GEOLOGICAL SURVEY OF NORWAY
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Photo: Jan Egil Wanvik (NGU).Treching at the Møkland graphite prospect.

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THE GRAPHITE POTENTIAL OF NORWAY; TARGETS GALORE

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GRAPHITE IN NORWAY

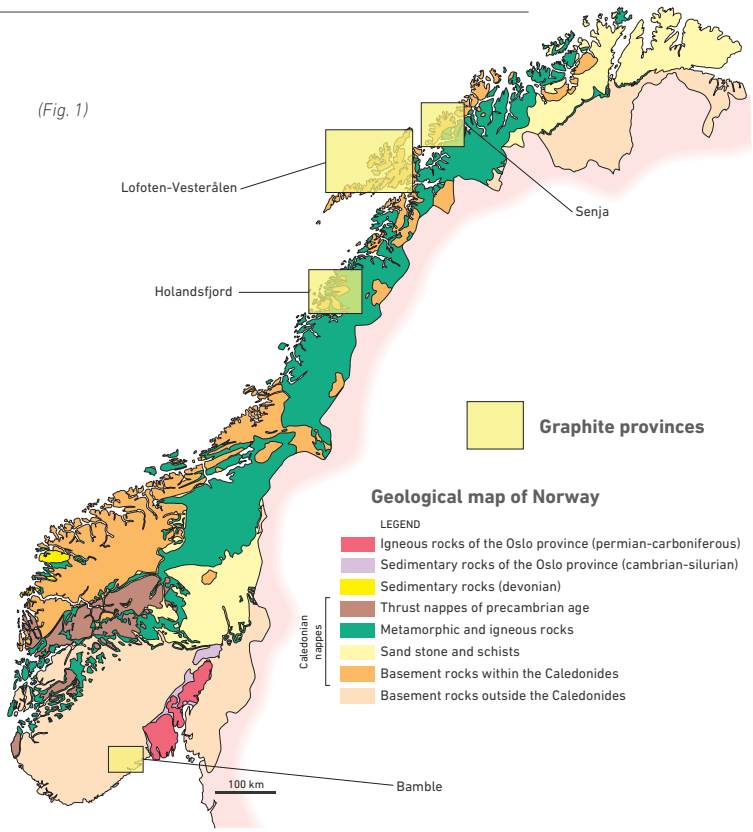
Norway has been a graphite producer for almost 100 years. Historically graphite has been produced from three mines of which one, Skaland Graphite, is the only current producer. The Norwegian graphite deposits are all of flake graphite type and are all situated in Proterozoic rocks of upper amphibolites or granulite facies metamorphic grade. Most of the deposits occur in three main provinces. Most of these areas are covered with new high-resolution Electromagnetic, Magnetic and Radiometric helicopter geophysical surveys. Apart from the mine in production very few of the Norwegian graphite deposits have been drilled or have any approved reserve calculation. Skaland graphite mine, produces from the worlds richest flake graphite desposit, with an average grade of 31% graphitic carbon.

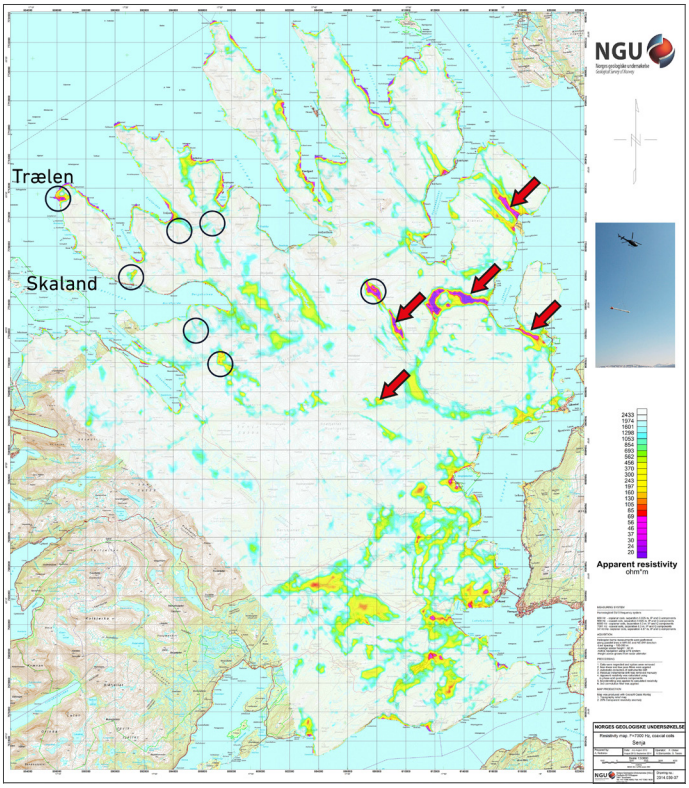
GRAPHITE PROVINCES

The areas in Norway in which the bulk of the graphite desposits occur are *(see Fig. 1)*:

THE ISLAND OF SENJA: There are 14 graphite showings or prospects and one mine currently in production *(see Fig 2)*.

(Fig. 1)





(Fig. 2) Airborne (helicopter) EM map with the biggest new discoveries shown (red arrow), old occurences (black circle)

The Trælen deposit, contains 1.8 Mt of proven reserves with a grade of 31% graphitic carbon. With the present annual production the mine has reserves for at least 50 years. The biggest geophysical anomalies associated with the Bukkemoen and and Vardfjellet prospects and have a length of 2000 meters.

LOFOTEN –VESTERÅLEN: This archipelago has 26 different graphite showings and prospects, many of them on the island of Langøya. The Jennestad graphite mine was in operation from 1898-1914 and again from 1948 to 1962. NGU from 1990 to 1994 and from 2012 to the present investigated a number of known graphite prospects and new geophysical anomalies associated with known occurrences. A number of new prospects have been discovered and new information about ore grades is available.

HOLANDSFJORD: The Rendalsvik graphite mine in the Holandsfjord area was in operation from 1932-1947. New exploration in 1980 included a drilling programme of 660 meters revealed a 30 meter wide, 300 long graphite orebody with an average graphite content 9.5%.

GEOLOGICAL SETTING OF THE GRAPHITE DEPOSITS

All Norwegian graphite deposits occur in similar geological settings. The graphite ore is typically occur associated with carbonates, intermediate and mafic gneisses and sometimes banded iron formations. The graphite-bearing rocks are always folded and deformed in a complex manner involving polyphase folding, deformation and metamorphism up to granulite or high amphibolite facies. This rock association make it most probable that the graphite-bearing rocks were initially part of a supracrustal rock association that comprised organic-rich sediments together with arenitic sandstones and intermediate to basic volcanic rocks. On Senja and in Lofoten-Vesterålen the age of this supracrustal sucession is believed to be about 2 billion years.

MINERALOGY OF GRAPHITE BEARING ROCKS

The graphite-bearing rocks are quartz-feldspar rocks that can contain up to about 40% graphite, but a typical range is 5-25% *(see Table 1)*. The silicate minerals are typically (in descending order): Quartz, orthoclase, plagioclase, biotite, ortho and clinopyroxene. Sulphides are in general a minor mineral. In situ in the rock, the graphite crystals occur as irregularely shaped grains with a typical grain size from 0.1 to 1.5 mm.

DEPOSIT NAME	PROVINCE	LENGTH(M)	WIDTH(M)	% GC	STATUS
Bukkemoen	Senja	2000	300	5	Prospect
Hesten	Senja	1600	50	6	Prospect
Vardfjellet	Senja	1700	50	10	Prospect
Trælen	Senja	400	100	31	Active mine
Grunnvåg	Senja	800	160	8	Prospect
Frøskeland	Vesterålen	600	50	7	Prospect
Skogsøya	Vesterålen	1200	100	22	Prospect
Svinøaya	Vesterålen	200	6	23	Prospect
Smines	Vesterålen	2000	50	8	Prospect
Kvernfjorddalen	Vesterålen	4000	20	15	Prospect
Lille Hornvann	Vesterålen	300	50	14	Prospect
Hornvann/Græva	Vesterålen	100	20	25	Abandoned mine
Golia	Vesterålen	200	20	18	Abondoned mine
Møkland	Vesterålen	2000	50	16	Prospect
Morfjord	Vesterålen	300	30	15	Abondoned mine
Koven	Vesterålen	800	50	13	Abondoned mine
Nordværnes	Holandsfjord	500	50	5	Prospect
Rendalsvik	Holandsfjord	300	30	13	Abondoned mine
Dobbe	Bamble	500	200	3	Prospect
Sundebru	Bamble	600	200	1,5	Prospect
Bjørnhei	Bamble	50	4	18	Prospect

(Table 1) Length, width of geophysical anomaly and content of graphitic carbon (gC) for selected graphite prospects and deposits.

MORE INFORMATION, PLEASE CONTACT:

JAN SVERRE SANDSTAD

Team leader mineral resources
jan.sandstad@ngu.no

HÅVARD GAUTNEB

Researcher mineral resources
havard.gautneb@ngu.no

MARCO BRÖNNER

Team leader geophysics
marco.bronner@ngu.no

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NGU - GEOLOGICAL SURVEY OF NORWAY

CONTACT ADDRESS

PO Box 6315 Torgarden
NO-7491 Trondheim, Norway
Phone: +47 73 90 40 00

VISITING ADRESS

Leiv Eirikssons vei 39, Trondheim
E-mail: ngu@ngu.no
www.ngu.no

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