The potential of remote sensing for assessing urban contamination levels around a legacy mining zone

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Introduction

Populations in legacy mining areas are exposed to dangerous levels of contamination. The ability to remotely and extensively map contaminant levels using multispectral remote sensing could be an important contribution to public health, especially in developing country contexts, allowing risk assesment and more targeted risk reduction and remediation efforts. This potential would be amplified by the growing availability of multispectral satellite imagery, and the dropping costs of unmanned aerial vehicles (UAVs) with multi- and even hyper-spectral sensors, which greatly increase resolution and availability. Our team has been assessing the challenges and potential of remote sensing analytic techniques, both traditional and more cutting-edge, to map contaminant levels and impacts [1, 2, 3]. In particular, we used multispectal imagery and X-ray fluorometry (XRF) field measurements to evaluate the possibility of predicting contamination levels in the urban areas adjacent to Kabwe, Zambia, where nearly a century of unregulated lead (Pb) and zinc (Zn) mining left extensive and extremely high contaminant levels.

Results

We will report on our efforts at Kabwe to develop and validate multispectral image classification models calibrated with ground data, assess their ability to predict contamination levels, and reflect on their potential for single sites and generalizability between sites, where contaminant, contaminant matrix, lithology, and soils may differ.

[1] Garb & Davis (2013) *Final Report to Blacksmith Inst*. [2] Davis & Garb *in review*. [3] Friedlander, et al. *in review*.