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Impact of copper-containing algicide on nitrogen cycling in freshwater reservoir sediments

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Citrine is a copper-containing algicide used for the control of algal blooms in water reservoirs. Accumulation of Cu in reservoir sediments is a noted consequence of Citrine application, but the impact of Cu on mineral N availability and cycling in reservoir sediments is unknown. Denitrification (conversion of NO_3 into N_2O and N_2) and dissimilatory nitrate reduction to ammonia (DNRA, conversion of NO_3 into NH_4) are two processes that are likely in the low- O_2 and C-rich environment encountered in most reservoir sediments. Their relative dominance could determine the long term N status of the reservoir with DNRA leading to a greater N retention and denitrification providing complete N removal from the sediment. In ECR sediment, then the Citrine treatment would in the long-term exacerbate the nutrient problem. Conversely, if with increased sediment Cu content, denitrification is stimulated, then the Citrine treatment would have a positive impact on the control of nutrient enrichment. Field and laboratory experiments data will be presented, and relationships with Cu forms and speciation will be discussed.