Progress and opportunities for the use of isoscapes in forensic science

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Since the publication of the first text on isoscapes in 2010, there has been a rapid increase in the development of data sets, modeling and applications of spatial variation in stable isotope ratios. Across a large number of disciplines efforts to describe and in some cases quantitatively model spatial variation have yielded new maps of the variation, insight to processes underlying it and approaches to using these new surfaces to infer important aspects of various systems. This work combines knowledge of processes driving isotope variation across landscapes and spatially explicit sampling that permits interpolation approaches. I will discuss the expanding role isoscapes have come to play in inferring the geographic origin and other aspects of materials and highlight examples relevant to forensics where the development of both mechanistic model predictions and spatially explicit sampling are useful for the development of isoscapes. Finally, I will discuss areas where additional research is needed and suggest potential constructive paths forward.