
Employability of GEES graduates: the approach of the Environment Agency

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Abstract

The Environment Agency is a major employer of GEES graduates across many areas of environmental protection and improvement. As university courses have changed in recent years, we have adapted our approach to the recruitment and retention of our employees.

The quantity of graduates, and particularly postgraduates, has reduced in disciplines such as geoscience. In addition, the quality of the core technical skills of those recruited is 'worse' than in the past. Roles where postgraduates were applying now attract graduates that we have to develop ourselves.

We have established a series of technical development frameworks to assess our staff capabilities. This has highlighted areas for development and associated programmes of training and mentoring have evolved. We are focussing future workforce plans on the development and retention of critical skills. Professional body endorsement plays an important part in our work.

This paper is based on the presentation given at the 2008 GEES Subject Centre Conference, and follows on from the presentation delivered at the GEES conference in 2007 and published in Planet 19 (p 44).

Background

The Environment Agency is the leading body looking after the environment in England and Wales. We have responsibility for protecting, improving and regulating air, land and water. We are the largest UK employer of hydrogeologists and the second largest for geoscientists. We employ around 12,000 staff, with probably around 60% possessing GEES or related backgrounds. We have traditionally employed postgraduates into many of our GEES related roles, even in junior positions. In recent years, there has been a reduction in the number and quality of applicants, especially postgraduates, applying for our posts.

The Environment Agency has been gathering evidence and developing solutions to these recruitment problems. This has included creating

Technical Development Frameworks (TDFs) for key roles, with supporting training and mentoring schemes to develop and retain staff. We have reduced staff turnover and are developing future technical specialists in our key activities. This work is supported by endorsement from professional bodies and is being adopted by the brownfield industry (industry related to the re-use/re-development of land sites previously developed for other uses). We are sharing our approach with the oil and gas industry as well, including with OPITO, the Oil and Gas Academy.

GEES related work within the Environment Agency

We provide a wide range of environmental roles. These include providing environmental advice, regulation (permitting, compliance and enforcement), monitoring, protection, incident management and flood risk management. Increasingly, our support roles, such as finance, are attracting people with GEES backgrounds as well as the more obvious technical roles. Water quality, water resources, conservation, flood defence, fisheries, ecology, land quality, recreation, air quality, environmental planning, and environmental impact assessment are just some of the activities we are involved in. Our work suits all working styles and includes research, field officers, specialist technical roles and support staff who are more office based.

In terms of numbers of posts, we have approximately:

- 350 geoscientists
- 1200 field officers
- 1300 policy and science staff
- 1200 environmental monitoring staff
- 1500 flood risk management roles
- Others involved in hydrology, hydrometry, geomorphology, land use, climate change, sustainable development etc.

Entry requirements

We would generally require a scientific degree for all GEES related roles. Geoscience and science roles have traditionally needed a postgraduate degree. For our flood risk management staff, we have

developed a foundation degree with the University of the West of England, as there have been reducing numbers of graduates.

All staff have internal training, development and on the job experience before they are deemed capable of managing the whole role without support.

Recruitment and retention issues

Using geoscience as an example that is applicable across the Agency, we have a number of issues that affect our recruitment and retention. These include the reduction in the number of relevant postgraduate courses on offer from HE. We have, therefore, experienced a decline in applicants with postgraduate level qualifications. We have also identified a high turnover of geoscience staff. When

we gathered data in 2001, the rate of staff moving internally or externally was 44%. Much of the movement occurred after 3 years and was related to our historical pay scales, which rewarded new staff with higher pay rises during their development for the first 3-4 years. We looked at recruitment data and found that graduates were regularly applying for our vacancies, but postgraduates were not.

Employability issues

We also realised that the graduates that we were attracting did not have the skills that we traditionally associated with graduates. Some of these are outlined in Box 1. As a consequence of this skills deficit, we identified an annual expenditure of £1.5 M on consultants to fill gaps in our 'day job' with additional expenditure on project work.

Box 1: Environment Agency issues with graduate skills

- Lack of ability to apply theory in practical situations - possibly due to less field work at university
- Lack of basic maths skills - eg manipulating equations, changing units from litres to cubic metres
- Lack of ability to think in 3D – eg developing a conceptual model from information provided on maps and site investigations and the potential impact on the environment
- Lack of ability /confidence to interpret data from risk assessments in the real world - rigidly sticking to exact results from even simple numerical risk assessment calculations
- Lack of ability/confidence to take risk-based decisions

Environment Agency actions to tackle the problem

We have identified the key capabilities for geoscientists and other key roles and included them in a series of Technical Development Frameworks (TDFs). TDFs for geoscientists include:

- Health and safety
- Personal behaviours (eg team work, influencing, communication etc)
- Core technical knowledge (eg 3D thinking, numerical modelling, data and information etc)
- Application of knowledge to various activities (eg developing permits or compliance against a specific area of legislation)

For each role we have also defined competency levels that someone would be expected to have

within these various capabilities, and what level they would enter the role at. There are 5 competency levels within the capabilities ranging from 1-5. These are:

1. awareness
2. basic knowledge, able to work while supervised
3. capable, able to work unsupervised
4. distinguished, local expert
5. expert, national lead expert

Our TDFs have indicators that define each level, with development options to move to the next level up the scale.

Having identified the key capabilities for geoscientists, we asked all our staff to work with their line managers to define their level of competency within the capabilities across their

roles. The initial set of national data raised many concerns. Twenty per cent of staff did not meet entry competency in three or more key capabilities. 40% of staff needed supervision to carry out their roles. 40% of staff had under five years experience. We identified significant gaps in the core technical capabilities across the Agency's geoscientists, with no internal training available to address these skills deficits.

What did we do about it?

Linking with the University of the West of England (UWE) under an umbrella arrangement that the Agency has with them, we have developed a series of modules at postgraduate level towards a M.Sc. in Environmental Management. The various modules are delivered by experts around the country, including those from other universities. The modules earn Agency staff CAT points and can be studied individually or as part of a longer term development programme, leading to a Masters qualification. The modules are targeted at our core technical skills and have already resulted in an improvement in capability levels for those who have attended. New modules are currently under development.

We have developed a tool kit for team leaders to help them assess technical skills during recruitment, rather than looking at issues such as team working, and our mentoring scheme for staff development is now supported by structured discussion sheets.

As a result of the changes we have made, the

standard of our appointments has been raised and turnover has reduced to the Agency average of around 10%. Furthermore, we have looked at the skills our organisation will need for the next 3 years and have developed a workforce plan for geoscientists to address this need. In response to this scoping we have examined what resources are needed to deliver these skills, and how we are going to develop and maintain them. Other areas of the Agency are now following suit.

Future plans

Our TDFs have been endorsed by the Geological Society of London and the Chartered Institute of Water and Environmental Management (CIWEM) and other professional bodies. We have also been given their endorsement to present staff achieving an agreed level of capability with a certificate of 'Practising Geologist', which they will be able to count towards their 'Chartered' status. Our first three certificates have recently been awarded. We are also developing parallel Technical Development Frameworks and workforce plans across the business in areas such as field offices, environmental monitoring and hydrology. The ideas and approach are being adopted across the brownfield industry.

We will be continuing to work with many universities in the future to develop staff and attract new staff.

Some relevant issues highlighted during discussions at the recent conference are mentioned in Box 2.

Box 2. Issues for universities to consider:

- Greater engagement with the needs of employers, balanced with needs of university funders and management
- Recognition that universities need to be flexible in the way they engage potential employers
- Employer awareness needs to be raised that universities have changed (eg distance learning, making separate modules available, part-time study, partnership funding, single day courses). Unless employers have had children at university in the last few years, they will assume HE is as it used to be when they were students themselves!
- Recognition that employers need to adapt as well (eg need to work with universities on student placements, short-term shadowing, accommodating student volunteering etc.) rather than the more traditional 'sandwich students in the office for a year'
- Awareness raising of M. Sci. degrees, as they are considered, by many, to be what a B.Sc. "used to be in the 'good old days' with an extra year needed for 'remedial' work to replace what is no longer done in school", rather than as education to postgraduate level.

Conclusions

The reduction in the number of courses, especially postgraduate, and changing syllabi at schools and universities has had an impact on GEES employers. We have to plug gaps in the technical knowledge of graduates that previously we had been able to take for granted. We currently have particular issues with recruitment in geoscience, hydrology, civil engineering and land use planning.

Our approach to tackling the problem is being shared with other organisations across the brownfield industry and the oil and gas industry. We are working closely with many universities to help address our issues and will continue to do so in the future.

To make graduates employable, universities need to talk to employers about what they want and can provide. Flexibility is the key for both employers and universities. Making graduates more employable involves generating an enthusiasm for their subject, and developing an awareness of what roles are available in the world of work. Any opportunities for work experience should be encouraged to help ensure individuals stand out from the other applicants.

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Designing effective fieldwork for the environmental and natural sciences

by John Maskall and Alison Stokes,
released November 2008

Fieldwork is an extremely useful tool for learning and teaching environmental and natural sciences and is highly valued by students and employers.

This guide, released by the GEES Subject Centre in December 2008, is intended to provide support and ideas to academic and technical staff engaged in the design and delivery of fieldwork in these disciplines. It draws on literature and experiences from environmental science, geography, earth science and the biosciences.

The guide has been prepared for higher education in the UK, with the focus predominantly, but not exclusively, at the undergraduate level. However, most of the issues discussed are also relevant for teachers in further education and sixth-form colleges in the UK, and upper level high school teachers in other countries.

This document aims to:

- outline the main elements in fieldwork design
- investigate the nature and diversity of fieldwork
- assess the practical and pedagogical issues facing fieldwork leaders
- discuss the issues surrounding fieldwork in higher education

To access the electronic version of this Guide, please see <http://gees.ac.uk/pubs/guides/eesguides.htm> or to order a free hard copy of this or any other GEES Subject Centre publication, please email info@gees.ac.uk.

Another guide you may find useful, released earlier this year, is the Earth Science Fieldwork Guide, online at www.gees.ac.uk