

forests and thus used similar GPP ranges for fertile and infertile sites (see Supplementary Information of ref. 2), and the models again revealed a strong nutrient effect on CUEe. Even when excluding the ‘uneven sampling effect’ (only considering forests with GPPs ranging from ~1,000 to 2,200 gC m⁻² yr⁻¹) and the conjectured ‘outliers’ (the three very young forests), nutrient availability remains significant for NEP and CUEe ($P = 0.0064$ and $P = 0.0008$, respectively) in a GLM model also including MAT and GPP (only for NEP) as significant factors.

Werner L. Kutsch and Pasi Kolari⁴ also suggested that our analysis was flawed for various reasons. After removing 47 forests from our study (~35% of the data set) for questionable reasons, they suggested that nutrient availability had no significant effect on forest carbon balance and that the results in ref. 2 were driven by a few outliers. Their statement, however, is incorrect. When we analyse the much restricted data set of Kutsch and Kolari using the same GLM as in ref. 2, in contrast to their simple linear model, the effect of nutrient availability on forest NEP remains unequivocal. The GLM model reveals a statistically significant interaction between GPP and nutrient availability on NEP and on Re ($P = 0.026$), and a marginally significant effect of nutrient availability on CUEe ($P = 0.073$).

Kutsch and Kolari’s reasons for deleting forests from the analysis were: (1) data quality, (2) history of the young forests, and (3) complex terrain affecting C flux measurements. Regarding these points:

- (1) Important in the discussion about unavoidable uncertainties in the GPP, Re and NEP estimates is that inaccuracies (for example typesetting, errors on site-level calculations) were not responsible for our results (that is, there was no bias towards any category of nutrient availability, ANOVA, $P = 0.32$). Moreover,

the equation of the carbon balance is not $GPP - Re - NEP = 0$, as Kutsch and Kolari assumed, but the sum of the variables with their associated errors: $GPP \pm E_{GPP} - Re \pm E_{Re} - NEP \pm E_{nep} = 0 \pm E$. Including these uncertainty terms in the equation is relevant because several sites also provided chamber-based estimates. In this sense, only one of the 129 sites used in our study presented a carbon imbalance larger than the uncertainty. The one site (La Mandria), with many zero values, was included in our visual presentation (Fig. 1 in ref. 2) but not in the statistical analyses upon which we based our conclusions (because stand age was unknown). Therefore this site did not affect our conclusion.

- (2) We see no reason to remove forests under 15 years old, as Kutsch and Kolari suggested, because we included stand age as a covariate in our models interacting with GPP. Furthermore, the effect of nutrient availability on CUEe was not driven by young forests (Supplementary Fig. S4 in ref. 2).
- (3) The criterion that Kutsch and Kolari suggested of removing sites in complex terrains is questionable, subjective and not generally accepted, in contrast to ustar filtering applied to all sites, which is the most accepted method to address the advection problem. Also, in their Correspondence, differences in CUEe for forests with contrasting TDA cannot be statistically assessed, because they did not present the significance of the test nor the description of the error bars in their Fig. 1.

We agree with Kutsch and Kolari on the general statement of the importance of high standards of data quality in multi-site statistical analyses. However, they failed to demonstrate in their specific comments why data quality, site history or complex terrain should cause a bias in favour of our

main hypothesis. We continue to insist on our strong factual base that these 47 forests should not be removed from the original data set. In fact, all the additional analyses performed with subsets of the original data set for points (1), (2) and (3) and with Kutsch and Kolari’s data set strengthen our finding that nutrient availability plays a key role in forest carbon balance. □

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CORRESPONDENCE:

Clarity of meaning in IPCC press conference

To the Editor — In a recent Letter¹, Hollin and Pearce suggest that the panel at the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment

Report Working Group 1 (ref. 2) press conference fell into a “certainty trap” by presenting an “incoherent” message. We argue that this conclusion is incorrect

because the authors misunderstand key points of the panel’s message and misrepresent some of the press conference statements.

Hollin and Pearce argue that in trying to meaningfully present the scientific certainty about anthropogenic global warming, IPCC speakers selected some temporally short events to stress certainty, while dismissing other temporally short events that brought such certainty into question. The Letter focuses on global surface temperature anomalies and the recent slowdown in surface warming (1998–2012), which the authors termed ‘the pause’. This period overlapped with the hottest decade since records began (2001–2010).

The IPCC was not incoherent, and clearly distinguished between the high confidence that human activity has led to multi-decadal warming and lower confidence in the specific causes of recent short-term variability (that is, the warming slowdown, ‘pause’ or ‘hiatus’). The Letter quotes outgoing IPCC chair Rajendra Pachauri (transcript lines 261–262 in the Supplementary Information of ref. 1) as evidence of focusing on “recent and short-term climate changes”⁷¹ to make it more meaningful to the public. However, they omitted his preceding words: “each of the last three decades has been successively warmer at the Earth’s surface than any preceding decade since 1850” (lines 258–260). Thus, as illustrated in Fig. 1, which was shown at the press conference, the recent “hottest” decade was explicitly placed in the context of long-term, climatically relevant trends².

The IPCC characterized the recent slowdown as having less relevance to anthropogenic global warming than do multi-decade changes in surface temperature. Although of interest regarding short-term climatic variability^{3,4} and/or how well model forcings anticipated their real-world evolution⁵, the ‘hiatus’ has little relevance when attributing surface temperature and other climatic responses to human influences^{5,6,7}. The temperature slowdown is reasonably well captured by those climate simulations in which the external forcings and internal variability are aligned with real-world observations^{3,4,6,8}.

Furthermore, Hollin and Pearce assert that the IPCC dismissed the recent slowdown in warming as scientifically irrelevant and suggested questions about it could be ignored. However, the transcript shows that the IPCC did not dismiss the so-called hiatus as scientifically irrelevant (lines 1,052–1,055). Five of the 18 journalists asked a question about recent temperature trends; none were ignored (Supplementary Information of ref. 1). The Letter further states that “Stocker repeatedly pinpointed a lack of published literature as a problem”. However, far from documenting “repeated” instances of this occurring, the authors only proffered two

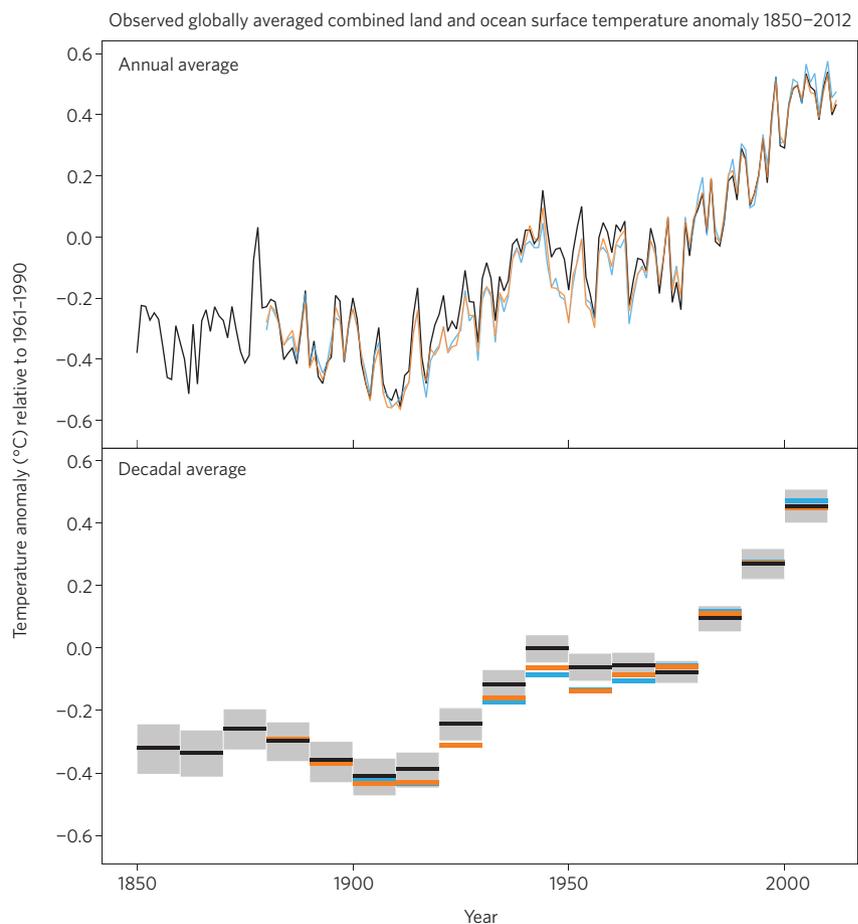


Figure 1 | The combined land and ocean surface temperature anomaly from 1850–2012, averaged annually (top) and decadal (bottom). The bottom panel illustrates that the discussion in the Fifth Assessment Report of the IPCC regarding 2001–2010 being the hottest decade is with reference to a record starting in 1850. Reproduced from Fig. SPM.1 in the AR5 WG1 Summary for Policymakers².

examples, one of which was not related to the slowdown at all (Supplementary Information of ref. 1).

In summary, Hollin and Pearce mischaracterize several fundamental aspects of the press conference, with their central argument being based on a misunderstanding of the context of multi-decadal timescales. The premise of “temporally local events” was incorrectly applied to the IPCC’s statement about the “hottest decade”. Therefore the conclusion that the IPCC fell into a “certainty trap” does not follow. □

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Additional information

Supplementary information is available in the [online version of the paper](#).

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