

A CAUTIONARY TALE FOR GOVERNMENTS AROUND THE WORLD

Part 2



The City of Ottawa's Climate Change Master Plan is Unnecessary

December 7, 2023

There is no climate emergency. The City of Ottawa's climate plan is therefore largely pointless. Even if climate problems did lie ahead, the city's plan is hopelessly naïve and, ultimately, impossible to successfully enable. As we demonstrated in [Part 1 of this report](#), it will also cause great financial pain to residents and the businesses of Ottawa for no environmental benefit. Indeed, enabling the plan would contribute to an ecological and humanitarian disaster.

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1.0 Executive Summary

Canada's capital city, Ottawa, is on the verge of a self-induced crisis. This predicament is being brought on by an obsession with climate change and the fanciful notion that the policies prescribed in the city's recently adopted climate change and energy plans will significantly affect climate at either the local or global level.

In this report, we demonstrate that the main focus of the City of Ottawa on mitigation, reducing greenhouse gas (GHG) emissions to supposedly help "stop climate change," and the drive to achieve net zero emissions by 2050, is largely driven by a misunderstanding of the actual state of today's climate science. Despite the steady drumbeat of climate catastrophism from mainstream media, politicians and climate activists, we show that there is no evidence of a climate emergency in the real-world observational data. In [the 2019 documentary film "Global Warning,"](#) University of Ottawa Earth Sciences emeritus professor [Dr. Ian Clark](#) (now on the ICSC-Canada Science Advisory Panel) explained, "A warming world is not a smoking gun for a CO₂ catastrophe."

In fact, carbon dioxide (CO₂) rise has been highly beneficial, leading to a huge increase in crop productivity, the densification of forests and the promotion of plant growth in regions previously too dry to support photosynthesis. Dr. Richard Lindzen, Professor Emeritus, Department of Earth, Atmospheric and Planetary Sciences at the Massachusetts Institute of Technology, summed up today's the situation as follows:

"What historians will definitely wonder about in future centuries is how deeply flawed logic, obscured by shrewd and unrelenting propaganda, actually enabled a coalition of powerful special interests to convince nearly everyone in the world that CO₂ from human industry was a dangerous, planet-destroying toxin. It will be remembered as the greatest mass delusion in the history of the world – that CO₂, the life of plants, was considered for a time to be a deadly poison."

We also show in this report that it is only in the forecasts of highly flawed computerized climate models that problematic climate change is even a possibility. Those models regularly fail when compared with actual empirical data and so should not be relied upon to make public policy.

In other words, the mitigation components of the city's climate change and energy plans are pointless. The problems they are ostensibly trying to solve do not exist and so most of the estimated \$57.4 billion cost of Ottawa's plans are an inexcusable waste of tax-payer funds.

2.0 Introduction

On April 24, 2019, a resolution to declare a climate emergency was passed by the City of Ottawa town council. As a result of the declaration, two documents were created:

1. **“Energy Evolution,”** prepared by the city’s consultant, Sustainable Solutions, for attaining the goal of “net zero” carbon dioxide emissions by 2050. The document was published in October 2020, and it forms one of the foundations for the City of Ottawa Climate Change Master Plan.
2. **“The Climate Change Master Plan,”** the city’s master plan, first published in January 2020 and amended in Dec 2020, to reach net zero greenhouse gas emissions by 2050 and adapt to warming and related phenomena.

As expected, media, environmental group and politician response was highly supportive. For example:

- Ecology Ottawa stated that “A city like Ottawa – relatively wealthy and highly educated, with no major industry emissions – has an obligation and an opportunity to lead the way.”
- Daniel Buckles of “The People’s Official Plan” stated that “Humanity is facing a climate emergency, and cities are at the centre of the solution—which makes Ottawa’s new Official Plan a once-in-a-generation opportunity to point the city toward a carbon-free, climate-safe future.”
- Then Ottawa Mayor Jim Watson indicated that flooding and tornadoes in Ottawa were caused by climate change. He stated that “There is a connection, and I think when you look at almost every scientific journal and every report that’s come out on climate change, these are not coincidences. They’re actually serious challenges to the planet’s well-being.”

For detailed descriptions of the genesis and specifics of Ottawa’s climate and energy plans, see the Introduction to part 1 of this report at [Ottawa's Climate Change Plan | ICSC - Canada](#) and our open letter to the city at [July 27, 2022 - ICSC-Canada Open letter to City of Ottawa Council.pdf - Google Drive](#). No one on city council has replied to either of these documents despite widespread coverage on the Web.

3.0 No Need for a Municipal Climate Change Mitigation Plan

3.1 Introduction

Citing an article in the UK Guardian newspaper, the Introduction to the City of Ottawa's Climate Change Master Plan begins:

“Around the world, cities are experiencing escalating and accelerated changes due to a significantly warming planet caused by human activity. Worldwide, climate scientists agree that the fast-rising global temperature has created a climate crisis.”

This is unfounded. As can be seen in the graph below, the so-called global temperature* has risen only just over 1° Celsius since the late 1800's. And this despite the fact that most of the early temperature data has been adjusted, some of it multiple times, to accentuate the warming of the past century. Regardless, this slight warming has been beneficial as we recovered from the centuries-long Little Ice Age during which cold conditions caused widespread crop failures and other serious hardships across the world.

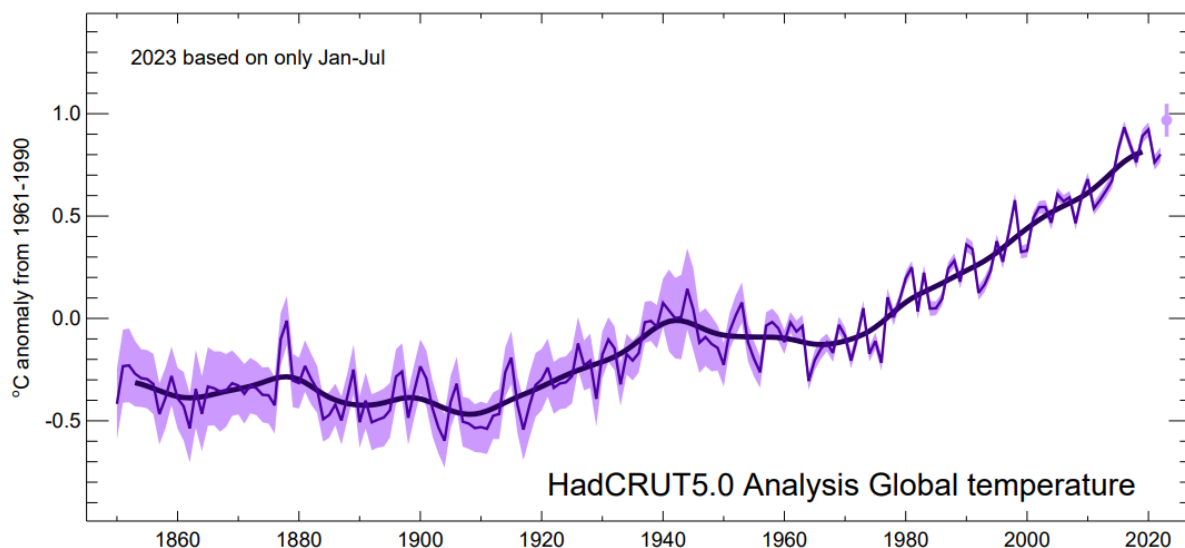


Figure 3.1 HadCRUT 5.0 temperature anomaly plot is a collaborative product of the UK's Met Office Hadley Centre and the Climatic Research Unit at the University of East Anglia

**Strictly speaking, a “global temperature” does not exist. Temperature, like density, pressure, viscosity or any [intrinsic property of a substance](#), is not something that can be averaged to give an average global temperature. Global temperature is merely a statistic that may, or may not, be useful in different circumstances. For more on this topic, see [“Does a Global Temperature Exist?”](#) by Essex, McKittrick and Andresen in the Journal of Non-Equilibrium Thermodynamics.*

While discussing temperature findings from Greenland ice cores, [Dr. Jørgen Peder Steffensen](#), Professor of Physics of Ice, Climate and Earth at the University of Copenhagen [explained](#):

“Around 1875, we have the lowest point in the last 10,000 years, and that matches exactly the time when meteorological observations started... I agree completely that we have had global temperature increase in the 20th century. But an increase from what? Probably an increase from the lowest point we've had for the last 10,000 years. This

means that it would be very hard indeed to prove whether the increase of temperature in the 20th century was man-made or it's a natural variation. That would be very hard because we made ourselves an extremely poor experiment. We started to observe meteorology at the coldest spot in the last 10,000 years!"

The most comprehensive documents about the current state of climate science are the Climate Change Reconsidered series of reports of the Nongovernmental International Panel on Climate Change (NIPCC – see <http://climatechangereconsidered.org/>). Citing thousands of peer-reviewed scientific references published in the world's leading science journals, the NIPCC reports show clearly that today's climate is not unusual and the evidence for future climate calamity is very weak. These documents conclude that we are *not* causing a climate crisis.

The [most recent \(December 2018\) volume of the NIPCC reports](#) concluded:

"...fundamental uncertainties arising from insufficient observational evidence and disagreements over how to interpret data and set the parameters of models prevent science from determining whether human greenhouse gas emissions are having effects on Earth's atmosphere that could endanger life on the planet. There is **no compelling scientific evidence** of long-term trends in global mean temperatures or climate impacts that exceed the bounds of natural variability."

In other words, the modest changes we now see in climate are almost certainly natural.

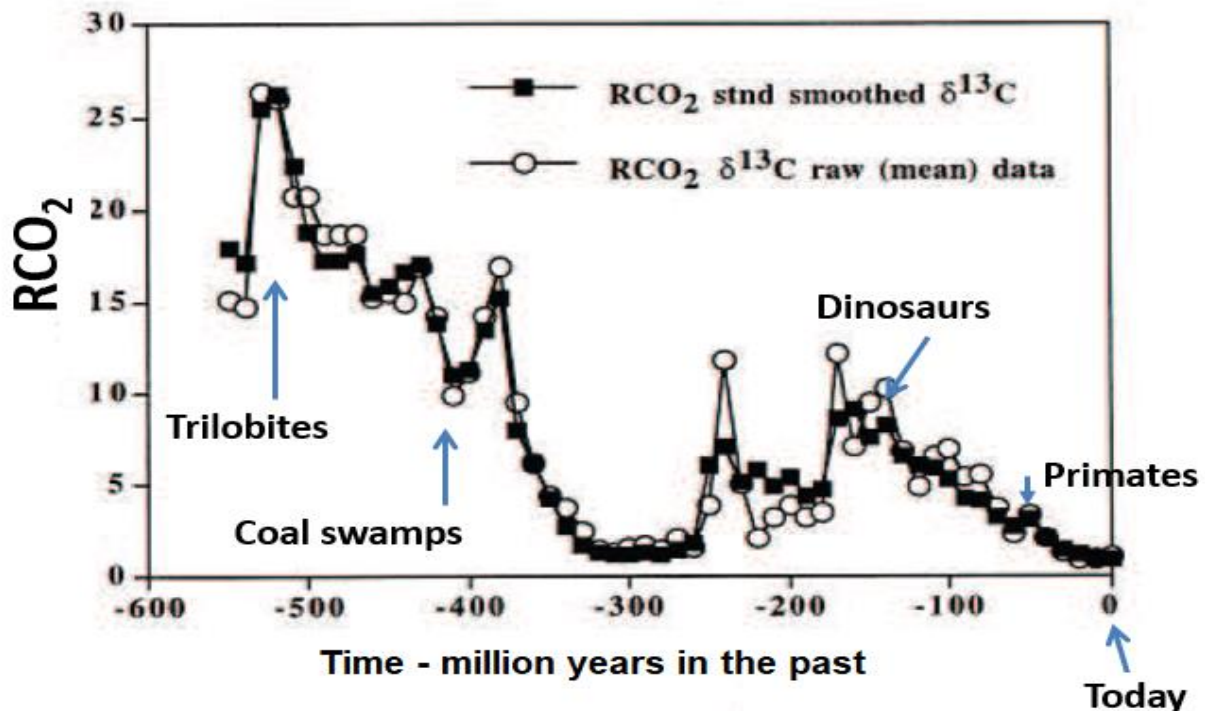
Yet, like in many jurisdictions across the world, the City of Ottawa's *Declaration of Climate Emergency*, its *Energy Evolution* document and the *Climate Change Master Plan* are all based on popular, though unjustified, climate science myths. Fully correcting these beliefs is beyond the scope of this report, but ICSC-Canada makes the comments on the following pages after samples of the city's implied or directly-stated climate science assumptions.

3.2 Climate Science Myths

3.2.1 Climate Science Myth #1: Carbon dioxide is a dangerous pollutant that must be controlled. The city regularly refers to the gas as “carbon pollution” in its documents.

The facts: Carbon dioxide (CO₂) is anything but pollution. It is an invisible, non-toxic, trace, natural component of the atmosphere, allowing plants, and thus all life on Earth, to thrive. Contrary to the assertions of activists, politicians and most mainstream media, the figure below demonstrates that we are close to the lowest levels of CO₂ in Earth’s history.

**The Earth has been in a CO₂ famine
for several tens of millions of years**
 $RCO_2 = \text{past CO}_2 / \text{today's CO}_2$



R. A. Berner and Z. Kothavala, *Geocarb III: A Revised Model of Atmospheric CO₂ over Phanerozoic Time*, American Journal of Science, V. 301, pp. 182-204 (2001)

Figure 3.2 Graph shown by Dr. William Happer, Professor of Physics Emeritus at Princeton University, in a November 15, 2021 presentation hosted by the Climate Intelligence Foundation (CLINTEL) in Amsterdam

Former ICSC-Canada director the late Dr. Jay Lehr provided the figure below. It also illustrates how low atmospheric concentration of CO₂ actually is today. The human-made portion is only about a quarter of that. It is also important to recognize that, as plants have evolved over long time frames, the average level of CO₂ in the atmosphere was about three times today's levels.

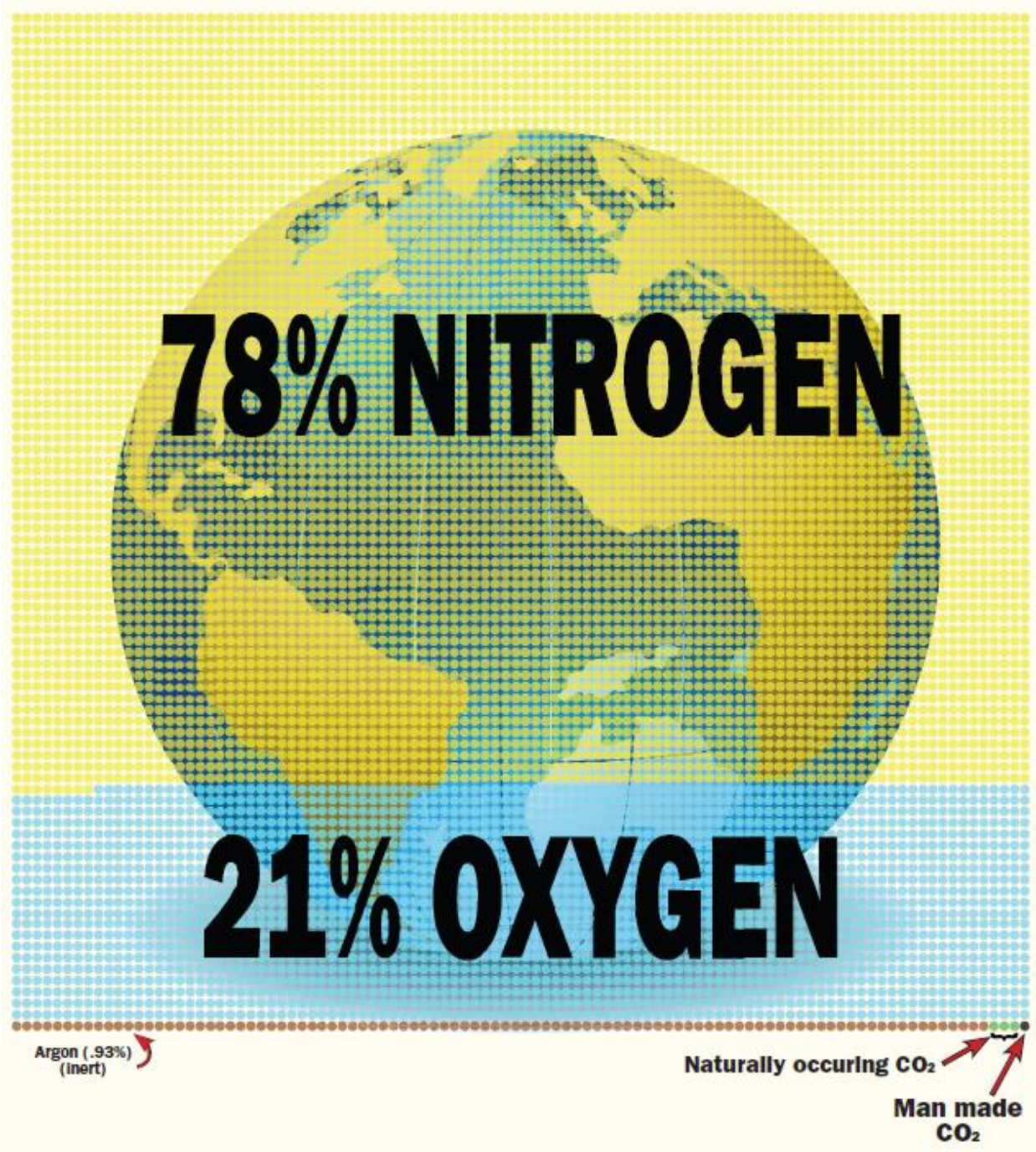


Figure 3.3 The constituents of Earth's atmosphere

To properly understand all this, we need to remember our high school science:

Earth's atmosphere now contains just over 0.04% CO₂, 78% nitrogen, and 21% oxygen. Even if our CO₂ emissions increased 10-fold, the atmosphere would still only contain trace amounts of this benign gas. Photosynthesis converts CO₂ into organic plant matter. When organic matter reaches the ocean floor, it can be sequestered for millions of years, creating petroleum reserves. Similarly, on land, organic matter is sequestered in peat and coal deposits.

During the Carboniferous Period approximately 360 – 300 million years ago, when CO₂ levels are thought to have been higher than today, plants rapidly colonized the land and large amounts of carbon were sequestered on land and in the oceans. This dramatically reduced atmospheric CO₂, falling from several thousand ppm (parts per million) to far lower levels, finally about 180 ppm, dangerously close the level at which plants start to die (150 ppm or 0.015%), during the last glacial maximum about 20,000 years ago. By the beginning of the Industrial Revolution levels had risen to 280 ppm and, since then, CO₂ levels have risen about 50% and now stand at about 419 ppm.

Since photosynthesizing plants evolved in a relatively high CO₂ environment, they become partially starved for CO₂ when levels are low as today. This is why greenhouse operators inject an extra 1,000 ppm of CO₂ into their greenhouses to stimulate plant growth. Not surprisingly, rising atmospheric CO₂ is significantly helping plant growth across the world. According to NIPCC's [Climate Change Reconsidered II: Biological Impacts](#) report:

“Long-term CO₂ enrichment studies confirm the findings of shorter-term experiments, demonstrating numerous growth-enhancing, water-conserving, and stress-alleviating effects of elevated atmospheric CO₂ on plants growing in both terrestrial and aquatic ecosystems.”

Indeed, as explained in the [Aug. 23, 2021 ICSC-Canada's Climate Change Minute](#), increasing CO₂ is “greening” the world with the stimulation of plant productivity, which has occurred in spite of fires, disease, pest outbreaks, and deforestation. NASA released the image and video on the next page of this document, reporting (“[Carbon Dioxide Fertilization Greening Earth, Study Finds](#),” April 26, 2016):

“From a quarter to half of Earth's vegetated lands has shown significant greening over the last 35 years largely due to rising levels of atmospheric carbon dioxide, according to a new study published in the journal *Nature Climate Change* on April 25.

NASA continued:

“An international team of 32 authors from 24 institutions in eight countries led the effort, which involved using satellite data from NASA’s Moderate Resolution Imaging Spectrometer and the National Oceanic and Atmospheric Administration’s Advanced Very High Resolution Radiometer instruments to help determine the leaf area index, or amount of leaf cover, over the planet’s vegetated regions. The greening represents an increase in leaves on plants and trees equivalent in area to **two times the continental United States.**”

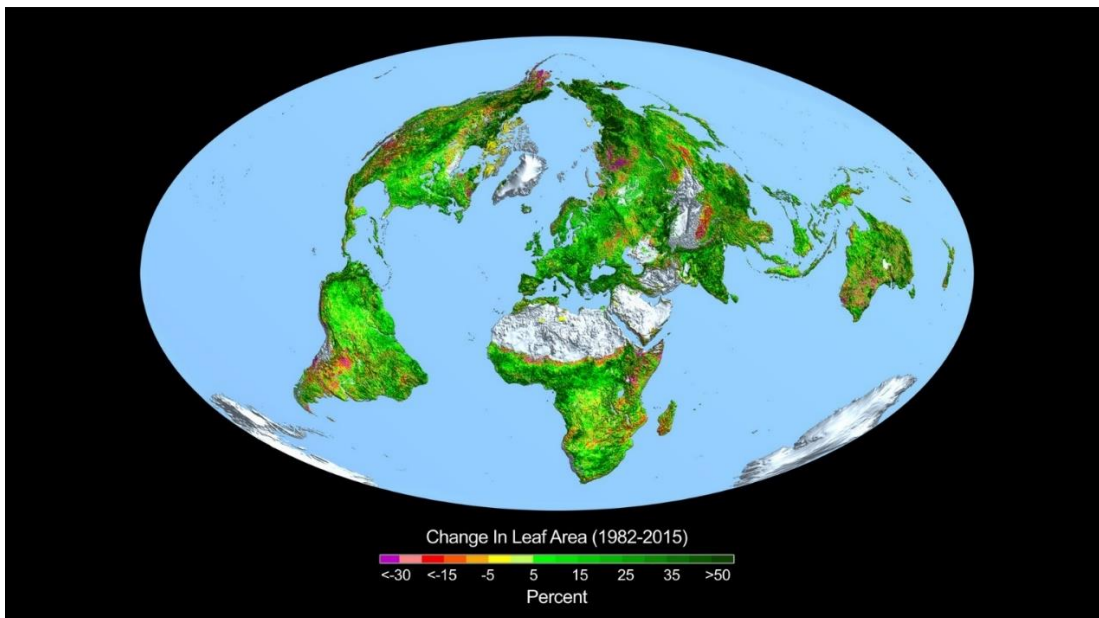


Figure 3.4 This image shows the change in leaf area across the globe from 1982-2015.
Credits: Boston University/R. Myneni



Figure 3.5 – NASA video showing the ‘greening’ of Earth from rising CO₂. Click on image to play.

In 2020, NASA [confirmed](#) that this beneficial trend is continuing, concluding:

“The paper’s authors reviewed more than 250 published articles that have used satellite data, modeling, and field observations, to understand the causes and consequences of global greening. Among the key results, the authors noted that on a global scale greening can be attributed to the increase of carbon dioxide in the atmosphere. Rising levels of carbon dioxide increase the rate of photosynthesis and growth in plants...According to climate models, the future looks even greener.”

According to an October 2021 [paper](#) from Columbia University’s Charles A. Taylor and Wolfram Schlenker, since 1940 in the United States, there has been a 10% increase in corn yield, a 30% increase in soybean yield and a 40% increase in wheat yield, all “attributable to rising CO₂.”

In fact, [many studies](#) have shown that elevated atmospheric CO₂ is positive for plants. Forest productivity and growth rates have also been increasing since the Industrial Revolution, and the Earth’s vegetation will be able to hold more carbon dioxide, muting any effects of possible carbon dioxide-induced global warming. In Figure 3 below, from NIPCC’s [Climate Change Reconsidered II: Biological Impacts](#) report, we can clearly see the positive impact of carbon dioxide on plants and trees.

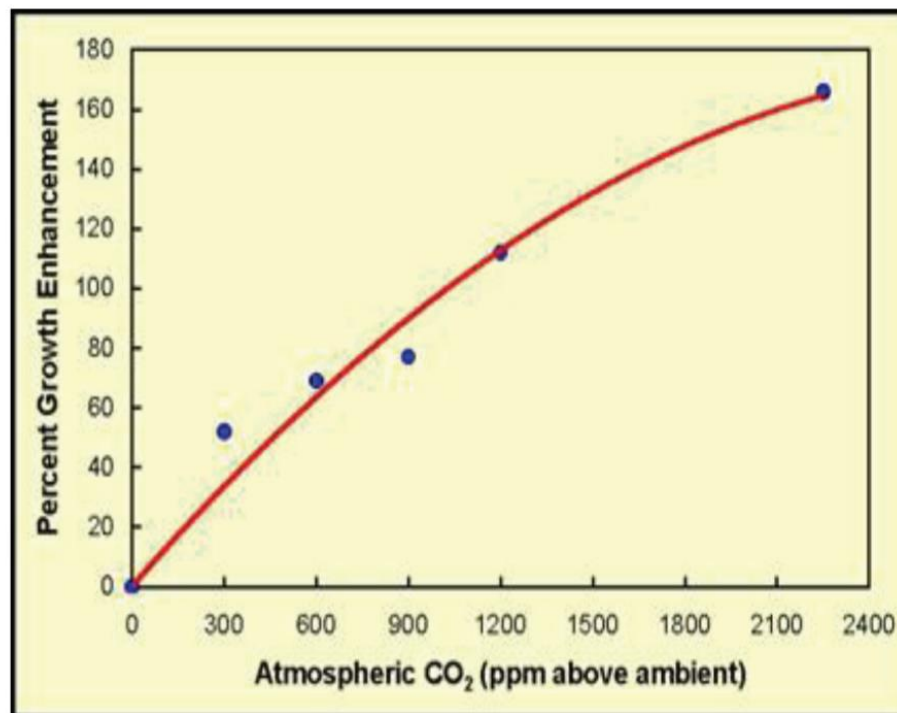


Figure 3. Positive Impact of CO₂ on Plants and Trees.
Adapted from Idso, K.E. (1992).

Figure 3.6 – Carbon dioxide rise benefits plants and trees

Moreover, numerous animal species, including amphibians, birds, insects, reptiles, and mammals, have thrived throughout the world as a result of warming temperatures and rising levels of atmospheric CO₂. Aquatic life also benefits from increased CO₂. The NIPCC report cited above states:

“Any projected adverse impacts of rising temperatures or declining seawater and freshwater pH levels (‘acidification’) will be largely mitigated through phenotypic adaptation or evolution during the many decades to centuries it is expected to take for pH levels to fall.”

Furthermore, as CO₂ levels rise, stomata, the pores in plant’s leaves, are open for shorter lengths of time. Plants therefore lose less water to the air and so they may grow in drier environments such as semi-arid areas like the sand banks on oceans and lakes. This also acts to stabilize the soil and it also allows more moisture to stay in the soil, reducing fire risk.

In [his May 8, 2023 interview with Biz News](#) ecologist and founding member of Greenpeace Dr. Patrick Moore (now a member of ICSC-Canada’s board of directors) summed up the good news:

“We have increased the amount of CO₂ in the atmosphere by about 50%. And this is one of the best things that has happened in the history of life. And humans did it inadvertently, just like the shellfish inadvertently caused the CO₂ to decline so drastically over half a billion years. We have come back and saved life from a certain demise. No other species could do this.”

Speaking at 2019 seminars in Montreal and Toronto, Dr. Moore showed a slide that spelled out the situation clearly:

“Our CO₂ Emissions have Reversed the 150 million-Year Decline in CO₂ and Restored a Balance to the Global Carbon Cycle. We have saved Life on Earth from an Early Demise.”

He then showed the graph on the next page (to which has been added current and pre-industrial CO₂ levels) which well illustrates this point.

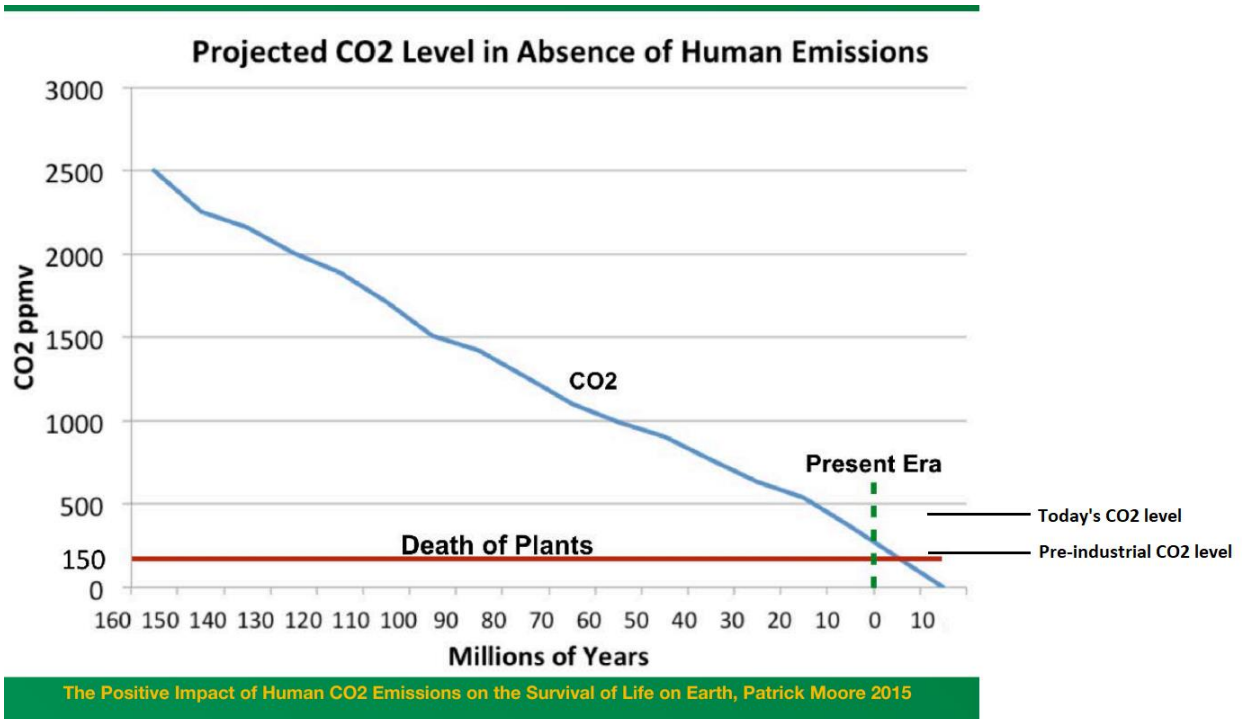


Figure 3.7 - Human release of CO₂ may have saved life on Earth

No one should fear rising CO₂ levels; they have been much higher in the past and no climate catastrophe occurred. The recent rise is working to green the Earth and benefit everyone.

3.2.2 Climate Science Myth #2: Climate and related changes that we have witnessed in recent decades are abnormal and dangerous.

The facts: No knowledgeable person doubts that Earth’s climate has been changing since the planet’s formation of 4.5 billion years ago. Testifying before the House of Commons Standing Committee on Environment and Sustainable Development on February 10, 2005, Professor Tim Patterson of Carleton University, now Chair of Earth Sciences, [put it well](#):

“Based on the paleoclimatic data I and others have collected, it’s obvious that climate is and always has been variable. In fact, the only constant about climate is change; it changes continually. We certainly have no chance of stopping this natural phenomenon.”

The changes that we witness today are minimal compared to what has occurred throughout geologic history. Consider, for example, the most recent glacial maximum that ended about 20,000 years ago. Glaciers covered most of North America all the way down to just south of the present-day border between Canada and the U.S. There was about 3.3 km of ice over the land where Montreal now sits. That’s almost 5 and a half times the height of the CN Tower. Apart from a small area in the Yukon where there was little snow and ice cover due to low moisture levels in the atmosphere, practically no plants and animals survived in Canada.

Then, Patterson explained in the Financial Post in 2006, “Ten thousand years ago . . . temperatures rose as much as 6 degrees C in a decade.” **This is about 50 times faster than what we have seen over the past century.**

Sea level was 120 m lower during the last glacial period than today, allowing people and animals to cross the Bering Land Bridge and enter North America. Current sea level changes pale in comparison to such massive upheavals. It is also important to recognize that, during the Cretaceous period when dinosaurs roamed the Earth, there were no ice sheets, and high latitude regions contained forests. Indeed, dinosaurs also inhabited Antarctica.

By recognizing the vast changes that have occurred in the past, we can better understand that what we observe today is natural and in no way unusual or catastrophic to life. We are actually in a period of relative climate tranquility.

Speaking at a panel held in Katowice, Poland while the UN’s 2018 climate conference (COP24) was being held, Dr. Craig Idso, a lead author for Climate Change Reconsidered series of reports, said:

“Given what is compiled in those reports and the thousands of peer-reviewed scientific references therein, I can tell you with complete confidence that there is absolutely no observational evidence that provides any compelling support for the contention that there is something unusual, unnatural or unprecedented about Earth’s current warmth. Neither are there any real-world data that confirm that floods, droughts, wildfires or hurricanes are becoming either more frequent or more severe as a result of global warming.”

Let's consider this issue in more detail under several headings: temperature, extreme weather, flooding, snow cover, sea level, and wildfires.

3.2.2.1 Temperature Change

Earth's "average temperature" today is in no way unusual. Yes, some regions have recently set new temperature records, for example, the polar darkness period from April to September 2021 was the coldest on record near the South Pole (-61°C according to the U.S. National Snow & Ice Data Center). But Fritz Vahrenholt, CEO of the German Wildlife Foundation, and the former CEO of a wind turbine company, was correct when he said in the 2019 documentary film "[Global Warning](#),"

"... what we could show [in published in peer reviewed journals] is that the medieval warm period from 950 to 1250 was as warm as today. The IPCC said, yes, it is only in Northern Europe. So, what we did is we investigated South America, we investigated Africa, Antarctica, Oceania and could show in all continents of the Earth it was as warm as today, 1,000 years ago... And if you go further to the Roman period, you have the same thing every thousand year you have a warm period."

There is no question that climate change has had a huge impact on human affairs. The plot of temperature versus time for Central Greenland on the next page is a good illustration of the natural climate change we have seen over the past four thousand years and the related societal impacts. Note how cold periods coincided with hardships for humanity while, in most cases, warm periods were beneficial. Contrary to the proclamations of climate activists, every year more people die from the cold than from the heat. A study in the British Medical journal *The Lancet* found that,

"Cold weather kills 20 times as many people as hot weather, according to an international study analyzing over 74 million deaths in 384 locations across 13 countries."

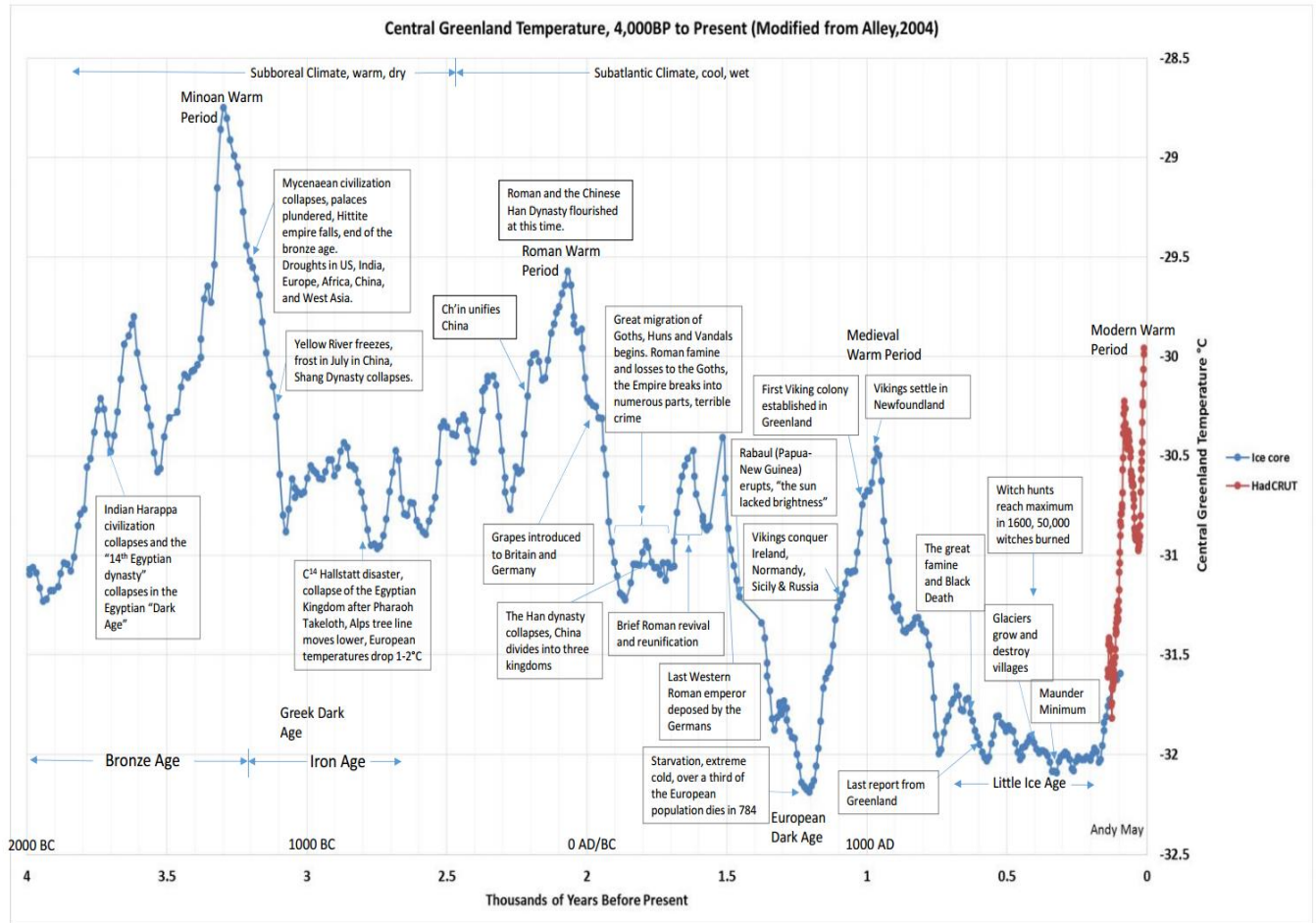


Figure 3.8 – Humanity thrived in warm periods and suffered in cold ones; from petrophysicist [Andy May](#).

We should be thankful that we entered the Modern Warm Period about a century and a half ago. Before that, we were in the Little Ice Age which some scientists think was the longest sustained cold spell in the last 10,000 years and at a temperature just above the minimum temperatures for that time frame. For more on the Little Ice Age, see [CO₂ Science](#).

If you go far back in geologic times, you have even more evidence that today's temperatures are normal. Note that in the plot of temperature and CO₂ over the past 4.6 billion years on the next page, the estimated range in temperatures of Earth is from about 12°C to 25°C, with the mean of about 17°C.

Clearly, we are at the low-end today at 15° C as we are still warming from the last glacial period, which ended over 10,000 years ago (note also how weak the correlation between CO₂ and temperature is in the graph on the next page).

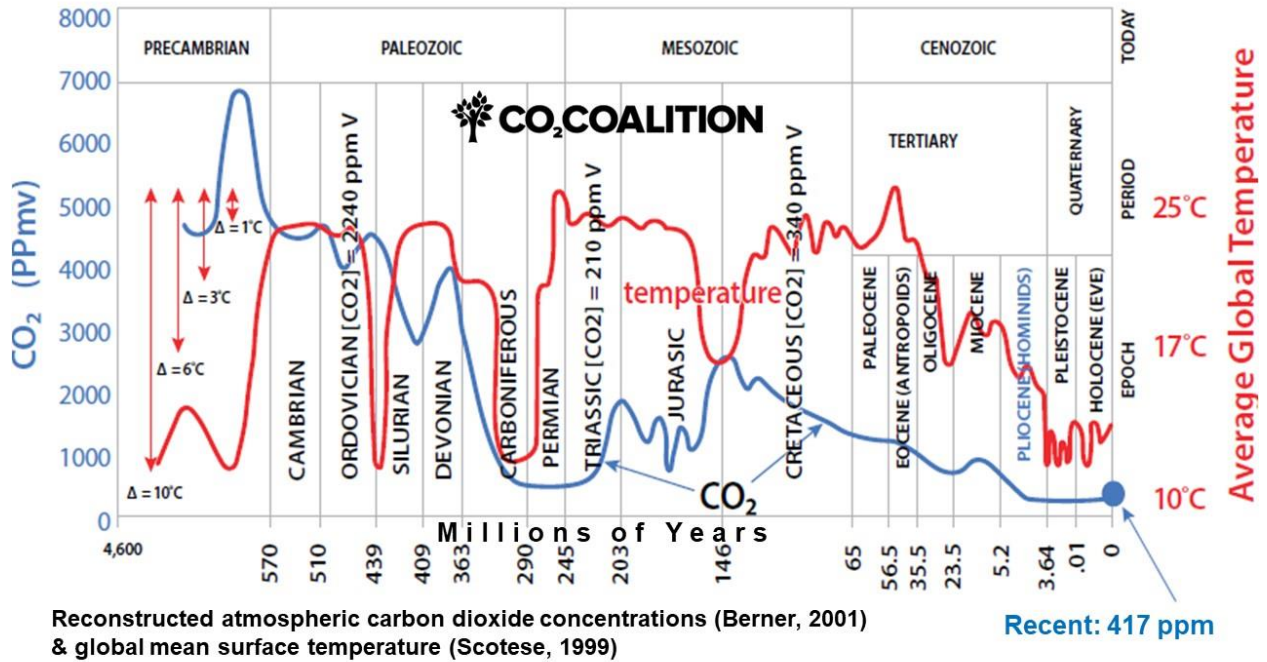


Figure 3.9 – There is no consistent correlation between temperature and CO₂. Image courtesy of [CO2 Coalition](http://CO2Coalition.com).

The modest, beneficial warming that has been experienced across the world since the end of the Little Ice Age, slightly more than 1° Celsius, has mostly stopped, as can be seen in the following satellite-based temperature record. Although the November 2023 average temperature was the second warmest in the satellite record, it was still less than a degree Celsius higher than the 1991 – 2020 average.

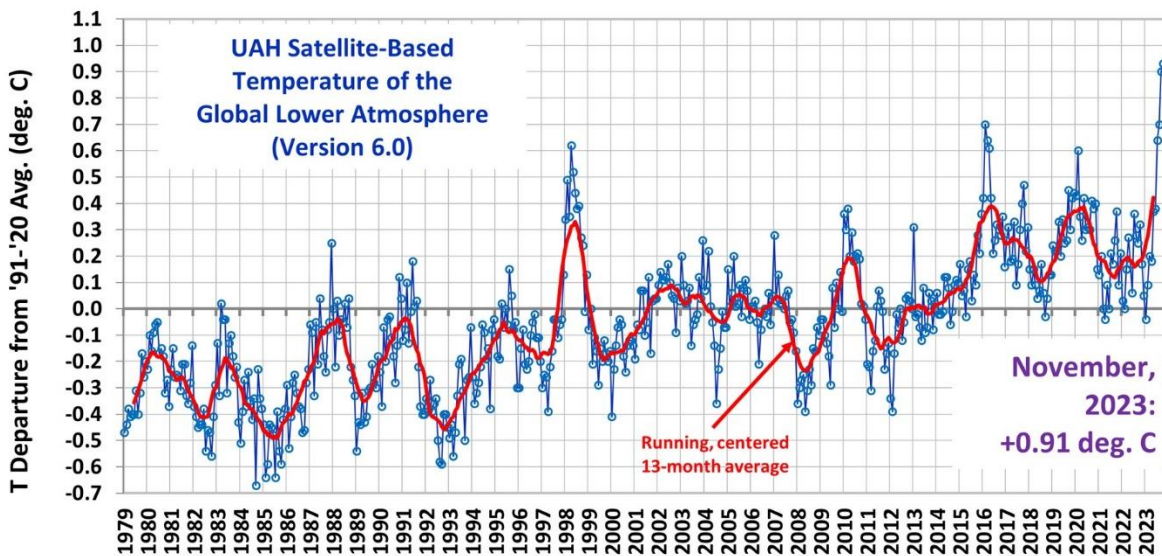
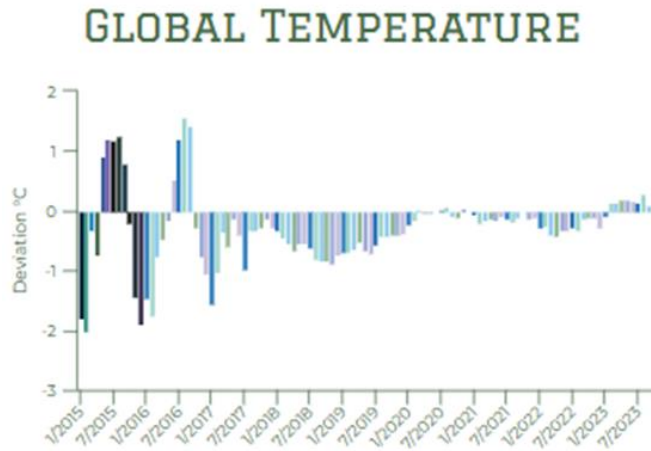


Figure 3.10 – The temperature rise as determined from satellite data has been very small.

No informed person would call the above temperature record “fast-rising” or a “climate emergency,” as proclaimed by the City of Ottawa.

It is also important to note that an average of actual surface temperature measurements taken around the world and processed on a minute-by-minute basis by a website called [Temperature.Global](https://www.temperature.global) (created by professional meteorologists and climatologists with over 25 years experience in surface weather observations) shows lower than usual temperatures for each of the past eight years (see graph at right). They list the previous yearly averages as follows:

- 2015 average: 0.98 °F (0.54 °C) below normal
- 2016 average: 0.48 °F (0.27 °C) below normal
- 2017 average: 0.47 °F (0.26 °C) below normal
- 2018 average: 1.33 °F (0.74 °C) below normal
- 2019 average: 0.65 °F (0.36 °C) below normal
- 2020 average: 0.00 °F (0.00 °C) below normal
- 2021 average: 0.20 °F (0.11 °C) below normal
- 2022 average: 0.47 °F (0.26 °C) below normal.



Average (Jan 2015-Oct 2023): -0.274°C
 Source: Temperature.Global
 Data: NOAA global METARs 2015-current
 NDBC global buoy reports 2015-current
 MADIS Mesonet Data, NOAA OMOs
<https://temperature.global>

BEAM venngage.com/beam

Figure 3.11 - The current temperature is the 12 month average mean surface temperature over the last 12 months compared against the 30 year mean.

Ottawa temperature changes have not been problematic over the past century either. Winter temperatures have risen since 1938, a trend few Ottawans would not welcome, almost certainly primarily due to the urban heat island effect, not greenhouse gas (GHG) emissions. Here are the winter trends for the Ottawa Airport between 1938 and 2010, for example:

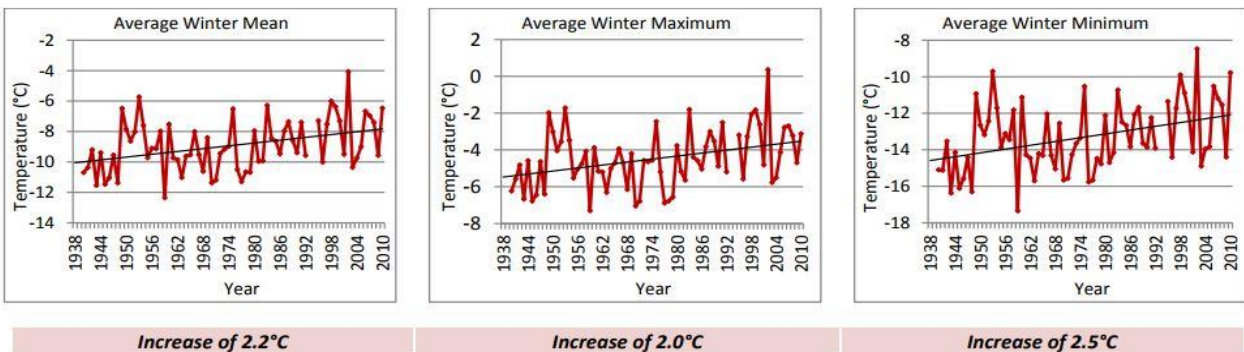


Figure 3.12 – Ottawa winter temperatures to 2010

The Climate Change Master Plan asserts that in Ottawa, “On average, summers are getting hotter...”

That is true but irrelevant. For example, Ottawa airport summer maximum temperatures have not increased at all as can be seen in the centre chart on the next page. Other Canadian cities show similar trends. The mean Ottawa summer temperature (left plot) is increasing slightly due to the minimum at night (right plot) increasing.

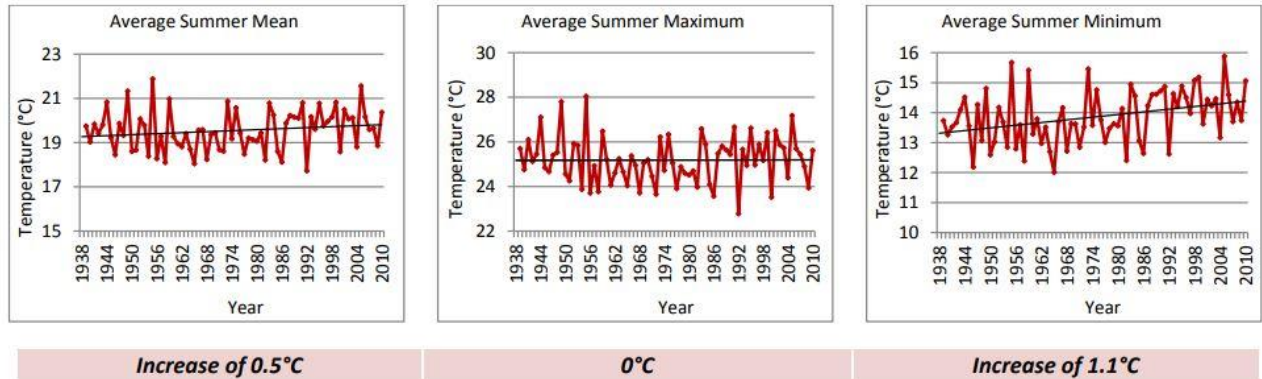


Figure 3.13 – Ottawa summer temperatures to 2010

As can be seen in the following graph from [Ottawa Annual Weather Averages - Ontario, CA \(worldweatheronline.com\)](http://www.worldweatheronline.com), there has been no significant change in temperatures in Ottawa across the seasons since 2010, the end point of the above plots.

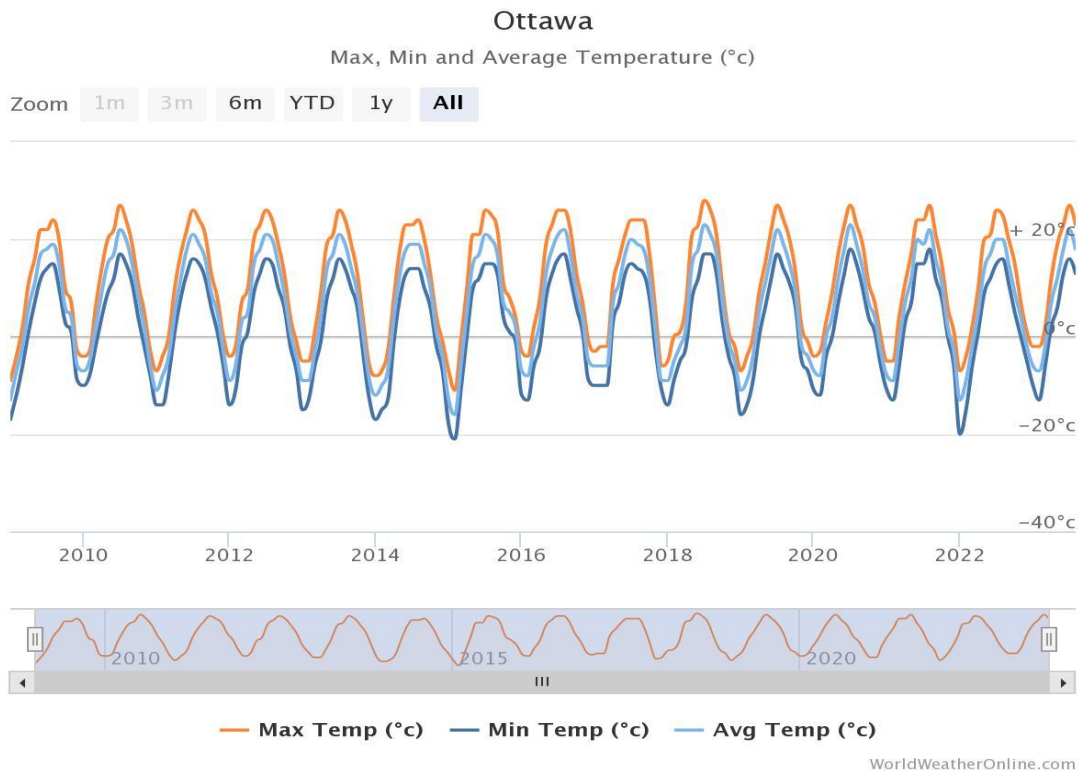


Figure 3.14 – Ottawa temperatures since 2010

Other Ottawa temperature stations display similar trends, with the station at Hog's Back even showing a reduction in maximum temperatures over the years:

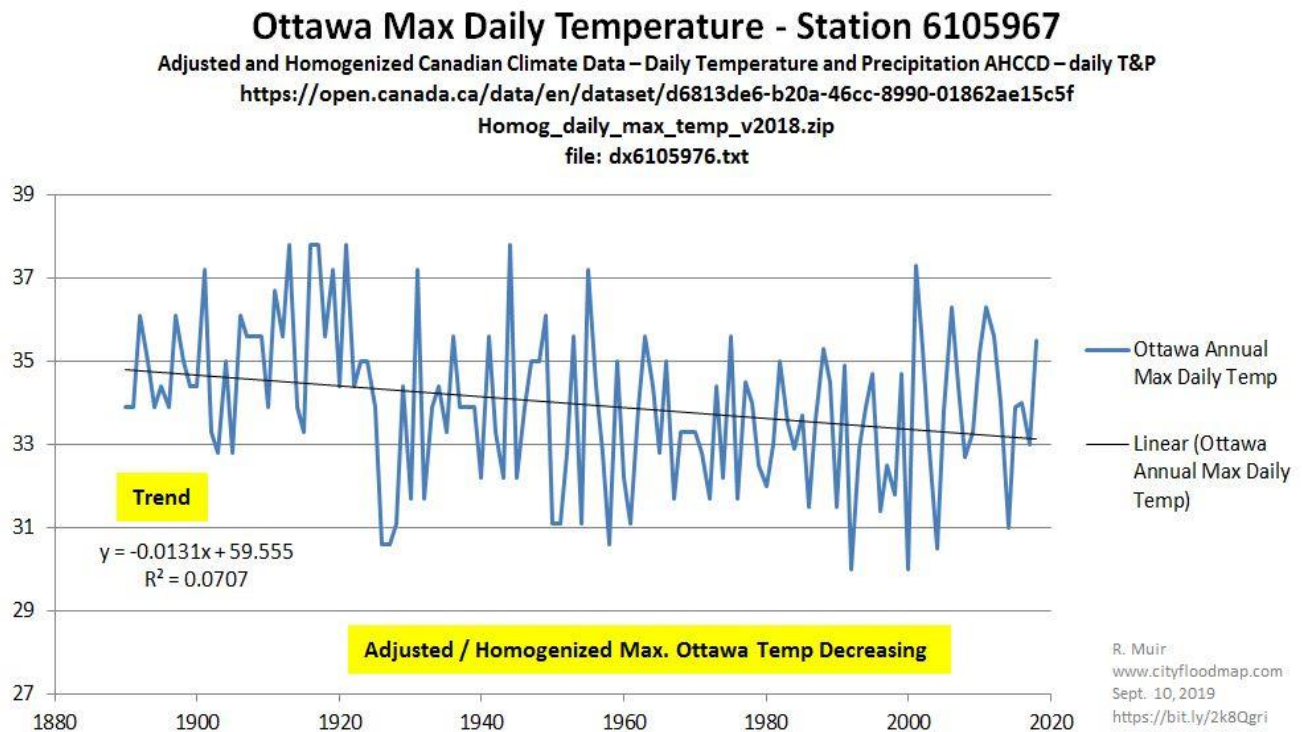


Figure 3.15 – Hog's Back, Ottawa maximum temperatures dropping

Even the IPCC indicates low confidence (~20%) for the detection of trends in extreme heat and the attribution of such trends to human causes for both central and eastern North America.

3.2.2.1.1 The Sun's possible influence on temperatures

Temperature trends apparently follow in accordance with solar cycles, and indeed, we may be entering a Grand Solar Minimum when the Sun could be at its weakest in the past 300 years. This could result in significant global cooling, something Ottawa needs to prepare for. Professor Patterson warned the Canadian government about this as far back as December 15, 2011 when [he testified before the Senate Standing Committee on Energy, The Environment and Natural Resources](#). While describing his research, Dr. Patterson said:

“In that record, we discovered repeated cycles in marine productivity that correlate very well with cycles in the brightness of the Sun. And this was not unique. **And hundreds of other studies have shown exactly the same thing, that the Sun and not variations in carbon dioxide, the gas that's most targeted by Canada's national climate change campaigns, appears to be *the* most important driver of climate change.**”

“Solar scientists predict that by later in this decade, the Sun will be starting into its weakest solar cycle of the past two centuries, and this will likely lead to unusually cool

conditions on Earth, which may persist for decades. And planning for an adaptation to such a cool period should be the primary position for governments. **And it's global cooling, not warming that is a major climate threat to the world, and this is particularly true for Canada with such a high latitude nation as we have, where agriculture is right at the edge of where we can farm."**

More recently, the Epoch Times [reported](#) on November 23, 2021:

"In an exclusive interview, scientist Valentina Zharkova told The Epoch Times that her [2015 paper](#) predicting the onset of a grand solar minimum between 2020 and 2053 has been borne out, prompting her to warn that temperatures could soon rapidly fall.

"Grand solar minima last for multiple solar cycles, during which the Sun produces less energy and sunspot activity is low. During a previous grand solar minimum, the [Maunder minimum](#) between 1645 and 1715, glaciers expanded and the River Thames in England frequently froze over."

[Professor Zharkova](#) has a PhD from the Solar Division of the Main Astronomical Observatory, Kyiv, Ukraine. She is now a Professor in Mathematics at Northumbria University in the United Kingdom. In "[Modern Grand Solar Minimum will lead to terrestrial cooling](#)," her editorial published on August 4, 2020 in the journal *Temperature*, which publishes papers related to interactions between living matter and temperature, Professor Zharkova wrote:

"This period [upcoming grand solar minimum in which solar magnetic field and its magnetic activity will be reduced by 70%] has started in the Sun in 2020 and will last until 2053. During this modern grand minimum, one would expect to see a reduction of the average terrestrial temperature by up to 1.0°C, especially, during the periods of solar minima between the cycles 25–26 and 26–27, e.g., in the decade 2031–2043.

Professor Zharkova continued:

"The reduction of a terrestrial temperature during the next 30 years can have important implications for different parts of the planet on growing vegetation, agriculture, food supplies, and heating needs in both Northern and Southern hemispheres. This global cooling during the upcoming grand solar minimum 1 (2020–2053) can offset for three decades any signs of global warming and would require inter-government efforts to tackle problems with heat and food supplies for the whole population of the Earth."

The city has included, as a secondary objective in its Climate Change Master Plan, adaptation to climate change. However, it focused *only* on the threat of dangerous warming and its associated impacts. Included in the [Climate Change Master Plan 2021 Status Update](#) was reference to the following now being included in the city's Official Plan: "Reduce the urban heat

island effect and help protect the vulnerable from extreme heat.” Despite asserting that “Ottawa must be an energy conscious city where people can live, work and play in all future climate conditions,” cooling adaptation requirements *were entirely ignored*. This, despite the fact that cooling is a far more threatening for a high latitude city like Ottawa and so, just as for Canada as a whole, should be the primary focus of any adaptation planning for our city.

3.2.2.1.2 Ottawa’s Plans Based on Models that Over-forecast Warming

The figure below is included on page 11 of the City of Ottawa’s New Official Plan, the revised version of which was [adopted](#) by the City of Ottawa Council on November 24, 2021.

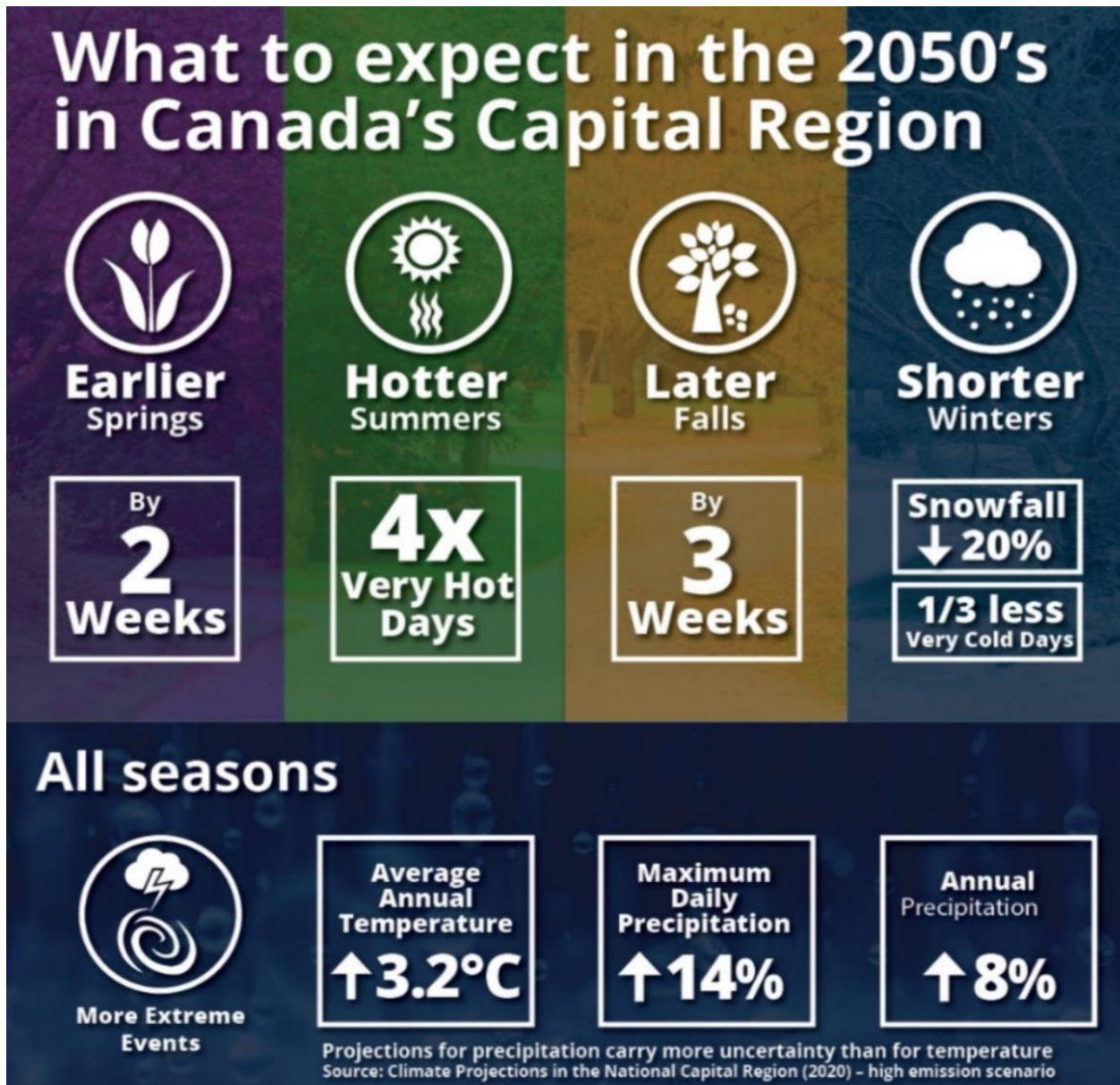


Figure 3.16 – “What to expect in the 2050’s” – from City of Ottawa’s New Official Plan

When shown the figure on the previous page, ICSC-Canada Science Advisory Panel member, consulting meteorologist [Dr. Madhav L. Khandekar](#), a former Environment Canada Research Scientist, responded (September 29, 2021):

“Many [of these] items are mostly projections based on climate models, which, as we know, are 'RUNNING HOT!' These projections have been found to be notoriously exaggerated and have proved wrong. [They are] NOT based on past or recent weather/climate data.

“For example, Ottawa snow clearing expenses are increasing in recent years: In 2018 Ottawa had a short fall of over seven million Canadian dollars in snow clearing expenses. At present snow clearing costs about \$70M to \$75M for Ottawa. To expect snowfall decreasing by 20% by 2050 is a stretch; there is absolutely no past or recent evidence to suggest such a large decrease in snow fall in just 30 years; these projections are highly speculative and cannot be relied upon for any long-term or even short-term planning.

“Same is true for increase in annual mean temperature: Expecting mean temperature for Ottawa to increase by 3.2°C in next 29 years is purely speculative and highly exaggerated.

“If one takes Ottawa temp records, the mean temperature over 120 or more years for which good temp data are available, we find mean temperature rising by only about 1°C or so at most. So, by extension, mean temperature over next 30 years may rise, if at all, by about 0.5°C at most. **Any suggestion that mean temperature will rise by over 3°C in next 30 years is simply an alarmist projection and has no scientific merit.**

“Further, as the Sun enters a grand solar minimum in next decade or about, we could see a significant drop in Ottawa's mean temperature in next 30 years, NOT a rise as suggested here.”

3.2.2.1.3 Getting Real About Temperature Rise

A common refrain from the climate activists is “1.5 to stay alive.” Indeed, the United Nations Intergovernmental Panel on Climate Change (IPCC) advocates that we make greenhouse gas emission reductions adequate to limit global warming to 1.5°C above pre-industrial levels. The IPCC even published a special report in 2018 titled “[Global Warming of 1.5°C](#).” The City of Ottawa cite this 1.5°C limit no less than 25 times in their Climate Change Master plan. But this makes no sense. Given that, according to the World Meteorological Organization report on the [State of the Global Climate 2020](#) released in April 2023, we are already at 1.2°C above pre-industrial levels, most people can see that an additional three-tenths of a degree rise in a statistically computed “global temperature” is largely inconsequential.

Determining a temperature rise from pre-industrial levels requires that we know what the temperature was long ago and that we know what it is today. ICSC-Canada board member [Dr. John McLean](#) explains that neither criterion is met by the temperature data from HadCRUT that is being used to back up trillion-dollar policy decisions around the world. McLean said,

“Today, about 85% of the world is covered with temperature data. I recently looked closely at the HadCRUT5 data, especially between 1850 and 1900. I wanted to see if the data collection was comparable to recent data. It's not by a long way. What data we have from back then are from very variable coverage (annual average coverage from about 14.5% to 49%), very different number of weather stations, and it isn't homogenous around the world but focussed heavily on Europe, the Atlantic Ocean and the voyages from Europe to Indonesia and Hong Kong. And, it wasn't until 1949 that we started to get temperature data from even 50% of the southern hemisphere.

“The newest version of the composite data from weather stations, the CRUTEM5 dataset, has no data for the southern hemisphere - and therefore no global average - until January 1857. The previous version, CRUTEM4, did have global averages, but in 2018 it was pointed out to the CRU people that there was very little data from the southern hemisphere in the early years after 1850, including that *a single weather station provided the only data from January 1850 to June 1852*. Of course, they should have already recognised this and taken action rather than claiming how accurate their global averages were, but, with enough pushing, they've finally accepted that coverage of the southern hemisphere was far too small to claim that, when data from both hemispheres were combined, there was sufficient to label the result a global average.

“What's even more dishonest is claiming that climate models are sufficiently accurate that they can meaningfully work backwards from the scant 1850-1900 data to define what the global average temperatures were in true pre-industrial times [i.e., 1720 – 1800 is the pre-industrial date range suggested by [this paper](#) in the Bulletin of the American Meteorological Society].”

"Therefore, the actual 'global temperature' rise since pre-industrial times is really unknown," said Dr. McLean.

He concluded,

“we've only been measuring temperature for about 170 years... Proxy temperature measurements are used for earlier times, but they are a poor substitute for genuine measurements. **The climate paranoia is over something that we have relatively little experience, and very little data, of.**”

For more on this topic from Dr. McLean, listen to:

- [“Governments Must Stop Using Unverified Data for Climate Fear,”](#) Dr. McLean interview on Tom Harris’s America Out Loud Talk Radio network talk show, August 21, 2023
- Two March 2021 podcasts on *Exploratory Journeys with Tom Harris*, Episode 33 and 34 at [Spreaker](#).

3.2.2.2 Extreme weather

The City of Ottawa expresses concern over extreme weather, but this has little basis in reality. Environmental activists often point to last year's derecho (a derecho is a long-lived, widespread, straight-line windstorm associated with a rapidly-moving group of severe thunderstorms) that seriously damaged Ottawa's Merivale power station and left many in the region without electricity as a sample of extreme weather caused by climate change. But the IPCC actually states, concerning extreme winds (between 60S and 60N; Ottawa is at about 45N):

“the observed intensity of extreme winds is becoming less severe in the lower to mid-latitudes, while becoming more severe in higher latitudes poleward of 60 degrees (low confidence).”

Similarly, concerning winter storms the IPCC says:

“There is low confidence in observed recent changes in the total number of extratropical cyclones over both hemispheres. There is also low confidence in past-century trends in the number and intensity of the strongest extratropical cyclones over the Northern Hemisphere...”

The UN body also says:

“observational trends in tornadoes, hail, and lightning associated with severe convective storms are not robustly detected due to insufficient coverage of the long-term observations.”

[Dr. Khandekar](#) shows in many reports that extreme weather events are not increasing in frequency or severity in Canada. Dr. Khandekar said:

"Extreme weather is an integral part of weather and climate that has always been with us whether our climate was cooler or warmer. Reducing CO₂ levels in order to reduce extreme weather is a fantasy."

The most severe weather of recent centuries occurred during the far colder Little Ice Age which ended about 1880. The worst weather of the past century, however, was generally during the Dust Bowl years of the 1930s. The “dirty thirties” were miserable for farmers on the American and Canadian prairies, far worse than anything we are seeing today. Well-known American climatologist Stanley Changnon has documented how the 1920s and 1930s also witnessed significantly higher numbers of thunderstorms and associated violent weather than today. University of Alberta Emeritus Professor Keith Hage’s research showed that severe and destructive windstorms over Alberta and Saskatchewan peaked during the 1920s and 1930s and have lessened since.

The National Oceanic and Atmospheric Administration’s [State Climate Extremes Committee database](#) of extreme weather records is the best of its kind in the world. It clearly shows that the incidence of extreme weather records today is not unusual. The [database](#) shows that in 2023, there has been only one extreme weather record set on a state-wide basis—the largest hail stone diameter ever recorded in Colorado (5.25 in.). In 2022, no extreme weather records of any kind were set. In 2021, only three states set or tied maximum temperature records (Washington, Oregon (2021 tied with 1898) and Utah (2021 tied with 1985)). Other records set in 2021 were Texas (hail size), Kentucky (wind gust) and Tennessee (24-hour precipitation). In 2020, no extreme weather records were set. Other recent years show similar low frequency of extreme weather records.

Contrast this with 1936 when 27 extreme weather records were set, 23 of them maximum temperature records.

A plot of all extreme weather records set that still stand today (below) shows the 1936 spike. It also reveals that there has been no significant overall trend in the incidence of extreme weather records in the US since 1940.

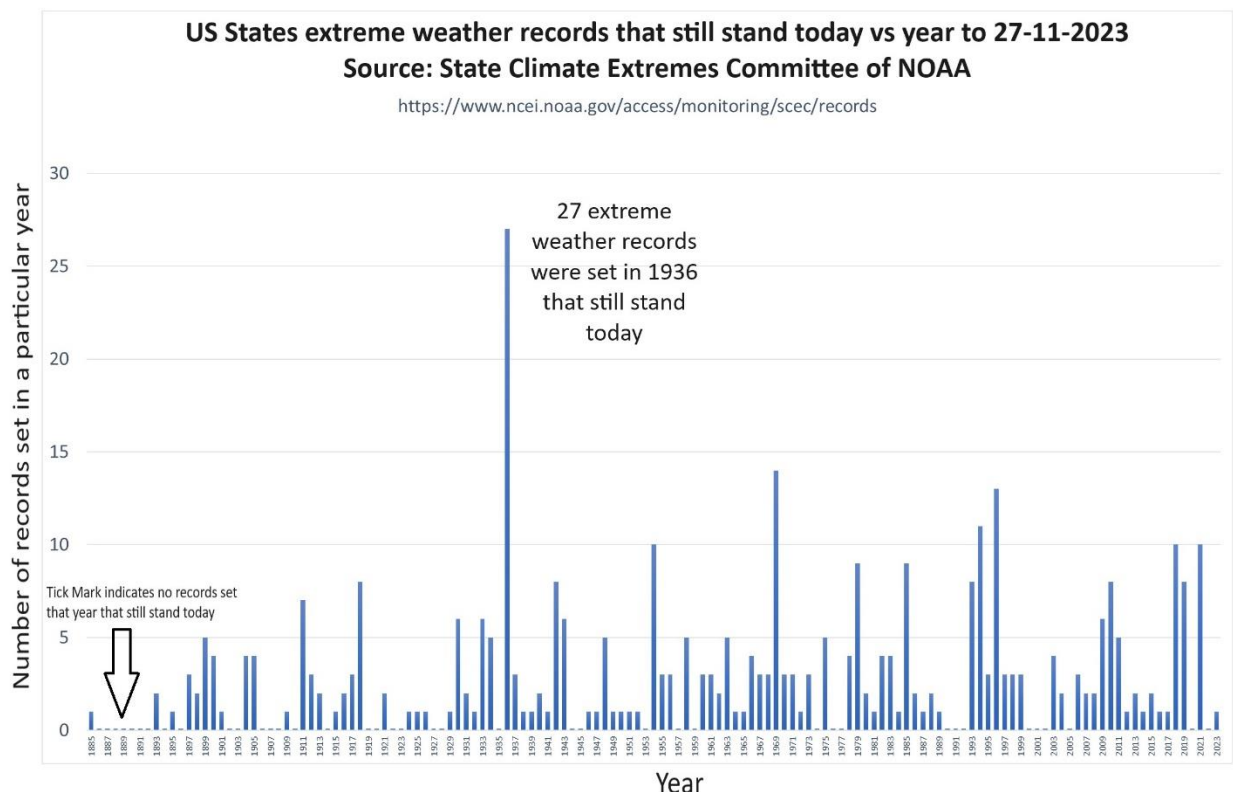


Figure 3.17 – Number of extreme weather records set in each state that still stand today

A plot of the number of state-wide extreme weather records set each decade since 1890 that still stand today also shows that nothing unusual is happening (see figure 3.18 on next page).

US states extreme weather records that still stand today vs decade to 27-11-2023

Source: State Climate Extremes Committee of NOAA

<https://www.ncei.noaa.gov/access/monitoring/scec/records>

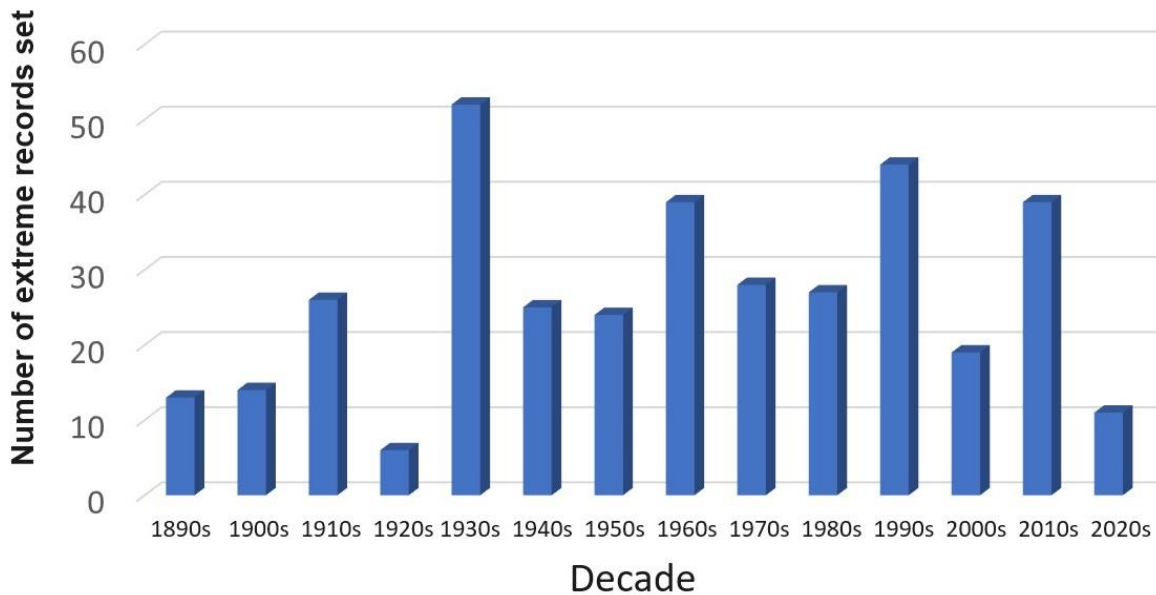
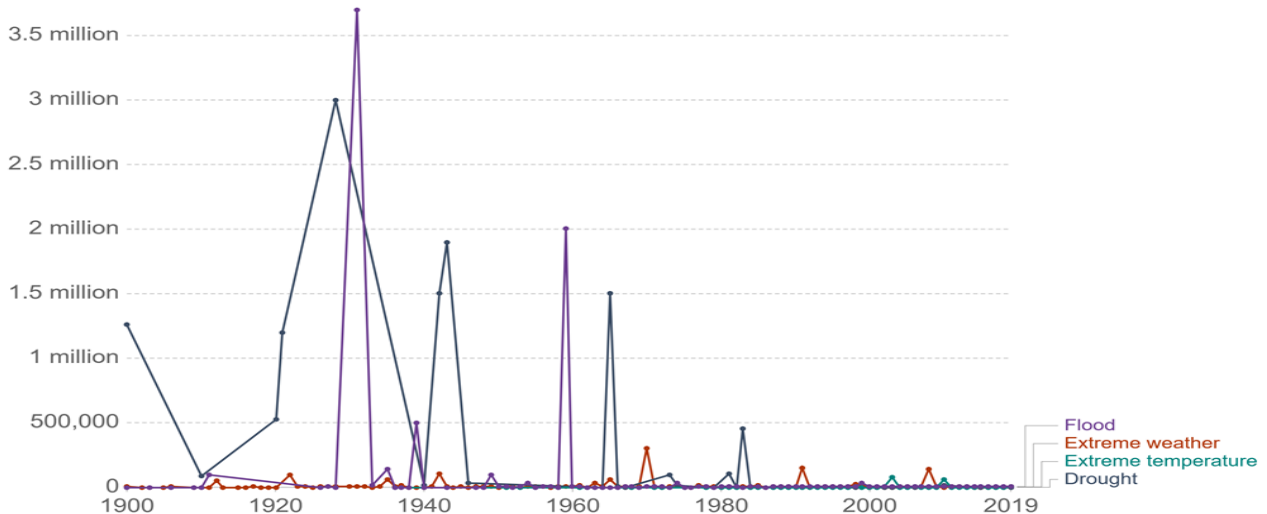


Figure 3.18 Number of state-wide extreme weather records by decade

Partly as a consequence of this extreme events record (and better early warning systems as well as more robust construction), we have seen a continual *decrease* in deaths due to natural disasters (click on graph below to see trend in the past decade):

Global deaths from natural disasters, 1900 to 2019

Absolute number of global deaths per year as a result of natural disasters. "All natural disasters" includes those from drought, floods, extreme weather, extreme temperature, landslides, dry mass movements, wildfires, volcanic activity and earthquakes.



Source: EM DAT: OFDA/CRED International Disaster Database, Université catholique de Louvain – Brussels – Belgium
 OurWorldInData.org/natural-disasters/ - CC BY

Figure 3.19 – Global Deaths from natural disasters 1900 - 2019

Joe Bastardi is Chief Forecaster for [WeatherBELL](#), an organization that is paid to forecast weather by companies whose economic futures depend on it. Bastardi, who just published a new book titled [The Weaponization of Weather in the Phony Climate War](#), explained:

“There were one quarter the number of human beings on the planet in 1930, but there were 28 times more deaths caused by climate and natural disasters than today. This was because the weather then was more extreme than now and we lacked the early warnings we get today when extreme weather is approaching.”

Former mayor Watson’s comments about Ottawa tornadoes being the result of climate change is also unjustified. The actual causes of the September 2018 Ottawa/Gatineau tornadoes were natural. As unseasonably cold and dry air from western Canada advanced toward the warm and moist air over southern Ontario, it produced a major thunderstorm with a funnel cloud. This then produced the two severe Ottawa tornadoes. Without that trigger of western cold air, there would not have been a severe thunderstorm and tornadoes in the Ottawa region.

In [“Politicians were wrong to blame the tornadoes on climate change,”](#) (Sun chain of newspapers across Canada, October 1, 2018), Dr. Khandekar and Tom Harris explain:

“The July 31, 1987 [Edmonton tornado](#) had wind speeds up to 417 km/h (Ottawa’s tornadoes peaked at 265 km/h) and destroyed over 300 homes and killed 27 people. Only the Regina tornado of June 30, 1912 was deadlier, killing 28 people. Other severe Canadian tornadoes include the 1946 tornado hit on the Detroit River (17 fatalities), the July 14, 2000 Pine Lake tornado (12 fatalities and at least 140 injured), and the June 22, 2007 Elie, Manitoba tornado that had wind speeds of between 420 to 510 km/h.”

Historical data show that weather has usually been more extreme during *colder* periods. This was especially the case during the centuries-long Little Ice Age. For example, Chinese researchers found that “typhoon frequency seemed to have increased at least regionally during the coldest phases of the Little Ice Age.” And during the most recent extended period when Earth’s climate was generally cooling (1945 – 1977), we saw twelve tropical cyclones in the north Atlantic reach hurricane intensity in 1969, far above normal. A year later a tropical cyclone in the Bay of Bengal killed about 250,000 people, the greatest number ever in a single weather-related disaster.

Global warming apparently reduces tropical cyclone activity over all time frames. Perhaps this is why we have seen a slight *reduction* in the frequency of all hurricanes in the past four decades (see graph below. Other tropical cyclone metrics may be seen [here](#)).

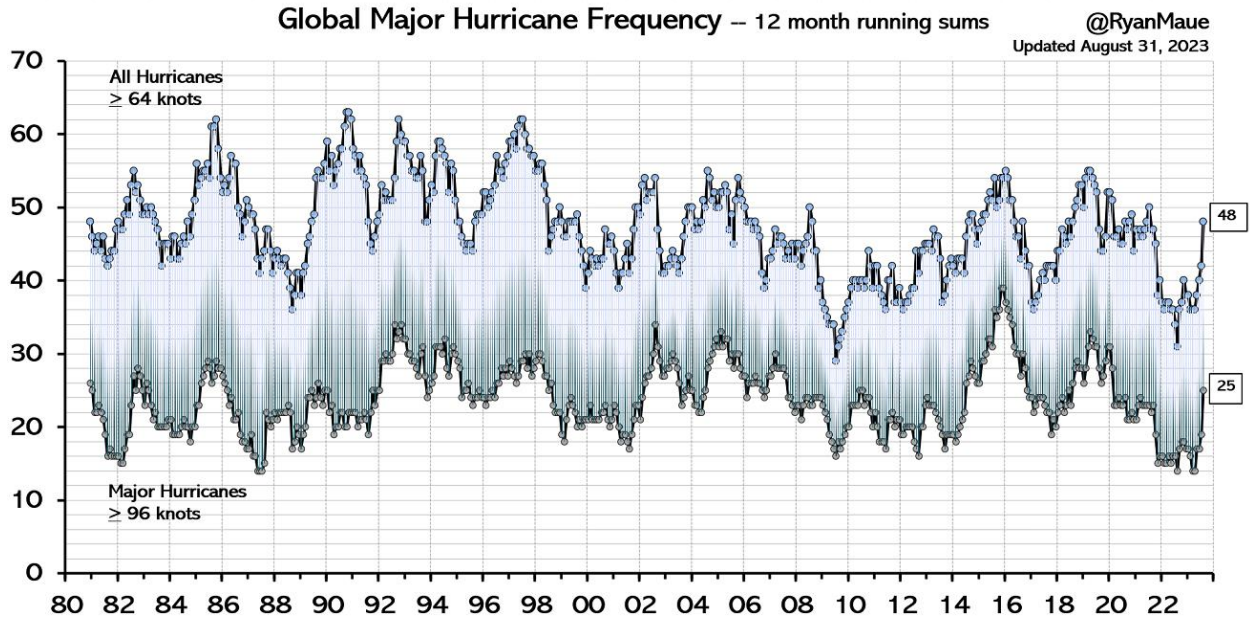


Figure 3.20 – Global Major Hurricane Frequency

In his presentation at the [14th International Conference on Climate Change](#) in Las Vegas on Oct. 17, 2021, atmospheric scientist Dr. Neil L. Frank, former Director of the National Hurricane Center and chairman for the World Meteorological Organization’s Hurricane Committee for North and Central America, showed a version of the graph on the next page and said:

“There has been a decrease in hurricane activity in the Atlantic, certainly a major decrease from the 40s and the 50s.”

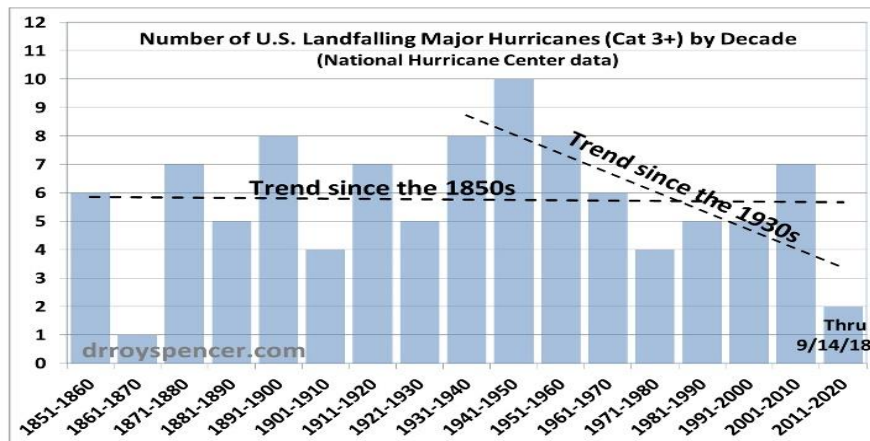


Figure 3.21 – The frequency of U.S. landfalling major hurricanes is down

For more on this topic, see [“U.S. Landfalling Hurricanes Trend Down in 2020 – Despite Claims of ‘Record-Breaking’ Season,”](#) by meteorologist Anthony Watts (January 5, 2021).

Massachusetts Institute of Technology professor emeritus of atmospheric meteorology Dr. Richard Lindzen's [statement](#) in the November 30, 2009 *The Wall Street Journal* still applies today:

“The notion that complex ‘catastrophes’ are simply a matter of the response ... to a single forcing, CO₂ (or solar forcing for that matter), represent a gigantic step backward in the science of climate. Many disasters associated with warming are simply normal occurrences whose existence is falsely claimed to be evidence of warming. And all these examples involve phenomena that are dependent on a confluence of many factors.”

Clearly, the City of Ottawa's concerns about increasing extreme weather events is not supported by real world observations.

3.2.2.3 Flooding

Former Ottawa mayor Watson's belief that flooding in Ottawa is worsened by climate change is also unsubstantiated as we have not seen any increase in flooding in the city in the past decades. Indeed, there has been a decrease in extreme rainfall throughout Ontario. There are twice as many statistically significant decreasing trends as increasing ones in southern Ontario (per the version 2.3 Engineering Climate Datasets on the slides [here](#)). Moreover, the relationship between temperature and extreme rainfall has been [disproved](#) by research at MIT, Columbia and the University of Western Ontario.

Even the United Nations Intergovernmental Panel on Climate Change (IPCC) finds no trends in flooding globally, writing in their [Sixth Assessment Report](#):

“In summary there is low confidence in the human influence on the changes in high river flows on the global scale. In general, there is low confidence in attributing changes in the probability or magnitude of flood events to human influence because of a limited number of studies, differences in the results of these studies and large modelling uncertainties.”

Similarly, in the Fifth Assessment Report the IPCC wrote:

“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.”

[Trevor Dickenson](#), emeritus professor at the University of Guelph, has determined that in Southern Ontario, warming has decreased the amount of spring floods. This is because there is more snow melt throughout the winter, and so fewer floods during the spring. In urban areas, the probability that severe storms cause damage has gone up, though this is only because the target area has increased due to increased urbanization.

Data from Environment Canada since the 1950s has shown that there has been no significant change in the frequency of flooding, and the IPCC has also admitted that there is no increase in climate-driven changes in the magnitude and frequencies of floods in the 20th and 21st centuries

around the world. Indeed, the deadliest flood in Canadian history was due to Hurricane Hazel, which killed over 75 people in Toronto in 1954.

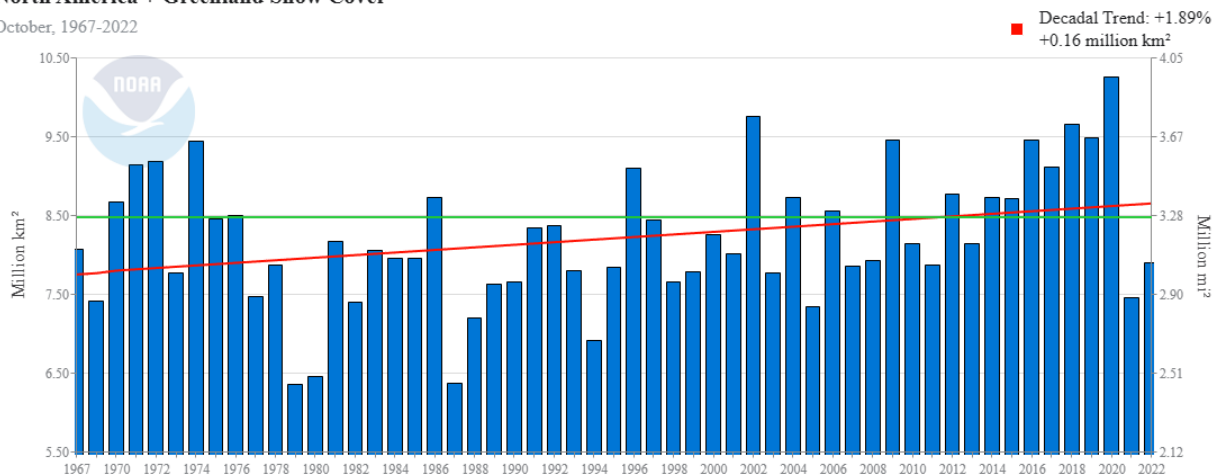
There have always been floods in history, and nothing we see now is abnormal.

3.2.2.4 Snow Cover

Snow cover across North America has been rising gradually for decades. The National Oceanic and Atmospheric Administration (NOAA) [has documented](#) a general increase in snow cover for North America and Greenland since 1967 as seen in the following graph:

North America + Greenland Snow Cover

October, 1967-2022



1991-2020 Average: 8.48 million km² (3.27 million m²)

Source: [Rutgers University Global Snow Laboratory \(GSL\)](#).

Figure 3.22 – Snow cover is rising slightly across North America and Greenland.

According to [Dr. Ole Humlum](#) (PhD in glacial geomorphology), emeritus professor of physical geography at the University of Oslo, Department of Geosciences and adjunct professor of physical geography at the University Centre in Svalbard, the overall Northern Hemisphere snow conditions have been stable since 1972 as seen in the graph on the next page (from [climate4you welcome](#)). Professor Humlum is the former scientific director at the [University of Copenhagen Arctic Station](#) near Qeqertarsuaq, Greenland.

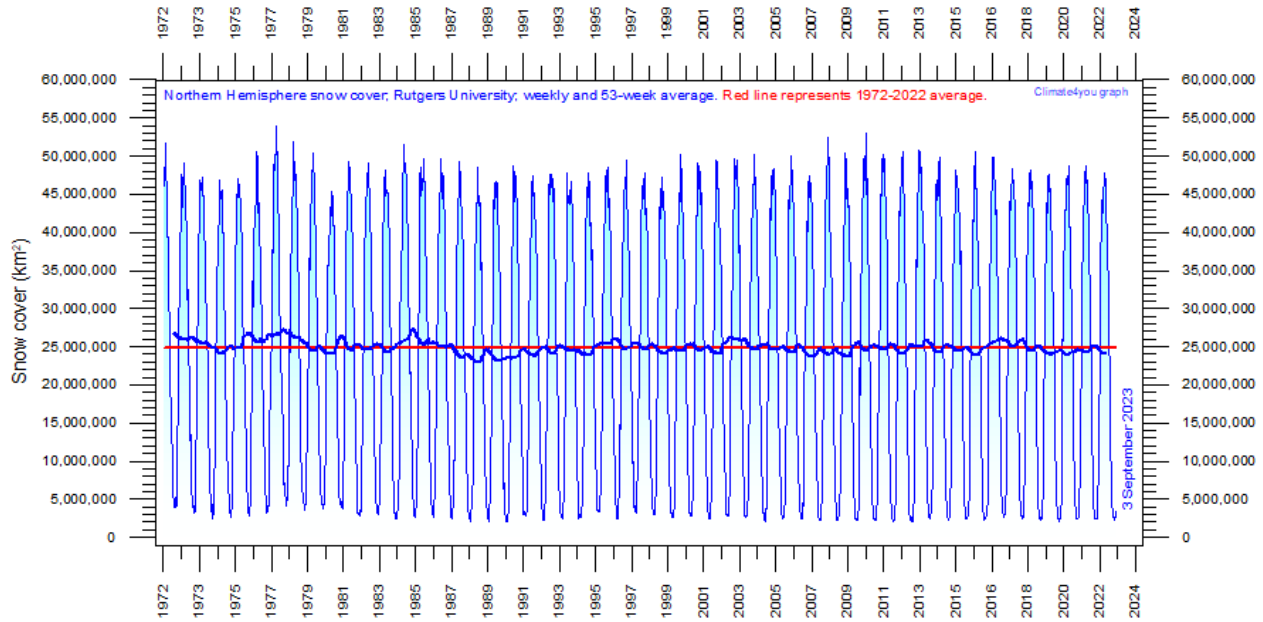


Figure 3.23 – Snow cover has been stable since 1972 across the Northern Hemisphere.

For people concerned about global warming, this is good news since snow cover reflects about 80 to 90% of the Sun's energy back into space, thus helping cool the planet.

It should also be pointed out that polar bear populations are in fact increasing, and the biggest threat they face is not global warming, but hunting. After all, they have survived changes in climate that have exceeded those experienced in the 20th century and even those forecasts by climate models. [Dr. Susan Crockford](#), a zoologist with more than 40 years' experience, including published work on the history of Arctic animals since the end of the last major glacial period, explains that the polar bear, the largest land (and sea ice)-based carnivore (up to 1,400 lbs), is not endangered. Dr. Crockford, a former adjunct professor at the University of Victoria, British Columbia, goes into more depth on this topic in [the interview ICSC conducted on the America Out Loud Network on July 2, 2023](#).

3.2.2.5 Sea Level

Sea level has been rising since the end of the last glacial period, 15,000 years ago. 8,000 years ago, sea level was rising ten times faster than today due to the large volume of ice that had yet to melt and the expansion of sea water due to the rapid warming that was occurring at the time. In Figure 3.23 below, we see that the oceans have risen only about nine inches in the last 140 years, a rise equal to the thickness of several pieces of paper per year. Reliable satellite data of the last forty years confirms this rise of about one to two millimeters per year before any complex adjustments are made.

It is relatively simple to compensate for such modest sea level rise with appropriate adaptation measures.

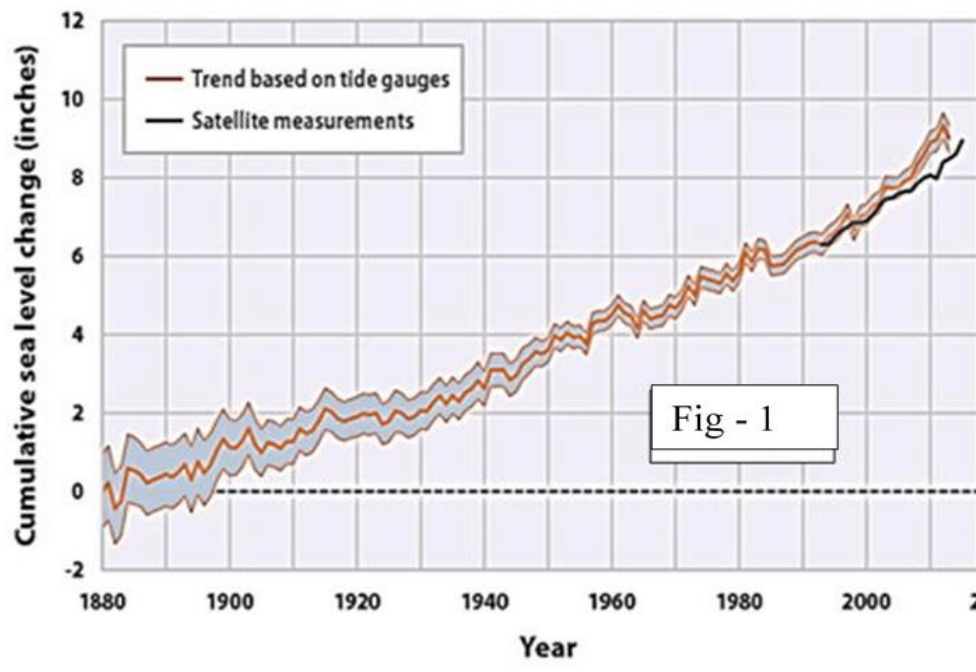


Figure 3.24 – Sea level rise has been moderate and consistent.

Gregory Wrightstone, Executive Director of the CO₂ Coalition, presented the graphs on the next page at a September 21, 2021 seminar that demonstrate that sea level rise at six of the world's largest cities is nothing unusual, merely slow and steady, as one would expect during a gradually warming period.

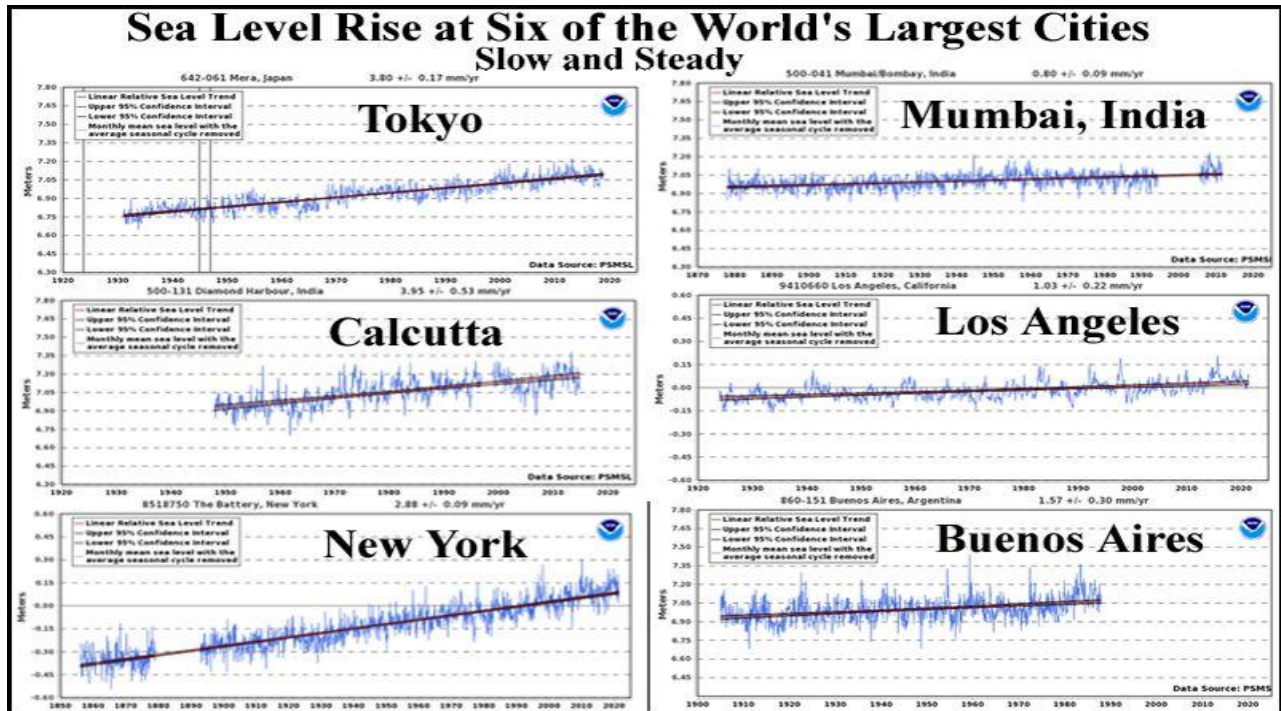


Figure 3.25 – Gradual, consistent sea level rise at six major cities

In “[Biden Killing America’s Energy Security With Sea Level Hysteria](#),” a June 22, 2021 article by Dr. Jay Lehr and Tom Harris, it is explained that melting sea ice does not cause the ocean levels to rise:

“When water starts to freeze, it expands, becoming 10% less dense and floats upon the water that made it up. When the ice melts back into the water, it shrinks by the same 10 percent. So, when sea ice melts, the 10 percent floating above the water combines with the 90 percent under the water, occupying the same original water volume.”

We are often told that small islands such as in the Maldives are at risk of being submerged due to global warming. Stockholm University sea level expert, the late Dr. Nils-Axel Mörner estimated (2017) that sea level will rise only about five cm (about two inches) in the next 100 years. Amazingly, the uncertainty on this estimate is plus or minus 15 cm, because of the large uncertainty in future climate. Regardless, even the highest of Mörner’s forecasts poses no danger to most of the low-lying areas of the world. For example, Mörner created the graph on the next page for the Maldives which shows that sea levels were higher than today five times in the past 5,000 years.

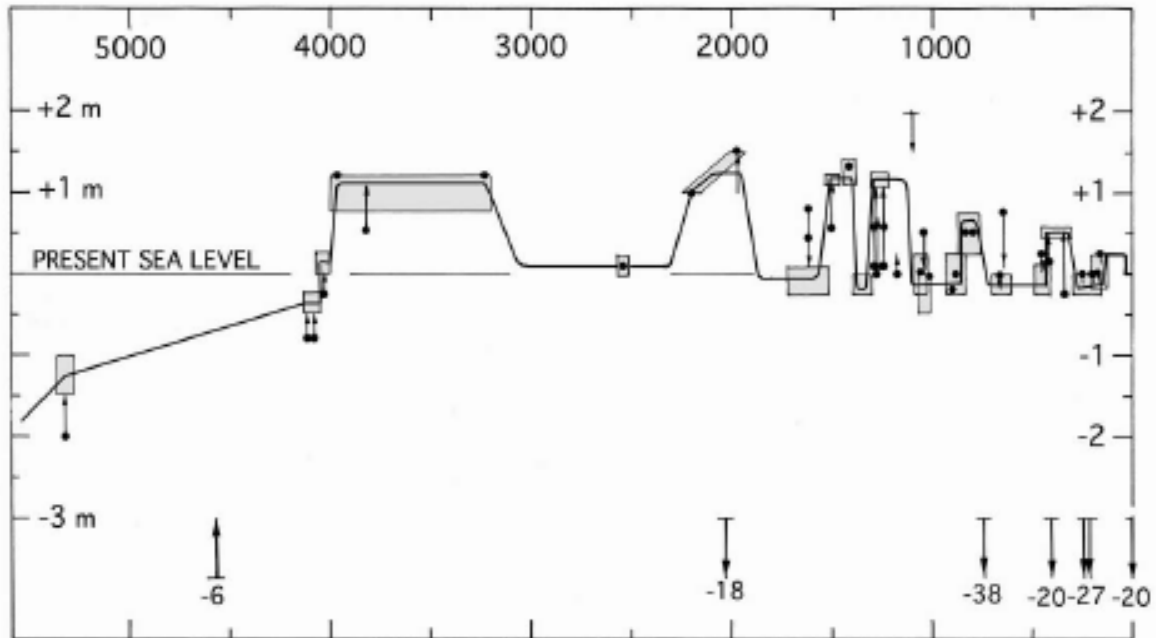


Figure 2

The new sea level curve of the Maldives. Age in C14-years BP with a “sea correction” of –350 years as defined by shell vs peat ages in the core on Goidhoo (Fig. 3). At the base: arrows down refer to sand spreading down into submarine caves at depths given by the numbers below, and arrow up refer to a coral in situ at –6 m.

Figure 3.26 – Sea level in the Maldives has been higher than it is now seven times in the past 5,000 years.

Many people are concerned that, if sufficient land glaciers melt, sea level rise will become a problem. Lehr and Harris explained that this is incorrect, writing:

“The Antarctic contains about 90 percent of the world’s ice mass. About 44 percent of that Antarctic ice is in the ice shelves (floating) and coastal ice (not floating), mainly in the western regions of the Pacific Ocean. More than 50 percent of the Antarctic sheet is land-based and can be several miles thick. Historical data confirms that there are few days per year when the temperature is above freezing, and then only a few hours per day and only along the coast. **Consequently, no continental Antarctic ice water ever reaches the oceans.**”

“During bright and sunny days, a small amount of the continental and shoreline ice surface is destroyed by infrared rays from the Sun. But this ice does not melt into the water; rather, it sublimates directly into water vapor. Sublimation means that the ice goes directly from the solid to the gaseous phase (water vapor) without ever going through the liquid phase. When the sublimated water vapor reaches the cold Antarctic air, the vast majority of



Figure 3.27 – Edge of Antarctic glacier

it quickly turns to snow and falls back on the glacier. The winds may blow only a tiny amount over the Antarctic Ocean. **Nearly zero goes into the oceans as water.**

“Coastal Antarctic ice, dramatized with films, photos, and articles in newspapers and TV, shows large ice chunks tumbling into the ocean. These dramatic falling cliffs are not caused by warm air. Instead, the melting is occurring at the water level by the warmed Pacific Ocean. Here the water splashes and melts and gouges caverns in the ice, forming large ice shelves or overhangs. This process continues until the overhang’s weight is big enough to cause the overhung ice to break and tumble off. That is when we get the stunning pictures. So yes, some of this ice will melt into the oceans and cause some levels to rise, but the volume is unmeasurably small.

“Still, 90% of the coastal ice is submerged in the freezing ocean depths (up to 2,000 meters), so practically only a tiny percent of the shelf or coastal ice actually melts.

“NASA published a study on October 30, 2015, saying that Antarctica is **accumulating** ice at a rate of about 112 billion tons per year. It has already replaced all the ice that melted in the previous several decades. Another NASA study reports an **increase** in the rate of Antarctic snow accumulation. Currently, enough continental ice is accumulating to outweigh the losses caused by its shrinking coastal glaciers.

“There was indeed substantial glacial melting in Greenland, Alaska, and other northern hemisphere locations, which added some waters to the oceans during the warming of the past several decades. However, these glaciers tend to melt and then increase in about twenty-year cycles, depending on the local conditions. Many of these glaciers are now **growing** at a significant rate, like the famed Jakobshavn glacier in Greenland. A world scorecard has been kept that shows which glaciers are melting and which are growing and, overall, about half are growing and half shrinking. Over a decade ago, signs were erected in

Montana’s Glacier National Park forecasting that the park’s dense ice formations would be gone by 2020. They had to remove them last year as the glaciers are still intact.”

The following graph from the paper “[Environmental Effects of Increased Atmospheric Carbon Dioxide](#),” by Dr. Arthur B. Robinson, Dr. Noah E. Robinson, and Dr. Willie Soon, published in the *Journal of American Physicians and Surgeons* (2007) 12, 79-90 is informative:

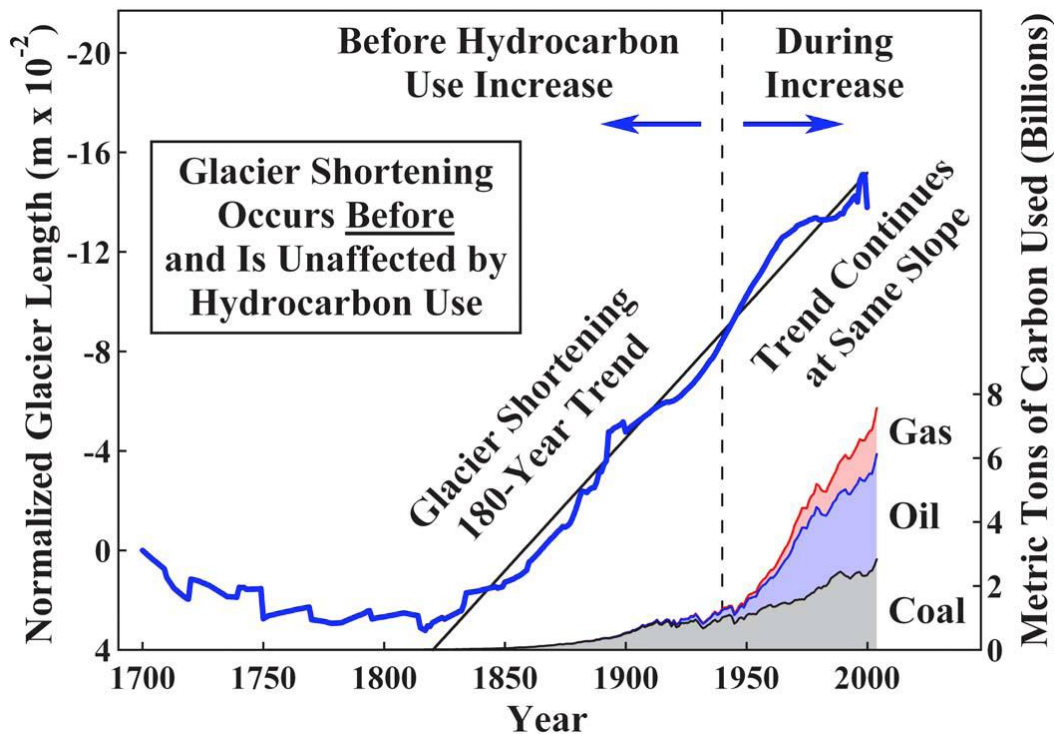


Figure 3.28 – Hydrocarbon use has had no overall effect on glacier lengths.

3.2.2.6 Wildfires

In their [Declaration of Climate Emergency](#), the City of Ottawa blamed climate change for supposedly increasing intense wildfires. The city implied the same in their Climate Change Master Plan as well as in their Energy Evolution document.

Yet there is no convincing historical evidence to support this idea. It doesn't even make sense on a theoretical science basis.

Since the 1920s, fighting forest fires has become an advanced field, with satellite surveillance, fire-retardant chemicals, water bombers, and helicopters. Although these measures reduced the area of land burned annually, it led to a buildup of dead grass, trees, and brush in forests. The green movement, taking a greater hold in the mid-1990s, insisted on a “hands-off” approach, claiming that forest fires should be allowed to burn unless they threaten lives and buildings, and so the dry fuel was not cleared.

It was after this time that forest fires started to increase. Lack of forest management, not climate change, causes severe fires that devastate communities throughout the country. A solution would be to manage some public forests for timber production, the income from which could be used to manage fuel loads and so reduce wildfire risk. Indeed, we have seen that when more wood is used, more trees will be planted, leading to a larger overall forested area of a region.

Yet, climate activists, politicians and the media continue to portray wildfires as a consequence of rising temperature and carbon dioxide. This is entirely backwards.

In "[Extreme wildfires caused by extreme stupidity, not global warming](#)," published on February 1, 2021, by historical climatologist the late Dr. Tim Ball and Tom Harris, it is explained:

"Rising temperatures and increasing CO₂ both act to increase soil moisture and so *reduce* the potential of fires. When temperatures rise, evaporation increases, causing more precipitation which increases soil moisture and so *lessens* fire risk. As CO₂ rises, stomata, the pores in plant's leaves, are open for shorter lengths of time. Plants therefore lose less water to the air and so more of it stays in the soil, again reducing fire potential.

"The natural cycle of forest fires creates what are called crown fires. They move through quickly, burning off dead debris but leaving most of the plants still alive. When governments decided to stop forest fires, they upset the natural dynamics completely. The bureaucracies, now populated by graduates of the biased environmental education system, willingly allowed the environmental extremists' demands to end the former sensible practice of cleaning the undergrowth. Activists complained that such forest tending was not 'natural,' when it was, in fact, a reasonable facsimile of 'nature.'

"So, the debris built up, leaving the forest a tinder box all ready to ignite. Making matters worse, when a fire takes hold, it now often creates what is referred to as a base fire. These fires are very difficult to extinguish — the heat allows such fires to burn into the ground and, days after a fire is supposedly out, it will flare up again."

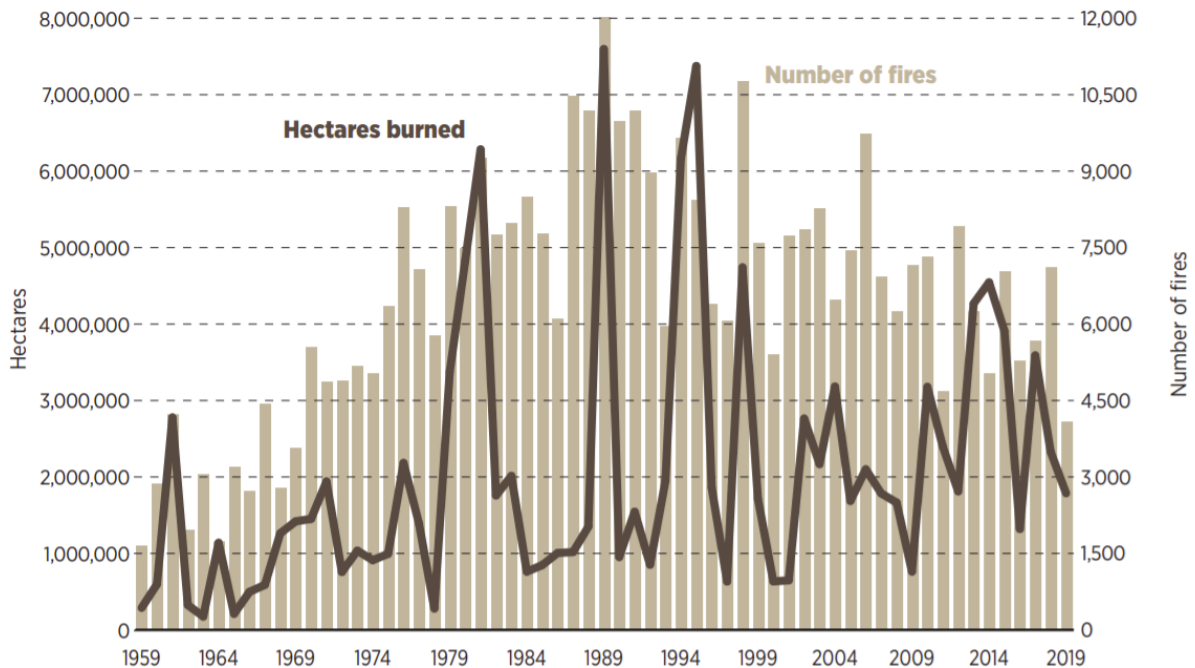
What this means, of course, is that intense wildfires are not caused by global warming or CO₂ rise, but generally speaking, by inept policy decisions by those responsible for managing our forests.

Furthermore, as explained by [Dr. Robert P. Murphy](#), Senior Fellow, Fraser Institute, in his November 19, 2020 report "[Trends in Canadian Forest Fires, 1959–2019](#),"

"There was a sharp increase in destruction caused by forest fires in the first half of this period [i.e., 1959-1989], and a general decline in the second half [1989 – 2019]. The all-time peak of fire activity in 1989 involved some 7.6 million hectares burned, while the most recent national data show only 1.8 million hectares burned in 2019."

Mr. Murphy's report includes the following graph:

Figure 1: Total area burned (hectares) and number of forest fires, Canada, 1959–2019



Source: Natural Resources Canada, 2020: Canadian National Fire Database (CNFDB).

Figure 3.29 – Area burned, and number of forest fires dropped between 1959 and 2019

Contrary to what we are told by climate activists, even the IPCC are not very confident about this. They write:

“There is medium confidence [in contrast to ‘high’ or ‘very high’ confidence] that weather conditions that promote wildfires (fire weather) have become more probable in southern Europe, northern Eurasia, the US, and Australia over the last century.”

The Royal Society wrote in a [2020 blog post](#):

“Fire activity is on the rise in some regions, but when considering the total area burned at the ground level, we are not seeing an increase an overall increase.”

3.2.3 Climate Science Myth #3: Climate and related changes that we have witnessed since 1880 are caused primarily by human activity, in particular, greenhouse gas (GHG) emissions, most specifically carbon dioxide. Future temperature changes caused by CO₂ will be catastrophic.

The facts: Environmental activists are apparently unaware that there are many natural climate drivers that operate in cycles, some caused by changes in the Earth's orbit and rotation, others as a result of changes in ocean currents and the output of the Sun.

3.2.3.1 Temperature Changes

Some scientists have concluded that changes in the Sun have a big influence on temperature.

3.2.3.1.1 The Past

Numerous experts have discovered that “Earth’s temperature” closely follows that of the Sun’s total solar irradiance, our star’s energy output. [Dr. Henrik Svensmark](#), physicist and professor in the Division of Solar System Physics at the [Danish National Space Institute](#) in Copenhagen stated:

“The impact of solar activity on climate is much larger than the official consensus suggests. This is therefore an important scientific question that needs to be addressed by the scientific community.”

It should surprise no one that the Sun, not human activity, is likely the main driver of climate change. Our home star is an enormous source of energy, only a minuscule portion of which comes to the Earth. Yet that is enough to raise the temperature of our planet from near absolute zero to the relatively comfortable 15° C we enjoy today.

For example, it was during a period of *high* solar activity around 1000 AD when we experienced the Medieval Warm Period when the great cathedrals were built in Europe and the Vikings settled Greenland. And it was during a period of *low* solar activity that the Little Ice Age occurred between about 1300 and 1850, at the start of which the Viking colonies died out. In 2004, Prof. Dr. Sami K. Solanki, now of the Max Planck Institute for Solar System Research, et al, [found](#) that the Sun had been more active during the previous 70 years than it had been in more than 8,000 years. It is facts like this that are practically never reported in mainstream media.

Nevertheless, even if *all* the warming that has occurred since 1880 was caused by humanity’s CO₂ emissions, an extremely improbable proposition, it still would not constitute a problem since Earth’s “average temperature” only rose just over 1° Celsius in this time frame.

3.2.3.1.2 The latest research on the Sun-climate connection

To counter "[Climate Change 2021: The Physical Science Basis](#)," the most recent United Nations climate change science assessment report, 23 experts in the fields of solar physics and climate science from 14 different countries published the paper "[How much has the Sun influenced Northern Hemisphere temperature trends? An ongoing debate](#)." The paper, which appeared in 2021 in the journal *Research in Astronomy and Astrophysics*, is the most comprehensive paper to date analyzing the 16 most prominent published solar output datasets, including those used by the IPCC. The abstract of the paper reads, in part:

"It appears that previous studies (including the most recent IPCC reports) which had prematurely concluded [that the Sun's output contributed negligibly to Earthly climate change] had done so because they failed to adequately consider all the relevant estimates of Total Solar Irradiance and/or to satisfactorily address the uncertainties still associated with Northern Hemisphere temperature trend estimates."

The related press release was even more direct:

"A diverse expert panel of global scientists finds blaming climate change mostly on greenhouse gas emissions was premature. Their findings contradict the UN IPCC's conclusion, which the study shows, is grounded in narrow and incomplete data about the Sun's total solar irradiance."

Dr. Richard Willson, of the California Institute of Technology, Jet Propulsion Lab, a co-author of the new report, is in charge of NASA's Sun monitoring efforts. He said:

"Contrary to the findings of the IPCC, scientific observations, in recent decades, have demonstrated that there is no climate change crisis. The concept that devolved into the failed CO₂ anthropogenic global warming hypothesis is based on the flawed predictions of imprecise 1980s vintage, global circulation models that have failed to match observational data both since and prior to their fabrication."

Clearly, blind faith and the output of climate models count for little. It's the empirical evidence, specifically evidence from observations, and proven science that matter.

3.2.3.1.3 The need for continuing research on the Sun-climate connection

For changes in the Sun's output to be a significant driver of the climate change we have seen over the past century, it is believed that there would have to be a natural factor amplifying these changes. This factor is likely to be Galactic Cosmic Rays.

Galactic Cosmic Rays are high energy particles that originate in supernovas in deep space, eventually flooding into our solar system. These particles are fully ionized, so they interact with the Sun's magnetic field.

When the Sun is highly active, it has a stronger magnetic field, and this field blocks a significant fraction of incoming Galactic Cosmic Rays. Since these particles encourage the formation of clouds, a reduction in Galactic Cosmic Rays entering our atmosphere leads to less cloud formation. Since clouds, generally speaking, cool the planet, less clouds means a warmer Earth.

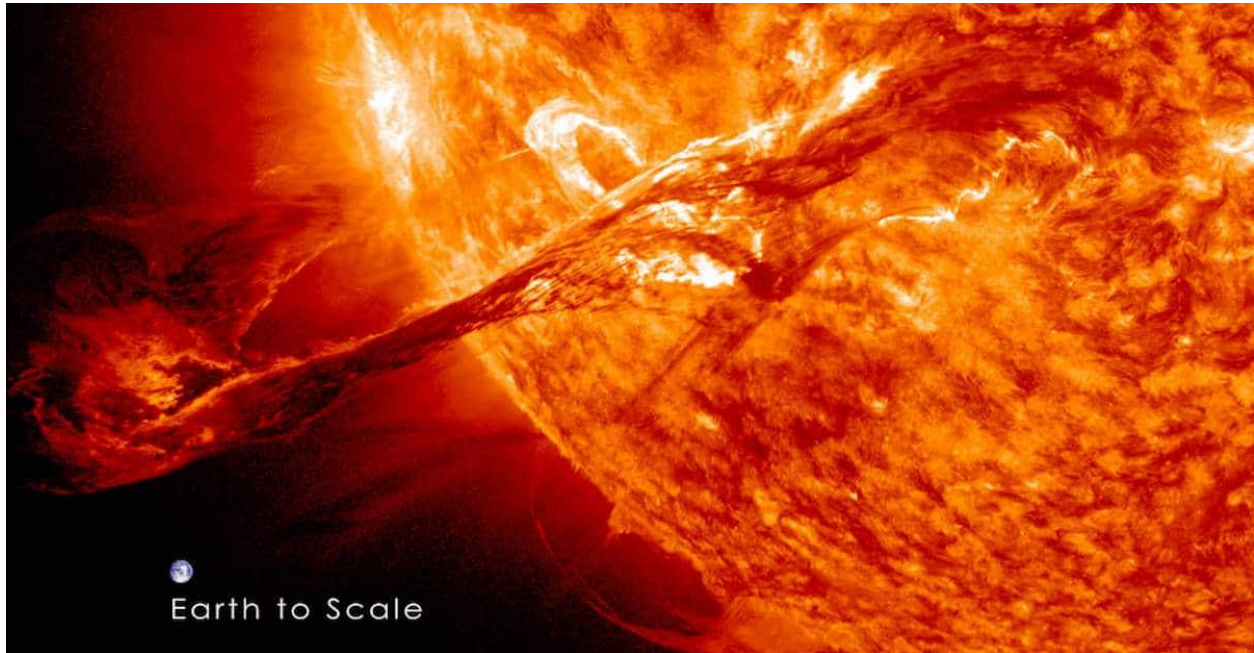


Figure 3.30 – The Sun appears to overwhelm all other climate drivers on Earth.

The reverse is also believed to be true: a weaker Sun produces a weaker magnetic field, and so more Galactic Cosmic Rays enter our atmosphere. This results in more clouds and leads to a slight cooling effect.

If we are to ever be able to meaningfully forecast climate change on Earth, it is crucial that we continue to research such natural factors.

3.2.3.1.4 The Future

Although the amount of atmospheric carbon dioxide, or CO₂, is minuscule, totaling approximately 0.04% of the atmosphere, we continually hear that human-made CO₂ will continue to grow and cause the Earth to warm dangerously. This, however, is based on a mistaken understanding of how the greenhouse effect works.

The absorption of heat by CO₂ will not increase exponentially, but instead taper off slowly as the concentration of this benign gas continues to rise. It is similar to painting a window black. When you apply the first coat, it will significantly reduce the amount of sunlight coming through. Subsequent coats of paint will further reduce the light entering the room, but they will block less and less light with each new coat of paint. The glass surface becomes “saturated” with black paint and, eventually, adding a new coat of paint will do essentially nothing to block out the light.

Likewise, after a certain level of CO₂ is reached in the atmosphere, adding more will do very little to warm the planet. Even doubling our emissions will not cause much of a change. For instance, in the pre-industrial era about 100 years ago, the level of CO₂ in the atmosphere was about 280 parts per million. Today, it is about 420 parts per million. This is an increase of 50%, but due to the saturation of the greenhouse effect, the increase in greenhouse warming was only just over about 6%.

The graph on the next page was presented by Dr. William Happer, the Cyrus Fogg Brackett Professor of Physics Emeritus at Princeton University in New Jersey, to an Institute of Public Affairs audience in Brisbane, Australia on September 28, 2023. It shows the intensity of outgoing thermal radiation at the top of the atmosphere to space (plotted on the vertical axis), for different infrared frequencies (on the horizontal axis), as the Earth cools. The influence of different concentrations of greenhouse gases (GHG) are highlighted:

- The top, smooth, blue line is radiation from the Earth if the atmosphere had no GHGs
- green indicates zero CO₂ but with other GHGs at their current concentrations
- black for CO₂ and other GHGs at their recent concentrations
- red for a doubling of the CO₂ concentration.

The important part is the region between the smooth blue line (radiation with no GHG) and the other jagged lines because that region indicates warming due to GHGs. Based on this plot, a doubling of CO₂ (red line) will cause very little increase in temperature since it deviates only slightly from the black line.

Professor Happer told the audience:

“Doubling CO₂ only reduces radiation to space by 1 percent... [this causes] a quarter percent change in absolute temperature.”

Thermal radiation to space from the Earth, with a surface temperature of 15.5 C and with greenhouse gases is the area under the jagged black “Schwarzschild” curve. This is only about 70% of what it would be without greenhouse gases, the area under the smooth blue “Planck” curve. The Sun heats the Earth and greenhouse gases hinder the cooling.

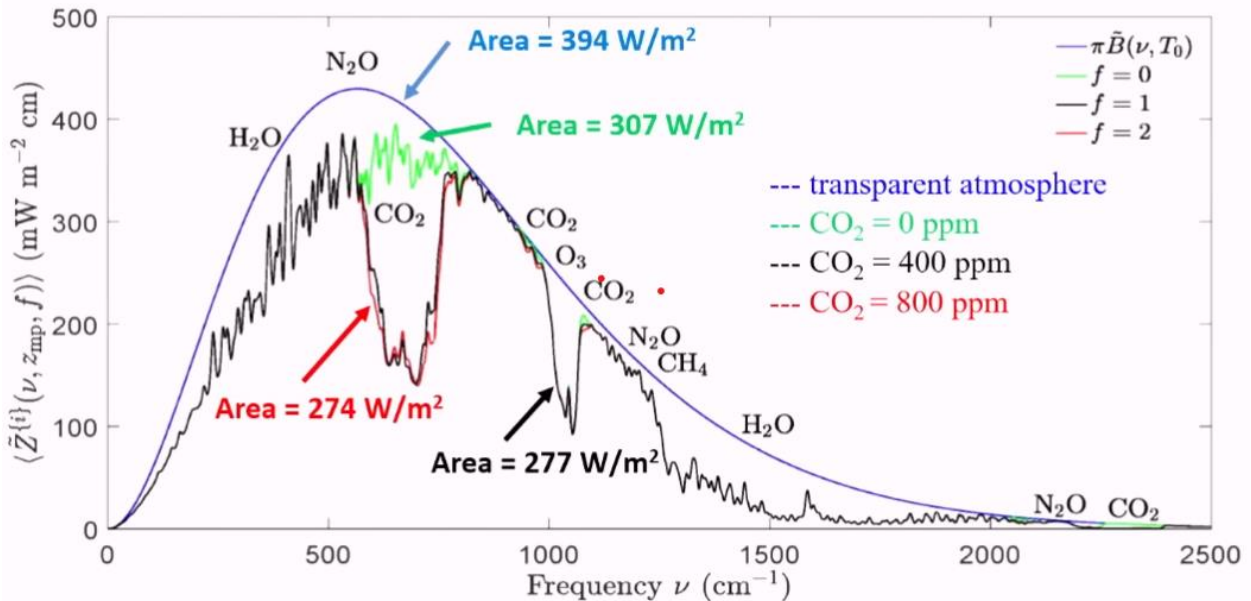


Figure 3.31 – Our atmosphere is nearly “saturated” with CO₂ from a temperature perspective

Professor Happer’s talk at the CLINTEL meeting in Holland on November 15, 2021, which may be seen [here](#), would be ideal for City of Ottawa staff to view as it is presented at a level understandable by any intelligent layperson. He concluded his talk about [the results of his research with Professor William van Wijngaarden](#) (York University) as described [in this paper](#):

- Policies to slow CO₂ emissions are based on flawed computer models which exaggerate warming by factors of two or three.
- More CO₂ is an overall benefit, so costly “mitigation” schemes are harmful. We should have the courage to do nothing about CO₂ emissions.

In their research, Happer and van Wijngaarden prove that their model of the atmosphere is accurate by comparing the output of the model to data recorded by satellites.

Consequently, this scientific study demonstrates is that there is **NO CLIMATE DANGER** to additional CO₂ in the Earth’s atmosphere. Any warming that might be caused by CO₂ has, for the most part, already been accounted for. The Sun’s radiation absorption bands for CO₂ are now practically saturated, and there will be little additional effect. Furthermore, Dr. Happer explains, the impact of methane (CH₄) is only about 10% that of CO₂, so contrary to the message implied in the City of Ottawa’s Energy Evolution document, CH₄ emissions present no problem from a climate change perspective.

3.2.3.1.5 Huge uncertainty about “CO₂ climate sensitivity” even among scientists who support the climate alarm

CO₂ climate sensitivity is the average change in global mean surface temperature in response to a doubling of CO₂. There is huge uncertainty about its magnitude. In the 2019 documentary film “[Global Warning](#),” ICSC-Canada Science Advisory Panel member earth sciences professor Dr. Ian Clark of the University of Ottawa explained:

“...climate sensitivity ... is under re-evaluation by the scientists, by the modelers themselves. But you never hear about this in the media. In fact, the IPCC has, in their science report, demonstrated [that the modelers] ... really don't know what ... the climate sensitivity is.”



Figure 3.32 - ICSC-Canada Science Advisory Board Member - Professor Ian Clark - still from the 2019 Canadian documentary “Global Warning” - used with permission of the director

Consider the graph on the next page which shows how estimates of the climate sensitivity to a doubling of CO₂ levels have changed over the years. On the graph, TCR is transient climate response, the average temperature response centered around the time of CO₂ doubling. ECS is equilibrium climate sensitivity, the temperature response upon reaching an equilibrium state after doubling. Note the decreasing trend to less and less warming, now trending to zero, expected due to a hypothesized doubling of CO₂.

[Scafetta et al., 2017](#), the paper which forms the basis of the graph on the next page, explains:

“Since 2000 there has been a systematic tendency to find lower climate sensitivity values. The most recent studies suggest a transient climate response (TCR) of about 1.0 °C, an ECS less than 2.0 °C and an effective climate sensitivity (E_fCS) in the neighborhood of 1.0 °C.”

“Thus, all evidences suggest that the IPCC GCMs [General Circulation Models used to forecast climate problems] at least increase twofold or even triple the real anthropogenic warming. The GHG theory might even require a deep re-examination.”

For further discussion of the many estimates of climate sensitivity see Kenneth Richard’s article on the Web site of German engineer Pierre L. Gosselin [here](#).

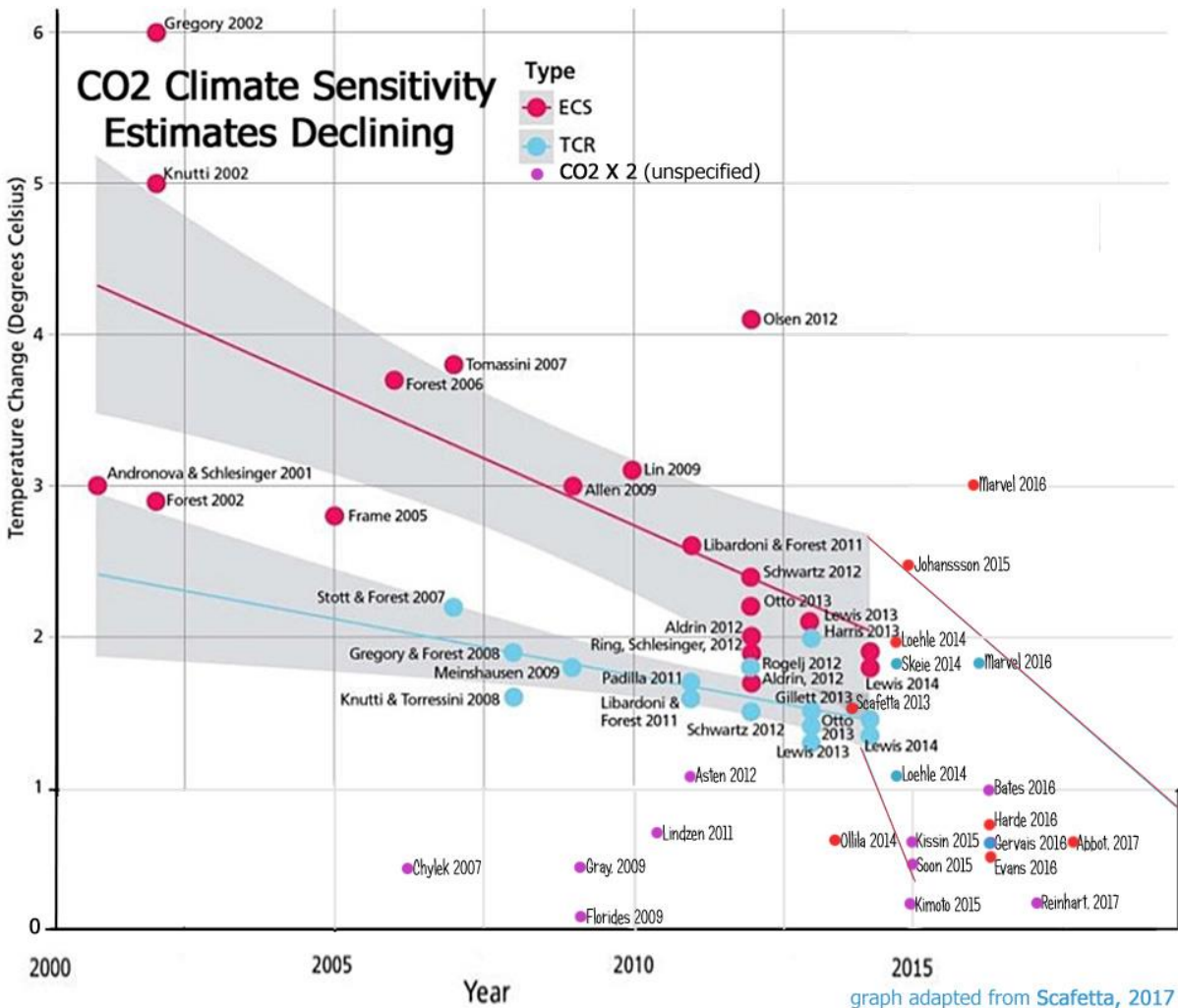


Figure 3.33 – Carbon dioxide climate sensitivity estimates declining

Gosselin also published "[135+ Papers find Extremely Low CO₂ Climate Sensitivity](#)" in which he listed:

- 52 scientific papers quantifying low or very low ECS (part a)
- 74 asserting that the consequent warming is negligible but don't quantify it (part b)
- four showing a reduction in the greenhouse effect as CO₂ increased (part c)
- seven asserting that increasing CO₂ rise causes surface cooling (part d).

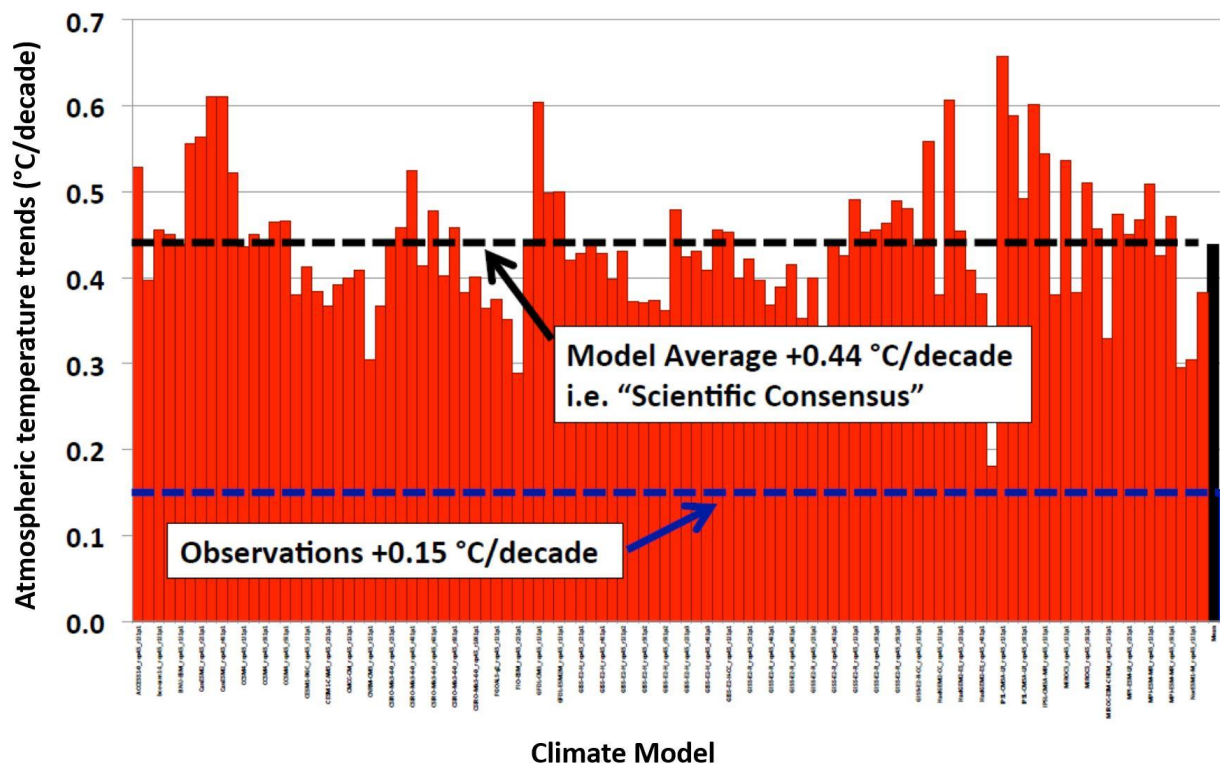
Climate science has significantly advanced in the last 30 years and yet the City of Ottawa is locked into outdated concepts and thinking. It makes no sense for Ottawa, or any jurisdiction, to base their future energy plans on such unsettled science.

3.2.4 Climate Science Myth #4: We are able to meaningfully forecast climate and related changes over the 21st century and these changes will be abnormal, dangerous and caused primarily by human activity, in particular, greenhouse gas (GHG) emissions, most specifically carbon dioxide.

The facts: The climate scare is based primarily on computerized climate model forecasts of the future that *have failed spectacularly to date*. As early as the IPCC's 5th climate assessment report (2013), they stated that, of 114 climate model predictions of the warming from 1998 to 2012, 111 models predicted more warming than the temperature recordings indicated.

Speaking at the 2018 Katowice, Poland panel mentioned in section 3.2.2, Dr. Craig Idso showed the below graph and said, concerning the model forecasts on which climate concerns are based:

“Radiosondes [balloon] measurements shown in blue reveal that the *actual* warming rate is *three times smaller* than that predicted by the models [graph plots 1979 – 2017].”



Model-predicted vs Observed Warming of the Tropical Troposphere

Figure 3.34 – Models, on average in this time frame, forecast three times as much warming as actually occurred.

It is important to remember that the UN IPCC forecast in its first assessment report (1990) that temperatures would increase 0.3°C each following decade. But warming has happened much more slowly – merely 0.15°C [as of 2017] per decade as determined by balloon measurements.

Speaking at the 13th International Conference on Climate Change in Washington DC in July 2019, Dr. Roy W. Spencer, a Principal Research Scientist at the University of Alabama in Huntsville, [described](#) how poorly computer models correlate with the temperatures as determine from satellite measurements and showed the following complicated graph (which is explained following the graph).

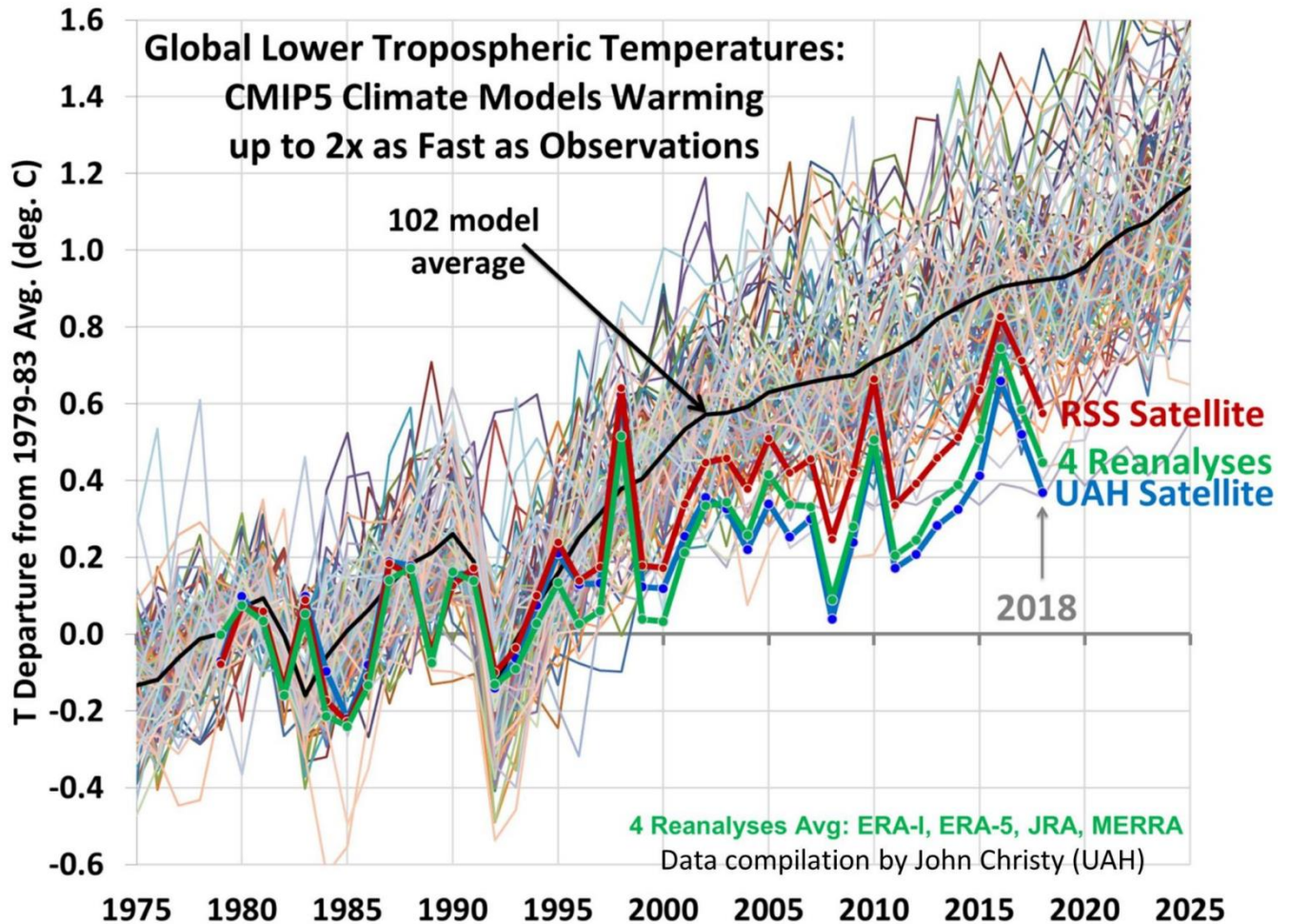


Figure 3.35 – Models vastly over-forecast global warming.

- The Blue line shows the actual average temperature as calculated from measurements made by the satellite used by the University of Alabama in Huntsville team.
- The red line shows the temperature as calculated by the Remote Sensing System team.
- The “spaghetti plot” of many light-coloured lines in the background shows yearly temperatures forecast by 102 climate model runs, which represents about two dozen climate models (because you can carry out different experiments with the same climate model and get different temperature forecasts).
- The black line is the information on which energy policy is now based across the western world and especially in Canada. It shows the average amount of warming predicted by the 102 climate model runs.

- The green line (labeled “4 Reanalysis”) is the temperature computed when many temperature measurements (land-based, balloon-based, satellite-based and that from commercial aircraft, ships, buoys and) are averaged.

What all this means is that models forecast *twice the warming* than that computed from the observed satellite data. This conclusion is well illustrated by the next graph which shows the warming trend per decade for both models and observations.

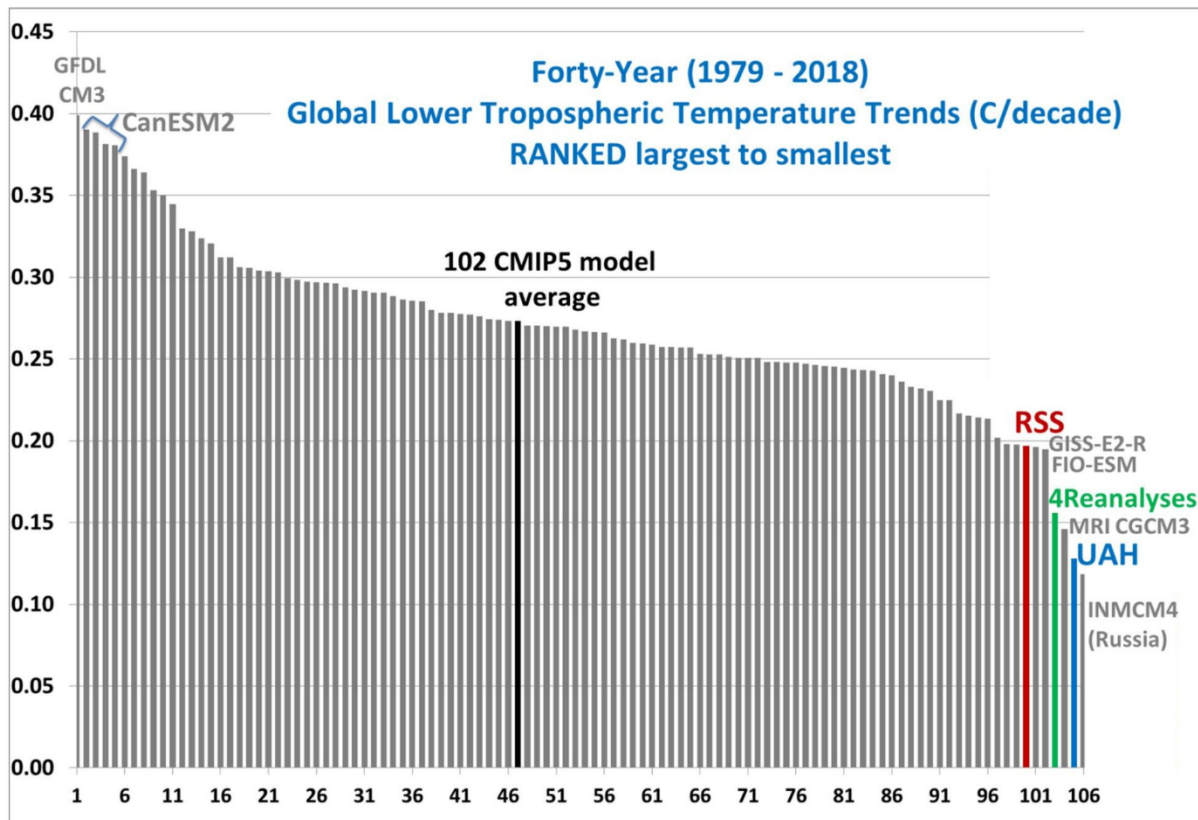


Figure 3.36 – Average temperature rise of 102 CMIP5 models far more than all observations

Spencer explains:

“The 42 years of observations we now have since 1979 shows that warming is occurring much more slowly than the average climate model says it should have.”

The discrepancy between temperatures as forecast by the models and actual observations is even more pronounced when one looks just at tropical temperatures. This is significant since theory predicts that temperatures in the tropics should reflect a tropical “hot spot” if the models are correct. But there is no hot spot evident in the observations. One comes to the same conclusion if average ocean surface temperature variations are considered (the oceans provide our best indicator of how quickly extra energy is accumulating in the climate system).

The message is clear - climate models upon which the City of Ottawa’s proposed climate and energy policies are based cannot be trusted for future climate forecasts, let alone be the basis for policy. The underlying science that produces the equations used in the models is flawed.

The latest IPCC report said that the average temperature for 2011-2020 was just 1.1°C above the average for 1850 - 1900. If we take the centre of those two periods, that's about 1.1°C in 140 years, or less than 1°C per century which means one one-hundredth of a degree per year.

Spencer sums up:

“Even if observed warming is due to increasing CO₂ (carbon dioxide), it’s too weak to notice in your lifetime.”

3.2.5 Climate Science Myth #5: The vast majority of experts in the field support the hypothesis that our CO₂ emissions are causing a global crisis.

The facts: There is no convincing evidence to support this assertion. The surveys cited by climate activists either ask the wrong questions, ask only a small number of scientists (ignoring many who should have been asked) or make methodological mistakes that invalidate the polls results.

For example, one source cited is a [2009 article](#) in "Eos, Transactions American Geophysical Union" by Zimmerman and Doran. They reported that "97 percent of climate scientists agree" that global temperatures have risen and that humans are a significant contributing factor.

Even if that finding was truly reflected in the data, it is immaterial. Besides the fact that they only used 79 of the 3,146 who responded to the survey, this says nothing about whether the change is in any way dangerous, or even significant.

Another example: in 2013, John Cook, an Australia-based blogger, and some of his friends reviewed abstracts of peer-reviewed papers published from 1991 to 2011. The abstract of their paper reads, “Among abstracts expressing a position on AGW, 97.1% endorsed the consensus position that humans are causing global warming.”

Again, this is immaterial for the same reason as above. Regardless, Mr. Cook's work was quickly debunked. In [Science and Education](#) in August 2013, for example, Dr. David R. Legates, former Director of the Center for Climate Research at The University of Delaware, and three coauthors reviewed the same papers as did Mr. Cook and found "only 41 papers—0.3 percent of all

11,944 abstracts or 1.0 percent of the 4,014 expressing an opinion, and not 97.1 percent—had been found to endorse" the claim that human activity is causing most of the current warming.

[A September/October 2022 poll conducted by Fairleigh Dickinson University](#) found that fully 41% of respondents (professionals and academics who held at least a bachelor's degree in the fields of meteorology, climatology, physics, geology, and hydrology) did not think global climate change will cause "significant harm" to the "living conditions for people alive today."

It makes no sense to base billion-dollar policy decisions on such a flimsy consensus.

Of the science organizations that issued statements supporting DAGW, none are known to have polled their members and showed that a majority of their members agreed with it. In contrast, consider the following documents:

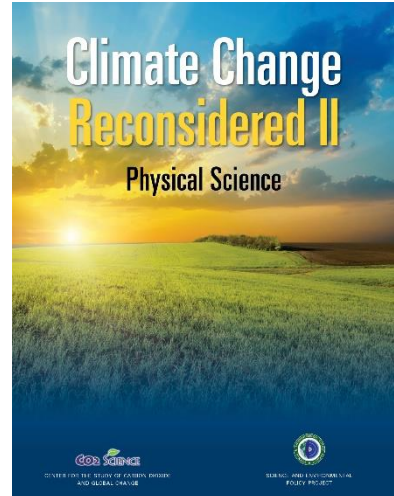
- [World Climate Declaration: THERE IS NO CLIMATE EMERGENCY](#): A global network of 1,609 scientists and professionals has prepared this urgent message. The 136 from Canada are listed [here](#). The declaration states:

"Climate science should be less political, while climate policies should be more scientific. Scientists should openly address uncertainties and exaggerations in their predictions of global warming, while politicians should dispassionately count the real costs as well as the imagined benefits of their policy measures."

- The [Global Warming Petition Project](#) had 31,487 signers, including 9,029 PhDs. All of the listed signers have formal educations in fields of specialization that suitably qualify them to evaluate the research data related to the petition statement. For example, there were 3,805 signers who were specialized in atmospheric, environmental, and Earth sciences, specialties directly related to the physical environment of the Earth and the past and current phenomena that affect that environment. Here is what they agreed to:

"There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gasses is causing or will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth."

- The [Climate Change Reconsidered](#) series of reports of the Nongovernmental International Panel on Climate Change (NIPCC) summarize thousands of studies from peer-reviewed scientific journals that either debunk or cast serious doubt on the hypothesis that emissions of CO₂ from human activities will cause catastrophic climate change.
- [The Climate Scientists' Register](#) of the International Climate Science Coalition attracted 143 qualified endorsers from 22 countries in just a few days. Those experts agreed to the following statement:

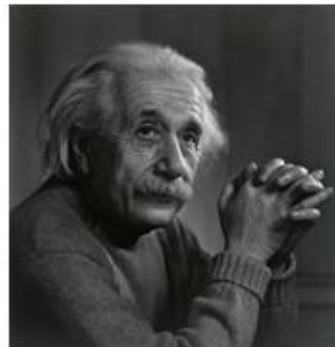


"We, the undersigned, having assessed the relevant scientific evidence, do not find convincing support for the hypothesis that human emissions of carbon dioxide are causing, or will in the foreseeable future cause, dangerous global warming."

Dr. Richard Lindzen was right when he said that a consensus was reached before the research even began. The so-called consensus supposedly "proved" the hypothesis of dangerous man-made global warming was correct, regardless of the evidence. But consensus never proves anything to be correct, or incorrect, in science.

Dr. Albert Einstein put it well when told of the publication of a book titled [100 Authors Against Einstein](#). Dr. Einstein replied:

"Why 100? If I were wrong, one would have been enough."



4.0 Conclusion

It has been pointed out by experts in the field that, when we understand the science well enough to make accurate medium-term weather forecasts, then we may be ready to tackle long-term weather, and eventually climate, projections. But we are a very long way from that point yet and indeed, we may never get there. Professors Chris Essex (University of Western Ontario) and Ross McKittrick (University of Guelph) write in their award-winning book [Taken by Storm](#):

“Climate is one of the most challenging open problems in modern science. Some knowledgeable scientists believe that the climate problem can never be solved.”

Regardless, we have demonstrated in this report that a dispassionate examination of the available weather and climate observational data shows that nothing out of the ordinary is happening in the real world. Forecasts of impending climate doom are based on hopelessly flawed computerized climate models that do not stand up to serious critique. Much of what climate alarmists claim is based on easily disproven myths.

There is no climate crisis. Even if there were, the impact on climate of Ottawa’s almost \$60 billion plan would be too small to even measure, let alone feel. Ottawa’s climate mitigation plans therefore are *all pain and no gain* and should be immediately withdrawn. Then, as we detailed in [part 1 of this report](#), a plan that focusses on enhancing resilience and cost-effective adaptation to natural climate change should be developed.

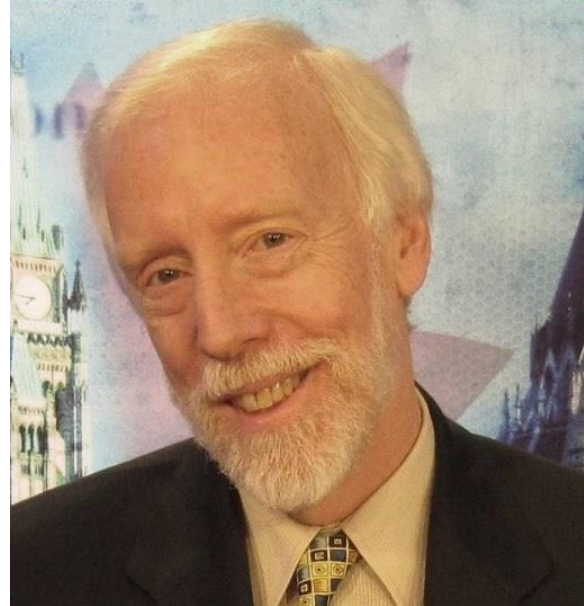
In the judicial system, there are mechanisms to reopen cases when relevant new evidence comes to light. In science, this is normal as well. Scientists question, re-examine, change ideas, and reject old theories when reliable new information surfaces. If the City of Ottawa is to base its climate and energy policies on real science and not just bow to aggressive, misguided pressure campaigns based on outdated science, then it must accept that its policy decisions should be changeable as science advances. Otherwise, the city’s policies become progressively disconnected from science, and we may endanger everyone and waste billions of dollars going in entirely the wrong direction.

ICSC-Canada calls on the City of Ottawa to immediately convene open, unbiased public science hearings in which leading experts from all sides of the issue, several of whom are referenced in this report, are invited to testify. ICSC-Canada has the contacts and expertise to help the city hold such hearings and we stand willing and able to assist in any way we can to help make this a reality.

ANNEX A – ABOUT THE AUTHORS

A.1 - ICSC-Canada Executive Director: Tom Harris, Ottawa, Ontario

Tom has Bachelor and Masters Degrees in Mechanical Engineering (thermo-fluids and energy focus). He has over 40 years' experience working as a mechanical and IT engineer and project manager, science and technology communications professional and media and S&T advisor to a former Opposition Senior Environment Critic in Canada's federal Parliament.



For the past 22 years Tom has been working with a team of scientists and engineers to promote a sensible approach to range of energy and environmental topics, climate change in particular. His main focus has been the controversial science underlying the dangerous human-caused climate change hypothesis and the problems with attempting to replace conventional power sources with unreliable and expensive alternative energy. Tom's December 2019 presentation in Madrid, Spain about the latter topic may be seen [here](#). A TV interview he took part in in Madrid may be seen [here](#). His most recent TV interview was broadcast on September 23, 2023 and may be seen [here](#).

Between 2006 and 2008, Tom was Executive Director of the Natural Resources Stewardship Project. Since 2008, he has been Executive Director of the [International Climate Science Coalition](#) (ICSC). Until 2011, he taught a total of 1,500 students at Carleton University in the second year Earth Sciences course, "[Climate Change: an Earth Sciences Perspective](#)." Tom describes his approach to the course [here](#). An excerpt from a lecture may be viewed [here](#).

Tom is regularly published in newspapers in Canada and the U.S. and occasionally in Australia, New Zealand, the U.K. and other countries. He is often interviewed on radio and occasionally television and hosts the radio program [The Other Side of the Story](#) on the America Out Loud Talk Radio Network, as well as the podcast [Exploratory Journeys](#).

Contact Mr. Harris by e-mail by clicking [here](#) or by calling 613-728-9200.

A.2 - ICSC-Canada Economics/Policy Advisor and Director: Robert Lyman, Ottawa, Ontario

Robert Lyman has an Honours degree in International Relations (Economics, Political Science and History). He is a retired economist and public servant who spent over forty years analyzing and advising on energy, environment and transportation policy issues.

Robert spent the first ten years of his career as a foreign service officer with postings to Canadian embassies in Caracas, Venezuela and Washington, D.C. He then spent 37 years working in different federal government departments, almost always as an analyst, advisor and manager dealing with energy and environmental policy issues. Here are highlights:



- He worked as an economist in the Energy Policy Branch of Energy, Mines and Resources during negotiations over oil and gas policy before and after the National Energy Program.
- In the late 1980s, he was the Senior Director of Energy Policy when climate change issues first arose; Robert was heavily engaged in the implementation of Offshore Accords with Newfoundland and Nova Scotia and with the negotiation of the resource aspects of aboriginal land claims.
- He was first federal co-chair of the Federal-Provincial Committee on Climate Change.
- Robert was the Senior Director of Oil Policy from 1995 to 2002 when the fiscal regime governing oil sands development was being expanded. At that time, he led the first federal work assessing the public policy that should govern CO₂ capture and storage.
- Robert managed the group providing advice on the potential for emissions reduction in the oil industry during the Climate Change Table Process prior to the Kyoto Protocol.
- He retired in 2006 as Director General, Environmental Affairs at Transport Canada, where he managed a directorate responsible for providing policy advice and delivering programs that would reduce the environmental effects of the transportation industry.

After retiring from the public service, Robert spent ten years as a consultant performing policy-related studies for the federal and provincial governments. His recent writings have been published by the U.K. Global Warming Policy Forum and by the Calgary-based not-profit [Friends of Science Society](#). He is an occasional contributor to the Comment page of the Financial Post.

Robert recently [appeared as an expert witness](#) before the House of Commons Committee on Industry, Science and Technology to discuss the role that ‘green’ energy should play in Canada’s economic recovery. His latest presentation, “When Will Climate Policy Hit the Wall?” [was presented](#) on October 17, 2023 to the friends of Science Society’s 20th Annual Climate Science Event. The full script of this important speech may be seen [here](#).