

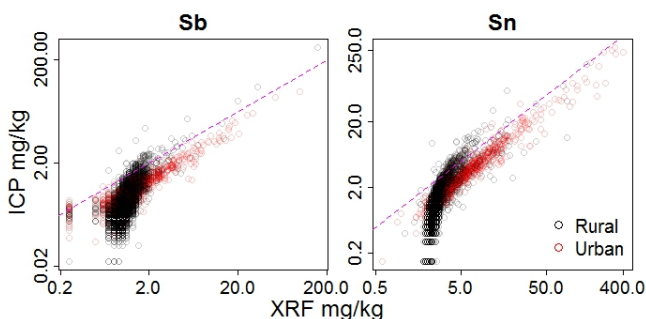
## Novel method for identifying element mobility in soil

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A novel method for identifying behavioural mechanisms of potentially toxic elements (PTEs) has been identified. The Tellus soil geochemical data set consists of almost 8000 samples taken across Northern Ireland and analysed by two methods; inductively coupled plasma (ICP) following an aqua regia acid extraction and x-ray fluorescence (XRF). This study hypothesises that by comparing the concentrations measured by these two methods information regarding the mobility of the elements can be deduced. ICP measurements depend on the acid extraction, meaning they will be relatively greater where the element exists in an extractable form in the soil, while XRF is said to measure total concentrations. Mobility, in turn, gives an indication of potential health risks, as elements which are more mobile in the environment are also more bioavailable to living organisms.

A number of interesting mechanisms have been identified for two PTEs under investigation; antimony (Sb) and tin (Sn). When the spatial distribution of the ratio between the two analytical methods was examined, land use and soil type were identified as two main controlling factors. Urban and rural areas showed very different relationships (figure 1), as did areas of peat. Investigations have suggested that areas of peat are acting as a sink for these PTEs, implying that geochemical ratios can be used as a method by which to map peat health.



**Figure 1:** Logarithmic plots of XRF against ICP for Sb and Sn with rural samples in black, urban samples in red and dashed line showing where the two methods are equal