The Siljan impact structure – a short review

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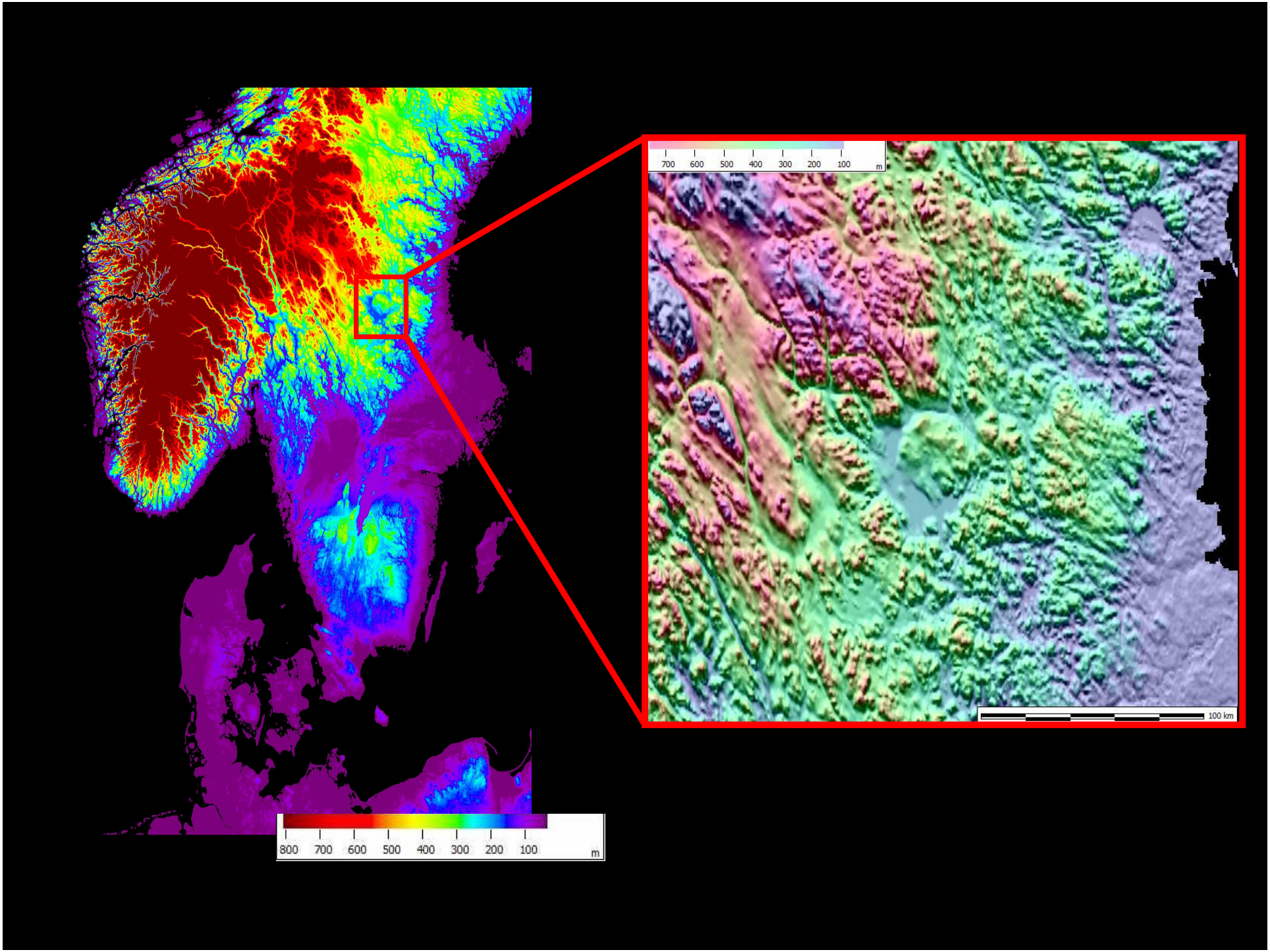
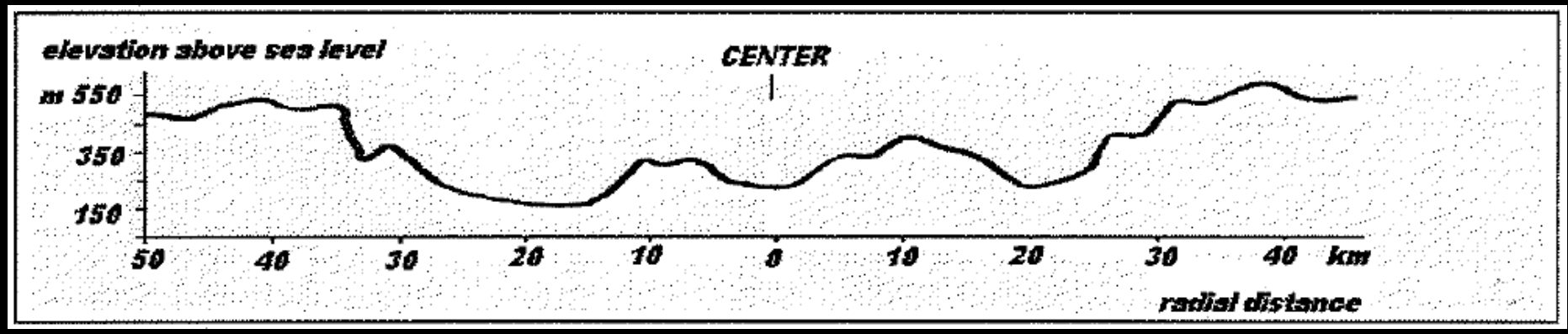
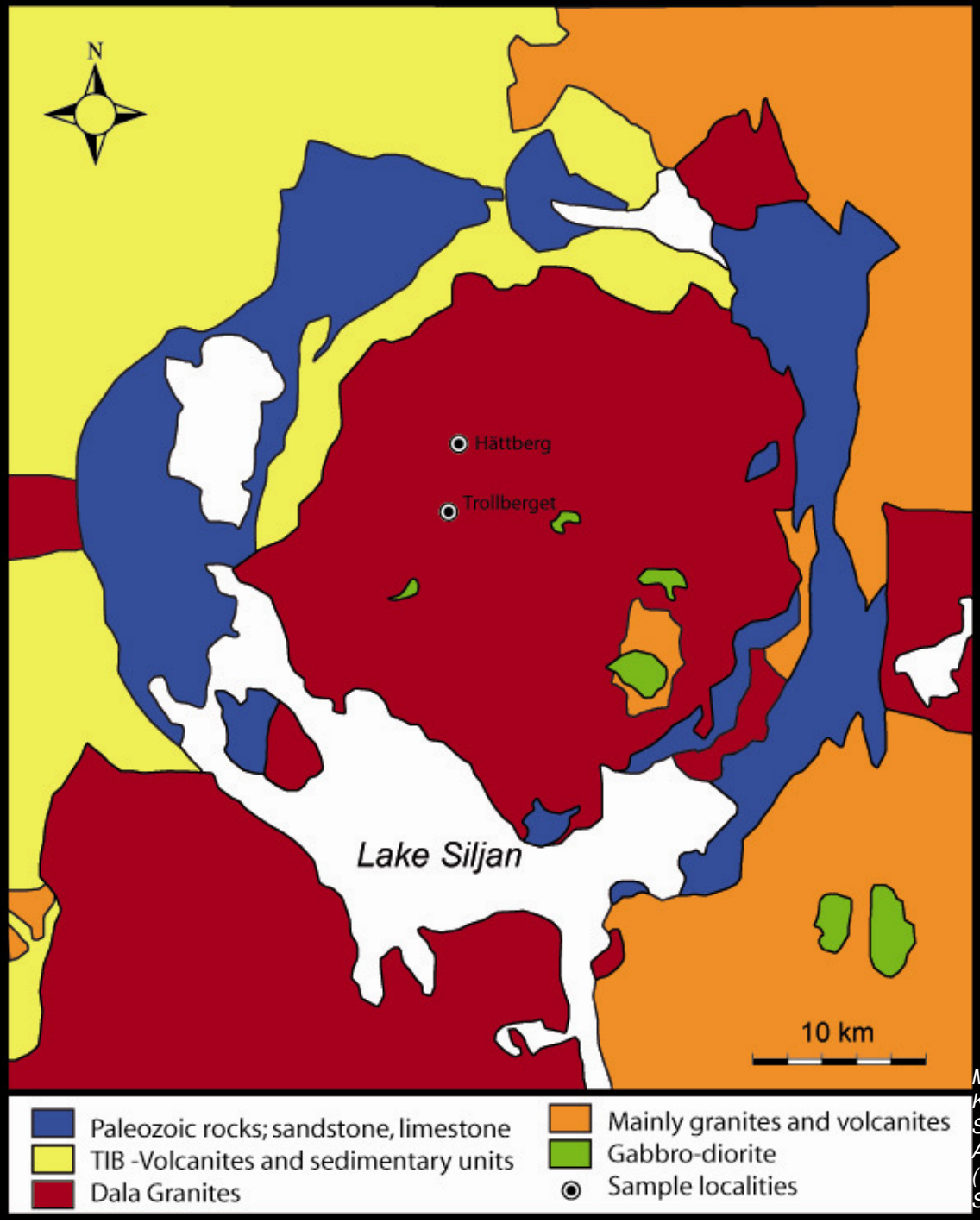

800 700 600 500 400 300 200 100
m
700 600 500 400 300 200 100
m
100 km



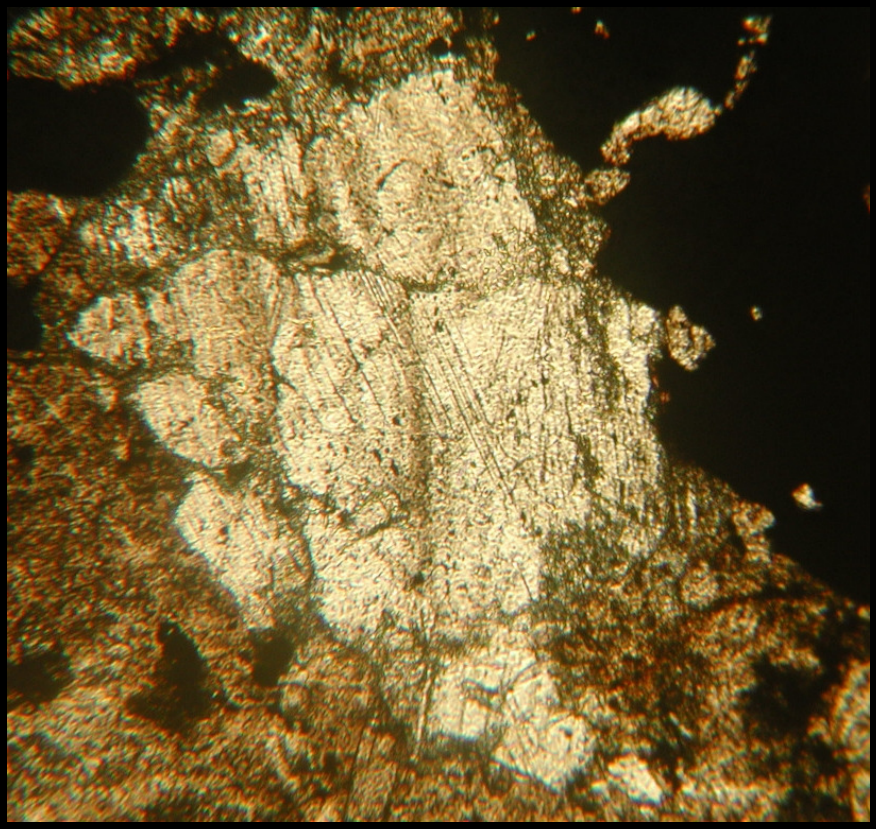
Henkel H. and Aaro S. (2005). In Koeberl C. and Henkel H. (eds.) Impact Tectonics. Springer Verlag, Berlin, 247-283.



Modified by Carl Alwmark after Kresten and Aaro (1987) Swedish Geol. Survey Series Ai15-Ai18, and Kresten et al. (1991) Swedish Geol. Survey Series Ai46-Ai51.

- Shatter cones

- PDFs in quartz (Peak shock pressure between 12-17 GPa)



Photographs by Carl Alwmark

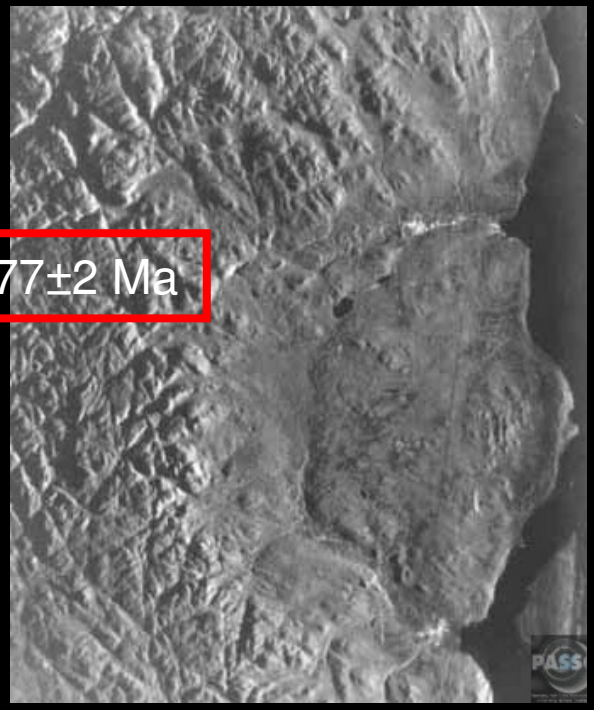
- Impact melt breccia

Photograph by Carl Alwmark

System Period	Series Epoch	Stage Age	Age Ma
Devonian	Upper	Famennian	359.2 ±2.5
		Frasnian	374.5 ±2.6
	Middle	Givetian	385.3 ±2.6
		Eifelian	391.8 ±2.7
	Lower	Emsian	397.5 ±2.7
		Pragian	407.0 ±2.8
		Lochkovian	411.2 ±2.8
			416.0 ±2.8

http://stratigraphy.science.purdue.edu/charts/Div_GeolChart.jpg

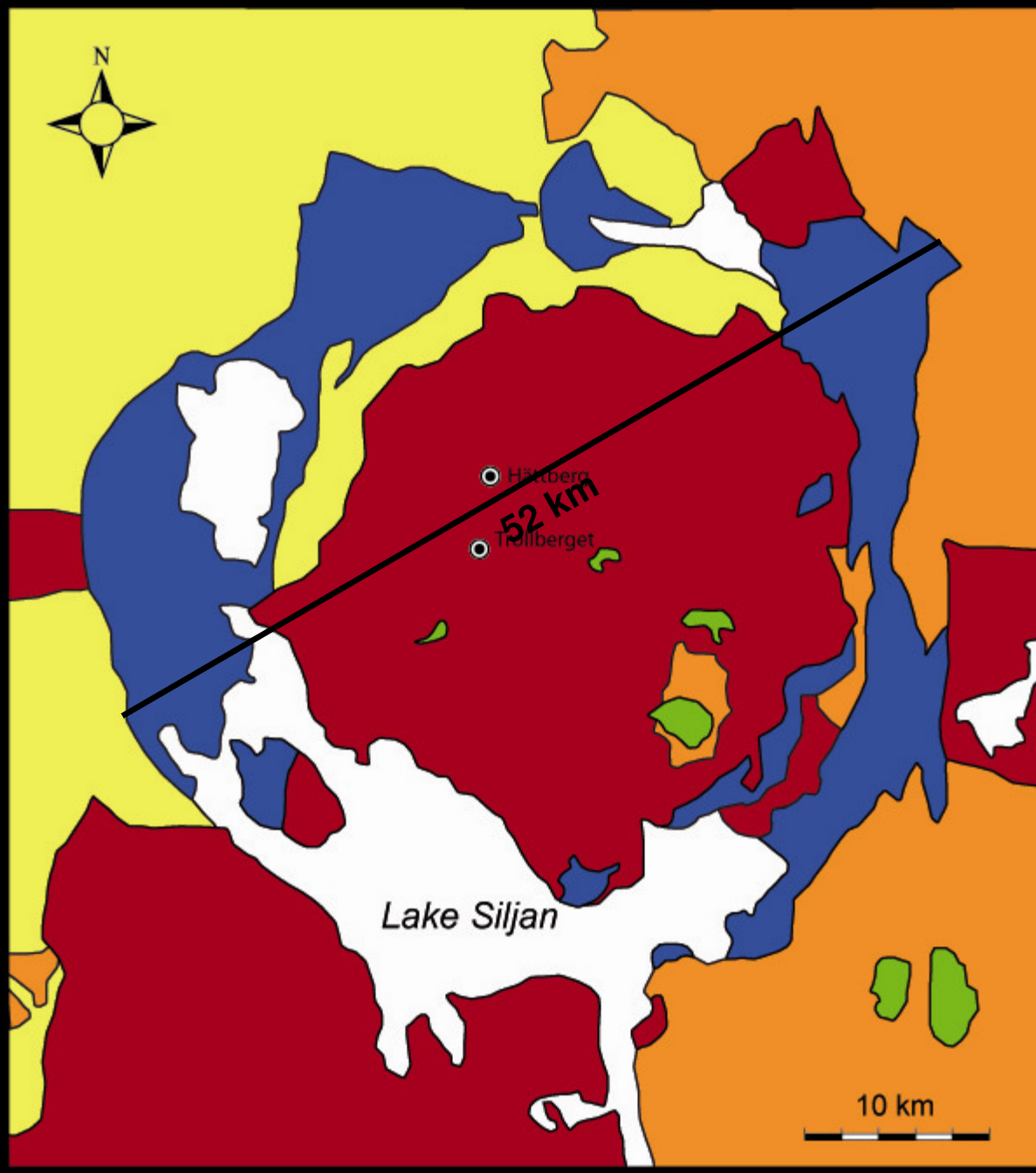
Siljan: 377±2 Ma

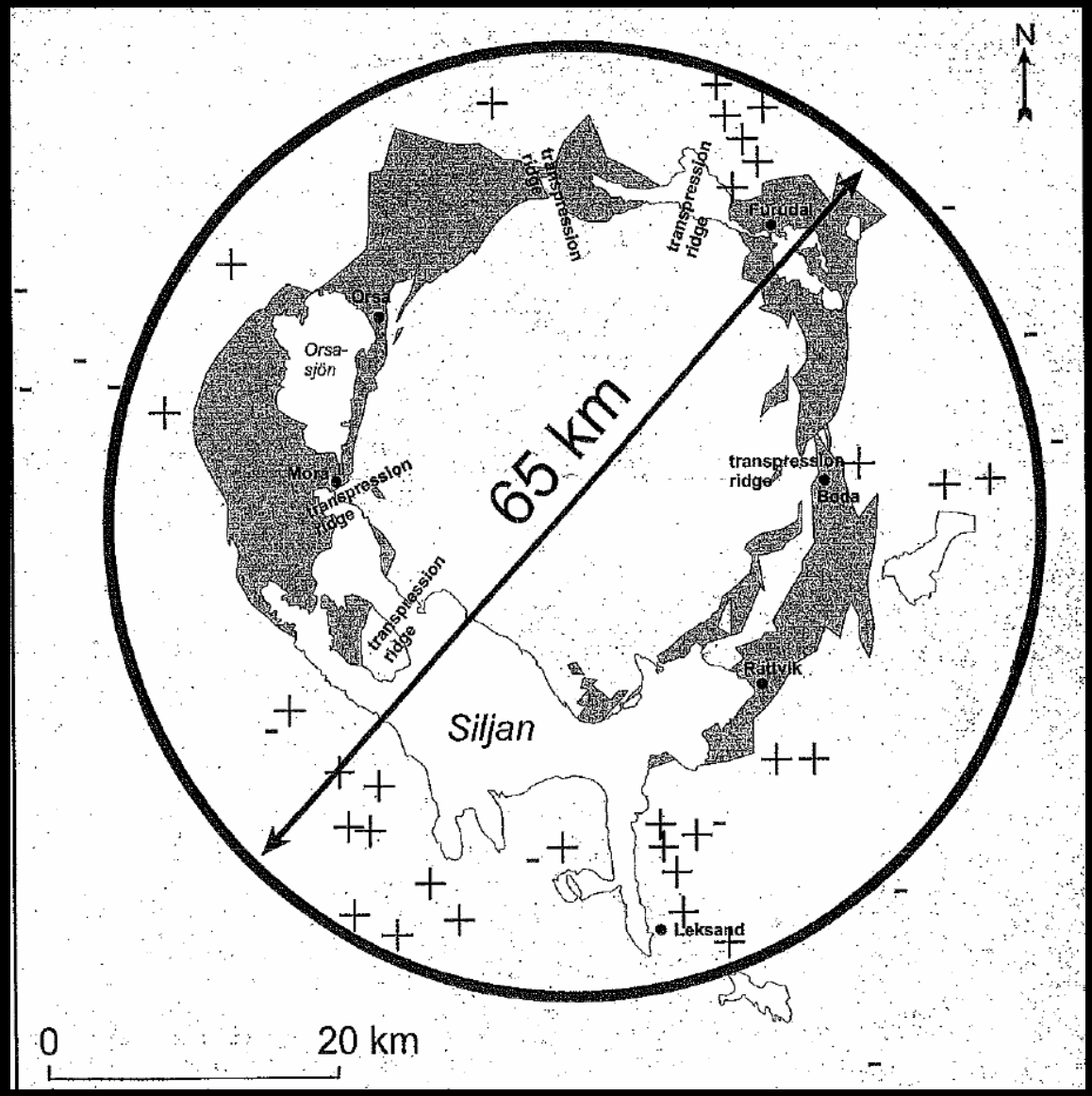


http://www.unb.ca/passc/ImpactDatabase/images/char022.jpg

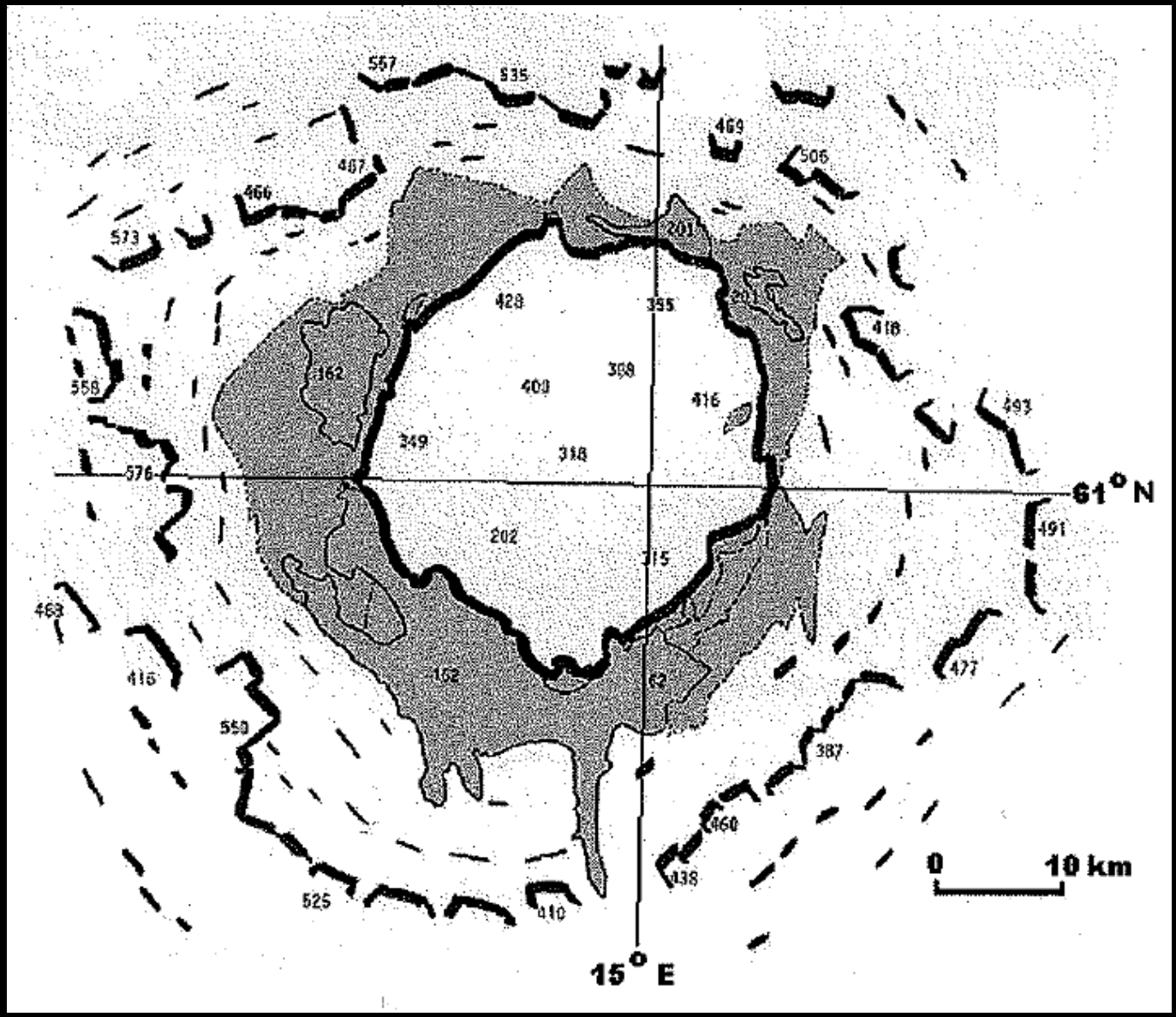
- Previous ages: 342-368 Ma.
- F-s boundary: 374.5±2.6 Ma
- Possible cluster of impacts as cause for extinction event? e.g. Charlevoix (54 km): 357±15 Ma, Woodleigh (40 km): 364±20 Ma, Flynn Creek (3.8 km): 360 ±20 Ma

http://www.unb.ca/passc/ImpactDatabase/images/flynn-creek.htm


N
Hättberg
Trollberget
52 km
Lake Siljan
10 km



Kenkmann, T. and von Dalwigk, I. (2000) Met. Planet. Sci. 35, 1189-1201.



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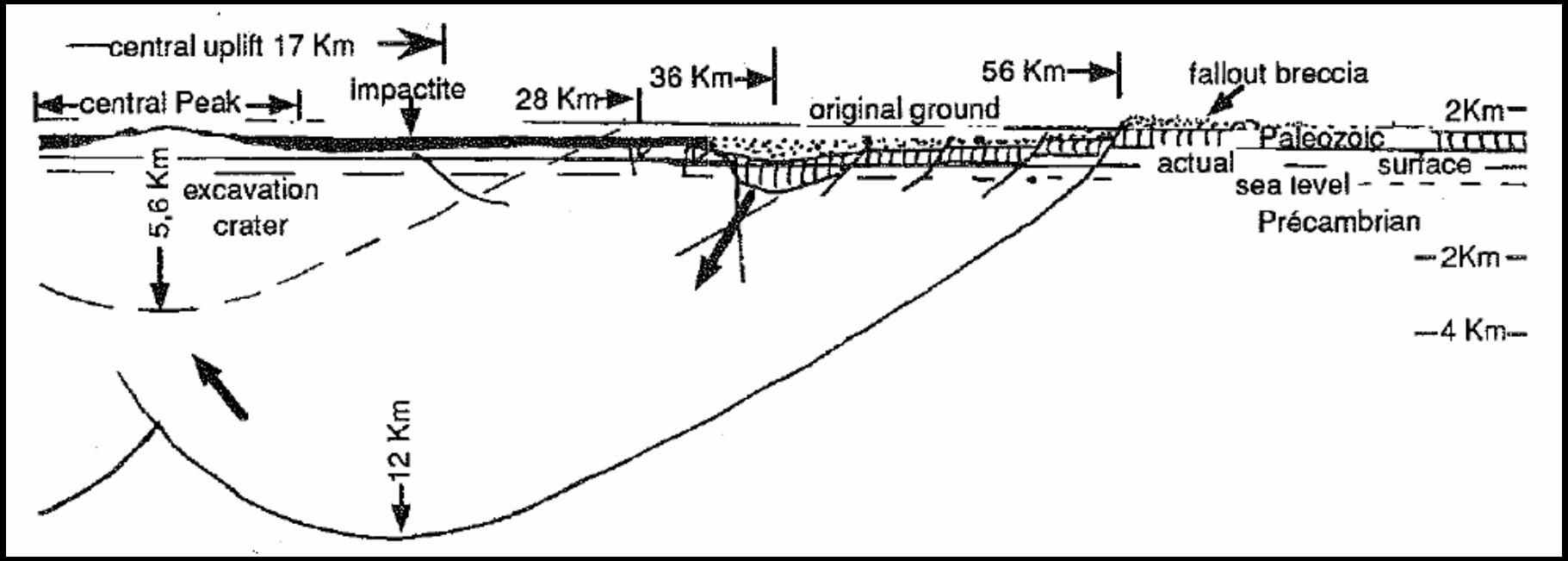
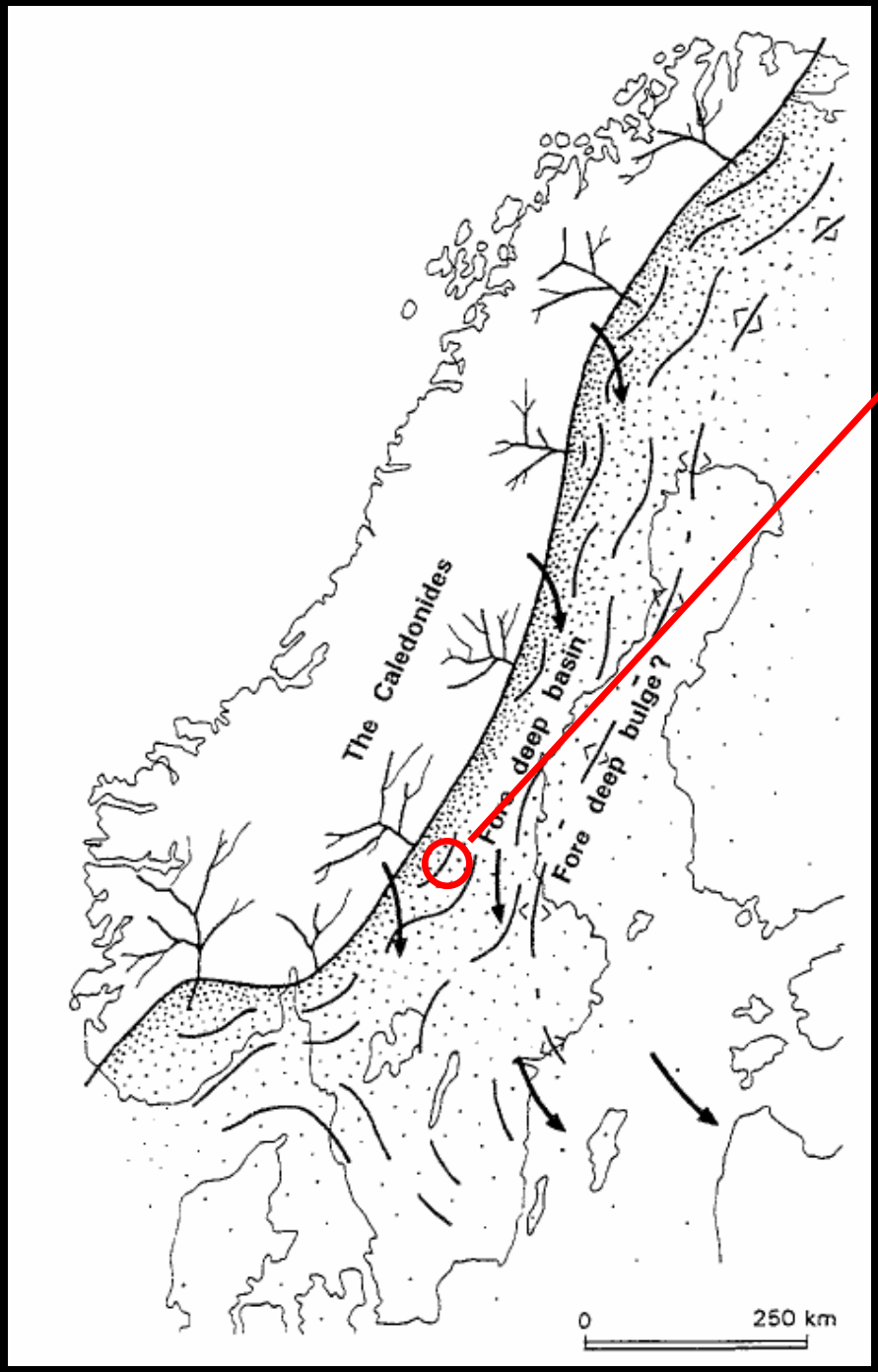


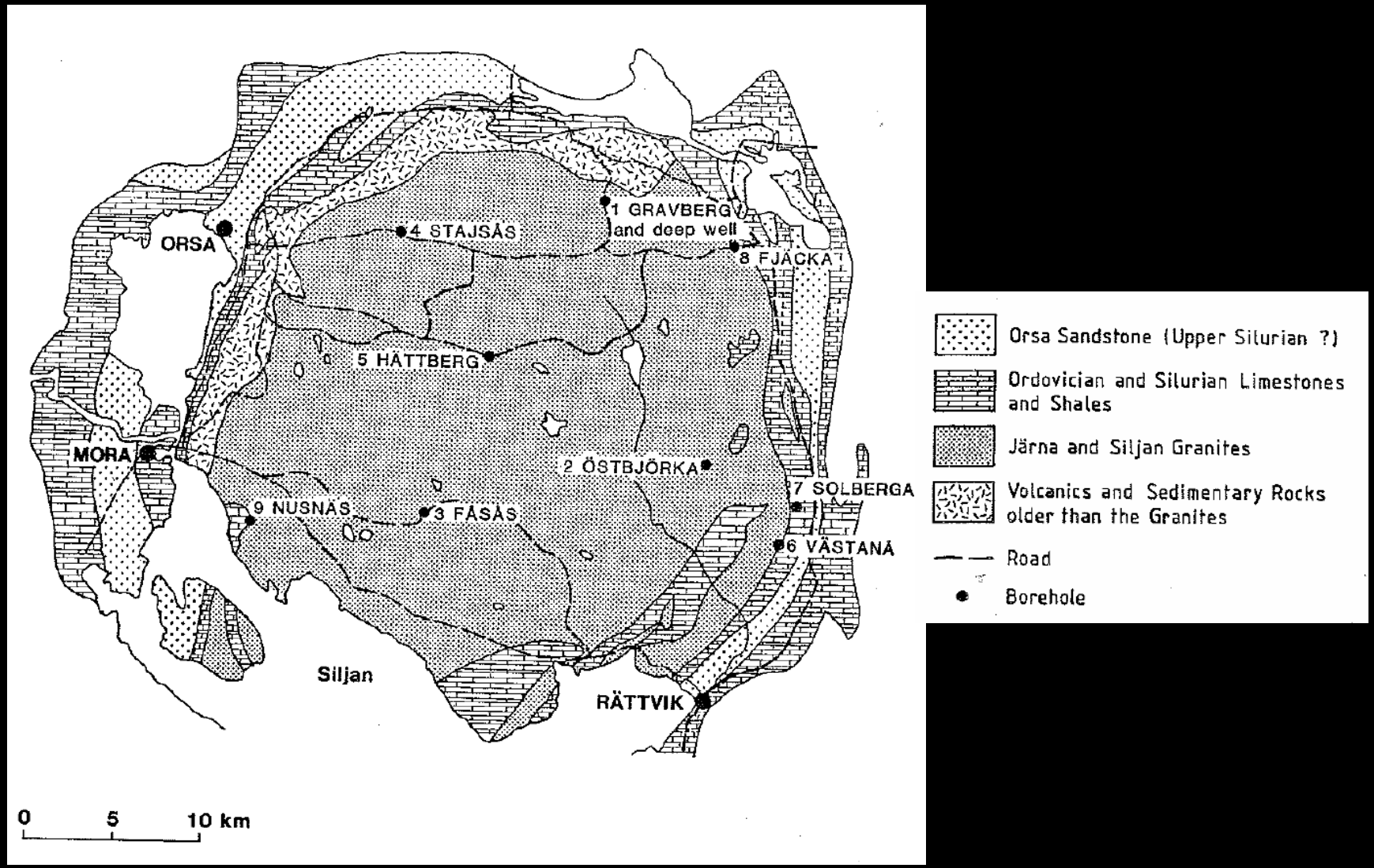
Rondot, J. (1990) In Pesonen L.J. and Niemisara H. Symposium Fennoscandian Impact Structures. Geological Survey of Finland.



Location of impact

Thermal indicators including $\delta^{18}O/\delta^{13}C$, conodont alteration indices, oil maturation, apatite fission tracks and lead mobility in basement rocks indicate increased temperatures during the Late Paleozoic, indicative of sedimentary cover with thickness of ~2.5 km.

Tullborg E.L. et al. (1995) Thermal evidence of Caledonide foreland, molasse sedimentation in Fennoscandia. Svensk Kärnbränslehantering AB technical report, 38 p.



Collini B. (1988) In Bodén A. and Eriksson K. (eds.) Deep drilling in crystalline bedrock vol. 1: The deep gas drilling in the Siljan impact structure, Sweden and astroblemes. Springer Verlag, Berlin, 349-354.

Closing remarks

- Research about Siljan has been almost absent after the closure of the Deep Gas Project in 1991.
- The structure is, however, now of interest again due to a proposal to drill in the structure.
- Data from the Deep Gas Drilling project can be the basis for further studies that may reveal new information about the structure.
- Major questions about Siljan remain unanswered, depth of erosion and original crater diameter.