



It's hard to imagine a more important focus for research than our environment, since all life depends upon it.

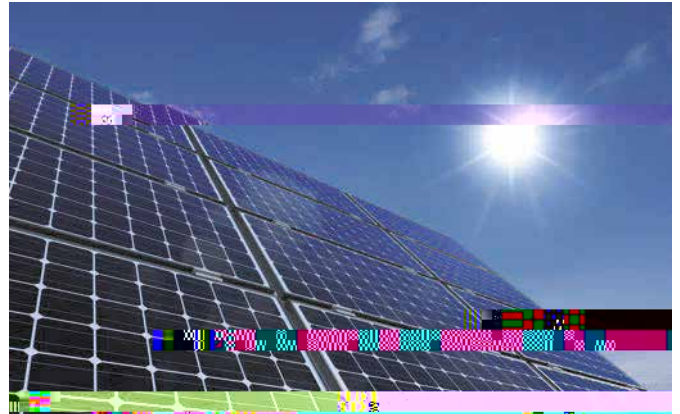
This brochure provides a snapshot of some of the key areas of research at Durham University that are having an impact on the environment and potentially all of our lives.

- We are helping to ensure that water is used sustainably, to avoid future shortages, by working with partners to ensure that water is used sustainably.

Decarbonising heat

Geothermal energy could provide over 100 years' worth of reliable, low-carbon energy in the UK. That's according to researchers at Durham Energy Institute (DEI) who are exploring ways of decarbonising heat. Around half of Europe's energy is used to provide heat and almost all of your heat comes from burning fossil fuels.

DEI researchers say we can harness warm water from the UK's flooded mines to heat our homes and workplaces. To support this work, we've engaged with communities and local authorities in former mining areas, and politicians nationally, on what could be a low-carbon, secure, affordable heat source.



Greater solar efficiency

Physicists are working on ways to make solar power cheaper and more efficient while also using less material.

Together with partners, we've been looking at why solar panels made from cadmium telluride produce cheaper electricity than traditional silicon panels.

Researchers found that a substance called selenium stops tiny electrons from becoming trapped and lost in miniscule defects in panels, increasing the amount of power that can be extracted.



Cheaper offshore wind power

Durham is working with industry and other universities to reduce the cost of electricity generated by offshore wind farms by improving the efficiency of wind turbines.

Cleaning up oil spills

Oil spills can have a hugely damaging impact on the environment and wildlife. Cleaning up spills is by no means simple and there is a clear need for new, easy and quick ways to separate oil from water.

Our surface scientists have now developed a coated mesh that could be a faster and more eco-friendly way to clean up oil.

The stainless steel mesh, similar to what you might find in screen doors to keep out flies, not only separates oil from water, but also kills water-borne bacteria very successfully.

Tests have so far shown the mesh separates oil from water with 100 per cent efficiency and kills at least 99.9 per cent of E Coli and Staphylococcus bacteria in the water.

Current studies are testing the patent pending coated meshes for real world applications.

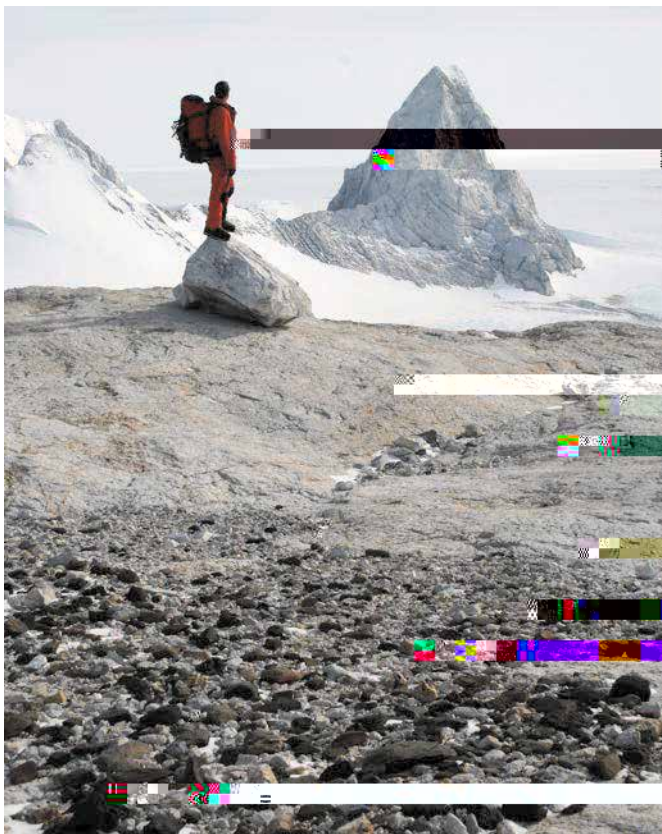
Food security and conservation in a changing climate

Durham's bioscientists are monitoring the effect of climate change on plant and bird life to support food security and conservation. Our researchers have found a protein that controls how plant roots grow and adapt to soil conditions.

Understanding the threat of melting ice sheets

Rising sea levels caused by melting ice sheets threaten coastal areas around the world, including major cities such as London. To help plan for the future and mitigate the effects, our scientists are studying the structure and dynamics of glaciers and how oceans interact with them.

With our international partners, we conducted a satellite survey of the Antarctic ice sheet, the most detailed yet carried out, showing that melting has accelerated in recent years. In another project, we are drilling cores from the sea bed to see what fossil plankton can tell us about previous climate change events and how ice sheets have responded.



The tiny bug that could help provide clean water

A tiny bug called a springtail is the inspiration for new technology that could help to provide clean drinking water. The springtail has a special pattern on the surface of its body to repel water very efficiently and our scientists are working with industry to use this design in water filters that can remove contamination. In another project, tiles with a special surface coating are being used to 'harvest' fog, condensing it into drinking water.

Protecting people from natural disasters

Many people live with the threat of natural disasters and while most cannot be prevented, the toll of death, injury and damage can be reduced by careful planning based on research.

In Nepal, we have been working with authorities and aid agencies to increase resilience to earthquakes and landslides, for example by identifying the communities at greatest risk and providing advice about where to deploy emergency aid equipment. We have also been asking local people about their concerns and giving them a voice in decision-making.

In Hawaii, we have studied the health effects of breathing volcanic ash and provided advice on the best design of mask to protect residents. The haze caused by an eruption is known as 'vog' and can cause severe respiratory problems.

In Europe, outbreaks of summer wildfires and the environmental conditions that cause them are being studied by our researchers, so they can be predicted and their effects mitigated.

Plastic concrete

Three PhD students who developed a method of recycling waste plastic by turning it into concrete aggregate have set up a business to commercialise the idea. Award-winning Plastech Innovations aims to reduce the amount of plastic in our oceans and landfill sites.

