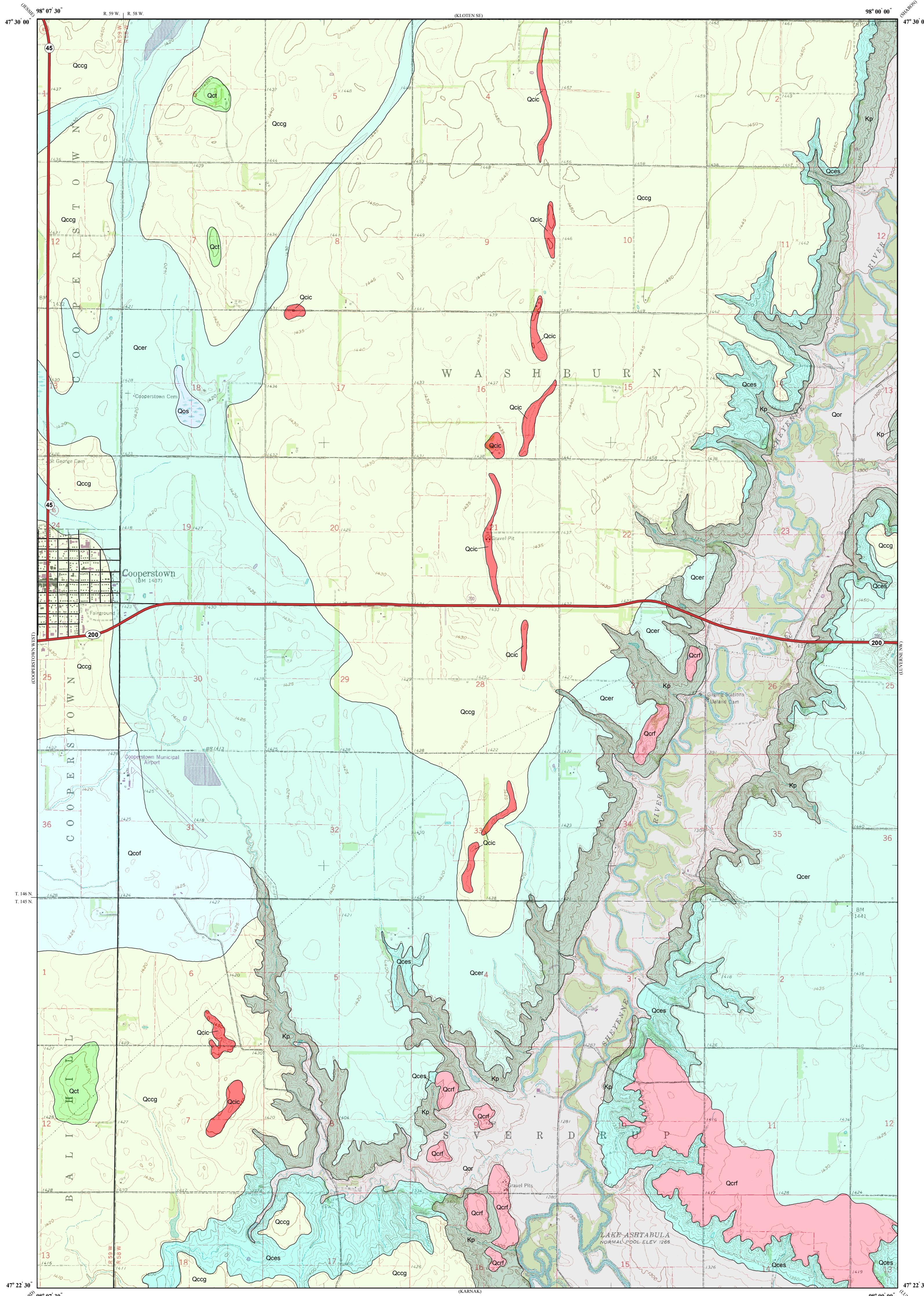


Surface Geology

Cooperstown East Quadrangle, North Dakota

John P. Bluemle

2008



EXPLANATION

QUATERNARY SYSTEM

RECENT

OAHE FORMATION

Qos Pond and Slough Sediment

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

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.

PLEISTOCENE

COLEHARBOR GROUP

Silt Facies

Offshore lake sediment consisting of laminated silt and clay of glacier-dammed lakes.

Qcof Proglacial Lake Plains

Flat bedded sediment of low-lying plains; thin, dark-gray silt and clay overlying glacial till.

Sand and Gravel Facies

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

Qcrf 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 terraces along the Sheyenne River Valley.

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 broad areas of till that have been washed by running water; overlain by a thin layer of fluvial sediment of the Cole Harbor Group or Oahe Formation in places.

Qcic Ice-contact deposits

Mainly gravel and sand with cobbles and boulders common; inclusions of glacial sediment common; local relief up to 50 feet; eskers and kames.

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.

Qccg Nearly Flat To Gently Undulating Surface

Poorly integrated drainage; relief generally less than 15 feet; ice disintegration features in places.

Qces Slopewash-Eroded Glacial Sediment

Sediment on sloping areas; glacial sediment surface with low local relief; analogous to a pediment surface.

Qcrf 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.

Qct Ice-Thrust Masses

Glacial sediment 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 200 feet.

CRETACEOUS SYSTEM

Kp Pierre Formation

Shale; exposed mainly on steep slopes along the walls of the Sheyenne River Valley in the southern part of the quadrangle. The dark-gray Gregory Member of the Pierre is exposed in the southern part of the quadrangle. It is overlain by the lighter gray De Gray Member, which occurs mainly in steep banks along the Sheyenne River Valley.

Geologic Symbols

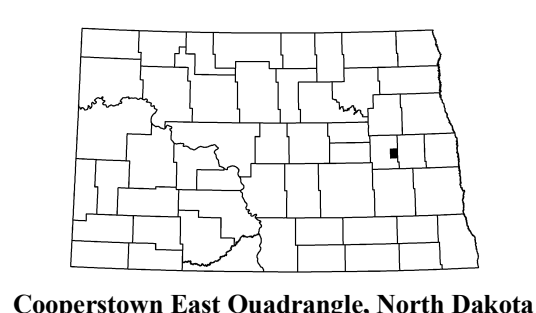
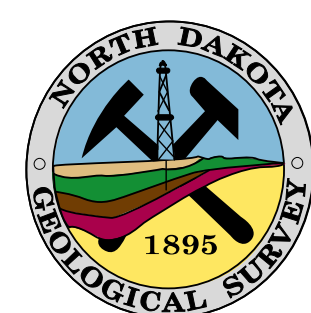
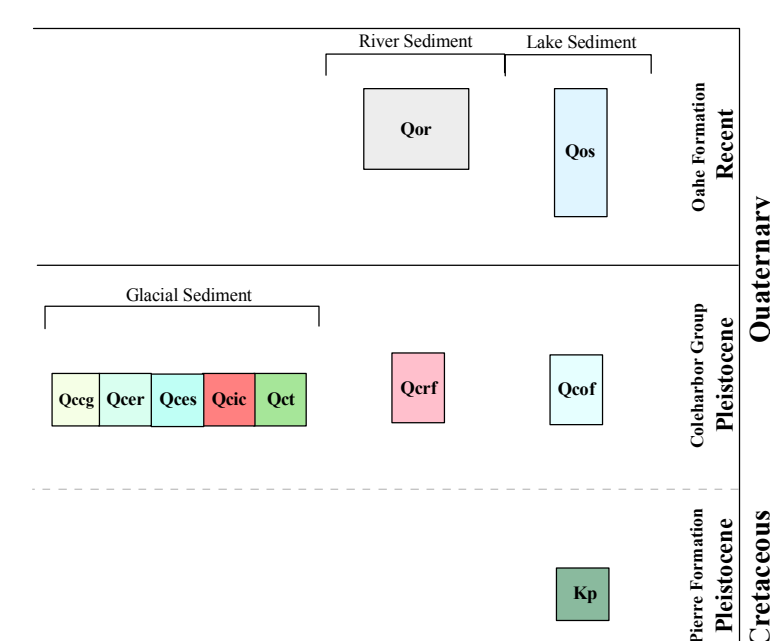
— Known contact between two geologic units

Other Features

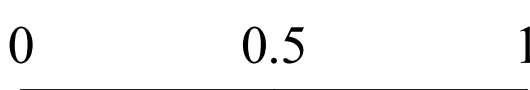
45 State Highway

— Paved Road

----- Unpaved Road



Scale 1:24,000



Miles

Lambert Conformal Conic Projection Standard Parallels 47° 22' 30" and 47° 30' 00"

1927 North American Datum NGVD 1929

USGS 7.5 Minute Topographic Map Contour Interval 10 Feet

Road Layer Rectified to 2003 NAIP Digital Orthophoto

