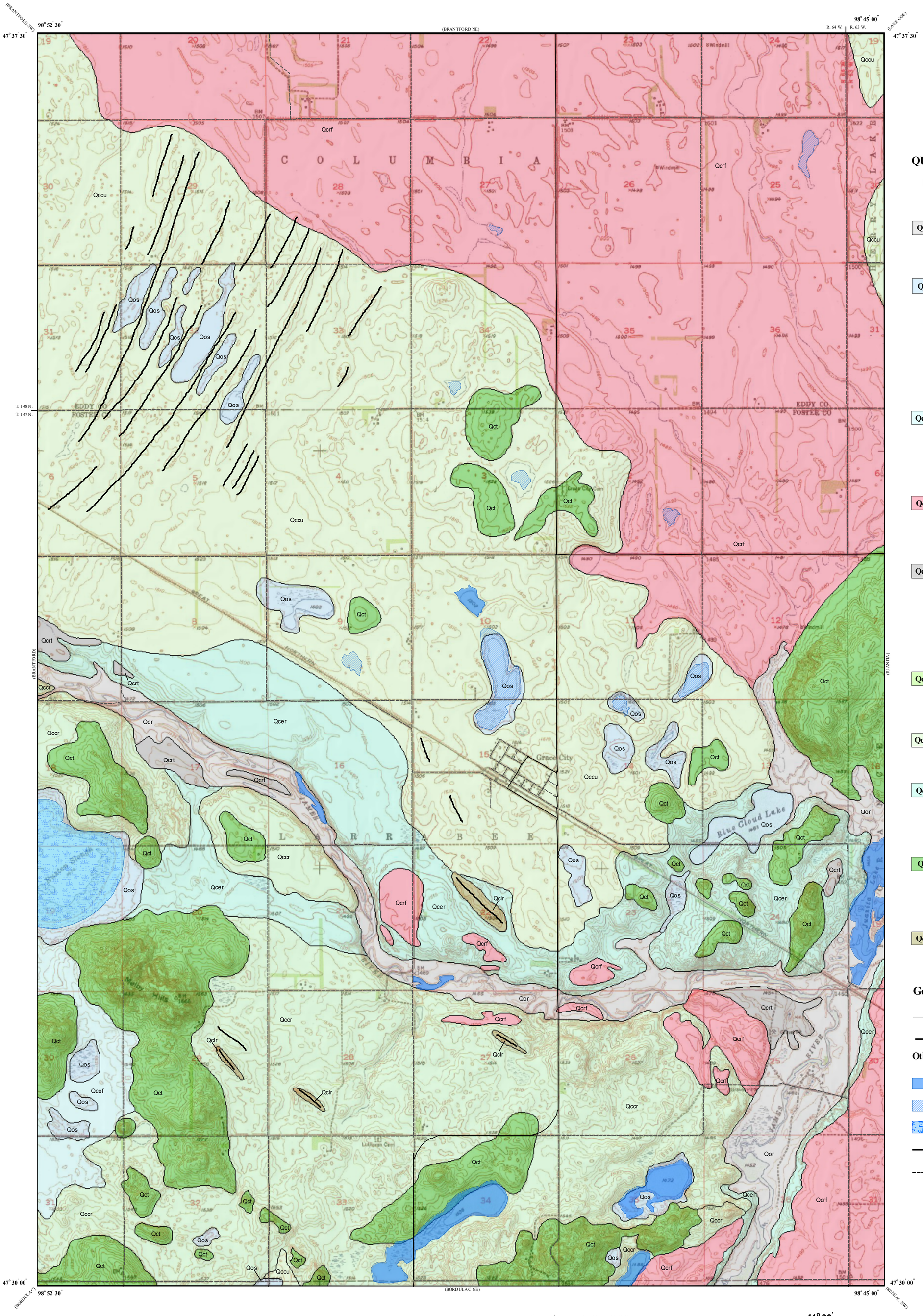
North Dakota Geological Survey
24K: GrcC - sg

Edward C. Murphy, State Geologist
Lynn D. Helms, Director Dept. of Mineral Resources

Surface Geology

Grace City Quadrangle, North Dakota



John P. Bluemle
2006

EXPLANATION

QUATERNARY SYSTEM

RECENT

OAHE FORMATION

Qor **Alluvium**

River and stream sediment. Dark obscurely bedded clay and silt (mainly overbank sediment); generally overlying cross-bedded sand (channel sediment); on plains of modern streams.

Qos **Pond and Slough Sediment**

Dark, obscurely bedded clay and silt; in modern ephemeral ponds.

PLEISTOCENE

COLEHARBOR GROUP

Silt Facies

Lake sediment. Laminated silty clay, clayey silt, and fine sand of glacier-dammed lakes; yellowish-brown to dark gray in exposures depending on weathering intensity.

Qcof **Proglacial lake sediment**

Flat bedded sediment of low-lying plains.

Sand and Gravel Facies

River sediment. Moderately well-sorted, cross bedded sand and plane-bedded gravel, including sediment of meltwater rivers.

Qcrf **Uncollapsed Flat Fluvial Plains**

Flat-bedded sediment of nearly level plains and river terraces, commonly with braided channel scars, oxbows, and other relict markings; relief of 1 to 10 feet. Mainly on the extensive outwash plain in the northern part of the quadrangle.

Qcrt **River terrace sediment**

Mainly gravel and sand along the edges of the James River Valley.

Till Facies

Glacial sediment. Unsorted, unbedded mixture of angular, subangular, and rounded blocks of rock, gravel, and sand, generally in a stiff matrix of silt and clay; yellowish-brown to olive-gray in exposures depending on weathering intensity; contains discontinuous lenses of gravel and sand.

Qccr **Collapsed Glacial Sediment-Rolling**

Rolling surface with kettles, partially to nonintegrated drainage, and numerous ice-disintegration features; slopes mainly to the southwest (toward the Missouri Coteau Escarpment).

Qccu **Collapsed Glacial Sediment-Undulating**

Gently undulating to undulating surface with poorly integrated drainage; local relief generally less than 10 feet.

Qcer **River-Eroded Glacial Sediment**

Glacial sediment with flat to undulating topography resulting from stream erosion in the bottom of large meltwater trenches or over board areas of till that have been washed by running water; overlain by a thin layer of fluvial sediment of the Coleharbor group or Oahe Formation in places.

Qct **Ice-Thrust Masses**

Glacial sediment that has been draped over glacial or preglacial sediment or rock that has been sheared up into thrust slabs or folds near the ice margin; hilly areas with intense internal linearity; local concentrations of gravel and boulders; local relief may exceed 150 feet.

Qclr **Longitudinal Ridges**

Drumlins - some of the narrower of these are showen by lines; trend is from NW to SE.

Geologic Symbols

Known contact between two geologic units

Transverse Ridge

Other Features

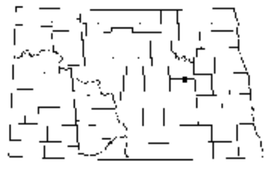
Water

Water - Intermittent

Rusten slough

Paved Road

Unpaved Road



Grace City Quadrangle, North Dakota

Scale 1:24,000

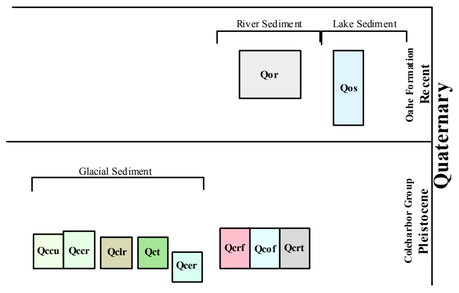
0 0.5 1

Miles

Lambert Conformal Conic Projection Standard Parallels 47° 30' 00" and 47° 37' 30"
1927 North American Datum NGVD 1929
USGS 7.5 Minute Topographic Map - Contour Interval 5 Feet
Roads and Hydrologic Layers Rectified to 2003 NAIP Digital Orthophoto

11° 30'
MN

1949 Magnetic North
Declination at Center of Sheet



Cartographic Compilation: E.L.Kadrmas & S.S.Kranich

This geologic map was funded in part, by the USGS National Cooperative Geologic Mapping Program.