Annabel Long, University of Calgary, Calgary, AB Canada, for her project: *A solution to the Phosphorous Problem - a warm little pond scenario*

I am a first year PhD candidate at the University of Calgary working under the supervision of associate professor Benjamin Tutolo in the Reactive Transport Group. My research is focused on probing planetary surfaces for habitable environments that provide a solution to the Phosphate problem caused by low solubility calcium-phosphate mineral Apatite. I focus on the warm little pond scenario where the solubility of phosphate can be increased due to gypsum solubility controlling Ca activity in solution. To analyse this mechanism, we combine experimental and modelling techniques with field data from early earth analogue sites like the Basque lakes of British Columbia and the magnesium and calcium-sulfate rich successions of Gale Crater. I plan to utilize the funding provided by GSA MGVP division to carry out fieldwork on Fe-rich lakes in Argentina that showcases precipitation of Fe-phosphate mineral Vivianite. This data can be used to validate modelling and experimental work to assess the role of Fe on phosphate solubility which will be instrumental in assessing the habitability of Fe-rich ancient Mars.

In the 7 years prior to starting my PhD I completed my undergraduate and master's at the University of St Andrews in Scotland, and then I went on to work in the St Andrews Stable Isotope Group under supervision of Eva Stueken. My research focus was on nutrient fluxes to the early biosphere, specifically focusing on Pyrite dissolution due to alternative oxidants such as NOx species which are produced from atmospheric breakdown in lightning channels.

In my spare time I am an ultra-marathon runner with the aim of competitively competing in the Western States 100-mile race one day!