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Pit lakes of the Central German lignite mining district: Creation, morphometry and water quality aspects

Dedicated to Prof. Dr. Walter Geller on the occasion of his 65th birthday anniversary

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Abstract

About 140 pit lakes exist in Central Germany. These have resulted from lignite mining and are important parts of the post-mining landscape in the Central German lignite mining district. Their water quality is mainly influenced by the consequences of pyrite oxidation, i.e., acidification or results of natural or artificial neutralization. The major way of filling as well as a cheap and successful measure against acidification was the diversion of river water into the lakes or their filling with neutral water from mines still operating. Eutrophication, contamination by industrial pollutants and infection with pathogens imported with river water were found to be unimportant threats for the pit lakes in the

Central German lignite mining district. Intrusion of naturally saline groundwater from deeper underground resulted in some cases in elevated concentrations of sodium chloride and in meromixis. The diverse uses of the lakes (e.g. recreation, nature conservation, water management) indicate that the pit lakes fulfil widely the typical functions of lakes in a landscape. The creation, the current state of water quality and lessons learned in water quality management are reported upon for the pit lakes of the Central German lignite mining district.



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Keywords

Pit lake; Lignite mining; Acidification; Remediation; Eutrophication; Trace contaminants; Saline groundwater; Water management

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