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**Abstract Title:**

An Ecological Risk Assessment for Microplastics in the San Francisco Bay Using the Bayesian Network Relative Risk Model

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**Abstract:**

Here we present an ecological risk assessment for a specific type of microplastic in the San Francisco Bay. This study lays the groundwork for future ecological risk assessments of microplastics and identifies key uncertainties that need to be addressed. Using a Bayesian network relative risk model (BN-RRM), we determined the risk tire wear particles present to juvenile Chinook salmon and Northern anchovy. In past studies, BN-RRM has been a successful framework for regional scale ecological risk assessments of multi-stressor systems, allowing for the creation of a model with predictive capability and adaptive potential as new data become available. The BN-RMM is parameterized for each risk region with tire wear particle environmental concentration data collected by the San Francisco Estuary Institute, plastic particle toxicity data generated by Oregon State University, and site-specific water quality, chemical, and land use data from regional databases. Relative risk was then calculated for each risk regions and spatial gradients of risk were determined. Results indicate a relatively low risk for risk for juvenile Chinook salmon and Northern anchovy at current tire wear particle concentrations in the San Francisco Bay. This risk assessments confirms that, with the data that is currently available, a quantitative, spatially specific risk assessment is possible. Additionally, Bayesian networks are an excellent tool for modeling the complex and uncertain nature of microplastics. This study is funded by the National Science Foundation Growing Convergence Research Grant (1935018) program.