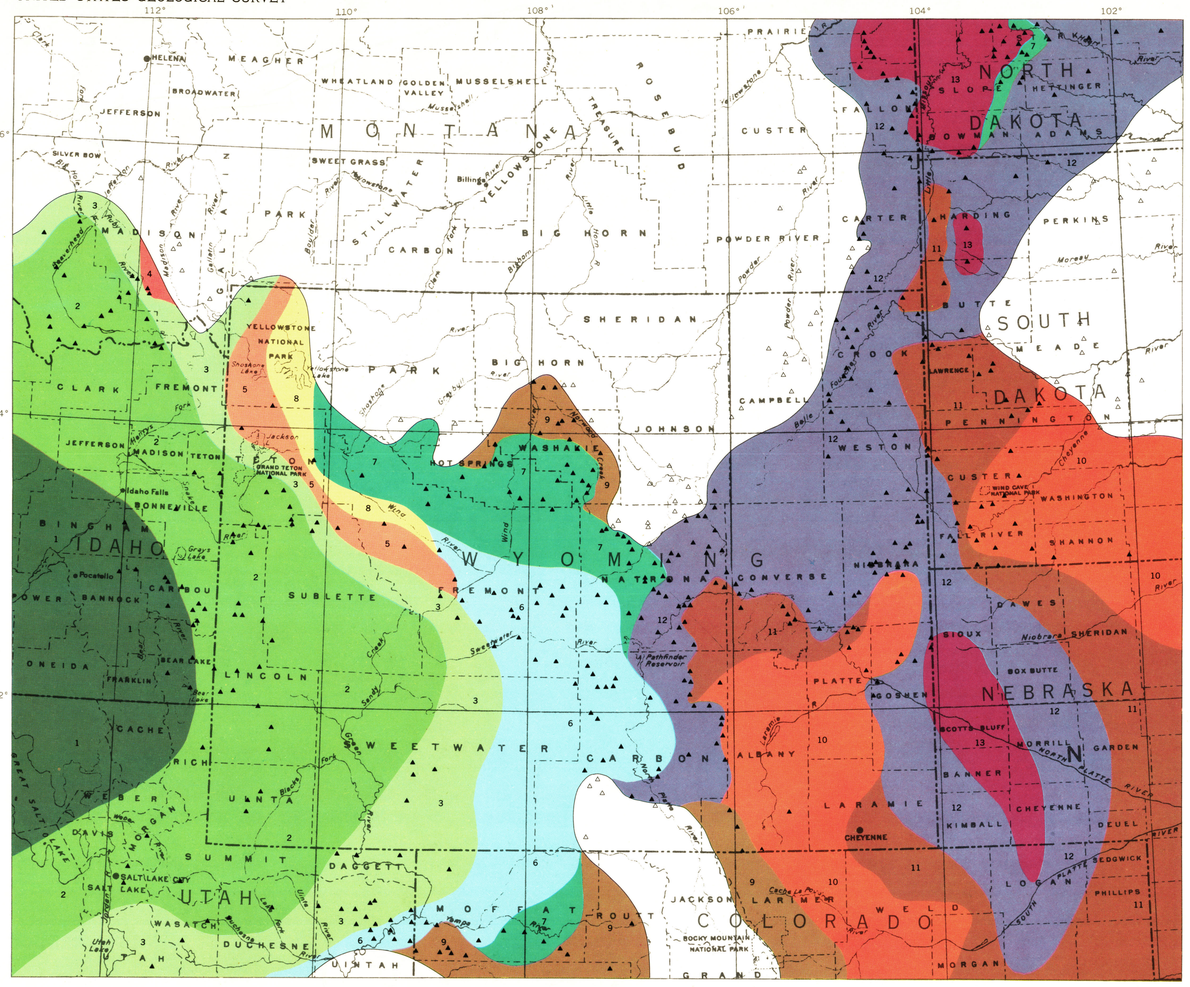
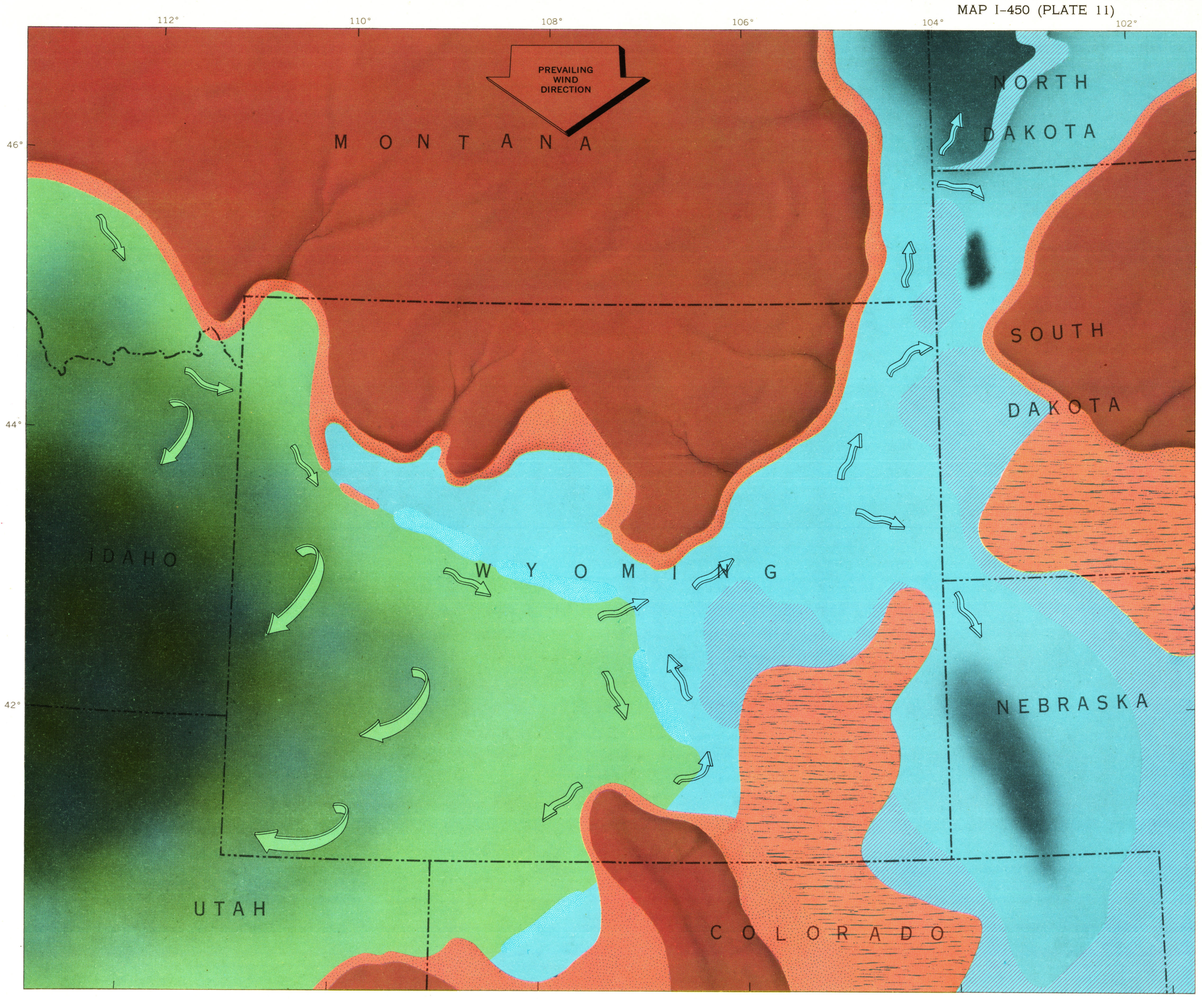
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-450 (PLATE 11)



A. LITHOFACIES



B. PALEOGEOGRAPHY

EXPLANATION

A

Sediment from which rock was probably derived is indicated in *C*

1 — Dark mudstone; sparse carbonaceous material; scattered apatite nodules

2 — Dark, richly carbonaceous pelletal phosphorite, mudstone, and microcrystalline dolomite in broad lenses

3 — Light-colored phosphorite

4 — Phosphatic conglomerate

5 — Phosphatic sandstone

6 — Carbonate rock, locally cherty

7 — Light-green dolomitic shale and argillaceous dolomite

8 — Sandstone

9 — Sandstone and mudstone, interbedded green and red

10 — Red sandy mudstone; anhydrite, gypsum, and dolomite in a few places

11 — Red mudstone

12 — Red mudstone, carbonate rock, anhydrite, and gypsum

13 — Red mudstone and halite, locally containing anhydrite, gypsum, and dolomite

Positive area; no deposits at time of mapped horizon

▲ Outcrop or well where rocks of mapped horizon are present

△ Outcrop or well where rocks of mapped horizon are absent

B

Land

Ocean water
Deep-medium-shallow

Bay and lagoon water
Deep-medium

Tidal flats
Low-high
In shallow bay and lagoon

Barrier islands

Shore deposits

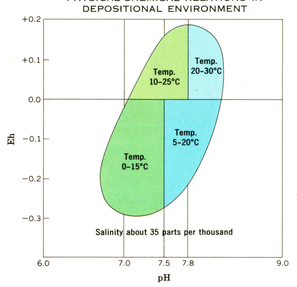
Upwelling currents

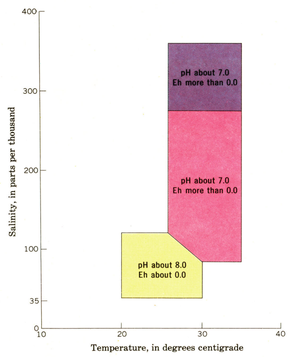
Wave-generated currents

Drift current due to evaporation of bay water

C

PHYSICAL-CHEMICAL RELATIONS IN DEPOSITIONAL ENVIRONMENT





BOTTOM-SEDIMENT COMPOSITION

1 Carbonaceous quartz and clay mud; minor apatite
2 Carbonaceous dolomite, quartz and clay mud, and pelletal apatite sand; minor pyrite
3 Pelletal, oolitic, and skeletal apatite sand, quartz sand, and minor glauconite sand; locally conglomeratic; little carbonaceous matter
4 Skeletal-calcite and skeletal-silica sand; minor glauconite sand
5 Dolomite, quartz, and clay mud; minor ferrous silicate mud
6 Quartz sand and clay, quartz, and dolomite mud; minor ferric oxide and ferrous silicate mud
7 Quartz and clay mud and quartz sand; minor calcium sulfate, dolomite, and ferric oxide mud
8 Clay, quartz, and calcium sulfate mud; minor quartz sand and ferric oxide mud
9 Clay, quartz, calcium sulfate, and dolomite mud; minor ferric oxide mud and quartz sand
10 Clay, quartz, halite, and calcium sulfate mud; minor dolomite and ferric oxide mud
11 Dolomite and calcium sulfate mud; some quartz and clay mud; minor ferric oxide mud
12 Quartz sand

Approximate boundary between sediments of different composition

Shore and near-shore deposits; mostly quartz sand; some quartz and clay mud

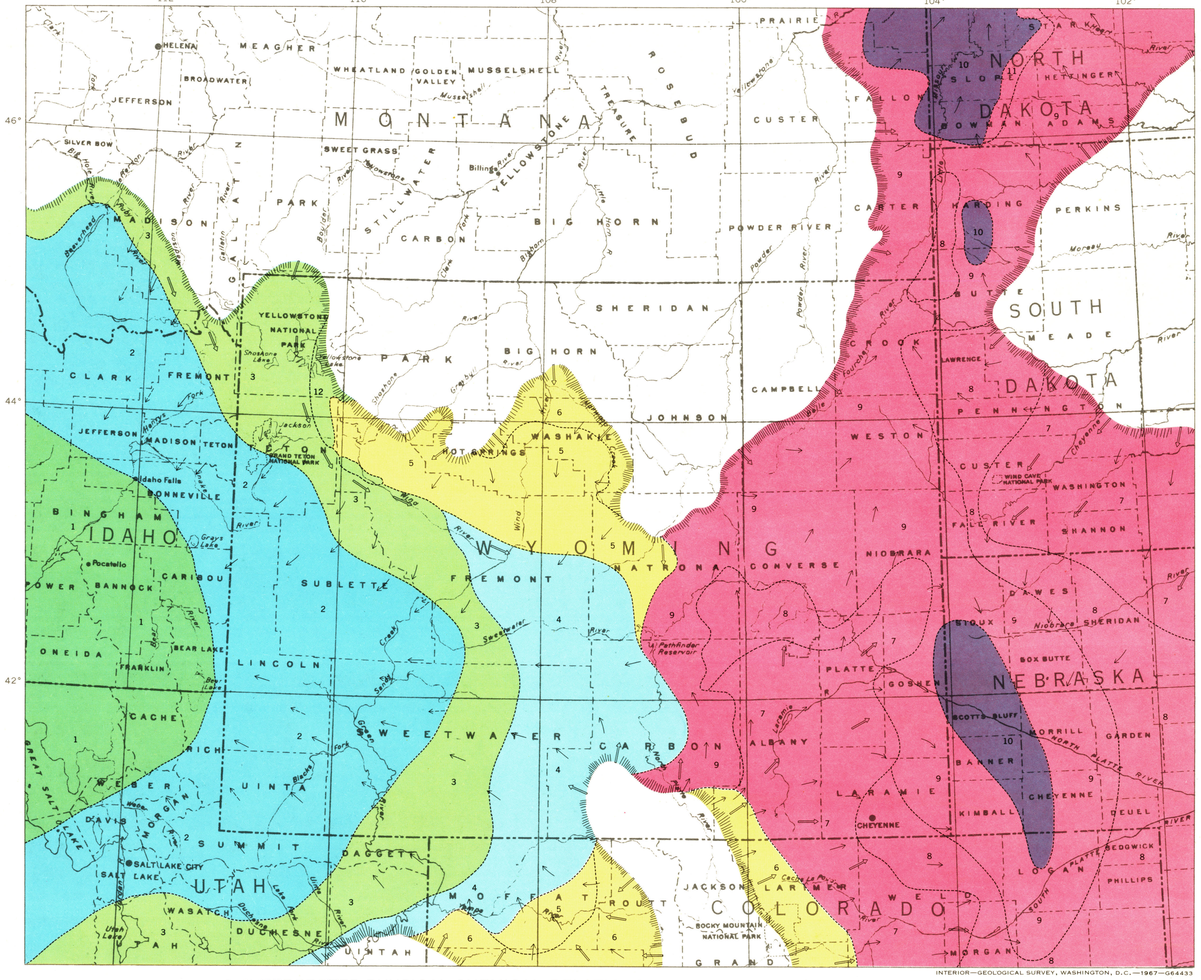
Land

Sand-size particles

Mud particles

Organically generated debris

Direction of sediment transport



C. INTERPRETED PHYSICAL-CHEMICAL RELATIONS IN THE DEPOSITIONAL ENVIRONMENT BOTTOM-SEDIMENT COMPOSITION, AND OF SEDIMENT TRANSPORT DIRECTION

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1967—G64433

PALEOGEOGRAPHY AND SEDIMENTARY ENVIRONMENTS AT TIME OF MAXIMUM TRANSGRESSION DURING LEONARD TIME IN WYOMING AND ADJACENT AREAS

By

R. P. Sheldon, E. K. Maughan, and E. R. Cressman

SCALE 1:2 500 000

50 0 50 100 150 200 250 MILES

50 0 50 100 150 200 250 KILOMETERS

1967

U. S. GEOLOGICAL SURVEY
WASHINGTON
MAY 25 1967
LIBRARY

~~United States. Paleotectonic: Permian. U.S. 1967.~~
~~sheet 11,~~
~~cop. 2.~~

M(200)
I-450
Sheet 11
C.2

G3700
.S4 S38
1967
I-450
sheet 11
copy 2

3 1818 00174627 8