Supplement to Chapter VI
Global Warming/Climate Change

Our thesis in Chapter VI is that the theory of human-caused (anthropogenic) global warming is based on short and noisy data sets, assumptions regarding the causes of global warming, highly complicated climate models, very rough estimates of damage that might be done by warming, and costly prescriptions for economic change that offer uncertain chances of success.

The rather vague term climate change is often employed by advocates of the theory of anthropogenic global warming. Some conservatives believe that the term represents a retreat that allows advocates to claim vindication when temperatures move abruptly in either direction, but the two terms have been used for roughly the same period of time. Our sense is that climatologists continue to emphasize warming over climate change and to place the primary blame for it on human activity.

In Chapter VI we summarized e-mails among leading climatologists leaked in 2009 that demonstrated an apparent pattern of data manipulation, hiding, destroying, or losing raw data that should have been publicly available, and conspiring to prevent scientists who disagree with their views from gaining access to scientific journals, United Nations publications, and news media platforms. In this supplement we add e-mails from a 2011 leak consistent with those of 2009. The more recent collection spans the same years as those released in 2009. Why there are two sets is not known. We located what appeared to be a full set of the 2011 e-mails at www.foia2011.org. As occurred with the 2009 leaks, the ones from 2011 disappeared within two weeks of our downloading them. So far, we have been unsuccessful in finding an alternative site.

Idealistically, science should be an open process. Raw data and complete information about how it was collected should be easily available as should methodologies employed in data analysis. The peer review process employed by scientific journals should be truly

anonymous and not the exclusive territory of tightly knit elites. The climatologists represented in the leaked e-mails fall short of these ideals.

Warming

In the e-mails leaked in 2009 global warming scientist-advocates pay close attention to current weather events and appear dejected when winters are unusually cold. In an e-mail in the 2011 batch from Phil Jones (University of East Anglia) to James Hansen (2/13/2009) Jones cheers for (presumably destructive) warm temperatures that appear to support the theory of global warming: "Even though it's been a mild winter in the UK, much of the rest of the world seems coolish - expected though given the La Nina. Roll on the next El Nino!"

Political Values of Some Global Warming Advocates

Some leading climatologists go beyond science into the realm of political advocacy, and one element of this activity includes stifling or isolating those with opposing views. In a May 30, 2008 e-mail to Phil Jones, Michael Mann (Pennsylvania State University) wrote: "I gave up on Judith Curry [Georgia Institute of Technology] a while ago. I don't know what she think's she's doing, but its not helping *the cause*, or her professional credibility." [italics added] Mann's use of the term "the cause" captures the political tone of many of the e-mails in both the 2009 and 2011 leaks as well as a recent book by Mann (2012) and another by one of his colleagues Raymond S. Bradley (2011). For example, in another e-mail to Jones, Mann wrote:

> Well, Legates 'paper' won't pass the laugh test. I suggest we ignore it and allow it to die the death of silence. It won't be worth our time responding. He's already discredited himself by publishing this on a right wing web site, so full of mistakes. If I were you, I would discontinue any further correspondence you might have had w/Legates, the Finn, or any of these other idiots. They're simply going to save up your emails and try to take anything you said out of context... [ellipsis in original]

Both sets of leaked e-mails revealed that critics of the theory of anthropogenic global warming are often dismissed as "idiots" or willing tools of the petrochemical and auto industries (Bradley 2011).

An e-mail from Bo Kjellen (Stockholm Environment Institute) to Asher Minns (University of East Anglia) (2/21/04) sketches out a broad vision of public policy for global warming/climate change and how to frame that vision:

> . . . I agree with Nick that climate change might be a better labelling (sic) than global warming. But somehow I also feel that one needs to add the dimension of the earth system, and the fact that human beings for the first time ever are able to impact on that system. That is why the IGBP [International Geosphere-Biosphere Programme] in a recent publication 'Global Change and the Earth System' underline that we now live in the anthropocene period. Climate change is one of the central elements of this process, but not the only one: loss of biological diversity, water stress, land degradation with loss of topsoil, etc etc all form part of this - and they are all linked in some way or another. Therefore a central message probably has to be that humans are now interfering with extremely large and heavy global systems, of which we know relatively little: we are in a totally new situation for the human species, and our impact added to all the natural variations that exist risks to unsettle subtle balances and create tensions within the systems which might also lead to "flip-over" effects with short-term consequences that might be very dangerous.
>
> And then, the good old precautionary principle must be guiding our effort. During the cold war, enormous resources were put into missiles, airplanes, and other military equipment to check Soviet expansion and make containment policy credible - in the firm hope that all this equipment would never have to be used. And it wasn't, and nobody complained about the costs. Now, in the face of a different, but clearly distinguishable global threat 'more dangerous than terrorism' the cost issue surfaces all

> the time. Somehow we all need to help in creating an understanding that the threat of global change is real and that we need to develop a new paradigm of looking at the world and the future: this is not just a scientific or technological issue. It involves important philosophical and ethical considerations where some fundamental value systems have to be challenged.

Kjellen's e-mail encompasses far more than global warming/climate change including several environmental problems that have long been part of the liberal-conservative ideological consensus in principle if not always in operational detail. He also asserts that we know "relatively little" about the impact of human activity on environmental systems, but he then argues that the "threat of global change is real." He complains that "the cost issue surfaces all the time," without admitting that the economic impact of what he wants to accomplish could be very great. Finally, it is not true that "nobody complained about the costs" of Cold War armaments. Many liberals objected at length.

In his 2012 book Michael Mann is consistent with Kjellen as he assesses the scale of change needed to reduce carbon emissions:

> Ending our addiction to carbon-based power requires a fundamental revision of our energy infrastructure and a substantial shift from our current lifestyle. Climate change requires solutions of a far greater scope than other global environmental challenges we have faced, but successful past efforts to confront acid rain and ozone depletion suggest we can meet this greater challenge (p. 251).

Judith A. Curry, described as not helping the global warming cause in an e-mail cited above, offers a different take on public policy in this area. In a November 17, 2010 statement before the Subcommittee on Energy and Environment of the United States House of Representatives she describes climate change as a "wicked problem" which she describes as "difficult or impossible to solve," offering "no opportunity to devise an overall solution by trial and error," and providing "no real test of the efficacy of a solution."

Making matters worse: "Efforts to solve the wicked problem may reveal or create other problems."

Curry criticizes the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Intergovernmental Panel on Climate Change (IPCC), in which many leading climatologists participated (including many represented in both e-mail leaks), for holding that climate change represents dangers that can only be resolved via international treaties to stabilize the release of greenhouse gases. Curry cautions that making large changes along these lines might work, or they could result in bankruptcy. She wonders whether the UNFCCC, with an "overconfident assessment of the importance of greenhouse gases in future climate change," may be stifling "the development of a broader range of policy options." [no page numbers]

Curry lays out the basic problem as one of understanding the magnitude of climate change complicated by feedback processes:

> We know that the climate changes naturally on decadal to century time scales, but we do not have explanations for a number of observed historical and paleo climate variations, including the warming from 1910-1940 and the mid-20th century cooling. The conflict regarding the theory of anthropogenic climate change is over the level of our ignorance regarding what is unknown about natural climate variability [no page numbers].

She complains that an individual who raises questions about uncertainty is attacked as a skeptic, denier, or climate heretic: "whose motives are assumed to be ideological or motivated by funding from the fossil fuel industry."

Michael Lemonick (2010) writing in *Scientific American* quotes some of Curry's critics as calling her "naive," "bizarre," "nasty," or worse. He describes Curry's basic scientific view of global warming as conventional. She believes that global warming is occurring and that it is partly caused by the production of greenhouse gases by humans and that the result could be catastrophic. Furthermore, she does not think that the leaked e-mails 2009 are evidence of fraud.

Curry is a professor of Earth and Atmospheric Sciences at the Georgia Institute of Technology, the co-author of two refereed books, co-editor of an anthology, and author of roughly 185 refereed journal articles.

We end this section on political values with a revealing e-mail to Keith Briffa (University of East Anglia) (10/12/03) from Raymond S. Bradley (University of Massachusetts) who complains of "living in a country that has been taken over by fascists." He does not specify the source of this feeling.

Data

Precise temperature measurements are relatively new compared to the multi-century time series that climatologists often study, so indirect techniques must be used. Temperatures leave imprints in ice, sediment, and tree rings among other things. For example, ice core samples contain gas bubbles and pollen that reveal clues to past temperatures. These indirect indicators of temperatures are known as proxies; translations of proxy characteristics to temperatures are called reconstructions. The processes of gathering samples, formulating reconstructions, and then linking the reconstructions to contemporary instrumental temperature measurements appear to be as much art as science. A March 7, 2000 e-mail from Henry N. Pollack (University of Michigan) to Phil Jones makes this point in several ways:

> We too are very interested in understanding what underlies the differences between the reconstructions from the high resolution proxies and the borehole temperatures. You suggest that we segregate the western North American sites from the eastern sites. We have done that, and there is a difference: the western sites have warmed only half as much (ca. 0.75K) [1.35F] as the eastern sites (ca. 1.5 K) [2.7F] over the past five centuries. But I am not fully persuaded that the difference is due to different land-use histories, although that might contribute.
>
> You might have a look also at the paper by Mareschal et al [JGR 103(B4), 7385-7397, 1998]. They remark on very careful

site-selection criteria, rejecting many boreholes for various reasons, including vegetation changes. The boreholes they describe are not in the database we have assembled because of the recent publication. Their reconstruction is parameterized differently than ours, but it is similar to a reconstruction we did for some forty boreholes in eastern Canada alone (not published). Both show a warming of about 1.5 K in the 19th and 20th centuries.

A related and puzzling observation is a comparison we did some years ago between the Hansen and Lebedeff and your CRU [University of East Anglia Climate Research Unit] instrumental SAT [Surface Air Temperature] time series. For most regions around the world the agreement was very good between the two, but for eastern North America there was a considerable difference, for reasons I have never been able to determine. The borehole reconstructions, however, looked more like the H&L SATs than the CRU series. Do you have any insights as to why the two SAT series might be different?

You also raise the question about whether snow cover renders the subsurface temperatures a seasonal rather than annual archive. This has always been an interesting question, and the answer (in part) lies in when and how long the snow covers the land surface. Dave Chapman has done a simple analysis that shows that the ground surface can be warmer if the snow is on the ground during the coldest part of the winter, but if the snow comes late in the season, it may shield the ground from some of the early warming of spring. The thickness of the snow is not very critical beyond some minimal thickness. It is possible to acquire snow-cover information from climatological archives (NCDC, Environment Canada, UEA-CRU?) to see just how much of the winter might be 'lost' in various locations. It is possible that the North American east-west difference is in part due to earlier-longer-deeper snow cover in the mountainous west. But at least a part of the American west is desert, with almost no

snow cover.

Perhaps equally important is the freezing of soil moisture in the winter, at least at latitudes where temperatures fall to or below the freezing point. The latent heat release produces what is known as the zero curtain, i.e. a zero temperature that exists until all the soil moisture is frozen; depths below the curtain do not feel subzero winter temperatures that may be occurring at the surface. This too might be amenable to a compilation from climatological archives of the number of days when the SAT drops below zero for some suitable period of time.

In some locations temperatures in 1000 AD may have been warmer than they are now. This is usually referred to as the Medieval Warm Period (MWP). Data from this era presented global warming advocates with myriad political and methodological problems. The central political problem was that advocates of the theory of anthropogenic global warming claim that temperatures today are hotter than they have been in recent times. For example in an e-mail from Edward Cook (Lamont-Doherty Earth Observatory) to Keith Briffa (University of East Anglia) and Tim Osborn (University of East Anglia) Cook presents a theory that apparent evidence of warmth during the MWP was due as much to drought as temperature:

> So the fact that evidence for "warming" in tree-ring records during the putative MWP is not as strong and spatially homogeneous as one would like might simply be due to the fact that it was bloody dry too in certain regions, with more spatial variability imposed on growth due to regional drought variability even if it were truly as warm as today. The Calvin cycle and evapotranspiration demand surely prevail here: warm-dry means less tree growth and a reduced expression of what the true warmth was during the MWP.

Interpretation and Presentation

Many of the climatologists represented in these e-mails were sensitive to how information was presented. For example, in a March 2, 2004 e-mail to Michael Mann, Stefan Rahmstorf (Potsdam Institute

for Climate Research) wrote: "You chose to depict the one based on C14 solar data, which kind of stands out in Medieval times. *It would be much nicer* [italics added] to show the version driven by Be10 solar forcing."

Many critics of the theory of anthropogenic global warming contend that warming is caused in large part by solar activity, while global warming advocates tend to downplay solar activity in favor of the human production of greenhouse gases. The references in Rahmstorf's e-mail to C14 solar data and Be10 solar forcing concern proxies of solar activity. C14 and Be10 proxy data are collected from tree rings and ice core samples, respectively. Direct observation of sunspots has been done since the mid 1700s, and rigorous data go back 140 years (Usoskin 2008, 9-11).

Raimund Muscheler et al. (2007, 95) use both C14 and Be10 data and find that the two sources are largely consistent, although ice core samples in different locations can show differing results. They observe:

> While Bard et al. (2000) conclude that solar activity at around 1200 AD was similar to, or even higher than at present, Usoskin et al. (2003) suggest that solar activity reached a distinct maximum during the last 60 yr, which was significantly higher than during the preceding 1000 yr. Solanki et al. (2004) go even further and suggest that the level of solar activity during the past 70 yr was exceptional compared to the preceding 8000 yr. [The abbreviation of yr for year is in the original text.]
>
> Muscheler, et al. (2007, 95) find that:
>
> . . . the current solar activity is relatively high compared to the period before 1950 AD. However, as the mean value during the last 55 yr was reached or exceeded several times during the past 1000 yr the current level of solar activity can be regarded as relatively common.

Ilya G. Usoskin (2008, 48, Figure 17), a coauthor of the Solanki, et al. (2004) article cited by Muscheler (2007), et al., displays a time series plot of sunspot activity from the year 0 through 2000 which

shows sunspot numbers oscillating but declining between 0 and 40 per year and suddenly spiking beginning in approximately 1850 to a peak of over 70 in approximately 1950 and maintaining levels above 80 through 2000. Usoskin (p. 53) describes recent solar activity:

> We have been presently living in a period of very high sun activity with a level of activity that is unprecedentedly high for the last few centuries covered by direct solar observation. The sunspot number was growing rapidly between 1900 and 1940, with more than a doubling average group sunspot number, and has remained at that high level until recently.

Usoskin (p. 56) emphasizes that the relationship between solar activity and climate is highly complex, and he does not suggest that there is a simple relationship such as high solar activity causing global warming, but he does view the two as related.

As we noted above, global warming advocates downplay recent solar activity. In an April 5, 2005 e-mail to Tim Osborn (University of East Anglia), Rob Wilson (University of Edinburgh) wrote: "Although I agree that GHGs [greenhouse gases] are important in the 19th/20th century (especially since the 1970s), if the weighting of solar forcing was stronger in the models, surely this would diminish the significance of GHGs."

Then, Wilson added: "Jeez - I sound like a sceptic - this is not my intension." Wilson continues:

> I guess, ultimately, what troubles me is that of the myriad of NH [Northern Hemisphere] recons [reconstructions] out there now, they generally show a MWP [Medieval Warm Period] that is NOT [emphasis in original] as warm as the late 20th century. I have no trouble with this - however, the solar activity of the MWP (excluding the Oort minimum) [a period of low solar activity in roughly 1010-1050 AD] is also generally not as high as the recent period. I know correlation does not mean causation, but it seems to me that by weighting the solar irradiance more strongly in the models, then much of the 19th to mid 20th century warming can be explained from the sun alone.

The reader will have noted Wilson's desire not to be labeled a "sceptic."

The results of some studies appear to depend on judgements of how information is formatted. For example, in a 12/10/03 e-mail to "Keith" [probably Briffa] "Ray" [probably Bradley] wrote:

> . . . the model output is very much determined by the time series of forcing that is selected, and the model sensitivity which essentially scales the range. Mike [probably Mann] only likes these because they seem to match his idea of what went on in the last millennium, whereas he would savage them if they did not.
>
> Also--& I'm sure you agree--the Mann/Jones GRL paper was truly pathetic and should never have been published (Mann & Jones 2003). I don't want to be associated with that 2,000 year "reconstruction."

Global Cooling and/or Warming

As noted above, a problem with the theory of anthropogenic global warming is the possibility that in at least some locations temperatures in 1000 AD may have been warmer than they are now. A March 7, 2000 e-mail from Henry N. Pollack (University of Michigan) to Phil Jones (University of East Anglia) reads in part: "The very best boreholes are in the ice in Greenland and Antarctica (low noise big signal environments). The geothermal reconstructions for Greenland continue to show a temperature maximum around 1000 AD (see the paper by Dahl-Jensen et al, Science 282, 268-271, 1998) that is about 1K [1.8F] above present temperatures. . . ."

The *Science* article to which Pollack referred describes the analysis of ice bored from the Greenland Ice Sheet which the authors used to measure surface temperatures extending back to the year zero. The results show a temperature increase from approximately -32C to a peak of approximately -30.5C at roughly 900 AD after which it declined to a little less than -32C in 1500 (the so-called Little Ice Age or LIA) then it increased to approximately -31.7C in 1750, dropped to approximately -32.7C in the late 1800s, went up to approximately -30.7C in the late 1900s, and then down to approximately -31.7C in

2000 (Figure 4, p. 270). The temperatures are approximations because of measurement error. Aside from the problem that temperatures in this location may have been warmer in the year 1000 than they are now, the temperature in the last 2000 years oscillated between near term minimums and maximums several times, and the variations appear to have been rather small considering the long time span.

In the March 7 e-mail Pollack describes research of his own that supports the Dahl-Jensen et al. findings but then references a study of Antarctica that measured temperatures 1,000 years ago as relatively cold. He then adds the following: "We will review carefully the borehole database for deep high quality data that may shed some additional light on the full millennium in different regions. We might even think about different parameterizations for some of the best data. *But it will be very difficult to make the MWP go away in Greenland*." [Italics added.]

It need hardly be added that wanting to make data "go away" suggests bias.

Receding glaciers are frequently described as melting, and the melting is usually blamed on human-caused global warming. This e-mail from Phil Jones to Raymond S. Bradley (4/12/2001) suggests that there are doubts about two locations:

> I saw Lonnie in Japan and it would be good to get a reference to his stuff as the retreat of glaciers is really convincing in the tropical Andes and on Kilimanjaro. There is a small problem though with their retreat. They have retreated a lot in the last 20 years yet the MSU2LT data would suggest that temperatures haven't increased at these levels. You and Henry have shown that high-elevation stations have warmed a lot and freezing levels have risen. Still the glaciers have clearly receded, but the temperature increases at these high-elevation stations isn't enough to explain the rapid retreat.

The melting and retreat of glaciers is a common topic among anthropogenic global warming supporters and their detractors. In a

9/16/04 e-mail to Phil Jones, Geoff Jenkins (Climate Prediction Programme Hadley Centre) wrote:

> . . . we have been concerned that people often use the melting glacier on kilimanjaro as an example of impacts of man-made warming. you may have seen some stories countering this on the sceptics websites. I got philip brohan to look at temps there (see attached) and there isnt any convincing consistent recent warming in the station data. but your gridded CRUtem2V does show a recent warming. presumably that is because (as philip suggests) the gridded stuff has influences from quite a large radius, and hence may reflect warming at stations a long way from kilimanjaro?
>
> would you agree that there is no convincing evidence for kilimanjaro glacier melt being due to recent warming (let alone man-made warming)?

A 9/18/04 e-mail from Phil Jones to Geoff Jenkins also sees little evidence that warming is causing glaciers to disappear:

> I've heard Lonnie Thompson talk about the Kilimanjaro core and he got some local temperatures - that we don't have access to, and there was little warming in them. The same situation applies for Quelccaya in Peru and also some of his Tibet sites. Lonnie thinks they are disappearing because of sublimation [a solid such as ice transforming directly into a gas such as water vapor without going through a liquid phase], but he can't pin anything down.

In 2004 newspaper stories describing simultaneous global warming and cooling appeared, and not surprisingly, they were not welcomed by the climatologists represented in the leaked e-mails. In a 2/20/04 e-mail Asher Minns (University of East Anglia) noted:

> In my experience, global warming freezing is already a bit of a public relations problem with the media, which can become public perception. It provides a new story for the old news that is climate change - a story that has been running since 1985/88.
>
> Last Friday, even NERC [Natural Environment Research

> Council] put-out a press release that opened "British scientists set sail today from Glasgow to begin work aimed at discovering if Britain is indeed in danger of entering the next ice age.

In an e-mail to Andy Revkin (Pace University and *New York Times*) and David Lea (University of California, Santa Barbara) (2/13/04) R. T. Pierrehumbert (University of Chicago) addressed the subject of abrupt warming/cooling:

> I very much agree with David Lea [who wrote] . . . I think the notion of telling the public to prepare for both global warming and an ice age at the same creates a real public relations problem for us. This scenario is based on a lot of sloppy and sensationalistic writing by the brain guy (Calvin?) who wrote the Atlantic Monthly article, and the fact that others, like the Beeb I guess, like to have the opportunity to show pictures of icebergs floating down the Thames. It's not absolutely out of the question, but given the direct effects of greenhouse gases in warming the planet, it's more likely that a THC [Thermohaline Circulation commonly known as the Gulf Stream] shutdown would moderate the European warming at the expense of making someplace else in the world hotter. Those who lived through the Canicule [hot period from July to September] in Europe last summer would find this scenario appealing, but at the same time the heat wave shows that there are other circulation changes (so far not at all understood) that could in fact make Europe a very hot place. What kind of circulation change could lock Europe into deadly summer heat waves like that of last summer? That's the sort of thing we need to think about.

The THC or Gulf Stream is a reason why the United Kingdom and Northern Europe have relatively mild climates. The THC "shut down" thousands of years ago resulting in dramatic reductions in temperatures in these areas. This may have occurred due to the release of water from melting glaciers when the ice ages ended. Some climatologists are concerned that global warming might have a similar impact. Pierrehumbert's 2/13/04 e-mail continued:

The message regarding the lesson of the THC should NOT be 'global warming will cause an ice age.' The message should be one about year to year or decadal variability, and the way alternation of cold years/decades/centurys with very hot ones will exacerbate the problem of adaptation. Imagine a decade of torrid heat, thirty years of pretty good climate, fifty years of early frosts, a century of drought, twenty years of flood -- that's the kind of thing we need to worry about, not the simple 'icebergs in the Thames' scenario.

I think it would be very premature to conclude that the angry beast [?] is a creature of cold climates, just because our very feeble present understanding of Younger Dryas [a period of abrupt cooling that occurred some 14,000 years ago] and D-O events [Dansgaard–Oeschger events are rapid temperature fluctuations that occurred during the last ice age.] suggests it. I'm not even sure that I agree with Richard Alley regarding the claim that Vellinga and Wood show that models have an adequate response to THC shutdown. We still have to worry about the southern hemisphere response, and those New Zealand glaciers are still a thorn in the side of the whole theory. There is ample evidence from past climates that the real system may be more sensitive to small changes in forcing than our current models predict. The southern hemisphere cooling during the LGM, and the continuing puzzle of Cretaceous and Eocene warm climates are two particular examples that come to mind.

I don't think it is even fair to say we understand THC shutdown and the conditions for triggering it. Some highly simplified models can be made to show a greater sensitivity in cold climates (cf the work cited by Mark Cane) and while these say something about how the physics could play out, 3D ocean models have many more ways to re-arrange the ocean circulation than simple models do. For that matter, even the sign of THC response to freshwater dumping is in dispute. It turns out to depend on the supply of 'mixing energy' and the vertical ocean

mixing. J. Nilsson of Stockholm, and R. Huang of Woods Hole have excellent work showing you can actually change the sign of response depending on what vertical mixing model you use.

Finally, there's more to life than the THC. Just because the THC is the most favored theory and the most well worked out for D-O events and YD, that doesn't mean its the only surprise lurking in the system. My own work shows that a change in the tropical transient eddy activity can have profound warming or cooling effects through its influence on water vapor feedback. Nobody's found a real 'switch' yet involving the tropical Pacific, but I'm not sure we would have identified the THC switch either, if we didn't have an example from Nature (herself, not the magazine) in front of us. It's the things we DON'T YET HAVE EXAMPLES OF that we need to worry about most. [Caps in original text.]

Freedom of Information

The first set of leaked e-mails described in Chapter VI describes efforts by University of East Anglia faculty and especially Phil Jones to maintain their monopoly of raw temperature data collected at public expense and possibly containing gaps or embarrassing mistakes. The second set of e-mails includes more examples of this effort.

In a 2009 e-mail from Phil Jones to Thomas (Stocker, University of Bern) Jones wrote:

> Below there is a link to Climate Audit [a website critical of the theory of human-caused global warming] and their new thread with another attempt to gain access to the CRU [Climate Research Unit, University of East Anglia] station temperature data. I wouldn't normally bother about this - but will deal with the FOI [Freedom of Information] requests when they come. Despite WMO Resolution 40 [World Meteorological Organization], I've signed agreements not to pass on some parts of the CRU land station data to third parties.

If you click on the link below and then on comments, look at # 17. This refers to a number of appeals a Brit has made to the Information Commissioner in the UK. You can see various UK Universities and MOHC [Met Office Hadley Centre] listed. For UEA [University of East Anglia] these relate to who changed what and why in Ch 6 of AR4." [AR4 is the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report on Climate Change (2007).]

One way to cover yourself and all those working in AR5 would be to delete all emails at the end of the process. Hard to do, as not everybody will remember to do it.

Phil Jones' concern over the Climate Audit website continued. In an e-mail from Jones addressed to "All" (7/27/09) he wrote:

Here are a few other thoughts. From looking at Climate Audit every few days, these people are not doing what I would call academic research. Also from looking they will not stop with the data, but will continue to ask for the original unadjusted data (which we don't have) and then move onto the software used to produce the gridded datasets (the ones we do release).

CRU is considered by the climate community as a data centre, but we don't have any resources to undertake this work. Any work we have done in the past is done on the back of the research grants we get - and has to be well hidden. I've discussed this with the main funder (US Dept of Energy) in the past and they are happy about not releasing the original station data. . . .

I just want these orchestrated requests to stop. I also don't want to give away years of hard effort within CRU. Many of the agreements were made in the late 1980s and early 1990s and I don't have copies to hand. I also don't want to waste my time looking for them. Even if I were to find them all, it is likely that the people we dealt with are no longer in the same positions. These requests over the last 2.5 years have wasted much time for me, others in CRU and for Dave and Michael. Some of you may

> not know, but the dataset has been sent by someone at the Met Office to McIntyre. The Met Office are trying to find out who did this. I've ascertained it most likely came from there, as I'm the only one who knows where the files are here.

There are several points in these e-mails that deserve emphasis. First, Jones' admission that he lacked raw data used in scientific publications and United Nations documents suggests a gross lack of professionalism. Second, Jones wanted to keep secret "who changed what and why" in a chapter of a United Nations IPCC report. Advocates of the theory of anthropogenic global warming, of whom Jones as head of the CRU was the most prominent, have devoted great effort to maintaining control over the content of UN reports in this field, and they encourage journalists to rely on the information in those publications. Jones' effort to conceal who changed what and why should be a matter of concern to those attempting to formulate thoughtful public policy regarding global warming/climate change. Participants covering themselves by deleting e-mails would be illegal in many private sector and governmental realms at least in the United States.

Third, note that those attempting to unearth data from the University of East Anglia include other universities, not just skeptics who some climatologists try to portray as crack pots or the tools of self serving interest groups. No doubt some skeptics fit both descriptions, but that is the nature of political debate over many if not most of the initiatives covered in our website. It goes with the territory.

Fourth, Jones does not regard the people participating in the Climate Audit web site as conducting what he regards as "academic research." This may or may not be true. Their orientation appears to be more in the direction of the implications of the theory of anthropogenic global warming for public policy than it is science for science's sake, but that theory has profound implications for government and the economy, so it is not surprising that a variety of interests want to participate in the debate. Furthermore, the advocates

of the theory of anthropogenic global warming have vigorously inserted themselves into the public policy debate, and they appear shocked when political interests push back. Raymond S. Bradley (2011), another academic represented in some of these e-mails, wrote an entire book about the "political intimidation" he suffered when conservative Republican members of Congress "cracked down" on him and some of his colleagues (both quotes from his book's cover). This intimidation primarily consisted of his being obliged to testify before sometimes unfriendly congressional committees and suffer criticism in the pages of the *Wall Street Journal*.

Fifth, Jones admits or is asking everyone to believe that he no longer possesses unadjusted (raw) data much of which was collected at government expense. This point also arose in the first set of leaked e-mails. Virtually all of the journal articles and reports in this field that we have read make clear that raw data is often gathered in a highly selective manner (e.g., locations of ice core samples and surface temperature recording stations) and undergoes considerable processing after that point. How all of this work is conducted should be of interest to all investigators–scientists as well as those concerned with public policy. No one should be satisfied with whatever information scientists decide to release or withhold.

Jones observes that the University of East Anglia's Climate Research United is "considered by the climate community as a data centre." However, he maintains that the CRU lacks the resources to store data except to the degree that it is bootlegged on research grants for other purposes and must be "well hidden." He would not be the first academic to divert resources from a grant to other purposes, but his comment about hiding that fact and being allowed to do so by the U.S. Department of Energy that also apparently approves of his withholding raw data are troubling.

A House of Commons (2011, 8) report on these e-mails notes that: "Professor Jones's actions were in line with common practice in the climate science community. It is not standard practice in climate science to publish the raw data and the computer code in

academic papers." This observation is beside the point. Virtually no scholarly publications in any field include raw data and computer code, and no one of whom we are aware has complained about this matter with regard to climatology. But the report goes on to recommend that: " . . . climate scientists should take steps to make available all the data that support their work (including raw data) and full methodological workings (including the computer codes). Had both been available, many of the problems at UEA could have been avoided."(p. 8) It is not unusual for publications with large data sets to put them on websites cited in the publications, and computer code is also sometimes released in this manner.

The House of Commons (2011, 79) report went into some detail regarding Freedom of Information in Great Britain:

> The FoIA, creating new rights of access to information, and the EIR, a statutory instrument providing access to environmental information, came into operation on 1 January 2005. CRU, as part of UEA, is classed as a "public authority" for the purposes of the FoIA and EIR. In his evidence to our predecessor Committee, Mr Richard Thomas, who was Information Commissioner from 2002 until June 2009, explained the application of the FoIA to scientific data held by UK universities: *"the public must be satisfied that publicly-funded universities, as with any other public authority in receipt of public funding, are properly accountable, adopt systems of good governance and can inspire public trust and confidence in their work and operations [...] The fact that the FoIA requests relate to complex scientific data does not detract from this proposition or excuse non-compliance."* [italics added]

The House of Commons (2011, 80) report continues:

> Mr David Holland was the author of several requests for information to UEA, some of which were allegedly mishandled. On 7 July 2010, the Information Commissioner's Office (ICO) announced that the UEA "breached regulation 14(2) of the EIR by failing to provide a response to a request within 20 working

> days and breached regulation 5(2) by failing to provide a response to other requests.
>
> The House of Commons (2011, 81) report goes on:
>
> Mr Holland also made an allegation that the information he requested had been deleted, an offence under regulation 19 of the EIR. The ICO decided that "although the emails referred to [...] indicated prima facie evidence of an offence, the Commissioner was unable to investigate because six months had passed since the potential offence was committed, a constraint placed on the legislation by the Magistrates Court Act 1980." An earlier House of Commons report concluded: "There is prima facie evidence that CRU has breached the Freedom of Information Act 2000. It would, however, be premature, without a thorough investigation affording each party the opportunity to make representations, to conclude that UEA was in breach of the Act. In our view, it is unsatisfactory to leave the matter unresolved simply because of the operation of the six-month time limit on the initiation of prosecutions. Much of the reputation of CRU hangs on the issue. We conclude that the matter needs to be resolved conclusively—either by the Independent Climate Change Email Review or by the Information Commissioner (House of Commons 2011, 83)"

The University of East Anglia established a committee called the Independent Climate Change E-mails Review (ICCER) which concluded that the CRU did not "appear to have acted in a way consistent with the spirit and intent of the FoIA or EIR." (House of Commons 2011, 84) The ICCER also determined that there was "clear incitement to delete emails." (House of Commons 2011, 84)

Conclusions

The leaked global warming e-mails are sometimes called ClimateGate in an unkind reference to the Nixon administration's burglary of Democratic Party offices in the Watergate building in Washington, D.C. and the subsequent cover-up. It is sometimes said about scandals that the greatest damage is inflicted more by the cover-

up than revelations of the original act. In the case of ClimateGate both are equally damning.

It is difficult for non scientists to understand the debates surrounding the e-mails described in Chapter VI and this supplement much less the scientific journal articles that make up the climate change literature. Ordinarily, this would be no different from any other field of science. But, global warming scientist-advocates and their political allies demand massive and expensive economic and governmental change. For example, Michael Mann (2012, 251) calls for industrialized nations to end their "addiction to carbon-based power." The combination of scientific complexity, high cost, and substantial expansion of governmental power make trust in the integrity of the small and tight-knit community of leading climatologists critical. These documents inspire the opposite of trust.

Our review of policy initiatives of all kinds makes clear that their formulation must feature open debate. The argument that the climatologists represented in these e-mails are making is that global warming is caused primarily by human activity and that warming is so destructive that drastic and highly expensive measures must be taken. If this is an unassailable truth, as its advocates claim, they should be able to debate those who disagree rather than attempting to suppress them and engaging in the other questionable practices portrayed in their own words in these e-mails. It is ironic that their behavior has undermined their own case.

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