

Agricultural water quality in eight off-channel reservoirs in the South Platte River Basin, Colorado

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Abstract. Water in the South Platte River, Colorado is subject to sequential reuse of over seven times before exiting into Nebraska. Currently, water in the South Platte River reservoirs downstream of Denver is primarily used for agriculture/irrigation. The waters from these reservoirs are generally acceptable for agricultural use. A variety of different water quality monitoring programs allowed us to assemble a database for 8 reservoirs. The monitoring periods were variable between reservoirs, with 10 irrigation seasons at Barr Lake and 2 irrigation seasons at Julesburg Reservoir. For this review, the irrigation season was defined as the in-reservoir water quality between the months of April and September. There was an increasing trend in the in-reservoir electrical conductivity in a downstream direction, but none of the waters have significant water quality restrictions for irrigation with regard to salts. All of the reservoirs have an annual algal bloom; these blooms are related to nutrients in the reservoirs (nitrogen and phosphorus species). There were no trends in the nutrient concentrations between reservoirs. Based upon decreasing in-reservoir nutrient concentrations over the irrigation season, the reservoirs appear to act as nutrient sinks. Whether the nitrogen is lost as a gas (N_2), or like the phosphorus, taken up in biologic activity, or precipitated was not examined in this review. If (or when) agricultural water rights are changed to urban uses, it may be required that the impacts on in-reservoir water quality may also need to be considered in conjunction with those changed water rights.