**SOCIETY OF ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY – April 29 - 30, 2015**

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# Adapting the SPEAR pesticide bioassessment index for use in California

L. Hunt[1], M. Liess[2], K. Foit[2], R. Mazor[3], V.H. Resh[1]

[1]*University of California, Berkeley, CA*
[2]*Helmholtz Centre for Environmental Research, , Liepzig, Germany*
[3]*Southern California Coastal Water Research Project Authority, Costa Mesa, CA, USA*

## Abstract

The Species at Risk (SPEAR) pesticide index is a trait-based stream bioassessment index developed in Europe that links pesticide concentrations to changes in stream invertebrate communities. Strong correlations between SPEAR values and maximum pesticide toxic unit (TU) values for *Daphnia magna* in water have been found in previous studies ($0.61 < r2 < 0.89$). We are modifying the index for use in California, and testing it using pyrethroid and bioassessment data collected by the Surface Water Ambient Monitoring Program and by storm water dischargers in southern CA. With only slight modifications to the existing SPEAR method, we found a correlation between pyrethroid TUs for *Hyalella azteca* in sediment ($n=77$, $r^2=0.35$), but no correlation between pyrethroid (TU) values for *Daphnia magna* in water even though the sample size was much larger ($n=464$). The next steps include: (1) updating the pesticide sensitivity values for CA taxa based on most the recent ecotoxicological data available; (2) modifying other trait values for CA taxa, focusing on generation times which are generally shorter in CA than in Europe; and (3) conducting a multiple regression analysis to account for other variables such as habitat quality and site characteristics.