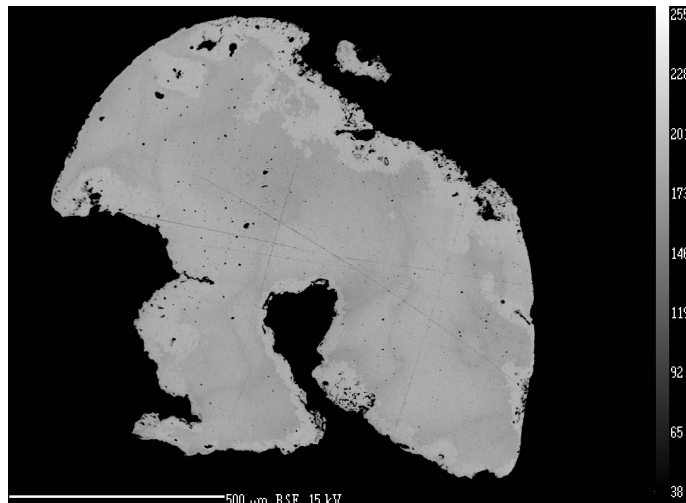

Gallery of Geology

Trace Element Analysis of Placer Gold

Tiffany Luterbach



The image on the left shows a photograph of a placer gold grain obtained through panning from Pinos Altos, NM. The image on the right is a backscattered electron (BSE) image of the same placer nugget. The various shades of gray in the right image

illustrates chemical zonation throughout the grain. The light gray rim, for example, indicates silver depletion. These images are being used for thesis research concerning the trace element analysis of placer gold to determine its bedrock source.

Trace element analysis of placer gold can be used as a valuable exploration tool in order to determine bedrock (lode gold) source areas. Placer gold collected from multiple districts in New Mexico, coupled with a broad database of previously analyzed placer gold samples, indicate correlations between chemical signatures (especially gold, silver, and copper) and type of deposits (i.e., Au-rich copper porphyry deposits, Au porphyry deposits, and epithermal deposits). By completing a chemical analysis and determining the particle morphology of placer gold collected from these districts using an electron microprobe, patterns in the chemical signatures from each location can be used to examine chemical variability 1) within the individual placer gold particles, 2) within the same district and 3) among different districts. This research is being completed by Tiffany, a graduate student originally from Houston, Texas, who is currently attending New Mexico Institute of Mining and Technology in the Mineral Engineering department focusing on mineral exploration.