

1617A

- QUATERNARY**
- LEGEND**
- ORGANIC DEPOSITS (MUSKEG):** lichen-moss, sedge, and woody peat containing ice; up to 3 m thick; derived from the accumulation and preservation of vegetation in a wet reducing environment; produces flat, wet terrain containing thermokarst depressions and ice-wedge polygons. Peat mantles most geological units. The different types of organic terrain and the main areas of peat cover are shown on the inset map.
- FLUVIAL DEPOSITS:** cross-stratified sand and gravel deposited by flowing water
- 7b** Modern alluvium: cross-stratified sand and rounded gravel, deposited by modern streams; commonly less than 3 m thick; occurs as floodplains, point bars, river islands, and deltas
 - 7a** Older alluvium: chiefly cross-stratified sand and rounded gravel, locally containing plane-bedded silty sand with organic lenses; deposited by postglacial streams with flow regimes and base levels different from those of present; commonly about 3 m thick; occurs as bottom deposits in braided channels, terraces, and abandoned floodplains; grades to outwash (unit 4c)
- MARINE GLACIOMARINE DEPOSITS:** well sorted stratified sand to massive stony silt, deposited into Tyrrell Sea; forms an extensive heterolept blanket several metres thick, commonly overlain by muskeg
- 6e** Undifferentiated marine offlap deposits: littoral sands fining downwards to nearshore sandy silt, deep water silty clay, or stony pellets; forms a wedge more than 6 m thick near the coast of Hudson Bay and thins to a veneer overlying till and lacustrine deposits inland near the upper limit of postglacial marine submergence (130 to 180 m); sparsely fossiliferous; covered by muskeg
 - 6d** Sand and gravel beach ridge complexes: sand and rounded gravel with carbonate and granitic lithologies; 2 to 4 m thick; occurs as sets of massive, multiple beach ridges created during recessional phases of the Tyrrell Sea
 - 6c** Littoral and sublittoral sand: stratified sand with minor gravel; sparsely fossiliferous; occurs as a blanket up to 3 m thick; grades downwards into marine pelite
 - 6b** Intertidal silt: uniform, grey, calcareous silt with fine sand; contains organic beds and ice-raftered boulders; about 2 m thick
 - 6a** Stony marine (glaciomarine) pelite: soft, poorly sorted, commonly massive but locally plane-bedded, stony to gritty silt; grey, calcareous; 2 to 6 m thick; mainly a marine or glaciomarine sediment containing large amounts of ice-raftered debris originating from ice shelves or drifting pack ice. Where deposits are thin, stony material may be derived from frost churning of marine pelites with underlying till
- GLACIOLACUSTRINE DEPOSITS:** calcareous clayey silt with some sand, derived primarily from Hudsonian drift and deposited into glacial Lake Agassiz
- 5b** Sandy deposits: well sorted stratified sand; nonfossiliferous; 1-2 m thick; generally a blanket deposit
 - 5a** Silty pelite: sticky, red-brown, calcareous silt-clay, with clay granules and dropstones; generally massive but locally rhythmically bedded with beds thinning upwards; in places intercalated with waterlaid silt; 3 to 6 m thick; forms an extensive blanket grooved by drifting ice; mantled by muskeg
- GLACIOFLUVIAL DEPOSITS:** sorted, stratified sand with gravelly sand deposited by running water in contact with, or near, glacier ice
- 4c** Outwash deposits: cross-stratified sand and rounded gravel; occurs primarily as bottom deposits in subglacial and proglacial meltwater channels
 - 4b** Kame and esker sands: kames consist of sorted, poorly stratified sand with gravel, forming hummocks and ridges ranging from small disintegration features 5 to 8 m thick, to arcuate interlobate kame moraine 10 to 30 m thick, which marks the suture between the Keewatin and Hudsonian ice regimes. Eskers consist of stratified sand, with some gravel in areas north of Seal River, forming prominent broad-crested ridges, 10 to 20 m high. Surfaces of eskers and kame moraine inundated by the Tyrrell Sea have been washed and reworked by waves and currents
 - 4a** Crevasse fillings: poorly stratified sand and gravel intercalated with silt; 4 to 5 m thick; occurs as belts of ridges in reticulate pattern; network marks fracture patterns in a thinning Keewatin ice mass
- TILL:** chiefly unsorted debris deposited beneath or at the front of moving glaciers and beneath ice shelves; of variable lithology, texture, and thickness. Sandy and bouldery till were deposited by an ice mass flowing southwards from a centre in District of Keewatin, whereas silty till was deposited by ice flowing westwards from a centre over Hudson Bay Basin or Labrador-Ungava
- 3** Silty till with a calcareous clay-silt matrix: contains both carbonate and granitic clasts; locally includes shell fragments; hard to compact, jointed, ranging from olive grey to black; occurs as a blanket up to 30 m thick, consisting of 1 to 4 sheets, and as grounding line moraines; deposited in part as waterlaid till
 - 2b** Sandy till: chiefly poorly sorted or unsorted, sandy textured debris; olive grey; consisting of, and derived from, granitic and metamorphic source rocks; 1 to 10 m thick; loose to moderately compact; in places partially sorted; occurs in small patches
 - 2a** Bouldery till: boulder-rich till with a sandy matrix; olive grey; moderately compact; 2 to 5 m thick; some deposits have openwork or bedding structures indicative of syngenetic water sorting; occurs mainly as belts of ribbed moraine, but also occurs as a blanket deposit where large amounts of frost shattered rock have been incorporated
- 1** **FELSENMEER:** frost-shattered rock composed of quartz monzonite, alkaliite, and gneiss, occurring as stacked angular blocks 0.5 to 2 m across, with unweathered surfaces; occurs extensively as felsenmeer and as boulder patches in small wet depressions
- PRE-QUATERNARY**
- BEDROCK:** bare or vegetated igneous and metamorphic bedrock of Precambrian age, and sedimentary carbonate rocks of Paleozoic age
- Rb** Carbonate rock: buff, finely crystalline, locally bioclastic, limestones and dolomites of Silurian and Ordovician age, occurring in sections along rivers and as platforms along the coast
 - Ra** Granitic and gneissic rock: small granitoid rock knobs with spalled and flaked surfaces, pitted to depths of 1 to 4 mm; unit includes prominent ridges of aphanitic greywacke with polished and striated surfaces, which outcrop near Churchill

- Small bedrock outcrop
- Striation
- Drumlin or fluting
- End moraine
- Ribbed moraine
- De Geer moraine
- Esker (direction of flow known, unknown)
- Abandoned or underfit river channel (direction of flow known, unknown)
- Beach ridge
- Washed esker (direction of flow known, unknown)
- Buried valley
- Iceberg furrow lineation
- Marine fossil locality
- Geological boundary (defined, assumed)

Geology by L. A. Dredge and F. M. Nixon, 1978

Geological cartography by F. J. Heney, Geological Survey of Canada

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

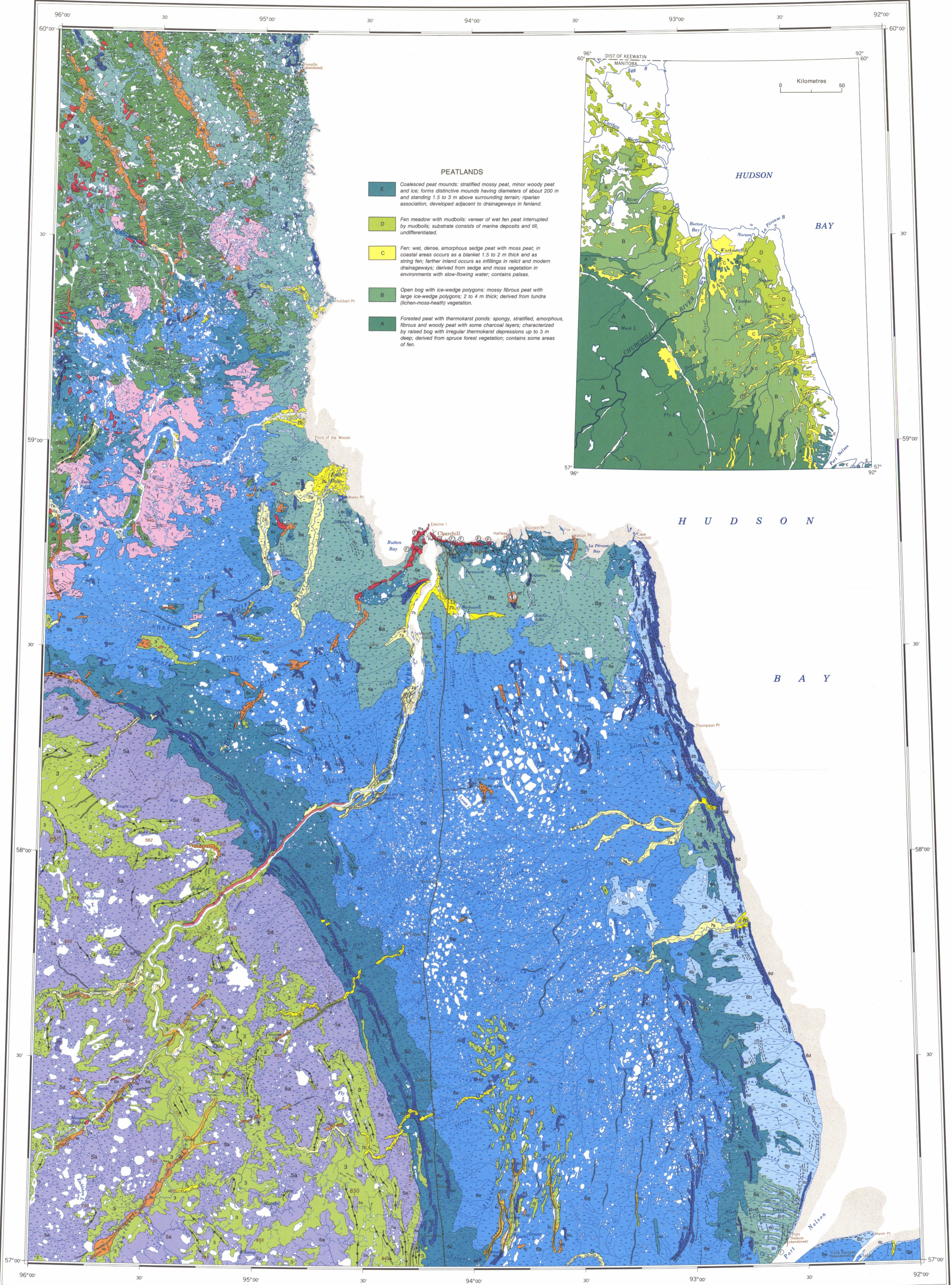
Base map assembled by the Geological Survey of Canada from maps published at the same scale by the Surveys and Mapping Branch in 1975, 1977

Copies of the topographical editions covering this map area may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa, K1A 0E9

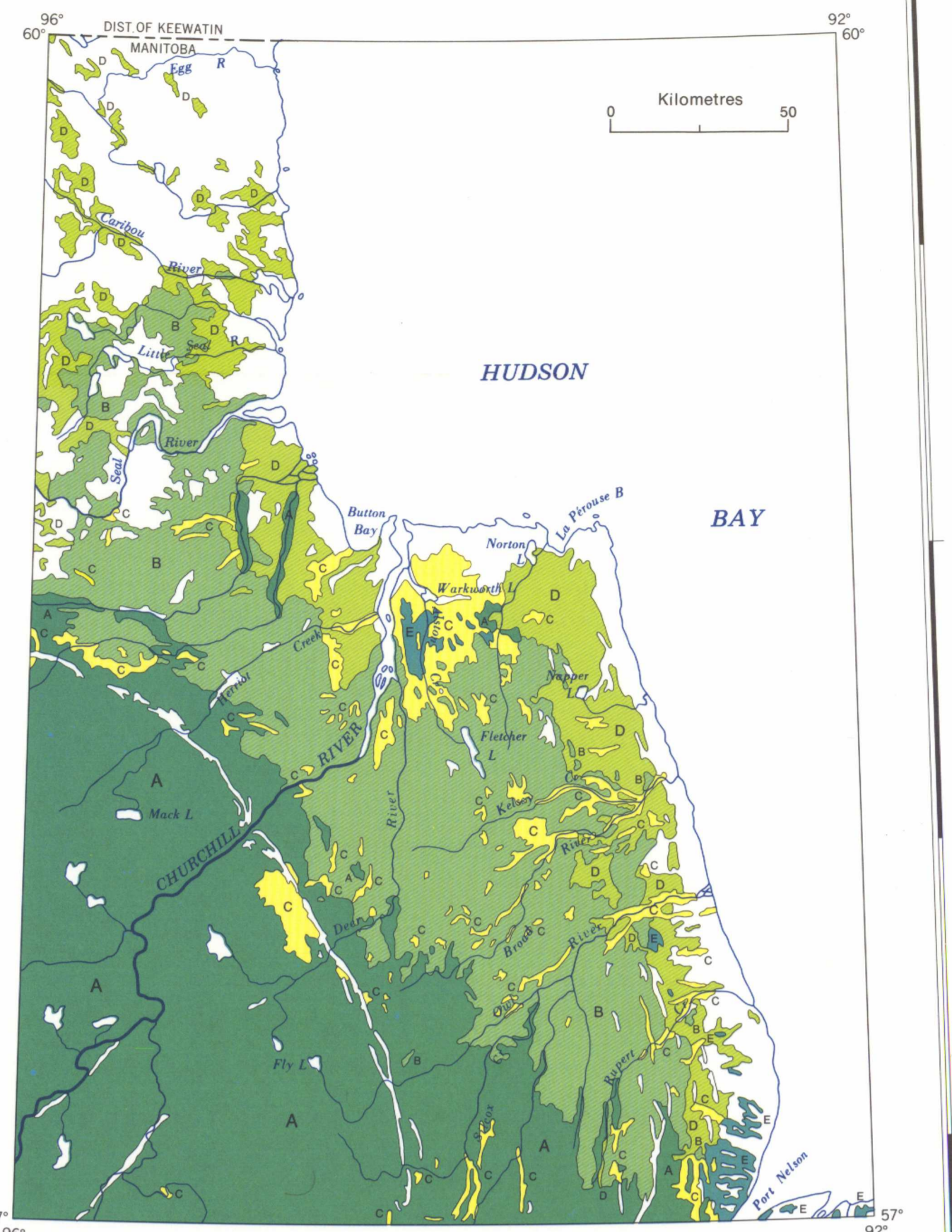
Mean magnetic declination 1985, 0°57' East, decreasing 23.0' annually. Readings vary from 1°29'W in the SE corner to 3°39'E in the NW corner of the map area

Elevations in feet above mean sea level

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 Dredge, L. A. and Nixon, F. M.
 1986: Surficial geology, Northeastern Manitoba.
 Geological Survey of Canada, Map 1617A, scale 1:500 000



- PEATLANDS**
- E** Coalesced peat mounds: stratified mossy peat, minor woody peat and ice; forms distinctive mounds having diameters of about 200 m and standing 1.5 to 3 m above surrounding terrain; riparian association, developed adjacent to drainageways in fenland.
 - D** Fen meadow with mudboils: veneer of wet fen peat interrupted by mudboils; substrate consists of marine deposits and silt, undifferentiated.
 - C** Fen: wet, dense, amorphous sedge peat with moss peat; in coastal areas occurs as a blanket 1.5 to 2 m thick and as string fen; farther inland occurs as infillings in relict and modern drainageways; derived from sedge and moss vegetation in environments with slow-flowing water; contains palsas.
 - B** Open bog with ice-wedge polygons: mossy fibrous peat with large ice-wedge polygons; 2 to 4 m thick; derived from tundra (lichen-moss-heath) vegetation.
 - A** Forested peat with thermokarst ponds: spongy, stratified, amorphous, fibrous and woody peat with some charcoal layers; characterized by raised bog with irregular thermokarst depressions up to 3 m deep; derived from spruce forest vegetation; contains some areas of fen.



Copies of this map may be obtained from the Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8, 3303-33rd Street, N.W., Calgary, Alberta T2L 2A7



MAP 1617A
 SURFICIAL GEOLOGY
NORTHEASTERN MANITOBA
 Scale 1:500 000
 Kilometres 10 0 10 20 30 40 Kilometres
 Transverse Mercator Projection
 CM 94°, Scale Factor 0.9996
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64 NW	64 NE	64 NW
1608A	1617A	64 SW
64 SW	64 SE	64 SW
63 NW	1603A	63 NW
63 SW	63 SE	63 SW

NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO GEOLOGICAL SURVEY OF CANADA MAPS
 NORTHEASTERN MANITOBA

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