



Understanding the Earth, Atmosphere and Ocean Manchester & Liverpool Doctoral Training Programme

STUDENT HANDBOOK 2015/16



Welcome Statement

Welcome to the Manchester and Liverpool Doctoral Training Programme, one of the 15 NERC-sponsored DTPs in UK Universities. Our aim is to provide you with a PhD programme that combines research at the cutting edge with a broad appreciation of the science of the Earth system that will serve as a solid foundation for your future career, whatever that may be. With vibrant research programmes in Atmospheric, Ocean, Earth and Environmental sciences we offer a breadth of opportunities to get to know and collaborate with some of the leading scientists in your chosen field. We also have an extensive range of research facilities to support your research and a wide-ranging training programme, whatever your background.

A PhD is often depicted as a lonely struggle with an almost-intractable problem. That is not what we're aiming for in our DTP. The problems are certainly there, and there will certainly be ups and downs along the way, but there will always be someone to support you – whether fellow-researchers sharing an office, your supervisory team or colleagues elsewhere in Manchester or Liverpool who can shine a light in your direction. At the beginning of my PhD a senior colleague advised me to treasure this time, as it would be the only opportunity I would have in my life to devote all my time to one academic problem – how right that turned out to be! Enjoy your time with us and make the most of the great research environment we have to offer.

Geraint Vaughan

DTP coordinator

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1. Introduction

1.1 Background to the NERC DTP programme

NERC changed the way they fund doctoral training from the 2014 intake onwards, to better meet the NERC strategic goal of “creating and supporting vibrant, integrated research communities” and to emphasise multidisciplinary training. Fifteen Doctoral Training Programmes were funded across UK Universities, most of them collaborations between two or more institutions. The much reduced number of points of contact compared with the previous NERC studentship scheme allows NERC to interact more with the Universities and assure themselves of the quality of provision.

More details can be found on <http://www.nerc.ac.uk/funding/available/postgrad/responsive/dtp/>.

1.2 The Manchester-Liverpool-NOC Partnership

The Manchester-Liverpool-NOC collaboration is able to offer a PhD programme across most areas of the NERC remit, building on the research and training strengths of the three institutions. Combined with our collaborative ethos, this means we can provide a unique training environment for the UK’s next generation of researchers. Our DTP builds on a long-standing strategic partnership between Liverpool and Manchester, and on the strong record in attracting NERC funding for research in the three partners.

In addition to our three core partners the DTP also has 8 external partners:

NERC Centres	National Centre for Atmospheric Science (NCAS) British Geological Survey (BGS)
Public sector organisations	The Met Office Diamond Light Source Defence Science and Technology Laboratory (DSTL) Nuclear Decommissioning Authority Radioactive Waste Management Directorate
Private companies	TOTAL Exploration & Production UK Limited BP Alternative Energy [NVIDIA]

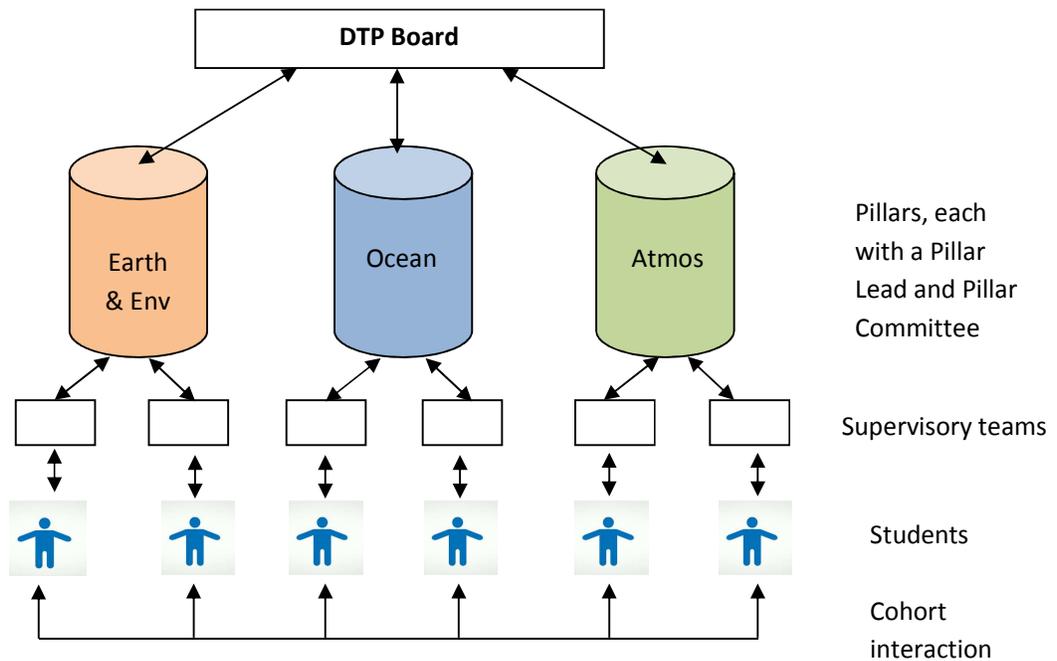
These partners will support the DTP in a number of ways, through student training, CASE partnerships, student placement and involvement in DTP events.

Students will be hosted at one of the three lead partners, and registered for a PhD at the University of Manchester or University of Liverpool. Their research projects may be exclusively based at one of the partners, or involve collaboration between them – but the training programme is provided jointly. Our aim is to expose students to the breadth of research in the environmental sciences, while at the same time developing them as cutting-edge scientists in their chosen field.

The studentships are for 3½ years with a possible extension to 4 years in exceptional circumstances. The DTP expects submission of the thesis by the end of 3½ years for the vast majority of students, and under the rules of the two Universities no theses will be accepted if submitted more than 4 years after registration.

1.3 Structure of the DTP - The Three Pillars

The DTP is arranged around three pillars in Atmospheric, Ocean and Earth and Environmental Sciences. Research and training in Atmospheric sciences takes place in the School of Earth, Atmospheric and Environmental Sciences (SEAES) in Manchester; Ocean Sciences in the School of Environmental Sciences (SoES) in Liverpool and the National Oceanographic Centre; and Earth and Environmental Sciences in SEAES, SoES and the Faculty of Life Sciences at Manchester. The pillar committees are responsible for designing and delivering the training programme in their area, monitoring student progress and take-up of training, and allocating students to supervisors. Overseeing the DTP is the DTP Board which is responsible for overall strategy and external links. This structure is summarised in the following diagram:



1.4 Aims of the PhD programme

Our aim is to provide a thematic viewpoint, focussing on the atmosphere, ocean and solid Earth, addressing physical, chemical and biological processes at work in our environment.

Our training is tailored to suit the individual needs of each student, drawing on our strengths in each research theme, as well as providing a broader environmental overview to the research challenges in environmental sciences.

Our programme is augmented by other government funded and industrial partners providing additional training, work experience and opportunity for placements.



2. Overall Programme of study

2.1 Getting started

Each student registers with their host University, and will be subject to all the rules and regulations of that University. They will follow the induction programmes provided for all new PhD students at the beginning of the semester. Registration at Manchester/Liverpool triggers an entry for the student on the eprog/toolbox electronic system which monitors student progress and training and students are required to familiarise themselves with the relevant system as soon as possible.

Each student will be provided with a desk and a computer in their chosen research group, and should meet with their lead supervisor as soon as possible to discuss the initial stages of their study. At this stage a Skills Audit will be conducted and an initial Training Plan will be drawn up, depending on the student's previous experience and their chosen research area. The Plan will include transferable skills as well as academic training, and will be reviewed regularly by the student and the Supervisory Team.

2.2 The Supervisory Team

Each student is advised by a supervisory team, which will include at least two academic supervisors. An academic from outside the subject area is also available to whom the student can turn in case of difficulties with his or her main supervisors; at Manchester this is the role of the Advisor while at both Universities the Postgraduate coordinator should be consulted.

The supervisory team may contain members from another of the core partners, one of the Partner Organisations or an external body; CASE supervisors for instance will be members of the team. Although the membership of the supervisory team normally remains the same through the PhD this does not have to be the case – if the student's research moves towards a topic where the current team's expertise is limited, the Pillar Committee will appoint new members better suited to the new direction of research. This would normally happen after the student's Annual Review (see Chapter 5).

2.3 Refining the topic

A very important aim of the first year of a PhD is for the student to refine their research project. The DTP provides a flexible choice of topics for students – some have clearly-defined objectives from the outset, while others are more general. Through the training courses, directed reading, conversations with staff and other students and advice from the supervisory team, the research topic is gradually refined and by the end of the first year a reasonably clear plan should be in place for the remainder of the PhD. Of course, this is not binding – the nature of research is that some ideas don't work out, unexpected opportunities arise along the way and a student's interests will change over the course of three years. But experience shows that a good start is very important if the PhD is to be finished in the allotted time.

Regular contact with the supervisory team is mandatory through the PhD (and monitored by eprog/toolbox) but a formal meeting to discuss the research topic will be held after roughly 4 months and 8 months of the first year.

2.4 Summary of Training Provision

Beginning with the Skills Audit, students and their supervisors will develop individual training plans monitored and reviewed by the DTP Board through the Pillar Committees. The formal training has two components: subject-specific and transferable skills. DTP courses will all be open to any student, with most students combining elements across the pillars in their training programme. A typical student will complete 8 units of subject-specific training in the first two years depending on individual needs (a unit very roughly equates to a 10-credit module). Some of this may be waived in the case of students who have already gained an MSc or equivalent in their subject area; in such cases the training plan should explain clearly why a waiver is appropriate.

Training will be delivered by a wide range of mechanisms, from traditional weekly lecture courses (especially where there is overlap with Masters provision), through workshops and intensive 2-day residential courses to hands-on practical instruction and self-learning courses accessed via the internet. Video conferencing and internet phones (e.g. skype) enable small groups spread across different sites to communicate efficiently. You are encouraged to develop your own on-line resources (e.g. wikis, facebook pages, youtube channels) to share knowledge and good practice - please make sure you follow your local University guidelines and policies though.

The programme described here is only one aspect – the formal aspect – of student training. Aspects not covered here – regular meetings with the supervisory team, preparing reports and papers for feedback by supervisors and eventually for publication, learning key techniques from colleagues, learning to read the scientific literature critically, are all essential parts of PhD training which take place in an informal environment. Through social interaction, use of on-line forums, attendance at seminars, research colloquia and conferences and presenting your results therein you will learn from your peers and from others in the field, and be in a position to compete strongly for the best jobs on offer internationally.



3. Subject-Specific Training Programme

The units described here are offered to all DTP students, though most will mainly follow courses within their own pillar. It should be stressed that the courses here are not a complete list of those you can follow – we encourage attendance at postgraduate training courses outside the DTP and recognise that students' individual needs will differ. In particular we encourage participation in national or international 'summer schools' which provide unrivalled networking opportunities as well as exposure to leading experts in the field of study. There are too many of these events to list here but you should discuss the possible options with your Supervisory Team.

3.1 Common Programme – compulsory for all students

Two introductory workshops will be held early in the first semester to bring the cohort together and provide an overall introduction to the science covered by the DTP. These workshops will span two consecutive days of training, one in Manchester and one in Liverpool:

- *Introduction to the DTP* – explanation of NERC and its expectations, overview of the training framework and a summary of research opportunities covered by the DTP.
- *Introductory view of atmospheric sciences* – overview of the key science challenges in the subject and of the work being undertaken at Manchester
- *Introductory view of ocean sciences* - overview of the key science challenges in the subject and of the research being conducted at Liverpool and NOC.
- *Introductory view of earth and environmental sciences* - overview of the key science challenges in the subject and of the topics being investigated at Manchester and Liverpool.

The subject workshops will also give an introduction to the facilities available at the three institutions. Together, these workshops comprise one training unit.

Around November of Year 1 a DTP course on *Communications* will be delivered to the DTP cohort by Prof David Schultz, to introduce the art of giving presentations and posters. Follow-up courses in Year 2 will cover paper writing and thesis writing.

3.2 Atmospheric Sciences Pillar

The training programme covers courses in the Atmospheric Science together with instruction in essential research techniques. It will be provided jointly by Manchester and NCAS, the latter through NCAS staff at Manchester and through residential training courses offered nationally.

Courses for students new to atmospheric science with a physical science background.

These courses present the essential concepts of the subject. Each course comprises 20 lectures and exercise classes.

- *Atmospheric Physics and Meteorology.* Dynamical meteorology, cloud processes and weather systems. Use of weather forecasting models. (G. Vaughan, P. Connolly)
- *Climate and energy.* Climate change and earth system processes. (M. Gallagher)
- *Remote Sensing.* Satellite and surface based remote sensing using imagery, radar and lidar. (G. Allen, G. Vaughan, M. Burton)
- *Atmospheric Chemistry and Aerosols.* Develops a broad underpinning knowledge of physical and chemical properties and processes governing gases and aerosols in the atmosphere. Available from 2016/17. (G. McFiggans, C. Percival)
-

Specialist techniques used in Atmospheric Science.

Taught through laboratory classes and field work.

- *Measurements in Atmospheric science.* Use of probes for measuring clouds and aerosols, chamber experiments on atmospheric composition, remote sensing techniques. (C. Percival).
- *Computing and data analysis.* Programming and data analysis techniques, using computer languages and packages. Data curation and standards. Suitable for any DTP student (J. Crosier and J. Allan)

Topics in Atmospheric Science. Weekly seminar series and weekly student-led current weather discussion.

NCAS Residential Schools: <https://www.ncas.ac.uk/index.php/en/education-and-staff-development>

These courses are offered by NCAS on a national basis, and will be open to any DTP student. Atmospheric science PhDs will attend at least one of them. Please check with NCAS which courses are running in 2014/15 and when they are being held.

- *Introduction to Atmospheric Science* 1 week intensive course in the autumn term
- *Atmospheric Measurements.* 1-week residential course with hands-on experience in field measurements
- *Climate modelling.* 2-week residential course on all aspects of climate modelling
- *Advanced Statistics Training for Climate Research*
- *NCAS/NCAR Training in use of WRF.* Five day course for European users of the Weather Research and Forecasting Model (WRF).
- *Met Office Unified Model.* Training in UM designed to give new users an introduction to the model, its output and data files.
- *United Kingdom Chemistry and Aerosols (UKCA) Model.* The training offered will ensure that the future users of UKCA will have a firm foundation in both the theory behind UKCA, and experience in both using the standard chemistry and aerosol options, and expanding the model schemes for their own research purposes.
- *Introduction to Scientific Computing.* This course provides an overview of programming concepts and handling data in a scientific environment. The course will cover: Shell programming, Introduction to python programming, Introduction to data handling, Visualising basic data.
- *Practical Aerosol Science.* The course provides an introduction to the challenges faced in making aerosol measurements. It is split between lectures on the theory and application of aerosol measurements and techniques and practical, hands on demonstrations in a laboratory.

3.3 Ocean Sciences Pillar

The training draws on the numerical modelling and data gathering and management skills at NOC including BODC and the interdisciplinary research in physical and biogeochemical oceanography at Liverpool. Research skills in data analysis, numerical modelling and laboratory work are provided, so that students can become effective researchers in Ocean Sciences. The courses will range from short intense blocks of 2 to 3 days to weekly lectures over a semester.

- *Modelling processes in oceans and climate.* Illustrating the role of the ocean in climate change and biogeochemistry. Students will develop 0-D and 1-D models using finite differencing of tracer equations, tracer transfer, carbon, nutrient and phytoplankton cycling. Autumn semester.
- *Sea level in a changing climate.* Address how sea level varies and the effects of different physical phenomena, including storm surges, eddy, gyre and overturning circulations, as well as the likely imprint of future climate change. Autumn semester.
- *Data analysis of Environmental Records.* Introduction to time-series analysis and statistical modelling, including error analysis, filtering and data gaps. Provided by NOC staff in a block session, drawing on University CSD training instructions for Matlab. This draws on the unique and extensive data records available at NOC and BODC. Spring semester.
- *Ocean biogeochemical cycling: sampling, laboratory analyses, and models.* Provide an integrated view from observational sampling (using Liverpool's research vessel *Marissa*), laboratory analyses, and models for ocean cycling of carbon, nutrients and trace metals. Spring semester.
- *Ocean and climate sciences: review topical issues.* Students lead a Journal club reviewing topical issues in the literature and drawing on high-impact papers. Spring and Autumn semesters.

3.4 Earth and Environment Sciences Pillar

The training programme covers courses in the Earth and Environment Sciences together with instruction in essential research techniques. It will be provided jointly by Manchester and Liverpool, as well courses by NERC and external bodies. The courses will range from short intense blocks of 2 to 3 days to weekly lectures over a semester.

Courses provided at Manchester or Liverpool, as weekly attendance.

Taught through lectures, laboratory classes and tutorials.

- Metamorphic Petrogenesis (Manchester)
- Sediment Transport Mechanisms (Manchester)
- Global Environmental Change (Manchester)
- Applied Earth Sciences (Manchester)
- Living with Climate Change (Manchester)
- Geomicrobiology (Manchester)
- Hydrogeochemistry (Manchester)
- Organic Geochemistry (Manchester)
- Conservation Biology (Manchester)
- Human Impacts on the Biosphere (Manchester)
- Planetary geophysics (Liverpool)
- Mineral deposits in space and time (Liverpool)
- Rock deformation (Liverpool)
- Evolution, oceans and climate (Liverpool)
- Geophysical Exploration techniques (Liverpool)
- Hydrogeology (Liverpool)
- Advanced structural geology (Liverpool)
- Water flows, sediment entrainment/transport and hydraulics (Liverpool)
- Field approaches to soft sediment sampling and analysis (Liverpool)
- Methods and data analysis in particle size and shape characterisation (Liverpool)
- A practical introduction to environmental magnetism (Liverpool)
- Theory and methods in soft sediment analysis: geochemistry, mineralogy and organic matter (Liverpool)
- Spatial data acquisition and analysis: from RTG dGPs to 3d laser scanning (Liverpool)
- Theory and practice in micro-and macro-palaeoecology (Liverpool)
- Optically stimulated luminescence dating (Liverpool)
- Environmental radioactivity, laboratory and analytical approaches (Liverpool)
- Boundary Layer Climates (Liverpool)

Specialist training held as short intensive courses

- Electron optics and methods (Liverpool and Manchester) (3 days)
- Experimental rock deformation (Liverpool) (3 days)
- Genomic technologies and bioinformatics (Manchester) (1 day)
- Electron microscopy (Manchester) (1 day)
- Bioimaging (Manchester) (1 day)
- Bioinformatics (Manchester) (1 day)
- Statistics and data handling (Manchester) (1 day)
- Mineralogical and (bio)geochemical analysis (Manchester) (1 day)

NERC Advanced Training Short Courses and BGS courses

This is not exhaustive. See later in the handbook for a full listing.

- Environmental statistics and data analytical training courses and advanced workshops
- NCAS Atmospheric Field Measurement Summer School
- Systematic review and meta-analysis for environmental sciences
- Practical use of Unmanned Aerial Vehicles (UAVs) for the environmental sciences
- A skills framework for delivering safe and effective fieldwork in the polar regions
- Extreme flood events: forecasting, modelling and response
- Scientific diving: In situ marine field identification and survey skills
- Data analysis with R statistical software
- Further beyond the code: developing software craftsmanship for environmental scientists
- Quaternary Palaeoecology
- UKCA Theory and Practice: workshop on atmospheric composition modelling using the UKCA model
- Predictive models and programming skills using agent-based models
- Sampling the environment design and analysis for efficient and robust collection of data
- An introductory molecular phylogenetics course: molecular diagnostics for species identification and evolutionary analysis

- Modelling structure and dynamics in complex networks – mathematical modelling and statistics
- Bayesian methods to fit statistical models in environmental science –mathematical modelling and statistics
- Introduction to palaeoclimate modelling for palaeodata specialists
- Taxonomic principles and tools in botanical research
- Environmental Genomics and Metabolomics (ENIGMA)
- Scientific diving techniques and technologies
- Introduction to mathematical modelling for the environmental and biological sciences
- Introduction to data visualisation
- NCAS Training for the Unified Model
- Numerical modelling short course for postgraduate students

3.5 Wider Training Opportunities

There are many opportunities for training outside the three core partners, usually in the form of intensive short courses. NERC support a number of Advanced Training Short Courses (see sect 10.1) which are designed especially for DTP students. NERC Centres also offer short courses; those from NCAS and BGS are included above. Beyond NERC, there are European summer schools like the European Research Course on Atmospheres and the Intensive Course Atmospheric Chemistry and Dynamics at the Research Centre in Jülich.

3.6 Multidisciplinary Training

The DTP aims to develop an awareness of other disciplines among all students, and foster multidisciplinary links. For this purpose there are a number of cross-cutting activities:

- *Induction events* (see above)
- *Current issues*. Topical and current issue modules in the three pillars will be available to the entire DTP cohort (see above).
- *Seminars and Workshops*. Students will be informed of the seminar and workshop programmes running across the three pillars with a requirement that they attend a broad range of research presentations.
- *Student conference*. Students at Manchester and Liverpool organise annual student conferences, in December and May respectively, with guest lectures and industrial sponsorship. From Summer 2016, the DTP will host its own student conference.
- *Integrating events*. A number of events will be held to bring the cohort together and get the students to think about environmental problems from different perspectives. In 2014/15 the cohort held a team-building weekend in Snowdonia in February and this will be repeated in 2015/16 for the first year intake. Other integrating events are in preparation.



4. Transferable Skills Training

4.1 DTP Provision

A wide range of transferable skills courses are provided by the two Universities, and are briefly described here. Students and their supervisors will be expected to build a substantial element of transferable skills training into their Training Programmes. DTP students can access skills training from either University. There will also be opportunities for NERC-wide skills training that students will be encouraged to access, especially in the later years.

4.2 University of Manchester Provision

The Engineering and Physical Sciences Faculty provide a Graduate and Researcher Development Programme with a series of workshops throughout the first three years of the PhD
see http://www.researchsupport.eps.manchester.ac.uk/postgraduate_home/

Year 1: Introduction to Research, Academic Writing, Effective Presentations, Optimising Research Posters, Time Management for Success, Your Career: It's Never too Early to Think Ahead

Year 2: Career Options for Researchers, Managing your Relationship with your Supervisor, Building a Funding Portfolio, Publishing Academic Papers, Practical Thinking.

Year 3: Writing Up Your Thesis, Managing thesis Submissions, Viva Survivor, Careers Intensive, Teaching in Higher Education, Starting a Business.

IT skills courses are offered by the Research Applications group: <http://wiki.rac.manchester.ac.uk/community/Courses>

4.3 University of Liverpool Provision

All Liverpool students are required to attend and complete the PGR Development Programme, <http://www.liv.ac.uk/pgr-development/programme/>. Full details of the Liverpool requirements are detailed in the University PGR Handbook:

<http://www.liv.ac.uk/student-administration/research/pgr-handbook/>

Courses available in Year 1 are: Team working, Networking, Creative thinking, Presentation skills, Project planning, Critical thinking, Oral and written communication, Time management, Public speaking (workshops), Web presentations (online course)



5. Progression and Assessment

5.1 Overview

Students will be expected to meet the student progression requirements of Manchester or Liverpool University, which are explained in their respective documentation. In addition, the DTP requires that students have followed a sufficiently comprehensive Training Plan as agreed with the Pillar Committees (to be originally submitted around the beginning of November of Year 1, and updated throughout the course of the first two years). Failure to engage with the Training Plan, even if research progress is satisfactory, will result in withdrawal of funding, since NERC require evidence that the DTP is delivering a satisfactory training programme to each student.

Student progression is monitored electronically and regular reports are provided through eprog/toolbox on student progress. Reports will also be provided to the DTP Pillar committees.

You can access a guide to the eprog system in Manchester here

<http://documents.manchester.ac.uk/display.aspx?DocID=21084>

Key milestones throughout Year 1 would include:

PGR Student Health and Safety Induction Mandatory – Beginning of October 2014

Initial Project Planning Meeting – Beginning November 2014

Expectations 1 – End of November 2014

Initial Personal and Professional Development Plan – Beginning of January 2015

Skills Audit (Initial) – Beginning of January 2015

Quarterly Research and Personal Development Review – Beginning of April 2015

First Year Research Progression Advice Form – End of May 2015

Submit Year 1 Progress Report – End of June 2015

Look here for details on the PGR Toolbox system in Liverpool

<https://www.liv.ac.uk/pgp-development/further-development/toolbox/>

The University progression requirements broadly require a satisfactory attendance record, evidence of satisfactory progress toward the PhD and a clear plan for the time left. Each student presents an annual report and is examined on it in a formal viva, by a nominated examiner from outside the supervisory team.

5.2 Year 1

The requirements in Year 1 are rather more stringent than in the other years. At the end of the first 3 months the student is required to submit to their Pillar Head a brief description of their PhD project – this applies to all students but is particularly aimed at those whose initial project descriptions were more general. The student will then submit a Progress Report 9 months after starting the course, which should include a thorough literature survey, a summary of work done towards the PhD and a plan for the next 2.5 years. Following the viva the student may be allowed to progress normally, allowed to progress subject to satisfactory performance and meeting of key targets over a set period, or not allowed to progress.

In addition to the academic assessment of their University, students will have to have completed the first year components of their Training Programme to retain their DTP funding beyond Year 1.

5.3 Years 2 - 4

The requirements here are similar to Year 1 but less stringent – however the basic elements are the same: the student

must write a Progress Report and pass a viva or interview to progress to the next year. The DTP expects students to continue with their Training Plan after the first year but will not introduce sanctions as in year 1 if academic progress is otherwise satisfactory.

5.4 Appeals Procedure

Students whose Pillar Committee advise that they do not meet the Training requirements for progression from Year 1 to 2 will be able to appeal to the DTP Board. The Board may require that that student follow an accelerated programme of training in the first semester of Year 2, with targets to be met by a set date, or it may confirm withdrawal of funding.

5.5 Attendance

Students are expected to live within easy travelling distance of their University and to keep regular working hours in their School or Department. Failure to attend the University without good reason (e.g. field work, conferences, internships, training courses, sickness, holiday etc) is a major warning signal for the team, and, since attendance is monitored through eprog/toolbox on a regular basis, could lead to disciplinary action being taken. Developing positive working relationships is an essential part of PhD student training since almost all research in the NERC remit is based on teamwork, so attending the University is not optional.



6. Writing the Thesis

6.1 Thesis advice

As noted above, courses are offered by the Universities to guide students towards their final submission, and all DTP students will be expected to attend such courses. The modern PhD can be presented in one of two forms:

- a) A thesis in the form of research papers (ideally already published but can be pre-submission) with an overall introduction and conclusions.
- b) A traditional monograph, with chapters on introduction, literature review, research methods, results and conclusions (possibly also appendices)

Students should discuss with their supervisors in good time (usually around a year before intended submission) which form of thesis they are aiming for and inform their Universities accordingly. The DTP will not prescribe which option is chosen – this depends on the subject, the results obtained and the student's desire, although we do encourage option a if possible as it provides better training in the crucial skill of writing research papers.

6.2 Plagiarism and Fabrication of Data in Research Degree Programmes

This is serious academic misconduct and is the subject of a detailed code of practice at both Universities. If in any doubt about the activities that fall under these headings students are advised to consult their relevant code of practice:

University of Manchester

<http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=2870>

University of Liverpool

The University cannot tolerate academic misconduct and take instances of plagiarism and fabrication of data very seriously. Suspected cases of plagiarism and fabrication of data in research degree programmes are dealt with under the Policy of Plagiarism and Fabrication of Data for PGR Programmes, which is available on the PGR Student Team Website:

www.liv.ac.uk/student-administration/research/pgr-code-of-practice/a-z-policies



7. Student support and guidance

7.1 Support

The DTP and the Universities take the well-being of their students very seriously. Where difficulties arise it is important to seek to address these as early as possible. Many difficulties can be resolved at an early stage by talking informally with the individual(s) most concerned with the problem at a local level. Briefly, students should initially raise any issues with their lead supervisor, or if they are not available, another member of the Supervisory team or the Advisor. Further support will be available at School level in the two Universities; contact your Director of Postgraduate Studies or the local postgraduate support office for more details. Where the issue directly concerns the DTP the Chair of the Pillar Committee or the Chair of the DTP Board should be consulted. It is the responsibility of students to ensure that any problems are raised at the appropriate level and at the earliest opportunity.

Alternatively, students registered at the University of Manchester may seek advice from the Academic Advisory Service (0161 275 3033; email: sgs@manchester.ac.uk), or the Students' Union Advice Centre (0161 275 2930; <http://manchesterstudentsunion.com/advice/service>)

Students registered at the University of Liverpool may contact the PGR Student Team, which is part of the Student Administration and Support Division. For further details, see pages 10-11 in the PGR Handbook, at <http://www.liv.ac.uk/student-administration/research/pgr-handbook/>

It is not unheard of for students to change supervisors during their PhD, usually because the topic drifts away from the original supervisor's research area, or the supervisor has left academia. The Pillar Committees will manage the appointment of new supervisors where necessary and students who are concerned about their supervision should approach the Pillar lead as soon as possible. Obviously the Pillar Committees will work in close consultation with the relevant School's Graduate Tutor when this happens.

7.2 Student feedback and representation

Student representatives sit on the DTP Board and will be expected to bring any concerns to the attention of the Board. At the end of each academic year each student will be asked to complete a questionnaire to inform the Board, and NERC, of the progress of the DTP.

7.3 Student appeals and complaints

In the event of complaints that cannot be resolved informally, both Universities have formal complaints procedures, whether about the delivery and quality of services received (i.e. non-academic matters), or about the delivery or quality of research supervision or any other matters relating to the programme of study. Formal complaints concerning the DTP should be addressed to the Chair of the DTP Board.

Appeals against progression decisions are discussed in 5.4.

7.4 Research Ethics

If a student plans to do research involving human participants, whether directly or indirectly - e.g. interviews, questionnaires, focus groups, observations, accessing personal data about individuals, any human biological materials - then the research must be independently ethically reviewed and approved BEFORE the student begins data gathering. Each University has procedures that must be followed in this case.



8. Administrative Matters

8.1 Memorandum of Understanding

The administration of the DTP is underpinned by a Memorandum of Understanding between the three Core partners. This allows for transfer of funds between them to meet the costs of student stipends and training.

8.2 Finance

The DTP stipend is paid to each student by their host University, usually on a monthly basis, subject to satisfactory attendance and progress. Students are registered for 3½ years and are expected to submit their theses before the end of this period. In exceptional circumstances, at the discretion of the DTP Board, financial support may be extended for up to an additional six months. Serious medical issues and personal trauma can only be considered as extenuating circumstances if brought to the Board's attention at the time. Occasionally, a stipend may be extended for students who undergo a placement away from the University. Please note that both Universities require the thesis to be presented within four years regardless of funding period.

Maternity provision follows the RCUK guidance on maternity pay: <http://www.rcuk.ac.uk/RCUK-prod/assets/documents/skills/RCUKMaternityBriefing.pdf>

Students should contact their local support teams for further information:

Manchester see <http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=6544>

Liverpool see <http://www.liv.ac.uk/working/whyworkhere/familyfriendly/policies/maternity/>

For disabled students, the research councils will provide additional funds through the Disabled Students Allowances - see <http://www.nerc.ac.uk/skills/postgrad/currentstudents/info>.

Students should contact their local Disability Support Office for further information:

Manchester see <http://www.manchester.ac.uk/study/experience/student-life/university/student-support/disabilities/>

Liverpool see <http://www.liv.ac.uk/studentssupport/disability/>

A Research Training Support Grant of £11,000 is available to each full DTP student over the course of their PhD to support training, attendance at conferences, consumables and fieldwork. There are rules for eligible expenditure, particularly regarding computer purchases:

Permitted	Not permitted
Lab consumables/components/chemicals for experiments	Large items of equipment
Workshop consumables for experiments	Salary costs
Small equipment/tools for experiments	Overheads
Travel costs associated with attendance at conferences, workshops, training events and courses	Travel costs or personal expenses of individuals other than named students
Travel costs associated with fieldwork	Alcohol or entertaining
1 laptop or 1 desktop where there is a specific requirement for heavy computer use	Laptops/desktops/tablets/printers/stationery for general use

8.3 Codes of Practice

University of Manchester

The Code of Practice sets out the University of Manchester's framework in relation to the management and coordination of postgraduate research degrees both full-time and part-time. The University is committed to ensuring the quality of every student's research experience and as such the code of practice defines minimum requirements to safeguard high standards of postgraduate research degree activity. The Code of Practice should be read in conjunction with the University's [Ordinances and Regulations](#) and faculty and/or school handbooks as appropriate.

<http://www.staffnet.manchester.ac.uk/services/rbess/governance/goodresearchpractice/>

University of Liverpool

The Code of Practice at the University of Liverpool is set out at

<http://www.liv.ac.uk/student-administration/research/pgr-code-of-practice/a-z-policies/>

The University operates a Student Complaints Procedure to be used when students have a complaint against the University. This procedure provides for complaints to be dealt with, as far as possible, on an informal basis. It also sets out the formal route for the consideration of complaints should informal procedures fail to resolve a complaint satisfactorily. The Student Complaints Procedure can be accessed at: <http://www.liv.ac.uk/student-administration/student-administration-centre/policies-procedures/complaints/>

8.4 Administrative procedures

University of Manchester

Travel

The University uses a travel management system, Egencia, for all travel bookings. All Manchester students regardless of faculty will be added to the SEAES profile within Egencia. Please contact your local administrator or DTP Administrator for details of how to register for the system.

Ordering consumables

Orders are placed using ORACLE, in particular IPROC. You will be given details by your supervisor/administrator on how to apply for access, soon after your arrival at the University of Manchester.

University of Liverpool

You will be invited to a PGR Induction event soon after your arrival at the University of Liverpool. As part of the induction you will be given a copy of the PGR and Finance Handbooks and other documentation.

8.5 CASE (Collaborative Awards in Science and Engineering) studentships within the DTP

NERC policy stipulates that:

- Each DTP must ensure that, over the lifetime of the DTP, 30% of the total notional studentships awarded to the DTP are CASE (collaborative studentships).
- The CASE partner(s) must supplement the studentship by a minimum of £1000 p.a. for a minimum of three years. For new studentships starting from 2016/17, this payment should be made to the lead Research Organisation to supplement the RTSG and not paid directly to the student.
- The CASE partner(s) must host the student for between three and eighteen months during their PhD, during which time they will undertake work outside the academic environment. This placement need not occur in one single period.
- CASE partners are expected to meet the extra expenses incurred by the student when visiting and working within their establishment.
- CASE partners are expected to contribute in cash or in kind towards necessary materials and/or facilities not possessed by the Research Organisation concerned that are required by the student to undertake research integral to their CASE studentship.
- NERC training grant funding cannot be used to meet the CASE partner financial contributions.

Supervisors planning a project with a CASE partner should:

- Find a company or organisation to partner. Normally this will be in the UK. Non-UK organisations may be acceptable if there is no equivalent UK organisation (ESA, for example).
- Submit the project proposal form to julie.samson@manchester.ac.uk noting the name of the prospective partner.

To set up a CASE studentship contract within the DTP, please contact julie.samson@manchester.ac.uk in the first instance.



9. Additional Information

9.1 NERC Advanced Training Short Courses

<http://www.nerc.ac.uk/funding/available/postgrad/advanced/atasc/course-list2015-16.pdf>

These courses are aimed at NERC PhD students and students are encouraged to apply for those relevant to their research topic.

May – Dec 2015	Advanced omic analyses in the natural environment
September 2015	Applied plant taxonomy, identification and field survey skills
May 2016	NCAS Atmospheric Field Measurement Summer School
January 2016	Extreme flood events: forecasting, modelling and response
September 2015	Scientific diving: In situ marine field identification and survey skills
September 2015	Data analysis with R statistical software
September 2015	Further beyond the code: developing software craftsmanship for environmental scientists
November 2015	Quaternary Palaeoecology
January 2016	UKCA Theory and Practice: workshop on atmospheric composition modelling using the UKCA model
January 2016	Predictive models and programming skills using agent-based models
January 2016	Sampling the environment design and analysis for efficient and robust collection of data
February 2016	An introductory molecular phylogenetics course: molecular diagnostics for species identification and evolutionary analysis
February 2016	Modelling structure and dynamics in complex networks – mathematical modelling and statistics
February 2016	Bayesian methods to fit statistical models in environmental science – mathematical modelling and statistics
February 2016	Introduction to palaeoclimate modelling for palaeodata specialists
March 2016	Taxonomic principles and tools in botanical research
March 2016	Environmental Genomics and Metabolomics (ENIGMA)
January 2016	Scientific diving techniques and technologies
February 2016	Introduction to mathematical modelling for the environmental and biological sciences
Autumn 2015	NCAS Training for the Unified Model
March 2016	Numerical modelling short course for postgraduate students

The dates for the above courses are provisional – the calendar on the “Training” page of the DTP website is updated regularly and can provide definite dates as and when they are confirmed.

See also NERC’s Environmental YES scheme aimed at increasing entrepreneurial awareness in the environmental science community, <http://www.nerc.ac.uk/funding/available/postgrad/advanced/yes/>

and NERC’s Policy Internships, <http://www.nerc.ac.uk/funding/available/postgrad/advanced/policy-interns/>

9.2 Research facilities and how to access them

The atmospheric science group at Manchester has distinctive facilities (<http://www.cas.manchester.ac.uk/restools/>) including a heavily instrumented photochemical reaction chamber which is unique in the UK for studying formation,

growth and properties of aerosol particles; and a 10 m high cold chamber temperature-controlled down to -50°C and pressure down to 100 hPa for studying ice formation and growth processes in the atmosphere. We have access to excellent field measurement platforms and locations, with students making extensive use of NERC facilities such as the FAAM and ARSF aircraft, the Chilbolton and MST radars, and international laboratories like the Aida chamber in Germany and the Jungfraujoch observatory in Switzerland. Access to each NERC facility uses different rules and students who wish to use them should discuss with their supervisor. The NCAS Atmospheric Measurement Facility also provides students with access to state-of-the-art instrumentation, much of which is managed by Manchester-based NCAS staff.

PhD students in Ocean Sciences use research equipment in both campus-based laboratories (<http://www.liv.ac.uk/earth-ocean-and-ecological-sciences/facilities/>) and at sea on research vessels. Students have access to a new state-of-the-art stable isotope facility, which contains isotope ratio mass spectrometers coupled to gas and elemental analysers that can determine the C, N, H and O isotope composition in organic material, specific organic compounds, liquids and gases. Students are trained to use gas and high performance liquid chromatography and mass spectrometry for detection of biomarkers and colorimetry, fluorometry and catalytic oxidation to measure inorganic and organic nutrients in seawater. In the trace metal laboratory, students are trained to use voltammetry for detection of metals, metal speciation and ligands and there is a focus on development of sensors for autonomous detection of metals in the environment. In 2009 the University commissioned a purpose-built inshore research vessel, the RV Marisa, a 14m catamaran, equipped for hydrographic and marine biological sampling, which is used by PhD students to study coastal ocean processes. In addition, students at NOC and Liverpool use gliders within shelf seas to obtain and interpret new turbulence, salinity and nutrient measurements. PhD students also benefit by having the British Oceanographic Data Centre (BODC) at Liverpool, enabling on-site advice about data availability, data protocols and data management.

Earth and environmental sciences draw on the world-class laboratories of the NERC-funded Williamson Research Centre for Molecular Environmental Science (WRC) at Manchester, (<http://www.seaes.manchester.ac.uk/our-research/facilities/>) essential for characterising complex systems involving mineral, biological and fluid phases and with facilities for geochemical and mineralogical analyses that are unrivalled in the UK. These are complemented by top of the range WRC geomicrobiology laboratories that provide infrastructure for culturing, microcosm and molecular ecology studies, linked to extensive genomic/post-genomic facilities in the Manchester Faculty of Life Sciences and Institute for Biotechnology. The newly established Soil and Ecosystem Laboratory at Manchester provides facilities for assessment of carbon and nutrient cycles under controlled conditions and in the field. The environmental radiochemistry laboratories in the Research Centre for Radwaste and Decommissioning and the Centre for Radiochemistry Research (unique in UK Universities) enable biogeochemical radionuclide investigations. Manchester is also the UK's major environmental science user of synchrotron radiation to address environmental science problems, currently using 8 synchrotrons worldwide, and is intimately involved in the development of environmental science capability at the Diamond Light Source (a DTP partner).

The Faculty of Life Sciences at Manchester maintains a wide range of analytical research facilities. These facilities are available to all students, and are maintained by dedicated, fulltime, expert staff to support state-of-the-art equipment located in custom built laboratories.

<http://www.ls.manchester.ac.uk/research/facilities/>

Both Liverpool and Manchester have world-class high pressure – high temperature rock deformation laboratories, specializing in brittle and plastic deformation, fluid flow, deformation/ metamorphism interactions and volcanology. The unique equipment, designed and built for purpose in both laboratories, covers deformation conditions from the surface to the mantle. The electron microscopy facilities in Liverpool and Manchester together are unique; electron backscattered diffraction (EBSD) techniques for rocks and metals were pioneered in Liverpool, and Manchester host state-of-the-art electron optics and microprobe facilities. Industry-leading software for basins and petroleum research is available at both sites and comprehensive in-house petrophysical analyses as well as field-based LiDAR, spectral gamma and XRF facilities are also available. The geomagnetism laboratories in Liverpool have a range of state-of-the-art magnetometers and susceptibility instruments including high- and low-temperature microwave SQUID magnetometers.

9.3 RCUK Conditions of Research Council Training Grants

<http://www.rcuk.ac.uk/funding/grantstcs/>



10. Contacts

Chair, DTP Board: Prof. Geraint Vaughan, geraint.vaughan@manchester.ac.uk, 0161 306 3931

DTP Administrator: Miss Julie Samson, julie.samson@manchester.ac.uk, 0161 306 3936

Chairs of Pillar Committees:

Atmospheric: Prof. Tom Choularton, t.w.choularton@manchester.ac.uk, 0161 306 3950

Ocean: Prof Kevin Horsburgh, kevinh@noc.ac.uk , 0151 795 4835

Earth and Environment: Prof. Dan Faulkner, faulkner@liverpool.ac.uk, 0151 794 5169

Visit our website: <http://www.liv.ac.uk/studentships-earth-atmosphere-ocean/>



@EAO_DTP https://twitter.com/EAO_DTP

11. Quick Links

Quick Links to University Information

Description	University of Manchester	University of Liverpool
Training Provision	http://www.researchsupport.eps.manchester.ac.uk/postgraduate_home/ http://wiki.rac.manchester.ac.uk/community/Courses	http://www.liv.ac.uk/pgp-development/programme/ http://www.liv.ac.uk/student-administration/research/pgp-handbook/
Electronic Progression	http://documents.manchester.ac.uk/display.aspx?DocID=21084	https://www.liv.ac.uk/pgp-development/further-development/toolbox/
Plagiarism	http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=2870	www.liv.ac.uk/student-administration/research/pgp-code-of-practice/a-z-policies
Support	Academic Advisory Service (0161 275 3033; email: sgs@manchester.ac.uk) http://manchesterstudentsunion.com/advice/service	http://www.liv.ac.uk/student-administration/research/pgp-handbook/
Maternity	http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=6544	http://www.liv.ac.uk/working/whyworkhere/familyfriendly/policies/maternity/
Disabled students	http://www.manchester.ac.uk/study/experience/student-life/university/student-support/disabilities/	http://www.liv.ac.uk/student-support/disability/
Code of practice	http://www.staffnet.manchester.ac.uk/services/rbess/governance/goodresearchpractice/	http://www.liv.ac.uk/student-administration/research/pgp-code-of-practice/a-z-policies/
Complaints	http://documents.manchester.ac.uk/display.aspx?DocID=23875	http://www.liv.ac.uk/student-administration/student-administration-centre/policies-procedures/complaints/
Facilities	http://www.cas.manchester.ac.uk/restools/ http://www.ls.manchester.ac.uk/research/facilities/	http://www.seaes.manchester.ac.uk/our-research/facilities/ http://www.liv.ac.uk/earth-ocean-and-ecological-sciences/facilities/

Quick links to NERC

Description	Link
Background	http://www.nerc.ac.uk/funding/available/postgrad/responsive/dtp/
Disabled students	http://www.nerc.ac.uk/skills/postgrad/currentstudents/info
ATSCs	http://www.nerc.ac.uk/funding/available/postgrad/advanced/atsc/course-list2015-16.pdf
Environment YES	http://www.nerc.ac.uk/funding/available/postgrad/advanced/yes/
Policy Internships	http://www.nerc.ac.uk/funding/available/postgrad/advanced/policy-interns/

Quick links to our Partners

Partner	Link
BGS	http://bgs.ac.uk/
BP	http://www.bp.com/en/global/corporate/about-bp/what-we-do/generating-low-carbon-energy.html
Diamond	http://www.diamond.ac.uk/Home.html
DSTL	https://www.gov.uk/government/organisations/defence-science-and-technology-laboratory
Met Office	http://www.metoffice.gov.uk/
NCAS	http://www.ncas.ac.uk/
NDA	http://www.nda.gov.uk/
Total	http://www.total.uk/en