

HYDROGEN SULFIDE IN ELEPHANT BUTTE RESERVOIR, NEW MEXICO.

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Elephant Butte Reservoir, the largest body of water in New Mexico, is the oldest of all US Bureau of Reclamation reservoirs. The reservoir was mostly oligotrophic after its impoundment in 1916 but with age and increased nutrient inputs the reservoir has become more eutrophic. High concentrations of hydrogen sulfide were found in late summer in the hypolimnion beginning in the mid-1990s. These sulfides escape through the dam tailrace causing noxious odors, health problems in dam employees, and damaging a high-quality trout fishery. There was speculation that these sulfides resulted from high water levels that had inundated geological sources of hydrogen sulfide with the anoxic hypolimnion. We studied the limnology of Elephant Butte Reservoir from 1999 through 2002. We found that these sulfides were biological rather than geological in origin. High sulfate concentrations (averaging over 100 mg/L) low iron concentrations, and a hypolimnion which is usually anoxic from August through October provide ideal conditions for biological generation of sulfide. Anoxia and sulfide are first evident in the upper portion of the reservoir, but the concentrations of sulfide increase strongly as anoxia progresses toward the dam.