

## Poster

### **Mapping mining heaps using multi- and hyperspectral remote sensing: A case study in the Mansfelder Land region in Central Germany**

MICHAEL DENK<sup>1</sup>, CORNELIA GLÄBER<sup>1</sup>

<sup>1</sup> Martin Luther University Halle-Wittenberg, Institute of Geosciences and Geography, Department of Remote Sensing and Cartography, Von-Seckendorff-Platz 4, 06120 Halle, Germany

#### **Abstract (Poster)**

Anthropogenic deposits are of increasing interest for scientists, economists and politicians in the context of urban mining, meaning the detection and reuse of materials of potential economic importance. Such deposits encompass old mining heaps and industrial dump sites.

The Mansfelder Land region is well known for its copper and salt mining history. Copper slate was mined and processed for more than 800 years while potash salt mining has taken place since the end of the 19th century. Relics of these mining activities are multitudes of heaps and dump sites of different ages and dimensions depending on the corresponding mining and deposition technologies.

Since the dump site locations and the mining history of this region are well documented, this area is a suitable test site for the application of multi- and hyperspectral remote sensing approaches for the detection and mapping of corresponding deposits and potentially associated raw materials in less documented and less explored regions in a global context.

Aims of this study are the detection and mapping of dominant dump materials like low-grade copper slate, carbonates, slag from copper slate processing and potash materials. For this purpose, ASTER and WorldView-2 satellite images as well as hyperspectral AISA Dual airborne data were used. Image analyses are aided by field and laboratory reflectance measurements along with further reference data.

The satellite images as well as the hyperspectral images have been radiometrically and geometrically corrected. In addition, high resolution digital terrain models were used for BRDF correction and to assist image interpretation. Afterwards, mineralogical indices and band ratios as well as different classification algorithms were tested.

The results show that satellite remote sensing is beneficial for a first screening of large scale dump site landscapes, allowing the identification of specific dump types and a coarse quantitative categorisation with only few reference data and field measurements.