

# Surface Geology

## Minto Quadrangle, North Dakota

Lorraine A. Manz

Kenneth L. Harris

2015

### QUATERNARY

#### HOLOCENE

##### OAHE FORMATION

Sand, silt, clay, gravel, and organic debris; all postglacial sediment deposited on the landscape; includes river sediment, windblown sediment, lake sediment, and slopewash.

##### Hor Alluvium And Overbank Sediment

Sand, silt, clay and disseminated organic debris; obscurely bedded; dark colored; in many places associated with sand and gravel of older river-channel sediment; commonly more than three feet (1 meter) thick.

##### Hop Pond and slough sediment

Organic debris, clay, and silt; obscurely bedded; dark colored; generally more than three feet (1 meter) thick; deposited in poorly drained depressions in the landscape.

##### SHERACK FORMATION

Clay, silty clay, silt, and sand; thinly laminated; clayey in the central part of the lake plain and silty toward the margins; light gray where unoxidized and yellowish gray to olive-brown where oxidized; wood fragments common at the base; offshore, nearshore, shoreline and deltaic sediment deposited south of ice that occupied the Red River lowland during the Emerson Phase of Glacial Lake Agassiz. Only the offshore, nearshore, and shoreline units occur in the map area.

##### Hso Offshore Lake Sediment

Laminated clay, clayey silt, silty clay, silt, and sand; clayey in the central part of the Red River Valley and siltier toward the margins; laminations are generally only a few millimeters thick but some of the silty beds are locally several centimeters thick; bedding deformed in places into folds a few feet high and several feet across; light gray when unoxidized and yellowish gray to olive brown when oxidized; wood fragments common in the lower few feet of the formation; as much as 100 feet (33 meters) thick. Contact between Hso, Hso1 and Hso2 are approximate and only indicated by color change between the three units.

##### Hso1 Offshore Lake Sediment - Saline

Low to moderately saline (2-16 mmho/cm). Areas where saline groundwater from subsurface Paleozoic and Precambrian bedrock aquifers is seeping to the surface.

##### Hso2 Offshore Lake Sediment - Saline

Moderate to highly saline (> 16 mmho/cm). Areas where saline groundwater from subsurface Paleozoic and Precambrian bedrock aquifers is seeping to the surface.

##### Hsn Nearshore Sediment

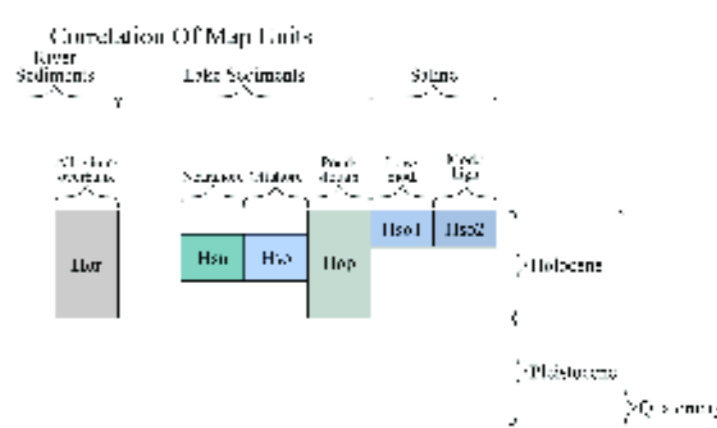
Moderately well sorted; flat bedded to cross-bedded; light gray when unoxidized and yellowish gray to olive brown when oxidized; as much as 15 feet (5 meters) thick; deposited in shallow water.

#### Geologic Symbols

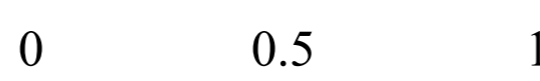
- Geologic contact
- Beach ridges and offshore bars  
Established from aerial photographs; line indicates the crest of the ridge; interpreted as beach ridges or offshore bars deposited along the margin of Lake Agassiz; discernible on topographic maps and on the ground.
- Ice-drag marks  
Established from aerial photographs; line marks the crest of a subtle ridge or the bottom of a subtle trough; located in the Glacial Lake Agassiz basin; interpreted as iceberg drag marks preserved on the lake bed; generally difficult to discern on topographic maps and on the ground.
- - - Ice-drag marks - approximate

#### Other Features

- 81 US Highway
- Paved Road
- Gravel Road



Scale 1:24,000



Miles

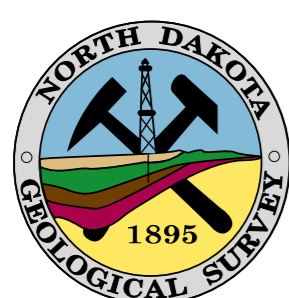
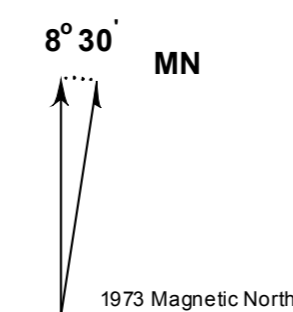
Lambert Conformal Conic Projection Standard Parallels 48° 15' 00" and 48° 22' 30"

1927 North American Datum NGVD 1929

USGS 7.5 Minute Topographic Map Contour Interval 5 Feet

County Road Layer (NDGIS HUB) Updated 06/16/2014

State Federal Road Layer (NDGIS HUB) Updated 10/20/2015



Minto Quadrangle, North Dakota