Mercury Distribution in Australian Catchment Outlet Sediments at the Continental Scale

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Anthropogenic mercury (Hg) is a global pollutant capable of undergoing long-range atmospheric transport. Understanding biogeochemical controls on the spatial distribution of Hg in Australia at the continental scale with its unique biota, soil types, and climatic variables, is critical for modelling Hg emission rates and transport at regional and global scales. Surface (0-10 cm) catchment outlet sediment samples from the National Geochemical Survey of Australia (NGSA) were analysed for aqua regia soluble element content including Hg in coarse (<2 mm) and fine (<75 μm) grain-size fractions by ICP-MS analysis. We hypothesise that natural controls including soil type (organic carbon and clay content), vegetation type and climate variables (precipitation, temperature, evapotranspiration, solar radiation) explain the Hg variability at the continental scale in Australia. For this purpose, we are utilizing digital maps of the above-mentioned variables, and the NGSA continental-scale geochemical data to perform geostatistical modelling of Hg distribution at the continental scale. Our preliminary results indicate that organic carbon and selenium concentrations correlate with Hg concentrations in coastal landscapes in the cool and warm temperate bioclimatic zones of southern and eastern Australia across latitudinal and longitudinal gradients.