SYMPTOM I

S T R E S S

Rede Brasil

Stress is one of the most common symptoms among burnout patients. It raises cortisol levels in the human body, triggering an array of physical, emotional, and psychological imbalances that harm health and reduce quality of life (WHO, 2022).

Things are no different with the Earth. Emissions of CO2 and other greenhouse gases are the equivalent to constant stress on our planet. They heighten environmental imbalances and trigger countless problems that threaten our way of life. And as we can see in any number of scientific studies, such emissions have been growing at breakneck speed over recent decades.

Concentrations of carbon dioxide, methane, and nitrous oxide reached record levels in 2023. Carbon dioxide levels rose some 51% over the previous decade's average, while methane levels increased by 165% and nitrous oxide rose 24%. Between June 2023 and September 2024, CO2 and associated gases outstripped the global average at a truly unprecedented rate (WMO, 2024).

An increase in CO2 and other polluting gases in the atmosphere means a more intense greenhouse effect, which is throwing our planet increasingly out of balance. While solar energy levels remain constant, the heat from the sun is trapped in the atmosphere, raising temperatures here on Earth.

The last 10 years have been history's hottest in over 175 years of recorded observations. The planet's temperature has risen 1.55°C over the preindustrial average, and our track record is troubling to say the least. This marked the first time that studies indicated a temperature increase over the maximum target established by the Paris Agreement, of 1.5°C (WMO, 2024).

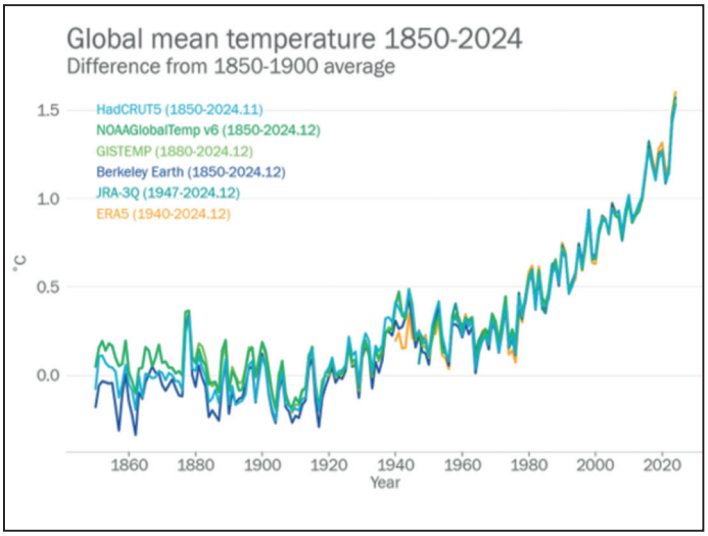

Figure 1: Global mean temperature, 1850-2024 Image: World Meteorological Organization (WMO, 2024).

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Rede Brasil

The consequences of this breakneck rise are more patent than ever, such as the substantial increase in ocean temperatures, which has damaged the marine ecosystem, affecting its capacity to regulate the climate and produce oxygen (UN, 2024). As ocean surface temperatures have risen, significant losses in biodiversity have followed; coral bleaching, for example, has attained levels never before seen in the history of humanity (NOAA; ICRI, 2024). Coastal flooding, globally and regionally, has been linked to this increase in temperature, triggered mainly by melting glaciers and the expansion of seawater as it heats up (UN, 2024).

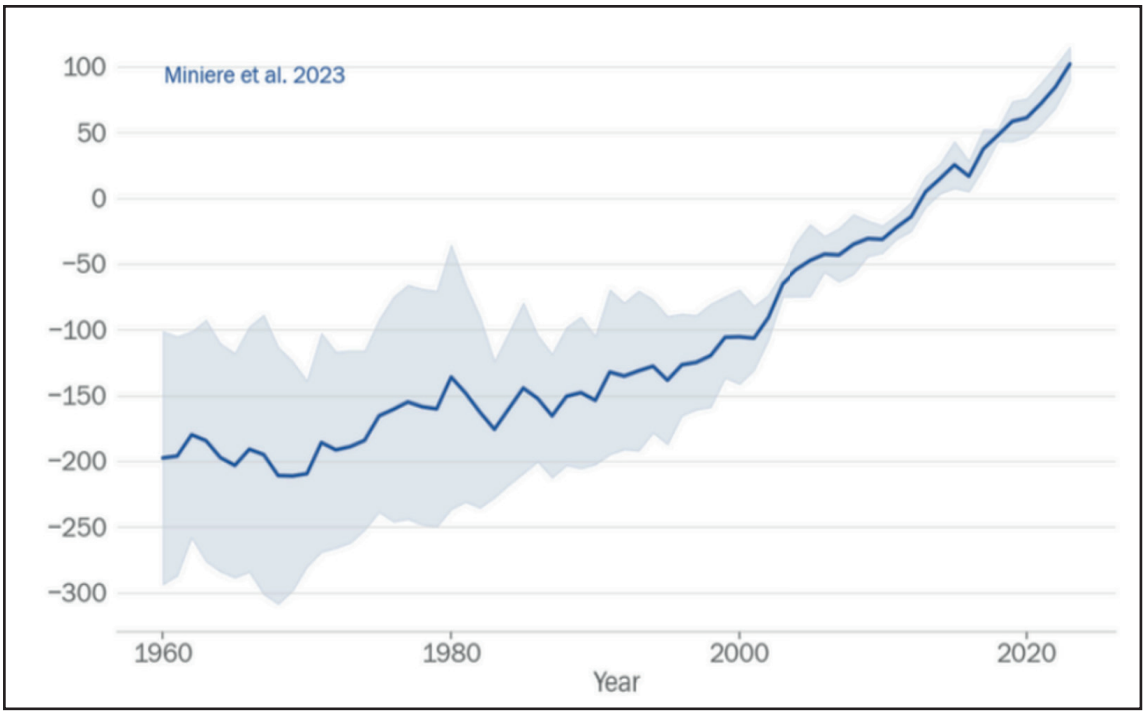

Figure 2: Ocean heat content from 1960 to 2023, shown as difference from 2005-2020 average.
Image: Miniere et al. 2023, apud WMO, 2024.

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Human interference in the climate, through the massive emission of greenhouse gases, has caused tremendous stress on the planet as the atmosphere, the Earth, and its oceans heat up. These actions on the part of humanity have provoked an unrelenting series of extreme climate events, with broad-ranging impacts on nature and people alike – especially the most economically vulnerable communities.

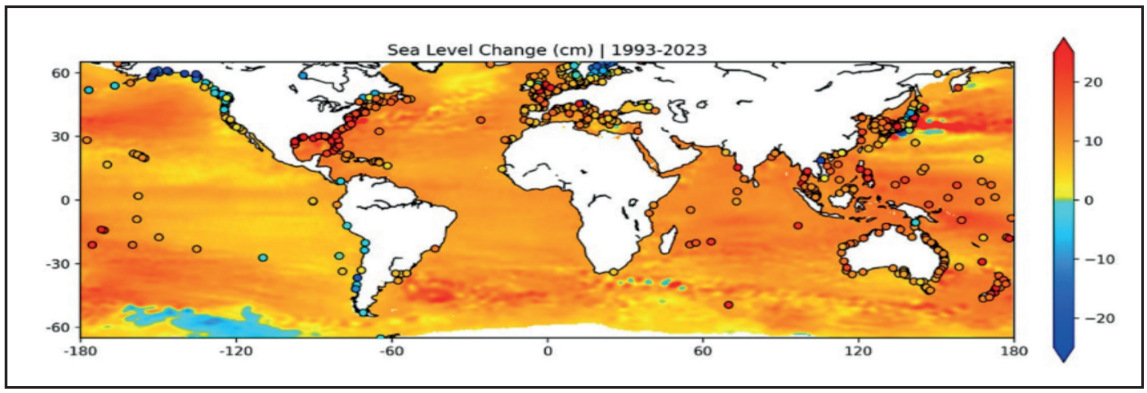

Figure 3: Sea level change (cm) 1993-2023 (warm colors show where sea levels are rising)
Image: Fournier et al.,2024, UN. 2024

Rising CO2 emissions help drive millions of people into food insecurity, imperil water security, submit human beings to conditions on the brink of survivability, and expose the environment to extreme heat waves that cause irreparable damage to ecosystem biodiversity, with repercussions for both marine and terrestrial life (IPCC, 2023).

It is all too clear that high emissions of polluting gases are causing an unsustainable state of stress for the Earth, triggering countless other environmental problems. Just as burnout causes unsustainable levels of stress for patients, triggering countless other health problems.

Rede Brasil

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SYMPTOM II

G A S T R I T I S

Rede Brasil

Gastritis is a common symptom in diagnoses of burnout. In such cases, the irregular production of gastric acid leads to the inflammation of the stomach lining, causing a burning, gnawing pain (Conitec, 2023).

Just like burnout sufferers, the Earth has been dealing with burning sensations of its own, as devastating fires across multiple ecosystems have grown in frequency and intensity in recent years.

Forest ecosystems represent around 30% of the planet's land coverage and play a crucial role in balancing the climate. As climate change has intensified, with extreme drought and heat waves associated with natural phenomena such as El Niño and La Niña, alongside human-caused deforestation, these ecosystems have become tinderboxes (WRI, 2024).

In 2024, the United States saw approximately 90% more fires than the 2000-2020 average, with over 61,000 wildfires destroying 8.8 million hectares of forest. The state of California saw the fourth-largest wildfire in its history, which devastated 430,000 hectares. Alaska, meanwhile, saw 667,000 hectares burned in 2024 (NOAA, 2025).

In Canada, 22.8 million hectares burned in 2022; the following year, that number rose to 28.3 million hectares, a 24% increase in tree cover loss, as seen in Figure 1 (WRI, 2024).

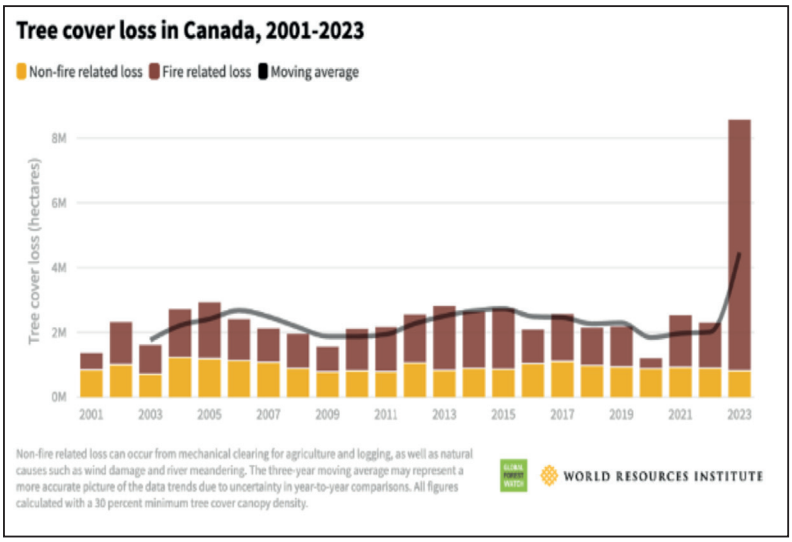

Figure 1: Vegetation loss in Canada from 2001 to 2023. Image: WRI, 2024.

SYMPTOM II
G A S T R I T I S

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Bolivia has lost 27% of its primary forest for the third year in a row, with wildfires driving over half of the destruction, as indicated by Figure 2. Climate change also brought record-breaking heat to the country, driving temperatures above 40.3°C (WRI, 2024).

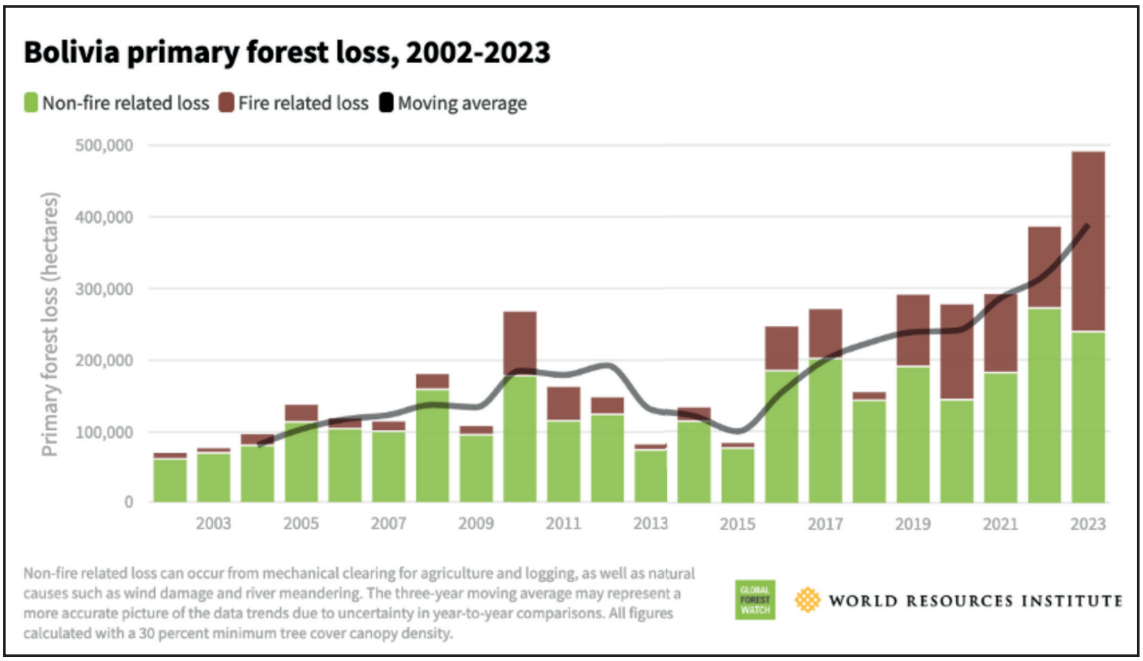

Figure 2: Vegetation loss in Bolivia from 2002 to 2023.. Foto: WRI, 2024.

Over the course of 2023, the European Union had over 500,000 hectares of land affected by wildfires, one of the worst such figures this century. Natura 2000, the world's largest coordinated network of nature protection areas, including all the countries of the European Union, saw 41% of such areas affected by wildfires in 2023, up 60% from 2022, as may be seen in Table 01.

At least 41 human lives were lost in the EU wildfires, and 96% of those fires were caused by human action (European Commission, 2024).

SYMPTOM II

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Country	Area (Ha)	% of Natura2000 Area	Number of Fires
Austria	403.0	0.026	6
Belgium	240.0	0.056	2
Bulgaria	11508.6	0.205	84
Croatia	629.9	0.019	15
Cyprus	544.8	0.229	4
Czechia	22.0	0.001	1
Denmark	144.0	0.024	6
Estonia	29.0	0.003	1
Finland	34.0	0.001	6
France	16367.4	0.175	403
Germany	1137.0	0.016	31
Greece	70640.3	1.467	84
Hungary	161.0	0.006	3
Ireland	1850.1	0.161	59
Italy	30680.3	0.419	398
Latvia	181.1	0.024	6
Netherlands	53.0	0.007	2
Poland	166.0	0.002	19
Portugal	14324.0	0.590	363
Romania	15707.5	0.202	78
Slovenia	131.0	0.011	2
Spain	42664.8	0.253	519
Sweden	69.7	0.001	7
EU27 total	**207688.5**		**2099**
Algeria	1484.4	0.892	11
Lebanon	23.9	0.088	5
Morocco	1.0	0.000	1
UK	1039.1	0.041	23
Non-EU total	**2548.4**		**40**
Total (all)	**210236.9**		**2139**

Table 01: Wildfires in 23 of 27 EU member states. Image: UE, 2024.

Wildfires affect the regulation of local climate, interfere with agricultural production and threaten food security, harm human health, and exacerbate the climate crisis (WRI, 2024). These fires are a serious symptom, which is affecting Earth's health and aggravating its current state of burnout.

SYMPTOM II

G A S T R I T I S

Rede Brasil

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SYMPTOM III

INSOMNIA

Rede Brasil

Insomnia is one of the most common symptoms in diagnoses of burnout, a public health issue affecting people worldwide. It prevents sufferers from falling or staying asleep and may trigger other health issues, as sleep plays a fundamental role in restoring the human body (Ayta, 2024).

The insomnia that plagues burnout patients has also affected animals, in the wake of the climate crisis and the multiple environmental effects triggered by human action. The climate imbalance that has affected average temperatures and air quality may have a similar effect on animals' sleep (Ayta, 2024).

Mammals are particularly sensitive to disturbances in their environment. Changes in their natural sleep cycle have been recorded worldwide; some diurnal mammals are becoming nocturnal to avoid contact with human beings, whose advance has affected their habitats (Gaynor et al., 2018; Ikeda et al., 2022; Li et al., 2022; Heather et al., 2024). This shift in the environment tends to impact the equilibrium of ecological interactions, affecting species on a populational level and threatening the survival of communities in certain habitats (Both, et al., 2009; López-Roig, 2024).

The jarring shifts wrought by climate change have already altered fundamental survival traits in some species. Many are beginning to hibernate in the spring and summer, breaking with patterns recorded over decades (Parmesan et al., 2003; López-Roig, 2024). In the Sant Llorenç del Munt i l'Obac Park, in northeastern Spain, Schreiber's bent-wing bats (Miniopterus schreibersii), are hibernating for increasingly short periods in response to temperature changes in their habitat.

Alpine ibexes (Capra ibex) in the Gran Paradiso National Park in northwestern Italy and in the Swiss National Park in eastern Switzerland were observed in the period preceding the region's harsh winters, from 2006 to 2019. Researchers noted alterations to their nocturnal behavior on hotter days, as a consequence of climate change (Brivio et al., 2024).

In the Southern California Bight, short-beaked common dolphins (Delphinus delphis delphis) and long-beaked common dolphins (Delphinus delphis bairdii) are changing their behavior to avoid the sounds emitted by naval sonar, especially military vessels. This is a sign of stress and may indicate a loss of sleep quality, as sonar affects dolphins' ability to communicate, navigate, and hunt, altering their behavior and the marine ecosystem as a whole (Southall et al., 2024).

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INSOMNIA

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Dolphins aren't the only animals being affected by sonars. One study associated individual and mass strandings of Cuvier's beaked whales (Ziphius cavirostris) on the Mariana Islands, an archipelago in the Pacific Ocean, to the use of sonar in the region between August 2007 and January 2019. Sonar has altered these whales' migration behavior, their eating patterns, and caused auditory damage that hinder their ability to communicate, provoking chronic stress that affects immune response and possibly sleep (Simonis et al., 2020).

Animals' insomnia, caused by climate change and other anthropic environmental impacts, is yet another symptom of the Earth's burnout. We are witnessing an utterly symptomatic ecological imbalance. The planet's cries for help are growing clearer by the day.

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SYMPTOM IV

A R R H Y T H M I A

Rede Brasil

One of the symptoms of burnout is cardiac arrhythmia, in which the heart's natural rhythm is altered, making it beat too fast or too slow.

Our planet is suffering from a sort of arrhythmia of its own: an arrhythmia in its levels of rainfall. Just as burnout patients may feel their hearts skipping a beat, the Earth's rains are not falling as regularly as they ought to be. Instead, the planet is experiencing extreme droughts and torrential rains, causing tremendous impacts on human life, the economy, food security, biodiversity, and ecosystem balance (IPCC, 2023).

The region on the border between Bangladesh and northeastern India has shown just how much damage irregular rainfall may bring. While the area is naturally vulnerable to floods, one study indicated that between 1950 and 2021, extreme rainfall events linked to climate change quadrupled. Between May and June 2022, as seen in Figure 01, two extreme rainstorms caused the deaths of 80 people, destroyed 244,060 hectares of farmland, and led to losses of $28.1 million in cattle (Fahad, 2023).

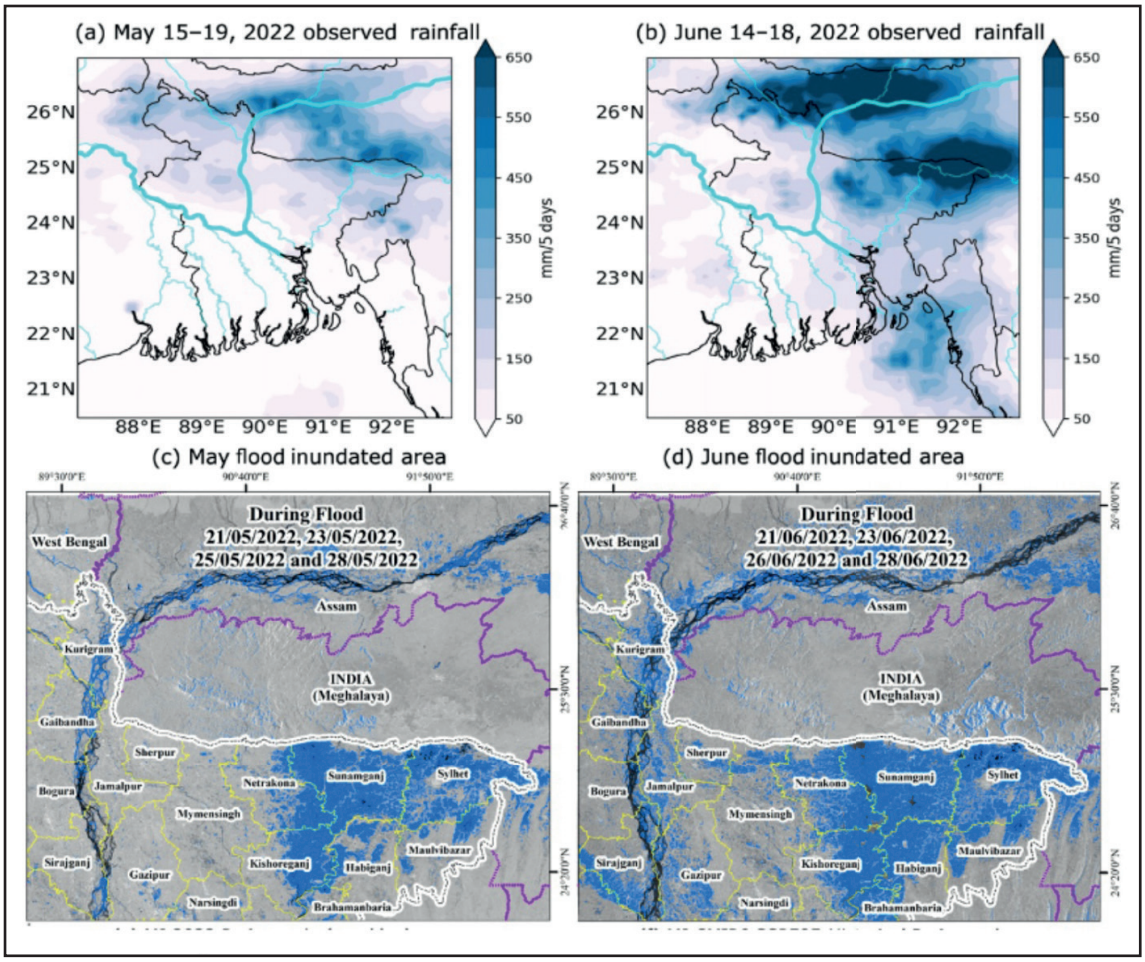

Figure 01: Flooding in May and June 2022, showing 5-day total rainfall Image: Fahad, 2023

SYMPTOM IV

A R R H Y T H M I A

Rede Brasil

In Brazil, over the past six decades, the average number of days without rain has gone from 80 to 100 days per year, a direct consequence of the climate change and its subsequent elevation of temperatures nationwide, as seen in Figures 02 and 03 (PBMC, 2024).

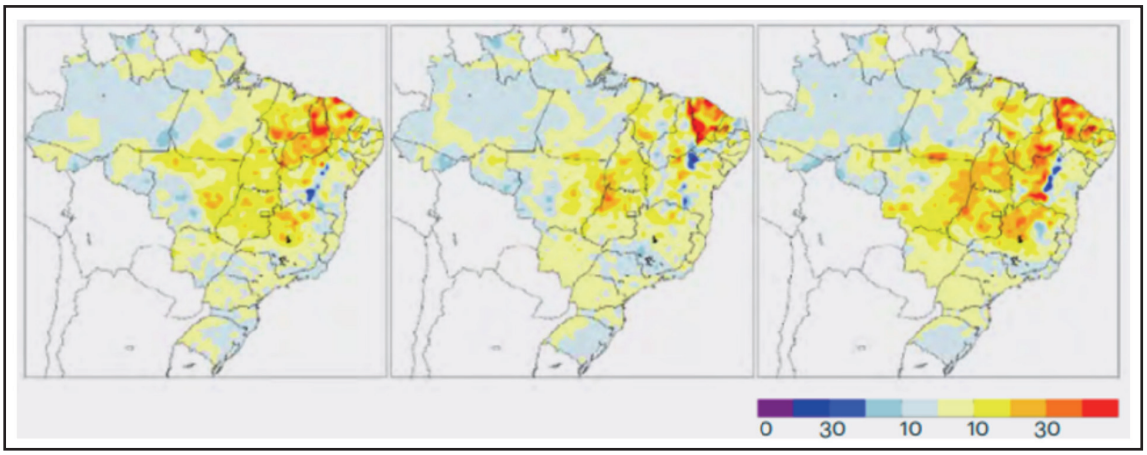

Figure 02: Anomalies of Consecutive Dry Days observed in three periods: 1991-2000, 2001-2010, and 2011-2020, using the period 1961-1990 as a reference. Image: PBMC, 2024

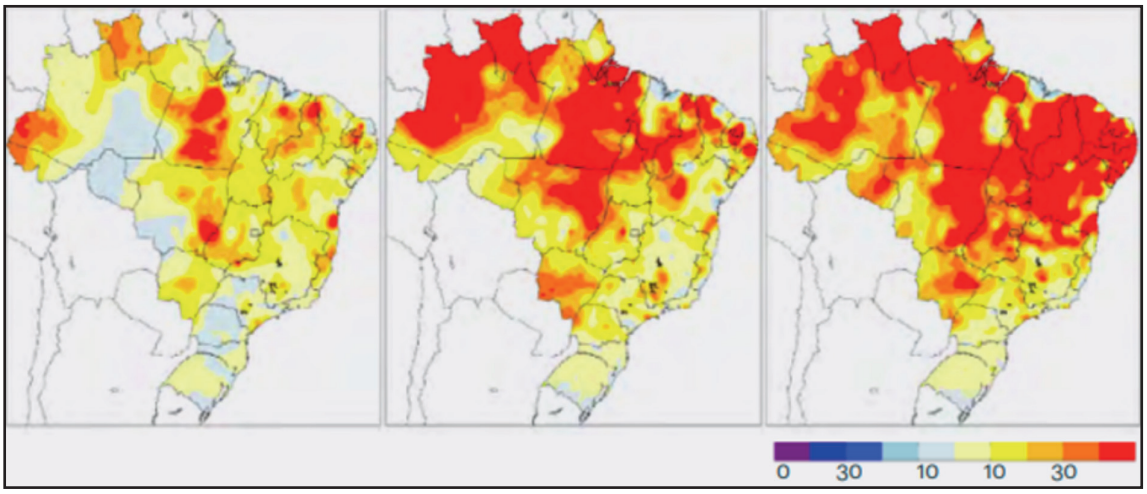

Figure 03: Anomalies of heat waves observed over three periods: 1991-2000, 2001-2010, and 2011-2020, using the period 1961-1990 as a reference. L. Alves et al., DIIAV/INPE. Image: PBMC, 2024

SYMPTOM IV

A R R H Y T H M I A

Rede Brasil

In 2023, the Brazilian Amazon experienced a severe drought. This rare event was exacerbated by climate change and human activity, tenfold in the case of reduced precipitation and thirtyfold in the case of agricultural drought, which is characterized by low soil humidity.

Deforestation, in tandem with rising temperatures caused by climate change, has contributed significantly to reducing humidity, thus making the region more vulnerable to drought, as seen in Figures 04 and 05 (Clarke, 2024). The ecological impacts of this hydric stress included heat waves in the region, resulting in loss of habitat and alterations in the dynamic of the forest, with severe consequences for local flora and fauna.

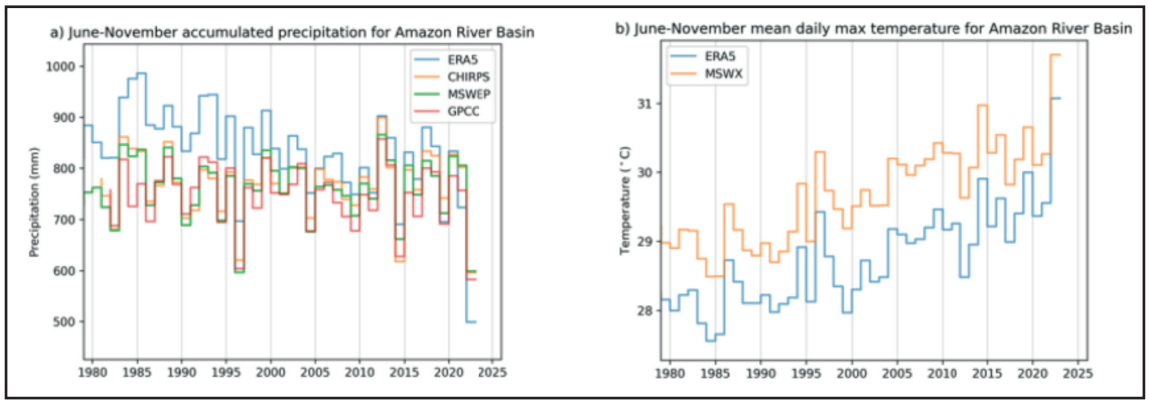

Figure 04: Observation of trends in the Amazon River Basin. Image: Clarke, 2024

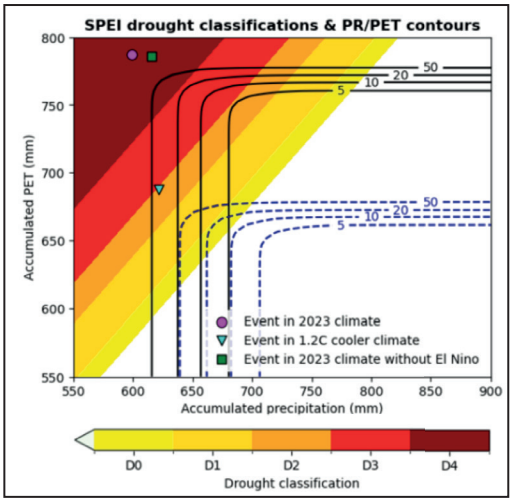

Figure 05: Distribution of accumulated precipitation over 6 months and drought classifications. Image: Clarke, 2024

The arrhythmia our planet is dealing with, alternating punishing rains with prolonged droughts, has created an imbalance in our ecosystems, in the economy, and in our way of life. We are witnessing a drastic change in rainfall patterns in multiple regions, and it is becoming increasingly evident that this is one of the major symptoms of the burnout that has left the Earth dangerously exhausted.

SYMPTOM IV

A R R H Y T H M I A

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SYMPTOM V

WEAKENING OF THE IMMUNE SYSTEM

Rede Brasil

Burnout isn't a natural condition for human beings; it's an ailment that results from professional exhaustion. One of the symptoms is a weakening of the immune system – a drop in immune response that leaves the human body more vulnerable to disease (Cui et al, 2021).

Just as burnout can cause lowered immunity in human beings, in our planet, it triggers changes in ecosystems that may lead to the emergence of new diseases.

The consequences of climate change, such as increased temperature, permafrost melt, deforestation, wildfires, and other extreme events, have accelerated the rise of zoonoses (diseases transmitted from animals to people). Annually, such diseases cause 2.5 billion cases in human beings and over 2.7 million deaths worldwide (Lee, 2023).

It is likely that 75% of viral infectious diseases are of zoonotic origin. Outbreaks over the past decade, including zika virus, ebola, dengue, and COVID-19, have demonstrated these pathogens' power to harm world health, the economy, and nature alike (Leifels, 2022).

Over 4 billion people worldwide may be infected by viruses transmitted by mosquitoes and ticks; and with human action and climate change, that figure is on track to rise to 5 billion by 2050 (WHO, 2024).

Environmental degradation and poor urban planning are drivers of multiple diseases, including dengue, zika virus, and chikungunya – all transmitted by the Aedes aegypti mosquito. Recorded dengue cases have doubled every year since 2021, and the disease has now become endemic in over 100 countries, surging in Africa, the Americas, the East Mediterranean, Europe, Southeast Asia, and the Western Pacific, as illustrated in Figure 01 (WHO, 2024).

SYMPTOM V

WEAKENING OF THE IMMUNE SYSTEM

Rede Brasil

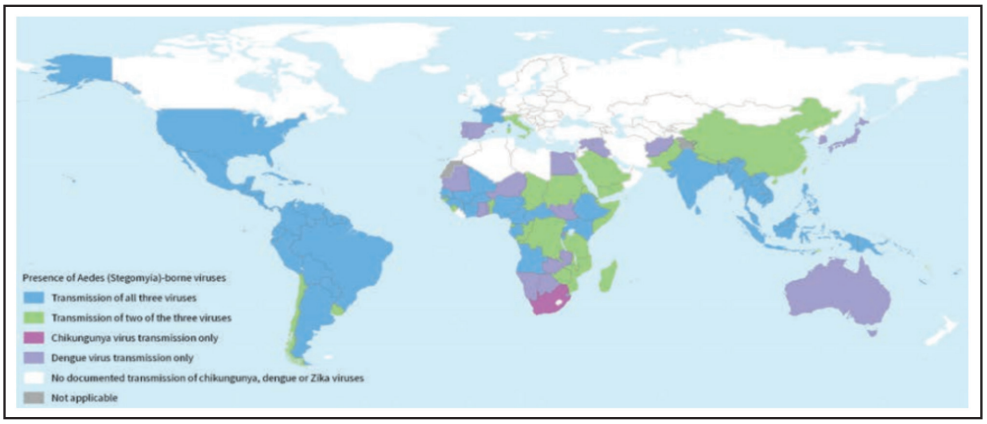

Figure 01: countries with active transmission of chikungunya, dengue, or zika virus.
Image: WHO, 2024

By June 2024, 10.9 million suspected cases of dengue had been recorded that year alone, with 5.6 million confirmed, 24,000 serious cases, and 6,500 deaths worldwide, as seen in Figure 02 (WHO, 2024).

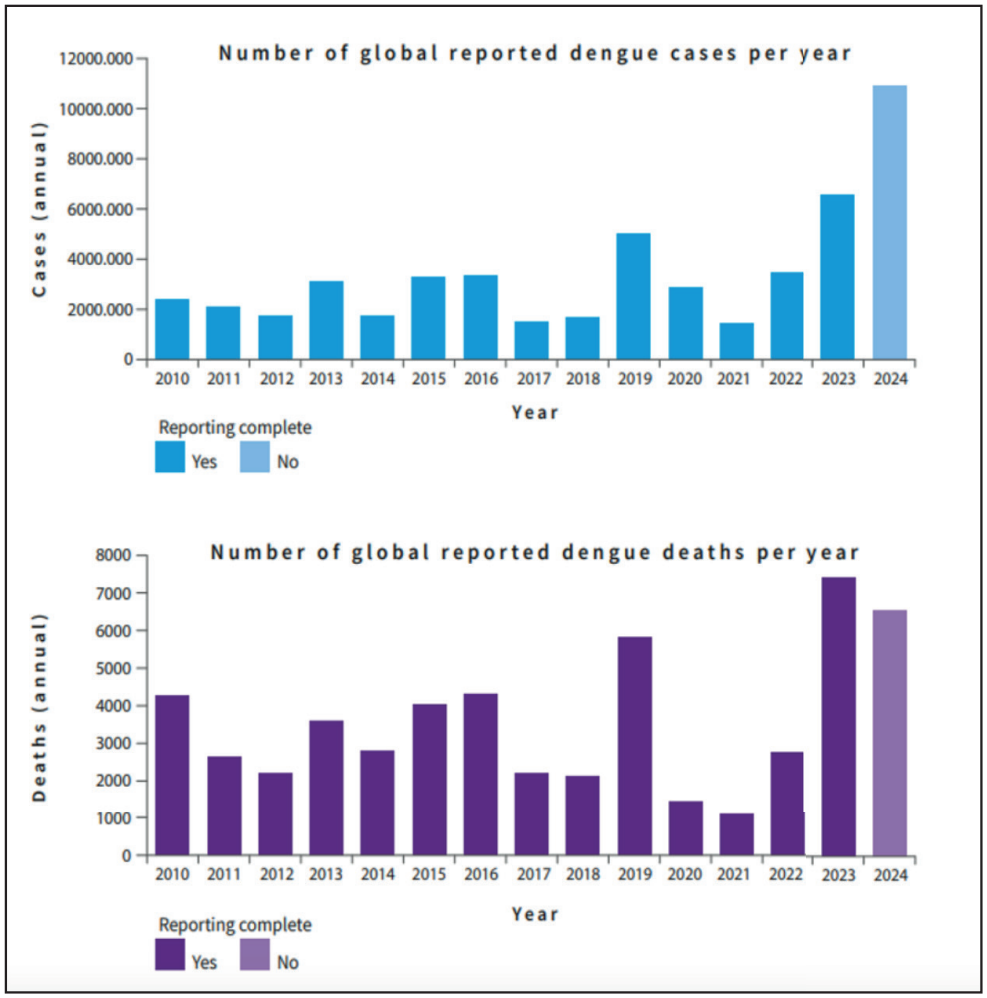

Figure 02. Image: WHO, 2024.

SYMPTOM V

WEAKENING OF THE IMMUNE SYSTEM

Rede Brasil

In late 2019, the world saw the direst global health emergency of the 21st century, born of a zoonosis related to human activity: the COVID-19 pandemic, caused by the SARS-CoV-2 virus.

The virus was first detected in the city of Wuhan, China, and it likely arose in the markets where vendors stored dozens of species of wild animals, confined in close proximity. A virus that arose with human help, given the exchange of genetic material across multiple species, subsequently infected one human, and spread across the globe from there. From January 2020 to December 2021, there were some 14.9 million excess deaths associated with COVID-19 worldwide, as seen in Figure 03 (WHO, 2022).

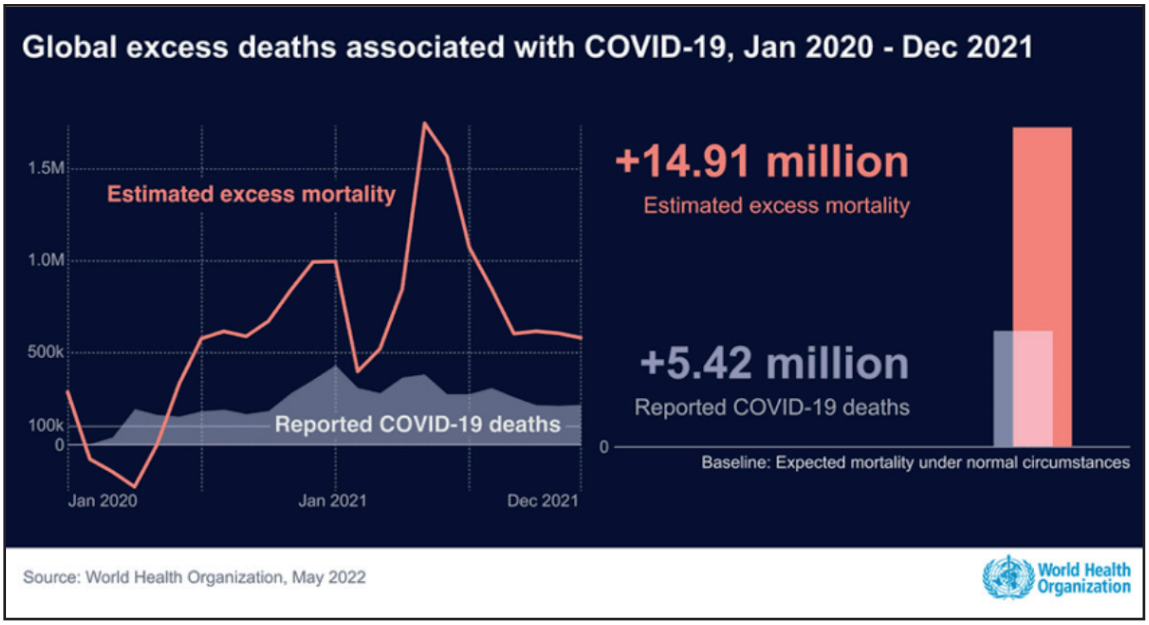

Figure 03: Estimated excess mortality and deaths associated with COVID-19, Jan 2020-Dec 2021.
Image: WHO, 2022

The Earth's burnout has accelerated and favored the emergence of novel diseases. The planet's weakened immunity makes it vulnerable to outbreaks, epidemics, and pandemics. Humanity's impact on the climate and the environment has led the world to a breaking point. And like any patient in such a delicate state, the Earth is left critically vulnerable to all sorts of new illnesses.

SYMPTOM V

WEAKENING OF THE IMMUNE SYSTEM

Rede Brasil

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SYMPTOM V

WEAKENING OF THE IMMUNE SYSTEM

Rede Brasil

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SYMPTOM VI

A L O P E C I A

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Alopecia is a disease that may cause large-scale hair loss. The condition can be triggered by stress or professional exhaustion – in other words, by burnout (Sales et al, 2022).

The Earth has been experiencing its own version of this symptom of burnout – a loss of vegetation cover and the desertification of multiple ecosystems as a consequence of human activity and climate change.

The climate crisis has altered rainfall patterns, with high temperatures increasing evapotranspiration and deglaciation and making droughts even more severe across the world. As humans have recklessly increased water use and engaged in deforestation, vegetation cover has shrunk, while arid regions and deserts have advanced worldwide, as seen in Figure 01 (European Commission et al, 2024).

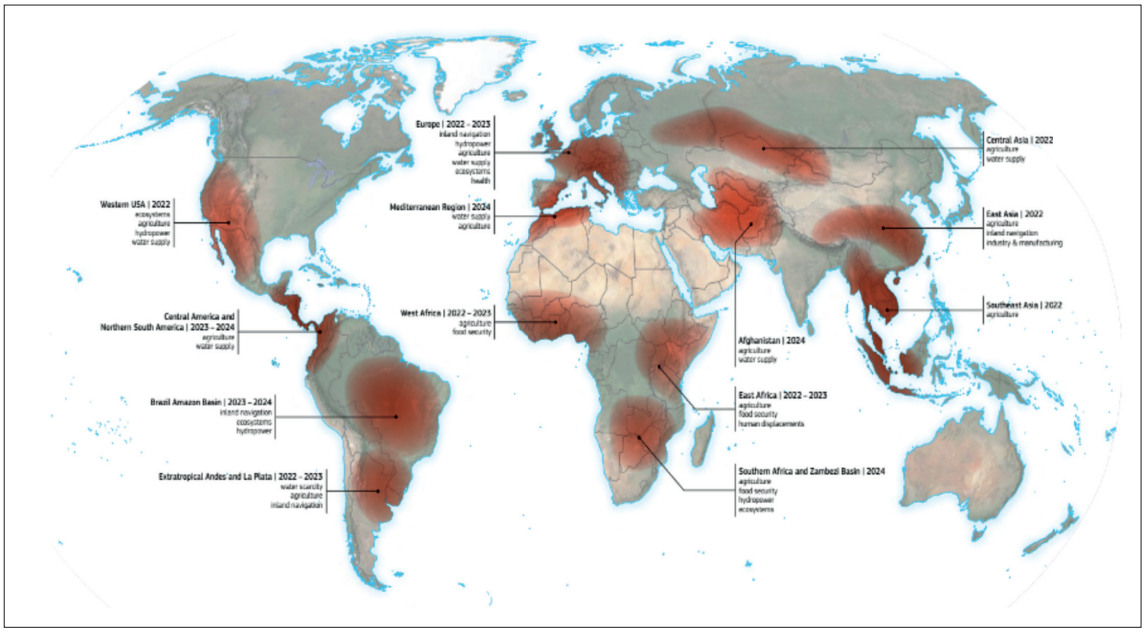

Figure 01: Major drought events across all continents, 2022-2024. Image: European Commission et al, 2024

Over the three decades prior to 2020, the Earth grew 75% drier in comparison to the preceding 30 years. Arid regions expanded on the order of 4.3 million km^2 – 7.6% of the planet, an area the size of Canada.

Calculations indicate that, in the absence of a broad-ranging effort to contain global warming, 3% of the world's humid zones will become vegetation-free deserts by the end of the century.

The number of people living in arid regions is also on the rise, doubling to 2.3 billion over the past 3 decades; in 1990, just 1.2 billion people were living in drylands, as seen in Table 01 (UNCCD, 2024)..

SYMPTOM VI

A L O P E C I A

Rede Brasil

%	Areas with AI decrease	Drylands		Populaton in drylands	
Region	1961–1990 v 1991–2020	1961–1990	1991–2020	1990	2020
NAM	68.9	21	21.3	25.7	26.4
LAC	82.1	14.3	18.6	14.9	16.2
EUR	95.9	7.3	12.1	5.7	10.7
AFR	88.4	66.2	70.5	47.2	49.6
ASIA	84	33.2	36.1	21.8	30.9
OCE	74.5	86.3	87.9	20.7	45.8
GLOB	77.6	37.5	40.6	22.5	30.9

Table 01: Population dynamics in drylands, 1961-1990 and 1991-2020. Source: UNCCD, 2024

As the world becomes drier, over 20% of the Earth's surface may undergo drastic transformations by the end of the century, altering fundamental characteristics of multiple ecosystems, especially in light of the loss of vegetation (Berdugo et al, 2020, UNCCD, 2024).

Just as patients with burnout often experience alopecia-related hair loss, our planet is also losing its natural coverage. The Earth's burnout has led to a drastic fall in vegetation cover and the advance of desertification across the globe.

SYMPTOM VI

ALOPECIA

Rede Brasil

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SYMPTOM VII

FIBROMYALGIA

Rede Brasil

Fibromyalgia is a chronic disease that increases muscular sensitivity, provoking intense, widespread pain in the human body. Burnout, which is a syndrome of chronic stress related to professional exhaustion, can lead to any number of physical and mental health issues, including fibromyalgia (Reietjens, 2024).

Just as burnout can cause fibromyalgia in humans, the Earth has been experiencing reduced mobility through the destruction of its wildlife corridors, which help maintain the planet's biodiversity. The fight to mitigate the impacts of climate change includes the maintenance and restoration of wildlife corridors in degraded ecosystems, as well as curbing resource overuse (PNUMA, 2021). When habitats are lost or fragmented, threatened by improper land use on agricultural frontiers – a bid to meet the growing demand for food on Earth – that represents a serious threat to biodiversity and ecosystem health. A direct consequence of human populational growth, as well as of pressures to meet other demands, such as real estate expansion (Cardinale et al, 2006, Beltrão et al, 2024).

> The Mesoamerican Biological Corridor (MBC), in Central America and southeast Mexico, is an example of an initiative dedicated to promoting biodiversity. While it represents just 2% of the planet's land area, Central America is a hotspot of biodiversity, home to 12% of all known species. The region is host to a treasure trove of thousands of vascular plants and a huge variety of mammals, many of them endemic. Mexico, for its part, is known as one of the most biodiverse countries in the world. Nicaragua's Atlantic coast has the largest stretch of primary forest in Central America, which serves as a habitat and wildlife corridor for endangered animals such as tapirs, harpy eagles, and jaguars. In spite of its undeniable relevance, however, the Mesoamerican Biological Corridor's future is uncertain. It faces three major challenges: deforestation, habitat fragmentation, and climate change. Deforestation reduces biodiversity and cuts off ecosystems from one another, hindering the flow of genetic material between populations and making them more vulnerable to disease and extreme events. Climate change, meanwhile, threatens the survival of many species, altering environmental conditions in severe and unpredictable ways (Ávilar Romero, 2023).

The Convention on the Conservation of Migratory Species of Wild Animals (CMS), signed in 1979, stands as a fundamental global agreement to protect migratory species and their habitats. The CMS divides migratory animals into two categories – Appendix I and Appendix II – which require different levels of protection and international cooperation. The Appendix I list refers to species that would benefit from restrictions on commerce and rigorous protective measures, especially those in danger of extinction. Appendix II includes species that require international cooperation and protection.

SYMPTOM VII

FIBROMYALGIA

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CMS data indicates an alarming decline in the health of migratory animals and the quality of their habitats, with potentially devastating impacts on global biodiversity. One in five species on the CMS list are in danger of extinction worldwide, and around 44% are in populational decline. All species listed in Appendix I are in danger of global extinction, while species in Appendix II comprise around 18% of the endangered list. Since 1970, the total population of CMS-listed fish species has declined by some 90%. Estimates indicate that 399 migratory species not currently listed under CMS are threatened or near threatened with extinction, as seen in the figure below (PNUMA et al, 2024).

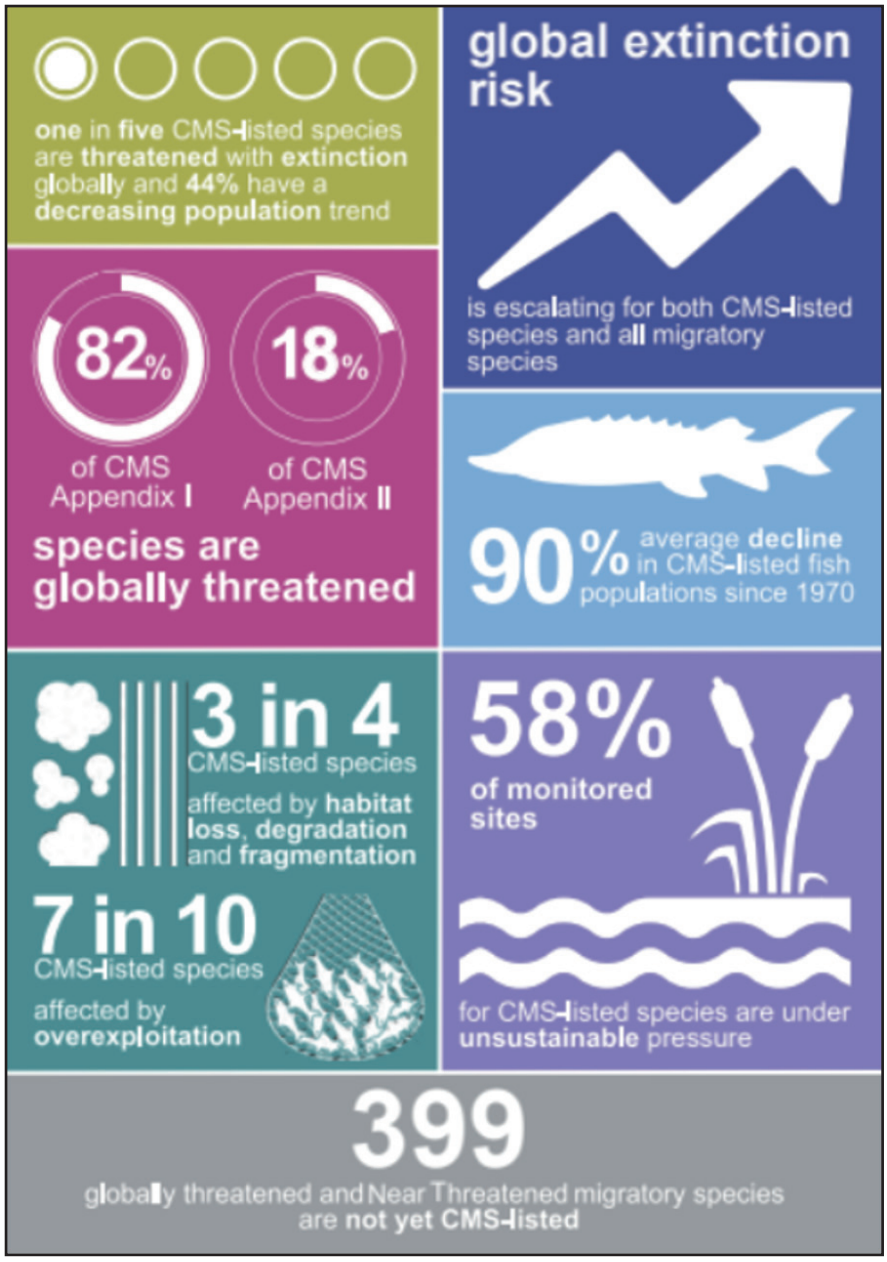

Figure 01: Illustration of data on the populational decline of migratory species. Source: PNUMA et al, 2024.

SYMPTOM VII

FIBROMYALGIA

Rede Brasil

Investments in ecosystem restoration are investments in a sustainable future. Healthy ecosystems offer natural solutions to global challenges such as food insecurity, climate change, and biodiversity loss. Humanity will need to restore 1 billion hectares of degraded land and expand the same initiatives to marine and coastal areas. In doing so, we will improve people's quality of life and take a crucial step toward a proper treatment of Earth's burnout.

SYMPTOM VII

FIBROMYALGIA

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SYMPTOM VIII

HIGH BLOOD PRESSURE

Rede Brasil

High blood pressure is a common symptom in patients suffering from burnout. Hypertension occurs when blood pushes too hard on the artery walls, exceeding levels of force considered healthy for a person's age and potentially causing strokes, heart failure, heart attacks, chronic kidney disease, aneurysms, hypertensive emergencies, or, at worst, death (SBN, 2023).

While people diagnosed with burnout suffer from hypertension, the Earth is suffering from the effects of climate change and its effects on the planet's natural cycles, shifts which are exerting pressure on multiple ecosystems – including in the form of volcanic eruptions. Variations in the amount of ice in glaciers triggers changes in pressure and tension on the surface of the earth, affecting both the crust and the upper mantle (Schmidt et al, 2013, Graeme, 2017). Even the slightest changes in surface load can alter the stress field around shallow magma chambers, significantly influencing the likelihood of eruptions in ice-sheathed volcanoes (Albino et al, 2010, Graeme, 2017). In addition to deglaciation, rainfall may also destabilize volcanos as water filters into pores or ruptures the dome – a sort of plug that shuts off preexisting calderas, as seen in Figure 01 (Harnett, 2019).

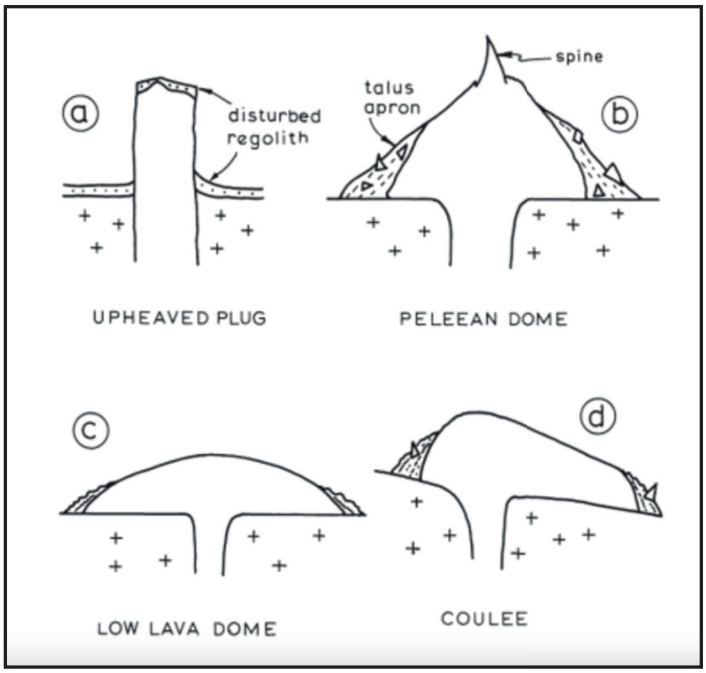

Figure 01: Illustrative sketches of the distinctive traits of four types of volcanic domes, seen in cross-cuts. Source: Blake, 1990, Harnett, 2019.

SYMPTOM VIII

HIGH BLOOD PRESSURE

Rede Brasil

Imbalances in rainfall caused by climate change may also trigger extreme geological events, such as volcano eruptions. Heavy rains may filter into volcanic pores, altering tensions along geological faults and potentially provoking eruptions.

In Hawaii in 2018, for example, Kilauea erupted as a consequence of extreme rainfall, as demonstrated in Figures 02 and 03 (Farquharson et al, 2020).

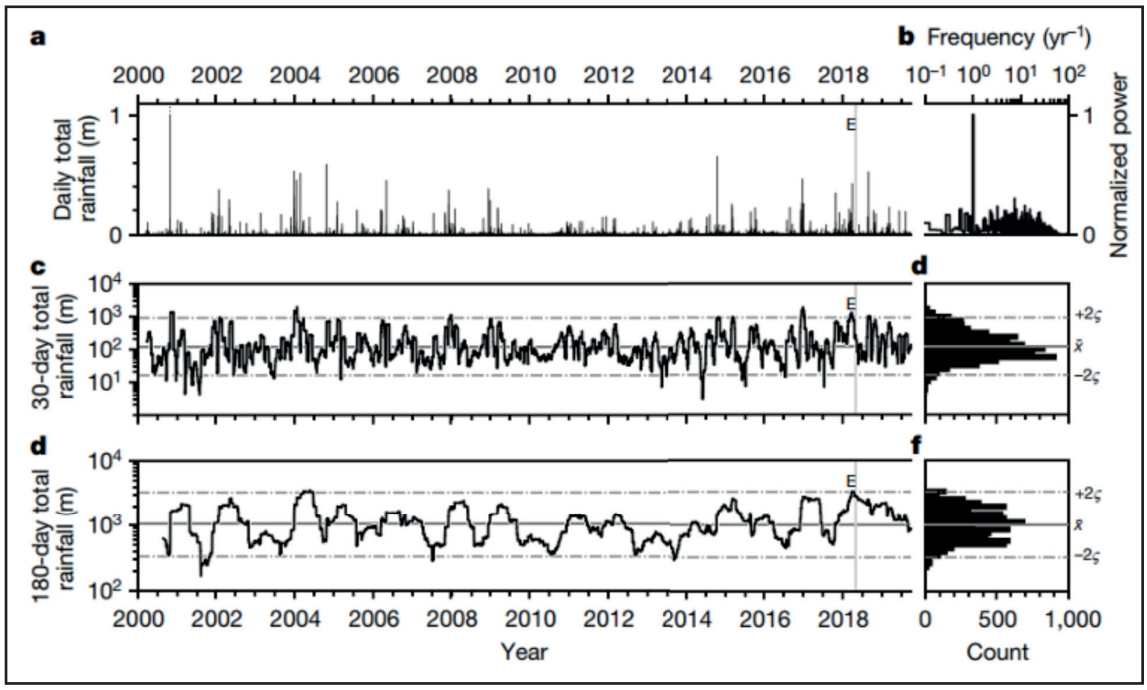

Figure 02: Rainfall on the volcano. a: precipitation on Kilauea, March 2000-July 2019. c: 30-day total rainfall since March 2000. d: histogram of data in c. Source: Farquharson et al, 2020

Water infiltration may increase pressure in volcanic pores, varying from kilopascals to dozens of kilopascals at depths of kilometers, as illustrated in Figures 02 and 03. This augmented pressure may weaken rocks, cause hydraulic fractures, and trigger the formation of magmatic dikes, reducing the stress threshold necessary for eruption. While the exact magnitude of the shift in tension depends on the draining and heat of the magma, variations of 1 kPa are comparable to the tensions unleashed by Earth tides, sufficient to activate preexisting faults. It is believed that alterations of 10 kPa may be necessary to create mechanical faults in unstressed rocks, but studies have shown that tensions of 0.1 to 1 kPa may trigger earthquakes if the crust is in critical state (Farquharson et al, 2020).

SYMPTOM VIII

HIGH BLOOD PRESSURE

Rede Brasil

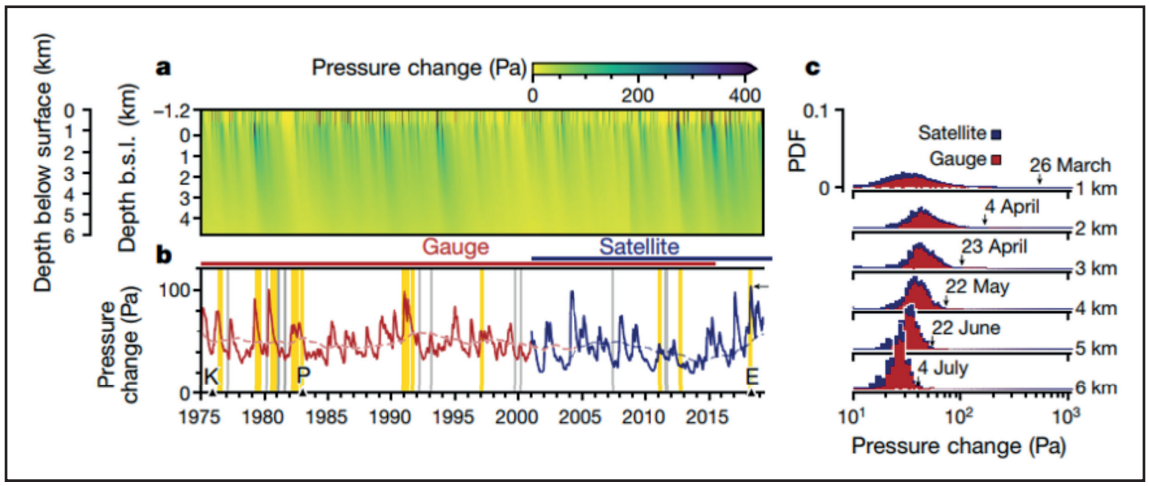

Figure 03: as per Farquharson et al, 2020, changes in pressure in pores in response to water infiltration in the structure of Kilauea. a: Pore-pressure change modeled over the period January 1975 to April 2019, using available HVNP gauge data (1950–2015) and calibrated satellite data (2000–2019), with depth and time. Daily rainfall data are used as a fluctuating boundary condition. Color scale indicates pressure change. b: Pore-pressure change at 3km below the surface (1.8km below sea level) modelled over the period January 1950 to April 2019 (data shown are since the 1975 Kalapana earthquake). The dashed line shows the four-year running average. K represents the 1975 magnitude-7.2 Kalapana earthquake; P shows the 1983 onset of the Pu'u ' ' eruption; E represents the 2018 Kilauea rift intrusion–eruption. Vertical bars show reported intrusion events within the rift zone, after refs. 22, 26-28. Intrusions are highlighted in yellow if they coincide with periods during which pressure change exceeds the four-year average, and gray if they do not. Intrusion 33 in this time series corresponds to the early 2018 activity (intrusion detected mid-March, followed by the rift eruption on 3 May). The arrow highlights the maximum pore-pressure perturbation over this timeframe (1975 to 2019), coinciding with the onset of 2018's rift eruption. Horizontal bars indicate data availability. c: Probability density function (PDF) of modelled pressure change at depths 1–6km below the surface. Arrows highlight the pore-pressure front diffusing from near the surface (1km) to greater depths over time (26 March, 4 April, 23 April, 22 May, 22 June and 4 July 2018 at 1km, 2km, 3km, 4km, 5km and 6km below surface). Source: Farquharson et al, 2020

In December 2021, there was a volcanic eruption on Mount Semeru on the island of Java, in Indonesia. Java is located in the Pacific Ring of Fire, a region known for intense earthquakes and volcanic activity; around 85% of the world's seismic activity is concentrated in the Ring of Fire. This particular eruption, which destroyed local vegetation and habitats, polluted the air and water and caused dozens of human fatalities, was attributed to extreme rainfall in the region, which eroded Semeru's lava dome to the point of partial collapse (CNN, 2021). The following year, in December 2022, another Semeru eruption led to the relocation of over 2,000 people – an event again attributed to intense rainfall. In the images captured of the ash and smoke plume from Semeru, Landsat 9 registered a major cloud, potentially heated by the eruption, covering part of the plume. Satellite imagery also showed how diffuse ash darkened the cloud's shadow and the underlying landscape, as seen in Figure 04 (NEO, 2022).

SYMPTOM VIII

HIGH BLOOD PRESSURE

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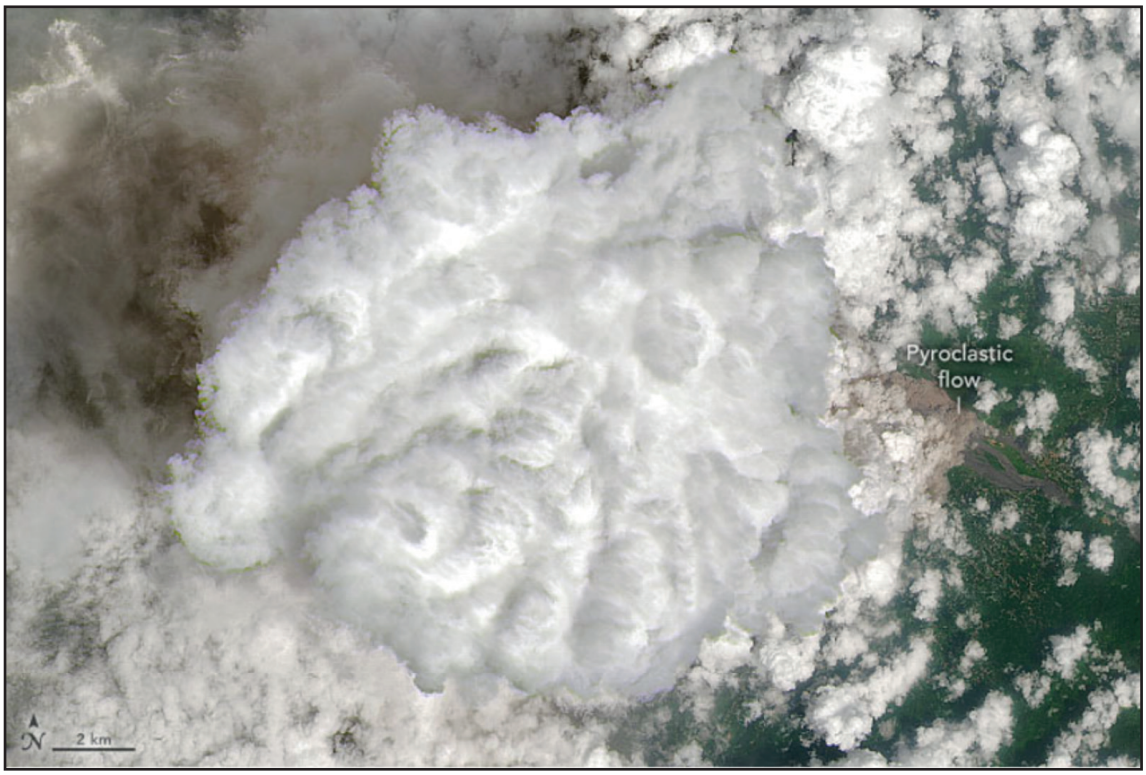

Figure 04: Intense explosions at the summit of Mt. Semeru sent avalanches of ash and mud racing down the southeastern flank of the volcano. Image: Landsat 9 - OLI-2, 2022, NEO, 2022

The prevailing imbalance in meteorological patterns, caused by climate change, has influenced geological systems across the globe and may provoke instability, especially in already-unstable volcanoes - a clear sign that the Earth is unwell. The disruption of these patterns has left the Earth even more vulnerable to extreme geological and weather events, in yet another demonstration that the planet is in a critical state of burnout.

SYMPTOM VIII

HIGH BLOOD PRESSURE

Rede Brasil

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