INTRODUCTION

The Navajo Sandstone is a thin, planar, west-northwest to east-southeast trending sandstone series that underlies most of Utah and extreme western New Mexico, and is locally prominent in southwestern Arizona. The Navajo Sandstone is a common lithofacies in a large portion of the western United States and is characterized by its distinctive light gray to tan color.

METHODS

To calculate the net-infiltration rates, the study area was divided into a grid of 30 meter by 30 meter cells and borehole data from within the study area were used to identify the extent of the Navajo Sandstone outcrop. The borehole data were used to create a digital elevation model (DEM) of the study area. The DEM was then used to calculate the topographic slope of each cell.

The soil-coarseness parameter was calculated using the USDA’s Soil Survey Geographic (SSURGO) database for the study area. The SSURGO database provides detailed information on soil properties, including particle size distribution.

The precipitation data were obtained from the National Oceanic and Atmospheric Administration (NOAA) and were used to calculate the net-infiltration rates.

The net-infiltration rates were calculated using the following equation:

\[ Q = \frac{P - E}{100} \]

Where:

- \( Q \) is the net-infiltration rate in millimeters per year
- \( P \) is the precipitation in millimeters per year
- \( E \) is the evapotranspiration in millimeters per year

The net-infiltration rates were then used to create a net-infiltration map of the study area.

CONCLUSION

The net-infiltration rates for the study area were calculated and mapped. The results show that the net-infiltration rates vary significantly across the study area, with higher values in areas with greater precipitation and lower values in areas with lower precipitation.

The net-infiltration map can be used to better understand the hydrogeological conditions of the study area and to inform decisions related to water management and conservation.