

Sandy Creek: Sustained, targeted extension helps reduce pesticide water quality risk



Sandy Creek, a sugarcane-dominated catchment in Queensland's Mackay Whitsunday region, has long recorded high pesticide risk scores in successive Reef Water Quality Report Cards and site-specific Pesticide Risk Metrics (PRM).

Following years of intensive grower education and extension activities provided by Queensland and Australian Government agencies and agriculture service providers like Farmacist — including the use of tools like [Pesticide Projector](#) and outreach by the [Catchment Water Quality Alliance](#) — measurable improvements have emerged.

An analysis of Pesticide Risk Metric trends between 2016 and 2023 at Homebush, a key monitoring site that measures 71.4% of Sandy Creek catchment, has shown statistically significant improvements.

Undertaken as an [Honours Project](#) within the [Reef Catchments Science Partnership](#) at the University of Queensland, the study shows improvements in scores for photosystem II (PSII) herbicides (diuron in particular).

Additional data for 2024 and 2025, continues to reflect these trends (Table 1). The weakly significant decreasing trend in PRM for all 22 pesticides in the metric was underpinned by the strongly significant decreasing trend in PRM for PSII herbicides (Figure 1).

Extension tools such as Pesticide Projector which allows growers to select pesticides with lower aquatic ecosystem toxicity, and other [pesticide risk monitoring tools](#) available through the [Catchment Water Quality Alliance digital hub](#), have proved to be a valuable toolkit for extension officers and landholders in improving waterway health.

Table 1. Statistical analyses for different groups of pesticides assessed using the Pesticide Risk Metric (PRM) between September 2016 and June 2025

Group	Year Range	Significant Trend? (α = 0.05)
PRM - Total Pesticides	September 2016 – June 2025	Weakly significant decreasing trend (p=0.048)
PRM - PSII Herbicides		Strongly significant decreasing trend (p=0.004)
PRM - Other herbicides		No trend (p=0.949)
PRM - Insecticides		No trend (p=0.650)

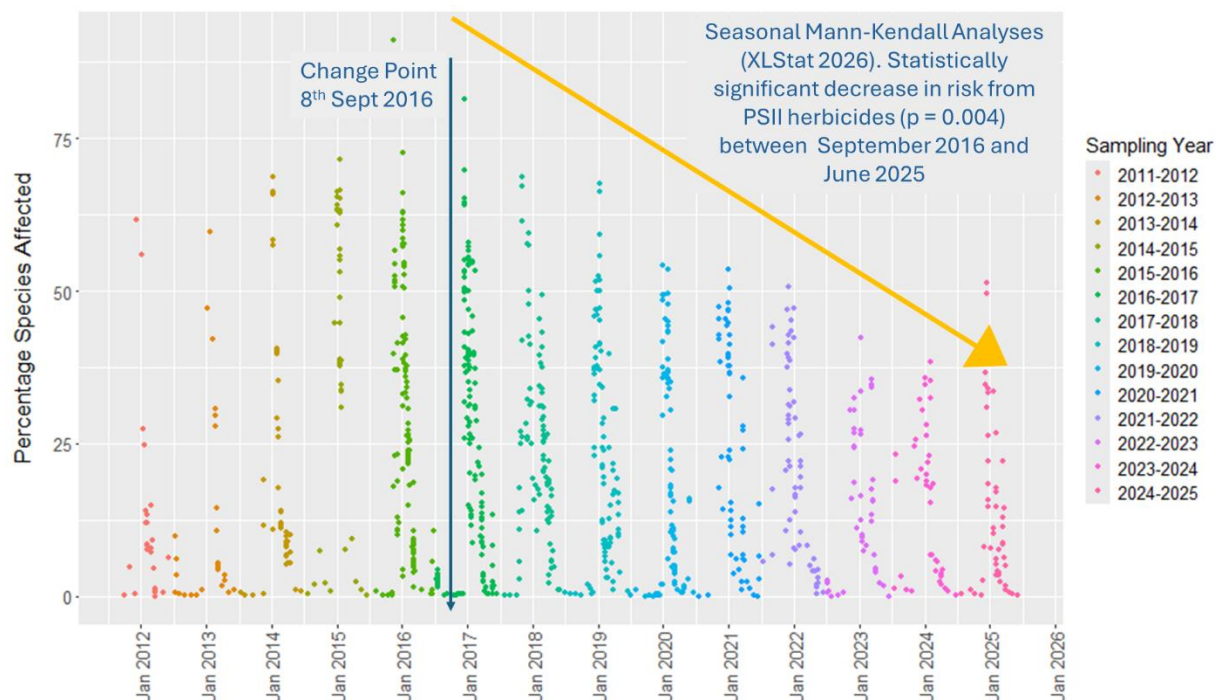


Figure 1. All Pesticide Risk Metric data calculated for photosystem II herbicides for all water samples collected between July 2011 and June 2025. A change in the direction of trend was calculated to have occurred on the 8 September 2016. There was a significant downward trend between that date and June 2025.



Monitoring data for the 22 pesticides were used to calculate Pesticide Risk Metric scores in the Sandy Creek catchment in Plane basin in the Mackay Whitsunday region. A trends analysis of those scores demonstrated a significant ($p = 0.004$) decrease in risk from photosystem II herbicides (e.g. diuron and atrazine) to the Sandy Creek aquatic ecosystem between 2016 and 2025.

