WALLACE S. BROECKER

BBVA Foundation Frontiers of Knowledge Award in Climate Change 2008

The BBVA Foundation Frontiers of Knowledge Award in the Climate Change category goes to U.S. researcher Wallace S. Broecker, the first scientist to alert the world to planetary warming. The prize jury cited the seminal nature of Broecker's work and his knowledge contributions with regard to the "abrupt changes" triggering extreme and sudden movements in the climate system.

A pioneer in the study of global warming, Wallace S. Broecker (United States, 1931) predicted the existence of climate warming due to human activity more than three decades ago. In 1975, Broecker published the article "Climate Change: Are We on the Brink of a Pronounced Global Warming?" in the journal *Science*, marking the first ever mention of the term "global warming" in a scientific publication. In this article, he also predicted that the rise in anthropogenic CO_2 emissions would weaken the ocean's ability to withdraw carbon dioxide from the atmosphere, leading to pronounced warming at the start of the 21st century – a prediction that has proved all too true.

Broecker was one of the first scientists to confirm the importance of air-sea interaction in climate regulation through CO_2 exchange, and to examine the physical processes responsible for carbon transport to the deep ocean. He has also contributed fundamentally to our understanding of the dynamics of climate change and the relationships between hydrological cycles and ocean circulation.

Seminal research

The jury singled out the ground-breaking quality of Broecker's work, which has opened up new avenues of research vital to our understanding of climate and its evolution: "his research into the oceans' biological and chemical processes pioneered the development of Earth System Science as the basis for understanding global climate change, both past and present".

Special mention goes to the laureate's knowledge contribution with regard to "abrupt changes"; processes which trigger extreme and sudden changes in the climate system. Today's rapid thawing of the Arctic polar cap threatens one such abrupt event: the alteration of the main current distributing heat across ocean basins (the thermohaline circulation, also known as the oceanic heat conveyor belt).

Broecker is, furthermore, an eloquent educator and a forceful champion of efforts to address the risks of greenhouse gas emissions from human activities. In this respect, Prof. Broecker confesses himself "a little disappointed that we haven't taken stronger actions. It has taken a lot of time to convince the citizens of almost every country to realize that this is a very serious problem". Broecker is convinced that this century we are going to experience "what the late Roger Revelle said was man's greatest geophysical experiment, and in many ways it is, because our computer models are inadequate to fill in the details. We will find out when it happens. We will see what it does to almost everything on the planet. Some things good, some things bad".

Wallace S. Broecker is Professor of Earth and Environmental Sciences at the Lamont-Doherty Earth Observatory of Columbia University (New York).