SPATIAL PATTERNS OF ATMOSPHERICALLY DEPOSITED ORGANIC CONTAMINANTS AT HIGH-ELEVATION IN THE SOUTHERN SIERRA NEVADA MOUNTAINS, CALIFORNIA

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Abstract -- Atmospherically deposited contaminants in the Sierra Nevada mountains of California have been implicated as adversely affecting amphibians and fish, yet the distributions of contaminants within the mountains are poorly known, particularly at high elevation. We tested the hypothesis that contaminant concentrations in a high-elevation portion of the Sierra Nevada decrease with distance from the adjacent San Joaquin Valley. We sampled air, sediment, and tadpoles twice at 28 water bodies in 14 dispersed areas in Sequoia and Kings Canyon National Parks (2785 to 3375 m elevation; 43 to 82 km from Valley edge). We detected up to 15 chemicals frequently in sediment and tadpoles, including current- and historic-use pesticides, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons. Only β-endosulfan was found frequently in air. Concentrations of all chemicals detected were very low, averaging in the parts-per-billion range or less in sediment and tadpoles, and on the order of 10 pg/m^3 for β-endosulfan in air. Principal components analysis indicated that chemical compositions were generally similar among sites, suggesting that chemical transport patterns were likewise similar among sites. In contrast, transport processes did not appear to strongly influence concentration

differences among sites because variation in concentrations among nearby sites was high relative to sites far from each other. Moreover, a general relationship for concentrations as a function of distance from the valley was not evident across chemical, medium, and time. Nevertheless, concentrations for some chemical/medium/time combinations showed significant negative relationships with metrics for distance from the Valley. However, the magnitude of these distance effects among high-elevation sites was small relative to differences found in other studies between the valley edge and the nearest high-elevation sites. *Notice: This is an abstract of a proposed presentation and does not necessarily reflect US Environmental Protection Agency (EPA) policy. The actual presentation has not been peer reviewed by EPA.*