Climate Hyperbole Shouldn't Supersede Climate Policy that is Responsible and Sensible

By Michael R. Arndt and Dr. Karl Svozil

Many enthusiastic climate change and environmentalists offer up unproven generalities of our current climate and a future climate state(s) that are hypothetical and highly uncertain. We would like to offer some facts and thoughts on the issue that are a bit more specific. We are in no way attempting to refute anthropogenic climate change, just the assumptions of unfounded truth that are often made. We are trying to bring some perspective to generalized statements often heard that have no proven current scientific basis that confirms their reality.

Generalized statements and catchy phrases about severe storms, floods, wildfires, crop failures, localized weather events, and droughts are scare tactics often used to substantiate climate change extremism. They certainly don't warrant taking extreme actions based on uncertain, unproven science either as documented in the IPCC reports. There is virtually no proof that these events are happening at any rate that is more severe since the mid 20th century in the eyes of the IPCC, the world's most authoritative source of scientific information on climate change.

The following summary from IPCC AR5 Chapter 2, Changes in Extreme Events states:
"In summary, there continues to be a lack of evidence and thus low confidence regarding the sign of trend in the magnitude and/or frequency of floods on a global scale."

Events like the Australian and California wildfires and drought are being unfairly labeled as climate causalities without conclusive evidence when they are more likely natural or in the case of wildfires anthropogenically induced events (i.e. arson, campfires accidents, downed power lines, ill conceived forestry management etc.) not related to anthropogenic climate change. It's not unusual at all for California and western US to have droughts and extreme climate variability.

California has a long history of droughts. El Nino (wet) or La Nina (dry) and atmospheric blocking weather patterns that can be persistent are well documented. In addition, ocean/atmospheric interaction of the Pacific Decadal Oscillation (PDO), Madden-Julian Oscillation (MJO) and Atlantic Multidecadal Oscillation (AMO) can have a significant impact in the western part of the US. We have been lucky the last 500 years with alternating periods of drier and wetter than normal conditions which have usually lasted 25 years or less. Between 800 and 1300 AD we had centuries of drought there. Droughts in the western US are nothing more than normal, natural, irregular recurring events mostly unrelated to current anthropogenic climate change.

Droughts are also quite common in portions of Australia but not well understood or documented. Although it's possible that droughts in parts of Australia have increased there is no proof that climate change has caused it. According to the IPCC, globally droughts are generally unchanged since the mid 20th century. The recent drought and associated wildfires were mostly caused by a Sudden Stratospheric Warming (SSW) event, a breakdown and reversal of winds of the Antarctic polar vortex, a rather unusual, even rare, occurrence caused by planetary waves, also known as Rossby Waves. The SSW also affects the natural Antarctic ozone chemistry. While occurring regularly in the Northern Hemisphere, in the Southern Hemisphere these are natural irregular recurring events unrelated to climate change. The Indian Ocean Dipole (IOD) positive phase, an irregular natural occurrence, also served to amplify these events. These events also affected the Antarctic climate. While some say the

IOD has increased since the 1960's, once again there is no conclusive scientific proof that climate change has caused it. It's most likely due to thermocline dynamics and decreased zonal equatorial wind feedbacks. It's simply multidecadal variability that's been happening for hundreds of thousands of years during interglacials. At this time anything to the contrary is hypothetically based on numerous models that don't even agree. Some models say climate warming should decrease the effects of this oscillation but those tend to be ignored. No doubt this drought is serious but to blame it on climate change due to simple correlation is a stretch and disingenuous when past history is poorly understood due to lack of historical and observational records.

In California, damage from wildfires is certainly higher attributable to building in and near wildfire zones and downed timber along with natural and human planted dried vegetation can add to the spread and intensity. More than 80% of the current wildfires there are human-ignited i.e. campfires, downed power lines etc. Any perception that global warming is causing more and bigger fires is downplaying the human element involved in starting, spreading and damage from wildfires and making the easy assumption that climate change is the culprit.

A study published in the Proceedings of the *National Academies of Science,* or *PNAS,* found that 84 percent of wildfires are ignited by humans, whether through downed power lines, careless campfires, or arson.

"Human-started wildfires accounted for 84% of all wildfires, tripled the length of the fire season, dominated an area seven times greater than that affected by lightning fires, and were responsible for nearly half of all area burned. " the paper reported.

According to a 2016 NCBI study 'Global trends in wildfire and its impacts: perceptions versus realities in a changing world', Stefan H. Doerr and Cristina Santín
"Analysis of charcoal records in sediments and isotope-ratio records in ice cores suggest that global biomass burning during the past century has been lower than at any time in the past 2000 years."

The following summary from IPCC AR5 Chapter 2, Changes in Extreme Events states:
"In summary, the current assessment concludes that there is not enough evidence at present to suggest more than low confidence in a global-scale observed trend in drought or dryness (lack of rainfall) since the middle of the 20th century, owing to lack of direct observations, geographical inconsistencies in the trends, and dependencies of inferred trends on the index choice. Based on updated studies, AR4 conclusions regarding global increasing trends in drought since the 1970s were probably overstated. However, it is likely that the frequency and intensity of drought has increased in the Mediterranean and West Africa and decreased in central North America and north-west Australia since 1950."

The 'tipping points' referred to in catastrophic climate warming scenarios are mostly arbitrary and hypothetical. Social, political, and other indirect tipping points are tenuous and unsubstantiated by empirical observation of human behavior under those circumstances. Regional tipping points are estimations by experts with no definitive, conclusive science to back up their 'guesstimate'. They are simply 'expert' opinions. The odds, timing, and significance of any 'tipping points' are unknown. These are not the realistic scientific evidence on which we should base climate policy. For example, one of these 'tipping points' is the collapse of the West Antarctic Ice Sheet (WAIS). This would add several meters to sea level yet will need at least several centuries and maybe several millennia for this to come to pass. Additionally, it's not unusual for the WAIS to collapse from natural causes during an interglacial.

It's possible, and maybe even likely, that the WAIS is destined for collapse from the current interglacial regardless of any anthropogenic warming. A climate tipping point doesn't mean immediate or even catastrophic consequences, it simply indicates a point where scientists 'think' climate processes will begin a slow systematic change that may or may not cause adverse climate related events in multidecadal, centennial or even millennial timescales. Abrupt changes have occurred numerous times in recent paleoclimatic history, most notably during the last glacial period of the Pleistocene (~110,000-12,000 YBP), sometimes regularly, i.e. the Dansgaard–Oeschger (D/O) events, also called Bond events, and the less frequent Heinrich cold events (stadials), and sometimes irregularly and unexpectedly, i.e. Younger Dryas, Bolling-Allerod, and the 8.2K Cooling Event. These have happened naturally and are still not well understood. In light of the current interglacial, trying to predict WHEN any like occurrence could happen is virtually impossible and quite literally guesswork. It's very unlikely, barring a complete thermohaline/AMOC disruption from ice sheet melting on a severe scale, i.e. a Meltwater Pulse event that spurs multiple cascading catastrophic events, that any consequence from a tipping point would be sudden and catastrophic.

The following summary from IPCC AR5 WG1, Chapter 13, Sea Level Change states:
"In summary, ice-dynamics theory, numerical simulations, and paleo records indicate that the existence of a marine-ice sheet instability associated with abrupt and irreversible ice loss from the Antarctic ice sheet is possible in response to climate forcing. However, theoretical considerations, current observations, numerical models, and paleo records currently do not allow a quantification of the timing of the onset of such an instability or of the magnitude of its multi-century contribution."

The climate system is inherently complex and chaotic. The weather and ultimately the climate is in a constant state of instability and highly nonlinear where multiple components are interacting with the environment and each other randomly and concurrently. Climate models are trying to project an uncertainty, the future climate, while having numerous uncertainties themselves and likely many atmospheric factors we don't understand or even know about yet. Paleoclimatological records show that abrupt climate events can happen without warning and conversely, surprisingly unexpected and conflicting results are also likely to happen with anthropogenic forcing as well. Nonlinearity and chaos do not necessarily mean a future climate event or state will be more or less adverse but it does mean erratic, unpredictable, and unexpected outcomes and reinforces the uncertainty and unknowns of our understanding. There are no absolutes or certainties that can accurately be projected with our current knowledge and methods. There is only non-linearity, chaos, and ultimately uncertainty. That makes determining future reality within a reasonable amount of accuracy, even with the use of wide ranges of variability, not only difficult but conditional, tentative, and inconclusive.

IPCC Third Assessment Report, Advancing Our Understanding, Chapter 14 Executive Summary states:
"The climate system is a coupled non-linear chaotic system, and therefore the long-term prediction of future climate states is not possible. Rather the focus must be upon the prediction of the probability distribution of the systems future possible states by the generation of ensembles of model solutions. Addressing adequately the statistical nature of climate is computationally intensive and requires the application of new methods of model diagnosis, but such statistical information is essential."

Uncertainty, of course, does not mean do nothing. Undoubtedly there is anthropogenic involvement with our current warming and reasonable means should be employed to limit greenhouse gases and pollutants and otherwise, be good stewards of the planet. Uncertainty further enhances the need for a realistic risk assessment climate policy that is sensible, flexible and progressive but not oblivious to

current and future reality either socially, economically, politically, or scientifically. It is important and useful to develop regionalized and localized vulnerability strategies relative to future climate states. As delineated in the study "NONLINEARITIES, FEEDBACKS AND CRITICAL THRESHOLDS WITHIN THE EARTH'S CLIMATE SYSTEM", a well executed vulnerability strategy includes all aspects of environmental risks and identifies any specific regions and localities that may be more susceptible to any particular type of environmental disruption caused by changes in climate. We can use the tools of climate models, paleo records, historical knowledge, and past abrupt worst case scenarios and apply them to current social, economic, and political conditions to develop a workable vulnerability strategy.

Accordingly, we need a reasonable, responsible, targeted, vulnerability-focused, well crafted climate policy that realizes and understands the needs of today and the immediate future as well as preparing us for the uncertainties of the distant future. We cannot let zealous alarmism guide climate policy. We must act in a sensible, rational way and with enough foresight to devise a carefully considered plan of action and not take extreme highly emotional and politically motivated extreme actions that could cause more harm to society than good.

Finally, we need to realize the non-linear, chaotic aspects of climate components and understand the complexities and uncertainties of the future climate and elect leaders who would calmly and rationally evaluate climate policy in light of reality and reason, not extreme hypothetical conjecture based on the most extreme climate state scenarios. Climate hyperbole shouldn't supersede climate policy that is responsible and sensible.

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