

# Spatial variation in soil geochemistry at regional, field and micro scales: New opportunities and challenges

Maynooth University Department of Geography invites you to attend a seminar by:

**Dr Chaosheng Zhang**      **School of Geography and Archaeology & Ryan Institute**  
NUI Galway

**Date:** March 1st

**Time:** 4.00pm to 5.30pm

**Location:** Rocque Lab, Rhetoric House



This presentation discusses the latest understanding of spatial variation in soil geochemistry at various scales, the uses of advanced spatial analysis techniques to quantify the variation, as well as the new challenges which go beyond academic research in the era of big data. Spatial variation in soil geochemistry have been found at all the scales of regional (in square kilometers), field and micro scales (in square centimeters). The techniques of local statistics, hotspot analysis and spatial correlation are explained and applied to soil geochemistry. One of the focuses is the use of local index of spatial association (LISA) and its applications in urban geochemical studies in Galway, Ireland and London, the UK. The

LISA is a useful tool for identifying pollution hotspots and classifying them into spatial clusters and spatial outliers. The results were affected by the definition of weight function, data transformation and existence of extreme values. It is suggested that all the influencing factors should be considered until reasonable and reliable results are obtained. The new opportunities have arisen from the current concept of “big data”, but the challenges for stronger “data analytics” are emerging. While the assumptions for the use of parametric statistical methods are widely known, attention is needed for the requirement of spatial autocorrelation when spatial distribution maps are produced based on spatial interpolation. Furthermore, when the geochemical study results are actually applied in environmental management and agricultural practices, political and socio-economic factors are playing an important role, going far beyond academic research !

**Department of Geography Seminar Series**

**All are welcome**

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