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Using geochemical fingerprinting to track the dispersion of radioactive contamination along coastal catchments of the Fukushima Prefecture

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Several coastal catchments located in the vicinity of the Fukushima Dai-Ichi Power Plant were impacted contaminated fallout in March 2011. Following the accident, typhoons and snowmelt runoff events transfer radiocesium contamination through the coastal floodplains and ultimately to the Pacific Ocean. Therefore it is important to understand the location and relative contribution of different erosion sources in order to manage radiocesium transfer within these coastal catchments and the cumulative export of radiocesium to the Pacific Ocean. Here we present a sediment fingerprinting approach to determine the relative contributions of sediment from different soil types to sediment transported throughout two coastal riverine systems. The sediment fingerprinting technique presented utilizes differences in the elemental geochemistry of the distinct soil types to determine their relative contributions to sediment sampled in riverine systems. This research is important as it furthers our understanding of dominant erosion sources in the region which will help with ongoing decontamination and monitoring efforts pertaining to the management of fallout radiocesium migration in the region.