Use of GIS for Predicting Areas with Seleniferous Soils and Plants. (S11-vance212700-Oral)

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Abstract:

Selenium (Se) occurs naturally in geological formations on the Fort Carson military base in southeastern Colorado. Due to erosional events, deposition of seleniferous sediments augment soil Se levels, often exceeding the suitable Se management level and creating the potential for some vegetation to accumulate Se concentrations that are of concern for food chain transfer. Our objective was to locate areas in Fort Carson where plant Se concentrations can occur at levels high enough to impact wildlife, and where programs for prevention and control of soil erosion might be implemented. Soil, geology and vegetation attributes were identified in GIS coverages for sampled descriptive units exceeding suitable Se levels (> 5.0 mg Se/kg in plants, > 0.5 mg Se/kg in soils), which were then used to project the potential for similar Se levels in comparable units that were not sampled. Plant Se levels followed the order: forbs > shrubs > grasses > trees. Plant Se uptake was not necessarily dependent upon land disturbance or Se concentration in soils; however, areas having the highest plant and soil Se concentrations were primarily coincident with areas of greatest plant productivity, plentiful water supply, and soils derived from or overlying Cretaceous shales.

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