

Climate change  
Discovery channel  
FROM 38'38

When the entire ocean gets warmer, the atmosphere reacts, resulting in all kinds of dramatic and dangerous weather around the globe.

There is no better example of this often stormy relationship between the ocean and the atmosphere than a phenomenon called 'El Niño'. When conditions are right, a giant stream of warm water flows into the Pacific Ocean. Normally, this superheated water is pushed westward, and trapped against the coast of Australia by powerful trade winds. But when those winds add up and change direction, all that warm water barrels eastward. El Niño is an example of how heat, stored in the ocean, not only causes the water to expand, but how it can turn weather upside down all over the world, and changes rainfall patterns, causes floods in usually dry places, and drought in normally rainy locations.

"Is El Niño a manifestation of global warming?"

"We don't know exactly what the effect of global warming on El Niño will be, but one theory has it that it will essentially turn all the Pacific into a permanent El Niño state and that will send echoes around the world and give us a quite different climate."

What scientists are sure of is that the tropical oceans are indeed warming and rising worldwide. And the heat stored in those waters provides even more fuel for one of the most devastating forces of nature: a hurricane.

The 2005 hurricane season, a year that did not simply break records, it smashed them, twenty eight officially designated storms, including the most devastating of the US in almost 75 years. On August 29<sup>th</sup>, Katrina slammed into the coast of Louisiana, Mississippi and Alabama. It is the most devastating hurricane to ever hit the Gulf States, reaching speeds of 175 miles an hour and ravaging one hundred miles of coastline. Then, on top of the wind and driving rain, more water. Katrina's storm surge was so horrible, it breaks through the levees of New Orleans, the only city in the United States built below sea level.

The barriers that had withstood storm after storm for the last forty years were no match for Katrina. Eighty per cent of the city floods, more than a thousand are killed. The sheer destructiveness of the hurricane has become a turning point for the scientists.

Although they can't say that one particular hurricane is caused by global warming; many scientists are now making the connections between global warming, rising sea temperatures and the strength of hurricanes.

Greg Holland, of the National Center for Atmospheric Research, is not surprised by Katrina's ferocity. 2005 also set the record for the warmest temperatures in the Gulf of Mexico where Katrina spun into a monster.

"It's here in the Gulf of Mexico that they really get going and develop their full destructive power."

As energy from the warm ocean is drawn up into the atmosphere, it condenses in the clouds. Winds go stronger and start a spiral, more air and moisture are drawn up into the vortex, a self-feeding cycle of frightening power is born.

“The really destructive winds in a hurricane extend out to a hundred miles or more, and it is so powerful that they can run the entire electric grid of the United States for several weeks.”

But like with the El Niño phenomenon, it’s tough for scientists to separate natural hurricane cycles from the effect of global warming. Right now, it’s a hot debate among scientists because we are in a thirty-year natural cycle of hurricane hyper activity. Holland believes it’s not the frequency of hurricanes that warmer temperatures are bucking, it’s the intensity.

“We went back and we got all the tropical storm cycles in the entire globe going back to 1970, and on the whole, and lo and behold, there was this major increase in category 4 and 5.”

Should the water temperatures continue to rise in the next century as predicted, Holland believes we will see not only more of these intense storms which happened in 2005, they will be worse.

“We have this category 5 hurricane, maybe we ’ ll have to invent a category 6, who knows, to account for this increased intensity.”

And it’s not only the hurricanes, scientists say that we can expect severe weather to become the norm rather than the exception. As rainfall patterns are disrupted, heavy rains will batter some regions, intense floods will become more frequent, while in other areas, severe rain will give way to severe drought. In northern China, rural villages and farmland have endured steadily decreasing rainfall in the last two decades, and in the last two years there has been almost no rain at all.

Every year, almost a thousand square miles of farmland in China turn to desert. . Since the 1950s that rate has doubled

[...]

For these Chinese villagers, there might be no option but to abandon their farm to the sand.

This is a phenomenon happening not just in China, but in regions such as southern Africa and India.

Around the world, the weather and climate are changing.