

Tuesday 9th of Nov 2021, 4.15 pm – 5.15 pm

The connection between atmospheric deposition of mercury and uptake to the terrestrial food web in coastal and mine impacted areas

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ABSTRACT. This talk will look at mercury burdens in steelhead trout (*Oncorhynchus mykiss*), terrestrial and aquatic invertebrates, and five species of lichens, from a region in central California on the Pacific Coast. In this region, there are several large, abandoned mercury (Hg) mines emitting significant quantities of gaseous Hg to the atmosphere. Additionally, along the immediate coastline, there is heavy summertime marine fog, potentially enriched in methylmercury (MeHg) from oceanic emissions of dimethylmercury. *O. mykiss* lives in the coastal streams of this area and is currently a threatened species due to the impacts of climate change, introduction of non-native species, and accumulation of toxins. It was found that non-native terrestrial isopods (*Porcellio scaber* and *Armadillidium vulgare*) made up about 40% of the energy value in the stomach contents of the fish. These terrestrial isopods are known to be effective bioindicators of the amount of Hg an area receives from atmospheric deposition. Thus, we measured total Hg (THg) and MeHg concentrations in *O. mykiss* and their associated aquatic and terrestrial food webs to determine if there could be evidence of marine-derived Hg in this ecosystem. My lab also investigated the effect of two former Hg mining districts, New Almaden Quicksilver Mining District and Knoxville Mining District, on the distribution of Hg in lichen species across the landscape, as a measure of atmospheric dry deposition of Hg. Our findings show how lichens accumulate Hg at a high rate and are representatives of the time-averaged Hg deposition of an area.



BIO. Dr Peter Weiss-Penzias is a faculty researcher at the University of California, campus Santa Cruz (UCSC). “I study the environmental chemistry of mercury (Hg), focusing on understanding how to characterize and quantify the sources of atmospheric Hg using sensors and bioindicators. I also look at Hg methylation/demethylation processes in soils as a way to understand the potential sources of methylmercury into waterways and into fish. I discovered that methylmercury can accumulate in marine fog along the Pacific Coast in California and make its way into the top predator of the terrestrial ecosystem of coastal central California, the mountain lion (*Puma concolor*). I have recently learned that lichens are an effective tool for tracking sources of Hg to the atmosphere and can thus better constrain the magnitude of atmospheric sources to an aquatic ecosystem.”

You are welcome to attend virtually in the [Zoom seminar room](#).

The presentation will be followed by a talk by Sabnam Mahat, doctoral candidate from the Soil Science Group, on the topic:

“Bioaccumulation of mercury in apex predators and possible biomagnification in terrestrial food chain.”

