

Mapping the Pyritic Sludge Spill of the Aznalcóllar Mine by the use of Airborne Daedalus 1268 Data

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The failure of the Aznalcóllar mine impoundment in April 1998, holding several million tons of pyrite stockpile, flotation tailings and acid water, produced a slurry flood along the Agrio river, a tributary of the Guadiamar which drains Doñana National Park. The fine-grained sulfide deposit covered 2600 ha of riverbanks and adjacent farmlands, extending to the upper Entremuros area, 45 km downstream from the mine. Removal of the pyritic sludge was carried out by mechanical methods.

Three multispectral airborne surveys (Daedalus-1268) were performed over the affected area in different periods to evaluate the efficiency of this system for monitoring soil condition during and after the sludge removal. Geometric and radiometric corrections were applied to the data. Chemical, mineralogical and spectral reflectance analyses on the pyritic sludge and its alteration products have permitted to interpret multispectral data. Digital classification has allowed mapping the pyritic sludge as well as the highly soluble efflorescence salts which present a high acidity potential. Detailed maps, at 1:10 000 scale, of the remnant sludge deposits and alterations have been produced and were used to monitor the progression of the pyritic sludge removal at different steps.