Consultation response

Royal Geographical Society with IBG

Advancing geography and geographical learning

House of Commons Science and Technology Committee

The Impact of Spending Cuts on Science and Scientific Research

1. The Royal Geographical Society (with The Institute of British Geographers) is the learned society and professional body for geography. Formed in 1830, our Royal Charter is for 'the advancement of geographical science'. We have more than 15,000 members and Fellows, of whom a substantial number are academics and other researchers whose work we support through a range of activities. These include holding the largest geographical research conference in Europe, publishing three international peer-reviewed journals, one of which (Transactions of the IBG) is the top ranked geographical journal in the world, co-ordinating specialist research groups and providing funding opportunities for researchers at all careers stages. We work closely with all HE geography departments.

2. As a discipline, geography is uniquely placed within the debate on science and scientific research, as a subject that combines physical science with social science and humanities. Since many of the scientific environmental issues facing the world have their causes and solutions in societal and individual behaviours, geography occupies a key research niche. It spans both SET¹ and non-SET funded areas in scope. The discipline is at the forefront of the tensions between SET and non-SET funding streams and suffers from the inadequate manner in which such 'interdisciplinary' subjects are funded.

3. The Society strongly recommends that before cutting/restricting science, engineering and technology (SET) designation/funding, the current arbitrary decisions on what is/is not SET classified need to be reconsidered. When it suits government geography is classed as a science; and vice-versa. For example, recent policy and skills and training documents include geography within SET and there are clear and convincing arguments as to the science research base in geography (see point 7). However, currently it is funded for QR (by HEFCE) entirely as a non-SET subject, which is placing unacceptable strains on properly resourcing the science-base of the discipline. It should be recognised for what it is, a part-STEM subject, and funded accordingly and with STEM protection for its 50% science component.

4. HEFCE is aware that there are inconsistencies of funding scientific research at the STEM: non-STEM boundary. The same piece of science conducted from a Geography department attracts substantially less QR resource than had it been conducted from an Environmental Science department or another STEM designated subject. Thus the true costs of conducting quality science are not being covered under the non-STEM funding for geography. Unless the current consideration and the consultations being undertaken HEFCE can address the STEM lottery, further reductions in UK Science and Innovation, in an area that is increasingly being profiled by NERC and others as important to the nation – the environmental sciences - seem inevitable. Geography and geographers make a substantial contribution to research in the environmental sciences.

5. As the learned society representing and promoting the discipline we have sought evidence and considered opinions about the position of geography from across the academic community, including all departments of geography in the UK, our Fellows and members, and the Society's research groups. Much of this evidence has also contributed to our response to the recent HEFCE consultation on the Research Excellence Framework (REF).

¹ We use STEM and SET interchangeably

6. That evidence has shown the important contribution of geography to science-based research 6a. The formal report of the Geography and Environmental Studies Panel in RAE 2008 concluded that 50% of geographical scholarship is scientific work – environmental science - of high quality. Science-based geographers are publishing in the same journals as other environmental scientists and attract substantial research grant income per capita. Evidence of sustained, even increased, emphasis on the science base of Geography can be seen in the level of SRIF investment that occurred in the 2001-2008 period, and is explicitly referenced in the RA5a returns for the 2008 RAE. In total, the available data reveals £30.7m of SRIF investment in laboratory facilities and the scientific equipment needed as research infrastructure to support research-active staff working in Geography departments on environmental research. This figure is directly comparable to Earth Systems and Environmental Science, for which the comparable data on SRIF investment is £34.4m.

6b. Geographers work on some of the key environmental and linked societal issues challenging policy today: including climate change, its causes and effects, at local, regional and international scales; fluvial processes and flooding; glacier dynamics and processes of accelerated melting; land use change and sustainable development. Specific examples of STEM related work by geographers include groups working at the core of international efforts to measure rates of sea level change (Durham, Plymouth); assessing environmental degradation in lake systems (UCL, Loughborough); developing polar and alpine ice mass models to understand how they link to global environmental systems (Cambridge, Edinburgh, Aberystwyth); understanding rates of abrupt climate change and how environmental processes and humans respond (RHUL, UCL); interfacing with climate modellers to develop Earth System Science models (Bristol); and mapping how humans have altered vegetation patterns and cover (Oxford, Southampton). This research has economic as well as environmental, social, cultural, and policy value and impact.

7. Examples of economic value from geographical science research

While it remains difficult to put a precise economic value on the impact of research in most cases, some geographical science research can be clearly linked to economic benefits. Among the many examples are: Professor John Thornes' (Geography, Birmingham) development of new technologies in the measurement, mapping and modelling of ice on road/railways has led to substantial reductions in the 'cost' of road accidents, more efficient applications of salt and grit by local authorities, and the formation of two private spin-off companies (Thermal Mapping International). Estimates of the cost benefit suggest the new system saves £3,224 million (2006 prices) per year in the UK². Dr Kevin Tansey and Professor Heiko Balzter's (Geography, Leicester), work on G-STEP (GMES Space and Technology Exchange Partnership), which supports and speeds up the use of Earth Observation (EO) data and information services, both by businesses and policy makers. Dr Hannah Cloke's (Geography, King's College London) development of an early flood warning system has been demonstrated successfully in the Upper Severn catchment in the UK and subsequently applied in the Upper Huai catchment in China.

8. Balance of science and social science/humanities research in Geography

Geography has long been recognized as a part-science discipline. It has been assigned, for example, a subject cost-weighting for research for a "part-laboratory" subject. At 1.3, this weighting is mid-way between that for social science/humanities subjects at 1.0, and science subjects at 1.6. This accurately reflects the evidenced 50/50 split in geography research between natural science and social sciences/humanities and recognizes the significant laboratory-based research needs in physical geography and IT needs of modelling and sophisticated applications of GIS. A similar approach applies to support for teaching.

9. The most pressing circumstances in which Geography's significant environmental science contribution fails to be recognized and supported is in the HEFCE QR funding allocation – where geography is not STEM recognized and does not receive STEM funding. This needs to be rectified with the physical science research within Geography being afforded STEM designation, in a similar manner to Environmental Science, thus protecting the breadth of the environmental science research base, especially at a time when the environmental issues that physical geographers are working on are some of the most

² Economic benefits of environmental science. A study of the economic impacts of research funded by the Natural Environment Research Council November 2006

pressing ones facing society and government. Published evidence demonstrates that there is a 50:50 balance between research which is physical geography and human geography (including social science environmental studies), and it would be appropriate to provide 50% STEM protection to Geography.

- 10. Thus, in conclusion:
- a. Before even considering cuts in STEM funding, it is critical that there is a level playing field and those subjects that rightfully deserve part STEM funding are recognized and funded as such.
- b. In our view all STEM areas, including physical geography, are important, as are both blue-skies research and more directly applied research. We see no robust, future-proof and readily identifiable basis on which one area of STEM research should or could be chosen above another for cutting. All should be treated equally and, if cuts are to be made, these should be the same across the board.
- c. The needs of science must be balanced with the needs of social science too. While funding needs for social science research are less, so too is the current budget allocation to social science research. Research issues relating to crime, social cohesion, employment, sustainable lifestyles, security, economic development, and many more, demand quality social science research. Robbing Peter to pay Paul will not foster a strong and vibrant UK research base as a whole.