2022 DELTA SCIENCE FELLOW FINAL REPORT

Sea Grant CALIFORNIA

Delta Stewardship Council
Delta Science Program

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Focus
Harmonizing pesticide risk management of the Bay-Delta watershed

Award
$62,991

Research Mentor
Dr. Arturo Keller, University of California, Santa Barbara

Community Mentors
Dr. Jennifer Teerlink, California Environmental Protection Agency, Department of Pesticide Regulation

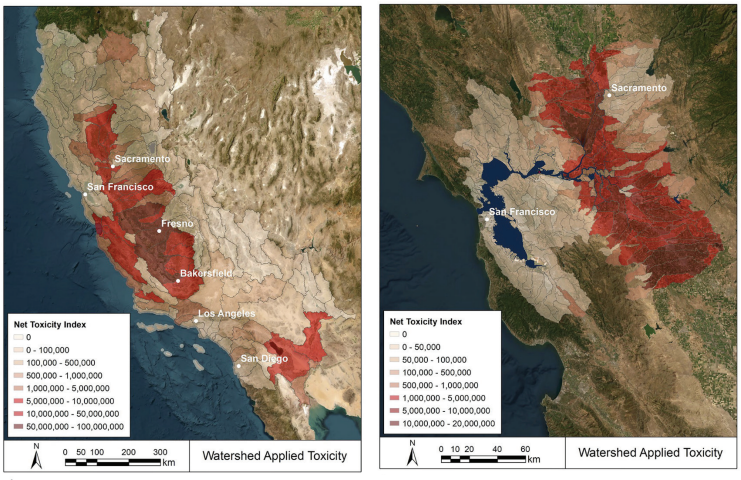
PROJECT

Farmers in California's Central Valley make decisions that have rippling effects across the Bay-Delta watershed, impacting human and ecological communities. But farmers do not always have access to the best science and may not understand how their choices impact the community.

To help improve that understanding, this project built and improved upon the Pesticide Management Prioritization Model (PMPM), which was developed during Parker's 2020 Delta Science Fellowship. Parker added high-resolution irrigation data, clarifying pesticide flows in the Delta, and a harmonized species indicator of pesticide toxic burden across various taxa.

RESEARCH CONCLUSIONS

The new work on the PMPM included creating an "Environmental Fate Tool," which quantifies the risks that hundreds of pesticides pose for aquatic ecosystems across the Delta, at both local and regional scales. The improved model allows Delta residents, especially those in agricultural areas, to better understand the impact of pesticide exposure on humans and the ecosystem and encourages meaningful conversations about how pesticide use in the region may be improved. The Environmental Fate Tool can help high-risk regions in particular conduct more detailed risk assessments and help prioritize mitigation schedules.



Maps displaying an index of overall toxicity, calculated two different scales of watersheds.

"I want my results to promote conversations that focus not on wrongdoings or pesticide restrictions, but on opportunities to improve how pesticides are used for the benefit of communities in the Delta – in terms of both public health and farm economics."