

# “Fact-check fact-check” on Climate Feedback’s “fact-check” of Alex Newman’s Epoch Times article

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## Framework used

In our comments below, we are explicitly using the framework for assessing “claim-level reviews” provided at your Science Feedback website here: <https://sciencefeedback.co/claim-reviews-framework/>, since this is the framework which Dr. Baraut-Guinet’s article links to in the “Method” section of the page.

Before we get onto Dr. Baraut-Guinet’s claims, we should probably give you the links to the various articles that he purports to be directly (or indirectly) fact-checking:

1. Dr. Baraut-Guinet’s “fact check”: <https://climatefeedback.org/claimreview/solar-forcing-is-not-the-main-cause-of-current-global-warming-contrary-to-claim-by-alex-newman-in-the-epoch-times/>
2. Alex Newman’s article in The Epoch Times: [https://www.theepochtimes.com/challenging-un-study-finds-sun-not-co2-may-be-behind-global-warming\\_3950089.html](https://www.theepochtimes.com/challenging-un-study-finds-sun-not-co2-may-be-behind-global-warming_3950089.html)
3. Science Feedback’s “Framework for claim-level reviews” which Baraut-Guinet’s article claims was used for the fact-check: <https://sciencefeedback.co/claim-reviews-framework/>
4. Our peer-reviewed paper in *Research in Astronomy and Astrophysics* that they were reporting on, i.e., Connolly et al. (2021): <https://doi.org/10.1088/1674-4527/21/6/131>
5. Link to the IPCC WG1 AR6 that they were also reporting on: <https://www.ipcc.ch/report/ar6/wg1/>

We have also attached pdf copies of items 1-3 for ease of reference.

## Claim 1 that Baraut-Guinet purports to have ‘fact-checked’: “The Sun and not human emissions of carbon dioxide may be the main cause of warmer temperatures in recent decades”

For our paper, we identified 16 different plausible estimates of the changes in solar output (i.e., the ‘Total Solar Irradiance’ reaching the Earth, TSI, in units of  $W/m^2$ ) since the mid-19<sup>th</sup> century or earlier which have been published in the scientific literature (or, in the case of 2 estimates, are publicly available on the internet, i.e., “the Svalgaard estimates”).

We also identified 27 different estimates of northern hemisphere surface air temperature (SAT) trends since the mid-19<sup>th</sup> century or earlier. These 27 estimates were then sorted into 5 different categories:

- 1) Land SAT estimates from rural stations only
- 2) Land SAT estimates from all available stations whether urban or rural
- 3) Sea surface temperature (SST) estimates
- 4) Land SAT estimates from glacier-length-based temperature proxies
- 5) Land SAT estimates from tree-ring based temperature proxies

For each of the categories, the average of all estimates was calculated along with the corresponding confidence intervals. This gave us 5 independent estimates of northern hemisphere SAT trends.

As a result we have 80 possible combinations of TSI vs. SAT, i.e., 16 estimates of TSI and 5 estimates of SAT. One of the most surprising and alarming results from the paper was the fact that depending on which estimate of TSI and SAT you used, you could obtain anything from 0% of the SAT trends being due to solar activity to 100% of the SAT trends being due to solar activity!

We showed that, for AR5, the IPCC’s widely-reported “detection and attribution” (D&A) analysis had only considered four of the 16 TSI estimates and that their main D&A analysis was effectively based on an average of estimates #2 and #3 for SAT. That is, AR5’s main analysis of the CMIP5 “natural & anthropogenic forcings” hindcasts was focused on the “global temperature instrumental” datasets constructed from a composite of SAT types #2 and #3. As a result, AR5 had dramatically underestimated the potential role of TSI in recent climate change.

That is, IPCC AR5 had prematurely come to a “scientific consensus” for their “attribution” statement (i.e., their “*It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century*” statement) that was not adequately supported by the available data. We warned that if AR6 took a similar approach for their D&A analysis then they would come to a similar conclusion, but that this conclusion would be similarly unjustified scientifically.

Now that AR6 has been published, it is apparent that they indeed regrettably took a similar approach to the one we had warned against.

To stress, in the paper – and this nuance was also repeatedly mentioned in Alex Newman’s reporting of our paper – we were **not** saying whether climate change is mostly natural *or* mostly human-caused. Rather we were pointing out that both arguments could be made by cherry-picking from the available data, and that the IPCC’s confident statements that it was the latter were (and still are) scientifically premature.

Newman’s headline for his article accurately reflected this key finding: “Study finds Sun – not CO2 – may be behind global warming”. This is an accurate statement. Our study did indeed find this. If he had said, “is behind...” instead of “may be behind...”, that would have been inaccurate. However, he didn’t say that.

Baraut-Guinet has singled out this as one of the two “claims” he asserts is “incorrect”. Specifically, Baraut-Guinet has (accurately) described Newman’s article as claiming, “The Sun and not human emissions of carbon dioxide *may be* the main cause of warmer temperatures in recent decades” [emphasis in bold italic added by us]. This is indeed a reasonable summary of the above headline, and as we said above, it is indeed an important finding of our paper.

Newman elaborates,

*“Using publicly available data sets from the U.S. government and other sources, it is easy to explain all of the warming observed in recent decades using nothing but changes in solar energy arriving on Earth, according to the new paper.*

*Indeed, while it agrees that using the data sets chosen by the UN would imply humans are largely to blame, the study includes multiple graphs showing that simply choosing different data sets not used by the UN upends the IPCC’s conclusion.*

*If confirmed, the study, published in the international scientific journal Research in Astronomy and Astrophysics (RAA) by experts from over a dozen countries, would represent a devastating blow to the UN IPCC and its conclusion that man’s emissions of CO<sub>2</sub> are the sole or even primary driver of warming.*

*While the paper calls for further research to resolve differences between conflicting data sets and studies, the authors show conclusively that, depending on the data sets being used, it is entirely possible that most or even all of the warming has nothing to do with man.”*

We strongly recommend reading the full paper, but here is an extract from the abstract of our paper:

*“For all five Northern Hemisphere temperature series, different TSI estimates suggest everything from no role for the Sun in recent decades (implying that recent global warming is mostly human-caused) to most of the recent global warming being due to changes in solar activity (that is, that recent global warming is mostly natural). It appears that previous studies (including the most recent IPCC reports) which had prematurely concluded the former, had done so because they failed to adequately consider all the relevant estimates of TSI and/or to satisfactorily address the uncertainties still associated with Northern Hemisphere temperature trend estimates. Therefore, several recommendations on how the scientific community can more satisfactorily resolve these issues are provided.”*

While Newman’s summary was written in a more “newspaper-friendly”-style than the academic style that we used for our article, it is a fair summary of what our study found. And, notice that he also was careful **not** to “conflate factual statement and opinion” (as you recommend) or to “misrepresent a complex reality” (as you recommend) or to “overstate scientific confidence” (as you recommend) or to “overstate the scientific impact of a finding” (as you recommend). That is, Newman was careful to emphasise what our study was and was not saying, and also to emphasise the context of how it compared with the findings of IPCC AR6.

In contrast, Baraut-Guinet’s “fact-check” of Newman’s claim invokes almost all of the issues your framework was designed to avoid.

His main critique involves a figure comparing one of the 16 estimates of TSI we considered, i.e., Krivova et al. (2007,2010) – Figure 2(b) in our paper – to a single estimate of SAT (instead of the 27 we considered). The estimate of SAT he considered was version 3.1 of GISTEMP global land + ocean temperature index. Details on version 3.1 can be found here (the current version is 4):

[https://data.giss.nasa.gov/gistemp/updates\\_v3/](https://data.giss.nasa.gov/gistemp/updates_v3/)

There are a few technical nuances to be aware of when comparing Baraut-Guinet's chosen SAT time series to the ones we analysed in our paper:

1. Our analysis was explicitly confined to the northern hemisphere since the data availability for the southern hemisphere is much more limited. Baraut-Guinet's estimate is the average of both hemispheres. However, if he is assuming that northern hemisphere temperature trends are representative of global temperature trends, then that is an understandable first approximation.
2. We also emphasized that it is well-established in the scientific literature that the variability of the land surface temperature (LST) data is much greater than for the sea surface temperature (SST) data. Therefore, we analysed both components separately. However, Baraut-Guinet's estimate is a composite of **both** land and sea.

Nonetheless, once those nuances are recognised, the single SAT time series considered by Baraut-Guinet is indeed broadly comparable to an average of two of the 27 SAT time series in Table 2 of our paper, i.e., the NASA GISS land time series of our Figure 9(e) and the NOAA NCEI ERSST3b sea surface temperature estimate of our Figure 10(f).

Therefore, the comparison Baraut-Guinet made is somewhat analogous to an average of 2 out of the 80 combinations of TSI and SAT that we analysed in our paper (see Figure 15 and 16 of our paper), i.e., the 2<sup>nd</sup> and 3<sup>rd</sup> combinations of Figure 15(b).

However, even that subset of 2 out of 80 combinations in our Figure 15(b) effectively represents a more comprehensive analysis of the available data than Baraut-Guinet's analysis, since he was effectively only considering 2/27 (7.4%) of the SAT estimates we were considering – see our Table 2.

It is correct that if you were to cherry-pick that particular sampling of 7.4% of the SAT estimates we considered and 6.25% (i.e., 1/16) of the TSI estimates we considered, it would imply a very small role for solar activity in long-term warming since the 19<sup>th</sup> century and zero role since the late-1950s. However, this was clearly acknowledged and emphasized throughout our paper. And Newman's reporting of our findings similarly emphasized the basic point (without getting into the technical details of comparing and contrasting the 27 SAT and 16 TSI estimates).

**To summarise:** Baraut-Guinet cherry-picked a particular subset of the datasets we had considered to claim he had proved our analysis of the full set was “incorrect”. However, this single assertion of his already invokes many of the errors Science Feedback's framework warns against.

At any rate, Baraut-Guinet then cites 6 papers taken from the literature (nearly all published before AR5, 2013) to supposedly contradict our 2021 analysis, i.e., his references [1]-[6]. In contrast, our review cited more than 500 papers covering the period up to early 2021. Several of the papers he mentions we had already explicitly cited and discussed. The rest were papers by researchers whose work we had already discussed using representative citations. Indeed, we had of course read and are very familiar with the particular 6 papers he cited, but in cases where a research group had published multiple relevant studies, we focused on those most representative for brevity. For instance, Baraut-Guinet cited Lean & Rind (1999) as one of his key studies. While we did not explicitly cite that *particular* study, we cited a more representative selection of their studies: Lean & Foukal (1988); Lean et al., 1992; Lean et al. 1995; Lean et al., 1997; Lean et al. 1998; Lean (2000); Lean & Rind (2008); Lean & DeLand (2012); Lean (2017) and Lean (2018).

In other words, Baraut-Guinet used a small sample of the scientific literature (most of which pre-dated AR5) and claimed that this was more representative of the range of scientific opinions on these subject than our extensive review of more than 500 references (which covered all of the literature he identified and far more besides).

In your framework, you list 14 “issues” that can lead to misinformation (<https://sciencefeedback.co/claim-reviews-framework/>). For Baraut-Guinet’s “fact-check” of Claim 1, we count 10 of them:

1. Factually inaccurate: A statement of fact in direct contradiction with available observations/data.
2. Conflates factual statement and opinion: Presents opinion as fact or fact as opinion.
3. Misleading: Leaves the reader with a false or poor understanding of how things work.
4. Misrepresents a complex reality: Fails to recognize that an observation can be influenced by more than one factor.
5. Fails to grasp significance of observation: Uses an observation in support of a conclusion that it does not support.
6. Flawed reasoning: Reasoning is flawed if conclusions do not follow from the premises.
7. Lack of context: The claim lacks elements of context (observations or explanations) that would change the reader’s takeaway.
8. Cherry-picking: The claim depends on highlighting only a subset of all the available relevant evidence.
9. Overstates scientific confidence: Presents a conclusion as conclusive while the hypothesis is still being investigated and there remains genuine scientific uncertainty about it.
10. Misrepresents source (Strawman): Substitutes a misrepresentation of a source’s conclusion for its actual conclusion, often in order to make it easier to discredit the idea of an “opponent”.

For Newman’s far more objective and balanced reporting on “Claim 1”, we count none of them.

## Our “fact-check fact-check” for Claim 1

Newman’s reporting:



Baraut-Guinet’s “fact-check” of Newman’s reporting:



## Claim 2 that Baraut-Guinet purports to have ‘fact-checked’: “There is a systemic bias in UN IPCC’s data selection”

Baraut-Guinet elaborates, *‘In the Epoch Times article, Newman additionally claimed that a new scientific paper [i.e., our paper] proves a systematic bias in the International [sic] Panel on Climate Change (IPCC)’s workflow, accusing it of supporting an unscientific agenda and ignoring data that contradict a “chosen narrative”.’*

As an aside, while it is true that many people understandably assume that the “I” of IPCC stands for “International”, the fact that Baraut-Guinet made the same mistake rather than correctly explaining that the IPCC stands for the *Intergovernmental* Panel on Climate Change is surprising for somebody who is supposedly a “fact-checker”. At any rate, here, Baraut-Guinet is actually straw-manning Newman’s more nuanced points about the IPCC by not providing the full context of what he actually reported (or the quotes from those of us interviewed by him).

Aside from *straw-manning* Newman’s reporting on the IPCC, Baraut-Guinet also *conflates factual statement and opinion*; makes multiple *factually inaccurate* claims about both the IPCC and Newman’s reporting. Baraut-Guinet’s claims on this are also *misleading* as well as *misrepresent(ing) a complex reality* (on how reviews of the scientific literature can be carried out). He *fails to grasp significance of observation* by missing the points about Newman’s reporting of both the comments on (1) the IPCC’s misleading representation of our 2019 Geosciences paper and (2) the discussion of ACRIM-calibrated datasets. Baraut-Guinet also uses *flawed reasoning, lack of context* and *cherry-picking* to discredit his straw-man depiction of what Newman actually said.

In Baraut-Guinet’s misunderstanding of the scientific process and also the IPCC process, he *overstates scientific confidence* of the IPCC’s process in addressing the issues Newman was reporting on. Baraut-Guinet also effectively *overstates the scientific impact of a finding* by mistakenly thinking IPCC AR6 had overturned the new insights from our paper despite the fact that Jonathan Lynn, the IPCC’s head of communications and media relations had explicitly stated to Newman that the AR6’s chosen “cut-off date” for reviewing the literature missed our paper by 10 weeks. As a result of this timing, the IPCC would not be in a position to even consider our paper until AR7. Therefore, Baraut-Guinet is incorrect to think that the IPCC AR6 (or AR5) could explicitly address our paper. The IPCC’s chosen deadlines physically prevented this possibility – as their response to Newman confirmed.

So, Baraut-Guinet’s “fact-check” on Claim 2 makes 11 of the 14 mistakes (highlighted above in italics) the Science Feedback framework warns against. Below, we will go through some of the main mistakes he makes in more detail.

## Details of Baraut-Guinet’s misleading on “Claim 2”

Baraut-Guinet claims “*the IPCC is mandated to compile the knowledge produced by the entire scientific community and cautiously evaluate the scientific merit of any new contribution*”. We’ve no idea where he found this supposed “mandate” of the IPCC, but it doesn’t match up with how the IPCC describes their role on their “about” page, for instance:

*“The IPCC provides regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation. Created in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), the objective of the IPCC is to provide governments at all levels with scientific information that they can use to develop climate policies. IPCC reports are also a key input into international climate change negotiations.”* – IPCC “About” page (<https://www.ipcc.ch/about/>, accessed 5<sup>th</sup> September 2021)

We appreciate that Baraut-Guinet might have his personal views on what the IPCC *should* do, but as the IPCC explains in the above description, their goal is merely to provide “*regular assessments of the scientific basis of climate change...*” (Working Group 1 deals with this aspect while the other two Working Groups deal with “*its impacts and future risks, and options for adaptation and mitigation*”). According to the IPCC, the primary objective of these assessments is to provide “*scientific information that [governments] can use to develop climate policies*”.

In order to figure out what “scientific information” the IPCC would consider useful for this objective and what “scientific information” would be considered unhelpful, it is worth reflecting on why the UNEP decided the IPCC was needed. In 1988, the UNEP had decided on the basis of computer model predictions that humans were causing dangerous “global warming” and climate change by increasing the average atmospheric concentration of “greenhouse gases”, chiefly carbon dioxide (CO<sub>2</sub>). The

UNEP believed that it was urgent to implement international negotiations to globally reduce greenhouse gas emissions.

To get an idea of the urgency the UNEP felt was needed, here are some extracts from a 1989 Associated Press article:

*“[Director of the UNEP, Noel Brown] says entire nations could be wiped off the face of the Earth by rising sea levels if the global warming trend is not reversed by the year 2000.*

*[...] He said governments have a 10-year window of opportunity to solve the greenhouse effect before it goes beyond human control.*

*[...] UNEP is working toward forming a scientific plan of action by the end of 1990, and the adoption of a global climate treaty by 1992. In May, delegates from 103 nations met in Nairobi, Kenya – where UNEP is based – and decided to open negotiations on the treaty next year.”*

Peter James Spielman, “U.N. predicts disaster if global warming not checked”, Jun. 30, 1989, Associated Press ([Link here](#); [Archived version here](#)).

That is, before the first IPCC report was published (in 1990), the UNEP had already decided that humans were causing potentially disastrous global warming through our greenhouse gas emissions (chiefly CO<sub>2</sub>), and they were already trying to organize international agreements to reduce greenhouse gas emissions.

Therefore, when the UNEP created the IPCC, the specific “climate policies” they wanted the IPCC to provide support for policies to reduce greenhouse gas emissions.

In other words, the IPCC’s primary goal is effectively to provide “scientific information” that will help the UNEP in arranging international agreements to reduce greenhouse gas emissions.

It is true that the IPCC Working Group 1 reports represent one “assessment of the scientific basis of climate change”. But, they are assessments that were carried out with the primary objective of helping the UNEP’s ambitious efforts to develop international agreements on greenhouse gas emission reductions.

Our review paper *also* represents a scientific “assessment of the scientific basis of climate change” in that we were evaluating the question, “how much has the Sun influenced Northern Hemisphere temperature trends?”. However, the primary objectives of our review were different from those of the IPCC. Our primary objective was to advance scientific progress into the understanding of the causes of climate change by describing where there still is scientific disagreement (and why) and where there is scientific agreement (and why). As we explained in the introduction of our paper (page 3),

*‘... we believe that it is timely to convey to the rest of the scientific community the existence of several unresolved problems, as well as to establish those points where there is general agreement. Therefore [...] we have agreed not to take the “consensus-driven” approach of the IPCC, but rather to emphasize where dissenting scientific opinions exist as well as where there is scientific agreement. As Francis Bacon noted in the 17<sup>th</sup> century, “if we begin with certainties, we shall end in doubts; but if we begin with doubts, and are patient in them, we shall end in certainties.”’*

This was a different approach to carrying out a scientific assessment than the IPCC’s, but it had a different objective to the IPCC. As we explain in the introduction of the paper, multiple researchers and philosophers have published peer-reviewed papers explaining how the IPCC’s approach is indeed very effective for their stated objective of helping governments “to develop climate policies”, yet it

leads to problems for describing the current state of scientific knowledge. That is, each approach has its pros and cons.

In terms of the IPCC's goal of helping governments develop climate policies, many argue that their approach is very useful since it provides a relatively unified collection of "scientific information" that allows the governments to ignore the many ongoing areas of scientific disagreement within the scientific community and focus on the (already very challenging!) project of "developing climate policies" through international negotiation.

The problem is that whenever the IPCC attempts to describe an issue where there is ongoing scientific disagreement, it is not helpful for their stated objective of providing "*scientific information that [governments] can use to develop climate policies*". From the perspective of simplifying things for governments, it would be more helpful if the IPCC could report a single cohesive narrative on each issue. Note that the IPCC's objective is **not** necessarily to provide **all** the relevant scientific information. Reporting that the scientific community is divided on an issue – or even worse, that there is scientific information which contradicts that narrative – could create problems for governments trying to develop climate policies.

Therefore, whenever the authors of the individual chapters are aware of relevant scientific papers or information that contradicts the chosen narrative for a given issue, they are in a bind. If their primary objective was helping scientific progress, then reporting on these disagreements would be an obvious solution (that's what we did). However, that would be unhelpful for the IPCC's primary objective. Instead, the options are:

- **Option 1.** *Not* report it.
- **Option 2.** Report it in such a way that it sounds like the paper or information actually agrees with the chosen narrative.
- **Option 3.** Report it in a dismissive way that implies the paper/information is irrelevant and/or has been shown to be somehow flawed.

This approach is very effective in creating a perception of "scientific consensus" on each issue, and the IPCC have done a remarkable job of applying it to multiple issues where there is considerable scientific disagreement in the published literature.

The IPCC deserve considerable praise for the mammoth efforts they have carried out in applying this approach to achieve their stated objective. Politically, this has been very effective. However, their approach is poorly suited for accurately and comprehensively describing the current state of scientific knowledge. Moreover, we and our co-authors are very concerned that the IPCC's approach is inadvertently leading to a suppression of open-minded scientific inquiry which is hindering scientific progress into improving our understanding of the causes of climate change.

As van der Sluijs et al., 2011 explain, "*Guaranteeing the scientific reliability of IPCC reports is indeed essential but it does not address the main weakness of the consensus approach: the underexposure of both scientific and political dissent. As a result of this weakness climate science has become politicized over the past decades.*" – van der Sluijs et al. (2011), "Beyond consensus: reflections from a democratic perspective on the interaction between climate politics and science", *Current Opinion in Environmental Sustainability*, <https://doi.org/10.1016/j.cosust.2010.10.003> – (paywalled, but pdf available [here](#))

Hence, we decided that it was important to provide a more comprehensive and objective scientific assessment of the Sun/climate debate for use by the scientific community.

The IPCC's Assessment Reports are clearly very useful for governments trying to develop climate policy (i.e., the IPCC's stated objective). However, while many scientists (including Baraut-Guinet it

seems) appear to have mistakenly assumed the IPCC reports **also** represent a comprehensive and accurate summary of the scientific literature, this was not what the IPCC reports were designed for. In our opinion, if scientists are looking for a comprehensive and accurate summary of the scientific literature, they should avoid relying on the IPCC reports. We hope that our review will offer a better starting point for those interested in the topics of either the Sun/climate debates or the challenges of estimating past climate changes.

To summarise, for governments trying to negotiate international climate policies, the IPCC reports are excellent. However, for scientists carrying out scientific research, the IPCC reports need to be treated with considerable caution.

In our review paper, we document how our science-driven approach often leads to different outcomes and conclusions than the IPCC's policy-driven approach. In Alex Newman's interviews with us, we discussed these differences, and he reported on this in his article. However, he favours the classical "balanced reporting" approach to journalism. Therefore, rather than *conflating factual statement and opinion* (as you warn against), he contacted representatives for the IPCC and also other scientists who might disagree with us and asked them for their response. He explained to the IPCC representatives what we were saying and asked them for their responses. He then also reported the IPCC's responses.

In contrast, Baraut-Guinet uses 11 of the errors your framework warns against to insist that Newman's reporting of this was "misleading".

## Examples of Baraut-Guinet's false and misleading arguments for Claim 2

**Example 1.** Baraut-Guinet says, 'The citation in the last IPCC report of a paper written by Connolly, who is attacking the IPCC for its supposed "confirmation bias" in Newman's article, shows that relevant research papers are scientifically evaluated and duly considered.'

Baraut-Guinet is referring here to an example that we gave to Newman of how the IPCC's AR6 misrepresented a study of ours, i.e., Connolly et al., 2019, "Northern Hemisphere Snow-Cover Trends (1967–2018): A Comparison between Climate Models and Observations", *Geosciences*, <https://doi.org/10.3390/geosciences9030135>

This is a paper in which we criticised the IPCC AR5 for their selective reporting of Northern Hemisphere snow cover extent (SCE) trends. In the paper, we noted that the observed trends showed snow cover had **increased** for both winter and fall. We agreed that for spring and for summer the SCE is lower in recent years than in the late-1960s (the start of the observational records). However, we also noted that most of the reduction in snow cover for spring and summer occurred in the mid-1980s and doesn't seem to have been related to greenhouse gas concentrations. Hence, we criticised the IPCC AR5 for choosing to **only** comment on the fact that snow cover had declined for the spring season.

We also warned that the CMIP5 computer models' "hindcasts" (opposite of forecasts) of snow cover are getting the trends wrong for all four seasons when compared to the observations of the last 50 years. This casts considerable doubt on the reliability of the CMIP5 computer models, and AR5 was heavily reliant on the CMIP5 models for many of their conclusions.

For AR6, the IPCC's description of snow cover extent (SCE) trends in the relevant section (Chapter 2, p67) largely took the same approach as AR5 except updated to 2019. However, they used our study as one of the references they cited to "support" their claim:

"The greatest declines in SCE have occurred during boreal spring and summer, although the estimated magnitude is dataset dependent (Rupp et al., 2013; Estilow et al., 2015; Bokhorst et al., 2016; Thackeray et al., 2016; Connolly et al., 2019)." – IPCC WG1 AR6, Chapter 2, p67

This statement is technically correct! But, definitely misleading. A more informative way of describing what these five papers found would have been:

“The ~~greatest~~ **only** declines in SCE have occurred during boreal spring and summer, ~~although the estimated magnitude is dataset dependent~~ **and even for these seasons, there is debate over the magnitudes and why most of the decline occurred during the mid-1980s** (Rupp et al., 2013; Estilow et al., 2015; Bokhorst et al., 2016; Thackeray et al., 2016; Connolly et al., 2019).” – IPCC WG1 AR6, Chapter 2, p67

But, we agree that this would not have been as helpful for the IPCC’s objective. Newman thought it was an interesting observation and reported on it by saying,

“In another case, the IPCC misrepresented a 2019 study that Connolly was involved in on snow cover, falsely implying that it showed less snow in all four seasons. In reality, the study showed *more* snow cover in fall and winter and that current climate models get all four seasons wrong.”

So, Baraut-Guinet is incorrect in asserting that this “*shows that relevant research papers are scientifically evaluated and duly considered*” by the IPCC reports.

**Newman’s reporting:**

ACCURATE

**Baraut-Guinet’s “fact-check” of Newman’s reporting:**

INACCURATE

**Example 2.** Baraut-Guinet then says, “*The ACRIM (Active Cavity Radiometer Irradiance Monitor) data sets that Newman and his guests claim were ignored by the IPCC appear in numerous studies cited in the report (the acronym itself is used 14 times in the fifth assessment report published in 2013).*”

We should elaborate here on the significance of the ACRIM satellite TSI records since it is a somewhat technical and detailed issue, but an important one. In our paper, we discussed the issue in some detail (Sections 2.2-2.4, p5-12). However, Newman’s reporting on it was quite brief since it was written for a general newspaper audience rather than a technical audience. So, a casual reader might not have understood the relevance of Newman’s reference to ACRIM.

That said, since Baraut-Guinet was supposedly carrying out a “fact-check”, it is surprising that he doesn’t seem to have bothered reading the more detailed discussion in our paper, but rather made an (incorrect!) guess as to why Newman was referring to the ACRIM debate.

At any rate, if you’re unfamiliar with the challenges of constructing an estimate of TSI trends since the 19<sup>th</sup> century (or earlier), there are broadly two parts to be considered:

1. **Satellite era (1978-present).** Direct satellite measurements of TSI since the satellite era. The first TSI satellite (NIMBUS-7) was launched in 1978 and the second (NASA ACRIM) was launched in 1980. But each satellite only remains operational for 10-15 years at most. Also each satellite’s TSI monitoring device is mostly calibrated on the ground before it is launched. This means that when it starts recording TSI in space, the values might be different from the previous satellite by a few W/m<sup>2</sup> (Watts per metre squared). So, estimating the TSI trends for the satellite era is a **very** challenging scientific problem involving creating a composite time

series from multiple satellites using the periods of overlap to re-calibrate them. As we will explain below, there are now several rival versions of the satellite TSI record.

- 2. Pre-satellite era (up to 1978).** There are no direct measurements of the TSI reaching the Earth before the satellite era. However, there are lots of records of different aspects of solar activity called “solar proxies”. Examples include “sunspot counts”, “faculae areas”, “solar cycle lengths”, “cosmogenic isotope records”. None of these provide a direct measurement of TSI in  $W/m^2$ . But, by choosing one of the rival versions of the satellite TSI record and several “solar proxies” for the longer era, scientists can try to calibrate these solar proxies to match the satellite record. This then gives you TSI estimates that stretch back to the 19<sup>th</sup> century or earlier. In our paper, we identified 16 of these estimates and showed that the IPCC AR5 only considered 4 of them. For AR6, the climate modellers that were contributing model results to the report were encouraged to only consider one of the 16 TSI estimates!

Three of the 23 co-authors on our paper have been directly involved in the satellite TSI measurements. Douglas Hoyt was a member of the team in charge of the first TSI satellite, NIMBUS-7. Dr. Richard Willson was the Principal Investigator of the second TSI satellite (NASA ACRIM) and also NASA’s entire ACRIM mission, i.e., the three ACRIM satellites (ACRIM, ACRIM2 and ACRIM3). Prof. Nicola Scafetta was also a member of the ACRIM team.

The three ACRIM satellites collectively span a period from 1980 to 2013 (except for a short gap in the mid-1980s between ACRIM and ACRIM2 after the Challenger shuttle disaster in 1986 led to delays in the launching of new satellites). Therefore, most of the satellite TSI composite records rely heavily on the ACRIM satellites. However, as the ACRIM data accrued over time, it gradually became apparent that the measurements were inconvenient for the IPCC’s stated objective. The ACRIM composite time series compiled by the ACRIM team suggested that solar activity (i.e., TSI) increased during the 1980s and 1990s before starting to decrease. This suggested that much (perhaps all) of the global warming from the 1980s to the end of the 20<sup>th</sup> century was solar in origin, and offers an explanation for the so-called “temperature hiatus” from the start of the 21<sup>st</sup> century until the 2016 El Niño year.

Therefore, a rival group of researchers (Dr. Judith Lean and colleagues) decided to create their own satellite TSI record called PMOD. The PMOD group used the ACRIM data, but they came up with several adjustments to apply to the original data that managed to remove the increase in TSI during the 1980s and 1990s. This new PMOD record implied that TSI had been decreasing over the entire satellite era! This was perfect for the IPCC’s objective since it ruled out the possibility that TSI could explain any of the warming during the satellite era and they could instead promote the narrative that it was due to greenhouse gas emissions.

The fact that the original ACRIM data of Willson and his colleagues was inconvenient for the IPCC’s primary objective and that the PMOD adjustments by Lean and her colleagues were far more convenient for the IPCC’s primary objective can be seen from the following quotes from the two in a 2003 NASA article on the debate:

*‘When asked how he felt about the possibility that his results might be used as justification for not doing anything to reduce greenhouse gas emissions, Willson said, “It would be just as wrong to take this one result and use it as a justification for doing nothing as it is wrong to force costly and difficult changes for greenhouse gas reductions per the Kyoto Accords, whose justification using the Intergovernmental Panel on Climate Change reports was more political science than real science.”*

*The potential for the findings to be used such a way is something Lean has considered. “The fact that some people could use Willson’s results as an excuse to do nothing about greenhouse gas emissions is one reason we felt we needed to look at the data ourselves,” says Lean.*

“Since so much is riding on whether current climate change is natural or human-driven, it’s important that people hear that many in the scientific community don’t believe there is any significant long-term increase in solar output during the last 20 years.” – Rebecca Lindsey, “Under a variable sun”, NASA Earth Observatory (2003)

<https://earthobservatory.nasa.gov/features/VariableSun/variable4.php>

At any rate, it remains the case that the original ACRIM dataset implies a very significant contribution for solar variability in the global temperature trends during the satellite era, while PMOD’s adjusted dataset effectively rules out any solar-driven warming for satellite era.

In Section 2.3 of our paper (see Figure 1 in particular), we showed that the choice of satellite record also has major implications for the pre-satellite era. For the pre-satellite era, using the ACRIM dataset to calibrate the solar proxies tends to lead to a larger solar contribution over the entire period since the 19<sup>th</sup> century or earlier. On the other hand, using the PMOD dataset for calibrating solar proxies tends to reduce the long-term solar contribution, and also implies a steady decline in TSI since the mid-1950s.

For that reason, we warned that the **only** TSI estimates considered by the climate models submitted to either IPCC AR5 or IPCC AR6 were PMOD-calibrated. We warned that this was a major scientific error.

The scientific debate between ACRIM, PMOD and other rival groups is ongoing. See Scafetta et al. (2019, *Remote Sensing*. <https://doi.org/10.3390/rs11212569>) for a good summary. However, by the IPCC **only** considering climate models that had used PMOD-calibrated TSI estimates, the IPCC completely dismissed a major source of scientific uncertainty associated with recent climate change.

Newman recognised that this was an important point:

*‘When solar data from NASA’s “ACRIM” sun-monitoring satellites are compared to reliable temperature data, for example, virtually all of the warming would be explained by the sun, with almost no role at all for human emissions.*

*And yet, for reasons that the study authors say are murky at best, the UN chooses to ignore the NASA ACRIM data and other data sets in favor of those that support the hypothesis of human responsibility for climate change.’*

As we said above, this “newspaper-friendly” style coverage of a technical and scientifically challenging issue doesn’t quite capture all the technical nuances and details of the various ACRIM vs. PMOD debates. But, as we explain in detail in the paper, in our opinion, the decision to only consider PMOD-calibrated TSI estimates for both AR5 and AR6 is scientifically unjustified.

### **Summary:**

Newman’s reporting of the overlooking of ACRIM-calibrated TSI estimates was “mostly accurate”.

Baraut-Guinet’s “fact-check” of this issue was “inaccurate”. It may well be that Baraut-Guinet was simply out-of-his-depth, didn’t understand what Newman’s point was, and didn’t bother to read our paper to find out more (see Sections 2.2-2.4 in the paper for a detailed discussion). However, if that’s the case, then he shouldn’t have been attempting to provide a “fact-check” on it.

Therefore, here is our “fact-check fact-check” on the IPCC’s handling of the ACRIM debate

### **Newman’s reporting:**

**MOSTLY ACCURATE**

## Baraut-Guinet’s “fact-check” of Newman’s reporting:

INACCURATE

MISLEADING

LACKS CONTEXT

**Example 3.** One of the most glaring oversights of Baraut-Guinet’s “fact-check” of Newman’s reporting is that Baraut-Guinet never mentions that Newman put to the IPCC all of the claims we made and asked them for a response. And, Newman reported those responses. That is, Newman was carrying out balanced-reporting.

With regards to our recent paper, Jonathan Lynn (Head of Communications and Media Relations at the IPCC) explained to Newman that our paper “had been accepted for publication after the deadline for consideration”.

We confirm this is the case. The IPCC AR6 explicitly notes that they only consider “scientific literature accepted for publication by 31 January 2021”, and our paper was only accepted for publication on 14 April 2021, i.e., more than 10 weeks later.

However, this means that Baraut-Guinet is wrong to suggest that the IPCC had considered what we said in this paper. The IPCC had explicitly explained to Newman that consideration of our paper was beyond the remit for AR6 due to the publication date.

That said, Newman was already aware of this (since we had mentioned this point about the deadlines to him in our interviews). However, we had raised to him several other concerns about AR6, and he asked the IPCC to also comment on those.

One of the main points Newman put to the IPCC was why they had overlooked papers that contradicted AR6’s claims about the so-called “urbanization bias” problem. It has long been recognised that urban areas are warmer than the surrounding countryside – this is called the “urban heat island” (UHI) effect and was first reported in the 19<sup>th</sup> century by an English meteorologist called Luke Howard. Urban areas only make up 3-4% of the land’s surface and so this doesn’t affect global temperatures a lot. However, a large fraction of the weather stations used for calculating “global temperatures” are in urban areas. Indeed, most of the *longest* weather station records tend to be in urban areas, since it is much harder to continuously staff a weather station in an isolated area for centuries.

Therefore, there has been a lot of controversy over how much of the apparent “global warming” from these stations is actually just “localised urban warming”. Some studies insist that this “urbanization bias” is very small and doesn’t need to be considered – these studies are very popular among IPCC authors. But others find that urbanization bias is a major problem.

Therefore, it is rather surprising that in chapter 2 of AR6 (pages 43-44), they insist that no papers have been published since AR5 arguing that urbanization bias could have raised land surface air temperature trends by more than 10%:

“No recent literature has emerged to alter the AR5 finding that it is unlikely that any uncorrected effects from urbanization (Box 10.3), or from changes in land use or land cover (Section 2.2.7), have raised global Land Surface Air Temperature (LSAT) trends by more than 10%, although larger signals have been identified in some specific regions, especially rapidly urbanizing areas such as eastern China (Li Y. et al., 2013; Liao et al., 2017; Shi et al., 2019).”

Our latest paper is an example of “recent literature” which would contradict that claim – as we explain in the abstract of the paper, “... urbanization bias might still be a problem in current global temperature datasets – despite the conclusions of some earlier studies.” However, as mentioned above, our paper was passed AR6’s deadlines, i.e., it was *too* recent for consideration in that claim.

However, aside from our latest paper, here are three examples of papers that have been published since AR5 that dispute that claim:

1. Soon et al., 2015 (<https://doi.org/10.1016/j.earscirev.2015.08.010>), “*Re-evaluating the role of solar variability on Northern Hemisphere temperature trends since the 19th century*”

“Then, in order to account for the problem of urbanization bias, we compile a new estimate of Northern Hemisphere surface air temperature trends since 1881, using records from predominantly rural stations in the monthly Global Historical Climatology Network dataset. Like previous weather station-based estimates, our new estimate suggests that surface air temperatures warmed during the 1880s–1940s and 1980s–2000s. However, this new estimate suggests these two warming periods were separated by a pronounced cooling period during the 1950s–1970s and that the relative warmth of the mid-20th century warm period was comparable to the recent warm period.” – from the abstract of Soon et al., 2015 (paywalled, but a pre-print can be downloaded from [ResearchGate](#))

2. Zhang et al., 2021, p1937, “*Urbanization Effects on Estimates of Global Trends in Mean and Extreme Air Temperature*” (which was accepted 2 December 2020 and thereby made the IPCC deadline by nearly 2 months) (<https://doi.org/10.1175/JCLI-D-20-0389.1>)

“The urbanization effects in global land, East Asia, and North America as a whole are statistically significant, with the corresponding urbanization contributions for the period of 1951-2018 are 12.7%, 15% and 9.1% respectively” - Zhang et al., 2021, p1937

3. Scafetta, 2021 (<https://doi.org/10.1007/s00382-021-05626-x>), “*Detection of non-climatic biases in land surface temperature records by comparing climatic data and their model simulations*” (published 17 January 2021, and thereby well within the IPCC deadline):

“The 0.6 °C warming observed in global temperature datasets from 1940 to 1960 to 2000–2020 can be partially due to urban heat island (UHI) and other non-climatic biases in the underlying data, although several previous studies have argued to the contrary. [...] [We] find that 25–45% of the 1 °C land warming from 1940–1960 to 2000–2020 could be due to non-climatic biases.” - from the abstract of Scafetta, 2021

The author of the 3<sup>rd</sup> paper was one of the co-authors of our paper that Newman was reporting on. We were also the co-authors of the first paper, i.e., Soon et al. 2015. The overlooking of Soon et al., 2015 is particularly ironic given that, Prof. Panmao Zhai, one of the two co-chairs of AR6 WG1 has cited the study’s findings on urbanization bias in one of his own papers, Chen & Zhai, 2017 (<https://doi.org/10.1088/1748-9326/aa822b>) with the following description:

“Among these thermodynamic contributions, the urbanization caused warming rate should be particularly noted, since most urban stations are coincidentally distributed over susceptible regions identified in figure 2(f) (Soon et al 2015).” (Chen & Zhai, 2017, p8)

Indeed, our latest paper was building upon the earlier analysis of Soon et al., 2015, in which we showed that IPCC AR5 had only considered 4 of 8 of the plausible estimates of TSI that were available at the time. We showed that if AR5 had considered the full range of TSI estimates they would probably *not* have concluded that it was “extremely likely” recent climate change was mostly-human-caused. So, it is noteworthy that Prof. Zhai was also aware of this problem associated with AR5:

“Enough cautions, however, should be warranted about the role of solar irradiance changes in triggering the warming hiatus, considering large uncertainties among differing datasets of solar activity (Soon et al 2015).” - Chen & Zhai, 2017, p8

For this reason, Newman asked the IPCC why they had not cited this 2015 paper in AR6 given that the co-chair of AR6 was aware of its importance and relevance. Newman then reported the IPCC’s response:

‘Asked why the 2015 study in a major journal cited by one of its own leaders, among other key papers, was not mentioned in its latest report, a spokesman for the IPCC told The Epoch Times after consulting with IPCC Working Group 1 Co-Chair Zhai that “decisions on citations are up to the chapter team authors not the co-chairs.”’

This indeed explains why IPCC AR6 failed to incorporate the insights of relevant literature that the co-chair of the report was aware of. However, in our opinion, it is another example of how the IPCC assessment reports do **not** “compile the knowledge produced by the entire scientific community and cautiously evaluate the scientific merit of any new contribution” as Baraut-Guinet incorrectly insists.

But, we stress that, despite Baraut-Guinet’s mistaken claims, the IPCC have not said that this is their objective. Rather, the IPCC’s stated objective is to provide “*scientific information that [governments] can use to develop climate policies*”.

We admit that in terms of IPCC’s stated objective, their assessment reports are probably more useful than our scientific review paper. However, our objective was different. Our goal was to accurately describe where there is scientific agreement, but also where scientific disagreement remains and why.

**Newman’s reporting:**

ACCURATE CORRECT

**Baraut-Guinet’s “fact-check” of Newman’s reporting:**

INACCURATE MISLEADING LACKS CONTEXT

**Our “fact-check fact-check” for Claim 2**

**Newman’s reporting:**

ACCURATE CORRECT

**Baraut-Guinet’s “fact-check” of Newman’s reporting:**

INACCURATE MISLEADING LACKS CONTEXT