

IPCC, CLIMATE CHANGE RESEARCH AND THE MARINE ENVIRONMENT

Jean-Pascal van Ypersele

Georges Lemaître Centre for Earth and Climate Research, Earth and Life Institute, Université catholique de Louvain, 2, Chemin du Cyclotron, L7.01.11, 1348 Louvain-la-Neuve, Belgium
E-mail: jean-pascal.vanypersle@uclouvain.be

Climate change due to human activities is happening now. The massive combustion of fossil fuels since the industrial revolution increased the atmospheric concentration of carbon dioxide, the main anthropogenic greenhouse gas, by 40% between 1750 and 2010. The additional infrared heat trapping due to this change in atmospheric composition will continue to increase the average global surface air temperature and modify the Earth's climate. In its fourth Assessment Report (AR4, 2007), the Intergovernmental Panel on Climate Change (IPCC) Working Group I reports that in the absence of climate protection policies, continued emissions are likely to increase this global temperature by 1.6 to 6.9°C between the pre-industrial period and 2100, depending on which scenario and model is used. Such rates of global climate change are rapid and very unusual in the context of changes over the past two million years. Through thermal expansion and the melting of glaciers and ice sheets, this warming is causing sea level to increase, and ocean currents and even the thermohaline circulation will be influenced. The hydrological cycle will also be affected, with, e.g., significant drying of the average Mediterranean basin. Besides changes in the average climate, the probability of occurrence of heat waves (virtually certain), heavy precipitation events (very likely), intense tropical cyclones (likely), and extreme high sea level (likely) is due to increase in a warming climate.

IPCC Working Group II assessed the impacts that would accompany such warming. Some of them are specific to the oceans: e.g., coral bleaching would increase, and coastal regions would be subjected to increased damage from flood and storms. Ocean acidification due to the increased carbon dioxide flow to the oceans risks to further affect marine life.

The oceans will receive particular attention in the fifth Assessment Report (AR5) of the IPCC. For the first time, a specific chapter will be devoted to 'Open Oceans' in the Working Group II contribution.

This talk will review those elements, and explain the role of the IPCC in assessing them so that all decision-makers have the best policy-relevant (but not policy-prescriptive) information at their disposal. Research on the marine environment will be key to provide improved knowledge to be assessed by IPCC.