

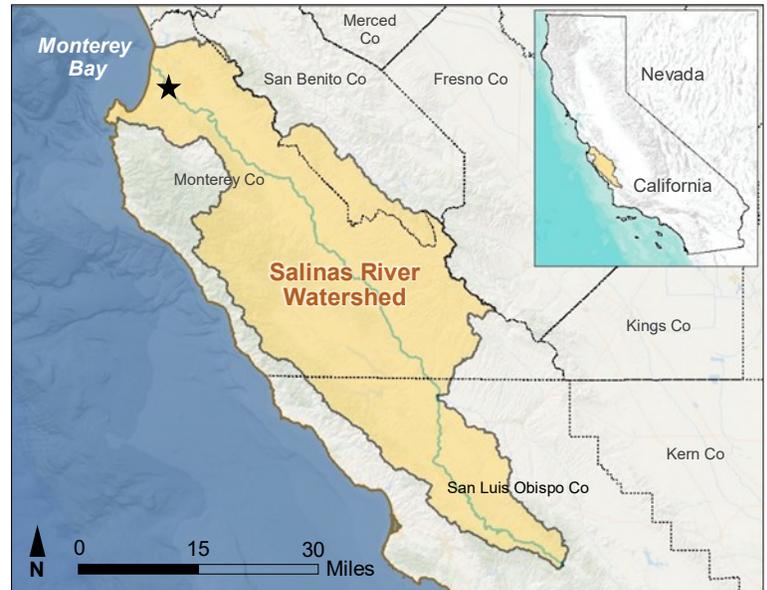
Flow-Proportioned Sampling Results for Pesticides in the **SALINAS RIVER** 2019-2023

Flowing 175 miles, the Salinas River is the longest river on California’s central coast. The river and its tributaries drain approximately 4,600 square miles of land in San Luis Obispo and Monterey Counties. The Salinas River runs south to north, which is unusual for California Rivers, and earned it its nickname the “upside-down river”. It begins in San Luis Obispo County and ultimately flows into Monterey Bay.

It is a corridor for wildlife and migratory birds, including species of special concern, and is the principal source of water for many communities. Local land uses include irrigated croplands, rangelands, mining, oil extraction, timberlands, open space, urbanization, rural residential, and two military facilities. Known as “America’s Salad Bowl”, the Salinas Valley produces the majority of the country’s cool season vegetables and strawberries.

Although many legacy pesticides (e.g., DDTs, toxaphene, and dieldrin) were banned decades ago, they are still present in the Salinas River and exceed water quality thresholds impairing aquatic life. These pesticides accumulate over time and are deposited into Monterey Bay where they enter the marine ecosystem.

Study Watershed

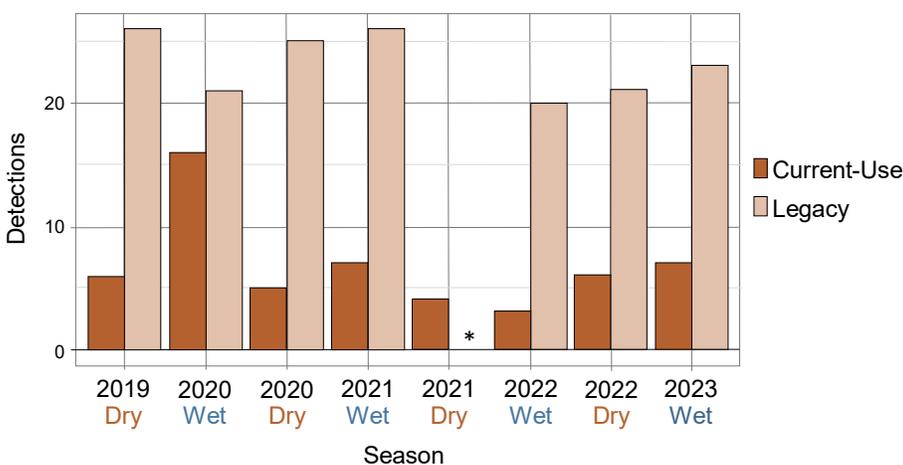


★ location of sampling station

Study Summary

Legacy pesticides (i.e., organochlorine pesticides) and current-use pesticides (e.g., organophosphates, neonicotinoids, pyrethroids, fipronils, carbamates, and phenolics) were analyzed in the Salinas River from 2019 to 2023. Twenty-nine legacy pesticides and 67 current-use pesticides were collected during eight sampling events alternating between dry- and wet-season sampling. Of the 96 pesticides sampled, 23 have water quality thresholds set by the University of California at Davis or the US Environmental Protection Agency. Of these 23, eight are legacy pesticides and 15 are current-use pesticides.

Number of Detections in the Salinas River



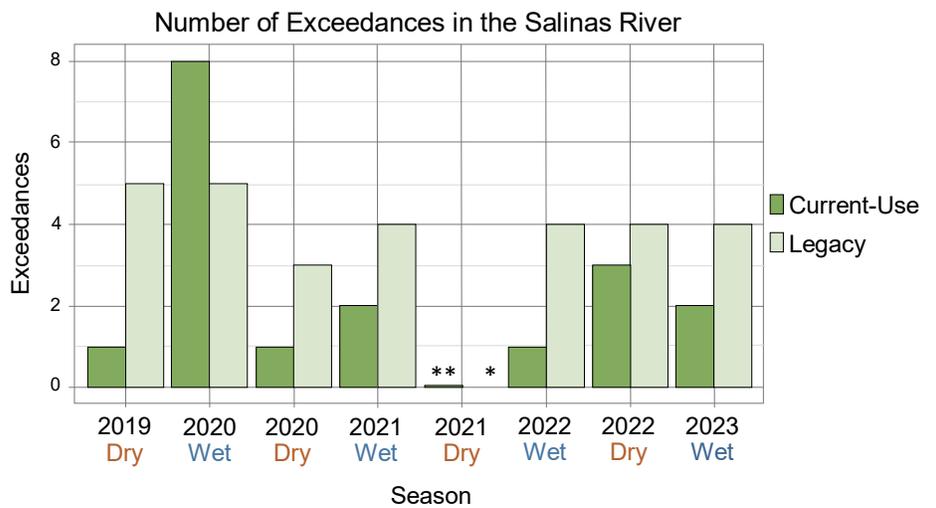
* Legacy pesticides were not sampled during the 2021 Dry season.

Study Results

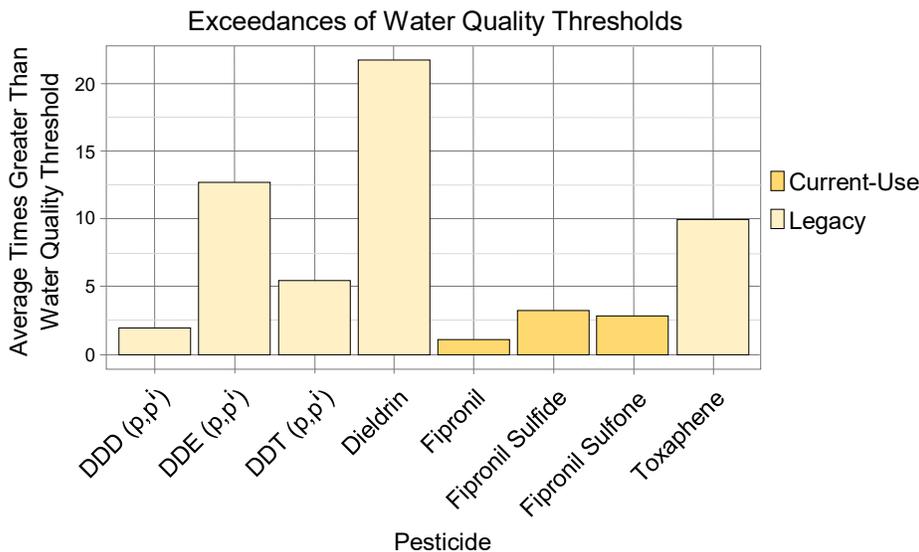
Both legacy pesticides and current-use pesticides were detected every season sampled from the Salinas River (left). Legacy pesticides were detected more often than current-use pesticides. Aquatic organisms are continuously exposed to water-soluble toxins via respiration, absorption, and/or feeding. Chronic exposure to these toxins can adversely alter the way aquatic organisms function and result in mortality.

Legacy and current-use pesticides both exceeded water quality thresholds during multiple sample seasons (right). The greatest amounts of current-use pesticides that exceeded water quality thresholds occurred in the 2020 Wet sampling season.

The concurrent exceedances of multiple pesticides amplify the toxic stresses on aquatic and avian wildlife species. No current-use pesticides exceeded water quality thresholds during the 2021 Dry season.

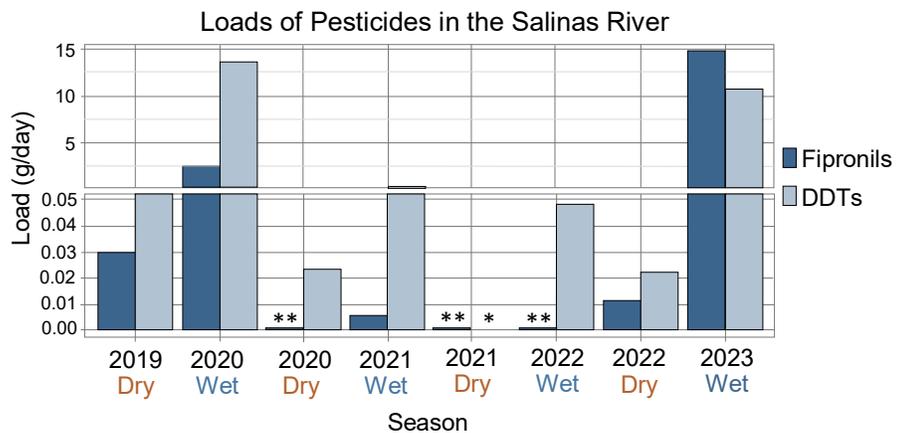


*Legacy pesticides were not sampled during the 2021 Dry season.
**Bars at the "0" line represent zero exceedances.



Legacy pesticides frequently occurred at concentrations many times above their respective water quality thresholds or criteria in the Salinas River. Dieldrin concentrations averaged more than 20 times their threshold, with many other pesticides averaging more than double their thresholds (left). These exceedances can lead to acute and chronic effects on aquatic organisms that inhabit the region.

Daily loads of summed DDTs and fipronils from the Salinas River were highest in wet-season samples, with highest loads near 15 g/day (right). Daily loads of DDTs from 2019 Dry to 2020 Wet averaged 6.9 g/day (2.5 kg/year). Fipronil loads from 2022 Dry to 2023 Wet averaged 7.4 g/day (2.7 kg/year). Studies have shown that low levels of pesticides and mixtures of compounds can cause sublethal effects on an organism's fitness and reduce species abundances.



*Legacy pesticides, including DDT, were not sampled during the 2021 Dry season.
**Bars at the "0" line represent zero exceedances.

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Sampling and analysis were conducted by Applied Marine Sciences with funding provided by the Central Coast Ambient Monitoring Program (CCAMP). For more information, visit ccamp.org, email ccamp@ccamp.org, or call (805) 594-6184. All data associated with this study is accessible via the California Environmental Data Exchange Network (www.ceden.org).