

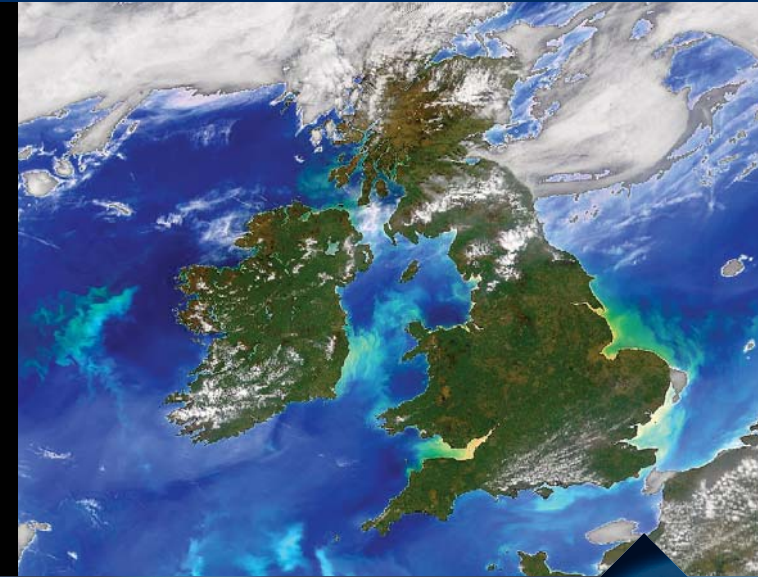
*Warming of the climate system is unequivocal ... For the next two decades a warming of about 0.2°C per decade is projected. It is very likely that hot extremes, heat waves, and heavy precipitation events will continue to become more frequent [IPCC AR4 2007].*



Professor Peter Lynch,  
UCD School of Mathematical Sciences



*The Blue Marble. NASA image of the Earth.*



The establishment of the UCD Meteorology & Climate Centre was one of the most exciting developments in meteorology in Ireland in recent years. The Centre, set up in 2004, is within the UCD School of Mathematical Sciences, and it is now the leading academic centre in Ireland for meteorology and climate science.

The new undergraduate B.Sc. programme, Climate and Earth System Science, commenced in September, 2007. This four-year degree programme (CAO Code: DN038) provides a thorough grounding in Climate and Earth System Science. In addition, students take modules in mathematics, applied mathematics, physics, geology and computer programming.

The Meteorology & Climate Centre works in partnership with Met Éireann in the C4I Project (Community Climate Change Consortium for Ireland), developing regional climate models to study climate change and its consequences. The Centre is also closely associated with the UCD Complex Adaptive Systems Laboratory (CASL) and the UCD Earth Institute.

Several computer models are used for research in the Centre. The COSMO model is run regularly to provide high-resolution experimental short-range wind forecasts. The website of the Centre is updated on a regular basis. News items are posted, and seminars announced there. Lecture notes are accessible to students.

<http://www.ucd.ie/meteorology>

## BSc in Climate and Earth System Science

### How do I find out more about this Degree Programme?

You can get more information by calling, emailing or writing to

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Eruption of Arenal Volcano, Costa Rica.

## What is Climate and Earth System Science?

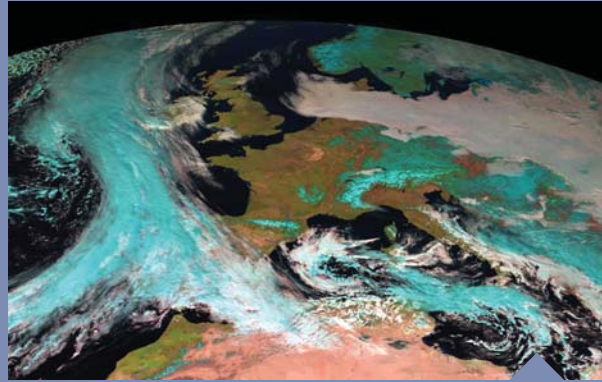
*“Climate change is the greatest global challenge facing humankind in the twenty-first century.”*

[Declaration of World Economic Forum]

If you are interested in global warming, this could be the degree for you. The climate involves not just the atmosphere and oceans, but also the entire Earth system, including polar icecaps, the biosphere and processes deep beneath the Earth’s surface. The rapidity with which changes are happening makes climate a vital area of study. The consequences of changes in climate for humankind will be profound.

The Earth is warmer now than at any time in the past 400,000 years. Climate change is a reality, and it is taking us into unknown territory. Temperature rises of between 1.5° and 6.5° are predicted. Increases in the frequency and severity of stormy weather are anticipated. Heat waves in Europe are likely to occur more often and last longer. The entire Earth System is inter-linked. There is strong coupling between the oceans, the atmosphere, and the processes in the solid earth, and there are complex interactions and feedbacks between these systems. Thus, it is vital to consider the entire Earth system as a unit. This is Earth System Science.

It is important that more young scientists learn about the Earth System, so that the very serious problems facing us can be addressed. This degree programme, for students with good mathematical ability, will introduce you to some of the most exciting research, and some of the most urgent problems facing us today.



Front approaching Ireland and snow over the Alps (Eumetsat RGB composite image).

## What will I study as part of my degree?

This new degree programme focuses on the Earth and our climate systems, providing a thorough understanding of the nature, controls and dynamics of the interacting physical and geological processes. Meteorology is concerned with the structure and dynamics of the atmosphere. Oceanography embraces the physics and dynamics of the ocean, and its interaction with the Earth and atmosphere.

Geology seeks to answer fundamental questions regarding the structure and age of the Earth, how it has evolved, its processes and the history of life.

All these components are part of Earth System Science. During the first two stages of the programme, students take modules in Mathematics, Physics, Geology and Computer Programming, as well as introductory modules on Earth System Science, including hydrology, volcanology and seismology. There are optional modules in Chemistry and Statistics and additional modules in Applied Mathematics.

In the third and fourth stages, more advanced modules in Climate & Earth System Science are at the centre of the programme. The programme includes some geological field studies and practical work in meteorological instrumentation. For admission to the programme, students must have a C3 or better in Higher Leaving Certificate Maths.



Cumulonimbus incus: Massive thunder-cloud with spreading anvil.

## What are the opportunities for graduates in Climate and Earth System Science?

Climate Change is important in all areas of life in Ireland. It will impact on:

- |                                 |                              |
|---------------------------------|------------------------------|
| <b>Hydrology</b>                | <b>Agriculture</b>           |
| <b>Fisheries &amp; Forestry</b> | <b>Natural environment</b>   |
| <b>Energy policy</b>            | <b>Tourism</b>               |
| <b>Human health and welfare</b> | <b>Legal &amp; Insurance</b> |

So, a wide range of public bodies and private companies are interested in employing graduates in Climate and Earth System Science. There are opportunities in many Government agencies: Met Éireann, the Marine Institute, the Geological Survey of Ireland and the Environmental Protection Agency. European National Meteorological Services and Geological Agencies also provide opportunities for employment.

There are an increasing number of commercial weather organizations seeking staff, for example, Fugro, WSI, Meteogroup and Accuweather. This is a growth area, so there should be more opportunities in the future. There are also openings for Postgraduate Studies in the UCD Schools of Mathematical Sciences and Geological Sciences. A taught Master of Science programme in meteorology is offered each year. Both Schools have vibrant research communities of PhD students and postdoctoral researchers with an international outlook.