

**PESTICIDES IN SALMONID-BEARING STREAMS:
INTENSIVE AND PASSIVE SAMPLING IN AN AGRICULTURAL DRAIN.**

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ABSTRACT

The Washington State Department of Ecology and Washington State Department of Agriculture compared pesticide concentrations measured in daily and weekly samples with pesticide residues accumulated by two types of passive samplers, Semi-Permeable Membrane Devices (SPMD) and Polar Organic Chemical Integrative Samplers (POCIS). The objective was to assess the current weekly sampling regime's ability to detect pesticides.

The study site was Marion Drain, a heavily cropped 19-mile drainage ditch that discharges into the Yakima River. Marion Drain is used by salmonids including: Chinook, Coho, and endangered Steelhead. The study was carried out over 22 days in the spring of 2007.

A total of 21 pesticide compounds were detected during the study. Daily grab sampling detected only one more pesticide than the number observed during four pre-scheduled weekly sampling events. Weekly sampling failed to detect the highest concentrations of several compounds detected in the daily samples.

The SPMDs detected five compounds that were not found by grab sampling; all pesticides with low water solubility. Daily grabs detected 6 water soluble compounds not found in the SPMDs. Results from the POCIS were compromised by pesticide detections in the field blank and by inconsistent detections between sample replicates.

The difference in the number of detections between daily and weekly grab sampling was small. However, daily samples detected more potentially harmful peaks in pesticide concentration. SPMDs complemented the grab samples by increasing the detection rate for hydrophobic pesticides.

KEYWORDS

Pesticide, Semi-Permeable Membrane Device, SPMD, Polar Organic Compound Integrated Sampler, POCIS, Grab Sampling, Passive Sampling, Surface Water