

# Chinese researchers say early climate changes responsible for human crisis

4 October 2011, by Bob Yirka

(PhysOrg.com) -- David Zhang of the University of Hong Kong and several of his Chinese colleagues have published a paper in the *Proceedings of the National Academy of Sciences*, where they say they have proven that climate change has been the cause of much of history's strife. They say that cold periods have led to reduced crop production which inevitably led to famine, disease outbreaks and wars.

To come up with their findings, the team collected known data based on fourteen different criteria types, such as the price of gold, tree ring information and average human height; all for the period 1500 to 1800 in [Europe](#) before it became industrialized. They then used [statistical analyses](#) to correlate the data they'd collected with events that were occurring in human history during that time period. Next they divided the time span into four slices, ranging from forty to one hundred and fifty years. The end result, they say, is a guide that shows that for any given time of strife, there was a climate change prior to it that caused it to come about.

As an example, they cite the Thirty Years War, a conflict that eventually involved most of the countries of Europe, that the researchers say, came about as a result of the drop in temperatures during the period, 1559 to 1652, or as historians call it, the General Crisis of the sixteenth century. Because of the famine that went along with the colder temperatures (and destruction of farmlands by warring parties) the average human height dropped by more than three quarters of an inch. Clearly this was a bad time for the people in Europe though it's a particularly good example for the researchers because most historians agree that the historically barbaric war didn't seem to have any real root cause, other than general strife.

Zhang and his team say that because the correlations were so clear, they could choose a climatic period of instability and then predict human

events based on what they saw with a very high rate of accuracy. They also note that periods of "good" climate tended to result in good times for people as well; the Renaissance being the prime example.

Not everyone is thus far convinced that climate change alone can be used as a pointer to chart out historical events however, or to blame them so easily for the [human](#) actions that occurred as result. Some suggest the model is a little too simplistic because it doesn't take into account such factors as rainfall, or the motivations of those in power at the time of [climate change](#).

Nonetheless, it's likely the results of this study will be used by historians for years to come as a means to explain at least some of the misery in European history, and of course, more such studies that cover other parts of the world and other time periods will likely be undertaken that will either bolster the researchers claims, or show that they are only partly right.

**More information:** The causality analysis of climate change and large-scale human crisis, *PNAS*, Published online before print October 3, 2011, [doi:10.1073/pnas.1104268108](https://doi.org/10.1073/pnas.1104268108)

## Abstract

Recent studies have shown strong temporal correlations between past climate changes and societal crises. However, the specific causal mechanisms underlying this relation have not been addressed. We explored quantitative responses of 14 fine-grained agro-ecological, socioeconomic, and demographic variables to climate fluctuations from A.D. 1500 - 1800 in Europe. Results show that cooling from A.D. 1560 - 1660 caused successive agro-ecological, socioeconomic, and demographic catastrophes, leading to the General Crisis of the Seventeenth Century. We identified a set of causal linkages between climate change and human crisis. Using temperature data and climate-driven economic variables, we simulated the alternation of

defined "golden" and "dark" ages in Europe and the Northern Hemisphere during the past millennium. Our findings indicate that climate change was the ultimate cause, and climate-driven economic downturn was the direct cause, of large-scale human crises in preindustrial Europe and the Northern Hemisphere.

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