

Middle East dust storm not caused by conflict, study finds

November 8 2016

Climate change, not the ongoing regional conflict, was behind last year's huge dust storm in the Middle East, according to new research published in *Environmental Research Letters*.

The storm in September 2015 affected Syria, Lebanon, Turkey and Cyprus, leading to scores of people being hospitalised, ports being closed, flights being cancelled, and large portions of the affected countries and the eastern Mediterranean Sea being covered in an unprecedented haze.

At the time, several media reports blamed land cover change attributed to conflict, including agricultural land desertion, reduced irrigation, and increased military vehicle traffic over unpaved surfaces for the unusually severe storm.

However, research by an international team found the explanation lies in the occurrence of extremely dry and hot conditions, coupled with cyclonic wind conditions.

Lead author Dr Anthony Parolari, from Marquette University, Wisconsin, said: "The Middle East is a notable hotspot dust source during summer, and [dust storms](#) in this region are usually associated with the Shamal winds from the north and cyclones.

"Using the Weather Research and Forecasting model, we ran meteorological simulations that showed that, in combination with these

winds, historically-unprecedented aridity – dryness – played a key role in the severity of this dust storm.

"The extremely hot and dry conditions suggest that the amount of dust available for erosion during this storm was greater than it otherwise would have been."

The research team's meteorological simulations showed a cyclone and "Shamal", typical for dust storm generation in this region, were immediately followed by an unusual wind reversal at low levels, which spread the dust west to the Mediterranean Coast.

In addition to running weather simulations, the team analysed vegetation cover data to understand the level of agricultural land abandonment caused by conflict. They found that, across much of the region, vegetation cover in 2015 was nearly double the 2007-2010 average, and was also greater than the 2001-2007 pre-drought average in many areas. Regions of vegetation decline were relatively sparse and concentrated near deserts. Their finding suggested that land cover changes associated with the ongoing conflict were unlikely to be the reason for increased erodibility of the soil surface.

To assess the impact of aridity on soil cohesion and erodibility, the researchers also investigated surface air temperature, humidity and wind speed. Using measurements from the Har Kenaan weather station in northern Israel, they found the summer of 2015 was unusually dry and hot in comparison to the most recent 20 years. This heat and aridity led to the soil becoming less cohesive, and more likely to dislodge large dry dust particles into the atmosphere.

Dr Parolari said: "Our study found the unusual dryness and heat, combined with unique synoptic weather patterns, enhanced dust emission and westward long-range transport across the region, causing

this extreme dust storm."

More information: Climate, not conflict, explains extreme Middle East dust storm, Parolari et al *Environ. Res. Lett.* 11 114013, iopscience.iop.org/article/10.1088/1748-9326/11/11/114013

Provided by Institute of Physics

Citation: Middle East dust storm not caused by conflict, study finds (2016, November 8)
retrieved 10 April 2024 from <https://phys.org/news/2016-11-middle-east-storm-conflict.html>

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