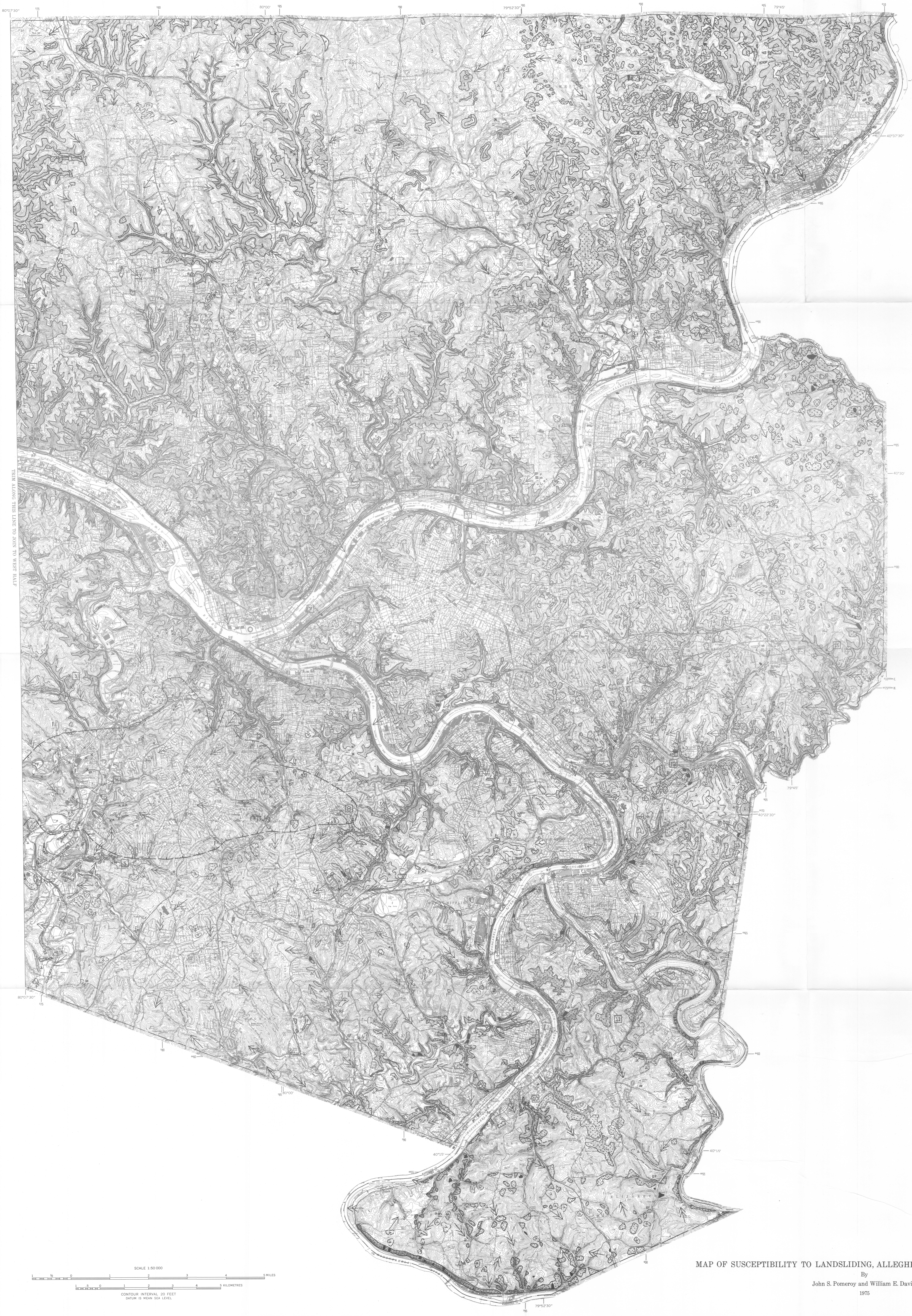
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
THE APPALACHIAN REGIONAL COMMISSION

MISCELLANEOUS FIELD STUDIES
MAP MF-685 B
(SHEET 2 OF 2)



EXPLANATION

Recent landslides

Dominantly earth slumps and earth flows, historically recorded or characterized by fresh scars observed in 1973 or 1974. Small landslides, mostly less than 100 ft (30 m) in maximum dimensions, are shown by X's.

Prehistoric landslides

Dominantly earth slumps and earth flows, characterized by uneven, hummocky ground surfaces and benchlike settings; relatively stable in natural undisturbed state, but can be reactivated by excavation, loading, and changes in ground-water and surface-water conditions. Areas shown probably include some recent non-documented landslides and other landslides not recognized during field reconnaissance.

Slopes with moderate to severe susceptibility to landsliding

Chiefly areas underlain by thick redbeds and associated rocks of the Glenshaw and Casselman Formations on which landsliding and creep in thick reddish clayey soil are prominent; rock weathers rapidly on exposure; most redbeds ("Pittsburgh red beds") occur in the interval beneath the Ames Limestone Member of Glenshaw (fig. 1; fig. 2). Cuts and fills in redbeds generally are not stable; fills (f) in these areas are patterned to show this relationship.

Slopes with slight to moderate, locally severe, susceptibility to landsliding

Clayey soils forming cohesive slabs generally less than 5 feet (1.5 m) thick, commonly underlain by weathered claystone and shale in the Glenshaw, Casselman, or Pittsburgh Formations (fig. 1; fig. 2); characterized by conspicuous slow movement of the slab that can be greatly accelerated by overloading by placement of fills or structures.

Ground with highly variable slope conditions

On the ticked side of the line, ground has been widely disturbed by earth-moving operations related to residential and commercial development and surface mining of coal. Complex zones of thin and locally thick soil and weathered rock mantle the area; redbeds are relatively rare. These conditions combine to prevent consistent classification of slopes on the basis of conspicuous or relatively minor soil creep. Largely underlain by rocks of the Monongahela and lower Dunkard Groups (fig. 1; fig. 2).

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Steep slopes most susceptible to rockfall

Bracket symbol faces steep, locally vertical, natural and manmade slopes and cliffs 15 feet (4.5 m) to more than 150 feet (45 m) high exposing layers of sandstone, subordinate limestone and flaggy, sandy shale, and interbedded claystone and shale. Sandstone and limestone commonly are highly fractured and are undercut by relatively rapid weathering of claystone and shale.

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Ground with little susceptibility to landsliding

Slopes commonly exhibit slight soil creep, but are susceptible to significant landsliding only where extensively modified by man.

Manmade fill

Heterogeneous soil and rock material with variable susceptibility to slope failure depending on nature of material, foundation conditions, design, and construction. Fills in redbed areas commonly contain redbed rock and soil, resting on redbeds and therefore are less stable than similarly constructed fills in other areas; these redbed fills are patterned to show this relationship. Fills in older urbanized areas and fills resulting from mining are shown only where associated with significant recent landslides. Many fills are too small to show at scale of map but are shown on open-file maps (Davies, 1974a-l; Pomeroy, 1974a-k).

Boundaries between areas of different landslide susceptibilities

Most boundaries are gradational over tens and locally hundreds of feet, so their locations are approximate. Boundaries between areas labeled 2 and 3 are dashed as an aid to map reading.

General directions of dip of rock layering

Single-barbed arrows--Layers largely dip 40 feet per mile (7.6 m/km) (about 0.8 percent of grade or 0.5 degrees from the horizontal) or less.

Double-barbed arrows--Largely dip more than 40 feet per mile (7.6 m/km) but mostly less than 200 feet per mile (38 m/km) (about 4 percent of grade or 2 degrees from the horizontal).

Slopes dipping in the same general direction but at greater angles than the dip of rock layering are somewhat more susceptible to landsliding than are slopes dipping in directions opposite to the dip of rock layering (Briggs, 1974).

7 4

Selected landslide localities discussed in table

Arrows point to landslide discussed. Locality 4 is shown by a small circle to indicate that this may have a cause other than landsliding.

SCALE 1:50 000

1 ½ 0 1 2 3 4 5 MILES

1 .5 0 1 2 3 4 5 KILOMETRES

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

MAP OF SUSCEPTIBILITY TO LANDSLIDING, ALLEGHENY COUNTY, PENNSYLVANIA

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