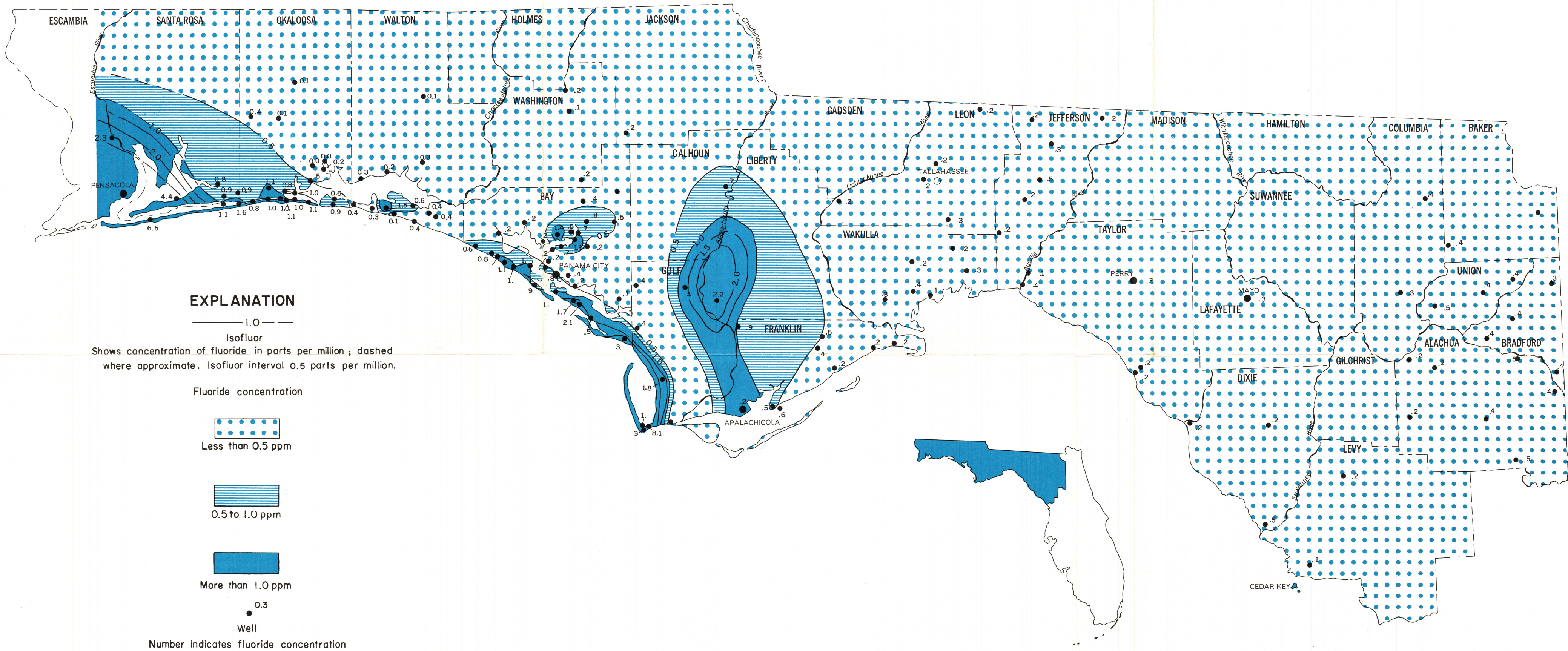




FLUORIDE CONTENT OF WATER FROM
THE FLORIDAN AQUIFER
OF NORTHWEST FLORIDA
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Fluoride in drinking water can aid in the prevention of dental caries in children (U.S. Public Health Service, 1962). Low concentrations have no apparent effect and high concentrations may cause mottled enamel known as dental fluorosis. The optimum fluoride concentration will be within the range 0.5 to 1.7 parts per million and will vary with air temperature. A lower fluoride concentration in drinking water is considered optimum in areas of high air temperatures than in areas of low air temperatures because normally more water is consumed by an individual in areas of high air temperatures. Therefore, the total fluoride intake in a warm area where the concentration is low, will be approximately the same as in a cooler area where the concentration is somewhat higher.

The U.S. Public Health Service (1962, p. 8) recommends fluoride concentrations as follows:

Annual averages of maximum daily air temperatures ^{1/}	Recommended control limits		
	Fluoride concentration in ppm		
	Low	Optimum	Upper
50.0-53.7	0.9	1.2	1.7
53.8-58.3	.8	1.1	1.5
58.4-63.8	.8	1.0	1.3
63.9-70.6	.7	.9	1.2
70.7-79.2	.7	.8	1.0
79.3-90.5	.6	.7	.8

^{1/}Based on temperature data obtained for a minimum of five years.

The annual average of maximum daily air temperature for 3 stations in Northwest Florida reported by the U.S. Weather Bureau were: Pensacola, 74.7°F; Tallahassee, 77.6°F; and Perry, 80.0°F. These averages are for the five-year period, 1958-1962.

The recommended limits of fluoride concentration in Northwest Florida will vary slightly, depending on the air temperatures; however, the limits will be between 0.5 and 1.0 ppm. Areas in which water from the Floridan aquifer has fluoride concentrations

within the recommended limits are shown by diagonal lines on the map. Areas of lower than recommended fluoride concentrations are shown by dots, and areas of higher than recommended concentration are shown by solid color. Data for Santa Rosa, Okaloosa and Walton counties were taken from Barraclough and Marsh (1962), modified slightly where more recent data were available. The locations of all wells sampled and the concentration of fluoride in parts per million are shown on the map.

The concentrations shown on the map do not reflect the fluoride content of water from a single geologic horizon. In Northwest Florida, the Floridan aquifer consists of a thick sequence of limestone which locally may be intergraded and interlayered with smaller amounts of sand and clay. The rocks forming the Floridan aquifer are exposed at the surface in the eastern and northern parts of the area. In the southwestern gulf coast area of Florida, the rocks dip beneath the surface and the top of the aquifer is about 260 feet below the surface near Panama City and about 1,200 feet below the surface near Pensacola. Generally, the wells penetrated only the upper part of the Floridan aquifer. Well depths are generally greater near the Coast because the rocks lie farther beneath the surface. Some of the data obtained suggest that the fluoride content of the water may increase with depth.

Possible sources of fluoride in groundwater are naturally-occurring minerals that contain fluoride, such as phosphate minerals, topaz, tourmaline, mica, glauconite, fluorite, and possibly others (Carleton, 1942; LaMoreaux, 1948; Sinnott, and Whetstone, 1962). Of these, glauconite, mica, and phosphate minerals have been found in significant quantities in the rocks of West Florida. No analytical data are presently available to determine whether any of these minerals is a principal source of the fluoride. Water samples analyzed for fluoride were also analyzed for phosphate but no correlation was found between the concentrations of the two constituents. This lack of correlation, however, does not preclude the phosphate minerals as a source of the fluoride.

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