

Dynamics of biogeochemistry of sulfur in Lake Maninjau

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Abstrak

A natural phenomenon called as tubo belerang had occurred repeatedly in Lake Maninjau where the sulfide odorous water was apparent causing massive fish kill. Sulfur biogeochemistry in sulfur rich lakes can be critical when inputs of organic matter are high as in Lake Maninjau which has been exploited by floating cage fishery. The objective of the research is to study the biogeochemistry of sulfur in Lake Maninjau and to determine what factors might initiate the natural phenomenon occurrence. The Oxycontin layer had Sheffield from the depth of 20-40 m in 2006 to the depth of 10-20 m in 2008. The dynamics of biogeochemistry of sulfur in Lake Maninjau could be perceived from Sulfide profiles where increasing Sulfide concentrations detected annually. Higher Sulfide concentrations produced indicating more sulfate was reduced in the hypothalami layer. Sulfide concentration reached at level of 5 mg/L in the pore water of sediment. The toxic hydrogen sulfide concentrations were 10 - 120 ug/L. Sulfate concentrations ranged from 4 to 16 mg/L. Based on the pH values, the sulfur species H₂S and HS were present in the lake water. Most of sulfur in Lake Maninjau were deposited in the sediment as iron Sulfide solids. The accumulation of organic matter in the hypothalami in the deepest part of the lake and Sheffield Oxycontin layer in four year observation periods indicated that the effect of floating cage fishery on the lake conditions was apparently atrocious. Increased in concentration of organic matter could play an important role on the dynamic of biogeochemistry of sulfur in Lake Maninjau and could be one of the major causes that might trigger the tubo belerang occurrence.