



SCC Publishing  
Michelets vei 8 B  
1366 Lysaker Norway

ISSN: 2703-9072

Correspondence:

bobbi\_john@jfcbat.  
com

Vol. 6.4 (2026)

pp. 1-62

# Global Warming, Climate Change, and Scientific Consensus have not been Proven: There is no Proven Climate Crisis!

## A Quantitative Audit Exposes Fraudulent Pseudoscience and Fudging of the IPCC's Earth's Energy Imbalance

John F. Clauser

Retired experimental and theoretical physicist, 2022 Physics Nobel Laureate  
817 Hawthorne Drive, Walnut Creek, CA 94596, USA

### Abstract

The United Nations Intergovernmental Panel on Climate Change (IPCC), along with its various collaborators and contributors (IPCC *et al.*), forecast an impending climate crisis with catastrophic consequences for the Earth's population. They predict an alarming increase in the frequency of dangerous extreme weather events and other bad natural phenomena. This work provides a quantitative scientific review of their efforts. It is a whistleblower report that exposes serious scientific misconduct. It provides a quantitative audit of the bad arithmetic and flawed scientific methodology behind their claims regarding the Earth's Energy Imbalance (EEI), global warming, climate change, and an impending "climate change crisis". It shows exactly where their claims amount to quantitatively fraudulent bad science. This work exposes a subtle but critical design flaw of the CERES Terra and Aqua workhorse satellites. The flaw's existence was admittedly known by IPCC *et al.* scientists, and the herein exposed data fudges were used to cover up the flaw. Seriously flawed and fudged pseudoscience was then employed in a massive futile attempt to bolster the original global warming crisis prediction using fudged ocean-temperature-anomaly data. This work also shows that Al Gore's alarmist claim of a "scientific consensus" alleging a proven impending climate change crisis is a total fantasy. Independent climate scientists at 20 different laboratories worldwide used the CMIP5 computer code to perform climate simulations using 43 different climate simulation models. There is vast quantitative disagreement among their variously assumed climate simulation parameters, their calculated predictions and observations. There are also errors clearly evident in the code's assumed physics. This paper's demonstrated conclusion is, that contrary to claims by the IPCC *et al.*, a positive energy imbalance, global warming and climate change have not been proven! There is no proven climate crisis! The world is correspondingly wasting trillions of dollars by attempting to limit the use of fossil fuels. *If it ain't been proved broke, don't fix it!*

**Keywords:** Global warming; climate change crisis; Earth's Energy Imbalance; IPCC, scientific fraud; scientific misconduct; pseudoscience

Submitted 2026-06-24, Accepted 2026-09-26. <https://doi.org/10.53234/scc202612/02>

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## **References**

## 1. Introduction

The United Nations Intergovernmental Panel on Climate Change (IPCC), along with its various collaborators and contributors (IPCC *et al.*), forecast an impending climate crisis with catastrophic consequences for the Earth's population. They predict an alarming increase in the frequency of dangerous extreme weather events and other bad natural phenomena. This work provides a quantitative scientific review of their efforts. *It is a whistle-blower report that exposes serious scientific misconduct.* It provides a quantitative audit of the IPCC *et al.*'s bad arithmetic and scientific methodology regarding their claims of the Earth's Energy Imbalance (EEI), global warming, climate change, and an impending "climate-change crisis". It shows that their claims amount to quantitatively fraudulent bad science.

Importantly, it exposes a subtle but critical flaw in the design of the workhorse CERES Terra and Aqua satellites. The satellites were effectively totally blind to specular reflection of sunlight from the ocean surface – sun glare! After a decade of observation, the satellites yielded a ridiculous result that was obviously flawed. The result was an "*Aw [expletive]! What do we do now?*" moment in 2009-2010. Details of the quandary thus posed are described in detail by Hansen *et al.* (2011), although the cause of the flaw was not clearly identified by them. The flaw was in the choice of using a MODIS line-scan camera rather than using a panoramically viewing pyranometer to measure the Earth's outgoing-radiation power. The scan-line is not parallel to the sun-glare's directional reflection-stripe! To cover up the flaw, the satellite data were literally overwritten with data from a seriously flawed study of ocean-temperature-anomaly rate-of-increase measurements, that, in turn, was badly and fatally skewed by the inclusion of time-varying Southern-Ocean-fraction composition and by erroneous fabricated anomaly-offset corrections. Many data fudges were needed for the satellite-flaw's cover up. The data fudges and incriminating evidence are all published and hiding in plain sight. The fraudulent assertions are fully documented herein by simply identifying and displaying the flawed published arithmetic and methodology. This paper shows exactly where to find the fudges for fact checking.

*Conclusion: Global warming and climate change have not been proven. There is no proven crisis. The world is wasting trillions of dollars by attempting to limit the extraction and use of fossil fuels.*

### 1.1 The IPCC *et al.*'s plausible causal chain

The IPCC *et al.* start by assuming a highly plausible climate-change model that consists of a causal linked chain. 1. Extraction and consumption of fossil fuels is assumed to cause increasing atmospheric CO<sub>2</sub>. Increasing CO<sub>2</sub> is actually observed via the Keeling curve from Mauna Loa. 2. Increasing CO<sub>2</sub> is assumed to cause a positive Earth's Energy Imbalance (EEI). Said positive energy imbalance is claimed to be observed via satellite and rising ocean heat-content "anomaly" observations. 3. A positive Earth's Energy Imbalance, if present, is expected to cause global warming. Global warming is claimed to be observed, based on observations of a rising global average "temperature anomaly", almost all of which is irregularly and sparsely recorded almost exclusively in urban land areas. 4. Global warming is assumed to cause climate change. Said change is claimed to be observed as an increasing frequency of extreme weather events. An increasing frequency of extreme weather events is claimed to be well documented by NOAA's historical weather data. 5. The claimed observed increasing frequency of extreme weather events then forebodes a predicted climate crisis and other bad stuff.

Break any one link of this chain, however, and the whole chain collapses.

Increasing atmospheric CO<sub>2</sub>, is clearly observed via the Keeling curve. That observation is probably the only good science in the whole chain. Extraction and use of fossil fuels are claimed by the IPCC *et al.* to cause the observed increase of the atmospheric greenhouse gas, CO<sub>2</sub>. While the associated linked observation may indeed be valid, it doesn't really matter, because the chain thereafter is herein proven to be false. The IPCC *et al.* assume all links to be true but never actually prove them to be true with observational data. This work breaks the remaining links, by requiring

observational proof of the claimed links, and by demonstrating that computer modelling, by itself, provides insufficient proof.

The IPCC and its contributors were tasked with determining the Earth's climactic parameters and ascertaining the magnitude of the threat that its predicted warming has to society. To accomplish these tasks, they used computer modelling and observational data from satellites, ocean bathymetry, and a global network of surface radiation and temperature measurements to determine important parameters for the Earth's climate. From these calculations and measurements, they have attempted to determine the so-called Earth's Energy Imbalance (EEI), along with other climatic parameters, including the Earth's associated global average surface-temperature history, and the Earth's natural power-balance feedback-stability strength.

### *1.2 Purpose*

It is the purpose of this paper to show that, contrary to claims by the IPCC *et al.*, global warming and climate change have not been proven, and that there is no proven climate crisis. Importantly, this work exposes a subtle but critical design flaw of the CERES Terra and Aqua workhorse satellites. The satellites were effectively blind to specular reflection – sun glare – reflected from the ocean surface. The flaw's existence was admittedly known by IPCC *et al.* scientists. *Herein exposed data fudges were then used to cover up the flaw, once it was recognized. Seriously flawed pseudoscience and fudged data are then employed in a massive attempt to bolster the original global-warming crisis prediction using fudged ocean-temperature-anomaly data.*

Unfortunately, with missing crucial satellite data, the IPCC *et al.*'s remaining assembled data, as referenced in the IPCC's Sixth Assessment Report (2021), are woefully insufficient to prove the existence of global warming. Neither do remaining data prove a positive Earth's Energy Imbalance (EEI), nor do they prove climate change. Available data clearly do not prove an impending "climate change crisis". Importantly, the tabulated audited EEI data, shown in Section 9.1 of this work, are shown to be mostly fudged. Moreover, Section 9.2 shows that when these fudged data are restored to their original un-fudged values, there is no evident proven energy imbalance, no proven global warming, and hence no proven climate change. *To the contrary, all available observational data are fully consistent with no energy imbalance and no global warming.*

Additionally, this work also shows that Al Gore's alarmist claim of a "scientific consensus" alleging a proven impending climate-change crisis is a total fantasy. Independent climate scientists at 20 different laboratories worldwide used the CMIP5 computer code to perform climate simulations using 43 different climate simulation models. There is vast *quantitative* disagreement among their variously assumed climate simulation parameters and their calculated predictions. Huge disagreement is both with each other and with observational data. Worse yet, the CMIP5 code, itself, is shown in Sections 8.2 – 8.6 to exhibit bad physics. It is totally incapable of simulating even closely, the observed Earth's temperature anomaly history, let alone its observed annually oscillating albedo history. Despite these huge discrepancies, the various simulation results all suspiciously concur on an extremely precise value for their "best-guess" EEI value.

The paper's demonstrated overall conclusion is that contrary to claims by the IPCC *et al.*, global warming and climate change have not been proven, and there is no proven climate crisis! Indeed, the half-century-long IPCC program has shown itself to be dishonest and incapable of demonstrating any such proof. The world is correspondingly wasting trillions of dollars by attempting to limit the extraction and use of fossil fuels. *If it ain't been proved broke, don't fix it!*

### *1.3 Foreword*

In what follows, Section 2 first dispatches NOAA's claims that there is an observed increasing frequency of extreme weather events. Those claims are demonstrated to be false. Section 3 provides some needed important preliminary comments along with a more detailed introduction to the IPCC program. First, it asks and answers the basic question - What is needed scientifically to define global annual average temperature and global warming? It shows that measurements of

global temperature for use as a global warming metric are impossible, let alone totally impractical. It also gives a highly critical discussion of the IPCC *et al.*'s repeated use of and reliance upon so-called "anomaly measurements", particularly the various measurements of temperature anomalies, and especially of ocean temperature anomalies. Fortunately, given that a better global warming metric is clearly needed for scientific purposes, one was actually adopted by the IPCC *et al.* That metric is the Earth's Energy Imbalance, or EEI. Unfortunately, it is not always used by much of the work done by the IPCC *et al.* Section 3 ends with a clarification of some standard scientific terminology and conventions. It also translates some IPCC *et al.* jargon that is frequently confusing, misleading, vague, and/or pedantic.

Section 4 provides detailed definitions of "net global power/energy imbalance" or Earth's Energy Imbalance (EEI). It shows how the use of assumed conservation of energy, the continuity equation, and energy flow through a Gaussian surface is applied to measurements of the Earth's energy flow at the Top-of-Atmosphere to and from outer space. It shows how EEI is calculated and conventionally reported (and frequently misreported) using power-flow diagrams. Unfortunately, the same arguments do not work for power-flows measured at the Bottom-of-Atmosphere that use only Gaussian-surface segments.

Section 5 describes the satellite-data collection program. The original program to measure EEI was to use satellite observation of energy flow at the so-called Top-of-Atmosphere. Initial data from the ERBE satellite gave promising results for that pursuit. Unfortunately, after many years of observation using the Terra and Aqua satellites, their data are found to be insufficiently accurate to determine EEI so as to prove or disprove the global-warming hypothesis. Actually, they measured a hugely positive value for EEI, which is obviously very wrong! While the random errors were small enough, the problem was traced to a systematic flaw in the design of Terra and Aqua. The satellites were effectively blind to specular reflection of sunlight from the ocean surface – sun glare – that is radiated back out into space!

The program's dark side began when the TOA satellite data were finally recognized to be incapable of proving the existence (or non-existence) of global warming. That recognition precipitated the 2009-2010 "*Aw [expletive]! What do we do now?*" moment. Hansen *et al.* (2011) and Loeb *et al.* (2009) in turn proposed the use of ocean-temperature-anomaly data as a weak substitute for the missing satellite data. To cover up the flaw, the satellite data were literally overwritten with data from a seriously flawed study of ocean temperature anomaly rate-of-increase measurements, that, in turn, was badly fatally skewed by its inclusion of time-varying Southern-Ocean-fraction composition, and by erroneous fabricated anomaly-offset corrections. The time-derivative of the results was fatally flawed because of this added extraneous time dependence.

Working definitions of the words fudge, "*constraint*", and scientific misconduct, are given in Section 6. Section 7 then describes the fudging of ocean temperature anomaly data via its presentation as fudged ocean-heat-content anomaly data, all taken at the Bottom-of-Atmosphere with a highly questionable linkage to the Earth's Top-of-Atmosphere Energy Imbalance. The fudged results then form the basis for the IPCC's Fifth Assessment Report, AR5 (2013). Section 8 details the progressively massive data fudging used in the progression from AR5 (2013) to the IPCC's Sixth Assessment Report, AR6 (2021).

Reporting data that is measured at Bottom-of-Atmosphere and claiming without proof that it is the same as Top-of-Atmosphere data, as is done by Loeb *et al.* (2012) (see Sect. 7.4), and then overwriting the Top-of-Atmosphere data in the EBAF satellite public database with different data values chosen to match data that is measured at Bottom-of-Atmosphere, as is done by Loeb *et al.* (2018) (see Sect. 8.9), clearly qualifies as a "*bait-and-switch*" hoax!

Section 9 summarizes just how badly the IPCC *et al.*'s books have been cooked. It first tabulates the results of this work's audit of published EEI values. It goes on to show how the resulting conclusions regarding global warming are actually reversed when corrected values are used instead. It proceeds to list details of the various dishonest fudging methods that were employed. Finally, it provides a summary listing of six cases of scientific misconduct that are exposed by

this work. The paper's conclusions are given in Section 10.

A second forthcoming paper addresses the net result of these data fudges. It shows that because of these fudges the IPCC *et al.* have clearly misidentified the dominant process that controls the Earth's climate. They have ignored the big numbers of the problem and focused on the small numbers that are associated with rising atmospheric CO<sub>2</sub> concentration. That paper shows that the actual dominant process is the cloud-variation-thermostatic feedback mechanism. The process provides a highly stable atmosphere and temperature, and it fully cancels the negligible destabilizing effects of CO<sub>2</sub>. It also shows confirmatory experimental evidence for this process and shows that it is fully consistent with existing observational data.

## 2. NOAA's False Claim to have Actually Observed an Increased Frequency of Extreme Weather Events

The easiest link in the IPCC *et al.*'s causal chain to break is NOAA's false claim to have actually observed an increased frequency of extreme weather events. Jane Lubchenco, Undersecretary for Oceans and Atmosphere at the US Dept. of Commerce, NOAA administrator, and Thomas Karl, Director of NOAA's Climatic Data Center and chair of the US Global Change Program, authored an important article in 2012 *Physics Today*, purporting to prove the link. It is titled "*Predicting and Managing Extreme Weather Events – Earth's climate is warming, and destructive weather is growing more prevalent. Coping with the changes will require collaborative science, forward-thinking policy, and an informed public.*" A copy of its first page is shown here in Fig. 1.



Figure 1: First page of the 2012 *Physics Today* article by Lubchenco and Karl – Predicting and managing extreme weather events.

The article asserts that there is an increase in the extreme weather event frequency that is associated with climate change, mostly occurring in the three decades ending in 2012. It presents data in its Fig. 2a displaying NOAA's Weather and Climate Extremes Index. That figure is reproduced here and shown in Fig. 2. The index is NOAA's numerical composite measure of the frequency of so-called extreme weather events, including droughts, floods, heatwaves, cold-spells, land-falling hurricanes, etc. EF3+ tornado frequency is conspicuously absent from their list, probably because its frequency was actually decreasing. (See Koonin (2021), pp. 124 - 125).

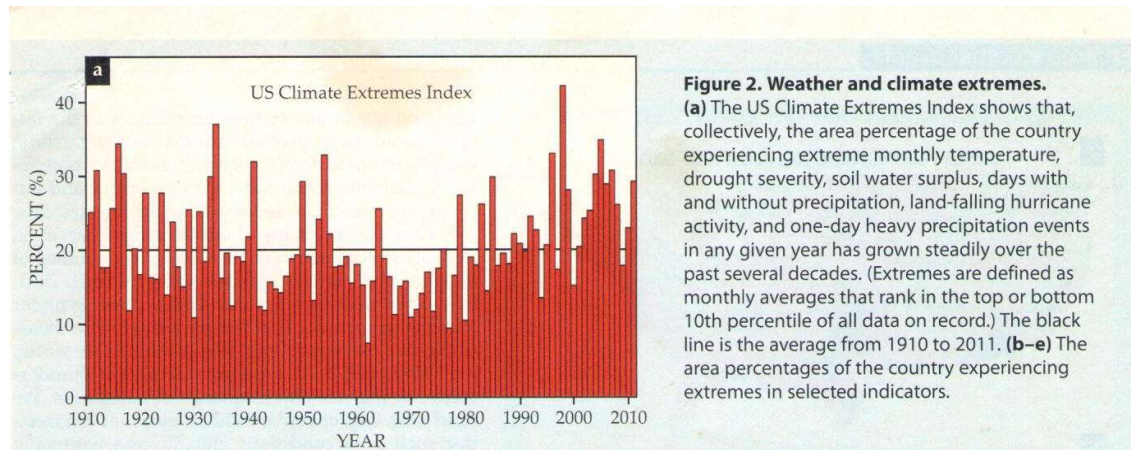


*Figure 2: Lubchenco and Karl's Fig. 2a.*

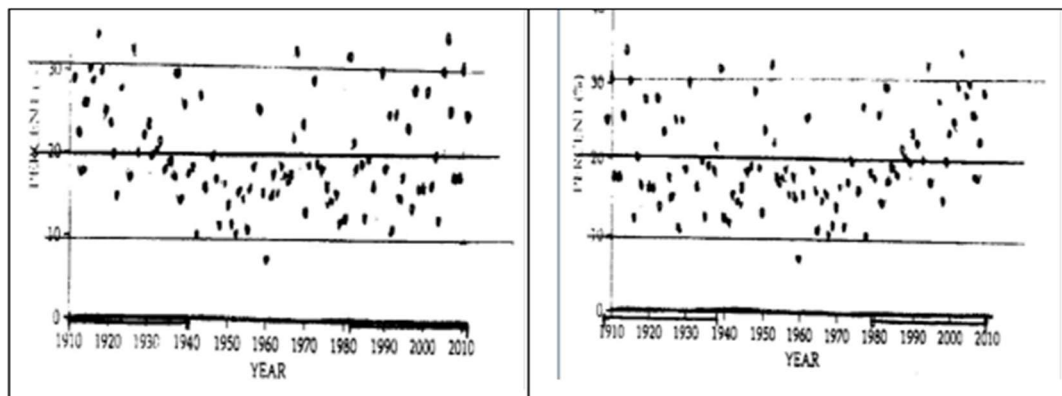


*Figure 3: Point-plot copies traced directly from Lubchenco and Karl's Fig. 2a, except that one of them is left-to-right reversed. Can you tell which one is right, and which one is backward? Are you willing to wager many trillions of dollars that your answer is correct?*

It would be expected that individuals with the ranks held by Lubchenco and Karl have available to themselves the best NOAA data possible from which to construct their climate extremes index. They assert that this index has “*obviously*” grown steadily over the last three decades. I disagree and assert that it actually disproves their own assertion. Figure 3 shows those same data values plotted twice. The points are traced directly from Lubchenco and Karl's Fig. 2a.<sup>1</sup> The two graphs in Fig. 3 are identical, except that one is plotted as a mirror image of the other. It is left-to-right reversed, i.e. backwards with time increasing to the left. I assert that if you can't immediately tell which one of these graphs is correctly plotted and matches the one on Fig. 2, and which one is its time-backwards mirror image, then their claimed recent “obvious” increase in extreme weather-

<sup>1</sup> I do admit that I deleted one extreme outlier point in the first three decades, and one in the last three decades that were both distracting.

event frequency is obviously not indicated by their data, as they claim. I wager that you cannot! Their claim is thus false! Are you really confidently willing to bet trillions of dollars that you can tell which one is correct? *These are the data that NOAA offers that portend the impending apocalypse. I assert that if you can't tell the difference, then the conclusion drawn by Lubchenco and Karl is fraudulent pseudoscience. At the very least, it is incompetent science.*

### **3. Preliminaries**

#### *3.1 What is needed to define global annual average temperature and global warming scientifically?*

Before proceeding further, a few preliminary clarifications are needed. One very basic question to ask is - What is needed scientifically to define global annual average temperature and global warming carefully and unambiguously? That question is rephrased here as the related question - Why is the Earth's Energy Imbalance (EEI) *now* used as a metric to define global warming, rather than the formerly used metric "temperature anomaly"? This question is best answered by breaking it down further into two even more basic questions: Question 1: What is wrong with using the former metric average global temperature as a global warming metric? Question 2: What is wrong with using so-called "anomalies", of any climate parameter, for that matter, as metrics?

#### *3.2 What is wrong with using average global temperature as a global-warming metric?*

The name, itself, "*global warming*" suggests that the Earth's global annual average temperature is slowly and consistently rising, and that it needs monitoring. Unfortunately, both from a scientific and a practical point of view, the Earth's global annual average temperature is quantitatively very difficult to define. Once defined, it is then much harder to measure, because it fluctuates very strongly, both spatially and temporally. Also, any practical definition of global warming and average temperature should use parameters that are actually capable of being measured. To measure the global average temperature properly (as per the Shannon and Nyquist sampling theorems), one must measure the actual temperature (not its so-called anomaly) on a dense set of grid points that covers the whole Earth's surface. The Earth is a very big place. Its surface area is 510 million km<sup>2</sup>. To meet the Shannon and Nyquist requirements, measurement stations need to be spaced minimally about 1 km apart on a grid that fully covers the Earth. To do so then requires temperature measurements to be made using an array of recording thermometers located on about 510 million grid points. That's a lot of recording thermometers! That's impossible - they don't exist.

In addition to the grid's spatial requirements, there are also important temporal requirements. The atmosphere's three biggest obvious temporal variations are its day-night cycle, its seasonal cycles, and its weekly, daily, and even hourly weather variations. The temperature (and every other climatic parameter, for that matter) at every point on the Earth's surface clearly varies strongly from one moment to the next, typically minimally on an hourly basis. To be correctly averaged, each of the 510 million thermometers correspondingly needs to record the temperature, minimally at least once per hour. That is also impossible!

Unfortunately, there are woefully insufficient observational surface temperature data from weather stations and buoys. The existing measurement capabilities of temperature are nowhere even close to the Shannon/Nyquist requirements. Figure 4 shows the GISTEMP map of actually available temperature measurement stations for 1971-2000. Note that the overwhelming number of measurement stations are on land, which occupies *only* 29 % of the Earth's surface. Moreover, most of the land-based stations are located in urban environments and suffer from the so-called "urban heat-island effect". (Urban concrete jungles are generally hotter places than are mountains, forests, oceans, etc.) On the other hand, note that oceans occupy 71 % of the Earth's surface. Correspondingly, note the nearly vanishing number of stations on the oceans. Any conceivable "grid" using these stations will clearly grossly under-sample temperature data, and misrepresent the desired global average temperature, especially on the oceans.

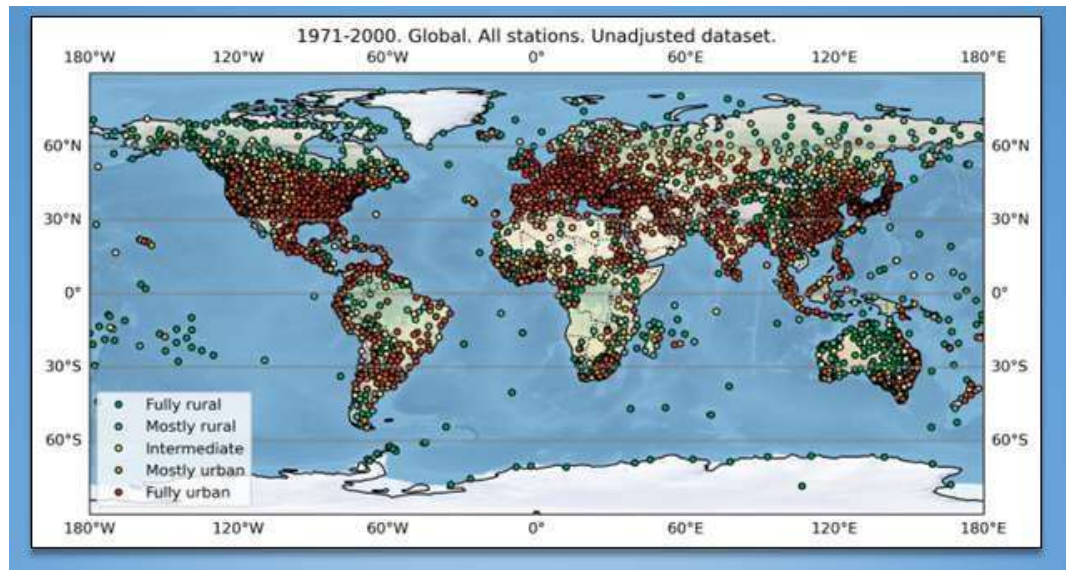


Figure 4: GISTEMP map of available temperature measurement stations for 1971-2000.

### 3.3 What is an “anomaly”, and what is wrong with the use of “anomalies” as scientific metrics?

Commonly, “anomalies” of atmospheric quantities, rather than the actual values of those quantities, are reported by the IPCC *et al.* Question: What is an “anomaly”, and what is wrong with the use of anomalies as a scientific metric? Answer: A quantity’s “anomaly” is its change over time with respect to some previously recorded, and/or previously arbitrarily defined zero-reference value or set of values. The anomaly’s subtracted value *offsets* it from that reference value. However, without a detailed knowledge of the subtracted-offset reference value, the anomaly’s absolute value is effectively meaningless and useless to subsequent workers. Its use as a metric that reports *only* the measurements of an anomaly is defended as a means for averaging natural seasonal variations of a quantity. However, that defense is silly. Assuming that these averages, both temporal and spatial, are *correctly* calculated, then there is no real reason that the actual average value, itself, should not be reported instead.

Another motivation for its use is that it expands the apparent variation of a quantity for dramatic effect. Unfortunately, it is used in a misleading fashion. Journalists and economists frequently do the same thing by plotting actual values using a suppressed zero y-axis scale. But an honest use of a suppressed-zero plot does not hide the quantity’s actual value. For claimed “scientific” reports in claimed “scientific” journals, it is only reasonable to demand that the IPCC *et al.* climate scientists adopt standards that are at least as honest and precise as those of journalists. Better still, they should adopt standard scientific rigor.

Importantly, the use of anomalies has at least two huge dishonest flaws. First, their use generally also hides the fact that there is no specified or standardized method for measuring a given atmospheric quantity, like temperature. The “hiding” problem is particularly acute with ocean-heat-content anomaly data, where the “anomaly-suffix” is frequently dropped by downstream users. In actuality, different investigators use different methods and different reference values. They all correspondingly get different histories. Which one is trustworthy? Who knows? Indeed, in most cases there is no standardized method for measuring how, where, and when data are taken. For example, the use of “temperature anomaly” does not specify the altitude or other associated parameters where the temperature data are measured – e.g. at the Earth’s surface, or Top-of-Atmosphere, or Bottom-of-Atmosphere.

One wonders why the IPCC *et al.* appear to have a fetish for the use of anomalies to hide actual data values. Are ocean-temperature data classified submarine-war secrets? (See Appendix G.)

Secondly and scandalously, anomalies are frequently misused with no reference offset value ever being given in an IPCC report to identify the data value for which the plotted anomaly value equals zero. Indeed, the unspecified offset value is needed to allow the reader to determine the actual temperature history. Very importantly, it is also needed to link and compare one report to another. Subsequent investigators must guess (fabricate) the subtracted offset to perform the linkage. Note that interpolation and/or extrapolation is a form of data fabrication, especially if it is done to fill wide data gaps. This problem was indeed prominent in the patching together of various XBT datasets performed by Lyman *et al.* (2010). Here, the reference values are from so-called “*climatologies*”, which are only models. Authors sometimes simply say that the mean value has been subtracted and never report what that subtracted value is. Some other authors subtract the history’s starting-point value rather than its average value. Do all reports subtract the same reference value? No! It is correspondingly impossible to combine sequential short records accurately to create a much longer more complete history. As a result, reports by different measuring groups differ in absolute value by highly significant unknown constant offsets.

It will be seen that poor recording and/or reporting of subtracted-offset values has very serious consequences. This malady is characteristic of the various datasets patched together for ocean-temperature-anomaly data, each with an evidently unrecorded anomaly offset that were compiled by Lyman *et al.* (2010) and by Lyman and Johnson (2008). Scandalously, Lyman *et al.* (2010) then claim to infer critically important meaning to the difference between associated data subtracted offsets of sequentially acquired XBT and ARGO data. Unknown offset values were simply fabricated. For atmospheric temperature anomalies, the missing temperature reference value, along with the missing *associated altitude* reference value, prevents the reader from applying the Stephen-Boltzmann law to calculate the average thermal radiant heat emission.

*All of this sloppiness is simply bad science.* Because of the above flaws, the reported values of temperature anomaly, or of any anomaly for that matter, are effectively useless to the reader and also impossible to audit. The IPCC *et al.*’s repeatedly reporting *only* anomalies, in general, is simply bad science! Doing so hides errors in the reported values of any quantity by showing only undefined “anomaly” values, and not the actual values.

### *3.4 A better global warming metric is clearly needed for scientific purposes. One is actually adopted – EEI.*

Many investigators and governing bodies still quote increasing “*temperature anomaly*” as a primary indicator of global warming. For example, the Paris Climate Agreement evidently constrains increased predicted temperature anomaly, which tacitly *also assumes* that the IPCC *et al.*’s predictions are *fully* reliable. They are not! The IPCC’s Fifth Assessment Report AR5 (2013) reports include a graph versus time of predicted “*temperature anomaly*”. (See Sect. 8.4.) A better and more careful single definition of global warming is clearly needed for scientific purposes. One was adopted. The IPCC’s Sixth Assessment Report AR6 (2021) instead relies on values for the Earth’s Energy Imbalance (EEI). *One immediate improvement in the use of EEI is that it requires that an actual value be reported, instead of an anomaly!* Its value and estimated measurement uncertainty are now necessarily displayed prominently on the IPCC Assessment Report’s power-flow diagram. Another huge improvement is that this reported value is now capable of being audited!

Although acceptance of the new definition sees less than full use among all investigators, a very recent confirmation of the UN’s acceptance of this new definition of global warming occurred on March 23, 2026. UN Secretary-General António Guterres declared a climate emergency, citing the WMO’s finding that Earth’s Energy Imbalance—the gap between absorbed and released heat—has hit a record high, accelerating climate chaos.

*A positive measured Top-of-Atmosphere Earth’s Energy Imbalance, or “positive EEI”, is now the generally agreed upon single definition of global warming. Thus, NO proven positive TOA EEI then means NO proven global warming!*

Given that EEI is much easier and cheaper to measure by satellites than by surface stations, especially over oceans, satellite measurements of EEI are highly preferred. Indeed, satellite measurements are mandatory. Only satellites are anywhere near capable of meeting the *daunting* Shannon/Nyquist data-sampling requirements that are imposed by the Earth's large size. Also, given that satellites measure values looking down at the Earth, Top-of-Atmosphere (TOA) is chosen as the reference altitude for EEI measurements. Furthermore, given that the atmosphere is totally opaque to far-infrared (LW) radiation because of CO<sub>2</sub> and H<sub>2</sub>O absorption-band spectra, it is the Top-of-Atmosphere's temperature that determines the LW heat radiation intensity emitted into outer space, *and this intensity can only be measured by satellites*.

It was also tacitly agreed (but never publicly announced) that the accuracy with which EEI must be measured is to within  $\pm 0.1 \text{ W/m}^2$ . Remember that number. It is the generally accepted threshold in rigorous science that is required for acceptance of an important discovery. (See Appendix A for a set of standards.) In what follows, it will very soon become evident that a careful examination of numbers reveals massive fudging of EEI data.

### *3.5 Some IPCC et al. standard scientific usage and conventions*

IPCC *et al.* reports use MKS units. Energy is measured in Joules. Note that power is energy flow rate. It is measured in Watts. One Watt equals one Joule per second. Power *flux* is the average energy-flow rate per unit of Earth's *total* surface area. The Earth's surface is four times its frontal area (as viewed by the sun). Power *flux* is measured in  $\text{W/m}^2$ . By convention it is the daily (daytime + nighttime) average power-flow rate to and from the Earth.

### *3.6 Some IPCC et al. pedantic jargon*

The IPCC *et al.* use jargon that is frequently confusing, misleading, vague, and/or pedantic. The IPCC *et al.* call *sunlight*, including its near-infrared and UV components, *Short-Wave (SW) radiation*. The IPCC *et al.* call *far-infrared thermal-heat radiation*, *Long-Wave (LW) radiation*. There is no overlap in the spectra of SW and LW radiation. EEI  $\equiv$  "Earth's Energy Imbalance", really means "Earth's average power-flux imbalance".

Top-of-Atmosphere Earth's Energy Imbalance is ideally supposed to mean the power-flux imbalance that is *actually measured* at the Top of the Earth's atmosphere. Unfortunately, the actual specific altitude for TOA is never actually carefully defined, nor are the altitudes of the important atmospheric processes. Indeed, most power-flow diagrams are extremely sloppy in specifying the altitudes of atmospheric processes. (See Appendix B.) Also unfortunately, the IPCC *et al.* frequently totally ignore the *Top-of-Atmosphere* and *actually-measured* requirements for EEI component values. Curiously, Hansen *et al.* (2011)'s alternative recommended substitute for "Top-of-Atmosphere Earth's Energy Imbalance" satellite measurements is the temporally-increasing ocean heat-content anomaly", as measured (and/or modelled) via temporally-increasing ocean-temperature anomalies. *It is measured at the Bottom-of-Atmosphere, and not at the Top-of-Atmosphere, but this discrepancy is ignored!* Via the use of the Hansen *et al.* (2011) substitute, ocean heat-content anomalies (OHCA) then dishonestly masquerade as TOA EEI data.

Wild *et al.* (2015, 2019) also misleadingly redefine the word "*bias*" to mean a discrepancy between computer-simulated data values and observational values (as in, "*Don't 'bias' my opinion by confusing me with clearly observed facts.*")

## **4. The Earth's Energy Imbalance**

### *4.1 What is meant by Earth's Energy Imbalance (EEI)?*

The "Earth's Energy Imbalance" (EEI) is the net global power-flow imbalance, specifically defined as the net energy-flow-rate imbalance at the top of the Earth's atmosphere. Positive EEI consists simply of more power coming into the Earth in the form of incident (SW) sunlight than

there is power going out via reflected (SW) sunlight and via radiated (LW) far-infrared heat. The difference between input and output total average powers is the Earth's net power-flux (Energy) imbalance, or EEI.

#### *4.2 Conservation of energy, the continuity equation, and energy flow through a Gaussian surface*

One of the most important laws of physics is the law for fluid-like flow of a conserved quantity, like energy. Conserved energy-flow is expressed mathematically by the continuity equation (a consequence of Gauss's divergence theorem from vector analysis). Suppose that you have a closed surface (e.g. a sphere) that completely surrounds an interior volume. The surface is called a "Gaussian surface". Suppose that there is a flow of some quantity (like energy) passing anywhere and everywhere through the surface, simultaneously into and out-from the interior volume. The continuity equation and conservation of energy specify that, if there is more energy that is flowing IN through the Gaussian surface than is flowing OUT through the surface, then the result is a net buildup of energy inside the surface. Additionally, Boltzmann's relation states, temperature is proportional to thermal-energy-content / k, where k is Boltzmann's constant ( $1.38 \times 10^{-23}$  Joule/K). Conservation of energy and Boltzmann's relation together imply that more energy flowing IN than is flowing OUT through the Gaussian surface results in a net buildup of thermal energy inside the surface, and a corresponding increasing average temperature inside the surface, i.e. "warming".

#### *4.3 Application of the continuity equation to the Earth's energy flow to and from outer space*

By convention, the needed Gaussian surface appropriate for satellite observations of power flow to and from the Earth is a sphere at the (so-called) Top-of-Atmosphere altitude. A Top-of-Atmosphere Gaussian surface works very nicely for measuring, calculating, and demonstrating EEI, because it has only three energy flows crossing it – incident sunlight (SWIN), reflected sunlight (SWOUT), and thermal radiant heat (LWOUT). All three are measurable using satellites. Unfortunately, a Bottom-of-Atmosphere" Gaussian surface does not exist.

#### *4.4 Ramanathan (1987) published the first power-flow diagram using satellite data*

The IPCC *et al.* report and depict power flows through the Earth's TOA Gaussian surface using power-flow diagrams. The first one of these was published by Ramanathan (1987). It is shown here in Fig. 5.

Note the spherical Gaussian surface at the Top-of-Atmosphere. It has only three power flows crossing it – incident sunlight (SWIN) flowing in, reflected and/or back-scattered sunlight (SWOUT) flowing out, and thermal radiant heat (LWOUT) flowing out. These three quantities allow the (signed) summation of the Earth's Energy Imbalance displayed by the diagram:  $EEI = SWIN - SWOUT - LWOUT = 343 - 106 - 237 = 0$ . These quantities also allow the calculation of the Earth's albedo (sunlight reflectivity fraction):  $SWOUT/SWIN = 0.31$ .

Ramanathan (1987) was also first to divide the whole sky into two parts – clear-sky and cloudy-sky - for his analysis of the atmosphere. Separate power-flow diagrams are now routinely given for each partition. King *et al.* (2013) subsequently discovered surprisingly large differences in cloud-cover fraction between land (54 %) and ocean (76 %) by using land-ocean partitioning. Wild *et al.* (2015)'s set of power-flow diagrams used land-ocean partitioning for their first EEI analysis. Wild *et al.* (2019), in their second EEI analysis, used power-flow diagrams that reverted to Ramanathan's partitioning into separate independent clear-sky and cloudy-sky diagrams.

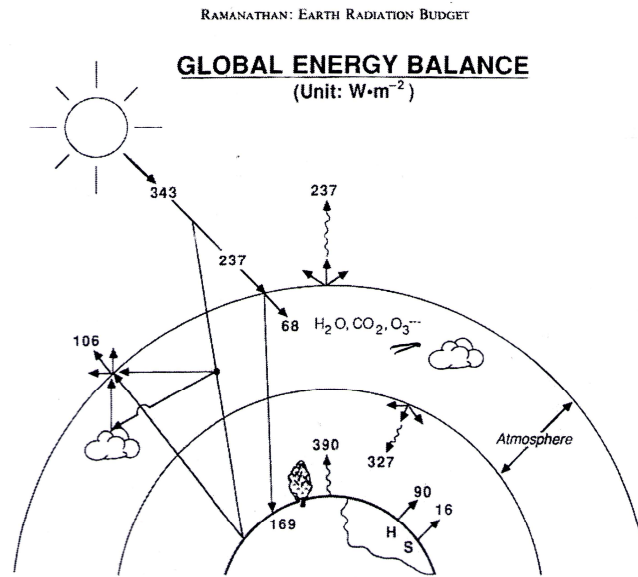


Figure 5: Ramanathan (1987)'s power-flow diagram.

#### 4.5 The Top-of-Atmosphere (TOA) power-imbalance arithmetic is simple

Given only three components the TOA – EEI power-imbalance arithmetic is not only simple, it is also very easy to audit, once that you locate the three numbers needed. An arithmetic-check then only has four lines. Given trustworthy *measured* Top-of-Atmosphere values of SWIN, SWOUT, and LWOUT, a typical power-flux imbalance calculation proceeds as follows:

Table 1: Sample power-flux imbalance calculation (All units  $\text{W}/\text{m}^2$ )

|                                                          |                                      |
|----------------------------------------------------------|--------------------------------------|
| SWIN: Incident Short-Wave sunlight power flux            | $+340 \pm \sigma_{\text{SWIN}}$      |
| SWOUT: Outgoing Short-Wave reflected-sunlight power flux | $-100 \pm \sigma_{\text{SWOUT}}$     |
| LWOUT: Outgoing (Long-Wave) radiant heat power flux      | $-240 \pm \sigma_{\text{LWOUT}}$     |
| EEI (summation): Net “observed” power imbalance          | $\text{EEI} \pm \sigma_{\text{EEI}}$ |

For an average of numerous measured data values,  $\sigma$  is the standard error of the mean, and the uncertainty range of the EEI sum is given by the

$$\text{RMS (root-mean-square) error-sum: } \sigma_{\text{EEI}} = (\sigma_{\text{SWIN}}^2 + \sigma_{\text{SWOUT}}^2 + \sigma_{\text{LWOUT}}^2)^{1/2}$$

An important RMS error-sum immediate cross-check is provided by three inequalities:

$$\sigma_{\text{EEI}} > \sigma_{\text{SWIN}}, \sigma_{\text{EEI}} > \sigma_{\text{SWOUT}}, \sigma_{\text{EEI}} > \sigma_{\text{LWOUT}}.$$

Is there global warming? (hypothesis test)

$$\begin{aligned} \text{NO global warming if } \text{EEI} &\leq \sigma_{\text{EEI}} * N, \\ \text{YES global warming if } \text{EEI} &> \sigma_{\text{EEI}} * N. \end{aligned}$$

See Appendix A for applicable values for  $N$ , depending on required scientific rigor.

#### 4.6 Power-flow diagrams are now routinely used to report the Top-of-Atmosphere power imbalance (EEI).

Figure 6 shows the “All sky” power-flow diagram from the IPCC’s Sixth Assessment Report, AR6 (2021, p. 934). The three power-flux numbers needed to calculate EEI are reported on the *Science of Climate Change*

<https://scienceofclimatechange.org>

diagram's top line (SWIN, SWOUT, and LWOUT). They are also shown as being appropriate to the Earth's (undefined) Top-of-Atmosphere altitude. The Earth's power imbalance, EEI, is in the lower left-hand corner next to a red arrow that depicts energy flowing into the ocean. Uncertainty-range limits on all quantities are shown in parentheses using a non-standard notation that was introduced by Wild *et al.* (2015). See Appendix D.4.

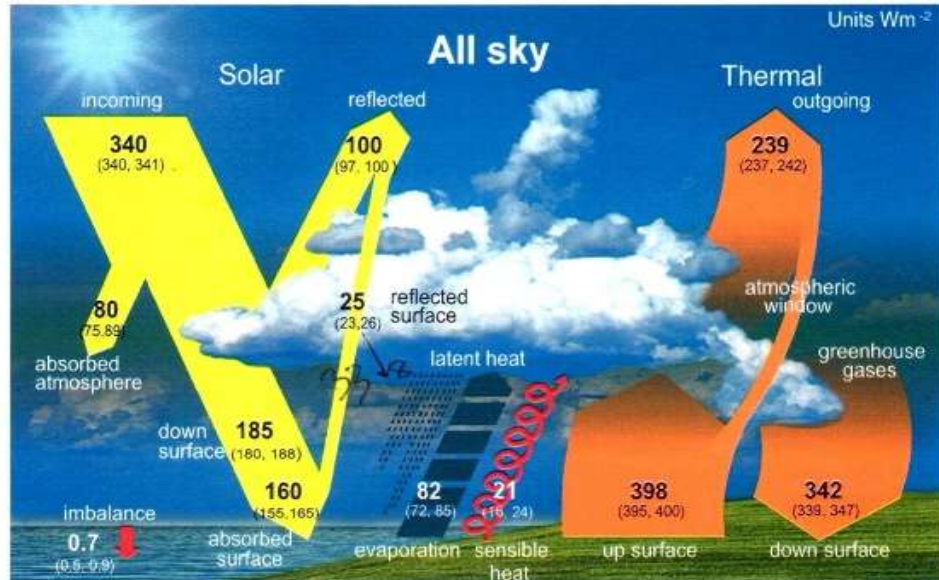


Figure 6: “All sky” power-flow diagram from the IPCC’s Sixth Assessment Report, AR6 (2021, p. 934).

Very frequently, the arithmetic used on a diagram is visibly incorrect, as it is on this one. Here, we have three (signed) whole numbers (integers) summing to a fractional (non-integer) number. The incorrect arithmetic and non-standard uncertainty range notation are discussed below in detail. That particular error is characteristic of small fudging methods that have become now standard in IPCC *et al.* documents. See Sections 9.3 and 9.4, and Appendices D.1 – D.5. The fudging of data by the IPCC *et al.* is far worse than you ever might have imagined. Also note that this diagram incorrectly specifies of the altitudes of the three most important atmospheric sunlight energy-transfer processes. Appendix B shows the correct altitudes of these processes. It also gives their magnitudes, all of which are very much larger than the comparative so-called “radiative forcing” by CO<sub>2</sub>, which is less than 2 W/m<sup>2</sup>. Rampant data fudging is typically far greater 2W/m<sup>2</sup>.

Unfortunately, power-flow diagrams rarely, if ever, show actually-measured TOA satellite data. Indeed, Table 9 of Section 9.1 shows that nearly every power-flow diagram listed there displays fraudulently bad arithmetic. Unless one carefully scrutinizes the details of the voluminous contributions of the IPCC and its various contributors, a casual reader naively assumes that the numbers published on a power-flow diagram’s top line represent actual Top-of-Atmosphere (TOA) satellite observations.<sup>2</sup> Table 9 shows that to be a very bad assumption! If one carefully reads the reporting text, it generally says what the observers actually did as a CYA note<sup>3</sup>. CYA notes are usually deeply buried. A report’s abstract and power-flow diagram’s top-line numbers frequently give results that conflict with the numbers discussed in the text. Almost always, a power-flow diagram incorrectly calculates EEI, if it shows it at all. Evidently, politically motivated editors have introduced conflicting details into the reports before publication, independently from the numerous contributing authors. These discrepancies occur commonly in publication figures and abstracts. (See GROSS Scientific misconduct #4, summarized in Section 9.5.) Often, the published numbers on power-flow diagrams are admitted in the text to be only “best guesses”. As a

<sup>2</sup> National Academies 2025 “casual” reviewers, please take note. See Appendix F.

<sup>3</sup> CYA is Generally Accepted Accounting Principles (GAAP) auditor’s jargon for “cover your ass!”

general rule of thumb, the numbers are NOT measured values. Also, there is no generally accepted scientific definition of the term “*best guess*”. In GOOD SCIENCE, “*best guesses*” are not allowed to masquerade as actually measured values.<sup>4</sup> The following (CYA) comment by Hansen *et al.* (2011, p. 13433) is particularly noteworthy, in this regard:

“... *Estimates of standard error of the observed planetary energy imbalance are necessarily partly subjective because the error is dominated by uncertainty in ocean heat gain, including imperfect instrument calibrations and the possibility of unrecognized biases. ...*”

It will become evident that virtually all so-called Top-of-Atmosphere (best-guess) data presented are data that have been fraudulently fudged! These are either satellite data that have been “*recalibrated*” and/or “*adjusted*” to agree with incorrectly analyzed ocean-heat-content anomaly data. Alternatively, they are data that have been fabricated using climate models and/or *blind-ass guesses*.

## 5. Satellite Observational Data

### 5.1 Measuring the TOA power imbalance using satellites should be simple. Shouldn't it?

How does one measure the Earth's power imbalance? The easiest, best, and only known way to get anywhere the Shannon/Nyquist requirements is to use satellite radiometry to measure the power-IN and the power-OUT and then subtract. Doing so was the early plan by Stephens *et al.* (1981) and Ramanathan (1987). Their earliest very preliminary data glimpses came from partially analyzed data for portions of only four months data from the ERBE satellite. Their results are based on only four partially analyzed months of observation by the ERBE satellite<sup>5</sup> – (Apr. 1985, July 1985, Oct. 1985, Jan. 1986). Ramanathan's partial analysis of the same four partially analyzed months of data was completed 6 years after the Stephens *et al.* (1981) report. Ramanathan's power-flow diagram is shown above in Fig. 5.

Table 2: *Top of Atmosphere net power imbalance Stephens et al. (1981) and Ramanathan (1987). All units W/m<sup>2</sup>.*

|                                      | Stephens <i>et al.</i> (1981) | Ramanathan (1987) |
|--------------------------------------|-------------------------------|-------------------|
| Incident Short-Wave power            | +344                          | +343              |
| Outgoing Short-Wave power            | -103.2                        | -106              |
| Outgoing Long-Wave power             | -234 ± 7                      | -237              |
| Correctly calculated summation EEI = | + 6.8                         | 0                 |
| The published power imbalance values | -9 ± 10                       | 0                 |

Their resulting Top of Atmosphere net power imbalance results are shown in Table 2 Note that both the Stephens *et al.* (1981) and Ramanathan (1987) data are consistent with zero net global warming.

### 5.2 Second generation satellite data, unfortunately, are admitted to be insufficiently accurate!

Sixteen years after Ramanathan (1987), and twenty-two years after Stephens *et al.* (1981), the 2003 US National Academy of Sciences / National Research Council report “*Understanding Climate Change Feedbacks (p. 112)*” cites the Ramanathan (1987) data, and comments that

<sup>4</sup> Best guesses are also not allowed for calculations made in bank statements, either!

<sup>5</sup> Four samples are clearly insufficient, given the non-sinusoidal albedo annual oscillation subsequently observed by Stephens *et al.* (2015), along with the apparently synchronous non-sinusoidal cloud-cover fraction oscillation observed by King *et al.* (2013).

*“The observations do not meet quality standards.”*

Unfortunately, thirty-one years after Stephens *et al.* (1981), including 10 years of further observation with the (CERES) Terra and Aqua satellites, nearly all principal observers, including Hansen, Stephens, Loeb, and L’Ecuyer, finally revealed in 2012 that available satellite radiometry data are incapable of determining the Earth’s (absolute) power imbalance (EEI) to the needed accuracy ( $\pm 0.1 \text{ W/m}^2$ ) to confirm or refute global warming.

Here are some direct quotes: Loeb *et al.* (2012, p. 111) admit

*“... A limitation of the satellite data is their inability to provide an absolute measure of the net TOA radiation imbalance to the required accuracy level. ...”*

Stephens *et al.* (2012) admit

*“... The combined uncertainty on the net TOA flux determined from CERES is  $\pm 4 \text{ W/m}^2$  (95 % confidence) due largely to instrument calibration errors. ...”*

Somewhat later, however, Johnson, Lyman and Loeb (2016), for their Fig. 1, say

*“... CERES annual random errors (blue error bars) are shown at one standard deviation ( $0.1 \text{ W/m}^2$ ). ...”*

Note the huge change of the random error magnitude,  $0.1 \text{ W/m}^2$ , to the total error magnitude,  $\pm 4 \text{ W/m}^2$  – an increase by a factor-of-40. Loeb *et al.* (2018) go on to admit,

*“... the absolute accuracy requirement necessary to quantify the Earth’s energy imbalance (EEI) is daunting. ...”*,

and they subsequently use this fact to justify their “adjustments” (fudges) of the satellite data. Finally note that the reportedly achieved  $\pm 0.1 \text{ W/m}^2$  random error magnitude is actually sufficiently small to actually accomplish the measurement task, were it not for a huge additional systematic error. *The two comments taken together then reveal the fact that the large total inaccuracy is due to a design flaw in the satellites that, in turn, creates a built-in systematic error that destroys their needed absolute-intensity measurement capability.*

### *5.3 What went right with the Terra and Aqua satellite plan?*

Before giving the answer to what went wrong, a question worth answering first is - What went right with the Terra and Aqua satellite program? Recall, the Loeb *et al.* (2018) comment,

*“... the absolute accuracy requirement necessary to quantify the Earth’s energy imbalance (EEI) is daunting. ...”*

There are two big experimental difficulties that evidently were in fact solved. A first big difficulty that had to be overcome for the TOA-EEI satellite measurement program is that power-IN and power-OUT are both huge numbers, and the difference between them is miniscule – about 0.2 % of power-IN. That miniscule difference is the net imbalance that is sought, both experimentally and theoretically. A second difficulty occurs when power-IN and power-OUT are both hugely varying, both in time and in space, in a seemingly random and totally irreproducible fashion. Measurement and calculation errors (including round-off errors – see Appendix D.5) of any of the three large power-component errors readily swamp the resulting summation error of the very small power-flow difference. Extreme absolute measurement accuracy is thus required. To their credit, as noted above, the two workhorse CERES satellites, Terra and Aqua, had instrumental random data error levels that were actually sufficiently small to accomplish the measurement task to within the target  $\pm 0.1 \text{ W/m}^2$  accuracy.

### *5.4 What went wrong with the Terra and Aqua satellite plan? – The fatal flaw!*

So, what went wrong with the CERES satellite plan? What was the fatal flaw? Why was the EEI value measured,  $+6.5 \text{ W/m}^2$ , so badly and obviously in error? That value definitely created the

2009-2010 “Aw [expletive]! We are in deep trouble” moment for the investigators.

There was a huge flaw in the design of Terra and Aqua. It is quite subtle. A critically important part of the problem is the fact that *the two satellites were nearly blind to sun glare, which is an important reflection component of SWOUT. Almost totally un-sampled and irretrievable*, missing sun-glare measurement data correspondingly ruined the absolute accuracy capability. Moreover, the un-sampled missing data were impossible to accurately simulate after the mission was over. The significant under-reporting of outgoing radiation then resulted in a very-much too-low reported outgoing radiation, and a corresponding very-much too-high reported EEI value (+6.5 W/m<sup>2</sup>).

The fatal design flaw was actually (partially?) recognized and weakly admitted early by Hansen *et al.* (2011). They misleadingly say

*“... These problems, the changing angular distribution of the scattered and emitted radiation fields and maintaining extreme precision of sensors over long periods of time must be faced by Earth-orbiting satellites. The angular distribution problem is treated via empirical angular distribution models, which are used to convert measurements of radiation in a given direction into radiative (energy) fluxes. ... The precision achieved by most advanced generation of radiation budget satellites by the ongoing (CERES) instrument ...which finds a measured 5-yr-mean imbalance of 6.5 W/m<sup>2</sup> (Loeb et al. 2009). Because this result is implausible, instrumentation calibration factors were introduced to reduce the imbalance to the imbalance suggested by climate models, 0.85 W/m<sup>2</sup> (Loeb et al. 2009).”*

Hansen *et al.* (2011) here refer to the model preferred by Hansen *et al.* (2005) that provides the result, EEI = 0.85 ± 0.15 W/m<sup>2</sup>.

The angular distribution problem that Hansen *et al.* (2011) discuss presumably consists of the averaging over continuously varying solar-incidence and scattered radiation directions. Unfortunately, Terra and Aqua could have done this averaging automatically, if they had been designed correctly, but they were not. The problem is associated with the fact that the satellites were attempting to gather both images and the spectral properties of the Earth’s reflected light like a camera and a spectrometer, rather than to measure only the Earth’s total reflected and reradiated energy like a simple photographic light meter, as per their mandated task. Moreover, the gathered image data and spectral data were never even used nor fully reported.

The heart of their problem is that a reflecting-surface’s emissivity is not angularly isotropic. The angular distribution of its reemitted radiation frequently depends on the direction of the incident radiation. Reflections have two forms – specular and diffuse reflection. The specular reflection of a thin pencil of light (e.g. a ray of sunlight or a flashlight beam) by a silvered mirror or a *dielectric surface* (like glass or water) is clearly highly directional. The reflected light’s outgoing direction or directions also strongly depend on the direction of the incident light. By contrast, the diffuse reflection by a sheet of white paper is approximately isotropic.

Partial reflections from the surface of water are very strong at shallow angles of incidence! (See Appendix H.) The specular reflections are called sun glare. Sunlight incident on the ocean surface provides very bright highly directional reflected sun glare. Figure 29 in Appendix I shows Claude Monet’s artist’s impression of bright morning sun glare from a calm water surface in 1872 Le Havre. Sun glare’s very bright reflected light is highly polarized, is often annoying, and is also the reason that Polaroid sunglasses were invented.

Sun glare is readily observed when the sun is low in the sky when one looks towards the sun across open water, as is depicted in Monet’s seminal painting. Appendix H shows Born and Wolf (1980)’s calculation of the albedo of a reflecting dielectric surface. It shows that the ocean’s surface becomes a nearly perfect mirror at shallow-angle incidence. Sun glare from water thus becomes very strong for sun elevation angles less than about 15 – 20 °, as occurs daily in early morning or late afternoon. When it is observed in winter at high North and South Latitudes, the sun is always low in the sky.

Oceans cover 71 % of the Earth's surface, whereupon careful measurements of ocean albedo are essential. The ocean's surface is commonly a rippled partially reflecting dielectric mirror surface. At very low sun elevation angles, it reflects a very high fraction of the incident sunlight, while sunlight at near perpendicular incidence is only 4 % reflected. (See Appendix H.) The reflection of an incident pencil of light on the ocean is concentrated in a narrow cone of light, whose opening angle unpredictably depends on varying sea-surface state. It does not occur on overcast days and is thus further unpredictable. When one looks towards the sun across open water, sun glare appears as a very bright narrow transitory stripe of light reflected from the water's surface, as was noticed and captured by Monet. If the observing satellite is looking exactly in that direction, i.e. if the satellite's field of view is wide enough to include that azimuthal direction, then the satellite will detect the very bright sunlight reflection. If, however, the satellite has a very narrow field of view, it will not detect the specular reflections. As a result of their line-scanning design, Terra and Aqua have an extremely narrow field of view in the North-South direction and are almost *totally blind* to the ocean's specular-reflection component of SWOUT. Since shallow-angle reflections comprise a significant fraction of all reflected sunlight, SWOUT radiation intensity is then reported significantly too low. The result was a way-too-low reported outgoing radiation, and a corresponding very-much-too-high reported EEI value (+6.5 W/m<sup>2</sup>).

Terra and Aqua had an extremely narrow field of view in the North-South direction, and virtually all sun glare was missed by them. As with Monet's painting, the narrow bright reflective stripe observed on the water's surface is always oriented directly from the sun's azimuthal direction, which, in turn, is only very briefly occasionally exactly true East or true West at the local equinoxes, depending on the observer's location and the season. Unfortunately, Terra and Aqua *only looked exactly true East and exactly true West* because they were doing moving-line-scan imaging, and not a full 2D image scan. Unfortunately, except for image data on the focal plane that are gathered by the thin 1D pixel ribbon, all of the remaining potentially useful image data are discarded.

A typical digital camera used for imaging stationary scenes has a lens focused on its focal plane which is filled with a 2D raster of pixels on which an image is formed. For a moving scene, a sequence of snapshots is then taken. Alternatively, for a smoothly moving scene like goods on a conveyor belt or the Earth's surface moving below a satellite, a line-scan camera is commonly used instead of a 2D raster to avoid image blur from the motion. Its focal plane consists of a 1D ribbon of imaging pixel receptors across the image's center. The scene's motion perpendicular to the pixel-ribbon then allows it to record a continuously scanned arbitrarily tall image. Terra and Aqua used line-scan imaging! The image of the sun glare's bright stripe was, however, formed on the focal plane diagonally radiating from the focal plane's center. As the satellite traversed its polar orbit, the bright stripe's image rotated around the center, like the sweep-second hand on a clock, and was invariably not recorded at all by the 1D narrow ribbon of pixels.

What is actually required to measure the reflected, scattered, and emitted outgoing radiation from the surface is a pair of very-wide-angle hemispherically viewing pyranometers, with one looking up and one looking down<sup>6</sup>. Such a pair, for example, was used by Griggs (1968) in his early careful measurements of the albedos of stratus clouds and various other Earth's surfaces in a DC3 aircraft. A pyranometer is, in essence, a fancy light meter. It has only one pixel and no imaging capability. It has an extremely wide-angle view - a full horizon-to-horizon panoramic wide cone-shaped circular field of view. It then gathers and automatically averages energy from all directions within the cone and from all image source points. As the pyranometer moves over the surface it averages both the emittance and the angular directions of the emitted radiation from the included source points on the surface below. It gathers sunlight that has scattered through a huge variety of angles from all points on the surface below from a huge variety of possible sunlight incidence directions. These directions include shallow-angle reflected sunlight from all azimuthal angles!

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<sup>6</sup> Of course, horizon matched approximate hemisphere solid-angles must be used to account for the dip of the horizon associated with the satellite's high altitude.

To measure the EEI total energy-flow component, SWOUT + LWOUT, a pyranometer's single pixel must detect energy at all wavelengths. If, however, SWOUT and LWOUT need to be measured independently, then two superposed pixels are required, and/or two independent SWOUT and LWOUT pyranometers are required.

Terra and Aqua were designed instead to measure SWOUT and LWOUT using very fancy MODIS multi-wavelength imaging spectrometers that spectrally measured 16 Long-Wave (LW) and 19 Short-Wave (SW) radiation channels. (But no microwave SST detection capability.) As imaging devices, they had very many pixels that were all in a thin line-scanning ribbon. Terra and Aqua were in sun-synchronous polar orbits, with 14 orbits per day at a 900 km (or 705 km?) altitude<sup>7</sup>. For image gathering, their field of view is always pointed straight down. Unfortunately, instead of using a wide-angle cone-shaped field of view with one or two pixels, they motion scanned a ribbon shaped transverse exactly East-West pattern using a fan-shaped field of view, a.k.a. a line-scan. The imaging pattern was  $\pm 52^\circ$  (horizon-to-horizon), 2330 km wide at the surface, by only  $\pm 0.2^\circ$ , 10 km tall at the surface in the North-South direction of motion. The field-of-view is not at all panoramic. It is not a very wide-angle cone-shaped pattern. As a result, scattered and/or reflected outgoing energy is missed if it arrives from angular directions from anywhere except exactly due East and West directions, outside of the very narrow angular acceptance ribbon. They were thus blind to sun-glare ribbons that were not azimuthally oriented exactly in an East-West direction.

## **6. Some Definitions: Fudge, “Constraintment”, and Scientific Misconduct**

An operational definition of the word “fudge” as it is used here is

*If the experimental data results don't match the preferred theory, change the measured data values to match the theory. Doing that is fudging the data! In honest science, it's the other way around – given such a mismatch, you change the theory to match the data, and you identify and throw out the bad data, correct the evident experimental flaws, and repeat the experiment correctly! It is generally agreed in scientific analysis that fudging or misrepresenting one's data is tantamount to committing serious scientific misconduct.*

Loeb *et al.* introduce a new word, “constraintment”, that is not found in either Webster's Collegiate or the Shorter Oxford dictionaries. Webster's dictionary however defines the transitive verb “to constrain” as “to force or produce in an unnatural or strained manner”. Oxford's dictionary similarly defines “constrain” as “to force or compel, to force out in opposition to nature.” Oxford's dictionary nearly synonymously defines the verb “to fudge” as “to put together clumsily, or dishonestly, to patch or fake, to talk nonsense.” Oxford's dictionary also defines “fudge” as a noun as “a made-up story, a deceit.”

Loeb *et al.* (2009, p.748, a direct quote) admit to

*“... applying an objective constraintment algorithm to adjust SW and LW TOA fluxes within their ranges of uncertainty to remove the inconsistency between average global net TOA flux and uncertainty between average and heat storage in the Earth-atmosphere system. ...”*

The use of Loeb *et al.*'s “objective constraintment algorithm” to fudge data underlies 5 out of the 6 forms of scientific misconduct exposed here. The Loeb *et al.* (2009) “adjustment” procedure is clearly not allowed under generally accepted methodology for data analysis in physics and engineering, as outlined, for example, by Bevington (1969). Under the above definitions, Loeb *et al.*'s “adjustments” and/or “recalibrations” via their “objective constraintment algorithm” clearly constitute fraudulent fudging of data and scientific misconduct.

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<sup>7</sup> A 900 km altitude is required for 14 daily sun-synchronous orbits, while confusingly, the reported altitude of Terra and Aqua is 705 km.

Hansen *et al.* (2011) and Loeb *et al.* (2009, p.748) admit to fudging data to cover-up design flaws in the Terra and Aqua satellites. They use preferred theory and fudged ocean-heat-content anomaly data as a replacement “anchor” value. Loeb *et al.* (2018) *clearly admit to changing the measured data values to match the preferred theory*. Lyman and Johnson (2008) and Lyman *et al.* (2010) admit to fabricating data to fill data “gaps” and replace poorly recorded data. Loeb *et al.* (2018, p. 897) and Wild *et al.* (2015, p. 3395 and 2019) go much further and hugely “adjust” data values far outside their claimed “ranges of uncertainty”.

Scientific misconduct #4 consists of dishonestly changing (editing) numbers before their final publication by persons unknown to match presumably politically driven objectives. Summaries of the various forms of innovative fudging methods, including the “*objective constraintment algorithm*”, and six cases of fraudulent scientific misconduct are given at the end of this paper, with additional specific details given in Appendices D.1 – D.5, E.1 and E.2.

## **7. What Did the IPCC *et al.* Do When the TOA Satellite Data Were Finally Recognized to Be Insufficient to Determine the Existence of Global Warming?**

The last sentence in the above Hansen *et al.* (2011, p. 13443) quote reveals a cover-up of the satellite design flaws -

*“... Because this result is implausible, instrumentation calibration factors were introduced to reduce the imbalance to the imbalance suggested by climate models, 0.85 W/m<sup>2</sup> (Loeb et al. 2009). ...”*

Note that Hansen here indicates here that he has prejudicially preferred climate models.

**Scientific misconduct #1:** *To justify use of ocean heat conduct anomaly data as a means for covering up the Terra and Aqua design flaws, Hansen et al. (2011) misleadingly cite only the different “calibrations” between the satellites and ARGO OHCA data. Hansen et al. (2011) then specifically propose shifting (fudging) satellite results to match climate models and/or to match ARGO buoy data, thereby simply erasing the relevance of the flawed satellite data. The methodology for accomplishing this data fudging is introduced by Loeb et al. (2009, p.248) as their “objective constraintment (sic) algorithm”.*

Scientific misconduct #1, as described here, fits exactly the above operational definition of the word “fudge” – If the experimental data values don’t match the preferred theory, change the measured data values to match the preferred theory!

As a means for *totally replacing* obviously flawed satellite absolute-intensity data, Hansen *et al.*, (2011, p. 13444) proposed

*“... An alternative potentially accurate approach to measure Earth’s energy balance is via changes in the ocean heat content, as has been argued for decades (Hansen et al. 1997) and is now feasible with ARGO data ...”*

So what did the IPCC *et al.* actually do following their “Aw [expletive]” moment when the TOA satellite data were finally recognized to be insufficient to determine the existence of global warming? The IPCC *et al.* program switched to Hansen’s preferred EEI substitute measurement – ocean-heat-content anomaly rate of increase.

**Scientific misconduct #2:** *Following the Hansen et al. (2011) proposal, ocean-temperature anomaly data from combined XBT and ARGO measurements are analyzed by Lyman et al. (2010) and Loeb et al. (2012) in an unscientific analysis that produced the fudged result, Top-of-Atmosphere EEI = 0.64 ± 0.11 W/m<sup>2</sup>, although the data were all acquired at the Bottom-of-Atmosphere. Quantitatively different analyses’ results produced by other workers, e.g. Levitus et al. (2000), were summarily discarded. The discarded Levitus et al. (2000) XBT-only data are, in fact, fully consistent with EEI = 0. Incompatible inhomogeneously biased datasets were combined by Lyman et al. (2010) and used along with subjectively shifted and fabricated (fudged) data. Both Lyman*

*et al. (2010) and Loeb et al. (2012) acknowledged but discarded an alternative hypothesis for their own data that is consistent with  $EEI = 0$  and that fits their data much better than their chosen hypothesis, that instead matched the preferred Hansen et al. (2010) model.*

**Scientific misconduct #3:** *The seminal work by Stephens et al. (2012) incorporates coauthor's work, Loeb et al. (2012), and the fudged result from Lyman et al. (2010). It presents the slightly modified value, Top-of-Atmosphere  $EEI = 0.6 \pm 0.4 \text{ W/m}^2$ , that is subsequently adopted by the IPCC's Fifth Assessment Report, AR5 (2013). This latter weaker result still presents combined inhomogeneous XBT and ARGO data masquerading as Top-of-Atmosphere satellite data. However, no actual satellite-measured absolute intensity measurements are used for this misrepresentation of TOA-EEI. Subsequently, the seminal Stephens et al. (2012) fudged EEI result is retracted and totally disavowed by L'Ecuyer et al. (2015). The (evidently unwitting) coauthors, Stephens and L'Ecuyer (2015) in a second, more powerful article together confess to the scientific misconduct. AR6 (2021) cites the L'Ecuyer et al. (2015) retraction, but not the Stephens and L'Ecuyer (2015) confession.*

### *7.1 Hansen et al. (2011) recommended the use of flawed ocean-heat-content anomaly data as an alternative to the flawed Terra and Aqua data.*

Hansen et al. (2011) comment

*"... Lyman and Johnson (2008) showed that by about 2004 the ARGO floats had sufficient space-time sampling to yield an accurate measure of heat content change in the upper ocean. ..."*

Hansen et al. (2011), in same article, warn that care must be exercised because of flaws inherent in the data.

*"... Because of the ocean's heat capacity, temperature change must be measured very precisely to do determine the ocean's contribution to planetary energy imbalance. ... Adequate precision is difficult to attain because spatial and temporal sparseness of data, regional and seasonal biases in observations, and changing proportions of data from various instrument types with different biases and accuracies. ..."*

Hansen et al. (2011) admit that

*"... analyses of ocean heat uptake by different investigators, (Levitus et al. 2009); Lyman et al. 2010; Church et al. 2011, differ as much as a factor of two, even in the relatively well-sampled period 1993-2008."*

Hansen et al. (2011) arbitrarily select the Lyman et al. (2010) and Loeb et al. (2012) results for use in AR5. It exhibits the largest EEI.

#### *7.1.1 Flawed ocean-temperature and heat-content anomaly data are acquired at the "Bottom-of-Atmosphere"; There is NO Gaussian surface for OHCA data*

Ocean heat-content anomaly data are actually massaged ocean temperature anomaly data. They are all acquired at the *Bottom-of-Atmosphere*, and NOT at the *Top-Of-Atmosphere*. Unlike TOA satellite data, there is no Gaussian surface with only three readily measurable power fluxes flowing through it. Indeed, the three essential numbers displayed on a power-flow diagram - SWIN, SWOUT, and LWOUT - cannot be independently measured using OHCA data. Neither can their absolute magnitudes be measured, nor even their relative ratios, like albedo  $\equiv$  SWOUT/SWIN. *Any display of these numbers on a power-flow diagram that claims to be based on OHCA data is a total scam!* Indeed, the Earth's albedo can only be measured by observations made from above the Top-of-Atmosphere.

By contrast, each ocean area component has very many energy flows to account for, most of which are not accounted for. For example, there is a huge transfer of energy from ocean to land in the form of latent heat carried in so-called atmospheric rivers, and then returned via land-based

revers. Since ocean heat-content anomaly data are not measured power fluxes passing through a single Gaussian surface, there is no conservation of energy argument that can be readily applied to link Bottom-of-Atmosphere data directly to global warming, as per the above causal chain. Rather than measured power-flows, the raw data consist of very under-sampled measured volumetric ocean-temperature-anomaly temporal histories.

Power is an energy flow rate. To convert the raw temperature data to a power-flow rate, its time-derivative must be estimated. Doing so is highly error prone, especially with a very short duration data record. Importantly, it is clearly seriously flawed scientific procedure to attempt to calculate the time derivative of data samples with time-varying inhomogeneous composition, such as the time-varying fraction of the samples that include ARGO Southern Ocean component data points. Doing so violates the chain rule of calculus for multivariate dependences.

The measured temperature anomalies, themselves, are also NOT measured differences with respect to a set of temperatures that have actually been measured. Instead, they are calculated differences with respect to a computer model that is called a “climatology”. The various climatology models used are totally untested and never revealed to the reader.

### *7.1.2 Flawed ocean-temperature anomaly data acquisition is from a multiplicity of different areas that do not cover the whole Earth*

Ocean temperature anomaly data are from a multiplicity of disjoint different ocean-only areas that do not cover the whole Earth. Land heat-content anomaly rate-of-change is never measured, nor included, and significant energy transfer between land and ocean areas is ignored. Many independent areas are used to cover independently the Atlantic, Pacific, and Indian oceans. Different oceans, however, exhibit very different local EEI values. (See the rejected analysis by Levitus *et al.* (2000) discussed in Sect. 7.1.7.). Ocean component sites are highly biased in favor of brightly sunlit areas. All ocean areas are bounded by Latitudes  $\pm 60^\circ$ , and only ice-free and non-polar areas are included. The possibility that cryosphere areas may have very different LWOUT characteristics than warm ocean areas and different EEI's is ignored. Lyman and Johnson (2008) describe in detail the subjective methods they used to fabricate data to fill in significant missing-data gaps. It should be noted that data fabrication is a serious scientific No-No (as per scientific misconduct #2).

All ocean areas must be somehow combined. How these data are combined and weighted is never specified in detail. How unsampled polar ocean regions are included is never mentioned. How their climatology-model temperature references were designed is never revealed by Lyman *et al.* (2011). (Perhaps they were military submarine-warfare secrets? See Appendix G.) By contrast, Levitus *et al.* (2000) show data from twelve different ocean areas. (See Sect. 7.1.7.) Finally, the specific formulae and parameters used in implementing Boltzmann's relation are never disclosed.

### *7.1.3 Flawed ocean-heat-content anomaly data come from two very different datasets*

#### *ARGO buoy ocean temperature anomaly measurements:*

Higher quality ocean temperature anomaly temporal change measurements come from the more recently deployed ARGO buoy-chain. All data acquired after 2004 are from ARGO buoys. The program to construct and deploy these buoys was, unfortunately, slow in getting underway. Even at full deployment, it had only 4000 active buoys, and data are still seriously under-sampled. (Some reports suggest only 3000.) Given the complexity of the ENSO (El Niño) current's continuously varying patterns, the Shannon/Nyquist temperature-sampling requirements were never anywhere near to having been met by the chain. A major fraction of the ocean's surface, latitudes outside of  $\pm 60^\circ$ , is not sampled at all by the chain! *Nearly all Southern Ocean data were acquired using only the ARGO buoy chain.*

#### *XBT “bathythermography” ocean temperature anomaly measurements:*

According to Lyman *et al.* (2010), the XBT program was initially set up by the US military to map the Earth's thermocline for submarine warfare purposes. (See Appendix G.) XBT data are

extremely under-sampled, especially in southern oceans. Much of the data are from voluntary water sampling by commercial and military ships using the so-called “bucket” method, and by engine-water intake temperature measurements. Seawater samples are thus retrieved mostly from near the surface. Additional XBT disposable drop-sondes are also occasionally irregularly deployed to measure temperature depth profiles. Data acquired before 2003 are almost all from XBT “bathythermography data”.

#### *7.1.4 Ocean temperature anomaly data components are irregularly taken and claimed to be poorly recorded.*

Unfortunately, ocean temperature measurements are only recorded as temperature *anomalies*. Temperature anomalies were recorded by many different teams, each using a different so-called “climatology” as a reference. and many of the anomaly offsets evidently got lost or were otherwise difficult to obtain, according to Lyman *et al.* (2010). As a result, recorded XBT and ARGO data evidently have significantly different unrecorded subtracted-offset values. To get their data, Lyman *et al.* (2010), patched together the various different teams’ data. They combined data from these totally different data acquisition methodologies, each with very different and evidently guessed-at subtracted-offset values. Different oceans had very different coverage levels. The southern oceans were recorded much more recently almost exclusively using ARGO buoys and almost no XBT data. Poor recording and/or reporting of subtracted-offset values unfortunately has very serious unrecognized consequences for the ocean temperature anomaly data compiled by Lyman *et al.* (2010). Scandalously, Lyman *et al.* (2010) claim to infer critically important meaning to the difference between the evidently different XBT and ARGO and partially fabricated subtracted offset values.

#### *7.1.5 Data from both XBT and ARGO datasets are under-sampled and/or fabricated.*

Many of the XBT and ARGO OHCA data were fabricated by Lyman and Johnson (2008) to fill in missing-data gaps. Most anomaly offsets were subjectively fabricated. Indeed, to form the single curve, Lyman *et al.* (2010) admit to “shifting” some of their component observations by as much as  $7.7 \cdot 10^{22}$  J. That shift is nearly half of the full range of their graph! Constantly changing, ENSO current patterns, contain both mobile and “stubbornly persistent” warm blobs of seawater. These very complex continuously changing patterns seriously complicate ocean-temperature anomaly data measurement and interpretation and grossly exacerbate the under-sampling problem. Their presence requires a far greater number of measurements than were actually taken. It is also important to notice that ENSO temperature oscillations dominate the OHCA anomaly data exhibited by Levitus *et al.* (2000), wherein the oscillation amplitudes appear far stronger than any evident long-term global-warming trend. (See Sect. 7.1.7, Fig. 7.)

#### *7.1.6 Lyman et al. (2010) use three very different data-acquisition time-periods for flawed OHCA data – 1=XBT only, 2=XBT-ARGO time-varying mix, 3=ARGO only.*

Hansen *et al.* (2011) initially suggested the use of ARGO data only, despite its short-term existence, and did not initially recommend the inclusion of XBT data. However, Hansen *et al.* (2011) then misleadingly called all OHCA data acquired in the period 1993 - 2004 to be “well-sampled”, although the ARGO buoy array did not become fully operational until after 2004. Thereby, they fully discredit the more than 45-year XBT data history presented by Levitus *et al.* (2000). It is important to note that the majority of Southern Ocean data were sampled only in the final data collection period by the ARGO array, after 2004. The Hansen *et al.* (2011) initial suggestion to use only ARGO data was ignored by Lyman *et al.* As a result, the various analyses of ocean-temperature and heat-content anomaly data discussed by Lyman *et al.* (2010) use only a 16-year history and blindly combined XBT and ARGO datasets from different data-gathering periods. In the process, they subjectively shifted the data (by as much as  $7.7 \cdot 10^{22}$  J) to form a single composite curve, rather than forming two separate XBT and ARGO curves. Data period 2 unfortunately has a temporally changing ocean composition, especially its Southern Ocean composition, while data

periods 1 and 3 have different associated anomaly-offsets, climatologies, and ocean compositions. This sloppy procedure causes serious fatal flaws in the results.

The three inhomogeneous data periods used by Lyman *et al.* (2010) are as follows:

1. Early data, from 1993 – 1999, are XBT-only and have a large multiplicity of subjectively shifted anomaly offsets.
2. Data in between the early and late datasets contain a continuously varying inhomogeneous combined mix of XBT and ARGO data and an associated time-varying fraction of Southern-Ocean data.
3. Late data, from 2004 – 2009, are ARGO-only, are more homogeneous, but still have subjectively shifted anomaly offsets.

7.1.7 Levitus *et al.* (2000) analyzed XBT-only ocean-heat-content-anomaly data for the 45-year period, 1950 – 1995. The results are consistent with  $EEI = 0$ .

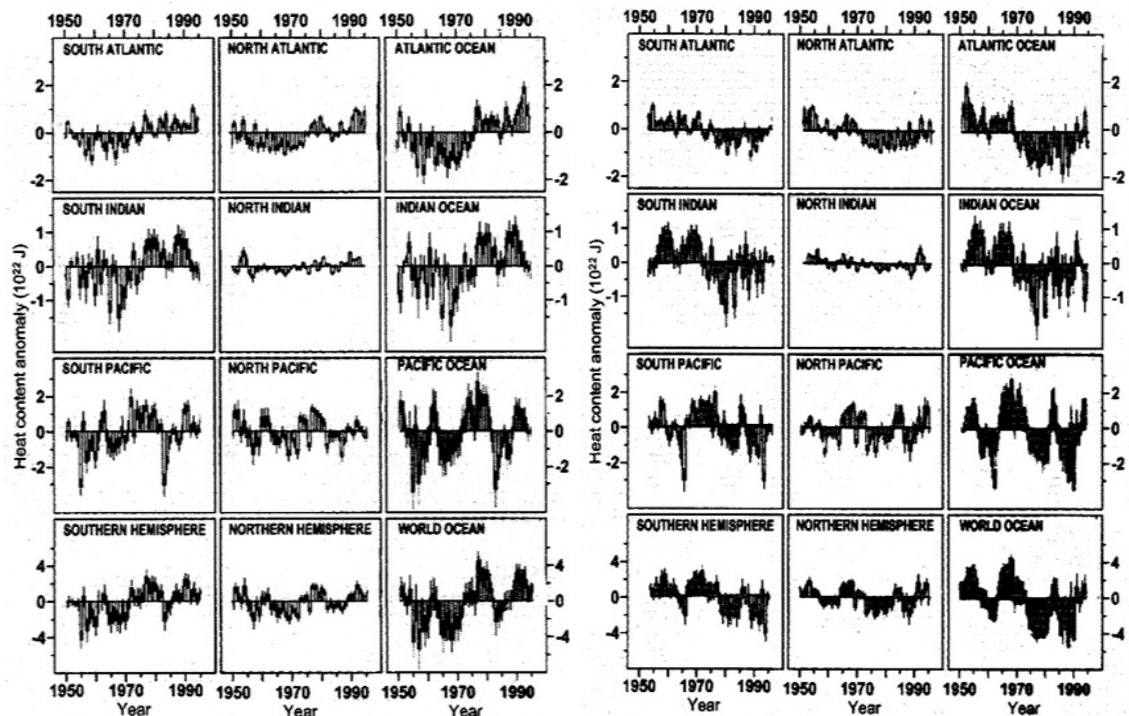


Figure 7: (Left and right) The two Figures are from Levitus *et al.* (2000) truncated by this work to show time series for period 1950 to 1995 of ocean heat content ( $10^{22}$  J) in the upper 300 m for the Atlantic, Indian Pacific and world oceans. They note that  $1.5 \times 10^{22}$  J equals  $1 \text{ W-year m}^{-2}$  (averaged over the entire surface of the Earth). The two Figures both show the same ocean-heat-content anomaly data for the 45-year time period 1950 – 1995. (The period was truncated here slightly to remove ARGO data.) The left and right Figures have one plotted correctly, and one plotted incorrectly with time left-right reversed, i.e. backwards with time increasing to the left. Are you willing to wager many trillions of dollars that you can tell which ones are correct and which ones are backwards?

Levitus *et al.* (2000) analyzed XBT-only ocean-heat-content anomaly data for the 45-year time-period, 1950 – 1995 (after my truncation). This time period precedes the much shorter 16-year time period, 1993 – 2009, used by Lyman *et al.* (2010). The Levitus *et al.* (2000) data is shown here in Fig. 7, slightly truncated by about 3 years, in order to exclude possible contamination with incompatible ARGO data. The Levitus *et al.* (2000) analysis covers twelve ocean areas while by comparison the Lyman *et al.* (2010) analysis presents only the whole Earth's ocean average. The Levitus *et al.* (2000) plots show temperature-anomaly history at 300 m depth.

The plots all prominently reveal strong temperature oscillations, presumably ENSO current variations, but no obvious long-term increasing trend. That is, they are consistent with  $EEI = 0$ . In order to demonstrate this second assertion, the data are plotted twice in Figures 7, left and right –

once correctly, and once incorrectly with time left-right reversed, i.e. backwards with time increasing to the left, in a fashion similar to that used above in Sect. 2. Note that the two parallel 12-plot sets are mirror images of each other. I assert that if you can't immediately tell in all cases which one of these graph sets is correctly plotted, and which one is the time-backwards mirror image, then there is no obvious temporal increase in ocean heat content, and the data are consistent with  $EEI = 0$ . Hansen *et al.* (2010) and Lyman *et al.* (2010) rejected the inclusion of the Levitus *et al.* (2000) data.

#### *7.1.8 Four-step conversion by Lyman et al. (2010) of recorded Bottom-of-Atmosphere temperature data to a single number Top-of-Atmosphere EEI estimate*

**Step 1.** Various teams' gatherings of ocean temperature anomaly data for different regions of the Earth's different oceans have the anomaly offsets from their associated "climatology" references "*adjusted*" i.e. subjectively shifted and somehow weighted to an unknown associated world average climatology model, and then further shifted to a single temperature anomaly, all as a function of time. Note that the Lyman *et al.* (2010) analysis of ocean temperature and heat content anomaly data blindly combines XBT and ARGO datasets in the three different periods defined above in Sect. 7.1.6.

**Step 2.** Composite ocean temperature anomaly data, as a function of time, are then converted to ocean heat-content anomaly data (OHCA), via Boltzmann's relation. It is important to note that the conversion requires many unpublished assumptions and formulae that depend on the water depth.

**Step 3.** To convert OHCA. data to a Bottom-of-Atmosphere Earth's Energy Imbalance (BOA-EEI) estimate, the slope of the OHCA-history record versus time (the time-derivative) is estimated.

Unfortunately, estimating the slope of a noisy data curve is a bitch! Estimating the error bars of the final slope is especially difficult. High-frequency noise makes the measurement of slopes very imprecise. Hansen *et al.* (2011, p. 13431) acknowledge this difficulty, as per their comment

*"... Graphs of ocean heat content usually show cumulative change. The derivative of this curve, the annual change of heat content, is more useful for our purposes, even though it is inherently 'noisy'. ..."*

**Step 4** To convert Bottom-of-Atmosphere Earth's Energy Imbalance (BOA-EEI) estimates to Top-of-Atmosphere Earth's Energy Imbalance (TOA-EEI) estimates, a massive number of assumptions must be made regarding unmeasured energy flows to and from the component ocean areas, to and from each other, and to and from unaccounted-for ocean areas. Unfortunately, detailed discussions of the Step 4 execution are wanting.

#### *7.2 Hansen et al. (2011) select the Lyman et al. (2010) OHCA data analysis from among various other analyses for use in AR5 (2013). It exhibits the largest TOA EEI.*

Figure 8 is a copy of the Lyman *et al.* (2010) Fig. 1. It shows the competing analyses made by other investigators, whose computed average slopes differ by as much as a factor of two with respect to that found by Lyman *et al.* (2010). Hansen *et al.* (2011) and Lyman *et al.* (2010) both note that

*"... analyses of ocean heat uptake by different investigators, (Levitus et al. 2009); Lyman et al. 2010; Church et al. 2011, differ as much as a factor of two, even in the relatively well-sampled period 1993-2008."*

The different (unscientific) treatments of the data reaffirm the Hansen *et al.* (2011, pp. 13433-13434) statement –

*"Estimates of standard error of the observed planetary energy imbalance are necessarily partly subjective because the error is dominated by uncertainty in ocean heat gain,"*

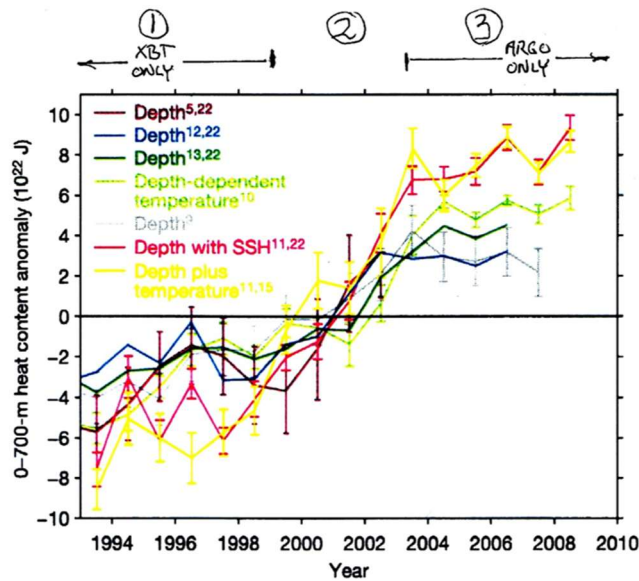


**Figure 1 | OHCA curves using published methods.** Globally integrated annual average OHCA curves from 0 to 700 m, estimated using methods published in papers cited in the key. All OHCA curves are estimated using different baseline climatologies, mapping methods and XBT corrections (first reference). Types of XBT bias corrections used include depth, depth-dependent temperature and depth with sea surface height (SSH; second reference, if different from first). Each curve has had its 1993–2006 mean removed to aid comparison, except for the depth<sup>5,22</sup> curve, which has been aligned with the 1993–2002 mean of the other curves. Error bars, 1 s.e.m. (Supplementary Information).

Figure 8: Figure 1 from Lyman *et al.* (2010) showing combined inhomogeneous ocean-heat-content anomaly data assembled into a single OHCA history by various investigators.

(Subjective estimates are a scientific No-No!) Note that the different investigators' fitted curves and data values all fall far outside of each other's error bars. However, for some strange reason, this salient fact does not appear to influence in any way the ultimate Lyman *et al.* (2010) quoted TOA-EEI uncertainty. Presumably, a huge unexplained factor-of-2 disagreement among different investigators should increase the uncertainty range of the Lyman *et al.* measured EEI estimate ( $\pm 17\%$ ). It doesn't! Perhaps a factor-of-2 disagreement regarding the final result's value is fully consistent with Al Gore's definition of "scientific consensus".

### 7.3 Ocean-heat-content anomaly data analyzed by Lyman *et al.* (2010) – scientific misconduct #2

Lyman *et al.* (2010) combine OHCA temperature "anomaly" data from the 3 different data-gathering periods described above in Sect 7.1.3. Using the 4-step method described in Sect 7.1.8 ocean temperature anomaly data are converted using Boltzmann's relation to ocean thermal-heat-content anomaly single annual values as a function of time. Doing so correspondingly requires the combining of inhomogeneous XBT and ARGO annual data in temporally varying different proportions to form a single (thin black) curve, shown here on their Figure 2 (my Fig. 9). Its average slope is then used to estimate the ocean heat-content anomaly's temporal change and EEI. The added thick black lines on the Figure are mine. My added dark diagonal black line represents their derived linear average slope:  $EEI = 0.64 \pm 0.11 \text{ W/m}^2$ . They determine the average slope using a "fully combined 5.7 degree of freedom fit"<sup>8</sup> to the combined inhomogeneous data. The linear component then (presumably) provides their estimate of the average slope of the plotted data values,

<sup>8</sup> Whatever that is?

which they assert is equivalent to Top-of-Atmosphere EEI.

Recall my earlier warnings about the total lack of reliability of the different subtracted offsets of different recordings of anomalies that are made by different investigators. To form their composite curve shown in their Fig. 2 (my Fig. 9), *Lyman et al. (2010)* admit (in their text) that they had to shift some of their component observations by as much as  $7.7 \cdot 10^{22}$  J, nearly half of full-scale of their plot. The various shifts all dramatically change the effective slope of the composite curve's calculated fit, but the uncertainties in those shift amounts is not incorporated into their final slope's (subjective) uncertainty estimate. Note that the individual XBT-only (period 1) and ARGO-only (period 3) data each appear to be temporally constant (flat). There also appear to be very different subtracted-offset shifts in periods 1 (XBT-only) and 3 (ARGO-only).

Recall my earlier warnings about the time-varying composition of time-periods 1, 2, and 3. Recall my earlier observation that time-period 1 (all XBT), has very little Southern Ocean data. Recall my observation that time-period 3 (all ARGO) has a large fraction of Southern Ocean data. Recall my observation that the plotted "heat-content anomaly" values are simply directly proportional to "ocean-temperature anomaly" values. Keeping these caveats in mind, observe that the data plotted in the *Lyman et al. (2010)* Fig. 2 appear to be fully consistent with all ocean temperatures being effectively constant, i.e. with no thermal heat gain and  $EEI = 0$ , and that their plotted heat-content variation is solely due to the temporal fractional change in ocean sampling that, in turn, is due to an extension of the sampling activity into more Southern Ocean areas.

Consider two different hypotheses. The first one gives the best fit to the data. It is dismissed.

Hypotheses 1. Data for each homogeneous ARGO-only (3) and XBT-only (1) time-period, when taken alone, are each fully consistent with having zero slope (my two added black flat lines). Both lines are fully consistent with  $EEI = 0$ . Inhomogeneous (combined) data acquired in between these two homogeneous-data periods (2), that represent the transition from XBT to ARGO should be discarded or separated and used independently.

Hypotheses 2. The *Lyman et al. (2010)* hypothesis from their preferred theory<sup>9</sup> gives a lousy fit. It is used! *Lyman et al. (2010)* combine all of the inhomogeneous data and then calculate the average slope,  $EEI = 0.64 \pm 0.11$  W/m<sup>2</sup>. Their calculated slope value is plotted as my added black diagonal line spanning their combined mixed-mode datasets.

Here we have the heart of scientific misconduct #2. The hypothesis giving the best fit to the data is dismissed, while the hypothesis claiming to confirm the preferred theory is chosen. *Lyman et al. (2010)* indeed recognized the different "calibrations" of the early and late data. They admitted to piecing together the different ocean-heat-content *anomaly* datasets that had been acquired by the many different "teams", with each one using a different "climatology" (i.e. with a different subtracted offset). They recognized that the slopes of the early XBT-only and the later ARGO-only data periods were both effectively "flat" ( $EEI=0$ ), especially in the later ARGO-only period. They recognized that the mix of calibrations in the transition between the two periods can cause a "misestimate" of EEI. They admit that the ARGO data include a much greater fraction of Southern Ocean than the XBT data do. *However, they dismiss the misestimate-possibility as a "coincidence". The alternative hypothesis ( $EEI = 0$ ) is ignored in their final analysis.*

Here is a direct (CYA) quote from their paper.

*"... The flattening of the OHCA curves also occurs around the time (2004) that the ARGO array of autonomous profiling floats first achieved near-global coverage and became the primary source of OHCA data. .... The transition from an ocean temperature record consisting of ship-based XBT data to one dominated by high quality conductivity-temperature-depth instrument data from ARGO floats occurred between roughly 2004 to 2008 and marked a revolution in ocean observing. ... ARGO has dramatically increased the sampling in the*

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<sup>9</sup> Recall that *Hansen et al. (2011)* requested the use of his preferred climate models.

Southern Ocean since 2004. However, we find that this region continues to warm (not shown) and apparently did not contribute to the flattening of the ocean curves. The fact that this transition occurred at the same time as the flattening could be coincidental, but raises the possibility of a yet-undiscovered bias in the observing system.”

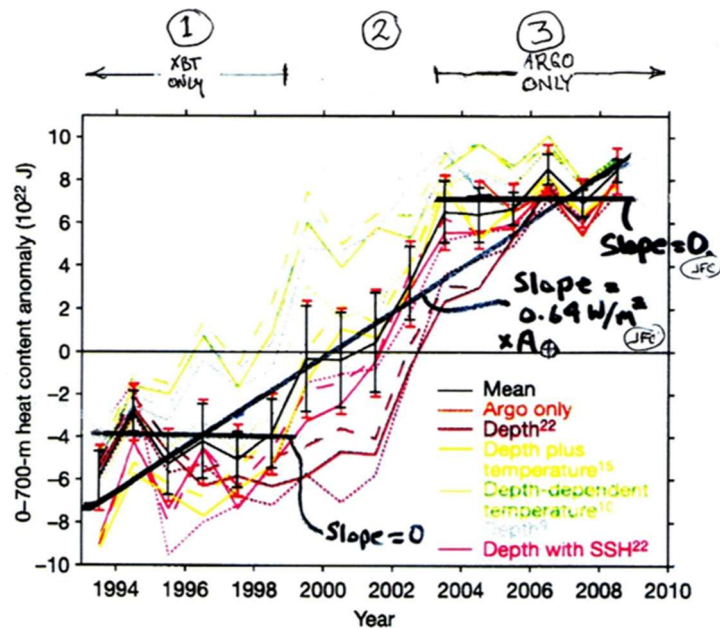


**Figure 2 | OHCA curves produced using the same mapping technique.** Solid lines are OHCA curves with a single 1993–2002 climatology and variously corrected XBT data provided by individual research teams. Dashed and dotted lines show the same thing as the solid lines, but using a single 2005–2008 climatology (dashed) or applying different published XBT corrections to the identical EN3 (version 2a) XBT data set (dotted). The key describes the type of XBT bias correction, with references. The trend estimate of the mean curve (black line; red error bars, 90% confidence intervals) is  $0.64 \pm 0.11 \text{ W m}^{-2}$  and has 5.7 effective degrees of freedom (Supplementary Information); red error bars show the overall uncertainty, determined from combining all of the individual uncertainties in Fig. 3 assuming they are uncorrelated. Black error bars show XBT correction and XBT quality-control uncertainty from Fig. 3. The difference between the global means of the two climatologies has been added to the dashed lines.

Figure 9: Figure 2 from Lyman *et al.* (2010) showing combined inhomogeneous ocean-heat-content anomaly data from various XBT and ARGO datasets. The two horizontal and one diagonal black line are added by this work. The lower-left-hand flat line is across the (1993 – 1999) XBT-only data, while the upper-right hand flat line is across the (2004-2009) ARGO-only data.

#### 7.4 Ocean heat-content anomaly data further analyzed by Loeb *et al.* (2012) – continuing scientific misconduct #2

Loeb *et al.* (2012) further refined the analysis by Lyman *et al.* (2010) using unspecified “JPL” algorithms to smooth and (somehow?) to calculate the local slope values for each year of the ocean heat temperature anomaly data<sup>10</sup>. Figure 10 shows their Fig. 3 as providing “Net Top-of Atmosphere flux or ocean heating rate”, although their data are all clearly measured at the Bottom-of-Atmosphere. In their upper graph, the black line is the claimed CERES satellite data giving an average TOA EEI value of  $0.6 \text{ W/m}^2$ .

<sup>10</sup> Their calculated local slope values and error bars are totally ridiculous, in my opinion.

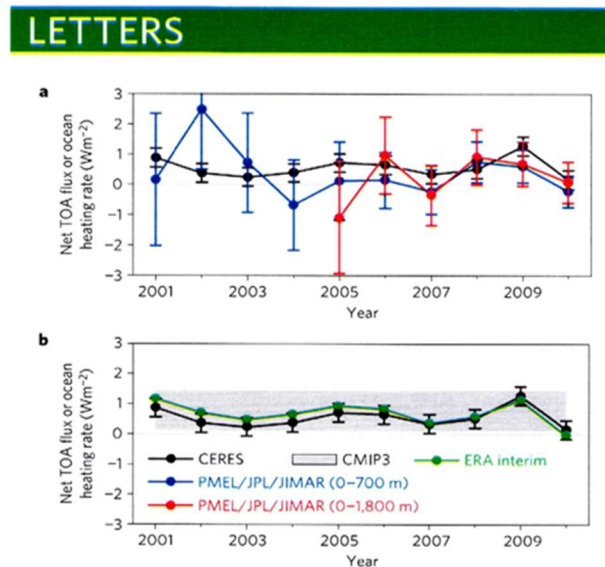


**Figure 3 | Comparison of net TOA flux and upper-ocean heating rates.**  
**a.** Global annual average (July to June) net TOA flux from CERES observations (based on the EBAF-TOA\_Ed2.6 product) and 0-700 and 0-1,800 m ocean heating rates from PMEL/JPL/JIMAR (Ref. 26). Uncertainties for upper-ocean heating rates are given at one standard error derived from OHCA uncertainties<sup>3</sup>. See Methods for a description of CERES uncertainties. **b.** Net TOA flux from CERES, ERA-Interim reanalysis<sup>24</sup> and the one standard deviation about the 2001-2010 average of 15 CMIP3 models (grey bar) are anchored to an estimate of Earth's heating rate for July 2005-June 2010 (see Methods).

Figure 10: Figure 3 from Loeb *et al.* (2012) showing revaluated ocean-heat-content anomaly data that, in turn, is claimed to imply a Top-of-Atmosphere Earth's Energy Imbalance of  $EEI = 0.64 \pm 0.11 \text{ W/m}^2$ .

In their abstract Loeb *et al.* (2012) claim

*"... We find that the difference between the heat balance at the top of the atmosphere and the upper-ocean heat content change is not statistically significant when accounting for observational uncertainties in ocean measurements [Reference 3)] ...".*

However, their Reference 3 is to Lyman *et al.* (2011), who make no such claim, and never even mention any satellite data at all! Worse yet, the new Loeb *et al.* (2012) value is very different from the much larger TOA satellite value,  $6.5 \text{ W/m}^2$ , quoted above in Sect. 5.4, from Hansen *et al.* (2011),

*"The precision achieved by most advanced generation of radiation budget satellites by the ongoing (CERES) instrument ...which finds a measured 5-yr-mean imbalance of  $6.5 \text{ W/m}^2$  (Loeb *et al.* 2009). Because this result is implausible, instrumentation calibration factors were introduced to reduce the imbalance to the imbalance suggested by climate models,  $0.85 \text{ W/m}^2$  (Loeb *et al.* 2009). ...",*

Regarding significant disagreement of OHCA and satellite with this much larger EEI value, Hansen *et al.* (2011) reference Loeb *et al.* (2009). In turn, Loeb *et al.* (2009, p.748) earlier found it necessary to "adjust" (fudge) the satellite measurement EEI value by

*"... applying an objective constraint algorithm to adjust SW and LW TOA fluxes within their ranges of uncertainty to remove the inconsistency between average global net TOA flux and uncertainty between average and heat storage in the Earth-atmosphere system. ..."*

Without admitting to their earlier use of their "objective constraint algorithm", Loeb *et al.* (2012) now say

*"To provide a more observation-based representation of changes in net TOA flux during the Science of Climate Change*

*<https://scienceofclimatechange.org>*

*past decade, the CERES net TOA radiation record is anchored to an estimated Earth heat uptake for July 2005 - June 2010 of  $0.58 \pm 0.38 \text{ W/m}^2$ , by combining the Pacific Marine Environmental Laboratory/Jet Propulsion Laboratory/Joint Institute for Marine and Atmospheric Research (...) Argo-only estimate from 0 to 1800m with estimates of smaller heat uptake terms from warming of the deep ocean, land, and atmosphere, as well as melting ice."*

Their admitted need for "anchoring" (fudging) the satellite data to different values, along with their earlier use of the "an objective constraint algorithm" appears to repudiate their above quoted claim in the abstract of no significant statistical difference between Top-of-Atmosphere satellite measurements and Bottom-of-Atmosphere ocean heat content anomaly measurements.

To show a heating "rate", the Loeb *et al.* (2012) ocean heat content anomaly value is now given units  $\text{W/m}^2$ . There is no (CYA) admission that it is based on "anomalies" that are patched together, nor that the data contain temporally varying Southern Ocean fractional content. Regarding the alternative  $\text{EEI} = 0$  hypothesis discussed above in Section 7.3 that was noticed and rejected by Lyman *et al.* (2010), Loeb *et al.* (2012) similarly notice and reject the "flattening" of the (2005-2010) ARGO-only (period 3) data. They also notice that it indicates a much-reduced EEI value, but again, they prefer to quote the (flawed) combined XBT + ARGO datasets and higher indicated EEI value. They still echo and cite nearly exactly the Lyman *et al.* (2010) (BAD PENNY<sup>11</sup>) value,  $\text{EEI} = 0.64 \pm 0.11 \text{ W/m}^2$ . They also increase the number of significant figures *and shrink the error-limits by a factor-of-four!* Note that their displayed (ARGO-only) red points appear to be consistent with  $\text{EEI} = 0$ . Loeb *et al.* (2012) thus continue scientific misconduct #2.

#### *7.5 Power imbalance analysis summary by Stephens et al. (2012)*

Stephens, Loeb, L'Ecuyer, Wild, *et al.* coauthor a new summary energy-imbalance report - Stephens *et al.* (2012). Its primary reference is Loeb *et al.* (2012). Both reports admit to having "adjusted" the above EEI result to "anchor" (shift, fudge) the satellite data to match the OHCA data (scientific misconduct #3). The Stephens *et al.* (2012) power-flow diagrams' results further exhibit bad arithmetic, and the final uncertainty limits (error bars) visibly fail the RMS error-sum crosscheck. (A clumsy fudge.) Stephens *et al.* (2012) provide two power-flow diagrams. They are reproduced here together in Fig. 11.

Stephens *et al.* (2012) mention a variety of EEI values and error limits to choose between. They include the following:

- Lyman *et al.* (2010) earlier reported  $\text{EEI} = 0.6 \pm 0.4 \text{ W/m}^2$  from OHCA data.
- Coauthors Loeb *et al.* (2012) reported  $\text{EEI} = 0.64 \pm 0.11 \text{ W/m}^2$  from OHCA data.
- The CMIP5 [Hansen *et al.* (2007)] simulation result (shown in "Box 1" of Fig. 11) calculates  $\text{EEI} = +2.2 \pm 4.0 \text{ W/m}^2$ .

Stephens *et al.* (2012) note that "... The combined uncertainty on the net TOA flux determined from CERES is  $\pm 4 \text{ W/m}^2$  (95 % confidence) due largely to instrument calibration errors. ...". Stephens *et al.* (2012) chose to report the Lyman *et al.* (2010) ocean-heat-content anomaly "BAD PENNY" value,  $\text{EEI} = 0.6 \pm 0.4 \text{ W/m}^2$ , and ignore all satellite data. Coauthors Stephens and L'Ecuyer later regret having made that choice. (See Sect. 7.6.) The Stephens *et al.* (2012) and Lyman *et al.* (2010) BAD PENNY EEI value is subsequently accepted as gospel by the IPCC's Fifth Assessment Report, AR5 (2013).

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<sup>11</sup> As per **Gross scientific misconduct #4** the BAD PENNY EEI value was defined by Hansen *et al.* (2005, 2010), Lyman *et al.* (2010), and Loeb *et al.* (2012). It is routinely inserted by unknown persons into nearly all significant IPCC *et al.* publications. (See Table 9.) These actions are so frequent that they cannot be dismissed as simple typographical mistakes, and they clearly qualify as gross scientific misconduct #4. The high frequency of these fraudulent insertions is why they are herein named the "BAD PENNY". Like the "proverbial bad penny", they keep showing up over, and over, and over again! See Appendix D.2 for a history of the BAD PENNY - EEI value's evolution and use.

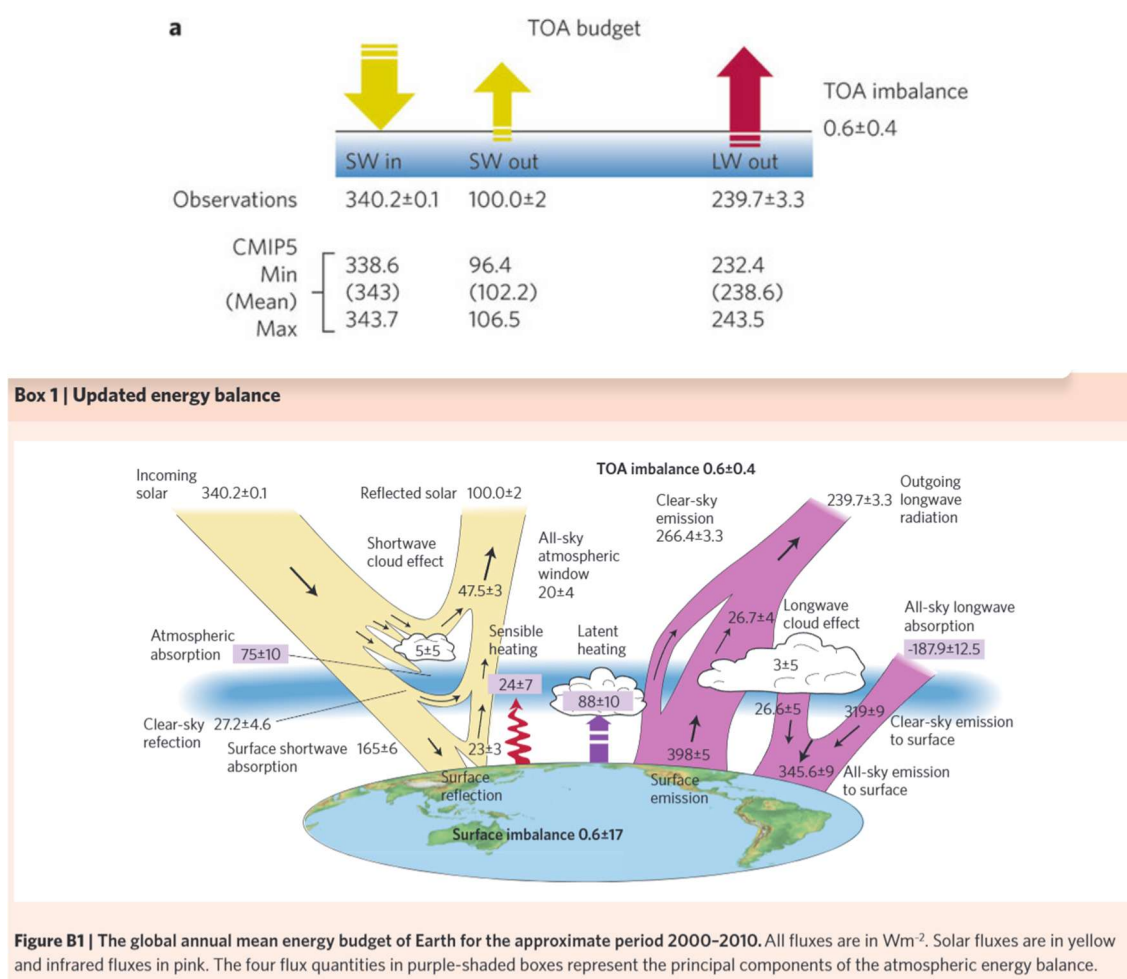


Figure 11: Stephens et al. (2012) power-flow diagrams – their Figures B1a and Box 1.

Both of these figures display bad arithmetic. Note the magic unexplained shrinkage of the reported imbalance error by nearly a factor of ten. They show the incorrect result:  $\text{TOA imbalance} = (340.2 \pm 0.1) - (100.0 \pm 2) - (239.7 \pm 3.3) = (0.6 \pm 0.4)$ . The correct result (see Sect. 4.5.) is  $\text{TOA imbalance} = (0.5 \pm 3.9)$ . Values from CMIP5 computer modelling are also shown. The EEI RMS error range that is calculated from the displayed CMIP5 simulation is  $\pm 4.0 \text{ W/m}^2$ .

### 7.6 Stephens and L'Ecuyer publicly retract the fudged Stephens et al. (2012) results

In a pair of articles with nearly identical power-flow diagrams, L'Ecuyer et al. (2015) and Stephens and L'Ecuyer (2015) publicly retract the fudged Stephens et al. (2012) results. In the first of these two articles L'Ecuyer et al. (2015) reanalyze the ocean-heat-content anomaly data and get different results with much larger uncertainty estimates than those reported earlier by Stephens et al. (2012) and Lyman et al. (2010). L'Ecuyer et al. (2015) thus revise Loeb et al. (2009, 2012)'s and Stephens et al. (2012)'s ocean-heat-content anomaly data analysis. Their power-flow diagram is shown here in Fig. 12. Its power-flux values are extracted and summed here in Table 3.

Table 3: Claimed "observed" power imbalance L'Ecuyer et al. (2015) (All units  $\text{W/m}^2$ ).

|                                    |                 |
|------------------------------------|-----------------|
| Incident Short-Wave power          | +340.0 ± 0.5    |
| Outgoing Short-Wave power          | -102 ± 4        |
| Outgoing Long-Wave power           | <u>-238 ± 3</u> |
| Claimed "observed" power imbalance | EEI = 0 ± 5.0   |

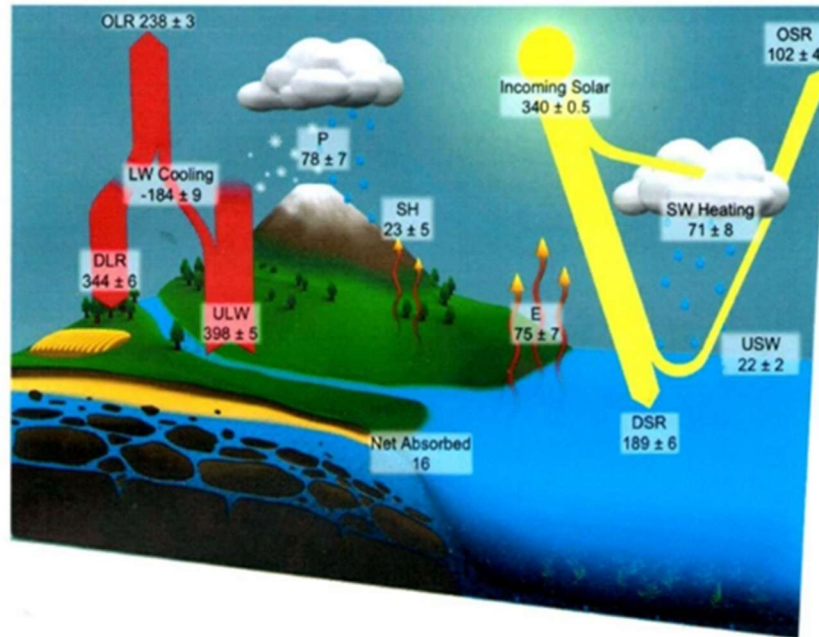


Figure 12: Power flow diagram from L'Ecuyer et al. (2015, Fig. 1).

L'Ecuyer et al. (2015) thus dramatically revise the previously fudged power imbalance error limits offered by Stephens et al. (2012). The new L'Ecuyer et al. (2015) results are now fully consistent with  $EEI = 0$ , and with NO global warming! The National Academies of Sciences, Engineering, and Medicine (2025, p.16) unfortunately misquote L'Ecuyer et al. (2015) and cite them as instead confirming positive EEI and global warming (see Appendix F. National Academies reviewers please note your error!).

The article by Stephens and L'Ecuyer (2015) is somewhat more explicit, and the two authors jointly offer a *mea culpa* admission of their data fudging. Stephens and L'Ecuyer together admit that “adjustments” did need to be made to obtain agreement (*closure*) between satellite data and ocean heat-content anomaly data, and that these “adjustments” are very much larger, “by about  $10 \text{ W/m}^2$ ”, than their previously claimed power imbalance and its uncertainty limits,  $+0.6 \pm 0.4 \text{ W/m}^2$  (the BAD PENNY). Stephens and L'Ecuyer (2015, p. 196) also admit that their choice of which data (satellite or OHCA) needed “adjustment” was made “in a totally ad hoc” fashion”, and that “there is no real evidence to support one adjustment approach over the other”. Stephens and L'Ecuyer (2015, p.198) now assign equal uncertainty ranges on their power-flow diagram to SWIN, SWOUT, and LWOUT for satellite and OHCA data. Their final result gives  $EEI = 0 \pm 5.6 \text{ W/m}^2$  to both cases. Note that this error bound exactly includes the Terra and Aqua measured value that is associated with the design flaw discussed above in Sect. 5.4. Their power flow diagram is shown here in Fig. 13. Their associated power fluxes are now shown in two lines. The upper black numbers are OHCA data, while the lower blue numbers are satellite data. The data extracted from the diagram are summed in Table 4.

Table 4: Power fluxes after Stephens and L'Ecuyer (2015) (All units  $\text{W/m}^2$ ).

|                                      | OHCA            | CERES (Satellites) |
|--------------------------------------|-----------------|--------------------|
| Incident Short-Wave power            | $340.0 \pm 0.5$ | $340.0 \pm 0.5$    |
| Outgoing Short-Wave power            | $-102 \pm 4$    | $-100 \pm 4$       |
| Outgoing Long-Wave power             | $-238 \pm 4$    | $-240 \pm 4$       |
| Correctly calculated summation EEI = | $0 \pm 5.6$     | $0 \pm 5.6$        |
|                                      | (No warming)    | (No warming)       |

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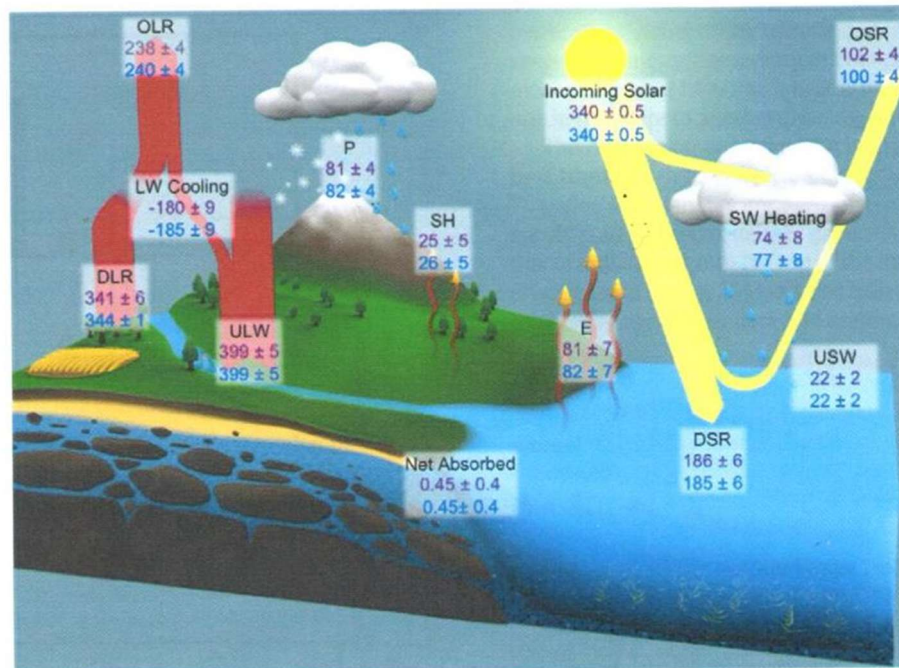


Figure 13: Power flow diagram from Stephens and L'Ecuyer (2015). [Note the strong similarity to the L'Ecuyer et. al. (2015) power-flow diagram shown in Fig 12.]

Given the powerful confession in the article's text, the presence of the BAD PENNY EEI power imbalance reported in the article's abstract, line 5,  $+0.6 \pm 0.4 \text{ W/m}^2$  exhibits a strong (WOOPS) disconnect. The article itself confesses to scientific misconduct #3 in the text and power-flow diagram, where it instead claims the value,  $\text{EEI} = 0 \pm 5.6, \text{ W/m}^2$ . How did the contradictory BAD PENNY value get there in the abstract? The answer is perhaps via gross scientific misconduct #4. It seems highly possible that line 5 of their abstract was edited ("adjusted"? ) after it left the desks of these two authors. Alternatively, it was simply included there as a required citation of previous work, since it is never actually used in the text. Nonetheless, elsewhere the insertion during editing of BAD PENNY EEI values by unknown persons into IPCC literature is very frequent, as will be seen below in Section 9.1, where results of the EEI audit are tabulated in Table 9. In that Table, there are more than nine obvious similar insertions of the same BAD PENNY value, thereby causing bad arithmetic. These insertions are sufficiently routine that they cannot be attributed to simple typographical mistakes. They clearly qualify as *gross scientific misconduct #4 by multiple persons unknown*.<sup>12</sup>

## 8. The IPCC et al. proceed from AR5 (2013) to AR6 (2021)

*If you thought that the scientific misconduct 1,2, and 3 described so far was bad, you ain't seen nuthin' yet. It gets much worse with misconduct 4,5, and 6!*

Following their 2009-2010 "*Aw [expletive]!*" moment, how did the IPCC et al. actually proceed from AR5 (2013) to AR6 (2021)? What was their plan to bypass (cover-up) flaws in the Terra and Aqua satellite design? Evidently, they still hoped that they could "prove" global warming to generally accepted scientific standards. They evidently hoped to "improve" the claimed Stephens et al. (2012) and AR5 (2013) EEI accuracy of  $\pm 0.4 \text{ W/m}^2$ , to obtain the tacitly needed target  $\pm$

<sup>12</sup> AR6 (2021) cites the L'Ecuyer et al. (2015) retraction, but not the Stephens and L'Ecuyer (2015) confession.

0.1 W/m<sup>2</sup> accuracy threshold that is generally accepted for “good science”? See Appendix A for a list of the standards, and compare with the Hansen *et al.* (2011, pp 13433-13434) CYA comment

*“... Estimates of the standard error of the planetary energy imbalance are necessarily partly subjective ... These estimates may be optimistic because of the potential for unrecognized systematic errors. ...”*

The CMIP5 climate-simulation computer code was written at NASA’s Goddard Institute for Space Studies under direction by GISS Director James Hansen. The evident first part of the planned improvement was to distribute the CMIP5 computer code to twenty different climate science laboratories worldwide. In turn, these laboratories independently ran computer simulations using 43+ different models. To provide an improved EEI analysis, they include additional data from the Baseline Surface Radiation Network (BSRN). A group led by Martin Wild at ETH University in Zurich compiled the results in order to generate a world’s “consensus” about global warming. The final part of the plan was for Norman Loeb at NASA-Langley to perform an “improved analysis” of OHCA data and use it to further “adjust / recalibrate / fudge” the clearly flawed Terra and Aqua satellite data. In the process, his analysis was expected to provide the desired target accuracy result.

What were the results?

The results for distributing the CMIP5 climate-simulation computer code to demonstrate consensus regarding EEI and all other climate parameter values are a disaster! The results from including the BSRN data are that it doesn’t help! The additional data gathered from the Baseline Surface Radiation Network is far too sparse.

*Actually, the whole idea totally backfires!* First, the computer codes, themselves are badly flawed. Worse, despite what Al Gore had repeatedly asserted, there is no “consensus” obtained among the world’s climate-science community. Instead, there is total disarray and massive disagreement among their various climate simulations and among their chosen input data parameters.<sup>13</sup> The project instead clearly demonstrates *a total lack of consensus* in the climate-science community. The power-balance simulation-result summaries by Wild *et al.* (2015 and 2019) have no choice but must be grossly fudged (see Appendix E.2), whereupon Wild *et al.* exhibit outrageous *gross scientific misconduct #5*. No one seems to notice the backfire or the misconduct.

The results for the second part of the plan, however, were that Loeb’s reanalysis of OHC anomaly data is used very successfully to “adjust / recalibrate / fudge” the fudged Terra and Aqua satellite data, and thereby to achieve a fudged “closure”. Loeb *et al.* (2018) use it to overwrite the data in the public EBAF Edition 4.0 database. Their analysis provides the desired target result, EEI =  $0.71 \pm 0.10$  W/m<sup>2</sup>, with the desired target accuracy. The result is obtained via *gross scientific misconduct #6*. The IPCC’s Sixth Assessment Report AR6 (2021), in turn, uses the Wild *et al.* (2019) power-flow diagram, and further inserts into it a modification of the Loeb *et al.* (2018) result, EEI =  $0.7 \pm 0.2$  W/m<sup>2</sup>, now claiming 95 % confidence in the result. The UN applauds.

### *8.1 There are totally insufficient downward-radiation monitoring surface data from BSRN weather stations and buoys.*

The Baseline Surface Radiation Network (BSRN) network consists of a set of stations that monitor solar radiation at the Earth’s surface. Wild *et al.* (2015) attempt to use the BSRN weather station data to improve the accuracy of the CMIP5 modelling. Figure 14 shows the small number of available weather station locations in the BSRN network with complete data sets available to Wild *et al.* (2015). Given the resulting lack of actual surface data, Wild *et al.* (2015) admit to “blind-ass” guessing most of their parameters for their CMIP5 climate simulations.

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<sup>13</sup> As per Section 7.2, a factor-of-2 disagreement regarding a final result’s value is perhaps fully consistent with Al Gore’s definition of “scientific consensus”.

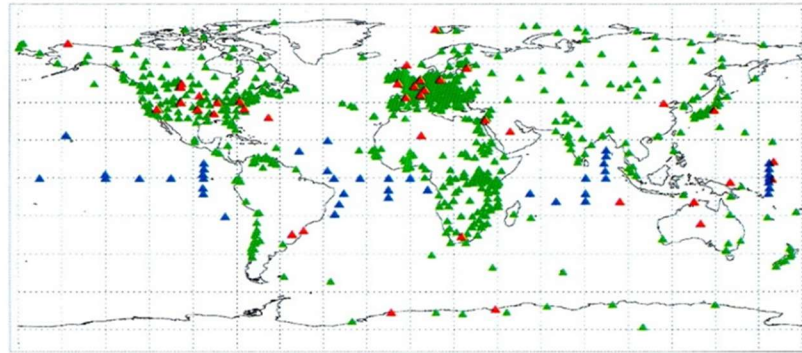


Figure 14: Map of the available Baseline Surface Radiation Network (BSRN) stations with complete datasets. (from Wild *et al.* (2015).

Radiation monitoring on the ocean was by BSRN stations on islands, as well as by some radiation monitoring buoys. Wild *et al.* (2015) must base their power-flow map for the ocean (71 % of the Earth) on data available from a total of only 5 ocean Baseline Surface Radiation Network (BSRN) weather stations, and only 17 ocean-surface downward-radiation monitoring buoys. There is virtually zero data at all from the South Pacific Ocean. Unfortunately, the South Pacific Ocean covers nearly half of the whole Earth. Data from ocean-surface downward-radiation monitoring buoys and BSRN stations are under-sampled there spatially a factor of at least 16 million by the Shannon/Nyquist criteria.

Land occupies only 29 % of the Earth's surface. Almost all measurement stations are on land. However, note the paucity of land stations everywhere except the USA and Europe. Data from northern North America, North Africa, along with virtually all of Greenland, Asia, Australia and South America are all grossly under-sampled.

### *8.2 A problem with the CMIP5 code - it uses seriously flawed physics.*

The CMIP5 computer modelling (GISS – Model E2) was written by the Goddard Institute for Space Studies under direction by GISS Director James Hansen. It was distributed and used by various laboratories worldwide. Each lab used different input-data for the assumed parameters, but still kept the same flawed physics built into the code. In their description of the code's merits, Hansen *et al.* (2007, p. 661) admit

*“... Discrepancies between observations and simulations with all forcings are due to model deficiencies, inaccurate or incomplete forcings, and imperfect observations. Although there are notable discrepancies between model and observations, the fidelity is sufficient to encourage use of the model for simulations of future climate change. ...”*

I strongly disagree with their second sentence! I assert that GOOD SCIENCE would conclude the opposite - that the computer code's forecasts are thoroughly untrustworthy, especially when trillion-dollar decisions are riding on the code's accuracy. A recent (11/13/24) New York Times article authored by GISS Director, Gavin Schmidt<sup>14</sup>, is titled *“We Study Climate Change. We Can't Explain What We're Seeing.”* He admits in the article's title that the GISS models don't work.

### *8.3 How big are the typical CMIP5 discrepancies between observations and simulations ('biases') that Hansen et al. (2013) admit to?*

Wild *et al.* (2015, 2019) use very misleading jargon. They redefine the word “bias” to mean a “theory minus experiment quantitative discrepancy”, i.e. a “bias” is defined as the numerical

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<sup>14</sup> Gavin Schmidt was James Hansen's successor as GISS director.

difference between the CMIP5 simulated value and the actually observed data value”<sup>15</sup>. The answer to the question “*How big are the typical biases, i.e. how big is the typical disagreement between simulation and observed reality?*” depends strongly on who uses the CMIP5 code and what are the chosen assumed model parameters.

Wild *et al.* (2015, 2019) gather 43+ CMIP5 simulation results calculated at 20 different climate-science laboratories around the world. They plot the results using bar graphs, where each bar depicts a different model’s prediction. Figure 15, taken from Wild *et al.* (2015), shows their bar graph of the so-called “*biases*” for the various calculations of the specific parameter “Surface Downward Solar Radiation” ( $\equiv$  SWIN-SWOUT)<sub>surface</sub>. This bar-graph indicates that the 43 climate scientists each get very different results from one another and from GISS climate scientists. The full range of “*biases*” from among all 43 values is 38 W/m<sup>2</sup>. (Recall the target accuracy is  $\pm 0.1$  W/m<sup>2</sup>.) Hansen *et al.* (2011) praise the CMIP5 “*fidelity*” to observation. On the other hand, the CMIP5 code, itself, obviously does not try very hard to emulate and/or exhibit “*fidelity*” to the experimental data that are discussed by Wild *et al.* (2015 and 2019).

The four models calculated at GISS are marked on Fig. 15. The GISS “*bias*” calculations themselves have a very small spread of values - only about 1 W/m<sup>2</sup>. Nonetheless, the four GISS models’ predictions *still* differ from actually observed values by about 5 to 6 W/m<sup>2</sup>. Schmidt *et al.* (2014) publish the assumed parameters for these GISS models. The GISS models (surprisingly) all show associated EEI values ranging maximally from only 0.76 to 0.34 W/m<sup>2</sup>. These various simulations, however, evidently all get the same “*best estimate*” value for EEI. “*Surprisingly*”, that value is the BAD PENNY value, EEI =  $0.6 \pm 0.4$  W/m<sup>2</sup>. A probable conclusion to this conundrum is that the CMIP5 code, itself, massively fudges the assumed “*input*” data in order to maintain what appears to be an evidently mandatory rigged “*output*” result - the BAD PENNY value. (See also the discussion in Appendix E.2.)

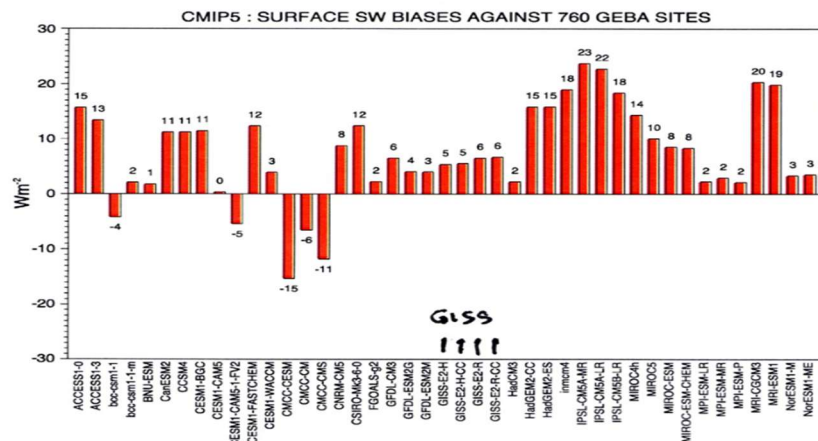


**Fig. 7** Average biases (model—observations) in downward solar radiation at Earth’s surface calculated in 43 CMIP5 models at 760 sites from GEBA. Units Wm<sup>-2</sup>

Figure 15: Bar-graph from Wild *et al.* (2015, Fig.7) showing “*biases*” (discrepancies between model-calculations and observations) for the parameter, Downward Solar Radiation (SWIN-SWOUT)<sub>surface</sub>. Each bar’s height represents the “*bias*” calculated at a specific laboratory using a specific climate model. The four simulations calculated at GISS are marked.

For their various additional assembled models’ results, Wild *et al.* (2015) display 29 different bar graphs, and Wild *et al.* (2019) display 23 different bar graphs each showing the results of different simulations. As a result of the bad physics incorporated within the CMIP5 modelling codes and the different choices for input parameters used by the different models, the various CMIP5 simulation results are all in violent disagreement both with the observed data and with each other!

<sup>15</sup> As used in a sentence, “Don’t ‘*bias*’ my opinion by confusing me with different observed quantitative facts.”

Similarly large bias ranges are typical for all other parameters computed using for these models. To demonstrate just how bad the Wild *et al.* (2015) disparity of results among the various models and laboratories, a few typical examples are provided here.

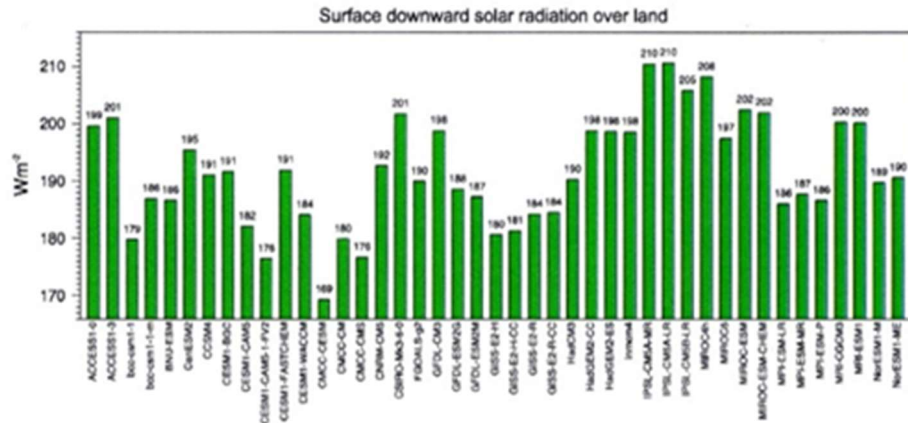


Figure 16: From Wild *et al.* (2015, p.3403, Fig. 6 - top). It shows the various simulation results for All-sky (TOA over land) of  $SW_{down}$  ( $\equiv SWIN_{down} - SWOUT_{down}$ ).

Figure 16 is from Wild *et al.* (2015, p.3403, Fig. 6 - top). It shows the various model results for All-sky over land of  $SW_{down}$  ( $\equiv SWIN - SWOUT$ ) for the CMIP5/IPCC-AR5 computer simulations in 43 models, 23 labs. Calculated values range by 41  $W/m^2$  (from 169 to 210). The results reported on the Wild *et al.* (2015)<sub>LAND</sub> power-flow map value differ. They show 184  $W/m^2$  with a full range from 182 to 187, i.e. a full uncertainty range of only 5  $W/m^2$ . Note that Land is where most of the weather stations are. If weather station data are input parameters, then the values for all simulations should be the same.

A second example is shown in Figure 17. It is from Wild *et al.* (2019, p. 4800, Fig. 8 - top). It shows the various simulation results for Clear-sky (TOA over ocean + land)  $LW_{out}$ , from CMIP5/IPCC-AR6 computer simulations (37 models). Values fully range by 13  $W/m^2$ , from 258 to 271  $W/m^2$ . For comparison, the associated power-flow map value, 267, indicates an associated uncertainty range from 264 to 270  $W/m^2$ , with an uncertainty full range of 6  $W/m^2$ . The centers of the ranges differ and/or are shifted by 2.5  $W/m^2$ .

The power-flow diagram values in both Wild *et al.* (2015) and Wild *et al.* (2019) also frequently do not match the tabulated simulation results or their uncertainties or experimental data described in the text.

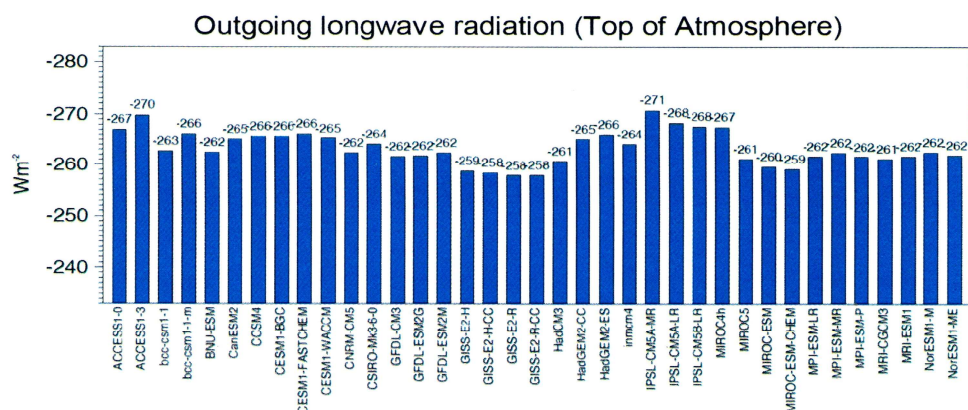


Figure 17: From Wild *et al.* (2019, p.4800, Fig. 8 - top). It shows the various simulation results for Clear-sky (TOA over ocean + land)  $LW_{out}$ .

#### 8.4 CMIP5 simulations are totally incapable of explaining, even approximately, the Earth's observed temperature anomaly history as adopted by AR5(2013)

Figure 18 shows the GISS CMIP5 computer modelling of the Earth's so-called temperature "anomaly". The graph is copied from the IPCC's Fifth Assessment Report, AR5 (2013, Fig 11.25). It was also republished in the APS (American Physical Society) news, "Back Page". The solid black curve is the claimed observed temperature anomaly. The various computed curves display the Earth's predicted (colored) and historical (gray) computer-simulated "temperature anomaly". Note that not one of the 138 displayed models is capable of simulating the Earth's past (so-called) temperature anomaly history, let alone predicting its future. The models' major disagreement between theory and observation, especially with their inability to simulate history, indicates that something is clearly very wrong with the physics incorporated within all of the computer models. Correspondingly, their predictions must be considered totally unreliable, despite what Hansen *et al.* (2011) said to the contrary. Eric Niiler reports in a recent New York Times article (May 20, 2026, p. A11), that (with 13 years of hindsight) the IPCC has now retracted the red curves that represent the RCP 8.5 predictions (39 models), admitting that the RCP 8.5 scenario "is unrealistic and should be scrapped".

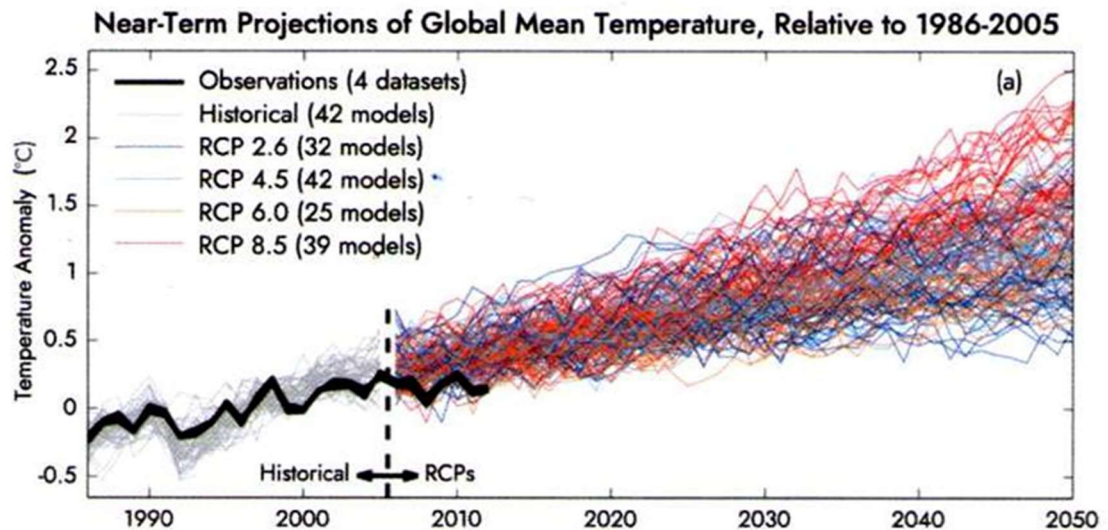


Figure 18: Flawed CMIP5 computer modelling estimates of the Earth's temperature "anomaly" history and predictions. It is Figure 11.25 is from AR5 (2013). RCP 8.5 models have been recently retracted as "unrealistic".

#### 8.5 CMIP5 computer modelling is pathetically incapable of simulating the Earth's annually varying albedo

The CMIP5 computer modelling is also unable to simulate, anywhere nearly correctly, the Earth's albedo - its sunlight reflectivity fraction, SWOUT / SWIN. Serious disagreement between theory and the claimed surface-temperature observation again indicates that something is very wrong with the physics incorporated within the computer models, and/or with the SWOUT observation, as noted in Sect. 5.4.

Figure 19 is reproduced from Stephens *et al.* (2015). It shows the Earth's annual systematic albedo oscillation. The solid black curve is the 10-year average value measured by CERES satellite radiometry. The various yellow curves are various CMIP5 simulations. My added SWOUT scale shows the associated reflected sunlight power flux. It assumes a constant solar irradiance, SWIN = 340 W/m<sup>2</sup>. It does not, however, include the added and much larger sinusoidal variation of the so-called solar constant that is due to the eccentricity of the Earth's orbit. With that inclusion, the actual total non-sinusoidal variation of the global average Outgoing Short-Wave power is then about  $\pm 16$  W/m<sup>2</sup>.

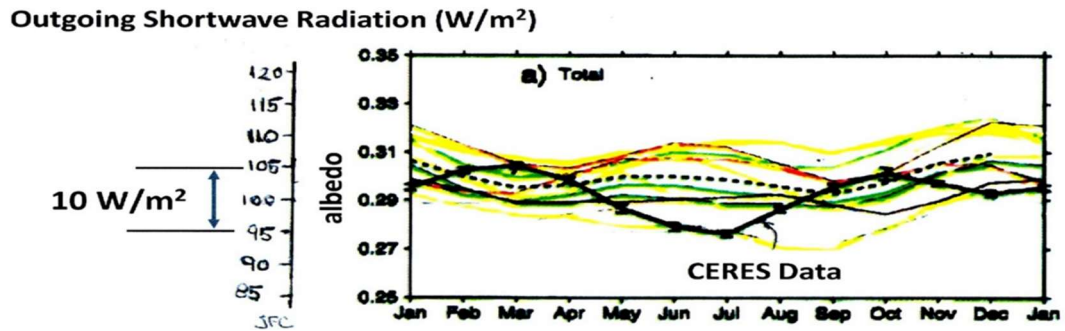


Figure 19: The Earth's annual systematic albedo oscillation. The solid black curve is the 10-year average value from CERES satellite radiometry measurements. The various colored curves are CMIP5 simulations.

The various CMIP5 computer modelling is totally incapable of simulating, anywhere nearly correctly, the Earth's albedo – i.e. its sunlight reflectivity fraction, SWOUT / SWIN. Serious disagreement between theory and observation again indicates that something is very wrong with the physics incorporated within the computer models. The CMIP5 simulation error with respect to observed data (bias) is at least 10 – 15 W/m<sup>2</sup>. Note that reflected (outgoing SW) power errors translate directly into EEI errors. The IPCC's AR6 (2021) does not show this embarrassing Figure!

#### 8.6 CMIP5 simulations are all in violent disagreement with observed data and with each other. The disagreement indicates a total lack of consensus among climate scientists!

Except for their final EEI value, the simulations by Wild *et al.* (2015 and 2019) all yield wildly different quantitative values for almost all of their calculated and/or assumed climate parameters, and the various values are all in serious disagreement with each other. The disarray among the results calculated using CMIP5 by different climate scientists clearly demonstrates a significant lack of consensus among these climate scientists regarding the Earth's climate's properties as well as its underlying flawed physics. It correspondingly repudiates Al Gore's emphatic claim in his 2006 movie, "*An Inconvenient Truth*", of a "*scientific consensus*" regarding proven global warming and climate change. *Al Gore's claims are a total fantasy.* Some of the disarray and lack of reliability among the CMIP5 predictions was also highlighted earlier by the former White House science advisor, Steve Koonin, in his recent (2021) book - *Unsettled? What climate science tells us, what it doesn't, and why it matters.*

Al Gore and the IPCC *et al.* draw their foreboding conclusions by assuming that the CMIP5 simulations are reliable. The simulations, on the other hand, clearly demonstrate a total lack of reliability. Indeed, they provide a totally flakey basis for the IPCC's "*best-estimate*" for the Earth's Energy Imbalance and for global warming. The simulations all exhibit serious disagreement (Wild *et al.*'s so-called "*biases*") with the limited available observational data. The CMIP5 code exhibits a 38 W/m<sup>2</sup> range of theory vs. observation discrepancies. However, as noted above, the final CMIP5 EEI's very precise value is evidently rigged by the code, itself, as a controlling required result that is built in to the software! CMIP5 and the IPCC *et al.* together have evidently cooked the books!

#### 8.7 Power-imbalance analysis by Wild *et al.* (2015) - Scientific misconduct #5

*What about the Wild et al. (2015 and 2019) EEI best estimates? Here is where the fraudulent data fudging gets extreme - Scientific misconduct #5.*

Wild *et al.* (2015) break tradition from using Ramanathan's convention and construct power-balance diagrams, still with only two sky-partitions – All-sky over Ocean and All-sky over Land. The data values shown on these power-flow diagrams are totally silly and are very obviously

fudged! They present a smoking gun example of GROSS scientific misconduct #5. Their first two associated power flow diagrams “Sea only” and “Land only” are reproduced here in Fig. 20, with the obviously fudged values circled.

The unusual notation used in the Wild *et al.* (2015) power-flow diagram has a “best-guess” number followed by its uncertainty-range’s lower and upper limits in parentheses. Appendix D.4 discusses the Wild *et al.* (2015) non-standard notation and its use. They introduce it as a new method for (mis)representing a number that has been “adjusted” (fudged) by using the Loeb *et al.* (2009) dodgy fudging technique. The unusual notation is subsequently adopted by Wild *et al.* (2019) and AR6 (2021). Other IPCC *et al.* fudging techniques used here are discussed in detail further in Sections 9.3 and 9.4, and Appendices D.1 - D.4, E.1, and E.2.

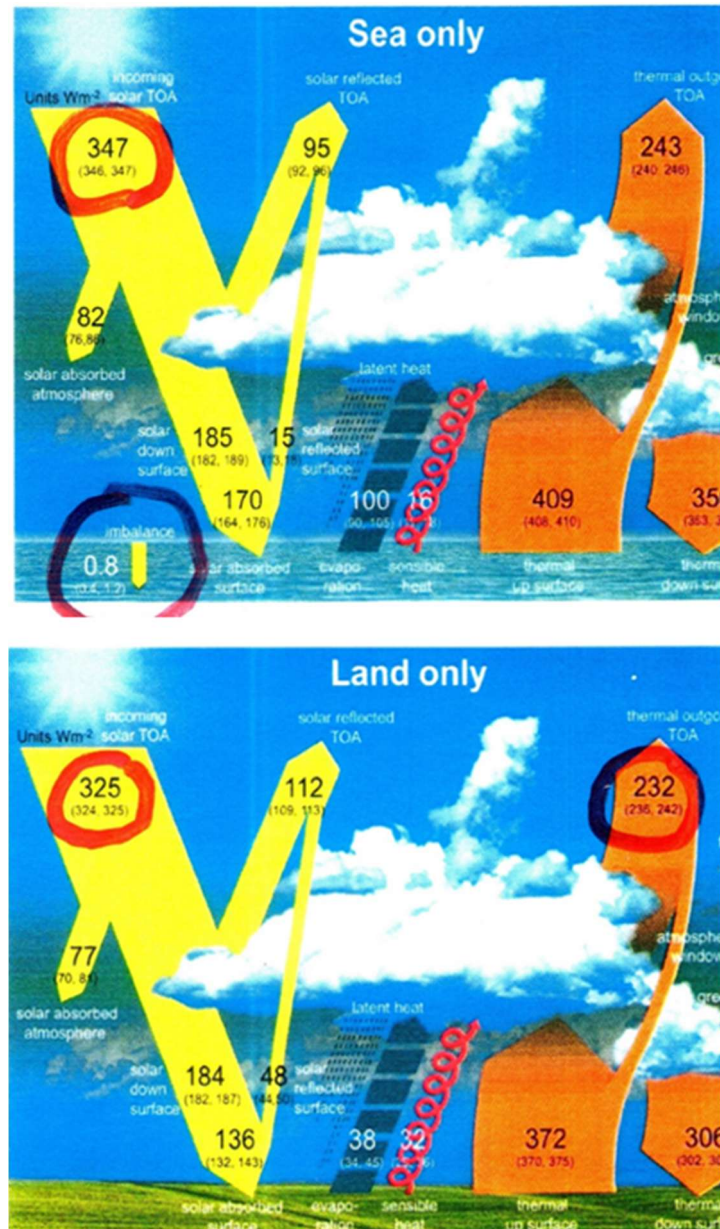


Figure 20: (Upper) Wild *et al.* (2015) Sea only power-flow diagram. (lower) Wild *et al.* (2015) Land only power-flow diagram. Encircled numbers are obviously fudged.

Obviously fudged numbers are encircled in Figs. 20, (Upper and Lower). The two most prominent of these are: SWIN (Sea only) = 347 (346,347) and SWIN (Land only) = 325 (324,325). Note that

the two diagrams together assert that the sun mysteriously shines at the top-of-atmosphere over ocean (Sea) more brightly by  $22 \text{ W/m}^2$  than it does over land<sup>16</sup>. Wild *et al.* appear to be fully aware of the silliness of what they assert! Here is a direct quote from p. 3422 of their article:

“... As noted above and evident from Fig. 2, the surface downward solar fluxes averaged over land and oceans are nearly identical, which seems a robust feature in various estimates. (See Sect. 5.1.) This is the case, despite an insolation at the TOA which is higher by  $22 \text{ W/m}^2$  over ocean than over land. ...”

The probable cause of this situation is bad physics included in the CMIP5 code that forces the ridiculous displayed Land-Sea difference in TOA insolation. It is discussed further in Appendix E.2.

Another encircled value is LWOUT (Land only) =  $232 (236,242) \text{ W/m}^2$ . The value has been “adjusted” by  $7 \text{ W/m}^2$  to  $4 \text{ W/m}^2$  below the lower limit of its uncertainty range. The land LWOUT(Land) “best estimate” value, and two SWIN values have all been “adjusted” (fudged) far outside of their claimed 95 % uncertainty-limit range! They present a very clear “smoking gun” example of GROSS scientific misconduct #5. Curiously, all three of these huge fudges become unobservable when the two power-flow diagrams are added together to form a single “Land + Sea” diagram. It is shown here in Fig. 21.

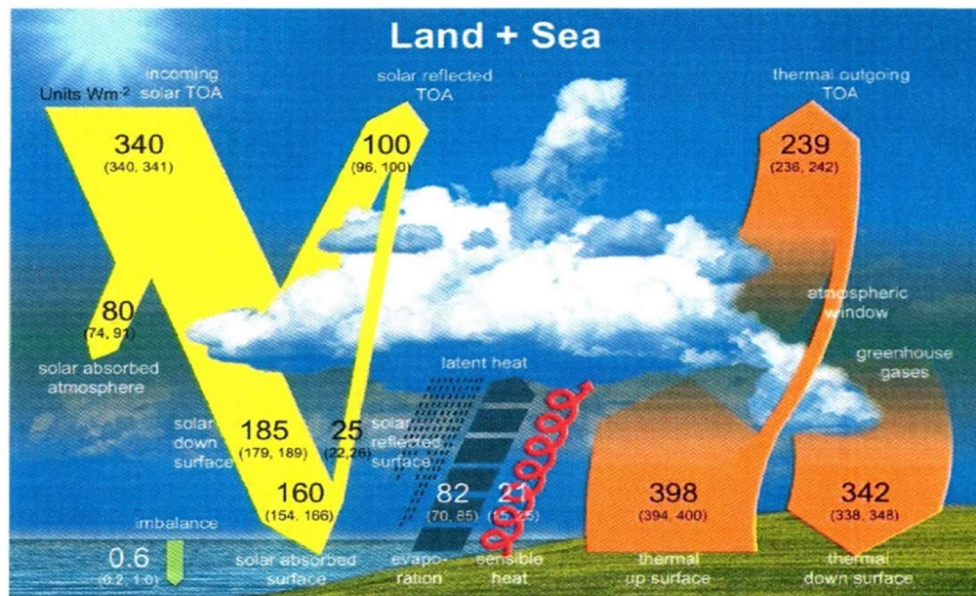


Figure 21: The Wild *et al.* (2015) Land + Sea power-flow diagram.

The Land + Sea power-imbalance arithmetic indicated by Fig 21 is shown in Table 5.

Table 5: Land + Sea power-imbalance arithmetic indicated by Fig. 21 (All units  $\text{W/m}^2$ ).

|                                 |                |                   |
|---------------------------------|----------------|-------------------|
| SW IN                           | 340 (340,341)  | ErrRng = 1        |
| SW OUT                          | -100 ( 96,100) | ErrRng = 4        |
| LW OUT                          | -239 (236,242) | ErrRng = 6        |
| Correct sum: EEI =              | 1              | RMSΣ ErrRng = 7.3 |
| (note bad arithmetic)           | c.f. ↓         | c.f. ↓            |
| Wild <i>et al.</i> (2015) EEI = | 0.6 (0.2,1.0)  | ErrRng = 0.8      |

<sup>16</sup> One wonders how Wild *et al.* train the sunlight photons to divert course to accomplish this magical feat.

The arithmetic on Fig. 21 is seriously in error, but the huge fudges on the individual Sea and Land diagrams on Fig. 20 are now hidden and covered up. The uncertainty ranges (error bars) still visibly fail the RMS error-sum crosscheck discussed above. Magically, the final uncertainty range has been shrunk by a factor-of-9 from that indicated by the RMS sum.

Note that the Wild *et al.* (2015) analysis was made as a compilation of 43 different CMIP5 computer models made at 20 different climate-science laboratories around the world. The global-warming BAD PENNY (lower left-hand corner) seems to have been automatically inserted by the CMIP5 code. (See Appendix E.2.) Evidently, the code *adjusts* the (assumed) input numbers to get the required BAD PENNY. Wild *et al.* (2015) in the text admit to having simply guessed the ocean and land Clear-sky albedos.

### 8.8 Power-imbalance analysis by Wild *et al.* (2019)

Wild *et al.* carry forward their 2015 GROSS scientific misconduct #5 fudges to Wild *et al.* (2019). Following their 2015 debacle, the Wild *et al.* (2019) EEI analysis reverts to the two-component sky partitioning proposed originally by Ramanathan (1987) – Clear-sky and Cloudy sky. Perhaps as a lazy shortcut, the Wild *et al.* (2019) “All sky” diagram is reused and copied nearly exactly from the Wild *et al.* (2015) “Land + Sea” power-flow diagram. It is simply renamed “All sky”. In turn, that diagram was the (evidently area-weighted) sum of the (All-sky) over Ocean (Sea) and (All sky) over Land component diagrams. The two diagrams are shown together in Fig. 22 for comparison. Unfortunately, both of those two diagrams still contain results from the badly fudged SWIN and LWOUT numbers, as noted above. See Appendix C for the associated Wild *et al.* (2019) clear-sky and “Cloud-Radiative-Effect” (CRE) diagrams.

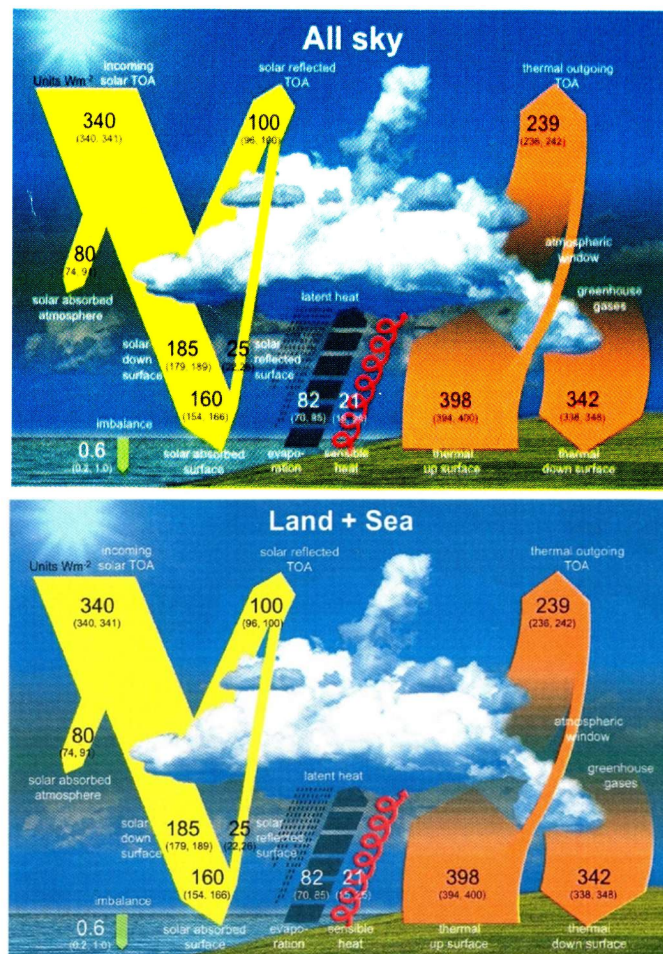


Figure 22: (Upper) Wild *et al.* (2019) All sky power-flow diagram. Compare it to (Lower) the Wild *et al.* (2015) Land + Sea power-flow diagram (a repeat of Fig. 21).

The Wild *et al.* (2019) power-imbalance values extracted from the Fig. 22 (upper) All-sky diagram values, along with their summation, are shown in Table 6. These power-flow values are tabulated with two different error/uncertainty limits depictions. The normally used method is shown in the left-hand column, and the innovative (non-standard) Wild *et al.* method is used in the right-hand column. It was introduced earlier by Wild *et al.* (2015). Appendix D.4 describes the Wild *et al.* (2015) method for (mis)representing a number that has been “adjusted” using the Loeb *et al.* (2009) dodgy data-shifting (fudging) technique. The fudged power fluxes and uncertainty error bounds presented here in Table 6 are all copied directly from the top line and lower left-hand corner of their power-flow diagram. The uncertainty full range is listed as “ErrRng” and its lower and upper limits are in parentheses.

*Table 6: Wild et al. (2019) power-imbalance, all-sky diagram values (All units W/m<sup>2</sup>).*

| Error/uncertainty limits depiction:           | Normal method   | Wild et al method     |                   |
|-----------------------------------------------|-----------------|-----------------------|-------------------|
| Incident Short-Wave power (W/m <sup>2</sup> ) | +340.5 ± 0.5    | 340 (340,341)         | ErrRng = 1        |
| Outgoing Short-Wave power                     | -98 ± 2         | -100 (96,100)         | ErrRng = 4        |
| Outgoing Long-Wave power                      | <u>-239 ± 3</u> | <u>-239 (236,242)</u> | <u>ErrRng = 6</u> |
| Correct summation    EEI =                    | 3.5 ± 3.6       | +1                    | RMSΣ ErrRng=7.3   |
|                                               | No warming      | No warming            |                   |
| (Note bad arithmetic)                         | c.f. ↓          | c.f. ↓                |                   |
| EEI reported by Wild et al. (2019) =          | +0.6 ± 0.4      | +0.6 (0.2,1.0)        | RMSΣ ErrRng=0.8   |
|                                               | Strong warming  | Strong warming        |                   |

In any reasonable methodology, the full range of the summation should equal the root-mean-square of the error ranges of summands, (RMSΣ ErrRng = 7.3). However, Wild *et al.* (2019) instead report the value, RMSΣ ErrRng = 0.8, *wherein they have dishonestly, arbitrarily, and without comment* shrunk that error range by more than a factor-of-nine by using bad arithmetic. By using correct arithmetic and by using either method, then both summations show negligible global warming. However, as reported in the lower left-hand corner of their diagram, the infamous BAD PENNY reappears once again (reverting to its Loeb *et al.* (2012) uncertainty limit). Their error limits (uncertainty ranges) not only are incorrectly calculated, but they also visibly fail the RMS error-sum crosscheck! The Wild *et al.* (2019) power-flow diagram is adopted and used in the IPCC’s AR6 (2021), but not without the introduction of further fudges that are needed to achieve the sought after target uncertainty range, ± 0.1 W/m<sup>2</sup>. See the next two Sections.

### *8.9 Johnson, Lyman and Loeb (2016) and Loeb et al. (2018) overwrite the EBAF public satellite-database with fudged OHCA data*

*What about Loeb’s refinement of the EEI estimate from ocean-heat-content anomaly data and the AR6 (2021) best estimates? Here is where the fraudulent data fudging gets even more extreme – Gross Scientific Misconduct #6 (smoking gun).*

Johnson, Lyman and Loeb (2016) *a priori* assume that greenhouse gases are causing global warming in their first sentence and insist that the best way to measure the Earth’s power imbalance (EEI) is by using the grossly-sparse, strongly biased, and mostly fabricated ocean-heat-content anomaly data. They update the Lyman *et al.* (2010) and Loeb *et al.* (2012) previous OHCA power-imbalance estimate from EEI (2005.5 - 2010.5) = 0.58 ± 0.38 W/m<sup>2</sup>, and report their new BAD PENNY value, EEI (2005.5 - 2015.5) = 0.71 ± 0.10 W/m<sup>2</sup>. Note that the tacit desired “target” uncertainty limits are now claimed to have been met.

Figure 23 shows the Loeb *et al.* (2018) Table 5. It displays the “*adjustments*” that were made to fudge the Terra and Aqua data in order to force it to agree with ocean-heat-content anomaly data that was earlier reanalyzed by Johnson, Lyman, and Loeb (2016). Loeb *et al.* (2018) freely admit,

“... the absolute accuracy requirement necessary to quantify the Earth’s energy imbalance (EEI) is daunting. ... “,

and use this fact to justify their “adjustments” (overwriting and fudging) of the satellite data in the permanent public database.

TABLE 5. Global mean TOA fluxes ( $\text{W m}^{-2}$ ) for July 2005–June 2015 before and after applying net TOA flux constraint for EBAF Ed2.8 and EBAF Ed4.0.

|                | EBAF Ed2.8 |                 | EBAF Ed4.0 |                 |
|----------------|------------|-----------------|------------|-----------------|
|                | Unadjusted | With constraint | Unadjusted | With constraint |
| Incoming Solar | 339.8      | 339.8           | 340.0      | 340.0           |
| All-sky LW     | 238.7      | 239.6           | 238.6      | 240.1           |
| All-sky SW     | 97.9       | 99.6            | 97.1       | 99.1            |
| All-sky net    | 3.2        | 0.63            | 4.3        | 0.71            |

Figure 23: Table 5 from Loeb et al. (2018) shows “adjustments” made to the Terra and Aqua data to force it to agree with ocean-heat-content anomaly data, as reanalyzed by Johnson, Lyman, and Loeb (2016). Added red ellipse surrounds the EBAF Edition 4.0 “adjustment”.

Loeb et al. (2018) use the Johnson, Lyman, and Loeb (2016) data values, to “recalibrate” and overwrite (now for the second time – c.f. EBAF Edition 2.8) all Terra and Aqua satellite observational data, using the highly questionable OHCA data as an “anchor”. This is done to all satellite data available in the whole EBAF public database so that it now matches the ARGO EEI result, and totally covers up the inability of satellites to make absolute flux measurements. Note that this action totally eliminates any relevance of satellite measurements to an absolutely calibrated estimation of Top-of-Atmosphere Earth’s Energy imbalance. Deceived by the Loeb et al. (2018) overwritten data that is used as a cover-up of satellite design flaws, the (gullible and careless) 2025 US National Academies of Sciences, Engineering, and Medicine (2025, p. 16) review cites the (now fudged) EBAF database as “proof” of a close agreement between the satellite and OHCA data (a.k.a. *closure*), thereby confirming (in their opinion) an observed global warming via a positive Earth’s Energy Imbalance. (See Appendix F.)

The “adjustment” values (shown in their Table 5) are repeated here in my Table 7. Note the “creative rounding” fudges indicated by the difference between the actual summation values and the reported values.

Table 7: EBAF Adjustment values with ‘creative rounding’ (all units  $\text{W/m}^2$ ).

|                  | EBAF Edition 2.8         |               | EBAF Edition 4.0           |                    |
|------------------|--------------------------|---------------|----------------------------|--------------------|
|                  | Unconstrained            | Constrained   | Unconstrained              | Constrained        |
| SW Power IN      | 339.8                    | 339.8         | 340.0                      | 340.0              |
| SW Power Out     | -97.9                    | -99.6         | -97.1                      | -99.1              |
| LW Power Out     | <u>-238.7</u>            | <u>-239.6</u> | <u>-238.6</u>              | <u>-240.1</u>      |
| Actual EEI sum   | 3.20                     | 0.6           | 4.30                       | 0.8                |
| Reported EEI sum | 3.20                     | <u>0.63</u>   | 4.30                       | <u>0.71 ± 0.10</u> |
|                  | (Old inserted BAD PENNY) |               | (Newly inserted BAD PENNY) |                    |

Loeb et al. (2018, p. 904) go on to say

“...As in previous versions of EBAF, we use the objective constraint algorithm described in Loeb et al. (2009) to adjust SW and LW TOA fluxes within their ranges of uncertainty to remove the inconsistency between average global net TOA flux and heat storage in the earth-atmosphere system as determined primarily from ocean-heat-content anomaly (OHCA) data. In the current version, the global annual mean values are adjusted such that the July 2005–June 2015 mean net TOA flux is  $0.71 \pm 0.10 \text{ W/m}^2$ , as provided in Johnson et al. (2016). ...”.

It is important to note that Loeb *et al.* (2018) *falsely claim* that their “adjustment” of EEI is “within their ranges of uncertainty”. The Loeb *et al.* “adjustment” of EEI is  $3.5 \text{ W/m}^2$ , i.e. from  $4.3$  to  $0.8 \text{ W/m}^2$  and is a huge shift (35X) when compared to their claimed final uncertainty range limit,  $\pm 0.10 \text{ W/m}^2$ . Also note that Loeb *et al.* (2018) are not simply “recalibrating” the satellite EEI measurements. They are effectively totally covering up the bad satellite data measurements that result from design flaws, thereby *totally erasing their value*, and instead, throwing 100 % of the EEI measurement burden onto the dubious ARGO measurement values. The Loeb *et al.* (2018) EEI value, in turn, is then adopted by the IPCC’s Sixth Assessment Report, AR6 (2021), as its final official value, further “adjusting” the Wild *et al.* (2019) EEI value and halving its uncertainty range, as a last update to the Hansen-Loeb-Wild-Lyman-Johnson BAD PENNY EEI value.

#### 8.10 Fudged power-imbalance analysis by the IPCC’s AR6 (2021)

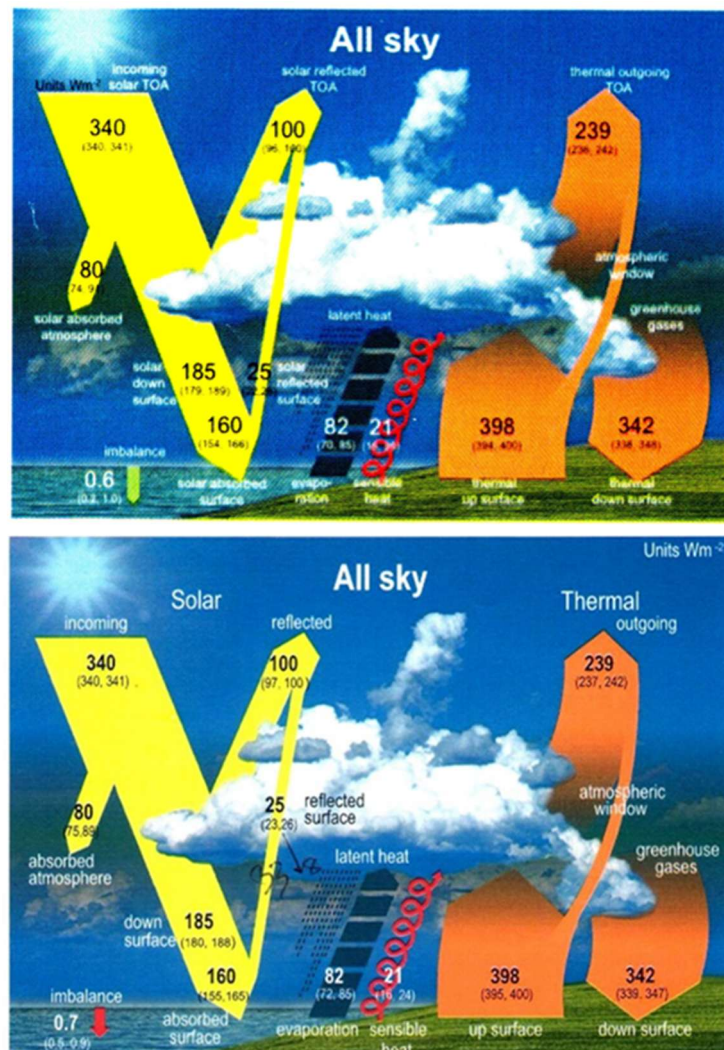


Figure 24: (Upper) The IPCC’s AR6 (2021, p. 934) All sky power-flow diagram. (Lower) Wild *et al.* (2019) All sky power-flow diagram [a repeat of Fig. 22 (Upper), shown for comparison]. SWIN, SWOUT, and LWOUT are reported on the top line of each diagram, while the EEI power imbalance is reported in the lower left-hand corner.

The IPCC’s AR6 (2021, p. 934) All sky power-flow diagram is shown in Fig. 24 (Upper). Except for its changed EEI value (with red arrow in the lower left-hand corner),  $\text{EEI} = +0.7 \pm 0.2$ , it is

copied exactly from the Wild *et al.* (2019) power-flow diagram, shown here in Fig. 24 (Lower), which is a repeat of Fig. 22 (Upper), shown for comparison. The changed “red-arrow” EEI result is the fudged value from the Loeb *et al.* (2018) data-overwrite of EBAF Ed.4.0 database. In turn, that fudged number is “*anchored to*”, i.e. it has been “*adjusted to match*”, the Johnson, Lyman and Loeb (2016) OHCA data value.

The power imbalance numbers from the AR6 (2021) Fig. 24 (upper) are reproduced here in Table 8. The numbers are shown in two columns with two different error/uncertainty limits depictions. The normal depiction method is shown in the left-hand column, and the innovative (non-standard) Wild *et al.* method is in the right-hand column. Appendix D.4 describes the Wild *et al.* (2015) new method for (mis)representing a number that has been “*adjusted*” using the Loeb *et al.* (2009) dodgy data-“*shifting*” (fudging) technique. Additional fudging techniques used by the IPCC *et al.* are discussed further in Sections 9.3 and 9.4, Appendices D.1, D.2, D.3, D.4, E.1, and E.2.

*Table 8: Power imbalance numbers from the AR6 (2021). Units are W/m<sup>2</sup>.*

| <i>Error/uncertainty limits depiction</i> | <i>(Normal method)</i> | <i>(Wild et al. Method)</i> |                 |
|-------------------------------------------|------------------------|-----------------------------|-----------------|
| Incident Short-Wave power                 | +340.5 ± 0.5           | +340 (340,341)              | ErrRng=1        |
| Outgoing Short-Wave power                 | -98.5 ± 1.5            | -100 (97,100)               | ErrRng=3        |
| Outgoing Long-Wave power                  | <u>-239.5 ± 2.5</u>    | <u>-239 (237,240)</u>       | <u>ErrRng=3</u> |
| Net ‘calculated’ power imbalance (jfc)    | 2.5 ± 3.0              | +1 RMS Σ                    | ErrRng=4.4      |
|                                           | (No warming)           | (No warming)                |                 |
| Note bad arithmetic                       | c.f ↓                  | c.f.↓                       | c.f.↓           |
| EEI                                       | +0.7 ± 0.2             | +0.7 (0.5 0.9)              | ErrRng=0.4      |
|                                           |                        | (Strong warming)            |                 |

The BAD PENNY EEI reappears, this time imported from the Loeb *et al.* (2018) CERES satellite EBAF-database overwrite (fudge), described above in Section 8.9. Again, the error bars (uncertainty ranges) visibly fail the RMS error-sum crosscheck! The uncertainty range is magically reduced by 11-fold, from 4.4 to 0.4. The tacit ± 0.1 W/m<sup>2</sup> EEI measurement target requirement is now met by claiming their error range is ± 2 σ.

## 9. How Badly Have the Books Been Cooked?

### 9.1 Tabulated results of the EEI audit

Table 9 shows a summary of the Earth’s Energy Imbalance audit. Clearly fudged numbers and bad arithmetic are red. “BAD PENNY” power imbalance (EEI) insertions are in column 6 with \*. Correctly summed EEI values (SWIN-SWOUT-LWOUT) are shown in column 5. Note the mismatch.

Table 9 reveals the following scientific misconduct:

*GROSS Scientific misconduct #4:* The “BAD PENNY” power imbalance (EEI) has been repeatedly falsely inserted in column 6 at least nine times!

*GROSS Scientific misconduct #5:* As discussed in Section 8.7 and 8.8, it consists of the following Wild *et al.* (2015) “*fraudulent dodgy data adjustments*”: Wild *et al.* (2015) magically require 22 W/m<sup>2</sup> brighter sunlight to be incident at the Top-of-Atmosphere over the ocean than over the land (in column 1). Also, their LWOUT(Land) value is far outside of its error range (in column 4).

Table 9: Audit summary of Earth's Energy Imbalance data.

| Reference                                                                                                                                           | SW IN<br>W/m <sup>2</sup>                                                                         | SW OUT<br>W/m <sup>2</sup>                                          | LW OUT<br>W/m <sup>2</sup>                                                                   | Calculated<br>imbalance<br>& err range    | Authors' EEI<br>imbalance<br>& error range                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------------------|
| Stephens <i>et al.</i> (1981)                                                                                                                       | +344                                                                                              | -103.2                                                              | -234 ± 7                                                                                     | +6.8                                      | +9 ± 10                                                      |
| Ramanathan (1987)                                                                                                                                   | +343                                                                                              | -106                                                                | -237                                                                                         | 0                                         | 0                                                            |
| Hansen <i>et al.</i> (2005)<br>OHC data & simulation                                                                                                |                                                                                                   |                                                                     |                                                                                              |                                           | 0.85 ± 0.15*                                                 |
| Loeb <i>et al.</i> (2009) CERES satellites<br>OHC & simulation                                                                                      | +340<br>+340                                                                                      | -107<br>-99.5                                                       | -234.6<br>-239.6                                                                             | -1.6<br>+0.9                              | +6.5<br>+0.85 ± 0.15*                                        |
| Hansen <i>et al.</i> (2011) 1993-2008:<br>OHC data & simulation 2005-2010:                                                                          |                                                                                                   |                                                                     |                                                                                              |                                           | 0.8 ± 0.2*<br>0.58 ± 0.15*                                   |
| Loeb <i>et al.</i> (2012)<br>satellites & OHC merged                                                                                                |                                                                                                   |                                                                     |                                                                                              |                                           | +0.64 ± 0.11*                                                |
| Stephens <i>et al.</i> (2012)                                                                                                                       | +340.2 ± 0.1                                                                                      | -100.2 ± 0.2                                                        | -239.7 ± 3.3                                                                                 | +0.5 ± 3.9                                | +0.6 ± 0.4*                                                  |
| L'Ecuier <i>et al.</i> (2015) OHC                                                                                                                   | +340.0 ± 0.5                                                                                      | -102 ± 4                                                            | -238 ± 3                                                                                     | 0 ± 5.0                                   |                                                              |
| Stephens, L'Ecuier (2015)<br>OHC<br>CERES satellites                                                                                                | +340.0 ± 0.5<br>+340.0 ± 0.5                                                                      | -102 ± 4<br>-100 ± 4                                                | -238 ± 4<br>-240 ± 4                                                                         | 0 ± 5.6<br>0 ± 5.6                        | (in abstract, only)<br>+0.6 ± 0.4*<br>+0.6 ± 0.4*            |
| Wild <i>et al.</i> (2015)<br>Land (only):<br>Sea (only):<br>Land + Sea                                                                              | 22 W/m <sup>2</sup> dif!<br>325 (324,325)<br>347 (346,347)<br>Rng=1<br>+340 (340,341)<br>ErrRng=1 | 112 (109,113)<br>95 (92,96)<br>" Rng=4<br>-100 (96,100)<br>ErrRng=4 | Value outside (. )<br>232 (236,242)<br>243( 240,246)<br>" Rng=6<br>-239(236,242)<br>ErrRng=6 | -19<br>9<br>ErrRng=7.3<br>1<br>ErrRng=7.3 | 0.8 (0.4,1.2)*<br>" Rng=0.8*<br>0.6 (0.2,1.0)*<br>ErrRng=0.8 |
| Loeb <i>et al.</i> (2018) Force (recalibrate) ALL<br>satellite data in EBAF public database to match 2009<br>OHC buoy data Earth's Energy Imbalance | 340.0                                                                                             | 99.1                                                                | 240.0                                                                                        | 0.80                                      | 0.71 ± 0.11                                                  |
| Wild <i>et al.</i> (2019) All sky=Clear+Cloudy Sky                                                                                                  | 340 (340,341)<br>ErrRng=1                                                                         | -100 (96,100)<br>ErrRng=4                                           | -239 (236,242)<br>ErrRng=6                                                                   | 1<br>ErrRng=7.3                           | 0.6 (0.2,1.0)*<br>ErrRng=0.8                                 |
| IPCC, AR6 (2021) Allsky=Clear+Cloudy sky                                                                                                            | 340 (340,341)<br>ErrRng=1                                                                         | -100 (97,100)<br>ErrRng=3                                           | -239 (237,240)<br>ErrRng=3                                                                   | 1<br>ErrRng=4.4                           | 0.7 (0.5,0.9)*<br>ErrRng=0.4                                 |

## 9.2 Correcting the Loeb *et al.* (2018), Wild *et al.* (2015), and AR6 (2021) fraudulent dodgy data adjustments reverses their analyses' conclusions

The Wild *et al.* (2015), Wild *et al.* (2019) and AR6 (2021) power-flow diagrams' data values all fraudulently affirm global warming to be real.

Table 10: Correcting the Wild *et al.* (2015) big fudges that propagate through Wild *et al.* (2019), and thence to AR6 (2021).

| Reference                                                                                                                                  | SW IN<br>W/m <sup>2</sup>                                       | SW OUT<br>W/m <sup>2</sup>       | LW OUT<br>W/m <sup>2</sup>                                                 | Calculated<br>imbalance EEI<br>W/m <sup>2</sup> | Reported imbalance<br>EEI W/m <sup>2</sup> |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------|
| Wild <i>et al.</i> (2015) (from Table 1)<br>Land (reported)<br>Sea (reported):<br>Land + Sea (reported)<br>.29 Land + .71 Sea (calculated) | 22 W/m <sup>2</sup> dif!<br>325<br>347<br>340(340,341)<br>340.6 | 112<br>95<br>100(96,100)<br>99.9 | Value outside Error range:<br>232(236,242)<br>243<br>239(237,242)<br>239.8 | 1                                               | +0.6 ± 0.4*                                |
| Wild <i>et al.</i> (2015) (corrected)<br>Land (corrected)<br>Sea (corrected):<br>.29 Land + .71 Sea (corrected)                            | 340<br>340<br>340                                               | 112<br>95<br>99.9                | 239<br>243<br>241.8                                                        | -1.7 (cooling!)                                 | +0.6 ± 0.4*                                |
| Wild <i>et al.</i> (2019) (corrected)<br>All sky=Clear sky + CRE                                                                           | 340                                                             | 100                              | 242                                                                        | -2 (cooling!)                                   | +0.6 ± 0.4*                                |
| IPCC, AR6 (2021) All sky (corrected)                                                                                                       | 340                                                             | 100                              | 242                                                                        | -2 (cooling!)                                   | +0.7 ± 0.2*                                |

However, when the Wild *et al.* (2015) GROSS Scientific misconduct #5 “dodgy data adjustments” are restored to the centers of their uncertainty ranges and propagated through Wild *et al.* *Science of Climate Change*

<https://scienceofclimatechange.org>

(2019) to AR6 (2021), then their indicated global warming is totally gone! The resulting power imbalance correspondingly becomes  $EEI = -1.7 \text{ W/m}^2$  (see Table 10). The IPCC's "best-guess" EEI value thus changes from showing a positive warming imbalance to a negative imbalance. It also changes the claimed result of the whole IPCC climate change program from a highly confident assertion of global warming and climate change with disastrous consequences, to no observational proof of either global warming or climate change. See Table 10 and Appendix E.2.

### *9.3 List of methods used for small fudges*

- Small fudges, method 1: The power-flow-diagram arithmetic is dishonestly fudged using flawed arithmetic. It typically involves the brute force insertion of the BAD PENNY EEI value with its uncertainty ranges typically shrunk 9-fold. See Appendices D.1 and D.2, and gross scientific misconduct #4.
- Small fudges, method 2: Loeb *et al.* (2009) introduce and use what they call an "*objective constraint*" algorithm to "*adjust*" data values to new values "*within the uncertainty range limits*" of a measured value. The *adjustment* does not appropriately expand the final uncertainty range as it should. Instead, the range is shrunk. See Appendix D.3.
- Small fudges method 3: Wild *et al.* (2015) introduce a new method for (mis)representing a number that has been "*adjusted*", to allow a "*best-estimate value*" to masquerade as a measured value. See Appendix D.4.
- Small fudges, method 4: Data fudging is accomplished via creative round-off, where additional round-off error is not included in the RMS error-range sum. See Appendix D.5.

### *9.4 The Loeb et al. (2009) Small fudges, method 2 is expanded and used for huge fudges*

- The Loeb *et al.* (2009) *dodgy data-adjustment* small-fudging technique is extended by Loeb *et al.* (2018) to make huge fudges. They "*adjust*" data to new values that are now far outside their own assigned uncertainty limits. They then use the results to overwrite the EBAF database, effectively to erase (twice) any absolute flux measurement significance by satellite data. See Appendix E.1 for details.
- Wild *et al.* (2015 and 2019) also extend Loeb *et al.* (2009)'s *dodgy data-adjustment* small-fudging technique to make huge fraudulent fudges that totally reverse the AR6 conclusions from strongly proven global warming to NO global warming, and NO climate change. See Table 9, Table 10 and Appendix E.2, for details.

### *9.5 Scientific misconduct tally*

This Section contains a list of the six cases of scientific misconduct identified above.

- **Scientific misconduct #1:** To justify the use of ocean-heat-conduct anomaly data as a means for covering up the Terra and Aqua design flaws, Hansen *et al.* (2011) misleadingly cite the different "*calibrations*" between the satellites and ARGO OHCA data. Hansen *et al.* (2011) then specifically propose shifting (*fudging*) satellite results to match climate models and/or to match flawed ARGO buoy data, thereby erasing the relevance of the flawed satellite data. The methodology for accomplishing this data fudging is introduced by Loeb *et al.* (2009, p.248) as their "*objective constraint (sic) algorithm*". Their initial fudge consists of shifting the satellite measured value,  $EEI = 5.6 \text{ W/m}^2$ , so that it first matches the  $EEI = 0.85 \text{ W/m}^2$  value from Hansen's preferred climate model, and second to match the Lyman *et al.* (2010) value,  $EEI = 0.64 \pm 0.11 \text{ W/m}^2$ , from their analysis of combined XBT and ARGO ocean-heat-content anomaly data. Note that the magnitude of these fudges is huge - about  $5 \text{ W/m}^2$ .
- **Scientific misconduct #2:** Following Hansen *et al.* (2011)'s proposal, ocean-temperature anomaly data from combined XBT and ARGO measurements are analyzed by Lyman *et al.* (2010) and Loeb *et al.* (2012) in an unscientific analysis that produces the fudged result, Top-of-Atmosphere  $EEI = 0.64 \pm 0.11 \text{ W/m}^2$ , although the data were all acquired at the Bottom-of-Atmosphere. Quantitatively different analyses' results produced by other workers were summarily discarded. Incompatible inhomogeneous biased datasets were combined and used along with subjectively shifted and fabricated (fudged) data. Both Lyman *et al.* (2010) and

Loeb *et al.* (2012) acknowledged but discarded an alternative hypothesis that is consistent with  $EEI = 0$  and that fits the data much better than their chosen hypothesis, that instead matched the preferred Hansen *et al.* (2010) model.

- **Scientific misconduct #3:** The seminal work by Stephens *et al.* (2012) incorporates coauthor's work, Loeb *et al.* (2012), and the fudged result from Lyman *et al.* (2010). It presents the slightly modified value, Top-of-Atmosphere  $EEI = 0.6 \pm 0.4 \text{ W/m}^2$ , that is subsequently adopted by the IPCC's Fifth Assessment Report, AR5 (2013). This latter weaker result still presents combined inhomogeneous XBT and ARGO data masquerading as Top-of-Atmosphere satellite data. However, no actual satellite-measured absolute intensity measurements are used for this misrepresentation of TOA-EEI. Subsequently, the seminal Stephens *et al.* (2012) fudged EEI result is retracted and totally disavowed by L'Ecuyer *et al.* (2015). The (evidently unwitting) coauthors, Stephens and L'Ecuyer (2015), in a second more powerful article together confess to the scientific misconduct. AR6 (2021) cites the L'Ecuyer *et al.* (2015) retraction, but not the Stephens and L'Ecuyer (2015) confession.
- **Gross scientific misconduct #4:** BAD PENNY EEI values are routinely inserted by unknown persons into IPCC *et al.* publications. (See Table 9.) This action is so frequent and blatant that it cannot be dismissed as simple typographical mistakes, and it clearly qualifies as gross scientific misconduct. The IPCC's acceptance and promotion of these actions without an outside critical audit, such as that offered here, further constitutes complicit fraud on their part.
- **Gross scientific misconduct #5:** Wild *et al.* (2015) report SWIN (Sea only) = 347 (346,347), SWIN (Land only) = 325 (324,325). The SWIN difference,  $22 \text{ W/m}^2$ , is clearly impossible! Wild *et al.* (2015) also report LWOUT (Land only) = 232 (236,242)  $\text{W/m}^2$ . That value has been fudged by  $7 \text{ W/m}^2$ , moved from the center of its uncertainty range to  $4 \text{ W/m}^2$  below the lower limit of its uncertainty range. The use of these fudged values is propagated through Wild *et al.* (2019) and AR6 (2021). When these obvious fudges are corrected, they change the IPCC's final conclusion from strongly proven positive EEI and proven global warming, to effectively zero EEI and NO global warming, i.e. to  $EEI = -2 \pm 4 \text{ W/m}^2$ . (See Section 9.2)
- **Gross scientific misconduct #6:** Johnson, Lyman and Loeb (2016) report an analysis of ocean-heat-content anomaly data that claims to show  $EEI = 0.71 \pm 0.10 \text{ W/m}^2$ . Their claimed uncertainty range estimate is ridiculously small. Their analysis uses data collected from misrepresentative small portions of the Earth and contains many flaws, including the use of time-varying Southern Ocean data content. Loeb *et al.* (2018) further use these results to repeat the #1 and #2 misconduct by Hansen *et al.* (2011), Loeb *et al.* (2009 and 2012), and Lyman *et al.* (2010) to further cover up the Terra and Aqua design flaws by shifting (fudging) the satellite EEI data to values far beyond the limits of its uncertainty range, in order to match these new OHCA values. They overwrite all of the satellite data in the EBAF public database, Edition 4.0. Their EEI value is subsequently adopted as the final word by AR6 (2021).

## 10. Conclusions

There is no positive Earth's Energy Imbalance (EEI) that has been observably proven. There is no proven global warming. There is no proven long-term climate change. There is no observed increased frequency of extreme weather events. There is no climate-change crisis!

There is clearly no quantitative consensus regarding the Earth's climactic parameters among climate scientists in at least 20 different laboratories worldwide. Instead, there is huge disagreement among them. A (more than) factor-of-2 disagreement among the various EEI estimates based on different investigators OHCA data analyses is also a clear repudiation of Al Gore's misplaced claims of "consensus".

The world is wasting trillions of dollars with its vain attempts to limit production and use of fossil fuels. *If it ain't been proved broke, don't fix it!*

The IPCC and its contributors have fraudulently fudged observational data and have committed *fraudulent scientific misconduct* on multiple occasions in order to claim falsely and dishonestly that there is a positive Earth's Energy Imbalance and an associated impending climate crisis.

There is a design flaw in the CERES Terra and Aqua satellites that prevents them from measuring the Earth's Energy Imbalance with an accuracy sufficient to assert the existence of global warming. The satellites are nearly totally blind to strong sun glare from the ocean surface at shallow angles of sunlight incidence. They correspondingly very-significantly underestimate the Earth's reflected sunlight intensity. The presence of this flaw has been knowingly covered up by IPCC *et al.* climate scientists by their use of fudged ocean-heat-content-anomaly data.

Experimental measurements of the Earth's Energy Imbalance (EEI), made by the IPCC and its contributors using satellite radiometry and ocean-heat-content anomalies, are all fully consistent with zero energy imbalance and with zero global warming.

The analysis by Lyman *et al.* (2010) of ocean-heat-content anomaly (OHCA) data is seriously flawed. It claims the widely quoted value,  $EEI = 0.64 \pm 0.11 \text{ W/m}^2$ , subsequently revised by Stephens *et al.* (2012) to  $EEI = 0.6 \pm 0.4 \text{ W/m}^2$ . However, a corrected analysis using only homogeneous OHCA datasets is consistent with the result  $EEI = 0$ . It is also consistent with their reported heat-content variation being solely due to the temporal fractional change in ocean-data sampling that, in turn, is due solely to a significant extension of the ocean-temperature anomaly sampling activity into more Southern-Ocean areas.

The 45-year history of OHCA data presented by Levitus *et al.* (2000) clearly reveals strong temperature oscillations that are presumably due to ENSO (El Niño) current variations, but no obvious long-term increasing global-warming trend. That is, the OHCA data presented by Levitus *et al.* (2000) are fully consistent with  $EEI = 0$ . Their results are in sharp contrast to the results by Lyman *et al.* (2010) using a much shorter 16-year history of highly flawed ocean-heat-content-anomaly (OHCA) data.

Archived satellite based EEI measurements by Loeb *et al.* (2018) have been fudged to match the ocean heat-content anomaly based fudged EEI measurements so that their noted agreement cannot be used as validation of either one, as has been done by the recent review by the National Academies.

Climate modelling predictions by GISS computer simulations are demonstrably unreliable. The IPCC now agrees and further admits that the RCP 8.5 scenario "*is unrealistic and should be scrapped.*"

There are serious admitted flaws in the theoretical basis behind the CMIP5 computer atmospheric simulation codes and serious structural flaws in their included physics. There is virtually no reliable agreement between CMIP5 simulation and observation. It should be noted further that so-called attribution studies that rely on these computer predictions are also totally unreliable.

Greenhouse gases, including CO<sub>2</sub> have negligible observed influence on the Earth's Energy Imbalance. (See Appendix B.)

The best measured EEI values are undoubtedly those offered by Stephens and L'Ecuyer (2015), equal for both measurement sets, at  $EEI = 0 \pm 5.6 \text{ W/m}^2$ , and from L'Ecuyer *et al.* (2015),  $EEI = 0 \pm 5.0 \text{ W/m}^2$  for both satellite and OHCA data sets combined. Also, the National Academies of Sciences, Engineering, and Medicine recent 2025 report misquote L'Ecuyer *et al.* (2015). They incorrectly cite them as confirming positive EEI and global warming. (See Appendix F.)

## **Funding**

This work was supported solely by the author's personal funds.

**Co-Editor:** H. Harde, **Reviewers:** Anonymous.

## Acknowledgements

No Artificial Intelligence software was used in composing this work. It is the sole effort by the author, himself.

**Acknowledgements for support or funding of the publication:** None

## Disclaimer/Publisher's Note:

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## Appendix A: Generally accepted standards in science for claiming experimental proof of the hypothesis: $|x| \leq \sigma_x \cdot N$

The confidence limits are:  $N = 1 \rightarrow 75.8\%$ ,  $N = 2 \rightarrow 94.6\%$ ,  $N = 3 \rightarrow 99.6\%$ , for the hypothesis,

$$|x| \leq \sigma_x \cdot N$$

Those values apply, assuming measurement value errors are Gaussian distributed.

- Generally accepted practice used in experimental physics to confirm a hypothesis is to require the inequality to be satisfied to better than  $N = 5$ , in order to take account of additional typical unknown systematic errors. Experimental confirmations of Nobel-Prize winning discoveries, such as the existence of the Higgs boson, gravitational waves and non-local quantum entanglement, have all met or exceeded that criterion.
- The Stephens *et al.* (2012) power-flow diagram claims  $EEI = 0.6 \pm 0.4 \text{ W/m}^2$ , yielding,  $N = 1.5$  confidence level. Their result was adopted by the IPCC's AR5 (2013). Note, however, that this result was subsequently retracted and totally disavowed by Stephens and L'Ecuyer (2015), and by L'Ecuyer *et al.* (2015).
- The Wild *et al.* (2019) power-flow diagram claims  $EEI = 0.6 \pm 0.4 \text{ W/m}^2$ , but it also claims a 95 % confidence level.
- Hansen *et al.* (2011, p. 13431) note "... analyses of ocean heat uptake .... differ by as much as a factor of two, even in the well sampled period 1993-2008. "
- Hansen *et al.* (2011, p. 13431) note and adopt "... Lyman *et al.* (2010) estimate average heat gain in the upper 700 m of the ocean as  $0.64 \pm 0.11 \text{ W/m}^2$ , where the uncertainty is the 90 % confidence interval. ..."
- Hansen *et al.* (2011, p. 13433-13434) note "... Estimates of the standard error of the planetary energy imbalance are necessarily partly subjective because the error is dominated by uncertainty in the ocean heat uptake gain, including imperfect instrument calibrations and the possibility of recognized biases ... Our estimated planetary energy imbalance is  $0.80 \pm 0.20 \text{ W/m}^2$  for 1993-2008 and  $0.58 \pm 0.150 \text{ W/m}^2$  for 2005-2010, with estimated 1- $\sigma$  standard error. ... These estimates may be optimistic because of the potential for unrecognized systematic errors."
- Perhaps the factor-of-2 disagreement regarding a final result's value is fully consistent with Al Gore's definition of "consensus". (See Section 7.2.)

## Appendix B: Actual altitudes and relative importance of the three most important atmospheric sunlight-energy transfer processes

The AR6 power-flow diagram incorrectly shows the altitudes of the three most important sunlight-energy transfer processes that occur between the Top-of-Atmosphere and the Earth's surface. Figure 25 shows their correct placement. For sunlight energy transfer, the three most important are atmospheric absorption of sunlight (mostly by ozone), Rayleigh (blue-sky) scattering

of sunlight (forward and backward), and sunlight reflection of sunlight by clouds. The AR6 diagrams incorrectly show ozone absorption and Rayleigh scattering both occurring at the same and/or lower altitude as the sunlight (SW) reflection by clouds. On the contrary, clouds exist only in the troposphere, at very much lower altitudes. The atmospheric absorption of sunlight is mostly by ozone ( $73 \text{ W/m}^2$ ). It mostly occurs high in the stratosphere in the ozone layer. The absorbed energy is then quickly reradiated as heat.

The blue sky is created by Rayleigh scattering ( $\sim 20 \text{ W/m}^2$  upward and  $\sim 20 \text{ W/m}^2$  downward). The strong downward component of Rayleigh scattering provides substantial illumination in cloud shadows on a partly cloudy day. The strong upward component gives the Earth much of its blue appearance from outer space. Rayleigh scattering occurs mostly in the stratosphere, unlike where the AR6 power-flow diagram shows it. The high altitude of Rayleigh scattered blue skylight's source should be obvious to anyone who looks up at the sky, either from an airplane or from the ground, that the blue-sky's scattered light is emitted overwhelmingly from far above clouds.

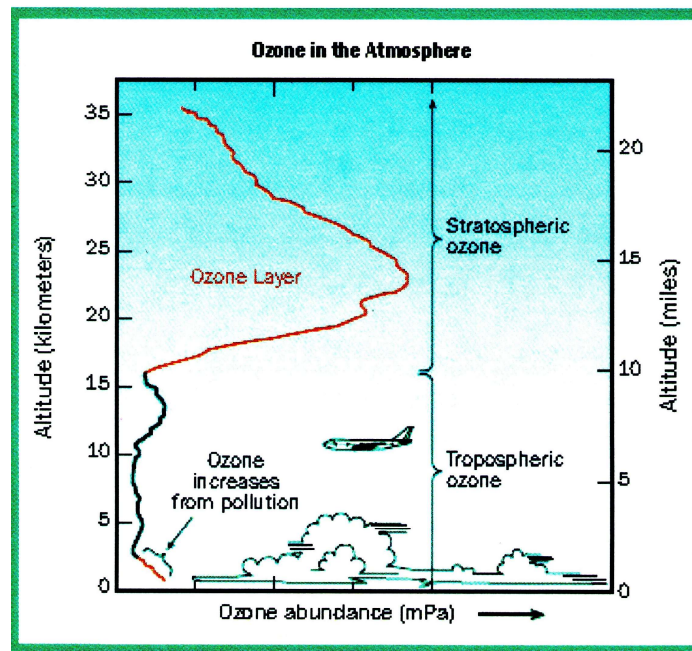


*Figure 25: Altitudes of the stratosphere, the ozone layer, the troposphere, and clouds. Figure from Hegglin, M., I. et al. (2015).*

Clouds reflect substantial sunlight into space. Annual twenty-four-hour average sunlight (SW) reflected by clouds (about  $81 \text{ W/m}^2$ ) occurs only in the troposphere (at very low altitude), and, of course, only in daytime. Clouds appear bright white when viewed and illuminated at near-normal incidence. To confirm this, look at photographs of the earth from space. Also, look down from an aircraft when above clouds and when the sun is directly overhead. Gray clouds, on the other hand, are created by the shadows of themselves or of other clouds. This fact can be confirmed by carefully staring at clouds, and paying attention to the location of the sun in the sky. Clouds cast sharply defined shadows on the Earth below them. On a partly cloudy day look down from an aircraft, or into the valley below when driving on a mountain road to see this effect.

The associated so-called radiative “forcings” (power fluxes) of these above mentioned three processes are all big numbers. Note that a very minor “juggling” of these big numbers has a huge effect on the calculated EEI. For comparison, the so-called radiative forcing by  $\text{CO}_2$  is no more than about  $2 \text{ W/m}^2$ . It is also noteworthy that the definition of albedo (sunlight reflected fraction), quantitatively depends strongly on the altitude where they apply, and/or are measured. For example, overcast-sky albedo measured by a high-flying airplane is very different from that measured by a satellite.

### Appendix C: Wild *et al.* (2019) power-flow diagram components - Clear sky and Cloud Radiative Effects (CRE)

Wild *et al.* (2019) report new Clear-sky (a. k. a. cloud-free-sky) measurements made using ground sunlight observations via the Baseline Surface Radiation Network (BSRN). Their Clear-sky and the associated Cloud Radiative Effects (CRE) diagram are shown here in Fig. 26. These two new diagrams were needed because Wild *et al.* (2019) partitioned the sky into Clear sky and Cloudy sky components, as per the earliest suggestion by Ramanathan (1987), while the Wild *et al.* (2015) effort partitioned the sky into Ocean (Sea) and Land components. The Wild *et al.* (2019) Clear-sky diagram then allows the calculation of a new Clear-sky albedo.

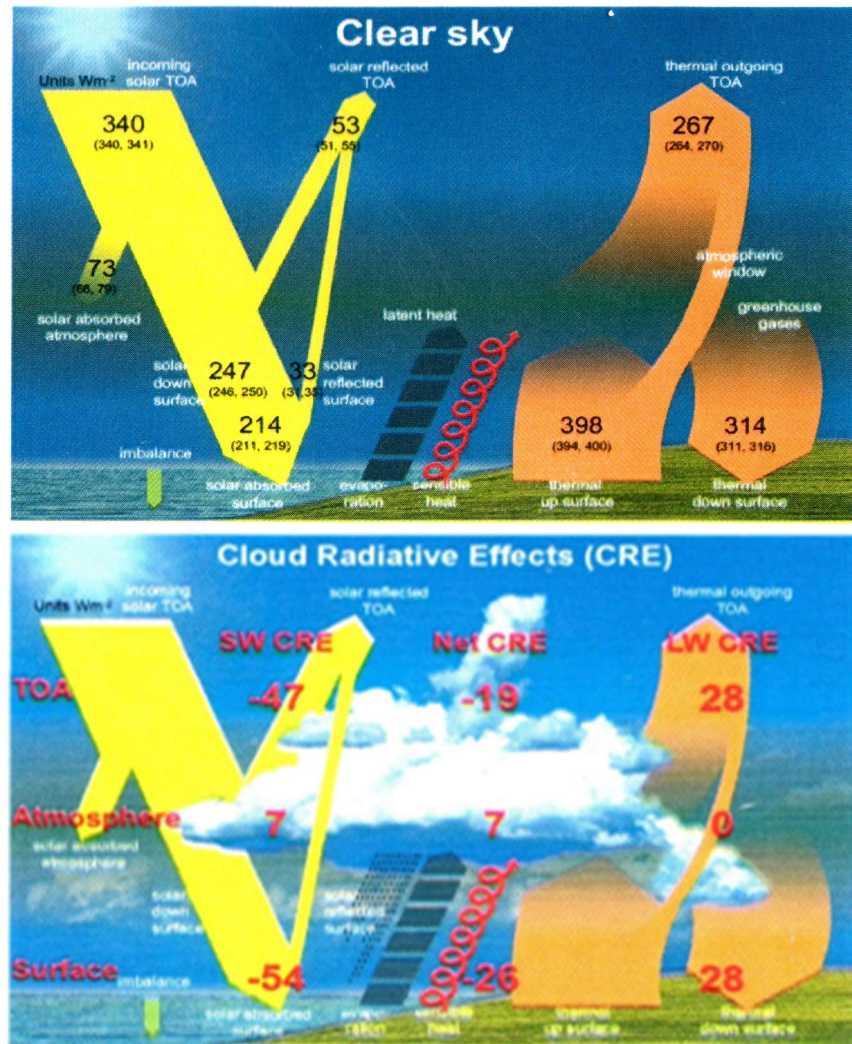


Figure 26: Wild *et al.* (2019) power-flow-component diagrams: Clear sky (upper) and Cloud Radiative Effects (CRE) (lower.)

However, the 33  $\text{Wm}^{-2}$  surface reflected power flux in the Clear-sky diagram is computer simulated by CMIP5, and never actually measured! The Wild *et al.* (2019) Clear-sky albedos are simply guessed and *adjusted* to give the required BAD PENNY power imbalance. The associated Cloud Radiative Effects (CRE) diagram, in turn, is calculated simply as the difference between the All-sky and Clear-sky diagrams. It is NOT actually a “Cloudy Sky” diagram (i.e. the opposite of a Clear-sky diagram) which would correctly be cloud-fraction-area weighted (0.67, 0.33), as per the ignored measurements made by King *et al.* (2013). The Wild *et al.* (2019) Clear sky diagram is modified slightly and is adopted by AR6 (2021) along with the (modified) Wild *et al.* (2019) All sky diagram as part of the AR6 Figure 7.2. The AR6 Figure 7.2 caption admits that

“...This enables the quantification of the effects of clouds on the Earth energy budget and corresponds to the way clear-sky fluxes are calculated in climate models. Thus, the cloud-free energy budget is not closed and therefore the sensible heat and latent heat fluxes are not quantified in the lower panel [Clear sky diagram]. Figure adapted from Wild *et al.* (2015, 2019) as the source.”

### **Appendix D.1: The power-flow diagram arithmetic is dishonestly fudged using flawed arithmetic!**

Almost all of the various power-flow diagrams offered by the IPCC *et al.* use visibly incorrect arithmetic in calculating the summation value of three values:  $EEI = SWIN - SWOUT - LWOUT$ . They also use visibly incorrect arithmetic in calculating the RMS summation of these three values' uncertainty ranges. The final uncertainty range has been dishonestly and arbitrarily shrunk from the RMS summation value with no justification, typically by factors of 4 to 9. The fudged BAD PENNY value,  $EEI = 0.6 \pm 0.4 \text{ W/m}^2$ , was published by Stephens *et al.* (2012) (but later retracted). It was adopted as a prominent conclusion in the IPCC's AR5 (2013) Assessment Report. Appendix D.2 tracks some of the evolution of the BAD PENNY value.

The BAD PENNY is repeatedly and dishonestly inserted as the final EEI result on more than nine IPCC contributor's power-flow diagrams, even though the associated arithmetic is visibly wrong in all of them! See the summary in Table 9, where the BAD PENNY value is inserted at least nine times! Incorrect arithmetic is indicated by differences between columns 5 and 6. (See Gross scientific misconduct #4.) The BAD PENNY's value fluctuates slightly from one insertion to the next by about  $0.1 \text{ W/m}^2$ , while its uncertainty range varies typically from  $\pm 0.4$  to  $\pm 0.1 \text{ W/m}^2$ . The AR6 (2021) power-flow diagram updates the Wild *et al.* (2019) power-flow diagram's value, and overwrites it with the value from Loeb *et al.* (2018), as its foremost prominent conclusion,  $EEI = 0.7 \pm 0.2 \text{ W/m}^2$ , citing 95 % confidence in the error range. That value, in turn, is quoted as being from Johnson, Lyman and Loeb (2016) who actually reported  $EEI = 0.71 \pm 0.11 \text{ W/m}^2$ .

### **Appendix D.2: Tracking the BAD PENNY value**

|                                                                                          |                                                                                             |           |
|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------|
| Willis <i>et al.</i> (2004):                                                             | $EEI = 0.86 \pm 0.12 \text{ W/m}^2$                                                         |           |
| Hansen <i>et al.</i> (2005):                                                             | $EEI = 0.85 \pm 0.15 \text{ W/m}^2$ (model studies only)                                    |           |
| Loeb <i>et al.</i> (2009):                                                               | $EEI$ (1960's - 2009) = $0.85 \text{ W/m}^2$ (Hansen's model studies)                       |           |
| Lyman <i>et al.</i> (2010):                                                              | $EEI$ (1993 - 2008) = $0.64 \pm 0.11 \text{ W/m}^2$ (XBT & ARGO, combined)                  |           |
| Hansen <i>et al.</i> (2011, p.13421):                                                    | $EEI$ (2005 - 2010) = $0.58 \pm 0.15 \text{ W/m}^2$ (XBT & ARGO, combined)                  |           |
| Hansen <i>et al.</i> (2011, p.13431):                                                    | $EEI$ (2005 - 2010, (Lat= $\pm 60^\circ$ )) = $0.38 \pm 0.07 \text{ W/m}^2$ (ARGO only)     |           |
| Loeb <i>et al.</i> (2012, p. 111):                                                       | $EEI$ (2005 - 2010) = $0.58 \pm 0.38 \text{ W/m}^2$<br>(incorrectly claimed = Ceres anchor) |           |
| Loeb <i>et al.</i> (2012):                                                               | $EEI$ (1993 - 2008) = $0.64 \pm 0.11 \text{ W/m}^2$<br>(Actual CERES anchor = XBT & ARGO)   |           |
| Johnson, Lyman and Loeb (2016): to be used for CERES anchor by Loeb <i>et al.</i> (2018) |                                                                                             |           |
| previously:                                                                              | $EEI$ (2005.5 - 2010.5) = $0.58 \pm 0.38 \text{ W/m}^2$ ,                                   | ARGO only |
| revised                                                                                  | $EEI$ (2005.5 - 2015.5) = $0.71 \pm 0.11 \text{ W/m}^2$ ,                                   | ARGO only |
| Loeb <i>et al.</i> (2018):                                                               | $EEI = 0.71 \pm 0.11 \text{ W/m}^2$ ,                                                       |           |
| Wild <i>et al.</i> (2015):                                                               | $EEI = 0.6$ (0.2, 1.0) $\text{W/m}^2$ ,                                                     |           |
| Wild <i>et al.</i> (2019):                                                               | $EEI = 0.6$ (0.2, 1.0) $\text{W/m}^2$ ,                                                     |           |
| AR6 (2021):                                                                              | $EEI = 0.7 \pm 0.2 \text{ W/m}^2$ .                                                         |           |

### **Appendix D.3: The Loeb *et al.* (2009) dodgy “data adjustment” technique is first used to make small fudges.**

Loeb *et al.* (2009) introduce and use what they call an “*objective constraint*” algorithm to “*adjust*” data values to new fudged values “*within the uncertainty range limits*” of a measured value. (See Sections 8.7, 8.10, 9.3 and 9.4.) Initially, they use this dodgy technique to force agreement between satellite and OHCA data, staying *within* the uncertainty range limits. Loeb *et al.* (2009)’s technique, however, is NOT a generally-accepted method used in science and engineering for data reduction. Loeb *et al.* (2009)’s method is used for creating a so-called “*best guess*”, which is NOT the same thing as a measured value, although it tacitly appears to represent a measured value and masquerades as one! It is clearly a scientific NO-NO to make such “*adjustments*” without correspondingly appropriately increasing the associated assigned uncertainty range, because whatever the *adjustment* is, its value is clearly uncertain. Worse, it is a *huge* scientific NO-NO to do this *and simultaneously to shrink the assigned uncertainty range* which is what is done! Even worse, it is a colossal NO-NO to do this because you can’t explain discrepancies among measured and/or guessed and/or fabricated data. Far worse, it is also a colossal NO-NO to do this to cover up embarrassing instrumental design flaws.

### **Appendix D.4: Wild *et al.* (2015) introduce a new method for (mis)representing a number that has been “adjusted” using the Loeb *et al.* (2009) dodgy technique.**

Wild *et al.* (2015) introduce/invent a new dodgy method for (mis)representing a guessed/fabricated value that has been “*adjusted*” along with its uncertainty range. The method is adopted for use thereafter by Wild *et al.* (2019) and AR6 (2021). The usual, generally accepted representation for data and error-range reporting of a value and its uncertainty range is

“Measured value  $\pm \sigma$ ”,

where  $\sigma$  is the standard-error-of-the-mean. It assumes symmetrically Gaussian distributed random errors among measured values. It requires the value to remain centered in the uncertainty range, and does not permit Loeb’s “*adjusting*” to the “*best-guess*” value, somewhere else within the  $\pm \sigma$  range.

Wild *et al.* (2015, 2019) and IPCC’s AR6 (2021), introduce a dodgy method for representing an “*adjusted*” value and its uncertainty range, along with its asymmetric uncertainty ranges. Their representation is

“*best-guessed value, (Lower Limit, Upper Limit)*”,

where the two values in parentheses specify the uncertainty-range limits. However, for this representation method to have any degree of legitimacy in summations of thusly represented values, the uncertainty-full-range for the summation should expand proportionately to the RMS sum of the summands’ uncertainty-full-ranges. The fraudulent misuse of this method by the IPCC *et al.* becomes evident by the fact that the summation’s uncertainty-full-range instead magically shrinks, anywhere from 4 to 11-fold (see Table 9).

### **Appendix D.5: Data fudging via creative round-off**

Another cute and innovative fudging method was invented by Wild *et al.* (2015), and used thereafter by Loeb *et al.* (2018), Wild *et al.* (2019) and AR6 (2021) to make small data-value “*adjustments*” (fudges). Reported data for SWIN, SWOUT, and LWOUT are first rounded off to a whole number, before performing their (signed) summation. Each such round-off introduces an associated additional round-off error  $\pm 0.5 \text{ W/m}^2$ . The summation, somehow, then magically gains accuracy during the summation process so that the resulting summation total now regains an increased number of significant figures beyond the decimal point! Importantly, the *additional*

*round-off error is not included in the RMS error-range sum.* Worse, the additional round-off error ( $\pm 0.5 \text{ W/m}^2$ ), necessarily added three times in the RMS summation, has approximately the same value as the calculated net power imbalances ( $0.6$  and  $0.7 \text{ W/m}^2$ ), and is even larger than the newly reported uncertainty ranges ( $\pm 0.4$  and  $\pm 0.2 \text{ W/m}^2$ ).

### **Appendix E.1: Loeb *et al.* (2009)’s dodgy data *adjustment* small-fudging technique is extended by Loeb *et al.* (2018) to make huge fudges.**

Loeb *et al.* (2018) admit to “*adjusting*” data to new values. While these *adjustments* are (initially) claimed to be within the uncertainty limits, most are very far outside their own assigned uncertainty limits. In particular, this situation occurs when they overwrite the EBAF database because they can’t explain the discrepancies among the measured and/or guessed, and/or fabricated data, and/or simply because they don’t like the results without the “*adjustments*”. The reality is that they are making the *adjustments* to cover up the satellite design flaws. Scandalously, Loeb *et al.* (2018) forcefully use the 2009 grossly sparsely sampled and mostly fabricated ocean heat-content anomaly data by Johnson, Lyman and Loeb (2016) to “*recalibrate*” (fudge) and overwrite ALL satellite data in the public EBAF so that it matches (i.e. “*is anchored to*”) the OHCA data. The Loeb *et al.* (2018) BAD PENNY value  $\text{EEI} = 0.7 \pm 0.2 \text{ W/m}^2$  is adopted by AR6 (2021), superseding the Wild *et al.* (2019) BAD PENNY value  $\text{EEI} = 0.6 \pm 0.4 \text{ W/m}^2$ , on their adopted power-flow diagram. Loeb *et al.* (2018) admit that

*“... the absolute accuracy requirement necessary to quantify the Earth’s energy imbalance (EEI) is daunting. ...”*

They use this fact to justify their “*adjustments*”. These “*adjustments*” extend their 2009 method to *adjust* data values to new values that are far outside of their claimed uncertainty ranges. See Appendix E.2.

### **Appendix E.2: Wild *et al.* (2015 and 2019) extend the Loeb *et al.* (2009) data “*adjustment*” technique to make huge fraudulent fudges that totally reverse the analysis conclusions.**

Loeb *et al.* ’s (2009) dodgy data *adjustment* technique is used and extended by Wild *et al.* (2015 and 2019) to make *huge* fraudulent fudges. Wild *et al.* (2015) “*adjust*” (fudge) the three important numerical values, SWIN (Land), SWIN (Ocean), and LWOUT (Land), to new values that are far outside of their uncertainty ranges. They *adjust* SWIN (Land) and SWIN (Ocean) to new values that differ by  $22 \text{ W/m}^2$ . By comparison, the final reported SWIN (Land + Ocean) uncertainty range’s full width has shrunk to only  $1 \text{ W/m}^2$ . Wild *et al.* (2015) even admit to noticing the huge SWIN (Land versus Ocean) discrepant values, recognize that they are ridiculous, and ignore the problem. Here is an exact quote from Wild *et al.* (2015, p. 3422). They say

*“... As noted above and evident from Fig. 2, the surface downward solar fluxes averaged over land and oceans are nearly identical, which seems a robust feature in various estimates. (See Sect. 5.1.) This is the case, despite an insolation at the TOA which is higher by  $22 \text{ W/m}^2$  over ocean than over land. ...”*

These guys actually believe their own BS! One wonders how the sunlight photons redirect their paths to accomplish this needed magic! The probable cause of this dilemma is bad physics incorporated in the CMIP5 code. Evidently, the code itself forces the ridiculous displayed  $22 \text{ W/m}^2$  Land-Sea difference in TOA insolation. The so-called “robust feature” requirement by CMIP5 to have “*the surface downward solar fluxes averaged over land and oceans nearly identical*” is clearly incorrect, given the dramatic difference between land (54 %) and ocean (76 %) cloud fraction that was discovered by King *et al.* (2013). Indeed, it is the temporal variation of the ocean cloud-cover fraction observed by King *et al.* (2013) that provides the observational basis for the author’s cloud thermostat model (to be published).

Wild *et al.* (2015) also *adjust* LWOUT (Land) upwardly by 6 W/m<sup>2</sup> from the center of its reported uncertainty range to far outside those limits. They don't comment regarding this huge "*adjustment*". Wild *et al.* (2015) then bury these "*adjusted*" results so that they are invisible in their final "Land+Sea" power-flow diagram. Wild *et al.* (2015)'s erroneous *adjustments* get propagated through and reused in their Wild *et al.* (2019) nearly identical but renamed "All-sky" power-flow diagram. Their "*adjustments*" magically produce the inserted BAD PENNY value, EEI = +0.6 ± 0.4 W/m<sup>2</sup>. The IPCC's AR6 (2021) then adopts the Wild *et al.* (2019) power-flow diagram for the Earth's Energy imbalance value, including the Wild *et al.* (2019) values for SWIN, SWOUT, and LWOUT. However, instead, of using the Wild *et al.* (2019) EEI value, AR6 (2021) further "*inserts*" the BAD PENNY" value, EEI = +0.7 ± 0.2 W/m<sup>2</sup>, chosen by Loeb *et al.* (2018) for their overwriting of the EBAF Ed. 4.0 permanent satellite database, so that it matches the Johnson, Lyman, and Loeb (2016) OHCA results. Additionally, AR6 arbitrarily further cuts the uncertainty range in half! As a result, both the Wild *et al.* (2019) and AR6 (2021) diagrams fraudulently affirm global warming to be real. When the Wild *et al.* (2015) fudges are undone, the flawed global-warming conclusion is reversed. See Tables 9 and 10 for details.

#### **Appendix F: Two different 2025 US government-sponsored reports give diametrically opposite conclusions.**

"*A critical review of impacts of greenhouse gas emissions on the US climate*" (2025), authored by the US Department of Energy, concludes that CO<sub>2</sub> emissions pose neither a threat to human health nor to climate stability. On the other hand, "*Effects of human-caused greenhouse gas emissions on US climate, health, and welfare*" (2025), authored by the National Academies of Sciences, Engineering, and Medicine, *concludes exactly the opposite*. The second report is based mostly on publications by the EPA (2009). However, the National Academies report's treatment (on p. 16) of the Earth's Energy Imbalance (EEI) uses flawed physics. (1) The National Academies of Sciences, Engineering, and Medicine (2025) report cites the (fudged) agreement between the OHCA and satellite data that results from the Loeb *et al.* (2018) data-overwrite (cover-up) as proof of a correct IPCC analysis. Its results are totally fudged. (2) The National Academies report misquotes L'Ecuyer *et al.* (2015) and cites them as confirming positive EEI and global warming. However, exactly the opposite is true. The reports by L'Ecuyer *et al.* (2015) and Stephens and L'Ecuyer (2015) were, in fact, retracting their earlier claims of positive EEI that were made in Stephens *et al.* (2012).

#### **Appendix G: The oceans' epipelagic zone and thermocline**

The thermocline is well known to submarine warfare. Its steep temperature gradient causes a steep refractive index gradient for sound waves. Surface emitted sonar then simply bounces off of it, so that submarines can hide below it, undetected by surface sonar.

The following discussion is extracted from the NOAA website:

"A thermocline (also known as the thermal layer or the metalimnion in lakes) is a distinct layer based on temperature within a large body of fluid (e.g. water, as in an ocean or lake) - source *Thermocline Wikipedia*. A thermocline is the transition layer between warmer mixed water at the ocean's surface and cooler deep water below. When a submarine goes above or below thermal layer it can possibly hide from detection by other sonar systems in the area, in extremely simple terms. It is a proven tactic for submarines to stay above the thermocline and deploy towed array sonar under the thermal layer, surface ships can deploy a towed array above or below the layer as well."

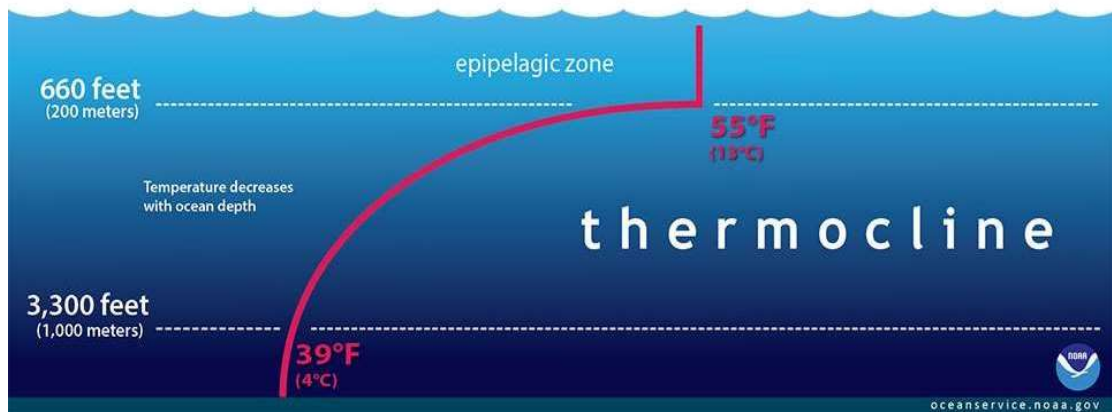


Figure 27: Figure is from the NOAA Naval Warfare enthusiast website by PMC. Image Credit: National Oceanic and Atmospheric Administration (NOAA).

## Appendix H: The very strong reflectivity (albedo) at shallow incidence on a smooth dielectric surface like water or glass creates bright sun glare.

Figure 28 is from Born and Wolf (1980, p. 44), *Principles of Optics*. Curves (b) show the reflectivity (albedo) of a dielectric surface as a function of incidence angle (w. r. t. to perpendicular). Black curve (b) is for glass ( $n = 1.52$ ). Added red curve (b) is for water ( $n = 1.33$ ). “Shallow” incidence is to the right. Wavy water has a smear of incidence angles. It shows that the ocean surface is nearly a perfect mirror at very shallow angles of incidence, i.e. with the sun low in the sky, as occurs daily in early morning or late afternoon. At high North and South Latitudes, the sun is always low in the sky.

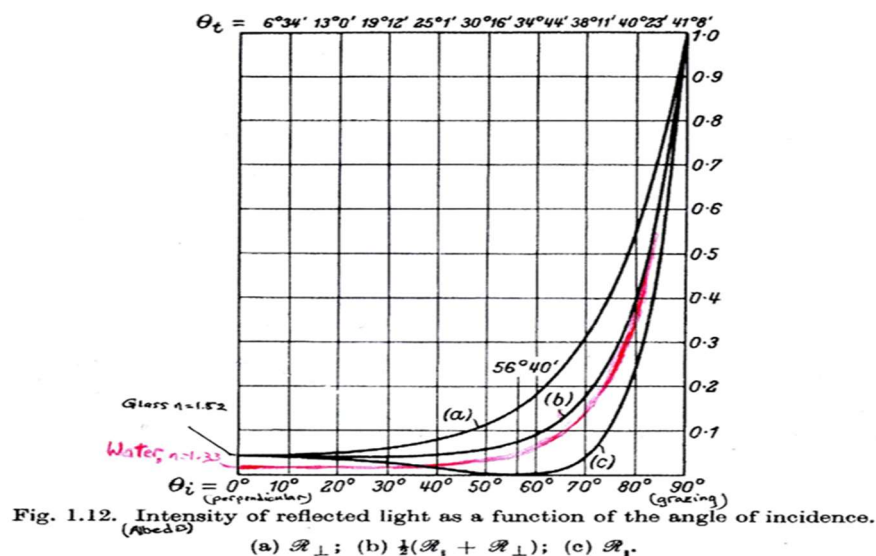


Figure 28: Reflectivity fraction (albedo) by a dielectric surface as a function of illumination incidence angle w. r. t. to normal (perpendicular). [from Born and Wolf (1980, p. 44), *Principles of Optics*]. Black curve (b) is glass ( $n=1.52$ ). Added red curve (b) is for water ( $n=1.33$ ). Curves (a) and (c) are for opposite linear polarizations on glass. Note that a smooth dielectric surface (like water) becomes a nearly perfect reflector at very shallow incidence angles.

## Appendix I: Claude Monet’s impression of bright morning sun glare.

Figure 29 shows Claude Monet’s impression of reflected sun glare as a bright orange stripe on the water’s surface. The stripe is always directly under the sun and always points exactly towards

the sun's azimuth. The stripe's width and shape give a direct measure of the water-surface's roughness. The water's surface in this scene is obviously quite calm.

Monet's paintings emphasized light and color. This painting in particular, 'Impression, Sunrise', is sometimes credited for having inspired the whole French impressionist movement.

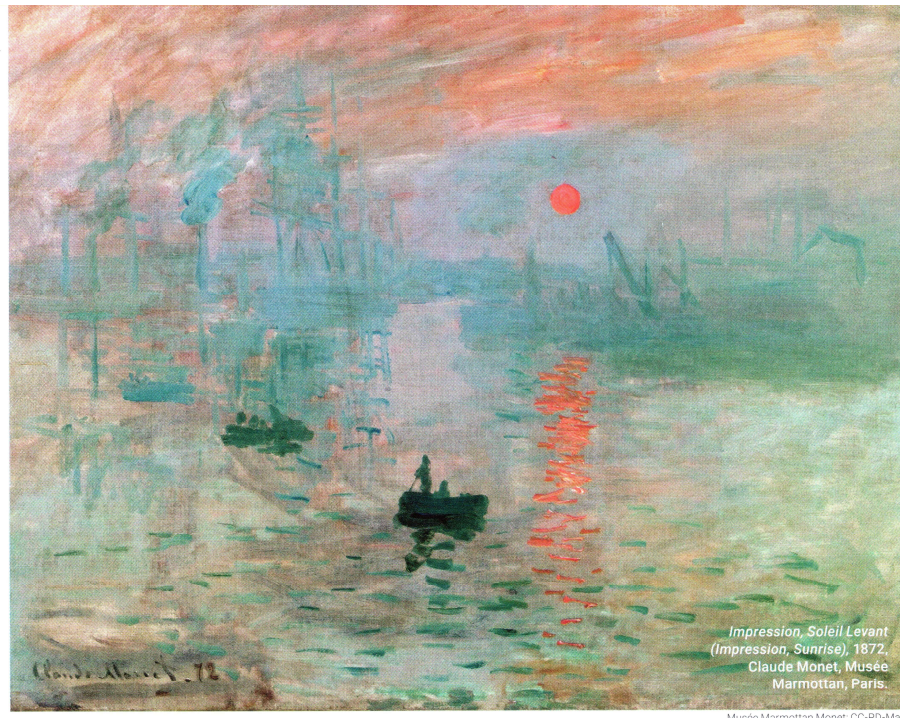


Figure 29. The vertical wiggly orange stripe directly below the sun is French impressionist Claude Monet's 1872 artist's impression (*Impression, Sunrise*) of morning sun glare at a very shallow incidence angle.

## References

- Bevington, P. R. 1969: 'Data Reduction and Error Analysis for the Physical Sciences'. McGraw Hill Book Co.
- Born, M., and E. Wolf, 1980: *Principles of Optics*, 6th Edition, Pergamon Press.
- Griggs, M 1968: 'Aircraft Measurements of Albedo and Absorption of Stratus Clouds, and surface Albedos', *J. Appl. Meteorology*, v7, pp. 1012-1017.
- Hansen, J. *et al.* 2005: 'Earth's energy imbalance: Confirmation and implications', *Science* v. 308, pp. 1431-1435.
- Hansen, J. *et al.* 2007: 'Climate simulations for 1880-2003 with GISS model E', *Climate Dynamics* v.29, pp. 661-696.
- Hansen, J. *et al.* 2011: 'Earth's energy imbalance and implications', *Atmos. Chem. Phys.* v.11, pp. 13421-13449.
- International Panel on Climate Change (IPCC) 2013: Fifth Assessment Report (AR5), 'Ch. 7: Clouds and Aerosols', IPCC, <https://www.ipcc.ch/report/ar5/wg1/clouds-and-aerosols/>
- International Panel on Climate Change (IPCC) 2021: Sixth Assessment Report (AR6), <https://www.ipcc.ch/assessment-report/ar6/>
- King, M. D. *et al.* 2013: 'Spatial and Temporal Distribution of Clouds', *IEEE Transactions on Geoscience and Remote Sensing*, v. 51, no. 7, pp. 3828-3852.

- Koonin, S. E. 2021: ‘*Unsettled? What climate science tells us, what it doesn’t, and why it matters*’, BenBella Books, Dallas, Texas.
- L’Ecuyer T. S. *et al.* 2015: ‘*The Observed State of the Energy Budget in the Early Twenty-First Century*’, *Journal of Climate*, v.26, p 8319, <https://doi.org/10.1175/JCLI-D-14-00556.1>
- Levitus, S. *et al.* 2000: ‘*Warming of the World Ocean*’, *Science* v.287, pp. 2225-2229.
- Loeb, N. G. *et al.*, 2009: ‘*Toward optimal closure of the Earth’s top-of-atmosphere radiation budget*’, *Journal of Climate*, v. 22, no. 3, pp. 748–766.
- Loeb, N. G. *et al.* 2012: ‘*Observed changes in top-of-the-atmosphere radiation and upper-ocean heating consistent within uncertainty*’, *Nature Geoscience*, v. 5, pp. 110-113.
- Loeb, N. G. *et al.* 2018: ‘*Clouds and the Earth’s Radiant Energy System (CERES) Energy Balanced and Filled (EBAF) Top-of-Atmosphere (TOA) Edition-4.0 Data Product.*’ *Journal of Climate*, v.31, pp.895-918.
- Loeb, N. G. *et al.* 2024: ‘*Observational Assessment of Changes in Earth’s Energy Imbalance Since 2000*’, *Surveys in Geophysics*, <https://doi.org/10.1007/s10712024-09838-8>.
- Lubchenco, J. and Karl, T.R. 2012: ‘*Predicting and managing extreme weather events*’, *Physics Today*, March, v. 65, no. 3, pp. 31–37.
- Lyman, J. M. and Johnson, G.C. 2008: ‘*Estimating Annual Upper-Ocean Heat Content Anomalies despite irregular In Situ Ocean Sampling*’, *Journal of Climate*, v. 21, pp. 5629-5641, <https://doi.org/10.1175/2008JCLI2259.1>.
- Lyman, J., M. *et al.*, 2010: *Robust warming of the global upper ocean*, *Nature* **465**, 334–337, <https://doi.org/10.1038/nature09043>.
- Hegglin, M., I. *et al.* 2015: ‘*Twenty Questions and Answers About the Ozone Layer: 2014 Update, Scientific Assessment of Ozone Depletion:2014*’ World Meteorological Organization, Geneva.
- National Research Council, US National Academy 2003: ‘*Understanding Climate Change Feedbacks*’.
- National Academies of Sciences, Engineering, and Medicine 2025: ‘*Effects of human-caused greenhouse gas emissions on US climate, health, and welfare*’.
- Niiler, E. May 20, 2026: “*Climate Outlook Is Revised in Sign of Progress*”, *New York Times*, p. A11.
- Ramanathan, V. 1987: ‘*The role of Earth Radiation Budget studies in climate and general circulation research*’, *Journal of Geophysical Research Atmospheres*, v. 92, no. D4, pp. 4075–4096.
- Schmidt, G. Nov. 13 2024: ‘*We Study Climate Change. We Can’t Explain What We’re Seeing*’, *New York Times*.
- Schmidt, G. *et al.* 2014: ‘*Configuration and assessment of the GISS Model E2 contributions to the CMIP5 archive*’ *J. Adv. Model. Earth Syst.*, 6 141-184.
- Sherwood, S. C. *et al.* 2020: ‘*An Assessment of Earth’s Climate Sensitivity Using Multiple Lines of Evidence*’, *Reviews of Geophysics*, v. 58, no. 4.
- Stephens, G. L. *et al.* 1981: ‘*Clouds and climate: sensitivity of simple systems*’, *Journal of Atmospheric Sciences*, v. 38, p. 235.
- Stephens, G. L. 2012: ‘*An update on Earth’s energy balance in light of the latest global observations*’, *Nature*, vol. 5, pp. 691–696.
- Stephens, G. L., *et al.* 2015: ‘*The albedo of Earth*’, *Review of Geophysics*, v. 53, no. 1, pp. 141–163.
- Stephens, G. L. and T. S. L’Ecuyer 2015: ‘*The Earth’s energy balance*’ *Atmospheric Research, Science of Climate Change* <https://scienceofclimatechange.org>

v. 166, pp. 195-203, <https://doi.org/10.1016/j.atmosres.2015.06.024>.

Wright, C. ed., US Department of Energy 2025: *'A critical review of impacts of greenhouse gas emissions on the US climate'*

Wild, M, et al. 2015: *'The energy balance over land and ocean and oceans: an assessment based on direct observations and CMIP5 models'*, Climate Dynamics, v. 44, pp. 3393-3429.

Wild, M. et al. 2019: *'The cloud-free global energy balance and inferred cloud radiative effects: an assessment based on direct observations and climate models'*, Climate Dynamics, v. 52, pp. 4787–4812.

Willis, J. K. et al. 2004: *'Interannual variability in upper ocean heat content, temperature, and thermosteric expansion on global scales'*, J. Geophys. Res. Oceans, v.109, no C12, pp. 1-52.