

# THE LENS OF REALITY

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## THE LENS OF REALITY

My father has taught me to be mindful and care for the environment ever since I was mature enough to understand those things. As I began this project, I asked him for books to read on the issue and, after finishing the first page of the first book, I was shocked to learn that I really knew very little about the extent of which these climatic changes are affecting our biosphere. With further research, I learned that in the past 60 years, our polar ice caps have lost 40% of their mass. I learned that the overall global temperature has increased 1.5 degrees Fahrenheit in the past century. I learned that since 2000, there have been 16 recorded “hottest years.” I learned that 70 countries in the world no longer have any intact or original forests. I learned that global flooding will triple by 2030, and that 99.4% of the land in the state of California is suffering from drought. I learned that the sea levels have risen 8 inches since 1900, and the rate of rise has doubled in the past two decades, the fastest they have risen in 2,000 years.

I also learned that 97% of scientists are in agreement that these climate changes have brought our planet into uncharted territory and that our species is the sole agent to be blamed for these issues. If the scientific community is all in agreement, why have we not done more to slow and put an end to climate change? There are countless forces resisting efforts that have been made in favor of climate change mitigation. These forces consist mostly of corporate economic globalization, political partisanship in science and the media, the political system itself, and finally, the nature of the human brain. It turns out that our brains are not well equipped to act on complex statistical risks. Threats that develop over decades rather than seconds circumvent the brain’s alarm system; and since climate change is a large, slow-moving threat, we are not wired to compute the seriousness of the issue.

If only it were as easy as putting on a pair of glasses to see the world from this very real perspective. The painting is my way of spinning this metaphorical idea into life, that our next step in the fight against climate change is to get people to see what is happening to the only home we will ever know. By looking through this red lens, I hope that you will all will leave with a better understanding of the truth that is plaguing Earth.

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*I would like to dedicate all the research, writing, and work I've done in an effort to spread consciousness and empathy to my dad. Without him, I might not heed the morals I hold so dear, the very ideals that led me to choose a subject that is so much bigger than either of us.*

My generation, or Generation Z, will inherit countless world issues, the most pressing of which, in my opinion, is the rapid environmental destruction that is occurring on our planet. With melting polar ice caps, an alarming increase in natural disasters, “dying forests, and a heaving, corrosive sea, raked by winds, strafed by storms and scorched by heat,” the threat of planet earth becoming inhospitable is now imminent.<sup>1</sup> Though the sciences have always fascinated me, and that is a notably significant reason for my interest in this topic, I believe it is essential to be well versed in the details of the world-altering events we know as climate change. I see it almost as my duty to answer the urgent and crucial question, “How do we solve these problems?” Naturally, this overriding question leads to more questions. Addressing the past, present, and future, we ask: “What is the cause of these problems,” “Has this happened before,” “Can we really do anything about it,” “*Should* we do anything about it,” and “How pressing is it really?” This is where politics comes into play. Because this threat is slow-moving compared to the life-threatening occurrences that throw us into “fight or flight” mode, we are unprepared in the face of this environmental annihilation.<sup>2</sup> So, arguments against the very existence of climate change have developed amongst those who see it as an inconvenience to their lives. As highly developed creatures of intelligence, the fact that we pose these questions, no matter how we may answer them, means that the neurons in our brains are fast at work. What intrigues me specifically, is where in the brain we form these thoughts and conjure the emotions we feel when we talk about climate change, its causes, and its effects. From a purely chemical perspective, what chemicals, both in our brains and in the environment, have played a part in climate change? What is the story of the relationship between humans and their environment told on a molecular level? In other words, what chemicals have damned us, and what chemicals will save us?

First, we must really understand what is actually happening to our planet, and how exactly has mankind contributed to these changes that we are now seeing. Many scientists would agree that human behavior began to shift before and during the Industrial Revolution. The revolution was provoked by the beginning of the 18th-century Agricultural Revolution, in which European farmers started to use new methods of crop rotation and livestock utilization in order to have more crop yields and the ability to support more livestock. As a result, the population was well nourished and healthy and began an exponential period of growth. Additionally, wealthy lords began buying up smaller farms, so the small-time farmers began looking for work in the cities.<sup>3</sup> Mass urbanization ensued, with this new workforce providing labor for rising industries in what became known as the Industrial Revolution. Another hallmark of the Industrial Revolution is the rise in demand for non-essential items that improved the quality of life. Technologies were invented to meet these new higher demands which paved the way for the first industrial factories. The Revolution is also marked by the production of power-driven machinery. There was a huge increase in the use of new types of energy, giving rise to the fossil-fuel age in which we began using stored energy from the sun that had been fossilized in the earth for millennia, replacing wood, wind, and water with coal, then eventually oil and natural gas. “Not only did society develop the ability to have more things faster, it would be able to develop better

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<sup>1</sup> Bill McKibben, [Eaarth: Making a Life on a Tough New Planet](#), (St. Martin's Press, 2010, 2011): 1

<sup>2</sup> Greg Harman, “Your Brain on Climate Change: Why the Threat Produces Apathy, Not Action,” (Guardian News and Media, 10 Nov. 2014)

<sup>3</sup> Patricia Chappine, “The Agricultural Revolution: Timeline, Causes, Inventions & Effects,” (Study.com)

things.”<sup>4</sup> Ever since this rise in industry, mass production and all its effects have continued to increase exponentially on a larger scale.

We have all heard of climate change, or the changes in global and regional climate patterns that the planet has been experiencing in the past 100 years. Even small changes in the Earth’s climate can be enough to affect different places across the globe dramatically. A couple degrees increase has “been enough to melt 20% of the sea ice in the arctic,...to speed up the spin and duration of hurricanes by about 50%,...to start the permafrost beneath the tundra across the north melting.”<sup>5</sup> Climate change effects are seen especially in specific parts of the world where there is more of an amplifying effect, like in the arctic, which “at the end of the century, perhaps even in a few decades,...will be quite ice-free.”<sup>6</sup> The Greenland and Antarctic ice-sheets are suffering from a decrease in mass. NASA's Gravity Recovery and Climate Experiment explains that Antarctica lost about 152 cubic kilometers (36 cubic miles) of ice between 2002 and 2005, Greenland lost 150 to 250 cubic kilometers (36 to 60 cubic miles) of ice per year between 2002 and 2006. Ice sheets and glaciers are melting at faster rates than ever before, losing measurements of both extent and thickness over the past few decades. The glacial retreat across the globe is paired with a decrease in snow cover. With satellite cameras positioned on the northern hemisphere, we can see that snow cover “has decreased over the past five decades and that the snow is melting earlier.”<sup>7</sup> Climate change is also having a huge impact on our water cycle. Scientists project an increase in changes of rainfall patterns across the world, particularly “our experience with floods and droughts,” and “almost certainly...the pattern of river flows throughout the year...all very fundamental aspects of how we manage and use water.”<sup>8</sup> Warmer climate also means a warmer atmosphere, and a warmer atmosphere has the ability to hold more water, which can increase the intensity of weather events. So we can attribute the surge in droughts, heat waves, severe hurricanes and cyclones to climate change. The few degrees difference in regional temperatures is having a great effect on weather and landmass, not to mention how the warmer climate is affecting the oceans which cover most of the globe. The sea level has started to rise and will continue to rise over the next century and since “the oceans have absorbed much of this increased heat,... the top 700 meters (about 2,300 feet) of ocean [are] showing [a] warming of 0.302 degrees Fahrenheit since 1969.”<sup>9</sup> In the nineteenth century, “global sea level rose about 8 inches,” but the “rate [of sea level rise] in the last two decades, however, is nearly double that of the last century.”<sup>10</sup> And if the sea level rises another 10 meters, then 23 million people in the US, 144 million in China, 12 million in the Netherlands, and 63 million people in Bangladesh will be displaced.<sup>11</sup>

Human generated pollution is the main cause and contribution to these environmental changes. We are very much to blame for these incidents because “the speed of the natural changes is now dwarfed by the changes that humans are making to the atmosphere and the

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<sup>4</sup> Eric McLamb, “Impact of the Industrial Revolution,” (Ecology Global Network, May 2014)

<sup>5</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

<sup>6</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

<sup>7</sup> “Climate Change Evidence: How Do We Know?” Edited by Susan Callery (NASA, 4 Apr. 2018)

<sup>8</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

<sup>9</sup> Levitus, et al, “Global ocean heat content 1955–2008 in light of recently revealed instrumentation problems,” *Geophys. Res. Lett.* 36, L07608 (2009).

<sup>10</sup> “2016 Project Elijah Final Report PDF,” (2014)

<sup>11</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

surface.”<sup>12</sup> We also have a population of about 7 billion people, which has grown from less than one billion in 200 years, and will continue to grow, with the United Nations predicting it could reach 9.7 billion people by 2050 and over 11 billion by 2100. As our population grows in size, “we continue to increase our need for far more water, far more food, far more land, far more transport and far more energy,” resulting in the accelerated “rate at which we're changing our climate.”<sup>13</sup> Our emissions of carbon dioxide modify our atmosphere. Air pollution from industrial production and transportation is a great threat to our planet and our well-being. The now banned refrigerant and component of aerosol products, chlorofluorocarbons (CFCs), contributes to air pollution since they were responsible for the deterioration of the ozone layer of the Earth’s atmosphere. Sulfur dioxide, “a component of smog,” adds to air pollution. Originally, volcano eruptions were the main source of sulfur dioxide in the air, but now humans account for 99% of the chemical’s presence in the atmosphere due to “industrial activity that processes materials that contain sulfur, eg the generation of electricity from coal, oil or gas that contains sulfur.”<sup>14</sup> Nitrogen oxide that forms from “emissions from cars, trucks and buses, power plants, and off-road equipment,” can combine molecularly with “water, oxygen and other chemicals in the atmosphere to form acid rain.”<sup>15</sup> Acid rain, a byproduct of air pollution, is harmful to the environment, specifically to “sensitive ecosystems such as lakes and forests.”<sup>16</sup> Burning coal -- lignite, bituminous and sub-bituminous coal (C<sub>137</sub>H<sub>97</sub>O<sub>9</sub>NS), and anthracite (C<sub>240</sub>H<sub>90</sub>O<sub>4</sub>NS) -- for power generation both industrially and domestically contributes to air pollution. But the major cause of the increase in the leading pollutant, carbon dioxide, is the burning of gasoline, a product made from crude oils called petroleum, and natural gas, a fuel mixture of methane and hydrocarbons which sometimes includes varied amounts of alkanes.<sup>17</sup> Our increasing water use has started to modify our hydrosphere. We use hundreds of thousands of tons of water to generate and manufacture meat, produce, coffee, clothing, and the many plastic containers in which we package everything. “Our increasing use of land, for agriculture, cities, roads, mining – as well as all the pollution we [are] creating – [has] started to modify our biosphere.”<sup>18</sup> Another huge effect that we have on the world is the mass deforestation we’ve caused. There is an alarming growth of desert-land across the globe, because when trees are cut down, especially in the rainforest, the earth becomes dry and arid. Not having as many trees, we now realize that there are so many things that trees do for us besides use carbon dioxide to aid in the process that makes glucose and oxygen. The loss of trees leads to flood, soil erosion, and loss of water supply. As a result of deforestation “70 countries in the world no longer have any intact or original forests.” In the US, “95% percent of our old-growth forests are already gone.”<sup>19</sup> We have a waste-making system, and chemicals that have become common in this day and age, “things in plastics, artificial colors, pesticides are high on the list of suspect agents that promote cancer, that promote premature aging, that increase the risks of chronic degenerative diseases.”

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<sup>12</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

<sup>13</sup> Stephen Emmott, “Humans – the Real Threat to Life on Earth,” (Guardian News and Media, 29 June 2013)

<sup>14</sup> “Sulfur Dioxide (SO<sub>2</sub>),” (Department of the Environment and Energy, 2005)

<sup>15</sup> “Sulfur Dioxide (SO<sub>2</sub>),” (Department of the Environment and Energy, 2005)

<sup>16</sup> “Basic Information about NO<sub>2</sub>,” (Environmental Protection Agency, 8 Sept. 2016)

<sup>17</sup> Peter Essick, “Air Pollution Causes, Effects, and Solutions,” (National Geographic Partners, LLC., 17 Oct. 2017)

<sup>18</sup> Stephen Emmott, “Humans – the Real Threat to Life on Earth,” (Guardian News and Media, 29 June 2013)

<sup>19</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

So not only are our actions harmful to the planet and animals around us, they are harmful to us, too. The ocean's acidity has risen by about 30% since the Industrial revolution. The oceans rise in acidity and literal rise is a direct result of the increase in carbon emissions which is being "absorbed by the upper layer of the oceans" and the amount being absorbed "is increasing by about 2 billion tons per year."<sup>20 21</sup> We take too much out of the ocean and put too much into it. We introduce pollutants, toxic waste, pesticides, herbicides, human sewage, and just plain trash to the oceans of our planet. Corporations dump millions of gallons of waste into the sea, including benzene, acrylnitril, mercury, copper and many, many more. Basically every synthetically produced toxin under the sun is thrown away in the oceans every single day.

We could really tip the ocean into a different state. The health of the ocean as we know it depends on the water turning over, of the surface water sinking to the bottom and the bottom water coming up to the top. It's conceivable that we could turn that conveyor belt off by warming the surface of the ocean a little bit too much, and if we do that, we, with all of our dead zones, we could make the surface, the whole damn surface, stagnant, and that's a terrifying thought. The last time that happened was the end-Permian mass extinction, and more than 95% of all the species on the Earth went extinct.<sup>22</sup>

The next questions we need to investigate are: Why haven't we done more about this? What are the forces that are blocking change? After thorough research, I have concluded that perhaps "the greatest weapon of mass destruction is corporate economic globalization."<sup>23</sup> Before we get into the detriment of corporate and political involvement with science, I can begin by saying that the global economic system is growing too big for the biosphere. The economy is basically a subsystem of a more major system, that being the biosphere. The problem with this is that the subsystem, our economy, is geared for growth and expansion, and the "parent system doesn't grow, it remains the same size." As our economy grows, it begins to displace the biosphere. "This is the fundamental opportunity cost of economic growth."<sup>24</sup> Another roadblock to action against climate change is the government, where nowadays, science is being politicized. The argument against having science becoming partisan seems to have an obvious response: to remove it from the government all together, but that is not the case. Science does absolutely take an essential place in the government because lawmakers must base policies on scientific findings. However, one would think that because science is based upon fact, opinions should not really come into play. The problem is that they do come in to play in our current system of legislation. It is clear that we are taking advantage of the environment, which has no rights of its own, as an asset to the various industries in the economy, and since the goal of our economy is to just keep growing, we are using more than nature can support. The government does not seem to take this fault into account, because "in this structure of law, you're either property, or a person, and it's very clear that nature is property." Then we must complain that our leaders in both the economy and the government are not very responsive, which is wrong. In fact "we have very responsive political leaders, they're just responsive to wealth, and to money, and to corporate power." And so, regarding environmental issues and the shifts in our planet's climate, the

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<sup>20</sup> C. L. Sabine et.al., "The Oceanic Sink for Anthropogenic CO<sub>2</sub>," *Science* vol. 305 (16 July 2004), 367-371

<sup>21</sup> I. Allison, et al, "Climate Science Report," (The Copenhagen Diagnosis, UNSW Climate Change Research Centre)

<sup>22</sup> Leila and Nadia Conners, et al, *The 11th Hour*, (Warner Independent Pictures, 2007)

<sup>23</sup> Leila and Nadia Conners, et al, *The 11th Hour*, (Warner Independent Pictures, 2007)

<sup>24</sup> Leila and Nadia Conners, et al, *The 11th Hour*, (Warner Independent Pictures, 2007)

political system is failing us, because “after two decades of evidence, the United States has yet to formulate a sensible and science-informed climate policy.”<sup>25</sup>

It’s the bridge across this chasm of public opinion to public policy,...that’s where the failure has been. That bridge has fallen into disrepair. There was a time in the 1960’s and 1970’s when Republicans and Democrats in the United States joined to pass the major environmental laws of that time -- the National Environmental Policy Act, the Clean Air Act, the Clean Water Act, the Endangered Species Act. Those were done by Republicans and Democrats coming together, and that system is now broken. And part of the crisis is, as everybody knows, it’s that there is money, too much money, in the political system.<sup>26</sup>

Another force preventing people from seeing the damage to our planet and taking action is the overwhelming presence of bad science reported in the highly politicized media as fake news. Bad science is basically exactly what it sounds like -- untrue or unproven data presented as factual science. There are many ways for science to become bad: “poor research, poorly designed experiments, misconduct by researchers, and accidental or deliberate misinterpretation of data,” but the one I would like to focus on is the more corrupt system, in which there is a more precise aim.<sup>27</sup> With the combination of bad research, a scientist with an agenda, poor political leadership, and a society in which the media thrives on hysteria, bad science, or science that is simply put, not true or factual whatsoever, can be produced and spread.<sup>28</sup> Alternatively, real, factual science is now being presented as ambiguous, vague, and questionable. Because the scientific evidence that climate change exists is now a partisan issue, the biased media reports only what their audience want to hear. Since this is such “a miserable time for science,” and “America has an almost non-existent climate policy,” reports of bad science, and science reported as debatable issues to satisfy political goals are definitely not helping us get anywhere near the recognition and action that this climate-change issue so desperately needs.<sup>29</sup> Media outlets that present these sort of sources of misinformation are the big reason why so many people feel the news cannot be trusted anymore, because “if journalists can be fooled by bogus or simply bad science, how is a layperson supposed to sort out the hype from the help?”<sup>30</sup> The biased, partisanship of the media in our society aids in the separation between scientific fact and the general public. How can we push our representatives in government to pass climate-change legislation if the public can’t even agree on whether or not our planet is actually changing, let alone whether or not humans indeed had a role to play in these changes?

After assessing all of this information about the lack of recognition and effort put into mitigating to these environmental issues, I came to the conclusion that maybe there is more than just external forces at work, that maybe, this ties to something about the human brain. What does ignoring the environment mean in an anatomical sense? What part of the brain controls that? These questions launched me into investigating why we are at the top of the food chain, and what about being human makes us special, or different from other animals. The most obvious answer is our highly developed prefrontal cortex, which controls things like decision making, cognitive thinking, social behavior, and executive functioning. Our frontal lobes have a more complex and

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<sup>25</sup> Robinson Meyer, “The Case for the Politicization of Science,” (The Atlantic, 28 Apr. 2017)

<sup>26</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

<sup>27</sup> Tim Sandle, “What Is ‘Bad Science’ and How to Spot It?” (Digital Journal: A Global Digital Media Network, 22 Jan. 2016)

<sup>28</sup> Phil Newton, “Bad Science,” (Psychology Today, Sussex Publishers, 31 Dec. 2008)

<sup>29</sup> Robinson Meyer, “The Case for the Politicization of Science,” (The Atlantic, 28 Apr. 2017)

<sup>30</sup> Steven AUSTAD, “Bad Science Makes Big Headlines,” (The Huffington Post, 4 Feb. 2018)



matured prefrontal cortex compared to those of other animals. We also are just now discovering the various different parts of the brain that do very specific things, like recognize faces, recognize patterns, and hear familiar voices.<sup>31</sup> So then, do we use a specific part of our brains to process information about dire environmental changes, or high level problem solving? Is there a place where we feel guilty for not having done more to reverse these changes? It turns out, there is on some level. We “can point fingers at the influence of fossil fuel companies, at misinformation from climate deniers and at political obstructionism, notably from a fragmented Republican party,” but what most people don’t realize is that there is “a much deeper force is also at work: the way our brains function.”<sup>32</sup> Nik Sawe and Brian Knutson conducted an experiment to “better understand how people value the environment, and what types of thoughts or feelings promote valuation of these natural resources.” Many studies show that the brain is simply not wired to compute climate change, in other words “large, slow-moving threats.”<sup>33</sup> Psychologist Daniel Gilbert said that climate change is “not happening nearly quickly enough to get our attention.” Since we are made to respond to imminent, life-threatening danger that sends us into fight or flight mode, “humans aren’t well wired to act on complex statistical risks.”<sup>34</sup> While traits like these are part of the reason we prevail over the planet today, “threats that develop over decades rather than seconds circumvent the brain’s alarm system.” Not only are we hard-pressed to find a way to compute climate change, “humans are saddled with other shortcomings, too. ‘Loss aversion’ means we’re more afraid of losing what we want in the short-term than surmounting obstacles in the distance,” and that we “care a lot more about the tangible present than the distant future.”<sup>35</sup> <sup>36</sup> This is where we see greed come in. Elke Weber, professor of management and psychology at Columbia University said:

*“Self-control is a huge issue for people, whether it’s what we’re eating or saving for our retirement,’ referencing a classic psychological experiment on gratification, she added: ‘There’s a two-year-old in the back of our minds that’s still there that we’ve learned to overrule that wants to have their one marshmallow now rather than wait for two marshmallows. Very few people on this planet want to destroy planet earth. It’s just that our other agendas get in the way of things that might have a longer time horizon.’”<sup>37</sup>*

There is also the frontolimbic network or the guilt complex, which plays an important role in our emotions towards climate change and the environment. The frontolimbic network, aside from everything else it does, also works in tandem with the right superior anterior temporal

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<sup>31</sup> Nancy Kanwisher, “A Neural Portrait of the Human Mind,” (TED: Ideas Worth Spreading, 2014)

<sup>32</sup> David G. Victor, Nick Obradovich, and Dillon J. Amaya, “Why the Wiring of Our Brains Makes It Hard to Stop Climate Change,” (Brookings, September 18, 2017)

<sup>33</sup> Greg Harman, “Your Brain on Climate Change: Why the Threat Produces Apathy, Not Action,” (The Guardian, 10 Nov. 2014)

<sup>34</sup> David G. Victor, Nick Obradovich, and Dillon J. Amaya, “Why the Wiring of Our Brains Makes It Hard to Stop Climate Change,” (Brookings, September 18, 2017)

<sup>35</sup> Greg Harman, “Your Brain on Climate Change: Why the Threat Produces Apathy, Not Action,” (The Guardian, 10 Nov. 2014)

<sup>36</sup> David G. Victor, Nick Obradovich, and Dillon J. Amaya, “Why the Wiring of Our Brains Makes It Hard to Stop Climate Change,” (Brookings, September 18, 2017)

<sup>37</sup> Greg Harman, “Your Brain on Climate Change: Why the Threat Produces Apathy, Not Action,” (The Guardian, 10 Nov. 2014)

lobe, the connection in which we can attribute the origin of a lot of emotions felt during a mental illness.<sup>38</sup> Studies show that emotion processing and regulation rely heavily on the the engagement of this network, where guilt and many other strong feelings are processed and delivered.<sup>39</sup> I would agree that thinking about environmental damage across the globe is a big stimulus for guilt, and therefore often provokes the frontolimbic circuits.

I have now stated that the earth is suffering, that humans are the major cause of this suffering, that we are failing in our duty to reverse the damage, and that this is because our brains aren't equipped to fulfill this duty. So, what does that all mean? While "the key to our survival and our taking over the planet was the human brain," it seems like our brain is now working against us.<sup>40</sup> We are the most developed species on the planet, but we do have many, many faults, one of them being the well-documented case of human carelessness. We are extremely careless with our resources and things that we label as human property. We use without thinking and without regarding how it can affect others or ourselves in the future. We are careless with life, human life, yes, but especially the lives other beings. And above all, we are careless with our home, planet Earth. The point is that we "have destroyed and endangered more species on our planet than any other species or group, with our continuous pollution and lack of respect for our own environment."<sup>41</sup> Maybe it's because we are so reckless and irresponsible that we have found ourselves in this position of environmental destruction. It is conceivable to say that it was inevitable for these changes to take place across the planet due to the nature of our ways. Perhaps, given this evidence about human character, I can also say that "the world can no longer avoid dangerous global warming because [we] have done little to tackle the problem apart from spout 'rhetoric.'"<sup>42</sup> I am not the only one who considers this; I am joined by leading economists and researchers. William Nordhaus, an economics professor at Yale University said it "was no longer practicably feasible to keep the level of warming to within two degrees Celsius above pre-industrial levels, the point at which climatologists believe the world will start to experience particularly dangerous climate change."<sup>43</sup> The certainty of the Earth and all its species alike experiencing far more dangerous climate change effects and facing possible extinction is turning from a theoretical possibility into a dangerous reality; since, despite the overwhelming evidence of environmental deterioration, "in all the world only the European Union [has] introduced major policies designed to reduce global warming." There is evidence to support this way of thinking, for "as we destroy nature, we will be destroyed in the process."<sup>44</sup> This dreadful fate becomes a significantly more plausible phenomenon when there is little implemented national climate policies besides those of the EU, "and the policies of the EU today are very modest."<sup>45</sup> Maybe, given all that we have done to our surroundings, we should be wiped of the face of the earth, and

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<sup>38</sup> Melissa Healy, "That Guilt You Feel? There's a Place (in Your Brain) for That," (Los Angeles Times, 5 June 2012)

<sup>39</sup> G. S. Malhi, et al., "Differential Engagement of the Fronto-Limbic Network during Emotion Processing Distinguishes Bipolar and Borderline Personality Disorder," (Molecular Psychiatry, Dec. 2013)

<sup>40</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

<sup>41</sup> "Careless Human Environmental Destruction," (UKEssays.com, 11 2013)

<sup>42</sup> Ian Johnston, "Devastating Global Warming Is Inevitable Due to Inaction of International Community, Says Leading Economist," (The Independent, 11 Jan. 2017)

<sup>43</sup> Ian Johnston, "Devastating Global Warming Is Inevitable Due to Inaction of International Community, Says Leading Economist," (The Independent, 11 Jan. 2017)

<sup>44</sup> Leila and Nadia Conners, et al, The 11th Hour, (Warner Independent Pictures, 2007)

<sup>45</sup> Ian Johnston, "Devastating Global Warming Is Inevitable Due to Inaction of International Community, Says Leading Economist," (The Independent, 11 Jan. 2017)

maybe the ecosystem would be better for it. In fact, there is no doubt that all environments of the planet would prosper and thrive long after we were gone. Scientists have made very educated predictions stating just that. So is it hopeless to continue the efforts we are making to slow and eventually reverse these climate changes?

Considering all this, is there still hope? Is it worth it to continue our efforts, even if they may not be enough? Or do we actually have the resources available in order to win this war against climate change? Contrary to the statement that I made previously, explaining that our brains are not equipped to even understand the meaning behind the statistical analysis of the threat of these climatic changes, there is evidence of high-level thinkers who are able to see and comprehend the implications behind the numbers. So, this means that there are those who are able to work towards climate change mitigation under the condition that they take the threat more seriously for longer periods of time. We also can trust in the facts that these people and people like them are and have been making large-scale, conscious efforts to fuel climate change mitigation. And many scientists, economists, and environmentalists are working to move forward with their efforts like Professor Richard Betts, head of climate impacts research at the Met Office's Hadley Center who "said Professor Nordhaus's analysis did not mean the world should give up."<sup>46</sup> There are organizations on local, continental, and global levels that are working to better the state of the environment, protect the inhabitants of specific ecological habitats, inform people about conservancy, limit waste, increase efficiency, and expand the public's involvement in these efforts. Though there is no debate that we will have to modify our actions dramatically over a long period of time in order to halt the changes that have occurred and are expected to occur in the near future, "there are people out there, [not only] to fight against the pollution and destruction caused by large corporations and businesses," but also to make the transition to sustainability quicker and easier.<sup>47</sup> There has also been evidence to suggest that other emotion processing parts of the brain "can powerfully influence environmental decisions," combatting the greed, carelessness, and ineptitude, indicating that "emotional appeals may motivate environmental protection more than data-intensive arguments."<sup>48</sup> A study has shown that our more positive emotions play a significant role in the way we think about protecting and preserving the beautiful parts of the planet. For example, "viewing images of iconic parks such as Yosemite activated participants' nucleus accumbens, a part of the brain's reward pathway that tends to respond to enjoyable experiences, such as good food, music or financial gain."<sup>49</sup> Conversely, when subjects in this experiment were shown "images of increasingly destructive proposed land-uses," it activated "the anterior insula, which tends to anticipate negative experiences, like the loss of money or physical pain." This data indicates that people would be more willing to fund and donate to the expansion and preservation of protected lands.<sup>50</sup> This research will be able to provide better strategies to get people to participate in the movements

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<sup>46</sup> Ian Johnston, "Devastating Global Warming Is Inevitable Due to Inaction of International Community, Says Leading Economist," (The Independent, 11 Jan. 2017)

<sup>47</sup> "Careless Human Environmental Destruction," (UKEssays.com, 11 2013)

<sup>48</sup> Miles Traer, "Stanford Scientists See How the Brain Makes Environmental Decisions," (Stanford News, 28 Sept. 2017)

<sup>49</sup> Miles Traer, "Stanford Scientists See How the Brain Makes Environmental Decisions" (Stanford News, 28 Sept. 2017)

<sup>50</sup> Miles Traer, "Stanford Scientists See How the Brain Makes Environmental Decisions" (Stanford News, 28 Sept. 2017)

against climate change and the threats that it poses. Moreover, I have found that there is hope, and though it will be a long and painful process, we can have faith in the prospective common goal that is a stable, temperate planet Earth. So, moving forward, we need to be able to find a harmony between people and nature and in order to do that, we must “drive and recognize that nature has rights, too.”

## Bibliography

- “2016 Project Elijah Final Report PDF.” 2014, doi:10.17307/wsc.v1i1.183.s6.
- Allison, I., et al. “Climate Science Report.” *The Copenhagen Diagnosis*, UNSW Climate Change Research Centre, [www.copenhagendiagnosis.org/](http://www.copenhagendiagnosis.org/)
- Austad, Steven. “Bad Science Makes Big Headlines.” *The Huffington Post*, Oath Inc., 4 Feb. 2018, [www.huffingtonpost.com/american-federation-for-aging-research/bad-science-makes-big-hea\\_b\\_14602532.html](http://www.huffingtonpost.com/american-federation-for-aging-research/bad-science-makes-big-hea_b_14602532.html).
- “Basic Information about NO<sub>2</sub>.” *EPA*, Environmental Protection Agency, 8 Sept. 2016, [www.epa.gov/no2-pollution/basic-information-about-no2#What is NO<sub>2</sub>](http://www.epa.gov/no2-pollution/basic-information-about-no2#What%20is%20NO2).
- "Careless Human Environmental Destruction." UKEssays.com. 11 2013. All Answers Ltd. 04 2018 <<https://www.ukessays.com/essays/philosophy/investigating-careless-human-environmental-destruction-philosophy-essay.php?vref=1>>.
- “Climate Change Evidence: How Do We Know?” Edited by Susan Callery, *NASA*, NASA's Jet Propulsion Laboratory, 4 Apr. 2018, [climate.nasa.gov/evidence/](http://climate.nasa.gov/evidence/).
- Chappine, Patricia. “The Agricultural Revolution: Timeline, Causes, Inventions & Effects” *Study.com*, Study.com, [study.com/academy/lesson/the-agricultural-revolution-timeline-causes-inventions-effects.html](http://study.com/academy/lesson/the-agricultural-revolution-timeline-causes-inventions-effects.html).
- Chatterjee, Anjan. “How Your Brain Decides What Is Beautiful.” *TED: Ideas Worth Spreading*, TEDMED 2016, Nov. 2016, [www.ted.com/talks/anjan\\_chatterjee\\_how\\_your\\_brain\\_decides\\_what\\_is\\_beautiful](http://www.ted.com/talks/anjan_chatterjee_how_your_brain_decides_what_is_beautiful).
- Dunbar, Brian. “What Is Climate Change?” *NASA*, NASA, 13 May 2015, [www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-climate-change-k4.html](http://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-climate-change-k4.html).
- Dunn, Greg. “Self Reflected Videos.” Greg Dunn Design, Greg A. Dunn, 2006, [www.gregadunn.com/self-reflected/videos/](http://www.gregadunn.com/self-reflected/videos/).
- Emmott, Stephen. “Humans – the Real Threat to Life on Earth.” *The Observer*, Guardian News and Media, 29 June 2013, [www.theguardian.com/environment/2013/jun/30/stephen-emmott-ten-billion](http://www.theguardian.com/environment/2013/jun/30/stephen-emmott-ten-billion).
- Essick, Peter. “Air Pollution Causes, Effects, and Solutions.” *Causes, Effects, and Solutions*, National Geographic Partners, LLC., 17 Oct. 2017, [www.nationalgeographic.com/environment/global-warming/pollution/](http://www.nationalgeographic.com/environment/global-warming/pollution/).
- “Global Climate Change: Effects.” Edited by Susan Callery, *NASA*, NASA's Jet Propulsion Laboratory, 27 Feb. 2018, [climate.nasa.gov/effects/](http://climate.nasa.gov/effects/).
- Johnston, Ian. “Devastating Global Warming Is Inevitable Due to Inaction of International Community, Says Leading Economist.” *The Independent*, Independent Digital News and Media, 11 Jan. 2017. [www.independent.co.uk/environment/deadly-global-warming-](http://www.independent.co.uk/environment/deadly-global-warming-)

Is-inevitable-due-to-inaction-feasible-rhetoric-climate-change-fight-paris-a7521111.html.

- Malhi, G S, et al. "Differential Engagement of the Fronto-Limbic Network during Emotion Processing Distinguishes Bipolar and Borderline Personality Disorder." *Molecular Psychiatry*, U.S. National Library of Medicine, Dec. 2013, [www.ncbi.nlm.nih.gov/pmc/articles/PMC4429860/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4429860/).
- Harman, Greg. "Your Brain on Climate Change: Why the Threat Produces Apathy, Not Action." *The Guardian*, Guardian News and Media, 10 Nov. 2014, [www.theguardian.com/sustainable-business/2014/nov/10/brain-climate-change-science-psychology-environment-elections](http://www.theguardian.com/sustainable-business/2014/nov/10/brain-climate-change-science-psychology-environment-elections).
- Healy, Melissa. "That Guilt You Feel? There's a Place (in Your Brain) for That." *Los Angeles Times*, Los Angeles Times, 5 June 2012, [articles.latimes.com/2012/jun/05/news/la-heb-guilt-brain-depression-20120604](http://articles.latimes.com/2012/jun/05/news/la-heb-guilt-brain-depression-20120604).
- Kanwisher, Nancy. "A Neural Portrait of the Human Mind." *TED: Ideas Worth Spreading*, TED2014, 2014, [www.ted.com/talks/nancy\\_kanwisher\\_the\\_brain\\_is\\_a\\_swiss\\_army\\_knife](http://www.ted.com/talks/nancy_kanwisher_the_brain_is_a_swiss_army_knife).
- Levitus, et al. "Global ocean heat content 1955–2008 in light of recently revealed instrumentation problems." *Geophys. Res. Lett.* 36, L07608. 2009.
- McKibben, Bill. *Eaarth: Making a Life on a Tough New Planet*. St. Martin's Press, 2010, 2011.
- McLamb, Eric. "Impact of the Industrial Revolution." *Ecology Global Network*, Ecology Communications Group, Inc., 17 May 2014, [www.ecology.com/2011/09/18/ecological-impact-industrial-revolution/](http://www.ecology.com/2011/09/18/ecological-impact-industrial-revolution/).
- Meyer, Robinson. "The Case for the Politicization of Science." *The Atlantic*, Atlantic Media Company, 28 Apr. 2017, [www.theatlantic.com/science/archive/2017/04/scientists-should-just-be-political/524682/](http://www.theatlantic.com/science/archive/2017/04/scientists-should-just-be-political/524682/).
- Newton, Phil. "Bad Science." *Psychology Today*, Sussex Publishers, 31 Dec. 2008, [www.psychologytoday.com/us/blog/mouse-man/200812/bad-science](http://www.psychologytoday.com/us/blog/mouse-man/200812/bad-science).
- Petersen, Leila Conners, et al. *The 11th Hour*. Warner Independent Pictures, 2007.
- Sabine, C. L. et al. "The Oceanic Sink for Anthropogenic CO<sub>2</sub>." *Science* vol. 305. 16 July 2004. 367-371
- Sandle, Tim. "What Is 'Bad Science' and How to Spot It?" *Digital Journal: A Global Digital Media Network*, Digitaljournal.com, 22 Jan. 2016, [www.digitaljournal.com/science/why-some-science-is-actually-bad-science/article/455538](http://www.digitaljournal.com/science/why-some-science-is-actually-bad-science/article/455538).
- "Sulfur Dioxide (SO<sub>2</sub>)." *Department of the Environment and Energy*, Commonwealth of Australia Creative Commons License, 2005, [www.environment.gov.au/protection/publications/factsheet-sulfur-dioxide-so2](http://www.environment.gov.au/protection/publications/factsheet-sulfur-dioxide-so2).
- Traer, Miles. "Stanford Scientists See How the Brain Makes Environmental Decisions." *Stanford*

*News*, Stanford University, 28 Sept. 2017, [news.stanford.edu/2015/09/11/eco-brain-study-091115/](https://news.stanford.edu/2015/09/11/eco-brain-study-091115/).

Troxel, Wendy. "Why School Should Start Later for Teens." *TED: Ideas Worth Spreading*, TEDxManhattanBeach, Nov. 2016, [www.ted.com/talks/wendy\\_troxel\\_why\\_school\\_should\\_start\\_later\\_for\\_teens](https://www.ted.com/talks/wendy_troxel_why_school_should_start_later_for_teens).

Victor, David G., Nick Obradovich, and Dillon J. Amaya. "Why the Wiring of Our Brains Makes It Hard to Stop Climate Change." Brookings. September 18, 2017. <https://www.brookings.edu/blog/planetpolicy/2017/09/18/why-the-wiring-of-Our-brains-makes-it-hard-to-stop-climate-change/>.