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Active subglacial volcanism in West Antarctica as assessed by airborne geophysics: Distribution and context

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A combination of aerogeophysics, seismic observations and direct observation from ice cores and subglacial sampling has revealed at least 21 sites under the West Antarctic Ice sheet consistent with active volcanism (where active is defined as volcanism that has interacted with the current manifestation of the West Antarctic Ice Sheet). Coverage of these datasets is heterogenous, potentially biasing the apparent distribution of these features. Also, the products of volcanic activity under thinner ice characterized by relatively fast flow are more prone to erosion and removal by the ice sheet, and therefore potentially underrepresented. Unsurprisingly, the sites of active subglacial volcanism we have identified often overlap with areas of relatively thick ice and slow ice surface flow, both of which are critical conditions for the preservation of volcanic records. Overall, we find the majority of active subglacial volcanic sites in West Antarctica concentrate strongly along the crustal thickness gradients bounding the central West Antarctic Rift System, complemented by intra-rift sites associated with the Amundsen Sea to Siple Coast lithospheric transition.