Antarctic Science Bursary

I would like to provide you with a summary of my project and where it currently stands. My proposed work was to investigate if bedrock erosion rates differ along the Antarctica coast when compared to inland sites adjacent to the Antarctic Ice Sheet. The motivation for this work stems from clear sampling bias in almost all prior published Antarctic erosion rate studies, ~60 % of published studies were completed at high-elevation near the Antarctic Ice Sheet, with the remaining ~40 % located in the hyperarid McMurdo Dry Valleys. This sampling bias is problematic because the conditions present in these hyperarid-cold locations inhibit most if not all available erosion mechanisms. This biased dataset leads to fundamental misunderstandings about the role, distribution, and mechanisms of erosion in Antarctica. A biased erosion rate dataset has knock-on effects for exposure dating studies aimed at reconstructing outlet glacier thinning histories and ice sheet reconstructions more broadly. Work to reconstruct ice sheet/outlet glacier histories is primarily conducted within ~50 km of the Antarctic coast where glacial deposits record the most dynamic ice sheet thinning and retreat behaviour.

My progress to date has been significant. I completed the lab work for this is 2019 and incorporated this study into my PhD. My work clearly demonstrates that the rate of erosion along the coast of Antarctica is one to two orders of magnitude higher than erosion rates from the interion of Antarctica, making coastal Antarctic erosion rates comparable to other cold non-polar climates. Our findings are significant for ice sheet reconstructions as well as landscape evolution studies in general. This study has allowed me to broaden the scope of the project the Antarctic Science Bursary supported and collaborate with a number of other scientists on a comprehensive Victoria Land data set.

My intention is to submit two papers for review, the first paper with the samples funded by the Antarctic Science Bursary will be submitted to Antarctic Science in late 2022 or early 2023. The final draft of the manuscript is currently with the other co-authors and should see minimal revisions at this point. The second paper will be submitted to an as yet unidentified journal in early 2023.

Thank you for supporting my work.

Kind regards,

Dr. Ross Whitmore