



## Stygos - A Board Game Depicting the Challenging Life of Underground Organisms

Julia Becher<sup>1</sup>, **Mareike Galle**<sup>2</sup>, and Moritz Haene<sup>3</sup>

<sup>1</sup>Martin-Luther-University, Institute for Geoscience and Geography, Applied Geology, Von-Seckendorff-Platz 3, 06120 Halle (julia.becher@geo.uni-halle.de)

<sup>2</sup>Burg Giebichenstein University of Art and Design Halle, Neuwerk 7, 06003 Halle (Saale)

<sup>3</sup>Martin-Luther-University, Institute for political science, Emil-Abderhalden-Str. 26-27 06108 Halle (Saale)

Beneath the surface, concealed in the darkness beneath our feet, a complex and captivating ecosystem exists, largely unbeknown to the majority of people. In an environment devoid of light, characterized by cold temperatures, limited food supply, low oxygen concentrations, and limited space, the challenge of survival is profound. The authors seek to embark players on an enthralling journey through the life of a groundwater organism (Stygobiont), exploring this fascinating and hidden ecosystem and demonstrating its dependence on decisions made above ground.

The game design follows a round-based structure where players navigate along the board, comprised of different layers representing various underground settings. Their objective is to fulfill tasks (action cards) to earn points. Aquifer organisms move within different layers, reflecting diverse aquifer structures, land use settings, and the needs of these organisms. Players assume the roles of cooperative companions, assisting stygobionts in navigating their lives. When encountering a groundwater ally, players face critical decisions addressing the stygobionts' questions: Where can they find food? How much oxygen is crucial for survival? How should they spend their day—resting, swimming, or digging? How to deal with environmental disturbances? Through the use of action cards, various environmental events impact groundwater life, including temperature shifts due to climate change, contaminant pollution from agricultural practices or urbanization, and groundwater depletion resulting from human overuse. The players' task is to make decisions that will not only benefit the organisms but also contribute to their collective mission: maintaining water purity.

The overarching goal of the project is to create an easy-to-understand board game suitable for both children and adults, playable in workshops, teaching units, or at home. The game's design not only seeks to educate players about the diversity and complexity of groundwater ecosystems but also emphasizes how human decisions and events above ground profoundly impact the underground environment. Simultaneously, players gain insights into the vital functions of groundwater ecosystems, such as water purification.

This game presentation marks the initial phase of development. Embedded in the project "Stygos-Grundwasserleben," funded by iDiv (Deutsches Zentrum für integrative Biodiversitätsforschung

Halle-Jena-Leipzig), which incorporates outreach activities to engage people interactively with groundwater ecosystems, the authors aspire to raise awareness about groundwater ecology and fostering a greater understanding among players of their role in preserving this vital natural resource.