

The Role of Non-Native Earthworms in the Terrestrial Bioaccumulation of Mercury at Jasper Ridge Biological Preserve

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California's geology, mining history and atmospheric deposition have led to an accumulation of the toxicant mercury in the Bay Area, with troubling implications for human and environmental health. Although mercury is well studied in aquatic ecosystems, little work has focused on the terrestrial pathway. The challenge is to determine how and where mercury is made bioavailable from soil to other organisms. We know that decomposition, as performed by earthworms, should make mercury more bioavailable to other organisms.

Californian earthworms are poorly studied and little is known about their functioning in our native grasslands. Worms can be very abundant locally, yet only a few native worms remain: most have Eurasian and African origins. Non-native species have distinctly different impacts on below-ground and above-ground ecosystem functioning than do native earthworms. Changes in function should mean that the bioaccumulation of mercury release will be affected. Our project will assess the role of earthworms in mercury cycling of terrestrial ecosystems using Stanford's Jasper Ridge Biological Preserve. We will compare the relative roles of native and non-native earthworms in making mercury more accessible to other species. We will also spatially model the earthworm contribution to mercury dynamics in order to identify hot spots of mercury release in soils in Jasper Ridge Reserve and its environs.