

EXPLANATION

Approximate outline of drainage basin subsidiary to Cherry Creek

Area of collection of surface water by streams that are tributary to the master stream of that drainage system. Cherry Creek is the master stream for most of the Parker quadrangle. A small area mostly north of Smoky Hill Road in the northeast corner of the map area drains northward into Sand Creek, and parts of the land near the west margin of the map area drain northward into Dry Creek. Heavy lines delineate drainage divides of major tributaries to Cherry Creek. Alteration of drainage-basin outlines by the construction of Arapahoe County Airport is not shown

Cherry Creek Reservoir

Area, as of 1971, that will be covered by water impounded by Cherry Creek Reservoir at maximum storage pool stage, which is 5,596 feet above mean sea level. It is reasonable to assume that the reservoir may be filled by floodwaters resulting from heavy rainfall in the Cherry Creek drainage basin

Area showing evidence of inundation by running water

Area where evidence of erosion or deposition by running water in recent geologic time has been observed in the field or interpreted from aerial photographs. Recurring inundation may be expected in these areas, at irregular intervals, as a result of heavy rainfall

DISCUSSION

The Cherry Creek drainage basin, in which most of the Parker quadrangle lies, has been ravaged time and again by floods resulting from heavy rains in the headlands of the basin. Before Cherry Creek Dam and Reservoir were finished in 1958, Cherry Creek flooded parts of Denver near the confluence of Cherry Creek and the South Platte River. An enormous storm system, concentrated near the head of the basin, produced floods of record-breaking intensity in the Cherry Creek basin in June 1965. Most of the map area where the land has been modified by running water in the recent geologic past was covered to some extent by waters of the 1965 storm and flood. All runoff in the basin above the reservoir was stored by the reservoir, thus preventing damage downstream.

For safest development of the land within the Cherry Creek basin, future floods need to be considered. This map shows those areas where the effects of deposition or erosion caused by running water in the recent geologic past are still observable. Evidence of land modification was observed in the field during detailed geologic mapping in 1970-71 in the Parker quadrangle; neither hydraulic theory nor projection of hydraulic characteristics of the Parker area is intended or implied. The map is designed to aid the layman in the planning of land development; physical characteristics of specific sites in the map area must be determined by appropriate specialists.

Drainage-basin boundaries, also shown on the map, are important to planning because they delimit the area of natural drainage between one stream system and another. Knowledge of the physical characteristics of a given basin is necessary to permit an estimate to be made of the runoff effects that may be produced by storms of varying intensity. Generally, a large amount of rain spread over a long period of time will not produce disastrous flooding; a large amount of rain in a short time, however, as might result from several storm cells in succession being centered over a particular basin, nearly always produces flooding. The magnitude of the effects of running water is increased if the ground is already saturated at the time of the storm.

Knowledge of land areas that have been modified or damaged by running water in the recent past is important to development planning because these are areas where repeated water incursion may be expected. Parts of the land that have been flooded or severely eroded once will be damaged or altered again until the flow is controlled upstream from that point.

The areas shown on the map where running water is known to have altered the land surface in the recent geologic past are not the only areas liable to inundation or flood damage in the future. Generally, the higher a point on the land surface is above a watercourse, the less likely it is to be inundated by water flowing in the channels. The more gentle the slope that point is on, the less likely it is to be eroded, although it may become a site of deposition of sediments by floodwaters. For example, the low wide areas on each side of Cherry Creek and along its major tributaries are flood plains -- wide flat areas underlain by material deposited during past floods. These streams may be expected to flood repeatedly, at irregular intervals. The U. S. Army Corps of Engineers plans to build a dam across Cherry Creek at Castlewood, about 3 1/2 miles south of Franktown (see index map and Anonymous, 1972). Although a dam at Castlewood failed in 1933, causing a severe flood, the new dam is expected to provide full flood protection from runoff water that is gathered by the upper reaches of Cherry Creek basin. The flood susceptibility of some small tributary areas may be reduced or eliminated by the application of proper engineering techniques. Individual sites should be evaluated by a specialist with reference to their intended use.

The area of the Parker quadrangle has been subjected to two types of land modification or damage by running water. Running water has caused much erosion, especially gully and arroyo cutting, scouring of stream banks, deepening of natural channels, and the removal of surficial materials from gently sloping land surfaces by unconcentrated flow (sheet wash). Deposition of surficial materials from running water has formed accumulations of clay, silt, sand, gravel, and boulders that were swept into an area by stream flow, has formed debris piles of tree limbs and other vegetational remains, and has caused silting of channels and man-made drains.

The height of a flood stage above a given point on the land and the speed at which a gully or arroyo is cut depend on both variable and constant factors. Variable factors include intensity and distribution of rainfall, storm duration, and the hydraulic characteristics of restrictions placed in the path of the flow; constant factors include basin area, slope, and shape.

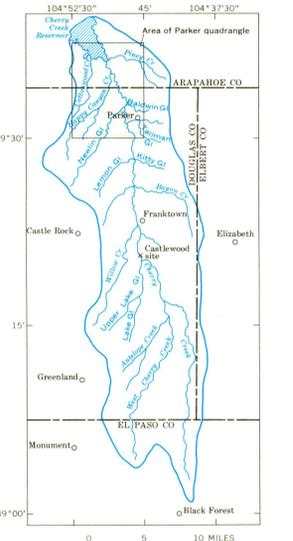
The Cherry Creek drainage basin upstream from Cherry Creek Dam comprises about 340 square miles, from the Cherry Creek Reservoir south to near Black Forest in El Paso County, and from near Castle Rock on the west to near Elizabeth on the east. This basin is large enough to have accumulated, following the massive rainstorms in June 1965, a peak flow into Cherry Creek Reservoir of 59,000 cfs (cubic feet of water per second). By contrast, the peak flow of the South Platte River near the mouth of Cherry Creek during the same flood was 40,300 cfs (Matthai, 1969). The Cherry Creek flow was all stored by the reservoir, and there was virtually no flow in the creek below the dam. Also, there was no overflow from the reservoir into the spillway. The spillway empties into the Sand Creek drainage basin, which empties into the South Platte River north of Denver.

Flooding in June 1965 in the Cherry Creek basin caused an estimated \$795,000 damage to rural property and an estimated \$511,000 damage to transportation facilities (Matthai, 1969). Because the reservoir contained all the runoff from above the dam and because there was no appreciable flow in the creek downstream from the dam, it must be assumed that most of the damage occurred in the basin upstream from the dam.

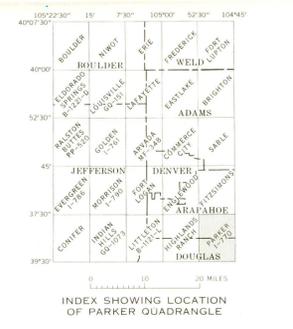
Only the low population density of the area in June 1965 minimized property damage and prevented loss of life from the floodwaters. The Newlin Gulch and Happy Canyon Creek drainage basins provided examples of specific types of damage. Floodwaters in Newlin Gulch caused losses of farm equipment, small buildings, an automobile, some crops; partial destruction of a farm-to-market road; and temporary blockage of West Parker Road. Floodwaters of Happy Canyon Creek have inundated parts of farms and roads many times; in 1965, they also nearly washed out the bridge across the creek on West Parker Road, nearly destroyed a concrete ford in Grandview Estates, and buried livestock in flood debris downstream from Grandview Estates.

Parker and Franktown are at present the only incorporated communities within the Cherry Creek basin above the reservoir, but plans are under way for additional residential development and recreational or retirement cities, and most of the rest of the basin area may not long remain undeveloped.

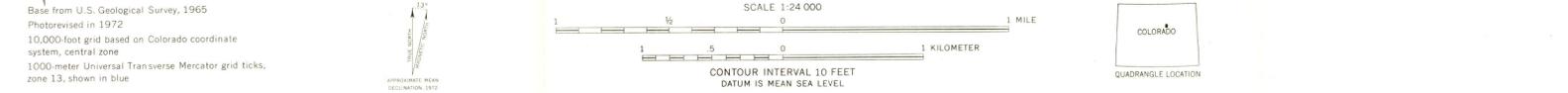
People having responsibility for land-use planning and construction activities in the Parker quadrangle should remember that floodwater accumulates in channels, and that the more tributaries in an area, the greater total flow it may accumulate. Also, those parts of the land that periodically have been covered by floodwaters or eroded by channelled flow during historic time are susceptible to recurrent flooding. These areas include but are not limited to the flood plains of Cherry Creek, Piney Creek, Cottonwood Creek, Happy Canyon Creek, Newlin Gulch, Sulphur Gulch, Tallman Gulch, Baldwin Gulch, and other unnamed drainages.



INDEX MAP SHOWING APPROXIMATE OUTLINE OF CHERRY CREEK DRAINAGE BASIN UPSTREAM FROM CHERRY CREEK RESERVOIR AND OUTLINE OF AREA COVERED BY LARGE MAP



INDEX SHOWING LOCATION OF PARKER QUADRANGLE



MAP SHOWING AREAS OF PAST FLOODING IN THE PARKER QUADRANGLE, ARAPAHOE AND DOUGLAS COUNTIES, COLORADO

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