# Nature Climate Change Example

## Introduction

“Earth's 2016 surface temperatures were the warmest since modern recordkeeping began in 1880” (NASA, NOAA Data...) The atmospheric co2 levels of Earth have always increased and decreased over a period of 650,000 years. However, as of 1950, carbon dioxide levels have increased to 400 million, which is significant when compared to the highest of 290 million nearly 300,000 years ago. Keeping the CO2 levels low is important because it corresponds to global temperature, ocean temperature, and ice sheets. Although it is important to maintain low levels of carbon dioxide, it is the highest ever because of serious climate change. Indeed, the rise in sea levels, extreme events, and ocean acidification are some examples of climate change due to an increase in carbon dioxide levels. Climate change is a serious problem as ice sheets are melting, the Earth is warming, and severe storms are increasing.

However, if we promote clean energy, change wasteful habits and reduce our intake of beef and milk, we can reverse environmental damage. The ice sheets have been melting at an astonishing rate because of climate

change. The ice sheets of Greenland and Antarctica are extremely large and have been formed for thousands of years and played a key role in the environment. One reason why the ice sheets are important is that they contain about 99 percent of the earth's fresh water and prevent the ocean levels from rising. Another reason why ice sheets are important is that they help palaeoclimatologists to study the atmosphere of the earth in prehistoric times. Palaeoclimatologists extract large ice tubes from ice sheets and scientists can collect information on the climate of that period by studying the chemicals in each layer of the ice tube. As temperature increases rapidly, glaciers, ice caps, and ice sheets begin to melt.

Furthermore, due to the rising temperature, ice sheets are melting faster than can be produced affecting ecosystems across the planet. In addition, Ice sheets melting contribute to rising sea levels. When ice sheets melt in the Antarctic and Greenland, they increase the ocean level as Peter Wadhams states, “Greenland is now the largest single contributor to global sea level rise, it's melting ice cap adding some 300 cubic kilometers (72 cubic miles) of water per year to the ocean” (Peter Wadhams).

Not to mention that if the ocean level increases, even more, coastal habitats are at risk of flooding. Scientists are especially concerned about the effects of melting do to New York City, New York; Washington, D.C; San Francisco, California; or New Orleans, Louisiana being in danger of becoming underwater cities if the ice sheets continue to melt. Not to mention, the melting of ice sheets will result in the dilution of the ocean’s salinity as National Geographic explains, “Tons of freshwater are added to the ocean every day by melting ice sheets. Large additions of freshwater change the ocean ecosystems.” (Ice sheet). Because of the sudden increase in freshwater to a mainly saltwater ecosystem, many fish and coral species cannot survive.

The Arctic and Greenland ice sheets play an important role in the Earth ecosystem. Global warming is expected to have profound and widespread effects on earth's ecosystems. Between 1900 and 1990 the average U.S. temperature was 52.0 Fahrenheit, but as of recently, it has risen to new records of 55.0 degrees. As Noaa states “2017 was the third warmest year since official records began in 1880. It ranked behind only 2016 (warmest) and 2015 (second warmest)” (Climate). This sudden increase in temperature on Earth means more than a rise in hot

days. Due to warming temperatures, many plants and animals move north. “They are not just moving north, they are moving from the equator toward the poles. They are quite simply following the range of comfortable temperatures, which is migrating to the poles as the global average temperature warms” (Bradford) The reason that this is a problem is that if the climate changes too quickly many organisms can’t migrate fast enough leading to their extinction. In addition to birds that migrate earlier, disease-causing pathogens once confined to tropical and subtropical areas kill plants and animal species that have previously been protected from disease due to an increase in average temperature. As Alina Bradford states “These and other effects of global warming, if left unchecked, will likely contribute to the disappearance of up to one-half of Earth's plants and one-third of animals from their current range by 2080, according to a 2013 report in the journal Nature Climate Change” (Bradford).

The earth rising at an average temperature is a problem for everyone, including humans. Agriculture will be affected by drought, severe weather and the absence of accumulated snowmelt, and a larger number and diversity of pests could lead to global food shortages as well as livestock shortages. Not to mention a sudden drop in food would create worldwide chaos with riots, civil unrest, and famines. Lastly, human health is expected to decline because of global warming. Mosquito-borne diseases such as malaria, dengue fever, and asthma are a direct consequence of global warming. “The 2016 outbreak of Zika virus, a mosquito-borne illness, highlighted the dangers of climate change. The disease causes devastating birth defects in fetuses when pregnant women are infected” (Bradford). With the increase of the average temperature, insects like mosquitoes can migrate north, leading to the spread of mosquito-related diseases.

An increase in extreme weather is a direct cause of climate change. Over the past 50 years, humans have seen excessively high temperatures, an abundance of downpour and it some regions, floods, and droughts. Furthermore, heat waves have increased in recent years with a trend that continued in 2011 and 2012. Texas in 2011 and the Midwest in 2012 recorded the highest average monthly temperatures. As the nca states “Analyses show that human-induced climate change has generally increased the probability of heat waves., And prolonged (multi-month) extreme heat has been unprecedented since the start of reliable instrumental records in 1895” (Extreme Weather). Due to the increase in heat waves in the United States, an abnormal number of droughts have

occurred. A drought occurs when surface evaporation increases and plants with insufficient water lead to dry soil resulting in drought. Examples of droughts that have happened recently were as the nca states “when many locations in Texas and Oklahoma experienced more than 100 days over 100°F. Both states set new records for the hottest summer since record-keeping began in 1895.

Rates of water loss, due in part to evaporation, were double the long-term average. The heat and drought depleted water resources and contributed to more than $10 billion in direct losses to agriculture alone” (Extreme Weather). Due to the increased quantity of heatwaves and droughts, it is harder for farmers because the quality of the soil decreases Although dry events in the USA are on the rise, there is also an increase in heavy downpours. The amount of heavy rainfall has increased substantially in the last three to five decades, especially in comparison to 1991. Due to the sudden increase in heavy downpours, this equates to floods in the United States. Moreover, a sudden increase in rainfall is not the only factor contributing to the increase in floods. Factors such as thunderstorms, snow, and ice or debris jams and human factors such as dam failure and land alterations are also contributing to the sudden increase in flooding. There are a few types of floods as the nca describes “Flash floods occur in small and steep watersheds and waterways and can be caused by short-duration intense precipitation, dam or levee failure, or collapse of debris and ice jams.

Most flood-related deaths in the U.S. are associated with flash floods… Urban flooding can be caused by short-duration very heavy precipitation. Urbanization creates large areas of impervious surfaces…” (Extreme weather). Floods are extremely dangerous, causing more than 500,000 deaths and affecting 2.8 billion people between 1980 and 2009, and causing damage of almost 8 billion dollars between 1981 and 2011. Finally, the last extreme weather that has worsened is the hurricane. In the last few years, the frequency and intensity of category 4 and 5 hurricanes have increased due to climate change. Hurricanes occur when sea surface temperature changes lead to a change in the local atmosphere that eventually results in a hurricane. Finally, meteorologists predict that the number of categories 4 and 5 hurricanes will increase towards the end of the century. Moreover, extreme weather is becoming an ever-growing problem but if we don't try to counter climate change, it will only get worse.

Turning to green renewable energy will greatly help us fight climate change. There are many ways in which companies can switch from fossil fuels to renewable energy, such as solar panels, wind turbines, and low impact hydropower. There are many advantages of switching to renewable energy such as reducing greenhouse gas emissions and helping to combat air pollution, to name but a few. In the United States, approximately 29 percent of harmful emissions come from fossil fuels such as coal and natural gas.

On the contrary, most renewable energy sources release zero to no global warming emissions even in the life cycle of recycling production. As ucsuas states “Burning natural gas for electricity releases between 0.6 and 2 pounds of carbon dioxide equivalent per kilowatt-hour (CO2E/kWh); coal emits between 1.4 and 3.6 pounds of CO2E/kWh. Wind, on the other hand, is responsible for only 0.02 to 0.04 pounds of CO2E/kWh on a life-cycle basis; solar 0.07 to 0.2; geothermal 0.1 to 0.2; and hydroelectric between 0.1 and 0.5” (ucsuas). This quote explains the difference when we switch to a renewable energy source. On average, green energy preforms twice as much and produces half the emissions of fossil fuels.