

LATER LIFE LEARNING

SERIES B: Climate Change, Catastrophe and the Tides of History
Fridays, 10:00 – 11:45 am, January 12 – March 23, 2018
No class February 23, 2018 for Reading Week

Innis College, Town Hall

Lecturer: *Tony Davis is an Emeritus Professor in the Department of Geography at the University of Toronto. As a bio-geographer, his research focussed on the reconstruction of past environments using pollen analysis. Although officially retired for over a decade, Tony continued to teach a large introductory course on human-environment interactions until three years ago. He is very active with lifelong learning groups in Mississauga, Etobicoke and with LLL. This will be his third series for LLL.*

Overview:

Climate change has driven the evolution of life, the emergence of humans and their movement around the world. It has determined where and when civilization emerged. In the last two thousand years, it has regulated the rise and fall of many societies. In this lecture series, we will explore how climate change continues to exert enormous control over how we occupy the earth and our very survival.

Weekly Schedule:

1. Friday, January 12: Earth History and Changing Climate.

What is climate and how do we measure it? Information on past climate spans nearly four billion years, but it's plentiful only for the last half billion years. What is the nature of the record? What does it tell us? How do past climates compare to what we have today?

2. Friday, January 19: Understanding Earth Climate.

The Earth is located in our solar system's Goldilocks Zone (not too hot, not too cold, etc.). That suggests that the critical control on our climate is distance from the sun, but the internal processes of our planet (plate tectonics) also play a major role. They control the carbon cycle and atmospheric chemistry and thus the processing of solar radiation.

3. Friday, January 26: Climate and Evolution.

Over the last half billion years, life has become more diverse and complex. Although there seems to have been an increase in diversity through that time, the record is marked by several episodes of mass extinction. Five major events are recognized. The largest, at the end of the Permian, may have eliminated 70-90% of species. Each extinction provides opportunities for survivors. The biological modernization of our world comes after the extinction event at the Cretaceous-Tertiary boundary, about sixty-five million years ago. Climate change appears to have been heavily involved in all of these events.

4. Friday, February 2: Ice Advances and Retreats – the Quaternary.

From about twenty-five million years ago, Earth's climate cooled and became more seasonal. This culminated in the series of pulse-like ice advances and retreats that have marked the last two million years. Cooling climate constrained the evolution of hominids and their spread around the world.

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5. Friday, February 9: Climate Change and Agricultural Origins

Guest Lecturer: *Dr. Gary Crawford: Professor Gary Crawford (Anthropology, University of Toronto at Mississauga) studies ancient human ecology. He pioneered research into plant- people relationships (Paleoethnobotany) in Ontario and in China. He has published two textbooks, a monograph on Japanese archaeology, hosted a television series for TV Ontario and is a Fellow of the Royal Society of Canada.*

The impact and role of climate change in agricultural origins has been of considerable interest to archaeology. Did people develop agriculture as a response to the pronounced climate change at the end of the Pleistocene or were other influences involved? While agriculture developed in several regions of China from about 10,000 years ago developing cultures in Japan never emphasized agriculture in the same way. Why?

6. Friday February 16: El Nino (ENSO) and the Early Civilizations of the Americas.

El Nino is a periodic climatic phenomenon initiated by the reversal of oceanic and atmospheric circulations in the equatorial Pacific, but its effects are global. Severe ENSO events may have catastrophic consequences. Several major famines in India and China have been attributed to ENSO. It is likely that multiple ENSO events were responsible for the demise of the Maya in Central America, the Moche, Chimu and Nazca in South America and the Anasazi in the Chaco Canyon area of the US southwest.

*** NO CLASS on February 23 - Reading Week**

7. Friday, March 2: The Medieval Warm Epoch.

The time since the last ice retreat, the Holocene, is marked by a series of climatic shifts that lasted for decades to centuries. Some appear to be global, while others are largely regional phenomena. One of these was the Medieval Warm Epoch, between 950 and 1350 AD. It's marked by an expansion of agriculture into higher latitudes and altitudes, but is best remembered for its coincidence with Norse expansion across Europe and the North Atlantic.

8. Friday, March 9: The Little Ice Age.

The period of cooling after the Medieval Warm Epoch known as the Little Ice Age lasted from about 1350 AD to 1850 AD. It was marked by an expansion of glaciers, retrenchment of agriculture and widespread famine in Europe, depopulation in Iceland, and the demise of the Greenland settlements. It was also a time of cultural and economic shifts – the rapid expansion of European influence across the globe, for example. Were the French Revolution and the Irish potato famine products of the LIA?

9. Friday, March 16: Contemporary Climate Change ('global warming'): Causes.

Our activities have radically altered the Earth's surface and the chemistry and behaviour of its atmosphere. The major culprit, the burning of fossil fuels, has increased the concentration of greenhouse gasses, notably carbon and methane. Although we focus on rising temperature, the package is complex and includes increasing climatic variability, increased storminess, higher intensity ENSO events and rising sea-levels.

10. Friday, March 23: Contemporary Climatic Change: Consequences.

Increasing temperature is likely to be accompanied by increasingly unpredictable weather, water shortages, less productive/less secure agriculture and political and economic instability. One immediate impact is rising sea-level. Some project that perhaps a billion people will be displaced. Many of the small island nations in the Pacific and Indian Oceans are likely to disappear within a few decades.