GEOLOGICAL MAP OF THE FE

Scale 1:2 000

Geological units outside the Fennoscandian Shield

100 METEORITE IMPACT ROCKS AND SITES

101 Impact melt, impact breccia

☆ 102 Impact site

200 CONTINENTAL SHELF (including ocean floor in the northwest)

210 Cenozoic rocks

211 Sediment underlain by ocean-floor basalt

212 Sandstone, conglomerate, siltstone, shale, limestone

213 Olivine nephelinite (Palaeocene)

220 Mesozoic rocks

221 Sandstone, siltstone, shale, coal, marl, limestone

230 Neoproterozoic (and possibly Mesoproterozoic) and Palaeozoic rocks

231 Volcanic, sedimentary and intrusive rocks, undifferentiated (Permo-Carboniferous)

232 Limestone, marl, oil shale, shale, siltstone, sandstone (Middle Cambrian to Permian)

233 Sandstone, conglomerate, siltstone, shale (Vendian to Lower Cambrian, in part even Middle Cambrian)

234 Sandstone, conglomerate, siltstone, shale (Upper Riphean and possibly older)

240 Uppermost Palaeoproterozoic and Mesoproterozoic rocks

241 Dolerite, basalt (c. 1.27-1.22 Ga, in part c. 1.47 Ga)

242 Sandstone, conglomerate, siltstone, shale (Riphean, pre-1.27 Ga)

243 Granite, syenite, monzonite, gabbro, anorthosite (Mesoproterozoic)

244 Granite, syenite, monzonite, gabbro, anorthosite, quartz porphyry (Uppermost Palaeoproterozoic)

300 NEOPROTEROZOIC (AND POSSIBLY MESOPROTEROZOIC) AND PHANEROZOIC ROCKS OUTSIDE THE CALEDONIAN OROGENIC BELT

310 Cenozoic rocks

311 Sandstone, siltstone, shale, limestone

320 Mesozoic rocks

321 Basalt (Jurassic and Cretaceous)

322 Sandstone, siltstone, shale, coal, marl, limestone

330 Neoproterozoic (and possibly Mesoproterozoic) and Palaeozoic rocks

331 Granite, syenite, monzonite, nepheline syenite, foid-bearing monzosyenite, diorite, gabbro, pyroxenite (Permo-Carboniferous)

332 Latite porphyry, dolerite (Permo-Carboniferous)

333 Rhyolite, trachyte, latite, basalt, sandstone, conglomerate (Permo-Carboniferous)

334 Nepheline syenite, foidolite, carbonatite, melilitolite, pyroxenite, peridotite (Devonian)

335 Lamprophyre, melilitite, nephelinite, dolerite (Devonian)

336 Phonolite, trachyte, alkali basalt, picrite (Devonian)

337 Limestone, marl, coal, oil shale, shale, siltstone, sandstone, conglomerate (Middle Cambrian to Permian)

338 Sandstone, conglomerate, siltstone, shale (Vendian to Lower Cambrian)

339 Nepheline syenite, carbonatite, pyroxenite, alnöite (Vendian to Cambrian)

340 Dolerite (Vendian to Cambrian)

341 Sandstone, conglomerate, siltstone, shale (Upper Riphean and possibly older)

K Area with kimberlite pipes

400 CALEDONIAN OROGENIC BELT

410 Neoautochthonous rocks

411 Sandstone and conglomerate (Devonian, in part uppermost Silurian)

420 Exotic and outboard terranes in Upper and Uppermost Allochthons

421 Granite, syenite, monzonite, granodiorite, tonalite, trondhjemite, diorite, dolerite including sheeted dyke complex, gabbro, ultramafic rock (Lower Palaeozoic)

422 Mica schist, paragneiss, marble, calc-silicate gneiss, quartzite, conglomerate, amphibolite in Uppermost Allochthon

423 Metagreywacke, phyllite, conglomerate, quartzite, limestone, felsic and mafic metavolcanic rocks in Upper Allochthon (Lower Palaeozoic)

430 Continent-ocean transition zone in Upper Allochthon

Neoproterozoic sedimentary cover and igneous rocks

431 Metadolerite including sheeted dyke complex, amphibolite, gabbro, eclogite, ultramafic rock

432 Garnet-mica schist, quartzo-feldspathic schist, quartzite, marble, amphibolite

Older Precambrian rocks

433 Metagranite (c. 1.65 Ga)

434 Anorthosite, gabbro, ultramafic rock and metamorphic equivalents

440 Continental margin in Middle Allochthon

Neoproterozoic sedimentary cover and Neoproterozoic to Cambrian intrusive rocks

441 Gabbro, ultramafic rock, nepheline syenite, carbonatite, granite (Neoproterozoic to Cambrian)

442 Dolerite (Neoproterozoic)

443 Feldspathic metasandstone, meta-arkose, quartzite, metagreywacke, marble, tillite (Neoproterozoic)

Older Precambrian rocks

444 Granite, syenite, monzonite, tonalite and metamorphic equivalents (c. 1.70-0.90 Ga)

445 Gabbro, anorthosite and metamorphic equivalents (c. 1.70-0.90 Ga)

446 Felsic metavolcanic rock, metaporphyry

450 Continental margin (including platformal rocks) in Lower Allochthon and in windows with uncertain tectonostratigraphic status

Neoproterozoic to Silurian sedimentary cover rocks

451 Arkose, quartzite, greywacke, siltstone, shale, phyllite, limestone, dolomite, tillite

Proterozoic rocks

452 Granite, granodiorite, quartz monzonite, monzogabbro (1.00-0.90 Ga)

453 Gabbro, eclogite, ultramafic rock (in part c. 1.45 Ga)

454 Granite, granodiorite, tonalite and metamorphic equivalents (c. 1.70-1.51 Ga)

455 Felsic volcanic rock, porphyry

456 Mafic and intermediate volcanic rocks

457 Granite, granodiorite, syenite, monzonite and metamorphic equivalents (c. 2.20-1.70 Ga)

458 Gabbro, diorite, anorthosite, ultramafic rock and metamorphic equivalents (c. 2.20-1.70 Ga)

459 Mica gneiss, paragneiss, subordinate marble and graphite schist

460 Quartzite, metagreywacke, mica schist, minor mafic metavolcanic rock (c. 2.30 Ga)

461 Mafic metavolcanic rock, banded silicate-carbonate rock, serpentinite (c. 2.30 Ga)

Archaean rocks

462 Granite, granodiorite, tonalite and metamorphic equivalents

463 Migmatitic gneiss of granodioritic to dioritic composition

Fennoscandian Shield

500 NEOPROTEROZOIC (TO MESOPROTEROZOIC) ROCKS

501 Gabbro, norite, anorthosite, monzogabbro, monzonite, quartz monzonite (c. 0.93-0.92 Ga)

502 Granite, pegmatite (c. 1.00-0.92 Ga)

503 Dolerite, metadolerite (c. 1.18-0.93 Ga)

600 MESOPROTEROZOIC (TO PALAEOPROTEROZOIC) ROCKS

601 Meta-arkose, metagreywacke, conglomerate, quartzite, marble, mafic and felsic metavolcanic rocks (younger than c. 1.27 Ga)

602 Granite, granodiorite, trondhjemite, monzonite, monzodiorite, diorite and metamorphic equivalents (c. 1.25-1.00 Ga)

603 Granite, syenite and metamorphic equivalents (c. 1.25-1.20 Ga)

604 Lamprophyre, lamproite (c. 1.23-1.15 Ga)

605 Dolerite (c. 1.27-1.22 Ga)

606 Granite, monzonite, syenite and metamorphic equivalents (c. 1.56-1.20 Ga)

Granite, quartz monzonite, syenite and metamorphic equivalents, in part hypersthene-bearing (c. 1.46-1.30 Ga)

608 Gabbro, pyroxenite, anorthosite, dolerite and metamorphic equivalents (c. 1.46-1.30 Ga)

609 Quartzite (c. 1.45 Ga or younger)

610 Sandstone, conglomerate, siltstone, shale (Riphean, pre-1.27 Ga)

611 Basalt, dolerite

612 Meta-andesite, matarhyolite, metasandstone, quartzite, conglomerate, amphibolite (c. 1.50 Ga)

613 Granite, quartz monzonite, syenite, nepheline syenite and metamorphic equivalents (c. 1.58-1.47 Ga)

614 Gabbro, pyroxenite, anorthosite, dolerite and metamorphic equivalents (c. 1.58-1.47 Ga)

615 Dolerite, metadolerite, amphibolite, gabbro, metagabbro, granophyre (c. 1.57-1.47 Ga)

616 Granite, granodiorite, monzonite, monzodiorite, diorite and metamorphic equivalents

617 Granodiorite, tonalite, granite, monzonite and metamorphic equivalents (c. 1.61-1.56 Ga), banded orthogneiss and paragneiss

618 Gabbro, diorite, ultramafic rock and metamorphic equivalents

619 Metagreywacke, quartzite, paragneiss, mafic metavolcanic rock (c. 1.60 Ga)

620 Quartzite, mica schist, mica gneiss, marble, hornblende gneiss, amphibolite

700 PALAEOPROTEROZOIC ROCKS (1.71-1.61 Ga and possibly older)

701 Quartz porphyry, basalt (c. 1.62 Ga)

702 Dolerite (c. 1.65-1.62 Ga)

703 Granite, monzonite, syenite (c. 1.65-1.62 Ga)

704 Gabbro, anorthosite, dolerite (c. 1.65-1.62 Ga)

705 Felsic metavolcanic rock (c. 1.66 and c. 1.61 Ga)

706 Granite, quartz monzonite, monzonite, quartz syenite and metamorphic equivalents (c. 1.71-1.66 Ga, in part older, possibly as old as c. 1.86 Ga)

707 Gabbro, diorite, dolerite, ultramafic rock and metamorphic equivalents (c. 1.71-1.66 Ga, in part possibly as old as c. 1.86 Ga)

708 Sandstone, conglomerate

709 Rhyolite, trachyte, trachydacite (c. 1.71-1.69 Ga)

710 Trachybasalt, basaltic trachyandesite, trachyandesite (c. 1.71-1.69 Ga)

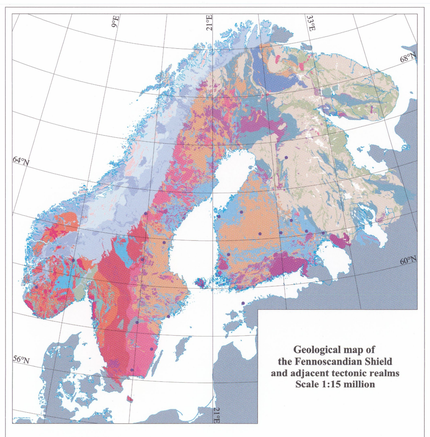
711 Metagranite (c. 1.71-1.66 Ga)

712 Metagranodiorite, metatonalite (c. 1.71-1.66 Ga)

713 Gabbro, diorite, ultramafic rock and metamorphic equivalents

714 Granitic orthogneiss, fine- to medium-grained (c. 1.70 Ga or possibly older)

715 Felsic and mafic metavolcanic rocks, paragneiss, quartzite (c. 1.70 Ga or possibly older)



Geological map of the Fennoscandian Shield and adjacent tectonic realms Scale 1:15 million

Meteorite impact rocks and sites

- Impact melt, impact breccia/Impact site

Neoproterozoic (and possibly Mesoproterozoic) and Phanerozoic rocks outside the Caledonian orogenic belt

- Permo-Carboniferous igneous rocks including the Oslo rift
- Vendian to Cambrian and Devonian alkaline igneous rocks
- Upper Riphean (and possibly older), Vendian and Phanerozoic sedimentary rocks

Caledonian orogenic belt

- Lower Palaeozoic intrusive rocks in exotic and outboard terranes
- Supracrustal rocks in exotic and outboard terranes
- Neoproterozoic and Palaeozoic (Cambrian to Devonian) rocks along the shortened Baltoscandian continental margin
- Proterozoic rocks (c. 2.30-0.90 Ga) along the shortened Baltoscandian continental margin
- Archaean rocks along the shortened Baltoscandian continental margin

Fennoscandian Shield

Neoproterozoic rocks

- Granite, pegmatite, syenitoid, anorthosite, gabbroid (c. 1.00-0.92 Ga)

Mesoproterozoic to Palaeoproterozoic (1.71-1.61 Ga and possibly older) rocks

- Granitoid, syenitoid, dioritoid, dolerite and metamorphic equivalents (in part c. 1.27-1.00 Ga)
- Granite, syenitoid, dioritoid, gabbroid and metamorphic equivalents (c. 1.46-1.30 Ga)
- Supracrustal rocks (younger than c. 1.50 Ga), predominantly metasedimentary
- Granitoid, syenitoid, dioritoid, gabbroid and metamorphic equivalents (in part c. 1.61-1.56 Ga)
- Supracrustal rocks (in part c. 1.66-1.60 Ga)
- Granite, syenitoid, dioritoid, gabbroid, dolerite and metamorphic equivalents (c. 1.65-1.47 Ga)
- Granitoid, syenitoid, dioritoid, gabbroid, dolerite and metamorphic equivalents, supracrustal rocks (c. 1.71-1.66 Ga and possibly older)

Palaeoproterozoic rocks (1.96-1.75 Ga)

- Granite, pegmatite (c. 1.85-1.75 Ga)
- Granitoid, syenitoid, dioritoid and gabbroid, supracrustal rocks (c. 1.86-1.84 & c. 1.82-1.76 Ga)
- Granitoid, syenitoid, dioritoid, gabbroid and metamorphic equivalents, metavolcanic rocks (c. 1.96-1.86 Ga, in part as young as c. 1.84 Ga)
- Supracrustal rocks (c. 1.95-1.85 Ga and possibly older), predominantly metasedimentary

Palaeoproterozoic rocks in Lapland-White Sea granulite belt

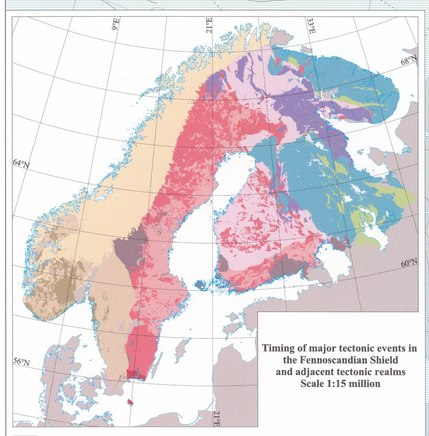
- Granulitic rock, amphibolite, anorthosite (rocks of uncertain age, in time range 2.30-1.90 Ga)

Palaeoproterozoic rocks (2.50-1.96 Ga)

- Intrusive rocks, predominantly mafic and ultramafic
- Supracrustal rocks, predominantly mafic/ultramafic metavolcanic and metasedimentary rocks

Archaean rocks

- Intrusive rocks (c. 2.80-2.50 Ga), orthogneiss, migmatitic gneiss
- Supracrustal rocks (c. 3.20-2.75 Ga and possibly older)



Timing of major tectonic events in the Fennoscandian Shield and adjacent tectonic realms Scale 1:15 million

- Neoproterozoic (and possibly Mesoproterozoic) and Phanerozoic rocks outside the Caledonian orogenic belt
- Caledonian orogenic belt (c. 0.51-0.40 Ga deformation and metamorphism, in part overprinting Proterozoic tectonic events)

Fennoscandian Shield

- Sveconorwegian (c. 1.10-0.92 Ga). Late-tectonic igneous rocks as young as 0.92 Ga included
- Sveconorwegian (c. 1.10-0.92 Ga), in part overprinting Svecokarelian (c. 1.90-1.75 Ga), Gothian (c. 1.70-1.56 Ga) or Hallandian (c. 1.46-1.42 Ga) tectonic events
- Post-Svecokarelian, Palaeo- and Mesoproterozoic rocks east of the Sveconorwegian orogen
- Post-c. 1.77 (1.70) Ga / pre-c. 1.45 Ga tectonic event with c. 1.45-1.40 Ga metamorphic overprint
- Svecokarelian phase 2 (c. 1.86-1.75 Ga). Late- to post-tectonic rocks (with respect to both Svecokarelian phase 1 and phase 2) as young as c. 1.75 Ga included
- Svecokarelian phase 1 (c. 1.90-1.88 Ga) and/or Svecokarelian phase 2 (c. 1.86-1.75 Ga)
- Svecokarelian phase 1 (c. 1.90-1.88 Ga). Approximate eastern limit of c. 1.89-1.88 Ga igneous activity and migmatisation shown with a dashed line ornament in red
- Archaean with Svecokarelian overprint
- Palaeoproterozoic rocks (c. 2.50-1.96 Ga, even younger in the Lake Onega area), little affected or unaffected by Svecokarelian deformation and metamorphism
- Archaean. Late- to post-tectonic intrusive rocks as young as c. 2.50 Ga included

GEOLOGICAL MAP OF THE FENNOSCANDIAN SHIELD
Scale 1 : 2 000 000

Main compilers and bibliographic reference: Koistinen, T., Stephens, M.B., Bogatchev, V., Nordgulen, Ø., Wennerström, M. and Korhonen, J. 2001. Geological map of the Fennoscandian Shield, scale 1 : 2 000 000. *Geological Surveys of Finland, Norway and Sweden and the North-West Department of Natural Resources of Russia.*

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Spatial reference:
Datum: WGS84
Map projection: Gauss-Krueger, central meridian 21°E.
False easting: 1500 km

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0 50 100 150 200 km

HE FENNOSCANDIAN SHIELD

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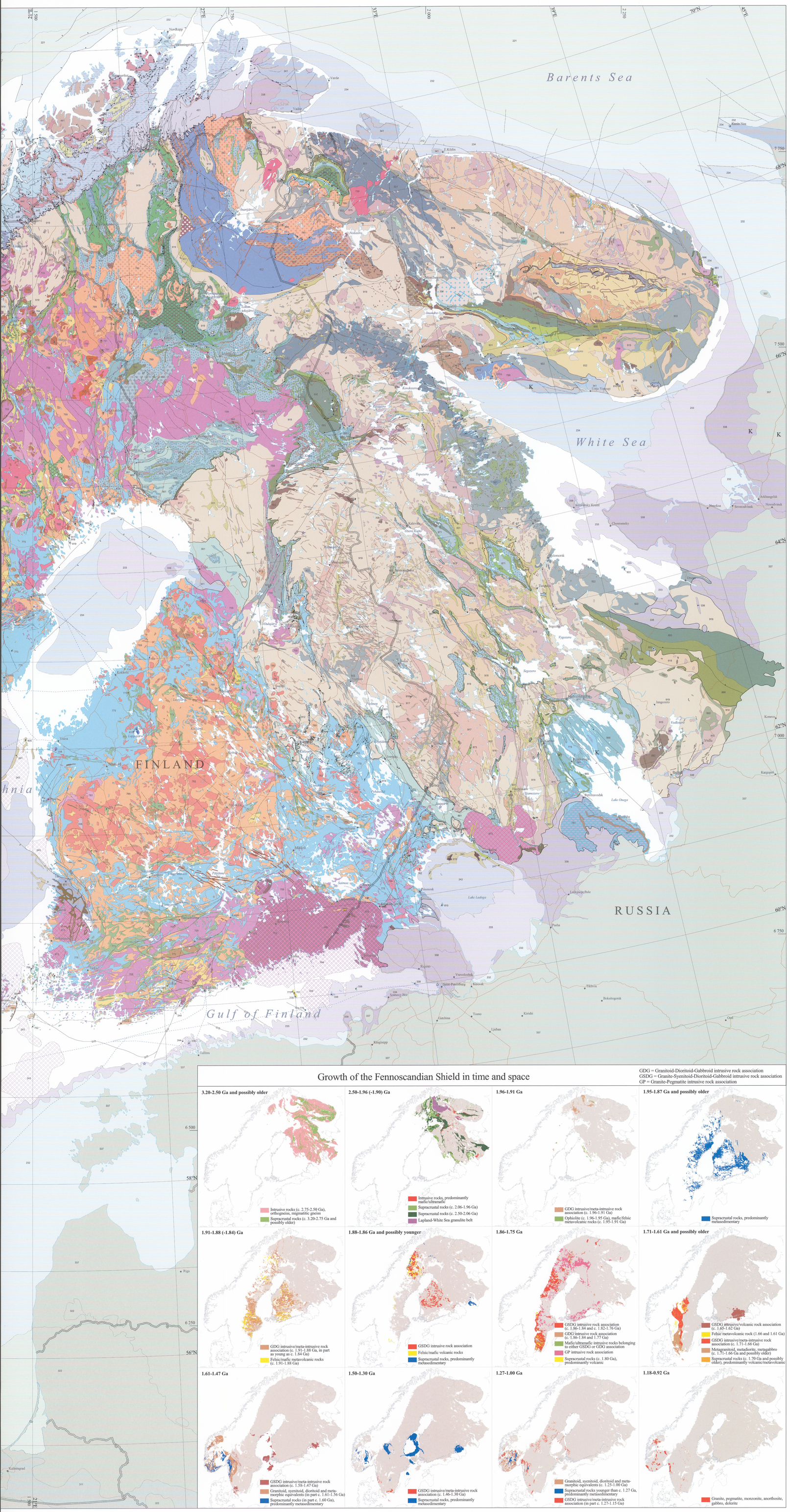


Fennoscandian Shield (continued)

750 PALAEOPROTEROZOIC ROCKS (1.96-1.75 Ga)

- 751 Dolerite, gabbro, metagabbro (c. 1.77 Ga)
- 752 Lamprophyre (c. 1.84-1.77 Ga)
- 753 Dunite, peridotite, pyroxenite, gabbro, alkaline gabbro, alkaline granite, nepheline syenite, carbonatite
- 754 Rhyolite (c. 1.80-1.78 Ga), conglomerate, sandstone
- 755 Basaltic andesite, trachyte, trachydacite, dacite (c. 1.80-1.78 Ga)
- 756 Granite, granodiorite, quartz monzonite, monzonite, syenite and metamorphic equivalents, in part hypersthene-bearing (c. 1.86-1.84 Ga and c. 1.82-1.76 Ga)
- 757 Gabbro, diorite, ultramafic rock and metamorphic equivalents (c. 1.86-1.77 Ga)
- 758 Granodiorite, tonalite, granite and metamorphic equivalents (c. 1.86-1.84 Ga and c. 1.77 Ga)
- 759 Granite, pegmatite (c. 1.85-1.75 Ga)
- 760 Granodiorite, granite, pegmatite, subordinate gabbro (c. 1.86-1.85 Ga)
- 761 Red sandstone and mudstone, conglomerate, metasandstone, quartzite, phyllite, volcanic and metavolcanic rocks
- 762 Granite, granodiorite (c. 1.88-1.87 Ga)
- 763 Granite, monzonite, syenite, in part pyroxene-bearing (c. 1.88-1.87 Ga)
- 764 Gabbro, diorite, monzodiorite, ultramafic rock (c. 1.88-1.87 Ga)
- 765 Peridotite, pyroxenite, gabbro
- 766 Dolerite dyke complex (c. 1.88 Ga)
- 767 Mafic to intermediate volcanic and metavolcanic rocks (c. 1.88-1.86 Ga, in part possibly younger)
- 768 Felsic to intermediate volcanic and metavolcanic rocks (c. 1.88-1.86 Ga, in part possibly younger)
- 769 Granodiorite, tonalite, granite, monzonite, syenite and metamorphic equivalents, in part hypersthene-bearing (c. 1.91-1.88 Ga, in part as young as c. 1.84 Ga)
- 770 Gabbro, diorite, ultramafic rock and metamorphic equivalents (c. 1.91-1.88 Ga, in part as young as c. 1.84 Ga)
- 771 Quartzite, meta-arkose
- 772 Marble
- 773 Mafic metavolcanic rock (c. 1.91-1.88 Ga)
- 774 Felsic to intermediate metavolcanic rock (c. 1.91-1.88 Ga)
- 775 Metagreywacke, metasiltstone, metasandstone, mica schist, graphite- and/or sulphide-bearing schist, paragneiss, amphibolite intercalations (c. 1.95-1.87 Ga and possibly older)
- 776 Picrite, basalt, andesite and high-Mg andesite, metamorphosed
- 777 Andesite, dacite and rhyolite, metamorphosed
- 778 Mafic metavolcanic rock (c. 1.92-1.91 Ga)
- 779 Felsic to intermediate metavolcanic rock (c. 1.92-1.91 Ga)
- 780 Granodiorite, tonalite, granite, gabbro and metamorphic equivalents; alkaline gneiss (c. 1.96-1.91 Ga)
- 781 Mafic metavolcanic rock (c. 1.95 Ga and/or older)
- 782 Felsic metavolcanic rock (c. 1.95 Ga and/or older)
- 783 Ophiolite complex including serpentinite, gabbro, sheeted dykes, pillowed tholeiitic metabasalt, black schist, chert (c. 1.96-1.95 Ga)

800 LAPLAND-WHITE SEA GRANULITE BELT (rocks of uncertain age, in time range 2.30-1.90 Ga)

- Anorthosite
- 802 Felsic to intermediate granulitic rock
- 803 Mafic to intermediate granulitic rock
- 804 Mafic granulitic rock, amphibolite

850 PALAEOPROTEROZOIC ROCKS (2.50-1.96 Ga)

860 Rock group 2.06-1.96 Ga

- 861 Mica schist, metagreywacke, black schist, conglomerate
- 862 Gabbro and dolerite, of variable ages
- 863 Ferrodolerite, monzodiorite
- 864 Tholeiitic basalt, rhyolite, chert, jasper, banded iron formation
- 865 Tholeiitic basalt, ferropicrite, picrite, peridotite, pyroxenite, gabbro, wehrlite/dolerite
- 866 Gabbro, peridotite
- 867 Komatiite, picrite, tholeiitic basalt
- 868 Black schist, carbonaceous quartzite, siltstone, shungitic rocks, dolostone, limestone, basalt, andesitic basalt, picrobasalt/dolerite
- 869 Tholeiitic basalt, arkosic sandstone, quartzite, greywacke, dolostone, black schist

870 Rock group 2.30-2.06 Ga

- 871 Dolostone, stromatolitic dolostone, arkosic sandstone, quartzite, siltstone, limestone, basalt
- 872 Trachybasalt, trachyandesite, tholeiitic basalt, picrite, dacite, quartzite, arkosic sandstone, dolostone, stromatolitic dolostone, jasper
- 873 Tholeiitic basalt, subordinate quartzite and conglomerate
- 874 Quartzite, mica schist, mica gneiss, conglomerate

880 Rock group 2.40-2.30 Ga

- 881 Basalt, high-Mg basalt, high-Mg andesite, dacite, komatiitic basalt/dolerite
- 882 Mica schist, conglomerate, gritstone, diamictite, arkosic sandstone, quartzite, tuffite

890 Rock group 2.50-2.40 Ga

- 891 Granite, quartz syenite, quartz monzonite, monzonite, charnockite
- 892 Layered intrusion: gabbro, gabbro-norite, anorthosite, dunite, peridotite, pyroxenite
- 893 Anorthosite, gabbro
- 894 Rhyolite, dacite, greywacke, conglomerate
- 895 Tholeiitic, komatiitic and andesitic basalt, andesite, dacite, peridotite, gabbro, siltstone, quartzite, arkosic sandstone
- 896 Basalt, andesite, komatiitic basalt, dacite, quartzite, arkosic sandstone
- 897 Graphite-bearing, garnet-kyanite-staurolite schist, sericite schist, quartzite, arkosic sandstone, conglomerate

900 ARCHAEAN ROCKS

910 Plutonic rocks and undifferentiated gneiss and migmatitic rock complexes

- 911 Granodiorite, granite, porphyritic granite (c. 2.60-2.50 Ga)
- 912 Carbonatite (c. 2.60 Ga)
- 913 Alkaline granite, alkaline syenite (c. 2.65 Ga)
- 914 Anorthosite, gabbro (c. 2.65 Ga)
- 915 Granite, pegmatite (c. 2.70-2.65 Ga)
- 916 Gabbro, monzodiorite, syenite, granodiorite (c. 2.74-2.65 Ga)
- 917 Granite, granodiorite, diorite, quartz diorite, porphyritic granite (c. 2.80-2.65 Ga)
- 918 Diorite, tonalite, granodiorite, trondhjemite, enderbite, charnockite (c. 3.00-2.74 Ga)
- 919 Tonalite-trondhjemite-granodiorite gneiss, quartzo-feldspathic gneiss, enderbite, migmatitic gneiss, with mafic and felsic enclaves (c. 3.20-2.65 Ga and possibly older)

920 Amphibolite - schist - gneiss belts

- 921 High-Al mica schist, mica gneiss, hornblende gneiss with amphibolite enclaves
- 922 Mica schist and mica gneiss, migmatitic gneiss, amphibolite, banded iron formation
- 923 Amphibolite, amphibole gneiss

930 Volcanic-dominated greenstone belts (c. 3.20-2.75 Ga and possibly older)

- 931 Komatiite, basalt, andesite, dacite, rhyolite
- 932 Andesite, dacite, rhyolite, greywacke, arkosic sandstone, conglomerate, amphibolite, mica schist, locally banded iron formation
- 933 Tholeiitic, komatiitic and Fe-rich tholeiitic basalt, peridotite, gabbro, dacite, rhyolite, conglomerate

Geological time units

MILL. YEARS	EON	ERA	PERIOD	AGE
2	PHANEROZOIC	CENOZOIC	QUATERNARY	1.635
			TERTIARY	65
100		MESOZOIC	CRETACEOUS	144
200			JURASSIC	206
			TRIASSIC	248
300		PALAEOZOIC	PERMIAN	290
			CARBONIFEROUS	360
400			DEVONIAN	417
			SILURIAN	443
500			ORDOVICIAN	490
543			CAMBRIAN	543
1000	PRECAMBRIAN	PROTEROZOIC NEO	VENDIAN	650
			RIPHEAN LATE	1000
		MESO	RIPHEAN MIDDLE	1400
1600			RIPHEAN EARLY	1600
2500		PALAEO		2500
3000	ARCHAEAN			
3500				
4000				4000

Compiled from:
Haq & van Eysinga, 1987: Elsevier
Gradstein, F.M. et al. 1995: SPEM Spec. Publ. 54, 95-126
Tucker, R. & McKerrow, W. 1995: Can. J. Earth Sci., 32, 368-379

STRUCTURAL SYMBOLS

- Depositional or intrusive contact
- Major unconformity
- Fault or ductile deformation zone with reverse sense of movement. Tag points to upthrown block
- Fault or ductile deformation zone with dextral strike-slip sense of movement
- Fault or ductile deformation zone with sinistral strike-slip sense of movement
- Fault or ductile deformation zone with normal sense of movement. Tag points to downthrown block
- Fault or ductile deformation zone. Tag points to downthrown block
- Fault or ductile deformation zone, kinematics unspecified
- Fault or ductile deformation zone with combined thrusting and normal dip-slip movement
- Fault or ductile deformation zone with combined reverse and dextral strike-slip movement
- Fault or ductile deformation zone with combined reverse and sinistral strike-slip movement
- Fault or ductile deformation zone with combined dip-slip and dextral strike-slip movement

Major geological units of Fennoscandia and adjacent area Scale 1 : 15 million

Major geological units

- Meteorite impact rocks and sites
- Ocean floor / continental shelf
- Neoproterozoic (and possibly Mesoproterozoic) and Phanerozoic rocks outside the Caledonian orogenic belt
- Caledonian orogenic belt
- Fennoscandian Shield

Topographic data

- 100 m
- 300 m
- 500 m
- 900 m

Data announcement 88-MGG-02, Digital relief of the surface of the Earth. NOAA, National Geophysical Data Center, Boulder, Colorado, 1988.

Nordic Map Database 1 : 2 million, National Land Survey of Finland, licence no. 13/MYY/01, Helsinki, Finland. (topographic lines)

Russia: Gaskelberg, L., Bogatchev, V. & Mishin, V. 1995. Geological map of NW Russia 1 : 500 000. RICC NWRGC. (topographic lines)

Growth of the Fennoscandian Shield in time and space

GDG = Granitoid-Dioritoid-Gabbroid intrusive rock association
GSDG = Granite-Syenitoid-Dioritoid-Gabbroid intrusive rock association
GP = Granite-Pegmatite intrusive rock association

3.20-2.50 Ga and possibly older

- Intrusive rocks (c. 2.75-2.50 Ga), orthogneiss, migmatitic gneiss
- Supracrustal rocks (c. 3.20-2.75 Ga and possibly older)

2.50-1.96 (-1.90) Ga

- Intrusive rocks, predominantly mafic/ultramafic
- Supracrustal rocks (c. 2.06-1.96 Ga)
- Supracrustal rocks (c. 2.50-2.06 Ga)
- Lapland-White Sea granulite belt

1.96-1.91 Ga

- GDG intrusive/meta-intrusive rock association (c. 1.96-1.91 Ga)
- Ophiolite (c. 1.96-1.95 Ga), mafic/felsic metavolcanic rocks (c. 1.95-1.91 Ga)

1.95-1.87 Ga and possibly older

- Supracrustal rocks, predominantly metasedimentary

1.91-1.88 (-1.84) Ga

- GDG intrusive/meta-intrusive rock association (c. 1.91-1.88 Ga, in part as young as c. 1.84 Ga)
- Felsic/mafic metavolcanic rocks (c. 1.91-1.88 Ga)

1.88-1.86 Ga and possibly younger

- GSDG intrusive rock association
- Felsic/mafic volcanic rocks
- Supracrustal rocks, predominantly metasedimentary

1.86-1.75 Ga

- GSDG intrusive rock association (c. 1.86-1.84 and c. 1.82-1.76 Ga)
- GDG intrusive rock association (c. 1.86-1.84 and 1.77 Ga)
- Mafic/ultramafic intrusive rocks belonging to either GSDG or GDG association
- GP intrusive rock association
- Supracrustal rocks (c. 1.80 Ga), predominantly volcanic

1.71-1.61 Ga and possibly older

- GSDG intrusive/volcanic rock association (c. 1.65-1.62 Ga)
- Felsic metavolcanic rock (1.66 and 1.61 Ga)
- GSDG intrusive/meta-intrusive rock association (c. 1.71-1.66 Ga)
- Metagranitoid, metadiorite, metagabbro (c. 1.71-1.66 Ga and possibly older)
- Supracrustal rocks (c. 1.70 Ga and possibly older), predominantly volcanic/metavolcanic

1.61-1.47 Ga

- GSDG intrusive/meta-intrusive rock association (c. 1.58-1.47 Ga)
- Granitoid, syenitoid, dioritoid and meta-morphic equivalents (in part c. 1.61-1.56 Ga)
- Supracrustal rocks (in part c. 1.60 Ga), predominantly metasedimentary

1.50-1.30 Ga

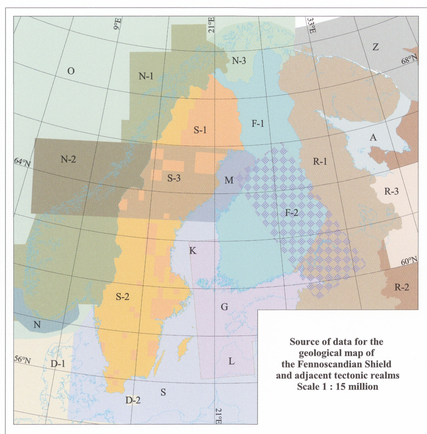
- GSDG intrusive/meta-intrusive rock association (c. 1.46-1.30 Ga)
- Supracrustal rocks, predominantly metasedimentary

1.27-1.00 Ga

- Granitoid, syenitoid, dioritoid and meta-morphic equivalents (c. 1.25-1.00 Ga)
- Supracrustal rocks younger than c. 1.27 Ga, predominantly metasedimentary
- GSDG intrusive/meta-intrusive rock association (in part c. 1.27-1.15 Ga)

1.18-0.92 Ga

- Granite, pegmatite, monzonite, anorthosite, gabbro, dolerite



Source of data for the geological map of the Fennoscandian Shield and adjacent tectonic realms Scale 1 : 15 million

Norway:

N-1 Norwegian Bedrock Map Series 1 : 250 000. NGU.

N-2 Lundqvist, T., Bøe, R., Kousa, J., Lukkarinen, H., Lutro, O., Roberts, D., Solli, A., Stephens, M.B. & Weihed, P. 1996. Bedrock map of Central Fennoscandia 1 : 1 000 000. GSF, NGU, SGU.

N-3 Siedlecka, A. & Roberts, D. 1996. Finnmark Fylke. Bedrock map 1 : 500 000. NGU.

Sweden:

S-1 Bedrock geological data compilation (scale 1 : 50 000, 1 : 100 000 or 1 : 250 000) archived in digital format, published or prepared in manuscript format during the period 1989-2000. SGU.

S-2 Lundqvist, T., Bygghammar, B., Stephens, M. B., Beckholmen, M. & Norling, E. 1995. Bedrock of Sweden. National Atlas of Sweden (digital format, map published at the scale 1 : 1 250 000).

S-3 Lundqvist, T., Bøe, R., Kousa, J., Lukkarinen, H., Lutro, O., Roberts, D., Solli, A., Stephens, M.B. & Weihed, P. 1996. Bedrock map of Central Fennoscandia 1 : 1 000 000. GSF, NGU, SGU.

Finland:

F-1 Korsman, K., Koistinen, T., Kohonen, J., Wennerström, M., Ekdahl, E., Honkamo, M., Idman, H. & Pekkala,Y.(eds) 1997. Suomen kallioperäkartta - Berggrundskarta över Finland - Bedrock map of Finland 1 : 1 000 000. GSF.

F-2 Koistinen, T. & Saltykova, T. (eds) 1999. Map 1: Structure-lithology of the Raahe-Ladoga Zone 1 : 1 000 000. Raahe-Ladoga zone structure-lithology, metamorphism and metallogeny: a Finnish-Russian cooperation project 1996-1999. GSF.

Russia:

R-1 Gaskelberg, L., Bogatchev, V. & Mishin, V. 1995. Geological map of NW Russia 1 : 500 000. RICC NWRGC.

R-2 Geological map of USSR 1 : 2 500 000. VSEGEI, 1980.

R-3 Bogdanov, Yu., Jakobson, K., Guseva, E. & Petrov, B. 2000. State geological map of Russia 1 : 1 000 000. The map of pre-Quaternary deposits. Lists P(35-37). Petrozavodsk.

Continental shelf and ocean floor:

O Sigmond, E. M. O. 1992. Bedrock Map of Norway and Ocean Areas, 1 : 3 000 000. NGU.

N Bøe, R., Rise, L. & Brekke, H. 2000. Bedrock map of the Norwegian part of Skagerrak between Kristiansand and Karmøy. NGU-report 2000.010.

S Pre-Quaternary rocks of the continental shelf (1994). In: Fredén, C. (ed.), Geology, National Atlas of Sweden (digital format, map published at the scale 1 : 2 500 000).

M Lundqvist, T., Bøe, R., Kousa, J., Lukkarinen, H., Lutro, O., Roberts, D., Solli, A., Stephens, M.B. & Weihed, P. 1996. Bedrock map of Central Fennoscandia 1 : 1 000 000. GSF, NGU, SGU.

G Koistinen, T. (ed.) 1994. Precambrian basement of the Gulf of Finland and surrounding area 1 : 1 000 000. GSF.

K A.Korja, personal communication

Z Geological map of pre-Quaternary deposits of Novaja Zemlja and the shelf of the Barents and the Kara seas 1 : 2 500 000. VNII "Okeangeologija", 1998.

A A.Amantov, personal communication

Denmark:

D-1 H.-R. Gaertner (coord. principal), Carte géologique internationale de Europe 1 : 500 000, feuille C3 (1966), feuille C4 (1972). Votée par le Congrès géologique international, publiée par la Bundesanstalt für Bodenforschung et l'Unesco.

D-2 Bedrock map of Bornholm. In Bornholms Geologi I, Varv 1988.

Latvia:

L Geological map of Latvia (map published 1998 at the scale 1 : 2 000 000).

All countries:

Geoscientific publications (principally geochronological data) and recent field work data