
CURRENT CONTROVERSIES



Geoengineering Versus Natural Climate Solutions

BY ROBIN COLLINS

Many climate researchers now believe keeping our planet below the IPCC warming “limit” is impossible. The [Copernicus Climate Change Service](#) has just reported the first 12-month period in which average global surface temperature exceeded the pre-industrial average by 1.5° C. Some climatic “tipping points” – melt-

ing of Arctic ice, massive releases of natural methane, irreversible biodiversity damage – appear shockingly close. The situation is dire. Priority now requires innovative interventions and adaptation, not just preventive measures. And as many will argue, ‘net zero’ will now have a limited impact and be insufficient; climate restoration is required for our survival.

CRISIS, WHAT CRISIS?

The United Nations Environment Assembly in Nairobi just held its sixth assessment (UNEA-6) of the climate, pollution and biodiversity status of the globe. A resolution was proposed by Switzerland, Monaco, Georgia and Israel to establish an Expert Scientific Group focussed on climate mitigation. Its purpose was to study the “risks

and opportunities” of solar radiation modification (SRM), which are ways to cool the Earth by reflecting solar radiation back into space. The resolution was first watered down, and then withdrawn after strong opposition from (surprisingly) Pacific Island States, as well as Colombia, Mexico, the European Union and Africa. Many of these countries face the most immediate and harshest climate risks. So, what’s going on?

For one thing, a significant “justice vs technology” divide, that looks more political than pragmatic, has arrived. Some countries see geoengineering methods as the thin edge of a technowedge they want nothing to do with.

Notably Canada, however, has included a research element within its new [Science Strategy](#) report for 2024-2029. There we find an intention to explore technologies “that aim to deliberately alter the climate system, typically to counteract climate warming (e.g., solar radiation modification, marine geoengineering, carbon dioxide (CO2) removal techniques)” and to “conduct scientific assessments” of them.

NOW, WHO’S IN DENIAL?

The denialism that may matter most is no longer a diminishingly marginal group of citizens who dispute that global warming is real or fundamentally caused by greenhouse gas (GHG) emissions. Oddly it is a highly engaged sector (scientists, environmentalists, and activists) who ridicule climate engineering research because they believe the effort is nonsensical, unnecessary, or too dangerous. So dangerous as to prohibit further investigation through careful experiments, even as global temperatures, raging wildfires, severe storms, droughts and floods are all increasing. Further, many don’t acknowledge that some favoured geoengineering approaches emulate natural processes that occur on Earth every day.

Their preferred response, in addition to the necessity of an uncontroversial energy transition away from carbon fuels, is Natural Climate Solutions (NCS), which are designed primarily to

enhance the natural ability of ecosystems to sequester and store carbon. In 2021 Ronnie Drever and his coauthors developed a Canadian model for better environmental management. They advocate for ecological protection and restoration, “alongside the steep reductions needed in fossil fuel emissions.” They highlight preservation of carbon stocks by avoiding grassland conversion and by restoring forest cover. Their proposals are broadly supported and are a data-rich blueprint for altering current practices. On offer are 24 distinct pathways aimed at agriculture, wetlands, grasslands and forests.

NCS are widely embraced because proposed reforms seem sensible, safe

and possible. These are undeniably good national goals but (and Drever presumably agrees) the problems are global. All NCS measures combined will be conspicuously insufficient given the continuance of greenhouse gas production and the mammoth transitions required.

Among environmentalists, as expected, there is a diversity of opinion, but a surprisingly large number believe that nature will resolve existential threats (caused by humans) without further human intervention. The most extreme “fortress conservationists”, as A Trillion Trees (2021) author Fred Pearce describes them, are even opposed to deploying Indigenous methods of

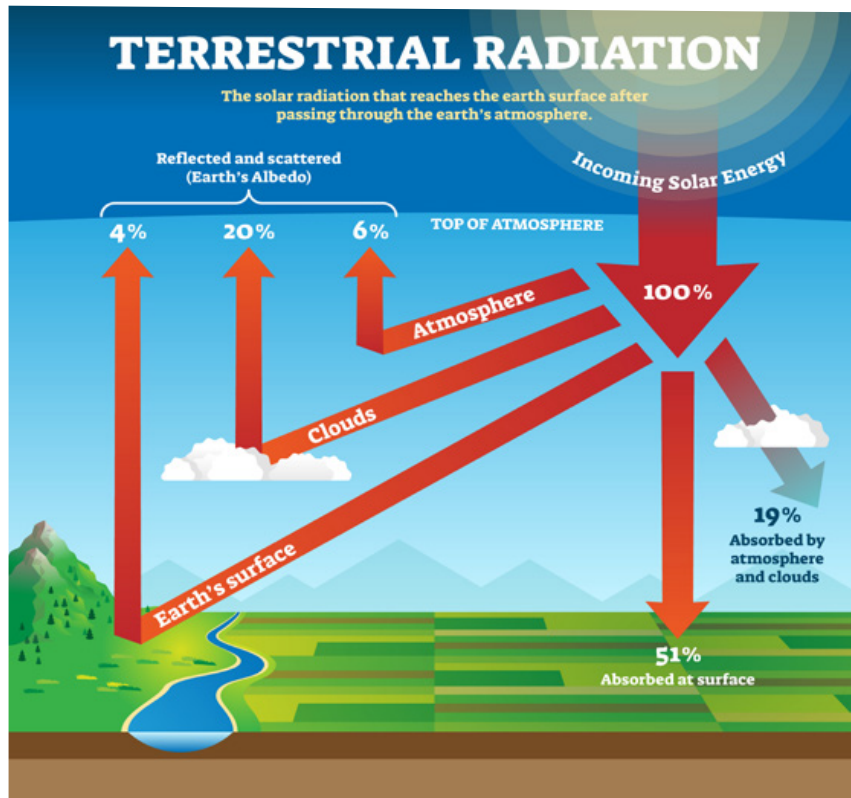


Volunteer for Project Save the World

If you have some spare time and hidden talent, perhaps you’d like to join us in saving the world by volunteering for one of these tasks. Occasionally we need help with some chores:

- Edit forum transcripts
- Post comments or replies on website or YouTube
- Forward forum posters to 50 of your friends.
- Edit videos (if you know Filmora well)
- Post video links to social media
- Design posters, cartoons or photos
- Update our website (if you know WordPress well)

If interested, email us here:
project@tosavetheworld.ca



Terrestrial radiation vector illustration. Labeled educational solar waves. | © VectorMine, Adobe stock

forest management, such as setting fire breaks to prevent or reduce wildfires. Romanticizing nature is a dangerous distraction when humans are not seen as part of the natural world but solely as destroyers of it.

For some, even large-scale tree-planting is a geoengineering project and not a “nature-based” solution relying entirely on ecological succession. And they believe planting distracts public and political attention from the larger issue of reducing greenhouse gas emissions. (This, we learn, is a common theme.)

Well-known UK science writer George Monbiot has focussed on agriculture and particularly livestock farming. 28% of the planet’s surface is used to produce just 1% of our food protein, so we must transition towards plant-based diets. This means being “brave in confronting livestock production and the dark arts used to promote it.” Monbiot also argues in favour of drawing down CO2 by fixing it in forests, wetlands, and other ecosystems. He believes that the kind of social change

required for speeding up these changes requires only about 25% public buy-in to work. And he supports new treaties that bypass the decision-by-consensus roadblocks found in the COP climate summit process.

he also recognizes the sense of urgency is lacking, despite the ‘clear and present danger’.

However, an increasing number of researchers don’t believe this approach will be sufficient or rapid enough.

IF NOT NATURALLY, THEN HOW?

Bob McDonald, host of CBC’s Quirks and Quarks, in his recent book *The Future is Now* (2022), makes a cogent argument for deploying all our existing technologies to lower hu-

manity’s carbon footprint. He believes we have time before we are past the tipping point when some problems become both far worse and irreversible. In this pursuit, he argues for government regulation, taxation, rewriting of building codes, requiring passive solar heating be part of new building design, and restricting personal car use in cities. “That is how change comes about,” he writes, “a slow evolution of technology that improves on what was there before rather than abandoning the old entirely and starting over with a new vision.”

McDonald’s views are conservative, despite his support for fusion energy and modular nuclear power reactors and his promotion of the kind of innovative thinking evident in the global response to the COVID pandemic. “Switching to clean energy and reaching beyond net-zero carbon emissions is **entirely doable with current technology**” (emphasis added), he believes, but he also recognizes the sense of urgency is lacking, despite the “clear and present danger.” His recent advocacy for a gentle energy transition may already be too little, too late.

Behind all these narratives is a common belief that our climate crisis can be solved in time absent radical geoengineering.

“REMEDIAL RESTORATION AND REPAIR” (GEOENGINEERING)

A very wide range of technologies fit within the scope of the term ‘geoengineering’. Some research is underway. About a third of MIT’s faculty, alone — more than 300 people — are working on climate projects, from decarbonizing energy and industry, remediating adverse health effects, forecasting, atmospheric restoration (including CO2 and methane removal) all the way to “wild card unconventional approaches.”

It was recently reported that Canada has signalled support for a multi-million-dollar solar reflection research project championed by entrepreneur Bill Gates. Many geoengineering options exist, but two of the most

prominent (and promising) ones within the Solar Radiation Modification (SRM) category are Marine Cloud Brightening (MCB) and Stratospheric Aerosol Injection (SAI).

Yet, some believe the “g-word” is a step too far.

David Suzuki, himself a geoengineering skeptic, in an episode of the Nature of Things (*Apocalypse: Plan B*) did provide an airing of the different arguments. Prominent climatologist and geophysicist Michael Mann (originator of the famous “hockey stick” temperature graph) said: “We don’t have time for dead ends and wrong turns like geoengineering and carbon capture and sequestration.” Our focus, he argues, must be on ending the burning of fossil fuels. Yet, Mann tentatively acknowledges the virtue of increasing the reflectance of low cloud cover (Marine Cloud Brightening) — using natural sea salt particles lofted by thousands of cloud-generating solar-powered ships. But how will this affect wind circulation and rainfall patterns; will it impact flooding and droughts; and is it cost-effective, he asks?

David Keith studies the reflection of sunlight by seeding the stratosphere

using aircraft-dispersing sulphur dioxide particles, a proposal inspired by research on volcanic explosions. He agrees that believing geoengineering alone will solve the GHG problem is “insane” because “there is no version of this that gets you out of the necessity to [also] cut carbon dioxide.”

believing geoengineering alone will solve the GHG problem is ‘insane’

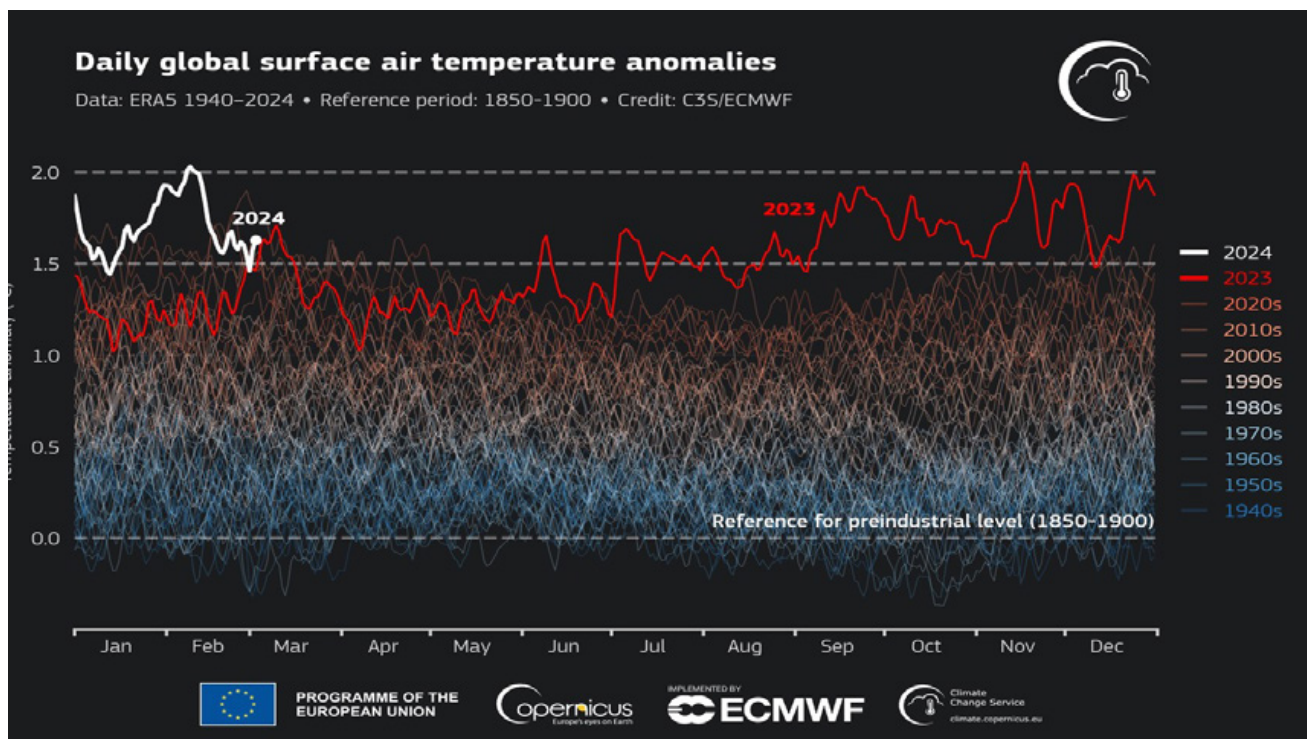
There are in fact very few geoengineering advocates who see technology as a substitute for the necessary energy transition and major reductions in industrial emissions. Rather, geoengineering measures can reduce the warming while the energy shifts take place, and until excess carbon can be removed from the biosphere. This will allow the world’s biomes to have more chance of surviving the impending effects of unchecked warming — and increase their NCS capability. Together with sequestration (CO₂ removal), solar geoengineering and other forms of climate modification are

seen as complementary, and mandatory missions. Most agree to the logic of a moratorium on high-risk ventures (risk of significant trans-national harm), while they are evaluated by testing, but caution is being amplified into rejectionism. This is stifling the experimentation needed to determine the risks of full-scale implementation.

According to Daniel Rosenfeld, a specialist in man-made impacts on cloud composition, there are some major obstacles in developing safe and efficient methods for Marine Cloud Brightening, and these issues justify scientific and engineering experiments. The political resistance, however, seems driven by a priori opposition to human engineered solutions.

PRECAUTION OR TOO CAUTIOUS?

Nikki Reisch, with the Center for International Environmental Law (CIEL) believes that “geoengineering ultimately shifts the burden and responsibility for real workable climate action [i.e. bearing the political costs of significant carbon reductions] to vulnerable populations, especially in the global south, and to future generations. It’s both a spatial and a temporal



displacement...infringing rights and replicating patterns we've seen again and again," she claims.

Mary Church, also with CIEL, focusses on a fair transition for energy workers disrupted by the new decarbonized economy, and campaigns against SRM, marine geoengineering, and carbon removal technologies.

international consent will be required for progress on SRM

She cheered the recent rejection of an international Experts Group being established: "The vocal opposition to geoengineering at UNEA-6 sends a powerful message underscoring a broad commitment to upholding established norms of international environmental law. Solar Radiation Modification (SRM) technologies **are dangerous and do not have any role to play** in our common future. These technologies cannot tackle the root causes of the climate crisis and would instead enable major polluters to delay the urgent need to phase out fossil fuels." (Emphasis added.)

A key concern behind this alarmism, in addition to suspicion that geoengineering will displace necessary carbon reductions, is fear about unintended consequences such as damage to the ocean ecosystems or shifting weather patterns. Despite geoengineering skepticism, however, a recent [survey reported in Nature Climate Change](#) (February 2024) found significant public support for climate modification, within a representative sample across 125 countries. 69% said they are "willing to contribute 1% of their household income every month to fight global warming" whereas only 26% said they are not; and "89% demand intensified political action." Contrary to the dismissal observed in votes at the UNEA, "Countries facing heightened vulnerability to climate change show a particularly high willingness to contribute."

MORAL OBLIGATION OR MORAL HAZARD?

In early 2022, hundreds of scholars signed an [open letter](#) opposing Solar Radiation Modification (SRM). They called on governments to commit to an International Non-Use Agreement on Solar Engineering that will "prohibit their national funding agencies from supporting the development of technologies for solar geoengineering, domestically and through international institutions."

They are opposed to funding, experimentation, and patenting, and consider the global governance system "unfit to develop and implement the far-reaching agreements needed to maintain fair, inclusive, and effective political control over solar geoengineering deployment." That includes the United Nations General Assembly, the United Nations Environment Program, and the United Nations Framework Convention on Climate Change.

But John Nissen, a specialist in the area of Arctic sea ice, believes the current stumbling blocks to addressing the climate crisis will (i) deny the dangers of Arctic meltdown and worsening extreme weather; (ii) reveal a mistaken fear of SRM; (iii) fixate on

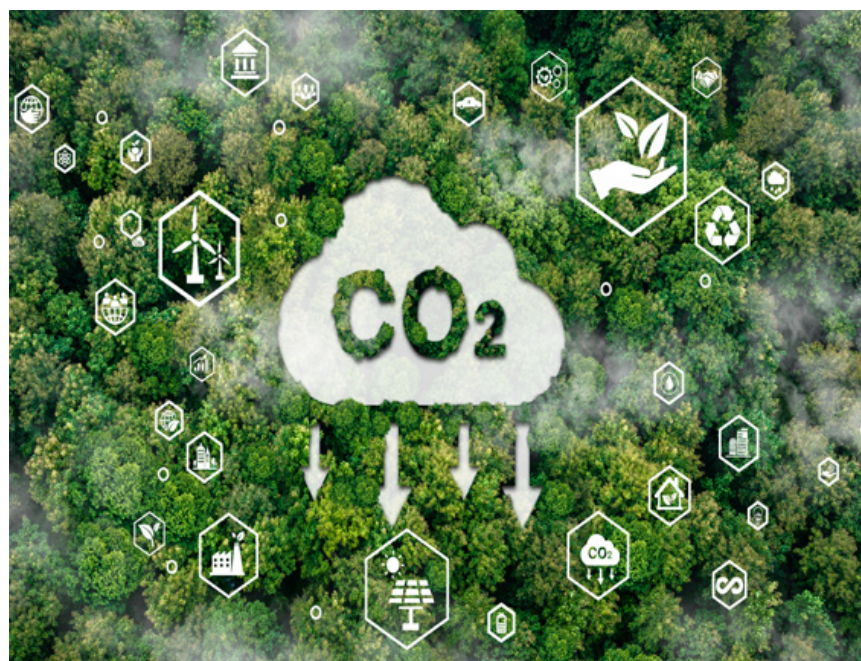
carbon emissions reduction alone and (iv) reveal the need for an international body which can authorise SRM deployment for our common benefit. Nissen believes the IPCC is "still trying to show that global warming is manageable through emissions reduction and adaptation" alone.

Robert Chris, an expert in complex adaptive systems theory and climate change, agrees that international consent will be required for progress on SRM. We do require "a dramatic increase in the social acceptance of cooling ... [and that] must be a prior condition to any deployment at scale."

Past delay and political ambivalence or even outright opposition by major energy consuming countries to decarbonization, for decades, has brought us to a tenuous moment such that now being too cautious is itself dangerous. Tipping points lie ahead, possibly within years, not decades. ■

Robin Collins writes from Ottawa about global threats.

You are welcome to comment on this article [here: tosavettheworld.ca/](https://tosavettheworld.ca/)



Deemerwha studio | © VectorMine, Adobe stock