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John P. Bluemle, State Geologist
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SURFACE GEOLOGY OF THE GOOSE RIVER MAP AREA

by Kenneth L. Harris and Mark R. Luther

1991

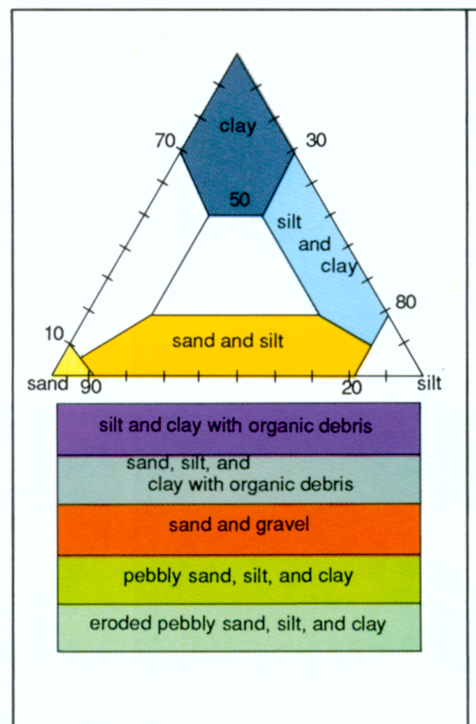


Figure 1. Key to sediment textures.

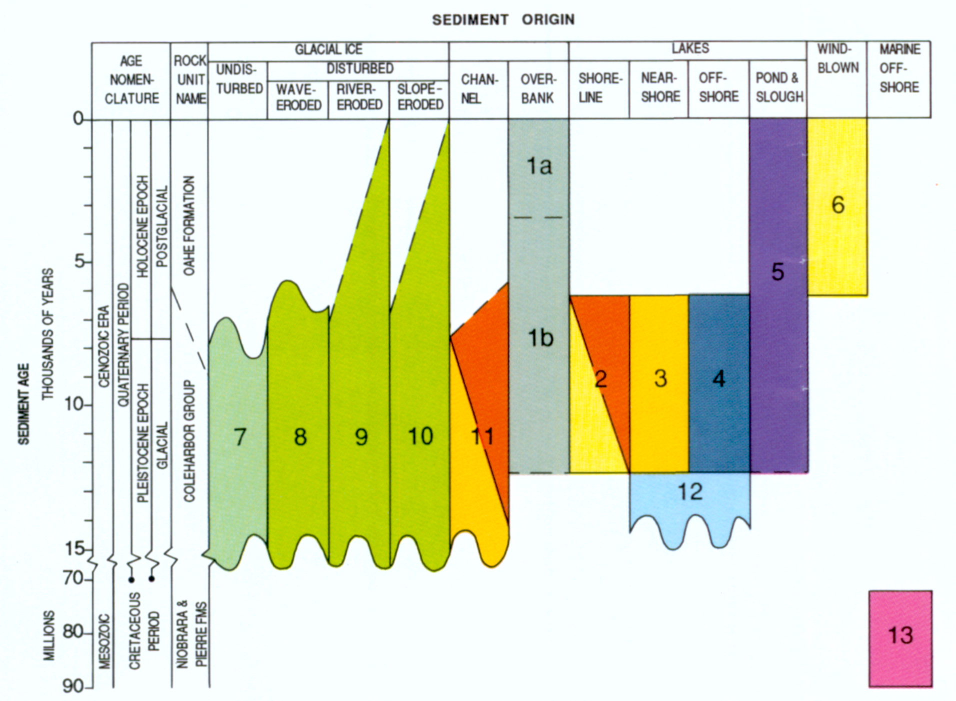


Figure 2. Correlation of sediment age, origin, and texture with map-unit numbers.

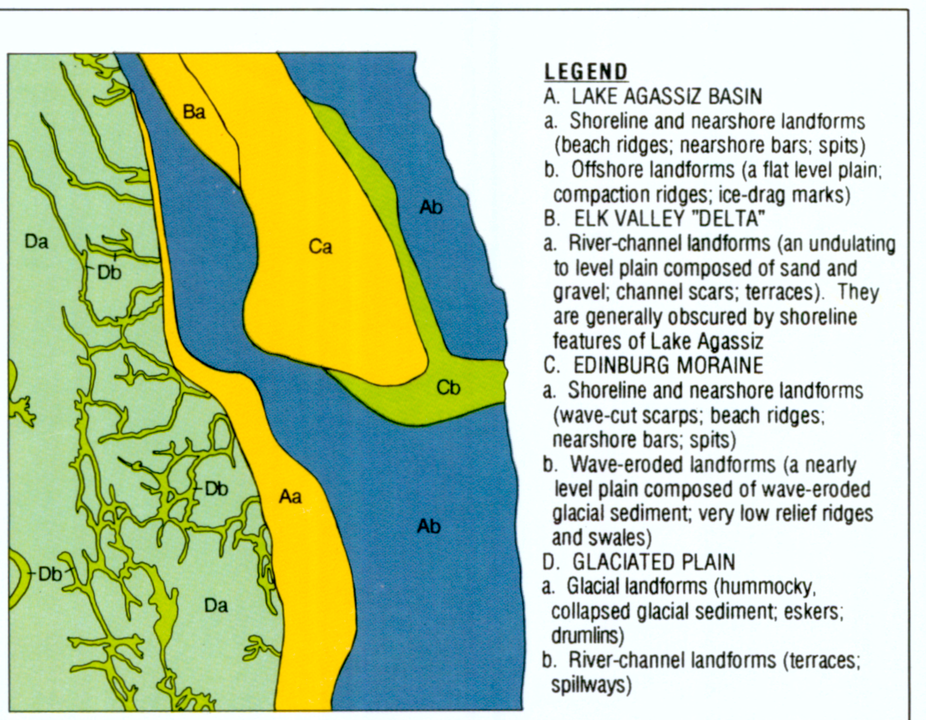
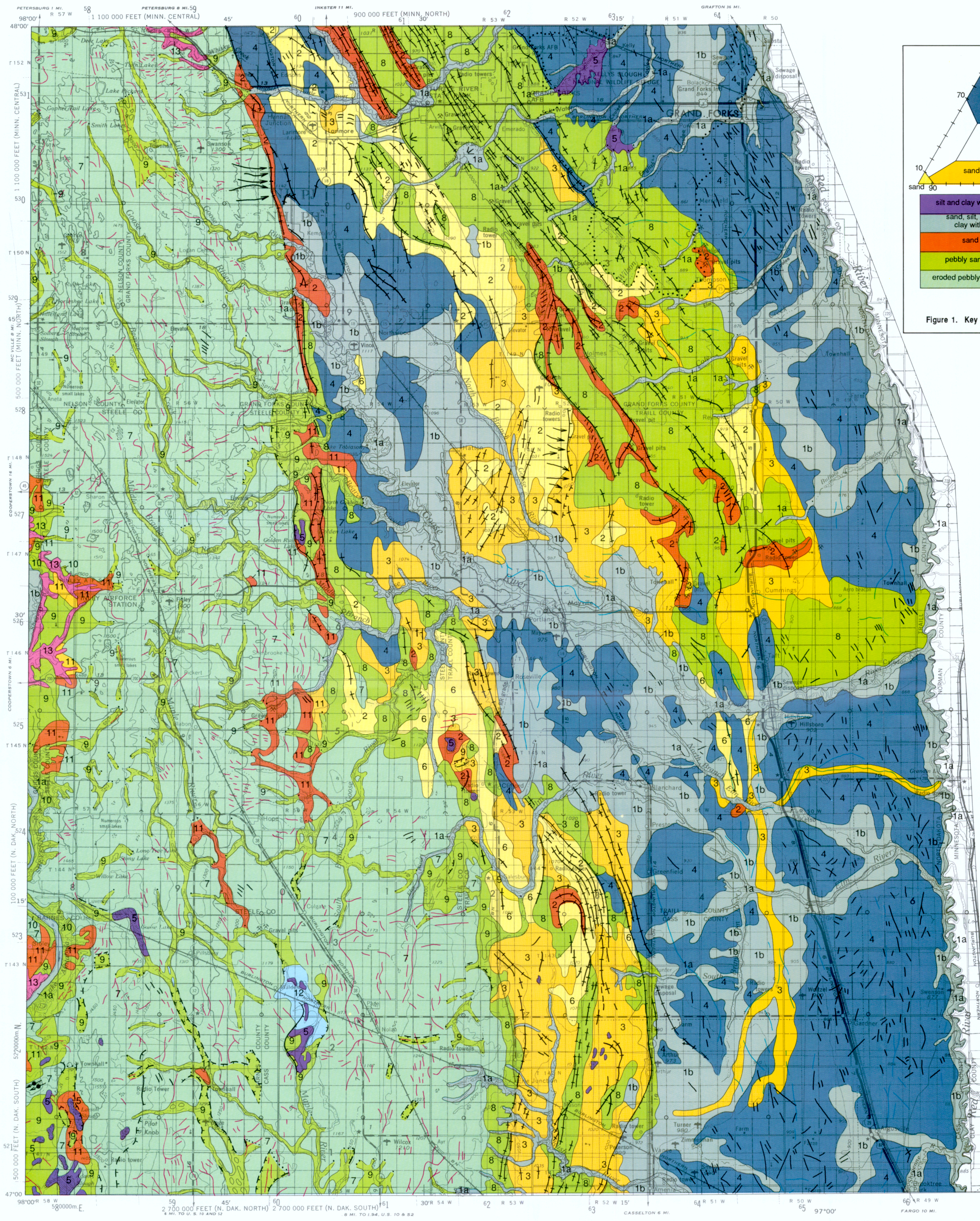


Figure 3. Major landform areas (capital letters) and typical landforms (lower case letters).



Base modified from U. S. Geological Survey 1952-75

Cartography by Philip Heywood

MAP EXPLANATION

This map displays four elements of the surface geology of the Goose River Map Area: (1) a description of the sediment present, (2) an interpretation of the age of the sediment, (3) an interpretation of the origin of the sediment, and (4) a description of the topography of the map area.

The texture of the sediment in the map area is shown by the use of color. All Quaternary sediment of the same texture is represented by map units of the same color, regardless of its age or origin. For example, sand is shown as a yellow map unit no matter what its interpreted age or depositional history might be. This map emphasizes sediment texture, a descriptive map element. Figure 1 is the sediment texture key.

The age and origin of the sediment (interpretive elements) are shown by the use of map-unit numbers. For example, a map unit described as sand (yellow map unit) may be interpreted to be lake, river, or windblown sediment of a specific age. These interpretations would be indicated by different map-unit numbers. Figure 2 shows the correlation diagram relating sediment age, origin, and lithology with map-unit number. The map units and line symbols used on this map are described below.

The Goose River Map Area can be divided into four areas based on the occurrence of similar or genetically related landforms. These areas are the Lake Agassiz Basin, the Elk Valley "delta," the Edinburg moraine, and the Glaciated Plain. Each of these areas contains a unique set of landforms determined by the geologic processes responsible for depositing or modifying the sediment in that area. Figure 3 shows the major landform areas and lists the typical landforms in each area.

This map is the result of a compilation of previous work, an interpretation of the geology based on aerial photographs, and field studies. The aerial photographs used were taken in 1952 by the Army Map Service and printed at a scale of about 1:63,400 (1 inch:1 mile). Field studies were conducted mainly during the 1987 and 1988 field seasons.

MAP SYMBOLS

- Confident map unit boundary, judged to be within 0.4 km (0.25 mi) of the true boundary along most of its length
- Approximate map unit boundary, judged to be between 0.4 km (0.25 mi) and 0.8 km (0.5 mi) from the true boundary along most of its length
- Uncertain map unit boundary, judged likely to be more than 0.8 km (0.5 mi) from the true boundary
- Continuous scarp; scarp symbols omitted along major river valleys where they would interfere with closely spaced contour lines
- Collapsed scarp
- Buried meltwater channel, collapsed tunnel valley, or esker complex
- Beach ridge or nearshore bar
- Drumlin; arrow indicates direction of ice movement
- Esker (red)
- Compaction ridge (blue)
- Alluvial fan
- Channel scar; arrow indicates direction of water flow
- Lineations apparent on aerial photographs; these are likely to be ice-drag marks (in the Lake Agassiz Basin), washboard moraines (on the glaciated plains), or other lineations of unknown origin
- Boundary of area affected by saline spring pits; saline soils
- Township corner; shown to aid the user in finding land locations

DESCRIPTION OF MAP UNITS

QUATERNARY

OAHE FORMATION

RIVER SEDIMENT

1 — OVERBANK SEDIMENT: Clay, silt, sand, and disseminated organic debris; obscurely bedded; dark colored; commonly associated with sand and gravel of older, river-channel sediment; typically less than a metre (3 feet) thick; deposited on the floodplains of modern rivers (1a) and over extensive areas of the Lake Agassiz plain by ancient rivers (1b)

LAKE SEDIMENT

2 — SHORELINE SEDIMENT: Sand and gravel; moderately to well sorted; plane bedded and cross bedded; as much as 5 metres (15 feet) thick; deposited along the shoreline of a lake, usually on eroded till; beach ridges are shown as line symbols

3 — NEARSHORE SEDIMENT: Silt and sand; moderately to well sorted; cross bedded to flat bedded; as much as 5 metres (15 feet) thick; deposited in shallow water near the shore of a lake, usually on eroded till; nearshore bars shown as line symbols

4 — OFFSHORE SEDIMENT: Clay with thin silt laminae; flat bedded, typically laminated; as much as 60 metres (200 feet) thick; deposited in deep, quiet water of a lake

5 — POND AND SLOUGH SEDIMENT: Clay, silt, and organic debris; obscurely bedded; dark colored; generally less than 3 metres (10 feet) thick; deposited in modern ponds and sloughs

WINDBLOWN SEDIMENT

6 — WINDBLOWN SEDIMENT: Sand and silt; medium to fine grained; moderately sorted; obscurely bedded; associated with older lake and river deposits; as much as 3 metres (10 feet) thick; wind-scoured surfaces and low-relief dunes

COLEHARBOR GROUP

GLACIAL SEDIMENT

7 — UNDISTURBED GLACIAL SEDIMENT: Sand, silt, and clay; pebbly; unsorted; unbedded; contains abundant cobbles and boulders; as much as 30 metres (100 feet) thick (multiple-event deposits as much as 200 metres (600 feet) thick); the surface ranges from flat to very hilly (surface variation is shown on the topographic base map); deposited by glacial ice

8 — WAVE-ERODED GLACIAL SEDIMENT: Sand, silt, and clay; pebbly; unsorted; unbedded; glacial sediment that has been eroded (washed) by the action of waves in a lake; the surface of the eroded glacial sediment ranges from flat to undulating; a veneer of shoreline or nearshore sediment is commonly present

9 — RIVER-ERODED GLACIAL SEDIMENT: Sand, silt, and clay; pebbly; unsorted; unbedded; glacial sediment that has been eroded by rivers; the surface of the eroded glacial sediment is flat or undulating; typically bounded by scarps; a veneer of river sediment, including sand and gravel, is commonly present

10 — SLOPEWASH-ERODED GLACIAL SEDIMENT: Sand, silt, and clay; pebbly; unsorted; unbedded; glacial sediment that has been eroded by slopewash and other hillslope processes; its surface forms steeply sloping valley walls; a veneer of slopewash sediment is commonly present

RIVER SEDIMENT

11 — RIVER-CHANNEL SEDIMENT: Sand and gravel; moderately to poorly sorted; cross bedded to flat bedded; as much as 30 metres (100 feet) thick; deposited by meltwater rivers

LAKE SEDIMENT

12 — LAKE SEDIMENT: Silt and clay; moderately to well sorted; typically flat bedded or laminated; as much as 5 metres (15 feet) thick; surface is flat, or rolling where it has been disturbed by the melting of underlying ice; deposited in a lake in front of the glacier

CRETACEOUS

PIERRE AND NIOBRARA FORMATIONS (undifferentiated)

MARINE OFFSHORE SEDIMENT

13 — BEDROCK: Shale; dark gray to brown; deposited on the floor of a sea about 70 to 90 million years ago

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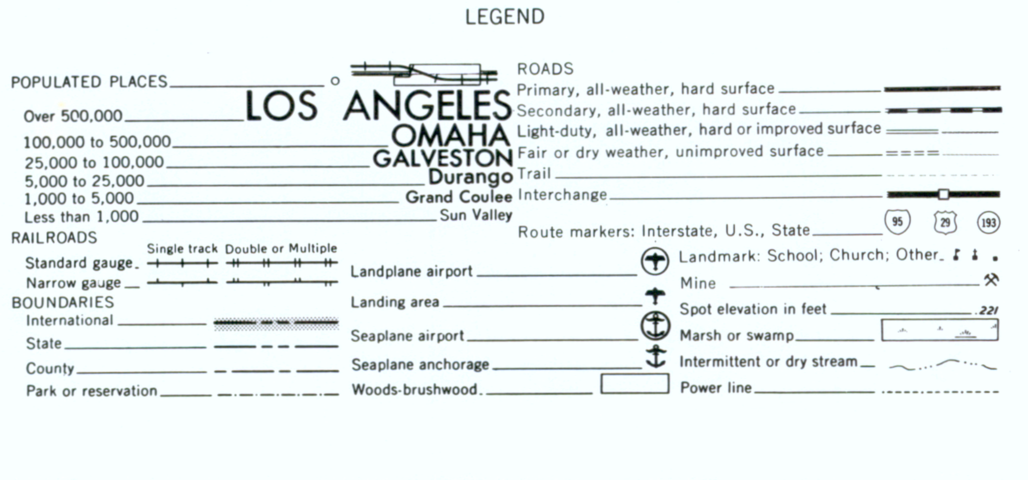
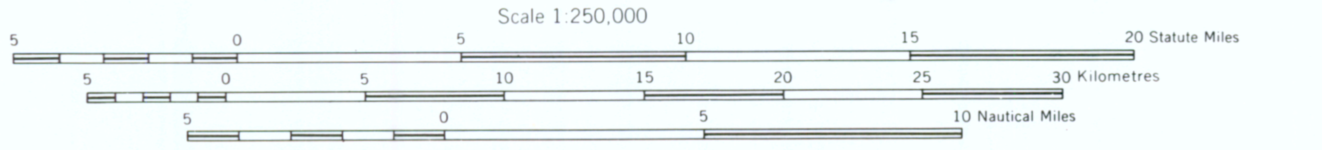
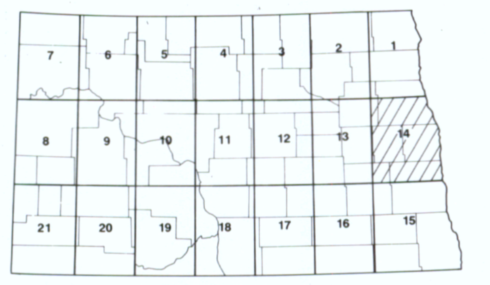
LEGEND





CONTOUR INTERVAL 50 FEET WITH SUPPLEMENTARY CONTOURS AT 25 FOOT INTERVALS

Approximate mean declination, 1975



ATLAS SERIES MAP AREAS

SECTIONIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36