

It is only a question of time, however, until human induced effects become distinguishable from natural effects. Given the immensity of climatic systems, we can anticipate that once these changes are precipitated, there will be little that humanity can do but watch them unfold and try to adapt to them.

There is debate regarding how quickly society should respond to this threat and how far-reaching public policy initiatives should be at this time. There is little disagreement, however, that we are conducting a global experiment in atmospheric chemistry with little understanding of how it will turn out. Testifying before our Committee on the extent of scientific agreement about the reality of global warming, James Bruce, a leading Canadian authority on climate change, remarked:

... I think on any scientific topic you care to name you can probably find a few scientists who will dissent from the general view of the subject. I have chaired and participated in many meetings with the leading scientists of the world on this topic and I would say I have rarely seen such a consensus on what will happen with increased greenhouse gases in the world's atmosphere. (House of Commons, Standing Committee on Environment, Minutes of Proceedings and Evidence, Issue No. 30, 25 January 1990, p. 45)

Society's emissions of greenhouse gases are changing the chemical composition of the atmosphere at a rate unparalleled in human history. We understand that altering the Earth's climate will have far-reaching impacts on the social, economic and natural systems of our world. The current scientific consensus is that we are already committed to an increase in average global temperature ranging from 1.5°C to 4.5°C in the first half of the 21st century. Warming is expected to be more pronounced at higher latitudes and temperature increases will be accompanied by changes in climatic conditions that are not readily predictable. Patterns of agriculture and water resources will be affected.

Sea Level Rise

Sea level is projected to rise roughly one metre by 2050, flooding coastal lowlands and islands and reducing freshwater supplies as saltwater intrudes into the groundwater regime. Higher temperatures will cause some permafrost, mountain glaciers and polar ice to melt. The upper layers of the oceans will expand through warming, adding to the rise in sea level. Canada could experience a substantial loss of land on Prince Edward Island, the Hudson Bay coastline, and in river deltas such as the lower Fraser and the Mackenzie. A rise in sea level could be catastrophic for low-lying countries and island states. Millions of people could be forced to relocate from the delta regions of Bangladesh and Egypt alone. The Republic of Maldives in the Indian Ocean, with a population of 200,000, has been described by its President as an "endangered nation".

Climate Instability

Populations in many regions of the world could be subjected to increasingly severe and unpredictable cyclonic storms, and more erratic weather patterns. Regional changes in precipitation patterns will occur, concomitant with regional variability in temperature increases. Altered climates would affect world food security by changing agricultural productivity, and would affect the productivity and biological diversity of natural ecosystems, particularly forests.