UC SANTA BARBARA

THE Current

March 2, 2015
Julie Cohen

A Perfect Storm

A growing body of research suggests that extreme weather — including high temperatures and droughts — increases the chances of violence, from individual attacks to full-scale wars. Some researchers project that manmade global warming will heighten future conflicts or argue that it may already be doing so.

New research by UC Santa Barbara's Colin Kelley is perhaps the first to look closely and quantitatively at climate change in relation to a current war. The study, which combined climate, social and economic data, appears today in the Proceedings of the National Academy of Sciences.

The research suggests that a record drought, which ravaged Syria in from 2006 to 2010, was likely stoked by ongoing manmade climate change and that the drought may have helped propel the 2011 Syrian uprising. Kelley says the drought — the worst ever recorded in the region — destroyed agriculture in northern Syria's breadbasket, driving dispossessed farmers to cities, where poverty, government mismanagement and other factors created unrest that exploded in spring 2011. The conflict has since evolved into a complex multinational war that has killed at least 200,000 people and displaced millions.

"While we're not saying the drought caused the war, we are saying that it certainly contributed to other factors — agricultural collapse and mass migration among them — that caused the uprising," said Kelley, a postdoctoral researcher who did the research for this doctorate while at Columbia University's Lamont-Doherty Earth Observatory.

The recent drought affected the so-called Fertile Crescent, spanning parts of Turkey and much of Syria and Iraq, a region has always seen natural weather swings. Kelley and colleagues used existing studies and their own research to show that since 1900, the area has undergone warming of 1 to 1.2 degrees Centigrade (about 2 degrees Fahrenheit), with about a 10 percent reduction in wet-season precipitation. The results show the trend matches neatly with models of human-influenced global warming and therefore cannot be attributed to natural variability.

According to the scientists, global warming effected the Fertile Crescent in two ways that exacerbate any given dry year. First, weakening wind patterns that bring rain-laden air from the Mediterranean reduced precipitation during the usual November-to-April wet season. In addition, higher temperatures increased moisture evaporation from soils during the usually hot summers.

“One of the things we tried to show in this paper is that there were very significant trends not only precipitation but also in temperature and sea level pressure,” Kelley said. “The long-term precipitation trend tended to make multiyear droughts, which occur naturally in this area from time to time, much more severe and explains why this recent drought was the most severe during the preserved record.”

Kelley says that the record drought’s effects were immediate. The study reports that agricultural production, typically a quarter of the country’s gross domestic product, plummeted by a third and as many as 1.5 million people fled from the countryside to the peripheries of cities already strained by influxes of refugees from the ongoing war next door in Iraq.

“There was a huge population shock in a very short period of time in these urban areas, which were already marginally sustainable in terms of their resources,” Kelley said. “This kind of rapid change in demographics encourages instability. The combination of large acute geographic and demographic changes created a huge vulnerability.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society.

All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.