Interagency Management of Pesticides and Water Quality in Oregon
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Abstract
Targeted monitoring has detected a variety of pesticides in Oregon surface or ground water. To optimize the efficacy of pesticides and protect water quality, four state agencies formed the interagency Water Quality Pesticide Management Team (WQPMT) in 2007. A major role of the WQPMT is to evaluate monitoring data. A key source of pesticide monitoring is the DEQ Pesticide Stewardship Partnership (PSP) program. Core Member Agencies
- Oregon Department of Agriculture (ODA)
- Oregon Department of Environmental Quality (ODEQ)
- Oregon Department of Human Services (ODHS)
- Oregon State University (OSU) – Technical Advisory Council

1. Water Quality Pesticide Management Team
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Primary Scope
- Currently registered pesticides in Oregon
- Surface and ground water
- Agricultural and non-agricultural uses
- Initial focus does not include “legacy” pesticides
- Operates under an interagency Memorandum of Understanding

Address 4 Key Questions
1. How do key active ingredients have the biggest potential impact/risk? (identify & prioritize highest risk pesticides)
2. Which watersheds are most vulnerable?
3. What does monitoring data tell us?
4. How to prevent/reduce off-target movement?

1.1 Oregon Pesticides of Interest & Concern
- Pesticide of Interest (POI): potential to occur at concentrations approaching or exceeding an established environmental or human health benchmark or standard.
- Pesticide of Concern (POC): close to or exceeds an established environmental or human health benchmark or standard.

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3. Pesticide Stewardship Partnerships (PSP) Collaboration at the watershed level
- ODEQ monitors for 100 pesticide and degradates in streams in 7 sub-basins under the Pesticide Stewardship Partnership (PSP) program.
- Partnership is voluntary, collaborative and focused on local sub-basin issues.
- Includes Watershed Councils, SWCDs, Tribal Govt., Grower Groups, OSU Extension, State Agencies, etc.
- Identifies streams with elevated pesticide concentrations and/or high # of detections.
- Collaboration to implement voluntary management practices.
- Follow-up monitoring to track trends over time.

4. Evaluation of Pesticide Monitoring Data
Measures of relative risk:
- Detected concentrations relative to established water quality criteria/standards or benchmarks.
- In the absence of numeric criteria/standards, the WQPMT uses EPA Office of Pesticides (OPP) established Aquatic Life Benchmark® or Human Health Benchmark.

Aquatic Life Ratio (AQL) = Maximum Detected Concentration / Lowest Toxicity “Benchmark”

AQL Values > 1.0 indicates further attention
- Number & frequency of detections
- A pesticide’s environmental fate profile
- The presence of pesticide mixtures
- Pesticide use patterns and application methods
- Monitoring studies in neighboring states and/or watersheds with similar conditions.

5. Pesticide Mixtures
Many PSP samples contain mixtures of pesticides. In 2009 -10, >80% of samples across sub-basins contained 2 or more pesticides. In the Molalla-Pudding sub-basin, 29% of the samples in 2009 and 11% in 2010 contained ≥ 10 pesticides.

6. Examples: Pudding & Yamhill Sub-Basins


8. Summary and Key Challenges
Summary
- Pesticides are commonly detected in Oregon streams; but a relatively low number of detections are above established standards or benchmarks.
- It is not uncommon to find two or more pesticides in a single water sample.
- The herbicides diuron, atrazine, simazine and metolachlor were the most commonly detected in surface water. In some watersheds these were found in 70%-100% of the samples.
- From 2009-2011, 35 detections of diuron were above an aquatic life benchmark. Twenty-eight (28) detections of the OP chlortroxyfip were above the acute or chronic water quality standard.
- Monitoring provides a valuable real-world feedback mechanism, especially when linked to outreach and education on pesticide labels, management practices and the risk factors associated with off-target movement.
- The PSP approach has demonstrated significant reductions in chlorpyrifos in the Hood, Wasco and Walla Walla watersheds.

Key Challenges
- How to evaluate & communicate frequent detections at concentrations below water quality criteria/standards?
- How to adequately evaluate the potential risk of pesticide mixtures and potential sub-lethal, indirect and/ or cumulative effects.
- How to maintain consistent long-term resourcing for monitoring programs that address surface and ground water, urban & Ag uses, sediment partitioning pesticides such as the pyrethroids and new products entering the marketplace.

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Footnotes: Referenced Internet links
- PMP and list of Oregon POIs & POCs: http://www.oregon.gov/ODA/PES/Pesticide/quality.shtml
- Pesticide Stewardship Partnership (PSP): http://www.odeq.state.or.us/pubs/pesticide.htm
- EPA Pesticide Human Health Benchmarks: http://iaspub.epa.gov/pes/pesindex.htm?/NHBP/home (03/369/148935496)