

Announcement of Opportunity

Joint NERC-BBSRC Centre for Doctoral Training (CDT): Soil Science

Proposal Deadline: 16:00 Thursday 26 June 2014

Summary

1. Proposals are sought to host a new Centre for Doctoral Training (CDT) specialising in Soil Science.
2. The Natural Environment Research Council (NERC) and Biotechnology and Biological Sciences Research Council (BBSRC) invites proposals from consortia of research organisations interested in hosting a new Centre for Doctoral Training (CDT), specialising in the training of scientists with a high level of rounded skills and knowledge to tackle current and future challenges in soil science.
3. We invite interested consortia to submit a full application to this joint funding opportunity. Applications must be submitted via the Research Councils' Joint electronic-Submission system (Je-S). To use this system, the applicant's research organisation must be Je-S registered. Full details are available on the Je-S website. This call will be managed by NERC on behalf of both funding partners.
4. Funding for 8 studentships will be awarded per annum, and the CDT award will provide funding for three years of new student intake, i.e. 24 studentships in total, from the start of the academic year 15/16.
5. There is value in delivering studentships in partnership. Bids from organisations that can show they are working across boundaries (including across departmental boundaries within a single organisation, or across boundaries between both academic and non-academic organisations), are expected. A key outcome of the CDT will be to create a concentrated national focus for doctoral training underpinning future skills in soil related research. A minimum of three eligible Research Organisations should be involved in each bid.
6. This opportunity is open to organisations eligible for NERC and/or BBSRC research grant managed mode funding, i.e. applicants based in UK Higher Education Institutions (HEIs), NERC/BBSRC Research Centres/Institutes, and Independent Research Organisations (IROs) approved by NERC/BBSRC. Please refer to www.rcuk.ac.uk/funding/eligibilityforrcs/ for details.

7. Applications must be submitted via the Research Councils' Joint electronic-Submission system (Je-S). The closing date for proposals is 16.00 on 26th June 2014.

Background

8. Soil is central to the UK economy, generating an annual income of £5.3 billion¹. Soil is also the fundamental life-support system for the terrestrial environment. It is vital to protecting and maintaining the ecosystems services on which society depends. These services include food provision, generation of non-food crops, climate mitigation, habitat provision, nutrient cycling and the storage and filtration of fresh water. An understanding of soils is key to tackling many of today's global challenges, including: food, water and energy security, climate change and biodiversity decline. The centrality of soils to these global issues is reflected in the recent greater consideration of soils in national and international policy and regulation. Soil-based research also has an important role to play in a number of UK business sectors including agriculture, construction, conservation-related, insurance, housing, tourism and mining.
9. Soil comprises a complex matrix of biological chemical and physical properties, and is thus central to many of both NERC and BBSRC strategic priorities. Understanding the multiple functions of soil and its interactions with the wider environment is key to protecting and maintaining our terrestrial ecosystems and delivering solutions to the global food security challenge and climate mitigation. Understanding soil is central to the sustainable intensification of agriculture, the provision of biological solutions to the energy crisis and water management; thus putting it at the heart of the food, water energy nexus.
10. The requirement for a new generation of scientists who are able to understand the complexity of the soil ecosystem and the role it plays in wider ecosystem services, and who have up-to-date skills is paramount to maintain the UK's capability in soils research. The 2011 Natural Environment White Paper, The Natural Choice: securing the value of nature, highlights the need to 'safeguard our soils' and aspires that by 2030 'soils to be managed sustainably and degradation threats tackled successfully in order to improve the quality of soils and to safeguard their ability to provide essential ecosystem services and functions for future generations'. The UK agri-tech strategy² recognises that soil degradation and biodiversity loss threatens food security. Investment in areas including environmental sciences, plant/ crop genomics and health (e.g. nutrient acquisition and drought/flooding tolerance) and agri-

¹ National Statistics 2012 - Agriculture in the United Kingdom

² www.gov.uk/government/uploads/system/uploads/attachment_data/file/227259/9643-BIS-UK_Agri_Tech_Strategy_Accessible.pdf

engineering (e.g. soil monitoring and precision farming) all require knowledge of soil and scientists with wider multidisciplinary skills.

11. In recent decades, UK soil-based PhDs have tended to focus on individual sub-disciplines under a general soil science, agriculture or ecology umbrella. There is now some urgency to change the way we train scientists in understanding the UK soil system. A more holistic, systems-based approach, reflecting the multidisciplinary requirements of the above opportunities and challenges, will help to ensure the next generation of scientists have the breadth of skills and knowledge essential to address them. To achieve this, training will benefit from involvement with a wide community of researchers and end users, providing access to expertise and equipment and facilitating links between soil physics, biology and chemistry, with advances in other areas of biological and environmental sciences.
12. In addition, training in the utilisation of new technologies and scientific approaches to soil based research is required to take account of these new ways of working. For example, it is now feasible to monitor soil from the molecular to landscape scale and to do so with greater automation and remote sensing. At the same time, emerging technologies and methodologies (for example metagenomics), allow for far greater analysis and understanding of *in situ* soil functions than was previously possible. Such technologies produce large quantities of data that need to be handled, shared, understood and utilized effectively alongside existing data sets and models.
13. This CDT aims to fill some of the recognised existing skills gaps, as well as developing interdisciplinary capacity in the use of new tools and technologies. It aims to create a highly-skilled community of researchers with transferable skills, and an ability to integrate plant, soil, water and land management to address future research needs. The CDT will provide focused postgraduate training to develop individuals with specialist skills that are linked to strategic priorities or to priority skills needs.

Remit of the call

Key Features of the CDT

14. The global challenges described above span the scientific remits of NERC and BBSRC. Proposals must therefore bring together environmental and biological science to address them. Proposals must:
 - a. provide the next generation of soil researchers with the skills and expertise to address these challenges through their knowledge of the soil system.

- b. provide a combination of training programmes and a multi-disciplinary approach to understanding soil as the nexus for many ecosystem services.
- c. have a UK focus.
- d. equip researchers with the skills to communicate soils knowledge to non-experts (as well as to experts), and to deliver information needed by decision-makers at all levels - from land owners/managers to policy makers.
- e. adopt a holistic approach to soil science, reflecting the multi-faceted nature of soils. This approach should incorporate biology, chemistry and physics at a range of temporal and spatial scales. To ensure the UK leads in solving soil-based issues, this approach should be truly systems-based, and targeted at global opportunities and challenges.
- f. create a vibrant student cohort encompassing key institutions with excellent soil research capacity, with added value from interaction with end users, industry and academic-based experts to increase students' understanding of the sector and provide reciprocal access to expertise and facilities.
- g. enhance multidisciplinary skills and thinking at the NERC/BBSRC interface.

Initial Training Priorities

15. We particularly encourage proposals addressing training for the following challenges:

- Understanding the soil-root interface (physical, chemical and biological interactions), and the role this interface plays in both agricultural and natural ecosystems at different spatial and temporal scales.
- Understanding of the role of soil in the provision of ecosystem services including (but not limited to) those of food provision, nutrient cycling, water storage and filtration, lowering emission of greenhouse gases and enhancing C stocks.
- Bringing together an understanding of the physical, chemical and biological functions of soil systems and how they respond to global change, for example climate change, including extreme weather events, human disturbance and land use change.

- Modelling the soil ecosystem at different spatial and temporal scales, specifically through the utilization, development and interoperability of 'big data' sets.

Funding

16. A key outcome of the CDT will be to create a concentrated national focus for doctoral training in soil research. A minimum of three eligible Research Organisations should be involved in each bid. . There is value in delivering studentships in partnership and bids from organisations that can show they are working across boundaries, including across departmental boundaries within a single organisation, or across boundaries between organisations are expected.
17. Strong proposals should evidence a track record of collaborative working, especially at the NERC/BBSRC interface, and outline a strategy for engaging with partners to nurture additional investments and added value to studentships.
18. Any agreed, or expected, in-kind support or additional funding for supporting additional studentships within the CDT should also be outlined.
19. Eight notional studentships per annum for three years (these awards will be cash-limited within the limits described below) will be awarded. Each notional studentship will be four years in duration; it is expected that individual students will undertake training over a variety of time frames (between three and four years as appropriate, depending on the discipline and the student's experience/knowledge).
20. For each annual cohort, at least four of the studentships must involve completing a Professional Internships for PhD Students (PIPS www.bbsrc.ac.uk/PIPS) although all students should be given the opportunity to undertake a PIPS.

21. Indicative funding total per notional doctoral studentship:

Student Stipend	£55,452
Fees	£15,984
Research Training Support Grant	£20,000
Management Costs	£1,500
Total	£92,936

22. The CDT will have flexibility in how the funding is used (subject to the normal training grant terms and conditions. Please see www.rcuk.ac.uk/RCUK-prod/assets/documents/documents/TermsConditionsTrainingGrants.pdf), as long as the minimum notional numbers of students are supported per annum. The funding is for the training of PhD studentships.

CASE Studentships:

23. There are no additional or minimal CASE studentship requirements.

Management

24. The CDT will need to have strong leadership and management. The CDT should have both a lead operational manager and steering committee. The steering committee should be comprised of all the CDT partners (both academic and non-academic), have overall responsibility for the effective governance of the CDT and its relationship with NERC/BBSRC and provide a strategic needs framework to aid the prioritisation and development of PhD projects.

25. PhD projects must take account of both NERC and BBSRC strategic plans; with a substantial component within each Council's remit.

26. The CDT will be able to demonstrate that robust and transparent governance arrangements are in place, which may include formal partnership agreements, communication plans and systems for monitoring the CDT's overall progress and success. We strongly encourage applicants to incorporate CDT students into the management/running of activities of the CDT.

Eligibility

27. This opportunity is open to organisations eligible for NERC and/or BBSRC research grant managed mode funding, i.e. applicants based in UK Higher Education Institutions (HEIs), NERC Research Centres, BBSRC Research Institutes and Independent Research

Organisations (IROs) approved by NERC/BBSRC. Please refer to www.rcuk.ac.uk/funding/eligibilityforrcs/ for details.

28. Each CDT must be led by an accredited higher education PhD award-making body.

29. A minimum of three eligible Research Organisations must be involved in each bid.

Application process

30. Full proposals must be submitted using the Research Council's Joint Electronic Submission System ([Je-S](#)) by 16:00 GMT on 26 June 2014. Applicants should select Proposal Type – 'Studentship Proposal' and then select the Scheme – 'Doctoral Training' and the Call – 'CDT June 2014'.

31. To use the Je-S system, the Research Organisation must be registered as a Je-S user. Full details are available on the Je-S website. Further information can also be obtained by contacting the Je-S Helpdesk by email at JeSHelp@rcuk.ac.uk, or by telephone on 01793 444164.

32. Applicants must ensure that their proposal is received by NERC by 16:00 on the closing date. They should leave enough time for their application to pass through their organisation's Je-S submission route before this date. Any proposal that is received after the closing date, is incomplete, or does not meet the eligibility criteria, will be returned to the applicant and will not be considered. Please note, this call will not open on Je-S until 26 March.

33. A single proposal should be submitted from the administrative lead partner.

Proposals:

34. All proposals must be contained within 14 sides of A4, using the pro forma provided on the NERC website. Applicants will need to provide details under the following headings:

- i. Research excellence
- ii. Training excellence
- iii. Multidisciplinary Training Environment
- iv. Partnership Operational Management

35. No other attachments will be accepted. Wording about links to websites will be ignored.

Assessment process

36. Proposals will be assessed by a peer review assessment panel, consisting of international experts, supplemented by member(s) of the BBSRC Fellowships and Awards Panel and the NERC Training Advisory Group (TAG). The assessment criteria used by the Panel is given in Annex A. The process includes applicant presentation and interview at the assessment panel.

37. Proposals will be assessed on four criteria: Research Excellence, Training Excellence, Multidisciplinary Training Environment and Partnership Operational Management. These criteria will be weighted as shown in Table A.

Table A: Proposals Scoring System

CDT Assessment Criteria	Weighting	Score	Overall Excellence Score
1. Research Excellence	35%	/10	= 0.35 x Score
2. Training Excellence	35%	/10	= 0.35 x Score
3. Multidisciplinary Training Environment	15%	/10	= 0.15 x Score
4. Partnership Operational Management	15%	/10	= 0.15 x Score
Overall Grade Excellence Score	100%		/10

38. Applicants will be invited to make a presentation and answer questions at the assessment panel meeting to assist the assessment process. NERC will try to provide early notice of an invitation to attend, but applicants should note that the panel meeting is currently scheduled for the second week of September 2014.

39. Following the assessment panel meeting, feedback for unsuccessful proposals will be available upon request.

Reporting

40. There will be mandatory annual reporting requirements for the CDT in addition to the standard studentships information captured through the Je-S Studentship Details Portal (SDP). This information will be used by NERC/BBSRC to report on the success of our training investments to government and other partners. Information provided will also be used to provide assurance that the CDT is being managed appropriately and is progressing in accordance with the RCUK Joint Vision for Collaborative Training and the aims and expectations outlined in this AO document. This additional reporting will take the form of an annual return. Indicative reporting headings include:

- i. Information regarding the student population – demographics, application information, etc.
- ii. Information regarding additional partner engagement, collaborations and co-funding

- iii. CASE partner engagement
- iv. Student Research outputs
- v. Cohort Specific Training Progress and Development updates
- vi. Information regarding supervisor training and professional development
- vii. Any structural and managerial changes that have occurred within the CDT

Timetable

41. Overview of the competition timetable:

- 26 June 2014 16.00: Closing date for full proposals
- W/C 8 September 2014: Assessment Panel meeting and interview
- October 2014: Decision communicated to applicants
- October 2015: First CDT studentships commence

42. For further information please contact Katie Tearall (kattea@nerc.ac.uk).

Annex A: Assessment Criteria

The assessment criteria used to judge proposals will be as follows:

Assessment Criteria	Key aspects for an outstanding CDT	Factors and Evidence that might be discussed
1. Research excellence (35%)	<p>The training and training environment must include scientifically excellent and original research within the NERC and BBSRC remits.</p> <p>Critical mass of relevant researchers/teams/projects to allow students to be supported effectively and sufficiently exposed to excellent research and researchers.</p>	<p>Number of active NERC and BBSRC-funded research projects at host RO's in the remit of the call.</p> <p>RAE 2008 profiles (where relevant).</p> <p>Standing in the appropriate academic community – national, international etc.</p> <p>Institutional commitment to research excellence the remit of the call.</p> <p>Amount of NERC/BBSRC and Research Council research income in appropriate research areas.</p>
2. Training excellence (35%)	<p>Students are part of an active community and managed as a cohort.</p> <p>Excellent scientific training and transferable/professional skills development opportunities.</p> <p>Challenging and relevant projects.</p> <p>Timely access to world-class facilities, direct experience of cutting-edge techniques, technologies and up to date methodologies.</p>	<p>Students have access to, and are encouraged, by peer to peer learning and support.</p> <p>Mechanisms for supervision and monitoring of both student and supervisor.</p> <p>Integration of students into the relevant teams/projects/departments/schools.</p> <p>How generalist and specialist development needs of individual students will be identified and delivered.</p> <p>The personal/ professional/ career learning and development that students will receive.</p>

	<p>End user engagement: Students will gain value from interaction with end-users in industry, government and civil society) and leave equipped with skills applicable to the environment sector: skills for policy-makers and regulators; industry and business; and NGOs and charities.</p> <p>Excellent training and support for supervisors.</p>	<p>The collaborative opportunities, which may include internships, industrial placements, overseas studies, and co-supervisory arrangements if appropriate.</p> <p>Completion rates, publication and first destination data for students hosted within CDT institutions.</p> <p>Employability.</p> <p>Mechanisms to ensure the development of independent researchers and world-leading scientists.</p> <p>Leveraged funding and in-kind support for the CDT.</p>
<p>3. Multidisciplinary Training Environments (15%)</p>	<p>Training is embedded in multidisciplinary training environments.</p>	<p>How students will be made aware of the context of their research and how it relates to other areas.</p> <p>Supervisory or wider advisory team engagement in research outside the relevant discipline(s).</p> <p>Ability to expose students to different disciplines via, for example:</p> <ul style="list-style-type: none"> i. Establishing cohorts beyond the funded students by using the CDT as a magnet/nucleus for research and training activities and investment; ii. Placing students within multidisciplinary research teams; iii. Giving students the opportunity to attend transferrable skills training programmes at which students from different disciplines come together; iv. Offering rotations across different disciplines within the first few months of training, where appropriate;

		<p>v. Networking opportunities including multi-discipline student conferences or poster competitions;</p> <p>vi. Seminars open to students across different disciplines.</p>
<p>4. Partnership Operational Management (15%)</p>	<p>Robust and transparent governance arrangements.</p> <p>Mechanism for planning, managing and monitoring training.</p> <p>Mechanism for managing partnerships between or within organisations.</p> <p>Mechanism for aligning and agreeing ways of working and sharing resources between different organisations (including non-academic partners).</p>	<p>Systems and processes for assessing the suitability of supervisors and projects.</p> <p>Competitive mechanisms for awarding studentships within the CDT.</p> <p>Excellent students - processes for student recruitment, induction, progression, monitoring and submission.</p> <p>Arrangements for returning accurate and timely data on studentships to NERC.</p> <p>Mechanisms for improving and maintaining submission rates.</p> <p>Establishing cohorts beyond the NERC funded students by using the CDT as a magnet/nucleus for research and training activities.</p> <p>Robust quality-assurance procedures and structures.</p> <p>Development and demonstration of Success Stories.</p> <p>Arrangements in place for management of data generated by studentship projects.</p> <p>Plans for engaging with end-users.</p>