



## **Exploring coastal fog and redwood CO<sub>2</sub> and H<sub>2</sub>O fluxes using carbonyl sulfide**

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Summer coastal fog is prevalent along the U.S. mainland Pacific coast where coastal upwelling creates a narrow band of relatively cold surface water. Coast redwoods (*Sequoia sempervirens*), the world's tallest trees, live exclusively in this area. Despite redwoods' iconic stature, little is known about redwood-fog feedbacks. If redwoods close their stomata when fog dissipates, they could act as "heaters", warming the forest with their low albedo. If redwood stomata remain open in the absence of fog they could act as "coolers" to the forest, with evaporative cooling from transpiration dominating. Coastal fog is expected to decline with increasing coastal urbanization and warming temperatures, and the nature of these redwood–fog interactions could slow or speed that process, perhaps even affecting the continued viability of redwoods to survive in their current range. Here we present modeling experiments to accompany the Summen ([www.fogsci.com](http://www.fogsci.com)) project's first-in-the-world measurements of redwood carbonyl sulfide exchange. We demonstrate quantitatively that the WRF-CLM coupled model is able to resolve urbanization, soil moisture, and redwood canopy influences on coastal fog.