

Climate and the Rise in Human Dominance

Renée Hetherington and Andrew J. Weaver

University of Victoria, School of Earth and Ocean Sciences, Climate Modelling Group,
P.O. Box STN CSC, Rm. 296a Ian Stewart Complex, 3964 Gordon Head Rd.,
Victoria, B.C., Canada V8W 3P6

ABSTRACT

Catastrophic climate change is not new in Earth's history; what is new is human dominance. In the last 10,000 years – a short period of relative climate stability – *Homo sapiens* have dominated Earth through technological innovation and behavioral adaptability. Successful domestication of plants and animals resulted in a burgeoning human population. Fossil fuel technology mitigated the climate vagaries of disparate locales and made suitable for habitation all regions of Earth.

Today fossil fuel burning inputs an additional seven gigatons (billion tons) of carbon dioxide per year into the atmosphere, an amount expected to reach twelve gigatons per year by 2100 AD. Between the last glacial maximum and the Industrial Revolution in 1850, the level of carbon dioxide in Earth's atmosphere increased by less than the increase between the Industrial Revolution and today. The delay in climatic response associated with the thermal inertia of the oceans means we have only just begun to feel the impact. Climate models indicate that even with rapid reductions in greenhouse gas emissions, global average temperatures will continue increasing to levels warmer than anything Earth has experienced over the last seven hundred thousand years or humans have ever experienced.

At the University of Victoria, an interdisciplinary team using climate model output, paleoproxy data, and archaeological data is interrelating worldwide variations in climate with archaeological evidence, endeavoring to isolate the extent to which climatic events may have influenced human adaptability and migration in the past in order to assist in understanding the potential impact of current and future climate change.