# METHODS

## Site description

Location

Scott Base is located Pram Point, in Hut Point Peninsula, Ross Island, Antarctica (Fig. A) at approximately -77.848797, 166.767922. I used measurements from January 18th, 2019, until 1st of November 2023. The measuring probes were located in the base of a hill, slightly north to the base (Fig. A). We got the climatic data from the Scott Base Climatic Station which is situated uphill from the Base, on a side slope at 38 m elevation (Seybold et al., 2009).

A screenshot of a satellite image

Description automatically generated

*Figure A.*

Geology, topography and climatic conditions

Pram Point is located in the McMurdo Volcanic Formation (Sheppard et al., 2000). The soil is mainly formed by flows of strongly unsaturated alkaline basal (Kyle, 1981; Sheppard et al., 2000), and consists of loosely compacted stony gravelly sand (Council of Managers of National Antarctic Programs, 2017). The tectonic history of the area remains unclear (Kyle, 1981).

The base is located at 10 m of altitude, at the side of a hill that gently slopes southwards towards the sea (Council of Managers of National Antarctic Programs, 2017), and ice has modified the surface (Sheppard et al., 2000). Permafrost occurs at 30 cm depth (Council of Managers of National Antarctic Programs, 2017).

This topography diverts air from the south, so at the Base the main winds blow from the north-east, whereas at higher altitudes they predominantly come from the south and are stronger (Sheppard et al., 2000). The mean wind speed is 19.1 km h-1 (Council of Managers of National Antarctic Programs, 2017). Water content of the soil over the permafrost is around 6% (Seybold et al., 2009), and average mean soil temperature is one degree higher than the air temperature that hovers around -19.4 °C (Seybold et al., 2009). This is because during the summer the soil gets warmer than the air due to the constant solar radiation 24 h a day (Seybold et al., 2009). There is no records of precipitation patterns, but there is snow all year round (Council of Managers of National Antarctic Programs, 2017).

Management

The area hosts New Zealand’s main Antarctic research base, and it has an occupation of 10 people during the winter season and around a 100 during the summer (Sheppard et al., 2000). The United States’ McMurdo Station is also located in Hut Point Peninsula, and it hosts more that 1000 people during the summer (Lohrer et al., 2023). Both stations serve as research bases and posts for expeditions further inland(Sheppard et al., 2000). As a result of the human activity in the area, the environment around the base has been highly modified, resulting in a reduction in moss, lichen, and snow cover (Sheppard et al., 2000). Spills of waste, oils and chemicals have polluted the soils closer to the base (Aislabie et al., 2000; Lohrer et al., 2023; Sheppard et al., 2000).

## Data collection

The data set started on January 18th, 2019 and continues to present (March 2024) recording measurements every hour.