Extreme Weather during La Nina Events

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CASF Presentation
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El Nino Rain and Flooding

La Nina events have serious droughts associated with them and very active tornado seasons that are well documented “extreme weather” during cool Pacific Decadal Oscillation (PDO) periods. There are always lots of claims of extreme weather due to global warming (especially due to so called man-made warming supposedly due to CO_2). To show some push back, I wanted to show cases of extreme weather during cooler periods. But it is actually more complicated than that.

There are weather events caused by an increase of the El Nino index of the PDO in its warm phase. Especially during super El Nino years (such as early 1940s, early 1980s, 1997-98 and 2016-17). Sea Surface Temperatures (SSTs) have some other teleconnections beyond El Nino Southern Oscillation (ENSO) PDO Index or the Atlantic Multi-decadal Oscillation Index. This includes a stratospheric ramp up of SSTs to a polar vortex driven by Jet Stream shifts at critical times (perhaps driven by eastward stadium wave like coriolis effects?).

Direct El Nino and La Nina Effects

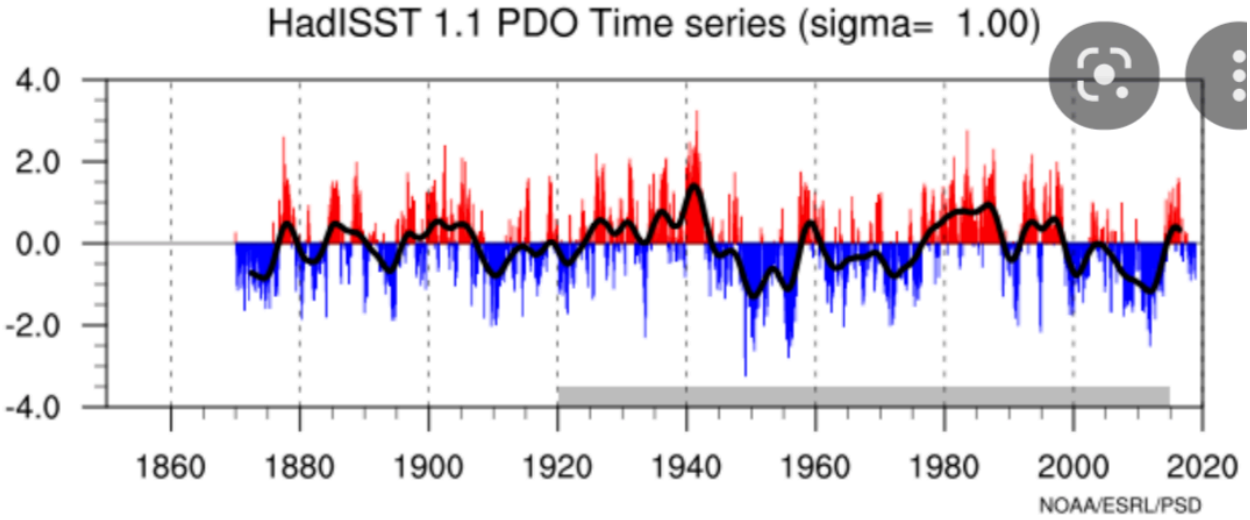
As we will see there are direct effects in the Pacific basin as noted above but there are some indirect effects globally that are very counter-intuitive. Some of these indirect effects occur during times that the US is experiencing La Ninas. Let’s do a quick look at classical El Nino Southern Oscillation (ENSO) effects that are centered in the Pacific with a temporal look at the “rest of the world”. Most of this relates to sea surface temperatures

(SSTs) that are ultimately mostly heated directly by the sun but Bob will also take a quick look at atmospheric wind effects.

What are ENSO events?

We have discussed El Nino and La Nina extensively in the past but simply put . . .

The ENSO is **a recurring climate pattern involving changes in the temperature of waters in the central and eastern tropical Pacific Ocean.**



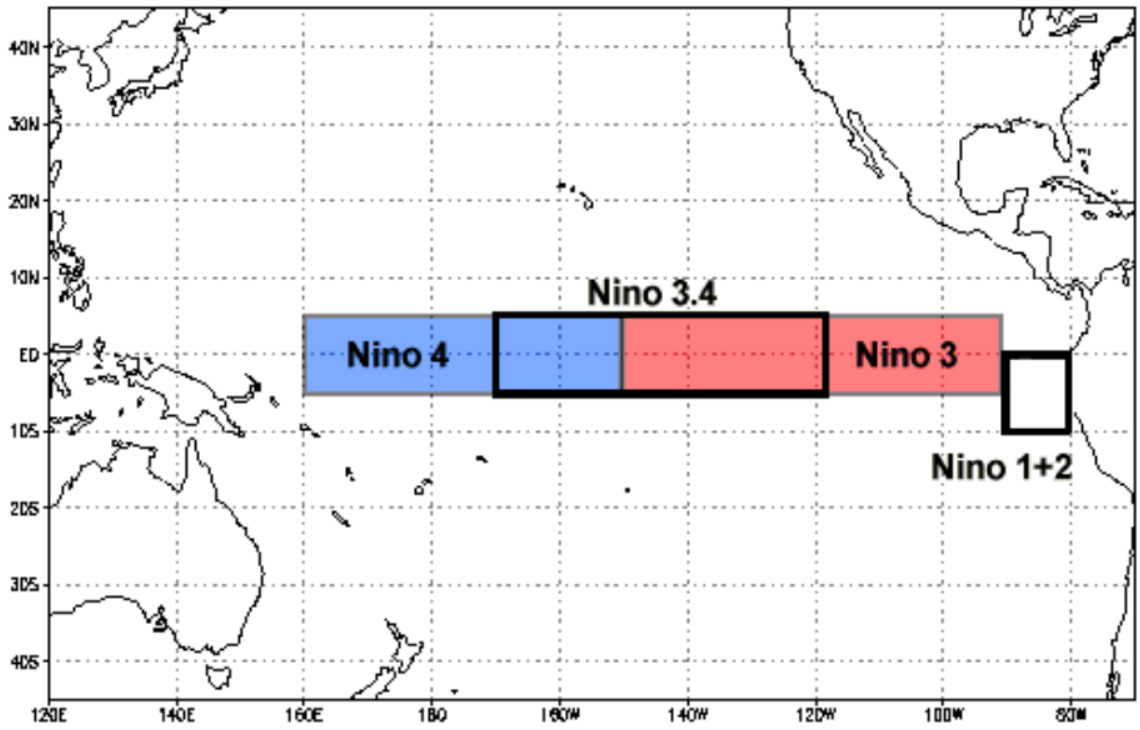
The PDO is also an important ENSO 60 year long pattern that influences weather patterns.

El Niño (La Niña) is a phenomenon in the equatorial Pacific Ocean characterized by a five consecutive 3-month running mean of sea surface temperature (SST) anomalies in the Niño 3.4 region that is above (or below) the threshold of +0.5°C (or -0.5°C).

This standard of measure is known as the Oceanic Niño Index (ONI)

Historically, scientists have classified the intensity of El Niño based on SST anomalies exceeding a pre-selected threshold in a certain region of the equatorial Pacific

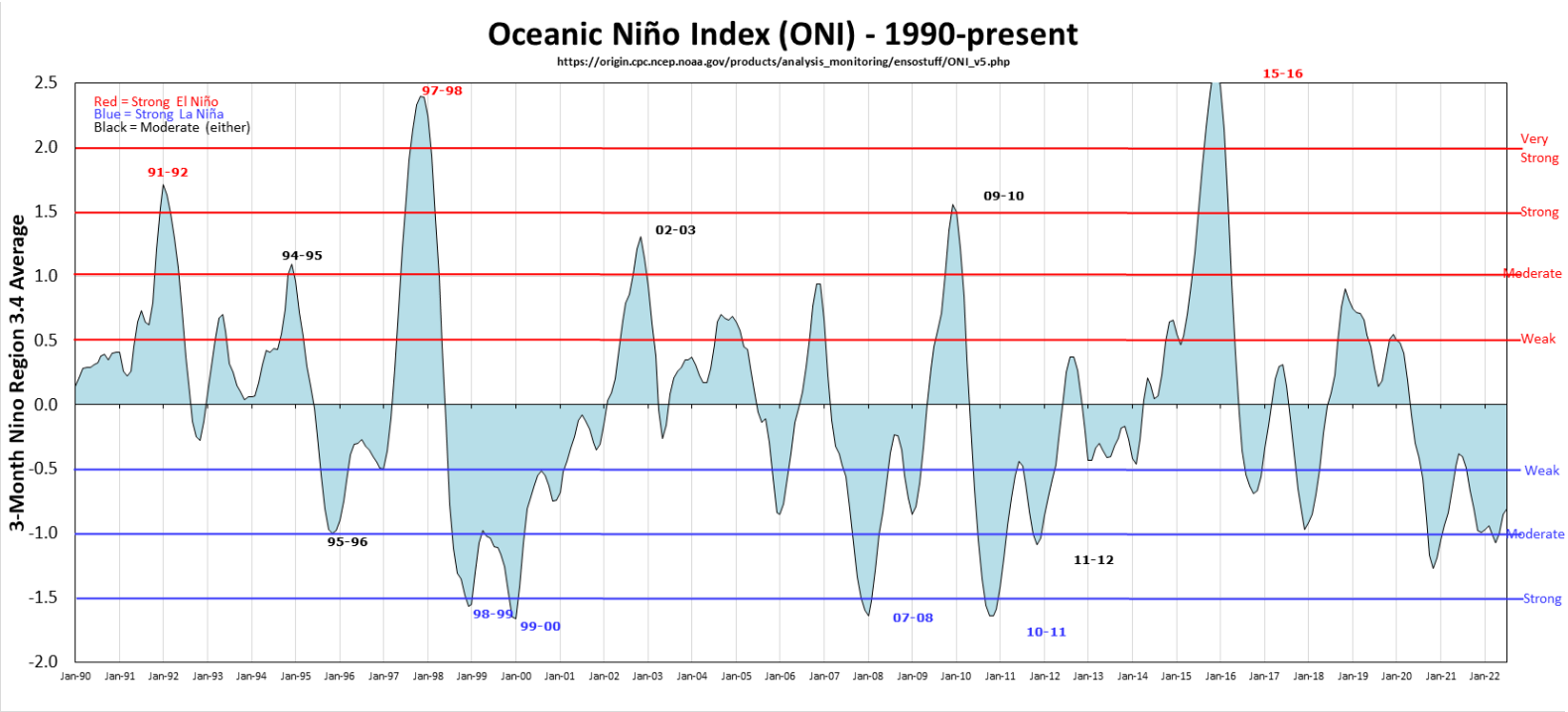
The most commonly used region is the Niño 3.4 region, and the most commonly used threshold is a positive SST departure from normal greater than or equal to +0.5°C. Since this region encompasses the western half of



https://www.ncei.noaa.gov/access/monitoring/enso/sst

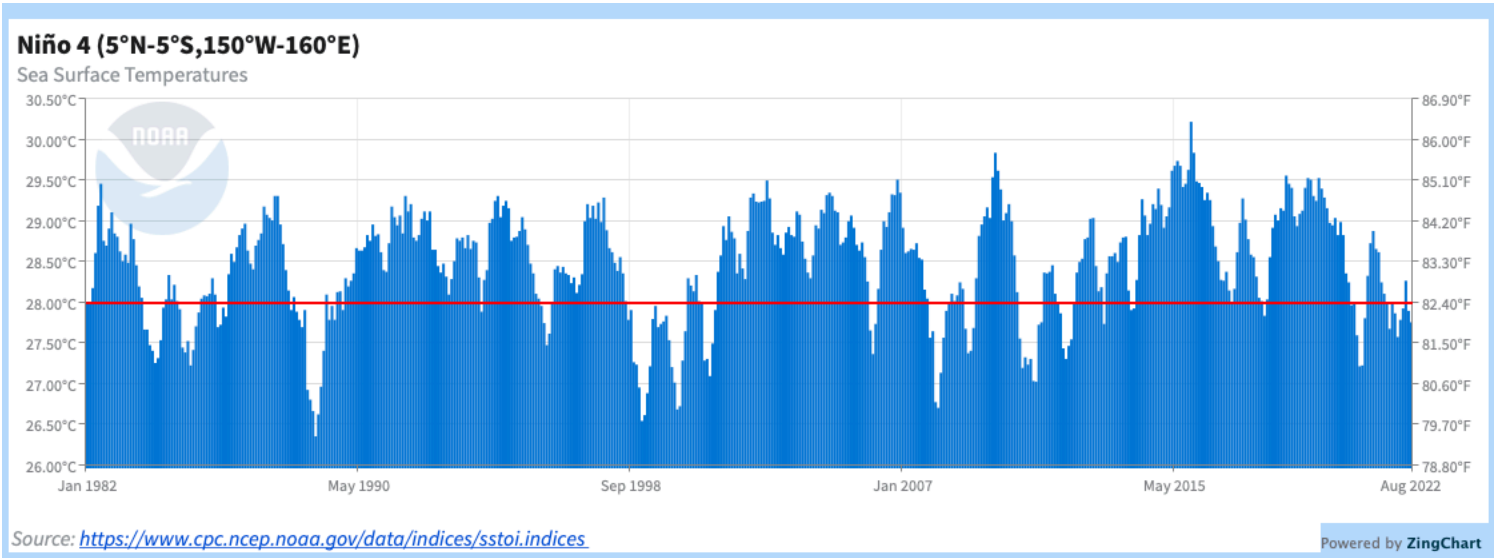
the equatorial cold tongue region, it provides a good measure of important changes in SST and SST gradients that result in changes in the pattern of deep tropical convection and atmospheric circulation.

The criteria, that is often used to classify El Niño episodes, is that five consecutive 3-month running mean SST anomalies exceed the threshold.



Deep Convection & Rain

Studies have shown that a necessary condition for the development and persistence of deep convection (enhanced cloudiness and precipitation) in the Tropics is that the local SST be 28°C or greater. Once the pattern of deep convection has been altered due to anomalous SSTs, the tropical and subtropical atmospheric circulation adjusts to the new pattern of tropical heating, resulting in anomalous patterns of precipitation and temperature that extend well beyond the region of the equatorial Pacific. An SST anomaly of +0.5°C in the Niño 3.4 region is sufficient to reach this threshold from late March to mid-June. During the remainder of the year a larger SST anomaly, up to +1.5°C in November-December-January, is required in



order to reach the threshold to support persistent deep convection in that region.

Nino 4 Region

SST values in the Niño 3.4 region may not be the best choice for determining La Niña episodes but, for consistency, the index has been defined by negative anomalies in this area.

A better choice might be the Niño 4 region, since that region normally has SSTs at or above the threshold for deep convection throughout the year.

An SST anomaly of -0.5°C in that region would be sufficient to bring water temperatures below the 28°C threshold, which would result in a significant westward shift in the pattern of deep convection in the tropical Pacific.

Human Caused Events . . .

. . . . where there is Ignorance and Lack of Preparation.

Right here in the middle of discussing natural heating and cooling, the elephant in the room is the question of human emissions of CO_2 and their effects on global warming. In the face of all the discussion of natural warming (and cooling), there still is the specter of human effects on the climate. Nothing in this discussion of natural caused weather effects indicates that humans have more than a very minor Urban heat island (UHI) effect on atmospheric warmth. Humans can at the very least spend some time and energy preparing for what nature has sent us in these many past weather events and will surely send us in future weather events.

Extreme weather events can be broadly predicted by monitoring SSTs - but this has nothing to do with CO_2. There are very clear patterns especially over 50-60 year periods. People should be more careful if they choose to live in our forests - they should build with fire in mind, know when droughts exist and be extremely careful with regard to fires (most wildfires are human caused). They should build with weather in mind - especially near coasts where hurricanes occur and in tornado alley - cool

SSTs increase tornado risk - warm SSTs in the Atlantic = more and stronger hurricanes.

And so on . . . . with a few more issues like power lines starting to criss-cross our forests and create many more forest management problems. Alternate energy power line grids that will have to be dramatically increased to meet our growing needs must allow forest managers to gain control of these corridors. This is in order to allow those increasing number of power line right-of-ways to be kept free of a variety of flammable material in those increasingly large areas so that sparking line failures will not produce real human caused fire and CO_2 disasters in some big uncontrollable burns especially during drought periods.

SSTs & Mechanisms Surrounding them

Warming and cooling of the sea surface are only a part of the weather and climate systems we must accommodate. There are a series of atmospheric surface and stratospheric wind patterns that exist around us with temporal and dimensional elements that are mostly known but cannot always be predicted. They complicate our understanding of their even short term effects. The oceans have similar elements that must be understood. Not only on the surface but at depths of 100s of meters and even 1000s of meters deep. However, there are natural patterns that seem to reoccur over days, years, decades and even millennia that can be used to predict coming events.

Regional Effects of SSTs

Without getting too deeply into the mechanisms that drive ENSO effects of SSTs, I plan to discuss and show some interesting patterns. These patterns tend to repeat across various regions of the planet in time sequence that seems to repeat. There should be a way to uncover the various reasons for the repeat of the patterns over time. I may speculate on some of these issues but the very complex nature of the winds, convection effects, ocean currents, temperature gradients, etc. etc. poses a very complicate task of putting it all together. Bob Tisdale's videos and discussions do start to get at the mechanisms of these processes.

But before I go any further with my SST discussion and ENSO effects. It is time for Bob Endlich to enlighten us a bit on global wind patterns from pole to pole and especially at Pacific ocean latitudes.

Bob's part of the presentation:

https://casf.me/wp-content/uploads/2022/09/Visualizing-Mike-Wallaces-Zonal-Wind-Charts-Using-Meteorological-Diagnostics-16-Sep-2022.pdf

Bob Tisdale has studied a number of issues involving ENSO and their global effects

There is a two part Youtube series that clearly explains most of these issues (they especially show that neither CO_2 nor man has anything to do with it). I showed 3 short movie clips from this presentation at our meeting.

Part 1 https://www.youtube.com/watch?v=lmjaNO5DD_Q

This part is about 55 minutes long and there are three key segments that are much shorter and should definitely be watched if you do not wish to watch it all.

Look at the the first 5 minutes and then skip to around minute 21 and watch about 5 minutes there. Just keep watching or skip to minute 28 and watch for 2 or 3 minutes. Having only about 15 minutes of video will give you a much better understanding of El Nino and La Nina events and how these ENSO patterns affect us globally.

Part 2 gets deeper and in a shorter pitch that can help to "clarify" the issues. If you want to watch this part it is at . . . .

Part 2 https://www.youtube.com/watch?v=fsYdhRhKURg

Teleconnections of SSTs in the ocean basins of the world and their effects on the land

Pacific SSTs sometimes related to the Indian Ocean SSTs with both areas warming in large areas of their basins at the same time. Sometimes they cool at the same time with a warm pool between them from Australia north to Japan and Russia. Later in the time sequence the Indian Ocean is warm with a cool arm between them with a very large warm eastern Pacific that goes from Alaska all the way down along the west coast of South America. At the same time as the previous sequence the Atlantic SSTs are also warm except near the Arctic and Antarctic.

When the Indian Ocean and the Eastern Pacific SSTs are cool, the land of Europe and across the top of Russia is warm. As the Indian Ocean and the Eastern Pacific SSTs warm, the Alaskan and Canadian land areas near the warm pools begin to warm and spread until western US and South American land masses warm. Africa, India and Australia land masses also warm as the mid-Atlantic SSTs warm. The whole progression appears to be driven by the movement of the SSTs across the face of various ocean basins (and remains generally at an even temperature).

Moisture Patterns

The various global warm pools of SSTs that come and go in the world's ocean basins when they come near to coastal areas of the world, seem to increase rainfall in the spots where they form during the time that they exist. When those same pools turn cooler near various global land masses, those land areas experience drought conditions that are more severe, and when the SSTs become much cooler this condition has a dearth of clouds which allows more sunlight to reach the surface and produce localized warm spots. The largest and most recognizable of this phenomenon is the huge dynamic surface water event that occurs during El Nino-La Nina cycles found in the equatorial Pacific.

Data & Determining SSTs

SST Data before Argo see my 2 presentations - Part 1 and 2

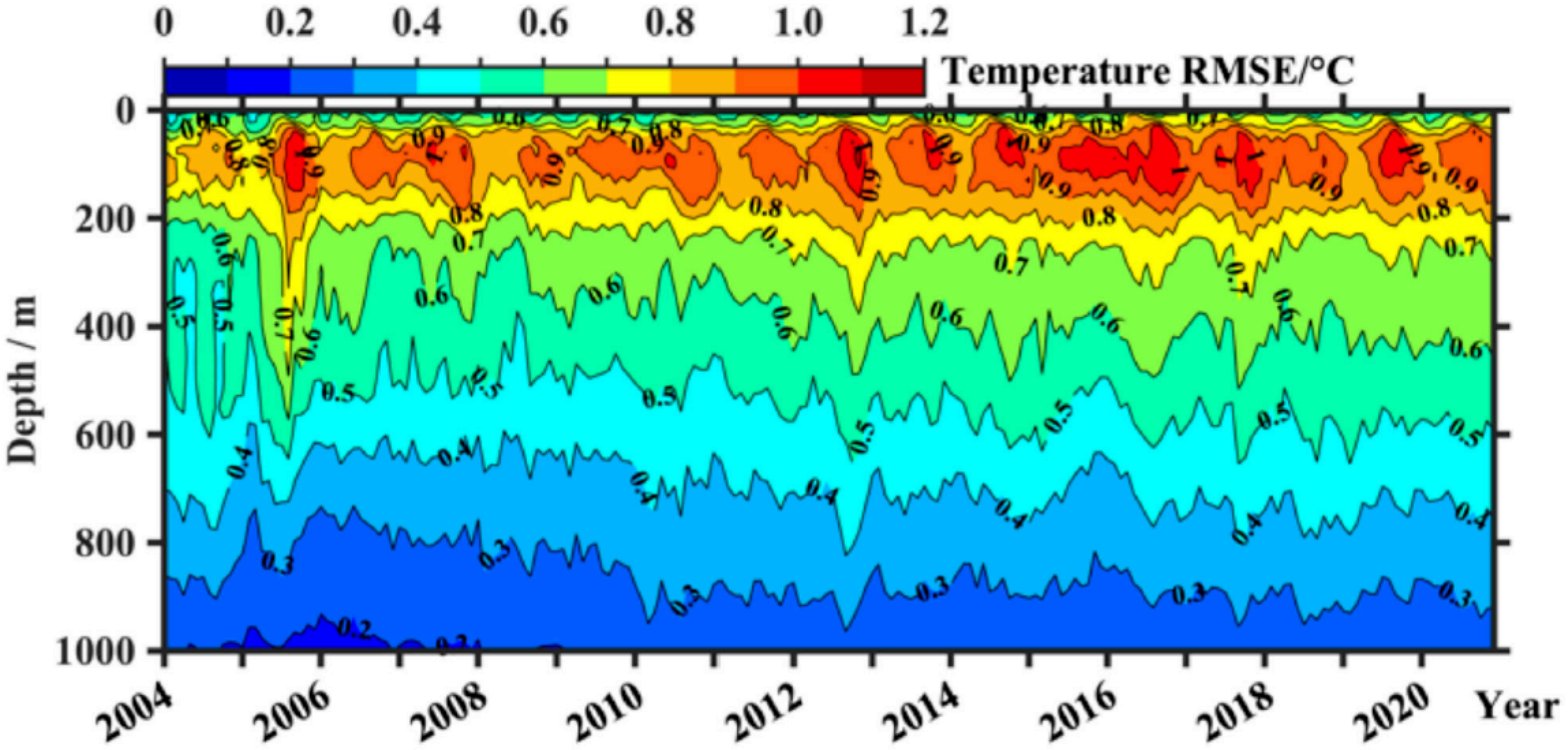
https://casf.me/wp-content/uploads/2021/07/Argo-System-Dec2014.pdf

https://casf.me/wp-content/uploads/2021/07/Argo-System-Pt2-March-2015-PDF.pdf

Argo data has dramatically increased the amount of ocean data (especially temperature data) from the surface to very deep. There is evidence that some of the raw data is already being modified to fit the anthropomorphic global warming meme.

Recent Argo Data

This is a globally averaged data set. It is fairly uniform except for some spikes in 2005, 2007, 2012 etc. Surface temperatures show clear annual variations.



This is a graphic of temperatures in the northeast Pacific (to 500m) while the previous graphic is a global averaged data set to 1000m.

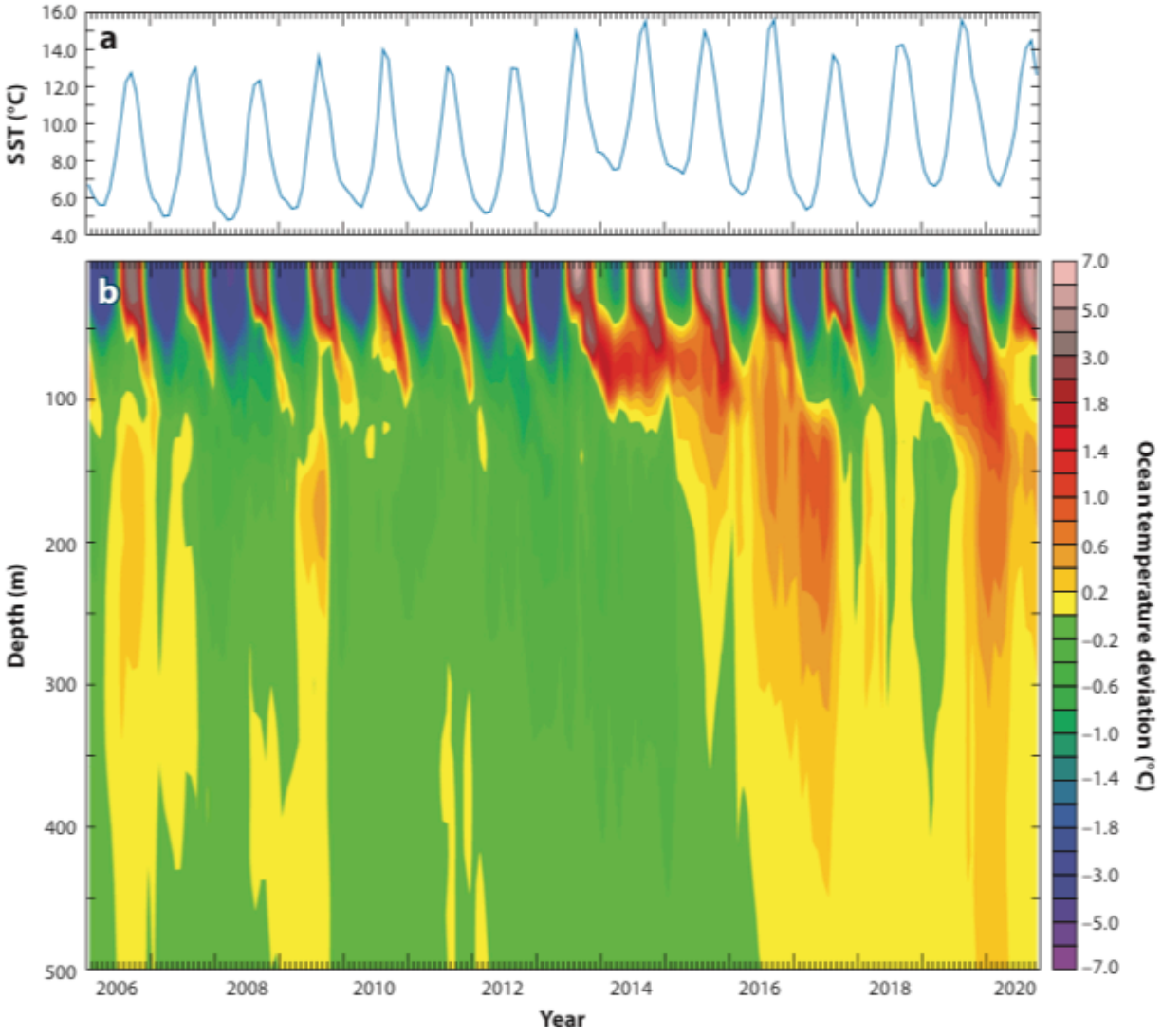


Figure 4

The northeast Pacific marine heat wave (here at 50°N, 145°W), from Argo data. (*a*) Sea surface temperature (SST). (*b*) Ocean temperature deviations from the 2006–2020 means from the surface to 500 m. The strong summer SST warming in 2013–2016 and 2019–2020 is mixed and/or subducted into subsurface layers.

Conclusions

Classical ENSO data sets of SST for determining the El Nino's and La Nina's Index values come from a very small area of equatorial Pacific zones. El Nino's and La Nina's in the sense that they affect north America do show some very wide ranging extreme events in many other parts of the globe. Those effects due to all the issues we have discussed today range from extreme rain events (and hurricanes) to extreme cold events such as drought and violent winds (tornadoes). All of these weather events are natural and appear to be relatively random and spikey unless we view them as a larger global pattern.

And Bob Tisdale shows that none of the global ocean areas nor SSTs in general show any significant long term warming trend. In fact the east Pacific ocean area that makes up about a third of the global ocean area has had a zero temperature value if viewed on average over the past 3 decades. In general this is also true for the rest of the global ocean surface. And remember that the global ocean surface makes up 70% of the earth's surface.

For the human emission of CO_2 to be a factor in the changing climate, the growing levels of CO_2 should have warmed the global ocean's surface. There is no evidence of that at all.

Some climate scientists and most media and politicians tend to ignore these more complex natural patterns and blame "extreme" events and natural disasters on human emissions of CO_2. Unprecedented events cited in modern day events like these almost always have a historical "extreme" precedent especially when we consider the global scope of these events and the extended time frames of geological epochs.

Further Discussion

Extreme temperature events (both hot and cold). An update in the Argo float system as it relates to SSTs is probably in order.

North-south and Asian-American latitudinal see-saw effects.

In general it is interesting how temperature events have large variations (day-night, seasonal and regional) that tend, for the most part, to be natural (and normal). Day-night temperatures can easily vary over 30 degrees F and sometimes up 40 degrees F in a 24 hour period. Seasonal ranges of temperatures often vary the same. And north-south polar temperatures vary at the same time by large extremes both during northern winters and southern summers and vice versa and during 60 year cycles.

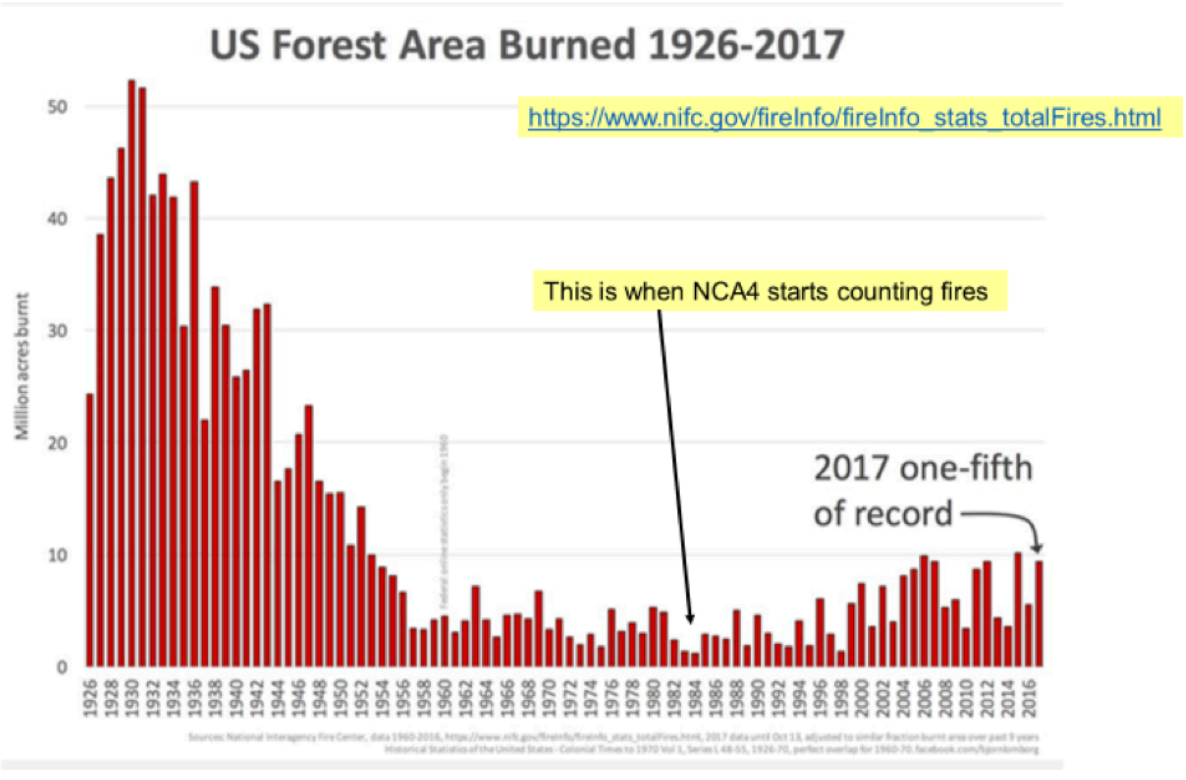
When a few tenths or even a whole degree C in warming is considered an existential threat, you have to wonder - where has our common sense gone to? Especially when that warming, cycles back to cooling especially over the long term.

Extreme rain events

Extreme wind events

a Boy Scout tenet - “Be Prepared”

There was a brief recap of some of this data in mostly graphic charts.



http://www.nws.noaa.gov/oh/hdsc/record_precip/record_precip_us.html

Duration	Amount (in)	Amount (mm)	Location	Lat (deg)	Long (deg)	Start date	Ref
1-min	1.23	31.2	Unionville, MD	38.80	-76.13	4 Jul 1956	2,3,4,5
5-min	2.03	52	Alamogordo Creek, NM	34.66	-104.39	5 Jun 1960	4
12-min	2.30	58	Embarrass, WI	44.67	-88.71	28 May 1881	4
15-min	3.95	100	Galveston, TX	29.29	-94.79	4 Jun 1871	4
30-min	7.00	178	Cambridge, OH	40.00	-81.58	16 Jul 1914	4
42-min	12.0	305	Holt, MO	39.45	-94.33	22 Jun 1947	1,4
60-min	13.8*	351*	Burnsville 6 WNW, WV	38.88	-80.77	4 Aug 1943	4
	12.0	305	Holt, MO	39.45	-94.33	22 Jun 1947	2,3,5
	12.0	305	Kilauea Sugar Plantation, Kauai, HI	22.21	-159.41	24 Jan 1956	3,5
90-min	14.6*	371*	Burnsville 6 WNW, WV	38.88	-80.77	4 Aug 1943	4
2-hr	15.0	381	Woodward Ranch (D'Hanis), TX	29.49	-99.38	31 May 1935	4
2.17-hr	19.0	483	Rockport, WV	39.07	-81.55	18 Jul 1889	1
2.75-hr	22.0	559	Woodward Ranch (D'Hanis), TX	29.49	-99.38	31 May 1935	1,4
3-hr	28.5	724	Smethport, PA	41.80	-78.45	18 Jul 1942	4
4.5-hr	30.7	780	Smethport, PA	41.80	-78.45	18 Jul 1942	1,4
12-hr	34.3	871	Smethport, PA	41.80	-78.45	17 Jul 1942	4
18-hr	36.4	925	Thrall, TX	30.59	-97.30	9 Sep 1921	4
24-hr	43.0	1092	Alvin, TX	29.42	-95.24	25 Jul 1979	3,4,5

The most recent date on this chart is 25 July 1979, 43 years ago.

The next most recent date, 5 June 1960, was 62 years ago.

Claims that heavy precipitation is increasing are False.

Figure 2. Listing of extreme rainfall data from the NWS Hydrometeorological Design Center from 1-minute to 24 hours, captured in 2018. The most recent extreme rainfall record was set in Alvin, TX, on 25 July 1979, over 43 years ago. By examining the date column, observe that the claims that the modern increases in atmospheric <CO2> are leading to more heavy and extreme rainfall events are simply not true. Three of the extreme rainfall amounts still valid were set in the 1800s.

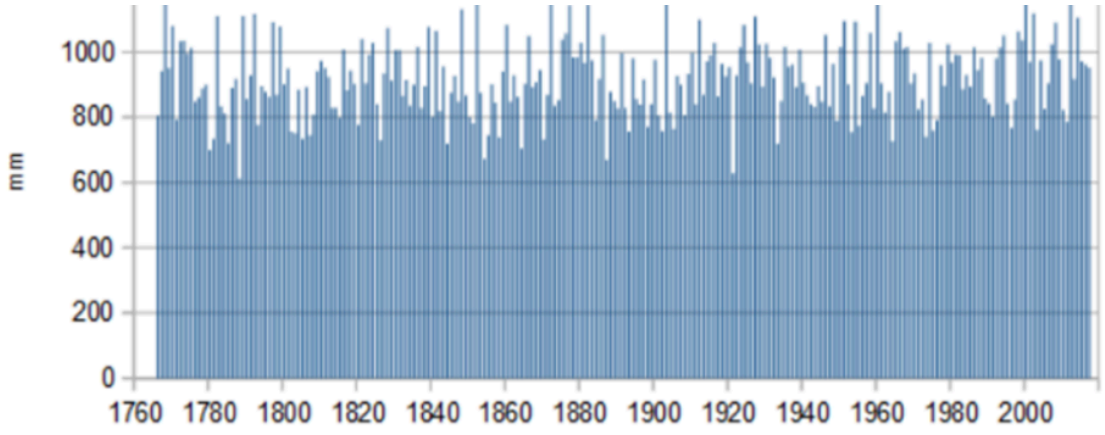
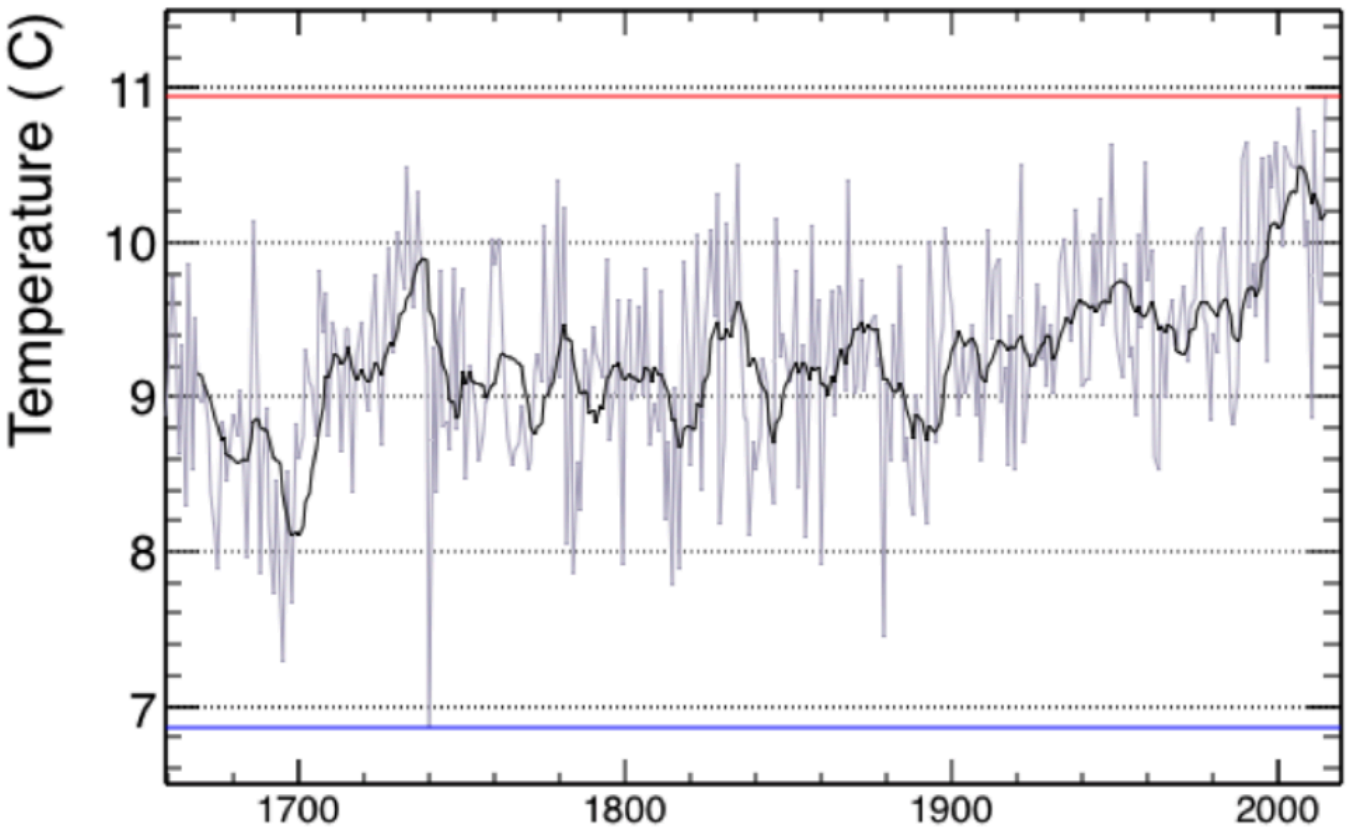
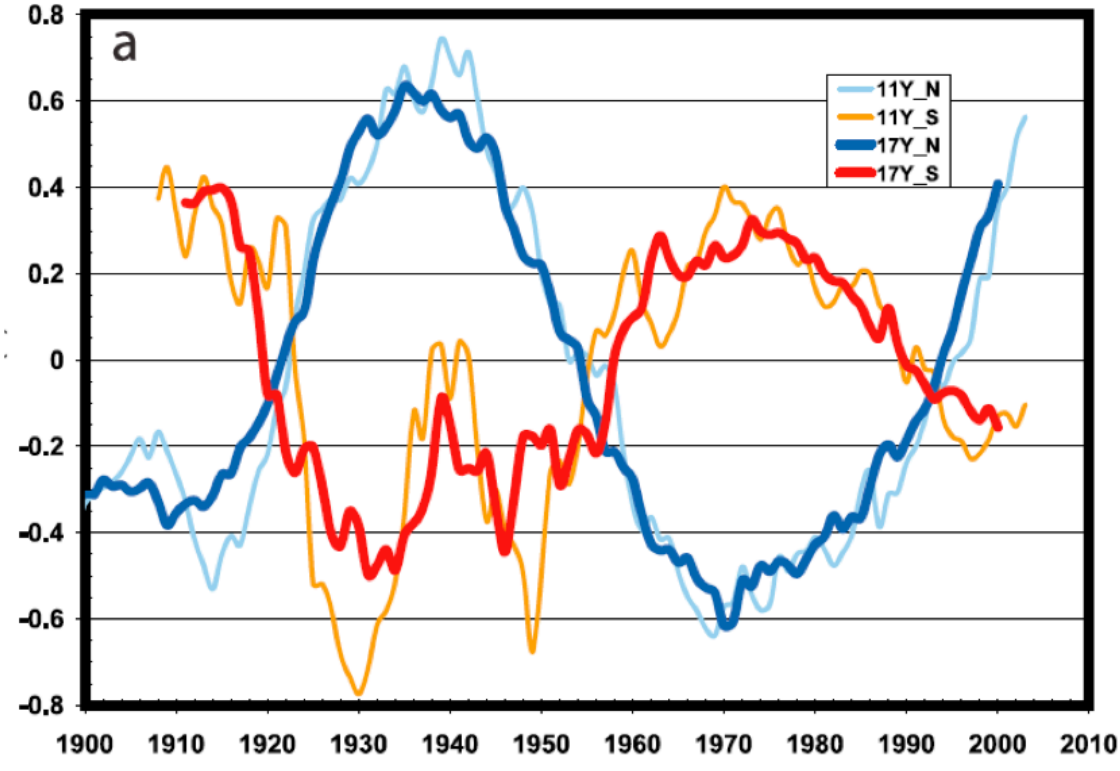


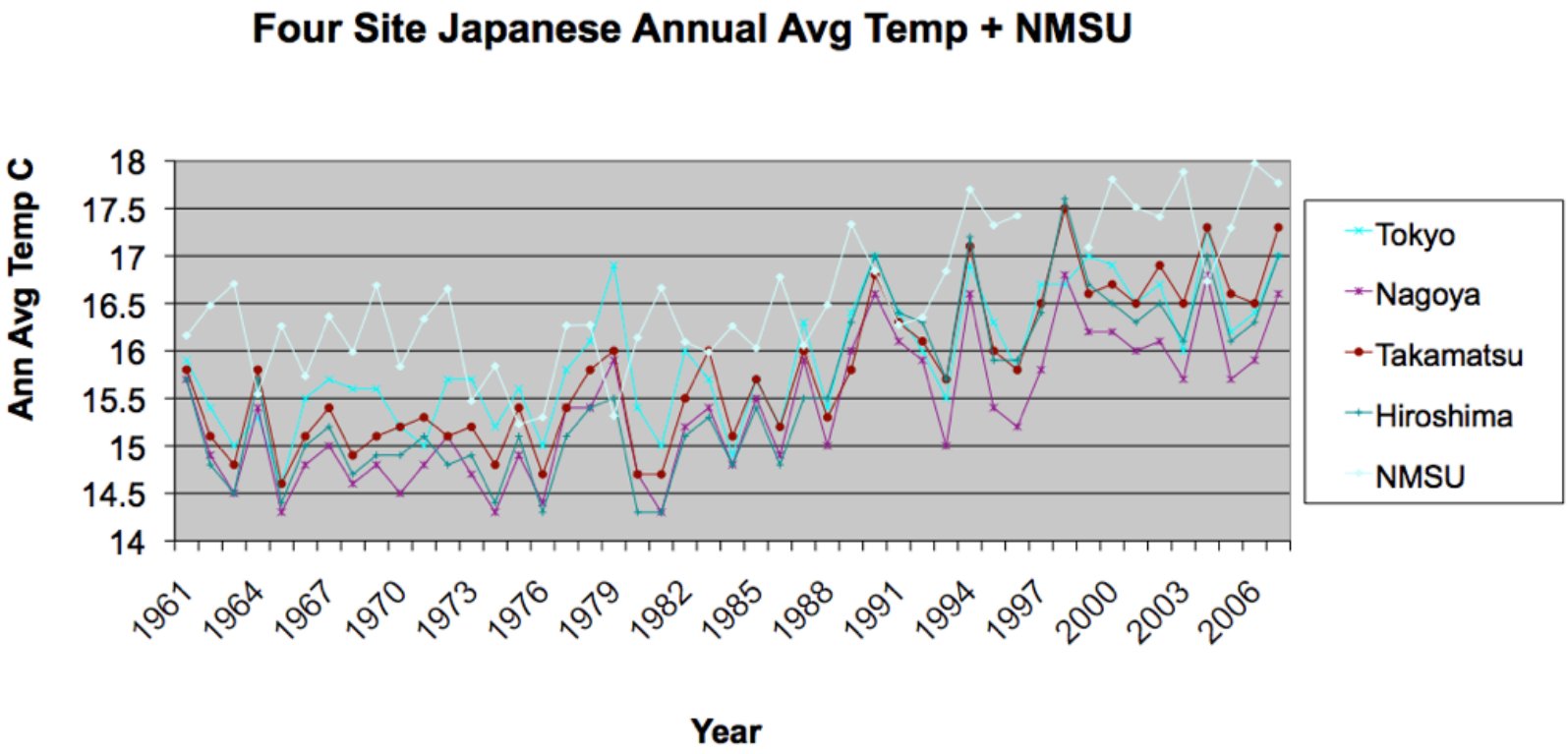
Figure 3. Time series of rainfall from the UK Met Office for England and Wales, beginning in 1766. There are no long term increases in the amount of rainfall which would lend the slightest credence to Climate Alarmist claims that more atmospheric <CO2> is driving heavier rainfall.



Central England Temperature 1659-2014

The Poles are melting from CO_2 warming!
Chylek's Polar See-Saw





The Fundamental Cause of ENSO effects

Several folks after my presentation asked what causes these La Nina and El Nino events. Clearly tropical winds are very important and of course, the sun is key to this process but again it is more complicated than that simple answer seems. Again in simple terms the sun heats up the sea surface and the trade winds pile up that heated surface water however . . . .

If you look at Bob Tisdale's Part 1 discussion at about the 30 minute mark, you will find about 5 to 10 minutes of detailed explanation of the "La Nina charge up" of the process. Humans have nothing to do with it. And note

how clouds and moisture play a much greater part in the process than any other GHG. And again “what’s CO_2 got to do with it?”.

Wake up world . . . before the charlatans bankrupt us over a whole lot of nonsense! We, frankly, have much bigger fish to fry. For example, how do we safely and effectively deal with tyrants like Putin and Xi.

Jon Kahler found a paper after the above presentation was made that gives a very different view of disasters that seem to be a daily media view of how humans are creating climate chaos. It supports our view of a natural weather pattern that can at times be very violent. This natural view of weather events is the basis of this presentation and can be found everywhere at our CASF website:

https://casf.me/wp-content/uploads/2022/09/s13360-021-02243-9.pdf