want big picture, become bored or impatient with details
- Oriented towards the future
- Talk in general terms
- Ask “why” questions
- Look for patterns and possibilities
- Use metaphors, analogies, and other symbolic language

**Thinking**
- Present information using cause-and-effect reasoning
- Analytical
- Need to know “why”

**Feeling**
- Use personal situations, stories, and examples to communicate
- Empathetic
- Connect with people

**Judging**
- Prefer to make decisions quickly, come to closure and move on
- Uncomfortable with free-flowing discussions
- Prefer focused discussion and options

**Perceiving**
- Prefer to stay open to new information and last-minute options
- Feel confined by detailed plans and final decisions
- Prefer open discussion to explore linkages between topics

Table 4.1. Personality traits (Weiler *et al.*, 2011).
Table 4.2. Comparison of personality traits of climate scientists with those of the general public (Weiler et al., 2011).

| Personality trait          | Climate scientists vs. public                                                                 |
|----------------------------|-----------------------------------------------------------------------------------------------|
| Extraversion/intraversion  | Climate scientists similar to general public (roughly 50% extravert and 50% intravert)          |
| Sensing/intuition          | Climate scientists were far more likely to use intuition (82%) over sensing (18%) than the general public, who preferred sensing (73%) vs. intuition (27%) |
| Thinking/feeling           | Climate scientists were somewhat more likely to use thinking (49%) over feeling (51%) than the general public, who preferred feeling (60%) vs. thinking (40%) |
| Judging/perceiving         | Climate scientists were far more likely to use judging (73%) over perceiving (27%) than the general public but were more even with judging (54%) vs. intuition (46%) |

advent of climate alarmism over the past couple of decades, climatologists seem to have taken on a more strident tone. Assertions today are presented as fact regardless of the technical underpinnings. This has created a great market for selling climate research, and climatologists have banded together to minimize and snuff out those who would raise the specter of “The Emperor has no Clothes”.

Weiler et al. (2011) provided a very interesting insight into the personalities of climate scientists. Personality types of interdisciplinary, Ph.D. climate-change researchers were collected based on a Jungian type personality assessment (described below). Each person was characterized by four personality traits as shown in Table 4.1. Climate researchers were compared with the general public as shown in Table 4.2. One thing stands out. There is a huge statistical inversion between climate scientists vs. the public in that climate scientists greatly lean towards intuition whereas the public heavily leans towards sensing. This implies that the climate scientists “focus on theories” and “follow hunches to reach conclusions” whereas the public tends to “focus on experience” and “build carefully and logically towards conclusions”. The strange thing is that one would expect that the very nature of the scientific method requires that scientists should focus on sensing, rather than intuition. In addition, there is also a much stronger tendency of climate scientists to prefer judging to perceiving, and there is a somewhat greater tendency of climate scientists to prefer thinking to feeling. Thus, climate scientists tend to “prefer to make decisions quickly, come to closure and move on”. This is clearly evident in the many papers in climatology that utilize a penny’s worth of data to draw a dollar’s worth of conclusions. In fact, one might say in a Churchillian sense: Rarely have so many drawn so many conclusions from so little reliable data.

Martin (1979) wrote an interesting report in which he described the biases that inevitably creep into scientific research and reporting. According to Martin, scientists “do not disinterestedly look at the available evidence, do not make a balanced analysis, and do not present results in a neutral manner”. Instead, he
suggested “from the beginning [they] support or favor a particular conclusion, and in a number of ways organize their scientific work so as to selectively support this conclusion”. He labeled this as “pushing the argument”. Martin argued that pushing scientific arguments is inevitable, and therefore pushing should not reflect unfavorably upon the competence or integrity of the scientist. He said:

“The important thing is not to eliminate pushing, which is impossible anyway, but to recognize that it exists. . . . Neither does the existence of pushing automatically imply that a scientist’s results or conclusions are unjustifiable or wrong. While a scientist’s argument may be judged on the basis of current understanding to be pushed, it may eventually be vindicated. Or it may not.”

He went on to say:

“A scientist in developing an argument to support an hypothesis draws evidence from a number of sources. In presenting evidence one must always be selective—all the evidence and arguments cannot be presented. Often different authorities support different viewpoints, present different ‘facts’, and offer different interpretations of evidence. Depending on the field, a scientist may draw sound support for many points of view and find some support for nearly any view. Therefore it is easy for a scientist, knowingly or unknowingly, to push an argument by selective choice and use of available evidence.”

Most of Martin’s treatise was framed in terms of the debate during the early 1970s as to whether emissions from high-flying supersonic transports (SSTs) would destroy the ozone layer and thereby endanger the Earth’s population by exposure to excessive radiation. For purposes of discussion, he presented detailed summaries and reviews of two prime scientific papers in the field with contrasting approaches. One paper was said to contain “the built-in assumption that the burden of proof lies with those who claim that SSTs are safe: that all that he must demonstrate is that there is at least some small possibility of danger”. By contrast, the other paper used “the [implied] assumption that the burden of proof lies with those who claim that SSTs are dangerous to ozone: that all [they needed to] demonstrate was that the likelihood of significant danger was small”.

Above all, Martin emphasized that scientists are human beings, motivated by various forces and factors in their lives. According to Martin:

“People tend to selectively observe and interpret information in a way that supports their preconceived ideas. Because of this, the personal commitments of individual scientists can help to explain the link between the scientists’ presuppositions and their pushing of arguments. . . . In a scientist, this process might operate as follows. The scientist starts with an original idea or hypothesis, perhaps arrived at as a creative solution to a certain problem. In testing or validating the idea, the scientist will tend to notice and use supporting evidence and arguments. Data that seems mainly supportive will be studied, analyzed and applied so that every possible advantage can be drawn from it. Seemingly irrelevant or inconclusive items will be filtered from advantageous components,
or interpreted in a way that promotes the argument. Evidence that seems mainly
to contradict or challenge the argument at hand may be ignored completely or
explained away or reinterpreted and twisted into support for the argument.

“Some of the ways in which a person may deal with a challenging item of
information are (1) flat denial of the item; (2) skepticism about the source of the
item; (3) ascription of a motive to the source of the item; (4) isolation of the item
from the context of one’s attitude; (5) minimization of the importance of the
item; (6) interpretation of the item to suit one’s purpose; (7) misunderstanding
of the item; and (8) thinking away or just forgetting the item.”

According to Martin, one may often detect a deep-rooted personal commitment
or bias of a scientist by examining a series of published papers and detecting a
constancy of attitude that repeats itself from year to year. He claims:

“The idea that scientists are often strongly committed or biased is quite
compatible with the fact that scientists are human beings. ... That is, they are
subject to motivations and failings similar to those of other people. They may
strive for money, power and prestige; they may work for the satisfaction of a job
well done or for revenge or to relieve boredom; they may make terrible blunders
as well as have brilliant insights. It is sometimes said or suggested that scientists,
at least when it comes to their work, live on a higher moral plane than other
mortals. Don’t believe it!”

In examining the literature on SST emissions and their impact on the ozone
layer, Martin concluded:

“From my point of view, the authors do not disinterestedly look at the
available evidence, do not make a balanced analysis, and do not present results
in a neutral manner. Rather, it appears to me that the authors from the
beginning support or favor a particular conclusion, and in a number of ways
organize their scientific work so as to selectively support this conclusion.”

These claims made by Martin (1979) are backed up by lengthy and detailed
discussions and analyses that seem quite credible to this writer.

Michaels and Balling (2009) devoted a chapter to “Pervasive bias and climate
extremism”. They began with an analogy. If one starts with a particular weather
prediction for a locality, the next update of that prediction might forecast an increase
or a decrease in the predicted temperature. There is an equal probability for either
outcome. However, in regard to the climate–CO₂ connection and the predicted
severity of future global warming, the overwhelming majority of new published
papers find that the climate–CO₂ connection is strengthened and the predicted
severity of future global warming is increased. Only rarely do papers get published
with opposite conclusions. Alarmists might argue that the original hypothesis of
CO₂-induced global warming becomes solidified as more data and better analyses
accumulate. On the other hand, we have already demonstrated that cabals rule the
review process for major journals, favoring those of the alarmist persuasion. We
have also noted that the majority of published climatologists favor the alarmist
position and this influences their perspectives. The alarmist position is also favorable to receiving funding for research. Michaels and Balling (2009) discussed the so-called “file-drawer problem” in which

“Negative results are generally considered not noteworthy. . . . Scientific journals are skewed by a prejudice for the publication of statistically significant, ‘positive’ results and prejudiced against findings of no relationship between hypothesized variables. . . . For any given research area, one cannot tell how many studies have been conducted but never reported.”

They also quote Stephen Jay Gould, who said publication bias results from “prejudices arising from hope, cultural expectation or . . . a particular theory dictate that only certain kinds of data will be viewed as worthy of publication, or even documentation at all”.

In the 30 years that have passed since Martin wrote his report, several major changes have taken place in the way that scientific information is distributed. With the advent of the Internet, the monopoly of scientific journals has been weakened. Other cultural changes have taken place. Of some relevance is the fact that scientists are now far more prone to issue press releases on their work prior to publication, and these tend to find their way onto many websites. Other scientists, disagreeing with the orthodoxy of the consensus, have difficulty getting published in the journals. A number of so-called web blogs dealing with climate change have emerged over the past several years, and these have become foci for discussions and commentary. Most blogs are rabidly one-sided and present forums for either alarmists or skeptics to agree with one another. Any moron can voice his or her opinion. Two blogs that stand out above the others are climateaudit.org, which has become a universal watchdog for reviewing statistical analysis of large data sets, and judithcurry.com, which provides an even-handed forum for both sides. The judithcurry.com blog has emerged in 2010–2012 as by far the best source of new ideas in climate science analysis, with many stimulating new posts by Judith Curry. Unfortunately, the responses on these blogs have become so numerous (typically many hundreds) that the wheat often gets lost in the chaff. It is particularly disappointing to observe that a limited number of adherents clog up the responses to Judith Curry’s stimulating posts with mostly irrelevant, trivial, or nonsensical entries. Most of these responses are contributed with supercilious attitudes under pseudonyms. pielkeclimatesci.wordpress.com/ is also a very informative website.

Ward (2008) extolled the peer-review system and

“. . . warned about the growing number of unvetted publications being distributed through an expanding number of electronic and online outlets . . . Publishing online . . . has become an increasingly popular way to circumvent more rigorous peer review altogether . . . the public and the media need to be attuned to these trends and distinguish them from highly respected professional peer-reviewed journals.”

However, in many cases, peer review has become subject to political correctness, and assures that only one viewpoint will be heard. Michaels and Balling (2009)
provided a number of examples of publication bias by the journals *Science* and *Nature*. Perhaps the most egregious example of politicization of science is the journal *Nature* that has become an alarmist propaganda medium. For example, the April 30, 2009, issue of *Nature* includes three articles that are essentially alarmist propaganda (Meinshausen *et al.*, 2009; Allen *et al.*, 2009; Schmidt and Archer, 2009). There is absolutely no doubt in these articles that CO₂ emissions were the prime cause of global warming in the 20th century. The only issue discussed is how rapidly CO₂ emissions must be reduced to save the world from disaster. The approach taken by these authors is statistical. The wide swath of modeled estimates of future CO₂ emissions and future temperatures are treated as votes, and the winning candidate is the result with the greatest preponderance of ballots. The conclusion is that, to save humanity, future CO₂ emissions must be draconically reduced—a recipe guaranteed to produce much more financial hardship in the world than global warming.¹⁵

Furthermore, most of the peer-reviewed articles in climatology are narrow, highly detailed, and represent new measurements or models. Most of the material that “circumvents peer review” is typically interpretive, synoptic, or in the nature of a review. Relatively little of it presents fundamental new measurements or calculations. One very important role for non-peer-reviewed reports is the activity of the climateaudit.org blog that checks out many of the publications passed by peer reviews, attempts to reproduce the results (usually they cannot), and reviews these papers to put them into perspective—a task ignored by the peer-review system. The climateaudit.org blog run by Steve McIntyre performs a valuable role in checking out the details of many published papers relevant to global warming—a task not done well (and usually not at all) by peer reviews. As it turns out, McIntyre has uncovered many errors and biases in these papers, most notably the Mann, Bradley, and Hughes “hockey stick” papers.

A significant characteristic of climatology is that, in general, data are very sparse and noisy, and of inadequate duration. Chaos seems to reign over the data and unless very good long-term data are available, the signal-to-noise ratio tends to approach zero. Nevertheless, a significant characteristic of climatologists is that they seem willing to draw incredibly firm conclusions from sparse noisy data.

A case in point is the vital issue of cloud feedback. When the Earth warms due to increases in greenhouse gas concentrations, does this warming produce deterministic changes in cloud cover that produce a feedback, and is the feedback positive (amplifying the greenhouse warming) or negative (opposing the greenhouse warming)? McIntyre discusses the debate on this issue at some length.¹⁶ The effect of a change in greenhouse gas concentration is expressed as an equivalent forcing at the top of the atmosphere in W/m². Similarly, the feedback from cloud-cover changes is

¹⁵ Perhaps unrelated to the politicalization of *Nature*, it is noteworthy that every journal except *Nature* has gladly and willingly given me permission to reproduce figures in my books, whereas *Nature* would have charged me as much as $700 for the right to reproduce a single figure.

¹⁶ [http://climateaudit.org/2011/09/06/the-stone-in-trenberths-shoe](http://climateaudit.org/2011/09/06/the-stone-in-trenberths-shoe).
also expressed as an equivalent forcing $\Delta R_{\text{cloud}}$ also in W/m$^2$. The debate between Spencer and Braswell (2010, 2011) and Dessler (2010) centers on whether $\Delta R_{\text{cloud}}$ is positive or negative. The raw data provided by Dessler (2010) are shown in Figure 4.2.

Unfortunately, as Dessler admits, this global cloud feedback data was taken “in response to short term climate fluctuations” where “the primary source of climate variations [was] the El Niño–Southern Oscillation (ENSO)”. The data suffer from two lacks: (1) the data are short-term, and (2) the data are not based on greenhouse gas warming. While Dessler derived the straight-line fit shown in the figure, indicating a weak positive feedback, it seems evident that cloud cover was not driven by Earth surface temperature at all, and varied chaotically during this short period due to unknown factors. Had additional data been taken, it is possible that the slope of the linear fit might turn negative. More likely, the cloud cover varies widely and randomly, independently of temperature over short time intervals.

As McIntyre pointed out, an argument could be made that there is a time lag of several months between a change in temperature and a change in cloud cover, so he replotted the data with a four-month time lag and obtained Figure 4.3. While McIntyre now obtained a negative feedback, the scatter in the data is even greater than before. Only a climatologist or a statistician could believe there is any significant information contained in this plot.

Judith Curry posted\(^\text{17}\) an interesting report on false positives in scientific research based on a paper\(^\text{18}\) published in an on-line journal. Simmons \textit{et al.} (2011) found that “flexibility in data collection, analysis, and reporting dramatically increases actual false-positive rates. In many cases, a researcher is more likely to

\(^{17}\) \url{http://juditcurry.com/2012/01/12/false-positives}.

\(^{18}\) Simmons, J.P., Nelson, L.D., and Simonsohn, U., “False-positive psychology: undisclosed flexibility in data collection and analysis allows presenting anything as significant”, \url{dionysus.psych.wisc.edu/lit/articles/SimmonsJ2011a.pdf}.
falsely find evidence that an effect exists than to correctly find evidence that it does not”.

Over the past few years, the www.judithcurry.com website has emerged as the center point of discussion of a myriad of topics relevant to climate change and climatologists with quite a number of insightful articles attended by hundreds of blogger entries. (Unfortunately, the great majority of the blogger entries are not up to the high level of the original postings by Curry.) Nevertheless, there is much to learn from this website. An article appeared on August 3, 2012, written by Stephen Mosher on “post-normal science” (PNS). PNS deals with situations in which:

1) facts are uncertain;
2) values are in conflict;
3) stakes are high;
4) immediate action is claimed by one side to be required (this, according to Mosher, is the defining characteristic of PNS).

In the case of climate change, the stakes are high because of the extremity of the immediate action, the cost of that action, the impact of that action on our lives, the political difficulty in obtaining worldwide agreement to this action, and the technical difficulty in implementing it even if all the other problems could be overcome.
In normal science,

“Because facts are uncertain, [both sides] listen to various conflicting theories. They try to put those theories to a test. They face a shared uncertainty and in good faith accept the questions and doubts of others interested in the same field. . . . Because the field of personal values is never in play, personal attacks are minimized. Personal pride may be at stake, but values rarely are. In normal science, . . . we can view the behavior of those doing science as puzzle solving. The details of a paradigm are filled out slowly and deliberately.”

For example, in regard to continental drift, the facts are uncertain (yet far more confirmed than in climate change), and the values are not in conflict, the stakes are not high, and there is no need for immediate action. In regard to evolution of species, the facts are not absolutely certain (yet far more confirmed than in climate change), and the values are in conflict with certain religious yahoos. Yet the stakes are not high (they only pertain to textbook content in some redneck states), and there is no need for immediate action (at a large scale).

According to Mosher:

“In all PNS situations it is almost always the case the one side sees the need for action, given the truth of their theory, while the doubters must of necessity see no need for immediate action. They must see no need for immediate action because their values are at risk and because the stakes are high. Another way to put this is as follows. When you are in a PNS situation, all sides must deny it. Those demanding immediate action, deny it by claiming more certainty than is present; those refusing immediate action, do so by increasing demands for certainty. This leads to a centralization and valorization of the topic of uncertainty. . . . That is decidedly not normal science.”

According to one blog entry in response to Mosher, anthropogenic global warming (AGW) proponents are justified in their alarm for the planet, but their view is that the public is always too selfish and parochial to appreciate the dire need to act. The IPCC and many climate scientists view the public as a bloc that needs to be manipulated into compliance. Thus, the IPCC manipulated the evidence to appear one-sided. It’s this arrogant noblesse oblige, that serves as justification for their tribal mentality. Somewhere, the mission to convince the public ended up distorting the ability of the science to self-correct (paraphrased from blog entry).

4.6 THE GOLDEN RULE

One form of the Golden Rule may be stated: “He who has the gold rules.” This is particularly true in climatology. The most prominent alarmists are typically college professors or researchers in National Laboratories, who derive most of their research funding from government agencies such as NSF, NOAA, NASA, DOE, etc. If global warming were not a major catastrophe facing mankind, why would these agencies want to invest heavily in climatology? At the same time, these agencies themselves
are under scrutiny in these days of budget cuts and economic austerity. They need a cause célèbre to justify continued high-level funding of the agencies. Thus, we have a neat little mutual co-dependency between the funders and the fundees working to their mutual advantage. Global warming is the “goose that laid the golden egg” for the agencies and the climatologists.

At the other end of the scale, it is claimed that some skeptics were funded by special-interest groups. It is claimed on the Internet that Exxon funded the National Center for Policy Analysis and the Heritage Foundation to publicize anti-alarmist ideas. However, even if this were true, the amounts of funding involved ($75,000 and $50,000, respectively) were miniscule compared to the hundreds of millions doled out by government agencies to support the alarmist agenda.\textsuperscript{19} Nature magazine\textsuperscript{20} claimed:

“The Heartland Institute plans to spend $1.8 million on its climate programme this year. Of that, $413,000 will go to supporting the Nongovernmental International Panel on Climate Change (NIPCC), a small group of skeptics who have set themselves up as a counterweight to the IPCC. Made up of … a few dozen colleagues, the NIPCC mines the scientific literature for nuggets of contrary evidence and doubt—often the kind of uncertainties that scientists readily acknowledge in their publications. The NIPCC also ignores mountains of evidence about the adverse effects of global warming and instead strings together a confident story that makes rising carbon dioxide concentrations seem entirely beneficial.”

The Heartland Institute is known as a right-wing conservative propaganda organization. However, the accusation made by Nature magazine is exactly transferrable to most of the college professors who espouse the alarmist viewpoint. They “mine the scientific literature for nuggets of supporting evidence—often ignoring the kind of uncertainties that scientists should, but don’t acknowledge in their publications”. (Emphasis added) The alarmists also ignore mountains of evidence and instead string together a confident story that makes rising carbon dioxide concentrations seem harmful well beyond what is understood.

Other claims exist on the Internet of funding of climate skeptics by oil and coal companies. As far as I can tell, some of this is probably true, but, again, such funding is trivial compared to government funding for alarmists. The stakes are much higher for alarmists. The U.S. governmental program in climate change\textsuperscript{21} is $2.7 billion, allocated as follows:

\textsuperscript{19} www.guardian.co.uk/environment/2009/jul/01/exxon-mobil-climate-change-sceptics-funding.

\textsuperscript{20} www.nature.com/news/2011/110727/full/475440a.html.

\textsuperscript{21} “Our changing planet: The U.S. Global Change Research Program for 2011—A supplement to the president’s budget for FY 2011”, downloads.globalchange.gov/ocp/ocp2011/ocp2011.pdf.
### 4.6 The Golden Rule

| Focus Area                                                                 | Millions of $ | Agencies & Departments                           |
|----------------------------------------------------------------------------|---------------|--------------------------------------------------|
| Improving our knowledge of the Earth’s past and present climate variability and change | 1,429         | USDA, DOC, DOE, DOI, NASA, NSF, SI                |
| Improving our understanding of natural and human forces of climate change  | 549           | USDA, DOC, DOE, DOI, DOT, NASA, NSF               |
| Improving our capability to model and predict future conditions and impacts | 281           | USDA, DOC, DOE, HHS, DOI, USAID, NASA, NSF, SI    |
| Assessing the nation’s vulnerability to current and anticipated impacts of climate change | 235           | USDA, DOC, DOE, DOI, EPA, NSF, SI                 |
| Providing climate information and decision support tools                   | 178           | USDA, DOC, DOI, DOT, USAID, EPA, NASA, NSF, SI    |
| Climate change communication and education                                 | 41            | USDA, DOC, NASA, SI                               |

### 4.7 THE LUNATIC FRINGE

Perhaps the most absurd aspect of the climate alarmist movement is the putative relationship between obesity and global warming. If you enter “obesity and global warming” into Google, you obtain 1,100,000 responses. Typical responses in the queue are: (1) Is obesity causing global warming? A new study has suggested that obesity is affecting the planet . . . by raising carbon emissions . . . ; (2) Do obese people aggravate global warming?—ABC News; (3) Scoop: Burning the Fat: Obesity and Global Warming, a study in the latest issue of the *International Journal of Epidemiology* by Phil Edwards and Ian Roberts plays out a grim scene: a world of overweight . . . ; (4) thinner is better to curb global warming, study says—CNN.com; and there are thousands more like this. Some claim the effect is through excessive use of resources, while others blame it on increased flatulence.

In a February 2013 news announcement, it was revealed that a French cattle feed company (Valorex) developed a novel form of carbon credits aimed at providing incentive to farmers to stop cows from emitting climate-changing “farts”. In France, cattle account for 5% of the country’s carbon output. Valorex sells a trade mix that comprises corn, soy, lupin, and linseed, which it says means cows emit 64% less methane, deliver better-quality milk, and need fewer vet visits. A credit of 100 euros ($134) will be awarded for every tonne of CO₂-equivalent gas that is saved from
entering the atmosphere. The new scheme, certified as bona fide by the French government and the U.N. Framework Convention on Climate Change (UNFCCC), has so far notched up 8,365 tonnes of averted carbon.

The website www.numberwatch.co.uk/warmlist.htm lists a huge number of ailments attributed by alarmists to global warming with links to the appropriate websites.

4.8 THE ROLE OF GOOGLE

Google has evolved to become the principal artery for finding information on almost any subject. As my granddaughter told me: “Why do I have to go to school to learn, when Google knows everything and has all the answers?”

Unfortunately, there are typically hundreds of thousands of responses to any query on Google, and, if a particular response appears, say, 7,000 down in the queue, it likely will never be found. In fact, if a response does not occur in the first two or three pages of a Google search, it is likely to be missed. Therefore, it is of great importance for any given website to have high priority in Google searches so it will appear in the first few pages of a search.

The exact algorithm used by Google to prioritize responses to a query is not public knowledge, but it is widely known that one very important element of the algorithm is the number of external web links to any particular website. Those websites with the greatest number of links to them by other websites will tend to rank higher in the queue of responses to a search. Thus, owners of websites are continually approached by other websites asking them for reciprocal links back and forth to enhance their places in search queues.

Unfortunately (or, depending on your viewpoint, perhaps fortunately), institutional websites have many more links to them than individual websites. Therefore, responses to a Google search strongly prioritize institutional websites high in the queue while leaving individual websites typically far down in the queue. As a result, institutional viewpoints are promulgated by Google, while individuals are often ignored. This brings up the question: Do institutions know more than individuals on any given subject? Or perhaps, more to the point, do institutional websites convey more and better information than individual websites?

For example, suppose you do a Google search for a specific hotel in a specific location. Google will return a queue that includes tripadvisor.com, yelp.com, hotels.com, expedia.com, hotelscombined.com, travelweekly.com, orbitz.com, hotelguides.com, edreams.com, etc. If you are lucky, you might find a website for your particular hotel on the third page.

In a Google search on “climate change”, the queue was prioritized from the top as follows:

(1) Environmental Defense Fund: an alarmist propaganda site. (Note: this is evidently a paid-for site, since it appears at or near the top of all pages in the Google queue.)
(2) Climate Central: an alarmist propaganda site. (Note: this is evidently a paid-for site since it appears at or near the top of all pages in the Google queue.)

(3) National Association for the Advancement of Colored People: amazingly enough, this site came up third in the queue; its concern is the mistaken belief that climate change is producing more hurricanes detrimental to colored people. (Note: this is evidently a paid-for site, since it appears at or near the top of all pages in the Google queue.)

(4) Environmental Protection Agency: the EPA was created to clean up the environment, and actually did a pretty good job of it; just as its reason for being was beginning to wane, along came a great deal of publicity about climate change, and the EPA adopted climate change as its reason for continued existence.

(5) Wikipedia: this widely quoted source appears high in the queue of most searches.

(6) *The New York Times*: an article in the paper on climate change.

(7) *The Guardian*: an article in the paper on climate change.

(8) News for climate change: a Google routing page to various news articles in global newspapers.

(9) Intergovernmental Panel on Climate Change: an alarmist propaganda site.

(10) NASA: an alarmist propaganda site.

(11) New Scientist: an alarmist propaganda site.

(12) Real Climate: an alarmist propaganda blog.

(13) Nature: a journal that once in a long while publishes an alarmist paper on climate change.

(14) United Nations Environment Programme: an alarmist propaganda site.

I checked seven pages deep into the queue (about 70 responses) and did not find one response to a site that was not rabidly worried about extreme climate change. I have no idea how deep in the queue *judithcurry.com* might be, or if it is there at all.