A Sustainable Environment: Our Obligation to Protect God's Gift

by

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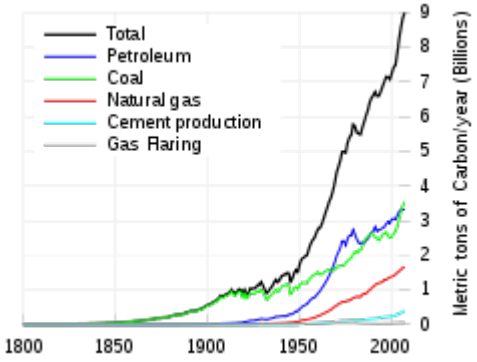
Is Climate Change Responsible for Recent Natural Catastrophes?

During the past several years, we have witnessed a number of natural catastrophes. This includes Hurricane Katrina in 2005, flooding in Oklahoma in 2009, a temperature record of 129 °F. in Pakistan in 2010, and the recent tsunami in Japan last month. While these and others have occurred in the last six years, I am sure we have observed others in the past decades. But it seems that they are occurring more often, and it raises the question as to why. Are they due to climate change?

There is little doubt that the temperature of the atmosphere has been gradually increasing and it is primarily due to the increase in the category of pollutants known as greenhouse gas emissions (GHG). This category consists of six different gases but the primary one is carbon dioxide. For centuries, the concentration of GHG in the atmosphere had been relatively constant. Whatever amount of GHG that was emitted by various sources was reabsorbed by trees and other vegetation. So the emission and absorption of the GHG was in equilibrium. But since the beginning of the industrial revolution, emissions have been exceeding the absorption so the GHG are accumulating in the atmosphere and making the earth warmer. The graph below shows the rapid increase in carbon being emitted in the atmosphere from various sources. So what does this have to do with these catastrophes?



The amount of moisture that can be contained by the air is dependent on the temperature. The higher the temperature, the higher the moisture content in the air. That is why the winter air is so dry. With a higher moisture content in the air, when the conditions are right for precipitation, there is much more moisture that can come down as rain. This is why we have been experiencing huge rainstorms during the past few years. Last summer, 13 to 19 inches of rain fell in Tennessee over a two-day period causing a flood throughout the state including downtown Nashville. They called this a 1-in-1,000 year event. Similarly, Oklahoma City received more rain in a 12-hour period than its

monthly average – a 1-in-100 year event. Unfortunately, with an increase in GHG in our atmosphere, these events will be occurring much more often than 1-in-1,000 years or even 1-in100 years. These are local issues. What is happening globally?

On a world basis, we may be aware of some present-day climate patterns such as El Nino which circulates in the Pacific Ocean. A lesser known but equally important pattern is a band of heavy rainfall that circles the planet in the tropics and migrates north and south seasonally. This area is called the Intertropical Convergence Zone (ITCZ) and it is located 3°N to 10°N latitude over the Pacific. In the Western Hemisphere, it includes countries like Ecuador and Colombia that depend on the warm temperature and about 80 to 90 inches of annual rainfall required for plants like bananas. Unfortunately, as the overall temperature of the planet continues to increase, this ITCZ will start to move further north and Colombia will no longer be able to grow bananas or coffee. North of this rain band is a subtropical dry zone which will also shift to the north. This dry zone, currently stretching across Mexico, will eventually become part of the U.S. The southwestern U.S. is already experiencing some of this, and it is likely to represent the new normal pattern.

The earthquake and tsunami that took place last month in Japan were the result of a seismic change in the earth's crust in northern Japan. These events are so common in Japan that we have adopted the Japanese word, tsunami, for what we might call a tidal wave. Some historians believe that a similar occurrence caused the destruction of the Minoan civilization around 1500 BC. A volcano on the island of Thira, better known today as Santorini, erupted and created such a large "tsunami" that it traveled south to Crete and destroyed much of the Minoan civilization. Today, Santorini represents what remains of that volcano. The recent Japanese and the old Mediterranean events had nothing to do with climate change, but were caused by an earthquake and a volcanic eruption, respectively. We can't blame everything on carbon dioxide and climate change.