Background and Geologic Setting

The Black Hills represent a spatial extension of the Trans-Hudson Orogen, an ancient orogenic belt that extends from the Trans-Hudson Orogen in Canada, through the Black Hills of South Dakota, and into the Bighorn Basin of Wyoming. The Black Hills represent a large-scale tectonic event that resulted in the formation of an orogenic gold province. The gold deposits in the Black Hills are associated with the Trans-Hudson Orogen and are located within the Bighorn Basin, a region that experienced tectonic activity during the Proterozoic Era.

Methods

The authors developed a comprehensive dataset consisting of 150 samples from the Black Hills. This dataset includes zircon U-Pb and Hf isotopic analyses, which were used to infer the tectonic setting of the gold deposits. The authors also employed advanced geologic mapping techniques, including aeromagnetic surveys and high-resolution mapping, to identify potential exploration targets.

Comparisons With Great Basin Tectonic History

The Black Hills gold province is similar to the Great Basin gold province, which is located in Nevada and Utah. Both provinces are characterized by the presence of orogenic gold deposits associated with the Trans-Hudson Orogen and the Trans-Cordilleran Orogen, respectively. The authors compared the Black Hills gold province to the Great Basin gold province to better understand the tectonic framework and identify potential exploration targets.

Conclusions

The Black Hills gold province is a significant orogenic gold deposit that is similar to the Great Basin gold province. The authors recommend that further exploration be conducted in the Black Hills to identify additional gold deposits. The results of this study will be useful for exploration companies and government agencies seeking to develop new mining opportunities in the Black Hills region.

References

1. U-Pb dating of zircon from the Black Hills indicates a significant age range, with the majority of ages falling between 1.8 and 2.0 Ga. This age range suggests that the gold deposits in the Black Hills are associated with the Trans-Hudson Orogen.

2. The authors used high-resolution mapping techniques to identify potential exploration targets in the Black Hills. This mapping identified several areas that are considered to be prospective for orogenic gold deposits.

3. The authors compared the Black Hills gold province to the Great Basin gold province to better understand the tectonic framework and identify potential exploration targets. This comparison revealed similarities between the two provinces, which suggests that similar exploration strategies could be applied to both regions.