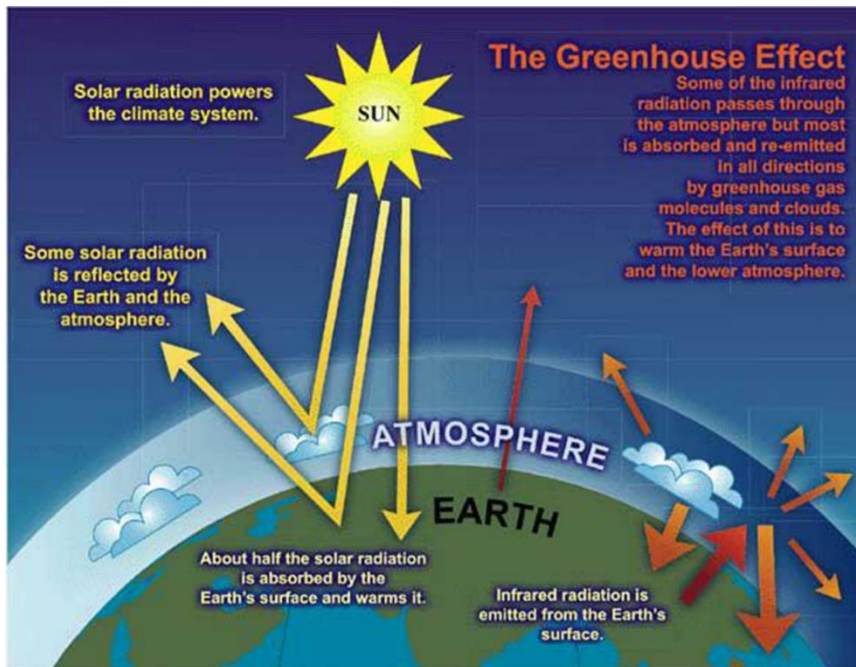


## Climate Change and Forests

Forests are considered a natural solution to climate change because they remove carbon dioxide (CO<sub>2</sub>) - a potent greenhouse gas (GHG) - from the atmosphere and store the carbon in wood and soil. Increasing the amount of carbon stored in forests and harvested wood products can reduce the amount of CO<sub>2</sub> in the atmosphere while providing the other critical ecosystem services that forests provide.

### The evidence and impacts of climate change

Climate change is largely caused by the human emissions of GHG, which forest carbon helps offset. The greenhouse effect results when solar radiation is trapped within the atmosphere because it cannot escape to outer space (Figure 1). While the earth's atmosphere must trap some of this radiation otherwise it would be too cold for life to survive, human derived GHG, primarily carbon dioxide (CO<sub>2</sub>) and methane, have exacerbated this natural phenomenon, resulting in warming global temperatures and other climate changes.



GHG amounts in our atmosphere have varied over the history of the earth. By analyzing glacial ice that has trapped air and particles for thousands of years, climate scientists have been able to determine that there has been a significant change in the amount of GHG in the atmosphere in the last 150 years. Figure 2 shows a significant change in the amount of GHG in the atmosphere, especially as a result of human development.

Figure 1 Source: National Institute of Water and Atmospheric Research

Atmospheric CO<sub>2</sub> concentration reached an 800,000 year high in 2021 at 421.36 parts per million. In 1870 the CO<sub>2</sub> levels were at 288.2 parts per million.

The Intergovernmental Panel on Climate Change (IPCC), the world's expert scientists working on climate change through the United Nations, says that a global climate temperature increase of over 1.5° Celsius compared to pre-industrial times will result in substantial climate change that will affect all reaches of the earth.

We are experiencing some of these changes now. The US National Oceanic and Atmospheric Administration (NOAA) concludes that, averaged across land and ocean, the 2020 surface temperature of the earth was 1.76° F (0.98° Celsius) warmer than the twentieth-century average of 57.0° F (13.9° C) and 2.14° F (1.19° C) warmer than the pre-industrial period (1880-1900).

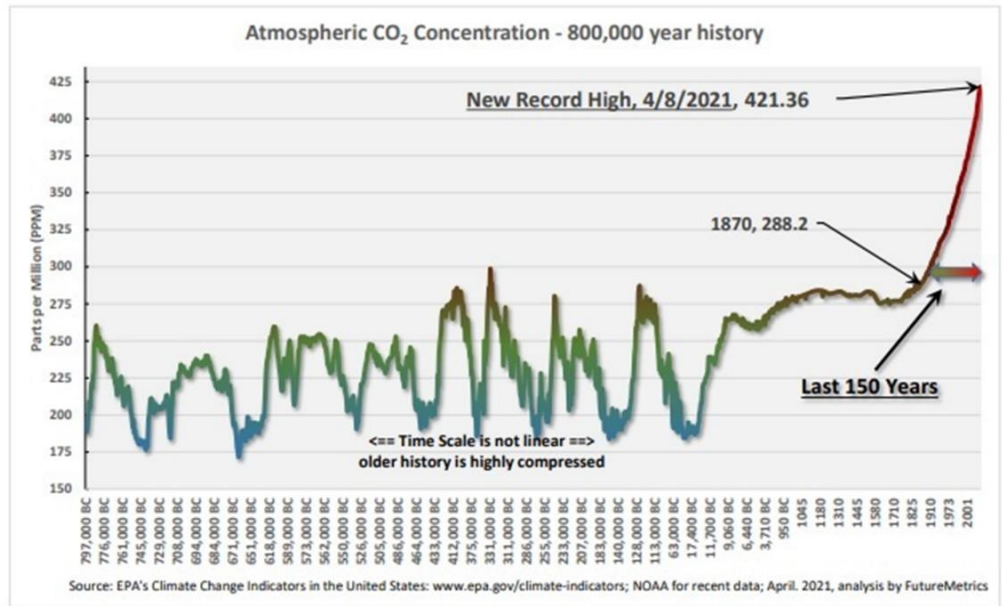


Figure 2

The most recent IPCC report (5<sup>th</sup>), states “Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and

tropical cyclones, and, in particular, their attribution to human influence, has strengthened.”

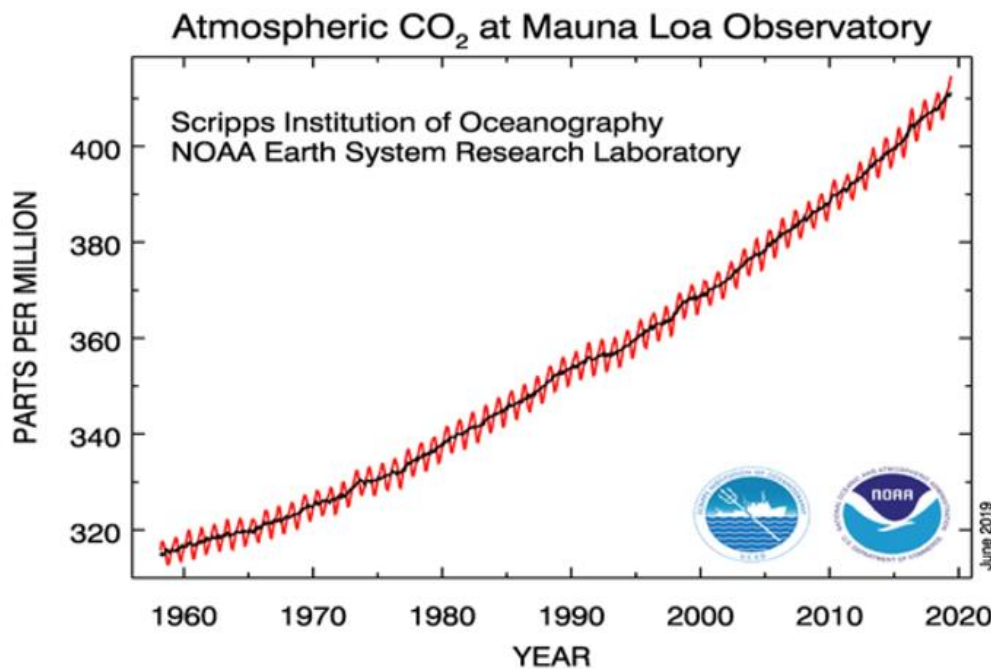


Figure 2

Given these trends, forests play a critical role in reducing GHG emissions and mitigating the effects of climate change given their ability to sequester and store carbon.