



## **Seasonal variation of total monoterpene emissions from a Ponderosa pine plantation in Central California**

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We operated a PTR-MS/eddy-covariance system in a Ponderosa pine plantation (38.90 N, 120.63 W, 1315 m) continuously for nearly 1 year (June 2003 - April 2004) measuring ecosystem fluxes of total monoterpenes. During all times the emissions were correlated with temperature, and in summer 2003 we observed enhanced emissions following a rain event. No significant correlation was observed with any other meteorological parameter. Monoterpene fluxes ( $F$ ) could be modeled by the commonly used, exponential relation  $F = F_b \exp(b(T-30))$ , where  $F_b$  is a basal emission rate at 30 degrees Celsius,  $T$  the temperature, and  $b$  the temperature response factor. However, the basal emission capacity ( $F_b$ ), as well as the temperature response factor ( $b$ ) changed substantially with season. Values for the basal emission were 22, 8, 5, and 4  $\mu\text{mol}/\text{m}^2/\text{h}$  for spring, summer, fall, and winter; and the corresponding temperature response factors were 0.22, 0.21, 0.14, and 0.10 per degree Celsius, respectively. Potential factors and mechanisms controlling the observed seasonal variations in basal emission capacity and temperature response factor will be discussed.