

Summary

NERC Postgraduate Training Allocation and Delivery Mechanisms Review and Recommendations

This document is a summary of the review work undertaken between autumn 2010 and autumn 2011. It includes information presented to the NERC Science Innovation Strategy Board (SISB) in March and October 2011, and NERC Council in December 2011.

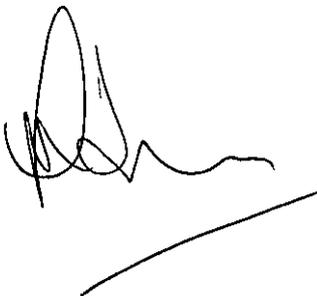
Foreword

It has been my pleasure to chair the Training Allocation and Delivery Mechanisms Review, and to work alongside review members whose deliberations and conclusions are seen in this report. We are a group of people from a variety of backgrounds and experiences, extending from funders to providers of training (universities and research organisations), and from those actively engaged in research (in an academic, business and public-sector setting) to those who spend their lives administering it.

Ours was not an easy task, given the current funding uncertainties within the HEI arena; any recommendations for change are difficult and have the potential to provoke emotive responses and views. I believe our recommendations, which have been agreed by NERC, start from an important point, in that the Review Group has determined for the first time the criteria by which our postgraduate training may be judged successful. By analysing various allocation and delivery mechanisms against these, the Group's recommendations offer a way of strengthening the postgraduate training NERC supports and so create a highly able and skilled next generation of scientist.

Members of the review are to be congratulated for their commitment to this work, which has gone well beyond what might have been expected of them.

This is most definitely the start of the journey for NERC, and over the next two years NERC will continue to work with our community to further develop these recommendations and so further enhance the excellent training provision the UK supports for the environmental sciences.

A handwritten signature in black ink, consisting of a large, stylized initial 'J' followed by a series of loops and a long horizontal stroke extending to the right.

Jonathan Bates
Interim Director People and Skills

Overview:

This review provides recommendations on how NERC manages its postgraduate training portfolio.

Review Members

The following were involved in the review and the development of the recommendations:

- Professor Bob Allison, University of Sussex
- Dr Avril Allman, NERC
- Mr Jonathan Bates, NERC (Review Chair)
- Dr Peter Dukes, MRC
- Professor David Fowler, Centre for Ecology & Hydrology (CEH)
- Mrs Kirsty Grainger, NERC (Review Manager)
- Dr Pamela Kempton, NERC
- Professor Michael Lockwood, University of Reading and NERC Council member
- Professor Paul Monks, University of Leicester and NERC Council member
- Dr Phil Newton, NERC
- Professor Richard Owen, The Peninsula College of Medicine & Dentistry (PCMD)
- Dr Daniel Raymer, Schlumberger Cambridge Research
- Professor Judith Smith, University of Salford
- Professor Steve Sparks, University of Bristol
- Professor Andrew Willmott*, National Oceanography Centre (NOC)

* With thanks to Professor John Huthnance (NOC) who deputised for Professor Andrew Willmott when the latter was unavailable.

In addition to the above, SISB members provided valuable comments that further developed the work.

Recommendations

The Review developed five recommendations:

Recommendation A: *NERC should take a more strategic and hands-on approach to its training investment including the set-up of a Training Advisory Group (TAG) to advise the Director, People & Skills, and the Director, Science Delivery, on training and skills issues.*

Recommendation B: *Notional studentship allocations should be based on four-year studentships (currently 3.5 years) for new awards from the start of academic year 2014/15.*

Recommendation C: *NERC should introduce success criteria against which training can be judged. Of the eighteen success criterion, six should be seen as particularly important.*

Six Priority Success Criteria

- **Research excellence:** the training, and training environment, must include scientifically excellent and original research within NERC's remit.
- **Training excellence:** students are managed as a cohesive group and acquire both research and transferable skills. There is a strong and active community of students that are able – and encouraged – to integrate, work and learn together.

- **Multidisciplinary training environments:** training is embedded in multidisciplinary training environments to enrich the student experience and to encourage the knowledge-sharing and interconnectivity, which benefits research within the environmental sciences. This does not mean that individual PhD topics are required to be multidisciplinary.
- **Excellent students:** attracting the right student. NERC funding goes to the right or 'best-fit' student: the individual whose previous training, experience and skills best suit the type of training being undertaken.
- **Quality assurance:** NERC is assured, ahead of allocation and delivery of training, that providers will deliver excellent training in line with the agreed success criteria, and that it will be possible to evaluate the outcomes of the training.
- **Produces success stories (demonstrates impact of investment):** training produces tangible outcomes; impacts in the broadest sense.

Recommendation D: *NERC should introduce a 'Dual-Core Model' for studentships, which specifically delineates between responsive and focused studentships.*

Responsive training: This is postgraduate training where the topic is chosen by the student/supervisor and which can be drawn from any part of NERC's remit.

Focused training: This is postgraduate training that ensures we provide individuals with particular, specialist skills that are linked to our strategic priorities or to priority skills needs. Whilst the training topic may be chosen by the student/supervisor, it will reflect a specific training priority which NERC has identified.

Recommendation E: *NERC should allocate responsive studentships through the introduction of a more open competition with a strong emphasis on partnerships: Doctoral Training Partnerships (DTPs). Focused Studentships should primarily be delivered through competitions in priority areas as and when there is a recognised need.*

In addition to the recommendations above, NERC Council recognised the need to consider the support for project studentships on responsive mode standard and large grants, and research programme grants, and how/if these can be brought in line with the agreed success criteria. In the short term, these mechanisms will continue to run in their current form.

These recommendations were agreed by NERC Council in December 2011. Further details of the review and recommendations are set out below.

Review and Recommendations:

Background

In 2010 NERC Council recognised a need to review the mechanisms used to deliver its postgraduate training investment. The NERC Postgraduate Training Allocation and Delivery Mechanisms Review aims to understand and clarify NERC's requirements for postgraduate training mechanisms; consider how well these needs are being met now; and identify the approach that NERC might take to improve the mechanisms used to underpin its postgraduate training portfolio. It looks at the 'how' of NERC support for training rather than the 'what' of the training NERC supports.

Postgraduate training has been a part of NERC's mission since its foundation and is explicit within our charter. For NERC to provide the starting point for research careers that will blossom and grow, it needs to create the future generations that will take forward the research that underpins our activities; it needs to ensure that the skills exist that are needed across our diverse community. Through this our sciences benefit and the economy benefits. It is notable how many of today's leading environmental scientists undertook their early research training through NERC support.

NERC also needs to ensure that its postgraduate training portfolio is robust, and is one that enables Council to be confident that it helps deliver NERC strategy.

NERC supports a variety of postgraduate training activities. This support:

1. Recognises that postgraduate training is a crucial first step in the development of a research career and that it is important that early-career researchers have the opportunity both to pursue their own lines of enquiry and to learn how to do so.
2. Links training opportunities, particularly at doctoral level, to high-priority, high-quality research.
3. Helps ensure that we identify skills priorities and gaps within our research base, both now and in the foreseeable future, and reflect this in the training we support.
4. Helps ensure that the needs of employers for people with particular skills are taken into account in the training we support.

Mechanisms currently used by NERC to allocate studentships include:

(i) **Algorithm**-based awards to research organisations, primarily based on a retrospective analysis of their 'research excellence', as measured by NERC research grant income (2/3 of total studentships in c70 organisations).

(ii) A variety of **other schemes**, including studentships tied to responsive mode and research programme grants, knowledge exchange and cross-council joint studentships, and studentships at research centres.

Review Terms of Reference

1. Taking into account NERC's training strategy, to develop 'success criteria' for training allocation and delivery mechanisms¹.
2. To consider how NERC's training allocation and delivery mechanisms meet the 'success criteria'.
3. To consider alternative allocation and delivery mechanisms against the 'success criteria'.
4. To advise on NERC's future training allocation and delivery mechanisms.

Summary of Discussions

Review group members spent time discussing the current NERC postgraduate training portfolio; three full-day meetings and additional shorter meetings over an 18-month period. Overall members concluded that NERC's current allocation of postgraduate studentships is done in an administratively light manner but with relatively little strategic oversight or understanding of the value or impact of this investment. Key points coming from the discussions include:

- (1) Recognising that NERC aims to support two distinct types of postgraduate training: responsive and focused training.

Responsive training: This is postgraduate training where the topic is chosen by the student/supervisor and which can be drawn from any part of NERC's remit.

Focused training: This is postgraduate training that ensures we provide individuals with particular, specialist skills that are linked to our strategic priorities or to priority skills needs. Whilst the training topic may be chosen by the student/supervisor, it will reflect a specific training priority which NERC has identified.

- (2) The current process for allocating and delivering postgraduate training needs to change to meet the objectives stated in NERC's Delivery Plan, i.e. to concentrate and cluster training in line with agreed RCUK policy and the direction of travel of the other research councils.
- (3) NERC should not seek to introduce a significantly different model from any of the other research councils unless there is a clear and distinctive business reason for doing so.
- (4) NERC's current 'hands-off' approach to training has the virtue of minimising administrative costs but is at odds with other research councils and other funders. This means NERC is not linking this activity sufficiently to its strategic objectives and cannot evaluate its quality. NERC should increase the dialogue between and within the NERC training community (NERC, students, training providers and employers). Reporting and evaluation of NERC's training investment should be strengthened and formalised; at present it falls below what could reasonably be expected of NERC.
- (5) Current awards for doctoral training are doctoral training grants (DTGs) that include 3.5 years funding per notional studentship. Numbers of studentships are notional as there does not need to be a 1:1 relationship between a student and a DTG (students can be funded from more than one DTG as long as at least 50% of the total funding comes from NERC). The flexibility in the DTG is beneficial to both NERC and the community, but that the length of notional studentships should be considered.

¹ As NERC's Delivery Plan was published during this work, the review also took into consideration the stated aims of the Delivery Plan i.e. that NERC will concentrate training in 'clusters of excellence' – in line with an evolving RCUK approach.

Recommendations

Recommendation A: *NERC should take a more strategic and hands-on approach to NERC's training investment including the set-up of a Training Advisory Group (TAG) to advise the Director, People & Skills, and the Director, Science Delivery, on training and skills issues.*

In developing this recommendation the review concluded that there were a number of key actions that would help increase the strategic management of the NERC postgraduate training portfolio, and that these should be developed with advice from the proposed Training Advisory Group (TAG).

The TAG should be introduced to provide advice to the both the Director, People & Skills, and Director, Science Delivery, on key questions relating to the strategic direction of NERC training, the particular issues which NERC needs to address in deciding on its training priorities and the allocation and delivery of studentships. This should be run on similar governance arrangements as existing groups such as research programme executive boards.

The TAG should consider ways of improving our strategic approach to training, with the aim of improving our understanding of the value and impact of training and to help improve the quality of the training experience. In particular TAG should provide advice to help NERC:

- **Strengthen its dialogue with providers and students;** allowing each to be aware of the others' training priorities and expectations. Including the introduction of a formal 'portfolio agreement' with its training providers (in line with sister research councils). The agreements should allow providers to represent their total studentship portfolio as a whole, celebrate the providers' contributions, and form part of the practical communications, reporting and evaluation processes.
- **Ensure that there are clear reporting and evaluation processes, set out in advance of award.** This reporting should be proportional to investment and information should be collected at different stages of the training cycle (from the start of the training grants to their end point and beyond), and make use of information that is routinely collected for other purposes e.g. HESA, and with clear reporting mechanisms that, where possible, make use of existing systems. Organisations and individuals providing information to NERC should be clear on the benefits of doing so and what the information will be used for. NERC should maintain a clear set of impact examples from the training it support; organisations actively want to be used as an exemplar. Reporting information is used to strengthen allocation mechanisms.
- **Introduce a virtual studentships network.** To encourage interdisciplinary working, provide networking opportunities with peers, and help establish links which may last well beyond the period of study.
- **Consider non-doctoral training activities:** the review did not have sufficient time to consider, and hence did not make any recommendations relating to, specific non-doctoral training activities, although these did form part of its remit. These activities should be reviewed as part of the work of the TAG.
- **Review the support of summer-school opportunities for students.** Summer schools allow both broader discipline training, to supplement student's specialist research, and further peer working and networking at the doctoral level. The importance of summer schools for NERC students is recognised.

In addition, to help facilitate this more strategic and hands-on approach there should be clear guidelines, handbooks and other documentation that sets NERC's expectations of training providers, students, collaborative partners and its own role in the training cycle. The community should also be clear who is responsible for different elements of the postgraduate training portfolio, who to contact for information, when opportunities will arise, how decisions are made and the reasons NERC support postgraduate training. This should be achieved through strong communications including up-to-date web pages, and an on-going dialogue with the relevant stakeholders.

Recommendation B: *Notional studentship allocations should be based on four-year studentships (currently 3.5 years) for new awards from the start of academic year 2014/15.*

To be implemented for all students starting the academic year 2014/15.

In formulating this recommendation the review took on board a number of arguments, many of which were discussed during the formulation of the success criteria for postgraduate training (Recommendation C).

The recommendation brings greater compatibility between European HE systems (Bologna Process) and helps enhance the training quality. It allows providers to fund studentships of appropriate length for both the type of training and the student selected. Submission times should range between three and four years to allow for differences in the individual student being trained and the specific PhD topic being addressed. The first year should commonly have a strong emphasis on skills and experience to help select and hone PhD topics. Some proportion of funded time for preparing and writing papers for publication should be included.

Benefits that this recommendation and approach to funding help facilitate include:

- time to individual tailor studentships
- explicit training in research and other specialist skills
- training in generic and transferable skills
- increased completion rates (and within time)
- increased input into PhD topic from the student
- development of independent researchers
- time for developing interdisciplinary skills and for understanding advanced research methodologies (especially as they become more complex and sophisticated)
- time for developing novel approaches and experimental failure and blind alleys.

The need to give time for students to prepare and publish papers was endorsed as an important part of the training process. Although the current cross-council grant conditions already allow this, it should be actively encouraged by NERC.

It was agreed that allowing 'submission-drift' beyond a four-year doctoral degree does not benefit the research or the individual being trained. Guidelines should therefore set out the need for students to submit between three and four years and research organisations should be penalised if submissions are consistently out of this timeframe; guidelines should be clear about under what circumstances submissions outside this timeframe would be acceptable.

Recommendation C: NERC should introduce success criteria against which training can be judged. Of the eighteen success criterion six should be seen as particularly important.

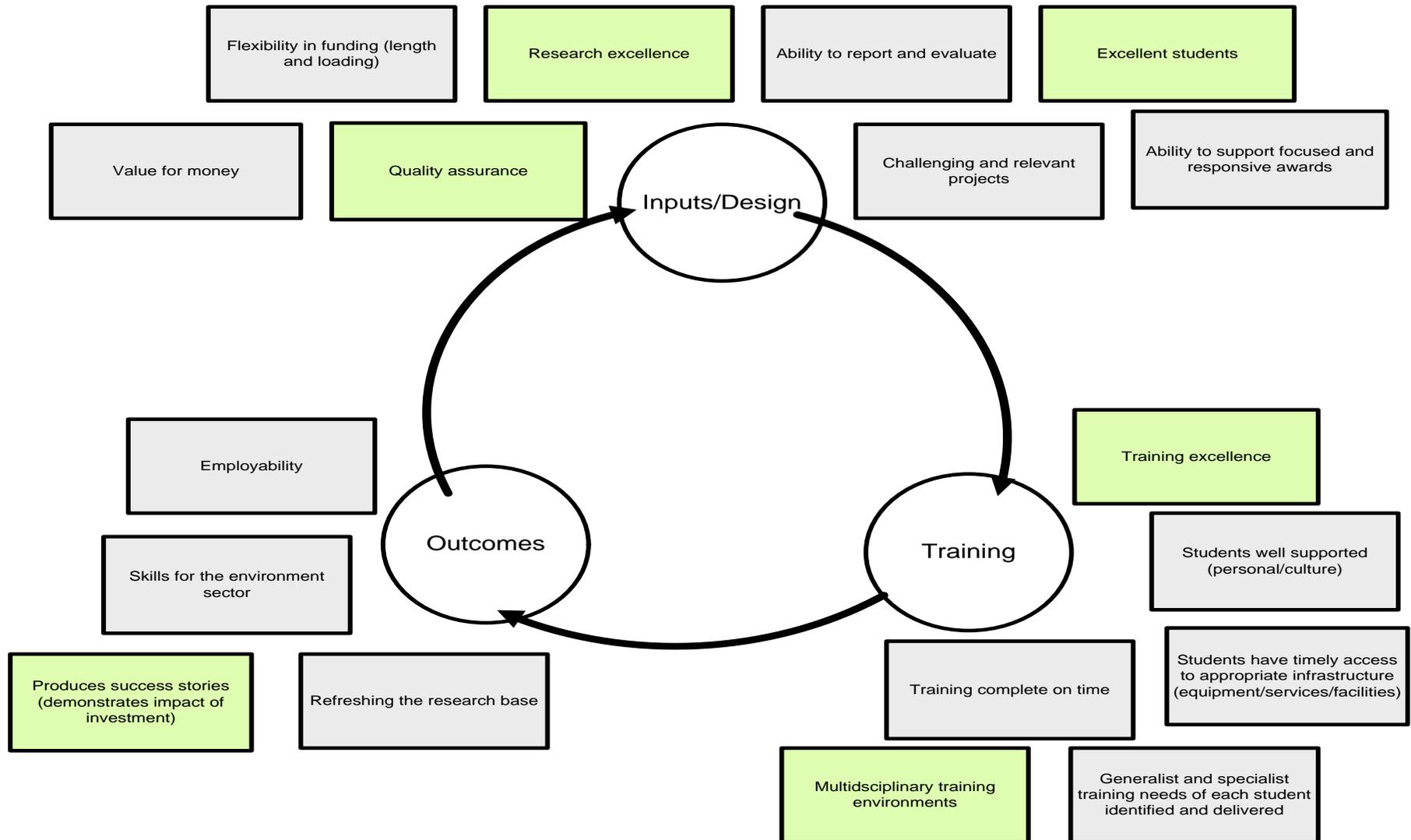
In order to help judge NERC training activity, the review proposes the introduction of success criteria for postgraduate training. The success criteria should be used to help guide the design, allocation, delivery and overall performance management of the postgraduate training portfolio, and the individual schemes within it. Eighteen success criteria are suggested for NERC's support for responsive and focused postgraduate training. Six of these are deemed priority success criteria.

Six Priority Success Criteria

- **Research excellence:** the training and training environment must include scientifically excellent and original research within NERC's remit.
- **Training excellence:** students are managed as a cohesive group and acquire both research and transferable skills. There is a strong and active community of students that are able – and encouraged – to integrate, work and learn together.
- **Multidisciplinary training environments:** training is embedded in multidisciplinary training environments to enrich the student experience and to encourage the knowledge-sharing and interconnectivity, which benefits research within the environmental sciences. This does not mean that individual PhD topics are required to be multidisciplinary.
- **Excellent students:** attracting the right student. NERC funding goes to the right or 'best-fit' student: the individual whose previous training, experience and skills best suit the type of training being undertaken.
- **Quality assurance:** NERC is assured, ahead of allocation and delivery of training, that providers will deliver excellent training in line with the agreed success criteria, and that it will be possible to evaluate the outcomes of the training.
- **Produces success stories (demonstrates impact of investment):** training produces tangible outcomes; impacts in the broadest sense.

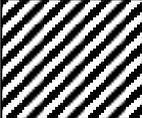
By introducing success criteria NERC training providers will be able to more easily align their training to NERC expectations and NERC will be able to more easily manage and review training practices. NERC will also have a set of performance information against which reporting and evaluation can take place.

Success Criteria for Responsive and Focused Postgraduate Training (green boxes indicate priority criteria).



Success Criteria (*priority criteria)		Brief Description	When Used	
			Overall Portfolio	Individual Awards (from pre-award to evaluation)
1	Research excellence*	The training and training environment must include scientifically excellent and original research within NERC's remit.	Y	Y
2	Training excellence*	Students are managed as a cohesive group and acquire both research and transferable skills. There is a strong and active community of students that are able – and encouraged – to integrate, work and learn together. Training organisations can meet success criteria 15 to 19.	Y	Y
3	Multidisciplinary training environments*	Training is embedded in multidisciplinary training environments to enrich the student experience and to encourage the knowledge-sharing and interconnectivity, which benefits research within the environmental sciences. This does not mean that individual PhD topics are required to be multidisciplinary.	Y	Y
4	Excellent students*	Attracting the right student. NERC funding goes to the right or 'best-fit' student: the individual whose previous training, experience and skills best suit the type of training being undertaken.	Y	Y
5	Quality assurance*	NERC is assured, ahead of allocation and delivery of training, that providers will deliver excellent training in line with the agreed success criteria, and that it will be possible to evaluate the outcomes of the training.	Y	Y
6	Value for money	Mechanisms used to allocate and deliver training are cost effective, for both NERC and the community.	Y	Y
7	Employability	Students' overall employability should be increased through the training undertaken.	Y	Y
8	Refreshing the research base	The stock and variety of highly skilled researchers and other R&D staff is replenished.	Y	Y
9	Skills for the environment sector	Students leave with skills for the environment sector: skills for policy-makers and regulators; industry and business; and NGOs and charities.	Y	Y
10	Produces success stories (demonstrates impact of investment)*	Training produces tangible outcomes (impacts in the broadest sense).	Y	Y

Success Criteria (*priority criteria)		Brief Description	When Used	
			Overall Portfolio	Individual Awards (from pre-award to evaluation)
11	Ability to report and evaluate	There are clear mechanisms for the reporting and evaluation of training provision, from the start of the training grants to their end point and beyond.	Y	
12	Ability to support focused and responsive awards	While not necessarily part of the same mechanism, the overall portfolio is able to support both focused and responsive studentships.	Y	
13	Flexibility in funding (length and loading)	Training providers are able to consider the needs of individual students and to fund in different ways depending on that need. NERC funding provides that flexibility, provided training is completed on time, and depending on the training and the individual student (between three and four years for PhD students). Continuation of cross-council flexibility in matching studentship funding so that more students are supported than the number of studentships awarded (within guidelines).	Y	
14	Challenging and relevant projects	Research topics must be concerned with the scientific aspects of the natural environment and must fall broadly within NERC's remit, which includes interdisciplinary interfaces with other research councils. The research topic must be realistically challenging for the student: well defined, with 'researchable' questions or hypotheses to be developed and addressed; and offering genuine scope for high-level research and innovative science.		Y
15	Students are well supported (personal/cultural)	Alongside training, there is student-centric support. This includes: ensuring students are recognised and valued as an essential part of their organisation's human resources and a key component of its overall strategy; the importance of the students' personal and career development is clearly recognised; and students share the responsibility for, and proactive engagement in, their own personal and career development, and lifelong learning.		Y
16	Students have timely access to appropriate infrastructure (equipment, services and facilities)	The organisation ensures that the students have timely access to the infrastructure they need to undertake their studies.		Y
17	Generalist and specialist training needs of each student are identified and delivered	Training programmes must address the appropriate training needs of individual students, their research topics, and cover both subject-specific and transferable skills and knowledge.		Y

Success Criteria (*priority criteria)		Brief Description	When Used	
			Overall Portfolio	Individual Awards (from pre-award to evaluation)
18	Training is completed on time	Postgraduate training to be completed within agreed timescales - depending on the type of training and the individual student. This should be between three and four years for a PhD.		Y

Recommendation D: *NERC should introduce a 'Dual Core Model' for studentships, which specifically delineates between responsive and focused studentships.*

Responsive training: This is postgraduate training where the topic is chosen by the student/supervisor and which can be drawn from any part of NERC's remit.

Focused training: This is postgraduate training that ensures we provide individuals with particular, specialist skills that are linked to our strategic priorities or to priority skills needs. Whilst the training topic may be chosen by the student/supervisor, it will reflect a specific training priority which NERC has identified.

The review recognised the distinction between responsive and focused studentships and agreed that there are good reasons for having distinct processes for allocating each training type, a 'Dual-Core Model', for studentships. For example, the need for flexibility in focused funding so that priorities are reviewed annually and investments made when there is a strategic need, compared to the ability to review responsive training allocations over longer periods e.g. five years.

Members were clear that this does not mean that the two types of studentships should be considered in isolation from each other; indeed, it is anticipated that in deciding on priorities for focused training, the TAG would consider how well the responsive side of the model is meeting NERC's strategic needs.

Recommendation E: *NERC should allocate responsive studentships through the introduction of a more open competition with a strong emphasis on partnerships: doctoral training partnerships (DTPs). Focused studentships should primarily be delivered through competitions in priority areas as and when there is a recognised need.*

In assessing how training should be delivered, the review concluded that mechanisms should meet the agreed success criteria and recognise the differences between focused and responsive training. The value of encouraging partnerships as a way of providers more effectively meeting the success criteria, for example in encouraging multidisciplinary working, and the need to meet NERC's Delivery Plan commitment to clustering, was also recognised.

NERC Doctoral Training Partnerships: Responsive training awards

While recognising there is no 'black and white' answer to how to best meet the needs of NERC in allocating responsive studentships, the review recommends a shift from an algorithmic approach to a competitive approach to allocating responsive studentships. The approach should:

- (i) retain the **CASE** requirement.
- (ii) have **flexibility in funding** i.e. studentships are nominal as, within the bounds of cross-council terms and conditions, research organisations may match fund or leverage funding from other sources to increase the overall number of studentships supported through the awards.
- (iii) award **responsive studentships**; the research organisation is left to decide in which subject areas and departments the students will work, although there is an expectation that studentships will be associated with departments that have active NERC funding. Research topics must be concerned with the scientific aspects of the natural environment and must fall broadly within NERC's remit, which includes interdisciplinary interfaces with other research councils.

- (iv) make allocations for a **five year** period i.e. support for new studentships every year over a five year period.
- (v) **concentrate** funding, given the stated aim of NERC's Delivery Plan.
- (vi) **encourage partnerships** as a way of best meeting the success criteria.
- (vii) use the **success criteria** as the basis for pre-award assessment.
- (viii) treat **research centres the same** as other providers (i.e. no 'special treatment').

The review concluded that a shift from the allocation of studentships via an algorithm to a more open training-competition would be the best way for NERC to meet the agreed success criteria. A competition would offer a real opportunity for innovation and should aim to establish community-led clusters of excellence, working in partnership with NERC, and with a strong steer towards partnerships between research organisations so that training best meets the success criteria (although collaboration would not be mandated). It would result in a smaller number of larger, longer-term grants competitively awarded; doctoral training partnerships (DTPs).

While the broad principles of the approach were agreed by the review, the full details would be developed by NERC in conjunction with the TAG.

Focused training awards

The review recognised two discrete elements to the allocation of focused studentships:

A. Annual competitions based on strategic need

B. Studentships funded by research centres

A. Annual Competitions based on strategic need.

This is the main element of the focused training awards. However, competitions should be flexible and only be run when there is a strategic need. Award holders are expected to ensure that the topic of the research undertaken meets the objectives set out in the announcement of opportunity i.e. the strategic need.

The NERC TAG should advise the objectives for each competition but it is expected that these may include linking studentships to high-priority areas of science or private-sector partnerships (including KE CASE awards), delivering particular skills (for example, as set out in the Skills Review), encouraging new areas of activity, building capability in particular subject areas, etc. They will be informed by input from SISB and other NERC boards and dialogue with theme leaders and the Director, People and Skills.

In the short term, NERC will continue with current competitions, e.g. OPEN case studentships, research programme studentships and other strategic studentship competitions.

B. Studentships funded by research centres

NERC research centres currently use funding from a variety of sources to support PhD studentships. These are always in partnership with a HEI because research centres are not award-making bodies. It is recommended that the research centres' ability to fund studentships that meet their, and therefore NERC's, strategic needs, is continued. This is not a recommendation to provide a specific funding stream for these studentships (nor should there be a separate funding stream). The funding of these studentships is at the individual research centre's discretion. However, these studentships should be subject to the success criteria for postgraduate training and NERC should take steps to ensure this.

In addition to the recommendations above, NERC Council recognised the need to consider the support for project studentships on responsive mode standard and large grants, and research programme grants, and how/if these can be brought in line with the agreed success criteria. In the short term, these mechanisms will continue to run in their current form.

Acknowledgements

The Project Board and Project Manager would like to thank all Review Group members for their enthusiastic and energetic participation in this activity, and the significant contribution they have all made. In addition, to acknowledge and thank Kay Heuser for the efficient organisation of meetings and overall support with the work – it has been invaluable.