

## Preface August 14, 2021

Since the Guide to the Science of Climate Change in the 21<sup>st</sup> Century was first published the global community continued to experience the terror of the Covid-19 pandemic. The solution to control and stop the pandemic in its tracks resulted in the very fast development of several effective and cost-effective vaccines. A very important and amazing scientific success story. It is surprising that the very technology that is now saving hundreds of millions of lives and has the potential to save billions of lives, is actually rejected by significant numbers of affected communities. They, (known as ‘anti-vaxers’) resist being vaccinated on the basis of misinformation shared on the internet, fatalism (if its your time, its your time), political loyalties (insanity), bizarre conspiracy theories that the pandemic is a construct with the intention to destroy western economies, complete ignorance (self sustaining) of how vaccinations protect, and unfortunately, religious grounds (usually something along the lines of how God will protect you); and, there are more reasons offered. A very few people, who wish they could be vaccinated, cannot legitimately take the vaccine for health reasons. The people who reject the vaccine and other precautions such as masking and social distancing, represent a minority of the population; but unfortunately, they still do real damage to the cause of quickly ridding humanity of the virus and many die unnecessarily as a result. This is evident in how the latest variant of Covid-19, the Delta variant, is sweeping the world in what is being called the fourth wave. The consequences are being felt particularly hard in south-eastern United States where the infection rates at this time are at record levels and where there are record hospitalizations (hospital ICUs filled) and many deaths, mostly among the unvaccinated youth. The Delta variant is being resisted by the new vaccines. Those who are vaccinated and do get infected typically are not hospitalized and do not die. This is so ironic because many other parts of the world that don’t have access to sufficient vaccines, and wish they did, are suffering the same consequences. Hopefully, humanity will not repeat the Covid-19 vaccination behaviour as it relates to the action needed to avoid the worst of imminent global warming and climate change.

On August 9, 2021 the Intergovernmental Panel on Climate Change, the IPCC, published the report, AR6 WG1, Climate Change 2021: The Physical Science Basis, (<https://www.ipcc.ch/report/ar6/wg1/#FullReport>), that clearly stated that global warming is real, potentially disastrous for Earth but, there is still time for humanity to take action to avoid the worst. (AR6 means Assessment Report 6. There are five previous assessment reports. Each has three parts, WG1, the physical science basis, WG2, impacts and adaptation, and WG3, mitigation.) It has just been announced that July 2021 has been the hottest month (globally speaking) in recorded history. There are droughts, wildfires and flooding events sweeping the planet that have at the very least been made worse by human caused global warming and climate change.

December 12, 2020 – Fifth Anniversary of the Paris Agreement

August 9, 2021 – Publication of IPCC AR6 WG1, Climate Change, The Physical Science Basis

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The IPCC report of August 9, 2021 is directed to the decision makers, help them develop policy and plans for action. They decide how society, their community in particular, will react to the imminent global catastrophe. The public is expected to understand these actions and support them and this can be a political problem. This is actually the reason behind the production and publication of this Guide and other guides published by several reputable organizations. The objective is to try to inform the public of climate science and how the science is used to describe the seriousness of the impending climate catastrophe using a language that most non-scientific people can understand and written in a manner that they can relate to. It is important that a concerned public can be enabled through education to support the leadership that promises to work at home and participate with world leaders to prevent the worst global warming and climate change might offer.

The science is very good. It is so good that the conclusions arrived at in the IPCC August 9 report can be viewed as accurate and actionable. (Taken to the bank so-to-speak.). Is the science perfect or complete? The answer is no. Science is never perfect or complete and is steadily improved on. That said, our present understanding of how Earth's climate has been, is being and will be affected by human actions (emission of greenhouse gases resulting from the burning of fossil fuels and destructive land use practices and pollution) is sufficient to identify achievable paths for humanity to avoid the worst consequences of climate change and accurately predict the inevitable consequences that we must adjust to. **It is essential that the global community acts now.** I repeat, the science is very good and the analysis and predictions can be viewed as accurate and actionable.

The United Nations Climate Change Conference, Conference of the Parties Number 26 or COP26 as it is known will be held in Glasgow, UK from the 31 October to 12 November 2021 to specifically address the conclusions of the IPCC report of August 9, 2021 with respect to how to mitigate the cause of human caused climate change and adapt to the inevitable impacts – including how to fund these activities. See <https://unfccc.int/process-and-meetings/conferences/glasgow-climate-change-conference> and <https://ukcop26.org/>. COP26 follows the United Nations Convention on Biological Diversity (CBD) Conference of the Parties number 15 (COP15) or CBD COP15 Phase 1 held between the 12 and 13 of October 2021 held in Kunming, PRC <http://sdg.iisd.org/events/2020-un-biodiversity-conference/>, where the achievement and delivery of the CBD's Strategic Plan for Biodiversity 2011-2020 was reviewed and future activities decided. The second part of CBD COP15 will be held from 25 April to 8 May 2022. The world sees human caused climate change as a very serious threat to life on Earth and the nations of the world are again meeting to develop urgently needed strategies to mitigate and adapt to the threat.

In the face of the recent IPCC August 9 report, IPCC COP26 and UN CBD COP15, the denialist community continues their attempts to diminish the legitimacy, scientific thoroughness and relevance of the 'accepted science of climate change'. Their behaviour is analogous to the December 12, 2020 – Fifth Anniversary of the Paris Agreement  
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'anti-vaxer' community. For what purpose? Is the intention to preserve the mining of fossil fuels and protect political entities that depend on the support of the companies mining fossil fuels? Is it an ego thing resulting from personal roots in the fossil fuel industry? Is it some misguided cheap excuse such as the conspiracy theory that the current view of climate change was invented to bring down western economies (similar to the Covid-19 pandemic and vaccinations)? The arguments presented by the denialist communities are ridiculous but there is a substantial gullible public that doesn't wish it to be possible that climate change could be caused by humans. Business as usual is best. The legitimate climate scientists find the denialists' arguments so ridiculous that they do not even address them head on. The view is that the science speaks for itself. Unfortunately, this position has in a twisted way provided fuel to denialist arguments that mainstream climate scientists are afraid of a debate because the denialists might actually have a case. NOT SO!

In the past I have also taken the position that engaging in debates with the denialist community over the validity and strength of climate science was a waste of time. After all the denialist community claims that 'there are two sides to the science', a very bizarre view, that indicates a complete lack of comprehension of what science is. Science is! There are not two sides (can't be a friend to both sides of science).

I personally have been reluctant to challenge the denialist community to a full-on debate because I also felt that it was very odd to attempt to correct the ridiculous and so give it some credibility. (Note that discussions of this type did take place in the class I taught at the University of Calgary for more than a decade where it was an appropriate part of the learning process.) I believe the debate is essential. So, let's debate and begin to clear the air of misinformation.