

## Where a little water makes a lot of difference - liquid water in Antarctic glaciology and microbiology

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Water is produced at the base of polar ice sheets when geothermal heat and basal shear heating exceed conductive heat escape. Published estimates of subglacial water production rates in Antarctica vary between an average of about 3 and 6 mm per year per unit bed area. This rate of production is almost two orders of magnitude smaller than the mean snow accumulation rate on top of the ice sheet. Yet, these small basal melt rates feed an active subglacial hydrological system, which includes the largest wetland on Earth, subglacial lakes, and streams/rivers. Subglacial water makes fast ice sliding possible and hydrological temporal variability induces changes in the rates of ice discharge into the ocean. Emerging scientific evidence suggests that Antarctic subglacial waters make microbial life possible beneath the ice sheet and produce significant (bio)geochemical fluxes into the Southern Ocean. Funded international drilling projects will provide vital data to further elucidate the surprising role of subglacial waters in controlling physical, chemical, and biological processes in Antarctica.

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