

Reflecting on our Changing Climate, from Fear to Facts

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A Voice in the Wilderness

By

Constantin Cranganu

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I dedicate this book to future generations, in particular my children, Dan and Andreea, and grandchildren Sam, Luke, Ben, Cate, and Ana.

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PREFACE

In the vast and often contentious landscape of climate change debates, where conflicting opinions rise like storm clouds, there are sometimes those who stand alone, voices crying out in the wilderness. These lone voices—researchers with inconvenient data, activists challenging powerful interests, or Indigenous communities bearing the brunt of a changing world—often face opposition, scepticism, and even ridicule. Yet, their solitary stand serves a crucial purpose: to pierce the illusion of consensus, to illuminate the cracks in mainstream narratives, and to keep the urgency of the crisis on the agenda. Thus, the concept of *a voice in the wilderness* emerges as a powerful metaphor, encapsulating the idea of an individual or group presenting unconventional perspectives or challenging the prevailing narratives within the climate change discourse. In a domain often dominated by consensus and established viewpoints, these dissenting voices play a crucial role in fostering diversity of thought and encouraging critical examination of established beliefs.

The voice in the wilderness can represent those who, amid the cacophony of consensus, bring attention to overlooked aspects, alternative solutions, or neglected consequences related to climate change. It embodies the courageous individuals who defy the pressure to conform to popular narratives and instead advocate for nuanced, evidence-based discussions.

Within the climate change consensus, divergent voices often face scepticism and resistance. However, history has shown that breakthroughs and paradigm shifts often originate from those challenging the status quo. *A voice in the wilderness*, although initially dismissed or marginalised, can catalyse paradigmatic change and reshape the contours of climate discourse.

Moreover, a healthy and inclusive debate is essential for refining policies and strategies aimed at mitigating climate change. Embracing diverse perspectives ensures a comprehensive understanding of the complex challenges involved and guards against the pitfalls of groupthink. While consensus is vital for collective action, it is equally important to foster an environment that values dissent and welcomes alternative viewpoints.

The role of these lone voices in the climate change debate is not to dictate a singular narrative, but to ensure that the narrative is never static, never settled. They challenge us to confront the uncomfortable truths, to question our assumptions, and to embrace the complexities of the issue.

They remind us that consensus, while valuable, is a fragile thing, easily swayed by power dynamics and vested interests. Ultimately, it is their courage, their perseverance, and their willingness to stand alone that keeps the conversation alive, reminding us that the fate of our planet is not a foregone conclusion, but a story still being written, every voice echoing within its ever-shifting narrative.

In essence, I think that *a voice in the wilderness* may serve as a reminder that, in the pursuit of addressing climate change, embracing diverse voices and ideas is not a sign of weakness but a strength that can lead to more robust, effective solutions. It calls for an open dialogue where the wilderness of ideas contributes to a richer and more nuanced understanding of the intricate issues surrounding climate change.

On the other hand, *a changing climate* reflects an intrinsic reality of our planet's history over the past 4.6 billion years. Natural variations (temperature, greenhouse gases, etc.) occur over time scales ranging from decades to millions of years and are controlled by a multitude of factors: solar system geometry, solar luminosity, global distribution of continents and oceans, orbital and solar variability, large-scale oceanographic oscillations, long ocean tidal cycles, El Niño and La Niña oscillations, volcanic activity, rock and mineral decay, regional tectonics, short ocean tidal cycles, solar storms and flares, smaller orbital cycles, methane hydrate melting, and meteorite impacts.

The emergence of the human species on earth has meant activities that can influence climate through changes in land use and land cover, emissions of CO₂ and other greenhouse gases, and changes in atmospheric aerosol concentrations.

But in recent decades, the definition of climate change has moved away from this broad interpretation. Article 1 of the United Nations Framework Convention on Climate Change (UNFCCC), adopted globally in 1992, requires the following definition:

“Climate change” means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.¹

This definition explicitly excludes natural changes occurring in the climate system, so that “climate change” refers only to anthropogenic influences,

¹ United Nations, 1992, *United Nations Framework Convention on Climate Change*, https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf, p. 7.

while “climate variability” is reserved for natural causes. *A changing climate* maintains both components, without executing a “climate reductionism” by implicitly attributing any observed change over the past century to human emissions into the atmosphere. This prevailing assumption results in associating every atypical weather or climate occurrence with climate change caused by human activities, particularly emissions from fossil fuels.

More recently, the phrase “climate change” has become a euphemism for “carbon dioxide emissions.” While focusing on CO₂ emissions is crucial for understanding climate change, solely using this term in scientific discussions may lead to overlooking other complex factors contributing, among other things, to extreme weather events, potentially affecting the quality of evidence analysis.

The shift towards using “climate change” interchangeably with “carbon dioxide emissions” within scientific circles, while highlighting a key driver, necessitates ensuring comprehensive discussions that encompass the diverse evidence related to all climate sub-systems (atmosphere, lithosphere, biosphere, hydrosphere, and cryosphere). Therefore, using the phrase *a changing climate* opens a bigger umbrella that facilitates covering the multiple and complex climate manifestations.

CHAPTER 1

ON CHICKENS AND EGGS, TEMPERATURES AND CO₂ AND CAUSAL LINKS IN CONTEMPORARY CLIMATE PROCESSES

Science is generated by and devoted to free inquiry: the idea that any hypothesis, no matter how strange, deserves to be considered on its merits. The suppression of uncomfortable ideas may be common in religion and politics, but it is not the path to knowledge; it has no place in the endeavor of science. We do not know in advance who will discover fundamental new insights.

—Carl Sagan

Two thousand years ago, Plutarch formulated a question that defines the dilemma of causality: Which came first, the chicken or the egg? For centuries, the answers have varied according to who gave them: philosophers, priests, biologists, palaeontologists, and so on. In the case of discrete events, the formulation of an answer must respect the temporal precedence of cause over effect. The same requirement applies (with specific modifications) to the comparison of processes, deterministic or stochastic.

The former are processes whose outcomes are completely determined by initial conditions and system rules. This means that if the initial state of a deterministic process is known, its future state can be perfectly predicted (movement of planets, clockwork, spread of fires, etc.). Their predominant feature is the perfect predictability of the reproducibility of the results.

On the other hand, stochastic processes involve a certain element of hazard. This means that even if you know the initial state of a stochastic process, you cannot perfectly predict its future state. Instead, you can only predict the probability of different possible outcomes. Classic examples include the outcome of coin/chance tosses, the price of a stock on the stock exchange on a given day, the weather forecast, and so on. Their predominant feature is the imprecision of the predictions given.

Climate and its variations, synergistically interconnected in the individual evolutions of the five subsystems—lithosphere, hydrosphere, atmosphere,

biosphere, and cryosphere—belong to stochastic processes for which the causal “chicken or the egg” relationship takes the form: *process X is the potential cause of process Y or vice versa*.

The causal relationship of two of the best-studied climate processes—temperature change T and carbon dioxide concentration change CO_2 —points to rising T resulting in rising CO_2 over hundreds of thousands of years until the onset of the industrial revolution (around 1850) (Figure 1).

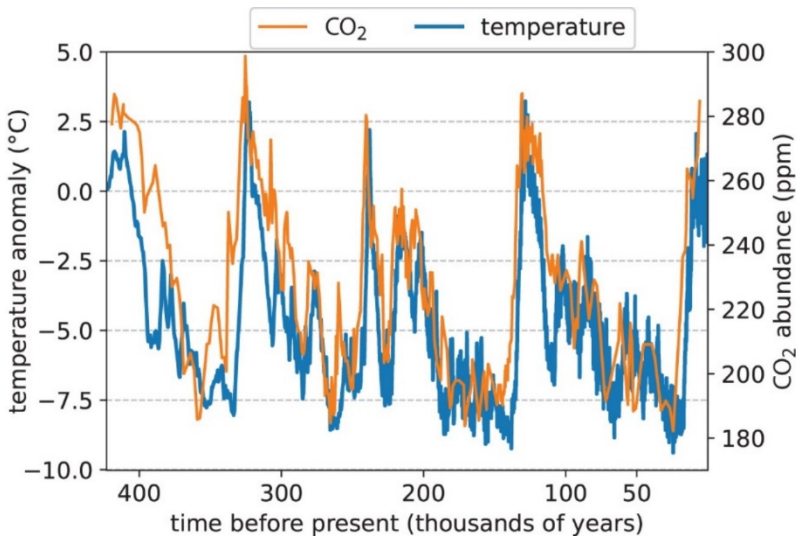


Figure 1. Temperature anomaly variation in the South Pole area (blue line) over the last 410,000 years, constructed from an Antarctic ice core. Carbon dioxide (orange line) is measured from air bubbles trapped in the ice.¹

A simple visual examination shows that changes in CO_2 concentration occur *after* changes in temperature. Meeting the condition of temporal precedence requires that the increase in temperature T be established as the cause of the increase in CO_2 . Similar measurements on Greenland ice cores indicate the same direction of causality: $T \rightarrow \text{CO}_2$.

With the onset of the industrial revolution and the burning of fossil fuels, the millennia-old paradigm shifted: humans are “poisoning” or “polluting” the atmosphere (one of the five climate sub-systems) with anthropogenic CO_2 , the increase of which causes an increase in temperature, that is, global warming. In short, the “chicken or the egg” causal relationship has been

¹ https://cdiac.ess-dive.lbl.gov/climate/paleo/paleo_table.html (accessed 3 July 2020).

reversed over the last two centuries: CO₂ → *T*. This paradigm has dominated the environmental policies of developed countries in recent decades, though less so or not at all those of poor and developing countries with majority populations. On the basis of IPCC reports and most climate experts' reports (97% or more), a hysteria has recently broken out: climate crisis, existential crisis, apocalyptic crisis, "code red for humanity," "boiling oceans," young people not wanting to have children, other young people vandalising artworks and perpetrating many other forms of mischief, and so on.

The good part of the story has its source in the remarks made by Carl Sagan in the chapter's motto and in a number of recent scientific developments that question the modern causal relationship, CO₂ → *T*. It is still a "chicken or the egg" relationship, one-way, but going in the opposite direction to that assumed for the last 200 years. These developments in scientific thinking without ideological strings include, among others: —An early study published in 1990 in *Nature* that initiated the current paradigm shift, which clearly states:

The hypothesis that the increase in atmospheric carbon dioxide is related to observable changes in the climate is tested using modern methods of time-series analysis. The results confirm that average global temperature is increasing, and that temperature and atmospheric carbon dioxide are significantly correlated over the past thirty years. *Changes in carbon dioxide content lag those in temperature by five months.*² [emphasis added]

—A study that examined temperature and CO₂ data that showed that CO₂ variations *follow* temperature variations *T* → CO₂³.

—A study (in two parts) that created the advanced theoretical framework for causality testing based on stochastic assessment of the potential causal link between two processes using the notion of impulse response function.⁴

—A recently published study that provides a practical application of using the advanced theoretical framework using "hard" data of CO₂ concentrations and temperature variations ("hard" data in this context means official data, used by the authors of IPCC reports and other documents. In other words, it

² Kuo, C., Lindberg, C., and Thomson, D., 1990, *Coherence established between atmospheric carbon dioxide and global temperature*, *Nature*, vol. 343, pp. 709–14.

³ Koutsoyiannis, D., and Kundzewicz, Z. W., 2020, *Atmospheric temperature and CO₂: Hen-or-egg causality?* *Sci*, 2 (4), 83, <https://doi.org/10.3390/sci2040083>.

⁴ Koutsoyiannis, D., Onof, C., Christofides, A. and Kundzewicz, Z. W., 2022, *Revisiting causality using stochastics: 1. Theory*, *Proc. R. Soc. A* 2022, 478, 20210836. Koutsoyiannis, D., Onof, C., Christofides, A., and Kundzewicz, Z. W., 2022, *Revisiting causality using stochastics: 2. Applications*, *Proc. R. Soc. A* 2022, 478, 20210835.

worked with the client’s “material”). The title of the latter study also inspired the title of that study.⁵

Some interesting conclusions of the research group led by Professor Demetris Koutsoyiannis are:

By studying lagged correlations of the two [T and CO₂], the study asserted that, while both causality directions exist, the results support the hypothesis that the dominant direction is $T \rightarrow \text{CO}_2$. Changes in [CO₂] follow changes in T by about six months on a monthly scale or about one year on an annual scale. In turn, the study attempted to interpret this mechanism by referring to biochemical reactions, since at higher temperatures soil respiration, and hence CO₂ emission, increases.

Clearly, the results [. . .] suggest a (mono-directional) potentially causal system with T as the cause and [CO₂] as the effect. Hence the common perception that increasing [CO₂] causes increased T can be excluded as it violates the necessary condition for this causality direction.

[. . .] in other words, *it is the increase of temperature that caused increased CO₂ concentration* [emphasis added]. Though this conclusion may sound counterintuitive at first glance, because it contradicts common perception [. . .], in fact it is reasonable. The temperature increase began at the end of the Little Ice Period, in the early nineteenth century, when human CO₂ emissions were negligible [. . .].

The mainstream assumption of the causality direction [CO₂] \rightarrow T makes a compelling narrative, as everything is blamed on a single cause, the human CO₂ emissions. Indeed, this has been the popular narrative for decades. However, popularity does not necessarily mean correctness, and here we have provided strong arguments against this assumption. Since we have identified atmospheric temperature as the cause and atmospheric CO₂ concentration as the effect, one may be tempted to ask the question: What is the cause of the modern increase in temperature? Apparently, this question is much more difficult to reply to, as we can no longer attribute everything to any single agent.

We do not claim to have the answer to this question, whose study is far beyond the article’s scope. Neither do we believe that mainstream climatic theory, which is focused upon human CO₂ emissions as the main cause and regards everything else as feedback of the single main cause, can explain what happened on Earth for 4.5 billion years of changing climate.

⁵ Koutsoyiannis, D., Onof, O., Zbigniew W. Kundzewicz, Z. W., and Christofides, A., 2023, *On hens, eggs, temperatures and CO₂: Causal links in Earth’s atmosphere*, Sci, 5 (3), <https://doi.org/10.3390/sci5030035>.

Where does the increase in CO₂ come from?

Apart from the ignorance argument, there is the causation argument, which simply cannot be ignored: *Variations in CO₂ occur after temperature variations on all time scales we can measure.*

Unless you dispute this, then it should be understood that CO₂ is *feedback*, not temperature forcing. If previous warm periods have shown a corresponding increase in CO₂, then the same question must be asked, “Where did CO₂ come from and where did it go?”

The current carbon budget in the form of CO₂ in the atmosphere has been modelled and numerous studies have been written. Koutsoyiannis et al. (2023) provide a balance of CO₂ emission sources and sinks again using official published data (Figure 2).

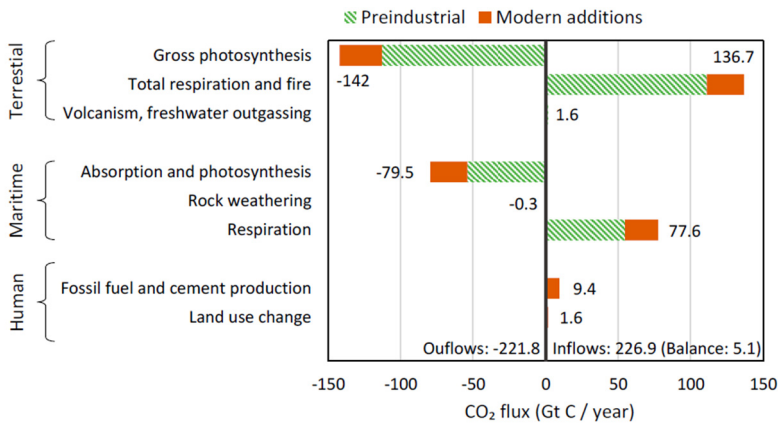


Figure 2. Annual carbon balance in the Earth’s atmosphere in Gt C/year, based on the IPCC estimates.⁶ The balance of 5.1 Gt C/year is the annual accumulation of carbon (in the form of CO₂) in the atmosphere.

Most of the *inflows* are due to biosphere respiration, that is, the biochemical reaction by which living organisms convert organic matter (e.g., glucose) into CO₂, releasing energy and consuming molecular oxygen.

⁶ Masson-Delmotte, V., Zhai, P., Pirani, A., Connors, S. L., Péan, C., Berger, S., Caud, N., Chen, Y., Goldfarb, L., Gomis, M. I., et al. (eds.), 2021, *IPCC, Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*; Cambridge University Press, 2391 p.

As shown in Figure 2, respiration has increased in recent years, the main reason being rising temperatures. Other recent studies confirm this.

In June 2023, a group of Japanese researchers published a study that opens with the following statement:

Soil respiration in terrestrial ecosystems is critical for assessing the net ecosystem carbon (C) balance, because it represents the second largest global C flux (100 Pg C yr⁻¹) between ecosystems and the atmosphere. [. . .] *This amount is more than 10 times what is currently produced by fossil fuel combustion.*⁷ [emphasis added]

A new study from the University of Stirling, published in the journal *Nature Ecology & Evolution* in early 2023, found that decaying dead plants and leaves release 60 petagrams of carbon into the atmosphere each year—*six times more than all human emissions*—and contribute about 10% of the total carbon in the atmosphere⁸ [emphasis added].

On the other hand, photosynthesis, the biochemical process that removes CO₂ from the atmosphere, producing carbohydrates in plants, algae, and bacteria using light energy, has also increased, leading to the greening of the Earth, due to the increase in atmospheric CO₂, which is plant food. The example in Figure 3 is highly educational.

⁷ Nakaji, T., Makita, N., Katayama, A., and Oguma, H., 2023, *Belowground spectroscopy—Novel spectral approach for estimation of vertical and species-specific distributions of forest soil characteristics and heterotrophic respiration*, *Agricultural and Forest Meteorology*, 339, 109563.

⁸ Joly, F.-X., Scherer-Lorenzen, M., and Hättenschwiler, S., 2023, *Resolving the intricate role of climate in litter decomposition*, *Nature Ecology & Evolution*, vol. 7, pp. 214–23.

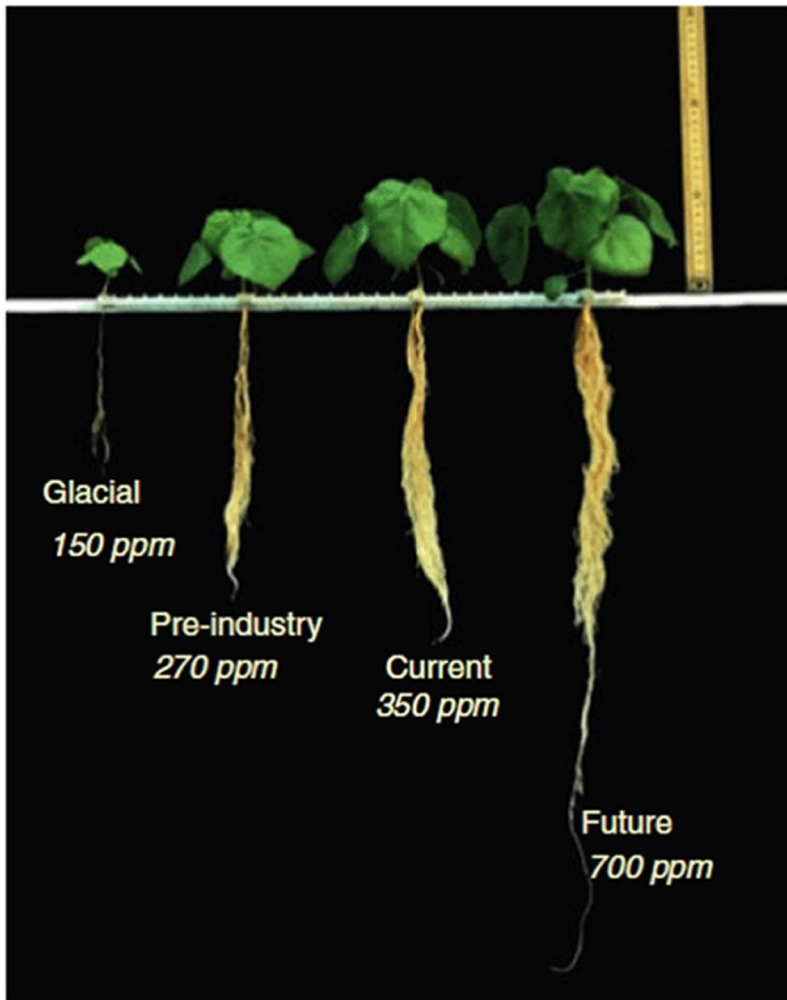


Figure 3. Specimens of the plant *Abutilon theophrasti* (C3) grown at varying concentrations of CO₂ from 150 ppm in glacial periods to 700 ppm in the future. The current concentration of CO₂ is about 420 ppm. All plants were 14 days old and grown under similar water, light, and nutrient conditions. These plants were photographed during a study by Dippery et al. (1995). (Photo courtesy of Anne Hartley, Florida Gulf Coast University.)⁹

⁹ Gerhart, L. M. and Ward, J. K., 2010, *Plant responses to low [CO₂] of the past*, New Phytologist, vol. 188, pp. 674–95.

More CO₂ obviously means more plants, which means more food. The planet's ten billion people in the near future will need more food than they do now. Will it be possible to provide it?

I must add one more significant reality: the carbon cycle is much more complex than it first appears. For example, the processes that release CO₂ into the atmosphere (biodegradation) are much more temperature-dependent than the processes that fix it (photosynthesis).¹⁰ So there is already a systematic imbalance, no matter what we do.

During glaciations, the rate of storage of CO₂ is greater than the rate of its release, leading to a decrease in CO₂ in the atmosphere, as happened during the Little Ice Age (LIA). During interglaciations, such as the current one, more CO₂ is released than stored, leading to an increase in its concentration. But the relationship is not linear.

It is better to think of CO₂ sources and sinks as dynamic entities that are never in perfect equilibrium and have a non-linear relationship with each other.

Finally, I quote an article from 2017 that also hammers a nail in the coffin of the current climate paradigm:

The IPCC carbon budget concludes that changes in atmospheric CO₂ are driven by fossil fuel emissions on a year by year basis. A testable implication of the validity of this carbon budget is that changes in atmospheric CO₂ should be correlated with fossil fuel emissions at an annual time scale net of long-term trends. A test of this relationship with insitu CO₂ data from Mauna Loa 1958–2016 and flask CO₂ data from twenty three stations around the world 1967–2015 is presented. *The test fails to show that annual changes in atmospheric CO₂ levels can be attributed to annual emissions.* The finding is consistent with prior studies that found no evidence to relate the rate of warming to emissions and they imply that the IPCC carbon budget is flawed possibly because of insufficient attention to uncertainty, excessive reliance on net flows, and the use of circular reasoning that subsumes a role for fossil fuel emissions in the observed increase in atmospheric CO₂.¹¹ [emphasis added]

¹⁰ Smagin, A. A., Sadovnikova, N. B., Vasenev, V. I., and V. Smagina, M. V., 2018, *Biodegradation of Some Organic Materials in Soils and Soil Constructions: Experiments, Modeling and Prevention*, Materials, vol. 11, issue 10, 1889, doi: 0.3390/ma11101889.

¹¹ Munshi, J., 2017, *Responsiveness of Atmospheric CO₂ to Fossil Fuel Emissions*: Updated (July 5, 2017). Available at SSRN: <https://ssrn.com/abstract=2997420> or <http://dx.doi.org/10.2139/ssrn.2997420>.

A natural cause of rising temperatures

One of the important contributions of the study by Koutsoyiannis et al. (2023) is the investigation of the causality between albedo* and atmospheric temperature. This causality is expressed by an adaptation of the Stefan–Boltzmann law:

$$T = \sqrt[4]{\frac{(n + 1)S(1 - \alpha)}{4\sigma}}$$

where T is the temperature in Kelvin, σ is the Stefan–Boltzmann constant, $s = 5.67 \times 10^{-8} \text{ W/m}^2/\text{K}^4$, S is the solar constant for the Earth, $S = 1360 \text{ W/m}^2$, $\alpha = 0.3$ is the Earth’s albedo, and n is the number of layers in the atmosphere; it is equivalent to the amount of greenhouse gases in the atmosphere. Therefore, all other things being equal, a decrease in albedo α will lead to an increase in temperature.

In the twenty-first century, albedo in the top of the atmosphere (TOA) can be estimated from satellite data. Specifically, this can be done using data from the ongoing Clouds and the Earth’s Radiant Energy System (CERES) project, managed by NASA.

The albedo values for the last 22 years are shown in Figure 4.

* Albedo (α) is a parameter that indicates the reflectivity (“whiteness”) of a planet—the fraction of incident photons of solar radiation that are reflected back into space. For Earth, the accepted average value is $\alpha = 0.3$.

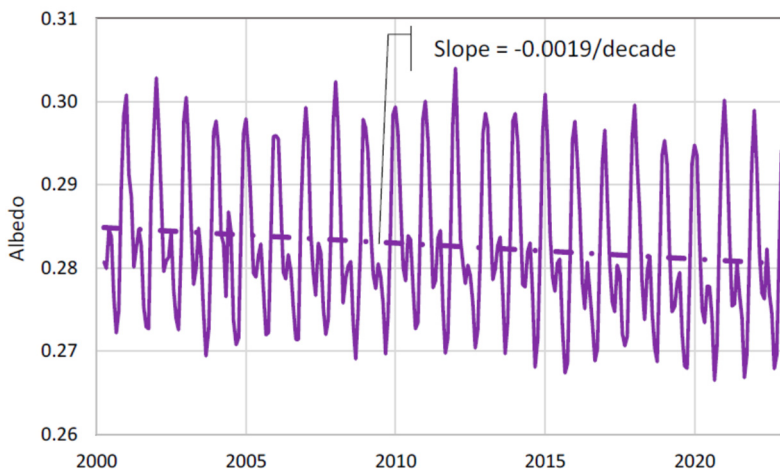


Figure 4. TOA albedo time series (continuous line), as provided by NASA's Clouds and the Earth's Radiant Energy System (CERES), along with linear trend (dashed line) (Figure A3 from Koutsoyiannis et al., 2023).

Koutsoyiannis et al. (2023) note:

A falling linear trend of $-0.0019/\text{decade}$ is also shown in the figure [above]. A falling trend means that less solar radiation is reflected by the Earth, which may result in an increase in temperature. For the entire period, the decline of the albedo is about 0.004. As the average incoming solar radiation (insolation), according to the same data set, is 340 W/m^2 , this implies a difference (imbalance) of received energy by Earth of $0.004 \times 340 = 1.4 \text{ W/m}^2$.

Using the above formula allows the calculation of the temperature increase over the last 22 years due only to albedo decrease. But why would albedo decrease in such a short period?

One possible cause is a decrease in clouds due to a reduction in aerosols. Aerosols have decreased because burning fossil fuels has become cleaner, with coal being replaced by natural gas. The main anthropogenic gas contributing to aerosols is sulphur dioxide in the form of sulphuric acid droplets, mainly from burning coal and oil. The concentration of sulphur dioxide in the air has decreased significantly in recent years due to stricter environmental legislation and will continue to decrease.

So, this situation is somewhat paradoxical: we have reduced CO_2 emissions to save the planet from global warming. But we also reduced aerosol production, which in turn reduced cloud cover, which in turn reduced

albedo, which in turn increased global temperature—a complete vicious circle.

Conclusions

The studies by the group led by Professor Koutsoyiannis may represent the beginning of the current climate paradigm shift, which sees increasing anthropogenic emissions leading to rising global temperatures. And the dilemma “Which came first, the chicken or the egg?” may receive a current resolution based on recently published contributions: changes in CO₂ concentration cannot be a cause of temperature change. On the contrary, temperature changes are a potential cause of CO₂ changes on all time scales.

Two of the authors conclude:

All evidence resulting from the analyses of the longest available modern time series of atmospheric concentration of [CO₂] at Mauna Loa, Hawaii, along with that of globally averaged T, suggests a unidirectional, potentially causal link with T as the cause and [CO₂] as the effect. This direction of causality holds for the entire period covered by the observations (more than 60 years).

...

While some of the findings of this study seem counterintuitive or contrary to mainstream opinions, they are logically and computationally supported by arguments and calculations.

CHAPTER 2

QUESTIONS ABOUT CLIMATE CHANGE FROM AN AI CHATBOT

Uncertainty is the only certainty there is.
Knowing how to live with insecurity is the only security.
—John Allen Paulos, mathematician

In anticipation of an interview or public debate about the current state of the climate, I recently chatted with Bard, the AI chatbot launched by Google on 21 March 2023. My prompt was as follows:

Suppose I am a climate change denier or sceptic. Ask me 10 questions to prove that I am either one or the other.

Bard asked the 10 questions after a few seconds:



Sure, here are 10 questions I could ask you to try to determine if you are a climate denier or skeptic:

1. Do you believe that the Earth's climate is changing?
2. Do you believe that human activities are the primary cause of climate change?
3. Do you believe that the effects of climate change are already being felt?
4. Do you believe that climate change is a serious threat to the planet?
5. Do you believe that we need to take action to address climate change?
6. If so, what kind of action do you think we should take?
7. Do you believe that the scientific consensus on climate change is accurate?
8. What are your main concerns about climate change?
9. What are your thoughts on the potential solutions to climate change?
10. What do you think the future holds for the planet if we do not address climate change?

Your answers to these questions could help me to determine if you are a climate denier or skeptic. However, it is important to note that these questions are not a definitive test of your beliefs. There is no single answer that will definitively prove that you are a climate denier or skeptic.

From the beginning, I noted the courtesy of the “interviewer”: “there is no single answer that will definitively prove that you are a climate denier or sceptic.” With the hope that I have a chance of not being labelled one way or the other, I formulated my answers to the 10 questions.

1. Do you think the Earth's climate is changing?

As a geologist and geophysicist, I think this is the simplest question. The climate of our planet has changed, is changing, and will change permanently, as long as the major sources—solar energy, geothermal energy, volcanic activity, lithospheric plate tectonics, atmosphere and biosphere dynamics, glacial evolution—are there and working.

On the other hand, “Do you think the Earth’s climate is changing?” is an extremely imprecise question. The magnitude of the change is not specified, nor is the extent to which it is negative or positive or the extent to which it is caused by humans (this detail appears in the second question). To such a vaguely worded question, any answer can only be yes.

2. Do you think human activities are the main cause of climate change?

The burning of fossil fuels, land-use change through deforestation, cement production, ruminant livestock, rice paddies, and so on are human activities that contribute to increasing concentrations of some greenhouse gases (mainly CO₂ and CH₄). But these activities are only part of the complex causes of climate change over time. The percentages associated with this part differ between different specialist groups, with some considering it to be 100% the anthropogenic contribution. Another group recently concluded: “Our results show that the percentage of the total CO₂ due to the use of fossil fuels from 1750 to 2018 increased from 0% in 1750 to 12% in 2018, *much too low to be the cause of global warming*”¹ [emphasis added].

A less extremist approach is much closer to reality.

3. Do you think the effects of climate change are already being felt?

Climate change is subordinate to and results from two major cycles: glaciations and interglaciations. The last glaciation ended and the geological epoch called the Holocene began 11,700 years ago, marking the onset of the current interglaciation. The effects of climate change during any interglaciation are typical and are also felt in the Holocene: for example, increases in global average temperature, greenhouse gas concentrations, and

¹ Skrabble, K., et al., 2022, *World atmospheric CO₂, its ¹⁴C specific activity, non-fossil component, anthropogenic fossil component, and emissions (1750–2018)*, Health Physics, vol. 122, no. 2, pp. 291–305.

global average ocean levels. It should also be noted that, against the general background of global warming, the Holocene has also seen periods of several centuries in which the climate evolution has had warmer or colder characteristics than the post-1750 period, which is the subject of current climate debates and controversies. These events were not caused by human activities but resulted (and probably will continue to result in the future) from the complex, chaotic, highly non-linear and highly unpredictable structure of the multi-component climate system (lithosphere, atmosphere, biosphere, hydrosphere, cryosphere).

4. Do you think climate change poses a serious threat to the planet?

No, *the current* climate change is not an “existential crisis,” “a sixth extinction of life,” “a code red for humanity,” “a climate Armageddon,” and so on. I have detailed this answer in several articles and chapters from this book: “Linguistic Gymnastics: New Vampire Words, ChatGPT and Climate Change,”² “The Complexity Monster and Climate Change” (which includes quotations from 20 of my articles on climate change and the supposed threat it would cause),³ “Postponed Apocalypse: Current Climate Models Significantly Overestimate Future Sea Level Rise. Some Thoughts on Their Credibility,” “On the Inconsistency of ‘Tipping Points’ in the Evolution of Complex Natural Systems,” and several others.

In the article “Don’t Look Up: Is Climate Change Like a Comet or Like Diabetes?,” I pointed out, among other things, that climate change is just a mental tattoo—a phrase we invoke with an air of scientific sophistication to create some sense of knowing about the unknowable. In other words, there is no climate “comet” approaching the Earth, no rigorous scientific or historical evidence that there will be an extinction of the human race or a catastrophic collapse of current civilisation.⁴

As I pointed out in another article, the major risks people need to pay attention to are pandemics, military, cyber, or nuclear wars, and advanced

² Crânganu, C., 2023, *Linguistic gymnastics: new vampire words, ChatGPT and climate change*, <https://www.contributors.ro/gimnastica-lingvistica-noi-cuvinte-vampir-chatgpt-si-schimbarea-climei/> (in Romanian).

³ Crânganu, C., 2023, *The complexity monster and climate change*, <https://www.contributors.ro/monstrul-complexitatii-si-schimbarea-climei/> (in Romanian).

⁴ Crânganu, C., 2022, *Don’t look up: Is climate change like a comet or like diabetes?*, <https://www.contributors.ro/dont-look-up-este-schimbarea-climei-ca-o-cometa-sau-ca-un-diabet/> (in Romanian).

artificial intelligence, to which I would add infant mortality, global economic recessions, and the existence of failed states—all true horsemen of the Apocalypse.⁵

If we consider the views of over 9.7 million people about the “serious threat” that climate change would pose, we see a completely unexpected picture. “Action taken on climate change” ranks last out of the 16 priorities of concern to the planet’s people (Figure 1).

This is what MY World voters want:

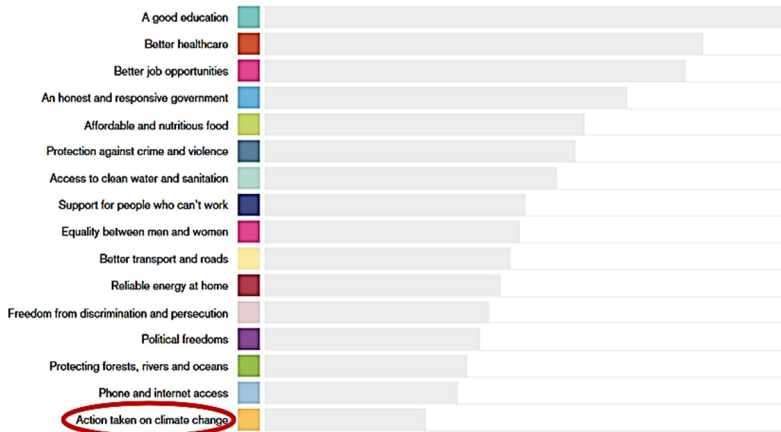


Figure 1. Top global priorities based on the votes of over 9.7 million people cast in the UN My World survey, 2015.⁶

And if we cannot accept the threat of a killer climate “comet,” we should consider the existence of a climate “iceberg,” which many people talk about, write about, or fear (Figure 2).

⁵ Crănganu, C., 2023, *Does natural selection favour artificial intelligence (AI) over human intelligence?*, <https://www.contributors.ro/selectia-naturala-favorizeaza-inteligenta-artificiala-ai-in-detrimentul-inteligentei-umane/> (in Romanian).

⁶ UN My World, 2015, *We the peoples celebrating 7 million votes*, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_330319.pdf.

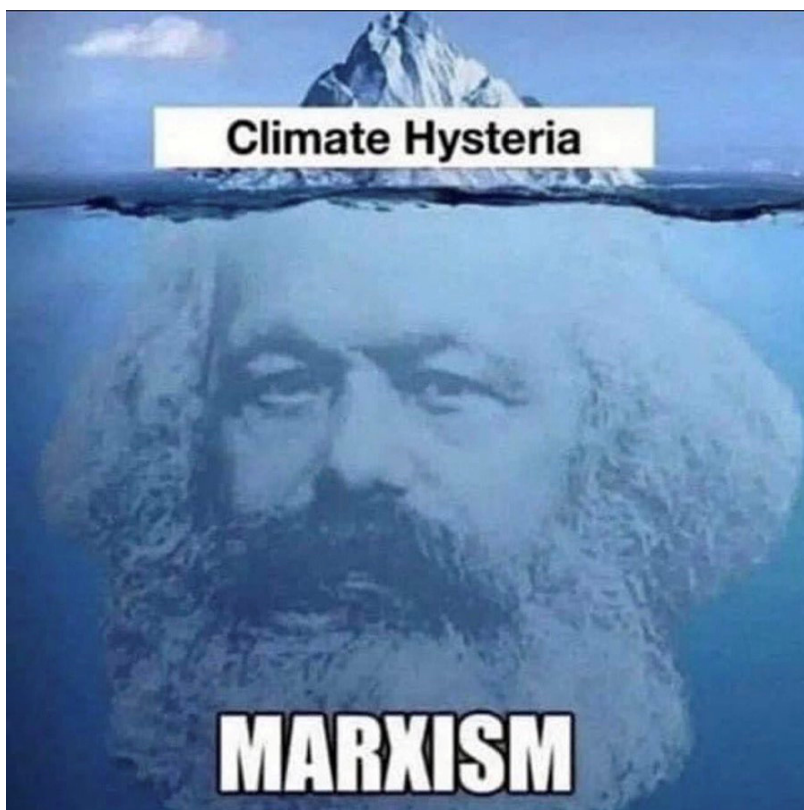


Figure 2. A climate “iceberg” floating on the ocean of human civilisation.⁷

Unfortunately, climate hysteria is often coupled with climate hypocrisy, which makes a mockery of the “serious threat to the planet” question. My readers have had the opportunity over the years to see many examples of the hypocrisy that, like the chaff in the grain of wheat, “tarnishes the lofty ideals” of climate activists and “green” organisations, for example: “Global Warming and Political Hypocrisy in China and Canada” (2017)⁸ and “New Climate Hypocrisies and the Energy Crisis” (2021).⁹

⁷ <https://twitter.com/DavidWolfe/status/1559058769841119232>.

⁸ Crânganu, C., 2017, *Global warming and political hypocrisy in China and Canada*, <https://www.contributors.ro/incalzire-globala-%c8%99i-ipocrizie-politica-in-china-%c8%99i-canada/> (in Romanian).

⁹ Crânganu, C., 2021, *New climate hypocrisies and the energy crisis*,