

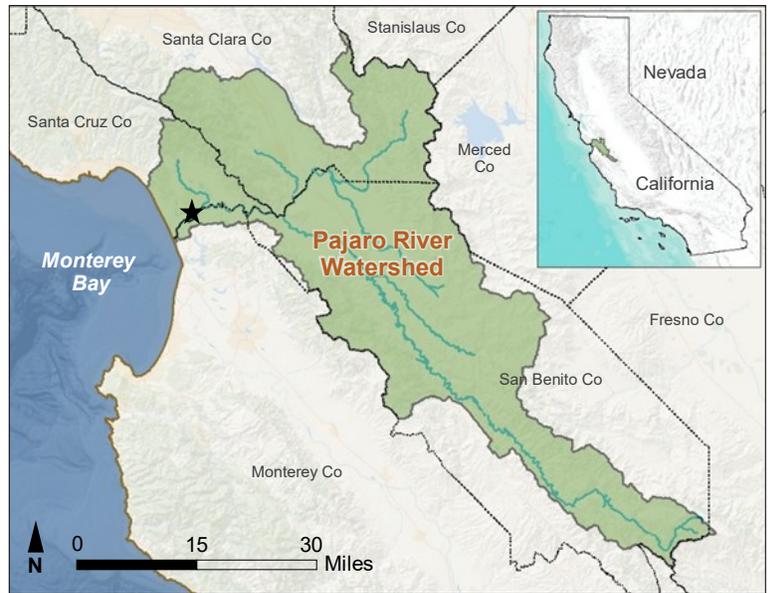
# Flow-Proportioned Sampling Results for Pesticides in the **PAJARO RIVER** 2019-2023

The Pajaro River is located in the central coast region of California. Over its 30-mile-long course, the river and its tributaries drain approximately 1,300 square miles of land. The river flows east to west beginning just west of San Felipe Lake in San Benito County and flows into Monterey Bay just west of Watsonville, CA. The San Andres Fault divides the watershed and is responsible for altering historical flow paths.

Local land uses include irrigated croplands, rangelands, timberlands, open space, urbanization, and rural residential. The Pajaro River has 24 miles of levees that protect around 3,600 people and 800 structures.

Despite the ban of many pesticides since the 1970s, the Pajaro River continues to exhibit water quality threshold exceedances of the legacy compounds. These exceedances can lead to acute and chronic effects on aquatic organisms that inhabit the region. These pesticides are eventually discharged into Monterey Bay, adversely affecting the marine ecosystem.

## Study Watershed



★ location of sampling station

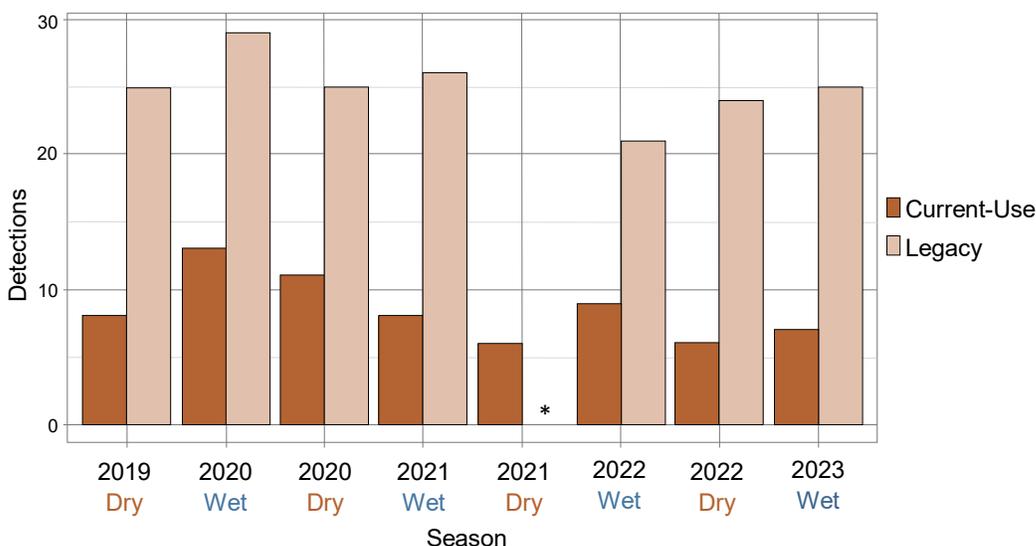
## Study Summary

Through this study, flow-proportioned sampling was used to obtain load estimates of pesticides that will enable managers to continue to track the impacts of such persistent chemicals in Monterey Bay. Twenty-nine legacy and 67 current-use pesticides were collected starting in late 2019 and ending in early 2023, alternating between dry and wet season sampling. Of the 96 pesticides sampled, 23 have aquatic toxicity thresholds or criteria 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.

## Study Results

Across all seasons sampled, both legacy and current-use pesticides were detected and exceeded water quality thresholds in the Pajaro River between 2019 and 2023. However, despite being outlawed for decades in the US, legacy pesticides still exceeded water quality thresholds more frequently than current-use pesticides (see page 2). During all seasons that legacy pesticides were sampled, more legacy pesticides were detected than current-use pesticides (left).

Number of Detections in the Pajaro River

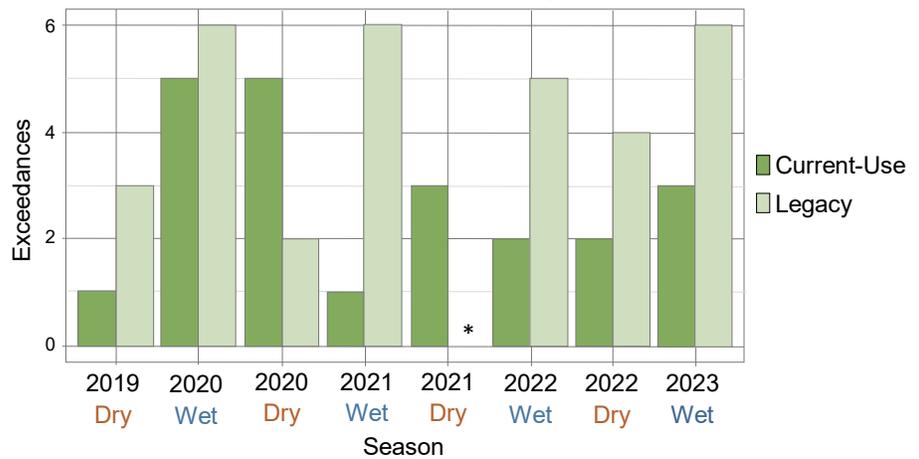


\* Legacy pesticides were not sampled during the 2021 Dry season.

Multiple pesticides consistently exceeded toxicity thresholds across all seasons they were analyzed (right), suggesting that aquatic life such as fish and shellfish in the Pajaro River are regularly subjected to multiple stressors from a variety of chemicals.

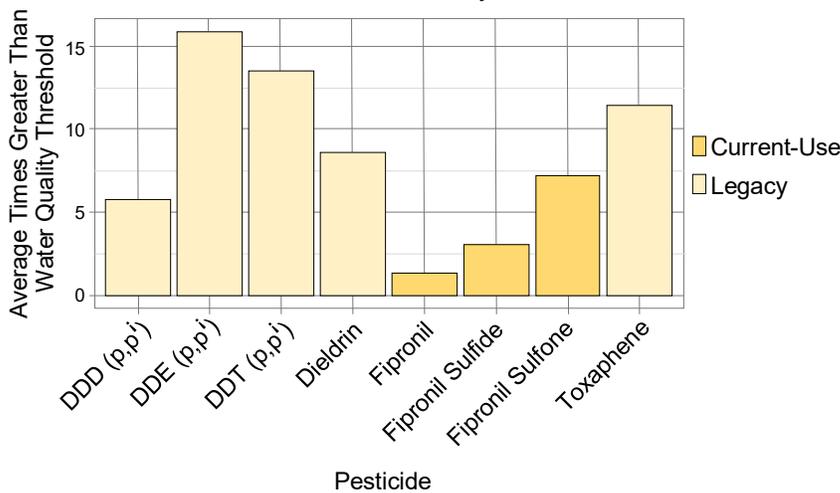
Studies have shown that low levels of pesticides and mixtures of compounds can cause sublethal effects on an organism's fitness and contribute to declines in species abundances.

Number of Exceedances in the Pajaro River



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

Exceedances of Water Quality Thresholds

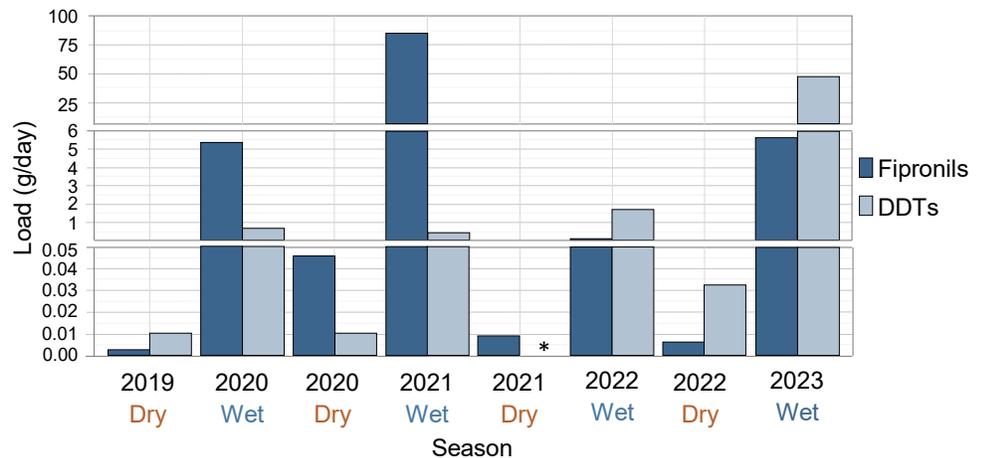


Biomagnification of legacy pesticides may lead to impacts to the birds and mammals that prey on aquatic organisms. DDTs, dieldrin, toxaphene, and fipronils were the chemicals that most often occurred at concentrations many times above their respective toxicity thresholds in the Pajaro River (left).

Best management practices (e.g., erosion and irrigation runoff control, agricultural and residential pesticide reduction) can reduce the amounts of pesticides reaching the Pajaro River and the ocean and limit the amount of groundwater contamination that could ultimately find its way into drinking water wells of rural communities.

Daily loads of summed DDTs and summed fipronils from the Pajaro River were higher in wet season samples, with highest loads exceeding 50 g/day (right). From 2022 Dry to 2023 Wet, DDTs averaged 23 g/day (8.4 kg/year). From 2020 Dry to 2021 Wet, fipronil loads averaged 41 g/day (15 kg/year). Legacy pesticides are known to persist for decades in soils, water, fish tissues, and other aquatic organisms.

Loads of Pesticides in the Pajaro River



\* Legacy pesticides, including DDT, were not sampled during the 2021 Dry season.

Winter 2025; First Edition

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](http://ccamp.org), email [ccamp@ccamp.org](mailto: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](http://www.ceden.org)).