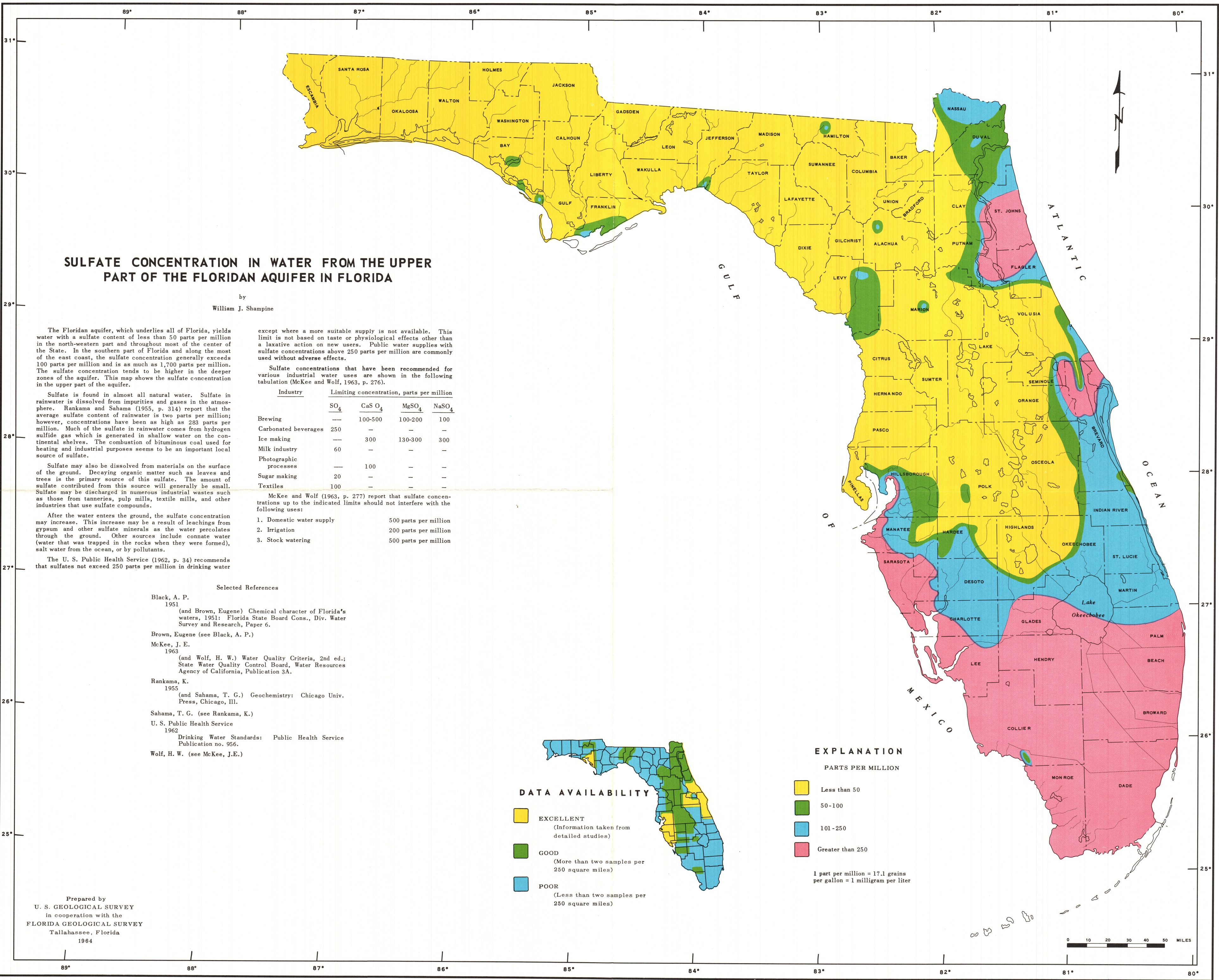




**SULFATE CONCENTRATION IN
WATER FROM THE UPPER PART OF
THE FLORIDAN AQUIFER IN FLORIDA**

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The Floridan aquifer, which underlies all of Florida, yields water with a sulfate content of less than 50 parts per million in the north-western part and throughout most of the center of the State. In the southern part of Florida and along the most of the east coast, the sulfate concentration generally exceeds 100 parts per million and is as much as 1,700 parts per million. The sulfate concentration tends to be higher in the deeper zones of the aquifer. This map shows the sulfate concentration in the upper part of the aquifer.

Sulfate is found in almost all natural water. Sulfate in rainwater is dissolved from impurities and gasses in the atmosphere. Rankama and Sahama (1955, p. 314) report that the average sulfate content of rainwater is two parts per million; however, concentrations have been as high as 283 parts per million. Much of the sulfate in rainwater comes from hydrogen sulfide gas which is generated in shallow water on the continental shelves. The combustion of bituminous coal used for heating and industrial purposes seems to be an important local source of sulfate.

Sulfate may also be dissolved from materials on the surface of the ground. Decaying organic matter such as leaves and trees is the primary source of this sulfate. The amount of sulfate contributed from this source will generally be small. Sulfate may be discharged in numerous industrial wastes such as those from tanneries, pulp mills, textile mills, and other industries that use sulfate compounds.

After the water enters the ground, the sulfate concentration may increase. This increase may be a result of leachings from gypsum and other sulfate minerals as the water percolates through the ground. Other sources include connate water (water that was trapped in the rocks when they were formed), salt water from the ocean, or by pollutants.

The U. S. Public Health Service (1962, p. 34) recommends the sulfates not exceed 250 parts per million in drinking water except where a more suitable supply is not available. This limit is not based on taste or physiological effects other than a laxative action on new users. Public water supplies with sulfate concentrations above 250 parts per million are commonly used without adverse effects.

Sulfate concentrations that have been recommended for various industrial water uses are shown in the following tabulation (McKee and Wolf, 1963, p. 276).

Industry	Limiting concentration, parts per million			
	SO ₄	CaSO ₄	MgSO ₄	NaSO ₄
Brewing	—	100-500	100-200	100
Carbonated beverages	250	—	—	—
Ice making	—	300	130-300	300
Milk industry	60	—	—	—
Photographic processes	—	100	—	—
Sugar making	20	—	—	—
Textiles	100	—	—	—

McKee and Wolf (1963, p. 277) report that sulfate concentrations up to the indicated limits should not interfere with the following uses:

1. Domestic water supply 500 parts per million
2. Irrigation 200 parts per million
3. Stock watering 500 parts per million

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DATA AVAILABILITY

- Information taken from detailed studies
- More than two samples per 250 square miles
- Less than two samples per 250 square miles

EXPLANATION**PARTS PER MILLION**

- Less than 50
- 50-100
- 101-250
- Greater than 250

1 part per million = 17.1 grains per gallon = 1 milligram per liter

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