USGS
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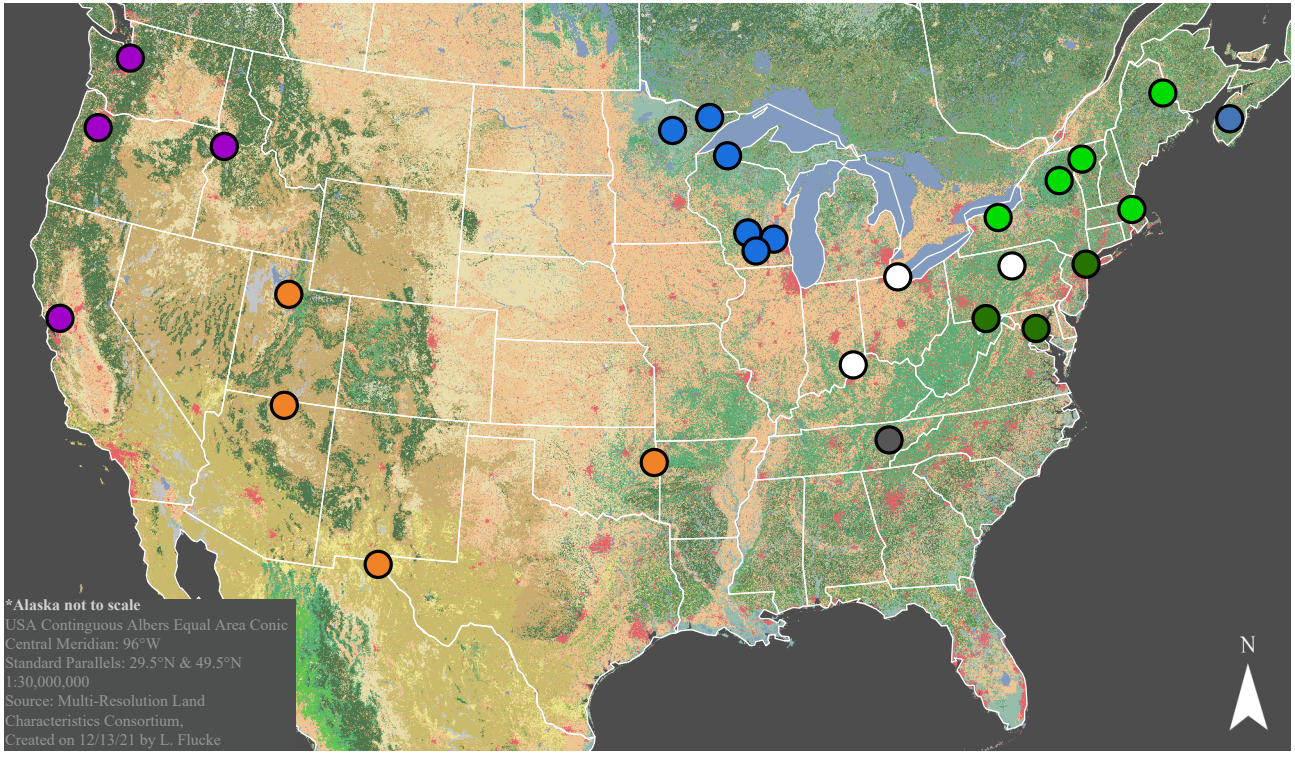
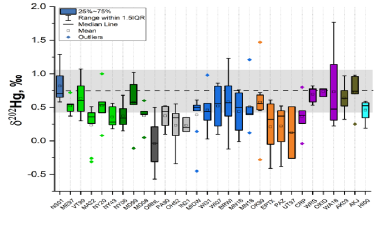
North American Gaseous Mercury Sampling Sites

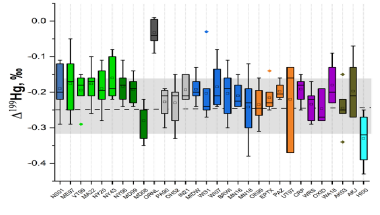
With the 2011 release of the Mercury and Air Toxics Standards by the U.S. Environmental Protection Agency, and the successful negotiation by the United Nations Environment Programme of the Minimata Convention, global emissions of mercury (Hg) are expected to decline. Recent reports suggest regional gaseous Hg declines have already begun well before they were anticipated; however, providing independent evidence for the drivers of such declines is difficult. To address this challenge, the U.S. Geological Survey and the National Atmospheric Deposition Program (NADP) have initiated a national-scale effort to establish a baseline of total gaseous mercury (TGM) and Hg stable isotopic compositions at 30 sites distributed across North America. Through the use of Hg isotopes, we intend to clarify the interactions between local and regional anthropogenic Hg pools and the larger global Hg pool. Using this approach, we expect to better characterize seasonal and spatial trends and to gain a better understanding of local versus global effects.

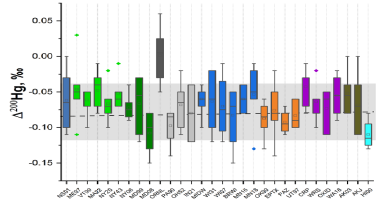


Sample Sites by Region

- West
- South-Southwest
- Ohio River Valley
- Oak Ridge National Lab
- Nova Scotia
- Northeast-New-England
- Northeast-Mid-Atlantic
- Midwest
- Hawaii
- Alaska







Arranged in a general west to east orientation, TGM concentration, δ202Hg and Δ199Hg distributions are shown for each site, colored by region. The high variability in δ202Hg reflects proximity to Hg sources and the dynamic nature of different Hg sources mixing and chemical transformations within the atmosphere. In contrast, Δ199Hg is fairly constant across the US. The site at ORNL has a mean δ202Hg and Δ199Hg near zero, which is consistent with legacy Hg contamination.

Land Cover

- Temperate or sub-polar needleaf forest
- Sub-polar taiga needeleaf forest
- Tropical or sub-tropical broadleaf evergreen forest
- Tropical or sub-tropical broadleaf deciduous forest
- Temperate or sub-polar broadleaf deciduous forest
- Mixed forest
- Tropical or sub-tropical shrubland
- Temperate or sub-polar shrubland
- Tropical or sub-tropical grassland
- Temperate or sub-polar grassland
- Sub-polar or polar shrubland-lichen-moss
- Sub-polar or polar grassland-lichen-moss
- Sub-polar or polar barren-lichen-moss
- Wetland
- Cropland
- Barren land
- Urban
- Water
- Snow and ice