

# 21 Earth Sciences

## Earth Sciences in the 21<sup>st</sup> century: *A forward look: 18<sup>th</sup> January 2010*

### Impressions and comments

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Earth Science research concerned with the solid earth is significantly under-represented in NERC directed research, forms a minor component of current theme action plans and is largely absent from the research portfolios of the theme leaders. This may be because the community has failed to identify and communicate the important areas whose resolution is essential for NERC to achieve its strategic objectives and which will accomplish results of high impact.

The results of the discussion here today are heartening for Earth Scientists in that they have identified 'Earth' topics which are central to many key areas of the NERC strategy. These include sustainable use of resources, applied geosciences, hazards, climate change, which is of urgent concern to society, as well as topics which are of primarily of scientific and public interest but which may provide important and unexpected insights into the behaviour of our planet and its surficial environment. For example the records recovered from sediment cores in the deep oceans will be critical to understanding palaeo-climate and palaeo-oceanography and these high resolution records will provide the only real ground-truthing of the climate models used to predict climate change. Solid Earth science topics of considerable societal interest include the origin and evolution of life and the surface environment that has sustained life over the history of the Earth, as well as the interior structure, composition and dynamics of our planet.

While identifying the first order research problems whose impact will justify special treatment, it is important to maintain a wide and skilled research base. Two examples close to home illustrate this. BP's donation of ~ £25 million to endow the BP Institute of Multi-Phase flow followed directly from research into mantle melting at Cambridge, a topic not obviously of interest to an oil company. Secondly research into geological carbon storage is now urgently needed as society plans to implement this as part of the strategy to reduce anthropogenic carbon emissions. The skills and training of members of my research group are derived primarily from metamorphic petrology, a subject not previously seen to have much immediate applied application.

To do high impact science it is important not to neglect the resources needed. These include trained numerate scientists, well equipped analytical laboratories and the facilities and abilities to make field observations. A broad research base is the foundation for the interdisciplinary research now seen as essential. Given the funding of Universities through FEC, support for research across the subject area will be essential to maintaining this broad research base.