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Warming boosts strongest storms

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The strongest tropical storms are becoming even stronger as the world's oceans warm, scientists have confirmed.

Analysis of satellite data shows that in the last 25 years, strong cyclones, hurricanes and typhoons have become more frequent in most of the tropics.

Writing in the journal *Nature*, they say the number of weaker storms has not noticeably altered.

The idea that climate change might be linked to tropical storms has been highly controversial.

A few years ago, it was claimed that hurricanes would become more frequent as well as more common in a warming world.

The swirling winds pick up energy from a warm ocean.

But recent research has suggested they would occur less frequently,

though likely to pack a more powerful punch each time.

James Elsner from Florida State University in Tallahassee, US and colleagues believed the link might become clearer if they analysed data according to the strength of storms.

HOW TROPICAL STORMS FORM

- Sea surface temperatures above 26.5C (79.7F)
- A pre-existing weather disturbance
- Moisture in the atmosphere
- Favourable conditions, such as light winds or weak wind shear

"We're seeing a signal, and it's telling us that the strongest effect (of rising ocean temperatures) is on the strongest storms," he told BBC News.

"At average or median wind speeds, about 40m/s, we don't see a trend; but when we get up to 50 or 60m/s we do see a trend."

A hurricane featuring winds of 40m/s (89mph) is a Category One storm according to the often-used Saffir-Simpson scale.

At about 60m/s (134mph) it enters Category Four, the strength at which Hurricane Gustav recently hit Cuba before weakening to Category One over the US coast.

Tropical trends

Hurricanes, typhoons and cyclones are different terms used in different regions of the world for the same phenomenon.

However, the bulk of the scientific work on possible links to climate change has featured North Atlantic hurricanes, largely because of the relatively good historical records contained in the US.

The new analysis, using satellite data acquired by US, European and Japanese programmes, shows up different trends across the tropics.



The increase in strong storms shows up most markedly in the North Atlantic and Indian oceans, and is absent in the South Pacific.

"We're looking at different ocean basins, and some are already pretty warm," said Professor Elsner.

"So there, an increase in temperature isn't going to produce as strong an increase as in basins where the the temperatures are only marginally supportive of cyclones."

The researchers believe weaker storms are not affected so much because the factors that prevent them developing to their full potential, notably wind shear - abrupt changes in wind speed and direction that prevent the cyclone fuelling itself with ocean heat - are not related to ocean temperatures.

Globally, a rise of 1C in sea surface temperature would increase the occurrence of strong storms by about one third, the researchers calculate.

Apart from human-induced climate change, the incidence of tropical storms is determined by natural cycles such as El Nino that affect

surface temperatures in various parts of the oceans.

The damage they do is affected far less by their strength than by where they hit land, and by how able a society is to withstand the winds and rain.