# **\*\*\*Warming Defense\*\*\***

## No Warming

### No warming – Earth’s cooling more than ever

Beisner 10—former associate professor of interdisciplinary studies in economics, government, and public policy, Covenant. PhD, University of St. Andrews, (Calvin, Forget Global Warming Mini Ice Age May Be on Its Way, 12 January 2010,http://www.rightsidenews.com/201001128144/energy-and-environment/forget-global-warming-mini-ice-age-may-be-on-its-way.html) Note – graph omitted

The UK's MailOnline did just that this week under the headline The mini ice age starts here. Lead paragraph? "The bitter winter afflicting much of the Northern Hemisphere is only the start of a global trend towards cooler weather that is likely to last for 20 or 30 years, say some of the world's most eminent climate scientists." Right. MailOnline reporter David Rose doesn't call them "the world's leading climate skeptics." He calls them "some of the world's most eminent climate scientists"--and he goes on to cite "Mojib Latif, a leading member of the UN's Intergovernmental Panel on Climate Change (IPCC)," "Anastasios Tsonis, head of the University of Wisconsin Atmospheric Sciences Group," and "William Gray, emeritus Professor of Atmospheric Sciences at Colorado State University." Contrary to fears of inexorably diminishing Arctic sea ice, Rose cites the U.S. National Snow and Ice Data Center as reporting that "Arctic summer sea ice has increased by 409,000 square miles, or 26 per cent, since 2007." Though snow's been unusual for most of the southern half of the United Kingdom in recent decades, the Mail published the accompanying satellite photo of Great Britain during the recent cold snap. The island is essentially all covered with snow. Rose reported record lows as far south as Cuba—s7omething I can attest to, living near Miami in south Florida, where we experienced sub-freezing weather over the weekend. He quoted Tsonis as saying that last week 56% of the United States was covered by snow--something that hasn't happened in several decades. And the "'Arctic oscillation'--a weather pattern that sees the development of huge 'blocking' areas of high pressure in northern latitudes, driving polar winds far to the south . . . is at its strongest for at least 60 years. As a result, the jetstream--the high-altitude wind that circles the globe from west to east and normally pushes a series of wet but mild Atlantic lows across Britain--is currently running not over the English Channel but the Strait of Gibraltar." Consequently, most of the Northern Hemisphere is much colder this winter than it's been in decades--and the Southern Hemisphere is cooler, too. According to Rose, Latif, Tsonis, and other scientists attribute the cold shift primarily to a shift in the world's dominant ocean circulations--the Pacific Decadal Oscillation and the Atlantic Multidecadal Oscillation--from a warm phase to a cool phase, something that happens about every 20 to 30 years. "The scientists' predictions also undermine the standard climate computer models, which assert that the warming of the Earth since 1900 has been driven solely by man-made greenhouse gas emissions and will continue as long as carbon dioxide levels rise. They say that their research shows that much of the warming was caused by oceanic cycles when they were in a 'warm mode' as opposed to the present 'cold mode'." That's a point made by Dr. Roy W. Spencer in the science chapter of the Cornwall Alliance's new document A Renewed Call to Truth, Prudence, and Protection of the Poor: An Evangelical Examination of the Theology, Science, and Economics of Global Warming and illustrated in the graph below. "A significant share of the warming we saw from 1980 to 2000 and at earlier periods in the 20th Century was due to these cycles," said Latif, "perhaps as much as 50 per cent. They have now gone into reverse, so winters like this one will become much more likely. Summers will also probably be cooler, and all this may well last two decades or longer. The extreme retreats that we have seen in glaciers and sea ice will come to a halt. For the time being, global warming has paused, and there may well be some cooling." Tsonis also believes that the ocean current cycles dominated global climate change in the 20th century, including the post-1970s, the period many point to as driven by human greenhouse gas emissions, but he doesn't venture to attribute specific percentages to the natural and human causes. "I do not believe in catastrophe theories," Rose quoted him as saying. "Man-made warming is balanced by the natural cycles, and I do not trust the computer models which state that if CO2 reaches a particular level then temperatures and sea levels will rise by a given amount. These models cannot be trusted to predict the weather for a week, yet they are running them to give readings for 100 years." Gray went farther: "Most of the rise in temperature from the Seventies to the Nineties was natural. Very little was down to CO2--in my view, as little as five to ten per cent." Gray, Tsonis, and Latif all agreed that the findings about the ocean currents undermined the credibility of the computer climate models on which the IPCC and other alarmists rely.

### No warming now and zero impact – international cooling and long term trends

Taylor 09 Senior Fellow Env. Policy at Heartland Institute [James, Naples Daily News, “Guest Commentary: Global warming”, <http://www.naplesnews.com/news/2009/jan/03/guest-commentary-global-warming/>, DS]

In a pair of recent columns claiming humans are causing a global-warming crisis, Ben Bova disparages mere “assertions” while saying people need to rely on “observable, measurable facts.” While Bova’s concern about Earth’s climate is admirable, he should follow his own advice regarding assertions versus facts. Bova asserts Earth has a “rising fever.” Yet the fact is that global temperatures are unusually cool. For most of the past 10,000 years temperatures have been 1.0 to 3.0 degrees Celsius warmer than they are today. The 0.6 degree rise in temperatures during the 20th century occurred from the baseline of the little ice age, which saw the coldest global temperatures during the past 10,000 years. Earth has a “rising fever” only if we pretend the little ice age was “normal” and ignore Earth’s long-term temperature facts. Bova asserts “the loss of sea ice in the Arctic is threatening the survival of polar bears.” Yet the fact is that polar bear numbers have doubled since the 1980s. Moreover, Antarctic sea ice is growing and has been setting records for much of the past year. If “global” warming is causing receding polar ice, then why is Antarctic sea ice setting growth records? Bova asserts “measurements ... show that the rise in global temperatures matches quite closely the increase in carbon dioxide.” Yet the fact is that solar scientists at Harvard and other leading universities have published research in the world’s leading scientific journals showing that temperatures match solar output much more closely than carbon dioxide, even in the 20th century. Bova asserts that as a result of global warming “much of our crop land turns to desert.” Yet, the fact is that global precipitation and global soil moisture have increased during the 20th century, and the Sahara Desert and other deserts around the world are in retreat. Bova asserts we run the risk of a breaching a “tipping point” or a “greenhouse cliff where the global climate shifts too rapidly for us to protect ourselves from its drastic effects.” Yet, the fact is that in a recent survey of more than 500 climate scientists from around the world, less than half agreed that “assuming climate change will occur, it will occur so suddenly that a lack of preparation could result in devastation of some areas of the world.” Bova asserts that in California’s Yosemite National Park warmer temperatures are allowing mice and pine trees to live at higher altitudes than a century ago. Yet, the fact is that fossilized trees exist at altitudes above the current California tree line, showing that temperatures were significantly warmer 1,000 years ago than today. Plant and animal species are migrating to higher elevations only in comparison to the abnormally cold temperatures of the little ice age that ended just over a century ago. For most of the past 10,000 years, warmer temperatures enabled mice and trees to live at altitudes significantly higher than is possible today. Global-warming activism is long on unsubstantiated assertions and short on objective facts. Only by comparing today’s temperatures to the abnormal cold of the little ice are — and by completely ignoring the warmer temperatures that predominated during most of the past 10,000 years — can global-warming activists paint a picture of a planet suffering a global warming crisis. Moreover, sound science has thrown cold water on each and every one of the alleged global-warming crises, such as endangered polar bears, melting ice caps, etc., alleged to result from global warming.

### No runaway warming – recent satellites can’t detect hotspots

McShane 8**—**Owen, chairman of the policy panel of the New Zealand Climate Science Coalition and director of the Centre for Resource Management Studies, April 4, 2008

Atmospheric scientists generally agree that as carbon dioxide levels increase there is a law of "diminishing returns" - or more properly "diminishing effects" - and that ongoing increases in CO2 concentration do not generate proportional increases in temperature. The common analogy is painting over window glass. The first layers of paint cut out lots of light but subsequent layers have diminishing impact. So, you might be asking, why the panic? Why does Al Gore talk about temperatures spiraling out of control, causing mass extinctions and catastrophic rises in sea-level, and all his other disastrous outcomes when there is no evidence to support it? The alarmists argue that increased CO2 leads to more water vapour - the main greenhouse gas - and this provides positive feedback and hence makes the overall climate highly sensitive to small increases in the concentration of CO2. Consequently, the IPCC argues that while carbon dioxide may well "run out of puff" the consequent evaporation of water vapour provides the positive feedback loop that will make anthropogenic global warming reach dangerous levels. This assumption that water vapour provides positive feedback lies behind the famous "tipping point," which nourishes Al Gore's dreams of destruction, and indeed all those calls for action now - "before it is too late!" But no climate models predict such a tipping point. However, while the absence of hot spots has refuted one important aspect of the IPCC models we lack a mechanism that fully explains these supposed outcomes. Hence the IPCC, and its supporters, have been able to ignore this "refutation." So by the end of last year, we were in a similar situation to the 19th century astronomers, who had figured out that the sun could not be "burning" its fuel - or it would have turned to ashes long ago - but could not explain where the energy was coming from. Then along came Einstein and E=mc2. Hard to explain Similarly, the climate sceptics have had to explain why the hotspots are not where they should be - not just challenge the theory with their observations. This is why I felt so lucky to be in the right place at the right time when I heard Roy Spencer speak at the New York conference on climate change in March. At first I thought this was just another paper setting out observations against the forecasts, further confirming Evans' earlier work. But as the argument unfolded I realised Spencer was drawing on observations and measurements from the new Aqua satellites to explain the mechanism behind this anomaly between model forecasts and observation. You may have heard that the IPCC models cannot predict clouds and rain with any accuracy. Their models assume water vapour goes up to the troposphere and hangs around to cook us all in a greenhouse future. However, there is a mechanism at work that "washes out" the water vapour and returns it to the oceans along with the extra CO2 and thus turns the added water vapour into a NEGATIVE feedback mechanism. The newly discovered mechanism is a combination of clouds and rain (Spencer's mechanism adds to the mechanism earlier identified by Professor Richard Lindzen called the Iris effect). The IPCC models assumed water vapour formed clouds at high altitudes that lead to further warming. The Aqua satellite observations and Spencer's analysis show water vapour actually forms clouds at low altitudes that lead to cooling. Furthermore, Spencer shows the extra rain that falls from these clouds cools the underlying oceans, providing a second negative feedback to negate the CO2 warming. Alarmists' quandary This has struck the alarmists like a thunderbolt, especially as the lead author of the IPCC chapter on feedback has written to Spencer agreeing that he is right! There goes the alarmist neighbourhood! The climate is not highly sensitive to CO2 warming because water vapour is a damper against the warming effect of CO2. That is why history is full of Ice Ages - where other effects, such as increased reflection from the ice cover, do provide positive feedback - while we do not hear about Heat Ages. The Medieval Warm Period, for example, is known for being benignly warm - not dangerously hot. We live on a benign planet - except when it occasionally gets damned cold. While I have done my best to simplify these developments they remain highly technical and many people distrust their own ability to assess competing scientific claims. However, in this case the tipping point theories are based on models that do not include the effects of rain and clouds. The new Nasa Aqua satellite is the first to measure the effects of clouds and rainfall. Spencer's interpretation of the new data means all previous models and forecasts are obsolete. Would anyone trust long-term forecasts of farm production that were hopeless at forecasting rainfall? The implications of these breakthroughs in measurement and understanding are dramatic to say the least. The responses will be fun to watch.

### It will be slow – carbon dioxide levels absorb radiation and naturally slow down

Carter 7**—**paleontologist, stratigrapher, marine geologist and environmental scientist, PhD from Cambridge University, 2007 is an Adjunct Research Professor at James Cook University (Robert M., “The Myth of Dangerous Human-Caused Climate Change”, the AusIMM New Leaders’ Conference, May 2-3)

Though not a pollutant, it is nonetheless the case that carbon dioxide absorbs space-bound infrared radiation, thereby increasing the energy available at Earth’s surface for warming or increased evaporation (eg de Freitas, 2002). Radiation theory thus accepted, there remain four problems with turning an increase in atmospheric carbon dioxide into global warming alarmism. First, the relationship between increasing carbon dioxide and increasing temperature is logarithmic, which lessens the forcing effect of each successive increment of carbon dioxide (Figure 4). Second, in increasing from perhaps 280 ppm in pre-industrial times to 380 ppm now, carbon dioxide should already have produced 75 per cent of the theoretical warming of ~1°C that would be caused by a doubling to 560 ppm (Lindzen, 2006); as we move from 380 to 560 ppm, at most a trivial few tenths of a degree of warming remain in the system. Claims of greater warming, such as those of the IPCC (2001), are based upon arbitrary adjustments to the lambda value in the Stefan-Boltzmann equation, and untested assumptions about positive feedbacks from water vapour. Third, the ice core data show conclusively that, during natural climate cycling, changes in temperature precede changes in carbon dioxide by an average 800 years or so (Fischer et al, 1999; Indermuhle et al, 2000; Mudelsee, 2001; Caillon et al, 2003); similarly, temperature change precedes carbon dioxide change, in this case by five months, during annual seasonal cycling (Kuo, Lindberg and Thomson, 1990). And, fourth, Boucot, Xu and Scotese (2004) have shown that over the Phanerozoic little relationship exists between the atmospheric concentration of carbon dioxide and necessary warming, including that extensive glaciation occurred between 444 and 353 million years ago when atmospheric carbon dioxide was up to 17 times higher than today (Chumakov, 2004).

### No impact – other atmospheric gases overwhelm it

Lindzen 9**—**professor of meteorology, MIT. Member of the National Academy of Sciences, and the Norwegian Academy of Sciences and Letters, and a fellow of the American Academy of Arts and Sciences, the American Association for the Advancement of Sciences, the American Geophysical Union and the American Meteorological Society. PhD, Harvard (Richard, 11/30/2009, The Climate Science Isn't Settled, WSJ, Lexis)

Claims that climate change is accelerating are bizarre. There is general support for the assertion that GATA has increased about 1.5 degrees Fahrenheit since the middle of the 19th century. The quality of the data is poor, though, and because the changes are small, it is easy to nudge such data a few tenths of a degree in any direction. Several of the emails from the University of East Anglia's Climate Research Unit (CRU) that have caused such a public ruckus dealt with how to do this so as to maximize apparent changes. The general support for warming is based not so much on the quality of the data, but rather on the fact that there was a little ice age from about the 15th to the 19th century. Thus it is not surprising that temperatures should increase as we emerged from this episode. At the same time that we were emerging from the little ice age, the industrial era began, and this was accompanied by increasing emissions of greenhouse gases such as CO2, methane and nitrous oxide. CO2 is the most prominent of these, and it is again generally accepted that it has increased by about 30%. The defining characteristic of a greenhouse gas is that it is relatively transparent to visible light from the sun but can absorb portions of thermal radiation. In general, the earth balances the incoming solar radiation by emitting thermal radiation, and the presence of greenhouse substances inhibits cooling by thermal radiation and leads to some warming. That said, the main greenhouse substances in the earth's atmosphere are water vapor and high clouds. Let's refer to these as major greenhouse substances to distinguish them from the anthropogenic minor substances. Even a doubling of CO2 would only upset the original balance between incoming and outgoing radiation by about 2%. This is essentially what is called "climate forcing." There is general agreement on the above findings. At this point there is no basis for alarm regardless of whether any relation between the observed warming and the observed increase in minor greenhouse gases can be established. Nevertheless, the most publicized claims of the U.N.'s Intergovernmental Panel on Climate Change (IPCC) deal exactly with whether any relation can be discerned. The failure of the attempts to link the two over the past 20 years bespeaks the weakness of any case for concern. The IPCC's Scientific Assessments generally consist of about 1,000 pages of text. The Summary for Policymakers is 20 pages. It is, of course, impossible to accurately summarize the 1,000-page assessment in just 20 pages; at the very least, nuances and caveats have to be omitted. However, it has been my experience that even the summary is hardly ever looked at. Rather, the whole report tends to be characterized by a single iconic claim. The main statement publicized after the last IPCC Scientific Assessment two years ago was that it was likely that most of the warming since 1957 (a point of anomalous cold) was due to man. This claim was based on the weak argument that the current models used by the IPCC couldn't reproduce the warming from about 1978 to 1998 without some forcing, and that the only forcing that they could think of was man. Even this argument assumes that these models adequately deal with natural internal variability—that is, such naturally occurring cycles as El Nino, the Pacific Decadal Oscillation, the Atlantic Multidecadal Oscillation, etc. Yet articles from major modeling centers acknowledged that the failure of these models to anticipate the absence of warming for the past dozen years was due to the failure of these models to account for this natural internal variability. Thus even the basis for the weak IPCC argument for anthropogenic climate change was shown to be false. Of course, none of the articles stressed this. Rather they emphasized that according to models modified to account for the natural internal variability, warming would resume—in 2009, 2013 and 2030, respectively. But even if the IPCC's iconic statement were correct, it still would not be cause for alarm. After all we are still talking about tenths of a degree for over 75% of the climate forcing associated with a doubling of CO2. The potential (and only the potential) for alarm enters with the issue of climate sensitivity—which refers to the change that a doubling of CO2 will produce in GATA. It is generally accepted that a doubling of CO2 will only produce a change of about two degrees Fahrenheit if all else is held constant. This is unlikely to be much to worry about. Yet current climate models predict much higher sensitivities. They do so because in these models, the main greenhouse substances (water vapor and clouds) act to amplify anything that CO2 does. This is referred to as positive feedback. But as the IPCC notes, clouds continue to be a source of major uncertainty in current models. Since clouds and water vapor are intimately related, the IPCC claim that they are more confident about water vapor is quite implausible. There is some evidence of a positive feedback effect for water vapor in cloud-free regions, but a major part of any water-vapor feedback would have to acknowledge that cloud-free areas are always changing, and this remains an unknown. At this point, few scientists would argue that the science is settled. In particular, the question remains as to whether water vapor and clouds have positive or negative feedbacks. The notion that the earth's climate is dominated by positive feedbacks is intuitively implausible, and the history of the earth's climate offers some guidance on this matter. About 2.5 billion years ago, the sun was 20%-30% less bright than now (compare this with the 2% perturbation that a doubling of CO2 would produce), and yet the evidence is that the oceans were unfrozen at the time, and that temperatures might not have been very different from today's. Carl Sagan in the 1970s referred to this as the "Early Faint Sun Paradox." For more than 30 years there have been attempts to resolve the paradox with greenhouse gases. Some have suggested CO2—but the amount needed was thousands of times greater than present levels and incompatible with geological evidence. Methane also proved unlikely. It turns out that increased thin cirrus cloud coverage in the tropics readily resolves the paradox—but only if the clouds constitute a negative feedback. In present terms this means that they would diminish rather than enhance the impact of CO2. There are quite a few papers in the literature that also point to the absence of positive feedbacks. The implied low sensitivity is entirely compatible with the small warming that has been observed. So how do models with high sensitivity manage to simulate the currently small response to a forcing that is almost as large as a doubling of CO2? Jeff Kiehl notes in a 2007 article from the National Center for Atmospheric Research, the models use another quantity that the IPCC lists as poorly known (namely aerosols) to arbitrarily cancel as much greenhouse warming as needed to match the data, with each model choosing a different degree of cancellation according to the sensitivity of that model.

# It’s Inevitable

### Warming inevitable – carbon dioxide will stay in the atmosphere

Dickinson 9 [Pete, Global warming: Is it too late?, 26 August 2009, http://www.socialistalternative.org/news/article19.php?id=1142 , DS]

New research is claiming that concentrations of carbon dioxide (the main greenhouse gas, CO2) will remain high for at least 1,000 years, even if greenhouse gases are eliminated in the next few decades. The climate scientists who produced this work assert that the effects of global warming, such as high sea levels and reduced rainfall in certain areas, will also persist over this time scale. (The findings are in a paper published in February in the Proceedings of the National Academy of Sciences by researchers from the USA, Switzerland and France, www.pnas.org/cgi/doi/10.1073/pnas.0812721106 ) Most previous estimates of the longevity of global warming effects, after greenhouse gases were removed, have ranged from a few decades to a century, so this new analysis could represent a development with very serious implications, including political ones. For example, those campaigning for action on climate change could be disheartened and climate sceptics could opportunistically say that nothing should be done because it is now too late. The authors of the paper make various estimates of CO2 concentrations based on the year emissions are cut, assumed to be from 2015 to 2050. They make optimistic assumptions, for instance, that emissions are cut at a stroke rather than gradually, and that their annual rate of growth before cut-off is 2%, not the 3% plus witnessed from 2000-05. They then estimate what the effects would be on surface warming, sea level rise and rainfall over a 1,000-year period using the latest climate models. The results of the melting of the polar ice caps are not included in the calculations of sea levels, only the expansion of the water in the oceans caused by the surface temperature increase so, as the authors point out, the actual new sea level will be much higher. The best-case results for surface warming, where action is taken in 2015 to eliminate emissions, show that over 1,000 years the temperature rises from 1.3 to 1.0 degree centigrade above pre-industrial levels. The worst case, where action is delayed to 2050, predicts surface temperatures will increase from just under to just over four degrees by 2320 and then remain approximately constant for the rest of the millennium. High levels of CO2 persist in the atmosphere because, over long timescales, reduction of the gas is dependent on the ability of the oceans to absorb it, but there are limits to this due to the physics and chemistry of deep-ocean mixing. On the other hand, the amount of heat in the atmosphere that can be absorbed by the sea, the key way surface temperatures are decreased, is limited by the same scientific laws. As a result, carbon concentrations cannot fall enough to force temperatures down while there is simultaneously reduced cooling due to limited heat loss to the oceans.

### Warming tipping points inevitable – cutting emissions can’t solve

NPR 9 (1/26, Global Warming Is Irreversible, Study Says, All Things Considered, <http://www.npr.org/templates/story/story.php?storyId=99888903>)

Climate change is essentially irreversible, according to a sobering new scientific study. As carbon dioxide emissions continue to rise, the world will experience more and more long-term environmental disruption. The damage will persist even when, and if, emissions are brought under control, says study author Susan Solomon, who is among the world's top climate scientists. "We're used to thinking about pollution problems as things that we can fix," Solomon says. "Smog, we just cut back and everything will be better later. Or haze, you know, it'll go away pretty quickly." That's the case for some of the gases that contribute to climate change, such as methane and nitrous oxide. But as Solomon and colleagues suggest in a new study published in the Proceedings of the National Academy of Sciences, it is not true for the most abundant greenhouse gas: carbon dioxide. Turning off the carbon dioxide emissions won't stop global warming. "People have imagined that if we stopped emitting carbon dioxide that the climate would go back to normal in 100 years or 200 years. What we're showing here is that's not right. It's essentially an irreversible change that will last for more than a thousand years," Solomon says. This is because the oceans are currently soaking up a lot of the planet's excess heat — and a lot of the carbon dioxide put into the air. The carbon dioxide and heat will eventually start coming out of the ocean. And that will take place for many hundreds of years. Solomon is a scientist with the National Oceanic and Atmospheric Administration. Her new study looked at the consequences of this long-term effect in terms of sea level rise and drought.

### US can’t solve warming – rising powers won’t cut emissions

Sensenbrenner 9 – Congressman and ranking minority member of the House Select Committee on Energy Independence and Global Warming (James, 4/3, Technology Is the Answer to Climate Change, WSJ,http://online.wsj.com/article/SB123871985916184973.html#mod=loomia?loomia\_si=t0:a16:g2:r3:c0.191864:b23626456, AG)

The U.S. cannot reduce the growth of greenhouse gases in the earth's atmosphere without the developing nations cutting their emissions as well. A 2007 study by the Battelle Memorial Institute found that if China, India and the other developing countries keep growing at current rates, they will emit nearly three times as much carbon dioxide as will the developed countries by the end of this century. But will China and India join in the effort to reduce CO2 emissions? During December's U.N. climate-change conference in Poznan, Poland, I asked delegates from both of these nations if they would agree to cut their emissions. Both said, unequivocally, "no." The Poznan conference wasn't my first experience with the developing world's refusal to sign up for the West's global-warming agenda. I led the congressional delegation to the infamous Kyoto, Japan, negotiations in 1997, and the story then was the same as now. Without China and India, there can be no deal. It's understandable why the developing nations are reluctant to cut emissions -- it means higher energy costs and reduced growth. China and India are more concerned with growing their economy, expanding access to electricity, and reducing poverty. I don't blame them.

# Not Anthro/Alt Causes

## Alt Causes

### Alt causes – tons of other greenhouse gases

Ecobridge 7 (http://www.ecobridge.org/content/g\_cse.htm, AG)

While carbon dioxide is the principal greenhouse gas, methane is second most important. According to the IPCC, Methane is more than 20 times as effective as CO2 at trapping heat in the atmosphere. US Emissions Inventory 2004 Levels of atmospheric methane have risen 145% in the last 100 years. [18] Methane is derived from sources such as rice paddies, bovine flatulence, bacteria in bogs and fossil fuel production. Most of the world’s rice, and all of the rice in the United States, is grown on flooded fields. When fields are flooded, anaerobic conditions develop and the organic matter in the soil decomposes, releasing CH4 to the atmosphere, primarily through the rice plants. US Emissions Inventory 2004 Water Vapor in the Atmosphere Increasing Water vapor is the most prevalent and most poweful greenhouse gas on the planet, but its increasing presence is the result of warming caused by carbon dioxide, methane and other greenhouse gases. (See NOAA's National Climate Data Center (NCDC) FAQ page) Water vapor holds onto two-thirds of the heat trapped by all the greenhouse gases.[129] As the Earth heats up relative humidity is able to increase, allowing the planet's atmosphere to hold more water vapor, causing even more warming, thus a positive feedback scenario. Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more water when its warmer), leading to more water vapor in the atmosphere, says the NCDC. There is much scientific uncertainty as to the degree this feedback loop causes increased warming, inasmuch as the water vapor also causes increased cloud formation, which in turn reflects heat back out into space. Nitrous oxide Another greenhouse gas is Nitrous oxide (N2O), a colourless, non-flammable gas with a sweetish odour, commonly known as "laughing gas", and sometimes used as an anaesthetic. Nitrous oxide is naturally produced by oceans and rainforests. Man-made sources of nitrous oxide include nylon and nitric acid production, the use of fertilisers in agriculture, cars with catalytic converters and the burning of organic matter. Nitrous oxide is broken down in the atmosphere by chemical reactions that involve sunlight. Deforestation After carbon emissions caused by humans, deforestation is the second principle cause of atmospheric carbn dioxide. (NASA Web Site) Deforestation is responsible for 20-25% of all carbon emissions entering the atmosphere, by the burning and cutting of about 34 million acres of trees each year. We are losing millions of acres of rainforests each year, the equivalent in area to the size of Italy. [22] The destroying of tropical forests alone is throwing hundreds of millions of tons of carbon dioxide into the atmosphere each year. We are also losing temperate forests. The temperate forests of the world account for an absorption rate of 2 billion tons of carbon annually. [3] In the temperate forests of Siberia alone, the earth is losing 10 million acres per year.

### Studies confirm that cosmic rays cause warming – massive solvency deficit

Rao 1/25 - PhD in space science, former chairman of the Indian Space Research Organisation, current Chairman of the Governing Council of the Physical Research Laboratory at Ahmedabad [Udipi, 1/25/2011, “Contribution of changing galactic cosmic ray flux to global warming,” Current Science, http://www.ias.ac.in/currsci/25jan2011/223.pdf]

The well established excellent correlation between low-level clouds and primary cosmic ray intensity, which act as nuclei for cloud condensation, clearly shows that a decrease in primary cosmic ray intensity results in lesser low cloud cover. Reduced albedo radiation reflected back into space, due to lesser low cloud cover, results in an increase in the surface temperature on the earth. Extrapolation of the intensity of galactic cosmic radiation using 10Be measurements in deep polar ice as the proxy, clearly shows that the primary cosmic ray intensity has decreased by 9% during the last 150 years, due to the continuing increase in solar activity. We present evidence to show that the radiative forcing component due to the decrease in primary cosmic ray intensity during the last 150 years is 1.1 Wm–2, which is about 60% of that due to CO2 increase. We conclude that the future prediction of global warming presented by IPCC4 requires a relook to take into the effect due to long-term changes in the galactic cosmic ray intensity. Keywords: Cloud cover, climate change, cosmic rays, global warming. THE working group of the Fourth Inter-Governmental Panel on Climate Change1 (IPCC-4) has made a comprehensive assessment of the effect of anthropogenic greenhouse gases on global warming and its consequences under different scenarios for the increase in greenhouse gas emission. Since the average growth rate of CO2 (1.9 ppm/year) is by far the largest compared to other greenhouse gases and is also expected to increase due to the growing global demand for energy, a realistic assessment of the actual contribution of CO2 to global warming is essential to accurately predict the increase in temperature and its consequences on weather and climate. In addition to the uncertainties involved in predicting the growth rate of CO2, many scientists believe there are additional causes contributing to the global climate change, which have not been fully taken into account in the report. New experimental evidence provides evidence to show that the primary galactic cosmic ray changes, which generate cloud condensation nuclei, can significantly affect global temperature. The role of primary galactic cosmic rays in generating low-level cloud condensation nuclei, which reflect solar energy back into space affecting the temperature on earth, was first reported by Svensmark and Christensen2. The effect of long-term changes in galactic cosmic ray intensity on low level cloud cover formation and its impact on global warming was however not clearly understood due to non-availability of reliable estimate of cosmic ray intensity changes over a long period. In this paper we present recent results on galactic cosmic intensity changes since 1800, obtained using accurate measurements of 10Be derived from deep ice core measurements3 as proxy, in order to estimate the realistic contribution of long-term cosmic ray intensity changes to climate warming. It is well known that 10Be nuclei in deep polar ice is a reliable proxy measure of the ~ 2 GeV/nucleon cosmic ray intensity impinging on the earth. By merging long time cosmogenic 10Be data derived from deep ice core measurements with actual cosmic ray observations during 1933–1965, McCracken et al.4 have reconstructed the long-term changes in cosmic ray intensity during 1428– 2005. Figure 1 shows the long-term changes in cosmic ray intensity as seen in neutron monitor counting rates and corresponding changes in helio-magnetic field (HMF) during 1800–2000, reproduced from McCracken’s papers5,6. From a critical analysis of the data, McCracken has shown that the average cosmic ray intensity near the earth during 1954–1996 was lower by 16% compared to the average for the period 1428–1944. The primary cosmic ray intensity recorded during the space era 1960– 2005 is the lowest in the last 150 years. Similar conclusion has been independently reached by Taricco et al.7 by analysing the 44Ti activity in meteorites. During the last 150 years when the carbon-dioxide intensity increased from around 280 ppm to 380 ppm, we find the corresponding decrease in cosmic ray intensity is about 9%, as seen from the data presented by McCracken and Beer3,4.

### Deforestation is an alt cause—outweighs their internal link

Howden 07 [Daniel, 5/14/2007, The Independent, “Deforestation: The hidden cause of global warming”, http://www.independent.co.uk/environment/climate-change/deforestation-the-hidden-cause-of-global-warming-448734.html]

The accelerating destruction of the rainforests that form a precious cooling band around the Earth's equator, is now being recognised as one of the main causes of climate change. Carbon emissions from deforestation far outstrip damage caused by planes and automobiles and factories. The rampant slashing and burning of tropical forests is second only to the energy sector as a source of greenhouses gases according to report published today by the Oxford-based Global Canopy Programme, an alliance of leading rainforest scientists. Figures from the GCP, summarising the latest findings from the United Nations, and building on estimates contained in the Stern Report, show deforestation accounts for up to 25 per cent of global emissions of heat-trapping gases, while transport and industry account for 14 per cent each; and aviation makes up only 3 per cent of the total. "Tropical forests are the elephant in the living room of climate change," said Andrew Mitchell, the head of the GCP. Scientists say one days' deforestation is equivalent to the carbon footprint of eight million people flying to New York. Reducing those catastrophic emissions can be achieved most quickly and most cheaply by halting the destruction in Brazil, Indonesia, the Congo and elsewhere. No new technology is needed, says the GCP, just the political will and a system of enforcement and incentives that makes the trees worth more to governments and individuals standing than felled. "The focus on technological fixes for the emissions of rich nations while giving no incentive to poorer nations to stop burning the standing forest means we are putting the cart before the horse," said Mr Mitchell. Most people think of forests only in terms of the CO2 they absorb. The rainforests of the Amazon, the Congo basin and Indonesia are thought of as the lungs of the planet. But the destruction of those forests will in the next four years alone, in the words of Sir Nicholas Stern, pump more CO2 into the atmosphere than every flight in the history of aviation to at least 2025. Indonesia became the third-largest emitter of greenhouse gases in the world last week. Following close behind is Brazil. Neither nation has heavy industry on a comparable scale with the EU, India or Russia and yet they comfortably outstrip all other countries, except the United States and China. What both countries do have in common is tropical forest that is being cut and burned with staggering swiftness. Smoke stacks visible from space climb into the sky above both countries, while satellite images capture similar destruction from the Congo basin, across the Democratic Republic of Congo, the Central African Republic and the Republic of Congo. According to the latest audited figures from 2003, two billion tons of CO2 enters the atmosphere every year from deforestation. That destruction amounts to 50 million acres - or an area the size of England, Wales and Scotland felled annually. The remaining standing forest is calculated to contain 1,000 billion tons of carbon, or double what is already in the atmosphere. As the GCP's report concludes: "If we lose forests, we lose the fight against climate change." Standing forest was not included in the original Kyoto protocols and stands outside the carbon markets that the report from the International Panel on Climate Change (IPCC) pointed to this month as the best hope for halting catastrophic warming. The landmark Stern Report last year, and the influential McKinsey Report in January agreed that forests offer the "single largest opportunity for cost-effective and immediate reductions of carbon emissions". International demand has driven intensive agriculture, logging and ranching that has proved an inexorable force for deforestation; conservation has been no match for commerce. The leading rainforest scientists are now calling for the immediate inclusion of standing forests in internationally regulated carbon markets that could provide cash incentives to halt this disastrous process. Forestry experts and policy makers have been meeting in Bonn, Germany, this week to try to put deforestation on top of the agenda for the UN climate summit in Bali, Indonesia, this year. Papua New Guinea, among the world's poorest nations, last year declared it would have no choice but to continue deforestation unless it was given financial incentives to do otherwise. Richer nations already recognise the value of uncultivated land. The EU offers €200 (£135) per hectare subsidies for "environmental services" to its farmers to leave their land unused. And yet there is no agreement on placing a value on the vastly more valuable land in developing countries. More than 50 per cent of the life on Earth is in tropical forests, which cover less than 7 per cent of the planet's surface. They generate the bulk of rainfall worldwide and act as a thermostat for the Earth. Forests are also home to 1.6 billion of the world's poorest people who rely on them for subsistence. However, forest experts say governments continue to pursue science fiction solutions to the coming climate catastrophe, preferring bio-fuel subsidies, carbon capture schemes and next-generation power stations. Putting a price on the carbon these vital forests contain is the only way to slow their destruction. Hylton Philipson, a trustee of Rainforest Concern, explained: "In a world where we are witnessing a mounting clash between food security, energy security and environmental security - while there's money to be made from food and energy and no income to be derived from the standing forest, it's obvious that the forest will take the hit."

### ****It’s not manmade – solar variability accounts for it****

Wojick 5 (David, President of Climatechange.org, Electricity Daily, January 10)

U.S. climate change research policy is seriously out of whack. There is growing evidence that solar variability is responsible for most of the global warming in the last century ( ED, Dec 15,2004). Coal fired power plants are being blamed for much of this warming, but if it is actually the sun at work then we are wasting time and a lot of money trying to cut carbon dioxide emissions. Clearly the Bush administration should be looking into this solar angle. But it is not, even though its $2 billion a year Climate Change Science Program just underwent a massive review. The CCSP is doing outdated, entrenched science, that assumes humans are to blame for what may well be a natural phenomenon. The problem is that the federal science program was defined 15 years ago. It was assumed then that the climate is naturally unchanging, so humans must be the cause of the observed warming. Since then we have learned that climate, like weather, is never constant, but the research program has not changed accordingly. In the last 6-8 years the sun has emerged as a big driver of Earth s climate change. For example, consider the findings of the United Nations Intergovernmental Panel on Climate Change, which conducts massive periodic reviews of climate science. In 1995 the IPCC said that the sun was not a factor in the warming over the last century. In 2001 it concluded that more than half of that warming was solar induced, not human induced. Given that the IPCC tends to be biased toward the theory of human induced warming, this was a huge admission. The scientific trend marked by the IPCC s flip flop has continued. The research problem is that the known variations in solar energy are not strong enough to account for all of the observed global warming. But in the last five years a number of indirect, amplifying mechanisms have been identified. The result is that we now know how the sun might account for all of the warming, and there is growing evidence that it does. Research problems do not get any better, or more important, than this. The policy problem is that the CCSP has no plans to do solar-climate research. Because carbon dioxide was assumed to be the culprit, the annual CCSP budget has a $110 million carbon cycle component. But CO2 is a trace gas and the CO2 increase to date cannot explain the observed warming, without assuming a water vapor feedback, so the CCSP also includes a $150 million water-cycle component. There is no corresponding solar-cycle research, what little is done on solar is round-off error. The word solar barely occurs in the new CCSP Strategic Plan, and occurs not at all in the plan s milestones. In short, the climate research program has assumed an old, speculative answer to the warming question (humans are doing it) and is throwing vast quantities of money at that answer. Billions of dollars over the last 15 years. Now that a new answer is emerging (it s the Sun, after all) the CCSP has failed to notice. Clearly its time to put some of these big science bucks into solar climate research. U.S. energy policy hangs in the balance.

## CO2 Not Key

### Carbon dioxide isn’t the cause – your models fail

Evans, ‘8 – former consultant to the Australian Greenhouse office who built carbon models [David, 8/30/2008, The Financial Post, “Why I recanted; 'There is no evidence to support the idea that carbon emissions cause significant global warming',” Lexis, DS]

I devoted six years to carbon accounting when I built models for the Australian Greenhouse Office. I am the rocket scientist who wrote the carbon accounting model (FullCAM) that measures Australia's compliance with the Kyoto Protocol, in the land use change and forestry sector. FullCAM models carbon flows in plants, mulch, debris, soils and agricultural products, using inputs such as climate data, plant physiology and satellite data. I've been following the global warming debate closely for years. When I started that job in 1999 the evidence that carbon emissions caused global warming seemed pretty good: CO2 is a greenhouse gas; the old ice core data; no other suspects. The evidence was not conclusive, but why wait until we were certain when it appeared we needed to act quickly? Soon governments and the scientific community were working together and lots of science research jobs were created. We scientists had political support, the ear of government, big budgets and we felt fairly important and useful (well, I did anyway). It was great. We were working to save the planet. But since 1999, new evidence has seriously weakened the case that carbon emissions are the main cause of global warming, and by 2007 the evidence was pretty conclusive that carbon played only a minor role and was not the main cause of the recent global warming. As Lord Keynes famously said, "When the facts change, I change my mind. What do you do, sir?" There has not been a public debate about the causes of global warming and most of the public and our decision makers are not aware of the most basic salient facts: 1. The greenhouse signature is missing. We have been looking and measuring for years, and cannot find it. Each possible cause of global warming has a different pattern of where in the planet the warming occurs first and the most intensely. The signature of an increased greenhouse effect is a hot spot about 10 km up in the atmosphere over the tropics. We have been measuring the atmosphere for decades using radiosondes: weather balloons with thermometers that radio back the temperature as the balloon ascends through the atmosphere. They show no hot spot. Whatsoever. If there is no hot spot then an increased greenhouse effect is not the cause of global warming. So we know for sure that carbon emissions are not a significant cause of the global warming. If we had found the greenhouse signature then I would be an alarmist again. When the signature was found to be missing in 2007 (after the latest IPCC report), alarmists objected that maybe the readings of the radiosonde thermometers might not be accurate and maybe the hot spot was there but had gone undetected. Yet hundreds of radiosondes have given the same answer, so statistically it is not possible that they missed the hot spot. Recently the alarmists have suggested we ignore the radiosonde thermometers, but instead take the radiosonde wind measurements, apply a theory about wind shear, and run the results through their computers to estimate the temperatures. They then say that the results show that we cannot rule out the presence of a hot spot. If you believe that you'd believe anything. 2. There is no evidence to support the idea that carbon emissions cause significant global warming. None. There is plenty of evidence that global warming has occurred, and theory suggests that carbon emissions should raise temperatures (though by how much is hotly disputed) but there are no observations by anyone that implicate carbon emissions as a significant cause of the recent global warming. 3. The satellites that measure the world's temperature all say that the warming trend ended in 2001, and that the temperature has dropped about 0.6 degrees Celsius in the past year (to the temperature of 1980). Land-based temperature readings are corrupted by the "urban heat island" effect: urban areas encroaching on thermometer stations warm the micro-climate around the thermometer, due to vegetation changes, concrete, cars, houses. Satellite data is the only temperature data we can trust, but it only goes back to 1979. NASA reports only land-based data, and reports a modest warming trend and recent cooling. The other three global temperature records use a mix of satellite and land measurements, or satellite only, and they all show no warming since 2001 and a recent cooling. 4. The new ice cores show that in the past six global warmings over the past half a million years, the temperature rises occurred on average 800 years before the accompanying rise in atmospheric carbon. Which says something important about which was cause and which was effect. None of these points are controversial. The alarmist scientists agree with them, though they would dispute their relevance. The last point was known and past dispute by 2003, yet Al Gore made his movie in 2005 and presented the ice cores as the sole reason for believing that carbon emissions cause global warming. In any other political context, our cynical and experienced press corps would surely have called this dishonest and widely questioned the politician's assertion. Until now, the global warming debate has merely been an academic matter of little interest. Now that it matters, we should debate the causes of global warming. So far that debate has just consisted of a simple sleight of hand: show evidence of global warming, and while the audience is stunned at the implications, simply assert that it is due to carbon emissions. In the minds of the audience, the evidence that global warming has occurred becomes conflated with the alleged cause, and the audience hasn't noticed that the cause was merely asserted, not proved. If there really was any evidence that carbon emissions caused global warming, don't you think we would have heard all about it ad nauseam by now? The world has spent $50-billion on global warming since 1990, and we have not found any actual evidence that carbon emissions cause global warming. Evidence consists of observations made by someone at some time that supports the idea that carbon emissions cause global warming. Computer models and theoretical calculations are not evidence, they are just theory. What is going to happen over the next decade as global temperatures continue not to rise? The Australian Labor government is about to deliberately wreck the economy in order to reduce carbon emissions. If the reasons later turn out to be bogus, the electorate is not going to re-elect a Labor government for a long time. When it comes to light that the carbon scare was known to be bogus in 2008, the ALP is going to be regarded as criminally negligent or ideologically stupid for not having seen through it. And if the Liberals support the general thrust of their actions, they will be seen likewise. The onus should be on those who want to change things to provide evidence for why the changes are necessary. The Australian public is eventually going to have to be told the evidence anyway, so it might as well be told before wrecking the economy.

## Water Vapor

### Water vapor’s just as important

Campbell, ’10 - Independent Canadian political consultant [Russ, 2/9/2010, Newstex, “Water Vapor and Global Warming,” Lexis, DS]

The debate over man-made global warming seems very much alive notwithstanding pronouncements from prominent global warming watchers that the facts supporting Anthropogenic Climate Change are irrefutable; the debate is over. Climate Change, we are told, will cause massive change to our planet”all negative. And we are rapidly running out of time. Climate scientists have based their predictions on ancient tree rings and core samples from ice sheets and marine sediment because the human race has only been keeping cohesive written records of climate statistics for less than a couple of hundred years. In addition to obtaining a record of historical and pre-historical temperatures from ice cores, scientists can use the cores to correlate the concentration of greenhouse gasses in the atmosphere with changes in climate. Many greenhouse gases”carbon dioxide, methane, halocarbons, nitrous oxide and others”affect climate. But so too does water vapour. And the water vapour record and its long-term effect on climate change is still being debated. Scientists seem to agree that if you add carbon dioxide to the atmosphere, warming will result. But how much warming and how quickly? Increasing water vapor is also know to lead to warmer temperatures, and warmer temperatures cause more water vapor to be absorbed into the air and so on in a spiraling cycle of warming and water absorption increase. Scientists at the U.S. National Oceanic and Atmospheric Administration (NOAA) recently reported that an increase in atmospheric water vapor is responsible for at least a third of the average temperature increase since the early 1990s. The scientist who lead the research,Susan Soloman, says that, while this finding does not undermine man-made global warming theories, it does suggest human emissions are having a much smaller role in climate change than previously thought. NASA researchers and climate scientists have reviewed the NOAA water vapor research. Researcher Andrew Dessler from Texas A&M University described the effect of water vapor on atmospheric temperature as œenormous. So where do we stand. Global warming does seem to be a long-term trend. And some warming may be caused by human activity. Is carbon dioxide the culprit? Partially, yes, but so too are other factors like water vapour. Do we need more information and study before spending hundreds of billions on mitigation and coping strategies? Yes, a lot more. The debate is alive and well.

Solomon et al, ’10 - NOAA Earth System Research Laboratory, Cooperative Institute for Research in Environmental Sciences, University of Bern [Susan Solomon, Karen Rosenlof, Robert Portmann, and John Daniel, all of the NOAA Earth System Research Laboratory (ESRL) in Boulder, Colo.; Sean Davis and Todd Sanford, NOAA/ESRL and the Cooperative Institute for Research in Environmental Sciences, University of Colorado; and Gian-Kasper Plattner, University of Bern, Switzerland; ScienceDaily, “Stratospheric Water Vapor is a Global Warming Wild Card,” <http://www.sciencedaily.com/releases/2010/01/100131145840.htm#>, DS]

A 10 percent drop in water vapor ten miles above Earth's surface has had a big impact on global warming, say researchers in a study published online January 28 in the journal Science. The findings might help explain why global surface temperatures have not risen as fast in the last ten years as they did in the 1980s and 1990s. Observations from satellites and balloons show that stratospheric water vapor has had its ups and downs lately, increasing in the 1980s and 1990s, and then dropping after 2000. The authors show that these changes occurred precisely in a narrow altitude region of the stratosphere where they would have the biggest effects on climate. Water vapor is a highly variable gas and has long been recognized as an important player in the cocktail of greenhouse gases -- carbon dioxide, methane, halocarbons, nitrous oxide, and others -- that affect climate. "Current climate models do a remarkable job on water vapor near the surface. But this is different -- it's a thin wedge of the upper atmosphere that packs a wallop from one decade to the next in a way we didn't expect," says Susan Solomon, NOAA senior scientist and first author of the study. Since 2000, water vapor in the stratosphere decreased by about 10 percent. The reason for the recent decline in water vapor is unknown. The new study used calculations and models to show that the cooling from this change caused surface temperatures to increase about 25 percent more slowly than they would have otherwise, due only to the increases in carbon dioxide and other greenhouse gases. An increase in stratospheric water vapor in the 1990s likely had the opposite effect of increasing the rate of warming observed during that time by about 30 percent, the authors found. The stratosphere is a region of the atmosphere from about eight to 30 miles above the Earth's surface. Water vapor enters the stratosphere mainly as air rises in the tropics. Previous studies suggested that stratospheric water vapor might contribute significantly to climate change. The new study is the first to relate water vapor in the stratosphere to the specific variations in warming of the past few decades.

# Impact Defense

## AT: War

### Warming doesn’t cause war – Africa proves

Schiermeier, ’10 – science policy writer for Nature magazine [Quinn, 9/6/2010, Nature, “Climate change not linked to African wars,” <http://www.nature.com/news/2010/100906/full/news.2010.451.html>, DS]

In his popular 2008 book Climate Wars, the US journalist and military historian Gwynne Dyer laid out a daunting scenario. Climate change would put growing pressure on fresh water and food over the coming century, he wrote, triggering social disorder, mass migration and violent conflict. But is there real proof of a link between climate change and civil war — particularly in crisis-ridden parts of Africa — as many have claimed? No, says Halvard Buhaug, a political scientist with the Peace Research Institute Oslo in Norway. In research published today in Proceedings of the National Academy of Sciences1, he finds virtually no correlation between climate-change indicators such as temperature and rainfall variability and the frequency of civil wars over the past 50 years in sub-Saharan Africa — arguably the part of the world that is socially and environmentally most vulnerable to climate change. "The primary causes of civil war are political, not environmental," says Buhaug. The analysis challenges a study published last year that claimed to have found a causal connection between climate warming and civil violence in Africa. Marshall Burke, an economist at the University of California, Berkeley, and colleagues, reported a strong historical relationship between temperature and the incidence of civil war. They found that the likelihood of armed conflict across the continent rose by around 50% in unusually warm years during 1981-20022. Projected future warming threatens to offset the positive effects of democratization and eradicating poverty in Africa, they warned. Data-set discord The two rival groups are now disputing the validity of each other's findings. Buhaug says that Burke's study may have been skewed by the choice of climate data sets, and by their narrow definition of 'civil war' as any year that saw more than 1,000 fatalities from intra-national conflict. The definition is at odds with conventional measures of civil war in the academic literature, says Buhaug: "If a conflict lasts for 10 years, but in only 3 of them the death toll exceeds 1,000, [Burke et al] may code it as three different wars." "You'd really like to apply as many complementary definitions as possible before proclaiming a robust correlation with climate change," Buhaug adds. Burke maintains that his findings are robust, and counters that Buhaug has cherry-picked his data sets to support his hypothesis. "Although we have enjoyed discussing it with him, we definitely do not agree with Halvard on this," says Burke. "There are legitimate disagreements about which data to use, [but] basically we think he's made some serious econometric mistakes that undermine his results. He does not do a credible job of controlling for other things beyond climate that might be going on." Buhaug disagrees vigorously. "If they accuse me of highlighting data sets in favour of my hypothesis, then this applies tenfold more to their own paper."

### Political and social factors overwhelm causality

Schiermeier, ’10 – science policy writer for Nature magazine [Quinn, 9/6/2010, Nature, “Climate change not linked to African wars,” <http://www.nature.com/news/2010/100906/full/news.2010.451.html>, DS]

The debate has much wider implications for policy-makers. The link between climate and civil war has been mooted several times before — for example, in a 2003 report for the Pentagon on the national-security implications of climate change; in the Stern Review on the Economics of Climate Change, prepared for the UK government in 2006; and in the United Nations' post-conflict environmental assessment of Sudan in 2007, which suggested that climate change was an aggravating factor in the Darfur conflict. Given the many causes of unrest, it is not surprising that a meaningful correlation with climate is hard to pin down, says Hans Joachim Schellnhuber, director of the Potsdam Institute for Climate Impact Research in Germany. "Even if the data and methods were up to the task — which they aren't — the 'causal noise' would be too loud to discern the currently still weak climate signals in civil wars." It is extremely difficult to identify simple, robust cause-and-effect relationships between changes in climate and societal outcomes, agrees Roger Pielke, a political scientist and climate policy expert at the University of Colorado in Boulder. "The climate signals are small in the context of the broader social factors," Pielke says. "This does not at all diminish the importance of responding to climate change, but it does offer a stark warning about trying to use overly simplistic notions of cause and effect to advocate for such actions."

### Political and social factors outweigh

Raleigh, ‘7 – researcher in department of government at Essex [Dr. Clionadh, 10/13/2007, Irish Times, “Little evidence linking climate to wars,” Lexis, DS]

Does climate change have anything to do with war or peace? The existing evidence does not support the claims about climate change and human security made by the Nobel committee, Al Gore and scores of other public figures. What we do know is that the levels of degradation and water shortages are certainly increasing, as is the occurrence of droughts and natural disasters, particularly in lesser-developed countries. Populations migrate from areas affected by these climatic disasters and move into already crowded urban areas, marginal rural land and across borders. The conclusions by the Nobel committee and the IPCC are that these "environmental refugees" may wreak havoc, leading to an increase in both internal and international wars. The governments of these countries are often too poor and weak to prevent these wars from occurring. The foregone conclusion is that human security is at risk and wars will flourish. There are multiple problems with these and other claims linking the environment, and migratory changes, to increased incidence of war. Civil wars are almost entirely relegated now to the poorest of developing countries and are not monocausal. They are due to a myriad of political, economic and social forces operating at a particular time and place. These forces may involve issues of income inequality, land tenure, uneven development and political representation. Peace researchers have found little evidence linking increased degradation, water scarcity and natural disasters to civil war. The evidence which does point to a link between climate change and conflict is very measured, emphasising that political and economic factors far outweigh those between local-level demographic and environmental changes and conflict. There is also little evidence that the indirect effects of climate change are related to higher civil war risks. The most thorough study on climate change and migration has found that the effects are as diverse as the populations involved and that they largely depend on the community affected. The insistence that such migration will lead to war implies that these refugees in some way incite large-scale violence. But there was no increase in civil conflict in the vast majority of countries that received 8.4 million refugees in 2006. Environmental degradation is certainly occurring, especially in lesser-developed countries, where much of the population depends on the land to sustain itself. But there remain three critical points regarding the environment and human security: firstly, within countries, peoples and regions are differently vulnerable to climate change. Secondly, it simply does not do the victims of civil wars any favours to assign the environment as the cause of their conflicts. Thirdly, limited research has been undertaken with respect to climate change's social and political impacts. It is true that climate change will affect human security, broadly defined. But it is in all our interests to not dictate conclusions and effects long before more research is undertaken.

## Long Timeframe

### Long timeframe means intervening actors and tech solve

Michaels 7 – Cato senior fellow. PhD in climatology. Former Research Professor of Environmental Sciences from the University of Virginia. (Patrick, 2/2, Live with Climate Change, http://www.cato.org/pub\_display.php?pub\_id=7502, AG)

Consequently, the best policy is to live with some modest climate change now and encourage economic development, which will generate the capital necessary for investment in the more efficient technologies of the future. Fortunately, we have more time than the alarmists suggest. The warming path of the planet falls at the lowest end of today's U.N. projections. In aggregate, our computer models tell us that once warming is established, it tends to take place at a constant, not an increasing, rate. Reassuringly, the rate has been remarkably constant, at 0.324 degrees F per decade, since warming began around 1975. The notion that we must do "something in 10 years," repeated by a small but vocal band of extremists, enjoys virtually no support in the truly peer reviewed scientific literature. Rather than burning our capital now for no environmental gain (did someone say "ethanol?"), let's encourage economic development so people can invest and profit in our more efficient future. People who invested in automobile companies that developed hybrid technology have been rewarded handsomely in the past few years, and there's no reason to think environmental speculators won't be rewarded in the future, too.

### Their impacts are overhyped – nothing will happen for 300 years and tech can solve anyways

Lomborg 8 – Director of the Copenhagen Consensus Center and adjunct professor at the Copenhagen Business School, Bjorn, “Warming warnings get overheated”, The Guardian, 8/15,http://www.guardian.co.uk/commentisfree/2008/aug/15/carbonemissions.climatechange

These alarmist predictions are becoming quite bizarre, and could be dismissed as sociological oddities, if it weren’t for the fact that they get such big play in the media. Oliver Tickell, for instance, writes that a global warming causing a 4C temperature increase by the end of the century would be a “catastrophe” and the beginning of the “extinction” of the human race. This is simply silly. His evidence? That 4C would mean that all the ice on the planet would melt, bringing the long-term sea level rise to 70-80m, flooding everything we hold dear, seeing billions of people die. Clearly, Tickell has maxed out the campaigners’ scare potential (because there is no more ice to melt, this is the scariest he could ever conjure). But he is wrong. Let us just remember that the UN climate panel, the IPCC, expects a temperature rise by the end of the century between 1.8 and 6.0C. Within this range, the IPCC predicts that, by the end of the century, sea levels will rise 18-59 centimetres – Tickell is simply exaggerating by a factor of up to 400. Tickell will undoubtedly claim that he was talking about what could happen many, many millennia from now. But this is disingenuous. First, the 4C temperature rise is predicted on a century scale – this is what we talk about and can plan for. Second, although sea-level rise will continue for many centuries to come, the models unanimously show that Greenland’s ice shelf will be reduced, but Antarctic ice will increase even more (because of increased precipitation in Antarctica) for the next three centuries. What will happen beyond that clearly depends much more on emissions in future centuries. Given that CO2 stays in the atmosphere about a century, what happens with the temperature, say, six centuries from now mainly depends on emissions five centuries from now (where it seems unlikely non-carbon emitting technology such as solar panels will not have become economically competitive). Third, Tickell tells us how the 80m sea-level rise would wipe out all the world’s coastal infrastructure and much of the world’s farmland – “undoubtedly” causing billions to die. But to cause billions to die, it would require the surge to occur within a single human lifespan. This sort of scare tactic is insidiously wrong and misleading, mimicking a firebrand preacher who claims the earth is coming to an end and we need to repent. While it is probably true that the sun will burn up the earth in 4-5bn years’ time, it does give a slightly different perspective on the need for immediate repenting. Tickell’s claim that 4C will be the beginning of our extinction is again many times beyond wrong and misleading, and, of course, made with no data to back it up. Let us just take a look at the realistic impact of such a 4C temperature rise. For the Copenhagen Consensus, one of the lead economists of the IPCC, Professor Gary Yohe, did a survey of all the problems and all the benefits accruing from a temperature rise over this century of about approximately 4C. And yes, there will, of course, also be benefits: as temperatures rise, more people will die from heat, but fewer from cold; agricultural yields will decline in the tropics, but increase in the temperate zones, etc. The model evaluates the impacts on agriculture, forestry, energy, water, unmanaged ecosystems, coastal zones, heat and cold deaths and disease. The bottom line is that benefits from global warming right now outweigh the costs (the benefit is about 0.25% of global GDP). Global warming will continue to be a net benefit until about 2070, when the damages will begin to outweigh the benefits, reaching a total damage cost equivalent to about 3.5% of GDP by 2300. This is simply not the end of humanity. If anything, global warming is a net benefit now; and even in three centuries, it will not be a challenge to our civilisation. Further, the IPCC expects the average person on earth to be 1,700% richer by the end of this century.

# **Ice Age**

## Uniqueness

### The ice age is coming and will end humanity, wipe out nations, and collapse civilization – we have no chance to adapt

Aym, ’10 - writer for the LA Sentinel, Individual Investor Magazine, and others [Terrence, 12/22/10, Helium, “German scientist predicts new Ice age now approaching” <http://www.helium.com/items/2045473-scientist-predicts-new-ice-age-now-approaching>, DS]

Panicking people fleeing dying cities…Pandemics and epidemics breaking out…Europe facing regional famines…Countries going to war…Millions dying… The plot for a new Hollywood disaster movie? No. Scenes from the near future. For those that live in the upper half of the northern hemisphere no theater tickets are needed. Everyone will have front row seats. The ice is coming A growing number of scientists have checked their data, the solar cycles, the climate cycles and the Arctic ice core samples. What they see is approaching disaster: a new Ice Age that could displace whole nations, destroy the word's fragile economy and bring freezing death to as much as one-fifth of the world's population. According to some, a new mini-Ice Age could occur in as little as five to ten years. And those are the optimists. The pessimists believe the Earth is spinning towards a full-fledged Ice Age—the kind that lasts thousands of years. The kind that changed the shape of continents and carved out gigantic fresh water lakes like the Great Lakes in the northern Midwest of the United States. The kind of planetary climate disaster that almost wiped out the entire human race some 12,000 years ago. Cycles Everything in the universe is cyclical. Climate is no exception. Ice Ages have come and gone in cycles. Two primary cycles exist: the cycle of the mini-Ice Ages and the major Ice Ages. Both types of cooling are destructive. Some regions become virtually uninhabitable with terribly shortened growing seasons, while southern areas can suffer devastating droughts. If the planet's truly on the cusp of a major Ice Age, some experts predict that the Antarctic ice sheet will calve at the edges and thicken towards the middle. That's exactly what's been happening during the last decade or so. According to the evidence gleaned from core ice samples, the Ice Age cycles are normally preceded by a brief warm-up in the atmosphere followed by years of greater precipitation and centuries or millennia of cooling. Despite the short-sightedness of the man-made global warming crowd—who were over-reacting to the brief warm-up before the massive global cooling kicked in—some of the clearer thinking climatologists have been tracking the trends towards a new Ice Age since the 1970s. Unfortunately, their voices of concern were shouted down by media and political hysteria over the trumped up warming. Now, humans may be about to face something far, far worse. “It is quite possible that we are at the beginning of a Little Ice Age,” ~ Thomas Globig, meteorological scientist As the frenzy over man-made global warming dies the slow death of a thousand cuts, desperate scientists are attempting to interpret what has happened to the sun, what will happen to the Earth as the solar system swings into alignment with the galactic core possibly exposing everything to titanic energies the planet is normally shielded from, and why the Earth may slip into a full-fledged Ice Age in less than ten years. The clock is running out. Then add to their discoveries raw data that suggests the Earth's molten core may have shifted and the readings pouring in that the magnetic field protecting the planet from Unimaginable deadly solar radiation is weakening. Passing the zenith of a nearly two centuries of robust warming, the sun's next phase will see a decline. Climatologists and heliologists agree that within 30 years the sun will go quiet resulting in a dramatic drop of solar heating. The early stages of this activity are already being felt. All of these factors—in one way or another—have or will have a significant impact on the future climate. The impact is not a favorable one. And again, each of these events is cyclical. Arctic ice could spread farther to the south “I think it is even conceivable that the Arctic ice spreads significantly in the years to come,” Globig told reporters for the German weather site weter.t-online. de. "The impact of solar activity on climate has been criminally underestimated for a long time." During the last few weeks of November and the first several weeks of December 2010, amazing climate anomalies have been occurring: Cuba's temperature plunged towards the freezing mark, historic mega-storms battered the West Coast; across Europe's temperatures plummeted as far south as the Mediterranean; Sweden braced for the coldest weather in 1,000 years and Australia had a record snowfall with one week before the beginning of summer. England is fighting against the coldest weather seen in many hundreds of years. “What actually will happen depends on the next five to ten years,” believes Globig. Harder, longer winters and shorter, colder summers Globig sees two main causes for the significant cooling: First, the cyclical changes in the big air currents over the Atlantic, and second, the variations in solar activity. Unfortunately, the high-tech Western world might not fare too well as the Ice Age advances. As Globig points out, people across northern Europe have been barely coping with just a little more snow and cold. “Our modern, high-tech world was completely overwhelmed with the winter situation." As the climate shifts towards an Ice Age footing, the world's weather patterns will reverse dramatically. Again, that is exactly what Globig sees happening. “The weather over the Atlantic is upside down,” explained Globig. "Now cold air from the polar region has lots of space to flow to Europe—and that's what's happening." The odds seem to favor an approaching Ice Age and Globig tends to agree. “We will have to abandon some climate forecasts.“ Perhaps weather prediction will actually become much easier. Day after day the forecast will be: "Colder, with the likelihood of more snow."

## 2NC Uniqueness

### A. Historical cycles prove

Caruba, 6/21 – freelance environmental writer [Alan, 6/21/2011, “The New ‘Consensus’ Predicts an Ice Age,” climaterealists.com/index.php?id=8114&linkbox=true&position=17, DS]

In 1997 Robert W. Felix published a book, “Not by Fire, but by Ice”, a softcover. It’s second edition, can be purchased from his website, IceAgeNow.com. For anyone interested in knowing the truth about the Earth’s many cycles of warming and cooling, and especially about its ice ages, I recommend it. While there, pick up his other book, “Magnetic Reversals and Evolutionary Leaps.” Fourteen years ago Felix pointed out that ice ages occur in a “dependable, predictable, natural cycle that returns like clockwork every 11,500 years.” Then he noted that the Earth is at the end of the current interglacial period! The human species, homo sapiens, that had been evolving from an ape-like state really hit its stride around 500,000 years ago while modern humans showed up around 200,000 years ago. It took a while to learn how to use fire, make tools, develop language, and spread around. It wasn’t until about 5,000 years ago that what we call civilization began. In addition to developing agriculture, building pyramids, and such, our ancestors spent their time making war on each other. With each passing century we developed new weapons of war, plundering, looting, raping and pillaging. Religions were invented, discarded, refined, but the wars have continued unabated. Now we are so “advanced” we can kill thousands of people with a single bomb. Civilization was greatly facilitated by an interglacial period that provided increasing crop yields to feed armies and populations clustered in cities, virtually all of which were surrounded by large walls. Since the weather was critical to agriculture and the waging of war, humans began to pay greater attention to what the sun was doing and keeping records. It was noticed that lots of sunspot activity was an indicator of warmer climate. From 1645 to 1715, virtually no sunspots appeared and this phenomenon called the Maunder Minimum coincided with the Little Ice Age. Rivers froze over in Europe and America. Crops failed. Revolutions occurred. Now, instead of “global warming”, scientists are agog over a new slowing of sunspot activity—enormous magnetic storms—something that occurs every 11 years, half of the 22-year sunspot cycle. Now the U.S. National Solar Observatory and the U.S. Air Force Research Laboratory are suggesting that a new Little Ice Age is on its way. Robert W. Felix told them that back in 1997 while most U.S. climate agencies were still blathering away with global warming predictions. This time, though, based on cycles known to the ancient Chinese and others, they have gotten it right. What is not being said, however, is that this predicted Little Ice Age could very well turn into a very Big Ice Age. It’s due. It could start tomorrow. Bundle up!

### B. Solar cooling

Page 6/14 – [Lewis, 6/14/2011, The Register, “Earth may be headed into a mini Ice Age within a decade,” <http://www.theregister.co.uk/2011/06/14/ice_age/print.html>, DS]

What may be the science story of the century is breaking this evening, as heavyweight US solar physicists announce that the Sun appears to be headed into a lengthy spell of low activity, which could mean that the Earth – far from facing a global warming problem – is actually headed into a mini Ice Age. The announcement made on 14 June (18:00 UK time) comes from scientists at the US National Solar Observatory (NSO) and US Air Force Research Laboratory. Three different analyses of the Sun's recent behaviour all indicate that a period of unusually low solar activity may be about to begin. The Sun normally follows an 11-year cycle of activity. The current cycle, Cycle 24, is now supposed to be ramping up towards maximum strength. Increased numbers of sunspots and other indications ought to be happening: but in fact results so far are most disappointing. Scientists at the NSO now suspect, based on data showing decades-long trends leading to this point, that Cycle 25 may not happen at all. This could have major implications for the Earth's climate. According to a statement issued by the NSO, announcing the research: An immediate question is whether this slowdown presages a second Maunder Minimum, a 70-year period with virtually no sunspots [which occurred] during 1645-1715. As NASA notes [1]: Early records of sunspots indicate that the Sun went through a period of inactivity in the late 17th century. Very few sunspots were seen on the Sun from about 1645 to 1715. Although the observations were not as extensive as in later years, the Sun was in fact well observed during this time and this lack of sunspots is well documented. This period of solar inactivity also corresponds to a climatic period called the "Little Ice Age" when rivers that are normally ice-free froze and snow fields remained year-round at lower altitudes. There is evidence that the Sun has had similar periods of inactivity in the more distant past. During the Maunder Minimum and for periods either side of it, many European rivers which are ice-free today – including the Thames – routinely froze over, allowing ice skating and even for armies to march across them in some cases. "This is highly unusual and unexpected," says Dr Frank Hill of the NSO. "But the fact that three completely different views of the Sun point in the same direction is a powerful indicator that the sunspot cycle may be going into hibernation." Good news for Mars astronauts – Less good for carbon traders, perhaps Hill's own research focuses on surface pulsations of the Sun and their relationship with sunspots, and his team has already used their methods to successfully predict the late onset of Cycle 24. "We expected to see the start of the zonal flow for Cycle 25 by now," Hill explained, "but we see no sign of it. This indicates that the start of Cycle 25 may be delayed to 2021 or 2022, or may not happen at all." Hill's results match those from physicists Matt Penn and William Livingston, who have gone over 13 years of sunspot data from the McMath-Pierce Telescope at Kitt Peak in Arizona. They have seen the strength of the magnetic fields which create sunspots declining steadily. According to the NSO: Penn and Livingston observed that the average field strength declined about 50 gauss per year during Cycle 23 and now in Cycle 24. They also observed that spot temperatures have risen exactly as expected for such changes in the magnetic field. If the trend continues, the field strength will drop below the 1,500 gauss threshold and spots will largely disappear as the magnetic field is no longer strong enough to overcome convective forces on the solar surface. In parallel with this comes research from the US Air Force's studies of the solar corona. Richard Altrock, in charge of this, has found a 40-year decline in the "rush to the poles" – the poleward surge of magnetic activity in the corona. "Those wonderful, delicate coronal features are actually powerful, robust magnetic structures rooted in the interior of the Sun," Altrock says. "Changes we see in the corona reflect changes deep inside the Sun ... "Cycle 24 started out late and slow and may not be strong enough to create a rush to the poles, indicating we'll see a very weak solar maximum in 2013, if at all. If the rush to the poles fails to complete, this creates a tremendous dilemma for the theorists ... No one knows what the Sun will do in that case." According to the collective wisdom of the NSO, another Maunder Minimum may very well be on the cards. "If we are right," summarises Hill, "this could be the last solar maximum we'll see for a few decades. That would affect everything from space exploration to Earth's climate." The effects on space exploration would be benign, as fewer or no solar storms would make space a much less hostile environment for human beings. At the moment, anyone venturing beyond the Earth's protective magnetic field (the only people to have done so were the Apollo moon astronauts of the 1960s and '70s) runs a severe risk of dangerous or fatal radiation exposure during a solar storm. Manned missions beyond low Earth orbit, a stated aspiration of the USA and other nations, might become significantly safer and cheaper to mount (cheaper as there would be no requirement for possibly very heavy shielding to protect astronauts, so reducing launch costs). The big consequences of a major solar calm spell, however, would be climatic. The next few generations of humanity might not find themselves trying to cope with global warming but rather with a significant cooling. This could overturn decades of received wisdom on such things as CO2 emissions, and lead to radical shifts in government policy worldwide.

### C. Ocean cooling – this independently reverses warming and is supported by leading climate scientists

Rose, ’10 – Science writer for the Daily Mail [David, 1/10/2010, Daily Mail, “The mini ice age starts here,” <http://www.dailymail.co.uk/sciencetech/article-1242011/DAVID-ROSE-The-mini-ice-age-starts-here.html#>, DS]

The bitter winter afflicting much of the Northern Hemisphere is only the start of a global trend towards cooler weather that is likely to last for 20 or 30 years, say some of the world’s most eminent climate scientists. Their predictions – based on an analysis of natural cycles in water temperatures in the Pacific and Atlantic oceans – challenge some of the global warming orthodoxy’s most deeply cherished beliefs, such as the claim that the North Pole will be free of ice in summer by 2013. According to the US National Snow and Ice Data Centre in Colorado, Arctic summer sea ice has increased by 409,000 square miles, or 26 per cent, since 2007 – and even the most committed global warming activists do not dispute this. The scientists’ predictions also undermine the standard climate computer models, which assert that the warming of the Earth since 1900 has been driven solely by man-made greenhouse gas emissions and will continue as long as carbon dioxide levels rise. They say that their research shows that much of the warming was caused by oceanic cycles when they were in a ‘warm mode’ as opposed to the present ‘cold mode’. This challenge to the widespread view that the planet is on the brink of an irreversible catastrophe is all the greater because the scientists could never be described as global warming ‘deniers’ or sceptics. However, both main British political parties continue to insist that the world is facing imminent disaster without drastic cuts in CO2. Last week, as Britain froze, Climate Change Secretary Ed Miliband maintained in a parliamentary answer that the science of global warming was ‘settled’. Among the most prominent of the scientists is Professor Mojib Latif, a leading member of the UN’s Intergovernmental Panel on Climate Change (IPCC), which has been pushing the issue of man-made global warming on to the international political agenda since it was formed 22 years ago. Prof Latif, who leads a research team at the renowned Leibniz Institute at Germany’s Kiel University, has developed new methods for measuring ocean temperatures 3,000ft beneath the surface, where the cooling and warming cycles start. He and his colleagues predicted the new cooling trend in a paper published in 2008 and warned of it again at an IPCC conference in Geneva last September. Last night he told The Mail on Sunday: ‘A significant share of the warming we saw from 1980 to 2000 and at earlier periods in the 20th Century was due to these cycles – perhaps as much as 50 per cent. 'They have now gone into reverse, so winters like this one will become much more likely. Summers will also probably be cooler, and all this may well last two decades or longer. ‘The extreme retreats that we have seen in glaciers and sea ice will come to a halt. For the time being, global warming has paused, and there may well be some cooling.’ As Europe, Asia and North America froze last week, conventional wisdom insisted that this was merely a ‘blip’ of no long-term significance. Though record lows were experienced as far south as Cuba, where the daily maximum on beaches normally used for winter bathing was just 4.5C, the BBC assured viewers that the big chill was merely short-term ‘weather’ that had nothing to do with ‘climate’, which was still warming. The work of Prof Latif and the other scientists refutes that view. On the one hand, it is true that the current freeze is the product of the ‘Arctic oscillation’ – a weather pattern that sees the development of huge ‘blocking’ areas of high pressure in northern latitudes, driving polar winds far to the south. Meteorologists say that this is at its strongest for at least 60 years. As a result, the jetstream – the high-altitude wind that circles the globe from west to east and normally pushes a series of wet but mild Atlantic lows across Britain – is currently running not over the English Channel but the Strait of Gibraltar. However, according to Prof Latif and his colleagues, this in turn relates to much longer-term shifts – what are known as the Pacific and Atlantic ‘multi-decadal oscillations’ (MDOs). For Europe, the crucial factor here is the temperature of the water in the middle of the North Atlantic, now several degrees below its average when the world was still warming. But the effects are not confined to the Northern Hemisphere. Prof Anastasios Tsonis, head of the University of Wisconsin Atmospheric Sciences Group, has recently shown that these MDOs move together in a synchronised way across the globe, abruptly flipping the world’s climate from a ‘warm mode’ to a ‘cold mode’ and back again in 20 to 30-year cycles. 'They amount to massive rearrangements in the dominant patterns of the weather,’ he said yesterday, ‘and their shifts explain all the major changes in world temperatures during the 20th and 21st Centuries. 'We have such a change now and can therefore expect 20 or 30 years of cooler temperatures.’ Prof Tsonis said that the period from 1915 to 1940 saw a strong warm mode, reflected in rising temperatures. But from 1940 until the late Seventies, the last MDO cold-mode era, the world cooled, despite the fact that carbon dioxide levels in the atmosphere continued to rise. Many of the consequences of the recent warm mode were also observed 90 years ago. For example, in 1922, the Washington Post reported that Greenland’s glaciers were fast disappearing, while Arctic seals were ‘finding the water too hot’. It interviewed a Captain Martin Ingebrigsten, who had been sailing the eastern Arctic for 54 years: ‘He says that he first noted warmer conditions in 1918, and since that time it has gotten steadily warmer. 'Where formerly great masses of ice were found, there are now moraines, accumulations of earth and stones. At many points where glaciers formerly extended into the sea they have entirely disappeared.’ As a result, the shoals of fish that used to live in these waters had vanished, while the sea ice beyond the north coast of Spitsbergen in the Arctic Ocean had melted. Warm Gulf Stream water was still detectable within a few hundred miles of the Pole. In contrast, Prof Tsonis said, last week 56 per cent of the surface of the United States was covered by snow. ‘That hasn’t happened for several decades,’ he pointed out. ‘It just isn’t true to say this is a blip. We can expect colder winters for quite a while.’ He recalled that towards the end of the last cold mode, the world’s media were preoccupied by fears of freezing. For example, in 1974, a Time magazine cover story predicted ‘Another Ice Age’, saying: ‘Man may be somewhat responsible – as a result of farming and fuel burning [which is] blocking more and more sunlight from reaching and heating the Earth.’ Prof Tsonis said: ‘Perhaps we will see talk of an ice age again by the early 2030s, just as the MDOs shift once more and temperatures begin to rise.’ Like Prof Latif, Prof Tsonis is not a climate change ‘denier’. There is, he said, a measure of additional ‘background’ warming due to human activity and greenhouse gases that runs across the MDO cycles. But he added: ‘I do not believe in catastrophe theories. Man-made warming is balanced by the natural cycles, and I do not trust the computer models which state that if CO2 reaches a particular level then temperatures and sea levels will rise by a given amount. 'These models cannot be trusted to predict the weather for a week, yet they are running them to give readings for 100 years.’ Prof Tsonis said that when he published his work in the highly respected journal Geophysical Research Letters, he was deluged with ‘hate emails’. He added: ‘People were accusing me of wanting to destroy the climate, yet all I’m interested in is the truth.’ He said he also received hate mail from climate change sceptics, accusing him of not going far enough to attack the theory of man-made warming. The work of Profs Latif, Tsonis and their teams raises a crucial question: If some of the late 20th Century warming was caused not by carbon dioxide but by MDOs, then how much? Tsonis did not give a figure; Latif suggested it could be anything between ten and 50 per cent. Other critics of the warming orthodoxy say the role played by MDOs is even greater. William Gray, emeritus Professor of Atmospheric Sciences at Colorado State University, said that while he believed there had been some background rise caused by greenhouse gases, the computer models used by advocates of man-made warming had hugely exaggerated their effect. According to Prof Gray, these distort the way the atmosphere works. ‘Most of the rise in temperature from the Seventies to the Nineties was natural,’ he said. ‘Very little was down to CO2 – in my view, as little as five to ten per cent.’ But last week, die-hard warming advocates were refusing to admit that MDOs were having any impact. In March 2000, Dr David Viner, then a member of the University of East Anglia Climatic Research Unit, the body now being investigated over the notorious ‘Warmergate’ leaked emails, said that within a few years snowfall would become ‘a very rare and exciting event’ in Britain, and that ‘children just aren’t going to know what snow is’. Now the head of a British Council programme with an annual £10 million budget that raises awareness of global warming among young people abroad, Dr Viner last week said he still stood by that prediction: ‘We’ve had three weeks of relatively cold weather, and that doesn’t change anything. 'This winter is just a little cooler than average, and I still think that snow will become an increasingly rare event.’ The longer the cold spell lasts, the harder it may be to persuade the public of that assertion.

## 2NC Inevitable

### Ice age is a structural inevitability – it’s only a question of when

Aym, ’10 – [Terrence, 12/30/2010, “Experts: Food and fuel shortages imminent as new Ice Age dawns,” <http://www.helium.com/items/2051424-food-and-fuel-shortages-imminent-as-new-ice-age-dawns?page=2>, DS]

While Casey sees a so-called mini-Ice Age occurring and lasting about 40 to 50 years, others like Robert Felix believes the data is there that supports a real possibility of a major Ice Age that could last several thousands of years. Felix believes the Earth's already entered the first stages of the mini-Ice Age and a bigger one might be close on its heels. Felix warns: " The next Ice Age could begin any day. Next week, next month, next year...it's not a question of if, only when. One day you'll wake up—or you won't wake up, rather—buried beneath nine stories of snow. It's all part of a dependable, predictable cycle, a natural cycle that returns like clockwork every 11,500 years." The last Ice Age happened to end almost exactly 11,500 years ago. Casey explains that "The present [solar] hibernation is proceeding in almost lock step as the last one which occurred from 1793 to 1830. If it continues on present course, while the cold weather impacts on food and fuel announced today are certainly important, they do not compare with what is to follow later. At the bottom of the cold cycle of this hibernation in the late 2020’s and 2030’s there will likely be years with devastating to total crop losses in the Canadian and northern US grain regions.” A scientific paper that presents his model, "The Theory of Relational Cycles of Solar Activity" (also called the "RC Theory"), is gaining followers in the scientific community. Perhaps that's because of the fact that of his three predictions based on the RC Theory climate model, all three are occurring.

## AT: Long Timeframe

### It’ll start in 2014

Corsi, ’10 – Harvard PhD, best selling author [Jerome, 5/17/10, World Net Daily, “New Ice Age to Begin in 2014,” <http://www.wnd.com/index.php?fa=PAGE.printable&pageId=155225>, DS]

CHICAGO – A new "Little Ice Age" could begin in just four years, predicted Habibullo Abdussamatov, the head of space research at St. Petersburg's Pulkovo Astronomical Observatory in Russia. Abdussamatov was speaking yesterday at the Heartland Institute's Fourth International Conference on Climate Change in Chicago, which began Sunday and ends today. The Little Ice Age, which occurred after an era known in scientific circles as the Medieval Warm Period, is typically defined as a period of about 200 years, beginning around 1650 and extending through 1850. In the first of a two-part video WND recorded at the conference, Abdussamatov explained that average annual sun activity has experienced an accelerated decrease since the 1990s. In 2005-2008, he said, the earth reached the maximum of the recent observed global-warming trend. In Part 2 of the video, Abdussamatov further explained that through 2014 the earth will go through a series of unstable variations in which global temperature will oscillate around the maximum reached in the years 1998-2005.

## AT: Intervening Actors

### Tech can’t solve – Ice Age would happen fast once it starts

Howarth, ‘8 - writer for The Scotsman [Angus, 8/2/2008, “Last ice Age happened in less than year say scientists,” <http://news.scotsman.com/scitech/Last-Ice-Age-happened-in.4351045.jp>, DS]

THE last ice age 13,000 years ago took hold in just one year, more than ten times quicker than previously believed, scientists have warned. Rather than a gradual cooling over a decade, the ice age plunged Europe into the deep freeze, German Research Centre for Geosciences at Potsdam said. Cold, stormy conditions caused by an abrupt shift in atmospheric circulation froze the continent almost instantly during the Younger Dryas less than 13,000 years ago – a very recent period on a geological scale. The new findings will add to fears of a serious risk of this happening again in the UK and western Europe – and soon. Dr Achim Brauer, of the GFZ (GeoForschungs Zentrum) German Research Centre for Geosciences at Potsdam, and colleagues analysed annual layers of sediments, called "varves", from a German crater lake. Each varve records a single year, allowing annual climate records from the region to be reconstructed.

## CO2 Stops It

### If they beat this argument, they lose the advantage – zero way they can solve warming otherwise

### CO2 key to stop Ice Age

RCS, ’10 – independent climate science website [Reporting Climate Science, 10/26/2010, “Carbon Dioxide prevents Earth from becoming an ice world,” <http://www.reportingclimatescience.com/news-stories/article/carbon-dioxide-prevents-earth-from-becoming-an-ice-world.html>, DS]

A computer model shows that without carbon dioxide the terrestrial greenhouse would collapse and plunge Earth into an icebound state, according to a paper by NASA scientists published in US journal Science on 15 October. Within 50 years the global average temperature would plunge by 35C to -21C without the thermostatic warming provided by atmospheric carbon dioxide. Despite the fact that water vapour and clouds account for around three quarters of the Earth's greenhouse effect, it is carbon dioxide that is the single most important climate-relevant greenhouse gas in the Earth's atmosphere, according to the paper. This is because water vapour can condense and precipitate out of the Earth's atmosphere whereas other greenhouse gases do not. The paper published in US journal Science on 15 October is called “Atmospheric CO2: Principal Control Knob Governing Earth's Temperature” and was written by Andrew Lacis, Gavin Schmidt, David Rind and Reto Ruedy of the NASA Goddard Institute for Space Studies. The scientists say that the non-condensing greenhouse gases provide the stable temperature framework that sustains levels of water vapour and clouds through various feedback mechanisms. They say that the terrestrial greenhouse would collapse and plunge Earth into an icebound state without the warming effect of these non condensing greenhouse gases. The conclusions are based on the results of a computerised climate model which the team built and set up so that the simulated atmosphere contained none of the non-condensing greenhouse gases. The result was that the simulated Earth's greenhouse collapsed, the water vapour in the atmosphere precipitated out and the Earth became an ice world.

### CO2 is the only thing stopping the ice age – means the plan plunges humanity into the blizzard

Inman, ‘8 – writer for National Geographic News [Mason, 11/12/2008, National Geographic News, “New Ice Age Predicted -- But Averted by Global Warming?,” <http://news.nationalgeographic.com/news/pf/29078080.html>, DS]

Deep ice sheets would cover much of the Northern Hemisphere thousands of years from now—if it weren't for us pesky humans, a new study says. Emissions of greenhouse gases—such as the carbon dioxide, or CO2, that comes from power plants and cars—are heating the atmosphere to such an extent that the next ice age, predicted to be the deepest in millions of years, may be postponed indefinitely (quick guide to the greenhouse effect). "Climate skeptics could look at this and say, CO2 is good for us," said study leader Thomas Crowley of the University of Edinburgh in Scotland. But the idea that global warming may be staving off an ice age is "not cause for relaxing, because we're actually moving into a highly unusual climate state," Crowley added. In about 10,000 to 100,000 years, the study suggests, Antarctic-like "permanent" ice sheets would shroud much of Canada, Europe, and Asia. "I think the present [carbon dioxide] levels are probably sufficient to prevent that from ever happening," said Crowley, whose study will appear tomorrow in the journal Nature. Permanent Ice Sheets? For the past three million years, Earth's climate has wobbled through dozens of ice ages, with thick ice sheets growing from the poles and then shrinking back again. These ice ages used to last roughly 41,000 years. But in the past half a million years, these big freezes each stretched to about a hundred thousand years long. Meanwhile, the temperature swings during and between these ice ages became more extreme, soaring to new highs and lows. These extreme climate swings don't appear to be easing anytime soon, according to evidence recorded in Earth's rocks, Crowley said. "The latest two glaciations were two of the biggest we've seen." The increasing variability is a sign that Earth's climate will soon move into a new state, according to a computer model used by Crowley and a colleague, William Hyde of the University of Toronto in Canada. They had previously used the model to simulate past ice ages. The researchers found that between 10,000 and 100,000 years from now, Earth would enter into a period of permanent ice sheets—more severe than any seen in millions of years. In some ways the ice age would be like those in the past few hundred thousand years, with a thick ice sheet covering North America, the study predicted. But in the model, Europe and Asia also succumbed to ice sheets up to 2 miles (3.5 kilometers) thick, stretching from England to Siberia—something never before seen in models of past ice ages. "We were surprised," Crowley said. "There's no evidence for this in Asia" during ice ages in the past few million years. Hard to Know Though this extreme ice age would be unusual, so is the climate that people are creating by emitting huge amounts of greenhouse gases, Crowley said (global warming fast facts). "It's hard to say what's going to happen," Crowley said. "The very fact that you have this nonglacial [warming] atmosphere with polar ice caps [still present], presents a bizarre scenario. "I don't know that we have a comparable analogy for it in the geologic record." Prehistoric-climate expert Lorraine Lisiecki said, "This is the only study of which I am aware that suggests the next ice age could be much more extreme than those of the previous one million years." Many more tests are needed to see if the study's prediction seems correct, said Lisiecki, of the University of California, Santa Barbara. But she agreed that we might never find out what would have happened naturally, due to human-caused global warming. "Current greenhouse gas concentrations are probably similar to those that occurred three million years ago and are high enough to prevent an ice age for hundreds of thousands of years," she said.

### CO2 is the control knob of Earth’s temperature—cutting it would lower temperatures

Moore, 10 (JC, retired physical chemist and teacher. 12/31/10. “Science, Global Warming, and the Ice Age Mystery” <http://jcmooreonline.com/2010/12/31/science-global-warming-and-the-ice-age-mystery/>)

In 1896, Svante Arrhenius, while still pursuing the idea that variations in CO2 might be the cause of the ice ages, laboriously calculated the effect of cutting the amount of CO2 in the atmosphere by half. He found that doing so would lower the temperature of Europe by 4-5 C, perhaps enough to bring on an ice age. He also found that doubling the amount of CO2 might raise the temperature of the atmosphere by 6-7 C. No one was concerned as Arrhenius’ model of the atmosphere was very crude and it was inconceivable that the amount of CO2 in the air could ever double. Some scientists speculated that man should intentionally add more CO2 to the air to ward off another ice age. As models of the atmosphere improved, a number of scientists tried to get a better estimate of the effect of doubling the amount of CO2 on the Earth’s temperature, but the increasing complexity of the models made the calculations daunting. A breakthrough came with the development of computers. In 1956, G.N. Plass calculated that doubling the concentration of CO2 in the air would cause a 3 to 4 C increase in the Earth’s temperature. Many dismissed his work, as it seemed impossible that CO2, which made up only 0.03% of the air, could have such a large effect on temperature. However, in 1997, J.T. Kiehl found that, under clear sky conditions, CO2 accounted for 26% of the greenhouse effect – with water vapor accounting for most of the rest. More recent research has confirmed their work . Clearly, CO2 could have a significant effect on the Earth’s temperature if it was increasing. But was it? CO2: In 1900, Arvid Hgbom calculated the amount of CO2 emitted by industrial sources and, surprisingly, found that man was adding CO2 to the atmosphere at roughly the same rate as volcanoes. No one thought much of it as, at that rate, it would take centuries for the amount of CO2 to increase significantly. However, after a protracted heat wave during the 1930′s, Guy Callendar re-examined previous temperature and CO2 measurements and found not only that the Earth was getting warmer, but also that atmospheric CO2 concentrations were increasing rapidly. Callendar’s work was mostly ignored, but a few scientists began monitoring the concentration of CO2 more closely. Their results were sporadic but, by 1958, Charles Keeling had established accurate procedures for measuring atmospheric CO2. His lab was eventually moved to the Mauna Loa observatory, far away from most CO2 sources. His graph showing how CO2 varies with time, now called the Keeling curve, proved to be an important piece of evidence. It showed that the oceans and plants were not taking up CO2 nearly as fast as man was producing it. Over the last century, the atmospheric CO2 concentration has risen from 280 parts per million (ppm) to 385 ppm, a 38% increase, and the Earth’s temperature has risen by 0.8 0C, well in line with Plass’ prediction. The role of CO2 as the major cause of global warming had been convincingly established. There is yet one more piece of evidence that confirms that conclusion. Ice Ages: It was now possible to solve the mystery of the ice ages. The Milankovitch cycles alone cannot explain the changes in the Earth’s temperature during the cycles, but the process becomes clear if CO2 is included. The ice core data shows that the concentration of CO2 falls to about 180 ppm during an ice age and rises to about 280 ppm during the warm part of the cycle. The changing CO2 concentration happens because the solubility of CO2 in water varies with temperature. In the part of the cycle where the Earth is warmed by the increasing solar radiation, the oceans release CO2, which further amplifies the warming by the greenhouse effect. In the part of the cycle where the solar energy decreases, the oceans cool, the CO2 dissolves again, and another ice age begins. The concentration of CO2 in the atmosphere is the “control knob” for the Earth’s temperature – and we have now turned the knob up to 380 ppm and are moving it even higher. The Earth will surely get warmer.

### CO2 is undeniably key to stop the ice age – exacerbates the greenhouse effect and stops runaway glaciation

Lacis et al, 10 Ph.D’s, climatologists at NASA [10/15/10, Science Magazine, Andrew, Gavin Schmidt, David Rind, Ph.D., studies climate at NASA, Reto Ruedy; “Atmospheric CO2: Principal Control Knob Governing Earth’s Temperature,” http://www.sciencemag.org/content/330/6002/356.full, DS]

A direct consequence of this combination of feedback by the condensable and forcing by the noncondensable constituents of the atmospheric greenhouse is that the terrestrial greenhouse effect would collapse were it not for the presence of these noncondensing GHGs. If the global atmospheric temperatures were to fall to as low as TS = TE, the Clausius-Clapeyron relation would imply that the sustainable amount of atmospheric water vapor would become less than 10% of the current atmospheric value. This would result in (radiative) forcing reduced by ~30 W/m2, causing much of the remaining water vapor to precipitate, thus enhancing the snow/ice albedo to further diminish the absorbed solar radiation. Such a condition would inevitably lead to runaway glaciation, producing an ice ball Earth. Claims that removing all CO2 from the atmosphere “would lead to a 1°C decrease in global warming” (7), or “by 3.53°C when 40% cloud cover is assumed” (8) are still being heard. A clear demonstration is needed to show that water vapor and clouds do indeed behave as fast feedback processes and that their atmospheric distributions are regulated by the sustained radiative forcing due to the noncondensing GHGs. To this end, we performed a simple climate experiment with the GISS 2° × 2.5° AR5 version of ModelE, using the Q-flux ocean with a mixed-layer depth of 250 m, zeroing out all the noncondensing GHGs and aerosols. The results, summarized in Fig. 2, show unequivocally that the radiative forcing by noncondensing GHGs is essential to sustain the atmospheric temperatures that are needed for significant levels of water vapor and cloud feedback. Without this noncondensable GHG forcing, the physics of this model send the climate of Earth plunging rapidly and irrevocably to an icebound state, though perhaps not to total ocean freezeover. The scope of the climate impact becomes apparent in **just 10 years.** During the first year alone, global mean surface temperature falls by 4.6°C. After 50 years, the global temperature stands at –21°C, a decrease of 34.8°C. Atmospheric water vapor is at ~10% of the control climate value (22.6 to 2.2 mm). Global cloud cover increases from its 58% control value to more than 75%, and the global sea ice fraction goes from 4.6% to 46.7%, causing the planetary albedo of Earth to also increase from ~29% to 41.8%. This has the effect of reducing the absorbed solar energy to further exacerbate the global cooling. After 50 years, a third of the ocean surface still remains ice-free, even though the global surface temperature is colder than –21°C. At tropical latitudes, incident solar radiation is sufficient to keep the ocean from freezing. Although this thermal oasis within an otherwise icebound Earth appears to be stable, further calculations with an interactive ocean would be needed to verify the potential for long-term stability. The surface temperatures in Fig. 3 are only marginally warmer than 1°C within the remaining low-latitude heat island. From the foregoing, it is clear that CO2 is the key atmospheric gas that exerts principal control over the strength of the terrestrial greenhouse effect. Water vapor and clouds are fast-acting feedback effects, and as such are controlled by the radiative forcings supplied by the noncondensing GHGs. There is telling evidence that atmospheric CO2 also governs the temperature of Earth on geological time scales, suggesting the related question of what the geological processes that control atmospheric CO2 are. The geological evidence of glaciation at tropical latitudes from 650 to 750 million years ago supports the snowball Earth hypothesis (9), and by inference, that escape from the snowball Earth condition is also achievable.

## AT: Ocean Conveyor

### ****Ocean conveyor isn’t slowing down—their evidence doesn’t look to the long term****

Watts 10**. (3/29/10. Anthony, meteorologist. “Atlantic conveyor belt—still going strong and will be the day after tomorrow” Watts Up With That. http://wattsupwiththat.com/2010/03/29/atlantic-conveyor-belt-still-going-strong-and-will-be-the-day-after-tomorrow/)**

The Gulf Stream does not appear to be slowing down, say US scientists who have used satellites to monitor tell-tale changes in the height of the sea**.** Confirming work by other scientists using different methodologies, they found dramatic short-term variability but no longer-term trend. A slow-down – dramatised in the movie The Day After Tomorrow – is projected by some models of climate change. The research is published in the journal Geophysical Research Letters. The stream is a key process in the climate of western Europe, bringing heat northwards from the tropics and keeping countries such as the UK 4-6C warmer than they would otherwise be. It forms part of a larger movement of water, the Atlantic Meridional Overturning Circulation, which is itself one component of the global thermohaline system of currents. Between 2002 and 2009, the team says, there was no trend discernible – just a lot of variability on short timescales. The satellite record going back to 1993 did suggest a small increase in flow, although the researchers cannot be sure it is significant. “The changes we’re seeing in overturning strength are probably part of a natural cycle,” said Josh Willis from Nasa’s Jet Propulsion Laboratory (JPL) in California. “The slight increase in overturning since 1993 coincides with a decades-long natural pattern of Atlantic heating and cooling.” **Short measures**  The first observations suggesting the circulation was slowing down emerged in 2005, in research from the UK’s National Oceanography Centre (NOC). Using an array of detectors across the Atlantic and comparing its readings against historical records, scientists suggested the volume of cold water returning southwards could have fallen by as much as 30% in half a century – a significant decline. The surface water sinks in the Arctic and flows back southwards at the bottom of the ocean, driving the circulation. However, later observations by the same team showed that the strength of the flow varied hugely on short timescales – from one season to the next, or even shorter. But they have not found any clear trend since 2004.

**Gulf stream shutdown unlikely, and there is no impact even if it does**

The Guardian 11**.** (3/29/11. “Will the Gulf Stream slow down, freezing the UK and northern Europe?” http://www.guardian.co.uk/environment/2011/mar/29/climate-gulf-stream-atlantic-drift-thermohaline)

The Gulf Stream and North Atlantic Drift – which are part of the Atlantic thermohaline circulation – bring warm water, and with it warm air, from the tropical Atlantic to northern Europe. This helps keep the UK several degrees warmer than it would otherwise be. Although this system is unlikely to pack up entirely, the IPCC deems a slowdown of it "very likely" over the next century. The reason is that increasing rainfall and snow-melt across the Arctic and nearby land areas could send more freshwater into the north Atlantic, pinching off part of the warm current. The best guess from the most sophisticated computer models is that the circulation might slow by 10% to 50% over the next century, if greenhouse gas emissions continue unabated. If this happens, the expected climate warming might be nearly erased across the United Kingdom and diminished across many other parts of Europe. However, summers could still be warmer and more drought-prone across the UK and Europe than they are now. In any case, the impacts would be much smaller – and would take much longer to play out – than the scenario dramatised in the film The Day After Tomorrow. Although evidence shows that the thermohaline circulation has ground to a halt more than once in climate history, it's believed that this process takes at least a few years to play out, and sometimes many decades, rather than the few days portrayed in the film.

## AT: Non-Anthro Warming

### Only human activity solves warming

BBC Focus Magazine, ‘11 (2/28/11, “Is global warming preventing the next ice age?” http://sciencefocus.com/qa/global-warming-preventing-next-ice-age)

Ice ages are controlled by cyclic changes in the Earth's orbit and orientation, and calculations suggest another one should have begun several thousand years ago. In 2005, a team led by Professor William Ruddiman of the University of Virginia suggested that man-made global warming might be holding back the next big freeze. They argued that ancient agricultural practices, deforestation and biomass-burning may have boosted levels of carbon dioxide and methane, and thus cancelled out the cooling produced by the astronomical cycles. Evidence for the idea has continued to accumulate. Last December, an international team of climate experts presented an analysis of air trapped in ice cores, which reveals the composition of the atmosphere over thousands of years. The results show that both carbon dioxide and methane began increasing around 5000 to 8000 years ago. This is in line with the historical origins of large-scale agriculture in Asia and extensive deforestation in Europe - and thus adds weight to the idea that human activity may indeed be holding off the next ice age.

## AT: Sunspots Outweigh

### CO2 emissions solve sunspot cooling

Bognor, 7/4 [Howard, Owen Sound Sun Times, “Global warming may help fend off another ice age,” <http://www.owensoundsuntimes.com/ArticleDisplay.aspx?e=3198084>, DS]

But before we all go out and paint our roofs white it is important to consider some real concerns that the planet may be heading not for global warming, but for another mini-ice age. In June NASA warned that the much delayed solar Cycle 24 may end abruptly and that Cycle 25 may not occur at all. Reduced sunspot activity may be associated with reduced solar luminosity which, in turn, would cool the Earth's ionosphere and the upper stratosphere. That is, disappearing sunspots may cause the Earth's temperature to decrease. The last time this occurred was the period known as the Maunder minimum from 1645 to 1715, which coincided with a mini-ice age across Europe. Prior to that was the Sporer minimum (about 1500) and the Wolf minimum (about 1300). Why they occur at roughly 200 year intervals is unknown, but it is known that the Earth's mean temperature decreased at these times. Also consider that last year's Icelandic volcano spewed an amount of ash into the Earth's stratosphere that was comparable to that believed responsible for the demise of the dinosaurs (and 80% of all life forms on Earth) caused by the impact of a comet or asteroid 65 million years ago. This ash was spread around the Earth by the jet streams and reduced the surface temperature by several degrees. While it is true that the ice caps are melting and the glaciers receding, these observations are due to secular warming as a consequence of the end of the last ice age. About 9,000 years ago our region was covered by a two-mile thick sheet of ice that was one of the southern lobes of the great ice sheet that covered all of Canada and much of the U.S. The periodic advances and retreats of these ice sheets are controlled by well-understood variations in the Earth's orbital eccentricity about the Sun and variations in the Earth's tilt axis and wobble. Currently we are in the end-stages of the retreat of the last ice sheets. It may very well turn out that any man-made contributions to global warming may be just what Earth needs to ameliorate natural processes that seem to be conspiring to force another mini-ice age on us.

## Top Line - Extinction

### Ice age causes extinction

EU Referendum, 8 (4/24/08, “The scariest photo” http://eureferendum.blogspot.com/2008/04/scariest-photo.htm)

It is time to put aside the global warming dogma, at least to begin contingency planning about what to do if we are moving into another little ice age, similar to the one that lasted from 1100 to 1850. Echoing precisely the point we made in our previous piece, Chapman says there is no doubt that the next little ice age would be much worse than the previous one and much more harmful than anything warming may do. There are many more people now, he writes, and we have become dependent on a few temperate agricultural areas, especially in the US and Canada. Global warming would increase agricultural output, but global cooling will decrease it. Millions will starve if we do nothing to prepare for it (such as planning changes in agriculture to compensate), and millions more will die from cold-related diseases. In fact, Chapman posits a remote but much more serious scenario of "severe glaciation" which can occur quickly – as fast as 20 years. "The next descent into an ice age is inevitable but may not happen for another 1000 years," he reassures us. "On the other hand, it must be noted that the cooling in 2007 was even faster than in typical glacial transitions. If it continued for 20 years, the temperature would be 14C cooler in 2027." By then, most of the advanced nations would have ceased to exist, vanishing under the ice, and the rest of the world would be faced with a catastrophe beyond imagining. Thus, he concludes, "All those urging action to curb global warming need to take off the blinkers and give some thought to what we should do if we are facing global cooling instead." Inevitably, Chapman warns, "It will be difficult for people to face the truth when their reputations, careers, government grants or hopes for social change depend on global warming, but the fate of civilisation may be at stake."

## Impact - Famine

### Ice age causes famine – cooling cycles converge to destroy crop supplies

Aym, ’10 – [Terrence, 12/30/2010, “Experts: Food and fuel shortages imminent as new Ice Age dawns,” <http://www.helium.com/items/2051424-food-and-fuel-shortages-imminent-as-new-ice-age-dawns?page=2>, DS]

With an Ice Age comes abrupt change, and with change comes death—sometimes death on a massive scale. More of the world's top scientists in the disciplines of geology, ecology, meteorology, astrophysics, and heliology [Downloadable list] are predicting that the two major cooling cycles are converging—the short term and long term Ice Ages—and Earth has just entered the beginnings of the dangerous cooling. Both cooling periods are due and both seem to have started just as the sun's about to reach its solar maximum. When the sun goes quiet after 2012, it's expected to stay quiet for at least the next 30 to 50 years. During that time, the sun will generate significantly less heat and the planets—including Earth—will cool rapidly. Mass migrations and famines Now other scientists—including John L. Casey, the Director of the Space and Science Research Center—are warning that people in the coming decades are facing food and fuel shortages. Some northern countries will be abandoned as the ice marches down from the Arctic; energy production will be interrupted; and shortened growing periods in the Northern Hemisphere will precipitate mass migrations, famines, food riots, regional conflicts and a loss of human life that could be measured on an apocalyptic scale. Imminent crop damage was forecast back in 2007 and predicted to start by 2010. Right on schedule the damage has been occurring as cold has gripped the Northern Hemisphere as far south as Cuba and southern Italy. During the next 30 months the world's temperatures are predicted to drop even more dramatically and at a faster clip than the worldwide plunge recorded during 2007 to 2008. Sun entering an extended "hibernation period" According to Casey, “The Earth typically makes adjustments in major temperature spikes within two to three years. In this case as we cool down from El Nino, we are dealing with the combined effects of this planetary thermodynamic normalization and the influence of the more powerful underlying global temperature downturn brought on by the solar hibernation. Both forces will present the first opportunity since the period of Sun-caused global warming period ended to witness obvious harmful agricultural impacts of the new cold climate. Analysis shows that food and crop derived fuel will for the first time, become threatened in the next two and a half years. Though the SSRC does not get involved with short term weather prediction, it would not be unusual to see these ill-effects this year much less within the next 30 months.” Other scientists concur and some see the speed at which the temperatures will drop as frightening. Casy's organization has been at the forefront of the climate change controversy, correctly predicting in advance three important changes in the climate that many others missed: the end of global warming cycle (1999), a long term drop in the Earth’s temperatures (starting in 2006 to 2007) the unsettling prospect of an historic contraction of the Sun’s energy resulting in a never-before-seen solar hibernation. The hibernation is now recognized by NASA's Long Range Solar Forecast through 2022 and as well as the stunning slowdown of sun's activity. At the urging of colleagues from around the globe that concur with him, Casey has taken an unprecedented step. "In view of the importance of this new forecast I have notified the Secretary of Agriculture to take immediate actions to prepare the nation’s agricultural industry for the coming crop damage.” Mini or major Ice Age - either are a disaster While Casey sees a so-called mini-Ice Age occurring and lasting about 40 to 50 years, others like Robert Felix believes the data is there that supports a real possibility of a major Ice Age that could last several thousands of years. Felix believes the Earth's already entered the first stages of the mini-Ice Age and a bigger one might be close on its heels. Felix warns: " The next Ice Age could begin any day. Next week, next month, next year...it's not a question of if, only when. One day you'll wake up—or you won't wake up, rather—buried beneath nine stories of snow. It's all part of a dependable, predictable cycle, a natural cycle that returns like clockwork every 11,500 years." The last Ice Age happened to end almost exactly 11,500 years ago. Casey explains that "The present [solar] hibernation is proceeding in almost lock step as the last one which occurred from 1793 to 1830. If it continues on present course, while the cold weather impacts on food and fuel announced today are certainly important, they do not compare with what is to follow later. At the bottom of the cold cycle of this hibernation in the late 2020’s and 2030’s there will likely be years with devastating to total crop losses in the Canadian and northern US grain regions.”

### Moral obligation to stop famine – inaction locks in global poverty

Singer, ’72 – Prominent utilitarian scholar [Peter, Philosophy and Public Affairs, “Famine, Affluence, and Morality,” <http://www.utilitarian.net/singer/by/1972----.htm>, DS]

I do not think I need to say much in defense of the refusal to take proximity and distance into account. The fact that a person is physically near to us, so that we have personal contact with him, may make it more likely that we shall assist him, but this does not show that we ought to help him rather than another who happens to be further away. If we accept any principle of impartiality, universalizability, equality, or whatever, we cannot discriminate against someone merely because he is far away from us (or we are far away from him). Admittedly, it is possible that we are in a better position to judge what needs to be done to help a person near to us than one far away, and perhaps also to provide the assistance we judge to be necessary. If this were the case, it would be a reason for helping those near to us first. This may once have been a justification for being more concerned with the poor in one's town than with famine victims in India. Unfortunately for those who like to keep their moral responsibilities limited, instant communication and swift transportation have changed the situation. From the moral point of view, the development of the world into a "global village" has made an important, though still unrecognized, difference to our moral situation. Expert observers and supervisors, sent out by famine relief organizations or permanently stationed in famine-prone areas, can direct our aid to a refugee in Bengal almost as effectively as we could get it to someone in our own block. There would seem, therefore, to be no possible justification for discriminating on geographical grounds. There may be a greater need to defend the second implication of my principle - that the fact that there are millions of other people in the same position, in respect to the Bengali refugees, as I am, does not make the situation significantly different from a situation in which I am the only person who can prevent something very bad from occurring. Again, of course, I admit that there is a psychological difference between the cases; one feels less guilty about doing nothing if one can point to others, similarly placed, who have also done nothing. Yet this can make no real difference to our moral obligations. [2] Should I consider that I am less obliged to pull the drowning child out of the pond if on looking around I see other people, no further away than I am, who have also noticed the child but are doing nothing? One has only to ask this question to see the absurdity of the view that numbers lessen obligation. It is a view that is an ideal excuse for inactivity; unfortunately most of the major evils - poverty, overpopulation, pollution - are problems in which everyone is almost equally involved.

## Impact – Global Nuclear War

### Ice age increases international tensions, and ends in nuclear war

Stipp 4 (2/9/04. David, Staff writer. “The Pentagon's Weather Nightmare The climate could change radically, and fast. That would be the mother of all national security issues.” Fortune Magazine. <http://money.cnn.com/magazines/fortune/fortune_archive/2004/02/09/360120/index.htm>)

A total shutdown of the ocean conveyor might lead to a big chill like the Younger Dryas, when icebergs appeared as far south as the coast of Portugal. Or the conveyor might only temporarily slow down, potentially causing an era like the "Little Ice Age," a time of hard winters, violent storms, and droughts between 1300 and 1850. That period's weather extremes caused horrific famines, but it was mild compared with the Younger Dryas. For planning purposes, it makes sense to focus on a midrange case of abrupt change. A century of cold, dry, windy weather across the Northern Hemisphere that suddenly came on 8,200 years ago fits the bill-its severity fell between that of the Younger Dryas and the Little Ice Age. The event is thought to have been triggered by a conveyor collapse after a time of rising temperatures not unlike today's global warming. Suppose it recurred, beginning in 2010. Here are some of the things that might happen by 2020: At first the changes are easily mistaken for normal weather variation, allowing skeptics to dismiss them as a "blip" of little importance and leaving policymakers and the public paralyzed with uncertainty. But by 2020 there is little doubt that something drastic is happening. The average temperature has fallen by up to five degrees Fahrenheit in some regions of North America and Asia and up to six degrees in parts of Europe. (By comparison, the average temperature over the North Atlantic during the last ice age was ten to 15 degrees lower than it is today.) Massive droughts have begun in key agricultural regions. The average annual rainfall has dropped by nearly 30% in northern Europe, and its climate has become more like Siberia's. Violent storms are increasingly common as the conveyor becomes wobbly on its way to collapse. A particularly severe storm causes the ocean to break through levees in the Netherlands, making coastal cities such as the Hague unlivable. In California the delta island levees in the Sacramento River area are breached, disrupting the aqueduct system transporting water from north to south. Megadroughts afflict the U.S., especially in the southern states, along with winds that are 15% stronger on average than they are now, causing widespread dust storms and soil loss. The U.S. is better positioned to cope than most nations, however, thanks to its diverse growing climates, wealth, technology, and abundant resources. That has a downside, though: It magnifies the haves-vs.-have-nots gap and fosters bellicose finger-pointing at America. Turning inward, the U.S. effectively seeks to build a fortress around itself to preserve resources. Borders are strengthened to hold back starving immigrants from Mexico, South America, and the Caribbean islands, waves of boat people pose especially grim problems. Tension between the U.S. and Mexico rises as the U.S. reneges on a 1944 treaty that guarantees water flow from the Colorado River into Mexico. America is forced to meet its rising energy demand with options that are costly both economically and politically, including nuclear power and onerous Middle Eastern contracts. Yet it survives without catastrophic losses. Europe, hardest hit by its temperature drop, struggles to deal with immigrants from Scandinavia seeking warmer climes to the south. Southern Europe is beleaguered by refugees from hard-hit countries in Africa and elsewhere. But Western Europe's wealth helps buffer it from catastrophe. Australia's size and resources help it cope, as does its location. The conveyor shutdown mainly affects the Northern Hemisphere. Japan has fewer resources but is able to draw on its social cohesion to cope. Its government is able to induce population-wide behavior changes to conserve resources. China's huge population and food demand make it particularly vulnerable. It is hit by increasingly unpredictable monsoon rains, which cause devastating floods in drought-denuded areas. Other parts of Asia and East Africa are similarly stressed. Much of Bangladesh becomes nearly uninhabitable because of a rising sea level, which contaminates inland water supplies. Countries whose diversity already produces conflict, such as India and Indonesia, are hard-pressed to maintain internal order while coping with the unfolding changes. As the decade progresses, pressures to act become irresistible. History shows that whenever humans have faced a choice between starving or raiding, they raid. Imagine Eastern European countries, struggling to feed their populations, invading Russia, which is weakened by a population that is already in decline, for access to its minerals and energy supplies. Or picture Japan eyeing nearby Russian oil and gas reserves to power desalination plants and energy-intensive farming. Envision nuclear-armed Pakistan, India, and China skirmishing at their borders over refugees, access to shared rivers, and arable land. Or Spain and Portugal fighting over fishing rights, fisheries are disrupted around the world as water temperatures change, causing fish to migrate to new habitats. Growing tensions engender novel alliances. Canada joins fortress America in a North American bloc. (Alternatively, Canada may seek to keep its abundant hydropower for itself, straining its ties with the energy-hungry U.S.) North and South Korea align to create a technically savvy, nuclear-armed entity. Europe forms a truly unified bloc to curb its immigration problems and protect against aggressors. Russia, threatened by impoverished neighbors in dire straits, may join the European bloc.) **Nuclear arms proliferation is inevitable.** Oil supplies are stretched thin as climate cooling drives up demand. **Many countries seek to shore up their energy supplies with nuclear energy, accelerating nuclear proliferation. Japan, South Korea, and Germany develop nuclear-weapons capabilities, as do Iran, Egypt, and North Korea. Israel, China, India, and Pakistan also are poised to use the bomb.**

## Impact - Resource Wars

### Global cooling causes resource wars

Schwartz and Randall 3. (October 2003. Peter, futurist, author, and cofounder of the Global Business Network (GBN), an elite corporate strategy firm, specializing in future-think and scenario planning AND Doug, previous president of GBN. “An Abrupt Climate change scenario and its implications for united states national security” info.themicroeffect.com/wp-content/uploads/2011/01/3-Articles.pdf)

Human civilization began with the stabilization and warming of the Earth’s climate. A colder unstable climate meant that humans could neither develop agriculture or permanent settlements. With the end of the Younger Dryas and the warming and stabilization that followed, humans could learn the rhythms of agriculture and settle in places whose climate was reliably productive. Modern civilization has never experienced weather conditions as persistently disruptive as the ones outlined in this scenario. As a result, the implications for national security outlined in this report are only hypothetical. The actual impacts would vary greatly depending on the nuances of the weather conditions, the adaptability of humanity, and decisions by policymakers. Violence and disruption stemming from the stresses created by abrupt changes in the climate pose a different type of threat to national security than we are accustomed to today. Military confrontation may be triggered by a desperate need for natural resources such as energy, food and water rather than by conflicts over ideology, religion, or national honor. The shifting motivation for confrontation would alter which countries are most vulnerable and the existing warning signs for security threats. There is a long-standing academic debate over the extent to which resource constraints and environmental challenges lead to inter-state conflict. While some believe they alone can lead nations to attack one another, others argue that their primary effect is to act as a trigger of conflict among countries that face pre-existing social, economic, and political tension. Regardless, it seems undeniable that severe environmental problems are likely to escalate the degree of global conflict. Co-founder and President of the Pacific Institute for Studies in Development, Environment, and Security, Peter Gleick outlines the three most fundamental challenges abrupt climate change poses for national security: 1. Food shortages due to decreases in agricultural production 2. Decreased availability and quality of fresh water due to flooding and droughts 3. Disrupted access to strategic minerals due to ice and storms In the event of abrupt climate change, it’s likely that food, water, and energy resource constraints will first be managed through economic, political, and diplomatic means such as treaties and trade embargoes. Over time though, conflicts over land and water use are likely to become more severe – and more violent. As states become increasingly desperate, the pressure for action will grow.