




SOUTH DAKOTA MINES

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Department of Geology and Geological Engineering GGE Research Highlights...

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SDSM&T Geology & Geological Engineering
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GGE Research Highlights...

MS Geology student Michael Day is using reflectance spectroscopy of white micas to map metamorphic intensity in the Black Hills.

White mica minerals have an absorption feature in the near infrared that results from the bond between Aluminum (Al) and hydroxyl (OH). The wavelength of the Al-OH feature varies based on how much Aluminum is in the mica crystals. The compositional variation of the micas can be used to map alteration patterns resulting from ore bodies or metamorphism.

Michael collected rock spectra throughout the Black Hills using a portable spectrometer (TerraSpec Halo). This involved spending many field days traveling the Black Hills National Forest to locate rock outcrops. At each outcrop, he would scan hand samples with the spectrometer to view and store the rock's spectrum.

In the office, he manually analyzed the field spectra to determine the wavelength of the Al-OH feature. The 1,952 field samples are then plotted on a map and analyzed using ArcGIS to investigate regional trends in white mica compositions.

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