Our Earth

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50 YEARS EARTH DAY 2020

Introduction

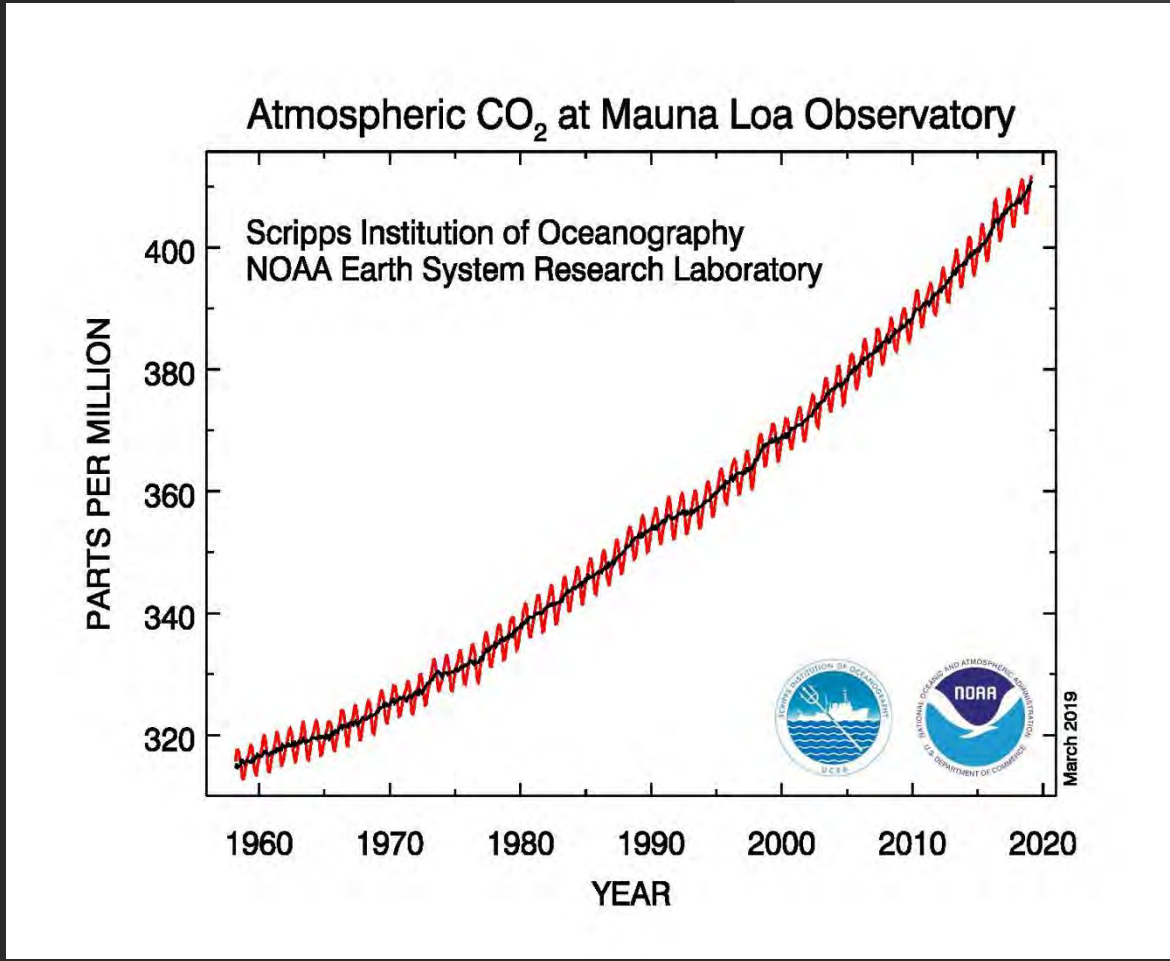
- Earth has been our home for billions of years and will continue to exist for billions more, so why are we cutting its lifetime early?
- Human industrialization (development of factories and industries) is responsible for climate change. It continues to pollute the Earth’s atmosphere, trash its ecosystems, and melt its glaciers
- Although industrialization benefits our societies and economies, we should keep in mind the overall health of our precious Earth
- With the turn of the decade, we should aim to prioritize the Earth’s health, both locally and nationally

Consequences

- While we cooperate to achieve our goal, we should never forget the severe disasters that would have occurred if we had not altered our destructive practices
  - Toxic Air (Air Pollution)
  - Rising Sea Levels (Melting of Ice Caps)
  - Increase in Natural Disasters (Change in Weather Patterns)
  - Increased Disease Outbreaks (Increase in Temperature)
  - Ocean Acidification (Air Pollution)
  - Disrupted Ecosystems (Pollution; ex. Coral Bleaching)

Statistics

- According to the National Oceanic and Atmospheric Administration (NOAA), the increasing rate of atmospheric CO_2 is accelerating. While an averaged amount of 1.5 ppm of CO_2 was released each year in the 1990s, the release of carbon dioxide has increased to 2.3 ppm per year on average between 2009-2018
- Researchers also found that the ocean has absorbed four times the amount of carbon dioxide between 1994-2007 than it did between 1800-1994

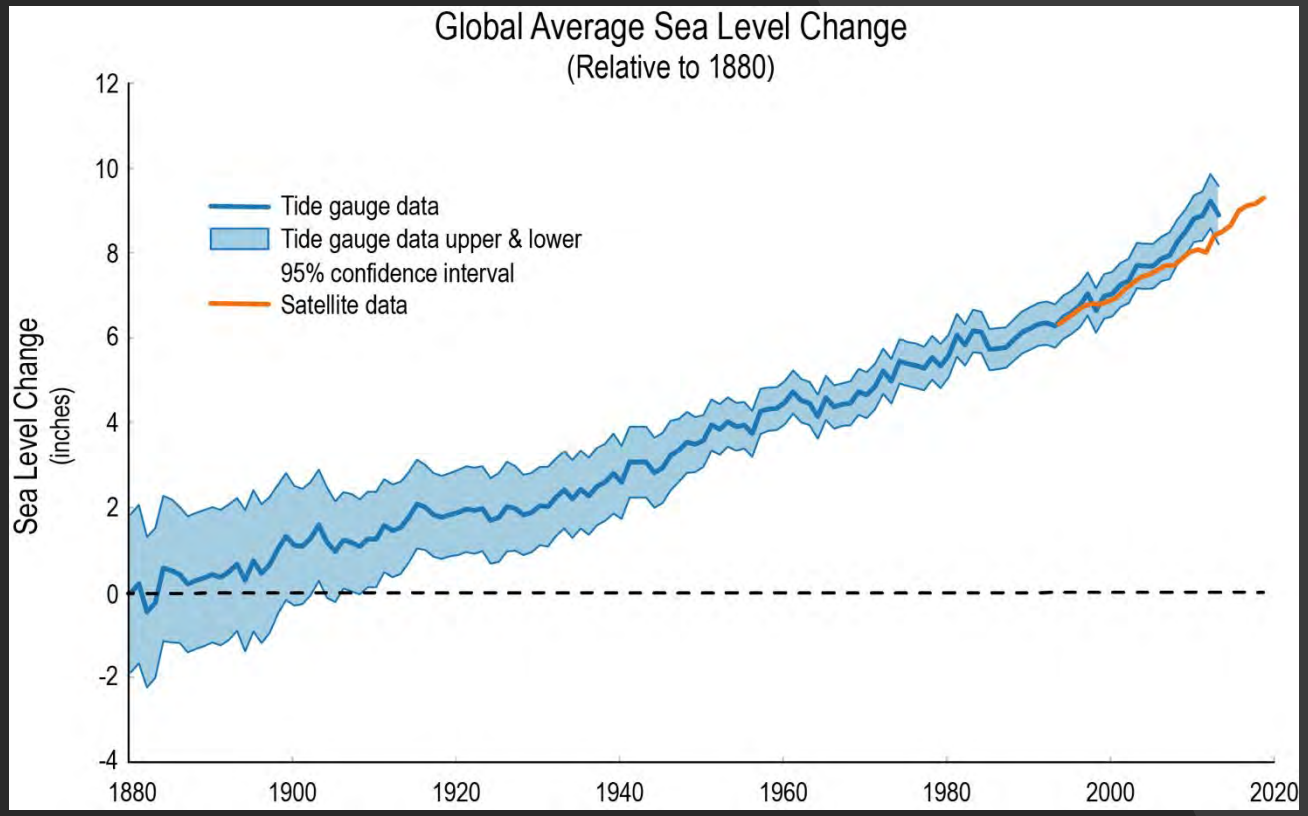


Statistics (continued)

- As of lately, the increase of greenhouse gas emissions has resulted in an increase in temperature (greenhouse effect). If the average global temperature increases by only a few degrees, many devastating effects will occur
- Since the 1800s, Earth's average surface temperature has increased about 1.62 degrees Fahrenheit (0.9 degrees Celsius). This increase in temperature has devastated the Arctic and the Antarctic. An experiment conducted by the National Aeronautics and Space Administration (NASA) showed that between 1993-2016, Greenland lost an average of 286 billion tons of ice per year, while Antarctica lost about 127 billion tons of ice per year during this time period. From 2000-2010, the rate of ice mass loss in Antarctica has tripled
- As ice from the polar ice caps continue to melt, sea levels around the globe continue to rise. From 1990-2015, a global tide gauge network showed an increase in global sea level of 3 inches. By 2100, sea levels could rise anywhere from 1-8 feet above current sea levels

The Impact

- For Americans who live in coastal areas, storm surge from hurricanes and flooding could be more common and will result in heavy expenses. According to the Federal Emergency Management Agency (FEMA), $27,000 in damages could result from only one inch of floodwater entering the average-sized house
- Also, in areas below sea level, rising sea levels could allow saltwater to enter groundwater drinking water supplies, contaminating the clean water supply
- In areas affected by drought, warmer temperatures and decreased water supply could attract contaminants. In 2014, cyanobacteria toxins in the water supply of Toledo, Ohio forced residents to drink bottled water for three days
- By 2100, millions of Americans will be forced to relocate due to rising sea levels
- In the ocean, ecosystems in the ocean will have to deal with plastic pollutants , which could kill some species who mistake it as food. Species will also begin to perish due to the ocean becoming more toxic due to CO_2 absorption



The Impact (continued)

- In the U.S, changes in precipitation patterns and an increase in wildfires could disrupt agriculture and result in bad harvests, altogether damaging America's food security
- Meanwhile, vectors, such as mosquitos, fleas, and ticks, depend on warm climates to survive and spread disease. The increase in temperatures in America could increase the spread of Lyme, Malaria, Dengue fever, West Nile Virus, and many more diseases
- Millions of civilians will become ill from such outbreaks due to an increase in the number of transmitters in the area
- There is no doubt that climate change exists and will affect every aspect of life. It was our actions that caused this, now it will be our actions that will fix this

My Thoughts

Environmental Issues

Dirty Energy

In fighting climate change, we will have to start at the foundations for it: the use of nonrenewable resources. This use of fossil fuels in powering society has deeply affected the Earth. First, burning fossil fuels produces CO_2, one of the main contributors to climate change. Second, fossil fuels are a nonrenewable resource. Once burned, the fuel cannot be converted back to a useable source for energy, thus being called “dirty energy.” In 2017, the two largest contributors of greenhouse gas emissions in the U.S were transportation (28.9% of total emissions) and energy production (27.5% of total emissions). Over 90% of the fuel used for transportation is petroleum-based (gasoline or diesel), which is used by motor vehicles, trains, ships, and planes. In addition, 62.9% of the energy produced in 2017 originated from the burning of fossil fuels. Thus, mitigating the use of nonrenewable resources, especially in transportation and energy production, will greatly reduce the amount of CO_2 being released into the atmosphere, a major step in reversing climate change.

My Thoughts

Solutions

National Level

For coastal areas, we can construct wind farms in shallow and deep oceanic areas. For shallow areas, we can build a fixed foundation planted to the ocean floor, then have the wind turbine above the water to utilize coastal winds. However, hurricanes and severe weather could damage these offshore wind turbines on the east coast. To combat this, the use of vertical-axis wind turbines could reduce the structural damage a traditional wind turbine's rotors could cause in the event of strong winds. In areas where ocean depth exceeds 60 meters, wind turbines could use floating foundations tethered to the seafloor to utilize winds generated by the Coriolis Effect. For the U.S, these offshore wind projects will not only generate a massive amount of energy, but also will provide thousands of job opportunities from the construction and maintenance of the wind farms. Of course, the use of hydroelectric power plants alongside rivers and reservoirs as well as the use of geothermal power plants in volcanic or tectonically active areas would be greatly appreciated in the mitigation of nonrenewable energy production. However, the construction of dams and geothermal plants would be disruptive towards civilian life who live near such plants. Moreover, constructing power plants is extremely expensive, compared to oil industries which are cheaper to build. It is up to our government to support the construction of these power plants, which is why we, as citizens, should protest the use of nonrenewable energy production. If the U.S can fully transition to clean energy production, greenhouse gas emissions will greatly reduce, preventing the probability of the extreme effects of climate change.

My Thoughts

Solutions

Business Level

Transportation is the largest source of greenhouse gas emissions in the United States, accounting for about 29% of all emissions released as of 2017. As for transportation being intricately integrated into American life (roughly 95% of U.S households own a car), tackling climate change in transportation will have to rest upon the shoulders of automobile manufacturers. The goal of these manufacturers is to ultimately switch from motor vehicles to electric vehicles to eliminate emissions from exhaust. However, these companies are unlikely to adjust their production methods, so I am suggesting that these companies start to provide electric vehicular options along with their usual motor vehicles. In time, if these electric vehicles produced by motor companies are successful, demand from consumers will result in the production of more electric vehicles. More electric vehicles on the road equates to less greenhouse gases in the atmosphere, decreasing the possibilities of climate change. Meanwhile, electric vehicular companies will produce more electric vehicular models in competition with the other motor companies' electric vehicles. But in addition to a larger production, these companies can improve their vehicles and services. Manufacturers can construct solar panels, even wind turbines, and connect their vehicle charging centers to these renewable energy suppliers. If this idea becomes real, electric vehicles on the road would virtually produce only the kinetic energy necessary for transportation, with no dirty energy converted for motion and no dangerous biproducts created as well. Thus, I beg for all of those entering an engineering or business field related to transportation to suggest cleaner and greener options to the executives because in the long run, it is a win-win situation. One for the company, and one for the Earth.

My Thoughts

Solutions

Local Level

The complete riddance of climate change is also dependent upon common practices. In other words, you must do your part in this battle! One way we can contribute is to replace any incandescent or halogen bulbs in our homes with compact fluorescent lighting (CFL) or light emitting diodes (LED). CFLs and LEDs are much more energy efficient and last longer than traditional bulbs, resulting in lower electricity bills. CFLs use about 70% less energy and LEDs are 90% more efficient than incandescent bulbs, whereas incandescent bulbs lose 90% of their energy as heat. When shopping for LED and CFL bulbs, appliances, equipment, or electronics, look for the ENERGY STAR certification on the product. ENERGY STAR certifies products based on their energy efficiency and electrical lifetime. Another way we can contribute is to plant trees. Trees are essential to the survivability of all life on Earth. Trees absorb carbon dioxide from the atmosphere and release oxygen in exchange, as part of photosynthesis. Think of trees as the cells that make up the lungs of the Earth. We want to prevent all difficulties so the Earth can survive. Diseases and viral infections, in this case deforestation and wildfires, would result in respiratory issues and ultimately death. We want to ensure that the Earth can breathe without difficulty, so we must constantly plant trees in order to prevent deforestation and to diminish carbon dioxide levels. Planting trees in your backyard or local park will help a lot in reducing CO_2 levels in the atmosphere. One idea I have is to install awnings or pavilions topped with solar panels in parking lots and some public areas exposed to constant sunlight. Not only would these awnings provide shade, but would also supply power either to the building responsible for the installation or if installed by the local government, to the community's power supply. With all these ideas set in place, we would be closer to halting climate change. However, it is up to each and every one of us to make the change happen.

Our Responsibility

“The world will not be destroyed by those who do evil, but by those who watch them without doing anything”

-Albert Einstein

- The Earth is our home. We can not afford to lose it to the devastating effects of climate change. We must act now, before it is too late to salvage the Earth
- Earth’s survival rests upon our shoulders. It is our responsibility to assist it as it has nurtured us for millenniums
- Together, we can achieve prosperity for generations to come. It is what we accomplish now that will determine our future as humans
- The time has come for change, so I must ask…
- **Are You with Us?**

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