

Cambridge

Earth System Science

NERC

Doctoral Training Partnership

HANDBOOK, V.2

September 2017

1. Introduction

Welcome to the Cambridge Earth System Sciences NERC Doctoral Training Programme. If you are reading this booklet you are most likely a student, supervisor or administrator involved in the DTP. You might also be considering becoming one of those! This document aims to provide some basic information about the aims and scope of the DTP, and about how it operates. It will also direct you to other resources that give you more information about how NERC and the host institutes operate, and about training possibilities. If neither the handbook nor the DTP website at <http://essdtp.esc.cam.ac.uk/> give you the information you need, don't hesitate to contact us.

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2. Doctoral Training Partnerships (DTPs) and the Natural Environment Research Council (NERC)

Studying for a Ph.D. provides students with an opportunity to carry out independent study and to get involved in research. However it has increasingly been recognised that it should also be seen as a way of improving future career prospects, in whatever sector that career may be. Recognising this, research councils have reorganised the way that they allocate their funds for doctorates, with a significant fraction of funding being allocated through the doctoral training partnerships (DTP) system. The aim, according to the NERC website, is that DTPs “provide excellent postgraduate research opportunities within the NERC science remit as well as varied professional and technical skills and personal development training.”

The Natural Environment Research Council (NERC) is the UK's largest funder of independent environmental science, training and innovation, delivered through universities and research centres. Cambridge is a major recipient of NERC grant funding, and numerous departments across the university have researchers within the NERC remit. The British Antarctic Survey (BAS), also situated in Cambridge, is a NERC institute. The DTPs funded by NERC support a nominal 240 students per year across the country in 15 separate DTPs. The award to Cambridge covers a nominal 15 students per year for each intake from October 2014 to October 2018.

Studentships funded by DTPs should fit within the NERC remit: “NERC's remit includes terrestrial, marine, freshwater, science-based archaeology, atmospheric and polar sciences,

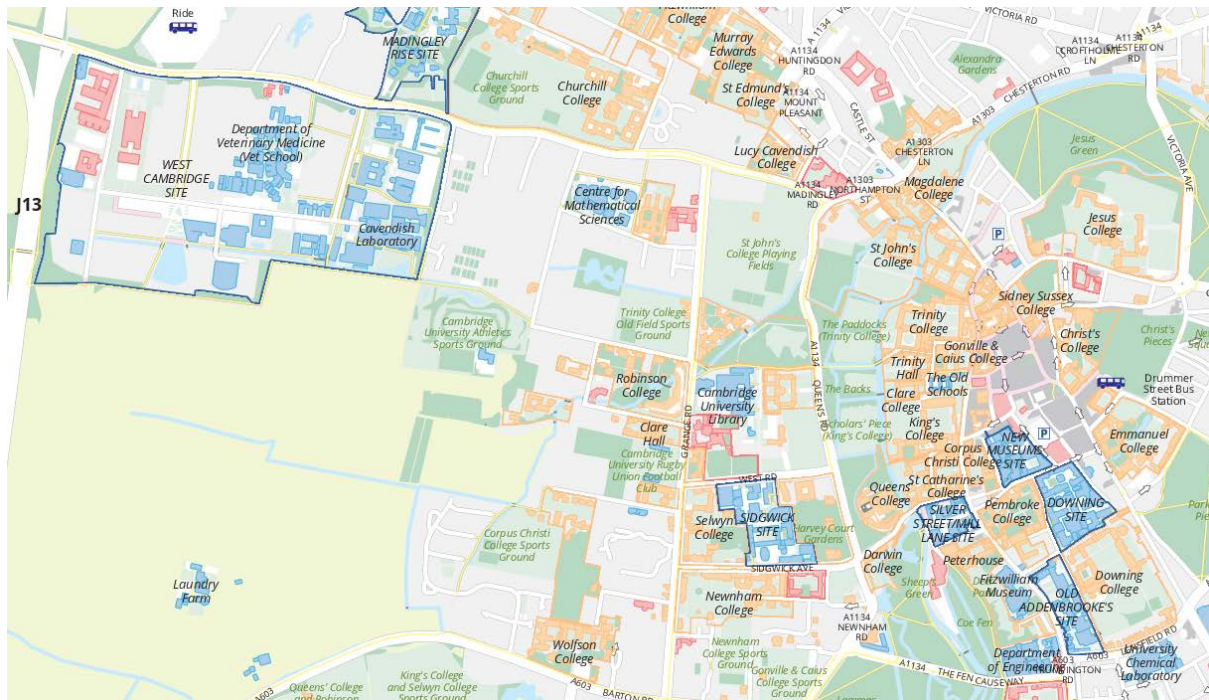
and Earth observation. (NERC) scientists study and monitor the physical, chemical and biological processes on which our planet and life itself depends.” NERC’s strategy currently focusses on 3 societal challenges: benefiting from natural resources; resilience to environmental hazards; managing environmental change.

3. What is the Cambridge Earth System Sciences (ESS) DTP?

The Cambridge DTP comprises leading Cambridge University research departments together with the British Antarctic Survey (BAS). Cambridge and BAS have an exceptional pool of talented researchers working right across the NERC remit, and this is the basis for our DTP. The DTP is embedded in a pre-eminent research university with a vibrant culture and a tradition of cross-disciplinary and multi-disciplinary research. Cambridge attracts outstanding applicants to its degree programs and produces graduates who assume leading roles in industry, academia and government. The partner departments each include a much wider cohort of Ph.D. students funded by various means. They provide a diverse research environment which supports specialist training needs while the DTP, drawing on the wider resources of the University, ensures that students acquire essential transferrable and professional skills.

The departments that can host students within the ESS DTP are:

- Archaeology & Anthropology
- Chemistry
- DAMTP (Applied Mathematics & Theoretical Physics)
- Earth Sciences
- Geography (including the Scott Polar Research Institute (SPRI))
- Plant Sciences
- Zoology
- British Antarctic Survey



All the components of the DTP are within easy reach, which is important where students are co-supervised, and for attending seminars. Archaeology & Anthropology, part of Earth Sciences, Geography and Plant Sciences are all in the Downing Site (bottom right of map), with Zoology nearby in the New Museums Site. Chemistry is a 2 minute cycle ride to the south, with SPRI next door. DAMTP is at the Centre for Mathematical Sciences (top centre of map). The Bullard Labs (part of Earth Sciences) is at the “Madingley Rise” site (top left), while BAS is located nearby, in one of the buildings coloured pink on the map in the West Cambridge site, next to “J13”. The furthest locations (Chemistry and BAS) are a 15-20 minute cycle ride apart. There are also buses from the city centre that end up at the car park/bus centre opposite BAS - both the Madingley Road Park and Ride, and the cheaper university-subsidised U service.

In addition to the host partners, the DTP assembled a wide range of industrial, government, and third-sector partners. These encompass major industrial partners (e.g. BP, Shell, Anglian Water, Waitrose), small and medium businesses including spin-off and start-up companies, government research organisations (NCAS, BGS, Met Office), leading government departments (e.g. The Foreign Office, the former DECC (now part of BEIS) through UKCCS) and NGOs and intergovernmental organisations with interests in environmental issues (e.g. RSPB, UNEP World Conservation Monitoring Centre). Some of the DTP partners co-fund studentships, some take part in CASE partnerships (discussed later), while others provide fully-funded studentships in the NERC remit (and these students form part of the larger cohort). A number act as training partners, or are simply available to provide advice and potentially placements and experience.

4. Research themes and governance

The DTP is organised around three major research themes: Climate (climate change and earth-ocean-cryosphere-atmosphere systems), Solid Earth (geodynamics, structure, composition and evolution), and Biology (biodiversity, ecology, palaeontology, evolution, phylogeny, and epidemiology). We receive a similar number of applications (and of applications from top students, with good gender balance) in each theme, and therefore have tended to allocate studentships almost equally between the themes, although this is subject to review each year.

Each theme has a theme panel, which conducts the recruitment process for that theme each year, and also advises the DTP Chair on other matters. There are usually 3 core members of each theme panel in each academic year (generally distributed across partner departments). Membership is reviewed each year and adjusted to spread the load of work while still retaining experience.

The DTP is administered by a Chair (currently Professor Eric Wolff, Earth Sciences) assisted by a Deputy Chair (from BAS), and by a part time administrator (currently Yvonne Gibbs) and Training Facilitator (currently Kathleen McDougall). The administrator and training coordinator are both currently hosted in Earth Sciences.

The operation of the DTP is overseen by a management committee, which meets at least once a year. Membership of the Cambridge NERC ESS DTP Management Committee is:

- DTP Director and Deputy Director
- Core members of each of the three DTP Theme Committees
- Representatives from Academic Practice and from Board of Graduate Studies
- DTP Administrator and Training Facilitator
- 3 student representatives (the aim is to have one from each year and from each theme)

The DTP Forum, which meets each autumn, is the same as for the Management Committee, but adding a representative of any department not otherwise represented.

There is also a Training Committee, which meets termly, and consists of the Chair, Deputy Chair, Training Facilitator, Administrator and a number (currently 4) of ordinary members (chosen from potential supervisors), plus 1 student representative.

5. Recruitment of students

Our main aim is to recruit the very best students, who would benefit from the Cambridge doctoral programme.

The process each year starts with a call to all eligible academics in the component departments to provide (using a web-based proforma) short summaries of student projects for which they wish to recruit. The summaries contain information about the lead supervisor and co-supervisors, and an indication of which of the 3 themes the projects is within. Next the supervisors must provide short paragraphs on (a) the importance of the area of research concerned, (b) a summary of the project and (c) a section on “what the student will actually do”. There is also a narrative about the training to be provided, the experience required, and the budget for the project. Finally the form asks whether there will be a CASE partner (see later section). We request these project outlines by a date around the end of September each year. Some projects are carried over from unfilled projects the previous year, but supervisors have to reconfirm the project details.

Each theme panel meets in mid-late October to consider project proposals. At this meeting, the core theme members are augmented by one representative from each other department that has submitted project summaries to the theme, to be sure there is someone available to defend a project summary. The panel considers whether each project is acceptable, with the criteria that (a) the project must fit into the NERC remit, (b) it must have appropriate supervision (in terms of topic and experience), (c) it must be clear that sufficient resources and instrumentation are available to carry out the project successfully. The few projects that fail one of these tests are not advertised on the website and are not available for applications. Outlines (mainly sections a-c above) of approved projects are loaded onto a searchable part of the DTP website (<http://essdtp.esc.cam.ac.uk/>) as early as possible (normally by the end of October). Projects that have a definite CASE partner are highlighted on the website and students are particularly encouraged to apply for these. The October theme panel meetings will also be asked to choose projects that might be highlighted for a “targeted” call (see under section 6, CASE projects).

Students should use these project summaries to decide on one or more projects and supervisors that interest them. They should then contact the supervisor(s) to discuss the project(s) and their suitability. This will help them to produce a better application and perform better at interview. Furthermore, supervisors may be able to advise on the strength of a candidate’s qualifications and experience before the cost and effort of an application are incurred.

Students apply to carry out a Ph. D. using the university’s Applicant Portal, with a deadline normally right at the start of January (but students should check this each year). The “How to Apply” section of the DTP website gives more details. Students are actually applying for

study on a particular course in a particular department (e.g. Earth Sciences Ph.D. in Earth Sciences, or Antarctic Studies Ph.D. hosted by BAS).

Departments will forward the applications that are eligible for DTP funding to the DTP selection panels, but applicants should indicate that they are seeking DTP funding in the Funding Section: using the funding directory search function please select the NERC DTP. Students indicate the projects they would like to be considered for in the Research Section: When prompted they should add the name of the supervisor as stated in the project summary, and for 'proposed title of research' they should add the project code and project title. Students may apply for more than one project or supervisor.

Note that where the lead department is BAS, students generally apply for a Ph.D. in Antarctic Studies. Because BAS is not a degree-awarding body, all BAS students will also have a supervisor in a university department, and that department will ultimately be responsible for administering university requirements on, for example, progression and degree awards.

Competition for admission to the University of Cambridge graduate programme is intense. We require our graduate entrants to have (a) at least a 2.1 in an Honours degree from a UK University or equivalent standard from an EU or Overseas University, (b) two outstanding academic references, and (c) fluency in the English language. See the university web pages for more details.

DTP funds can only be awarded to UK and EU students. However because there are other sources of funding available in Cambridge, students who are not eligible for DTP funding can still apply for the projects we advertise, but obviously they will complete the Funding Section differently. The deadlines for such funding may be earlier than that for the DTP funding so students should check this carefully. Note that EU students are currently eligible for “fees-only” funding, so that they require other support for their maintenance (living costs). Such students may wish to use the form to apply also for consideration by the Cambridge Trust, which has a European student funding stream.

After the deadline, each department forwards a ranked list of eligible candidates to the relevant theme panel. Each panel meets (again with representatives from each department that has submitted candidates) to shortlist a number for interview. No supervisor will be awarded more than one studentship (as lead) in each round. However we aim to appoint the best students irrespective of which projects they have chosen, so if more than one applicant is shortlisted for the same supervisor we will discuss alternative projects with them at interview or before. Each panel generally interviews over 2 days in late February and will make offers shortly afterwards. The interview consists of a small panel, and students should have the opportunity on the same day to meet as many of their supervisors as possible and visit their host department(s).

All DTPs have agreed a common acceptance date in mid-March (see website for specifics this year); this means that a student is not obliged to decide on an offer until this date, ensuring that they are aware of all possible offers before they have to make a decision. A consequence of this is that a small number of studentships become available after mid-March, so some students will be kept on a “waiting list” until after this date.

Because students apply to a department and indeed may be being considered for a range of funding sources, the DTP is not in a position to tell students whether or not they have been accepted or rejected by the department, only whether they have been awarded DTP funds. Potential students should therefore be sure to stay in contact with the departmental administrator as well as with the DTP.

6. What is a CASE studentship?

“CASE studentships (Collaborative awards in science and engineering) provide doctoral students with a first-rate, challenging research training experience within the context of a mutually beneficial research collaboration between academic and non-academic partner organisations” (from the NERC website). The non-academic partner may be from industry, business, public and third sector organisations.

NERC awards free-standing case studentships under the “Industrial CASE studentship competition”. However it also encourages DTPs to “CASE” some of their studentships and indeed requires that 30% of the nominal studentships are CASE.

NERC requires the CASE partner to supplement the studentship by paying at least £1000 per year to the lead Research Organisation for the duration of the studentship, and to meet the extra expenses incurred by students visiting and working in their establishments. They are also expected to contribute in cash or in kind towards necessary materials. The student must spend between three and eighteen months in total with their CASE partner in a workplace outside the academic environment.

A CASE studentship is generally focussed on a problem with a direct application, which might be to a commercial opportunity, a policy goal or a societal need. It provides the student with additional facilities and a little extra funding, as well as a broader experience. It should generally provide the non-academic partner with assistance in researching a problem relevant to their organisation, as well as access to the intellect of the student and the academic supervisor.

Some of the projects we advertise will have a confirmed CASE partner. In the 2018 recruitment round, we plan to choose 3 such projects to be treated as “targeted studentships”. That means that they will be guaranteed funding provided a student meeting our quality requirements is found, and will not have to enter the open competition. These will be highlighted on the DTP website and students are strongly encouraged to apply for them. We hope to “CASE” more than the 3 targeted studentships and in the open competition, if panels have to choose between 2 students of equal calibre, they may use the involvement of a CASE project as a tie-breaker. If one or two studentships remain at the end of the competition, the DTP Chair may request a panel to consider eligible applicants for CASE projects only. In this way, the DTP will continue to appoint only the best candidates but applying for a CASE project may offer students an advantage.

Once it is known which projects have won DTP-funded students each year, the Chair and Administrator will contact supervisors who do not yet have a CASE involvement to ask them to consider whether they could add a CASE partner. The student in such cases will still benefit from the additional funding and involvement of the non-academic partner.

7. DTP funding for students

NERC, through the DTP, provides, for each studentship:

- Fees
- Stipend (living expenses)
- Research Training Support Grant (RTSG)
- Management fee

EU students who do not qualify as home students can be paid only a fees-only award, which means that they do not receive a stipend.

The fee level is determined each year based on an inflation measure. The indicative level provided by RCUK (£4195/year for 2017/18) is not sufficient to pay the University Graduate fee. However, the university has agreed a temporary subsidy towards the difference for the duration of the current DTP, and departments cover the remaining shortfall. DTP-funded students may not be asked to pay any part of the fee. A Cambridge Ph. D. is a 3 year course, so fees are only payable for 3 years.

According to RCUK, the National Minimum Doctoral Stipend for 2017/18 is £14,553/year, and this is what will normally be paid to students. Although the Cambridge PhD is a 3 year course, many students exceed this and the NERC DTP provides funding for 3.5 years. However the expectation is that all students will aim for submission of their thesis early in their 4th year. There are no DTP funds available to fund students who have not submitted after their 42nd month (except those with agreed extensions due to e.g. internships, sick leave, maternity leave). Students who complete before month 42 may, under RCUK rules, be paid until the end of the quarter in which they submit, provided they are still working on material relevant to their Ph. D.

The RTSG is £11000 for the full length of the studentship, and is intended to cover items like laboratory consumables, travel (e.g. to conferences and fieldwork), and training costs. The DTP retains £1000 of this for centrally organised training costs, and the remaining amount (£10000) is transferred at the start of the studentship to the host department, along with the fee and stipend. Each department may have different policies about how this RTSG is used: some may simply state that each student has the same amount and delegate spending to the supervisor, while others may administer the funds centrally so that students with more costs receive more than the nominal amount and vice versa. Students should check this with their supervisor and department.

For students hosted by BAS, the funds are transferred to the department where the student is registered, who are then invoiced by BAS for the funds to be held there.

8. What does it mean to be a member of the DTP?

If you are funded fully or partly by the DTP then you are a DTP student, and also a NERC student (Note: the DTP must be covering at least 50% of eligible costs). This comes with some privileges and requirements.

In Cambridge we are fortunate that there are several other sources of funding, such as the Gates Foundation, Cambridge Trust, and college funds; additionally students arrive with funds from other sources such as foreign government fellowships. Students with any source of funding who are within the DTP (i.e. NERC) remit will be part of the “DTP cohort”, which is about double the size of the DTP-funded group (i.e. the cohort is about 30-40 students per year). They will be eligible to receive information from the DTP and to attend most of the DTP-organised events. However they do not have the same obligations, for example for NERC administrative purposes, and are not required to complete the DTP training planner (see later).

As a postgraduate student, you are part of a department, a DTP (if you are DTP-funded) and a college. The Cambridge system can seem complicated but the practical result is that it provides you with additional opportunities. We characterise it as follows:

Your main guide and mentor should be your supervisor(s). They will provide or arrange intellectual support and facilities for your project, and discuss training and progress with you.

Your department will have processes in place to provide a committee of advisors/friends, to check your progress, pay your stipend, etc. In some departments there may be extensive training requirements, in others less so, in which case you will rely more on the DTP. In many cases the cohort of departmental students may roam much wider than the NERC remit and provide you with a stimulating network in addition to that of the DTP. Finally the department and its parent faculty will be responsible for arranging your exam and making sure you receive your degree! The department is primarily responsible for your progress – however if you have problems with training, research progress, supervision or any other aspects of your Ph.D. please do talk to us at the DTP as we may be able to offer alternative support, and we need to be aware of problems that might delay or even derail your studentship.

Your college may be your home and social centre. There will also be processes there to offer you pastoral support, and to advise you if you feel you need extra support, or have difficulties within your department.

The DTP recruited you, will ensure you are being offered the variety of training you need, and will host cross-DTP events which will provide you with another network. The DTP is ultimately responsible to NERC for the funds supporting you, so we will occasionally have to ask you to come to obligatory events, to carry out admin tasks required by NERC, etc. We are happy to act as an additional source of help and advice if you are not getting what you need from your department.

9. Training

Training is a crucial part of your Ph.D. experience. It can be considered in two parts: firstly, the training you need to execute your project and secondly the training that will enhance your suitability for whatever you do after your Ph.D. Because your studentship is immersed in an academic environment, it's easy to forget that many students, even if they go on to a

postdoctoral position, will end up working outside academia, for example in industry, as entrepreneurs, or in the professions.

We therefore believe that you should leave the DTP with:

- Scientific training to enable you to be an independent scientist in your discipline
- An appreciation of a wider multidisciplinary area of research
- Personal and professional skills

Cambridge offers a huge range of training opportunities, and a main role of the DTP is to help you navigate and find what you need. Training will be available from:

- The DTP centrally
- Your department (and, where relevant, BAS)
- Your college
- The university through the central Researcher Development Programme and other providers like, for example, the University Computing Service or the Careers Service. The Researcher Development Programme's website (<http://www.rdp.cam.ac.uk/>) is a central port of call for links to other training providers in Cambridge, as well as providing information about their own courses and programmes.
- Outside providers, including other DTPs and NERC centres

Some DTPs offer a wide range of generic training delivered to the whole cohort at the start. While this may be useful to some students, we believe it is more useful to offer a smaller range of basic and specialised training while enabling access to a wide range of opportunities tailored to each student's needs. We are also aware that some departments have a very wide programme of compulsory training while others have a much lighter requirement. Our aim is to ensure that everyone has access to training without forcing people to repeat training they have already received.

The way that we manage this is to:

- 1) Provide the DTP students with **customised training guidance**
- 2) Provide a range of **basic and specialised courses** that respond specifically to the ESS DTP students' needs
- 3) Provide students with **information on courses** available within and outside Cambridge on a regular basis to make sure they don't miss opportunities

To help us provide students with customised training guidance, DTP students are asked to fill in a spreadsheet based tool, which is based on the ideas in the Vitae system, but simplified and modified to suit students and particularly our students. Each student should complete this spreadsheet, known as the training planner, in the first term and then update it at the end of each academic year when they also have to complete a training log

(according to departmental timetables). The planner takes around 30-60 minutes to complete, and allows students to identify the areas where they lack skills or require training. The Training Facilitator (with help from the training committee) will assess each planner and, in the first term and at the end of the first year, the Coordinator will provide each student with personalised advice, pointing them at suitable courses to meet their identified needs, and assessing their progress so far. A lighter touch assessment of planners will be carried out in later years of each studentship.

The areas of skill and training covered by the planner are:

- Academic
- Ph.D.
- Research
- Professional
- Personal
- Career
- Enterprise

We recommend that each student gains 20 “credits” each year (i.e. 60 in total) where a credit represents roughly half a day of training. Credits can be gained from courses, as well as from activities such as attending a conference and preparing a poster, although students are expected to gain a balance of credits across different areas of training.

We provide a number of activities each year that DTP-funded students are required to attend:

- Induction (for 1st year DTP-funded) - includes an introduction to the training provisions for DTP students Cambridge; supervisors are also asked to attend part of this event to understand how they can support the transferable skills training of their students
- Cohort training event for 1st year students (compulsory for DTP-funded), to include multidisciplinary talks (showcasing the breadth of environmental topics), and a cohort social event
- Career development (for all 1st year DTP-cohort students) - an introduction to thinking about the skills students should aim to obtain during their Ph.D.
- Literature review workshop
- Ph.D. workshop led by recent graduates
- Presenting a talk (seminar and workshop)
- Student poster/oral presentation conference

The DTP also organises centrally a range of other events in response to needs identified year-on-year. In 2016/17 we ran, for example, a GIS training course (with ESRI), a Policy and

Science workshop (with CSaP, Cambridge Science and Policy), and training in programming a Web App (with Cambridge Coding Academy). From time to time we have the chance to bid for funds for Innovation activities.

During term time, the DTP issues the whole DTP cohort with an e-Bulletin twice a month. This lists all the opportunities, starting with DTP events, then events in Cambridge and finally training available outside Cambridge.

There is a huge range of fascinating seminars in Cambridge every week, accessible through talks@cam (talks.cam.ac.uk). Students are strongly encouraged to sign up to receive alerts for interdisciplinary seminar series in Cambridge such as those of:

- Cambridge Centre for Climate Science (CCfCS) – 2-3 events per term across climate sciences
- Conservation Research Institute (UCCRI) – early career programme with weekly events
- Earth Science and Bullard seminars
- Quaternary Discussion Group (QDG): late afternoon seminars/term
- Centre for Atmospheric Science seminars
- Many guest speakers at BAS (only a 15 minute cycle ride from other departments)

The ESS DTP has formed an alliance with the EnvEast DTP (centred at UEA in Norwich). The alliance is called CEEDA (Cambridge ESS EnvEast Doctoral Alliance). We aim to share best practice, to organise occasional joint events, and for some events organised by ESS to invite EnvEast students and vice-versa. One particular event is an annual joint student symposium, scheduled to be held at BAS on March 19-20, 2018.



10. Research Experience Placements (REPs)

NERC provides each DTP with funding for summer Research Experience Placements (REPs) for undergraduates each year – we received 6 of these in 2017. We administer these by asking supervisors for project outlines. We then choose (nominally using the theme panels to choose the best where there are more than can be funded). We then liaise with the departments to advertise the REPs to eligible undergraduates (there are normally conditions on who is eligible), and collate the final reports that have to be sent to NERC before the funding is paid.

11. Other things students are required to do, or may like to do!

Because we receive a lot of money from NERC to fund the studentships, we are required to do a certain amount of bureaucracy, and some of it requires us to impinge on the time of students and supervisors. In particular:

Departments have to enter the main details about students in the JeS system, which is an online system administered for NERC. That means that, if circumstances change (a student requires an intermission, maternity leave, termination of studies), an entry must be made in JeS. However please also inform the DTP administrator as we may also need to act.

NERC requires all students (as also recipients of their grants) to enter data each year in its “Researchfish” database. The main things that need to be entered are publications and success stories. NERC will contact each student who needs to do this (1st years are exempted), and we (the DTP) will remind you. Please do this task. If there is nothing to report you **must** submit a NULL return, doing this is quick and easy. If you don’t do it, both you and the department could be penalised, and it could reflect badly on the DTP when we apply for renewal.

Each summer, we have to complete an annual report. We try to do this mainly using your training logs, so please submit this on time. However we are likely to mail you, asking you to tell us about success stories (such as papers you have published or major public engagement achievements). Please reply as it really helps to have these stories to hand, and we don’t have access to what you entered in Researchfish.

We hope that students and supervisors will find their activities funded by the DTP to be rewarding and enjoyable. However if you are having problems and doubts, do come and talk to us. We may be able to help and we certainly need to know if your circumstances change. Your supervisor and department are the first port of call, but we are happy to act as a backstop for problems that persist, and for enquiries.

Each year, NERC and RCUK advertise policy internships – essentially 3 months working with a government or other policy section related to science. You are encouraged to apply for these (and similar opportunities) but you should talk first to your supervisor to make sure they are happy that this is the right moment. You will also need a signature from the DTP, so contact us in good time before the deadline too. If you are successful then your studentship can be extended for 3 months and it is essential that you also notify your department so

that this extension can be arranged. Departments will need to update the student entry on JeS and CAMSIS.