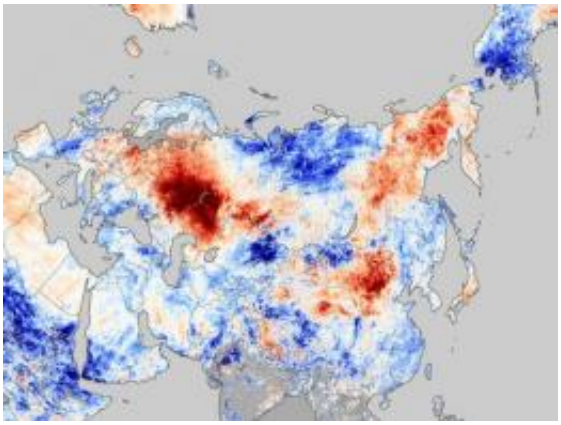
Russian heat wave 'had both manmade and natural causes'

February 22 2012



Map showing temperatures in July 2010 during the Russian heat wave

(PhysOrg.com) -- The heat wave that struck western Russia in summer 2010, causing 55,000 deaths, was caused by a combination of manmade and natural factors. However, the frequency of occurrence of such heat waves has increased by a factor of three over recent decades, new research suggests.

A study, led by Oxford University scientists, reconciles apparently contradictory results from two separate 2011 studies which attributed the extreme weather to, respectively, natural variability and human-induced climate change.

The researchers show that, because one study [Dole et al. (2011)]

focused on why the heat wave was as large as it was, whilst the other [Rahmstorf & Coumou (2011)] looked at how the chance of a large heat wave may have changed, their answers are actually complementary: the magnitude of the heat wave can largely be attributed to natural variability whilst the risk of such heat waves has increased mostly due to manmade influence. This study estimates that the risk of a heat wave of this magnitude has approximately tripled due to the global warming trend since the 1960s, which is mostly attributable to manmade greenhouse gas emissions.

A report of the research is published in the journal Geophysical Research Letters.

The 2010 Russian heat wave was a devastating extreme weather event, with monthly temperatures more than 5 degrees Celsius above average – daily temperatures peaked at up to 12 degrees above average, reaching over 40 degrees Celsius (104F). These conditions caused an estimated 55,000 deaths, a 25% drop in annual crop production, and a total economic loss of more than $15 billion.

"To say with any confidence what caused an extreme weather event, such as the Russian heat wave, you need to run not one but a large number of climate models," said Friederike Otto of the Environmental Change Institute, Oxford University, lead author of the paper. ‘Our work, using the weatherathome.net project, demonstrates that you don’t need a supercomputer to do this – we ask volunteers to run climate prediction experiments on ordinary computers. We show how you can use such an ensemble of simulations to investigate the magnitude and frequency of occurrence of intrinsically unpredictable extreme events.’

'These results show that the same weather event can be both "mostly natural" in terms of magnitude and "mostly human-induced" in terms of probability,' explained Neil Massey of the Smith School of Enterprise

and the Environment, Oxford University. "Thinking in these terms makes it possible to calculate, for instance, how much human-induced climate change cost the Russian economy in the summer of 2010."

"Most present-day impacts are related to extreme weather events. Quantifying how risks are changing allows us to better quantify (and insure against) present-day risks and build resilience to events that are becoming more probable due to human influence on climate," said Professor Myles Allen of the School of Geography and Environment, Oxford University, the Principal Investigator of the weatherathome.net and climateprediction.net projects.

"People deserve to know how much climate change is affecting them and we have the methods to answer the question: how is human influence loading the weather dice?"

Provided by Oxford University

Citation: Russian heat wave 'had both manmade and natural causes' (2012, February 22) retrieved 19 April 2024 from https://phys.org/news/2012-02-russian-manmade-natural.html