



## ONE Planet Undergraduate Research Experience Placement (REP) Scheme

**Placement title:** Genomic analysis to pinpoint the route of invasion of Wakame into the UK

**One Planet Research Theme:**

Climate & Climate Change  | Earth System Processes  | Anthropocene  |  
Environmental Informatics

**Supervisor:** Evelyn Jensen

**School/Department:** School of Natural and Environmental Sciences

**University:** Newcastle University

**Placement Description:** Genomics can be used to trace the route invasive species have taken to arrive in the novel ecosystem. One of the most widespread marine invasive species is the kelp *Undaria pinnatifida*, commonly called Wakame. Native to Asia, it has spread across the world, including to the UK in 1994. Previous genomic studies have uncovered that invasive populations in France and New Zealand occurred independently as primary invasions, but what about in the UK? No genetic study to date has set out to answer this question.

In this project, the student will collect and use whole genome sequencing data from three UK Wakame samples to pinpoint where they have invaded from. Using population genomic analyses, the objective is to test the hypothesis that it is a primary invasion from Asia, or a secondary invasion from France. This study is enabled by an existing global dataset of Wakame genomes.

The student will gain experience in the field, lab, and with high-performance computing to carry out our bioinformatic and population genomic analyses. The student will have access to a team of mentors to help them learn along the way and build their confidence with these advanced techniques.

**Timescale:** Placement will occur July 8 through August 16

Week 1: Field work to collect tissue samples near Edinburgh. Lab induction and DNA extraction, send DNA for genome sequencing.

Week 2: Gain familiarity with bioinformatics and high-performance computing.

Week 3: Begin assembling genome data from existing samples.

Week 4: Preliminary population genomic analyses.

Week 5: Incorporate new genomes into dataset, run population genomic analyses.

Week 6: Finalize results and prepare report.

**Itemised Budget for the Project:**

Travel to Edinburgh to collect tissue samples	£75
Lab consumables for DNA extraction, quantification, and QC	£50
Postage	£25
Whole genome sequencing of three samples to 20x coverage	£350

**Prerequisites:**

Student should have a keen interest in developing a diverse set of skills, from the field and lab to the computer. Familiarity with the command line is essential and should be developed prior to the beginning of the placement.

For more information, please contact [evelyn.jensen@newcastle.ac.uk](mailto:evelyn.jensen@newcastle.ac.uk)



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