

THE USE OF IN-SITU SENSOR TO OBSERVE THE SOIL MOISTURE IN MINING-INFLUENCED POLDER AREAS

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The impact of mining activities on surface ecology involves the influence on several ecological components, such as soil, water, and vegetation. Especially vegetation is due to a geo-monitoring process using vegetation indices from drone or satellite data. Given the limited understanding of the synergistic patterns of changes in the water-soil-vegetation ecological elements under the influence of coal mining in the western regions, particularly in the Ruhr area at the Prosper-Haniel mine site, this study examines the impact of coal mining on surface ecology, with a focus on the distribution of soil moisture across different land-use classes (forest, agriculture, meadow).

The aim is to produce a sorrow understanding on the ecological processes to reduce work to remote sensing as a base for a frequent geo—monitoring. The work helps to generate the relevant process understanding.

In 2021, the first measurements of soil moisture were taken at eight locations (at a depth of 5 cm), alongside the construction of weather stations to verify climate data. The study also analysed the interactions between soil moisture and soil temperature at these locations.

Thanks to the application of long-term monitoring, it is possible to present the annual variations in soil moisture at the measurement points in the form of graphs. These values serve as a basis for monitoring the environmental impact of coal mine subsidence over the years. It contributes to a possibly optimized polder management using frequent remote sensing data and integrate them with the generated process understanding.

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