

# **Applications of Non-Traditional Isotopes to Environmental and Human Health – A 2040 Perspective**

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The first 20 years of the 21<sup>st</sup> century saw the principles of stable isotope geochemistry expand across the periodic table, as MC-ICP-MS analyses revealed ubiquitous and at times surprisingly large natural isotope variations for elements as heavy as uranium. Exploration of these “non-traditional” isotope systems was rapid during this time of discovery and reconnaissance. However, applications focused mostly on well-established questions in the geosciences.

Few expected what happened over the next 20 years, from 2020 through 2040. Analytical innovations and a shift in federal funding toward interdisciplinary innovation spurred the development of applications in medicine, forensics, microbiology, and environmental monitoring. Today, as we approach mid-century, the vast majority of non-traditional isotope analysis occurs in these fields. Few recall the geoscience roots of this research! This presentation will review the history of these innovative applications from our vantage point in the year 2040.