

The IPCC's dubious evidence for a human influence on climate

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In February 2007 the IPCC Fourth Assessment Report (4AR) claimed that there was a 90% to 95% probability that man-made emissions of carbon dioxide were having a significant influence on climate. This claim was widely accepted by the public and many governments made both political and financial commitments on the basis of its statements.

But did anybody actually read the report in detail and check the evidence on which the claim was made? At the time this would have been extremely difficult because the Summary for Policy Makers was released well in advance of the detailed document on which it was based, but prudence would have dictated waiting for that evidence before accepting that pivotal claim.

When the Working Group I report was finally released in May 2007 anyone who reviewed the principal finding, that mankind was responsible for the increase in temperature, should have been appalled by the absence of concrete evidence.

The IPCC's claim is detailed in section 6.7 of the Working Group I report and rests on four pillars:

- (a) The world is warming and the temperature increase is widespread
- (b) The temperature increase cannot be explained by internal variability or heat moving from one climate component to another
- (c) The distribution of warming is not consistent with models
- (d) Climate models need to include an anthropogenic (i.e. "human") component in order for the output to match the observed surface temperatures,

The so-called evidence is a nothing more than pastiche of dubious assertions and false assumptions, and if these are the best arguments that the IPCC could advance then its future should be reconsidered.

Uncertain accuracy of surface temperature records

The IPCC claims that global average surface temperatures have increased in relatively consistent fashion since the mid 1970s. This is based on the data reported by 3 agencies, Britain's Climatic Research Unit (CRU) and the two US agencies GISS and USHCN.

Recent investigations in the USA by <http://www.surfacestations.org> have indicated that an estimated 25% of observations stations are positioned in such a way that they will be directly impacted by their proximity to the man-made environment (e.g. buildings, paved roadways, discharge from air-conditioning units). In the majority of circumstances these influences will cause an increase in temperature in the immediate vicinity of the observation stations and give false impressions of the extent of temperature change. Whether this is true in other developed or developing countries is unknown but investigations seem warranted.

As well as the problem of station positioning there is the question of the impact of man-made changes to the local environment. These changes include both urban areas (e.g. buildings, roads, local heat generation) and rural land-use changes where vegetation has altered over time. Any local heat output or changes to the local natural heat cycle can easily distort the local temperature record. The apparently widespread temperature increase might be largely an artefact of the proximity of recording instruments to man-made environments, and of course this corruption will extend into average temperatures on a global and hemispheric basis.

Britain's CRU claims that it does not know which observation stations supplied the data used in its monthly and annual calculations, but it does tell us that the data coverage if the Earth's surface varies each month.

This variable number of unknown weather stations makes it impossible to properly audit the data to check for possible contamination by man-made changes to the local environment.

The "Climate Audit" website (<http://www.climateaudit.org>) has recently attempted to audit some of the data from the USA and has reported both errors and inconsistencies in the data. One such error forced NASA to recalculate certain temperatures and this resulted in the 1930s being declared the warmest decade on record, not the 1990s as was previously claimed.

None of the three agencies has allowed an independent audit of its data and methods so we cannot be confident that these issues are properly addressed. The only published papers that discuss the accuracy of the methods for calculating the average temperatures are those written by the respective organisations themselves, a situation that would be deplored in most other fields.

Many scientists believe that the satellite-based measurements of lower tropospheric temperature are more reliable and comprehensive than surface temperatures measured by thermometer. The IPCC rejects this by citing a publication that claimed a similarity in the trends of the surface and lower tropospheric temperatures. That publication has never been peer reviewed and the authors have failed to disclose whether those trends continue to match after a very substantial natural event, the 1998 El Niño, is removed.

The data for the lower tropospheric temperature is available only since 1979 and it shows oscillations about a mid-point, a peak during the 1998 El Niño, a substantial drop immediately afterwards and then an oscillation about a slightly higher mid point since that time. It suggests step-wise changes with periods that vary about a certain level. This is in sharp contrast to the surface temperatures that show a near-continuous increase since 1977.

The IPCC claims the latter is correct but provides no evidence to show that the observed symptoms of warming could not have been caused by a step-wise increment rather than the consistent increase reportedly in surface temperatures.

Even if the widespread warming is not entirely due to data corruption by man-made changes to the environment there is no good reason to automatically associate it with man-made emissions of carbon dioxide as the IPCC have done.

Incomplete knowledge about factors described as "internal variability"

The IPCC claims that "internal variability" cannot account for the supposed temperature increase but this is a suspicious statement because climate scientists often use the term "internal variability" for situations that are poorly understood, and the IPCC admits to plenty of those. The term implies that the observed phenomena are not driven by any external forcing, but that's a very premature claim until the phenomenon can be explained in complete detail.

One example of this is the description of El Niño conditions as an "internal variable". The exact process that causes an El Niño to form is not known nor are the determinants of its strength. Certain aspects of El Niño events have been shown to correlate with solar emissions and activities suggesting that this "internal variable" may have a substantial "external" component.

But what about changes to cloud cover? Is it an internal variable that is a consequence of climatic conditions or should it be designated as an external variable because it modifies the amount of sunlight reaching the earth? The decrease in low-level cloud outside the tropical regions since 1998 may well have contributed to warming in the mid-latitudes but the IPCC WG I report fails to mention that this occurred. It only refers to the entire cloud cover dataset in passing during discussion of various fine particles in the atmosphere that might influence cloud formation. The report also mentions changes in albedo that result from a change in cloud cover but the more fundamental issue of changes in the amount of solar radiation striking the earth is glossed over.

Incomplete knowledge of many climate factors

The IPCC bases much of its claims on issues that suffer from fundamental uncertainties.

The problems with temperature data have already been discussed but the IPCC report is replete with words like "understanding", "estimate", "reconstruction", "simulation" and "model". All of these terms refer to elements of unknown accuracy and validity, and the numerous uncertainties are further compounded when one estimate is subtracted from another or when the output of models is compared to other uncertain data.

Models and simulations are critical to the IPCC's case for man-made warming but in its Third Assessment Report (TAR) the IPCC admitted that the level of scientific understanding (LSU) of 7 of 11 climate factors was "very low" and that for another the LSU was "low" (see figure). A similar table was absent from the Fourth Assessment Report - would it be an admission that science had advanced very little? - but a table of various radiative forcings did appear and again many factors were poorly understood.

It beggars belief that the IPCC can put such faith in understandings, estimates, reconstructions, simulations and models when it has already acknowledged that scientists lack detailed knowledge of many factors. It is folly to assume that understandings, estimates and reconstructions will be accurate and is totally illogical to suppose that accurate simulations and models can be developed.

By the same token, if so much knowledge is uncertain then how can the IPCC possibly claim that the mismatch between the known circulation patterns and the distribution of warming mean that humans have influenced climate?

The transfer of tropical heat to the polar regions is a highly contentious issue among scientists. For many years it has been claimed that the Ferrel Cell circulation moves surface air from the mid latitudes to the Arctic where it rises and returns to its starting point. This circulation is described in most climate science literature but recently many scientists have pointed to a lack of solid evidence for its existence and questioned whether such circulation even exists. Some scientists have also estimated that the transfer of heat from the tropics to northern mid-latitudes can be as much as 5 petawatts (5×10^{15} watts) but other scientists reject such claims out of hand.

If the circulation system is poorly understood then it follows that the modelling of heat distribution is very likely to be inaccurate and that the IPCC's claim that surface temperature changes do not match distribution models rests on very weak ground.

The claim that climate models can only match the observed surface temperatures if a "human component" is included is frankly risible. As noted above, there are good reasons to doubt the accuracy of that temperature data, so one might suggest that the inclusion of a "human influence" in climate models has been made necessary by human activities corrupting the temperature record. Numerous studies also report that climate models should be viewed with extreme scepticism because they incorporate many assumptions, as if we suspect that already from the incomplete knowledge of the climate system.

Claims by the IPCC that the output from various models is close to observational data are irrelevant because it fails to prove that the internal workings of the models are both accurate and complete.

The IPCC doesn't base its assertion of man-made warming on the output from just one model but attempts to use a consensus of models. This is nonsense because each climate model is different and at most just one model could ever be an accurate simulation of all climate factors. Any collation of the output from multiple models will therefore contain, at the very most, accurate output from one model merged with the output of a number of inaccurate models. The notion that the averaging of the results a collection of inaccurate models will somehow produce a correct or even meaningful answer is utterly farcical.

Section 9.7 of the IPCC Working Group I report concludes:

"...The consistency across different lines of evidence makes a strong case for a significant human influence on observed warming at the surface. The observed rates of surface temperature and ocean heat content change are consistent with the understanding of the likely range of climate sensitivity and net climate forcings. Only with a net positive forcing,

consistent with observational and model estimates of the likely net forcing of the climate system ... is it possible to explain the large increase in heat content of the climate system that has been observed."

Not one sentence in this extract is supported by any incontrovertible evidence. The consistency across different lines of evidence is nothing more than evidence of *some* warming, but whether it is a sustained upward step in temperature or a continuous increase is not clear. The IPCC acknowledges that climate factors are poorly understood but conveniently forgets this when making assertions about understanding, estimating and modelling. Even then a "net positive forcing" (i.e. warming) is not irrefutable evidence of a human influence but only that heat from some source has been added to the climate system, assuming of course that the temperature data is accurate.

Confidence in the IPCC's claims should be zero

Three of the IPCC's four pillars of evidence rest on uncertain temperature and climate models that are based on incomplete knowledge. The fourth, that the temperature increase cannot be explained by internal variability or heat moving from one climate component to another, assumes that the temperature data is correct and that factors described as "internal variables" are well understood.

It is true that anecdotal evidence of glacier and sea ice retraction is indicative of warming but these have happened in the past without human influence and in some cases what we see now started in the nineteenth century, so to attribute these to recent human activities is both to ignore historical climatic influences and to act prematurely while so much remains unknown about climate.

The IPCC's claim of a 90% to 95% probability of human influence is more than just wishful thinking; it is selective bias that ignores the uncertainty of the data and the low level of climate knowledge on which the claim rests.

Perhaps the situation is best expressed by using percentage probabilities as the IPCC have done. A reasonable estimate of the probability that the unverified surface temperatures are correct is 20% and that's based on the notion that corruption of the record just might balance and have no net effect. The probability that the climate system's energy distribution is thoroughly understood seems to be less again and we have a probability of around 0% that climate models are accurate despite the acknowledged lack of knowledge.

Given the doubts over the quality of the temperature record I am not sure that the IPCC has even proven any recent increase in temperatures let alone produced any credible evidence that humans are having a substantial impact on temperature.
