## UGRL Scholarship Learning Contract

*This document provides the framework for the project to be undertaken by the UGRL Scholar. It provides an outline of the larger research project to which the Scholar will contribute and the detail of that contribution, including timing, duties, outcomes and supervision arrangements.*

1. **Title of Overarching Research Project:**

Characterisation of the sea breeze over Indonesia and its importance for severe weather

1. **Research Project Leader:**

Dr Cathryn Birch

1. **Scholarship Project Supervisor:**

Dr Cathryn Birch/ Beth?

1. **Working title of Scholarship Project:**

Characterisation of the sea breeze over Indonesia (summer one)

1. **Period of Scholarship Project Work** *(see note i)***:**

Summer one: 25th July 2016 – 2nd September 2016

Summer two: arranged at a later date

1. **Summary of the research to which the Scholar will contribute (200 words):**

The country of Indonesia is comprised of more than one thousand islands of different sizes, many with high mountains and complex coastlines. It is a tropical country that lies over the equator and is influenced by both the northern and southern hemisphere monsoon systems. The region is known as the ‘boiler box’ of the Earth due to the combination of the high mountains, strong heating from the sun and moisture from the surrounding oceans. These three elements produce the wettest climate on Earth and some of the most intense thunderstorms on the planet. The rainfall is strongly influenced by the Madden-Julian Oscillation (MJO), which takes the form of a cluster of intense storms that form over the Indian Ocean every 1 or 2 months and that propagates eastwards over Indonesia and into the Pacific.

Evidence from satellite observations and model studies suggests that the islands of Indonesia have a strong influence on the MJO during its eastward propagation towards the Pacific. One theory suggests that the sea breezes, which form along the coasts of the islands during the afternoon, play an important role in initiating new storms within the MJO cluster. Dr Cathryn Birch and other scientists in the School of Earth and Environment have simulated this with computer models. The model simulations suggest that the sea breeze strength and storm intensity vary by MJO phase and that the sea breezes themselves are also modulated by the MJO, i.e. there is a two-way interaction between the small-scale sea breeze process and the larger-scale MJO.

1. **Summary of the work to be undertaken by the Scholar (200 words)**

This project will utilise surface weather station data to characterise the strength of the sea breeze circulation over the Indonesian islands and will investigate how the sea breeze varies during the passage of MJO events. Results from the project will provide evidence to verify the results of the recent model simulations and will form the basis of a peer-reviewed journal article.

1. **Detail of the work to be undertaken by the Scholar (500 words)** *(see note ii)***:**

Summer one:

Identify suitable coastal surface weather station data on the islands of Indonesia (available online)

Analyse the data using a programming language such as Python or Matlab

Build a climatology of the sea breeze circulation using the observations

Investigate whether the sea breeze strength varies seasonally and through the phases of the Madden-Julian Oscillation

Summer two:

Investigate whether the strength of the sea breeze impacts the formation of severe storms in the region

Or, depending on progress and the interests of the student, develop a second research project that is different to but related to the first, possibly involving the use of weather or climate models

1. **Detail of the Leadership development to be undertaken as part of the project** *(see note iii)*

Lead independent scientific analysis required for the research project.

Responsible for good time management and producing a report summarising the research results at the end of each 6-week placement.

Responsible for overseeing observational data sets and code necessary for the project.

Attend one or two relevant conferences or meetings.

1. **Outputs expected of the Scholar (200 words) including the final report** *(see note iv)*

Results in graphic format.

Observational data sets and computer code for analysis stored in a tidy format with documentation/comments.

Data and graphs available for inclusion in a peer-reviewed journal article

Report at the end of each 6-week summer period outlining scientific background, methods, results, conclusions and future work.

Poster presentation at a suitable conference (Summer two).

1. **Details of supervision arrangements** *(see note v)*

Dr Birch will be available for weekly meetings (more frequent meetings in the first 2 weeks if necessary) throughout the 6 week project and will provide guidance on the data analysis methods and computer programming.

To prepare the student for the research he/she will be given the opportunity to participate in research group activities during semester 2 of L1 and throughout L2 and L3. This will include optional attendance of the weekly weather chart discussion (‘Chatmosphere’), research group meetings, convection meetings, where group members present recent research. There is also the opportunity to attend the ICAS internal and external seminar series.

Dr Birch will also act as an advisor to the student throughout his/her time at Leeds, offering advice on module choices, dissertation topics, career options, interview technique etc.

1. **Resources required for the Scholar to undertake the project** *(see note vi)****:***

Linux desktop computer

***Project Leaders – please tick to confirm the following:***Consideration of Health and Safety context and appropriate risk assessment and risk management exercises have been completed 🞎  
Relevant ethical clearance has been sought 🞎  
Scholar and project leader are aware that any additional expenses or equipment costs are the 🞎  
responsibility of project leader to plan for and approve (if approved, students must provide receipts)

Signature of Scholar \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Signature of Project Leader \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

*Notes*

1. Scholars are expected to work the equivalent of six weeks full-time over the summer following their first and second year, they need not be continuous weeks but the dates are to be agreed between project supervisor and student. Any changes to the dates in the Learning Contract to be updated and signed by the supervisor and the scholar.
2. The work is normally assumed to be campus-based unless otherwise agreed, and where this is the case allocated office space and equipment (eg in spaces allocated to PG students) is expected to be available during office hours for the period of the project

The majority of the work must not take place in term time, but exceptionally an early start when exams and assessments are complete may be appropriate, but please note the dates of the induction programme that all scholars are expected to attend. If there is an event or output falling during term time it would be useful for the scholar to contribute to, please ensure time demands are light and does not conflict with programme study.

1. **Leadership development:** The project work undertaken by the Scholar is required to develop both research and leadership skills. All Scholars receive leadership training before they start their project and expect to be able to practice and develop those skills as part of their Scholarship Project. Projects should therefore include a specific strand of work which enables the Scholar to practice and develop leadership skills in some aspect of the project, *eg* data collection, analysis and presentation; dissemination event organisation; experimental design; project management; client feedback; market research design and evaluation. The University’s Leadership and Management Standard informs the leadership development to be provided by the Scholarship scheme and details are provided in Annex 2c on page 13.
2. **Outcomes:** Describe the intended project outcomes, these may be broken down for summer year 1 and summer year 2, or one long-term goal over the two years. Outcomes must be realistic and clear, and depending on the nature of the project outcomes might include reports, events, media, artefacts, experiments etc). A clear statement of timeframes for work to be completed and reported on is essential so that the responsibility of the Scholar is clear.

**Reports:** Please indicate the reporting expectations. It is expected that this should include at least a first report at the end of summer 1 covering both the project work and the development of the appropriate leadership skills and a final report at the end of the second period of research which should be a reflective and summative report of the whole project covering both the project work and the development of the appropriate leadership skills. Both reports (each of between 1000 and 2500 words depending on the nature of the project) should be scheduled to be completed within the periods of project work and not left for completion during term time.

1. The minimum requirement for UGRL Scholarship supervision is a formal meeting between scholar and project supervisor at the start, middle and end of each period of project work. The Scholar will provide a record of each of these meetings, to include a review of progress and a action points, to be confirmed in writing by the project supervisor
2. Funding is available to cover any essential costs directly associated with project work the Scholar will be undertaking. This is not a grant, it is available where necessary to ensure the Scholar has the resources they need to undertake their project. It might, for example, cover additional equipment needed by the Scholar, travel and accommodation costs to attend a conference to inform the project work or to present its outcomes. Any equipment purchased remains the property of the School and must be retained for the benefit of future scholars. Any funds not used in this way are returned to the Alumni Office at the end of the Scholarship.