

WMO (05/18/22) Press Release Rebuttal – Cover Letter

I was asked to review the press release (titled “*Four key climate change indicators break records in 2021*”), put out by the World Meteorological Organization (WMO) just prior to the World Economic Forum’s 2022 Annual Meeting in Davos (May 2022). I was asked to not provide too much detail. My apologies, but the climate change discussion is complicated and the WMO loaded this press release with a boat load of narrative not science. This short summary touches on the general problems. The detailed backup (empirical data, links, etc.) is included in my WMO Rebuttal which generally asks a simple question and provides the answers. What are they not telling us?

The key unscientific, misleading points put forward by the WMO are summarized below. You might say misinformation or disinformation (or more accurately omission information), for the fact checkers out there.

- The WMO press release is loaded with anecdotal, localized examples of recent weather events. A heat wave here, drought conditions there, floods, etc. and oops, just about forgot about that one hurricane they mentioned. Painting a catastrophic climate picture must require at least one hurricane. While all these events are concerning and in many cases devastating, they are on their own are not indications of climate change.
- The WMO focus on individual events, ignores the long-term climate trends. For the record, 1850 to the present barely qualifies as a long-term trend. Ignoring pre-1850 data ignores the natural forcings (primarily direct and indirect solar forcings) that have been driving and will continue to drive the climate in our future. The long-term trends do not support the CAGW alarmist narrative.
- The WMO tries to pass off the “four key climate change indicators” as record breakers. “Greenhouse gas concentrations, sea level rise, ocean heat and ocean acidification” have all been significantly higher in the past, all due to natural processes and all those much higher levels were safe for (and even enhanced) life on this planet. So no, the minor changes in the four key indicators and temperature increases we will experience from our activities do not represent a climate emergency. We will not even come close to the levels the planet has experienced in the past.

What is the most significant omission in this press release? The WMO mentions solar activity exactly 0 times. Solar activity through a variety of processes (Total Solar Irradiance (TSI), Cosmic Ray Flux (CRF), Orbital Patterns (Milankovitch Cycles), Ocean Cycles, Magnetic Field changes, etc.) has been the dominate climate driver for billions of years. That Solar activity has been augmented on the long-term time scales (the Phanerozoic (600 million years) and the Cenozoic (67 million years)) through plate tectonics and a variety of celestial events (impacts and positioning within the galaxy). Now the IPCC “climate scientists” have decreed that CO₂ is the primary driver. That position ignores three key points (outlined below).

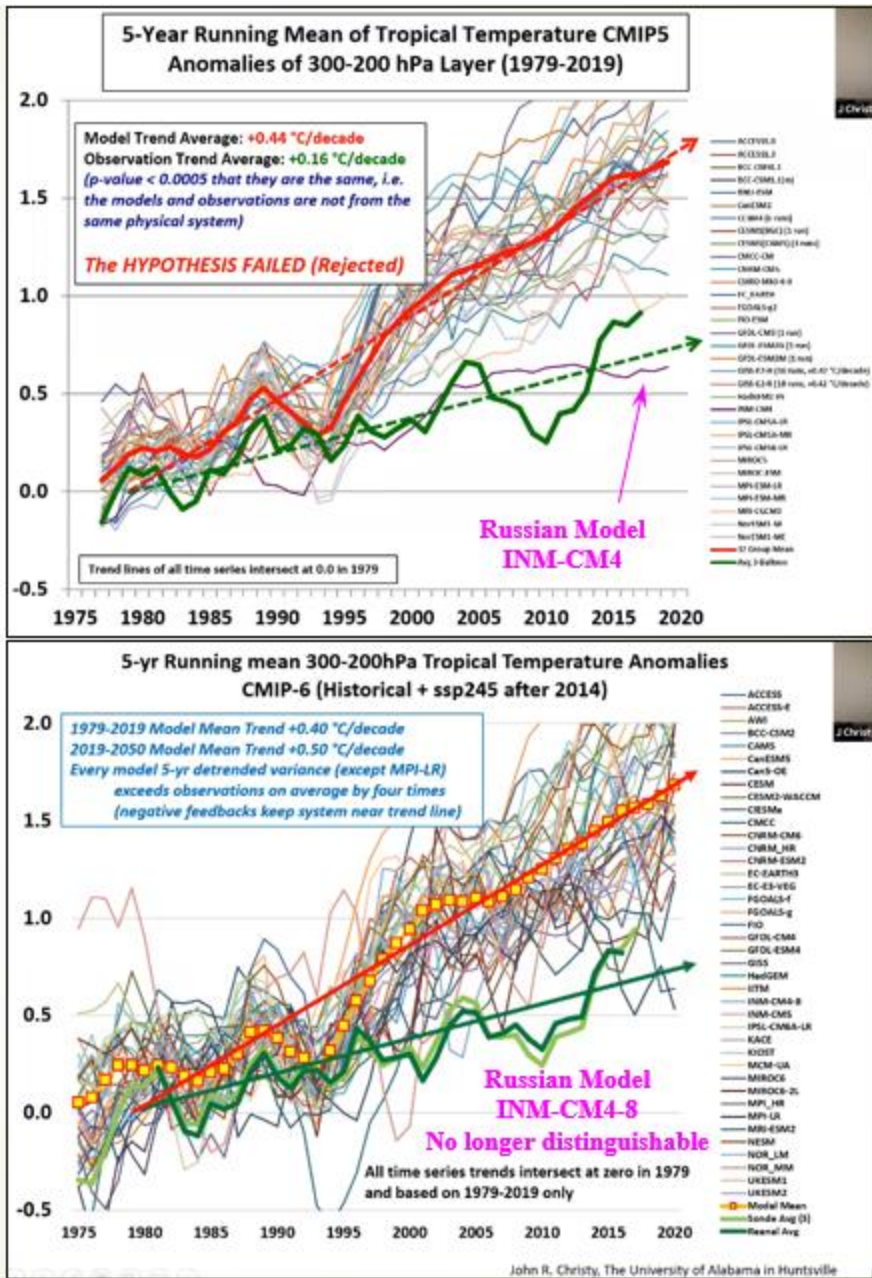
- ✓ The natural forcings were active prior to the Modern Temperature Record (MTR, 1850 to the present), they have been active through the MTR and will be active in the future (except in the virtual world created by computer models).
- ✓ There is no empirical CO₂/Temperature data that shows CO₂ driving the climate on any statistically significant historical time scale. That empirical data is required for the CAGW narrative to be considered a scientific principle (it is not).
- ✓ The Computer models run too hot, implying that the “climate science” programmed into the models is incorrect and/or being allocated improperly. The exception might be the Russian INM-CM4 model (using the CMIP5 protocol). The newer CMIP6 protocol has CRF and High Energy Particle (HEP) solar forcings built in, but the programmers have obviously turned them off or way down. Strange that they would do that when beta testing showed the new forcings could model the MTR without CO₂ forcing?

We need to stop wasting huge capital on uneconomic, technically implausible green initiatives when there are so many other real economic, environmental, political, societal and technological problems to deal with.

WMO (05/18/22) Press Release Rebuttal

The WMO is supposed to be a scientific organization. But ultimately, they follow the same simplistic, unscientific CO₂ narrative as every other Catastrophic Anthropogenic Global Warming (CAGW) alarmist group/individual (UN-IPCC, Al Gore, etc.). Rather than focusing on their narrative and talking points, you should ask the question, “What are they not telling us”? The following document goes through this WMO news release, asks that question, and lays out the ignored data. The first unscientific tactic applies to the entire document. The discussion focuses almost entirely on the satellite period (1978 to the present) with an extension all the way back to 1850 where surface temperatures are discussed. For those that are unaware, climate change began long before 1978 or 1850. Ignoring that pre-1850 data is highly unscientific and hides the many much more important natural forcings (solar (directly and indirectly)) that have been driving the climate in the past (with minimal to no CO₂ contribution), through the 1850 to the present period and into

the future. Ignoring empirical data in the 1850 to the present period, is also in play. The most egregious omission is temperature data collected by satellites and radiosonde equipment. You might ask why this data (by far more accurate than the manipulated (i.e.: over-homogenized)) surface data estimates) is ignored? The answer is quite simple, this data does not fit the CAGW narrative. The observed satellite temperature data is plotted against the IPCC’s projected temperatures (for both the CMIP5 and newer CMIP6 protocols) in the two plots to the left. More detail is available in my [CSS-6 – John Christy – January 2021](#) post. The back-up for these statements is embedded in the document.

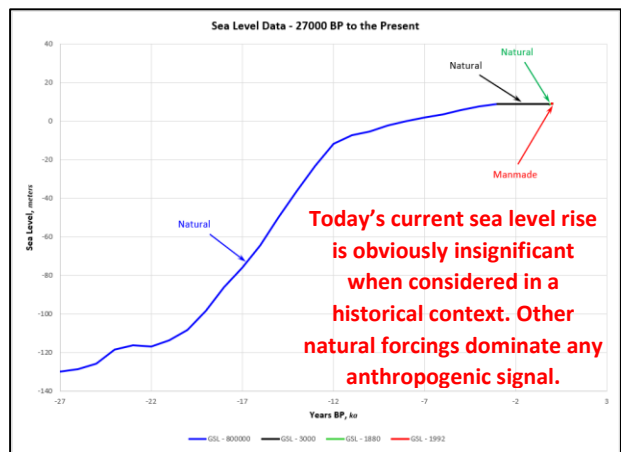
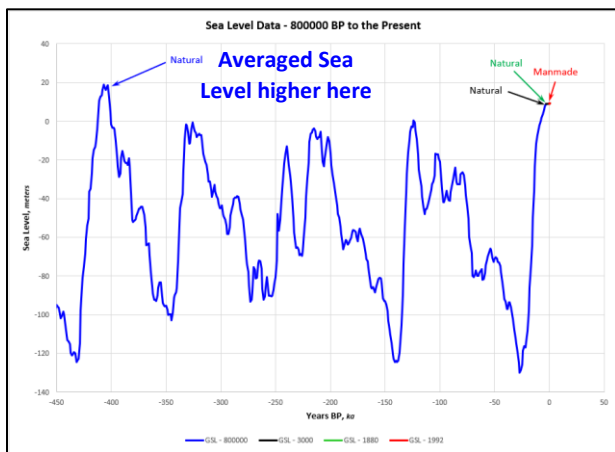
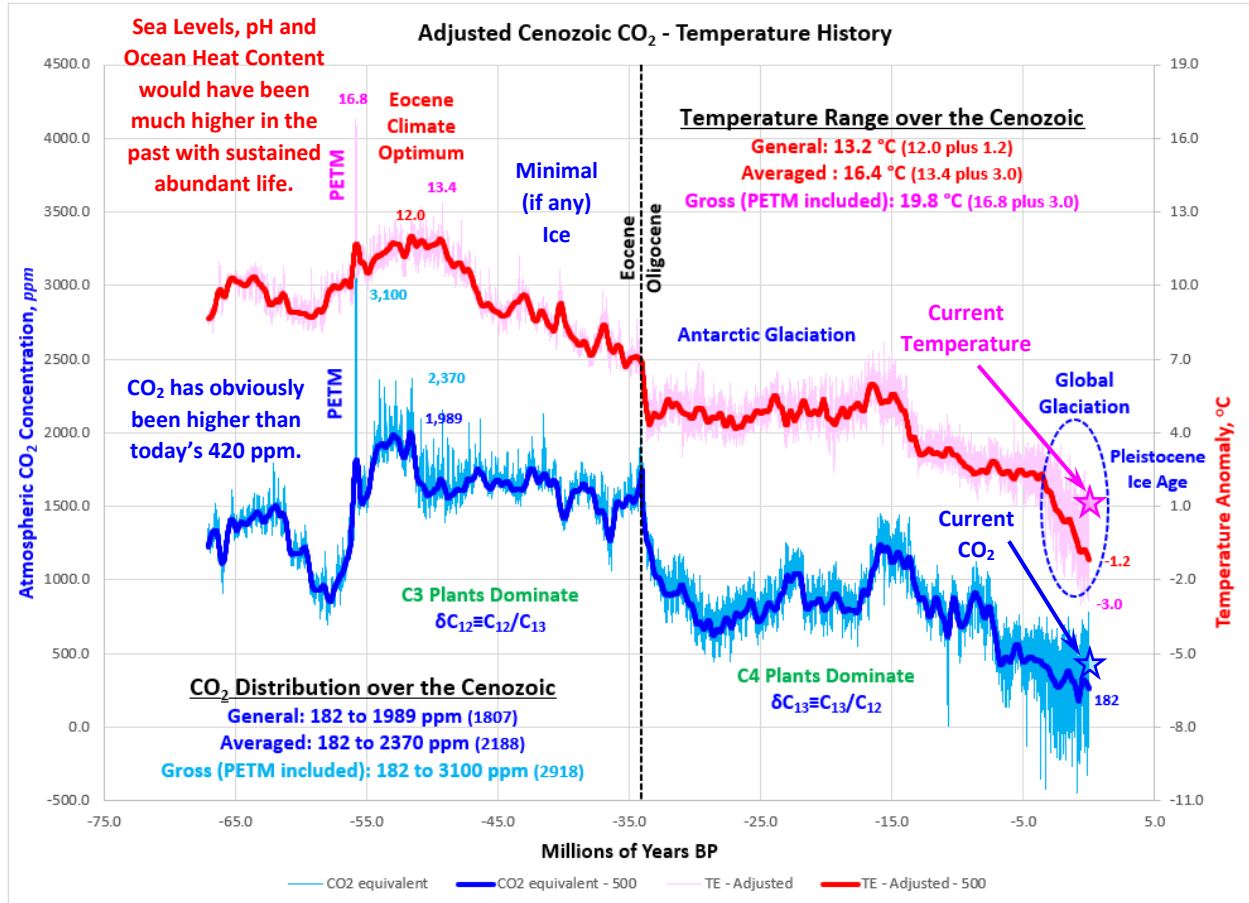


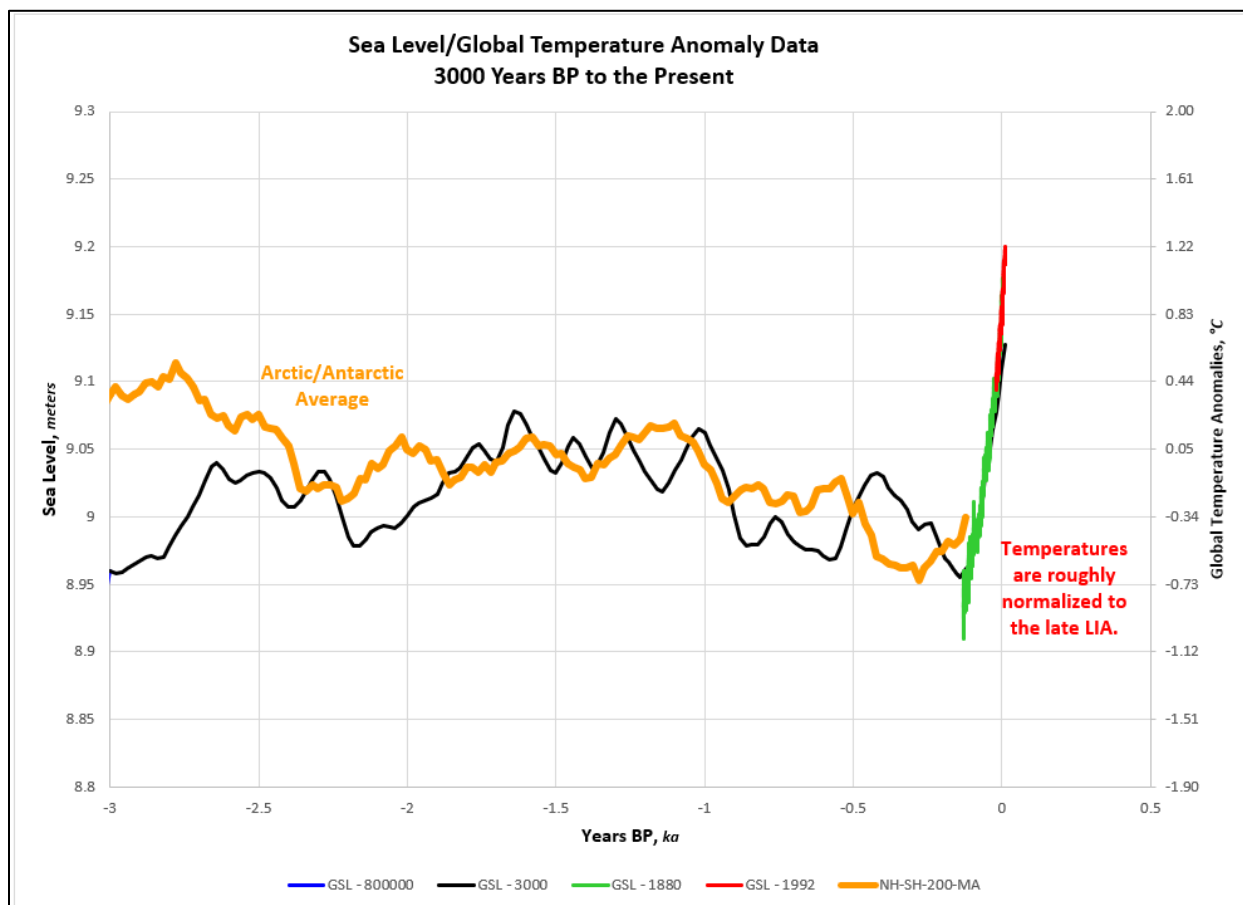
Note: The original document is displayed in italics and a smaller font.

Geneva, 18 May 2022 (WMO) - Four key climate change indicators – greenhouse gas concentrations, sea level rise, ocean heat and ocean acidification – set new records in 2021. This is yet another clear sign that human activities are causing

planetary scale changes on land, in the ocean, and in the atmosphere, with harmful and long-lasting ramifications for sustainable development and ecosystems, according to the World Meteorological Organization (WMO).

What are they not telling us in this opening statement? To start with, their four key climate change indicators did not set new records in 2021 if you do not clarify the time period. The attached Cenozoic CO₂/Temperature data would indicate that all four “key climate change indicators” have been much higher during times when life was more abundant than during our brief lifetimes. CO₂ and Sea Level shown below.





This is not “another clear sign that human activities are causing planetary scale changes...”. While all those key indicators have changed, there is no indication that the changes are primarily anthropogenic in nature. To refute that statement, an empirical CO₂/Temperature data set must be put forward that shows CO₂ driving the climate on any statistically significant historical time scale. That data set (a Scientific Method requirement) does not exist. The statement that human activity will have “harmful and long-lasting ramifications for sustainable development and ecosystems,” is speculation at best and is based on IPCC computer models that by the modeller’s own admission, run way too hot. The IPCC has also stated that the RCP8.5 emission scenario used by the CAGW community as the business-as-usual case, is highly implausible. Back-up links are available in my [OPS-55 – The State of Climate Science](#) post. A variety of reasons can be put forward to explain the model shortcomings (overzealous CO₂ sensitivity and ignored (or downplayed) solar forcings (i.e.: cosmic ray flux influence on cloud albedo, etc.)). But that would not fit the narrative.

Extreme weather – the day-to-day “face” of climate change – led to hundreds of billions of dollars in economic losses and wreaked a heavy toll on human lives and well-being and triggered shocks for food and water security and displacement that have accentuated in 2022.

Extreme weather is not a new phenomenon. And the WMO is again showing their lack of scientific integrity by referring to extreme weather as “the day-to-day face of climate change”. Climate change occurs over centuries, millennia or longer periods. What are they not telling us? For one, the WMO does not point out that the IPCC downplays links between extreme weather and anthropogenic forcings. They also do not point out the many strong and more frequent periods of historical extreme weather. And they lack context by saying that current extreme events have “led to hundreds of billions of dollars in economic losses and

wreaked a heavy toll on human lives”. The high economic losses are not surprising since we have developed a lot more and a lot more expensive infrastructure in the path of hurricanes, tornados, floods, etc. The loss of life is indeed a heavy toll but the number of people that die due to climate change has dropped by well over 90% in the last century.

The WMO State of the Global Climate in 2021 report confirmed that the past seven years have been the warmest seven years on record. 2021 was “only” one of the seven warmest because of a La Niña event at the start and end of the year. This had a temporary cooling effect but did not reverse the overall trend of rising temperatures. The average global temperature in 2021 was about 1.11 (± 0.13) °C above the pre-industrial level.

The temperature rise is not unreasonable but is one of many estimates. What are they not telling us?

- These temperatures are homogenized (i.e.: subjected to significant manipulation without divulging the algorithms behind the homogenization).
- The temperature rise is not solely the function of anthropogenic CO₂, since 86%+ of human emissions occurred prior to 1950 and roughly half of the temperature rise occurred pre-1950. Solar Activity Momentum (the Total Solar Irradiance, (TSI) 20 Year Moving Average) peaked around 1950, flattening out until around 2005 with a shallow decline since. Ocean cycles have played a significant role in the temperature post-1950 (dropping global temperatures between 1945 and 1975 (the Ice Age Is Coming Scare) and contributing significantly to the warming trend from 1975 to 2005. The 1996 to 2014 temperature “PAUSE” is likely due to the minor TSI decline that easily overwhelmed the minor warming provided by CO₂. More detail in my [CSS-7 – CO₂ – The FECKLESS GreenHouse Gas](#), [CSS-13 – A Look At Homogenization](#), [CSS-19 – Calgary – Homogenization](#), [OPS-56 – The PAUSE](#) and [OPS-58 – US Temperatures – Tony Heller](#) posts.

There is no attempt at science in the next few paragraphs (although they definitely do their best at fear mongering and sticking with the narrative), so I mostly will skip over them to the Key Messages section. They mention the “*drought emergency unfolding in the Horn of Africa, the recent deadly flooding in South Africa and the extreme heat in India and Pakistan*”. All of which are recent/extreme events, but they are not unprecedented nor unusual and do not represent a global position.

What are they not telling us?

Plenty but I will just mention their deliberately scary and misleading fossil fuel subsidy comment (\$11 million per minute). Notwithstanding their definition of subsidy, they should provide the reader with a full explanation of renewable subsidies and then compare them to their so-called fossil fuel subsidy on a per unit of energy produced basis.

Criticizing “the dismal litany of humanity’s failure to tackle climate disruption,” United Nations Secretary-General António Guterres used the publication of the WMO flagship report to call for urgent action to grab the “low-hanging fruit” of transforming energy systems away from the “dead end” of fossil fuels to renewable energy.

In a video message, Mr Guterres proposed five critical actions to jump-start the renewable energy transition. They include greater access to renewable energy technology and supplies, a tripling of private and public investments in renewables and an end to subsidies on fossil fuels which amount to roughly \$11 million per minute.

“Renewables are the only path to real energy security, stable power prices and sustainable employment opportunities. If we act together, the renewable energy transformation can be the peace project of the 21st century,” said Mr Guterres.

The world must act in this decade to prevent ever worsening climate impacts and to keep temperature increase to below 1.5°C above pre-industrial levels, he said.

“It is just a matter of time before we see another warmest year on record,” said WMO Secretary-General Prof. Petteri Taalas. “Our climate is changing before our eyes. The heat trapped by human-induced greenhouse gases will warm the planet for many generations to come. Sea level rise, ocean heat and acidification will continue for hundreds of years unless means to remove carbon from the atmosphere are invented. Some glaciers have reached the point of no return and this will have long-term repercussions in a world in which more than 2 billion people already experience water stress.”

“Extreme weather has the most immediate impact on our daily lives. Years of investment in disaster preparedness means that we are better at saving lives, though economic losses are soaring. But much more needs to be done, as we are seeing with the drought emergency unfolding in the Horn of Africa, the recent deadly flooding in South Africa and the extreme heat in India and Pakistan. Early Warning Systems are critically required for climate adaptation, and yet these are only available in less than half of WMO’s Members. We are committed to making early warnings reach everyone in the next five years, as requested by the United Nations Secretary-General Antonio Guterres,” said Prof. Taalas.

The WMO State of the Global Climate report complements the IPCC Sixth Assessment report, which includes data up to 2019. The new WMO report is accompanied by a story map and provides information and practical examples for policy-makers on how the climate change indicators outlined in the IPCC reports played out during the recent years globally and how the associated implications on extremes have been felt at national and regional level in 2021.

The WMO State of the Global Climate report, which will be used as an official document for the UN Climate Change negotiations known as COP27 to take place in Egypt later this year.

Dozens of experts contribute to the report from Member-States including National Meteorological and Hydrological Services (NMHSs) and Global Data and Analysis Centers, as well as Regional Climate Centres, the World Climate Research Programme (WCRP), the Global Atmosphere Watch (GAW), the Global Cryosphere Watch and the EU’s Copernicus Climate Change services.

United Nations partners include the Food and Agriculture Organization of the United Nations (FAO), Intergovernmental Oceanographic Commission of UNESCO (UNESCO-IOC), International Organization for Migration (IOM), the United Nations Environment Programme (UNEP), UN High Commissioner for Refugees (UNHCR), the UN Office for Disaster Risk Reduction (UNDRR) and the World Food Programme (WFP)

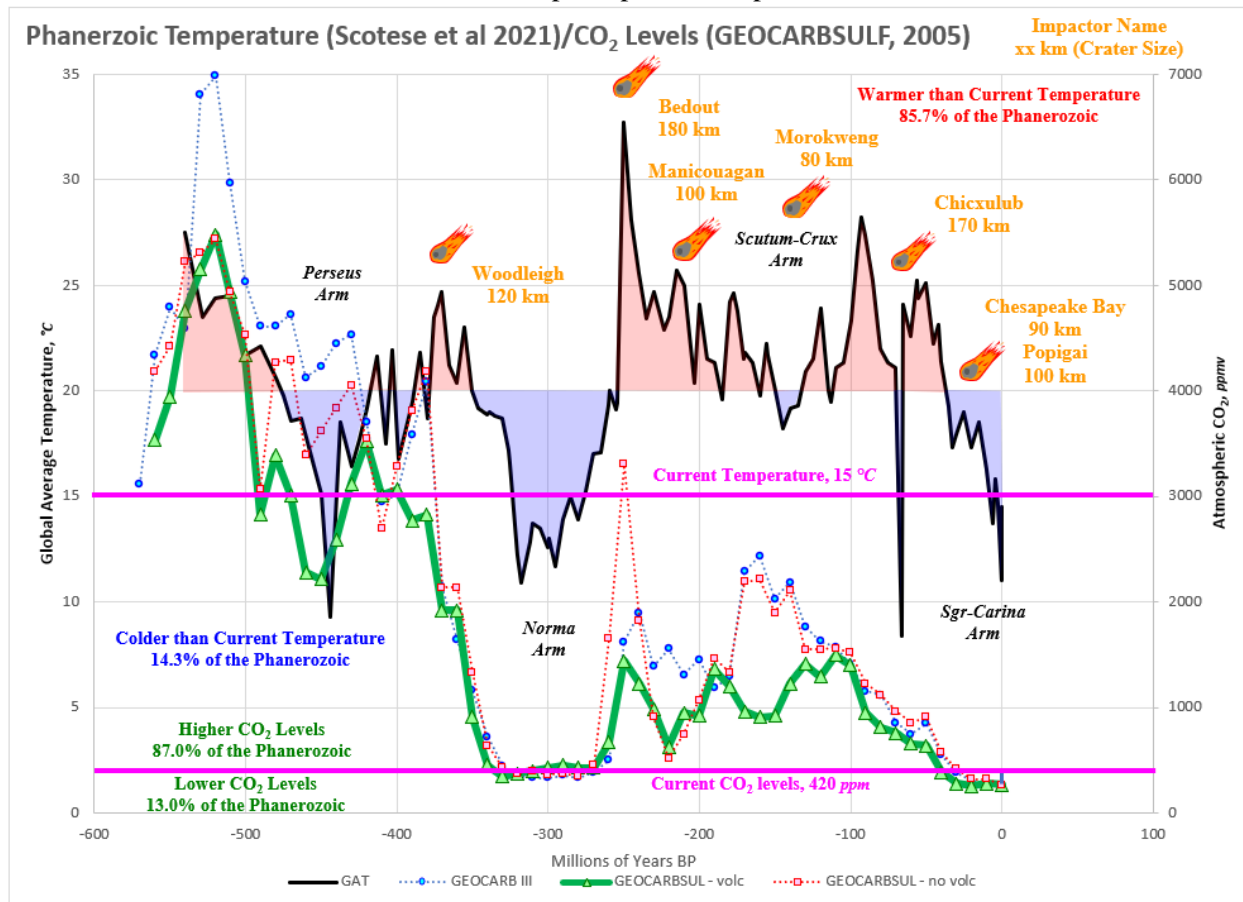
Global annual mean temperature difference from pre-industrial conditions (1850–1900) for six global temperature data sets (1850–2021). For details of the data sets and processing see Data sets and methods. Source: Met Office, United Kingdom of Great Britain and Northern Ireland

Key Messages

Greenhouse gas concentrations reached a new global high in 2020, when the concentration of carbon dioxide (CO₂) reached 413.2 parts per million (ppm) globally, or 149% of the pre-industrial level. Data from specific locations indicate that they continued to increase in 2021 and early 2022, with monthly average CO₂ at Mona Loa in Hawaii reaching 416.45 ppm in April 2020, 419.05 ppm in April 2021, and 420.23 ppm in April 2022.

What are they not telling us? A lot and I (and you the reader) do not have time to go into the full discussion.

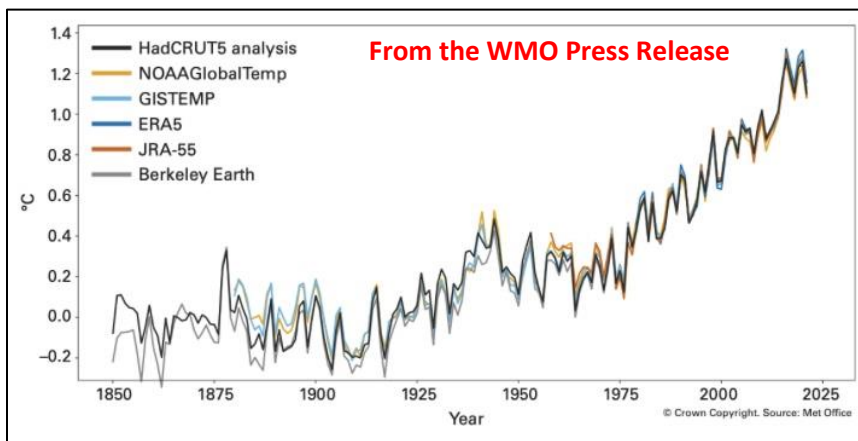
- The most important point that you need to consider is that there is no empirical CO₂/Temperature data set that shows CO₂ driving the climate on any statistically significant historical time scale. Period. Without empirical data, the CAGW narrative is just that a narrative with no scientific proof to move it from a belief to a scientific principle. Read up on the Scientific Method.



- Then you can look back at the Cenozoic plot (Page 3) and the Phanerozoic plot above to see that life has flourished (in greater quantities) at much higher temperatures and CO₂ concentrations. Life on this planet has never been threatened by CO₂ levels at or above the April 2022 420.23 ppm “record” ([OPS-41 – CO₂, Life and Temperature Fluctuations Over the Last 600 Million Years](#)).

Life on this planet has survived (and flourished) with CO₂ greater than today (most of which was much greater), 87% of the time. Barring celestial disasters and full-on Ice Ages, the only thing that will threaten humanity is our stupid, idiotological politicians, the elite that control them and the people that blindly follow their dangerous, totalitarian policy dictates.

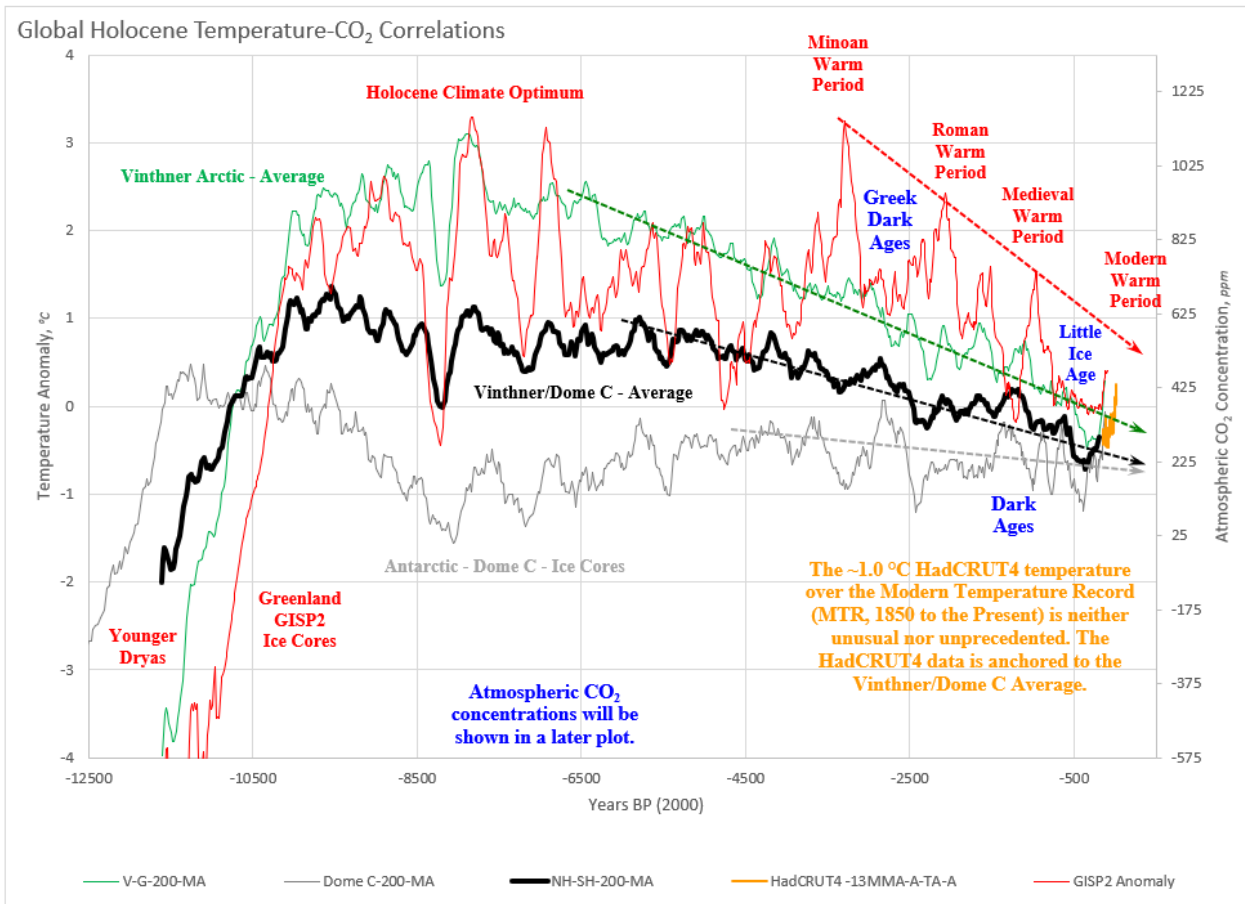
- Low CO₂ levels are the only threat to humanity and the planet ([OPS-35 – CO₂ Will Kill the Planet](#)). Plant life and (therefore all life) on this planet dies when we reach 150 ppm. Without our current intervention, life on this planet would have ceased to exist within a few million years. Every deep ice age has a lower CO₂ level with the last one coming in at just 182.2 ppm (near starvation levels). At the April 2022 420.23 ppm, the planet is still living through a CO₂ famine. If you think we are experiencing food shortages and supply chain problems now, wait until “they” lower the CO₂ levels back to the pre-industrial levels (around 275 ppm). There will be mass starvation on top of the mass starvation that is already being forecasted.



The global annual mean temperature in 2021 was around 1.11 ± 0.13 °C above the 1850-1900 pre-industrial average, less warm than some recent years owing to cooling La Niña conditions at the start and end of the year. The most recent seven years, 2015 to 2021, are the seven warmest years on record.

What are they not telling us?

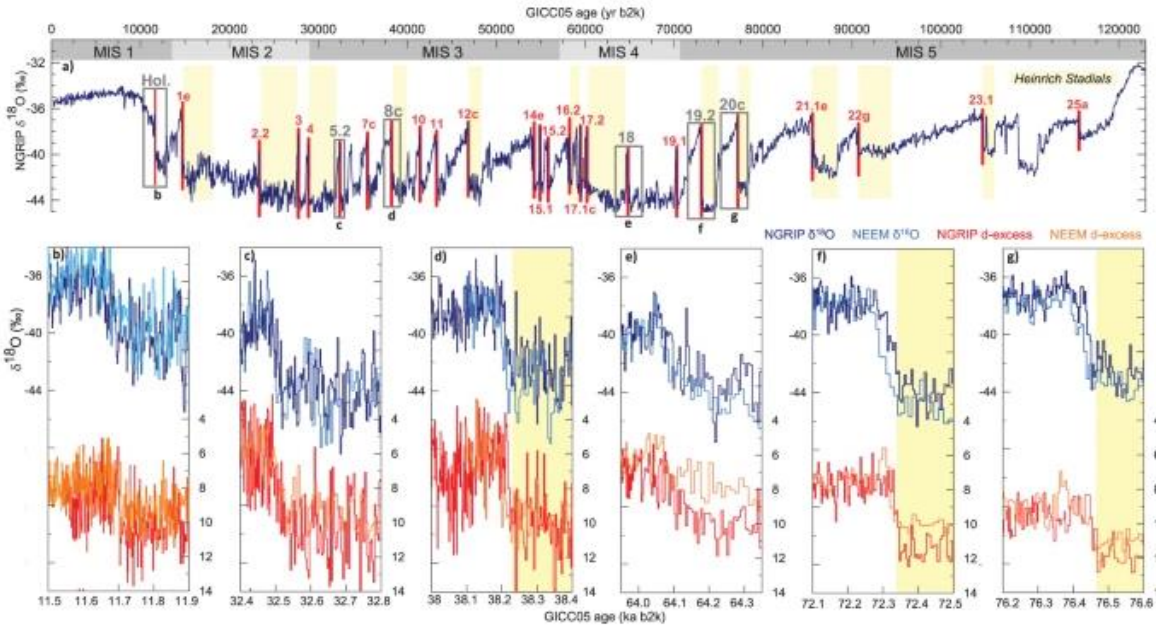
- As with the CO₂ levels, Global temperatures have been much higher throughout abundant life’s existence on this planet. The Phanerozoic plot on the previous page shows that temperatures were higher (85.7%. and most of the time, much higher) than today’s moderate 15 °C. Again, life has survived and flourished at much higher temperatures. We can easily survive a few more degrees. We will have more trouble surviving a drop of a degree or two as we move further into the Grand Solar Minimum.
- The 2021 1.11 ± 0.13 °C temperature rise from the 1850-1900 pre-industrial era (out of the Little Ice Age (LIA)), has been homogenized (i.e.: manipulated) significantly and lacks so much context (which I am sure the fact checkers will point out). That temperature rise would not have been possible without the natural forcings that had dropped the planet down to those cold LIA Temperatures. Those natural forcings were active prior to the pre-industrial era, have continued to be active and will be active in the future (except in the virtual reality world created by computer models). The LIA Temperature rise is shown (on the following page), relative to the Holocene temperature fluctuations and the corresponding CO₂ levels. CO₂ is plotted on a vertical scale that reflects the CAGW narrative (i.e.: 140 ppm rise is equivalent to a 1.07 °C rise (the IPCC’s official temperature increase from the last years’ AR6 report)).
- As shown the 1.11 °C rise is neither unusual nor unprecedented (based on a variety of temperature records). And roughly half of that temperature rise occurred prior to 1950. Most of which would have been natural (i.e.: minimal human influence) since 86%+ of human emissions occurred post-



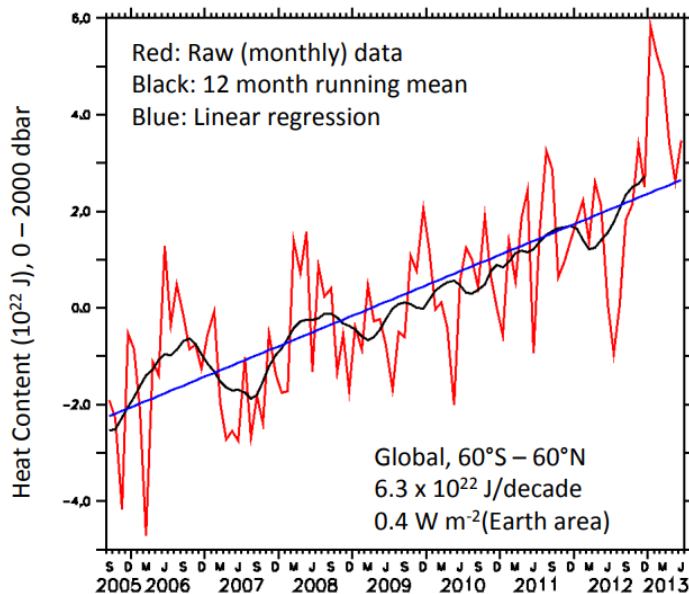
1950. They might also have supplied us with the magnitude of the homogenization built into the various “official” temperature profiles. Tony Heller (realclimatescience.com) has done extensive work on the USA data and has shown that the homogenization (through increasing recent measured temperatures and decreasing older measured temperatures) is well over the 1.0 °C level. I have also looked at homogenization in a couple of posts ([CSS-13 – A Look at Homogenization](#) and [CSS-19 – Calgary – Homogenization](#)). Calgary, while localized and anecdotal is not untypical around the world. A new weather station was set up in 1973 (at the Calgary International Airport). Measured temperatures since then have dropped at a rate of 1.76 °C/century (courtesy NASA-GISS). Through the magic of homogenization, the “official” record is increasing at a rate of 1.35 °C. That is 3.11 °C/century of homogenization. With enough homogenization we will definitely burn down the planet!

- And just to finish off that scary 1.11 °C temperature rise discussion, they might have provided some information on the Dansgaard-Oeschger (D-O) events, summarized on the next page. The Figure was pulled from [Capron et al's \(April 2021\)](#) paper. What are the main takeaways from this paper? Again, the MTR warming is neither unusual nor unprecedented (in fact, a 1.11 °C warming is totally inconsequential and well within the “unforced or noise-induced oscillations of the coupled atmosphere-ice-ocean system”). Even the D-O event’s 5-16 °C temperature increases can be random events. One more example of how useless the IPCC computer projections are.
- “The most recent seven years, 2015 to 2021, are the seven warmest years on record.” That statement relies on the homogenization process and strong El Niños in 2015/16 and 2020. Measured temperatures were significantly higher in the 1930s (and still are, despite being homogenized out of the “official” record).

Fig. 1: Abrupt climate variability recorded in Greenland water isotopic records.



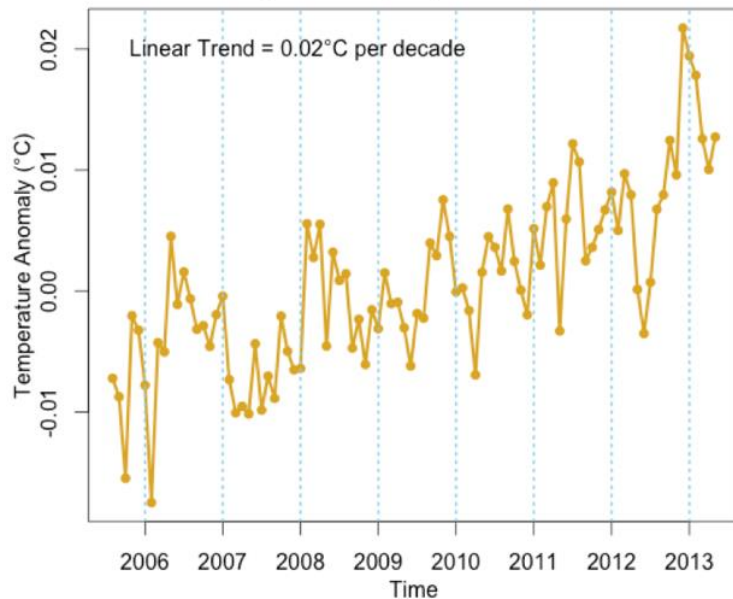
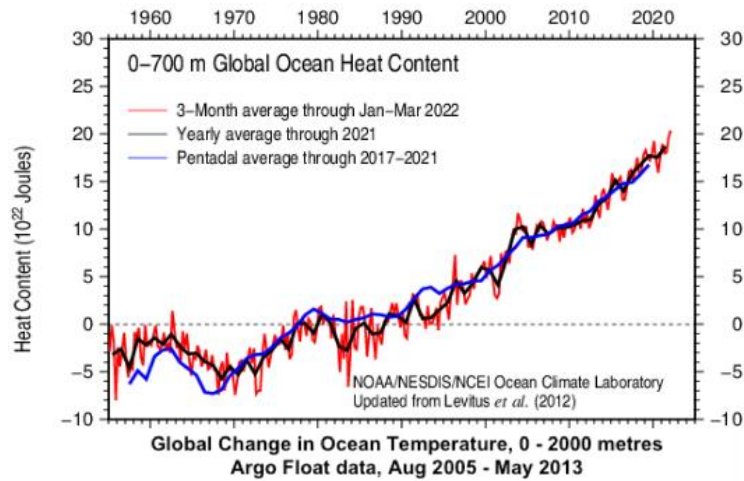
a NGRIP $\delta^{18}\text{O}$ record⁵. Studied abrupt warming transitions are highlighted with red vertical bars and Greenland Interstadials (GI) are numbered³⁸. Gray boxes indicate intervals shown in (b–g), illustrating the variety of abrupt GS–GI transitions across the Last Glacial; stadials containing Heinrich events are indicated in yellow following refs. ^{53,85}, and Marine Isotope Stages (MIS) are indicated in gray. b–g High-resolution $\delta^{18}\text{O}$ from NGRIP (dark blue) and NEEM (light blue) and d-excess from NGRIP (red) and NEEM (orange) over 400 yr time intervals centered on the Holocene abrupt onset (b) and the abrupt transitions into GI-5.2 (c), GI-8c (d), GI-18 (e), GI-19.2 (f), and GI-20c (g).



Ocean heat was record high. The upper 2000m depth of the ocean continued to warm in 2021 and it is expected that it will continue to warm in the future – a change which is irreversible on centennial to millennial time scales. All data sets agree that ocean warming rates show a particularly strong increase in the past two decades. The warmth is penetrating to ever deeper levels. Much of the ocean experienced at least one ‘strong’ marine heatwave at some point in 2021.

What are they not telling us? There is a lot they cannot tell us because we did not have much widespread measured deep ocean data until the ARGO system was set up in 2005.

- The 2005 – 2013 data is shown to the left (source: [Dean Roemmich, Scripps Institution of Oceanography](#) (October 2013, CERES Meeting). I have also included a longer more up-to-date data set from [NOAA/NCEI](#) (shown to the left). The third chart (below, to the left) is the ARGO data (10^{22} Joules) converted to more recognizable units ($^{\circ}\text{C}$) (since very few people can visualize 10^{22} joules). That chart was pulled from [Willis Eschenbach's work](#). There is no question that Ocean Heat Content has been rising, but at a $0.02^{\circ}\text{C}/\text{century}$ rate (not a very scary number).



They correctly reference the centennial to millennial time scales that are common in ocean cycles. But they do not bother pointing out that the current climate responses could be related to events that happened hundreds or thousands of years ago as well. A portion of the current CO_2 rise could be a natural response from warming that began in the depths of the LIA (the Wolf, Spörer or Maunder Minimums, the lowest Total Solar Irradiance (TSI) in the last 7,000 years). The early warming (1600s to 1950) was definitely natural (since 86%+ of human emissions were pre-1950) and coincided with a general rise in TSI (and a minor rise in CO_2).

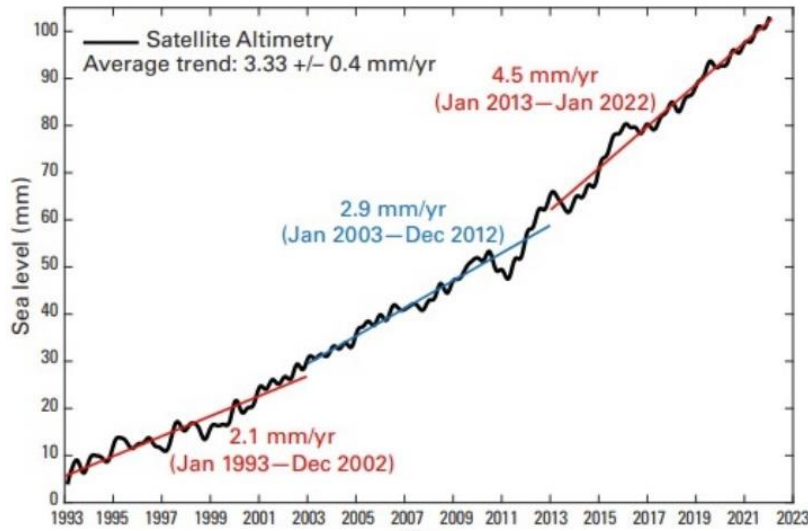
➤ They correctly reference the centennial to millennial time scales that are common in ocean cycles. But they do not bother pointing out that the current climate responses could be related to events that happened hundreds or thousands of years ago as well. A portion of the current CO_2 rise could be a natural response from warming that began in the depths of the LIA (the Wolf, Spörer or Maunder Minimums, the lowest Total Solar Irradiance (TSI) in the last 7,000 years). The early warming (1600s to 1950) was definitely natural (since 86%+ of human emissions were pre-1950) and coincided with a general rise in TSI (and a minor rise in CO_2).

The ocean is a vast, complex system on its own. Combine that with the complexity of the solar environment, atmosphere (or even clouds on their own), etc. Now roll in the interactions. Climate science is nowhere near settled. All the computer models in the world will never change that, since in the IPCC's own words, "The climate system is a coupled non-linear chaotic system, and therefore the long-term prediction of future climate states is not possible". The basic computer law, Garbage In, Garbage Out (GIGO), is also in play. The models can only output what they are programmed to. And as mentioned earlier, the models have been programmed (self-admittedly) to run too hot (GIGO).

Ocean acidification. The ocean absorbs around 23% of the annual emissions of anthropogenic CO_2 to the atmosphere. This reacts with seawater and leads to ocean acidification, which threatens organisms and ecosystem services, and hence food security, tourism and coastal protection. As the pH of the ocean decreases, its capacity to absorb CO_2 from the atmosphere also declines. The IPCC concluded that "there is very high confidence that open ocean surface pH is now the lowest it has been for at least 26,000 years and current rates of pH change are unprecedented since at least that time."

What are they not telling us?

- To start with they use the term acidification rather than acknowledging that the oceans are basic and have become slightly less basic. Acidification just sounds scarier.
- Refer to the earlier Cenozoic and Phanerozoic plots. The oceans were not acidic at those much higher atmospheric CO₂ concentrations. Crustaceans, mollusks, etc. had no problems developing and surviving in those early conditions. Burning all the fossil fuels on the planet (which will not happen) could only raise CO₂ levels to the 1600 ppm range (not at all dangerous to life).
- There are many locations on the planet that have much lower basic characteristics than the global average. Crustaceans, mollusks, etc. survive well in those conditions.

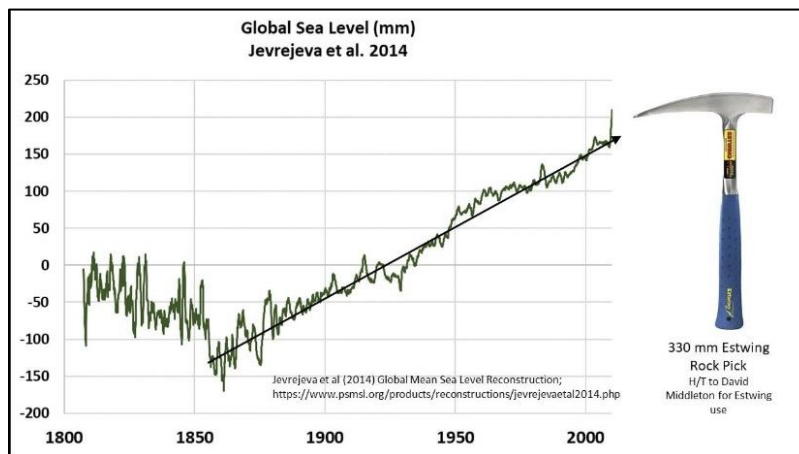


Global mean sea level reached a new record high in 2021, after increasing at an average 4.5 mm per year over the period 2013 -2021. This is more than double the rate of between 1993 and 2002 and is mainly due to the accelerated loss of ice mass from the ice sheets. This has major implications for hundreds of millions of coastal dwellers and increases vulnerability to tropical cyclones.

What are they not telling us?

➤ They focus solely on the plot to the left, which ignores data prior to 1993. Sea Levels have been changing for much longer than 30-year period shown here with extremely complex reasons for those changes. My CSS-18 – Sea Level post looks at sea level with much more context.

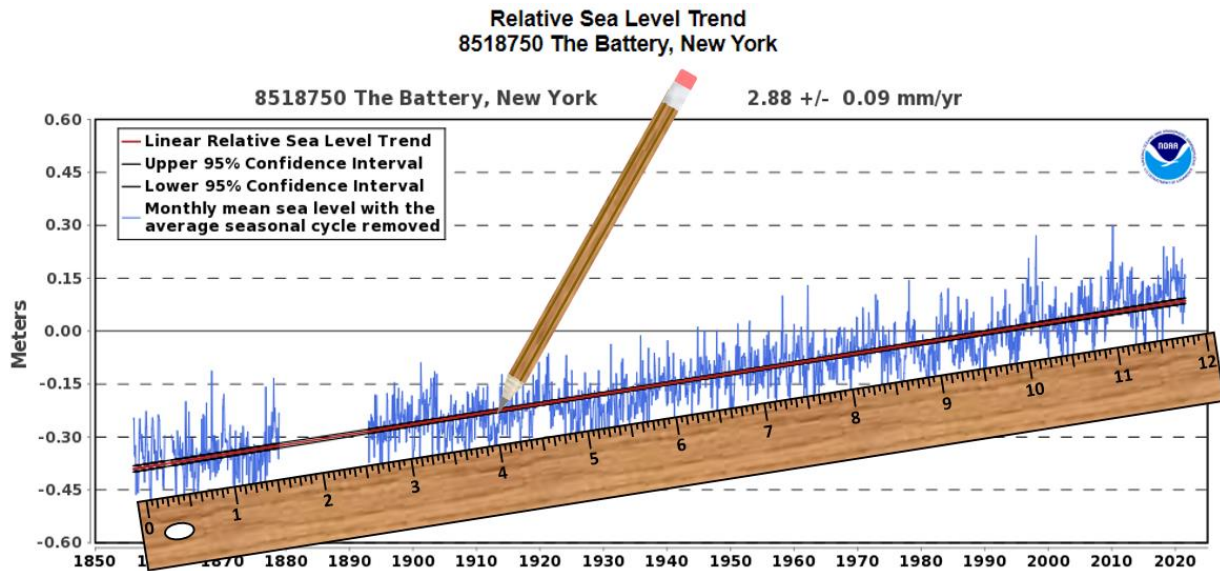
- The data shown is based on Satellite Altimetry. A new, complex, and evolving technology that has some potential accuracy issues. For instance, the upward curvature shown in this plot, does not show up in the tide gauge data from around the world. The New York Battery plot is included on the following page (as an example).



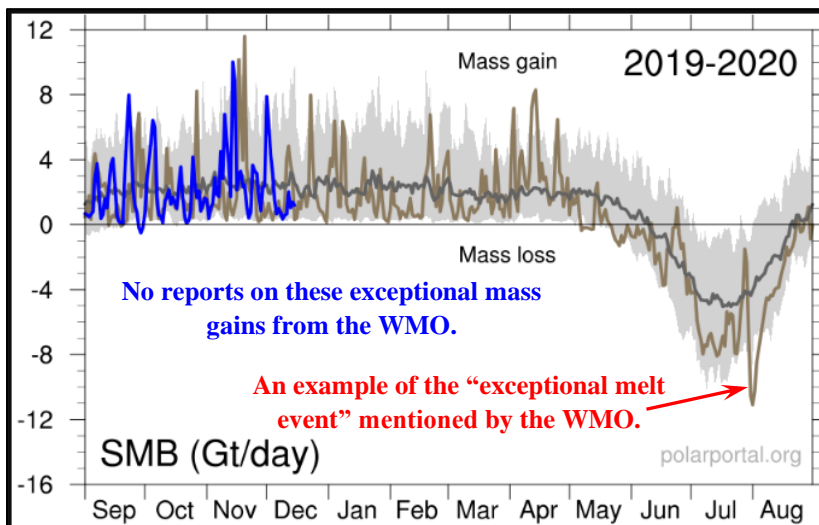
- The curve to the left shows a little more history. Sea Levels have been rising steadily since the late 1850s. That corresponds to the temperature rise out of the LIA. But that initial rise (pre-1950) would have little to do with human emissions. The sea level decline prior to 1850 has virtually nothing to do with CO₂. Glaciers around the world have advanced and receded many times over the Holocene Interglacial warm period that we

are living through.

- As a continuation of the previous point, they also do not mention the forests and human settlements that are being exposed as the glaciers recede. There are many historical references to villages being abandoned due to advancing glaciers through the LIA.
- There has been an accelerated loss of ice mass in Greenland (but again their statement lacks context). At the accelerated rate, Greenland would still have 28.4 of the 28.5 million km³ of its current ice mass. Greenland is not melting away anytime soon. The situation is similar in Antarctic (but even less scary). Temperatures have been declining in Antarctica for the last 40 years, culminating in the COLDEST 6 MONTH PERIOD EVER!!! (using CAGW alarmist terminology). The data, discussion and associated links are included in my [CSS-11 – Snow and Ice – July 2021 Update](#) and [CSS-13 – A Look at Homogenization](#) posts. Antarctica is also not melting away anytime soon.



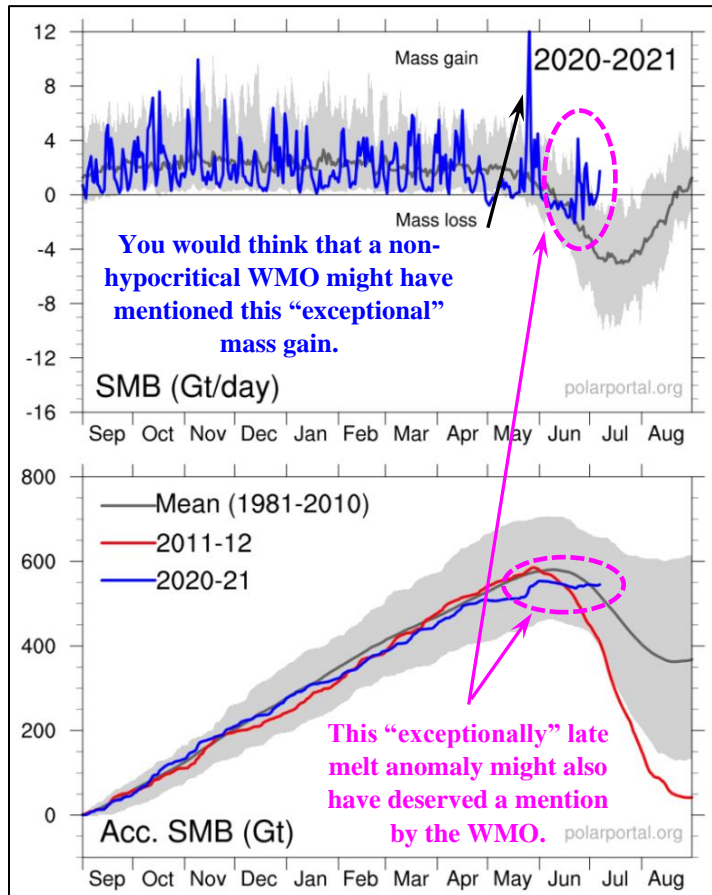
Cryosphere: Although the glaciological year 2020-2021 saw less melting than in recent years, there is a clear trend



towards an acceleration of mass loss on multi-decadal timescales. On average, the world’s reference glaciers have thinned by 33.5 meters (ice-equivalent) since 1950, with 76% of this thinning since 1980. 2021 was a particularly punishing year for glaciers in Canada and the US Northwest with record ice mass loss as a result of heatwaves and fires in June and July. Greenland experienced an exceptional mid-August melt event and the first-ever recorded rainfall at Summit Station, the highest point on the ice sheet at an altitude of 3 216 m.

What are they not telling us?

- They are not providing any information prior to 1950. But Greenland has been warmer, with thinner ice many times over the Holocene. The most notable would be during the Holocene Climate Optimum, the Minoan Warm Period, the Roman Warm Period, and the Medieval Warm Period (MWP, there is a reason the Vikings colonized Greenland during the MWP and then moved out when temperatures dropped into the LIA (which had virtually nothing to do with CO₂)). Look back to the Holocene Temperature/CO₂ plot for more info. Or review the many Holocene related posts stored on my website (which I will not list here for “brevity”).



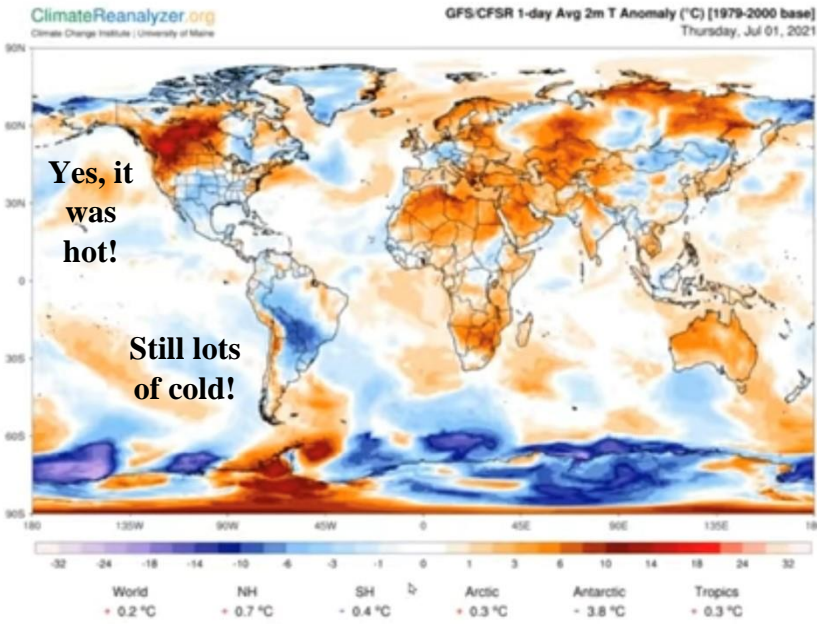
- They quickly report the first ever rainfall at Summit Station, but I don’t remember hearing the WMO or any other CAGW alarmist organization that pointed out the COLDEST EVER July Temperature (-33 °C) on July 4th, 2017, or the COLDEST EVER RECORDED Greenland Temperature (-66 °C) on January 2nd, 2020. Or the 2018 winter satellite measurements that showed temperatures near -144 °F (-97.8 °C, reported on by Forbes and National Geographic). There is also that little Antarctic cold issue I mentioned earlier where temperatures have been declining for 40 years and ending in the coldest 6-month period ever ([CSS-13](#)).

- With respect to rain at Summit Station, they are leaving out rain episodes (1933 and 1950) near the Summit (Central Station and a high-altitude area to the northwest (as catalogued by [Tony Heller](#))) and the many periods of higher temperatures mentioned earlier. Perhaps they had a little bit of rain back in the Cenozoic’s Eocene Climate Optimum (or the majority of the

Phanerozoic that was ice free). But to get closer to today, you can review the A.J. Christ, et al’s 2021 paper “[A multimillion-year-old record of Greenland vegetation and glacial history preserved in sediment beneath 1.4 km of ice at Camp Century](#)” where they “conclude that the GrIS (Greenland Ice Sheet) persisted through much of the Pleistocene but melted and reformed at least once since 1.1 Ma”. Pretty sure that vegetation required some rain and needed some ice-free areas to grow.

- They also like to point out, for example “exceptional mid-August melt events”, but are silent on the many exceptional SMB increases that occur throughout much of the year. The SMB mass gain has outperformed the SMB mass loss every year since the 1981 (even the very warm Arctic summer of 2012, led to a 40 Gigatons mass gain to Greenland’s SMB). Note SMB does not include calving glaciers. The SMB just shows the ice melt each year and the snow adds. Additional information on Greenland can be found in my [OPS-25 – Greenland Surface Mass Balance \(SMB\)](#) and [CSS-11](#).
- Their discussions also ignore the very real temperature drops that will accompany our descent into the Grand Solar Minimum (predicted by both NOAA and NASA (among others)). Refer to my

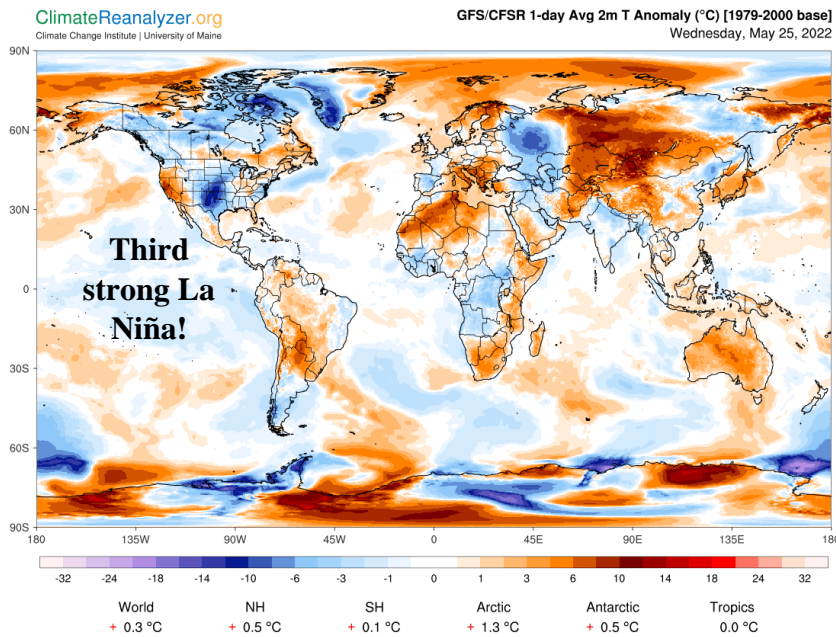
[OPS-52 – Solar Activity – NOAA Forecast](#) and [OPS-55 – The State of Climate Science](#) posts for more detail.



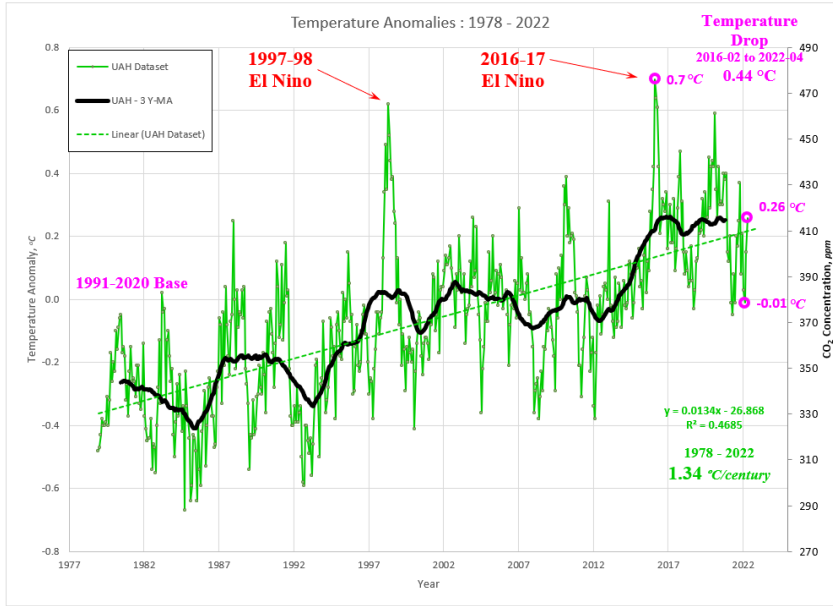
Exceptional heatwaves broke records across western North America and the Mediterranean. Death Valley, California reached 54.4 °C on 9 July, equalling a similar 2020 value as the highest recorded in the world since at least the 1930s, and Syracuse in Sicily reached 48.8 °C. The Canadian province of British Columbia, reached 49.6 °C on 29 June, and this contributed to more than 500 reported heat-related deaths and fuelled devastating wildfires which, in turn, worsened the impacts of flooding in November.

What are they not telling us?

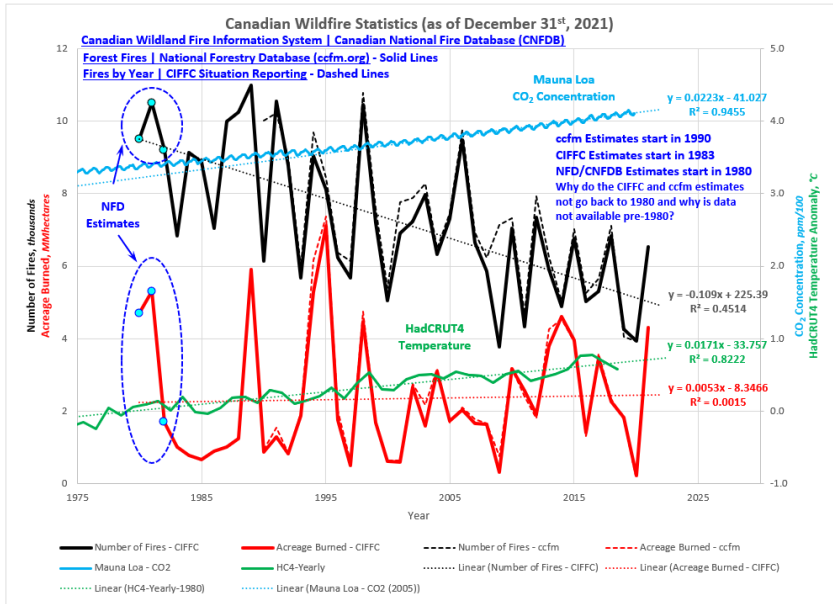
➤ They are not providing global context. The numbers they are reporting are real and I will give them credit for actually mentioning the 1930s (a slip up (?)). As an aside the 1930s have been homogenized out of existence. I would guess that does not sit well with the poor souls that lost their lives and/or suffered horribly during that devastating period. What caused those high temperatures and massive drought given that CO₂ was still pretty low? The July 1st, 2021 global temperature anomaly was only +0.2 °C above the 1979 - 2000 average temperature despite the very warm temperatures in the



Pacific Northwest. Just for interest, I included the recent University of Maine’s current Temperature Anomaly map (May 25th, 2022, above), which has warmed up by 0.1 °C to +0.3 °C above the 1979 – 2000 average. Not exactly burning up the planet lately and I am not liking the colder than normal Pacific Northwest “late spring” temperatures just yet. Not as bad as the cold, unnecessary disaster in Texas last February 2021.



➤ The low temperatures shown in the University of Maine's data is consistent with University of Alabama, Huntsville (UAH satellite temperatures, shown to the left). The Lower Tropospheric temperatures have declined significantly since the peak in February 2016. Inconveniently, not consistent with the CAGW narrative. The Global Temperature Anomaly peaked in February 2016 at +0.7 °C. Since then, the temperature anomaly had dropped to a low of -0.05 °C in April 2021, a second dip to -0.01 °C in February 2022 and a small increase to +0.26 °C in April 2022.

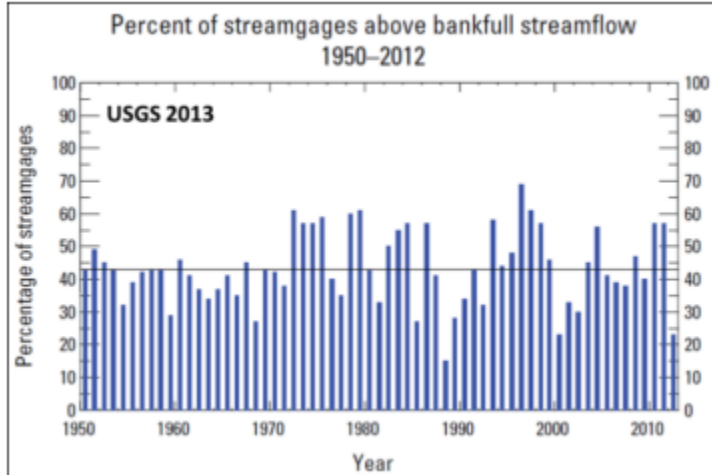


➤ The WMO tied BC's hot 2021 temperatures to heat-related deaths, wildfires and then flooding. However, that unusual heat is weather not climate. The Canadian Forest Fire data is shown in the Figure to the left. In the available data, the number of fires has been declining and the acreage burned is virtually flat. The 2021 season comes in as the 8th largest acreage burned (4.30 million hectares) since 1980. Significant but not trend setting

(and 42% below the 1995 peak burn acreage, 7.38 million hectares). The 2020 fire season was the lowest in the recorded data. I do not remember hearing that fact in the news. There is a lot more to the wildfire discussion. And for those that want more data/discussion, you can find some in my [CSS-17 – Forest Fires – March 2022](#). The BC flooding, while expensive and devastating was not unprecedented and not surprising, given the area is a flood plain and was still a lake in the early 20th century. Not shown here but acreage burnt around the world has been declining and with much higher burn acreage pre-1950.

Flooding induced economic losses of US\$17.7 billion in Henan province of China, and Western Europe experienced some of its most severe flooding on record in mid-July associated with economic losses in Germany exceeding US\$20 billion. There was heavy loss of life.

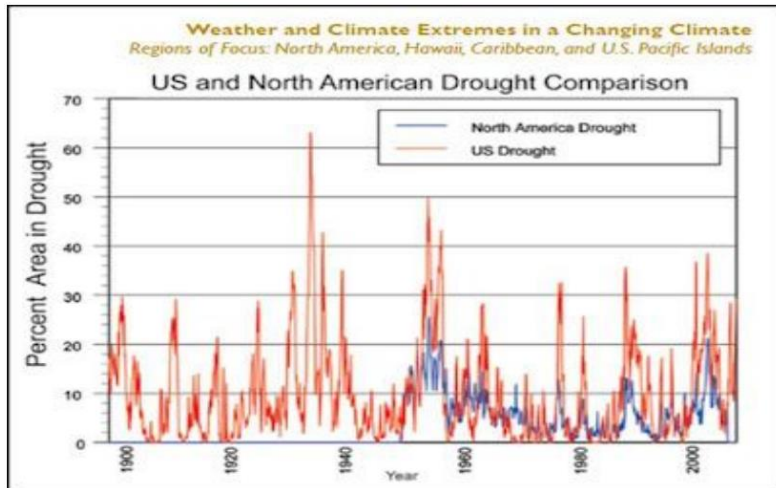
What are they not telling us?



➤ While these events are expensive and devastating, they are localized events that have happened before and at much lower CO₂ concentrations. They are not evidence of Climate Change. [Floods in 1974](#) killed an estimated 50,000 Chinese citizens. Was that evidence of “Climate Change”? Roger Pielke Jr. has been researching extreme weather (flood trends included) for years. I have attached a couple of images from his STATEMENT to the SUBCOMMITTEE ON ENVIRONMENT of the COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY of the UNITED

STATES HOUSE OF REPRESENTATIVES, [A FACTUAL LOOK AT THE RELATIONSHIP OF CLIMATE AND WEATHER](#), 11 December 2013. Updated information can be found on his website (rogerpielkejr.com).

Drought affected many parts of the world, including the Horn of Africa, Canada, the western United States, Iran, Afghanistan, Pakistan and Turkey. In sub-tropical South America, drought caused big agricultural losses and disrupted energy production and river transport. The drought in the Horn of Africa has intensified so far in 2022. Eastern Africa is facing the very real prospect that the rains will fail for a fourth consecutive season, placing Ethiopia, Kenya and Somalis into a drought of a length not experienced in the last 40 years. Humanitarian agencies are warning of devastating impacts on people and livelihoods in the region.

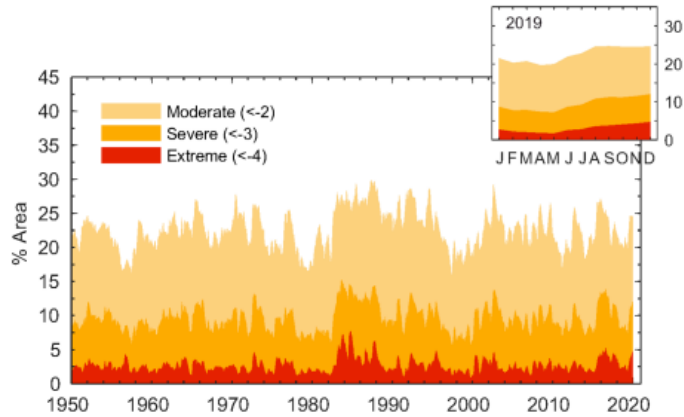


What are they not telling us?

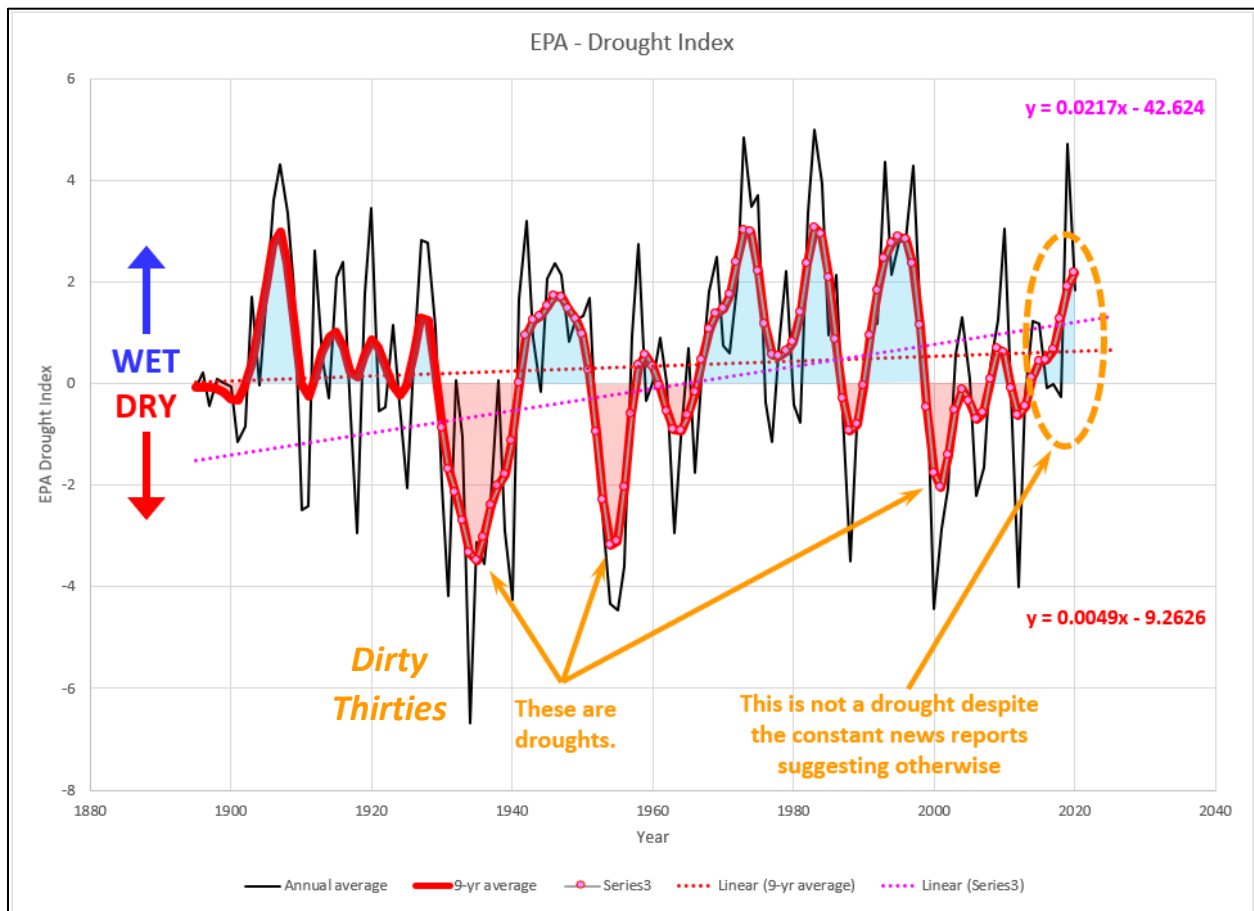
➤ Another example of no context and trying to tie current disasters to climate change. Climate Change happens over decades, centuries, and longer periods of time. Picking current events has virtually nothing to do with “Climate” unless you (in this case, the WMO) provide the long-term historical data. The WMO has provided no long-term data anywhere in this document. The US/North American data (to the left) comes from the Pielke Jr.’s Subcommittee

Statement. The Colorado River Basin plot comes from the McCabe et al 2020 paper, “[Basinwide Hydroclimatic Drought in the Colorado River Basin](#)”. The Global data comes from a [2021 study in the Bulletin of the American Meteorological Society](#) (BAMS). The last two plots are all shown on the following page.

¹⁷ Note: A 2005 peer-reviewed paper examined flood trends around the world and concluded: “observations to date provide no conclusive and general proof as to how climate change affects flood behaviour.” Source: Kundzewicz, Z.W., D. Graczyk, T. Maurer, I. Przymusińska, M. Radziejewski, C. Svensson and M. Szwed, 2005. Trend detection in river flow time-series: 1. annual maximum flow. *Hydrol. Sci. Journal*, **50**:797-810.



➤ The [EPA drought index](#) shows (below) that the US drought situation has improved since 1900 and significantly improved since those pesky, anti-narrative Dirty Thirties. The Palmer Drought Severity Index (PDSI) for April 2022 and April 1934 (the worst drought year available on the PDSI) shows (on the following page) that although there are drought conditions, we are still not comparable to the 1930s.



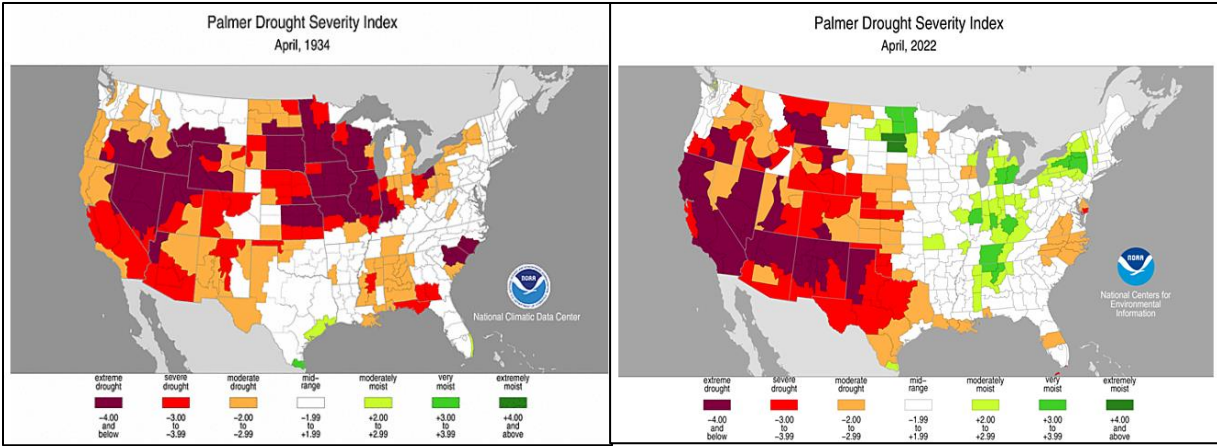
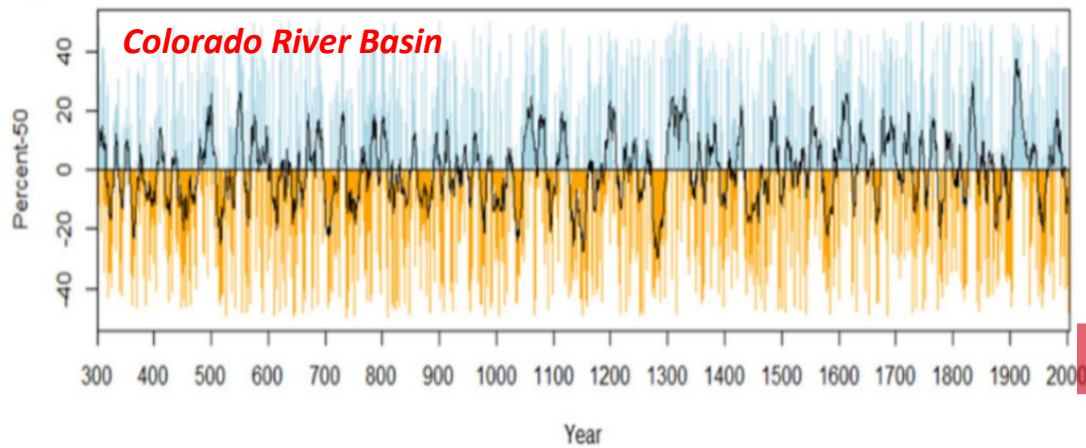


Figure 8.



Hurricane Ida was the most significant of the North Atlantic season, making landfall in Louisiana on 29 August, with economic losses in the United States estimated at US\$75 billion.

What are they not telling us?

- So, all the WMO could come up with is one hurricane of note (Ida, which briefly reached Category 4)? The 2021 Hurricane season was not a great year for the CAGW alarmist crowd. The number of North Atlantic hurricanes dropped in half (7 in 2021 versus 14 in 2020). No year since the 1980s has been much of a good year for the CAGW alarmist narrative. While the North Atlantic hurricane frequency has been increasing at rate of 3.2 hurricanes/century, the global average has been declining since the 1980s at a rate of 20.5 hurricanes/century. The number of tropical storms follows the same general pattern, but the decline started in the 1960s. North Atlantic storms have been increasing at a rate of 7.8 storms/century, but the Global average has been declining at a much larger 30.9 storms/century. CO₂ and temperature have increased over this period. If CO₂ is

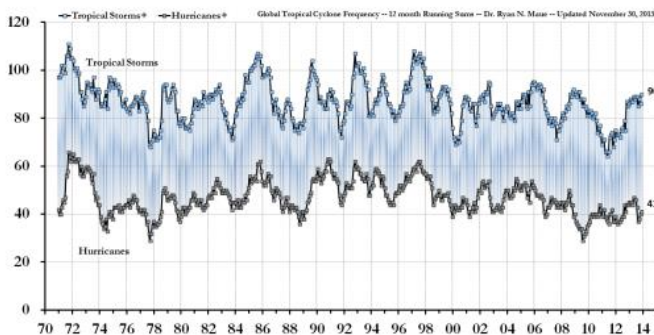
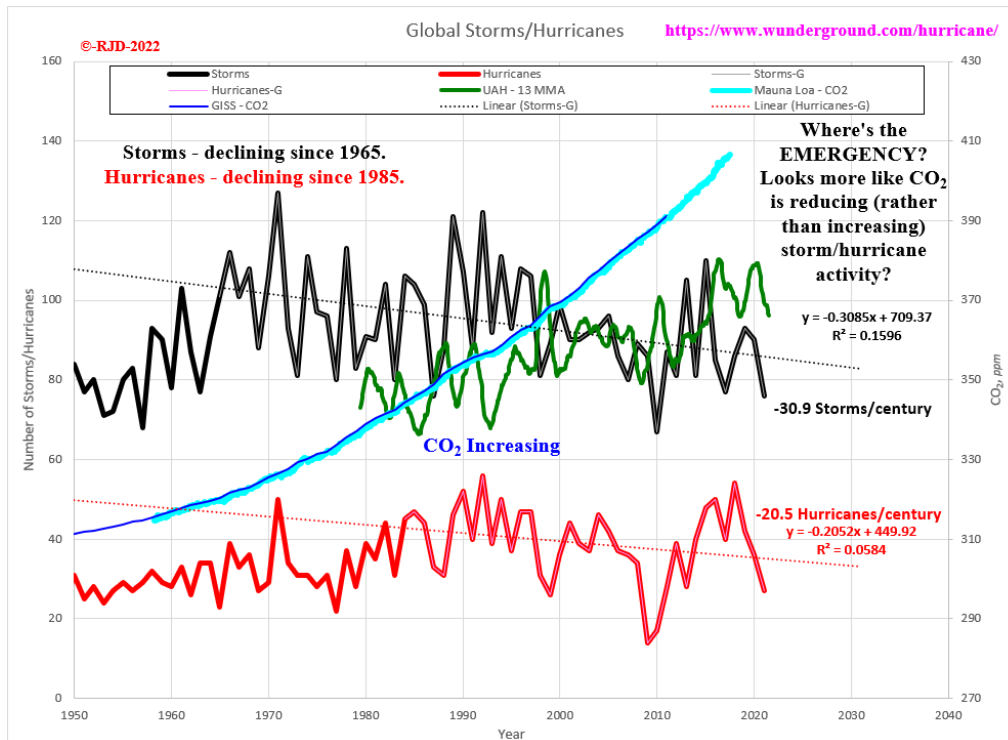


Figure 4b. Total count of tropical cyclones of tropical storm (top curve) and hurricane strength, 12-month running sums 1970 through November 30, 2013. Figure courtesy Ryan Maue.¹⁶

responsible for these trends, you must put this in the CO₂ is great for the global climate category. More detail is provided in my [OPS-57 – Hurricane Update – 2021 Season](#) post.

➤ The plot (to the left) comes from Roger Pielke Jr’s Subcommittee Statement back in 2013 and shows similar declines.

The ozone hole over the Antarctic was unusually large and deep, reaching its maximum area of 24.8 million km² (the size of Africa) as a result of a strong and stable polar vortex and colder than average conditions in the lower stratosphere.

What are they not telling us?

I have not researched the Ozone topic and its relationship to climate in detail. In general, more ozone helps to cool the planet, implying that reduced ozone will heat the planet. That may well be an anthropogenic contribution to Global Warming but has little to do with CO₂ emissions (unless CO₂ is responsible for those “colder than average conditions in the lower stratosphere”). How much did ozone add to global temperatures? Given that we already made major reductions in CFC’s and the ozone layer is still subject to significant reductions, something else must also be in play. Could that be solar activity? As our magnetic fields decline in strength, more solar protons reach further into our atmosphere, destroying ozone. NASA

has stated that “[The role the ozone hole itself plays in global warming and the resulting climate change is small compared to the impacts coming from human activities](#)”. A more accurate statement would end with “the impacts coming from” natural forcings, with a minor contribution from “human activities”.

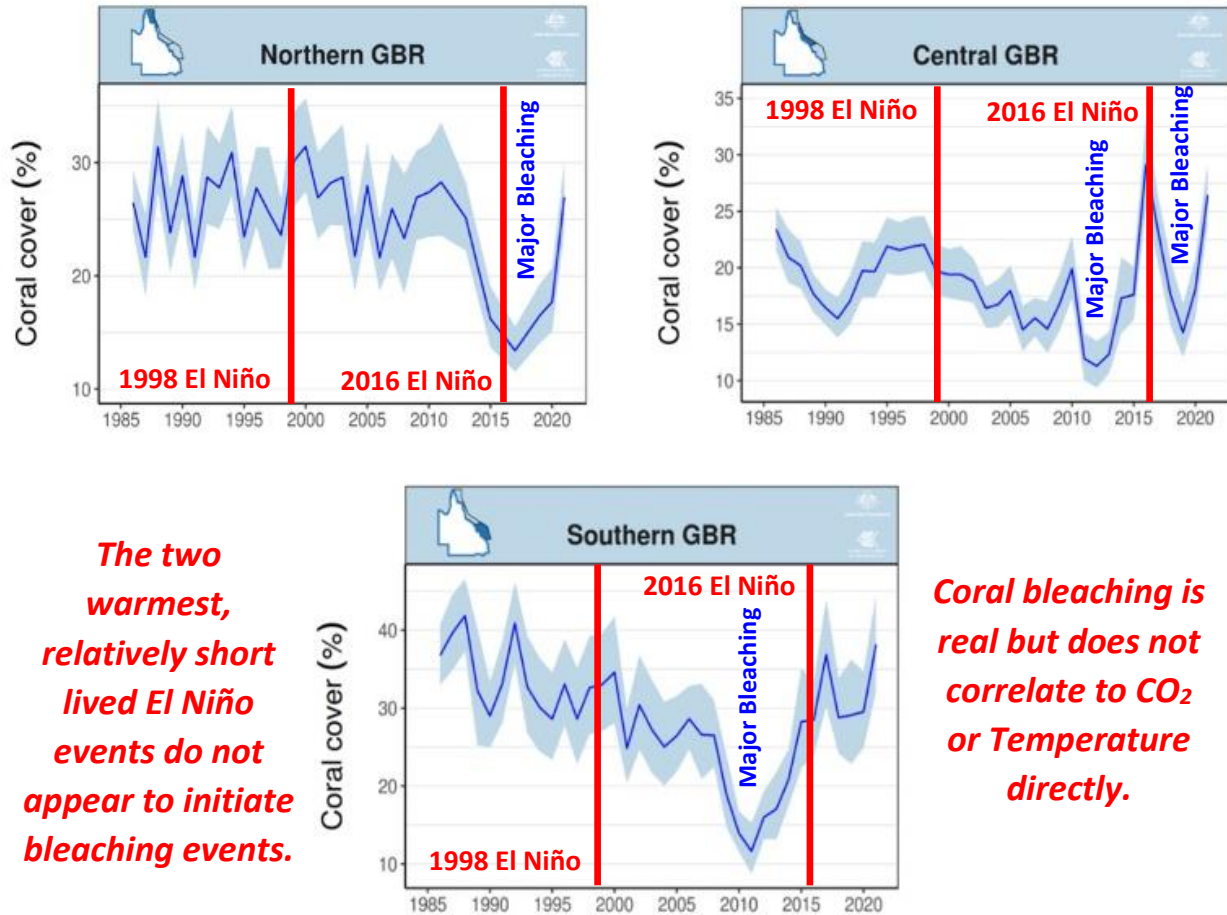
Food security: The compounded effects of conflict, extreme weather events and economic shocks, further exacerbated by the COVID-19 pandemic, undermined decades of progress towards improving food security globally. Worsening humanitarian crises in 2021 have also led to a growing number of countries at risk of famine. Of the total number of undernourished people in 2020, more than half live in Asia (418 million) and a third in Africa (282 million).

Displacement: Hydrometeorological hazards continued to contribute to internal displacement. The countries with the highest numbers of displacements recorded as of October 2021 were China (more than 1.4 million), the Philippines (more than 386 000) and Viet Nam (more than 664 000).

Ecosystems: including terrestrial, freshwater, coastal and marine ecosystems – and the services they provide, are affected by the changing climate and some are more vulnerable than others. Some ecosystems are degrading at an unprecedented rate. For example, mountain ecosystems – the water towers of the world – are profoundly affected. Rising temperatures heighten the risk of irreversible loss of marine and coastal ecosystems, including seagrass meadows and kelp forest. Coral reefs are especially vulnerable to climate change. They are projected to lose between 70 and 90% of their former coverage area at 1.5 °C of warming and over 99% at 2 °C. Between 20 and 90% of current coastal wetlands are at risk of being lost by the end of this century, depending on how fast sea levels rise. This will further compromise food provision, tourism, and coastal protection, among other ecosystem services.

What are they not telling us? Most of the discussion in this section is not directly related to climate science. So, I will limit my comments to just a couple of the points.

- The Great Barrier Reef is at or close to record high coral coverage despite all the media’s coverage to the contrary and the HOTTEST YEARS EVER that we are suffering through. As an aside, when is that warming going to make its way to Calgary? The reef data is available but in keeping with big tech’s campaign against climate realism, that data is not easy to find without being very specific. The current status is shown on the following page (pulled from a [site that summarized Peter Ridd’s work](#) and the headwinds he has experienced getting the truth to the general public).



- Most of the rest of discussion is related to the computer projections which were covered at the beginning of this document review. The projections are based on models that self-admittedly run too hot. The models do not reflect the observed temperatures, they cannot hindcast the historical temperatures. So, how can they be expected to predict future temperatures? Especially since they do not have most of the solar activity forcings built into the models (or more accurately, they do not have the significant solar forcings (cosmic ray flux, high energy particles, etc.) turned on (or they are turned way down). As such, the projections discussed here are essentially meaningless.

Source: AVISO altimetry (<https://www.aviso.altimetry.fr>)

World Economic Forum

The report was released just ahead of the World Economic Forum 2022 Annual Meeting, which brings together more than 2,000 leaders and experts from around the world under the theme “History at a Turning Point: Government Policies and Business Strategies.” Mobilizing public-private action to deliver on critical 2030 and 2050 global climate goals is a key topic on the agenda.

“The State of the Global Climate report emphasizes the need for speed, scale and systemic action to mitigate the environmental risks presented in the World Economic Forum’s Global Risks report,” said World Economic Forum Managing Board Member Gim Huay Neo.

“As shown by the recent IPCC report, we already have the means and the know-how to cut emissions and limit global warming. We need to focus our efforts on bold policies and solutions that can quickly transform the way we produce and consume resources. People and partnerships have to be at the heart of our approach, whether it is to create new jobs, provide more access and affordability for everyone and to build a cleaner and greener living environment.”

“The upcoming Annual Meeting in Davos is a key opportunity to strengthen our resolve for climate action, translate ambition to deeds and forge more partnerships to co-create a future we can be proud of,” she said.

*The World Meteorological Organization is the United Nations System’s authoritative voice
on Weather, Climate and Water*

For further information contact: Clare Nullis, media officer. Email cnullis@wmo.int. Mobile phone: +41 79 709 13 97

Notes to Editors

Information used in this report is sourced from a large number of National Meteorological and Hydrological Services (NMHSs) and associated institutions, as well as Regional Climate Centres, the World Climate Research Programme (WCRP), the Global Atmosphere Watch (GAW), the Global Cryosphere Watch and the EU’s Copernicus Climate Change services. United Nations partners include the Food and Agriculture Organization of the United Nations (FAO), Intergovernmental Oceanographic Commission of UNESCO (UNESCO-IOC), International Organization for Migration (IOM), the United Nations Environment Programme (UNEP), UN High Commissioner for Refugees (UNHCR), the UN Office for Disaster Risk Reduction (UNDRR and the World Food Programme (WFP).

WMO extends its gratitude for all the dedicated hard work from WMO’s network of experts which makes this report an authoritative source of information on the state of the climate and on climate impacts. We are especially grateful to the UK Met Office, which acted as lead author of this report.

Where possible the WMO climatological standard normal, 1981-2010, is used as a base period for consistent reporting. For some indicators however, it is not possible to use this baseline due to a lack of measurement during the whole period or because a longer period is needed to calculate representative statistics.

For global mean temperature, a baseline of 1850-1900 is used. This is the baseline used in recent IPCC reports as a stand in for pre-industrial temperatures and is relevant for understanding progress relative to the aims of the Paris Agreement.

WMO uses six international datasets for temperatures HadCRUT.5.0.1.0 (UK Met Office), NOAA GlobalTemp v5 (USA), NASA GISTEMP v4 (USA), Berkeley Earth (USA), ERA5 (ECMWF), JRA-55 (Japan).

Further information on UN Renewable Energy Initiative is at [5 actions to fast-track renewables](#) [What is renewable energy](#) [Why invest in renewable energy](#)