

SOIL METAL CONCENTRATION AND PRODUCTIVITY OF BETULAL
POPULIFOLIA (GRAY BIRCH) AS MEASURED BY FIELD SPECTROMETRY AND
INCREMENTAL ANNUAL GROWTH IN AN URBAN BROWNFIELD.

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A forested brownfield within Liberty State Park, Jersey City, New Jersey, USA, has soils with arsenic, chromium, lead, zinc and vanadium at concentrations above those considered ambient for the area. Using satellite imagery and field spectral measurements, this study examines plant productivity at the assemblage and individual specimen level. Longer term growth trends (basal area increase in tree cores) were also studied. Leaf chlorophyll content within the hardwood assemblage showed threshold model for metal tolerance, decreasing significantly beyond a soil total metal load (TML) of 3.0. Biomass production (calculated with RG – Red/Green ratio index) in Betula populifolia (gray birch), the co-dominant tree species, had an inverse relationship with the Zn concentration in leaf tissue during the growing season. Growth of B. populifolia exhibited a significant relationship to TML. Assemblage level NDVI, individual tree NDVI also had significant decreases with increasing TML. Ecosystem function measured as plant production is impaired at a critical soil metal load.