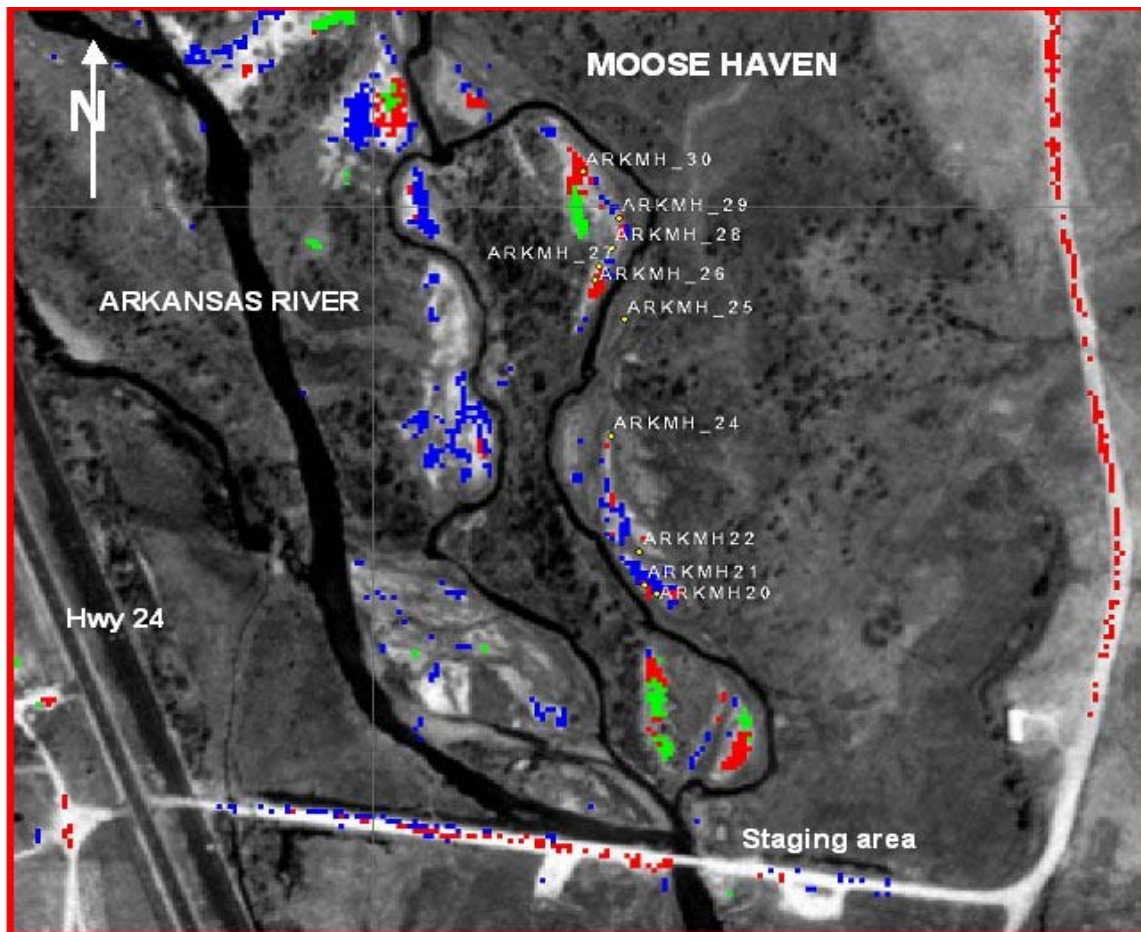


The Use of Hyperspectral Remote Sensing to Identify Evidence of Acid Mine Drainage

This NASA-funded research and technology-demonstration project focuses on the use of hyperspectral remote sensing to map acid generating minerals and their attendant pH zones, to identify streambed precipitates that reflect water quality, and to detect the relative contributions of natural and anthropogenic sources of acid drainage within a watershed. The Arkansas River Flood Plain study area involves working with mine wastes as disseminated tailings along the river banks. Tailings deposited along the upper Arkansas River are of concern for environmental purposes not only for siltation effects, but also for contained metals that can leach into the wetlands and river. Sulfate blooms (aluminite (Al), Amarantite (Fe). Copiapite, melanterite and jarosite) are seen in many places during drier weather, indicating that metals could be being mobilized from the tailings and flushed during wet periods. There has been more neutralization by the carbonate gangue materials in the Leadville District.



SpecTIR's hyperspectral mineral classification image of the Moose Haven area, Leadville district, Colorado. This was flown at 3 meter spatial and 10nm resolutions. Pixel classifications: Red = iron minerals and tailings; blue = tailings; green = river clays. This area is located 15 kilometers south of Leadville, Colorado, just east of Highway 24. Most sample sites lie on the east side of the river for ease of access with the spectrometer. The clays and tailings are intimately related and required the higher resolution to discriminate the tailings.