

Climate Change, the Fossil Empire and the Creator's Takeover

Alan K Betts



B P International

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Creator's Takeover**

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India ■ United Kingdom



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Climate Change, Society and the Fossil Empire

Alan K Betts ^{a*}

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ABSTRACT

This book has three chapters covering sequential aspects since I took on the role of understanding the physical climate system in 1976, nearly 50 years. This first chapter, the longest, is a review, based closely on [1], of the links between society and the changing climate system as the greenhouse gases increase from the burning of fossil fuels. It reviews the reluctance of industrial societies to deal with the drivers, before the future consequences become catastrophic, and discusses the criminally deceptive role of what I call the Fossil fuel Empire, who knew what was coming in 1978 but have bribed politicians not to intervene for 46 years. This initial overview describes how the energy balance of the Earth, oceans, land and Arctic sea ice are maintained, and how climate is warming and changing with increases in the three most important greenhouse gases: carbon dioxide from burning fossil fuels, water vapor from the evaporation of a warmer ocean, and methane from several sources. We discuss the Earth's water cycle and the role of evaporation, latent heat and condensation in driving storms, transporting energy poleward and giving increasing precipitation extremes, floods, droughts and fires. We review the increasing challenge of meeting human demand for water as water tables are falling globally from increased pumping, and winter snowpack storage is shrinking. We discuss rising sea level, the challenges of long-term carbon storage and the lessons from the past four ice age cycles. The text is written for scientific and public audiences, both global and in the US, so metric and US units are given. The social, moral and ethical choices are mapped by contrasting the Earth-centered indigenous worldview needed for our survival with the industrial mindset that is willing to destroy a stable climate to keep the profits of the current economy growing. We review the long history of the misuse of human power, the rise of science and technology without a guiding moral framework, and how neoliberal capitalism by default makes choices that are driving rapid climate change. We outline how deceit by

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the matrix of corporations and fossil fuel interests that we call the Fossil Empire has prevented government regulation for decades and accelerated the climate crisis. The second and third chapters deal with my background and training and then discusses links to the creator, who has now taken over the system to reduce the destruction of species on Earth.

Keywords: Climate change; greenhouse gases; water cycle; sea level rise; ice ages; blue river declaration; fossil empire; moral choices.

1.1 INTRODUCTION

My career as a professional scientist started in 1970 in the USA after scientific training in the UK. I also realized 50 years ago that science alone is not enough to deal with pressing global issues, as it lacks a moral framework and it lacks wisdom. So I decided it was also my responsibility as a scientist to develop the skills to map out what drives the social framework and the social assumptions. Traditionally this was not the scientist's responsibility; it was left to those in power, who typically also lack the necessary understanding. For a long time, I have been convinced [2] that scientists have a clear responsibility for global issues since these are connected to the use and misuse of both our science and technology, as well as the misuse of human power.

This chapter is "Climate Change, Society and the Fossil Empire" and it will cover the topics explicitly. It is based on a careful edit of [1]. Climate change is driven primarily by burning fossil fuels to power our industrial society. Fossil carbon that was sequestered long ago from the atmosphere and biosphere over a hundred million years is now being burnt and returned rapidly to the atmosphere as CO₂, a greenhouse gas. With several feedbacks that amplify, the resulting climate change and a parallel species extinction crisis have brought human society and the Earth to an existential crisis. In the following chapters, I will discuss my background and how the Creator has now intervened.

First, a selective set of climate change issues will be described in Section 2, starting with the climate energy balance of the Earth and the role of the greenhouse gases in Section 2.1, followed by a water cycle analysis in Section 2.2. Then section 2.3 will discuss sea level rise, the challenges of long-term carbon storage and what we have learnt from the last four ice age cycles. I will say little about the extinction crisis which is the response of the Earth's ecosystem to both climate change and human exploitation. We are able to model with uncertainties the future of the physical climate system, but modeling the future of ecosystem species, both microscopic and macroscopic, is still very difficult.

We are in an extraordinary situation where we have the technical skills to transform our energy system from fossil fuels to an efficient society powered by renewable energy sources. This would stabilize the climate system in a decade or so. However, global society and the web of financial, economic, political and social interests have not acted at all swiftly in the past three decades since June

1992, when 154 nations signed the United Nations Framework Convention on Climate Change (UNFCCC) [3]. In fact, global society on its present path will sacrifice our children and grandchildren and a substantial fraction of the natural world, simply to preserve the short-term profits and the financial interests of the matrix of wealthy corporations and individuals that support the fossil fuel industry. I will name this power matrix, with dark humor, the "Fossil Empire" (Section 3.3).

This raises an immediate issue. The scientific aspects of climate change are well known and some will be cited, but the public writings and comments by the Fossil Empire are at their core deliberately deceptive or misleading. Citing fraudulent material is pointless. My strategy as a scientist is to map out explicitly the conflicting choices for civilization, which are rarely discussed openly, and clarify how and why the Fossil Empire is free to destroy so much of life on Earth for profit. I will reference several recent detailed discussions by others.

In Section 3.1, I will start with a very different frame of reference for our social assumptions. The October 2011 Blue River Declaration [4]: "A truly adaptive civilization will align its ethics with the ways of the Earth. A civilization that ignores the deep constraints of its world will find itself in exactly the situation we face now, on the threshold of making the planet inhospitable to humankind and other species. The questions of our time are thus: What is our best current understanding of the nature of the world? What does that understanding tell us about how we might create a concordance between ecological and moral principles, and thus imagine an ethic that is of, rather than against, the Earth? In our time, science, religious traditions, Earth's many cultures, and artistic insights are all converging on a shared understanding of the nature of the world: The Earth is our home. It will always be our only source of shelter, sustenance, and inspiration. There is no other place for us to go. It follows that the world is worthy of reverence, awe, and care."

Clearly, thirteen years later, industrial societies have not made this transition to align their ethics with the ways of the Earth, and the climate crisis is deepening. There are pervasive issues here extending back many centuries that are linked to our concepts of human power, control, and the rise of science. I will examine these in Section 3.2 by presenting the contrasting frame, which I call the "Modern industrial mindset." I will discuss its origins, the current role of science and technology, and the abuse of human power and control.

I will confront the deceit issues in Section 3.3 by citing a recent book by Dr. Michael Mann [5], a scientist of great integrity, who was ruthlessly but unsuccessfully attacked for a decade by the Fossil Empire because he was the lead author of a now famous paper [6]. This paper, cited by the Summary for Policy Makers in the 2001 Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report [7], showed clearly the rapid and exceptional warming of the climate in the past century. Dr. Mann's book outlines in detail both his own experience and the changing multiple levels of fraud and deceit from the Fossil Empire.

1.2 CLIMATE CHANGE SCIENCE

The climate of the Earth is changing because the Earth is not in energy balance. The mean temperature of the Earth is a balance between heating by the sun and the cooling of the Earth to space. The visible and infrared energy coming from the sun has only a small fluctuation with the 22- yr solar cycle. However, thermal or infrared cooling of the Earth to space is reduced by the atmospheric greenhouse gases (GHGs). As GHGs increase, the Earth warms. The initial driver of the GHG increase is the burning of fossil fuels, which were exploited to power our industrial societies in the last century. Fossil fuels consist of ancient carbon stored underground for hundreds of millions of years. The second driver is that as the Earth warms, more water vapor evaporates into the atmosphere, and because water vapor is a strong greenhouse gas, the Earth warms more. Then, in addition, the melting of snow and ice reduce the reflection of sunlight, so the Earth warms further.

1.2.1 The Climate Energy balance of the Earth

Earth:

The Earth's climate is forced at the top-of-the-atmosphere by the short-wave radiation coming from the sun. Some of this energy (about 31%) is reflected directly back to space; this reflectivity of the whole globe is called the planetary albedo. Per unit area, clouds, snow and ice reflect a lot of the sun's energy (60–80%), so any reduction in the fractional coverage of clouds, snow or ice increases significantly how much of the sun's energy can heat the planet (Fig. 1.1).



Fig. 1.1. The sun heats the Earth: clouds and ice reflect sunlight. (4 January 2012, NASA Suomi NPP)



Fig. 1.2. Winter reflection by snow, Pittsford, Vermont

Land:

Vegetation over land has an albedo of only 10–15% for forests and 15–20% for grasslands, so vegetated surfaces absorb most of the sun's energy. However, with snow covering low vegetation, the albedo increases to 50–70% (Fig. 1.2), but not for forests above the snow. Locally in winter, this large reflection of sunlight by snow cover helps lock in cold winter temperatures [8]. Plants use only 1–2% of the sun's energy for photosynthesis to grow in the warm season. A little heat is conducted into the soil in summer, but most of the sun's energy is used to evaporate water, some from wet leaves but most as transpiration by plants. Vapor is lost through leaf pores (stomata) as plants take in CO₂ for photosynthesis. Some energy is radiated back to the atmosphere as long-wave infrared radiation, and some is lost directly to the air by turbulence and convection. Sandy deserts have little water to evaporate, so they get hotter than vegetated surfaces, despite having a higher surface albedo (20–40%).

Oceans:

The oceans have a very low albedo (8%), so 92% of the sun's energy that reaches the surface enters the ocean, and most is absorbed within a few tens of meters. If there is a lot of plankton, the water is less clear, and the sun's heat does not penetrate as deeply. This heat from the sun is then mixed down further by turbulence (driven by the surface waves) into an upper ocean 'mixed' layer that may be 50-200m deep. The ocean is cooled mainly by the evaporation of water at the surface which increases as the wind gets stronger or the air gets drier. Just as over land, there is long-wave radiative heat loss from the ocean surface; and some heat transfer from water to air. Fig. 1.3 shows the non-precipitating shallow cumulus clouds that cover most of the tropics. Here the direct losses of heat from the ocean surface to the air are small. In contrast, the surface fluxes of heat can be very large if cold winter air blows off the continent over warm ocean currents like the Gulf Stream. As water evaporates from the

ocean, leaving the salts behind, the ocean's mixed layer increases in salinity. Over longer timescales, the ocean circulations transfer heat and salinity from the surface mixed layer down into the deep ocean.



Fig. 1.3. Oceans and clouds: Sunlight heats the ocean, evaporation cools it, and rising water vapor forms clouds which reflect some sunlight

Arctic sea ice:

The very large difference between the albedo of the open ocean and of sea ice plays a critical role in the Earth's climate. In recent decades, as the Arctic has warmed, the melting of the Arctic sea ice in summer means that more sunlight is absorbed by the open ocean as less is reflected by sea ice. Fig. 1.4 shows that the September minimum sea ice extent has decreased by about 13% per year in the last thirty years. This gives positive feedback that has accelerated the warming of the Arctic. There is a second positive feedback because water evaporates from the open ocean much faster than from sea ice. The extra water vapor in the atmosphere is a powerful greenhouse gas that also reduces the cooling of the Arctic to space. The increase of evaporation from the ocean has a third impact. Storminess increases, and stronger winds can break up more ice. In decades past, the Arctic sea ice was much thicker multi-year ice that had survived for several years. Now the sea ice is thinner, much of it formed only the previous winter, so it melts more readily in summer [9]. Other processes are contributing to the warming of the Arctic. Soot from airborne pollution from cities or fires darkens the ice [10], which reduces the albedo and accelerates melting. As the Arctic warms, shrubs are growing in the Arctic tundra regions, and this also darkens the surface (Fig. 1.2) and accelerates regional warming.

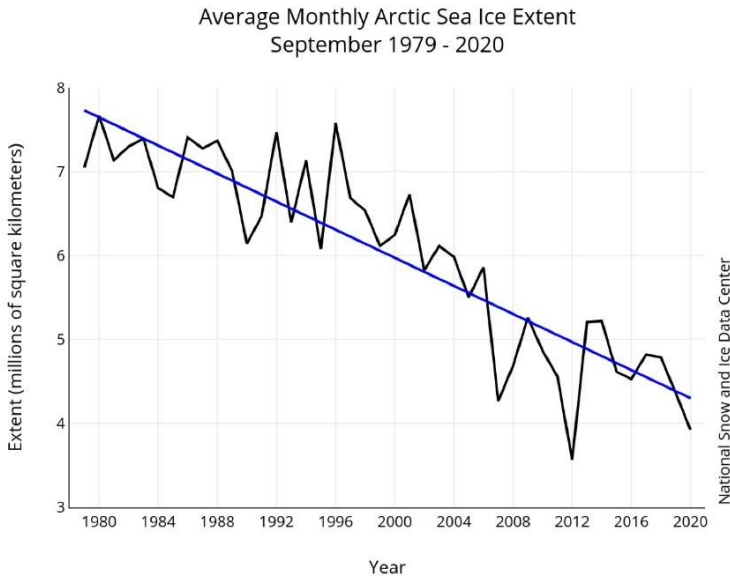


Fig. 1.4. September sea-ice extent from 1979 to 2020 shows the decline. The (linear) September rate of sea ice decline since 1979 has increased to 13% per decade. Image Credit: National Snow and Ice Data Center, University of Colorado, Boulder

Energy balance of the Earth and the greenhouse gases:

Solar energy heats the Earth, and the Earth cools to space by infrared radiation, which increases with temperature. To reach balance, the Earth warms up until it can radiate to space the energy that it gains from the sun. This is where the greenhouse gases (GHGs) are important. The GHGs are the gases that strongly absorb the Earth's thermal infrared radiation, so they effectively blanket the Earth (by radiating energy back down to the surface) and reduce the cooling of the Earth to space (because the radiation to space comes from higher in the atmosphere, where it is cooler). The primary GHGs are water vapor, carbon dioxide, methane, nitrous oxide, and ozone (H₂O, CO₂, CH₄, N₂O, O₃), but there are many other industrially produced gases (like hydrofluorocarbons, HFCs). All these GHGs are smaller constituents of the atmosphere, although they have modes of rotation and vibration that absorb the Earth's thermal radiation strongly. Most of the atmosphere is nitrogen and oxygen, but these simple diatomic molecules are too tightly bound to absorb this thermal radiation. The GHGs are critical to giving the Earth the warm climate that supports life – without them the Earth on average would be about 32°C (57°F) cooler, and most of the oceans would be frozen. We will discuss below only the first three of the greenhouse gases: H₂O, CO₂ and CH₄. An excellent review of radiative forcing processes is the IPCC Fifth Assessment Report, Chapter 8 [11].

CO₂ greenhouse:

CO₂ is currently the critical greenhouse gas driving climate change, even though there is much less CO₂ than H₂O in the air [12]. Atmospheric CO₂ is growing rapidly as we burn fossil fuels that have been stored underground for hundreds of millions of years. Fig. 1.5 shows the rise at the mountain-top Mauna Loa Observatory in Hawaii since March 1958, when Charles David Keeling [13] started detailed observations. The concentration of CO₂ has increased 48% in the past 100 years from about 280 to currently 425 parts per million (ppm) in March 2024. The yearly oscillations are because CO₂ goes up in the northern hemisphere winter when plant respiration dominates giving a net release of CO₂; and down in the summer when photosynthesis dominates and takes up CO₂. In the natural Earth system, before the human impact became large, these were close to being in balance over the annual cycle. However, now the input of CO₂ from burning fossil fuels and other industrial processes is large, and the biosphere and oceans can only take up about half of the human input. Consequently, atmospheric CO₂ is increasing every year because this human waste product has a long lifetime in the air—a century or more. Some CO₂ is dissolving in the oceans, which are becoming less alkaline. Some of this ocean CO₂ will be returned to the atmosphere centuries from now, once we have strictly controlled the burning of fossil fuels, exhausted the reserves, or climate catastrophes have triggered the collapse of our industrial society.

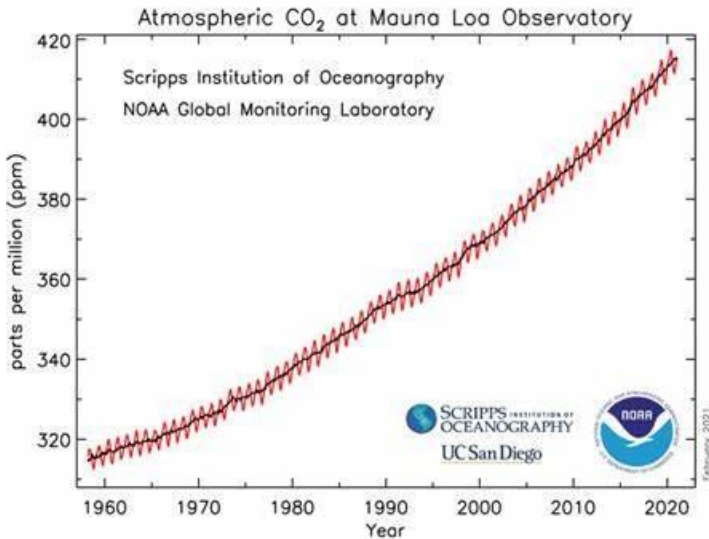


Fig. 1.5. Increase of atmospheric CO₂ from 1958-2020 at Hawaiian observatory. Credit:NOAA/ESRL/Scripps

Water vapor (H₂O) greenhouse:

Water vapor, which varies strongly across the Earth with surface evaporation and atmospheric transports, is the strongest GHG. The Earth's water cycle (Section 2.2) is close to balance on monthly timescales, so atmospheric water vapor increases with temperature on these relatively short timescales. Basically, water, evaporated from the surface, rains out in a few weeks and the latent heating from the condensation of water in the atmosphere (which falls out as precipitation) balances the radiative cooling of the atmosphere. This quick response means that the water vapor greenhouse effect has a rather large positive feedback to the climate system temperature: if the temperature rises, more evaporation gives more water vapor in the air, and this traps more of the Earth's thermal radiation. The water vapor greenhouse roughly triples the warming by the CO₂ greenhouse.

Methane (CH₄) greenhouse:

The third most important atmospheric GHG is methane (CH₄), which has many different sources: some from human activity and some of natural origin. The atmospheric concentration of CH₄ in 2023 is 1900 ppb (1.9 ppm) and it has doubled since 1920. This is 220 times lower than current atmospheric CO₂. However, CH₄ is a much more powerful GHG than CO₂ although its lifetime in the atmosphere is shorter, because it can be oxidized to CO₂. A 20-year comparison of the GHG impacts of CH₄ and CO₂ is complex and it is discussed in detail in [11].

Global data for the many sources of CH₄ are limited. Many sources are clearly anthropogenic. Leakage of natural gas from gas and oil well infrastructure is poorly regulated, and in-situ aircraft measurements show methane leakage is actually much greater than industry estimates of fugitive emissions [14,15]. A second human source comes from the fermentation of sewage and other waste products. A detailed measurement and modeling study of the downstream emissions from the large Eastern Ontario waste treatment facility [16] shows that the methane emissions from this plant are as much as methane emissions from 100,000 dairy cows (Ray Desjardins, personal communication). The agricultural source from enteric fermentation in ruminants (cattle, sheep and goats) has been quantified, and emissions from ruminant husbandry are much larger than emissions from other animal sources of protein such as pork, poultry or eggs [17].

There are two natural sources of CH₄ that may be increasing in a warming world. Over land, large deposits of carbon stored in wet soils can decompose to CH₄, and even larger deposits are frozen in permafrost. Where permafrost is melting, the decomposition of carbon to methane in wet soils will increase, but global estimates are uncertain as soil microbes may break down the methane before it is released into the air. There are also large ancient methane hydrate deposits at depths in the cold oceans. Direct global sampling is very limited, and if more CH₄ is released from these deposits, we do not know how much will be oxidized to

CO₂ by ocean microbes before reaching the surface. The Copernicus Sentinel-5P satellite system is now providing daily global maps.

Earth's energy imbalance:

Because of increasing GHGs in the atmosphere, the Earth at present has a net energy gain [18] of about 1–2 Wm⁻². A small part of this energy imbalance goes to melting ice, but more than 90% of the Earth's energy imbalance is stored in the oceans. Warming oceans are driving stronger storms and raising sea levels. The Earth will warm until this imbalance can be radiated back to space. The large thermal inertia of the oceans means there are lags of order 50 years. Furthermore, the climate system has instabilities and feedbacks [18] that are only partially understood, so there are still uncertainties in our projections for the future climate of the Earth. In the past few years, these uncertainties have increased further because Mother Nature has intervened in the climate system in an effort to reduce the loss of species on the planet. This will be discussed in more detail in the third chapter.

1.2.2 Earth's Water Cycle

The Earth's water cycle is central not only to the Earth's climate but to all aspects of life on this planet. It is one key component that humanity must understand and where necessary adapt. Water has two roles in the physical climate system and the energy balance of the Earth. The high albedo of snow, ice, and clouds is important in reflecting sunlight and cooling the planet. In addition, water vapor is a powerful greenhouse gas, which reduces the cooling of the Earth to space in the infrared. Water vapor in the atmosphere increases rapidly with temperature. The greenhouse gases keep the global mean surface temperature well above freezing. The years 1961–1990 are often taken as a reference baseline when the global mean surface temperature was 14°C (57°F). Without the greenhouse gases, the Earth would be almost completely frozen, with a mean temperature of around -18°C (0°F).

Every degree the Earth warms relative to freezing reduces the snow and ice which reflect sunlight, and increases the atmospheric water vapor, a greenhouse gas. Both these processes are called positive feedback because they heat the Earth more as the temperature rises.

Role of latent heat transport:

Equally important is the so-called latent energy associated with the phase changes of water. In the tropics, as the sun heats the ocean, the net solar energy flux at the surface is about 180Wm⁻². Most of this energy (150 Wm⁻²) evaporates ocean water, over 5 mm day⁻¹ since it takes about 29 Wm⁻² to evaporate each mm of water [19]. The infrared cooling of the surface is small because there is so much water vapor in the atmosphere in the tropics. This surface evaporation, which increases strongly with temperature, places a cap on ocean temperatures in the tropics at around 30°C (86°F) in the present climate. Most of the tropics are

covered in shallow clouds, as shown earlier in Fig. 1.3. The water vapor rises into clouds where it condenses, releasing this large latent heat back to the atmosphere. In these shallow clouds that do not precipitate, the droplets are transported upwards and evaporate again at the cloud tops, cooling and moistening the warm sinking air [19].

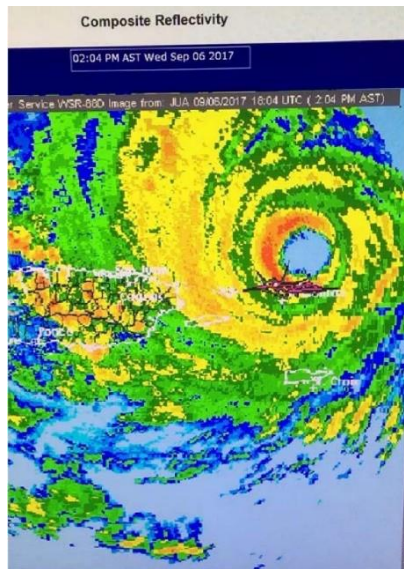


Fig. 1.6. Radar image of Hurricane Irma as it struck St. Thomas in USVI on 6 September 2017 at 2 pm AST

When clouds get deep, their droplets grow and precipitate, which releases the large latent heat of water vapor back to heat the atmosphere, and this energy drives storms. Fig. 1.6 is a radar image, taken from Puerto Rico (center left) of Hurricane Irma as it hit the north shore of St Thomas in the Virgin Islands, (marked with red crosses) on 6 September 2017. Irma was an exceptionally strong Category 5 storm with 290 kmph (180 mph) winds in the eyewall as it struck the north shore of the island. The hurricane spiral bands are getting their energy from the condensation of the water vapor evaporated from the warm tropical ocean. I was watching the radar closely as my daughter's family are huddled desperately fearful in a small, battered hotel near the southern shore. Their stories of surviving Irma, evacuating to Puerto Rico and then being hit two weeks later by Hurricane Maria have been published [20, 21].

Poleward transports:

Some water vapor is transported out of the tropics to supply energy for storms in the mid- latitudes. This is a large energy transport from the tropics towards the poles, which get much less energy from the sun than the tropics. The warm

ocean currents, such as the Gulf Stream, also transport a lot of energy poleward. Together these energy transports drive the mid-latitude cyclonic storm systems and at the same time reduce the gradient of temperature and moisture between the equator and poles. In essence, the sun's heat evaporates water from the surface; the vapor rises (and some move poleward) and condenses in the atmosphere, releasing its latent heat as precipitation falls out without re-evaporating. This heating from condensation balances the cooling of the atmosphere by infrared radiation to space. In this way the net radiative cooling of the atmosphere, the surface evaporation and precipitation are coupled together.

The details are complex, and global models are needed to compute the transports of cloud systems, their precipitation, reflection of solar radiation and absorption of infrared radiation, as well as fluxes from the underlying ocean. However, from the perspective of the Earth's climate, this means that the water cycle and net radiative cooling of the planet to space are coupled together, and this coupling changes as the Earth gets warmer [19]. This is because infrared radiative cooling increases almost linearly with temperature, but not as fast as the increase with temperature of water vapor in the atmosphere, which is linked to the almost exponential increase of the saturation vapor pressure with temperature. As a result, our models predict more intense precipitation and storms as the climate warms [22].

In the Northern Hemisphere, the Arctic region is warming twice as fast as the subtropics because the Arctic sea ice, which reflects sunlight, is melting (Fig. 1.4). Consequently the north-south temperature gradient is decreasing in the northern hemisphere mid-latitudes, which reduces the strength of the westerly jet stream. Often there are now larger north-south amplitude waves in the jet stream that move slowly, from west to east, and this changes the northern mid-latitude climate [23].

Precipitation extremes and distribution:

Precipitation extremes are important for human civilization because they determine flooding and drought. Generally, we expect precipitation extremes to increase, because of the steep increase of the saturation vapor pressure with temperature. We see this increase in heavy precipitation across the U.S. over 50 years (1958–2012), with a peak increase of 71% in the north-east [24]. One study suggested that precipitation events now last longer, which suggests slower travel speeds linked to changes in the global circulation [25]. In the tropics, there have been several remarkable slow-moving hurricanes that have done extensive damage. Hurricane Harvey was nearly stationary just south of Houston Texas for 4 days in late August 2017, and about 1000mm (40 ins) of rain fell on the city. Slowly moving Hurricane Florence with 635mm (25 ins) of rain produced record flooding in North Carolina in mid-September 2018. A USGS report indicated nine river gauges reported floods exceeding their 1-in-500-year expected return intervals, based on the historic record. In 2019, Category 5 Hurricane Dorian broke the wind-speed record set by Irma in 2017 (Fig. 1.6) for an open Atlantic

hurricane, and stayed stationary over Grand Bahama for 24 hours, causing the most catastrophic damage in Bahamian history.

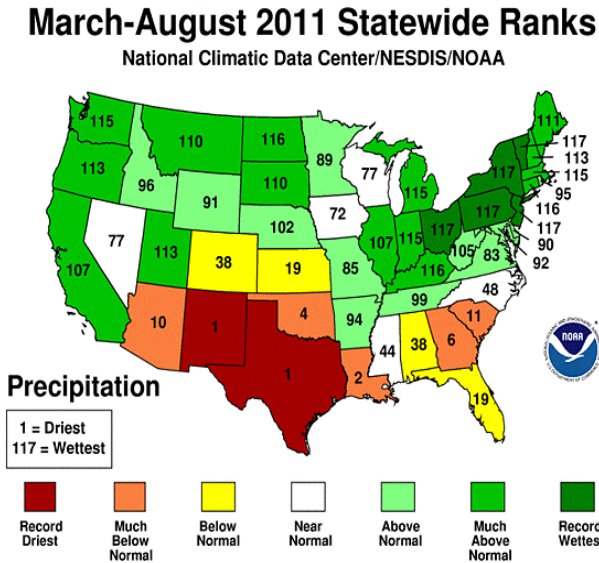


Fig. 1.7. Statewide ranks of precipitation for March-August 2011 (NCDC/NOAA)

Because global rainfall is constrained by the radiative cooling of the planet, heavy rain in one location means less rainfall elsewhere. Similarly more stationary storm patterns bring flooding to some regions and drought elsewhere. An example in Fig. 1.7 is the ranking of precipitation for the six months of March to August 2011 for the US states for the 117 years that data were available. The dark red states of Texas and New Mexico, labeled 1, had the driest six months on record, while the dark green states from Ohio to Vermont, labeled 117, were the wettest on record. Clearly, most storms for this period tracked across the northern US, not the south. Within these six months, Vermont had two record floods. In the spring, heavy rain fell on a melting winter snow pack. Floods in both Vermont and New York, which border Lake Champlain, pushed the lake above flood stage for 67 days, reaching a new record flood level on May 6. In late August, after a relatively wet summer, tropical storm Irene moved up the east coast across Vermont and also produced record flooding that cut off 13 towns [26].

This extreme drought in Texas in 2011 drove record wildfires covering 0.4 million hectares (Mha), the harbinger of the extreme wildfires that would come globally by the end of the decade in regions of drought. In 2020, California had fires covering 1.66 Mha (4.1 million acres), the Australian bushfires for the season

2019-2020 scorched a staggering 18.6 Mha and the vast Siberian fires in 2020 burnt through 20 Mha (49 million acres) of the Russian landscape.

Precipitation over land:

Vegetation can provide a buffer over land in moderate precipitation events. Vegetation cover intercepts precipitation, so that some are evaporated quickly back to the atmosphere, as shown in Fig. 1.8. Generally a vegetative surface is more porous and may have a surface organic litter, which increases recharge of ground water and aquifers, and reduces surface runoff. In tropical forests, the rooting systems transport water down in the rainy season and back from deep soil reservoirs in the dry season, so that they have a dependable water source, even if there is insufficient rain to meet evaporative needs for six months. Their survival depends on this local efficient management of water. Maintaining evaporation also stabilizes temperature year-round.



Fig. 1.8. Forests after rain with fast evaporation from wet canopy

Human demand:

In contrast, the human system approach to freshwater issues is to try to supply human demand, which in many regions already exceeds local supplies—and continues to grow. Rivers are dammed to supply towns and agriculture and to provide hydroelectric power. However, reservoirs of open water in dry climates experience substantial losses from evaporation and over time fill with silt. For crop irrigation, deep aquifers are also pumped. But the water in deep aquifers is only replaced on timescales of centuries, so globally water tables are dropping [27]. In many tropical regions, runoff water from roofs is stored in tanks to last through long dry seasons. This is a useful reference point for human water use: matching annual use to precipitation on the roof. An annual rainfall of 760mm (30 inches) on a 100 m² (1080 ft²) roof supplies 76000 liters (20000 gals) of water.

This corresponds to 210 liters or 55 gals per day, which is typical of per capita indoor household use in the US. Many drier regions have less annual rainfall.

The key lesson from natural systems is that the best water storage is groundwater. Good practice for all urban water management is to maximize infiltration, rather than accelerate runoff. Slowing runoff and maximizing infiltration are often critical issues for land management and agriculture (except where soils need drainage) since doing so reduces topsoil losses and also increases groundwater storage. This becomes even more essential in a warmer climate, as rainfall rates rise with temperature, extreme precipitation events become more frequent, and periods of drought may also become more common. Maintaining a shrub or forest land cover is generally a good solution. Ironically, hydrologists have sometimes been ambivalent towards forests historically, precisely because they reduce the runoff for human use.

The cold season storage of water as snow and ice in mountain snowpacks is important in many regions, as spring and summer melt then supplies water for human use though summer dry seasons. This supply is vulnerable to a warming climate. As the freezing level moves to increasingly higher elevations, snowpack storage may be reduced because more winter precipitation falls as rain and less as snow. Spring melt will come earlier, leaving less water storage into the summer.

There is little human society can do about global and regional changes in the water cycle, except adapt more intelligently to them—and of course, reduce the drivers of climate change. Water is a renewable resource, but local and global supplies are finite, and many regions have a strong annual cycle of rainfall. As in many areas of our society, more can be gained cheaply by using water more efficiently (and recycling it) than by trying to meet virtually unlimited human demand. However, a good strategy for land-use planning would be to build, contour and plant to maximize ground storage of water.

1.2.3 Long-term Issues

Climate has several timescales: current short-term extreme events and ongoing decadal shifts. Sea level rise is already causing flooding of low-lying islands with storm surges and high tides, and extensive coastal areas are seeing more flooding as Mother Nature intervenes. Many carbon cycle processes have slower components because they are coupled, for example, to forest growth as well as human management. There are also important lessons on climate going back through the ice ages of the past million years, long before the current human impact.

1.2.4 Sea Level Rise this Century

The sea level is rising for two reasons. The energy imbalance of the Earth is mostly stored in the oceans, and the sea level rises with the thermal expansion from this ocean heating. The second process involves the melting of grounded

ice. The water released flows down into the ocean, which raises sea level. The melting of floating sea ice does not raise sea level. Satellites directly measure the height of sea level, and global mean sea level from 1993 to 2020 has been rising about 3.3 millimeters per year, which is only 33cm per century or a little over one foot. Currently about a third of this rise comes from melting of grounded ice. However, models suggest that as the global temperature rises, the melting of glaciers into the ocean from Greenland and Antarctica will increase substantially, and the sea level rise this century might be much larger, depending on GHG emission rates.

As sea level rises, low-lying islands become flooded and uninhabitable, and salt water also intrudes into low-lying lands. Coastal floods come with high tides and storms, and storm intensities are increasing as the oceans warm. A separate issue is that coastal flooding depends on the relative rise of sea level. Some inhabited coastal land is sinking, from both natural causes and human causes, such as the pumping of ground water [28]. Globally, there are complex continuing changes in elevation with ongoing uplift where thick ice sheets melted at the end of the last ice-age and new uplift where ice sheets and glaciers are now melting.

Long-term carbon storage:

We will not discuss the carbon budget of the Earth in detail. As discussed in Section 2.2, the growth of vegetation by photosynthesis is coupled to transpiration and the water budget. The long-term storage of carbon in trees and in the ground is one important way to reduce the atmospheric CO₂ released from burning fossil fuels. But this balance depends on the complex biosphere carbon cycle and Earth system processes that are impacted by both climate change and extensive human intervention. Unfortunately, human society typically exploits the biosphere with little understanding of how this fully coupled complex system responds as it adapts to a globally changing climate.

In broad terms, higher atmospheric CO₂ changes plant photosynthesis. At middle and higher latitudes, warmer temperatures and a longer growing season increase gross primary productivity (GPP), which means more uptake of carbon by vegetation that is beneficial in reducing climate change. However, in the tropical forests, GPP appears to be decreasing, because of increased water stress at higher temperatures [29]. So the Amazon forest which was a sink for carbon may be losing this role. A related factor is that when trees grow faster they usually die younger. In addition, the felling of the Amazon forest for agriculture and development continues and has been increasing in the last few years. This puts carbon back into the atmosphere and also impacts the regional climate, as evaporation from crops falls off in the dry season.

Ice-age message:

The ice-age records of the past million years show that some strong positive feedback exists in the Earth system on long timescales, long before human civilization. For simplicity, Fig. 1.9 goes back just 400,000 years through four ice

age cycles. On timescales between forty and a hundred thousand years, changes in the inclination of the Earth's axis and the geometry of the Earth's orbit around the sun give small changes in the solar radiation reaching the Earth (15–20% at 60°N in June). These small radiative changes are amplified by the climate system because of changes in the ice sheets and in the greenhouse gases on long timescales to give variations of temperature at the poles of order 10°C (18°F).

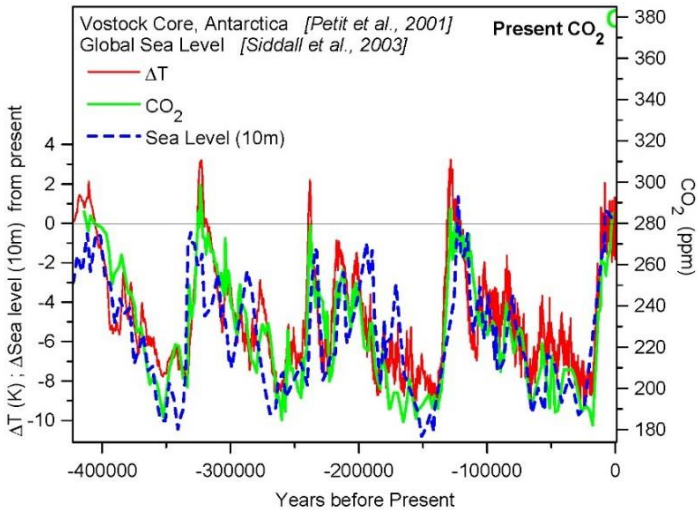


Fig. 1.9. Changes through the ice ages of Antarctic polar temperature, atmospheric CO₂ and sea level (in 10 m) [30,31]. Graph was drawn in 2003 and “Present CO₂” has risen to 420 ppm

During glacial maxima, ice sheets grew to more than double their present size, reflecting much more sunlight and lowering sea level by as much as 100 m (330 ft). Ice-age cycles appear to have ended during periods of higher solar radiation in summer at northern latitudes; with ice-sheet collapse taking only a few thousand years, and sea level rising again about 100m. On these ice-age timescales, as temperature dropped, CO₂ fell from 280 to 180 ppm, with the weathering of rocks and transports of carbon into the deep ocean; and methane fell from 700 to 350 ppb (not shown). Solar forcing was the driver (not the burning of fossil fuels!), but changes in the three GHGs (H₂O, CO₂, CH₄) greatly amplified the global climate change just as they are doing now.

However, the anthropogenic increase in atmospheric CO₂ that is driving the present climate shift is much faster than any of the natural Earth system processes seen in the ice-age cycles. We are witnessing a large amplification, as declining ice cover reflects less sunlight, and the increasing water vapor greenhouse traps more of the global long-wave heat radiation. But the Earth's temperature and atmospheric CO₂ are now much higher than during the ice

ages, so it is hard to predict exactly what will happen to the Earth. It has been millions of years since the Earth's atmosphere had 400-500 ppm CO₂ (which we are again reaching), and then the Earth may have had no ice caps, as well as a very different climate and vegetation. This is why Hansen [18] has suggested that atmospheric CO₂ should be brought back down below 350 ppm as soon as possible. Fig. 1.9 shows that this is still well above the highest interglacial values.

1.3 SOCIAL FRAMING

As outlined in the introduction, discussing the social framing of climate change is very different from discussing the science. The social assumptions of societies across the world differ. For a low-lying island nation in the Pacific, rising sea level is an imminent threat. For an oil company in the US, action on climate change is a threat to its business and profits. This section will spell out some of the key issues and differing perspectives on the Earth, and on our financial, economic and political structures, and how our concepts of human power and control differ from the indigenous mindset. The focus will be on industrial nations that are responsible for climate change, and especially on the US. We will end by using my experience in the state of Vermont to illustrate how the transition to renewable power is possible.

1.4 BLUE RIVER DECLARATION

The Blue River Declaration [4] was quoted in the Introduction. The first lines say: "A truly adaptive civilization will align its ethics with the ways of the Earth. A civilization that ignores the deep constraints of its world will find itself in exactly the situation we face now, on the threshold of making the planet inhospitable to humankind and other species."

This is a succinct definition of our global predicament in the face of climate change driven by burning fossil fuels. However, it is not the frame of reference for industrial societies that are guided by money and power, instead of ethics. The Blue River Declaration continues "The Earth is our home. It will always be our only source of shelter, sustenance, and inspiration. There is no other place for us to go. It follows that the world is worthy of reverence, awe, and care."

This is the framework of indigenous peoples who live embedded in the natural world and treat it with reverence, care and wisdom. Understanding this ethical framework is critically important for modern society [32], because our technology cannot replace the Earth and its fully coupled living infrastructure. However, this understanding clearly conflicts with the framework of industrial societies that mine the Earth for minerals and fossil fuels needed for economic growth, and strip forests for crops and livestock. With a growing human population and an economic system tied to growth, the carrying capacity of the Earth is approaching, along with the climate crisis.

1.4.1 Modern Industrial Mindset

As a contrast to an ethical framework of indigenous peoples aligned with the ways of the Earth, we will review the modern industrial mindset. Our

industrialization developed with the rise of science and technology, and it has been powered by fossil fuels—initially with steam engines fueled by coal. But the mindset that has given us such power has an important history that is rarely discussed.

Origin of the western mindset:

The key concept that humans have power and control over the natural world is an ancient one that can be found in some translations of the Old Testament. It was not, however, part of the holistic teachings of the indigenous Aramaic prophet Yeshua (whom we know as Jesus) [33]. His indigenous teachings were not framed in terms of human power, but in the understanding that the Creator was within all Creation. Our task as humans was to join with the Creation, so we could see the truth of the interconnected web of life that would set us free to act on behalf of the Creator—not human self-interest.

In 325 AD the Roman Emperor Constantine summoned the Christian Bishops from across his empire to the Council of Nicea, and explicitly told them to reject the Aramaic gospels in favor of the Greek Gospels. The Greeks, despite their polytheism, believed in the power of rulers over the people and people over nature. Constantine reframed a new “Christianity” as the Roman Catholic Church in simple doctrinal terms within the power framework of the Roman Empire. It was structured based on male power for warfare, power over women and indigenous people and over the earth. Many Jewish and Assyrian Christians, who understood the original Aramaic gospels, perished as heretics over the next two centuries. In time the persecution of the Jewish Christians shifted into the persecution of the Jews. For those of the Judeo-Christian faith, it is critical to understand this background of how the indigenous teachings of Yeshua were suppressed, because these teachings are now one of the keys to the survival of the living Earth. One good way to connect deeply to the living Earth system and the Creation is to sit quietly in the natural world and surrender until you become connected. This is not easy for the modern western mindset because of the contrary belief of “fight, fight and never surrender”.

In Western Europe throughout the medieval period, the Catholic clergy controlled society, until Western Christianity started to fracture into Catholicism and Protestantism, starting with Martin Luther in 1521. The Protestant groups looked back to the Old Testament view of human power over the natural world. In the next few centuries, the European colonial powers, backed by Christianity, crushed the indigenous people’s worldview, probably unaware that it was the perspective of their indigenous teacher Yeshua. They also embraced white (male) supremacy and slavery, based on a belief in the inferiority of black people.

At the same time that Christianity fragmented, science started the long process of becoming independent of religion, which took centuries. Observations of the heavens, the Copernican heliocentric model in 1543, Kepler’s laws of elliptical planetary motion and Galileo’s observations of the moons of Jupiter in 1610 all conflicted with, and in time replaced church doctrine. Isaac Newton’s treatise on

classical mechanics (Mathematical Principles of Natural Philosophy 1687) is viewed as a marker for the independent rise of science, even though his practice of alchemy and understanding of the occult was later shunned by scientists. However, as science developed, it has continued within the power framework of human superiority over nature, which is contributing directly to the climate and extinction crises.

In recent times, the view of some Protestant and Evangelical Christian groups that humanity is charged with subduing the earth has meshed well with capitalism [34]. A second evangelical belief that the end-times are coming by 2050 can make climate change concerns seem irrelevant. Indeed some believe God, not man, is responsible for the climate.

Current role of science and technology and capitalism:

Much of our present human world is driven by science and technology. Science is a good frame for understanding the technological world we made and for exploring the complexity of the living natural world. However, science is not useful for addressing social values and making moral choices. The historic framing of science was that understanding came from collecting facts, but without the direct indigenous understanding of the web of life, there is no basis for wisdom. The Indian sage Sri Aurobindo 1920 phrased this rather starkly: "Science gathers facts and thinks it knows, but wisdom, as she walks, hears the echo of her solitary tread on the shore of an infinite ocean."

In this void, choices are made implicitly by society's guiding economic frame, which is capitalism. For decades the free-market ideology of capitalism has been neoliberalism, a political framework based on privatization, deregulation, globalization, free-trade, austerity and reductions in government spending. Simplified, neoliberalism is a façade with the goal of increasing short-term profits for the private sector within a consumer growth economy under tight political control. Immense wealth has been created for some, and the human population has increased until our global impact reaches the Earth's carrying capacity. Now climate and extinction catastrophes are rapidly approaching, simply because this economic system does not accept responsibility to pay for future costs unless mandated. In principle, this could be corrected within the neoliberal framework by placing a rising price on burning fossil fuels, since we have estimates of the vast future damage to society from climate change. This economic trigger would help drive the shift to renewable sources of energy and amplify downstream savings. Clearly without including a realistic estimate for future costs, burning fossil fuels is an unregulated misuse of technology.

However, neoliberalism is also a mindset that has manipulated the thinking of both politicians, businesses and the public. A recent book [35] discusses how neoliberalism has encouraged the individual sense of entitlement and the uncaring part of their human psychology over the reality of our interdependent relationships with each other, and our connections with external realities like climate change. This helps businesses encourage individual consumption, and

talk about environmental issues without any sense of collective responsibility. The broader neoliberal mindset has a natural overlap with the mindset of the Fossil Empire, which will be discussed in section 3.3.

Abuse of human power and control:

Power and control over the natural world now include power and control over people, specifically the poor and underprivileged (who effectively replaced slaves). In other words, the rich and powerful corporations and individuals exploit both the Earth and the poor, both those living within the industrial nations and those living more sustainably in less developed countries. There are some laws limiting the abuse of humans, after centuries of abuse of slaves and women, but the struggle for ethical standards to limit the abuse of the Earth is only beginning. As Pope Francis said: "Our increased power has not been linked with deeper moral values and a true sense of our common home and common destiny" [36]. He pointed out that the exploitation of the Earth and the exploitation of the poor by the wealthy are now intertwined.

Power and wealth are indeed deeply linked in society. Capitalist economics focuses primarily on maximizing current quarterly profits and on growing the consumer economy. Only a few socially responsible businesses, connected with their communities, promote a more just and sustainable world. Simply maximizing profit means minimizing costs, and that means exploiting people, and also dumping waste streams at the lowest possible cost. Unless mandated by society, capitalism typically places no value on the future, which is deeply unethical, since currently it means sacrificing our children, grandchildren and half the species on the Earth.

Mismanagement of industrial waste streams is a large problem. Society has partially regulated the current pollution of air and water to reduce sickness and death in local communities, although air quality inside buildings is largely unregulated. However, the recent ex-president ordered the EPA to roll back automobile efficiency and GHG standards that were a decade old. Burning fossil fuels for energy puts billions of tons of carbon dioxide into the global atmosphere and oceans every year that had previously been stored underground for hundreds of millions of years. Since 1950, CO₂ has grown nearly 40% in the atmosphere, where it lasts as a GHG for decades to centuries. As the oceans warm, more water vapor, a powerful GHG, evaporates and triples the warming. The Arctic polar ice melts in summer and snow melts faster in winter and spring, so less sunlight is reflected.

Collectively these changes drive rapid change in both global and regional climate. The global downstream costs are huge, probably in the hundreds of trillions of US dollars. However, society has refused to place a rising cost on burning fossil fuels, primarily because of deceptive propaganda from the fossil fuel industries, which are concerned about reduced profits (Section 3.3). Dumping CO₂ on a massive scale into the atmosphere at little current economic cost is a clear ethical abuse of our technology, as it will destroy so much this

century, both human lives and infrastructure, as well as the large-scale extinction of species. Adding a substantial escalating cost to burning fossil carbon could be transformative, if the money is used to build renewable energy systems.

As climate change accelerates, each year brings new and different disasters. Short-term repairs and fixes are essential, but the long-term drivers are harder for society to confront. Some social conservatives long for the stability (and mythology) of the past, and fear change so much that they turn to climate change denial. On the other hand, others think control should be possible using science and technology to geo-engineer the Earth, but this may be pointless if we do not phase out burning fossil fuels in the next decade or so. As I edit this text in 2024, the past year set new records in terms of high global temperatures and melted icecaps that we thought lay years in the future.

1.4.2 Fossil Empire

I chose the term Fossil Empire to discuss the role of the fossil fuel industry and its industrial allies in driving the climate and extinction crises that have come from burning fossil fuels. The Exxon senior scientist James Black identified and modeled correctly the impact of doubling CO₂ on global climate in 1978, some 45 years ago. He speculated that “present thinking holds that man has a time window of five to 10 years before the need for hard decisions regarding changes in energy strategies might become critical” [37]. Exxon suppressed his report and started insidious campaigns to confuse the public and politicians that are still ongoing [38]. By 1989 the company had helped create the Global Climate Coalition (disbanded in 2002) to question the scientific basis for concern about climate change. It also helped to prevent the US from signing the international treaty on climate known as the Kyoto Protocol in 1998 to control greenhouse gases [37].

Historically for many decades, the US military and economic dominance had been closely tied to the control and access to global oil supplies [39]. The US kept the price of oil low until the OPEC oil embargo of 1973. The power of the US oil monopolies effectively ruled government policy for much of the past century, rather than the reverse. Exxon’s strategy in the 1970s and 1980s continued this, and remarkably it is still true decades later. A clear example was the 2003 attack on Iraq, which despite lies from the US and the UK governments, was an attempt to get stable access to Iraq’s oil production [39].

One of the central reasons why there has been so little progress in moving away from burning fossil fuels, despite IPCC Assessment Reports going back to 1990, has been the continued opposition of the fossil fuel companies, most of it hidden from the public [38]. Strategies for this deception have changed with time. In recent decades a conservative climate change counter-movement has developed both in the US [40] and a similar one in Europe [41] which merges the interests of the Fossil Empire and neoliberalism in delaying government and international action on climate change. One strategy uses media articles and advertising to suggest that individual and corporate actions are sufficient. Concealing their

funding sources behind donor-directed funds, like the Donors Trust, helps protect conservative organizations and businesses from criticism by those who understand the climate crisis. In parallel the direct bribery of conservative politicians is ongoing. A recent study [42] found that it cost the Fossil Empire only \$61 million to bribe 139 Republicans in the US Congress to publically lie and deny climate change: an average of only \$442,000 per politician.

For this paper, I will summarize some ideas from the recent book, 'The New Climate War' [5], by Michael Mann, an excellent scientist.

The new climate war:

As a young scientist, Dr. Michael Mann happened to be the lead author of an important paper [6] that used tree ring data from around the world to show the mean temperature change from the years 1000–1996 AD. This key figure was given the name "hockey stick", with the upturned blade showing the steep temperature rise in the past century after nine centuries of slow temperature decline. The Summary for Policy Makers in the 2001 IPCC Third Assessment Report included this figure to illustrate recent climate change, as its message was unambiguous to the public. The Fossil Empire reacted with horror, and with vengeance attacked and harassed Dr. Mann and his research for about ten years. He was exonerated by his institutions, and he has continued to examine in detail the patterns of deceit from the Fossil Empire. In the following paragraphs, I will summarize some key points from his book [5].

For decades, the Fossil Empire, following Exxon's strategy since the 1970's, simply denied the reality of climate change, or denied that fossil fuel combustion was the primary driver; that is, they consistently lied to the public to protect their huge profits. Their central goal has been and continues to be to prevent any systematic government regulation and phase out of fossil fuels. Mann describes their policy as "inaction" and calls them "Inactivists". In the past decade as climate disasters of many different kinds have mounted around the world, simple denial looks obviously dishonest, so the Fossil Empire strategy has shifted to deflection. This strategy has been widely used to shift issues from corporate responsibility to one of individual personal responsibility. For example, drink companies were able to prevent bottle bills in most of the US, by shifting the issue to the responsibility of individuals to pick up their litter. So locally we pick up litter in spring, but we have global plastic pollution in the oceans, because there is no corporate obligation to manage this waste stream.

It is our collective and corporate way of life that is driving climate change, but the Fossil Empire can be freed of corporate culpability by deflecting the issue and saying that changing our individual behavior is the best way to solve it. Covertly selling this strategy has been an immense success, as it also opens a wide field for divide and rule, and finger-pointing. Climate activists can be encouraged to argue over whether one should travel less, buy an electric car, install solar panels, eat a vegetarian diet, have fewer children or live a simpler life. The list is endless. This strategy has been very successful in deflecting attention from what

needs to be done at a collective level to the individual level, where people can either feel they are taking useful steps or instead perhaps feel guilty. Of course, changes are needed at both a collective societal level and in individual actions and choices. In the US where I am writing, deflecting and reframing the climate issue in terms of individual freedom is easy. At the same time, conservative interests that oppose collective action to reduce fossil fuel use can also be encouraged by framing collective action as socialism.

But just as genocide was only clearly defined as a crime after the fact, ecocide will only become a crime when we recognize the rights of life on Earth. This issue will be discussed further in the third chapter discussing the takeover by Mother Nature. The Creator. The flagrant immorality and deceit of the Fossil Empire and its political supporters will haunt the billions of people who will die this century from climate change disasters.

1.4.3 Simple Technical Solutions

I will close this review of social issues by illustrating the simple beauty of well-managed technical solutions, based on my direct experience in Vermont with electrical power generation and plug-in transportation. When I realized in 1976 that understanding the climate system would be my responsibility, I moved to Vermont from academia and built a passive solar post and beam home in 1978. The location was quite remote, with no electric power. It was much cheaper to install 200 W of solar panels and a bank of eight 6V deep storage batteries than to pay for a mile of electric power lines. This gave me basic 12V power for lighting, and with an inverter, 120V power for electronics and computers, as well as a washing machine. The well-insulated house faced south and had both a wood stove and a wood-fired cooking stove that also supplied hot water by convection to a tank upstairs. Water flowed downhill from a spring to the house. I cut the wood for the two stoves and had no electric bill. I could run two computers and do climate research. I lived there for ten years, grew vegetables and developed an appreciation for the basic principles of simpler living.

On moving to another house in VT, I purchased solar panels in a Vermont community array. Twenty panels at an investment cost of US \$18,240, covered on average about 80% of our electrical bill. Then to my surprise, the developer stopped repairing the array and filed for bankruptcy. I stepped in and purchased the array out of bankruptcy, as is, for just \$1 with VT state approval. Collectively we, the 60 owners of the panels, contributed funds to repair it with modern inverters. The array has 684 (30W) panels, and it is now running again at full power. In spring it generates 149kW of power in full sun at local noon and 1160kWh of daily power. The array land owner and I run it collectively with help from panel owners.

I had driven a Prius hybrid car for many years, simply because its gas consumption was close to 4.70 litres/100km (50 mpg), roughly half that of most gasoline cars or small trucks. Having solar electricity, we purchased a plug-in Prius Prime (Fig. 1.10) in late 2016 and have now driven it for 7 years. Its all-

electric range is only about 48km (30 miles), a little more in summer and less in winter. Yet after driving 112,000 km (70,000 miles) in 7 years, it has averaged 1.47 litres/100km (160 mpg). This is highly significant, as it has reduced our fuel use by a further factor of 3.2 to only about 20% of a typical small gasoline car. Much of our driving is local and therefore all-electric, but electrical energy recovery when slowing down or descending hills leads to greater efficiency in all driving. One long-distance trip we made through mountainous terrain from Vermont through the Canadian Atlantic provinces to Nova Scotia illustrates the remarkable overall efficiency. We drove 3380km (2100 miles) in two weeks, plugging in overnight at 110 V for a 6 kWh recharge, and we averaged 2.87 litres/100km (82 mpg). Maintenance is much less than for gasoline cars (we will change sparkplugs at ten years), and the new lithium storage batteries now have long warranties.



Fig. 1.10. 2017 Prius Prime plug-in hybrid

I use these examples to show that local investments, fully supported by the utility and state governments, are simple, inexpensive, and profitable for all the parties involved. They illustrate two key transitions away from fossil fuels: to solar electricity, and the transition towards electric vehicles. Plug-in hybrids can reduce gasoline use by up to 80% at very little cost. It is the hidden propaganda from the Fossil Empire that has limited rapid implementation of technologies to speed the transition away from fossil fuels in the US.

1.5 CONCLUSIONS

The climate crisis we face is an exceptional one for both humanity and the Earth itself, and it needs exceptional clarity for all audiences. It is an existential crisis for humanity and more broadly for life on Earth. We do not get a second chance if we continue to refuse to pay attention and act - as society has done for decades.

This first chapter has mapped out the key climate change issues for the coming decades, based on [1]. The Earth is warming as the energy balance has been changed over land, oceans and ice sheets by the burning of fossil fuels to CO₂, a greenhouse gas, which slows the cooling of the planet to space. As the Earth warms, evaporation increases water vapor, a stronger GHG, and the northern ice sheets are melting, reflecting less sunlight. As a result, the Arctic warms faster than the tropics and this changes the mid- latitude circulations. Along with rising temperatures, this circulation change has altered the water cycle, and increased the frequency, intensity and duration of extreme events, hurricanes, floods, droughts and fires. Rising sea levels from the warming oceans and melting ice sheets is a critical long-term issue for coastal regions and low-lying islands. Large uncertainty remains in the complex carbon cycle that is linked to photosynthesis and transpiration in the biosphere as the regional temperature, humidity and CO₂ of the climate system change.

The social, moral and ethical issues have been mapped out by contrasting the Earth-centered indigenous world view that is needed for our survival with the industrial mind-set that is willing to destroy a stable climate to keep the profits of the current economy flowing. I briefly review the long history of the concept that humans have power and control over the natural world, and the misuse of this power by science and technology, as well as by industrial societies and capitalism. Neither traditional science nor capitalism has a guiding moral or wisdom framework. Society's choices are largely based on the needs of neoliberal capitalism to expand and make profits and exploit both people and the Earth in the process. So the climate crisis grows.

Capitalism places no value on the future unless society demands it. The cruelty of this to future generations is clear, and rebellions by perceptive youth are underway. However, so far the Fossil Empire and its conservative neoliberal supporters have succeeded in controlling the political and public mindsets to slow the national and global phase-out of the fossil fuels. Their strategies have involved skillful webs of lies to conceal the urgency of what we face, and an effort to encourage the individual to feel responsible for changing behavior; as well as extensive bribery of politicians. Their attitude is that governments can make future promises but have little obligation to act on them. Scientists have started to speak out about the mythology of net-zero promises [43] while atmospheric CO₂ continues to rise. However, most of the academic climate science community is effectively forced to stay out of politics by the political system that funds research. Forty-eight years ago I objected to the fraud implicit in this separation [2]. There is little possibility of funding to address the central issues of corruption and deceit in the political and economic system that has driven the climate emergency for decades.

We showed how in Vermont with a favorable mindset and carefully managed incentives, the transition away from fossil fuels is relatively easy and inexpensive for electricity and light transportation. Indeed globally we have the technology to drive rapid change. However a huge effort is needed to change mindsets across the US to embrace change and the associated transition costs.

Manipulated by skillful propaganda, many are unhappy at the prospect of climate action driven by local and federal governments after decades of inaction. In the US it is especially difficult as the political right, which controls about half the States, largely believes webs of lies that debunk the climate crisis. It requires skillful leadership by elites, to explain the real consequences of delaying action, and large shifts in values and preferences towards an understanding of the indigenous mindset towards the Earth, which we have presented only in a very brief outline. So far no US administration has been able to create and rapidly implement realistic visionary solutions. The following chapters will shift first to a deeper discussion of my background and then to the Creator's takeover to save life on Earth. As the Creator is now moving to manage the climate crisis to save species, the industrial nations have a clear choice: cooperate with Mother Nature or the collapse of capitalism is likely.

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Author has declared that no competing interests exist.

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My Understanding of the Creator's View of Climate Change

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ABSTRACT

The first chapter of this book is an overview of the climate system and the energy balance of our planet, as well as the social and political drivers that are driving accelerating climate change. This chapter, based closely on [1], is largely a review of my background and understanding of the issues. It covers my training and experience which led to my search to merge science with wisdom. This led to a deep understanding of the role of the Creator in managing life on Earth and the evolving climate system, which will be discussed further in the third chapter.

Keywords: Climate change; indigenous view; fossil empire; moral choices.

2.1 INTRODUCTION

It is clear that the Earth is rushing towards a climate catastrophe. This first chapter of this book (revised from [2]) outlines the climate system and how the climate crisis is being driven by the conspiracy of the fossil fuel industries (which I called the Fossil Empire) to burn all the fossil fuels to make trillions in profits. This is a partnership with business-as-usual capitalism which demands a growing economy and expanding profits from the exploitation of both people and the Earth itself. As a society we are proud of our scientific and engineering capability that have given us such deep understanding of the technical human world, but our grasp of the living creation is more limited [3]. Many people expect and hope we will find technical solutions to the climate crisis. It is clear that we have had that capability for decades, but society is driven by power and profit, not by wisdom.

This second chapter includes a review of my background and learning path, which has conditioned all my understanding. It is based closely on [1]. Almost

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fifty years ago I realized disaster lay ahead because no-one took responsibility for the Earth [4]. So in parallel with my research career, I set out to understand how science and society could embrace wisdom. Most of what I learnt from saints, sages and indigenous teachers across the globe is beyond and outside our science. This means it has not been publishable in the scientific literature, which has a limited perspective going back only a few centuries. However disasters are rushing towards us so quickly that the scientific community, especially the younger generations, have to expand their grasp of the real living Earth system and the role of Mother Nature, the Creator, even though much of it is beyond our “traditional science” training.

As discussed in the first chapter, the indigenous Aramaic-speaking Jewish teacher Yeshua (known to us as Jesus) was killed because his indigenous understanding of the “Truth that sets you free to act on behalf of the Earth and the Creation” was heresy to both Roman and Jewish power. The early followers of Yeshua were persecuted by Rome for centuries. Then the Emperor Constantine, clearly a brilliant man, realized that this religion could be used to consolidate Roman power. He summoned the bishops from across the Roman Empire to the Council of Nicea in 325AD. Christianity was reframed as a creed that could be recited, and the holistic indigenous Aramaic gospels were destroyed [5] in favor of the Greek gospels. Simplistically the Greek philosophers understood power and warfare, while the indigenous framework was incompatible with male human power. This established within the Roman church, the dominance and misuse of human power over indigenous authority and wisdom. This has survived for 1700 years in Western thought, including the rise of science. Every effort has been made to suppress and destroy indigenous thought, along with Jewish thought, to bury the fact that “Christians” had destroyed the indigenous teachings of Christ to meet first the needs of the Roman Empire and later their own power. A simple almost humorous example was that the Creator was moved up into “Heaven” to limit his interference with church power. The truth is that everyone has the option to connect to the living Earth and the Creation as Yeshua taught. This key conflict between the indigenous world view and the misuse of human power is a global one. It is central to the climate crisis and the destruction of the Earth by modern society for profit. In parallel, society also lives with webs of lies on many levels rather than the “Truth that sets you free” [6]. Lies are used everywhere to protect the misuse of human power and wealth along with political and religious agendas.

I have realized the indigenous view is correct: the living Earth system is both fully interconnected, sentient (in ways beyond the limited grasp our most humans) and in control of the future of our planet. This is heresy of course to human power and to traditional science which deals with ‘provable facts’. Another example where our science struggles is the way animals know disasters such as earthquakes and tsunamis are impending and if needed run to higher elevations [7]. They are connected with the living Earth system while humans generally are not. So this paper steps out of the traditional framework of science into a much broader frame. I am going to start with my interpretation of recent climate

extremes from the Earth's perspective; and put my own direct experience of surrendering to the Earth's vision in section 3.

2.2 RECENT CLIMATE EXTREMES FROM THE EARTH'S PERSPECTIVE

In my Vermont newspaper commentaries every six weeks, I discuss the climate crisis, extreme events and the struggles of society. Rather little progress was made at the Glasgow Council of Parties COP26 talks on reducing carbon emissions that are driving extreme climate change. The fossil fuel industry sent 500 lobbyists to keep the discussions well under control, since burning all the fossil fuels is the key to their trillions in profits. The issues are all global, but my focus here is largely limited to North America. US greenhouse gas emissions rose 6.2% in 2022 compared to 2020 (which was affected more by the coronavirus); while globally oceans temperatures reached their highest level on record in 2022 and 2023, driving stronger storms.

So let us review from the Earth's perspective the North American climate disasters of 2021, for which the Fossil Empire and business-as-usual capitalism bear responsibility. I have commented [8] that it seemed that the living Earth system has started to selectively target human infrastructure.

Wildfires, hurricanes, tornadoes and a winter storm were among 20 weather and climate disasters in the U.S. that year that cost \$1 billion or more, totaling \$145 billion and killing 688 people, according to NOAA. Specific events include extreme temperatures in the Northwest US and Canada, wildfires and drought in the West, Hurricane Ida, three separate major tornado outbreaks in the South and central parts of the U.S. In addition, unusually cold temperatures in Texas in February left millions of people without electricity, but successfully destroyed refineries.

Extreme records for temperature are falling globally every year. July 2021 was the world's hottest month: 0.93 °C above the 20th-century average. The event in late June in the northwest US and Canada was described as: "the most anomalous regional extreme heat event to occur anywhere on Earth since temperature records began" (weather historian Christopher Burt, author of [9]). The forest town of Lytton, B.C. on June 29, 2021 burnt down as temperatures rose to 49.4°C (121°F). This set a new high temperature record, a stunning 4.44°C (8°F) above the all-Canadian record, set eighty years ago in a Saskatchewan drought. Across Washington State, many other local records were also broken by a similar amount. The world's highest temperature at 54.4°C was again reached in Death Valley on July 9, 2021. In January 2022, Onslow, a small coastal town in Western Australia, registered 50.7°C, setting a new record for the southern hemisphere.

The climate of the past is moving into history and forecasting new climate extremes before they actually occur is extremely difficult. One reason is the Earth appears to be choosing strategies to damage fossil fuel infrastructure to limit

damage to life on Earth. This is clear from an indigenous perspective, but it is heresy to capitalism, which thinks we are smart to make a lot of money exploiting and destroying the Earth.

The February 2021 freeze in Texas is a good example. This originated in the stratospheric oscillation over the North Pole, propagated down into the Arctic troposphere and then southward as a series of freezing blobs that sat over Texas, freezing and destroying infrastructure for nearly two weeks. Texas had never seen anything like it, and its infrastructure was not winterized. Much of the electrical power system shut down (as it is largely isolated from the US grid), and some local estimates of the total damages reached \$195 billion. But from the Earth's perspective, the real target was the Texas oil refineries, which suffered more damage from this February freeze than any major hurricane.

The extensive fires in North America are increasing the risks of devastating mudslides across large areas. The 2021 Dixie fire in California alone burnt nearly a million acres (400,000 ha) and studying the landslide impacts on this scale is a huge task as it depends on soil type and vegetation coverage, as well as rainfall intensity. Fires can reduce the permeability of the soil surface so that subsequent intense rain rates form streams that carry soil and rocks downhill generating mudflows. In landscapes which were forested, this process can be delayed until the tree root systems decay, which may take a few years. The extreme temperatures in British Columbia in late June and into July led to many fires that burnt and destabilized hillsides. Then a huge storm in mid-November 2021 coming from an atmospheric river off the Pacific dumped a month of rain on the region in two days. This generated massive mud and debris slides that closed the Trans-Canada Highway and national railway line. To us this is a "supply-chain disruption" but it is useful from the Earth's perspective as BC is mining and liquefying natural gas to speed the destruction of the Earth.

As the Gulf waters warm, many hurricanes have in recent years targeted the Texas and Louisiana coasts which are a network of oil wells and pipes to on-shore refineries. Each storm shuts the array down and damages some oil platforms. This past year hurricane Ida stood out as it did more than \$60 billion in damages. It targeted both the oil wells along the Texas and Louisiana coasts, and then targeted (1 September 2021) the New York City and New Jersey urban infrastructure and financial institutions that are funding the destruction of the Earth by the fossil fuel industries. Ida set a new record hourly rainfall rate of 3.15 in (7.56 mm) in Central Park, which broke the hourly record of 1.94 in (4.93 mm) set by the previous storm Henri, which came off the warm Atlantic only 10 days before.

We are at a turning point when it is obvious that the climate crisis, which is coming from exploiting the Earth by rapidly burning the fossil fuels, is not at all under our control. So the choice between backing the interests of the Earth or the Fossil Empire is now stark. However our industrial societies simply do not understand this choice. We are lost in the belief that humanity is smart and in charge, while the Earth is there to be exploited for profit. It is obvious to some

that this misuse of human power is incredibly stupid. We too are an important part of life on Earth, but we do not understand how to connect directly with the Earth. The Earth's climate system is a fully coupled complex system (atmosphere, oceans, ice, clouds, forests, grass and all of life above and below the ground, including humanity) with an infinity of coupled modes. It appears that the Earth can select modes, knowing the long-term impacts, while our numerical forecasts struggle to predict for the short-term. The truth is that the living Earth system is in charge not human power fantasies. Of course I cannot prove this within the framework of science I learnt in college, because it is outside that framework. Instead I will illustrate from direct personal experience how I came to understand the reality of the living Earth.

2.3 HOW CAN WE CONNECT TO THE EARTH?

2.3.1 My Personal History

I am going to start with my history as a scientist, so you can understand how I was trained, and why I knew we needed a deeper perspective. I went to ancient schools, first Nottingham High School founded in 1513 by Dame Agnes Mellors and then Peterhouse Cambridge, founded in 1284, where I studied Natural Sciences. My Director of Studies, Dr. John Kendrew was a Nobel Laureate (1962), and my primary tutor Dr. Aaron Klug became one in 1982. Both used crystallography to study molecular biology. Dr. Klug made sure I understood all aspect of Natural Sciences! Then I went to Imperial College in London (1967–1970) to get a PhD in Meteorology. My time in London was an interesting period, as I took classes in parallel at the Free University of London, staffed in part by US refugees from the Vietnam War, and the School of Philosophy, where the opening words were: "What is wisdom". There I realized how academia is sheltered from so much. So though I have been a researcher all my life in weather and climate, I realized by the time I was 25 in 1970 that science was not enough. So I have in parallel explored the indigenous, spiritual and philosophic traditions that are essential for understanding our place in the interconnected web of life that is the living biosphere or creation.

My PhD advisor at Imperial College London, Prof. Frank Ludlam, was an inspiring teacher with no degrees (until he was given an honorary doctorate). His observational abilities were extraordinary. He was the only person who could create a full synoptic forecast in his head simply by watching the sky, clouds, rain snow and wind, day after day. He supported his skills with a clear frame of reference that he taught to me: "If something is critical and you understand it, it is your responsibility." This have governed my life. In his life, this meant he was the young forecaster in 1945 on the UK and US bomber flights over Germany bombing the factories building the V1 and V2 terror weapons. He joked that he become an expert on atmospheric clouds and convection by hitch-hiking on bomber flights over Europe. This took courage as he had to bail out clutching his parachute on one occasion. At the same time in 1945 I was in the womb under the flight path of the V1 jets flying over Southend on their path to London. At their peak they came over every 15 mins, and 10,000 dogs would start barking, as

they knew the engine might switch off overhead (with a head-wind) and 2 tons of explosive would come down and destroy a city block. I was born terrified of barking dogs.

Knowing I needed real observational experience, Frank Ludlam sent me in 1969, to a field project in Carrizal Venezuela studying tropical convection and storms. This was organized by Prof Riehl from Colorado State (CSU); and I found out later it was funded by the US military, seeking hydrometeorological guidance for their Vietnam catastrophe. This field experience made me realize how little was known. I watched the world's leading tropical expert, Herbert Riehl, try and fail to forecast the afternoon convection almost every day for six weeks. On my return, I reviewed the limited literature and wrote my conceptual PhD dissertation on modelling cumulus convection from first principles in less than six months.

Then I was offered a post-doc position at CSU in 1970, where I stayed till 1978 on the academic faculty. I was back in Venezuela in 1972, now the field program director. Then along came a massive international project in 1974, the Global Atmospheric Research Program (GARP) Atlantic Tropical Experiment (GATE), in the tropical eastern Atlantic to study the coupling between convection, the tropical convergence zone and the vortices coming off Africa. GATE was a cold-war science collaboration, and the US, Canada, Europe and the Soviet Union committed all their oceanographic ships and research aircraft. The dates and logistics were committed, but the key convection plan was not written, and no-one volunteered! As an "expert on tropical convection" from the two Venezuelan field projects, the US science system, knowing I was trained by Frank Ludlam, said "Betts can do it". I was given the job of first writing the convection plan in 1973, and then implementing it in 1974. The aircraft were all based out Dakar, Senegal, and fortunately I speak French! So on the first day of GATE, I took off in the NASA 990, supposedly in charge, followed by another six long-range aircraft, British, US, Soviet and French. My first responsibility for a fleet of research aircraft in my life, and I was only 28. For four months through four field phases, I flew 12-hr grueling days every three days in an extraordinary range of storms, relying often on intuition, given only a single geostationary satellite data at sunrise, and typically a forward-looking radar on the British C-130. Subsequent analysis meetings over the next six years were fascinating, especially with the Soviet scientists, whose understanding of global issues was amazing. In parallel these meetings gave me the freedom to travel the world and search for deeper truths.

I returned from GATE knowing that vast field programs were not the life I wanted, but I now had a good understanding of the weather and climate of the ocean – as well as the land. So I asked the senior US scientists: "How are we going to manage the climate system?" The hidden answer to me sounded like "Do what you are paid to do, and keep quiet – we are in charge." I took a deep breath, and realized in 1976, that this meant the responsibility for understanding the Earth's climate system was mine. I realized also this could not be done within the academic framework, so I refused tenure at CSU where I was an associate professor, and in 1976 bought 30 acres in Vermont. I spent the summers there

making plans. I built a passive solar home in 1978 on a hillside with a few hundred watts of solar panels. I have worked from Vermont ever since, although I now live in Pittsford VT. I was funded as an individual by the National Science Foundation on rolling 5-yr grants (with zero overhead) for over thirty years; by Canada for data analysis, and most recently by the University of Vermont. In 2005, I gave myself the job of climate advisor to Vermont. I help with climate plans, and write for the newspapers, and give talks across the state from kindergarten to professional and academic groups (see alanbetts.com).

2.3.2 Connecting with the Real Living Earth

I realized long ago that because scientists were trained to do what those in power wanted and funded, but not address the broader implications, disaster lay ahead, as no-one had any allegiance to the Earth [4]. I was concerned about the proper use of science in the modern world. My basic question that I asked in 1980, after recovering from building a house, was "How do we merge science and wisdom". This is not addressed in western science schools, although I later found that my science colleagues from Leningrad had found a way to address this.

I started asking around and a woman who was the meditation teacher at the St John the Divine Cathedral in Manhattan said: "Go and ask Yogi Ramsuratkumar in Tiruvannamalai in SE India, he would know". Now in 1980 you simply sent a telegram telling him when you were coming. He was a man who had spent 20 years on the sacred mountain overlooking the city, 20 years on the temple steps, and now had a basement apartment opposite the temple steps. The Tiruvannamalai Temple is perhaps half a mile square with huge towers, and from a world at least 3000 years old (Fig. 1 is a 1980 photo).

Foreign visitors to Tiruvannamalai can stay at the Ramana Maharshi Ashram. After travelling across India I sat down on arrival to recover and meditate in the empty darshan (meeting) room of Sri Ramana Maharshi (one of Ramsuratkumar's teachers). It was empty except for a green leather couch with his picture—he had passed on 30 years before. He was a man who said and wrote little. I was so grateful to have arrived. I was a naïve scientist who had no idea what was coming! The creator herself however knew why I was there, and knew I needed real help! For an hour, I was shown my life as a clear thread in my brain, first backward in time and then forward in time connecting me with both the Creator and my place in creation. I was transformed and emerged ecstatic for days. In the language I did not know at the time, I had been shown the Truth of my place in the interconnected web of Creation and this had set me free.

A couple of days later (at a prescheduled time) I posed my question to Yogi Ramsuratkumar, but I did not get the learned verbal answer I expected. Instead this bearded yogi stood and went to his library on my left. His library was 6ft tall stacks of thin books and pamphlets, four stacks deep and ten stacks wide. How did a man sitting on the temple steps have a library of all the world's wisdom! He pulled one from a stack (knowing exactly where to look), opened to the right page

and said to me: "Read". It was from one of his teachers (Sri Aurobindo), written after the first World War, about 1920.



Fig. 2.1. Temple in Tiruvannamalai (1980 photo for vistors)

"Science gathers facts and thinks it knows, but wisdom as she walks hears the echo of her solitary tread on the shore of an infinite ocean (of truth)"

The first phrase is crystal clear to a trained western scientist, but the second needs weeks of reflection. I have added the last two words for the present context, which is the broad struggle between Truth and webs of lies.

I went on to spend a few weeks sitting and watching a very famous living Indian saint Sri Satya Sai Baba. It was clear he also knew why I was there. As he travelled, he would tell me to follow with a small beckoning hand-wave from across a large parking lot. I watched him pour a little sacred ash from his palm into the palm of a sitting lady who could not walk, and watch her stunned transformation as she was healed and could stand up. Then one day, Sai Baba turned and faced me from some 10 yards away and looked steadily into my eyes for several minutes with a piercing intensity that I will never forget. I realized the next day the hidden messages were: "This is the last time you will see me" and an endorsement of my work ahead.

I was traveling on to a GATE meeting in Kiev with my Soviet colleagues from Leningrad. On arrival, they clustered around me seeking the wisdom I had learnt in India. I discovered they shared with each other books of wisdom from religions and traditions all over the world. They could get anything they wanted because it was far beyond the grasp of the censors. I was amazed that they understood so much more than scientists in the west – they had achieved a merger of science with wisdom.

Living in Vermont I worked as a research scientist on short-term field projects (with the acronyms FIFE in Kansas, and BOREAS in Canada). These transformed our ability to model over land the weather and climate system, clouds and snow, through the seasons; and how well reanalysis data could represent these seasonal climate processes. I grew gardens and vegetables and watched the seasons change as the mean climate got warmer, until one year my grand-children could dig under a rye cover crop in mid-winter. I gave talks and climate advice to Vermont.

For several years I was trained by the Peacekeeper program of the Venerable Dhyani Ywahoo, a medicine teacher from the eastern Cherokee (Tsalagi) tradition. She is the Founder of the Sunray Peace Village which is near me in Vermont, and also a teacher of Vajrayana from the Tibetan Buddhism tradition. She is a wonderful teacher who gave me practical insight into the indigenous world view and framework.

A central practice of the tradition is a dance to the four cardinal directions. I would hear how a dance would be shown to a teacher at some special place, but my science-trained mind translated this into human terms—that the teacher would envisage this dance while being there. Then one day in fall I was sitting all alone for three days by a rushing stream in the Adirondacks in the middle of a vision quest. It was late in the afternoon and I was sitting in deep meditation on a huge nearly flat boulder more than 2 m across (about eight feet) by a rushing stream. The Earth noticed me and with a sense of humor showed me how my human interpretation was wrong. I was picked up from a cross-legged position with my weight somehow fully redistributed, and my arms going up first. My body simply unfolded smoothly and gracefully upward with no stress on any joint until I was standing, and I flowed directly into a new dance to the four directions. It was similar to the one I knew but precisely different, and for perhaps an hour I just danced it till I could dance no longer. I knew instantly that I was being taught by the Earth because my science hat was watching, and I cannot stand up from a cross-legged position without using my hands, and certainly not unfold with almost weightless smoothness and grace. All I could do was dance and watch, and when I tried to turn on another part of the brain to capture and remember the dance, it started to slip away until I let go and let my body just dance.

I was fully conscious and can remember and feel the details thirty years later. As a professional scientist, I am certain that the way my body was lifted was not consistent with the law of gravity. The Earth had not only read my mind but was

able to simply suspend the basic law of gravity to teach a climate scientist a lesson I would never forget. To generalize, it has become clear to me that the living Earth system can pay attention down to the level of the individual, and also influence events and connections through “serendipity”. The key concept that we must surrender to connect to the Earth itself, is difficult for many because we have been taught to —fight, fight and never surrenderll from our militaristic traditions.

2.4 CONCLUSION

Let me review some key issues that modern industrial society must grasp if it is to survive. Indigenous people understand and respect the living Earth system and know we must work with her wisdom that goes back long before humanity. The first precept in the Code of Right Relationship is Speak only words of truth (Voices of our Ancestors, Dhyani Ywahoo, 1987). In these I can hear the echo of the words of Yeshua that the “Truth will set you free to act on behalf of the Earth and the Creation”.

Yet few in modern society understand the depth of these central truths. We are surrounded by webs of lies constructed to protect political views, power and money, would-be and real dictators, business-as-usual and the Fossil Empire; and all kinds of deceptions to trap people and if possible make money from them. Society thinks humans are all-powerful and our beliefs and freedoms are all that matter. Yet we are tragically wrong. Without thinking or awareness we have taken on the destruction of the living Earth that is far more powerful than most can grasp or understand. Our industrial society could be destroyed by “Mother Nature – the Creator” to save life on Earth unless we change direction. This means reeducating both ourselves and our children this coming decade, and stepping away from the nightmare of burning all the fossil fuels so the rich can profit. The final chapter discusses the transition that is now underway in more detail.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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Climate Change Accelerates as Creator Takes Over

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ABSTRACT

This final chapter extends the discussion of the takeover of the climate system by the Creator, colloquially known as Mother Nature, in response to the refusal of global societies to significantly reduce the burning of the fossil fuels that are driving the extreme climate change that is destroying life on Earth. So it is not an article limited to a conventional science perspective because of course the perspective of the Earth is not documented in the literature.

The author is the only climate scientist working to present the perspective on Mother Nature in the science literature because it is part of the reality we must deal with. This article will review some of my past work, and reframe in familiar social terms four keys to understanding the perspective of the living Earth. Some current climate extremes will then be reviewed. The author is the only climate scientist working to present the perspective on Mother Nature in the science literature because it is part of the reality we must deal with. This article will review some of the past work, and reframe in familiar social terms four keys to understanding the perspective of the living Earth. Some current climate extremes will then be reviewed. As climate extremes accelerate, one human reaction is to become more fearful, especially living on the coast. Nonetheless, Mother Nature can read our minds and wait for some to glimpse reality. This is very important on the individual and community levels because what we do as individuals to help life on Earth gets Mother Nature's support. Wise groups of citizens can replace much with a deep understanding of the living Creation, and become free to rejoice her in love and Truth.

This paper is edited from [1].

Keywords: Climate change; creator; mother nature; fossil fuel; greenhouse gas; nature.

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3.1 INTRODUCTION

3.1.1 Perspective

For more than fifty years I have published extensively as a climate scientist (see my website: <https://alanbetts.com>). However, nearly fifty years ago I realized we were heading for a climate catastrophe because humanity and our leaders did not accept responsibility for the Earth [2]. I was told to do what I was paid to do, and let those in charge make decisions despite their ignorance of the complex climate system. So in parallel with my climate research career, I restructured my life, moved to Vermont and posed the question: "How do we merge science with wisdom." I was sent to Tiruvannamalai, India where the Creator herself showed me directly the interconnected web of my entire life backward and forward in time [3]. I was stunned, ecstatic, transformed and given the tools needed to meet and understand living saints and sages. More recently I realized the Creation itself was now making decisions directly in the interests of life on Earth – but not in the interests of capitalist society. This is a key focus of this paper, which clearly goes beyond the historical scientific tradition, which lacked the perspective of the Creator or Mother Nature.

This is the third chapter on the catastrophe of accelerating climate change, based on [1], with a few extensions. The first, "Climate Change, Society and the Fossil Empire" was extended from [4]. This discussed ongoing climate change driven by the burning of fossil fuels, and the immense power of what I called the Fossil Fuel Empire and 'business as usual' capitalism in delaying action. For these groups "human and natural resources" are there to be exploited to maximize current profits; and destroying life on Earth (including our children) can be handled by deceptive advertising, bribery and what is now called greenwashing. So extreme climate disasters have arrived. The second, "My understanding of the Creator's View of Climate Change" (extended from [3]) introduced the discussion of how it appears Mother Nature, the Creator, is taking over the climate system to protect life on Earth. It includes my journey to merge science and wisdom mentioned above, as well as my educational, research and field project background.

This chapter starts by reviewing four keys for understanding the living Earth in human terms. First, let us use a colloquial image and say "Mother Nature is taking over the climate system" to protect life on Earth because our global economic system has refused to act wisely and do this. Of course, Mother Nature, the Creator and concepts like Gaia [5] are just different human labels for the common reality that we need to understand and accept deeply. The indigenous concept of Mother Nature has an advantage in that it is understood by local communities and indigenous people. It has another huge advantage in that it is free of the male chauvinism that has been dominant for thousands of years and has contributed greatly to the exploitation of people and the planet and the current destruction of life on Earth. My direct experience with the Creator, discussed in Chapter 2, helped me grasp the immense sweep of her understanding and authority over all life, as well as her simple ability to read

human minds and communicate. This reality means that the living Earth system has a conscious intelligence that goes beyond Lovelock's concept of Gaia [5].

The second is that for European culture the Council of Nicea in 325AD was critical (see [4,3]). The Roman Catholic Church was created to meet the needs of the Roman Emperor Constantine for male power for warfare, power over women and indigenous people and control of the earth, rather than respect for the Creation and Mother Nature. Constantine insisted that the Aramaic gospels of the indigenous Aramaic-speaking teacher Yeshua (whom we know as Jesus) be destroyed. The original Aramaic gospels have only recently been retranslated [6]. The male Catholic priests worshipped a male god safely removed to heaven, so he would not interfere with their human power. Indirectly the priests ruled societies and influenced the rise of science for more than fifteen hundred years. Christianity split into many groups, but almost none understand how Yeshua as an indigenous person chose the Truth of Mother Nature over (male) human power over nature. In the present era, Pope Francis understands many of these issues, and has pushed successfully for wise strategies on global climate change.

The third is that the indigenous world view which understands Mother Nature takes precedence over amoral capitalism. Of course, this is why European and North American societies tried so hard to stamp out indigenous thought and suppress the culture. For many centuries, Catholic priests supervised the killing of millions of indigenous people; both to seize their land and perhaps because they feared the indigenous teachers, who had a better understanding than they did of the teachings of the indigenous Jesus. Just recently in July 2022, Pope Francis visited Canada to apologize for the church's role in running residential schools for more than a century. Indigenous children were forcibly taken from their parents, forbidden to speak their own language, and abused in an attempt to destroy their indigenous heritage. Many died and were placed in mass graves.

The fourth is the powerful concept that it is the "Truth that set us Free" to act on behalf of the Creation of Mother Nature. We attribute this deep understanding to the indigenous Aramaic teacher Yeshua. He had an intimate connection to the Creation and asked his disciples to step into her world to see and understand the interconnected web of all creation, so they could act on behalf of the whole web of life. The Jewish and Roman authorities had to kill him since his deep understanding and especially his respect for his female disciples was a threat to their male human power. However, it is important to understand that the overt takeover of the climate system by Mother Nature is not a religious issue. It is just the reality of the interconnected web of life and the Creation here on Earth that Yeshua understood so well that we need it today. However, this Truth is still today a direct threat to human power over nature. We believe we are the 'only' intelligent species and that we are 'in charge' when in reality we are the only species on Earth that does not listen to or communicate directly with Mother Nature, even though we could. Our society tries to hide the fact that 'business as usual capitalism' is destroying the climate system and life on Earth for profit. So Mother Nature, which is far more powerful than we are, appears to be taking over on behalf of all of life on Earth. Fig. 3.1 shows the clash of Realities.

Clash of Realities

Mother Nature

- Indigenous world
- Preserve web of life
- *She is the Truth that sets you Free*
- *Power unlimited*
- *Join her: she can help you!*

Capitalism/Fossil Empire

- Human/natural resources
- Exploit people and the Earth for profit
- **Make money: \$\$**
- **Use money and lies to bribe & control**
- **“We’re in charge”**

Fig. 3.1. The clash of irreconcilable realities between Mother Nature’s perspective and business-as-usual capitalism

This shows the radical difference between Mother Nature’s perspective and that of “business as usual” capitalism which includes the Fossil Empire. Individuals and society have to choose between these irreconcilable views of reality. The key aspects of Mother Nature’s perspective in Fig. 3.1 reflect the steps to the Truth; while the current criminal framing of capitalism will be familiar to readers and was discussed in detail in [2,7].

Section 1.2 will review in general terms the extreme climate issues we face using some recent examples, followed by a review in section 1.3 of the recent United Nations (UN) Council of Parties meetings, which addressed climate (COP27, COP28) and biodiversity (COP15). Section 2 will present some extreme climate events from Mother Nature’s perspective. Section 3 will briefly illustrate, using the United States as an example, the conflict between the “Truth that sets you Free” and the webs of lies in society; and review briefly the current climate status. Section 4 will summarize this chapter.

3.1.2 Review of Climate Issues

The major greenhouse gases, carbon dioxide (CO₂) and methane (CH₄) have reached new record levels. Atmospheric levels of the critical long-lived gas CO₂ have risen in 2024 to 420 ppm, 50% higher than the 280 ppm in the pre-industrial era [8]. At the annual Council of Parties review in Egypt, COP27, the 2022 Global Carbon Budget clearly showed that global carbon emissions remain at record highs with no sign of decreasing. Our industrial growth has depended on the large-scale burning of the fossil fuels that had been stored in the ground for more than two hundred million years. Methane is the second most important greenhouse gas. Atmospheric levels have risen to 1900 ppb, about 162% higher than pre-industrial levels [8]. Its global warming potential is around 25 times that of CO₂ but its lifetime in the atmosphere is much shorter, a decade or so. It

comes as leakage from the mining (and transportation) of oil and gas, from decay of organic matter in wetlands, as well as fermentation processes in agriculture and our garbage dumps. Scientists need to stand up and openly confront (with humor if possible) the many dark sides of our societies that work to increase atmospheric CO₂ and CH₄, which are driving accelerating global climate change, simply to maintain their profits.

As climate change accelerates, extremes of temperature coupled with fires have covered much of the globe in the summer of 2022. In the UK, widespread temperatures reached 40°C on 18-19 July 2022 for the first time [9], ironically producing a national temperature map that the British Met Office had predicted as representative for the year 2050. The Met Office Chief of Science and Technology said with classic understatement "I wasn't expecting to see 40°C during my career".

Across southern Europe, temperatures were much higher. Santarem in Portugal reached 46.3°C and Alamonte, Spain hit 45.6°C, approaching temperatures of the Sahara, and wildfires spread [10]. These record extremes were related to a split in the jet stream with a region of upper-level low-pressure air that was stalled off the coast of Portugal for days. It is known as a "cutoff low" because it was cut off from the normal mid-latitude westerly winds; and it pumped hot air northward from the Sahara. These temperatures have not been seen in the past two centuries of weather records over Europe, but it is clear with the rapidly warming climate they are now a reality.

Unprecedented monsoon rains produced record flooding in Pakistan starting in mid-June 2022, and one-third of the country was under water by September, and some rivers were still rising. Flooded homes and crops, polluted water and water-borne diseases spread misery, killing 1700 people and leaving 2 million people homeless. António Guterres, the UN secretary general, lamented after visiting Pakistan in September. "We have waged war on nature, and nature is striking back, and striking back in a devastating way,"

In China, July and August rainfall in 2022 in the Yangtze River basin was the lowest since records began eighty years ago, giving the worst drought on record. Many regions received up to 80% less rain than the 30-year average for that period, and temperatures were 2–4 °C higher than the average. China's largest freshwater lake (Poyang Lake) shrunk to 25% of its normal size, and water levels dropped from 19 metres in June to 9 metres by the end of August, causing a large drop in hydroelectric power production [11].

As temperatures increase with rising CO₂ the US had extensive wildfires in 2021-2022. These were followed in 2022 by regions of record exceptional drought from Texas, New Mexico, Utah and Nevada to California and heat waves up to 43 °C (110°F). Reservoir levels became critically low and threatened both water supplies and power generation. In sharp contrast, the Yellowstone region in northern Wyoming had extreme flooding early in July with river levels 2.5ft (76cm) higher than ever recorded. This flood caused massive damage to

roadways and isolated some communities. The southwest US monsoon in August brought some drought relief to Arizona and New Mexico. Logically, one might think that the costs of climate change disasters would all be directly billed to the fossil fuel companies; but they have bribed politicians so they are not held responsible.

Major floods in Nigeria from May to October 2022 killed 616 people and displaced 1.4 million. Over 200,000 homes were completely or partially destroyed, and 110,000 hectares of farmland were also destroyed. In late September and October, unusually heavy monsoon rains from two tropical storms brought extensive flash flooding to Thailand and Vietnam. The toll of extreme weather across the planet is accelerating as decade after decade we continue to burn fossil fuels. Many extreme events around the globe have never occurred before. It is devastating for the poorer countries of the world, who burn so much less fossil fuels. It is challenging for science and society when many events have not been seen before. I will discuss a set of these in section 2 and put them in the context of the perspective of Mother Nature.

3.1.3 Review of COP27, COP15 and COP28

Globally the UN Framework Convention on Climate Change came into force in March 1994 and has now been signed by 198 nations. These nations review progress every year at a Council of Parties (COP). COP27 met in Egypt in November 2022. Progress has been very slow because the fossil fuel lobbyists (there were a record 636 at COP27) make sure that the interests of the fossil fuel companies are not threatened. After the 2021 COP26 meeting the UN Secretary General Antonio Guterres appointed an expert group to review the slow progress. At the start of COP27, Guterres presented their report, saying “We must have zero tolerance for net-zero greenwashing [12]. This report is a how-to guide to ensure credible, accountable net-zero pledges.” Greenwashing is the label for the fact that the fossil fuel industry is rewriting its future plans to pretend it will remove carbon from the atmosphere many decades ahead! COP27 again showed little progress in reducing fossil fuel use. However strong leadership from Pakistan, which suffered the catastrophic floods in summer 2022 mentioned above, led to the approval for the first time of a loss and damage funding proposal for low and middle-income nations. The details were left till the next year, so funding sources were unclear – except that the fossil fuel industry did not intend to contribute.

The COP28 gathering in December 2023 actually met in a fossil fuel country, Dubai with President Sultan Al Jaber as the chair, to discuss what commitments they would make. The contrast with the ongoing reality seems to me a bizarre joke. As usual, there were some six hundred lobbyists from the fossil fuel empire present to ensure that their interests were protected. Many fine speeches were made and a list of ‘promises’ was cautiously drafted. The historic decision was made to establish the Loss and Damage Fund to help countries address the irreparable impacts of ongoing climate change. Nations committed hundreds of

millions of dollars but of course globally the catastrophic damage to island nations as sea levels rise, and poorer regions of the world that are not responsible for climate change, are far larger. A new Declaration on Climate and Health, signed by 124 countries, underscored the need to prepare healthcare systems for climate impacts and emphasized government responsibility for public health. Very true, but as long as capitalism and the rich countries do not act to drastically reduce emissions of CO₂ and methane, health impacts will increase rapidly. The COP28 summit in Dubai fell short of requiring the world to "phase-out" oil, coal and gas. Instead, the report used weaker language, proposing to make the transition away from fossil fuels. We have promised to do this for years but actions have been far too limited, so global temperatures will rise for decades.

The UN Biodiversity Conference COP15 which met in Montreal in December 2022, is a separate group concerned with restoring ecosystems and the survival of wildlife. Representatives from 188 governments gathered for two weeks and reached a landmark agreement to guide global action on nature through to 2030 [13]. Chaired by China and hosted by Canada, COP 15 resulted in the adoption of the Kunming-Montreal Global Biodiversity Framework (GBF) on December 19, 2022. The GBF aims to address biodiversity loss, restore ecosystems and protect indigenous rights. The plan includes concrete measures to halt and reverse nature loss, including putting 30 per cent of the planet and 30 per cent of degraded ecosystems under protection by 2030. It also contains proposals to increase finance to developing countries for these purposes.

The broad context here is that there has been a 69% plunge in wildlife populations over the past 48 years. The global rate of species extinction is already at least tens to hundreds of times higher than it has averaged over the past 10 million years. Much of this accelerated loss has been caused by the destruction of natural habitats by humanity for commercial or agricultural uses; coupled with the increase in climate extremes linked to the relentless burning of fossil fuels. A key agreement is to conserve 30% of the Earth, both terrestrial and marine ecosystems, by 2030. The expansion of new protected areas will respect indigenous and traditional territories. The language emphasizes the importance of effective conservation management to ensure wetlands, rainforests, grasslands and coral reefs are properly protected, not just on paper. One critical advance is the recognition that Indigenous rights are at the heart of conservation. Several scientific studies have shown that Indigenous peoples are the best stewards of nature, representing 5% of humanity but protecting 80% of Earth's biodiversity. From Brazil to the Philippines, Indigenous peoples are still subjected to human rights abuses, violence and land grabs (after centuries of similar abuse). The language in the text is clear: Indigenous-led conservation models must become the norm this decade if we are to take real action on biodiversity. The tasks will not be easy, as we have no global legal structures to protect life on Earth in the face of a capitalist system that presumes it has the right to exploit human and natural resources for profit.

3.2 EXTREME CLIMATE EVENTS FROM MOTHER NATURE'S PERSPECTIVE

My understanding of Mother Nature's perspective discussed in section 1.1 is that she is responsible for all of life on Earth. The Fossil Empire knew unequivocally in 1978 [3] that a change in energy strategy away from fossil fuels was essential to prevent the destruction of the Earth from climate change. Rather than take action, they started campaigns with webs of lies to confuse the public and politicians that are still ongoing [7], and now called greenwashing. For 40 years Mother Nature watched the refusal of our society to act swiftly, and since she has the power, she is now intervening to save life on Earth. This interpretation lies outside our traditional science framework, but it is based on my personal experience of her power and insight, presented in [3].

Let us consider some examples of extreme events that have never been seen before that appear to have an agenda from Mother Nature's perspective, starting with Antarctica. Our scientific perspective used to be that the 3000 m thick E. Antarctica ice sheet, which stores most of the frozen water above sea level on the planet would be stable for centuries, perhaps a thousand years. This is critical as its melt would raise sea level by 50m (or 165ft). However on March 18-19, 2022, the hot desert air over Australia was simply advected 8000 km to the south to sit over the top of this ice sheet (see Fig. 3.2). A new temperature record was set at the Concordia weather station on the E. Antarctica plateau that was 40°C above the 30-year climatology [14], and a small ice sheet melted for the first time. One stunned scientist on the plateau said: "If you had told me 3 days ago this would happen, we would never, never have believed you". Overnight, these scientists glimpsed the possibility of a new world, where a 20 ft global sea-level rise from the combined melt of the Greenland, Arctic and Antarctic ice sheets becomes a possibility within decades. From Mother Nature's perspective, this is one way to rein in the catastrophic behavior of humanity – flood the coasts globally.

At the same time, the Antarctic Circumpolar Current (ACC) is the most powerful current on Earth, encircling Antarctica and influencing the global climate. It links all the oceans and is free from continental barriers. Over the last few decades, observations show that it has become about 40% stronger. Experts were uncertain whether this was a result of human-caused warming or a natural pattern, and what does this mean for our planet's future? A recent publication [15] by an international team of researchers recovered sediment cores containing 5 million years' worth of clues about the ACC's behavior alongside Earth's temperature changes. The study showed a strong link between the ACC's speed and Earth's overall temperature, much like a thermostat. During colder periods, the current slowed down, but when the planet warmed up naturally in the past, the current responded by speeding up. These past ACC speedups were directly connected to major losses of Antarctic ice. We're observing a similar speedup of the ACC right now, driven by human-caused warming, which suggests that Antarctica's ice will likely continue to retreat – potentially fueling sea-level rise. The ACC is huge and powerful, reaching depths to the ocean floor of up to 4,000

meters (about 13,120 feet) and spans widths of up to 2,000 kilometers (about 1,240 miles). The ACC is a major player in the Earth's climate system, acting as a global conveyor belt that redistributes heat and nutrients across the world's oceans.

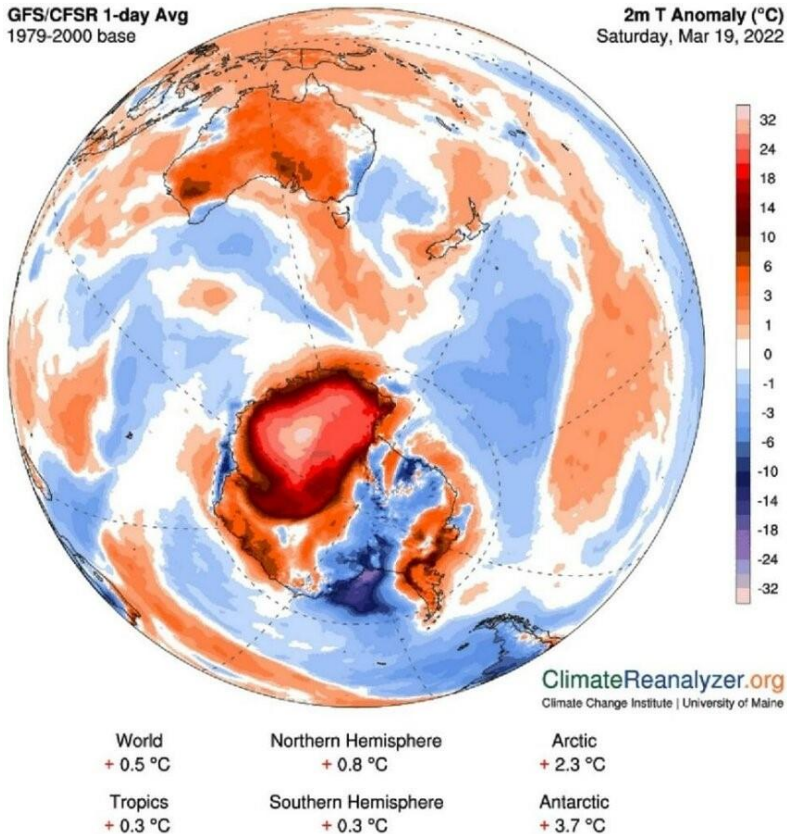


Fig. 3.2. East Antarctic temperature anomaly on March 19, 2022 and flow from Australia. (ClimateReanalyzer.org)

Hurricane after hurricane has damaged oil wells off the Texas and Louisiana coasts in recent years but they are rebuilt. However the Texas freeze in February 2021 [16] was a radically new event. This originated in the stratospheric oscillation over the North Pole, propagated down into the Arctic troposphere and then southward as a series of freezing blobs of air that sat over Texas, freezing and destroying infrastructure for 2 weeks. The Texas infrastructure was not winterized, and much of the electrical power system overloaded and shut down, so people were freezing in their homes. From the Earth's perspective, one key

target was the Texas oil refineries, which suffered more damage from this February freeze than any major hurricane.

In late June and into July 2021, the most extreme heatwave ever recorded [17] in the northwest US states and into British Columbia (BC) had widespread temperatures over 40°C (104 °F). An analysis suggested it was a 1000-year weather event, made 150 times more likely by climate change. Typically Washington State has summer Fahrenheit temperatures in the 70's and 80's °F (24-30°C). Fig. 3.3 is the NOAA map for June 28, 2021, showing that extensive regions of Washington State reached temperatures above 110°F or 43°C.

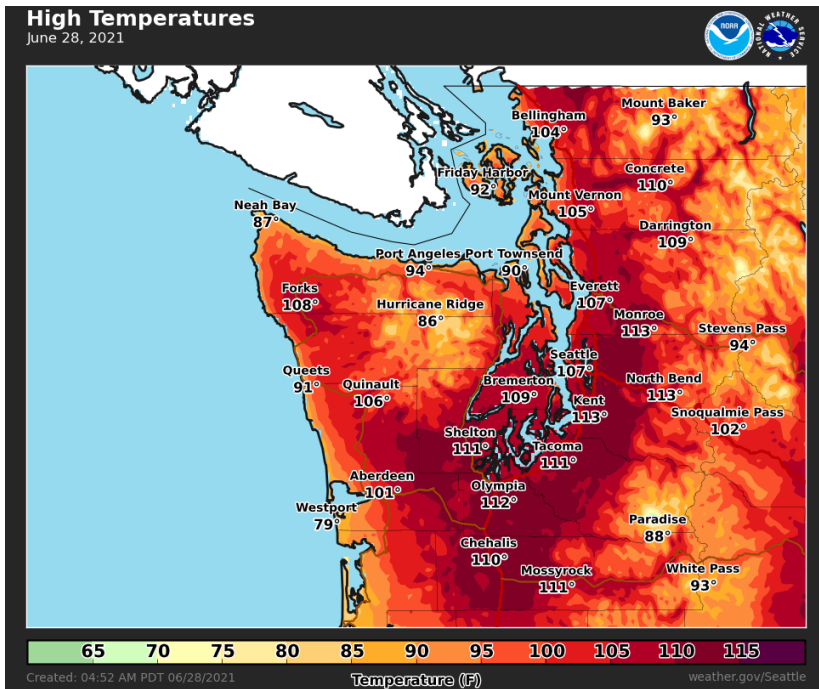


Fig. 3.3. Washington State forecast maximum temperature on June 28, 2021. (NOAA)

To the north in British Columbia in southwest Canada, the small forest town of Lytton was warmer three days in a row until it reached 49.6°C (121.3°F). Imagine Death Valley temperatures in a Canadian forest. On the fourth day, Lytton simply caught fire and burnt down [18]. This extreme event broke the all-Canadian temperature record, set during a drought in southern Saskatchewan 80 years ago, by an unimaginable 4.6°C. Canada was stunned. The extreme temperatures led to widespread fires that burnt and destabilized hillsides. Mother Nature was still planning ahead. In mid-November 2021 an atmospheric river off the Pacific dumped a month of rain on the BC region in two days. This generated massive

mud and debris slides that closed the Trans-Canada Highway and the national railway line. To us a 'supply-chain interruption' but useful from the Earth's perspective, as BC is mining and liquefying natural gas and exporting products from the tar sands of Alberta, all to speed the destruction of life on Earth. Canada has no intention of closing these profitable fossil fuel industries, so continued flooding is likely. On September 24, 2022, post-tropical storm Fiona with wind gusts still up to 100mph struck Nova Scotia and Prince Edward Island, leaving them without power [19]. It was the worst storm ever to hit eastern Canada with expected damages approaching a billion dollars. Six days earlier this storm as hurricane Fiona had severely damaged Puerto Rico's power grid.

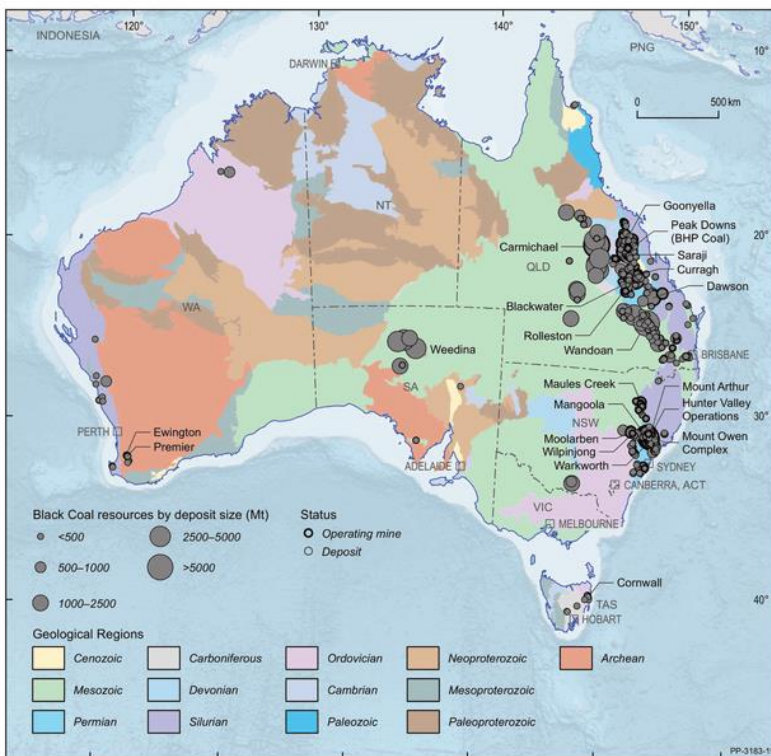


Fig. 3.4. Black coal deposits and operating mines in Australia, 2018. (Aussie Maps:reddit.com)

Eastern Australia had unprecedented wildfires in the summer of 2019-2020. Since then Queensland and New South Wales (NSW) have experienced a long series of record floods across the coal mines shown in Fig. 3.4. Sydney had a catastrophic flood July 2-4, 2022 [20]. A huge storm cell brought a year's worth of rain (about 1.2m or 4ft) in three days to some areas and led to the evacuation of

85,000 people as their homes were flooded. It was Sydney's fourth major flood since March 2021. The Earth's reason is apparent in the maps of the many coal mines around Sydney. To the north, Queensland has had a series of four floods in 2022 across the coal mines [21]. There was yet another huge flood from October 13-23, 2022 across Victoria, NSW and extending into Queensland [22]. Some areas got four times the mean October rainfall in 24 hours with flood waters up to 12m deep. More catastrophic floods followed in NSW Nov. 11-13, 2022 and helicopter rescue teams had to be summoned from New Zealand [23].

Australia is now the largest exporter of coal globally with \$44 billion in sales annually; and companies enjoy cash profit margins of about 45%. No one is discussing the connection between climate change, floods and the coal mines in Eastern Australia (Fig. 3.4). Instead the bizarre claim has been made that Australia is not responsible for the climate consequences as their coal is burnt elsewhere, so government references are unreliable! These climate change flood disasters are making parts of eastern Australia unlivable, especially for poorer people with few resources. However, the political system refuses to discuss the massive role of the coal mines in destroying life on Earth. Mother Nature has decided to act. An exceptionally long La Nina in the Pacific contributed to these floods.

Ironically, Auckland in New Zealand was struck by catastrophic floods near the end of January 2023, when a month of rainfall (250mm) fell in one day. The total monthly rainfall was the greatest ever recorded for any month of the year.

In the last week of July 2022, the state of Kentucky had extreme flooding [24] in the Eastern Kentucky Coalfield. The people are weeping, but the Earth's perspective is not being discussed. On one level society understands that the accelerating climate crisis is out of our control unless we rapidly cut the burning of fossil fuels. But we have refused to act for decades because it is so profitable, and of course, the mining industry is a source of local employment.

Hurricane Ian damaged Cuba to the south and then maneuvered to target Florida on September 28, 2022. It slowed down and amplified to nearly a category 5 storm. It struck the west coast near Fort Myers after passing over Sanibel Island, causing catastrophic damage from winds, storm surge and flooding, and heavy loss of life [25]. Heavy rain led to still more flooding, which continued on the slow-moving St. John's River for months. Hurricane Ian crossed Florida and then moved out over the Gulf, moving north to hit S. Carolina. Then five weeks later on November 10, Hurricane Nicole, only a category 1 storm on the coast, crossed Florida from the east bringing damage to the east coast, as well as heavy rain and floods to practically the whole state again. The major flood stage on the St. John's River was extended another month. Governor DeSantis could be one of the Earth's targets as he is a 'climate change denier', who doesn't support renewable power and has a largely neo-fascist political agenda that has no respect for life on Earth, and certainly not the Truth! Unfortunately for politicians and other powerful people, Mother Nature can read their minds.

Floridians are dispirited by the disaster, but no one is discussing the interests of Mother Nature.

The US winter climate for 2022-23 has been extreme in several ways. Freezing temperatures across the US severely affected road and air travel the week before Christmas, 2022. Heavy rain in California from multiple atmospheric rivers, starting on 31 December 2022 brought disastrous flooding in January 2023, following extreme drought in 2022. In January 2023, there were record numbers of tornadoes in the south (normally rare in winter). The media acknowledges climate change is involved without suggesting really dealing with it.

3.3 FUNDAMENTAL SOCIAL ISSUES

On a global scale, this is a huge topic and I will leave a deeper discussion to others. The rich and powerful nations have failed to address the climate crisis for decades because dealing with it would threaten their wealth. The poorer countries have suffered greatly.

3.3.1 The Clash between the Truth that Sets You Free and Webs of Lies

As I discussed in section 1.1, “The Truth will set you free – to act on behalf of the living Creation” is attributed in the Western Christian world to Yeshua (Jesus) the Aramaic-speaking Jewish teacher, who was making a statement about reality from the indigenous perspective. It is globally true regardless of religious beliefs because it is true for the Creation or Mother Nature. This Truth sets you Free from the webs of lies of politicians, advertising and all the misuse of human power and greed, and connects you to Mother Nature. This is a vast challenge for our society, and very few are willing to face it. With clarity and effort, it becomes easier to step into the Truth of the Creator’s world and feel the refreshing power and warmth of the Freedom to act wisely. Even once we see it, it takes time to unravel the webs that have been designed to trap us.

On a geopolitical level, webs of lies are everywhere. I will use the United States where I live for illustration. The last president Trump lied repeatedly throughout his term of office to protect his fragile self-image [26], and refused to accept reality when by a substantial margin he was not reelected in 2020. He ordered an attack on Congress on 6 January 2020 but failed to prevent the nomination of his successor and the transition to President Biden. Even now much of the Republican Party, fearful of Trump’s political power, still support his neo-fascist webs of lies. The Democrats of course reject Trump’s lies but are trapped in hopeful lies about economic growth, capitalism and military power. Politicians are interested in power, not the truth, so often they feel they have to lie because telling the real truth could lose votes. Many have been bribed to lie, and the media and especially the electronic media are free to lie to confuse the public and collect money for their sponsors. Virtually all advertising uses skillful lies to try to persuade you to buy something that you may not need, or believe something that allows rich individuals or corporations to profit. In fact, the

capitalist system is based on exploiting “human and natural resources” for profit (Fig. 3.1); and specifically exploiting individuals and the Earth itself to make money for wealthy individuals and corporations [27]. Swamped in these lies, most of society cannot possibly face the Truth that would set them Free to help Mother Nature, even though in return they would get her deep support to deal with the climate crisis on individual and collective levels.

3.3.2 Review of Global Climate Status

As I write in the spring of 2024, the science community is still stunned by the new record temperatures reached in 2023. The threshold outlined in the 2015 Paris Agreement of keeping the temperature rise to 1.5 degrees Celsius (above Industrial Revolution temperatures) has been reached, despite all the promises nations had made, and warmer temperatures lie ahead.

In early 2023, climate scientists started to notice something strange [28]. At the beginning of March, sea-surface temperatures began to rise. By April, they'd set a new record: the average temperature at the surface of the world's oceans, excluding those at the poles, was just a shade under seventy degrees F. Typically, the highest sea-surface temperatures of the year are observed in March, toward the end of the Southern Hemisphere's summer. Last year, temperatures remained abnormally high through the Southern Hemisphere's autumn and beyond, breaking the monthly records for May, June, July, September and onward. The North Atlantic was particularly bathtub-like. In the words of Copernicus, an arm of the European Union's space service, temperatures in the basin were “off the charts.”

Since the start of 2024, sea-surface temperatures have continued to climb; in February, they set yet another record. In a warming world, ocean temperatures are expected to rise and keep on rising. But, for the last twelve months, the seas have warmed so much that scientists are starting to worry about not just the physical impacts of all that heat but the theoretical implications. Are there forces at work that haven't been accounted for? “We don't really know what's going on,” Gavin Schmidt, the director of NASA's Goddard Institute for Space Studies, said: “And we haven't really known what's going on since about March of last year.” He called the situation “disquieting.” This is not surprising as the scientific community has not grasped that the takeover of the climate system by the Creator to save life on Earth means that the rule book has changed in ways we do not understand which are certainly beyond our historic analyses. As waves of storm systems have come up the eastern coast this winter, Vermont where I live has seen flooding along with record winter temperatures.

3.4 SUMMARY AND CONCLUSION

The greenhouse gases that are driving accelerating climate change continue to increase every year, and radically new climate extremes keep coming. The Fossil Empire has known for forty years that it was destroying the future of life of Earth, but it is cheap to bribe politicians and confuse the public with webs of lies, when

your annual profits are in the hundreds of billions. But after waiting for decades, it appears that Mother Nature (the Creator) has decided she must take over the climate system to protect life on Earth. This is incomprehensible to our leaders who have been lying for decades to ignore the key issues. Leaders still cling to the belief that we are the smart species in charge and we can do what we want.

The massive eruption of the Hunga Tonga volcano on Jan 15, 2022, illustrates human talents and limits. The global atmospheric shock wave circled the earth many times in both directions and first sent a tsunami across the Pacific. With our network of satellites and models, we could track everything precisely and issue warnings to the west coast. Yet scientists noticed that creatures along the Pacific coast simply moved to higher elevations well before the approaching tsunami was visible (as they always do). They don't read our satellite data, so how do they know? Mother Nature just tells them to move and they listen. We think we are the 'intelligent ones in charge' but we are the only species foolish enough not to listen to the Earth! Our technology is our current substitute. The coming reality is we will now have to surrender to the Creator's perspective as climate extremes increase, but this is going to be hard for most to grasp, after centuries of militarism based on 'fight, fight and never surrender'.

As climate extremes accelerate, one human reaction is to become more fearful, especially living on the coast. Nonetheless, Mother Nature can read our minds and wait for some to glimpse reality. This is very important on the individual and community levels because what we do as individuals to help life on Earth gets Mother Nature's support. One of her tools is serendipity, helping connect us so we can cooperate more easily in loving ways with each other. Another is that many individuals will realize that they too can listen to Mother Nature along with the other species on Earth. Then it becomes easier to see through the sham of consumer advertising, lying politicians and amoral capitalism that are all trying to make money from destroying the planet. Instead wise groups of citizens can replace all this with a deep understanding for the living Creation, and become free to rejoin her in love and Truth.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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