

UROP: Undergraduate Research Opportunities Programme

A Personal Perspective by Emma Needham

Emma had just completed her undergraduate degree in Environmental Geoscience, and embarked on an UROP research experience in the summer of 2015 (as an extension activity to her MSci project) under the supervision of David Wilson and Tina van De Flierdt (Department of Earth Science & Engineering).

Placement Title: Pleistocene Instability of the East Antarctic Ice Sheet

1. My motivations for doing the UROP in general and this research experience in particular:

- My motivation to undertake this UROP was to build upon the research I carried out during my MSci project, by collecting additional data and improving the resolution of the dataset to work towards publication.
- The results of my MSci project suggested that the East Antarctic Ice Sheet was not stable over the late Pleistocene, as was previously widely thought, but instead there were dynamic variations in the waxing and waning of the ice sheet. I was keen to present these findings to the scientific community as there are vast implications for past climate reconstructions and therefore future climate, ice sheet and sea level predictions. However a higher resolution record, and supporting evidence from other measurements were needed to increase our confidence in the findings.
- I also wanted to gain further experience in laboratory work and report writing, which I could apply to future research and working-life situations.

2. How I secured my research experience:

- I had maintained a good relationship with my supervisors throughout my MSci project and had become competent and able to independently use many of the required laboratory techniques. This coupled with the exciting results of my MSci data led to my supervisors suggesting that I return in the summer and gather more data on this topic; since I'd thoroughly enjoyed the project I was keen to do so and have more involvement in the research.

3. Preparation I undertook before my research experience commenced:

- I met with my supervisors to discuss what we'd all like to get out of the project, went away from this meeting and made a plan of what we could do and when.
- We decided that in the non-laboratory side of the placement I should focus on sea level records over the late Pleistocene, to see if they might correlate with my ice sheet data. Therefore I began reading up on sea level literature to prepare for the research experience.
- I began cleaning some equipment (centrifuge tubes, Teflon beakers etc) so that I wouldn't have to waste time doing so, or waiting for equipment to be cleaned before being able to begin certain procedures during the 8 weeks of my placement.

4. Training and other orientation undertaken at the beginning of my research experience:

- Some of the laboratory techniques used in my UROP were slightly different to those in my MSci project as the focus of the research was slightly different. David taught me these new techniques, and we discussed how we might adapt previously used techniques.

5. The skills and experiences gained or enhanced from undertaking my research experience:

- I gained further laboratory and organisational skills.
- I was able to explore the relevance of my data in the context of the existing (and rapidly changing)

literature on this topic.

- I was fully involved in the scientific research process in a context outside of coursework.
- The wide societal interest of the topic made this project a valuable experience for a range of potential future careers beyond academia.

6. Problems I experienced and how I resolved them:

- One problem was discovering that I didn't have enough equipment to do the work I had planned to do in the desired timeframe. I transferred some of my old samples from my MSci project into other receptacles so that I could clean and use the ones I needed. I also borrowed some clean equipment from others in the lab and replaced it when I'd finished cleaning more.

7. My integration into the research environment:

- I was involved in fortnightly MAGIC group lab meetings, as well as weekly meetings with my supervisors and two PHD students also studying cores from Antarctica. We would discuss topics relevant to all of us; we gave presentations and provided feedback, as well as thoughts and opinions on the results of our experiments.

8. How the research experience might influence the remainder of my course and my future career plans:

- I have now completed my degree so the UROP did not affect my course, however I think that it is an invaluable experience of working in a research environment and on a project, which will help me in any future careers.
- With my degree in Environmental Geoscience, any degree related career paths that I may choose would undoubtedly incorporate many of the skills acquired throughout this placement.
- After the UROP I will be contacted when my supervisors and others working on the same core would like to collate a paper and work towards publication, I am keen to learn about the process of doing so and believe that that involvement will be respected by future employers.

9. The best thing about my research experience:

- The best part about the UROP was being part of the MAGIC community, being able to work independently and getting to know the structure and processes occurring in the research side of the university.
- I'm glad that I have been given the opportunity to contribute to scientific research in such an interesting and widely important topic.