

Thank you, John, and thank you to the FST, in making this debate part of NERC's 50th celebrations.

Eighteen months or so ago, the BIS biannual survey of UK science excellence placed environmental science in first place in the UK in terms of field-weighted impact, and, per £, the world. That is a nice position for a Chief Executive of a research council to find himself. But what struck me as forcefully was what was occurring in competitor countries. Not just our established scientific competitors, but others, such as South Korea and China. In all cases, one saw an upward movement in environmental sciences. It would be nice to conclude that there has, in the last three years, been global rise in the intelligence and competence of environmental sciences, although, speaking for myself, that seems unlikely. Citations measure interest as much as quality. The message I took from the report was the ever-growing importance, in policy, society and business, of environmental sciences.

There are many other signs of the rising importance of environmental science. The post 2015 millennial goals, now under discussion at the UN, differ from the millennial goals by their explicit recognition that the desire of much of the world's population to obtain living standards that we take for granted may place demands on the environment that it might not meet.

There is another message in these goals too. It is that the question of resource extraction versus environmental protection is out of date. There is very little of the 'natural' world left. The terrestrial land surface is now almost completely given over to production. Global chemical cycles, of nitrogen, for example, have been altered out of all recognition. The issue is no longer one of preservation – we are some way past that point - it is, for those that seek it – to address why that aids the pursuit of human wellbeing.

What is the role of a research council in this? What it is not is to judge, it is to inform. If one imagines some castaways in a very cold hut one month from rescue, it is a scientific fact that if they burn one log per night they have a 30% probability of survival; or if they burn all the logs in the first night they have a 10⁻³ chance of anyone surviving. But the actual decision as to how many logs to burn is not a scientific one.

But this is not to underestimate the impact for independent, objective advice. The 50 years of NERC history has many examples of this impact. I will illustrate with three. We are all familiar with the discovery of the Ozone hole. What is perhaps less appreciated is that while it is associated with Antarctica, it is the northern hemisphere where depletion would have greatest impact on people and agriculture. There was a paper just recently showing that without the Montreal Protocol, UV radiation in northern Europe would be 10% higher than it is today.

We have today concerns in the UK over air quality. We can overlook how improved it is. It is a telling statistic that in the 1980's, the sulphur content of

the air in the Outer Hebrides was higher than it is in central London today. The unravelling of the story of acid rain and its impact on the UK and continental environment was instrumental in our cleaning up our energy production act.

Finally, there was 18 months ago a high wind, wave and tide event that was as large as the 1953 event that caused widespread devastation on the east coast of the UK and in the Low Countries. This time, however, it was unnoticed – save perhaps as a tourist attraction. This is a testament to the understanding, born of NERC-funded work and then outwards through the Met Office and beyond, in informing our coastal defences and response.

Independent, objective advice has had a tremendous effect on UK policy, no more so than concerns the environment.

In 1964 as the present research councils were coming into being, the proposal was to create a 'Natural Resources Research Council'. The emergence of the 'Natural Environment Research Council' was, even then, recognition of the tension between benefitting from the environment and the demands on it. We have become familiar with the concept of a 'safe' limit on CO₂ in the physical climate – to which NERC and the UK have made enormous contribution. But there remains questions of the same order to which we have much less insight. 'Is there a minimum safe level of biodiversity, or maximum demand on soils and water?' for example. More applied, 'What economic framework do we use to judge the tension that will meet wide agreement?'

I have no doubt that NERC, along with its sister councils, will have its work cut out in the next 50 years, just as it has in the last 50.