Climate change is arguably the most pressing issue faced by humanity today. As outlined in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) published in 2007, the impact of human activity on the global climate system, resulting from atmospheric pollution and destruction of ecosystems, is profound. Furthermore, this impact is increasing, and the rates of environmental change are accelerating to levels unprecedented in recorded history. However, the responses of key components of the Earth system, such as ocean circulation, ice mass stability and ecosystem functionality, to climate change is uncertain and difficult to quantify on defined time-scales. Because of this uncertainty, well-informed planning for future environmental change, which requires an urgent and high-priority response, remains a major challenge. An interdisciplinary and integrative approach is necessary to obtain a complete understanding of climate change and to translate uncertain climate forecasts into predictions, thereby informing effective policy decisions.

The universities of Aberystwyth, Bangor, Cardiff and Swansea have therefore joined together to launch the Climate Change Consortium of Wales (C3W). This is a £4 million initiative financed by the Welsh Assembly Government (WAG) through the Higher Education Funding Council for Wales (HEFCW). Together with additional support from the Countryside Council for Wales and substantial investment from the four universities, C3W is set to considerably enhance the climate science profile of Wales. The Consortium has been developed by a group of internationally respected academics in collaboration with staff in a wide range of disciplines across the four universities. These disciplines cover the impact of climate change on land, sea, atmosphere and cryosphere, as well as its social and political consequences.

The aims of C3W are to:

• improve our fundamental understanding of the causes, nature, timing and consequences of climate change on Earth’s environment and on human civilisation, and
• reconfigure climate research in Wales as an internationally recognisable centre of excellence.

C3W provides a central focus for around 200 academic staff across the four universities who work in the field of climate change, and will encourage formal collaboration between departments and universities, in addition to building upon already established networks of UK and international partners. The intention is to be able to inform the decision-making process concerning a sustainable future for Wales, and provide relevant, up-to-date information for schools, universities, businesses and the wider public, so that we can all make informed choices about our future lifestyles.

C3W has identified four ‘Grand Challenges’ that need to be addressed through an interdisciplinary approach: Earth system modelling; sea-level change; hazard evaluation, mitigation and adaptation; and the Welsh dimension of climate change. Within this context, IBERS research on climate change and disease, greenhouse gas emissions from livestock, plant breeding and biofuels is particularly relevant. Much of this activity already takes place within the Aberystwyth-Bangor Research and Enterprise Partnership. Elsewhere, in other departments, a number of collaborative ventures are already underway, including an assessment of the stability of the Greenland Ice Sheet which is implicated in future rising sea levels, and a study of how the past sedimentary record in the North Atlantic Ocean can inform us about future climate responses to oceanic circulation. How humans in Wales respond to climate change issues is also being explored. Despite the strength of scientific arguments
indicating that humans are contributing to global warming, there remains a strong lobby that opposes these arguments, and many members of the public remain unconvinced. It is therefore imperative that scientists continue to gather the best available data to evaluate the uncertainties of interpretation, and then present their results in a user-friendly fashion to the wider community.

Climate change will have an impact on the uplands of Wales (the Rhinog Mountains/Rhinogydd).

Investigation of the Antarctic Ice Sheet has implications for global sea-level rise.

Climate change scenarios.

The four universities are equal partners in this enterprise, with co-ordination being undertaken by Aberystwyth. Climate change issues are being addressed by Welsh academics not only within Wales, but across the whole planet, from the Antarctic through the tropics to the Arctic and from land to the deep oceans. Together, they have a global perspective that can be brought to bear on planning for our collective future.