From Copenhagen to Cancun ...
BEWARE! Politicians Still Believe in Climate Catastrophe
Cancun is coming – and it will pointlessly cost you dear

The authoritative *Monthly CO₂ Report* for June 2010 discusses the failure of the Climategate enquiries to do their job, and the coming Cancun Conference, which will be pointlessly expensive for all. *Editorial Comment: Page 3.*

- **Our graphs explained:** An account of how we compile our authoritative SPPI temperature and CO₂ graphs. *Page 4.*
- **IPCC assumes CO₂ concentration will reach 836 ppmv by 2100,** but, for nine years, CO₂ concentration has headed straight for only 570 ppmv by 2100. This factor alone almost halves all of the IPCC’s temperature projections. *Pages 5-7.*
- Since 1980 **global temperature has risen at only 2.7 °F (1.5 °C)/century,** not 6 °F (3.4 °C) as IPCC predicts. *Pages 8-11.*
- **Sea level rose just 8 inches in the 20th century,** and has been rising since 1993 at a very modest 1 ft/century. *Page 12.*
- Arctic sea-ice extent is at a 10-year record low for the time of year. In the Antarctic, sea ice extent is now at its third-highest in the 30-year record. **Global sea ice extent shows little trend for 30 years.** *Pages 13-17.*
- **Hurricane and tropical-cyclone activity is at its lowest since satellite measurement began.** *Pages 18-21.*
- **Sunspot activity is back to normal:** but, looking back it was a long – and cool – solar minimum. *Pages 22-23.*
- **The (very few) benefits and the (very large) costs of the Waxman/Markey Bill** are illustrated at *Pages 24-27.*
- **Watch China:** This month’s *Science Focus* shows that China’s emissions growth dwarfs Western cuts. *Page 28.*
- As always, there’s our “global warming” ready reckoner, the surest way to check policy costs against benefits. *Pages 29-30.*
- and **our bumper selection of scientific papers,** compiled by Dr. Craig Idso. *Pages 31-40.*
- **The medieval warm period was real, global, and warmer than the present,** as our global map shows. *Page 41.*
- **And finally ...** how the Urban Heat-Island Effect works, according to Sir Muir Russell’s enquiry. *Page 42.*
THE multiple official enquiries into Climategate are significant because their conclusions are insignificant.

The enquiries very, very carefully avoided looking at the actual science being discussed in the thousand emails released by a whistleblower at the University of East Anglia last November. Instead, they reached for the whitewash-bucket. All of them did this. Not one did its job properly or independently.

Why this failure to investigate even the most blatant incitement to destroy scientific material in emails from “Professor” Jones to fellow-“scientists”? Why the failure to investigate the “trick” by which Jones had sought to conceal the growing discrepancy between rising real-world temperatures as measured by thermometers and the falling temperatures shown by the tree-ring records that he was trying to pretend were reliable enough to tell us there was no medieval warm period?

Why the failure to investigate why various of the Climategate emailers – a poisonous, malevolent crew from the beastly tone of so many of the emails – had spent a year bullying and cajoling editors of learned journals to delay publication of a result they found uncongenial, so that they could cobble together an attempted refutation to be published at the same time as the paper they disagreed with?

Scientific dishonesty on this scale is not routine, even in the corrupted academe of today. But it was not investigated. The people who ran the enquiries knew what was expected of them. Their job was to look the other way. And why? Because almost the entire governing class of the world has foolishly signed up to the climate-extremist results of the UN’s climate panel, and governments never, ever admit they are wrong.

The classe politique has all the advantages of position, status, wealth (ours), and access to an increasingly spineless and fawning mainstream news media. And it knows how to grandstand. Every year, there is a major climate conference – last December at Copenhagen (where the stage-management went horribly wrong), and this December at Cancun, where the theater directors will be taking very good care that nothing shall go wrong at all.

The kow-towing media will be there in all their feeble strength. But the people will no longer be fooled.

The draft Treaty of Cancun – world government lite, in the words of one commentator – is already in draft, and has been studied by officials and world leaders at a still-incomplete series of meetings in Bonn, Germany. The Chinese, who rightly have no intention whatsoever of putting their economic growth at risk by making any serious cuts in carbon dioxide emissions, have offered to hold an additional meeting in Tientsin before December’s Cancun session, just to make sure that “the process”, as the UN’s bureaucrats call it, will not be derailed by the lackadaisical lifestyle of Mexico’s mañana republic.

What will Cancun mean? Higher taxes. More regulation. Less freedom. No democracy. The New World Order is upon us, in the name of solving the non-problem of man-made “global warming”. Life, liberty, and the pursuit of happiness were fun, while they lasted.

Monckton of Brenchley
Before we began producing the Monthly CO₂ Reports, it was easy for “global warming” profiteers to pretend, and repeatedly to state, that “global warming” is “getting worse”, and that the climate is changing “faster than expected”. Now they are unable to get away with such falsehoods as easily as before.

The centerpieces of our monthly series of graphs showing what is happening in the real world are our CO₂ and temperature graphs, now regarded as the definitive standard worldwide.

Our CO₂ concentration graphs show changes in real-world CO₂ concentration as measured by monitoring stations worldwide and compiled by NOAA. We also calculate and display the least-squares linear-regression trend on the real-world data. Because this trend has been very close to a straight line since late 2001, it is the best guide to future CO₂ concentration. We also display the range of UN projections for CO₂ concentration, based on its A2 “business as usual” scenario – the one that comes closest to reality at present. The one difference is that, for clarity, we zero the UN’s projections to the start-point of the linear regression trend on the real-world data.

The UN predicts that, this century, CO₂ concentration will rise exponentially – at an ever-increasing rate – towards 836 [730, 1020] parts per million by volume in 2100. In reality, however, for eight years CO₂ concentration has been trending in a straight line towards just 575 ppmv by 2100. If this linear trend continues, all of the UN’s predictions for 21st-century warming will have to be halved.

Our global-temperature graphs show changes in real-world temperature at or near the Earth’s surface. Each temperature graph represents the mean of two satellite datasets: the monthly lower-troposphere anomalies from the satellites of Remote Sensing Systems, Inc., and of the University of Alabama at Huntsville. We do not use the Hadley/CRU or NCDC/GISS datasets: the Climate-gate scandal has shown these to be unreliable.

On each graph, the anomalies are zeroed to the least element in the dataset. For clarity, the IPCC’s range of predictions is zeroed to the start-point of the least-squares linear-regression trend on the real-world data. Since late 2001, global temperature has been falling fast.

To preserve consistency with the IPCC’s published formulae for evaluating climate sensitivity to atmospheric CO₂ enrichment, the IPCC’s projections are evaluated directly from its projected exponential growth in CO₂ concentration using the IPCC’s own logarithmic formula for equilibrium temperature change, yielding a net-linear range of projections.

Equilibrium change – final temperature response when the climate has settled down after an external perturbation – is greater than the transient change predicted by the UN. However, on the A2 scenario that we use, the difference by 2100 is just 0.5 °C (0.9 °F). Therefore, when the UN and other scientists say that global warming “in the pipeline” will go on for “thousands of years”, just 0.5 °C of additional warming is all that they are talking about.
CO$_2$ concentration rises, but not at the predicted ever-increasing rate

**CO$_2$ is rising in a near-straight line**, well below the IPCC’s projected range (pale blue region). The deseasonalized real-world data are shown as a thick, dark-blue line overlaid on the least-squares linear-regression trend. There is no sign of the exponential (i.e. ever-accelerating) rate of growth the IPCC predicts. Instead, for almost a decade CO$_2$ has grown in a straight line at just 2 ppmv/year. If anything, the rate of growth is decelerating a little. **Data source:** NOAA.
IPCC predicts rapid, exponential CO$_2$ growth that is not occurring

**Observed CO$_2$ growth is near-linear**, not exponential as predicted by the UN’s climate panel. The trend in CO$_2$ concentration falls well short of the rapid rate of growth predicted by the panel. **Data source**: NOAA.
Projecting the past decade’s CO2 trend to 2100 halves IPCC forecasts

The dark-blue line shows CO2’s actual path, well below the exponential-growth curves (bounding the pale blue region) predicted by the IPCC in its 2007 report. If CO2 continues on its present path, the IPCC’s central temperature projection for the year 2100 must be halved.

Data source: NOAA.
The 29-year global warming trend is just 2.7 °F (1.5 °C) per century

Global monthly temperature anomalies, January 1980 to June 2010
IPCC predicts warming at +2.4, +3, +3.9, +4.7, +5.3 C/century
The observed warming trend is equivalent to 1.5 C/century

Global temperature for the past 30 years has been undershooting the IPCC’s currently-predicted warming rates (pink region). The warming trend (thick red line) has been rising at well below half of the IPCC’s central estimate. Data source: SPPI index, compiled from RSS Inc. UAH has not reported data for two months and has been excluded from this graph, but will be relied upon again when data become available. SPPI no longer uses any terrestrial-temperature datasets, because they have become discredited as unreliable.
Hardly any ‘global warming’ since the turn of the millennium

For nine and a half years since the turn of the millennium on 1 January 2001, the trend in global temperatures has been negligible. The IPCC’s predicted equilibrium warming path (pink region) bears no relation to the far lesser rate of “global warming” that has been observed in the 21st century to date. Note the very sharp peak in global temperature in early 2010, caused by a strong El Niño Southern Oscillation.

Previous Monthly CO2 Reports showed global cooling since 1 January 2001: the change has occurred because the University of Alabama at Huntsville has recently altered its results. Source: SPPI global temperature index.
Remote Sensing Systems’ satellite record since the turn of the millennium on 1 January 2001 shows a minuscule cooling trend in global temperatures over the decade. Note that the University of Alabama at Huntsville’s revised dataset, on the next page, now shows a warming trend over the same period. Source: RSS Inc.
The University of Alabama at Huntsville’s recently-revised satellite record since the turn of the millennium on 1 January 2001, in contrast to the RSS dataset, shows a slight warming trend in global temperatures over the decade. However, this warming trend, at just 0.5 °C per century, is not statistically significant. The contrast between the RSS and UAH graphs exemplifies data uncertainties. Source: UAH.
Sea level continues to rise more slowly than the UN predicts

Sea level (anomaly in millimetres) is rising at just 1 ft/century: The average rise in sea level over the past 10,000 years was 4 feet/century. During the 20th century it was 8 inches. As recently as 2001, the IPCC had predicted that sea level might rise as much as 3 ft in the 21st century. However, this maximum was cut by more than one-third to less than 2 feet in the IPCC’s 2007 report, with a central estimate of 1 ft 5 in. Mörner (2004) says sea level will rise about 8 inches in the 21st century. Mr. Justice Burton, in the UK High Court, bluntly commented on Al Gore’s predicted 20ft sea-level rise as follows: “The Armageddon scenario that he depicts is not based on any scientific view.” A fortiori, James Hansen’s prediction of a 246ft sea-level rise is mere rodomontade. Source: University of Colorado, 2010, release 2.
Arctic sea-ice extent passes from above average to below average

Arctic sea ice extent (millions of square kilometers: left scale): The red curve shows that the extent of sea ice in the Arctic has fallen from above the 10-year mean a couple of months ago to below it now. In 2005, 2007, and 2008, sea-ice extent during the September low season was below the 30-year minimum. Arctic summer sea ice covered its least extent in 30 years during the late summer of 2007. However, NASA has attributed that sudden decline to unusual poleward movements of heat transported by currents and winds: the Arctic climate has long been known to be volatile. The decline cannot have been caused by “global warming”, because, as the SPPI Global Temperature Index shows, there has been very little warming globally during the past decade. At almost the same moment as summer sea-ice extent reached its 30-year minimum in the Arctic, sea-ice extent in the Antarctic reached its 30-year maximum, though the latter event was very much less widely reported in the media than the former. Source: IARC JAXA, Japan, July 2010.
... and the same graph from the Danish Meteorological Institute

Recovering to the mean: The Danish Meteorological Institute’s graph of Arctic sea-ice extent (millions of square km on left scale: 2010 in black) shows Northern-Hemisphere sea ice returning to what has been normal in the past decade. Short-run fluctuations either side of the decadal mean are to be expected, and do not indicate long-run changes.
... and summer minimum sea-ice extent has grown 24% in 2 years

Arctic summer sea-ice extent (purple) has increased in each of the past two years, and is very close to the mean for the past decade. Since there has been no statistically-significant “global warming” since 1995, and since the decline in summer sea-ice extent has occurred only in the past five years, the decline that occurred in 2007 cannot be attributed to “global warming”. A paper by NASA in 2008 attributed the 2007 summer sea-ice minimum to unusual poleward winds and currents bringing warm weather up from the tropics. A few weeks after the Arctic sea-ice minimum, there extent of Antarctic sea ice reached a 30-year maximum. The Arctic was in fact 2-3 F° warmer in the 1930s and early 1940s than it is today.

A recent paper suggesting that the Arctic is now warmer than at any time for 2000 years is based on the same defective data, and is by the same authors, as the UN’s attempt to abolish the medieval warm period in its 2001 report. In fact, for most of the past 10,000 years the world – and by implication the Arctic – was appreciably warmer than it is today. One of the authors of that report had previously told a fellow-researcher, “We have to abolish the medieval warm period.” However, papers by almost 800 scientists from more than 450 institutions in more than 40 countries over more than 20 years establish that the medieval warm period was real, was global, and was warmer than the present. Source: University of Illinois, 15 September 2009.
Antarctic sea-ice extent is now at its third-highest in 30 years. This fact has scarcely been reported in any mainstream news medium. The peak extent, which occurred late in 2007, followed shortly after the decline in Arctic sea ice in late summer that year. In the summer of 2009, less Antarctic sea-ice melted than since records began 30 years previously, confirming that whatever warming is occurring is not global. Source: University of Illinois, July 2010.
The regular “heartbeat” of global sea-ice extent: steady for 30 years

Planetary cardiogram showing global sea-ice area (millions of square kilometers: left scale): There has been a very slight decline in the trend (red) of global sea-ice extent over the decades, chiefly attributable to loss of sea ice in the Arctic during the summer, which was well below the mean in 2007, with some recovery in 2008 and a further recovery in 2009. However, the 2008 peak Arctic sea-ice extent was exactly on the 1979-2000 mean, and current sea-ice extent is close to the 1979-2000 mean. The decline in summer sea-ice extent in the Arctic, reflected in the global sea-ice anomalies over most of the past decade, runs counter to the increase in Antarctic sea-ice extent over the period, suggesting that the cause of the regional sea-ice loss may not have been “global warming”. Source: University of Illinois, July 2010.
Hurricane, typhoon, and tropical-cyclone activity is at a 30-year low

“'Urricanes 'ardly hever 'appen”, as Eliza Doolittle sang in “My Fair Lady”. Hurricanes, typhoons, and other tropical cyclones have declined recently. Global activity of intense tropical storms is measured using a two-year running sum, the Accumulated Cyclone Energy Index, now standing at almost its least value in 30 years in the Northern Hemisphere, and also globally. The 2009 hurricane season in the North Atlantic was only half as active as normal. The graph shows the 24-month running sum of tropical-cyclone energy for the entire globe (blue: top) and the Northern Hemisphere only (green). The difference between the two time series is the Southern Hemisphere total. Data are shown from January 1979. Intensity estimates of southern-hemisphere cyclones are often missing before the graph’s start-date. Source: Ryan Maue, Florida State University, April 2010.
Global hurricane days are at their lowest in 30 years

Hurricane activity in decline: The 24-month running sum of hurricane days around the globe has been at its lowest level in 30 years during the 2009 season, confirming the findings of hurricane experts such as Dr. Chris Landsea to the effect that a warming world need not expect hurricanes to become more frequent, longer, or more severe. Source: Ryan Maue, Florida State University, April 2010.
Global major hurricane days are almost at their lowest in 30 years

Extreme hurricanes are not common at present: The 24-month running sum of major hurricane days around the globe is not far above its lowest level in the 30-year record, confirming that mere warming of the planet does not necessarily entail more intense hurricanes. Source: Ryan Maue, Florida State University, March 2010.
Almost no trend in North Atlantic hurricane activity for 60 years

North Atlantic Accumulated Cyclone Energy Index (ACE: left scale), 1950-2010: The ACE is a 24-month running sum that represents the combined frequency, intensity, and duration of hurricanes and tropical cyclones. Historically, the North Atlantic hurricane activity is usually characterized as a feast or a famine, making definitions of what is normal difficult. In "active" periods (such as 1995-present), a "normal" season sees much hurricane activity compared to inactive periods (such as 1970-1994). In the above figure, the light blue line indicates the linear trend of North Atlantic accumulated cyclone energy from 1950-2009 – a 60-year period of decent records – and the line is almost flat: no trend since 1950. When seasonal forecasters like Gray & Klotzbach at CSU and Tropical Storms Risk announce their upcoming seasonal forecast, they represent an entire season's worth of activity in an integrated sense either by predicting counts/frequency or ACE. However, there is no reason to assume that the entire hurricane season between June and November will experience uniform favorable or unfavorable atmospheric and oceanic conditions for tropical-cyclone formation. Indeed, the North Atlantic tends to spurt activity. For instance, one storm after another may form from African Easterly Waves and trek across the main development region for Atlantic hurricanes during the peak of the season. Source: Ryan Maue, Florida State University, April 2010.
Solar activity is heading for what may be a small 2013 maximum

Monthly sunspot numbers (black curve, smoothed in blue, and predicted in red) since January 2000: Sunspot activity had been less than for 100 years, but is now recovering as the new solar cycle gets under way. Note that the currently-predicted solar maximum for 2013-14 is considerably less intense than the previous solar maximum in 2000-01. However, the solar flux reaching the top of the atmosphere typically varies by only 0.15% between the minimum and the maximum of the ~11-year solar cycle. Source: NOAA/SWPC, Boulder, CO, USA, March 2010.
The minima of solar cycles 23 and 24 compared

Number of days without any visible sunspots during the previous solar minimum (blue) and the present solar minimum (red). During the last ~11-year solar minimum, in September/October 1996, the longest period without sunspots was 37 days, compared with 44 days in March/April 2009 and 51 days in July/August 2009. Source: Jan Alvestad, February 2010.
The stupefying cost of the Waxman/Markey Climate Bill

<table>
<thead>
<tr>
<th>Waxman/Markey Climate Bill</th>
<th>The facts and figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 concentration in 2100 [A2]</td>
<td>836 ppmv</td>
</tr>
<tr>
<td>- CO2 concentration in 2000</td>
<td>368 ppmv</td>
</tr>
<tr>
<td>= 21st-century CO2 increase</td>
<td>468 ppmv</td>
</tr>
<tr>
<td>/ 21st-century warming [A2]</td>
<td>3.4 C°</td>
</tr>
<tr>
<td>= Concentration increase per C°</td>
<td>140 ppmv/C°</td>
</tr>
<tr>
<td>x CO2 emissions per ppmv</td>
<td>14,150 million tons CO2</td>
</tr>
<tr>
<td>= Emissions cuts for 1 C° cooling</td>
<td>2 trillion tons CO2</td>
</tr>
<tr>
<td>/ WaxKey emissions cuts/year</td>
<td>5 billion tons CO2/year</td>
</tr>
<tr>
<td>= Years to prevent 1 C° warming</td>
<td>400 years</td>
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<tr>
<td>x 100 years’ warming [A2]</td>
<td>3.4 C°</td>
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<tr>
<td>= Years to stop 100 years’ warming</td>
<td>1360 years</td>
</tr>
<tr>
<td>x $180 billion/year WaxKey cost</td>
<td>$250 trillion</td>
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This postcard has all the key figures on the Waxman/Markey climate Bill in one place. Bottom line: to prevent the 3.4 C warming projected by the UN for this century under the A2 carbon emissions scenario would take 1360 years even if the Bill were fully implemented, and would cost $250 trillion. Source: SPPI calculations.
Why cap-and-trade will not change the global climate one iota

A pointless Bill: The Waxman/Markey Bill will cost billions to implement, but will reduce US carbon emissions hardly at all, unless the numerous exceptions in the Bill are implemented, in which event it will not reduce US carbon emissions at all. Source: [www.breakthrough.org](http://www.breakthrough.org).

### Cumulative 2012-2030 U.S. GHG Emissions Under the American Clean Energy and Security Act (HR 2454)

(Million Tons CO2-e)

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<th>Scenario</th>
<th>GHG Emissions (Million Tons CO2-e)</th>
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<tr>
<td>Business as Usual Emissions</td>
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<td>Economy Wide Emissions with Cap and No International Offsets Utilized</td>
<td>114,249</td>
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<td>Economy Wide Emissions with Cap and 1 billion International Offsets Utilized</td>
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<td>Economy Wide Emissions with Cap and 1.5 billion International Offsets Utilized</td>
<td>142,749</td>
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<td>Business as Usual Emissions in Capped Sectors</td>
<td>119,594</td>
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<td>Emissions in Capped Sectors with No Offsets Utilized</td>
<td>92,312</td>
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<td>Emissions in Capped Sectors with Full Offsets Utilized</td>
<td>130,312</td>
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The Waxman/Markey Climate Bill will scarcely affect temperatures

Temperature change predicted by the UN, and (dotted line) adjusted to reflect the negligible impact of the Waxman/Markey Climate Bill, which might cut temperatures by 0.2-0.02 F by 2100, at a cost of $18 trillion. **Source:** Chip Knappenberger: cost estimates $180 bn/year from the White House.
The Waxman/Markey Climate Bill will scarcely affect sea level change predicted by the UN, and (dotted line) adjusted to reflect the negligible impact of the Waxman/Markey Climate Bill, which might cut sea-level by less than half an in by 2100, at a cost of $18 trillion. Source: Chip Knappenberger: cost estimates $180 bn/year from the White House.
As recession drives down US carbon dioxide emissions, China’s emissions continue to soar. Other developing countries’ emissions (large nations in blue, smaller nations in black) are also climbing, though not as fast as those of China. This graph shows the pointlessness of mitigating Western carbon dioxide emissions unless emerging nations are prevented from developing as we have developed. Fortunately, the warming caused by CO2 is small, so no mitigation is necessary.
Here is a step-by-step, do-it-yourself ready-reckoner which will let you use a pocket calculator to make your own instant estimate of global temperature change in response to increases in atmospheric CO2 concentration.

**STEP 1:** Decide how far into the future you want your forecast to go, and estimate how much CO2 will be in the atmosphere at that date. **Example:** Let us do a forecast to 2100. The Monthly CO2 Report charts show CO2 rising to \( C = 575 \) parts per million by the end of the century, compared with \( B = 385 \) parts per million in late 2008.

**STEP 2:** Next, work out the proportionate increase \( C/B \) in CO2 concentration. In our example, \( C/B = 575/385 = 1.49 \).

**STEP 3:** Take the natural logarithm \( \ln(C/B) \) of the proportionate increase. If you have a scientific calculator, find the natural logarithm directly using the “ln” button. If not, look up the logarithm in the table below. In our example, \( \ln 1.49 = 0.40 \).

<table>
<thead>
<tr>
<th>( n )</th>
<th>1.05</th>
<th>1.10</th>
<th>1.15</th>
<th>1.20</th>
<th>1.25</th>
<th>1.30</th>
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<tr>
<td>( \ln )</td>
<td>0.05</td>
<td>0.10</td>
<td>0.14</td>
<td>0.18</td>
<td>0.22</td>
<td>0.26</td>
<td>0.30</td>
<td>0.34</td>
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<td>0.56</td>
<td>0.59</td>
<td>0.62</td>
<td>0.64</td>
<td>0.67</td>
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| \( n \) | 2.05 | 2.10 | 2.15 | 2.20 | 2.25 | 2.30 | 2.35 | 2.40 | 2.45 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 | 3.00 |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| \( \ln \) | 0.72 | 0.74 | 0.77 | 0.79 | 0.81 | 0.83 | 0.85 | 0.88 | 0.90 | 0.92 | 0.94 | 0.96 | 0.97 | 0.99 | 1.01 | 1.03 | 1.05 | 1.06 | 1.08 | 1.10 |

**STEP 4:** Choose a climate sensitivity coefficient \( c \) from the table below –

<table>
<thead>
<tr>
<th>Coefficient ( c ) ...</th>
<th>SPPI minimum</th>
<th>SPPI central</th>
<th>SPPI maximum</th>
<th>IPCC minimum</th>
<th>IPCC central</th>
<th>IPCC maximum</th>
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<tbody>
<tr>
<td>... for ( \degree C )</td>
<td>0.7</td>
<td>1.4</td>
<td>2.1</td>
<td>2.9</td>
<td>4.7</td>
<td>6.5</td>
</tr>
<tr>
<td>... for ( \degree F )</td>
<td>1.25</td>
<td>2.50</td>
<td>3.75</td>
<td>5.25</td>
<td>8.5</td>
<td>11.75</td>
</tr>
</tbody>
</table>

**STEP 5:** Find the temperature change \( \Delta T \) by multiplying the natural logarithm of the proportionate increase in CO2 concentration by your climate sensitivity coefficient. In our example we’ll choose the SPPI central estimate \( c = 2.50 \) \( \degree F \). Then –

\[
\Delta T = c \ln(C/B) = 2.50 \times 0.40 = 1.0 \degree F
\]

Your predicted manmade warming to 2100. It’s as simple as that!
Why cutting carbon emissions can never be cost-effective

A very simple calculation demonstrates definitively and conclusively that any attempt to address the imagined (and imaginary) “problem” of “global warming” is doomed not to be cost-effective. NOAA's global CO2 concentration record shows 388 parts per million by volume in the atmosphere in 2009/10. Throughout this millennium CO2 concentration has been rising in a straight line at 2ppmv/year, as our CO2 concentration graphs show every month. How much warming will this 2 ppmv/year increase cause? Using the formula for the UN’s implicit central estimate of CO2’s warming effect, taken from our Ready Reckoner, we can work this out thus: the warming, in Celsius degrees, is 4.7 times the Naperian logarithm of [(388+2)/388], which works out as 0.024 C° per year, or less than one-fortieth of a Celsius degree. So we should have to shut down the entire global carbon economy for 41 years, without any right to use an auto, train, or plane, to prevent just 1 Celsius degree of warming. However, the UN has exaggerated CO2’s warming effect at least fourfold, so make that 160 years. Closing the entire carbon economy would in effect close the entire global economy. And all this for the sake of a non-solution to a non-problem.
By Dr. Craig Idso

The Monthly CO₂ Report summarizes key recent scientific papers, selected from those featured weekly at www.co2science.org, that significantly add to our understanding of the climate question. This month we review papers about near-surface air temperatures from Greenland, forest isoprene emissions, the effects of rising temperatures and CO₂ on corals, projected ecosystem changes in east Africa, wind speed, forest growth trends, global tropical cyclones and British coastal temperatures over the past millennium. Our final papers give evidence that the Middle Ages were warmer than today.

Sixty-Second Summary

- Despite all the fuss climate extremists make about Greenland being on the verge of crossing a “tipping point” and beginning to experience dramatic ice loss, there is nothing unusual, unnatural, or unprecedented about the warming of Greenland from 1994-2007. In fact, it is much less impressive than the 1919-1932 warming.
- Rising atmospheric CO₂ concentrations will decrease isoprene emissions and thereby increase CCN concentrations and lead to a cooling of the planet.
- “The conventional belief that calcification rates will be affected by ocean acidification may not be widespread in temperate corals”.
- “Model results suggest that East Africa, a populous and economically poor region, is likely to experience some ecosystem service benefits through increased precipitation, river runoff and fresh water availability” as a result of possible CO₂-induced global warming, and may result in enhancements in net primary productivity and improved crop yields.
- Wind speeds have declined as the globe has warmed over the past few decades, leading to reduced evaporative demand.
- U.S. forest growth has benefited from nitrogen deposition to the tune of 40% over pre-industrial conditions.
- Contrary to the climate-extremist claim that global warming increases tropical storm activity, on a global basis tropical storm activity has experienced no upward trend since the mid-1960s.
- Changes in 20th-century marine climate along the northwest coast of Scotland reveal there is nothing unusual, unnatural or unprecedented about late 20th-century or early 21st-century warming.
- Was there a Medieval Warm Period? YES, according to data published by 834 individual scientists from 496 separate research institutions in 43 different countries in the CO₂Science Medieval Warm Period Project database ... and counting! View an interactive map here: http://www.co2science.org/data/timemap/mwpmap.html.
Near-Surface Greenland Air Temperatures: 1840-2007


"Using a set of 12 coastal and 40 inland ice surface air temperature records in combination with climate model output," the authors say they reconstructed "long-term (1840-2007) monthly, seasonal, and annual spatial patterns of temperature variability over a continuous grid covering Greenland and the inland ice sheet," after which they compared "the 1919-32 and 1994-2007 warming episodes" and made "a comparison of Greenland ice sheet surface air temperature temporal variability with that of the Northern Hemisphere average." The near-surface air temperature history that Box *et al.* derived for Greenland is reproduced in the figure below, along with the corresponding history of Northern Hemispheric near-surface air temperature.

*Low-pass-filtered Greenland & Northern Hemispheric near-surface air temperature anomalies plotted against time with respect to the 1951-1980 base period. Adapted from Box *et al.* (2009).*
Based on the results depicted in the figure above, the four researchers determined that the annual whole ice sheet 1919-32 warming trend is 33% greater in magnitude than the 1994-2007 warming, and that “in contrast to the 1920s warming, the 1994-2007 warming has not surpassed the Northern Hemisphere anomaly”. Indeed, they note that “an additional 1.0-1.5 C° of annual mean warming would be needed for Greenland to be in phase with the Northern Hemisphere pattern”. Despite all the fuss climate extremists make about Greenland being on the verge of crossing a tipping point and beginning to experience dramatic ice loss, the results of Box et al. demonstrate there is nothing unusual, unnatural, or unprecedented about the 1994-2007 warming episode. In fact, it is much less impressive than the 1919-1932 warming; and it becomes even “less impressive” when it is realized that the atmosphere's CO₂ concentration only rose by about 5 ppmv during the earlier period of stronger warming but by 25 ppmv (five times more) during the later period of weaker warming.

The future of forest isoprene emissions


In a paper published in the 17 September 2009 issue of Nature, Kiendler-Scharr et al. “present evidence from simulation experiments conducted in a plant chamber that isoprene can significantly inhibit new particle formation” of organic aerosols. These particles are important to the climate because they act as nuclei around which water vapor molecules can cluster to form clouds – i.e., as “cloud-condensation nuclei”. The significance of this finding derives from the fact that “the most abundant volatile organic compounds emitted by terrestrial vegetation are isoprene and its derivatives, such as monoterpenes and sesquiterpenes”, as well as the fact that “these compounds are involved in the formation of organic aerosols, which act as 'seeds' for cloud formation and hence as cooling agents via an effect on radiative forcing”.

Ziemann (2009) – in a “News & Views” article that discusses the Kiendler-Scharr result – say, “Clouds formed at higher cloud-condensation nuclei concentrations have more and smaller drops than those formed at lower concentrations, and so reflect more sunlight and are longer-lived – effects that, at the global scale, enhance the planetary cooling that counters some of the warming caused by greenhouse gases." Ziemann suggests that, if vegetative isoprene emissions were to increase, driven directly by rising temperatures and/or indirectly by warming-induced changes in the species composition of boreal forests, the resulting decrease in the concentration of cloud-condensation nuclei “could lead to increased global-warming trends”, as suggested by Kiendler-Sharr in a “Making the Paper” article in the same issue of Nature (p. 313).

The story propounded in these four related items may sound like a devastating blow to those of us who believe that the preponderance of real-world evidence suggests that earth's biosphere is fully capable of maintaining the temperature of the planet within bounds conducive to its own continued existence. However, and as almost an afterthought, Ziemann rightly writes that consideration should also be given to what he calls "the potential suppression of terpene emissions by elevated carbon dioxide concentrations [italics added]." And when this is done, it is readily evident that the reality of the phenomenon has been well documented, as demonstrated by the multiple sets of observational data plotted in the figure below; and it clearly suggests that rising atmospheric CO₂ concentrations will decrease isoprene emissions and thereby increase concentrations of cloud-condensation nuclei, leading to a cooling of the planet.
Field and laboratory observations of leaf isoprene (y axis) emissions from plants grown in a variety of atmospheric CO₂ concentrations (parts per million by volume: x axis), normalized to a value of unity at a CO₂ concentration of 370 ppmv. Adapted from Young et al. (2009).

Yes, there is always another side to the doom-and-gloom prognostications of the world's climate extremists; and that neglected side is almost always beneficial. Additional references from this review can be found at http://www.co2science.org/articles/V13/N19/EDIT.php.
Effects of elevated CO₂ and temperature on a temperate coral


Rodolfo-Metalpa et al. (2010) write that “anthropogenic CO₂ emitted to the atmosphere is absorbed by the oceans, leading to decreases in pH, CO₃²⁻ concentration, and the related CaCO₃ saturation state (Ω) of seawater”, and that “as a result, coral calcification is expected to decline dramatically in the future, raising widespread concerns about the future of our oceans in a high-CO₂ world (e.g. Hoegh-Guldberg et al., 2007)”.

Rodolfo-Metalpa et al., investigating the effects of this projected decline, collected three live colonies of a Mediterranean zooxanthellate coral, Cladocora caespitosa in the Bay of Villefranche (Ligurian Sea, France) at about 25 meters depth in July 2006, and from three other colonies in February 2007. They divided the colonies into fragments and carefully removed single polyps that they attached to PVC plates and randomly assigned to aquariums that were continuously supplied with unfiltered seawater and maintained either at ambient water temperature or at temperature elevated by 3 °C in equilibrium with air of ambient or elevated CO₂ concentration (400 or 700 ppm), subjecting them to “(1) mid-term perturbations (1 month) in summer and winter conditions of irradiance and temperature, and (2) a long-term perturbation (1 year), mimicking the seasonal changes in temperature and irradiance”.

Results indicated that, for this coral, “an increase in CO₂, in the range predicted for 2100, does not reduce its calcification rate”, and that “an increase in CO₂, alone or in combination with elevated temperature, had no significant effect on photosynthesis, photosynthetic efficiency and calcification”. However, they report that a 3 °C rise in temperature in winter resulted in a 72% increase in gross photosynthesis, as well as a significant increase in daytime calcification rate.

In light of these significant findings, Rodolfo-Metalpa et al. conclude that “the conventional belief that calcification rates will be affected by ocean acidification may not be widespread in temperate corals”. In this regard, for example, they note that Ries et al. (2009) have reported that the calcification rate of the temperate coral Oculina arbuscula is also unaffected by an increase in atmospheric CO₂ concentration of up to 840 ppmv, and that a large decrease in calcification was only found at a CO₂ concentration in excess of 2200 ppmv. In addition, they write that “some marine invertebrates may be able to calcify in the face of ocean acidification or, contrary to what is generally expected, may increase their calcification rates, as reported on the ophiourid brittlestar Amphiura filiformis (Wood et al., 2008), the seastar Pisaster ochraceus (Gooding et al., 2009) exposed to lower pH (7.8-7.3), the Caribbean coral Madracis mirabilis at pH 7.6 (Jury et al., 2010), and shown for coralline red algae, calcareous green algae, temperate urchins, limpets, crabs, lobsters and shrimp (Ries et al., 2009)”. Likewise, the authors write that there are many cases where “rates of photosynthesis are either not affected (e.g. Langdon et al., 2003; Reynaud et al., 2003; Schneider and Erez, 2006; Marubini et al., 2008) or slightly increased (e.g. Langdon and Atkinson, 2005) at the level of CO₂ expected in 2100”.

Yes, all is not the doom and gloom the world's climate extremists make it out to be. Additional references from this review can be found at http://www.co2science.org/articles/V13/N21/C2.php.
The future of East Africa in a CO₂-enriched and warmer world


Doherty *et al.* (2010) modeled future changes in land biogeochemistry and biogeography in the region bounded by 12.5°N, 12.5°S, 25°E and 42.5°E, representing the whole of East Africa (Kenya, Tanzania, Uganda, Rwanda, Burundi, Ethiopia, and Somalia), as well as portions of Central Africa (the Democratic Republic of Congo and Southern Sudan), using eighteen projections of future climate derived from nine general-circulation models that figured prominently in the IPCC's Fourth Assessment Report, employing the projections as input to the Lund-Potsdam-Jena dynamic global vegetation model that simulates changes in vegetation and ecosystem carbon cycling under future climate conditions, based on what they describe as “a coupled photosynthesis-hydrological scheme [that] computes gross primary productivity, plant respiration, and evapotranspiration on a daily time step based on the current climate, atmospheric CO₂ concentration, vegetation structure and phenological state, and soil water content”.

Results indicated that “all simulations showed future increases in tropical woody vegetation over the region at the expense of grasslands … regional increases in net primary productivity (18-36%) and total carbon storage (3-13%) by 2080-2099 compared with the present-day were common to all simulations”, and “seven out of nine simulations continued to show an annual net land carbon sink in the final decades of the 21st century because vegetation biomass continued to increase”.

The researchers conclude: “**Overall, our model results suggest that East Africa, a populous and economically poor region, is likely to experience some ecosystem service benefits through increased precipitation, river runoff and fresh water availability**, and they state that “resulting enhancements in net primary productivity may lead to improved crop yields in some areas”. What is more, they write that their results “stand in partial contradiction of other studies that suggest possible negative consequences for agriculture, biodiversity and other ecosystem services caused by temperature increases”.

The variation of near-surface wind speed with altitude of land


According to McVicar *et al.*, there has been great interest recently in “the widespread declining trends of wind speed measured by terrestrial anemometers at many mid-latitude sites over the last 30-50 years”, citing the work of Roderick *et al.* (2007), McVicar *et al.* (2008), Pryor *et al.* (2009) and Jiang *et al.* (2010); and they say that this stilling, as it has come to be called, is “a key factor in reducing atmospheric evaporative demand”, which drives actual evapotranspiration when water availability is not limiting, as in the case of lakes and rivers.
In addition, they note that near-surface wind speed \( (u) \) nearly always increases as land-surface elevation \( (z) \) increases, as demonstrated by the work of McVicar et al. (2007), and that increasing wind speeds lead to increases in atmospheric evaporative demand, while decreasing wind speeds do the opposite. Both changes can be of great significance for people dependent upon water resources derived from mountainous headwater catchments. Consequently, it would be advantageous to learn how this latter phenomenon (the change in near-surface wind speed with ground elevation) may also have varied over the last few decades of global warming, since the authors write that "over half the global population live in catchments with rivers originating in mountainous regions (Beniston, 2005), with this water supporting about 25% of the global gross domestic product (Barnett et al., 2005)."

Defining \( uz \) as change in wind speed with change in elevation – \( uz = \Delta u/\Delta z \), where \( \Delta u = u_2-u_1 \), \( \Delta z = z_2-z_1 \), and \( z_2 > z_1 \) – McVicar et al. calculated monthly averages of \( uz \) based on monthly average \( u \) data from low-set (10-meter) anemometers maintained by the Chinese Bureau of Meteorology at 82 sites in central China and by MeteoSwiss at 37 sites in Switzerland from January 1960 through December 2006. This result, in their words, constituted “the first time that long-term trends in \( uz \) in mountainous regions have been calculated”. The seven scientists determined that “for both regions \( uz \) trend results showed that \( u \) has declined more rapidly at higher than lower elevations”.

This double benefit – a general decline in wind speed at many mid-latitude sites and a further decline in wind speed at higher elevations – should act to reduce water loss via evaporation from high altitude catchments in many of the world’s mountainous regions, providing a more consistent water supply. McVicar et al. add that “reductions in wind speed will serve to reduce rates of actual evapotranspiration, partially compensating for increases in actual evapotranspiration due to increasing air temperatures”. Additional references from this review can be found at [http://www.co2science.org/articles/V13/N26/C1.php](http://www.co2science.org/articles/V13/N26/C1.php).

**Nitrogen deposition boosts US tree growth**


Thomas et al. (2010) write that “human activities have greatly accelerated emissions of both carbon dioxide and biologically reactive nitrogen to the atmosphere”, and that “as nitrogen availability often limits forest productivity, it has long been expected that anthropogenic nitrogen deposition could stimulate carbon sequestration in forests”. However, they note that spatially-extensive evidence for this phenomenon “has been lacking”. The authors used “spatially extensive forest inventory data to discern the effect of nitrogen deposition on the growth and survival of the 24 most common tree species of the northeastern and north-central US, as well as the effect of nitrogen deposition on carbon sequestration in trees across the breadth of the northeastern US”.

Results indicated that “nitrogen deposition (which ranged from 3-11 kg ha\(^{-1}\) yr\(^{-1}\)) enhanced the growth of eleven species and decreased the growth of three species”, while it "enhanced [the] growth of all tree species with arbuscular mycorrhizal fungi associations", leading to “a 40% enhancement over pre-industrial conditions".
This response includes the direct effects of nitrogen deposition on tree growth through soil fertilization, foliar nitrogen uptake and other potential interactions between nitrogen deposition and other environmental changes, including CO₂ fertilization. To give some feeling for the significance of the size of this response, they say that it “exceeds the 23% enhancement of net primary production anticipated for the year 2050 from a doubling of atmospheric CO₂ over preindustrial levels, as estimated using free-air CO₂ enrichment studies” such as Norby et al. (2005).

Thomas et al. conclude by noting that “nitrogen deposition is an important mechanism contributing to carbon sequestration within these temperate forests”, but they say that this phenomenon is still “unlikely to explain all of the observed terrestrial carbon sink”. Nevertheless, it does go a long way towards doing so, while demonstrating the major benefits of the concomitant increases in the air’s CO₂ content and temperature with which it interacted over the course of the industrial revolution and its aftermath, which latter increases climate extremists decry as two of the worst things ever to have happened to the biosphere. Clearly, however, they were not. And neither was the increase in anthropogenic nitrogen deposition.

All three of these phenomena interacted with each other in such a way as to greatly increase the productivity of earth's forests, both in temperate latitudes, as demonstrated by Thomas et al., and in tropical regions. The additional reference from this review can be found at http://www.co2science.org/articles/V13/N22/B3.php.

Global tropical storm days


According to Wang et al. (2010), “the impact of the rising sea surface temperature on tropical cyclone activity is one of the great societal and scientific concerns”, and “with the observed warming of the tropics of around 0.5 °C over the past four to five decades, detecting the observed change in the tropical cyclone activity may shed light on the impact of the global warming on tropical cyclone activity”. To detect a global warming influence, Wang et al. examined cross-basin spatial-temporal variations of tropical cyclone storm days for the world’s major oceans from 1965-2008. Satellite data for the period were obtained from the US Navy's Joint Typhoon Warning Center for the Western North Pacific, Northern Indian Ocean and Southern Hemisphere Ocean, and from the U.S. NASA's National Hurricane Center for the Eastern North Pacific and North Atlantic.

The five researchers report that “over the period of 1965-2008, the global tropical-cyclone activity, as measured by storm days, shows a large-amplitude fluctuation regulated by the El Niño-Southern Oscillation and the Pacific Decadal Oscillation, but has no trend, suggesting that the rising temperature so far has not yet [had] an impact on the global total number of storm days”, implying that “the spatial variation of sea-surface temperatures, rather than the global mean temperature, may be more relevant to understanding the change of the global storm days”. Thus, contrary to the climate-extremist claim that global warming increases tropical storm activity on a global basis, the results of this study reveal that long-held contention to unmeritorious, even with more than four decades of data in hand.
British coastal temperature anomalies of the last millennium


From a broad sediment shelf at a water depth of 56 meters in the main basin of Loch Sunart – a fjord on the northwest coast of Scotland (56°40.20'N, 05°52.22'W) – Cage and Austin (2010) extracted several sediment cores from which they developed a continuous record of various physical and chemical properties of the sediment that spanned the last millennium and extended all the way up to AD 2006. Of most interest to us are the $\delta^{18}O$ measurements made on the shells of the benthic foraminifer *Ammonia beccarii*, because earlier oxygen-isotope temperature-reconstruction data of this kind – when operated upon by the paleotemperature equation of O'Neil *et al.* (1969) – yielded bottom-water temperatures that had been judged by Cage and Austin (2008) to be “the most realistic water temperature values for infaunal benthic foraminifera from Loch Sunart”.

The results of the two researchers' most recent efforts revealed that the most distinctive feature of the Loch Sunart temperature record was an abrupt warming at AD 1540 that led to a temperature anomaly of 1.1 °C above the long-term mean from AD 1540-1600, preceded from AD 1445-1495 by some of the coldest temperatures of the past 1000 years.

Noting that “the rate and magnitude of the inferred warming at AD 1540 ... is similar to the rate of change and magnitude observed during the late 20th century”, Cage and Austin concluded that “changes in 20th-century marine climate cannot yet be resolved from a background of natural variability over the last millennium”, which is another way of saying that late 20th-century warming – which has not further manifested itself over the first decade of the 21st century – was not unusual enough validly to ascribe it to the concomitant increase in the air's CO$_2$ content. Additional references from this review can be found at [http://www.co2science.org/articles/V13/N25/C2.php](http://www.co2science.org/articles/V13/N25/C2.php).

The Middle Ages were warmer than today (1): Piancabella Glacier, Sceru Valley, Alps


Based on radiocarbon dating of the fossil wood remains of eight larch (*Larix decidua*) stem fragments found one meter beneath the surface of the ground at the base of the front of the Piancabella rock glacier (46°27'02" N, 9°00'07" E) in the Southern Swiss Alps in September 2005, the authors determined that the wood was formed somewhere between AD 1040 and 1280 with a statistical probability of 95.4%. Then, based on this information and “geomorphological, climatological and geophysical observations”, they inferred that “the treeline in the Medieval Warm Period was about 200 meters higher than in the middle of the 20th century, which corresponds to a mean summer temperature as much as 1.2 °C warmer than in AD 1950”. Thus, we assign the medieval warm period (at a minimum) to the period AD 1040-1280 and, adjusting for warming between 1950 and the present, we calculate that it was then about 0.5 °C warmer than the peak warmth of recent decades.
Kobashi et al. (2010) constructed a history of the last thousand years of central Greenland surface air temperature, based on values of isotopic ratios of nitrogen and argon previously derived by Kobashi et al. (2008) from air bubbles trapped in the GISP2 ice core that had been extracted from central Greenland (72°36'N, 38°30'W). The results, shown in the figure below, reveal that the latter part of the Medieval Warm Period was approximately 1.67°C greater than the temperature of the last decades of the 20th century, which climate alarmists claim to have been the warmest of the past millennium.
The Climategate emails reveal some of the tricks the IPCC’s leading “scientists” used in an attempt falsely to abolish the Medieval Warm Period, so that they could pretend that today’s temperatures are warmer than at any time in the past 1300 years. However, this graph from www.science-skeptical.de, a German website, shows graphs from scientific papers that examined proxy temperature data from all parts of the world. Visit the ScienceSkeptical.de website for an interactive version of the graph.
And finally, hot from the Russell Enquiry ...