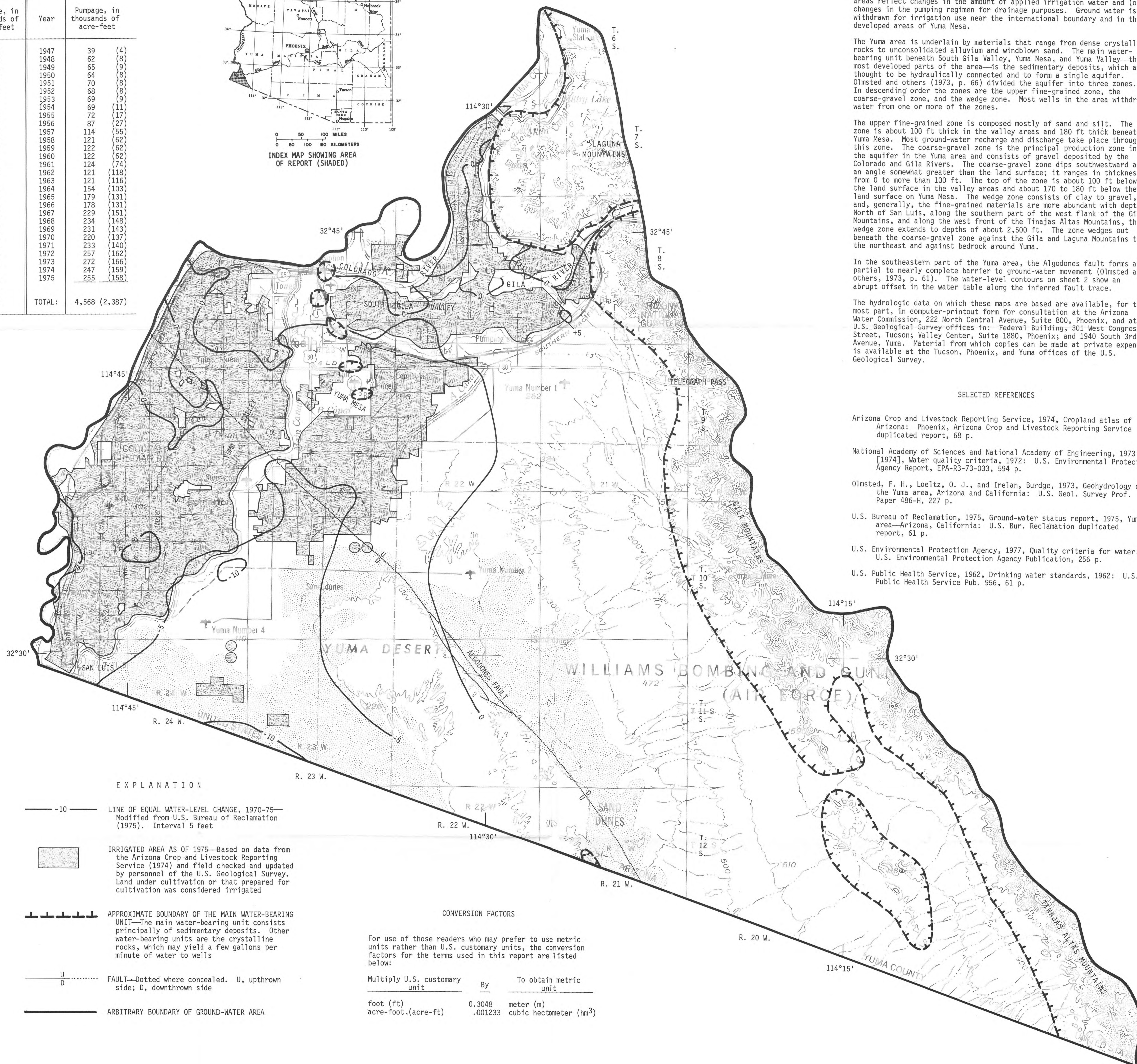
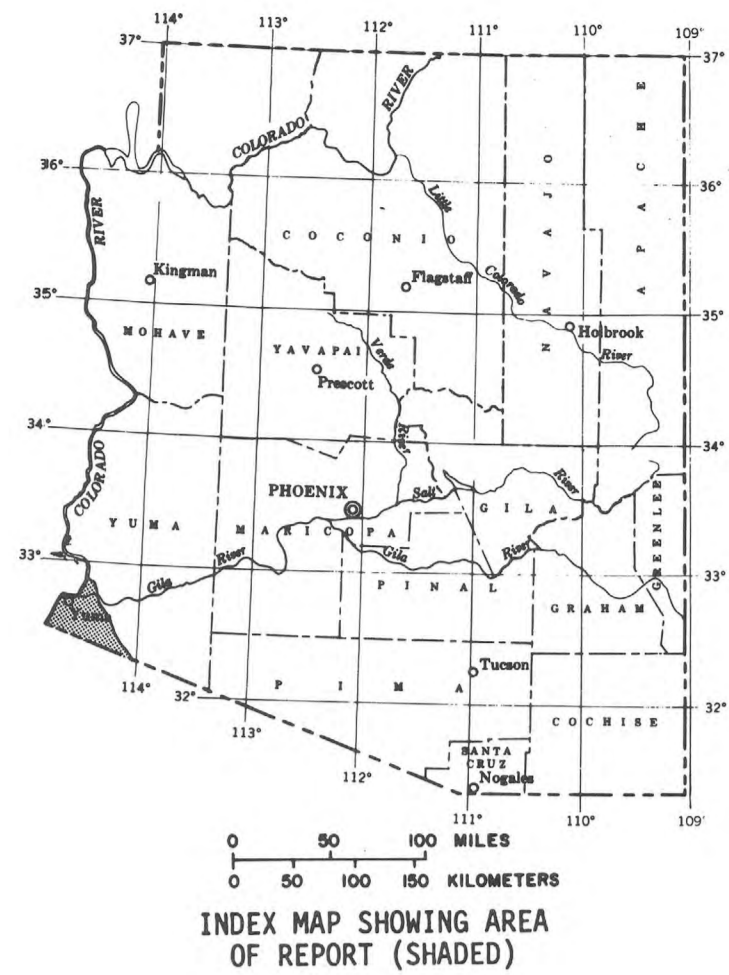


ESTIMATED GROUND-WATER PUMPAGE
IN THE YUMA AREA

[Numbers rounded to nearest thousand acre-feet. Numbers in parentheses indicate amount of pumpage for drainage of waterlogged land; the pumpage for drainage began in 1947 in Yuma Valley, in 1961 in South Gila Valley, and in 1970 on Yuma Mesa.]

Year	Pumpage, in thousands of acre-feet	Year	Pumpage, in thousands of acre-feet
1915	2	1947	39 (4)
1916	2	1948	62 (8)
1917	2	1949	65 (9)
1918	3	1950	64 (8)
1919	4	1951	70 (8)
1920	4	1952	68 (8)
1921	4	1953	69 (9)
1922	4	1954	69 (11)
1923	4	1955	72 (17)
1924	4	1956	87 (27)
1925	5	1957	114 (55)
1926	6	1958	121 (62)
1927	7	1959	122 (62)
1928	8	1960	122 (62)
1929	9	1961	124 (74)
1930	10	1962	121 (118)
1931	11	1963	121 (116)
1932	12	1964	154 (103)
1933	13	1965	179 (131)
1934	14	1966	178 (131)
1935	15	1967	229 (151)
1936	16	1968	234 (148)
1937	17	1969	231 (143)
1938	18	1970	220 (137)
1939	19	1971	233 (140)
1940	19	1972	257 (162)
1941	20	1973	272 (166)
1942	21	1974	247 (159)
1943	22	1975	255 (158)
1944	20		
1945	22		
1946	32		
TOTAL:		4,568	(2,387)



EXPLANATION

- 10 LINE OF EQUAL WATER-LEVEL CHANGE, 1970-75—Modified from U.S. Bureau of Reclamation (1975). Interval 5 feet
- IRRIGATED AREA AS OF 1975—Based on data from the Arizona Crop and Livestock Reporting Service (1974) and field checked and updated by personnel of the U.S. Geological Survey. Land under cultivation or that prepared for cultivation was considered irrigated
- APPROXIMATE BOUNDARY OF THE MAIN WATER-BEARING UNIT—The main water-bearing unit consists principally of sedimentary deposits. Other water-bearing units are the crystalline rocks, which may yield a few gallons per minute of water to wells
- FAULT—Dotted where concealed. U, upthrown side; D, downthrown side
- ARBITRARY BOUNDARY OF GROUND-WATER AREA

CONVERSION FACTORS

For use of those readers who may prefer to use metric units rather than U.S. customary units, the conversion factors for the terms used in this report are listed below:

Multiply U.S. customary unit	By	To obtain metric unit
foot (ft)	0.3048	meter (m)
acre-foot (.acre-ft)	.001233	cubic hectometer (hm ³)

In the Yuma area ground water is pumped mainly for the drainage of waterlogged land and for irrigation. In 1975 about 255,000 acre-ft of ground water was withdrawn, of which about 158,000 acre-ft was pumped for drainage. For 1915-75, about 4,568,000 acre-ft was withdrawn, of which 2,387,000 acre-ft was pumped for drainage. Surface water is used for nearly all irrigation in South Gila Valley, on the northwestern part of the Yuma Mesa, and in Yuma Valley. Changes in water levels in these areas reflect changes in the amount of applied irrigation water and (or) changes in the pumping regimen for drainage purposes. Ground water is withdrawn for irrigation use near the international boundary and in the developed areas of Yuma Mesa.

The Yuma area is underlain by materials that range from dense crystalline rocks to unconsolidated alluvium and windblown sand. The main water-bearing unit beneath South Gila Valley, Yuma Mesa, and Yuma Valley—the most developed parts of the area—is the sedimentary deposits, which are thought to be hydraulically connected and to form a single aquifer. Olmsted and others (1973, p. 66) divided the aquifer into three zones. In descending order the zones are the upper fine-grained zone, the coarse-gravel zone, and the wedge zone. Most wells in the area withdraw water from one or more of the zones.

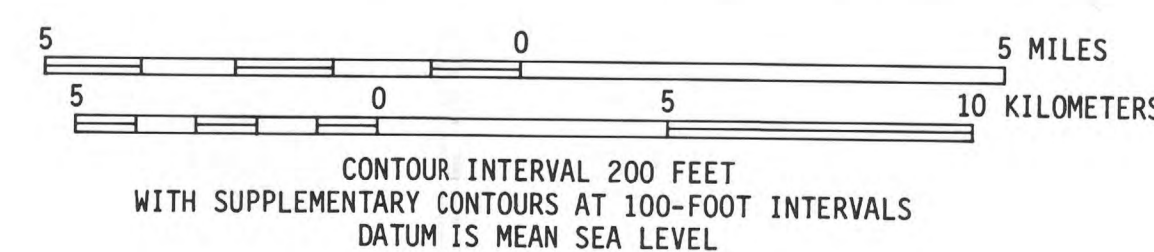
The upper fine-grained zone is composed mostly of sand and silt. The zone is about 100 ft thick in the valley areas and 180 ft thick beneath Yuma Mesa. Most ground-water recharge and discharge take place through this zone. The coarse-gravel zone is the principal production zone in the aquifer in the Yuma area and consists of gravel deposited by the Colorado and Gila Rivers. The coarse-gravel zone dips southward at an angle somewhat greater than the land surface; it ranges in thickness from 0 to more than 100 ft. The top of the zone is about 100 ft below the land surface in the valley areas and about 170 to 180 ft below the land surface on Yuma Mesa. The wedge zone consists of clay to gravel, and, generally, the fine-grained materials are more abundant with depth. North of San Luis, along the southern part of the west flank of the Gila Mountains, and along the west front of the Tinajas Altas Mountains, the wedge zone extends to depths of about 2,500 ft. The zone wedges out beneath the coarse-gravel zone against the Gila and Laguna Mountains to the northeast and against bedrock around Yuma.

In the southeastern part of the Yuma area, the Algodones fault forms a partial to nearly complete barrier to ground-water movement (Olmsted and others, 1973, p. 61). The water-level contours on sheet 2 show an abrupt offset in the water table along the inferred fault trace.

The hydrologic data on which these maps are based are available, for the most part, in computer-printout form for consultation at the Arizona Water Commission, 222 North Central Avenue, Suite 800, Phoenix, and at U.S. Geological Survey offices in: Federal Building, 301 West Congress Street, Tucson; Valley Center, Suite 1880, Phoenix; and 1940 South 3rd Avenue, Yuma. Material from which copies can be made at private expense is available at the Tucson, Phoenix, and Yuma offices of the U.S. Geological Survey.

SELECTED REFERENCES

- Arizona Crop and Livestock Reporting Service, 1974, Cropland atlas of Arizona: Phoenix, Arizona Crop and Livestock Reporting Service duplicated report, 68 p.
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