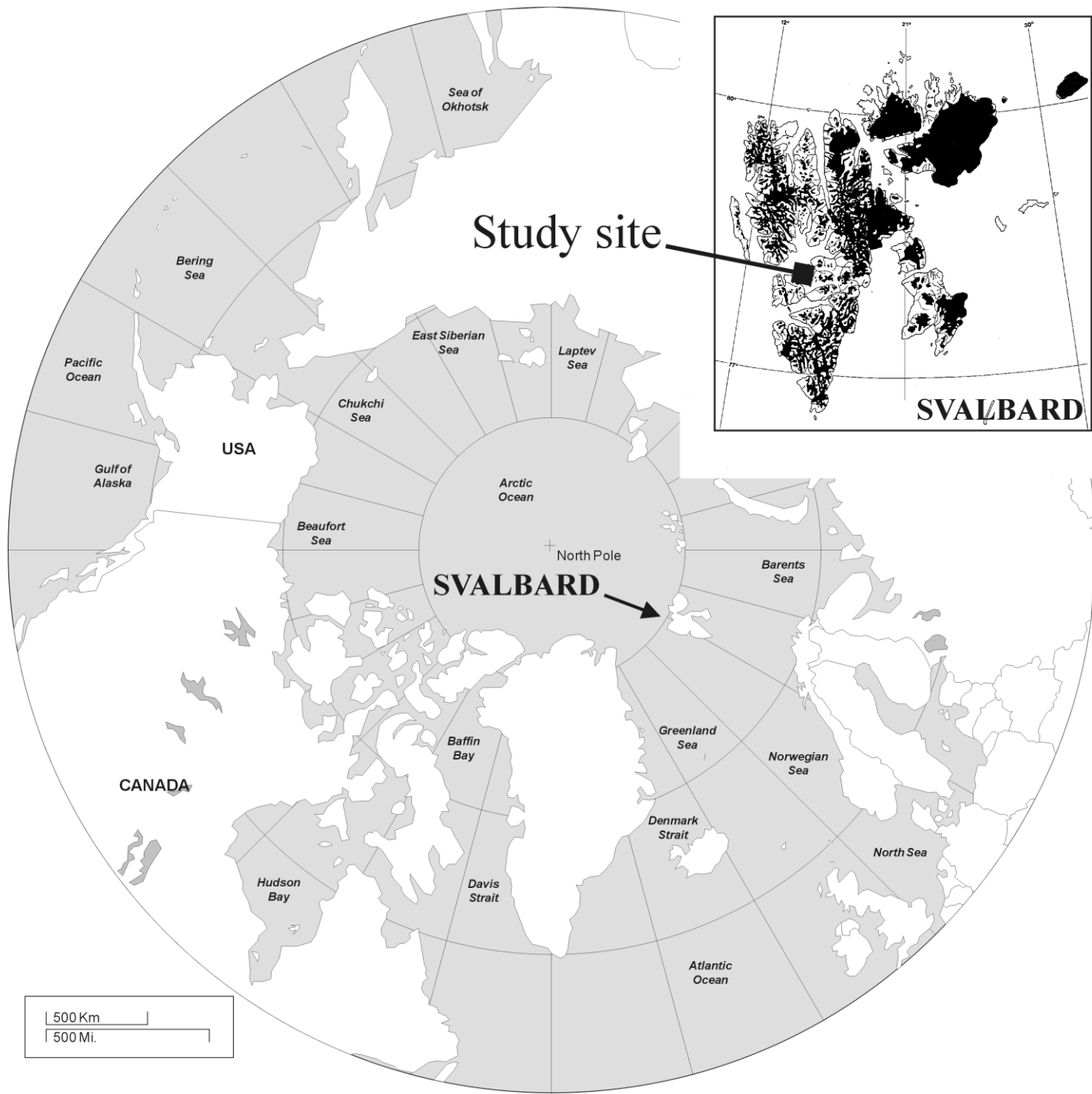




**Subglacial permafrost
at Longyearbreen,
central Spitsbergen**



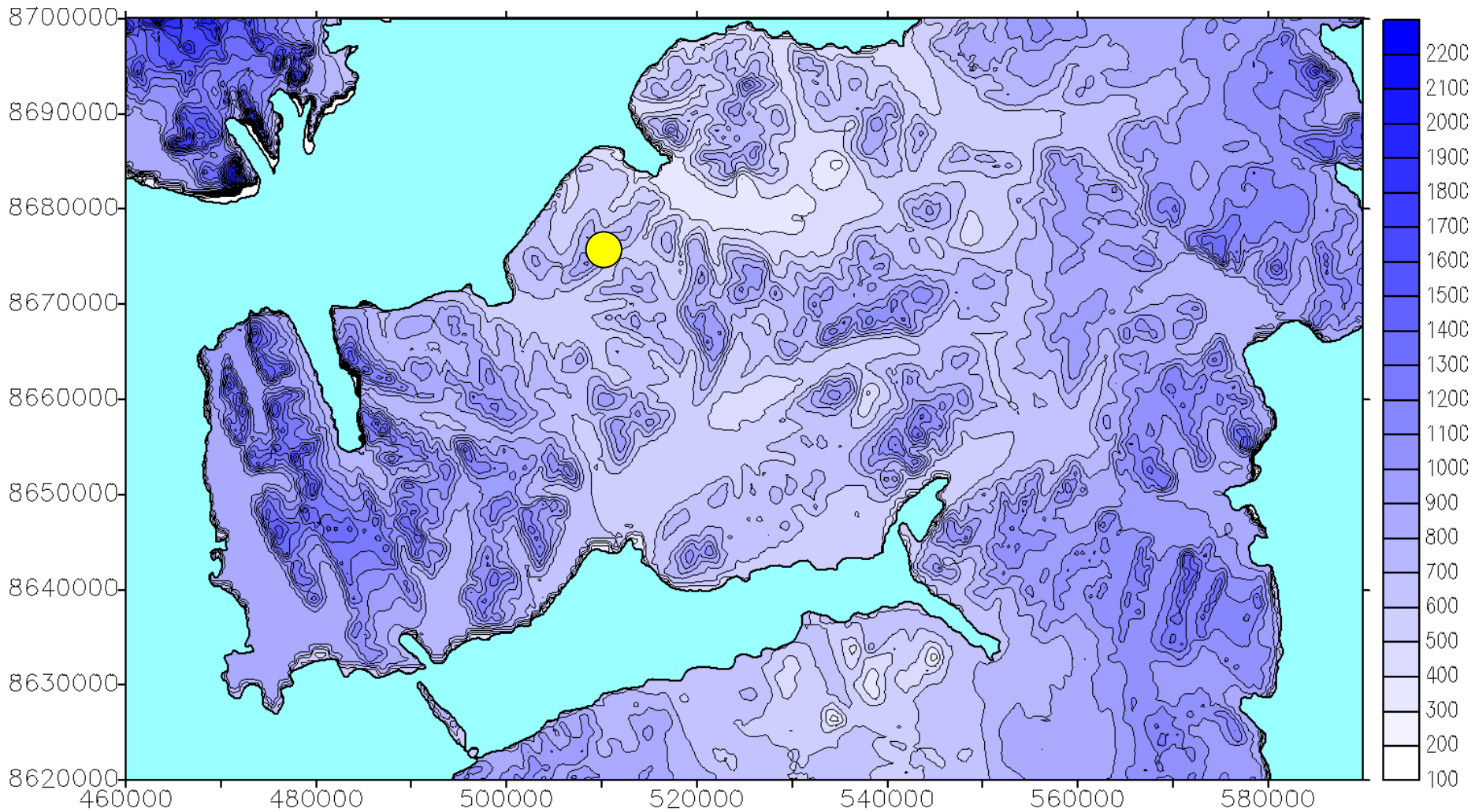
Study site

SVALBARD

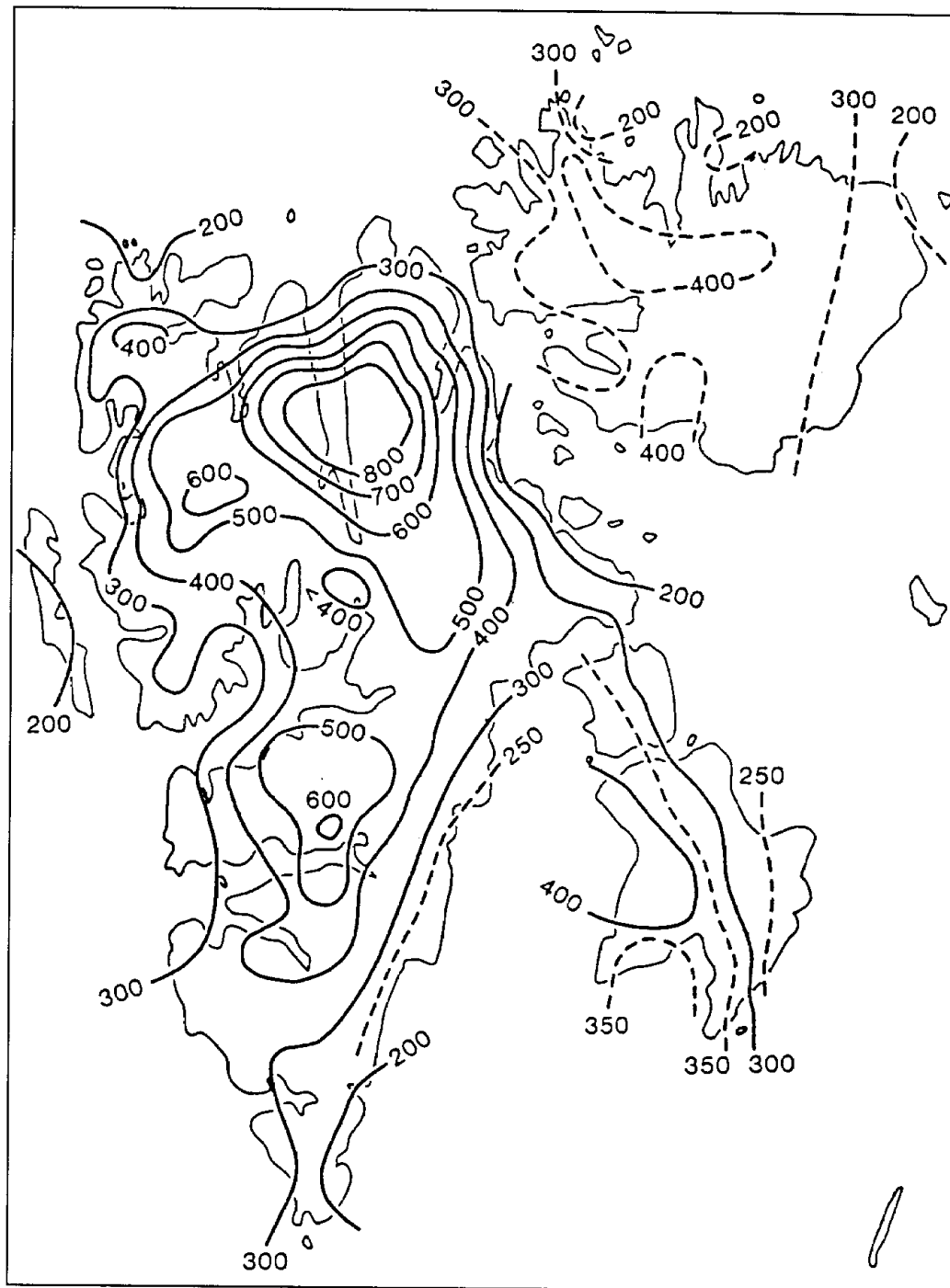
SVALBARD

500 Km
500 Mi.

**Calculated annual precipitation (mm w.e.)
Nordenskiöld Land, Spitzbergen, Svalbard**

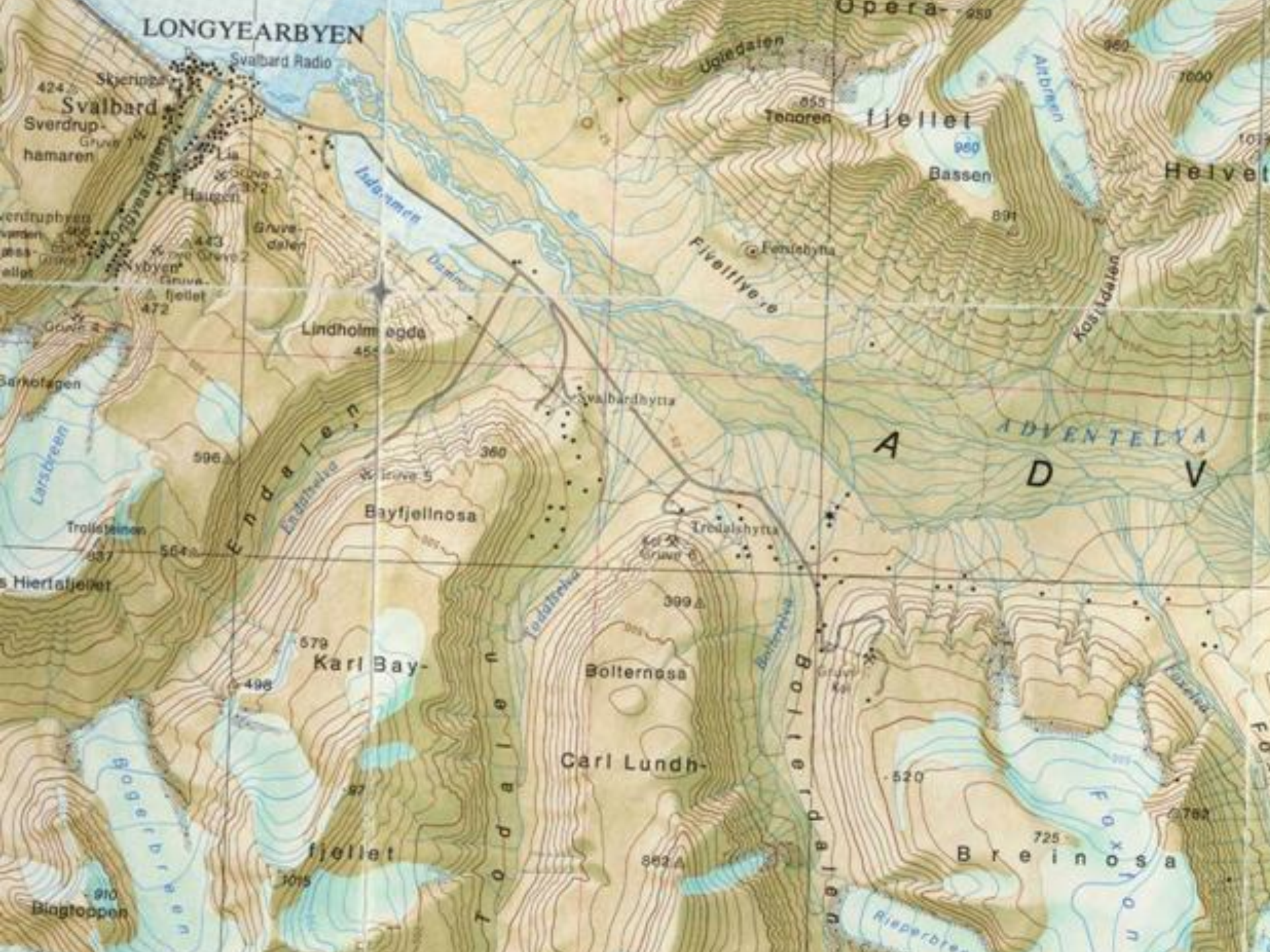


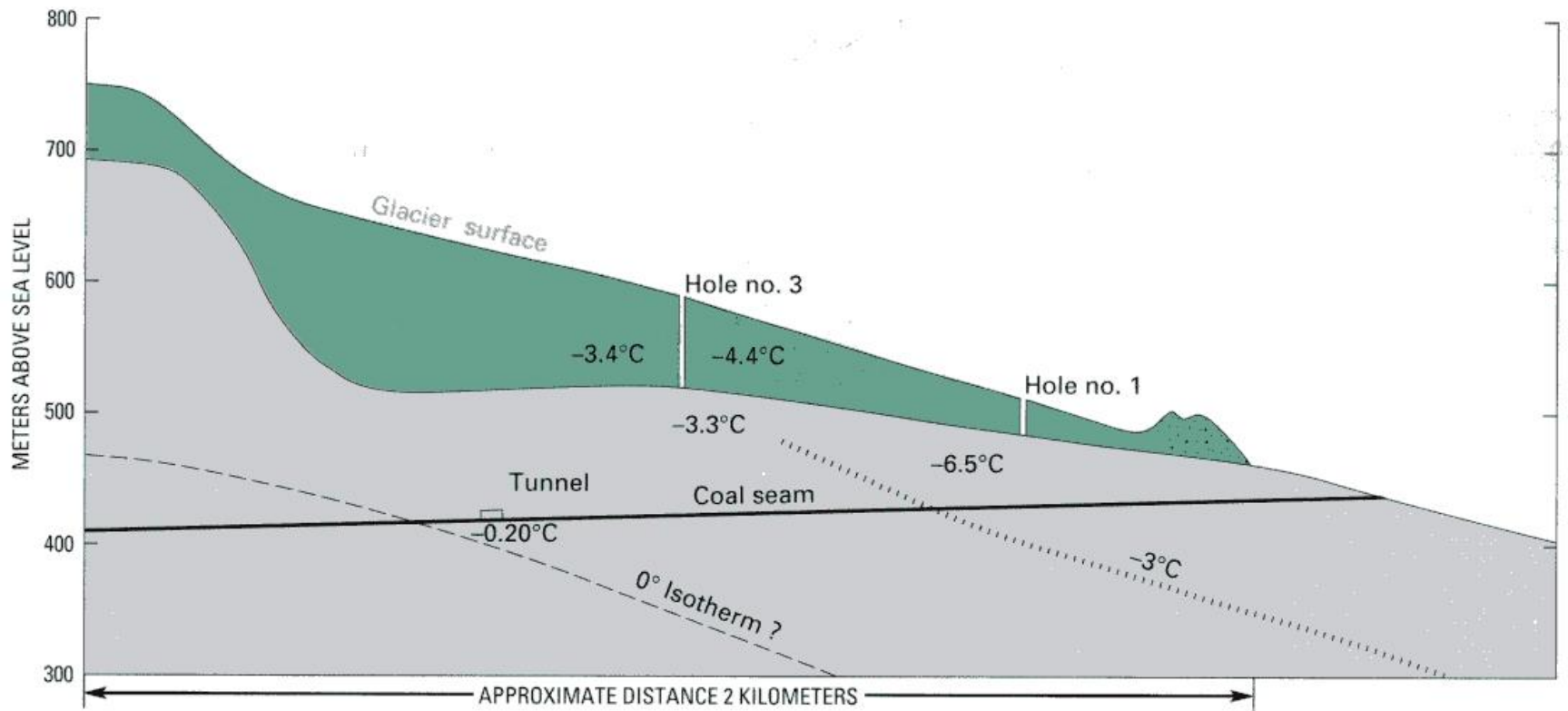
Humlum 2003



Hagen et al. 1993







Liestøl, 1993



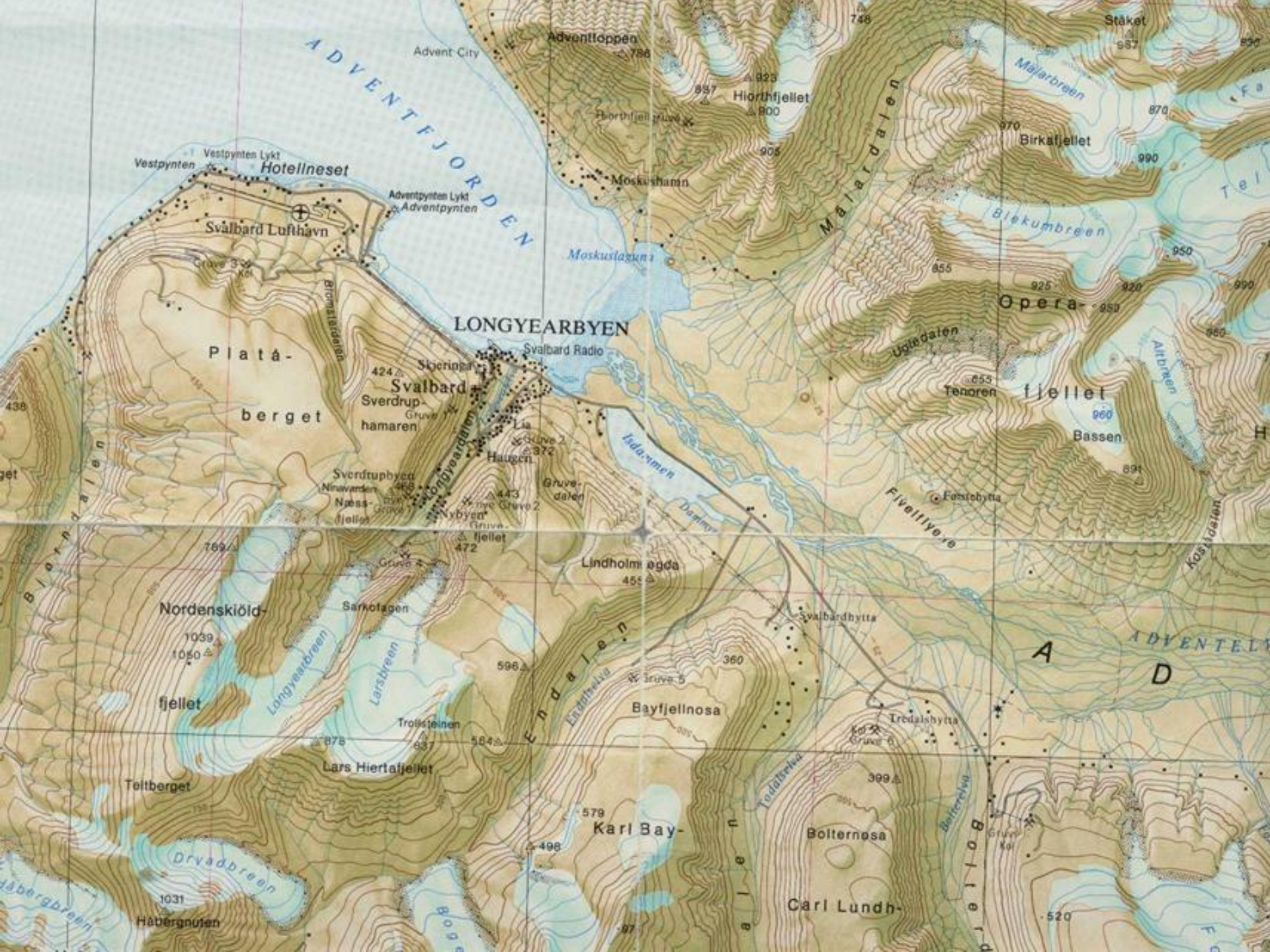
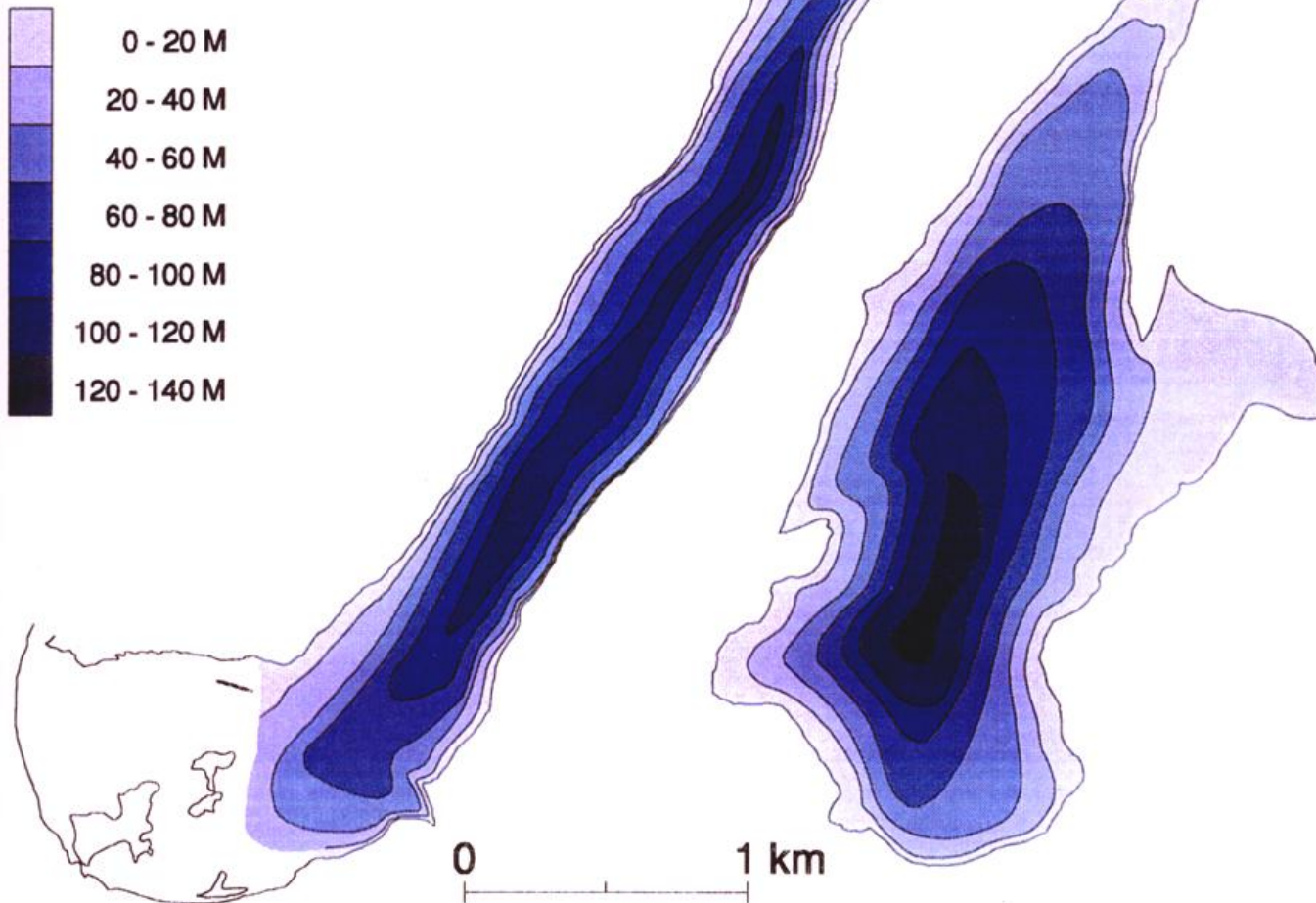




Photo by H. Christiansen

Bretjukne

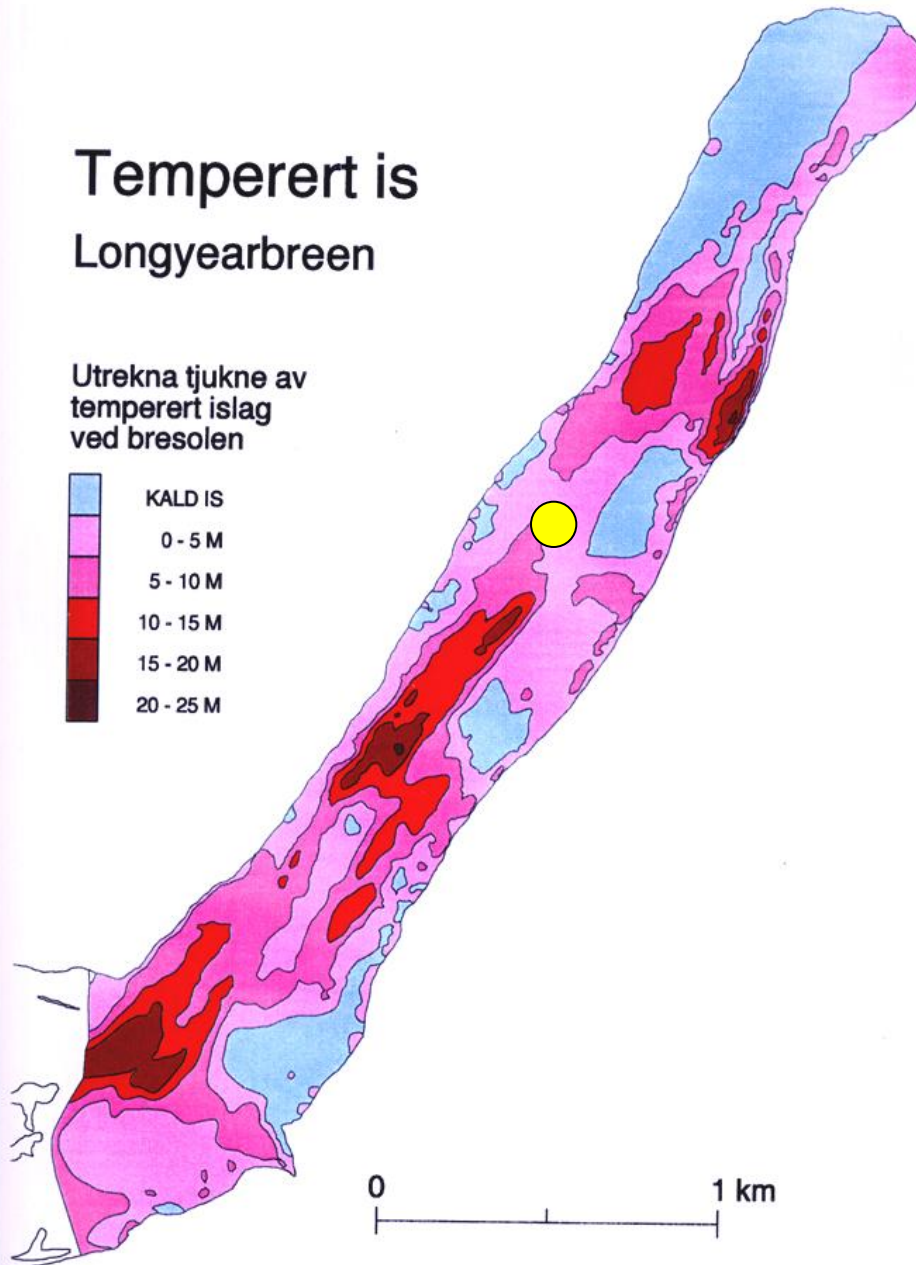
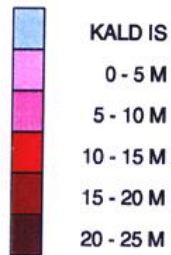


Tonning, 1996

Figur 3.6: Kart over bretjukna på Longyearbreen og Larsbreen. Bretjukna mellom radarprofila er her interpolert for hand.

Temperert is Longyearbreen

Utrekna tjukne av
temperert islag
ved bresolen



Tonning, 1996

Figur 3.8: I følgje radarmålingane har eit temperert islag under Longyearbreen ei utbreiing som synt over.













c. 6 m









Temperature c. -4°C

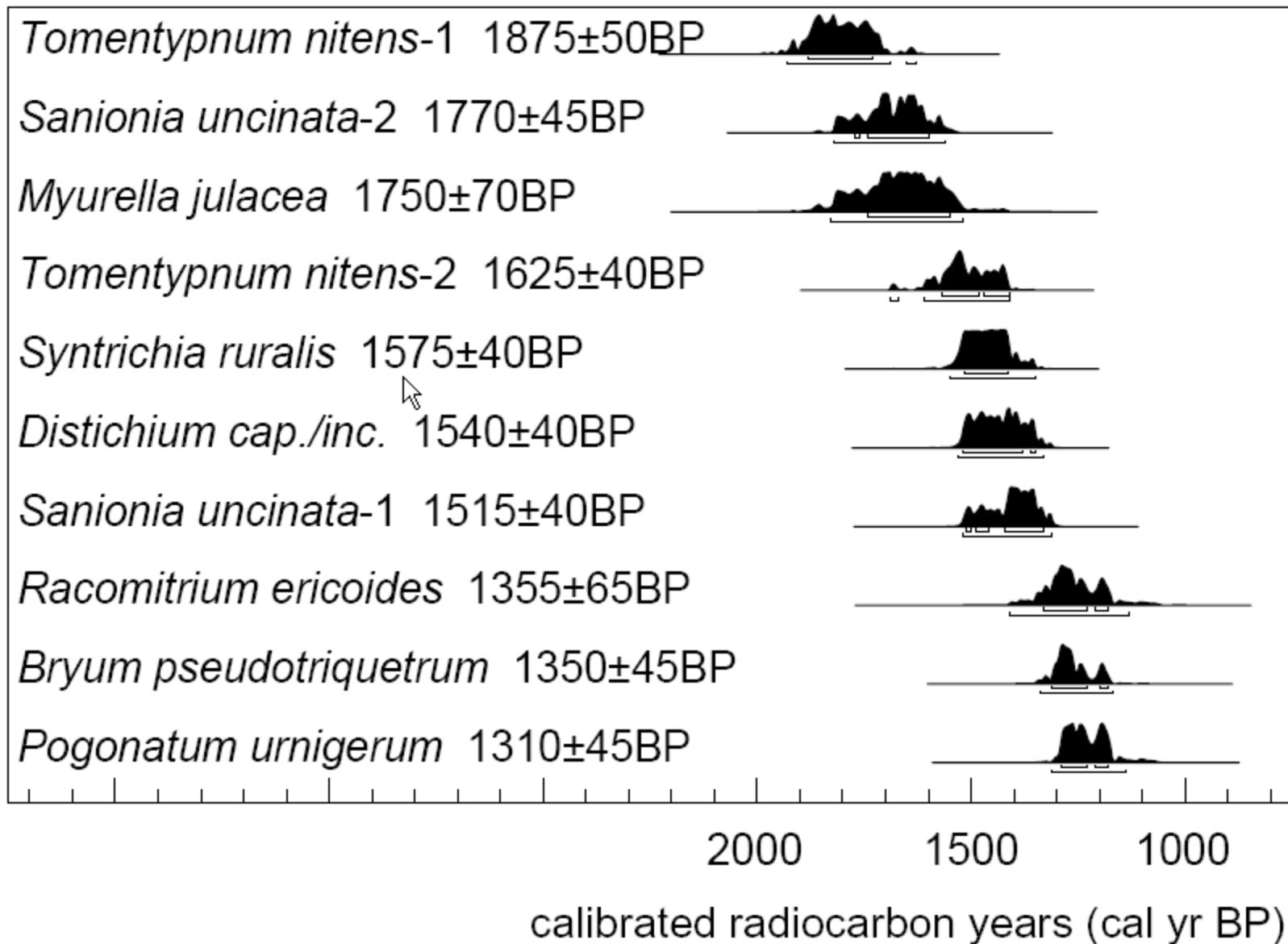




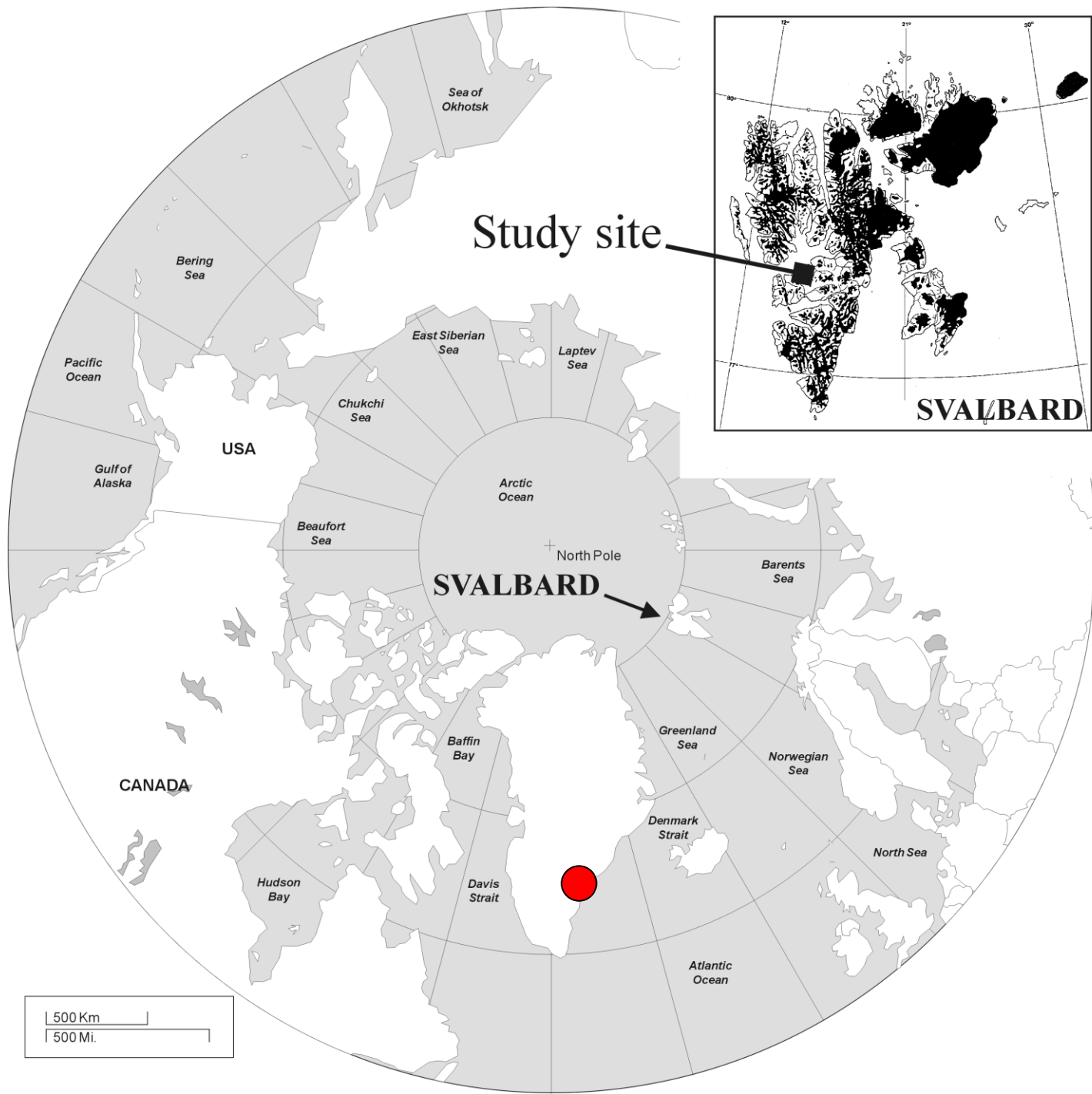
2 mm



Microscope view of *Myurella julacea*







Mitdluaqat glacier, SE Greenland

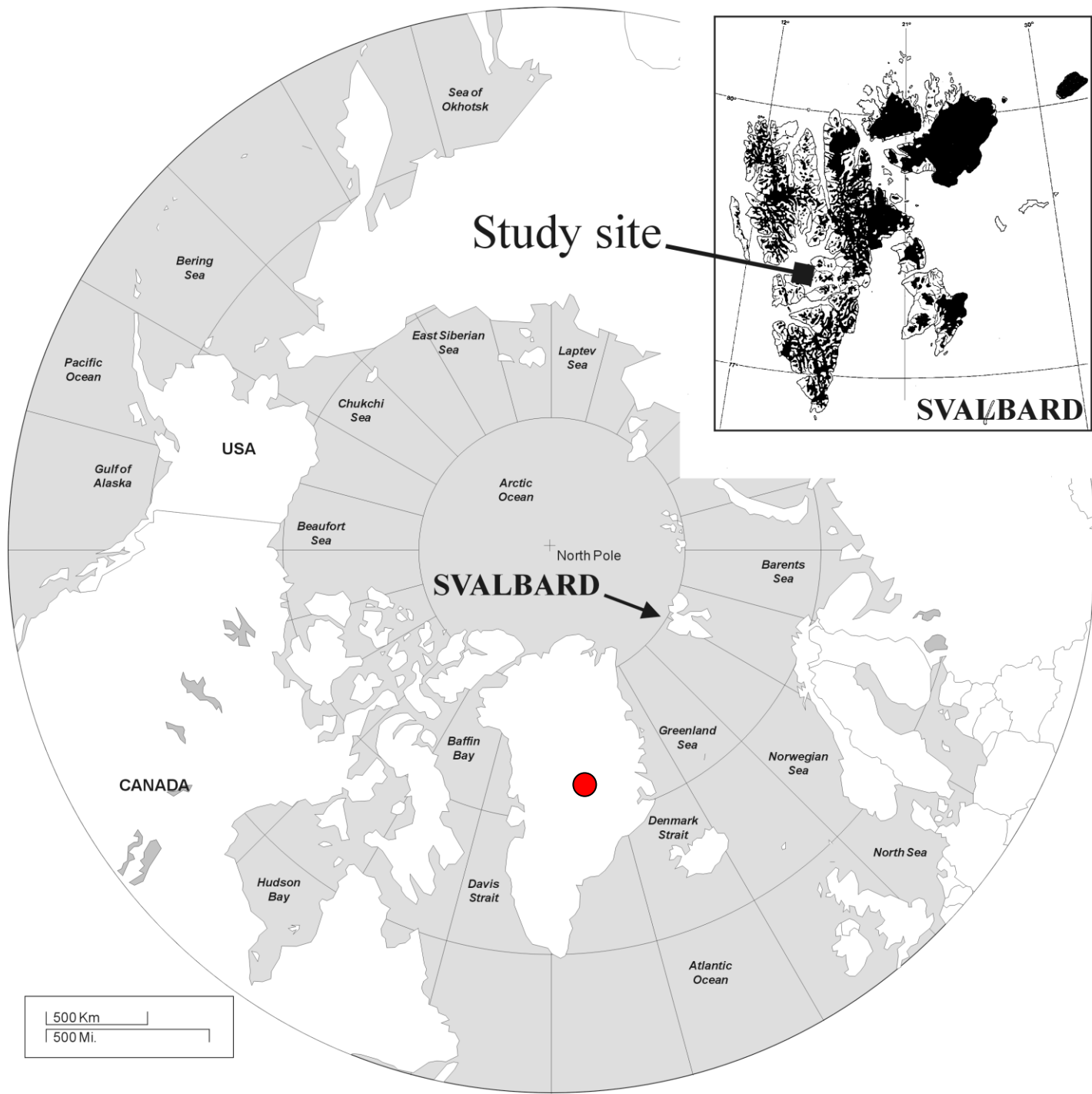
Upper marine limit
from Early Holocene

No raised coastal features

Modern delta



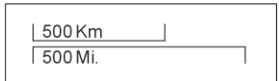


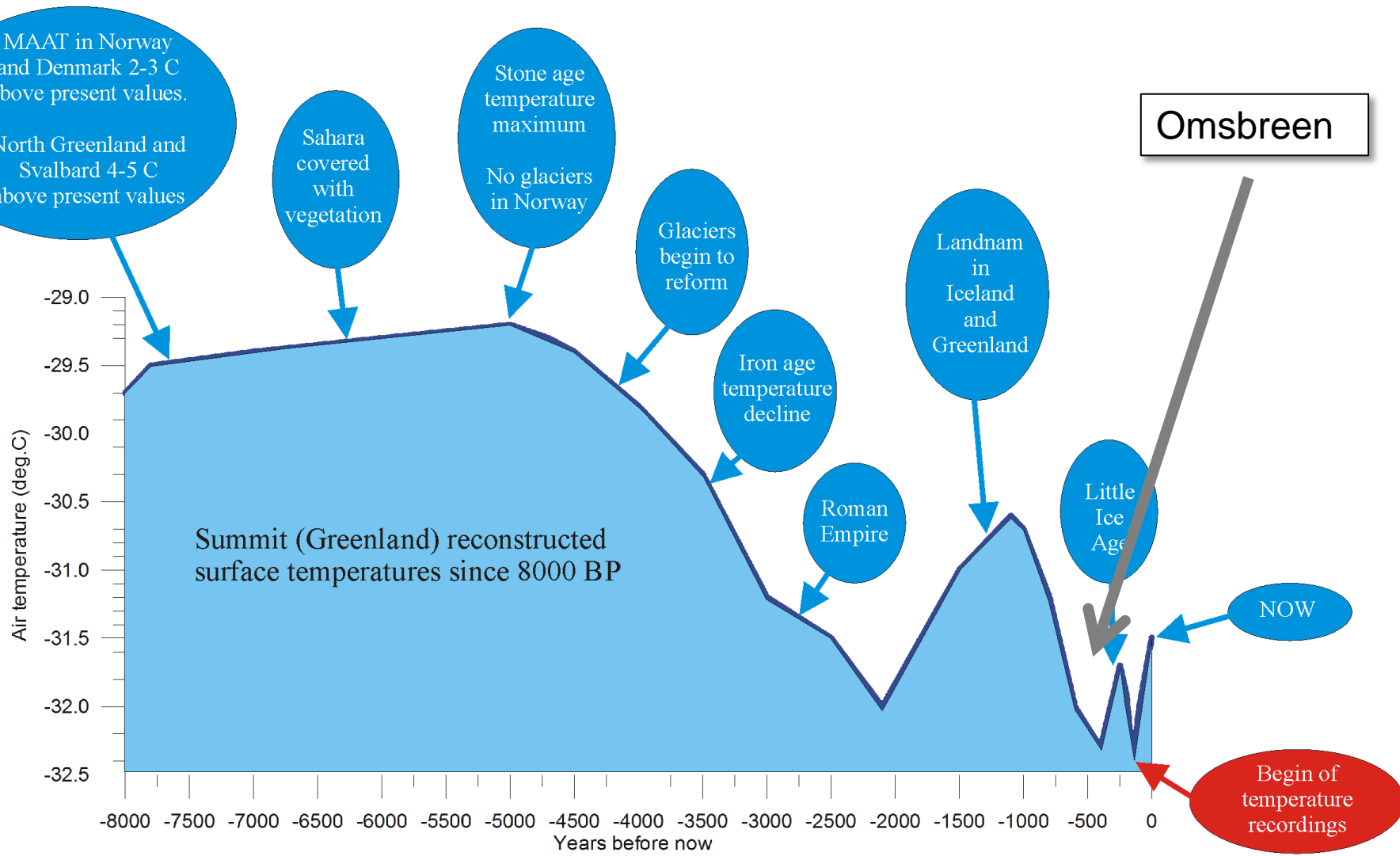


Study site

SVALBARD

SVALBARD





Omsbreen

Begin of temperature recordings

MAAT in Norway and Denmark 2-3 C above present values. North Greenland and Svalbard 4-5 C above present values

Sahara covered with vegetation

Stone age temperature maximum. No glaciers in Norway

Glaciers begin to reform

Iron age temperature decline

Roman Empire

Landnam in Iceland and Greenland

Little Ice Age

NOW