**The Anthropocene and Planetary Boundaries**

**Will Steffen**

The Australian National University & The Stockholm Resilience Centre

Abstract

The Anthropocene, which provides the scientific context for the planetary boundaries concept, is now widely used in the global change research community as a framework for the rapidly growing human influence on the planet and its implications for the functioning of the global environment – “the Earth System”. The human imprint goes far beyond climate change to include accelerating loss of biodiversity, modification of global element cycles such as nitrogen and phosphorus, and more direct impacts on the structure and functioning of ecosystems. Since the middle of the 20th century, the human influence on the planet has been particularly profound, a period sometimes called the Great Acceleration. The cumulative effect of all of these human-driven changes is that the Earth is now moving out of its present geological epoch, the Holocene, into the proposed new Anthropocene epoch. Humanity faces an uncertain future in the Anthropocene, as the Holocene is the only state of the Earth System that we know for certain can support agriculture, villages and cities and the complex contemporary civilization that we enjoy today.

Planetary boundaries, based on the scientific underpinnings of Earth System science and resilience theory, is a framework that is designed to contribute to the quest for global sustainability. The approach does this by defining a small number – nine, to be precise – of Earth System processes and features that together define the state of the System. The aim is to determine what boundaries exist for these processes and features that mark the transition out of the Holocene into another state of the Earth System. The goal is to retain the Earth in a Holocene-like state so that prosperous, complex human societies can continue to exist. In essence, the planetary boundaries define a safe operating space in which humanity can continue to develop and thrive.

Speaker Biography

Professor Will Steffen is a Commissioner in the Australian Government’s Climate Commission, and is a climate and global change researcher at the Australian National University (ANU), Canberra. He served on the Multi-Party Climate Change Committee (MPCCC) in 2010-11, and is also Chair of the Antarctic Science Advisory Committee. From 1998 to mid-2004, Steffen served as Executive Director of the International Geosphere-Biosphere Programme, based in Stockholm, Sweden, and is currently a guest researcher at the Stockholm Resilience Centre. His research interests span a broad range within the fields of climate and Earth System science, with an emphasis on incorporation of human processes in Earth System modelling and analysis; and on sustainability and climate change.