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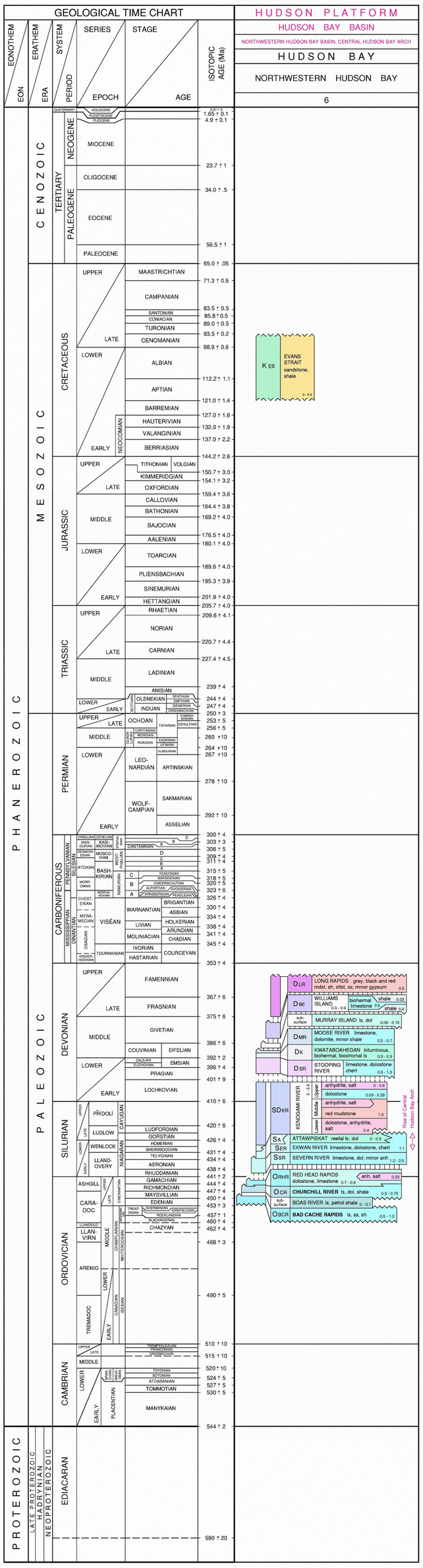
GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA

GEOLOGICAL TIME CHART



CONVENTIONS

Within each correlation chart column, units are placed above one another to portray relationships among them. Space limitations may require lateral separation of related units, or placing units that are not in contact, above one another. Where numerous units are included in a column and all relationships cannot be shown, first priority is given to stratigraphic (conformable, disconformable or unconformable) relationships. Second priority is given to intrusive contacts, many of which may also be inferred from the map.

Unit descriptors consist of, from left to right, all or some of the following elements:

1) *A block indicating age and age range (with isotopic ages if available). The block contains the map unit colour. The position and vertical extent of only this left - hand element indicate the best estimate of age and age range. The vertical time scale is 1 mm : 5 million years for Precambrian time and 1 mm : 1 million years for Phanerozoic time. Elements to the right may be enlarged to accommodate unit symbols, names and lithologies.*
   Map unit block illustrating age and age range . . . . . .
2) *A solid square placed to the left or right of the unit element indicates an isotopic age or the best interpretation of isotopic data. Vertical arrows indicate possible age range or uncertainty in the isotopic or paleontological range.*
   Isotopic age and age range . . . . . .
3) *The name of a composite unit (e.g. a group or a formation with members).*
   Group or supergroup . . . . . **CHURCHILL RIVER**
4) *A block containing the map symbol and colour (if not placed in the first element).*
   For explanation of geological unit symbols, see Sheet 1 . . . . . DWI
5) *A block containing the map unit name, lithological description, facies colour and thickness.*
   Formation or intrusive body . . . . . EVANS STRAIT
   Member . . . . . Middle
   Thickness (hundreds of metres) 6.8

The top and bottom contacts of each element block show relationships to units directly above and below.

ABBREVIATIONS

anh	*anhydrite, anhydritic*	mdst	*mudstone*
ch	*chert*	petrol	*petroliferous*
dol	*dolomite, dolomitic, dolostone*	ss	*sandstone, quartz arenite*
ls	*limestone*		

FACIES

- *Evaporite: gypsum, anhydrite*
- *Evaporite: halite, sylvite*
- *Platformal limestone*
- *Dolomite*
- *Bioherms*
- *Shale, red; sandstone, mud*
- *Shale, grey, greenish grey; mud*
- *Shale, calcareous; siltstone*
- *Sandstone, coal, paralic clastics*

CONTACTS

	Established
Conformable	
Nonconformity, angular unconformity	

GEOLOGIC TIME CHART REFERENCE

Okulitch, A.V.
1995: Geologic time scale 1995. Geological Survey of Canada, Open File 3040 (National Earth Science Series, Geological Atlas).

Geological compilations by A.V. Okulitch, R. Berman, B.V. Sanford, S. Tella and K.E. Eade, 1996

Metamorphic notes by R. Berman

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Digital image processing by A.V. Okulitch, Geological Survey of Canada (Calgary)

Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

PUBLICATION NOTE

The Geological Atlas of Canada is being published in substandard pre - liminary form to make map data available quickly and because there are no resources for traditional A-series printing. Release on open file does not provide the fine detail of bedrock geology, hydrology, topography or bathymetry of the printed version. A French version is available by special order only.

In addition to these open file maps and charts, base and geological map and text data are available in digital form by special order in a variety of file formats (dwg, dxf, ps) and media (diskette, Iomega Zip).

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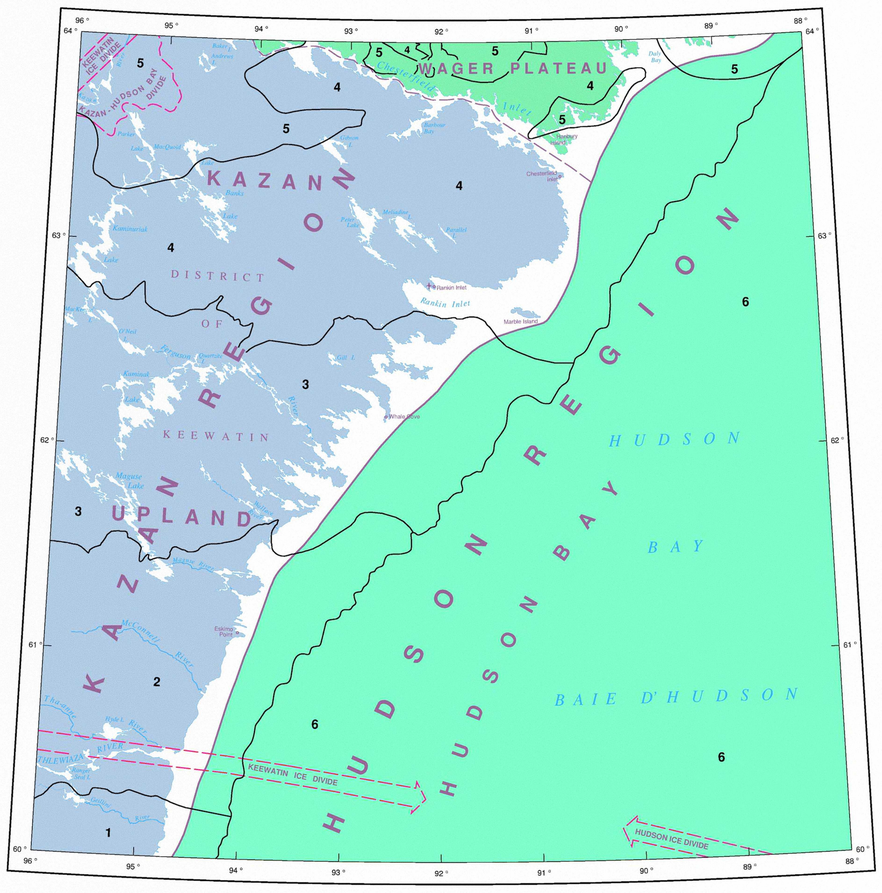


PHYSIOGRAPHIC FEATURES

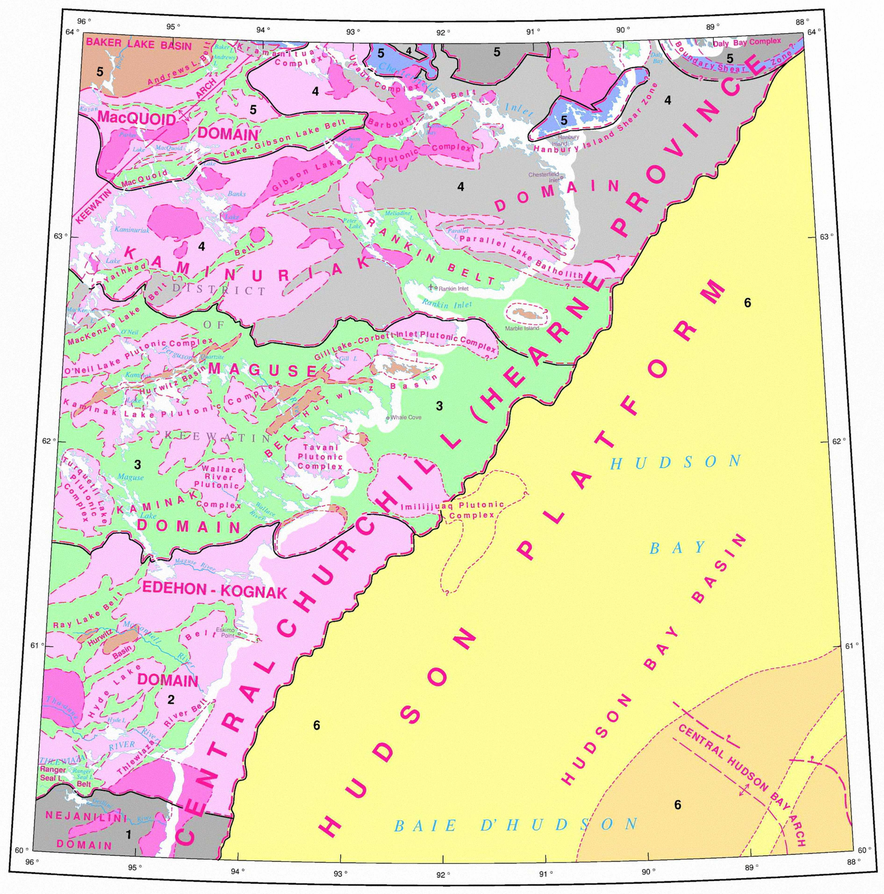
LEGEND

- *Plateaux, levels, tablelands, platforms and pediplains*
- *Uplands*
- *Depressions (continental and marine)*

Physiographic region boundary
Physiographic division boundary
Drainage divide
Ice divide; arrow indicates plunge towards saddle
Correlation chart boundary (number represents column number on correlation charts) 2

NOTE

Physiographic features are from Bostock (1970) with the addition of the divide between the drainage basins of the Kazan River and Hudson Bay, and the Keewatin and Hudson Ice divides from Dyke and Prest (1987).



LITHOTECTONIC AND TECTONOSTRATIGRAPHIC FEATURES

LEGEND

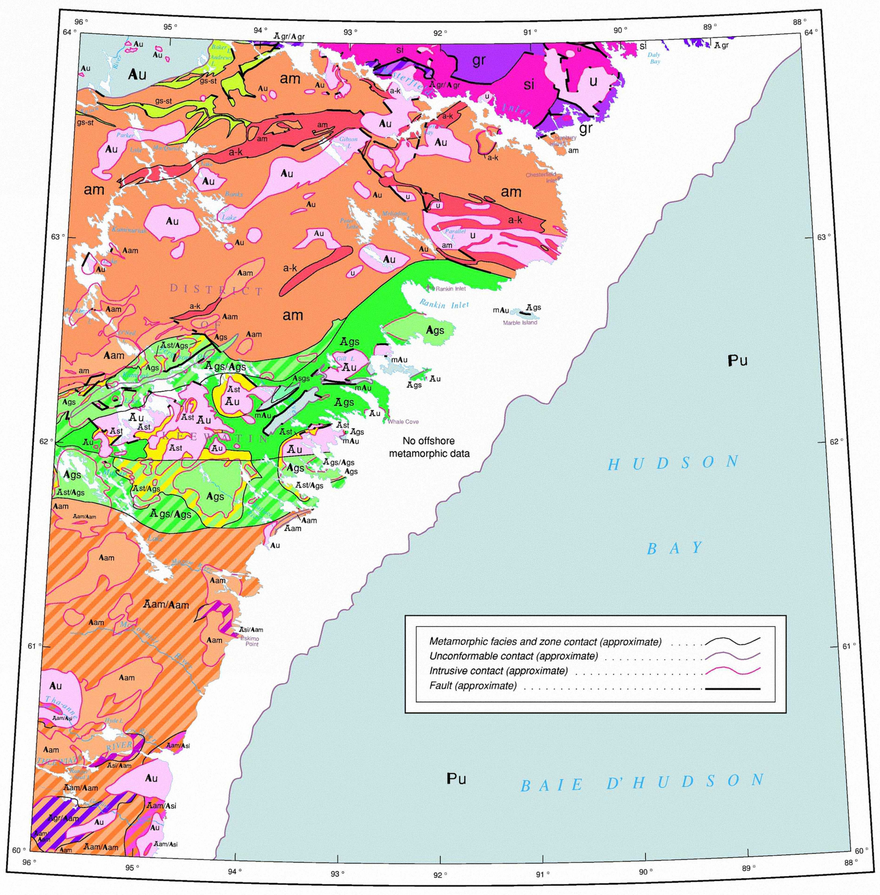
- *Mesozoic sedimentary basin*
- *Phanerozoic platform*
- *Precambrian tectonic zone*
- *Proterozoic plutonic terranes and intrusions*
- *Proterozoic sedimentary basin*
- *Archean plutonic terranes*
- *Archean metavolcanic and metasedimentary terranes*
- *Archean metasedimentary terranes*
- *Archean high-grade gneiss terranes*

Geological province boundary (approximate, subsurface)
Geological subprovince boundary (approximate, subsurface)
Geological belt, zone or terrane boundary (approximate, subsurface)
Normal fault; solid circle on hanging wall (subsurface)
Axial trace of arch, anticline (approximate, subsurface)
Correlation chart boundary (number represents column number on correlation charts) 2

NOTE

The Kramanitaur, Uvauk and Daly Bay complexes, the Hanbury Island and Boundary shear zones and the area of granulite gneisses north of Chesterfield Inlet collectively comprise the Aqxarneq gneisses. Lithotectonic feature names are derived for the most part from sources maps for the bedrock geology map. Several greenstone belts and plutonic complexes have been informally named for this compilation.

GEOTECTONIC CORRELATION CHART FOR MAGUSE RIVER, MAP NP-15/16-G



METAMORPHISM

LEGEND

PHANEROZOIC

PALEOZOIC
- Pu — *Unmetamorphosed sedimentary rocks*

PALEOPROTEROZOIC (APHEBIAN)
MIDDLE AND LATE PALEOPROTEROZOIC (MESO- AND NEOAPHEBIAN)
- Au — *Unmetamorphosed sedimentary and volcanic rocks*
- Asgs — *Subgreenschist facies*
- Ags — *Greenschist facies (undivided)*
- Aam — *Amphibolite facies (undivided)*
- Asi — *Middle amphibolite facies (sillimanite zone)*
- Au — *Unmetamorphosed to weakly metamorphosed plutonic rocks*

MIDDLE PALEOPROTEROZOIC (MESOAPHEBIAN)
- mAu — *Unmetamorphosed sedimentary and volcanic rocks*

PROTEROZOIC

ARCHEAN AND PROTEROZOIC

NEOARCHEAN AND/OR PALEOPROTEROZOIC (APHEBIAN)
- gs-st — *Greenschist facies and lower amphibolite (staurolite zone) facies*
- am — *Amphibolite facies (undivided)*
- a-k — *Lower and upper pressure facies (kyanite-andalusite zone)*
- si — *Middle amphibolite facies (sillimanite zone)*
- gr — *Granulite facies*
- u — *Unmetamorphosed to weakly metamorphosed plutonic rocks*

NEOARCHEAN AND PALEOPROTEROZOIC (APHEBIAN)
LATE NEOARCHEAN AND MIDDLE TO LATE PALEOPROTEROZOIC (MESO- TO NEOAPHEBIAN)
- Agr/Ags — *Greenschist facies (undivided) and greenschist facies (undivided)*
- Ast/Ags — *Lower amphibolite facies (staurolite zone) and greenschist facies (undivided)*
- Aam/Aam — *Amphibolite facies (undivided) and amphibolite facies (undivided)*
- Aam/Asi — *Amphibolite facies (undivided) and middle amphibolite facies (sillimanite zone)*
- Asi/Aam — *Middle amphibolite facies (sillimanite zone) and amphibolite facies (undivided)*

ARCHEAN
- Agr/Aam — *Granulite facies and amphibolite facies (undivided)*
- Agr/Agr — *Granulite facies and granulite facies*

NEOARCHEAN
LATE NEOARCHEAN
- Ags — *Greenschist facies (undivided)*
- Ast — *Lower amphibolite facies*
- Au — *Unmetamorphosed to weakly metamorphosed plutonic rocks*

NOTES

Multiple metamorphic events have affected the map area but data defining the timing, spatial distribution and physical conditions of metamorphism are limited.

In Maguse Domain, a suite of upper crustal plutons, emplaced ca. 2670 Ma, resulted in regional greenschist facies, and lower amphibolite facies adjacent to plutons. The grade of pre - Hurwitz Group diabase dykes (ca. 2450 Ma) in the Kaminak Lake area shows that Proterozoic metamorphism did not affect the region south and east of the lake but did cause an increase in grade to lower amphibolite northward and southward. Archean synmetamorphic plutons were unmetamorphosed except in the regions affected by Proterozoic metamorphism. The belt of rocks unaffected by post - Hurwitz metamorphism probably extends continuously through the Tavani region to the Pike Fault north of Rankin Inlet.

Proterozoic metamorphism occurs as far south as 61° N, where Hurwitz Group rocks are metamorphosed to lower amphibolite facies. Further south, migmatitic rocks adjacent to undeformed Proterozoic(?) plutons suggest localized upgrading from regional mid - amphibolite facies. Migmatitic rocks adjacent to ca. 2740 Ma plutons suggest that similar conditions occurred in the Neoarchean. Archean amphibolite grade supracrustal rocks within Nejanilini Domain granulite gneisses possibly as old as ca. 3190 Ma, suggest that the latter were subjected to at least two episodes of Archean metamorphism.

North of Kaminak Lake, a complex polymetamorphic history can be suggested by diagnostic minerals present only in some volcanic and pelitic supracrustal rocks. Whether surrounding gneisses share similar thermal histories remains uncertain. Euhedral and relic staurolite suggests lower - middle amphibolite conditions were widespread, but it is likely that not all staurolite is of the same age. Middle - upper amphibolite conditions were attained locally. Widespread distribution of all three aluminosilicate polymorphs indicates a range of metamorphic pressures but the age relationships among these minerals are unknown on a regional scale. Textures in some samples suggest two metamorphic events with early kyanite and late andalusite. Archean metamorphism is older than ca. 2600 Ma just south of Chesterfield field Inlet. Northwest of Kaminak Lake, several different orientations of dyke sets suggest that Proterozoic metamorphism reached lower amphibolite grade but geochronology is lacking for the different dyke sets.

North of Chesterfield Inlet, migmatitic gneisses and the granulite - grade Aqxarneq gneisses represent deeper crustal levels. The Uvauk and Kramanitaur complexes contain lower crustal rocks (10 - 12 Kbar) with Archean and Proterozoic components that show pronounced decompression textures. Archean gabbro - anorthosites of the Daly Bay complex yielded Proterozoic metamorphic ages. Mid-crustal (about 7-8 Kbar) pressures are recorded here, in the Hanbury Island shear zone and in the large granulite terrane north of the Inlet.

Copies of this map may be obtained from the Geological Survey of Canada: 3303-33rd Street N.W., Calgary, Alberta T2L 2A7

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GEOLOGICAL ATLAS
GENERAL CO-ORDINATOR: A.V. OKULITCH

MAP NP-15/16-G

SHEET 3

MAGUSE RIVER

DISTRICT OF KEEWATIN

NORTHWEST TERRITORIES

Scale 1:2 000 000

Kilometres 50 0 50 100 150 Kilomètres

Lambert Conformal Conic Projection
Standard Parallels 60° 40'N and 63° 20'N

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Sheet 3 of 8, Map NP - 15/16 - G, Phanerozoic geotectonic correlation chart, physiographic, lithotectonic and tectonostratigraphic features, and metamorphism.

Recommended citation:
Tella, S., Eade, K.E., Sanford, B.V., and Okulitch, A.V. (compilers) 1997: Geology, Maguse River, District of Keewatin, Northwest Territories. Geological Atlas of Canada, Map NP - 15/16 - G, scale 1:1 000 000. Geological Survey of Canada, Open File 3546.

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