

A Response by Bjorn Lomborg to Howard Friel's 'The Lomborg Deception'

Page references are to the advance copy of Friel's book.

Howard Friel's book *The Lomborg Deception* (LD) focuses on two of my books, *The Skeptical Environmentalist* (TSE) and the U.S. edition of *Cool It* (CIUS). It is heartening to write books that engage others, and I welcome his critique.

Unfortunately, it is obvious that Friel has no interest in fair-minded criticism or honest disagreement. Rather, he seems determined to portray me as devious, deceptive, and intellectually dishonest. Ironically, in his zeal to do so, he repeatedly commits the very sins he accuses me of—selective or incomplete quotation, misrepresentation of source material, and even outright fabrication. Rather than engaging with my books on their own terms, he caricatures my work and then attacks it.

Friel makes his intent clear in an author's note at the beginning of his book, in which he identifies what he calls "Lomborg's Theorem": the idea that "global warming is no catastrophe" (p. xi).¹ His aim, he says, is to discredit this idea—"to show that Lomborg's Theorem is grounded in highly questionable data and analysis, and that there is little if any factual or analytic basis for the theorem" (p. xi).

Fair enough. This is the stuff of academic debate: are my data accurate and is my analysis valid? I have no problem with anyone questioning the basis of my work, provided the questions are honest and fair-minded. But as I will document below, what Friel does in *The Lomborg Deception* is something else entirely. In his attempt to prove that my data and analysis are misleading and/or dishonest, he quotes source material out of context, mangles source figures and tables, misrepresents my text and source material, relies more on news reports than on peer-reviewed research, and consistently avoids engaging with the central arguments of my work.

Two quick examples from the very beginning of *The Lomborg Deception* will illustrate what I am talking about. In his introduction, Friel spends a half-dozen pages (pp. 11-16) recycling *Scientific American's* long-since debunked 2002 attack on TSE—without ever mentioning my exhaustive 32-page refutation of the magazine's criticism², a one-page version of which *Scientific American* allowed me to publish six months later.³

In a similar vein, Friel finds room in his Introduction to repeat Stephen Schneider's accusation that I misunderstood Richard Lindzen's work on clouds (p. 11)—while failing to mention that Lindzen himself refuted Schneider. Schneider's comment, he said, "misrepresents both the book he is attacking and the science that he is allegedly representing."⁴

Friel also demonstrates a troubling lack of knowledge of basic climate science and fundamental economic principles. For example, he writes:

The IPCC ... projected an increase in global temperatures of less than 0.6°C (1°F) from 2000 to 2100 if greenhouse emissions can be held constant at 2000 levels throughout the twenty-first century.[LD, p. 76]

¹ Friel also refers here to a related notion he calls "Lomborg's Corollary," the idea that "there is little need to incur the costs of reducing greenhouse-gas emissions to the extent urged by concerned experts," but he makes no effort to challenge it.

² Available at www.greenspirit.com/lomborg/ScientificAmericanBjornLomborgAnswer.pdf

³ May 2002, p. 14

⁴ Lindzen, 2002.

In fact, the IPCC said no such thing. Friel apparently misunderstood an IPCC chart that described an “experiment where [carbon-dioxide] concentrations were held constant at year 2000 values.” What Friel doesn’t seem to have realized is that holding concentrations constant is different from holding emissions constant.

The IPCC figure was based on a scenario where we put a mere 4 billion tons of carbon-dioxide (i.e., almost nothing) into the atmosphere each year; with constant emissions, which is what Friel thinks he read, we would be putting about 30 billion tons of carbon-dioxide each year. In other words, Friel is under the impression that we can keep global warming in check without cutting back from where we are now. This is wishful thinking.

Obviously, a truly complete response to *The Lomborg Deception* could easily end up being as long as the book itself. So instead of trying to correct every one of Friel’s many errors and missteps, I have chosen to focus on a number of key examples Friel uses to make his case that I engaged in “deception.” In doing so, I hope not only to point out these particular failings but also to illustrate the overall pattern of distortion and disingenuousness that characterizes his approach.

Friel and my ‘missing’ endnotes

Friel claims that my “modus operandi” is to cheat with my endnotes. He writes that the endnote system used in TSE is “the scholarly equivalent of an obstacle course, seemingly designed to test the limits of an inquisitive reader's perseverance and sanity” (p. 48). In fact, my endnote system is entirely consistent with the protocols of major academic research, following the general outlines of APA and APSR, as Friel at one point grudgingly acknowledges (“...in principle these documentation systems are generally acceptable” p. 48).

Even more offensive to Friel is what he regards as my failure to properly source my assertions. Determined to catch me out, he scrutinizes the first 29 of my almost 3,000 endnotes (pp. 46-65). Early on in the process, he complains: “Lomborg has logged thirteen endnotes, the most substantive of which document what he views as rhetorical excesses by journalists and environmentalists; none yet to document his thesis that such excesses reflect a skewed perspective of the real global environment.” Keep in mind that we have only reached page two of the main text. Then Friel arrives at the paragraph where I set out the major themes of the next 300-plus pages:

We are not running out of energy or natural resources. There will be more and more food per head of the world’s population. Fewer and fewer people are starving. In 1900 we lived for an average of 30 years; today we live for 67. According to the UN we have reduced poverty more in the last 50 years than we did in the preceding 500, and it has been reduced in practically every country.

Global warming, though its size and future projections are rather unrealistically pessimistic, is almost certainly taking place, but the typical cure of early and radical fossil fuel cut-backs is way worse than the original affliction, and moreover its total impact will not pose a devastating problem for our future. Nor will we lose 25–50 percent of all species in our life-time – in fact we are losing probably 0.7 per cent. Acid rain does not kill the forests, and the air and water around us are becoming less and less polluted.

Mankind’s lot has actually improved in terms of practically every measurable indicator. [TSE, p. 4]

I reference this passage with endnote 14, which says: “This and the following claims are documented in the individual chapters below.” Even though he quotes this exact note (p. 49), Friel nonetheless complains that Lomborg “fails to document a single claim” (p. 49), adding:

Lomborg never provides published peer-reviewed data to support his claim that we will lose only 0.7 percent of all species throughout our lifetime. For one thing, “throughout our life- time” is an unspecified period of time, and, for another, a 0.7 percent loss of species is a highly precise projection. It is unlikely that any studies exist that reconcile these seemingly incompatible variables [LD, p. 50]

If Friel had read my endnotes as exhaustively as he says he did, he would be aware that ample documentation is provided in subsequent chapters. Specifically, in the chapter on biodiversity, I clearly document and discuss the 0.7% figure.⁵ Of course, one could dispute the figure or debate the relevance of the referenced material. But it does not seem reasonable to claim that no such documentation exists.

Friel does much the same thing when he complains that by analyzing current trends, I might be ignoring future costs. As an example, Friel points out:

...if homeownership is higher in 2005 than it was in 1990, Lomborg might argue that the trend in homeownership is positive; but if he ignores conditions that portend a mortgage-foreclosure calamity, and an ensuing financial and economic crisis, then the cited trend can be misleading as an indicator of future well-being [LD, p. 51]

This is absolutely correct. What Friel fails to acknowledge is that I make precisely this point myself in TSE, though not within the first three pages of the book. It is actually the theme of one of the TSE’s six major sections, “Part IV: Pollution, does it undercut human prosperity?” (pp. 163-214):

It is possible that we pollute so much that we are in fact undercutting our life, our long-term welfare and the opportunities for our future generations. To this problem we shall turn next. [TSE, p. 160]

When considering omissions like these, one can’t help but wonder whether Howard Friel has actually read my books all the way through.

Friel’s inability to understand source tables

To support his assertion that I have deceived readers with insufficient or inappropriate endnotes, Friel cites my statements on food:

The point is that ever fewer people in the world are starving. In 1970, 35 percent of all people in developing countries were starving. In 1996 the figure was 18 percent and the UN expects that the figure will

⁵ As the chapter notes, “Mawdsley and Stork use an extremely high estimate by Professor Smith which says that the extinction rate will increase 12- to 55-fold over the next 300 years. This still means that the extinction rate for all animals will remain below 0.208 percent per decade and probably be about 0.7 percent per 50 years.” I also reference Smith et al. 1993 and provide a full description of Stork, including the uncertainty: “Stork (1997:61) estimates that between 100,000 and 500,000 of 8 million insects will die out over the next 300 years. This is equivalent to a maximum of 0.208 percent/decade, and an average of 350,000 is equivalent to 0.729 percent every 50 years, the figure mentioned at the start of this chapter.”

have fallen to 12 percent by 2010. This is remarkable progress: 237 million fewer people starving. Till today, more than 2000 million more people are getting enough to eat.

The food situation has vastly improved, but in 2010 there will still be 680 million people starving, which is obviously not good enough. ... But when things are improving we know we are on the right track. [TSE, p. 5]

This key passage, he claims, “was not supported by [my] endnotes” and is an example of how I “build one unsubstantiated assertion upon another” (p. 53). Friel bases this conclusion largely on the assertion that the passage is properly sourced only “up to the sentence ending, ‘fallen to 12 percent by 2010,’ but the subsequent assertions are not supported with documentation” (LD, p. 52). This is nonsense.

In fact, *all* the numbers in this passage have the same source, a single table from the UN Food and Agricultural Organization’s 1996 World Food Summit report⁶ which I reproduce below—and which Friel appears not to have understood. To be sure, the figures of 237 million fewer people starving and more than 2,000 million more people with enough to eat don’t appear as such in the table, but they are readily and easily calculable from the figures that do.⁷

Region	Year (three-year averages)	Total population (millions)	Undernutrition threshold (Calories)	Undernourished ² Percentage of total population	Persons (millions)
Sub-Saharan Africa	1969-71	268	1 810	38	103
	1979-81	357	1 806	41	148
	1990-92	500	1 802	43	215
	2010	874	1 830	30	264
Near East & North Africa	1969-71	178	1 828	27	48
	1979-81	233	1 836	12	27
	1990-92	317	1 838	12	37
	2010	513	1 872	10	53
East Asia	1969-71	1 147	1 823	41	475
	1979-81	1 393	1 868	27	378
	1990-92	1 665	1 884	16	268
	2010	2 070	1 919	6	123
South Asia	1969-71	711	1 767	33	238
	1979-81	892	1 782	34	303
	1990-92	1 138	1 794	22	255
	2010	1 617	1 833	12	200
Latin America & the Caribbean	1969-71	279	1 834	19	53
	1979-81	354	1 854	14	48
	1990-92	443	1 872	15	64
	2010	593	1 907	7	40
TOTAL	1969-71	2 583	1 808	35	917
	1979-81	3 228	1 834	28	905
	1990-92	4 064	1 844	21	839
	2010	5 668	1 875	12	680

⁶ WFS, 1996, p. table 3

⁷ You can calculate the reduction in the total number of starving people between 1971 and 2010 simply by taking the total number of starving people in 1969-71 (917 million) and subtracting the total number of those expected to still be starving in 2010 (680 million). The answer, of course, is 237 million. Likewise, the number of well-fed people in the developing world in 1969-71 was 1,666 million (2583-917m) and the linear midpoint for 2000-2001 (when TSE was first published) is 4,106.5 million $((4064+5668)/2 - (839+680)/2)$; thus, the increase in well-fed people is 2,440.5 million—or more than 2,000 million people.

Had Friel asked me where I got those figures from, I would have been happy to show him. Unfortunately, he did not, nor does he seem to have turned to anyone else for assistance either.

Friel repeats the same error a few pages later when he claims that an illiteracy statistic I attributed to a UNESCO document “cannot be located in the document” (p. 55). In fact, the figure in question can obviously be calculated from data in the report I cited.⁸ That Friel is unable to do this does not mean that the information is not there.

Friel’s problem with context

Friel also has a tendency to take quotes out of context. For example, when he criticizes me for using what he apparently regards as unduly upbeat statistics about illiteracy in the Third World, here’s how he presents his case

Lomborg...wrote that "women still do not have the same access to education, and this is also reflected in the higher illiteracy rate, which at 21 percent is almost double that of men at 12 percent." Lomborg supports this assertion by referencing it to a 1998 UNESCO document—"Gender-Sensitive Education Statistics and Indicators"—that cannot be found using the Lomborg-provided URL or document title. However, a 1997 UNESCO document with a nearly identical title—"Gender Sensitive Education Statistics and Indicators: A Practical Guide"—reports that the illiteracy rate in the developing world in 1995 was 38 percent among women and 21 percent among men, not the 21 percent among women and 12 percent among men that Lomborg reported. [p. 55]

It is, of course, a general problem of the Internet that some web pages eventually become unavailable. But the real problem here is that Friel has plucked the quote he attacks out of context. Here it is along with the sentence that immediately precedes it. (TSE, p. 81, emphasis added):

*...illiteracy in the developing world has fallen from about 75 percent for the people born in the early part of the 1900s to below 20 percent **among the young of today**. However, women still do not have the same access to education, and this is also reflected in the higher illiteracy rate, which at 21 percent is almost double that of men at 12 percent.*

Clearly, I am talking here about *young people*, whose illiteracy rate is much lower than the population as a whole, while Friel is quoting estimates for the *average* population. Of course the figures don’t match up.⁹

Friel’s tendency to miss (or at least ignore) the point

The basic point of *The Skeptical Environmentalist* is that while it is always possible to find examples of particular things that are getting worse, the real question to consider is

⁸ Figure 41 in TSE can easily be calculated from the age groups and decadal estimates of illiteracy plotted against birth year.

⁹ If Friel wants comparable numbers, he can look in (UNESCO, 2008, pp. 58, 66), estimating for the year 2000: 22.9% illiteracy among the average population in the developing world, 16.2% for men and 29.6% for women; 14.7% illiteracy among young people in the developing world, 11% for men and 18.5% for women. It has improved dramatically from 1990 to 2000.

whether things are getting better or worse *overall*. Friel seems unable to understand this—or if he does, he willfully ignores it. For example, in analyzing my assertion that the world food situation has been getting better, he criticizes me for ignoring the fact that “only 37 countries achieved reductions [in malnutrition] totaling 100 million [people]. Across the rest of the developing world, the number of hungry people actually increased by almost 60 million.” (p. 52)

But these facts *support* my point. That the number of hungry people has increased by 60 million is clearly a terrible thing, but the fact that at the same time an even greater number of people have escaped malnutrition means that overall the situation is improving. Certainly, one would be hard pressed to make the argument that things in general have gotten worse.

Friel goes on to claim that malnutrition numbers increased in the second half of the 1990s, “wiping out two thirds of the reduction of 27 million achieved during the previous five years.” This, he says, demonstrates that my “assessment of ‘remarkable progress’ in reducing malnutrition was at best premature.” (p. 53)

Again, he misses the point. By Friel’s own figures, the malnutrition numbers were still better than they had been ten years earlier. Moreover, the figures he uses are suspiciously old. He’s taken them from the UN’s 2004 State of Food Insecurity report—even though the UN has issued five newer reports since then. The latest, which came out last October, shows that the percentage of malnourished people dropped to 16% in 2004-6 (the most recent data available) from 20% in 1990-92.¹⁰

Friel does much the same thing when he takes me to task for saying that malnutrition has improved in Sub-Saharan Africa. His objection is based on the fact that the *absolute number* of hungry people has gone up. (pp. 56-57) To Friel, this is *prima facie* evidence that “Lomborg ... contradicts his own documented sources when he claims that malnutrition is down significantly in Sub-Saharan Africa and is expected to drop further.” (p. 57)

What he ignores, of course, is that the *percentage* of starving people has been steadily dropping—from 38% in 1970 to 33% in 1996 to an estimated 30% in 2010. (TSE, p 6) And as I argue in TSE, “when the absolute and the relative figures each points in its own direction, the relative figure will probably be the more morally relevant way to evaluate whether mankind’s lot has improved or deteriorated.” (TSE, p. 64)

Friel is not averse to using percentages if he thinks it will help bolster his case. As further evidence of how I am contradicted by my own sources, Friel claims:

... a country-by-country analysis, in addition to the broader regional analysis used by Lomborg, shows that the percentage of undernourished persons is above 33 percent of the total population in nearly half the countries of the Sub-Saharan region, including: 26 million undernourished persons in a total population of 47 million (55 percent) in the Democratic Republic of Congo; 4 million undernourished in a population of 6.3 million (63 percent) in Burundi; 2.2 million undernourished in a population of 3.3 million (67 percent) in Eritrea; 29 million undernourished in a population of 57 million (51 percent) in Ethiopia; 6.2 million undernourished in a population of 8.5 million (73 percent) in Somalia; and 11.3 million undernourished in a population of

¹⁰ FAO, 2009, p. 48. To be sure, the FAO believes that because of unemployment and high food prices, malnutrition probably has increased slightly since 2006, but even so it estimates that the malnutrition rate for 2009 is still below 18%. While this is clearly worse than the 12% rate the FAO had projected for 2010, it is still better than the 20% rate we had in 1992. (Percentage based on malnutrition data available at <http://www.fao.org/news/story/en/item/36207/icode/> or <http://www.fao.org/hunger/en/> and population data from <http://esa.un.org/unpp/p2k0data.asp>.)

17.9 million (63 percent) in Mozambique. Overall, Lomborg's claim that malnutrition has improved in Sub-Saharan Africa is not supported by the sources that he cited. [p. 58]

But as I note in TSE, while this kind of selective listing of catastrophe may be emotionally affecting, it is intellectually empty:

...we can only elucidate global problems with global figures. If we hear about Burundi losing 21 percent in its daily per capita caloric intake over the past ten years, this is shocking information and may seem to reaffirm our belief of food troubles in the developing world. But we might equally well hear about Chad gaining 26 percent, perhaps changing our opinion the other way. Of course, the pessimist can then tell us about Iraq losing 28 percent and Cuba 19 percent, the optimist citing Ghana with an increase of 34 percent and Nigeria of 33 percent. With 120 more countries to go, the battle of intuition will be lost in the information overload. On average, however, the developing countries have increased their food intake from 2,463 to 2,663 calories per person per day over the last ten years, an increase of 8 percent.

The point is that global figures summarize all the good stories as well as all the ugly ones, allowing us to evaluate how serious the overall situation is. Global figures will register the problems in Burundi but also the gains in Nigeria. Of course, a food bonanza in Nigeria does not alleviate food scarcity in Burundi, so when presenting averages we also have to be careful only to include comparable countries like those in the developing world. However, if Burundi with 6.5 million people eats much worse whereas Nigeria with 108 million eats much better, it really means 17 Nigerians eating better versus 1 Burundi eating worse—that all in all mankind is better fed. The point here is that global figures can answer the question as to whether there have been more good stories to tell and fewer bad ones over the years or vice versa. [TSE, p7]

A similar problem arises with Friel's critique of my assessment of a well-cited soil erosion estimate. My point was that it is dangerous to make sweeping estimates of continent-wide erosion based on a single, small-scale study:

In many ways this is reminiscent of one of the most cited European soil erosion estimates of 17 tons per hectare. This estimate turned out—through a string of articles, each slightly inaccurately referring to its predecessor—to stem from a single study of a 0.11 hectare sloping plot of Belgian farmland, from which the author himself warns against generalization. [TSE, p. 7]

Friel takes issue with me for not noting that “the United States and Europe had the lowest rates of soil erosion in the world” (p. 63). This is certainly true, but has nothing to do with whether the 17 tons per hectare figure is accurate. He then spends a page summarizing the problems that Pimentel found soil erosion would engender. Again, this is interesting but not at all relevant to the question of whether the 17 tons per hectare figure is right.

One can actively disagree with my analysis of the figures. But that's not what Friel does. Instead, he simply disregards my documentation, talks about something else, and then concludes that I am making unsubstantiated assertions.

Friel's problem with source material

As we saw above, Friel accuses me of being contradicted by my source material. Often, however, he either misunderstands or misrepresents the facts. For example, he is highly critical of the following passage from TSE, which casts a skeptical eye on a prediction about soil erosion in Africa.

In the most staggering prediction of problems ahead, Global Environmental Outlook Report 2000 tells us that soil erosion is a pervasive problem, especially in Africa. Indeed, "in a continent where too many people are already malnourished, crop yields could be cut by half within 40 years if the degradation of cultivated lands were to continue at present rates." This, of course, would represent a tragedy of enormous proportions, causing massive starvation on the African continent. However, the background for this stunning prediction stems from a single, unpublished study from 1989, based on agricultural plot studies only in South Africa. And it is in stark opposition to the estimates of the major food production models from the UN (FAO) and IFPRI, expecting an annual 1.7 percent yield increase over the next 20–25 years. Although the growth in yield in the 1990s was small but positive, the absolute grain production increased more than 20 percent. [TSE, p. 6-7]

After consulting the GEO2000 report I cited, Friel complains that I “neglected to mention that the overall paragraph [from which I quoted] included several statements supported by several sources describing serious land degradation in Africa.” (pp. 58-59) Why would this be relevant? I wasn't challenging the claim that land degradation is a serious problem. I was challenging the suggestion that crop yields could be cut in half within 40 years if degradation of cultivated lands were to continue at present rates—a provocative assertion based on only *one* citation.¹¹

Friel goes on to claim that the prediction of a 40% yield reduction does not conflict with FAO and IFPRI estimates (p59):

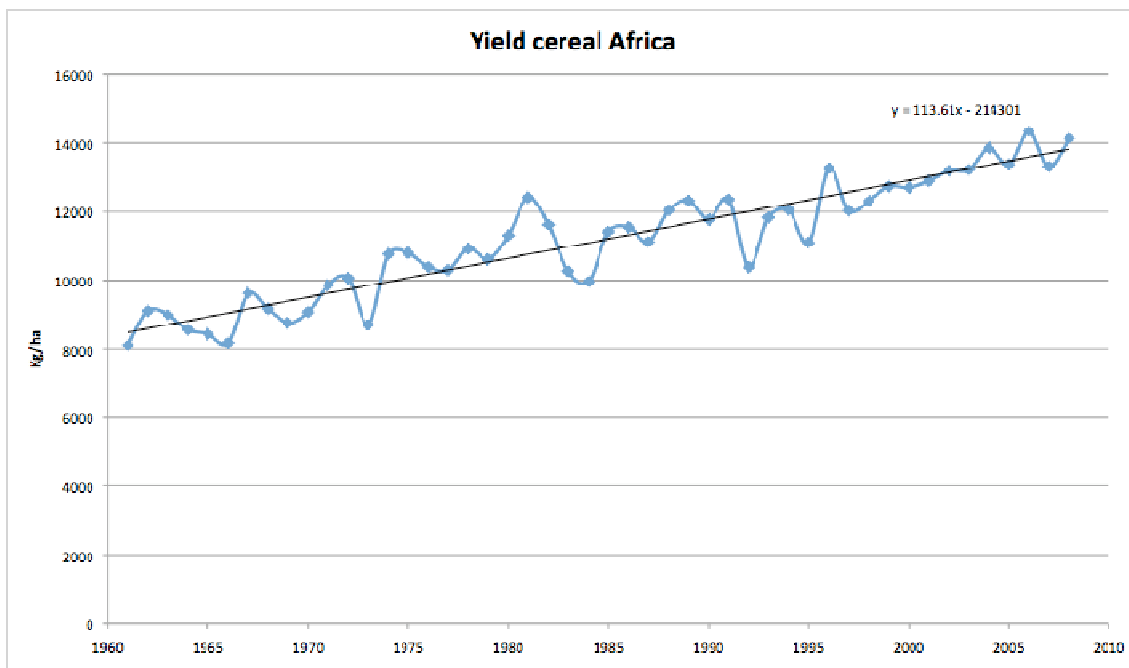
... there is no "stark opposition" in the FAO and IFPRI reports to the warning in GEO-2000. For example, the more recently issued IFPRI report (1999), like GEO 2000, described serious problems with soil fertility in Africa: "Low and declining soil fertility is a serious problem in many low-income countries, including most of Africa." And with respect to the future of undernourished persons in the developing world, including those in Sub-Saharan Africa, the 1999 IFPRI report also stated: "In the scenario described here, food insecurity and malnutrition will persist in 2020 and beyond. We project that 135 million children under five years of age will be malnourished in 2020, a decline of only 15 percent from 160 million in 1995. Child malnutrition is expected to decline in all major developing regions except Sub-Saharan Africa, where the number of malnourished children is forecast to increase by about 30 percent to reach 40 million by 2020. With more than 77 percent of the developing world's malnourished children in 2020, Sub-Saharan African and South Asia will remain 'hot spots' of child malnutrition and food insecurity."

¹¹ Friel doesn't question my point that this study dealt only with South African soils and thus might not be applicable to the rest of Africa.

It is difficult to find here any good news about the future of undernourished persons, especially in Sub-Saharan Africa.[p. 59]

Friel does not explain what any of this has to do with the question of whether yields in Sub-Saharan Africa will increase 52% over the next 25 years, as predicted by IFPRI, or decrease by 40%, as predicted by GEO2000.¹² He simply points out that the IFPRI report also notes that there are serious soil fertility problems in Africa, and that there will likely be many malnourished children. He seems to have lost sight of the point I was making—and that he set out to respond to—namely, that there is little evidence for a 40% decrease; to the contrary, the major models indicate a large, positive yield increase.

Moreover, if Friel wanted to examine the evidence, he could have assessed the yield change over the past 10 years. In the chart below, FAO's database shows that yield increases for all of Africa for cereals show an annual yield increase over the past ten years of about 1%/year.¹³



Friel's conclusion that “no significant tensions exist between these two [FAO and IFPRI] reports and GEO-2000” seems ludicrous—one is predicting a 40% *decline* in yields; the other, an *increase* of around 50%. Nonetheless, he goes on to question my assertion that “the growth in [agricultural] yield in the 1990s was small but positive, [and] the absolute grain production increased more than 20 percent.”

...there is no indication in this sentence, or in the endnote to this sentence (note 27), whether “the growth in yield in the 1990s” and the increase in “absolute grain production” refers to Sub-Saharan Africa, Africa in general, the developing world, the developed world, the real world, or the entire world. And Lomborg's endnote to this assertion refers to a document for which Lomborg gives no title, and which cannot be located on the Internet using the URL that Lomborg provided. Thus, it is

¹² An 1.7% annual increase over 25 years adds up to a total increase of 52.4%.

¹³ Of course, there are many ways to make this assessment, and I simply looked at cereals (being a big, but somewhat comparable group of yields) and Africa (because FAOSTAT doesn't allow an easy break-down for sub-Saharan Africa).

Lomborg (on at least a few counts)—and not GEO 2000—who made unsubstantiated assertions. [p. 61]

The preceding sentence in TSE makes it clear that I am talking about sub-Saharan yield. As for Friel’s inability to locate my source material, I find it hard to imagine that he doesn’t know why the URL in my decade-old book no longer works: the FAO data website changed its address from <http://apps.fao.org> to <http://faostat.fao.org/> several years ago. His assertion in this context that I make unsubstantiated claims about yields is wildly off-base (not to mention deeply offensive).

Friel’s tunnel vision

Friel frequently criticizes my book *Cool It* for not containing enough information and for its documentation system, at one point complaining:

The documentation system in Cool It is even more challenging, as Lomborg eliminated numbered citations in the text, thus challenging the reader to muster an additional level of resolve by having to identify which sentences or assertions in the text were sourced in the first place. [p. 48]

While I stand by the documentation system in both CIUS and TSE, I find it curious that, given his concerns, Friel chose to focus on the abridged U.S. edition of *Cool It*, ignoring the fact that there is a more scholarly, longer version of the book available. This is stated in the Acknowledgements of CIUS:

This is a short book on a complex issue. But if we are to make our democracies count, finding the best generational mission, it is important that the information gets spread far and wide. If you feel you need more information, I’m also publishing a longer version of Cool It, with plenty of graphs and more explanation, with Cyan in the United Kingdom. [p. 166]

Had he consulted the longer edition, Friel would have found about 50% more information, straight endnotes, 59 charts, and many more tables.

Friel’s habit of putting words in my mouth (and ignoring what I actually say)

Friel starts off his main climate chapter by cutting-and-pasting three-and-a-half pages of regional impacts from the IPCC that he believes I should have mentioned (LD, pp. 70-73). He claims that they refute my argument “that there would be few (if any) harmful impacts” from global warming (p. 69).

In fact, the idea that I claim global warming will cause “few (if any) harmful impacts” is simply untrue. Early on in *Cool It*, in a list of the book’s four basic points, I say just the opposite:

Global warming is real and man-made. It will have a serious impact on humans and the environment toward the end of this century. [CI, p. 8]

The closing chapter of the book makes the point even more explicitly:

Global warming is happening; the consequences are important and mostly negative. It will cause more heat deaths, an increase in sea level, possibly more intense hurricanes, and more flooding. It will give rise to more malaria, starvation, and poverty. [p. 113]

Friel acknowledges that my basic summary of global warming is correct, noting: “To my knowledge, this is an acceptable introductory summary of the greenhouse effect and human-induced global warming” (p. 74).

He then criticizes me (“things fall apart” p. 74) for writing that the IPCC standard scenario is the A1B scenario, when in fact there are six different SRES scenarios. Friel actually spends two pages insinuating that I am unaware of this, although I discussed these six scenarios in TSE (p. 264). In any case, I make it abundantly clear in my endnotes that others consider the A1 scenario to be business-as-usual (Dai, Wigley, Boville, Kiehl, & Buja, 2001), and the A1B temperature rise is both the median of the A1 scenarios and the median or median-high of all scenarios (IPCC, 2007a, p. 14). Even Jim Hansen, whom Friel refers to elsewhere as “one of the premier climate scientists in the United States” (LD, p.110), has referred to the A1B scenario as a business-as-usual scenario.¹⁴

Friel’s misunderstanding of the ‘heat death/cold death’ issue

Friel criticizes me for talking about a paper that shows that the 2003 heat wave was not unusual (Chase, Wolter, Pielke Sr., & Rasool, 2007) without mentioning a *Nature* paper (Patz, Campbell-Lendrum, Holloway, & Foley, 2005). He does not acknowledge that, whereas the first paper statistically tested whether the 2003 heat wave was unusual, the second paper simply assumed it on the basis of (Schar, et al., 2004), which the 2007 paper showed to be incorrect.¹⁵

Friel goes on to take strong exception to my central point, which is that while there is often a focus on the extra heat deaths likely to be produced by global warming—which I agree will definitely happen—there is less recognition that global warming is also likely to result in fewer people dying as a result of cold weather. Unlike any mainstream participant in the climate change policy debate that I am aware of, Friel seems unwilling to entertain the idea that global warming will also lead to fewer cold deaths.

The only peer-reviewed study to calculate all extra heat deaths and avoided cold deaths globally shows that the number of avoided cold deaths strongly outweigh the extra heat deaths. This study, (Bosello, Roson, & Tol, 2006), shows that although we are likely to see about 400,000 more heat deaths because of global warming by 2050, we will likely see about 1.8 million fewer cold deaths. Moreover, this effect will persist until at least 2200:

The first complete survey for the world was published in 2006, and what it shows us very clearly is that climate change will not cause massive disruptions or huge death tolls. Actually, the direct impact of climate change in 2050 will mean fewer dead, and not by a small amount. In total, about 1.4 million people will be saved each year, due to more than 1.7 million fewer deaths from cardiovascular diseases and 365,000 more deaths from respiratory disorders. This holds true for the United States and Europe (each with about 175,000 saved), as for the rest of the industrialized world. But even China and India will see more than 720,000

¹⁴ “A1B, that’s a typical business-as-usual IPCC scenario”, <http://www.zeroemissionnetwork.org/Dr-James-Hansen-Zero-Emissions-Conference-Melbourne-2007-TRANSCRIPT>.

¹⁵ It references (Schar, et al., 2004), which was one of the studies that (Chase, et al., 2007) disproved.

saved each year, with deaths avoided outweighing extra deaths nine to one. The only region where deaths will outweigh lives saved is in the rest of the developing world, especially Africa. There almost 200,000 deaths will be avoided, but more than 250,000 will die.

The reaction of both my editor and several of my friends on reading this chapter was telling—and perhaps also similar to your reaction: Yes, but what happens after 2050—will heat deaths not eventually begin outweighing avoided cold deaths? It is a good question. But the survey shows that the result doesn't hold true just in 2050: in the central estimates of the model, lives saved will continue to outweigh extra deaths when counting both cardiovascular and respiratory diseases at least till 2200. So the simple answer to the question is no, heat deaths will not outweigh avoided cold deaths, not in 2050, 2100, or even 2200. [CIUS, pp. 38-3]

Friel's specific concerns go more towards Europe. He claims that I do not provide any documentation for the following paragraphs:

However, what the optimal temperature is is a different issue. If you live in Helsinki, your optimal temperature is about 59°F, whereas in Athens you do best at 75°F. The important point to notice is that the best temperature is typically very similar to the average summer temperature. Thus, the actual temperature will only rarely go above the optimal temperature, but very often it will be below. In Helsinki, the optimal temperature is typically exceeded only 18 days per year, whereas it is below that temperature a full 312 days. Research shows that although 298 extra people die each year from it being too hot in Helsinki, some 1,655 people die from it being too cold.

It may not be so surprising that cold kills in Finland, but the same holds true in Athens. Even though absolute temperatures of course are much higher in Athens than in Helsinki, temperatures still run higher than the optimum one only 63 days per year, whereas 251 days are below it. Again, the death toll from excess heat in Athens is 1,376 people each year, whereas the death toll from excess cold is 7,852.

This trail of statistics leads us to two conclusions. First, we are very adaptable creatures. We live well both at 59°F and 75°F. We can adapt to both cold and heat. Further adaptation on account of global warming will not be unproblematic, because we have already invested heavily in housing and infrastructure such as heating and air-conditioning to handle our current climate. But that is why the second point is so important. It seems reasonable to conclude from the data that, within reasonable limits, global warming might actually result in lower death rates. (CIUS, p14-15).

Friel finds it “surprising that not one factual assertion or statistic in the above text appears to be attributed to any source.” (LD, p. 83). This would be surprising if it were true, but it is not. The endnote states clearly: “Based on the summary of the biggest European heat and cold study (Keatinge, et al., 2000, p. 672)” (CIUS, p. 170)

Friel then argues that even if the statistics are correct, they “do not substantiate [Lomborg's] conclusion that fewer cold-related deaths will more than offset the additional heat-related deaths worldwide.” (LD, p.83) Of course they don't. They simply show that the assumption seems to be a reasonable one for Europe.

Friel also complains that he does not understand how the numbers of heat deaths for Europe are computed: “Lomborg’s statistics, as quoted above, still cannot be found, though Keatinge et al. reported roughly comparable figures” (p. 83). “... though Lomborg wrote that ‘the death toll from excess heat in Athens is 1,376 people each year, whereas the death toll from excess cold is 7,852,’ Keatinge reported that ‘annual heat related mortality’ in Athens is 445, and ‘annual cold related mortality’ is 2,533.”

Reading the endnotes should have cleared up the confusion. In my endnote, I note that my figures assume a population in Athens of 3.1 million—hence my numbers are 3.1 times larger than Keatinge’s.

Finally, Friel reacts to the general point I make about Europe: “In Europe as a whole, about two hundred thousand people die from excess heat each year. However, about 1.5 million Europeans die annually from excess cold.” (CIUS, p.17)

Here is Friel’s response:

But Lomborg's only source for these figures—a chart in the statistical annex of a 2004 World Health Organization report—contains no data on human mortality due to excess heat or cold. In fact, the words "excess heat" and "excess cold" make no appearance in the WHO document; neither does the word "heat," and the word "cold" appears only once in a reference unrelated to death due to excess cold.

*Lomborg's reference to the WHO document, which allegedly supports his claim that two hundred thousand people die each year in Europe from excess heat, reads in its entirety: "207,000, based on a simple average of the available cold and heat deaths per million, cautiously excluding London and using WHO's estimate for Europe's population of 878 million (WHO, 2004a:121)." However, page 121 of the 2004 WHO report—The World Health Report 2004: Changing History—which is what this source references, lists no data on cold- and heat-related deaths per million, or for cold- and heat-related deaths in any context. Likewise, Lomborg's very next reference-to support his claim that 1.5 million Europeans die annually from excess cold - reads in its entirety: "1.48 million, estimated in the same way as total heat deaths." Thus, Lomborg's references indicate that page 121 of the 2004 WHO report is the source of his estimates of annual heat- and cold-related deaths in Europe; however, this page in the WHO report lists no statistics for either cold- or heat-related deaths. **Consequently, there is no apparent basis here or elsewhere in Cool It for Lomborg's claim that 1.5 million Europeans die annually from excess cold.** [LD, p. 86, emphasis added]*

In fact, the text and first endnote in this section make it very clear where the figures are sourced from: “Based on the summary of the biggest European heat and cold study (Keatinge, et al., 2000, p. 672).” (p. 170). In the UK edition of the book, there is even a figure with the numbers, with the further explanation: “estimated in the text, using Keatinge et al., 2000:672.” (p. 233, CIUK)

Friel’s claim that I relied on a WHO document that does not support my case is astonishing and profoundly disingenuous. I clearly used the WHO report solely to provide an estimate of Europe’s population (because WHO uses the standard geographical definition of Europe to the Ural Mountains). This is evident in the text that Friel himself quoted: “and using WHO’s estimate for Europe’s population of 878 million (WHO, 2004a:121).”

Instead of jumping to the conclusion that “there is no apparent basis here or elsewhere in *Cool It* for Lomborg's claim that 1.5 million Europeans die annually from excess cold,” Friel could have read the endnotes a second time if the meaning was unclear, gotten the longer version of the book if he remained confused, or contacted me for clarification.

Friel's trouble with glacier-related issues

Friel spends more than four pages criticizing my point that glaciers are dwindling *both* because of global warming and because we are coming out of the Little Ice Age (during which glaciers at least in the Northern Hemisphere were at their largest extent for the last 12,000 years).¹⁶ Yet, all he manages to show is that glaciers are not dwindling solely because we are coming out of the Little Ice Age. It is unlikely that Friel misunderstood what I said, for he quotes me accurately on the point:

Lomborg concludes that "both of these warmings"—that is, the natural emergence from the Little Ice Age and the recent human-induced warming—"have caused glaciers to recede." (p. 95).

Yet, he also quotes the IPCC as saying:

...that it is "very unlikely" that the current warming is "merely a recovery from a pre-20th century cold period," including the so-called Little Ice Age...¹⁷ [p. 94]

Indeed, it is very unlikely that it is *merely* a recovery, because it is *also* caused by man-made global warming, as I pointed out.

More disturbing is that he bolsters his argument by carefully editing the IPCC's quote. He writes that I should have known that...

...the 2007 IPCC assessment report stated that it is "very unlikely" that the Earth is warming due to "a recovery from a pre-20th century cold period." [p. 95]

Leaving out the word “merely” in this instance changed the meaning entirely. Instead of the UN climate panel telling us that glaciers did not *merely* melt because of a recovery from the previous centuries of cold (which is what I said), he has now made it seem as if the IPCC is claiming that it is very unlikely that the world is warming *at all* because of a recovery from the previous centuries of cold. This claim is untenable.

Friel later quotes the IPCC's finding that “present-day glacier retreat *exceed* any variations simulated by the GCM [general circulation models] control experiments and must have an external cause, with anthropogenic forcing [human-caused changes] the most likely candidate.” (p. 97, emphasis added) Of course, this is entirely compatible with the explanation that retreat is caused by *both* natural emergence from the Little Ice Age and human-induced warming. Thus, without human induced warming, the present-day glacier retreat will naturally *exceed* the simulated retreat. Again, Friel makes an unreasonable claim:

¹⁶ Curiously, Friel never comments on the fact that over the past 12,000 years the glaciers probably were at their maximum in 1750. Instead, he launches into a quote from the 2001 IPCC on how the Little Ice Age wasn't really a planet-wide phenomenon (p. 95). He seems unaware that this description was part of the problematic “hockey-stick” metaphor in the 2001 report, which has since been abandoned because it was untenable. He could have read much more about that in the UK version of *Cool It* from page 68 onwards.

¹⁷ He doesn't source the quote, but it is from (IPCC, 2007b, p. 436).

This statement from the IPCC sidebar—that no period within the Holocene with respect to expanding and receding glaciers is analogous to today’s melting glaciers—undermines an entire page (page 55) in Lomborg’s Cool It, wherein he meaningfully describes glaciers receding and expanding throughout the Holocene.[p. 97]

It actually reinforces the point that we *also* need global warming to understand the receding glaciers. However, Friel seems intent on finding that natural explanations must have *nothing* whatsoever to do with the glacier melt. It seems that this is less of an attempt to inform, and more of an effort to skew information.

Friel’s difficulty on Mount Kilimanjaro

In much the same way, Friel also criticizes my critique of pressure groups that use Mount Kilimanjaro as a poster-mountain for climate change (p. 98ff). As I document in CIUS, many climate activists, including Al Gore, have used Mount Kilimanjaro as the basis for emotional appeals that we need to cut emissions to help the victims of global warming. Somewhat contortedly, Friel actually accepts that Mount Kilimanjaro is probably not a good example of global warming.¹⁸ Yet, rather than taking Al Gore and others to task for using Kilimanjaro so frequently in their arguments, Friel criticizes me for not focusing on other glaciers. In other words, Friel seems to implicitly argue that Gore can legitimately talk about Mount Kilimanjaro even if he is wrong, but I cannot, even if I’m right.

Here is a portion of my text on Mt Kilimanjaro:

Yet we are often told that we need to reduce CO2 emissions to address the problem of the receding glaciers. In a video with Kilimanjaro in the background, Greenpeace tells us that the mountain’s entire ice field might be lost by 2015 due to climate change: “This is the price we pay if climate change is allowed to go unchecked.” But of course, for Kilimanjaro we are able to do nothing, since it is losing ice due to a drier climate. Even if we granted that its demise was partially related to global warming, nothing we could do would have even the slightest impact before 2015.

When Greenpeace informs us that “Mount Kilimanjaro’s fast-melting glaciers symbolise the fact that climate change may be felt first and hardest by the environment and people of Africa,” it is mixing two messages. No, Kilimanjaro is not a good symbol of climate change, but yes, climate change will definitely hit harder in the developing world.

While emotionally charged pictures of the beautiful glaciers from Kilimanjaro paired with admonishing concerns over CO2 undoubtedly are very effective with the media and opinion makers, they hardly address the real problems of the Tanzanian farmers on the slopes. I don’t claim to know the concerns of Tanzania any better than Greenpeace does. But what I do know is that local surveys in that country show the biggest concerns are the lack of capital to buy seeds, fertilizers, and pesticides; pests and animal diseases; costly education; high HIV-infection rates;

¹⁸ Here from p98-99, emphasis added: “Citing a study by several scientists, Lomborg wrote that ‘Kilimanjaro has not lost its ice on account of increasing temperatures, which have remained rather stable below freezing, but because of a regional shift around 1880 toward drier climates.’ The study cited by Lomborg reported that ‘a drastic drop in atmospheric moisture at the end of the 19th century and the ensuing drier climatic conditions are likely forcing glacier retreat on Kilimanjaro.’ The 2007 IPCC assessment report *concurred* with these findings, noting that the ‘glaciers on Kilimanjaro behaved exceptionally throughout the 20th century.’”

malaria; and low-quality health services. I believe we have to dare to ask whether we help Tanzanians best by cutting CO2, which would make no difference to the glaciers, or through HIV policies that would be cheaper, faster, and have much greater effect. [p. 56-57]

Friel dismissed my point as an “off-topic reference to Tanzanian farmers” (p. 100) and goes so far as to claim that I slip the reference on Kilimanjaro into the discussion on cutting carbon emissions “like a cardplayer cheating at poker.” (p.100) His logic is puzzling: Greenpeace and many other groups have long used Kilimanjaro as a reason why we should cut carbon emissions. Greenpeace, along with others, has stated that “Mount Kilimanjaro’s fast-melting glaciers symbolise the fact that climate change may be felt first and hardest by the environment and people of Africa.” It’s hard to know what makes their reference to the wellbeing of individual Africans acceptable, while mine can be compared to a “cheating” card player.

Friel concludes this section in his book:

This line of reasoning is an excellent example of Lomborg's modus operandi: an inaccurate assumption (that glaciers are melting worldwide due primarily to a natural thaw from the Little Ice Age), surrounded by invalid inferences (pertaining to the emissions reduction implications for Kilimanjaro and glaciers worldwide), wrapped with a non sequitur (the invocation of the Tanzanian farmers on the slopes of Kilimanjaro), leading to an erroneous conclusion (that reducing greenhouse emissions is bad policy). [p. 100]

This paragraph is loaded with inaccuracies and false premises. To begin with, I did not claim that “glaciers are melting worldwide due *primarily* to a natural thaw from the Little Ice Age.” This is indeed an inaccurate claim, but one that exists solely in Friel’s imagination. Second, it wasn’t me who dragged Mount Kilimanjaro into the climate discussion. I was simply responding to the fact that Al Gore, Greenpeace, and many others had brought it up. Moreover, to claim that the plight of Tanzanian farmers is a non sequitur makes no sense. Greenpeace believes Mount Kilimanjaro symbolizes suffering; surely, when we talk about global warming, the impacts that concern us the most are the ones that will affect people. Finally, it is hard to comprehend how it is an “erroneous conclusion” that Tanzanian farmers are poorly helped by CO2-cuts and better helped by increased access to seeds, fertilizers, and pesticides, better treatment of pests and animal diseases, better access to education, and more health care services. Needless to say, Friel provides no evidence and documentation whatsoever for this argument (which, of course, he couldn’t).

Friel’s difficulty in the Himalayas

Friel insists that I ignore an amazing wealth of information from the IPCC on the Himalayan glaciers (p.100), referencing what seems mostly to have been a search through the IPCC archives for the word “Himalaya,” without any indication of why this information could be useful (p. 225). However, his main gripe quickly becomes evident:

Lomborg ignored [IPCC] (with one exception below), and was thus unconstrained in pursuing the Little Ice Age connection to the Himalayan glaciers, while also misstating the projected life expectancy of those glaciers. Thus, Lomborg wrote in Cool It: “Glaciers in the Himalayas have been declining significantly since the end of the Little Ice Age and have caused increasing water availability throughout the

centuries, possibly contributing to higher agricultural productivity. But with continuous melting, the glaciers will run dry toward the end of the century.”

Lomborg referenced his assertion that the Himalayan glaciers have been declining “since the end of the Little Ice Age” to a 2005 study in the science journal Boreas, which reported: “Since the Little Ice Age, and particularly during this century, glaciers [in the Himalayas] have been progressively retreating. This pattern is likely to continue throughout the 21st century, exacerbated by human-induced global warming.” Lomborg invoked only the part that referenced the Little Ice Age, and chopped off the part that invoked “human-induced global warming.” [pp.100-101]

Friel’s claim that I looked only at the Little Ice Age connection to the Himalayas and that I ignored global warming to the extent that I even “chopped off” a reference to human-induced global warming is flat-out wrong. Friel is the one doing the “chopping” to suit his argument. If he had included the sentence immediately after the one he quoted from *Cool It*, it would have been clear that his conclusion was unfounded:

*Glaciers in the Himalayas have been declining significantly since the end of the Little Ice Age and have caused increasing water availability throughout the last centuries, possibly contributing to higher agricultural productivity. But with continuous melting, the glaciers will run dry toward the end of the century. Thus, **global warming** of glaciers means that a large part of the world can use more water for more than fifty years before they have to invest in extra water storage. [p. 58, emphasis added]*

After accusing me baselessly of “chopping off” a reference, and then cutting short a quote that would have undone his own argument, Friel claims that I am “also misstating the projected life expectancy of [Himalayan] glaciers.” (pp. 100-1)

He bases this claim on his inability to find my cited reference in the IPCC and he complains that my secondary source (Schneeberger, Blatter, Abe-Ouchi, & Wild, 2003) does not describe the Himalayas. In fact, I cite the same reference as the IPCC in its peer-reviewed description of what might happen—namely, “Schneeberger et al. (2003) simulated reductions in the mass of a sample of Northern Hemisphere glaciers of up to 60% by 2050.” (IPCC, 2007c, p. 184) Based on this, I felt justified in saying that the end of the glaciers won’t come until the second half of the century—or “towards the end of the century,” as I phrased it in the book. In the endnote, this is even more clearly described: “The simulations the IPCC refers to do not see a complete reduction of glaciers by midcentury but rather a 60 percent reduction (IPCC, 2007c:3.4.1; Schneeberger et al., 2003)” (p179). The description would have been even clearer for Friel had he consulted the UK edition of *Cool It*: “Of course, with continuous melting, eventually the glaciers will run dry, but the simulations IPCC refers to do not see a complete reduction of glaciers by mid-century but rather a 60% reduction.” (p73)

But none of this is noted by Friel. Instead, he happily embraces the now-repudiated (IPCC, 2010) and far-fetched claim that the Himalayan glaciers will be gone by 2035:

Glaciers in the Himalaya are receding faster than in any other part of the world (see Table 10.9) and, if the present rate continues, the likelihood of them disappearing by the year 2035 and perhaps sooner is

very high if the Earth keeps warming at the current rate. Its total area will likely shrink from the present 500,000 to 100,000 km² by the year 2035 (WWF, 2005). [IPCC, 2007c, p. 493]

This claim, which was the source of great controversy—and which the IPCC chairman admitted in 2010 was wrong—was clearly dodgy from the outset. That’s why I didn’t include it in *Cool It*. Not only is the IPCC’s reference to it based solely on a non-peer-reviewed article from World Wildlife Fund, but the claim is explicitly negated in the very next sentence, which states that there will still be glacier mass left in 2035.

Nonetheless, Friel repeats this claim three times:

...the likelihood of them disappearing by the year 2035 and perhaps sooner is very high... (p. 101)

...the Himalayan glaciers will disappear “by the year 2035 and perhaps sooner,” and not “toward the end of the century,” as Lomborg wrote. (p. 101)

...since the glaciers may disappear by 2035 (which is twenty-eight years, not fifty years, from the publication date of Cool It). (p. 102)

This is a situation where Friel could have benefitted by speaking to an expert who could have helped him to distinguish between high- and low-quality source material.

Friel then claims that I “cited no references that in fact supported” the suggestion that there will be more water availability because of melting glaciers (p. 103). Apart from this being obvious (if the glacier melts, losing mass, there will be more water down-river), it is also mentioned in several places in the IPCC report: “As glaciers melt, river runoff will initially increase.” (IPCC, 2007c, pp. 483, 184) But most important, Friel is simply wrong, because I do provide a very specific reference (58):

First, with glacial melting, rivers actually increase their water contents, especially in the summer, providing more water to many of the poorest people in the world. (reference reads (p178): Up to 28 percent more in summer (Singh, Arora, & Goel, 2006, pp. 1991-1992).¹⁹

Friel’s problems with water (and economics)

Friel’s very short chapter on what I have to say about water issues epitomizes the main problems with his critique. He makes two central criticisms, both of which are deeply flawed.

His first criticism has to do with my statement that it is misleading to say there is an approaching water crisis because of global warming. His problem with this assertion is odd because he accepts that I correctly quote the UN report on water, which says that lack of water “is primarily driven by an inefficient supply of services rather than by water shortages.” (UNESCO, 2006, p. 45) He similarly does not challenge the authoritative statement I quote from the World Water Councils summary: “There is a water crisis today. But the crisis is not about having too little water to satisfy our needs. It is a crisis of managing water so badly that billions of people— and the environment—suffer badly.”

¹⁹ Friel also quotes (IPCC, 2007c, p. 187) on page 103: “The entire Hindu Kush-Himalaya ice mass has decreased in the last two decades. Hence, water supply in areas fed by glacial melt water from the Hindu Kush and Himalayas, on which hundreds of millions of people in China and India depend, will be negatively affected.” However, IPCC’s reference is (Barnett, Adam, & Lettenmaier, 2005), which does not describe the Hindu-Kush mountains, and moreover this is in contradiction with the specific studies (Fowler & Archer, 2006), showing an *increase* in the Hindu-Kush ice mass, which could more plausibly have caused the decrease in melt water.

(World Water Council, 2000, p. xix)²⁰ He also acknowledges that I point out that there are “regional and logistic problems with water,” and that “we need to get better at using it.” (CIUS, p108)

And when I talk about how the future will be affected by global warming, he surprisingly *never* challenges or even mentions the main aspect of the chapter, namely that global warming will make for *more* water availability:

One of the largest models from the United Kingdom Fast Track Assessment has calculated this on the basis of populations and available water in the 1,300 major watersheds around the world. The remarkable result is that global warming actually reduces the number of people living in water-stressed areas, with less water stress in warmer scenarios than in colder ones. [CIUS, p. 109]

Friel never addresses any of these points. Instead, he claims that

[Lomborg’s] conclusions are inconsistent with the 2007 IPCC assessment: “Currently, human beings and natural ecosystems in many river basins suffer from a lack of water These basins are located in Africa, the Mediterranean region, the Near East, South Asia, Northern China, Australia, the USA, Mexico, north-eastern Brazil, and the western coast of South America. Estimates of the population living in such severely stressed basins range from 1.4 billion to 2.1 billion.” (p. 177)

Although he never explains his point (he simply states that my conclusions are contrary to a long cut-and-paste quote), his argument seems to be that since there are clear regional problems with water, it cannot be the case that these problems are mainly caused by inefficient supply of service and bad management. Yet, this was exactly the reason that I opened my chapter with the quotes from the UN and the World Water Council: of course there are problems, but simply listing them does not mean that they are not mainly caused by lack of service and poor management, and some of the world’s foremost authorities on water find that the problems are due to those causes.

More curiously, Friel almost entirely ignores the issue of global warming and water. He only makes two references to it. In one, he claims that my conclusions are inconsistent with the 2007 IPCC assessment because:

“Australia, western USA and southern Canada, and the Sahel have suffered from more intense and multi-annual droughts, highlighting the vulnerability of these regions to the increased drought occurrence that is expected in the future due to climate change.” [p. 177]

Again, he makes a cut-and-paste argument without actually engaging with the point I was making in *Cool It*. Note that I made a much longer argument in the UK version of the book on Australia and Western US. In the shorter U.S. version, I mainly focused on the problems of Africa and the Sahel:

²⁰ He makes a lot of noise in the main text about how he cannot find a quote: “In the endnote supporting his statement that lack of water ‘is primarily driven by an inefficient supply of services rather than by water shortages,’ Lomborg added, “Also, ‘there is enough water for everyone. The problem we face today is largely one of governance’ (3).” The “3” in parentheses presumably indicates that the words in quotation marks are referenced to page 3 of the same UNESCO document referenced in the endnote (which is the only reference cited); however, no such words appear on page 3 or anywhere else in the UNESCO document.” However, the quote appears quite prominently on page 3 of the executive summary (<http://unesdoc.unesco.org/images/0014/001444/144409E.pdf>). Perhaps it would have been appropriate to ask for help if he had a hard time finding the quote before declaring that “no such words appear on page 3 or anywhere else in the UNESCO document.”

Today, we have about two billion people in watersheds that are water stressed. Without global warming, this will increase to almost three billion by the end of the century. With global warming, it will be lower than today, at less than 1.7 billion. This is because a warmer world also means more precipitation—in general, models predict about 5 percent more precipitation by 2100. This does not mean that all regions will get more rain. Most of the planet will get wetter, such as southern and eastern Asia and parts of Africa, but some parts will get drier, especially the Mediterranean area, central and southern Africa, and the southern United States.

If we look at Africa, Al Gore is right that global warming will likely add twenty-eight million people to central Africa's water stressed by 2080 [the Sahel]. The same tendency is also true for southern and northern Africa, which will see fifteen million more water stressed. But then it also needs to be said that twenty-three million in western Africa will experience less water stress, and forty-four million in eastern Africa like-wise. In total, with warming we have an Africa where twenty-four million fewer will be water stressed. [CIUS, p. 110]

Simply arguing that some places will be worse off does not answer my argument that, *in total*, fewer people will be water-stressed. Indeed, if we cut carbon emissions and lowered temperature rises, we will cause *more* people to be water-stressed than in a higher-emission, higher-temperature world. (Arnell, 2004) Friel never tackles this argument.

He sums up his views on global warming and water scarcity in the following paragraph:

Similarly, while Lomborg accurately quoted from a 2006 United Nations Educational, Scientific, and Cultural Organization (UNESCO) paper, which reported that lack of water “is primarily driven by an inefficient supply of services rather than by water shortages,” the same UNESCO document reported: “In 2000, of the world's total population 20% had no appreciable natural water supply, 65% shared low-to-moderate supplies, and only 15% enjoyed relative abundance.” These assessments would seem to indicate that we do not have sufficient water, and that global warming will exacerbate widespread water insufficiency. [p. 177]

This is an obvious non-sequitur. Friel accepts that I quote the UN paper correctly, but says that it still tells us that there are water problems. As argued above, this does not mean that the UN is wrong in identifying the primary problem as a lack of services. But much more important, the UNESCO quote has *nothing* to do with global warming.

Thus, it looks as if Friel simply made up the claim that “global warming will exacerbate widespread water insufficiency.” In fact, the study that I reference (Arnell, 2004), shows that although some people in some places will experience more water scarcity, more people will experience less water scarcity—the exact opposite of Friel's contention.

Friel's second central critique of my treatment of water issues is very wide of the mark.

I write:

While climate policies will not help make water more available (and may actually decrease access to it), there are other very beneficial and inexpensive ways to improve access to water and sanitation. This is still needed for the one billion people without access to clean drinking water and the two and a half billion without sanitation. We could bring basic water and sanitation to all of these people within a decade for about \$4 billion annually. [Endnote: About \$10 billion per year from 2007 to 2015, from a range of global studies (Toubkiss, 2006:7); compare this to about \$100 billion over the period in (Rijsberman, 2004:521). Four billion dollars per year forever is the equivalent to \$10 billion from 2007 to 2015 at a 5 percent discount rate.] [pp. 110-111]

Friel insists that the \$4 billion estimate is wrong, and spends more than a page stating this. It is obvious that he simply does not understand economics:

Lomborg also gives a specific cost estimate of providing drinking water and sanitation to those in the world who lack these essential services (one billion lack access to drinking water, and two and a half billion lack access to sanitation). He wrote: "We could bring basic water and sanitation to all of these people within a decade for about \$4 billion annually." However, in the endnote supporting the \$4 billion per year figure, Lomborg wrote, inexplicably, given his \$4 billion per year estimate: "About \$10 billion per year from 2007 to 2015, from a range of global studies (Toubkiss, 2006:7)." Without citing any sources, Lomborg wrote in the same endnote, "Four billion dollars per year forever is the equivalent to \$10 billion from 2007 to 2015 at a 5 percent discount rate." He provided no further explanation for this statement.

What's more, the source that Lomborg referenced to support his claim that "we could bring basic water and sanitation to all of these people within a decade for about \$4 billion annually," did not give an annual estimate of \$4 billion. The source he referenced here, the World Water Council report "Costing MDG Target 10 on Water Supply and Sanitation," provided a range of estimates - beginning at \$10 billion per year:

The range of the estimates

At first, the range of the global estimates seems broad - between 9 billion USD (WHO 2004) and 30 billion USD per year (GWP 2000 and World Bank 2003). After closer examination however, a different picture emerges. Indeed, if the results are analysed on comparable bases, they appear quite similar: approximately 10 billion USD per year would be required to supply low-cost water and sanitation services to people who are not currently supplied (WSSCC 2000, WHO 2004), a further 15 to 20 billion USD a year to provide them with a higher level of service and to maintain current levels of service to people who are already supplied (Water Academy 2004). A much larger figure, up to 80 billion USD, is projected solely for collecting and treating household wastewater and for preserving the global environment through integrated water resources management (IWRM) and ecological methods (GWP 2000 and SEI 2004)'

Lomborg's estimate of \$4 billion per year appears neither in the "Target 10" report he cited nor within the range of estimates (between "10 billion USD" and "80 billion USD" per year) that the Target 10 report considered. [pp. 178-179]

Friel clearly does not understand my endnote: "Four billion dollars per year forever is the equivalent to \$10 billion from 2007 to 2015 at a 5 percent discount rate." This is a simple economic calculation. If one assumes that the discount rate (roughly the interest rate) is 5% per year, paying \$4 billion a year, each year, forever would be the equivalent of paying \$80 billion in one lump sum today. The value of the \$4 billion today is obviously \$4 billion, but the value of \$4 billion next year is worth only \$3.8 billion (because invest \$3.8 billion today and you have about \$4 billion next year). The \$3.8 billion is just \$4 billion multiplied by 1-0.05 or 0.95. The value of the \$4 billion in two years is \$3.61 billion (\$4 billion times 0.95²) and so on. Summarize all of these \$4 billion payments and you get \$80 billion.

Likewise, if you pay \$10 billion each year for ten years, the first payment is worth \$10 billion, the next \$9.5 billion, the third \$9.025 billion etc. The total for ten years is again \$80 billion. This is not surprising. It is, of course, why I use the \$4 billion figure—to make the 10-year limited payment for water services comparable to the long-term or essentially infinite payments for other efforts, such as malaria treatment, starvation, hurricane prevention, or indeed carbon emission cuts, as described on p. 162.

When Friel complains that I "provided no further explanation for this statement" and describes at length how this does not fit the \$10 billion discussed elsewhere, he shows he doesn't understand basic economics.

It is as if I had written: the cost of gas is \$3.785/gallon, and he had criticized me because my endnote sources showed that gasoline costs \$1/liter.²¹

Friel's reliance on newspaper articles

Friel ends his book with a chapter called "How wrong was Lomborg." In it, he tells us that "Lomborg was wrong on virtually every major claim that he made." (p194) Surprisingly, his arguments are supported almost entirely not by citations of scholarly research but by uncritical references to newspaper articles.

To begin with, Friel claims that the Arctic sea ice is rapidly shrinking, that "polar waters could be ice-free in summers within just 5-6 years," and that "scientists from Canada and more than a dozen other countries reported that the Arctic region will have an ice-free summer in as little as six years" (p. 193). This, of course, is in strong contradiction with the IPCC's estimate, which says there will be at least some summer sea ice for the next 90 years:

Sea ice is projected to shrink in both the Arctic and Antarctic under all SRES scenarios. In some projections, arctic late-summer sea ice disappears almost entirely by the latter part of the 21st century. [IPCC, 2007a, p. 15]

Friel cites statements from 2007 and 2008, when there was a flurry of concern over the Arctic. Yet, as Myles Allen, head of Oxford's Climate Dynamics Group recently pointed out:

"Some claims that were made about the ice anomaly were misleading. A lot of people said this is the beginning of the end of Arctic

²¹ A gallon is equal to 3.78541178 liters.

ice, and of course it recovered the following year and everybody looked a bit silly.” [Henderson, 2009]

Friel also thinks that events since the publication of *Cool It* in 2007 have proved me wrong on food:

Lomborg also argued in Cool It that "we will be able to feed the world ever better" in a warming world. However, an FAO report issued in January 2009 projected that "global food production ... must double by 2050 to head off mass hunger, the head of the UN's Food and Agriculture Organisation said on Monday." The report referred to a "food crisis [that] pushed another 40 million people into hunger in 2008," which increased the number "of undernourished people [worldwide] to 973 million." [p. 199]

Friel fails here on two accounts. It is true that food production must increase dramatically throughout the century, although the UN FAO has never expected or said that a doubling by 2050 is likely or necessary. In its longest-range forecast, FAO expects a 50% production increase in cereals by 2050, which would increase food availability about 10% per capita globally. (FAO, 2006, p.5) Moreover, while it is entirely true that the world has experienced a food crisis over the last few years, *Friel makes no effort to show that this is due to global warming*. The standard explanation is the economic crisis and the use of food for biofuels. At the UN hunger website, FAO explains:

*Hunger has increased not as a result of poor harvests but because of high domestic food prices, lower incomes and increasing unemployment due to the global economic crisis. Many poor people cannot afford to buy the food they need.*²²

Thus, increasing hunger has nothing to do with poor harvests caused by global warming. If anything, it is the effort to *stop* global warming that may be causing problems with food production. Economic estimates from the World Bank and IFPRI show that the rush to adopt biofuels to tackle global warming is likely to have caused 30%-75% of the increase in food prices. (Senauer, 2008) This would mean that at least 30 million more people are hungry *not because of global warming but because of bad policies to tackle it*.

Finally, Friel criticizes me for pointing out that the threat to Antarctic Emperor penguins was exaggerated. He feels vindicated because of an article in a British newspaper (p. 200):

Though Lomborg devoted a sidebar article in Cool It about what he considered to be an exaggerated threat to Emperor penguins from global warming, the Proceedings of the National Academy of Sciences reported in January 2009, according to the Independent, that "the Emperor penguin is marching towards extinction because the Antarctic sea ice on which it depends for survival is shrinking at a faster rate than the bird is able to evolve if it is to avoid disaster." The Independent reported: "By the end of the century there could be just 400 breeding pairs of Emperor penguins left standing, a dramatic decline from the population [of] about 6,000 breeding pairs that existed in the 1960s, scientists estimated."

²² <http://www.fao.org/hunger/en/>, accessed Feb 3, 2010.

Notice what Friel is reporting. He tells us that the Emperor penguin is threatened with extinction because the population may drop from 6,000 pairs to just 400 by the end of the century. But the Antarctic penguin population currently totals more than 135,000 pairs, which are categorized as stable by the IUCN, (BirdLife International, 2004). The newspaper article cited by Friel refers to a study that looked at only one small declining population, five hundred meters from the pioneering French research station Dumont d'Urville, at the most-warming part of the Antarctic. Moreover, it is a simple simulation study, which indicates that a small part of the Emperor Penguin population could decline over the 21st century.

Friel ends his book by returning to the theme of his introduction, insisting that “one can convincingly maintain that Lomborg’s arguments are an assault on science, as *Scientific American* did.” (p. 204). As noted earlier, it speaks volumes that Friel repeats this criticism without referring once to my lengthy response to that magazine.

Conclusion

I am proud of *The Skeptical Environmentalist* and *Cool It*, and I stand behind what I wrote in them.

Friel may claim that I cheat my readers, but he fails to make his case because the fact is that I did no such thing. The proposition that I duped my publishers Cambridge University Press and Knopf—or engaged in some sort of grand conspiracy with them—to “deceive” the public might be laughable if it were not so offensive.

At the start of his book, Friel outlined what he called the “Lomborg Theorem” (the idea that “global warming is no catastrophe”) and the “Lomborg Corollary” (“there is little need to incur the costs of reducing greenhouse-gas emissions to the extent urged by concerned experts”). However, not once did he actually attempt to grapple with the real central argument of *Cool It*, and indeed much of my work: that the costs of dealing with climate change poorly will be much higher than the benefits which will accrue. Outside of quotations, he never mentioned GDP once in his book or engaged with any economic arguments.

By his own account, Friel was aiming to write a book that would show that my work “is grounded in highly questionable data and analysis, and that there is little if any factual or analytic basis” for it.

In his longest chapter, Friel attempted to argue that my arguments were not supported by my source material. He claimed that endnotes were “missing” when they clearly exist, misread source figures and tables, relied on a misrepresentation of both my text and source material, and tried to shift the argument by claiming that I should have written about topics that he personally found more salient.

Next, Friel attempted to engage with my arguments on climate change. He did not participate in the relevant, constructive discussion about the economic arguments central to *Cool It*, but instead made a series of confused and confusing arguments.

I was disturbed by his reliance on cut-and-pasted source material that often did not even match the topic that he was responding to. It was troubling to find that he was unable to differentiate between different sources of information. This was why he placed such great stock in news reports rather than peer-reviewed pieces, and is also why he placed credence in arguments such as the now debunked claim that the Himalayan glaciers would entirely disappear before 2035. I was alarmed to find that Friel was unfamiliar with economic basics such as the discount rate, but was more alarmed that his demonstration of this lack of knowledge could make it to print.

I am no stranger to criticism: both *The Skeptical Environmentalist* and *Cool It* generated a vigorous response from many quarters. I welcome constructive, serious discussion about these books and their themes. Indeed, I am often involved in debate with global warming policy advocates. From my perspective, the greatest shame about what

Friel has done is that *The Lomborg Deception* adds nothing to any serious discussion about the best policy responses to global warming.

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