

The Vonarskard geothermal system, central Iceland: An oasis in the desert

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The Vonarskard geothermal system presents a unique opportunity to study the interplay between hydrogeology, water chemistry and microbial diversity. The presence of an unusually high groundwater table superimposed on an active geothermal system in an otherwise dry and barren area results in abundant surface water that is a mixture of non-thermal water, boiled geothermal reservoir fluid and condensed geothermal steam. Various degrees of mixing lead to large temperature, chemical and redox gradients, and offer a vast range of possible habitats within a relatively small area. Indeed, abundant and diverse microbial growth can be found in many springs and streams.

Here we present an overview of the water chemistry of the area, as well as selected examples of the *Archea* and *Bacteria* communities determined in various geothermal water types. The sampled water ranged from 3 to 98°C, pH 2.15 to 9.95 and total dissolved solids from 323 to 2250 ppm. Changes in water temperature, chemistry and redox conditions were found to mirror changes in microbiological species determined. Furthermore, we examine the energy potentially available to microbial metabolism from inorganic redox reactions.