Global Warming

Introduction

Global warming and **climate change** are terms for the observed century-scale rise in the average temperature of the Earth's climate system and its related effects. Multiple lines of scientific evidence show that the climate system is warming. Many of the observed changes since the 1950s are unprecedented in the instrumental temperature record which extends back to the mid 19th century and in paleoclimate proxy records over a thousand years.

In 2014, the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report concluded that "It is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century." The largest human influence has been emission of greenhouse gases such as carbon dioxide, methane and nitrous oxide. Climate model projections summarized in the report indicated that during the 21st century the global surface temperature is likely to rise a further 0.3 to 1.7 °C (0.5 to 3.1 °F) for their lowest emissions scenario and 2.6 to 4.8 °C (4.7 to 8.6 °F) for the highest emissions scenario. These findings have been recognized by the national science academies of the major industrialized nations and are not disputed by any scientific body of national or international standing.

Future climate change and associated impacts will differ from region to region around the globe. Anticipated effects include warming global temperature, rising sea levels, changing precipitation, and expansion of deserts in the subtropics. Warming is expected to be greater over land than over the oceans and greatest in the Arctic, with the continuing retreat of glaciers, permafrost and sea ice. Other likely changes include more frequent extreme weather events including heat waves, droughts, heavy rainfall with floods and heavy snowfall; ocean acidification; and species extinctions due to shifting temperature regimes. Effects significant to humans include the threat to food security from decreasing crop yields and the abandonment of populated areas due to rising sea levels. Because the climate system has a large "inertia" and greenhouse gases will stay in the atmosphere for a long time, many of these effects will not only exist for decades or centuries, but will persist for tens of thousands of years.

Possible societal responses to global warming include mitigation by emissions reduction, adaptation to its effects, building systems resilient to its effects, and possible future climate engineering. Most countries are parties to the United Nations Framework Convention on Climate Change (UNFCCC), whose ultimate objective is to prevent dangerous anthropogenic climate change. Parties to the UNFCCC have agreed that deep cuts in emissions are required and that global warming should be limited to well below 2.0 °C (3.6 °F) relative to pre-industrial levels, with efforts made to limit warming to 1.5 °C (2.7 °F).

Public reactions to global warming and concern about its effects are also increasing. A global 2015 Pew Research Center report showed a median of 54% consider it "a very serious problem". There are significant regional differences, with Americans and Chinese (whose economies are responsible for the greatest annual CO_2 emissions) among the least concerned.

Global Warming Causes

Natural Causes of Global Warming

1. Forest Fires: Deforestation by nature is another leading cause of global warming. Natural forest fires are usually televised on the news, showing the devastation of mountain homes and communities. While this loss is tragic, the effects of these natural occurring forest fires pose a problem for the earth's air. Forest fires emit carbon-filled smoke into the atmosphere, and new forests' growth is slow and not stable enough to produce the much needed oxygen into the newly, suffocating carbon air. Natural forest fires will eventually run their course, but left in the ashes are polluting gases that get trapped in the atmosphere.

2. Permafrost: When frozen soil, constituting about 25% of the Northern Hemisphere, increases, it keeps in the carbon and methane gases. So, while you may be thinking how it can be global warming when you're still freezing in Tibet, the permafrost is actually leaking carbon into the earth's atmosphere. While scientists cannot stop permafrost from emitting these gases, the earth's melting icecaps at incredibly fast rates, are cause for concern.

3. Sunspots: Definitely more contributing than your four legged friend are solar flares from the sun. According to the Environment Protection Agency (EPA), sunspots are increasing global temperature. Sunspots restrict the passing of solar plasma, which in affect gives off radiation. You don't have to work for NASA to know radiation is a bad thing. Sunspots and solar flares are powerful and unstoppable. They can change the energy radiating to earth's atmosphere, and thus increase climate temperature. Solar flares, however have been a natural occurring event for millions of years. If only sunspots and solar flares were to blame, the world's recent increased temperature would barely move.

4. Water Vapor: If you only thought NASA was busy planning moon missions and orbiting outer space, think again. According to NASA, two-thirds of the gases stuck in the thick blanket is in the form of water vapor. This hitch in tow effect means rising temperature, rising vapor. The water vapor is unable to escape, and thus results in hotter climate changes. NASA continues to work on water vapor solutions to reduce their effect on global warming.

5. Man's Best Friend: Our friendly, furry, bizarre, and sometimes extreme pals in the animal kingdom are also to blame, sort of. While animals also breathe out carbon dioxide and methane, their small contribution is miniscule compared to humans and their consumption of non-renewable energy. Nature's animal release of carbon dioxide, although minor, is still a natural causing factor in releasing more carbon dioxide into the atmosphere.

Man-Made Causes for Global Warming

1. Man-induced Deforestation: Deforestation is the cutting down of trees and plants to make way for any development activity. Mother nature taking out an entire forest is one thing, but man doing it for the use of crop cultivation, fuel, and other consumption, is another. Each day our forests are bulldozed for the prospect of farms and factories. Fuel used for wood and charcoal

only adds to the polluted gases in the atmosphere. Our consumer commodities provided by forestry includes paper and lumber. The loss of our forests results in a chain reaction where too much carbon is released into the air, with not enough oxygen to combat it.

This means that it is very important to protect our trees to stop the greenhouse effect, and also so we can breathe and live. Deforestation is blamed for rise in the greenhouse gases present in the atmosphere by cutting or burning them. New development projects, requirement of land for homes and factories, requirement for wood and also soil erosion are the major factors that are causing deforestation, which in turn leading to global warming.

2. Fossil Fuels: Pollution whether it is vehicular, electrical or industrial is the main contributor to the global warming. Everyday billions of vehicles release various gases into the atmosphere. This causes earth to warm up and increase its average temperature. Electricity causes pollution in many ways. Over 75% of the electricity worldwide is produced by burning of fossil fuels. Many gases are sent into the air when fossil fuels are burnt of which main is the carbon dioxide gas.

Fossil fuel like coal is burnt to produce electricity. Coal is the major fuel that is burnt to produce power. Coal produces around 1.7 times as much carbon dioxide per unit of energy when flamed as does natural gas and 1.25 times as much as oil.

We're all well aware of the vast amounts of energy consumed everyday by humans everywhere since our first memories. Nearly 40% of the U.S. release of carbon dioxide is due to the burning of fossil fuels-gasoline and electricity in our homes. Finding sources for renewable energy, clean burning fuel options, and methods to cut back the amount of energy exhausted, could cut that 40% significantly.

Industries on the other hand release various gases into the water and air. Carbon dioxide, methane and nitrous oxide are the major greenhouse gases. Different gases have different heat trapping capabilities. Some of them trap more heat than carbon dioxide. Methane is much more effective then carbon dioxide in entrapping heat in the atmosphere. By driving cars, using electricity from coal fired plants and heating up our homes from natural gases, we release carbon dioxide and other heat trapping gases in the atmosphere.

3. Landfills: When we throw garbage out of our house it goes to landfills. Landfills are those big chunks of garbage that stink and can be seen in so many places around the world. The garbage is then used by big recycling companies to make some useful products out from it.

Most of the time that garbage is burnt which releases toxic gases including methane into the atmosphere. These enormous amounts of toxic greenhouse gases when go into the atmosphere make global warming worse.

4. Overpopulation: Another cause of global warming is overpopulation. Since carbon dioxide contributes to global warming, the increase in population makes the problem worse because we breathe out more carbon dioxide in the atmosphere. More people means more demand for food, more carbon dioxide in the atmosphere, more demand for cars and more demand for homes.

More demand for food will lead to more transportation since movement of goods and services is done by transportation sector. More demand for cars means more pollution in the air and more traffic on the roads which means longer waiting time on the traffic lights and that will result in burning of more fuel. More demand for homes means cutting down of plants and trees to make way for homes, schools and colleges.

5. Mining: Oil and coal are two main culprits in producing greenhouse gases. Methane, like carbon dioxide creates a thick shield over the atmosphere trapping the sun's rays. With the continued use of mining operations, these harmful gases will only increase.

6. Fertilizer Use: Think of the countless farmlands across the heartland of America. The unique thing about fertilizer is that it produces nitrous oxide once it absorbs the soil. Nitrous oxide is 300 times more dangerous than carbon dioxide. The EPA strongly warns that the farming industry's use of fertilizer is one of the leading causes of global warming.

7. Meat Consumption: Remember earlier when the animal world was sort of to blame for emitting carbon dioxide into the air? Well, the bigger party to blame is us. Due to our Western diet and habits, the raising, grazing, and manufacturing of animal products contributes greatly to the rise of global temperature. According to research, 51% of the greenhouse gases: methane, carbon dioxide, and nitrous oxide are caused by animal agriculture. If we would stop ordering juicy cheeseburgers, excessive amounts of carbon dioxide by animals stop emitting the atmosphere.

There are a number of natural causing factors involved in global warming. While scientists continue to observe and study sunspots, water vapor, and permafrost, there is little that can be done to penetrate such vast forces. What we can do, however, is truly evaluate and prioritize how we treat and value our planet.

Global warming contributes to not only the fall of ecosystems, weather patterns, and rises in sea levels, but the overall quality of life we wish for on this planet. There are many things we can do to help reduce the amount of energy we consume. Switching to renewable energy, changing lifestyles and diets, and controlling our consumption of non-renewable products, can greatly make a huge difference. The future of the earth is in our hands. So, is global warming Nature's fault or ours?

Global Warming Effects

Rise in sea levels worldwide

Scientists predict an increase in sea levels worldwide due to the melting of two massive ice sheets in Antarctica and Greenland, especially on the East coast of the U.S. However, many nations around the world will experience the effects of rising sea levels, which could displace millions of people. One nation, the Maldives, is already looking for a new home, thanks to rising sea levels.

Killer storms

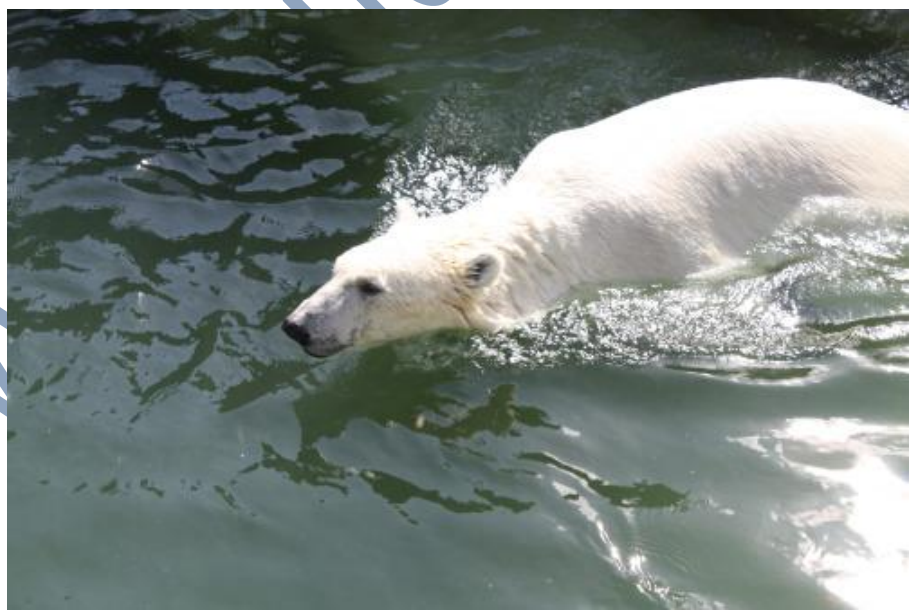
The severity of storms such as hurricanes and cyclones is increasing, and research published in *Nature* found:

"Scientists have come up with the firmest evidence so far that global warming will significantly increase the intensity of the most extreme storms worldwide. The maximum wind speeds of the strongest tropical cyclones have increased significantly since 1981, according to research published in Nature this week. And the upward trend, thought to be driven by rising ocean temperatures, is unlikely to stop at any time soon."

Massive crop failures

According to recent research, there is a 90% chance that 3 billion people worldwide will have to choose between moving their families to milder climes and going hungry due to climate change within 100 years. One of the main causes of this will be the spread of desertification, and its accompanying effects.

“Climate change is expected to have the most severe impact on water supplies. “Shortages in future are likely to threaten food production, reduce sanitation, hinder economic development and damage ecosystems. It causes more violent swings between floods and droughts.”” – Guardian: Global warming causes 300,000 deaths a year



Widespread extinction of species

According to research published in *Nature*, by 2050, rising temperatures could lead to the extinction of more than a million species. And because we can't exist without a diverse population of species on Earth, this is scary news for humans.

This 6th mass extinction is really just a continuation of the holocene extinction which began at the end of the last ice age and has resulted in the extinction of nearly all of the Earth's megafauna animals, largely as a result of human-expansion.

"Climate change now represents at least as great a threat to the number of species surviving on Earth as habitat-destruction and modification." Chris Thomas, conservation biologist at the University of Leeds

Widespread species loss and lists of endangered species just keep growing. This is a concerning matter on many fronts.

Disappearance of coral reefs

A report on coral reefs from WWF says that in a worst case scenario, coral populations will collapse by 2100 due to increased temperatures and ocean acidification and its effects. The 'bleaching' of corals from small but prolonged rises in sea temperature is a severe danger for ocean ecosystems, and many other species in the oceans rely on coral reefs for their survival.

"Despite the oceans's immensity — 71 per cent of the Earth's surface with an average depth of almost 4km (2½m) — there are indications that it is approaching its tipping point. For reefs, warming waters and acidification are closing in like a pair of jaws that threaten to make them the first global ecosystem to disappear." – Times Online: 21st-century Noah's Ark needed to save coral reefs from extinction

Is global warming too big of a problem for me to help tackle?

Wondering how to stop global warming? Reduce your own carbon footprint by following a few easy steps. Make conserving energy a part of your daily routine and your decisions as a consumer. When you shop for new appliances like refrigerators, washers, and dryers, look for products with the government's Energy Star label; they meet a higher standard for energy efficiency than the minimum federal requirements. When you buy a car, look for one with the highest gas mileage and lowest emissions. You can also reduce your emissions by taking public transportation or carpooling when possible.

And while new federal and state standards are a step in the right direction, much more needs to be done. Voice your support of climate-friendly and climate change preparedness policies, and tell your representatives that transitioning from dirty fossil fuels to clean power should be a top priority—because it's vital to building healthy, more secure communities.

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