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CREATOR:"Watson, Harlan L (OES)" <WatsonHL@state.gov> ("Watson, Harlan L (OES)" <Wa

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Was the 20th Century Climate Unusual?

Willie Soon and Sallie Baliunas

Summary 1,000year climate Study

This report examines the repeated claim that the climate of the 20th century was unusual compared with those of the last 1000 years. The claim takes several forms – e.g., that the 20th century has been warmer than any other century, that the 1990s were the warmest decade of the millennium, or that 1998 was the warmest year of the millennium.

These claims imply that the temperature of the past 1000 years is known well enough to allow a comparison of the 20th century with the previous centuries, decades and individual years. This is not the case. A sufficiently complete set of direct temperature measurements to allow computation of global average temperature is only available since 1861 and there are many reasons to question the accuracy of the record.

For earlier periods it is possible to use proxy information, e.g., tree growth, the isotopic composition of corals and ice cores, to estimate *local* climate information, sometimes including local temperature.

However, the proxy data are far too incomplete – both in spatial coverage and in temperature information – to allow a realistic estimation of a global surface temperature. The most widely quoted effort to reconstruct the temperature of the Northern Hemisphere for the last 1000 years depends heavily on a single set of tree growth data from the Western U.S., and the assumption that the differences in temperature between the Western U.S. and the rest of the Northern Hemisphere for the last millennium were the same as they were in the 20th century. This is an unrealistic assumption, because it is well documented that such local climate trends are not uniform over areas as large as a hemisphere.

While proxy data cannot be used to reconstruct the global average climate of the last 1000 years, they do provide a basis for comparing the climate of the 20th century to the climate of the preceding 900 years within individual locations. A survey of the scientific literature found that it was possible to identify a 50-year period in which temperatures were warmer than any 50-year period in the 20th century in most of the locations of the climate proxies. These results offer strong evidence that the climate of the 20th century was not unusual, but fell within the range experienced during the past 1000 years.

The proxy data also offer strong support for the existence of:

- the Medieval Warm Period, a period of warmer temperatures, which lasted from about 800 to 1300 C.E.
- the Little Ice Age, a period of colder temperatures, which lasted from about 1400 to as late as 1900 C.E. in some regions..

The recovery from the Little Ice Age may account for some of the warming experienced during the early 20th century, especially early in the century.

The existence of periods like the Medieval Warm Period and the Little Ice Age suggests that local climate varies on century-long time scales, a result that cannot be easily inferred from the much shorter thermometry records.

The available scientific evidence does not support the claim that the climate of the 20th century in many locations around the globe was unusual when compared to the climate of the previous 900 years.

Unilateral and Right

By James K. Glassman.

When the war in Iraq ends, a renewed clamor for the United States to back harsh restrictions on carbon-dioxide emissions will begin.

The reasons are obvious. Environmentalists, politicians and editorialists in the U.S. will complain that, if only the Bush Administration had been more "multilateral" and had backed the Kyoto Protocol on global warming, more Europeans would have joined our military campaign against Saddam Hussein.

Tony Blair, our strongest overseas ally, has bitterly criticized U.S. opposition to Kyoto - partly to prove to home audiences that he is no lapdog of George W. Bush. It's likely that he'll also want to patch things up with France and Germany by using some of his political capital with Bush to push the White House to adopt measures to fight climate change.

Key international meetings in Cancun and Florence this fall will be the battleground for the final assault by Greens and their allies to convince Americans to join Kyoto, or something like it.

That's why a new study, funded in part by NASA and announced in a Harvard University press release on Monday, is so important. The study concludes that, contrary to popular belief, "Many records reveal that the 20th century is likely *not* the warmest nor a uniquely extreme climatic period of the last millennium" [emphasis in the study].

The conclusion comes from "a review of more than 200 climate studies led by researchers at the Harvard-Smithsonian Center for Astrophysics." The researchers were Willie Soon and Sallie Baliunas of the Harvard-Smithsonian Center; Craig Idso and Sherwood Idso of the Center for the Study of Carbon Dioxide and Global Change at Tempe, Ariz.; and David R. Legates of the Center for Climatic Research at the University of Delaware.

Baliunas is also deputy director of the Mt. Wilson Observatory in California and co-host of TechCentralStation, to which Soon is a regular contributor.

In the press release distributed by Harvard, Soon is quoted as saying: "Many true research advances in reconstructing ancient climates have occurred over the past two decades, so we felt it was time to pull together a large sample of recent studies from the last five to ten years and look for

patterns of variability and change.

"In fact, clear patterns did emerge showing that regions worldwide experienced the highs of the Medieval Warm Period and lows of the Little Ice Age, and that 20th century temperatures are generally cooler than during the medieval warmth."

These findings are vital to the debate over the Kyoto agreement since the premise for cutting back on greenhouse-gas emissions is that humans played a significant role in heating up the Earth during the 20th Century. But Soon and his colleagues confirmed that a warm epoch appeared in various parts of the world from about 900 to 1000 A.D. through about 1200 to 1300 A.D., during which temperatures were greater than those of the 20th Century.

Needless to say, there were no SUVs 1,000 years ago.

Other warm periods are also identified in the study. For example, the researchers ask, "Was the warmth of the 1980s in western Europe exceptional or unusual?" Not at all.

They cite the respected climate scholar H. H. Lamb, who wrote that "even the great warmth of the years 1989/1991, hailed in some quarters as proof of the reality of the predicted global warming due to the enhancement of the greenhouse effect by increasing carbon dioxide and other effluents...may have a surprising analogy in the past to the remarkable warmth - well attested in Europe - of the year 1540, shortly before the sharpest onset of the so-called Little Ice Age." In the first week of January 1541, Lamb wrote that "young people were still bathing in the Rhine on the Swiss-German border."

The point here is that warm periods don't necessarily precede warmer periods. They may precede colder ones. We just don't know enough about climate to make predictions, and it would be folly to spend between \$150 billion and \$400 billion a year - the estimates for Kyoto-style mitigation - on the flimsy evidence of warming that currently exists.

The study also casts doubt on the sort of thin anecdotal evidence often cited by the media to show that the planet is heating up in unusual fashion. For example, the *New York Times* is obsessed with retreating glaciers, but they are not a new phenomenon.

"Broadly," write the scholars, "glaciers retreated all over the world during

the Medieval Warm Period, with a notable but minor re-advance between 1050 and 1150.... The world's small glaciers and tropical glaciers have simultaneously retreated since the 19th century, but some glaciers have advanced." Soon and his colleagues cite the work of D. J. A. Evans, who "commented that significant warming phases, especially those accompanied by relatively warm winters and cool summers, during interglacials [like the current period] may lead to the onset of another global glaciation."

So, melting glaciers are not unique to the industrial era, and they could signal a period of growing, not retreating, glaciers to come.

The evidence of earlier warming is not new. But, as Baliunas says, "For a long time, researchers have possessed anecdotal evidence supporting the existence of these climate extremes. For example, the Vikings established colonies in Greenland at the beginning of the second millennium that died out several hundred years later when the climate turned colder. And in England, vineyards had flourished during the medieval warmth. Now, we have an accumulation of objective data to back up these cultural indicators."

The data were from ice cores, tree-ring samples and other methods. And the results are clear: Despite our modern hubris, we aren't the only humans to experience a warmer earth. It makes sense, then, to view with skepticism the claims that we have *caused* major changes in climate.

Observers such as Bjorn Lomborg, the Danish statistician and author of *The Skeptical Environmentalist*, start their critique by accepting the notion that the earth is warming and that humans play a key role. Lomborg argues that trying to fix the problem with huge expenditures or cutbacks that will reduce economic growth is far too costly for the meager benefits that will ensue from Kyoto's strictures.

Yes, but now Soon and the other researchers are showing the shakiness of Kyoto's foundation. The strong implication of their work is that warming is probably natural and cyclical. It happens all the time, and there is not much we can do about it. Nor can we predict its course with much accuracy.

What's needed now - and we certainly have the time - is more research. Risking havoc with the world economy, especially in this fragile period, would be foolish and dangerous. Kyoto has been moved to the back burner, mainly by the U.S. and developing countries. That's where it belongs.

But it might not stay there. Policymakers need to pay attention to the facts - especially after the war ends and environmental extremists start applying the real heat.