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SITE SELECTION CRITERIA FOR SPACE ANALOGS: JORDAN SPACE RESEARCH INITIATIVE
CASE STUDY

Abstract

This paper aims to compare site selection criteria for architectural projects on Earth and in space, by focusing on the case study of selecting a site for the Jordan Space Research Initiative's analog site in the Jordanian desert.

The site selection criteria for any architectural project on Earth is highly influenced by the topographical conditions of a location, in addition its access to utilities and insusceptibility to environmental hazards. Other considerations include land availability, as well as social issues that may influence the project's location and functions. Site selection criteria should take into consideration the direct and lasting impacts it can have, not only on its surrounding community, but also on the economic and natural resources of the country, as well as the foreseen impact of its construction and operation. All of these factors play a major role in the site selection for an architectural project on Earth, however some of them may not directly apply to space, or a terrestrial space analog.

An analog site must adhere to many of the factors required for Earth architecture, while simultaneously aiming to simulate life in a space habitat off Earth. As they are designed to identify and solve the challenges of living in extreme environments, additional factors must be considered. The site selection research stage of a Moon or Mars analog defines the extent to which a space simulation can accurately reflect life on extraterrestrial surfaces. In the case of Jordan, the Wadi Rum desert is a particularly interesting location to consider as the JSRI analog site. It is known as the "Valley of the Moon" due to its geological and aesthetic characteristics, which resemble an alien terrain. Wadi Rum holds great cultural significance and is inscribed as a UNESCO World Heritage site. It is a natural reserve, long inhabited by the local indigenous community known as the Bedouins. Therefore, culture is an essential factor in the JSRI site selection. Other considerations include legal and governmental permissions, land availability, as well as the types of missions that will be carried out by JSRI.

In order to select a space analog site in Jordan, JSRI will investigate Wadi Rum as the main case study, while exploring other potential sites in the Jordanian desert. By building on the typical architectural considerations for sites on Earth, a deeper understanding of space analog factors can be developed, and further translated to a space environment.