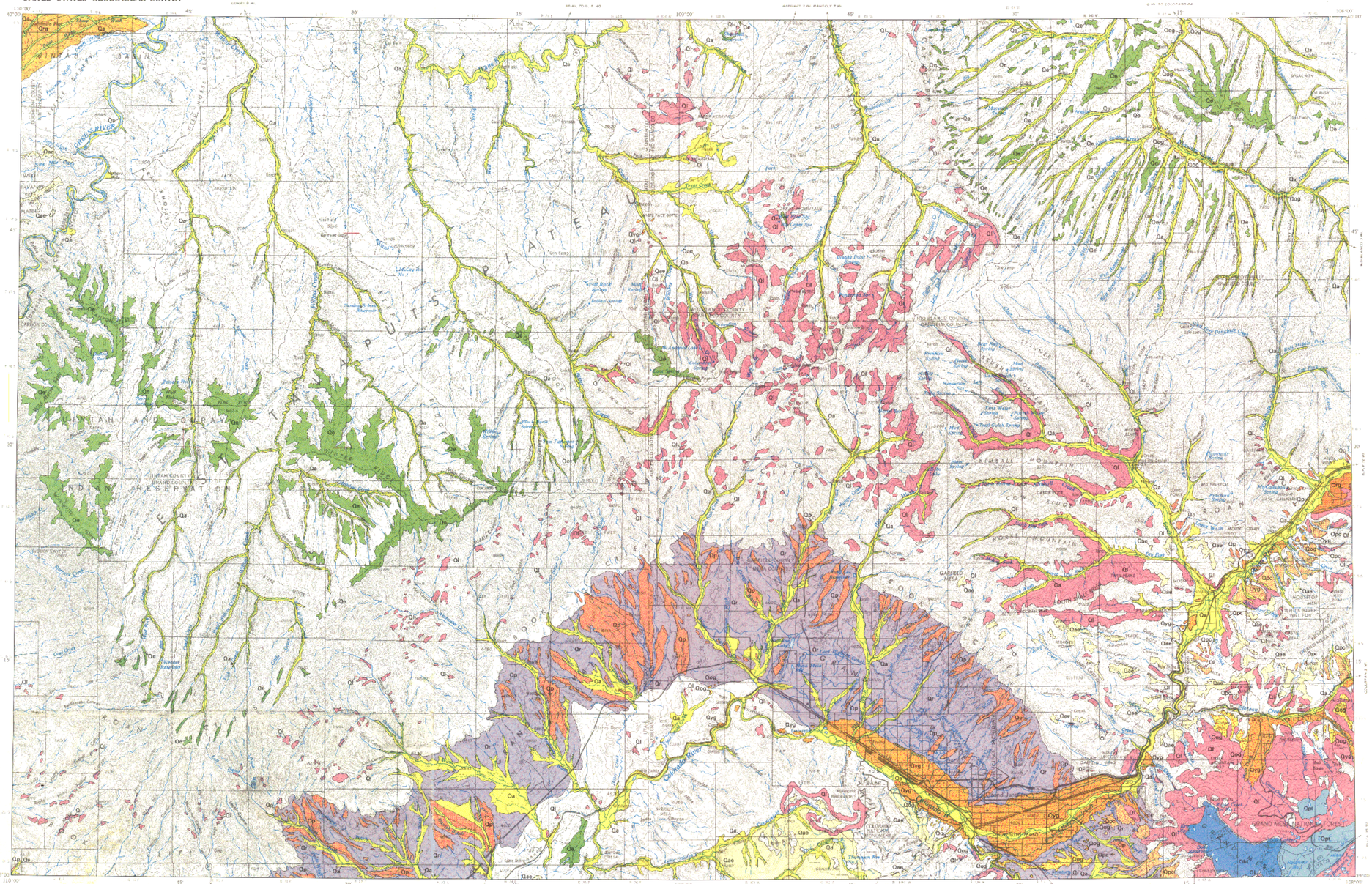
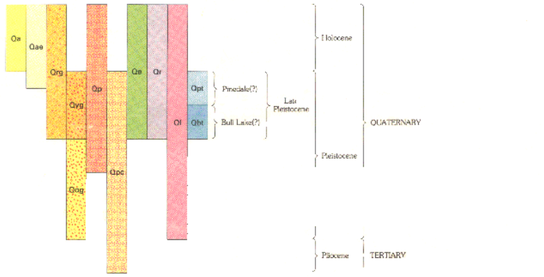


CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

[Units arranged generically, not chronologically]

Qa ALLUVIUM (HOLOCENE)—Clay, silt, sand, and gravel deposits underlying modern flood plains. Lower reaches of major streams draining northward are underlain by deposits of silty clay nearly 50 m thick. Coarse, poorly sorted side-valley alluvium and colluvium usually interfinger with mainstream alluvium in steep-sided, narrow valleys. Well-sorted pebbles, cobbles, and boulders in a sandy matrix with interfingering sand lenses extending to depths greater than 20 m are found along the Colorado River and Plateau Creek. Only deposits of larger streams are shown in the Grand Valley. These deposits range from 2 to 15 m in thickness and are composed of flood-derived sand and gravel from the Book Cliffs region and of clay and silt derived from weathered Upper Cretaceous Mancos Shale and deposited by slopewash and creep

Qae LOCALLY DEPOSITED SAND AND SILT (HOLOCENE TO LATE PLEISTOCENE)—Sand and silt mostly weathered from nearby sandstones and reworked by eolian and (or) alluvial processes. Deposits are generally thin (1–4 m) and patchy, and are found on flat benches, mesas, and in wind-protected niches of high-relief areas

Qrg REWORKED GRAVEL (HOLOCENE TO LATE PLEISTOCENE)—Poorly to well-sorted gravels that have a complex depositional history. Large active alluvial fans on Battlement Mesa are composed of interfingering fluvial gravels and debris flows. Fans appear to have been built up intermittently since the late Pleistocene without major downcutting. Gravels on sandstone benches along the Green River are usually less than 3 m thick and are locally reworked by local intermittent streams

Qyg YOUNG GRAVEL (LATE PLEISTOCENE)—Well-sorted pebbles, cobbles, and boulders in a sandy matrix forming gravels of Pinedale(?) and Bull Lake(?) age and that underlie terraces along Plateau Creek and the Colorado River (Yeend, 1969). Terraces are generally 6–23 m above stream level and the gravel ranges from 3 to 14 m in thickness. As much as 4 m of alluvial and windblown sand may locally cover gravel

Qog OLD GRAVEL (MIDDLE TO EARLY PLEISTOCENE)—Terraces and terrace-remnants along the Colorado River, Plateau Creek, and Piceance Creek are composed of stream gravels of pre-Bull Lake age. Generally located between 10 and 150 m above modern stream level. Surface of deposit may be covered by windblown or alluvial sand deposits as much as 5 m thick, in some places erosion has washed away the original surface. Carbonate deposits as much as 1.2 m thick can be observed in these deposits. Thickness ranges from 2 to 15 m

Qp PEDIMENT DEPOSITS (HOLOCENE TO PLEISTOCENE)—Thin (generally less than 3 m), sometimes discontinuous deposits of clayey silts, sand, and gravel on pediment surfaces. Coarse deposits represent former floods issuing from adjacent cliffs; deposits of clayey silt and sand are the products of slopewash from local storms on weathered Mancos Shale

Qpc COLLUVIAL DEPOSITS ON PEDIMENTS (PLEISTOCENE TO LATE PLIOCENE)—Coarse deposits of poorly sorted pebbles, cobbles, and boulders, commonly 6–10 m thick (locally thicker), mantling pediment surfaces adjacent to Battlement and Grand Mesas. Gravel is composed largely of basalt but also includes oil shale, siltstone, and sandstone. Surfaces of deposits are very bouldery; fine-grained material may have washed or blown away. Several deposits west of Battlement Mesa are considered to be late Pliocene to early Pleistocene in age because of their high elevation in relation to the modern stream (greater than 150 m). The deposits are mainly the product of colluvial processes, especially debris flows, associated with glacial episodes during the Pleistocene. Some stream deposition and reworking of colluvial gravels has occurred

Qe EOLIAN DEPOSITS (HOLOCENE TO LATE PLEISTOCENE)—Wind-deposited silty sand. Thin (0.3–2 m) reddish deposits mantling the Tavaputs Plateau were most likely derived from the deserts southwest of the Roan Cliffs. In the uplands of the Piceance Creek basin, deposits appear to have been derived from alluvium and weathered sandstones of Cretaceous and Tertiary age exposed to the west. In both areas, deposits as thick as 10–13 m are found in wind-protected valley heads, small upland depressions, and in the lee of some hills. Active erosion is common in areas where vegetation has been disturbed by animals, fire, and (or) man

Qr WEATHERED SHALE (HOLOCENE TO LATE PLEISTOCENE)—Clayey, silty residual deposit formed on Mancos Shale, generally 0.5–2.0 m thick. Predominant hillslope movement by creep and frost action (Schumm, 1964); also susceptible to movement by slopewash and earthflow resulting from local, intense rainstorms

Ql LANDSLIDE DEPOSITS (HOLOCENE AND PLEISTOCENE)—Mass movement deposits formed by slumping, debris flows, earthflows, rockfalls, and rock topples. Areas of extensive and complex slumps exist in the Roan Creek drainage, around Grand Mesa, and the region of Douglas and Baxter Passes largely due to the presence of the lower shaly member of the Eocene Green River Formation and the weak sandstones, siltstones, and shales of the Paleocene and Eocene Wasatch Formation (Schumm and Olson, 1974). Large-scale slumping may have occurred during colder, moister periods of the Pleistocene. Debris flows, rock topples, and evidence of creep and solifluction are commonly associated with the areas of extensive slumping. Rockfalls and small slumps are common in the Book Cliff and Roan Cliff regions. Small areas of undisturbed till may be included in the landslide deposits north of Grand Mesa

Qpt TILL OF PINEDALE(?) AGE (LATE PLEISTOCENE)—Unsorted material, ranging in size from clay to boulders, deposited by ice of Pinedale(?) age (Yeend, 1969). Surface of deposit is hummocky with many undrained depressions containing silt, clay, and organic material. Basalt boulders on the surface are fresh and frequently exhibit striations and pits. Where ice scoured below basalt cap of Grand Mesa, the till contains a high clay content derived from weathered shale of the Green River Formation. This till locally overlies till of Bull Lake(?) age. Thickness ranges from 2 to 25 m. Terminal moraine crest shown by dots

Qbt TILL OF BULL LAKE(?) AGE (LATE PLEISTOCENE)—Unsorted material ranging from clay to boulder size deposited by ice of Bull Lake(?) age (Yeend, 1969). Surface of deposit exhibits a subdued topography with approximately 20 percent of the boulders and cobbles being formed from cracking and splitting of larger basalt boulders due to long exposure to freeze-thaw processes. As much as 85 percent of basalt clasts in the top 2 m of the till are slightly to very weathered. Thickness ranges from 1 to 25 m. Recessional moraine crests shown by dots

REFERENCES

Cashion, W. B., 1969, Geologic map of the Black Cabin Gulch quadrangle, Rio Blanco County, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ–812, scale 1:24,000.

_____, compiler, 1973, Geologic and structure map of the Grand Junction quadrangle, Colorado and Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–736, scale 1:250,000.

Colton, R. B., Hollingsworth, J. A., Anderson, L. W., and Whitney, J. W., 1975, Preliminary map of landslide deposits, Grand Junction 1° x 2° quadrangle, Colorado and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF–697, scale 1:250,000.

Duncan, D. C., 1976, Preliminary geologic map of Square S Ranch quadrangle, Rio Blanco County, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF–754, scale 1:24,000.

_____ 1976, Preliminary geologic map of Greasewood Gulch quadrangle, Rio Blanco County, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF–755, scale 1:24,000.

_____ 1976, Preliminary geologic map of Jessup Gulch quadrangle, Rio Blanco County, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF 756, scale 1:24,000.

_____ 1976, Preliminary geologic map of Rock School quadrangle, Rio Blanco County, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF–757, scale 1:24,000.

Holmes, J. G., and Rice, J. G., 1907, Soil survey of the Grand Junction area, Colorado, in U.S. Department of Agriculture Bureau of Field Operations series 1905: U.S. Department of Agriculture p. 949–974.

Knobel, E. W., and others, 1955, Soil Survey of the Grand Junction area, Colorado: U.S. Soil Conservation Service series 1940, no. 19, 116 p.

Lohman, S. W., 1965, Geology and artesian water supply of the Grand Junction area, Colorado: U.S. Geological Survey Professional Paper 451, 149 p.

Roehler, H. W., 1972, Geologic map of the Brushy Point quadrangle, Rio Blanco and Garfield Counties, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ–1018, scale 1:24,000.

_____ 1972, Geologic map of the Razorback Ridge quadrangle, Rio Blanco and Garfield Counties, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ–1019, scale 1:24,000.

_____ 1973, Geologic map of the Calf Canyon quadrangle, Garfield County, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ–1086, scale 1:24,000, [1974].

_____ 1973, Geologic map of the Henderson Ridge quadrangle, Garfield County, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ–1113, scale 1:24,000, [1974].

Schumm, S. A., 1964, Seasonal variations of erosion rates and processes on hillslopes in western Colorado: Zeitschrift Geomorphologie, Supplement 5, p. 215–238.

Schumm, S. A., and Olson, R. W., 1974, Geomorphology of the Piceance Creek basin, in Cook, C. W., project coordinator, Surface rehabilitation of land disturbances resulting from oil shale development: Colorado State University, Environmental Resources Center, p. 1–29.

Spears, C. F., and Raven, E. V., 1978, Soil survey of Mesa County, area, Colorado: U.S. Soil Conservation Service, National Cooperative Soil Survey, 58 p.

Yeend, W. E., 1969, Quaternary geology of the Grand and Battlement Mesas area, Colorado: U.S. Geological Survey Professional Paper 617, 50 p.

_____ 1973, Slow-sliding slumps, Grand Mesa, Colorado: Mountain Geologist, v. 10, no. 1, p. 25–28.

INDEX MAP SHOWING AREA OF GRAND JUNCTION QUADRANGLE AND OTHER PUBLISHED 1 X 2° QUADRANGLE SURFICIAL MAPS

SURFICIAL GEOLOGIC MAP OF THE GRAND JUNCTION 1° X 2° QUADRANGLE, COLORADO AND UTAH

By
John W. Whitney

1981

For sale by Branch of Distribution, U.S. Geological Survey
Box 25286, Federal Center, Denver, CO 80225