

**JOB DESCRIPTION**

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| **Job Title:** Senior Research Associate in Firn Modelling | **Present Grade:** 7 |
| **Department/College:** LEC |
| **Directly responsible to:** Amber Leeson |
| **Supervisory responsibility for:** Some supervision of postgraduate students |
| **Other contacts**  |
| **Internal:**Academic and teaching staff, post-doctoral researchers and postgraduate students within LEC, CEEDS and DSI; university central administration. |
| **External:**  PICANTE partners, UK Centre for Polar Observation & Modelling (CPOM) staff. |
| **Major Duties:**This position will focus on the development and application of the Community Firn Model (CFM), for the purpose of understanding the impact of extreme weather events on the Antarctic firn layer. As part of the NERC-funded Processes, Impacts, and Changes of ANTarctic Extreme weather (PICANTE) project, you will work to perform gridded simulations of firn evolution over selected Antarctic ice shelves for the recent past and selected future periods using the CFM forced by RCM output (provided by a project partner). This may include some model development, in order to improve model performance with respect to observed firn states. Specific duties include:1. Perform gridded simulations using the Community Firn Model over selected East Antarctic, West Antarctic, and Antarctic Peninsula ice shelves for the 1979-2019 period forced by RCM output.
2. Use these data, together with an inventory of AEWEs compiled by a project partner to investigate 1) the direct impact of AEWE on firn depth, density and liquid water contect in the days/weeks following an extreme melt event and 2) the cumulative effect of AEWE on long-term firn pore space, and 3) the extent to which AEWEs contribute to preconditioning the firn layer for future saturation and ponding.
3. Perform statistical emulation of the CFM to constrain uncertainty in model outputs and to identify priorities for future model development.
4. Develop the model in order to minimize uncertainty and maximise fidelity with respect to reproducing observed firn depth-density profiles e.g. in the presence of meltwater.
5. Perform forward simulations with the developed model under two possible storylines; a) high sea ice loss in combination with a weak strengthening of the stratospheric polar vortex and b) low sea ice loss in combination with a strong strengthening of the SPV.
6. To undertake scientific analysis of the new datasets, and to publish the results in leading international journals.
7. To generate and pursue independent research objectives, including contributing to proposals.
8. To present at national and international conferences.
9. To supervise less experienced colleagues and postgraduate students.
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