

On 5 February 2017, 'The Mail on Sunday' published [an article by David Rose](#) on pages 10, 11 and 12 that made some incredible accusations about [a paper by Dr Thomas Karl and co-authors](#), which had been published in June 2015. The article by Mr Rose had appeared on the newspaper's website the previous evening, and was supported by a leading article.

[It was immediately apparent](#) that the article by Mr Rose, who has a cosy relationship with climate change 'sceptics' at the Global Warming Policy Foundation, included many inaccurate and misleading claims, and used a fake graph to misrepresent the data in the paper.

In the days following publication there were a number of new revelations that now show much of Mr Rose's article to be untrue. Here we identify 30 false claims in Mr Rose's main article, its sidebars and the leading article that accompanied it, and compare them with the facts.

These false claims are highlighted in a complaint that has now been submitted to the Independent Press Standards Organisation because they breach the [Editors' Code of Practice](#), which states: "The Press must take care not to publish inaccurate, misleading or distorted information or images, including headlines not supported by the text".

FALSE CLAIM 1: Headline (p.10): "Exposed: how leaders were duped over global warming".

FACT: This is untrue. Mr Rose's article suggests that the analysis presented in the paper by Dr Karl and co-authors was wrong. But there is no evidence to support this. Nor is there any evidence that world leaders were even aware of the paper by Dr Karl and co-authors.

FALSE CLAIM 2: Main article (p.10): "The Mail on Sunday today reveals astonishing evidence that the organisation that is the world's leading source of climate data rushed to publish a landmark paper that exaggerated global warming and was timed to influence the historic Paris Agreement on Climate Change."

FACT: This is wrong. The paper by Dr Karl and co-authors was not "rushed". As the [information at the end of the paper](#) indicates, it was submitted to the journal 'Science' on 23 December 2014, accepted for publication on 21 May 2015, and published online on 4 June 2015. Dr Marcia McNutt, who was editor of 'Science' at the time the paper was published, [told Associated Press](#): "The paper was not rushed in any way. It had an exceptional number of reviewers, many more than average because we knew it was on a controversial topic. It had a lot of data analysis." Dr McNutt is now President of the United States National Academy of Sciences. The paper did not "exaggerate global warming". In fact, it was thoroughly reviewed by independent referees for the journal, and then subjected to further independent scrutiny by Dr Zeke Hausfather and co-authors, who [published their results](#) in the journal 'Science Advances' in January 2017. [In a commentary for the 'Carbon Brief' website](#), Dr Hausfather stated: "While NOAA's data

management procedures may well need improvement, their results have been independently validated and agree with separate global temperature records created by other groups.” The paper was also not “timed to influence the historic Paris Agreement on Climate Change”. The Paris Agreement was reached at the United Nations climate change summit on 12 December 2015, almost 12 months after Dr Karl and his colleagues submitted the paper for publication.

FALSE CLAIM 3: Main article (p.10): “A high-level whistleblower has told this newspaper that America’s National Oceanic and Atmospheric Administration (NOAA) breached its own rules on scientific integrity when it published the sensational but flawed report, aimed at making the maximum possible impact on world leaders including Barack Obama and David Cameron at the UN climate conference in Paris in 2015.”

FACT: This is inaccurate and misleading. Although a blog by Dr John Bates accused Dr Karl and co-authors of “a flagrant manipulation of scientific integrity guidelines and scientific publication standards”, he also admitted that his concerns were considered in February 2016 by the Science Council of the NOAA National Centers for Environmental Information (NCEI). It appears that the Council did not agree with Dr Bates that Dr Karl and co-authors had “breached its own rules on scientific integrity”, as Mr Rose’s article alleges. Indeed, the current editor-in-chief of ‘Science’, Jeremy Berg, [told a journalist at ‘Propublica’, Andy Revkin, on 6 February](#) that “from materials that have come to our attention today, it appears that these accusations are not new, but have been investigated inside NOAA and found to be without substantial merit”. The paper by Karl and co-authors was not “a “sensational but flawed report” published by NOAA, but instead an academic paper published by the journal ‘Science’ after thorough review by independent referees, and subsequently verified by other researchers. Nor was the paper “aimed at making the maximum possible impact on world leaders including Barack Obama and David Cameron at the UN climate conference in Paris in 2015”. The paper was submitted for publication almost a year before the Paris summit took place, and the timing of its publication was determined by the journal ‘Science’. When the paper was published, NOAA issued [a media release](#) which did not mention the Paris summit or international policy-making. Neither [Prime Minister David Cameron](#) nor [President Barack Obama](#) referred to the paper by Dr Karl and co-authors in their speeches on 30 November 2015 on the opening day of the Paris summit.

FALSE CLAIM 4: Main article (p.10): “The report claimed that the ‘pause’ or ‘slowdown’ in global warming in the period since 1998 – revealed by UN scientists in 2013 – never existed, and that world temperatures had been rising faster than scientists expected.”

FACT: This is wrong. The so-called ‘pause’ in global warming was not “revealed by UN scientists in 2013”. The contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change actually [summarised on pages 61-63](#) earlier academic studies that had already suggested a possible slowdown in the rate of rise in global mean surface temperature after 1998, such as [a paper by Dr David Easterling and Dr Michael Wehner](#), which was published in the journal ‘Geophysical

Research Letters' in April 2009. The paper by Dr Karl and co-authors found that the rate of warming between 1998 and 2014 was not significantly different from the longer term warming rate between 1951 and 2014, and so was not "faster than scientists expected".

FALSE CLAIM 5: Main article (p.10): "But the whistleblower, Dr John Bates, a top NOAA scientist with an impeccable reputation, has shown The Mail on Sunday irrefutable evidence that the paper was based on misleading, 'unverified' data."

FACT: This is not true. As the independent reviews by referees for 'Science' and the independent verification by Dr Haufather and co-authors prove, the paper by Dr Karl and co-authors was not "based on misleading, 'unverified' data". [Dr Bates has subsequently told Associated Press](#) that there was "no data tampering, no data changing, nothing malicious".

FALSE CLAIM 6: Main article (p.10): "His vehement objections to the publication of the faulty data were overridden by his NOAA superiors in what he describes as a 'blatant attempt to intensify the impact' of what became known as the Pausebuster paper."

FACT: This is false. Dr Bates did not have "vehement objections to the publication of the faulty data". As already noted, the data in the paper by Dr Karl and co-authors was not "faulty". Dr Bates told Associated Press that there was "no data tampering, no data changing, nothing malicious". [An account of an interview with Dr Bates](#) published on 8 February states: "The 'Science' paper would have been fine had it simply had a disclaimer at the bottom saying that it was citing research, not operational, data for its land-surface temperatures, Bates says."

FALSE CLAIM 7: Main article (p.10): "In an exclusive interview, Dr Bates accused the lead author of the paper, Thomas Karl, who was until last year director of the NOAA section that produces climate data – the National Centers for Environmental Information (NCEI) – of 'insisting on decisions and scientific choices that maximised warming and minimised documentation... in an effort to discredit the notion of a global warming pause, rushed so that he could time publication to influence national and international deliberations on climate policy'."

FACT: This is wrong. The comments attributed to Dr Bates are actually contained in [a blog](#) that was made public at about the same time that the online version of Mr Rose's article appeared. While it is true that the blog includes this statement, Dr Bates has since backed down from these allegations, [telling Associated Press](#) that there was "no data tampering, no data changing, nothing malicious".

FALSE CLAIM 8 Main article (p.10): "Official delegations from America, Britain and the EU were strongly influenced by the flawed NOAA study as they hammered out the Paris Agreement".

FACT: This is patently absurd. Mr Rose's article offers no evidence to substantiate his claim. [A draft of the Paris Agreement](#) already existed in February 2015, long before the

publication of the paper by Dr Karl and co-authors. [The final version of the Paris Agreement](#) makes no reference to the paper or its findings.

FALSE CLAIM 9: Main article (p.10): “The scandal has disturbing echoes of the ‘Climategate’ affair which broke shortly before the UN climate summit in 2009, when the leak of thousands of emails between climate scientists suggested they had manipulated and hidden data.”

FACT: This is inaccurate and misleading. ‘Climategate’ is the term that climate change ‘sceptics’ use to describe the illegal hacking of emails and other documents from the Climatic Research Unit at the University of East Anglia. There is no similarity between the false allegations contained in Mr Rose’s article and the controversy over emails and documents from the Climatic Research Unit that were stolen from the computer server at the University of East Anglia. The emails and documents were not “leaked”, but stolen through computer hacking. Although nobody was ever brought to justice for the crime, [a statement by Norfolk Police concluded](#) that “the data breach was the result of a ‘sophisticated and carefully orchestrated attack on the CRU’s data files, carried out remotely via the internet’”. It added: “There is no evidence to suggest that anyone working at or associated with the University of East Anglia was involved in the crime”. Nine independent investigations were conducted into the content of the emails and documents by [the Independent Climate Change Email Review](#), [the International Panel set up by the University of East Anglia to examine the research of the Climatic Research Unit](#), [the House of Commons Select Committee on Science and Technology](#), [Pennsylvania State University](#), [the United States Environmental Protection Agency](#), [the Inspector General of the United States Department of Commerce](#) and [the United States National Science Foundation](#). None of these inquiries concluded that the stolen emails showed serious misconduct by any climate scientists.

FALSE CLAIM 10: Main article (p.10): “NOAA’s 2015 ‘Pausebuster’ paper was based on two new temperature sets of data – one containing measurements of temperatures at the planet’s surface on land, the other at the surface of the seas. Both datasets were flawed.”

FACT: This is not true. The datasets for land and sea surface temperatures have been independently investigated by Dr Hausfather, who wrote [in a commentary for the ‘Carbon Brief’ website](#) that the findings of the paper by Dr Karl and co-authors: “have been independently validated and agree with separate global temperature records created by other groups”. He added: “If anything, there is strong independent evidence that NOAA’s new record may be the most accurate one over the last two decades, at least for the two-thirds of the world covered in ocean.”

FALSE CLAIM 11: Main article (p.10): “This newspaper has learnt that NOAA has now decided that the sea dataset will have to be replaced and substantially revised just 18 months after it was issued, because it used unreliable methods which overstated the speed of warming. The revised data will show both lower temperatures and a slower rate in the recent warming trend.”

FACT: This is false. As Dr Bates makes clear in his blog, the paper by Dr Karl and co-authors used NOAA's Extended Reconstructed Sea Surface Temperature Version 4 (ERSST.v4). Dr Bates acknowledges that ERRST.v4 was approved for release in January 2015 by the Science Council of NOAA's National Climatic Data Center. The details of the construction of the dataset were provided in [a paper by Dr Boyin Huang and co-authors](#), which was published in the 'Journal of Climate' on 4 February 2015. Dr Bates also notes that the dataset was made publicly available on NOAA's website in June 2015 to coincide with the paper by Dr Karl and co-authors. There is no evidence that ERSST.v4 used "unreliable methods which overstated the speed of warming". The ERSST.v4 dataset used by Dr Karl in co-authors in their paper was independently examined and verified by Dr Hausfather and co-authors, who published their conclusions in [a journal paper published by 'Science Advances' in January 2017](#). It is true that NOAA is currently working on an updated version of the dataset, which will be called ERSST.v5. The detailed methodology for the new dataset is described in a new academic paper which is currently being subjected to independent review by a journal and has not yet been made public. It is not clear when ERSST.v5 will be released, nor how it will compare with the previous dataset. Mr Rose provides no evidence, and cites no source, for his speculation that ERSSTv.5 "will show both lower temperatures and a slower rate in the warming trend".

FALSE CLAIM 12: Main article (p.10): "The land temperature dataset used by the study was afflicted by devastating bugs in its software that rendered its findings 'unstable'. The paper relied on a preliminary, 'alpha' version of the data which was never approved or verified."

FACT: This is misleading. The methods and results used by Dr Karl and co-authors in their paper were rigorously reviewed by independent referees for the journal 'Science'. Dr Karl and co-authors used a new dataset, version 4, for land temperature measurements from the Global Historical Climatology Network. This was an update on the previous version 3 (GHCN.v3), [which was released in May 2011](#). [In a commentary for the website 'Carbon Brief'](#) about the land surface temperature data, GHCN.v4, used by Dr Karl and co-authors, Dr Hausfather wrote that "the land record was largely similar to their prior record and was responsible for relatively little of the increase in warming they showed".

FALSE CLAIM 13: Main article (p.10): "None of the data on which the paper was based was properly 'archived' – a mandatory requirement meant to ensure that raw data and the software used to process it is accessible to other scientists, so they can verify NOAA results."

FACT: This is misleading. While it is unclear to what extent, if at all, Dr Bates's complaints are justified about archiving of the data from the paper by Dr Karl and co-authors, it is not true that other scientists were unable to verify them. Dr Hausfather and co-authors were able to access the data in order to carry out an independent evaluation for their paper published in January 2017. [In a commentary for the website 'Carbon Brief'](#), Dr Hausfather wrote: "While I cannot speak to how well the authors followed internal

protocols, they did release their temperature anomalies, spatially gridded data land and ocean data, and the land station data associated with their analysis. They put all of this up on NOAA's FTP site in early June 2015, at the time that the Karl et al paper was published." He added: "Rose's claim that NOAA's results 'can never be verified' is patently incorrect, as we just published a paper independently verifying the most important part of NOAA's results".

FALSE CLAIM 14: Main article (p.11-12): "The sea dataset used by Thomas Karl and his colleagues – known as Extended Reconstructed Sea Surface Temperatures version 4, or ERSST.v4, tripled the warming trend over the sea during the years 2000 to 2014 from just 0.036C per decade – as stated in version 3 – to 0.099C per decade. Individual measurements in some parts of the globe had increased by about 0.1C and this resulted in the dramatic increase of the overall global trend published by the Pausebuster paper. But Dr Bates said this increase in temperatures was achieved by dubious means. Its key error was an upwards 'adjustment' of readings from fixed and floating buoys, which are generally reliable, to bring them into line with readings from a much more doubtful source – water taken in by ships. This, Dr Bates explained, has long been known to be questionable: ships are themselves sources of heat, readings will vary from ship to ship, and the depth of water intake will vary according to how heavily a ship is laden – so affecting temperature readings." Dr Bates said: 'They had good data from buoys. And they threw it out and "corrected" it by using the bad data from ships. You never change good data to agree with bad, but that's what they did – so as to make it look as if the sea was warmer.'

FACT: This is wrong. The increase in the short-term rate of warming from 2000 to 2014 of 0.099°C per decade, between ERSST.v3 and ERSST.v4 in the paper by Dr Karl and co-authors, was not "achieved by dubious means". It was the result of 11 improvements clearly outlined in the paper by Dr Karl and co-authors and the earlier paper by Dr Huang and co-authors. The largest correction resulted from an adjustment for differences between measurements taken from water in buckets drawn from the side of ships and those from the intake of water onto ships for cooling. This accounted for 0.030°C per decade of the difference in short-term trend between ERSST.v3 and ERSST.v4. A much smaller correction was applied due to the difference between the measurements obtained from ship intake and buoys. This accounted for 0.014°C per decade of the difference in short-term warming rates between ERSST.v3 and ERSST.v4. Dr Karl and co-authors explicitly acknowledged that ship intake measurements tend to be warmer than from buoys. However, they also noted that "buoy data have been proven to be more accurate and reliable than ship data, with better-known instrument characteristics and automated sampling". Hence the authors also applied another correction to give more weight to measurements by buoys compared with ships. This accounted for 0.012°C per decade of the difference in short-term warming rates between ERSST.v3 and ERSST.v4. Therefore, the comments attributed to Dr Bates are misinformed. It is important to note that he did not make such claims in his blog and he withdrew these allegations following the publication of Mr Rose's article. [Dr Bates told Associated Press](#) that there was "no data tampering, no data changing, nothing malicious".

FALSE CLAIM 15: Main article (p.12): “ERSSTv4 ‘adjusted’ buoy readings up by 0.12C. It also ignored data from satellites that measure the temperature of the lower atmosphere, which are also considered reliable. Dr Bates said he gave the paper’s co-authors ‘a hard time’ about this, ‘and they never really justified what they were doing.’”

FACT: This is misleading. Satellite measurements of the lower atmosphere are not the same as satellite measurements of sea surface temperature. Satellite measurements of sea surface temperature were available for the period between 1997 and 2011 and were explicitly used to evaluate ERSST.v4. The comments attributed to Dr Bates are also misleading. Satellite measurements of sea surface temperature are only available from 1997 onwards. The paper by Dr Karl and co-authors was not intended to present the details of the methodology used to prepare the ERSST.v4 dataset. The methodology for ERSST.v4 was documented in full in [a paper by Dr Boyin Huang and co-authors](#) which was published in the ‘Journal of Climate’ in February 2015, many months before publication of the paper by Dr Karl and co-authors in June 2015. The paper by Dr Huang and co-authors states: “The Along-Track Scanning Radiometer (ATSR) satellite SST observations on monthly $1^{\circ} \times 1^{\circ}$ grid from 1997 to 2011 (Merchant et al. 2012) are used to evaluate the ERSST.v4 analysis”. The results of the comparison were presented in full in the paper by Dr Huang and co-authors. It states: “SSTs in ERSST.v4 are reasonably close to the independent satellite-based ATSR observations”.

FALSE CLAIM 16: Main article (p.12): “Now, some of those same authors have produced the pending, revised new version of the sea dataset – ERSSTv5. A draft of a document that explains the methods used to generate version 5, and which has been seen by this newspaper, indicates the new version will reverse the flaws in version 4, changing the buoy adjustments and including some satellite data and measurements from a special high-tech floating buoy network known as Argo. As a result, it is certain to show reductions in both absolute temperatures and recent global warming.”

FACT: This is inaccurate and misleading. The draft paper by Dr Huang and co-authors, which is still undergoing review for the ‘Journal of Climate’, describes the preparation of ERSST.v5. The new dataset does not “reverse flaws in version 4”. As a co-author on the new paper, Dr Peter Thorne, pointed out in [a commentary for the website ‘Carbon Brief’](#) on 10 February 2017, ERSSTv.5 incorporates new analyses and data that were not available for ERSSTv4 and the paper by Dr Karl and co-authors. These include [a paper by Dr Huang and co-authors](#), published on 19 April 2016 in the ‘Journal of Climate’, on ‘Further Exploring and Quantifying Uncertainties for Extended Reconstructed Sea Surface Temperature (ERSST) Version 4 (v4)’, and [a paper by Dr Eric Freeman and co-authors](#), published on 27 June 2016 in the ‘International Journal of Climatology’, on ‘ICOADS Release 3.0: a major update to the historical marine climate record’. Dr Thorne wrote: “It’s worth noting that the ERSSTv4 and ERSSTv5 series are virtually indistinguishable in recent years and that the comparison does not include the data from 2016. The recent changes that were made for ERSSTv4 are largely untouched in the new version in terms of global average temperature anomalies. Therefore, as currently submitted, ERSSTv5 would not change the bottom-line findings of Karl et al (2015).”

FALSE CLAIM 17: Main article (p.12): “Dr Bates revealed that the failure to archive and make available fully documented data not only violated NOAA rules, but also those set down by Science. Before he retired last year, he continued to raise the issue internally. Then came the final bombshell. Dr Bates said: ‘I learned that the computer used to process the software had suffered a complete failure.’ The reason for the failure is unknown, but it means the Pausebuster paper can never be replicated or verified by other scientists.”

FACT: This is not true. Dr Karl and co-authors did make their data available and did not violate the rules of the journal ‘Science’. The current editor-in-chief of ‘Science’, Jeremy Berg, [told a journalist at ‘ProPublica’, Andy Revkin, on 6 February](#) that “others have used the datasets (which were made accessible consistent with ‘Science’ magazine’s policies)”. As a result, Dr Hausfather and co-authors were able to verify the findings of the paper by Dr Karl and co-authors, and to [publish their results](#) in the journal ‘Science Advances’ in January 2017. [In a commentary for the ‘Carbon Brief’ website](#), Dr Hausfather stated: “While NOAA’s data management procedures may well need improvement, their results have been independently validated and agree with separate global temperature records created by other groups.”

FALSE CLAIM 18: Main article (p.12): “Dr Bates said: ‘How ironic it is that there is now this idea that Trump is going to trash climate data, when key decisions were earlier taken by someone whose responsibility it was to maintain its integrity – and failed.’ NOAA not only failed, but it effectively mounted a cover-up when challenged over its data. After the paper was published, the US House of Representatives Science Committee launched an inquiry into its Pausebuster claims. NOAA refused to comply with subpoenas demanding internal emails from the committee chairman, the Texas Republican Lamar Smith, and falsely claimed that no one had raised concerns about the paper internally. Last night Mr Smith thanked Dr Bates ‘for courageously stepping forward to tell the truth about NOAA’s senior officials playing fast and loose with the data in order to meet a politically predetermined conclusion’. He added: ‘The Karl study used flawed data, was rushed to publication in an effort to support the President’s climate change agenda, and ignored NOAA’s own standards for scientific study.’”

FACT: This is false. The integrity of the datasets used by Dr Karl and co-authors for their paper has not been damaged. [Dr Bates told Associated Press](#) that there was “no data tampering, no data changing, nothing malicious”. Kathryn Sullivan, formerly the Under Secretary of Commerce for Oceans and Atmosphere and Administrator of NOAA, [was questioned on 16 March 2016](#) by Representative Lamar Smith, the Chair of the House of Representatives Committee on Science, Space and Technology. She said: “I stand by the integrity and quality of the Karl study”. NOAA has not “mounted a cover-up when challenged over its data”. Mr Rose did not mention that, [according to a statement provided to the journal ‘Nature’](#), NOAA has supplied to the Committee the publicly available data from the paper by Dr Karl and co-authors and briefed the Committee’s staff on the research for the paper. However, it has offered the following explanation for not handing over email communications to the Committee: “Because the confidentiality of these communications among scientists is essential to frank discourse among

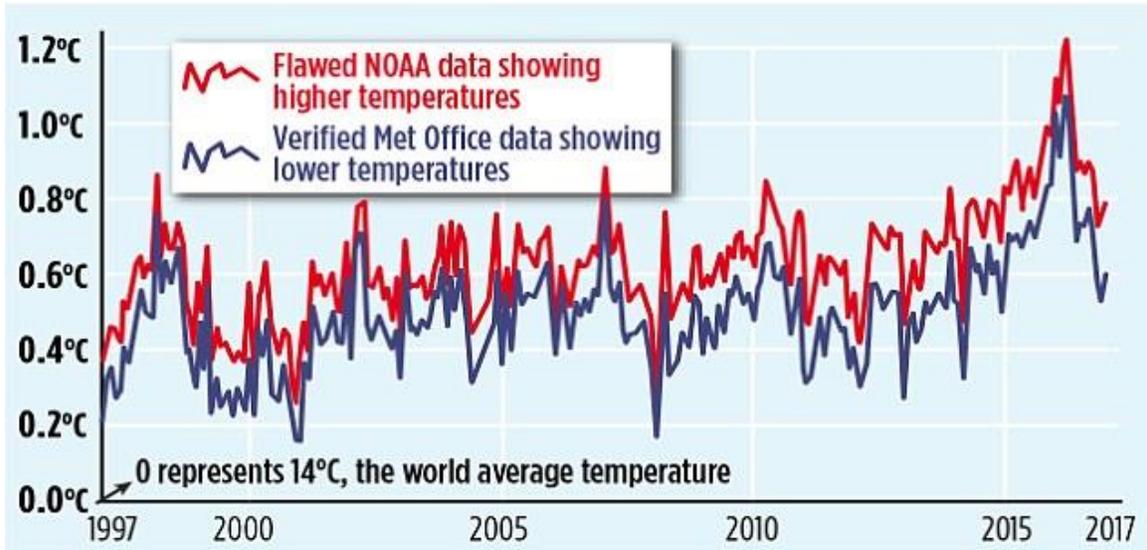
scientists, those documents were not provided to the Committee. It is a long-standing practice in the scientific community to protect the confidentiality of deliberative scientific discussions.” Nor did Mr Rose refer to [a letter to Representative Smith on 23 October 2015 from another member of the Committee](#), Representative Eddie Bernie Johnson, which accused Mr Smith of exceeding his authority in demanding the email communications. The letter states points out that “the issue is a scientific research study, not a policy decision by a Federal agency”. It added: “As such, this is not an area of delegated legislative authority by Congress to the Executive (unless you are proposing that Congress should somehow legislatively overrule peer-reviewed scientific findings). Moreover, in none of the letters do you allege any scientific misconduct, abuse of discretion, or fraud. In sum, NOAA has provided all the information necessary for the Committee to understand the scientific process at play. You have not articulated a legitimate need for anything beyond what NOAA has already provided.” The other statements attributed to Representative Smith in Mr Rose’s article are inaccurate and misleading. Dr Bates [told the Associated Press](#) that there was “no data tampering, no data changing, nothing malicious”, indicating that Dr Karl and co-authors did not “play fast and loose with the data”. The paper was subjected to a rigorous peer review process by the journal ‘Science’, which means it could not have been produced “to meet a politically predetermined conclusion”. The paper by Dr Karl and co-authors did not use “flawed data”, as Dr Bates’s statement confirms, and it was not “rushed” because it was submitted for publication in December 2014 and not published until June 2015.

FALSE CLAIM 19: Sidebar (p.10): “The ‘adjusted’ sea readings: Average sea surface temperatures are calculated using data from weather buoys (pictured). But NOAA ‘adjusted’ these figures upwards to fit with data taken from ships – which is notoriously unreliable. This exaggerated the warming rate, allowing NOAA to claim in the paper dubbed the ‘Pausebuster’ that there was no ‘pause’.”

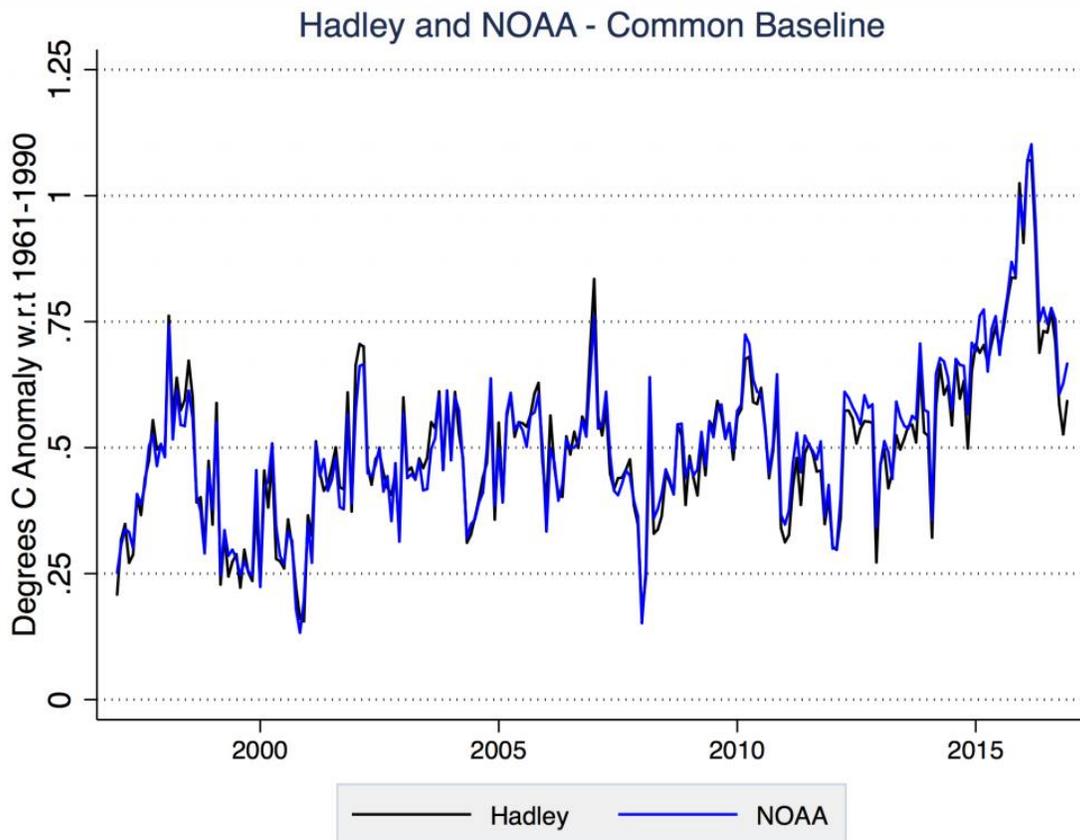
FACT: This is wrong. Average sea surface temperatures are not only calculated from measurements by buoys. [As the paper by Dr Karl and co-authors makes clear](#), measurements from ships also provide data about sea surface temperatures. It states: “The data used in our long-term global temperature analysis primarily involve surface air temperature observations taken at thousands of weather-observing stations over land, and for coverage across oceans, the data are sea surface temperature (SST) observations taken primarily by thousands of commercial ships and drifting surface buoys.” The warming rate was not “exaggerated” by the correction to the buoys because it was applied throughout the record. The correction only contributed 0.014°C per decade to the difference of 0.064°C per decade between ERSST.v4 and the previous version (ERSST.v3b) in the short-term rate of warming from 2000 to 2014. Hence the adjustment to the buoy measurements was not the main reason why the “pause” was not evident in the results of the paper by Dr Karl and co-authors.

FALSE CLAIM 20: Sidebar (p.11): “The misleading ‘Pausebuster’ chart: The red line shows the current NOAA world temperature graph – which relies on the ‘adjusted’ and unreliable sea data cited in the flawed ‘Pausebuster’ paper. The blue line is the UK Met

Office's independently tested and verified 'HadCRUT4' record – showing lower monthly readings and a shallower recent warming trend.”



FACT: This is a fake graph. The red line does not represent the data from the paper by Dr Karl and co-authors as it does not incorporate the land surface temperature data, GHCN.v4. Furthermore it misrepresents the differences between the two datasets as the red line was plotted from the [NOAA Merged Land Ocean Global Surface Temperature Analysis Dataset](#), which is presented as an anomaly relative to the baseline mean for the period between 1971 and 2000, and the blue line was obtained from the [HadCRUT4 dataset](#), which is presented as an anomaly relative to the baseline mean for the period between 1961 and 1990. As a result of the error in plotting the two datasets using different baselines, it also incorrectly indicates that “0 represents 14°C, the world average temperature”. While [a paper by Dr Phil Jones and co-authors](#) estimated that the average absolute global mean surface temperature for the period between 1961 and 1990 is 14.0°C, [NOAA estimates](#) that the average absolute global mean surface temperature for the period between 1901 and 2000 is 13.9°C. Hence, when the two datasets are correctly plotted with the same baseline, they are seen to be virtually identical, as Dr Hausfather demonstrated in [his commentary for the ‘Carbon Brief’ website](#):



‘The Mail On Sunday’ subsequently changed the caption on its fake graph to: “The red line shows the current NOAA world temperature graph - elevated in recent years due to the ‘adjusted’ sea data. The blue line is the Met Office’s independent HadCRUT4 record. Although they are offset in temperature by 0.12°C due to different analysis techniques, they reveal that NOAA has been adjusted and so shows a steeper recent warming trend.” This does not correct the graph which still incorrectly lists 0 as equivalent to 14°C for both datasets. If the newspaper had printed the real graph with the same baseline for both datasets, the NOAA dataset would not appear “elevated” compared with the Met Office dataset. In addition, the graph does not show the previous version of the NOAA dataset (ERSST.v3b) so it is not possible to conclude that the new dataset results in a higher rate of warming.

FALSE CLAIM 21: Sidebar (p.11): “...And how they were forced to correct it: They were forced to correct it: 18 months after the ‘Pausebuster’ paper was published in time for the 2015 Paris climate change conference, NOAA’s flawed sea temperature dataset is to be replaced. The new version will remedy its failings, and use data from both buoys and satellites (pictured) – which some say is the best data of all. The new version will show both lower temperatures and a lower warming trend since 2000.”

FACT: This is misleading and inaccurate. The paper by Dr Karl and co-authors was not “published in time for the 2015 Paris climate change conference”, but was actually published by the journal ‘science’ five months after it was submitted for publication in December 2014. The ERSST.v4 dataset is due to be replaced by ERSST.v5 not because it is “flawed”, but instead because new analyses and datasets have been published since it was made public in June 2015, as [the commentary by Dr Thorne for the website ‘carbon Brief’](#) makes clear. The new dataset will not use data from satellites, but will, like ERSST.v4, use data mainly from ships and buoys. The new paper by Dr Huang and co-authors, which is currently undergoing peer review, concludes that the rate of warming since 2000 is now higher than was found by Dr Karl and co-authors, and does not show “a lower warming trend since 2000”.

FALSE CLAIM 22: Sidebar (p.12): “It’s not the first time we’ve exposed dodgy climate data, which is why we’ve dubbed it...Climategate 2. Dr John Bates’s disclosures about the manipulation of data behind the ‘Pausebuster’ paper is the biggest scientific scandal since ‘Climategate’ in 2009 when, as this paper reported, thousands of leaked emails revealed scientists were trying to block access to data, and using a ‘trick’ to conceal embarrassing flaws in their claims about global warming.”

FACT: This is untrue. The paper by Dr Karl and co-authors is not based on “dodgy climate data”. Dr Bates [told the Associated Press](#) that there was “no data tampering, no data changing, nothing malicious”. The publication of the paper by Dr Karl and co-authors is not “the biggest scientific scandal” since November 2009. ‘Climategate’ is the term that climate change ‘sceptics’ use to describe the illegal hacking of emails and other documents from the Climatic Research Unit at the University of East Anglia. There is no similarity between the false allegations contained in Mr Rose’s article and the controversy over emails and documents from the Climatic Research Unit that were stolen from the computer server at the University of East Anglia. The emails and documents were not “leaked”, but stolen through computer hacking. Although nobody was ever brought to justice for the crime, [a statement by Norfolk Police concluded](#) that “the data breach was the result of a ‘sophisticated and carefully orchestrated attack on the CRU’s data files, carried out remotely via the internet’”. It added: “There is no evidence to suggest that anyone working at or associated with the University of East Anglia was involved in the crime”. Nine independent investigations were conducted into the content of the emails and documents by [the Independent Climate Change Email Review](#), [the International Panel set up by the University of East Anglia to examine the research of the Climatic Research Unit](#), [the House of Commons Select Committee on Science and Technology](#), [Pennsylvania State University](#), [the United States Environmental Protection Agency](#), [the Inspector General of the United States Department of Commerce](#) and [the United States National Science Foundation](#). None of these inquiries concluded that the stolen emails showed serious misconduct by any climate scientists. The emails did not reveal that climate scientists were “using a ‘trick’ to conceal embarrassing flaws in their claims about global warming”. [The Independent Climate Change Email Review](#) concluded: “The word trick has been widely taken to confirm the intention to deceive, but can equally well, when used by scientists, mean for example a mathematical approach brought to bear to solve a problem”.

FALSE CLAIM 23: Sidebar (p.12): “Because of NOAA’s failure to ‘archive’ data used in the paper, its results can never be verified.”

FACT: This is wrong. The datasets used by Dr Karl and co-authors for their paper have been made available and independently investigated by Dr Hausfather, who wrote [in a commentary for the ‘Carbon Brief’ website](#) that the findings “have been independently validated and agree with separate global temperature records created by other groups”. He added: “If anything, there is strong independent evidence that NOAA’s new record may be the most accurate one over the last two decades, at least for the two-thirds of the world covered in ocean.”

FALSE CLAIM 24: Sidebar (p.12): “Climate change email row deepens as Mail on Sunday investigation reveals astonishing manipulation of data: Blowing up the graph show is disappears in 1961 artfully hidden behind the other colours. The reason? Because this is what it shows after 1961, a dramatic decline in global temperatures.”

FACT: This is inaccurate and misleading. The graphs did not show “manipulation of data”, but instead the method by which scientists removed inaccurate proxy data for the reconstruction of global temperatures from a graph in a publication for the World Meteorological Organisation. [The Independent Climate Change Email Review](#) concluded: “We do not find that it is misleading to curtail reconstructions at some point per se, or to splice data, but we believe that both of these procedures should have been made plain – ideally in the figure but certainly clearly described in either the caption or the text.”

FALSE CLAIM 25: Sidebar (p.12): “Karl’s ‘Pausebuster’ paper was hugely influential in dictating the world agreement in Paris and sweeping US emissions cuts.”

FACT: This untrue. The paper by Dr Karl and co-authors, which was published on 4 June 2015, did not play a significant role in the Paris Agreement. There is no reference to the paper or the “pause” in [the final version of the Agreement](#), or even in [the early draft that existed in February 2015](#) before the paper’s publication. The paper was not mentioned by world leaders during their speeches at the beginning of the Paris summit on 30 November 2015.

FALSE CLAIM 26: Leading article (p.27): “But, as The Mail on Sunday reveals today, there are serious doubts about recent research – research which was used to thrust aside scepticism about the rate of warming, and so to intensify costly efforts to combat it.”

FACT: This is inaccurate and misleading. The article by David Rose has not provided any evidence to justify “serious doubts” about the paper by Dr Karl and co-authors.

FALSE CLAIM 27: Leading article (p.27): “A distinguished climate scientist, Dr John Bates, has gone public with claims that a 2015 document was based upon unverified and misleading data.”

FACT: This is inaccurate and misleading. The “2015 document” was a paper by Dr Karl and co-authors which was published in a leading scientific journal, ‘Science’, after rigorous review by independent referees. The paper was not based on “unverified and misleading data”. Dr Karl and co-authors made their data available so that other scientists could independently verify the research results. Dr Zeke Hausfather and co-authors examined the paper by Dr Karl and co-authors and [published their results](#) in the journal ‘Science Advances’ in January 2017. [In a commentary for the ‘Carbon Brief’ website](#), Dr Hausfather stated: “While NOAA’s data management procedures may well need improvement, their results have been independently validated and agree with separate global temperature records created by other groups.” [Dr Bates told Associated Press](#) that there was “no data tampering, no data changing, nothing malicious”.

FALSE CLAIM 28: Leading article (p.27): “America’s National Oceanic and Atmospheric Administration (NOAA) is now re-examining the 2015 figures on sea temperatures, which were measured using methods known to be unreliable.”

FACT: This is untrue. NOAA is not “re-examining the 2015 figures on sea temperatures”. The ERSST.v4 dataset for sea surface temperatures was described in detail in [the paper by Dr Huang and co-authors](#) and published in February 2015 after independent peer review in the ‘Journal of Climate’ in February 2015. The sea surface temperatures were not “measured using methods known to be unreliable”. The paper by Dr Huang and co-authors described a series of 11 procedures that were applied to correct for potential errors in the data.

FALSE CLAIM 29: Leading article (p.27): “The figures for land temperatures are equally questionable for different reasons.”

FACT: This is false. The methods and results used by Dr Karl and co-authors in their paper were rigorously reviewed by independent referees for the journal ‘Science’. Dr Karl and co-authors used a new dataset, version 4, for land temperature measurements from the Global Historical Climatology Network. This was an update on the previous version 3 (GHCN.v3), [which was released in May 2011](#). [In a commentary for the website ‘Carbon Brief’](#) about the land surface temperature data, GHCN.v4, used by Dr Karl and co-authors, Dr Hausfather wrote that “the land record was largely similar to their prior record and was responsible for relatively little of the increase in warming they showed”.

FALSE CLAIM 30: Leading article (p.27): “Thanks to this revelation, much of the urgent rhetoric spouted by politicians since 2015 now looks threadbare. And President Donald Trump will find it easier than before to dismiss the Climate Change agenda completely. If he does, those who rushed to publicise these flawed data have only themselves to blame.”

FACT: This is inaccurate and misleading. The unjustified allegations about the paper by Dr Karl and co-authors does not make the evidence base for urgent action on climate change look “threadbare”. The case for action is based on the evidence documented in many thousands of rigorous academic studies by tens of thousands of scientists around

the world. It is not based on a single paper. The paper by Dr Karl and co-authors was not based on “flawed data”. [Dr Bates told Associated Press](#) that there was “no data tampering, no data changing, nothing malicious”. The paper was not “rushed”. Dr Marcia McNutt, who was editor of ‘Science’ at the time the paper was published, [told Associated Press](#): “The paper was not rushed in any way. It had an exceptional number of reviewers, many more than average because we knew it was on a controversial topic. It had a lot of data analysis.” Dr McNutt is now President of the United States National Academy of Sciences.