



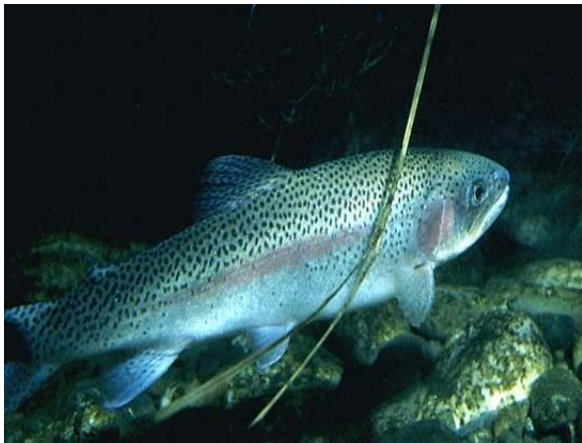
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Department
of Agriculture



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Authority



Oregon's Pesticide Water Quality Monitoring and Management Program: *The Pesticide Stewardship Program*

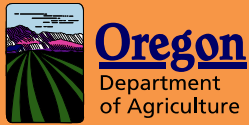


**Kevin Masterson, ODEQ
Steve Riley, ODA
February 5, 2015
Cranberry School – Bandon, OR**

Pesticide Stewardship

- ✓ Increased Awareness
- ✓ Local, Voluntary and Collaborative Actions





Pesticide Stewardship and Water Quality

- Pesticides in Oregon
- Pesticide Stewardship Partnerships (PSPs)
 - Goals, History and Successes
 - Monitoring results
 - Challenges and future plans
- Pesticide labels and buffers

Oregon Pesticides

Over 900 registered active ingredients



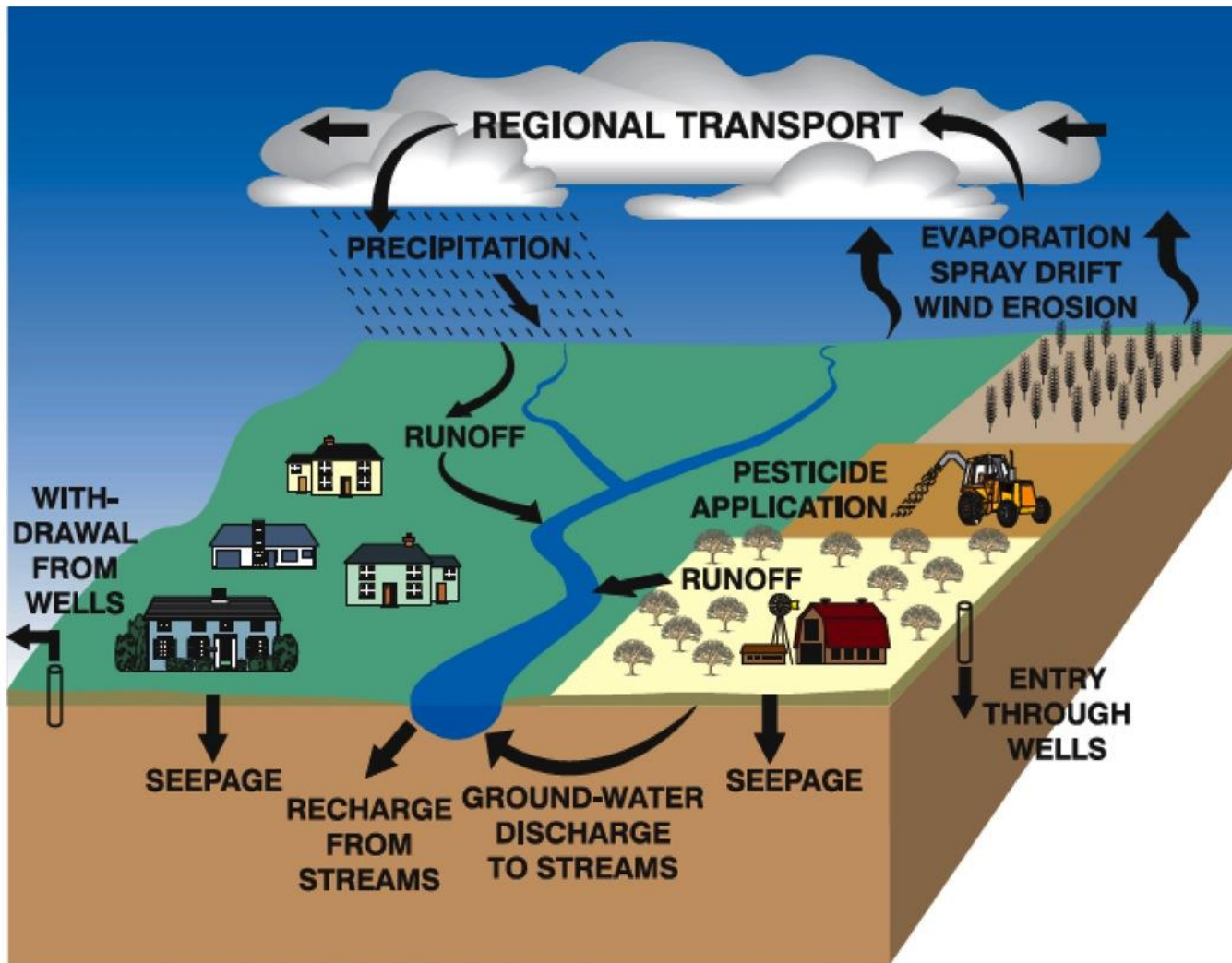
Over 12,000 registered pesticide products

- Multiple uses: agriculture, urban/home, recreation areas, ROW
- insecticides, fungicides, herbicides, pet products, mosquito repellents, antimicrobials, pool & spa chemicals...

EPA Registration Number



Sources of off-target movement often hard to trace:



Point Sources

- 1-2 locations
- Disposal sites
- Wells, sinkholes
- Storm drains

Non-Point Sources

- Wide area
- Drift
- Runoff
- Leaching

Figure 1. Pathways of pesticide movement in the hydrologic cycle (modified from Barbash and Resek, 1996).

OR Water Quality Pesticide Management and Assessment Program



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**WQ Pesticide
Management
Team
(WQPMT)
(2007)**

**Federal & State
Pesticides of
Interest**

**Oregon WQ
Pesticide
Management
Plan**

**Monitoring
Program
(PSPs)**

Original Scope

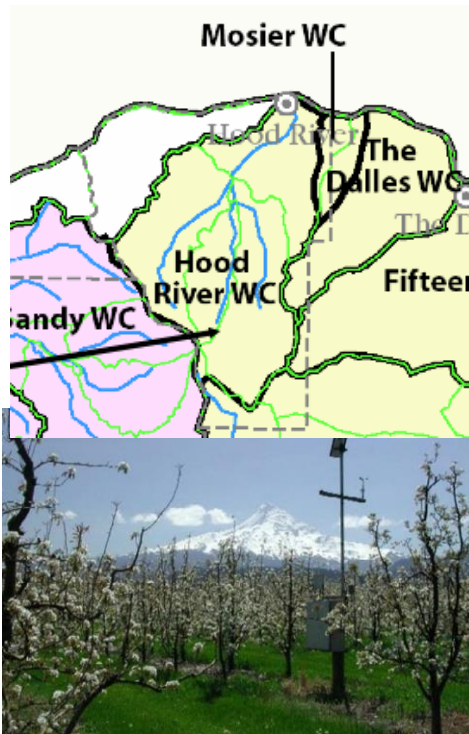
- Currently registered pesticides in surface & groundwater
- Agricultural and non-Agricultural

Pesticide Stewardship Partnerships (PSPs)

Collaborating at the watershed level



Birth of the Pesticide Stewardship Partnership (PSP)-- Hood River



1999: *Organophosphate (OP) insecticides detected* above WQ Standards for fish

2000: *Coordinated Program Developed*

- State Agencies – DEQ monitoring
- Local Stakeholders: Growers and Shippers, SWCD, WSC,, Irrigation Districts & Confederated Tribes of Warm Springs

2002-03: *Voluntary Best Management Practices (BMPs) Implemented*

- Application Practices, Buffers, etc.
- Outreach/Training
- Technical expertise, resources & pesticide management tools in place

Best Management Practices
for Pesticide Use

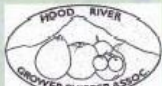
Grower Handbook

Second Edition

produced in cooperation by:

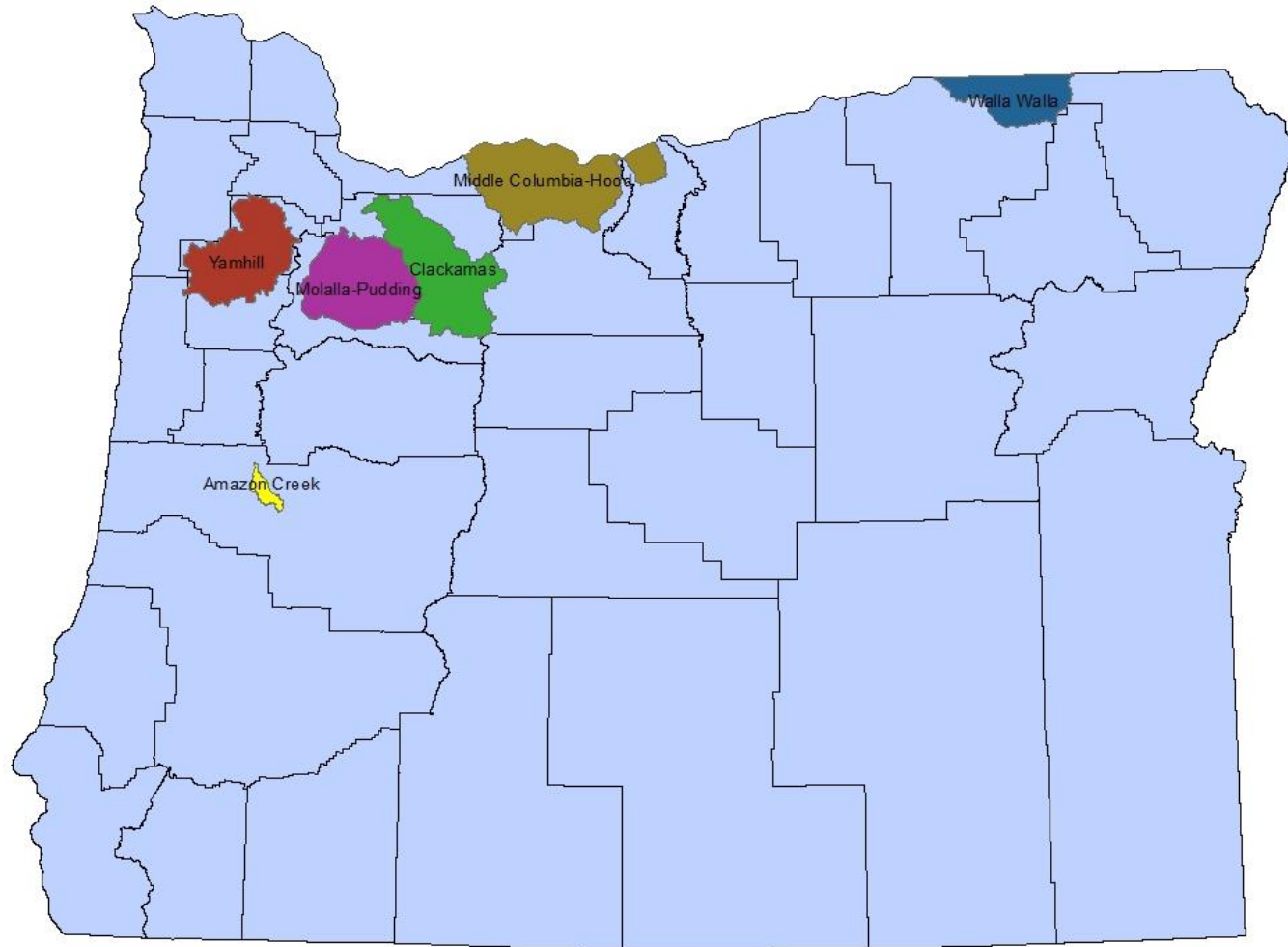
HRGSA Best Management
Practices Project

Areawide II Program



Oregon State
UNIVERSITY Extension
Service

Oregon Pesticide Stewardship Partnerships Grown to 7 Watersheds Since 2000

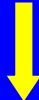


Pesticide Stewardship Partnerships (PSPs)

Collaborating at the watershed level

Key Steps in Partnership Projects

Monitor for current use pesticides in
surface waters from drift & runoff



Identify streams with elevated pesticide
concentrations or high # of detections



Collaborate to implement voluntary
management practices



Follow-up monitoring to determine
improvements over time



Pesticide Stewardship Partnerships

Key Partners

- **Watershed Councils, SWCDs & NRCS**
 - Collect samples, work with landowners
- **OSU Extension and Integrated Plant Protection Center**
 - Watershed-based Integrated Pest Management & pesticide risk reduction activities
- **Tribal Governments**
 - Collect samples, provide resource support
- **Grower Groups & Ag Chemical Distributors**
 - Direct work with landowners, info on pesticide use
- **State Departments of Environmental Quality, Agriculture, Forestry and Oregon Health Authority**
 - Laboratory and data analysis, project support and guidance

Evaluation of Monitoring Data by Inter-Agency Team

1. EPA Aquatic Life Benchmarks (ALB) in ug/L (ppb)

- Most sensitive acute & chronic toxicity data for each group of organisms (e.g fish) represented for EPA risk assessments
- Helps ID and prioritize pesticides & locations



Rainbow trout



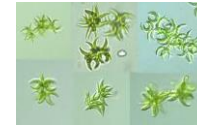
Fathead minnow



Bluegill sunfish



Daphnia magna



Green algae



Duckweed

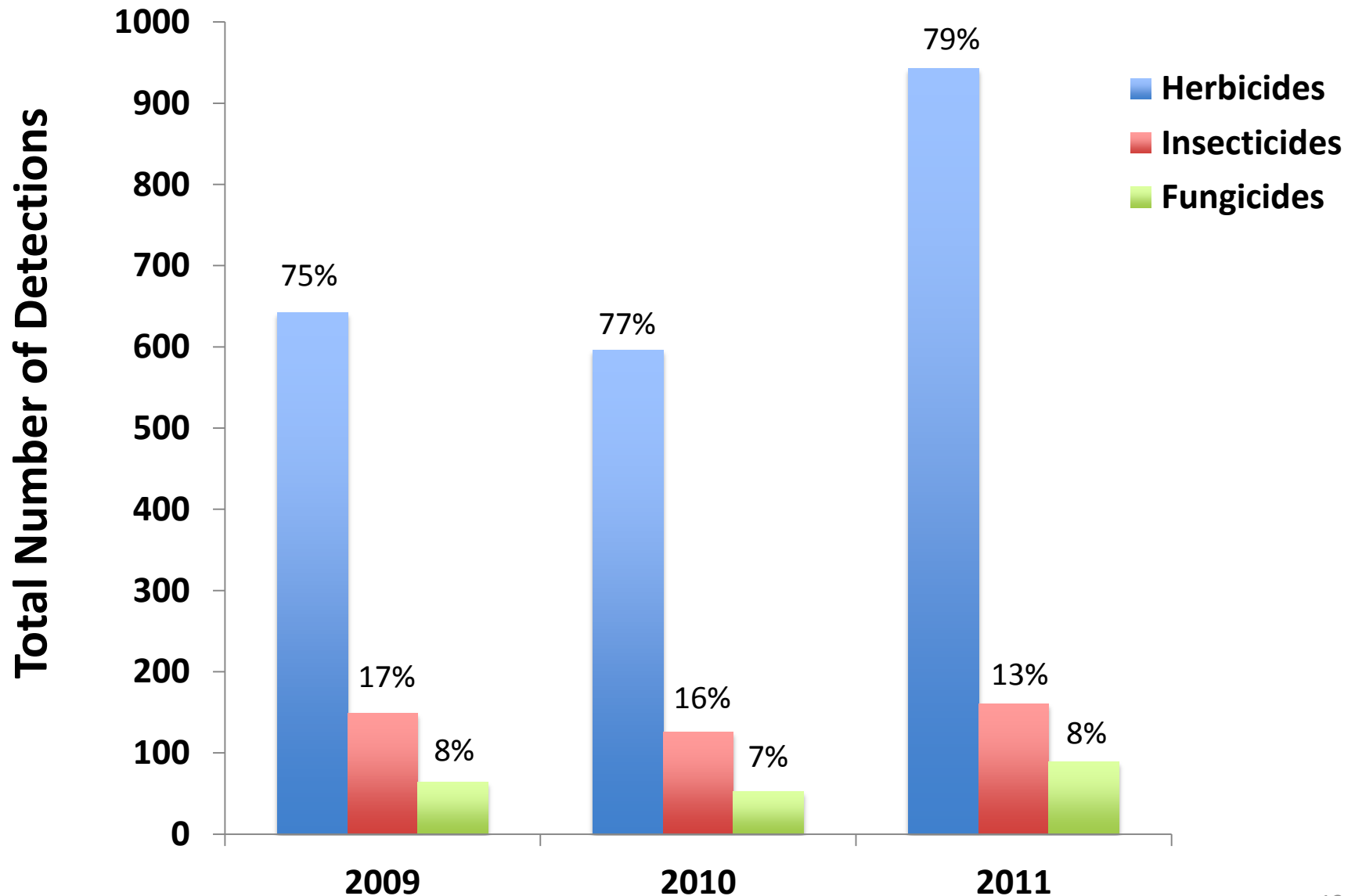
2. Aquatic Life Ratio:

Detected Concentration (ug/L) / Lowest Acute or Chronic ALB
Values ≥ 1.0 indicates further attention required

3. Other “weight-of-evidence” factors:

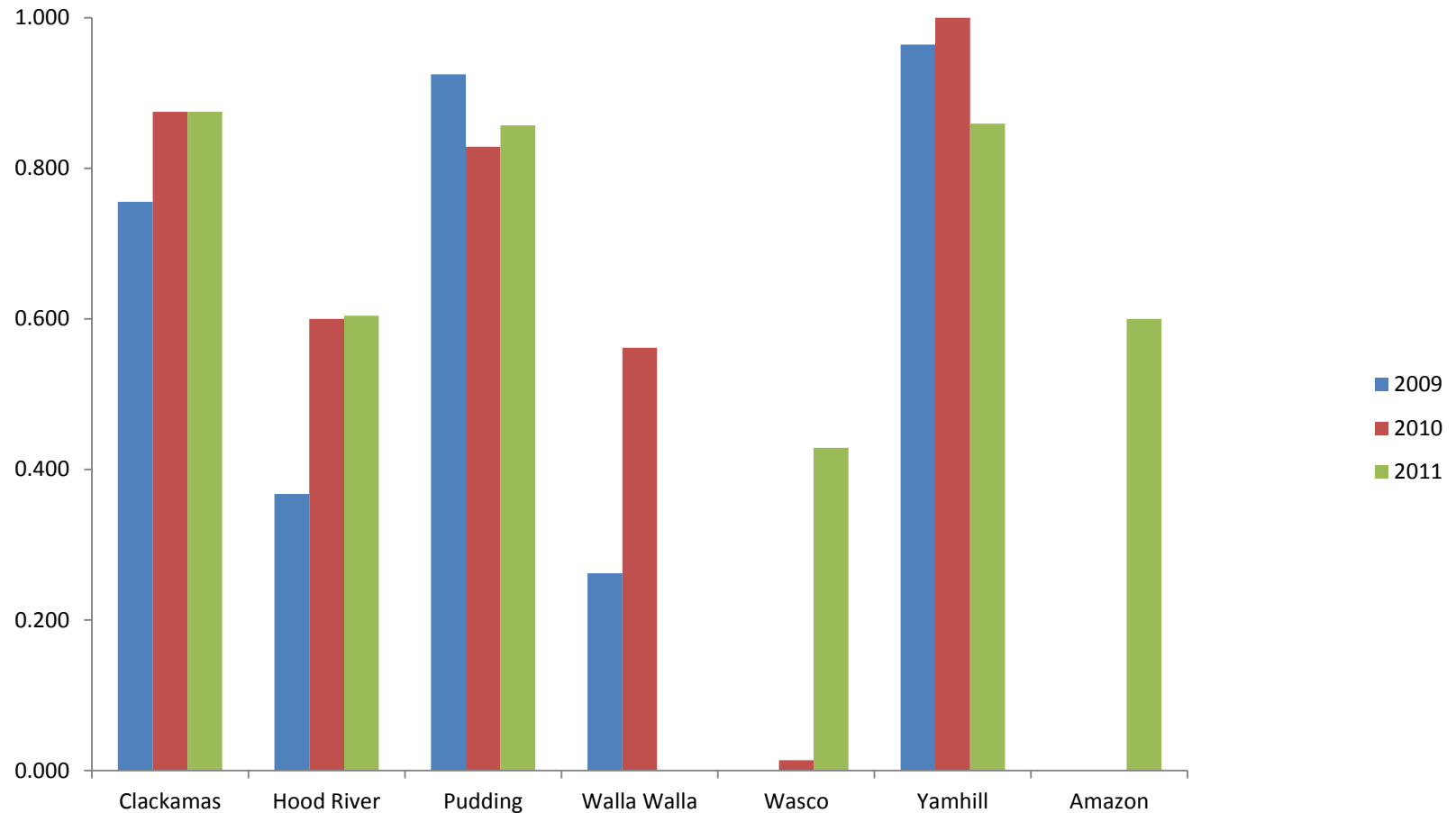
- Frequency of detections
- Pesticide’s chemical & physical properties

Pesticide Types Detected 2009-2011



Diuron Detections Across PSP Watersheds

Detection Frequency of Diuron

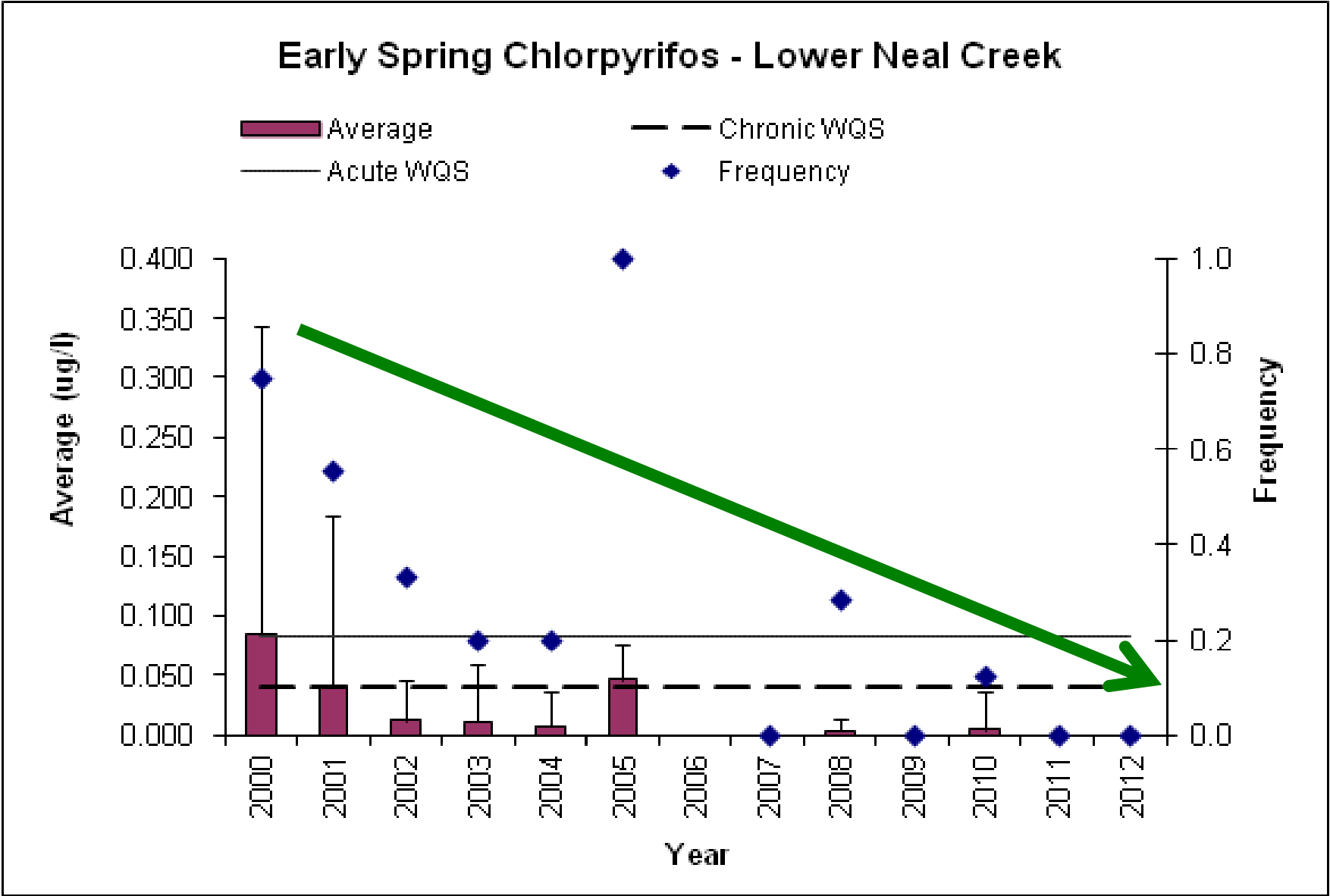


Note: Wasco monitoring began in 2010 and Amazon Creek monitoring began in 2011

Successes in Fruit Growing Areas along the Columbia

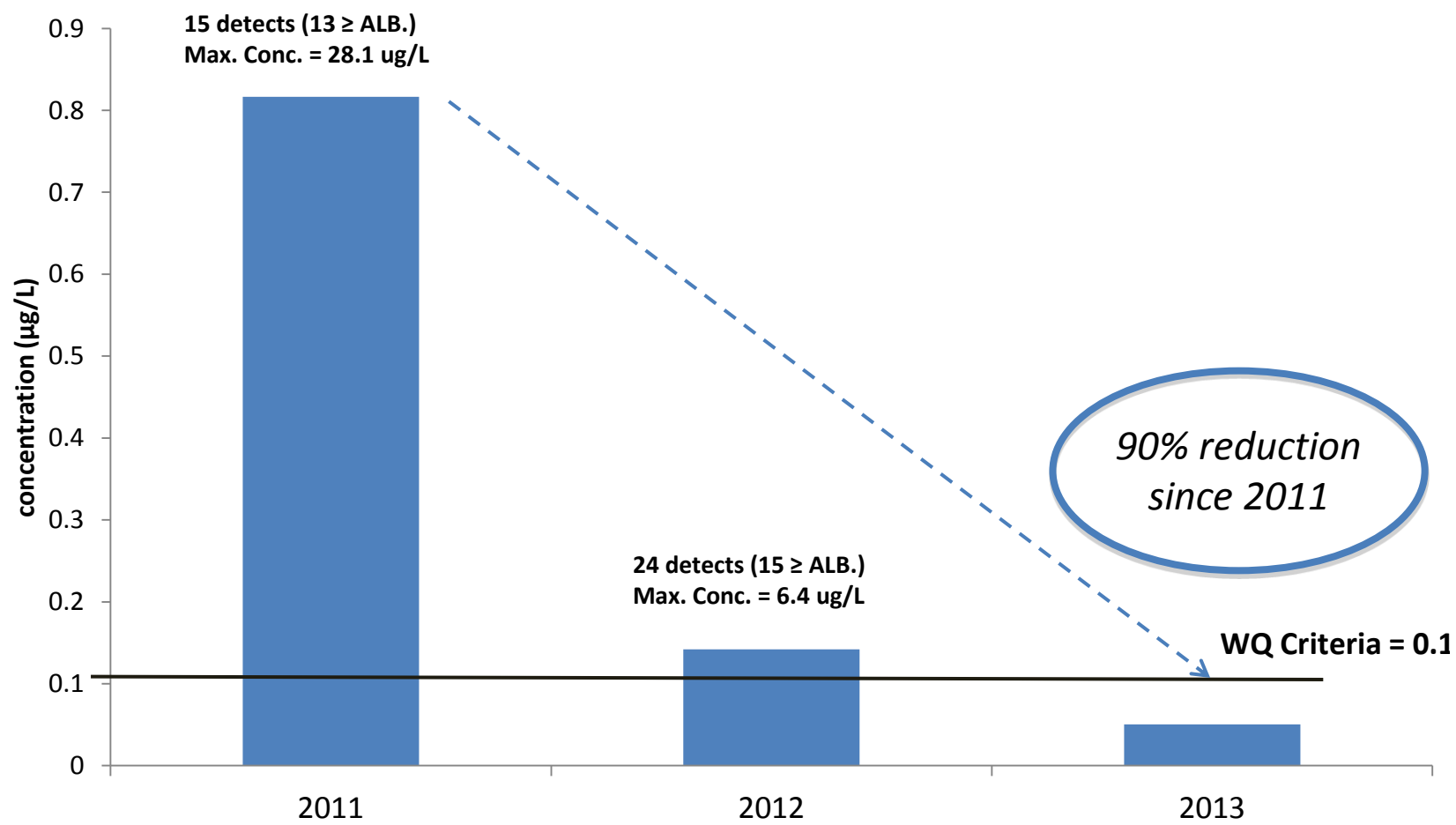
Hood River PSP: What Can Be Achieved?

Goal: Reduction in concentrations & frequency of detections over time



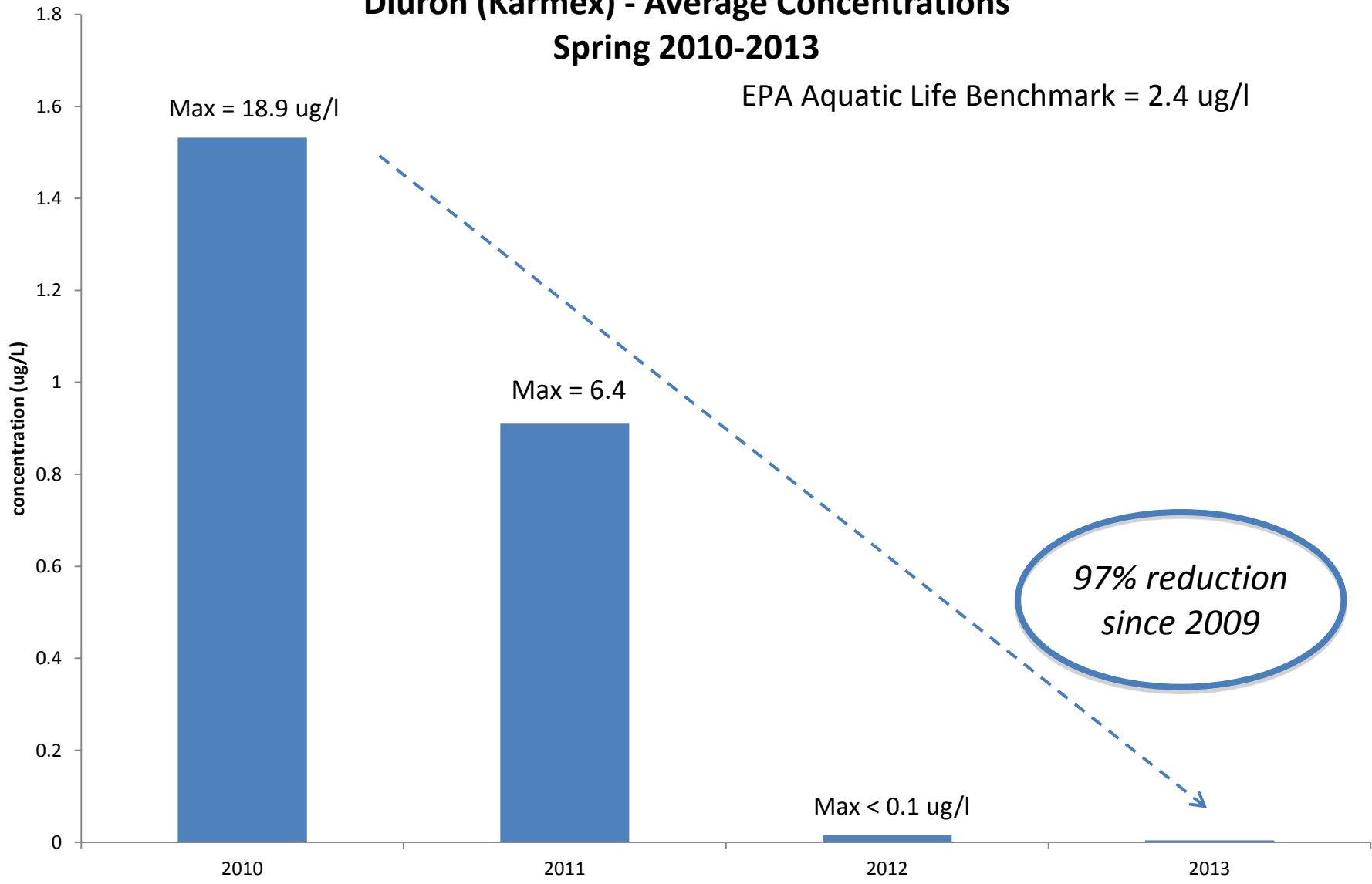
Malathion in Wasco Watersheds 2011-2013

Median Concentration of Detections



Continued Success...

**Little Walla Walla River Distributaries (3 sites)
Diuron (Karmex) - Average Concentrations
Spring 2010-2013**



What Types of Actions Have Been Implemented to Produce Results?

- *Spray Drift Reduction Trainings & Practices*
- *Installation of Weather Stations*
- *Use of Biological Controls (e.g., mating disruption)*
- *Integrated Pest Management Training & Technical Assistance*



- *Use of Less Toxic Pesticides*
- *Buffer Strips & Minimize Spraying near Streams*

Priority “Bins” : 2009 – 2013 Monitoring Data

Highest Priority (3)

- **Diuron (H): Karmex**
- **Chlorpyrifos (I): Lorsban**
- **Malathion (I)**

Moderate Priority (9)

Atrazine (H): Aatrex
Carbaryl (I): Sevin
Chlorothalonil (F): Bravo
Imidacloprid (I): Admire
Metolachlor (H): Parallel
Metribuzin (H): Tricor
Propiconazole (F): Propimax
Simazine (H): Princep
Sulfometuron-methyl (H): Oust

Lower Priority

Includes a number of commonly used pesticides

- **Examples: Pendamethalin, Hexazinone**

Pesticide-related Water Quality Management: Expansion of the PSP

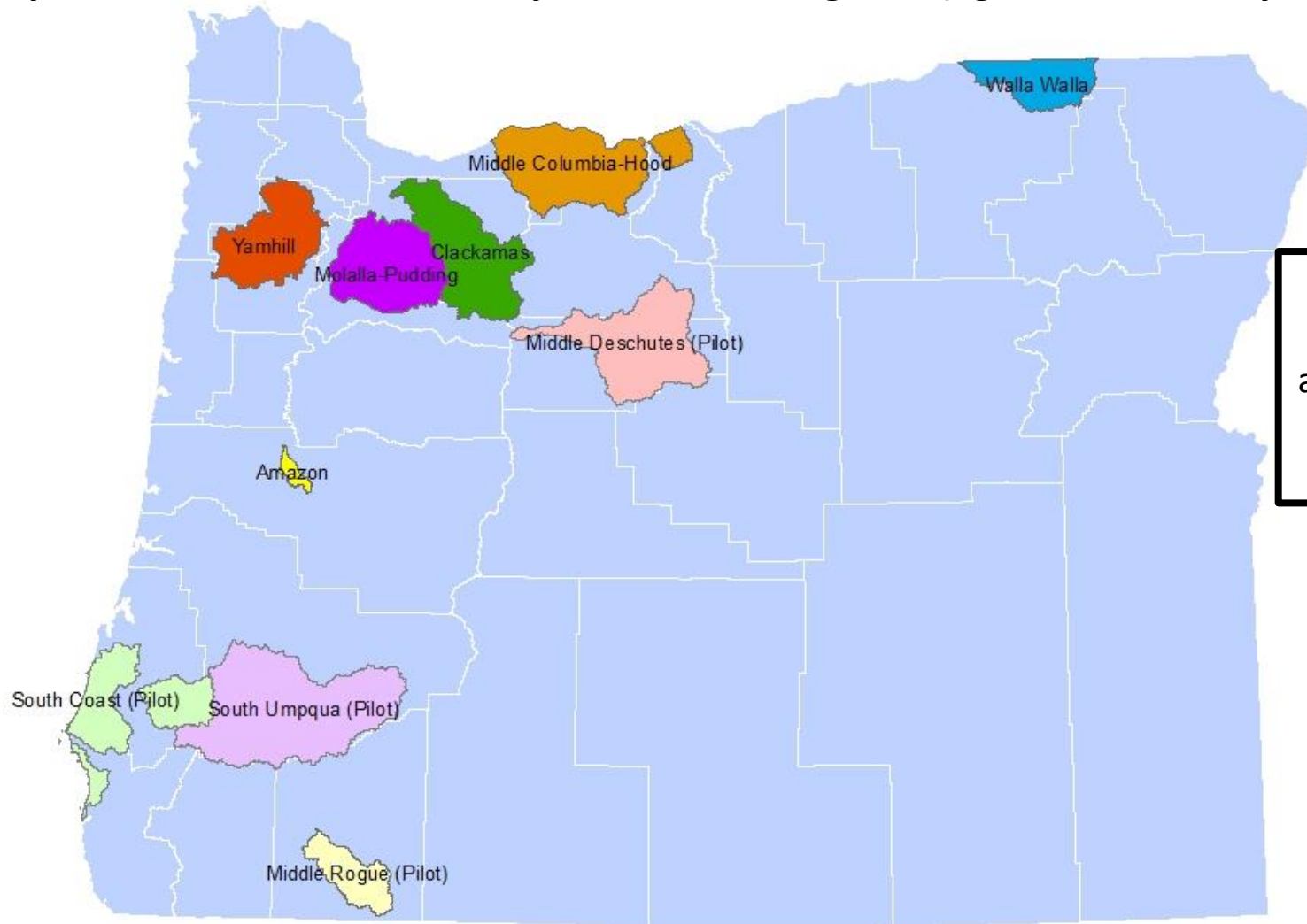
2013 Oregon Legislature allocated resources:

- 1. Add 2 new watersheds to PSP program*
- 2. Tighter link between pesticide use, water quality and pesticide disposal...*
 - Conduct up to 7 pesticide waste collection events 2013-2015.*
- 3. Provide technical assistance in existing PSP areas for biennium*

#2 Oregon Pesticide Stewardship Partnerships

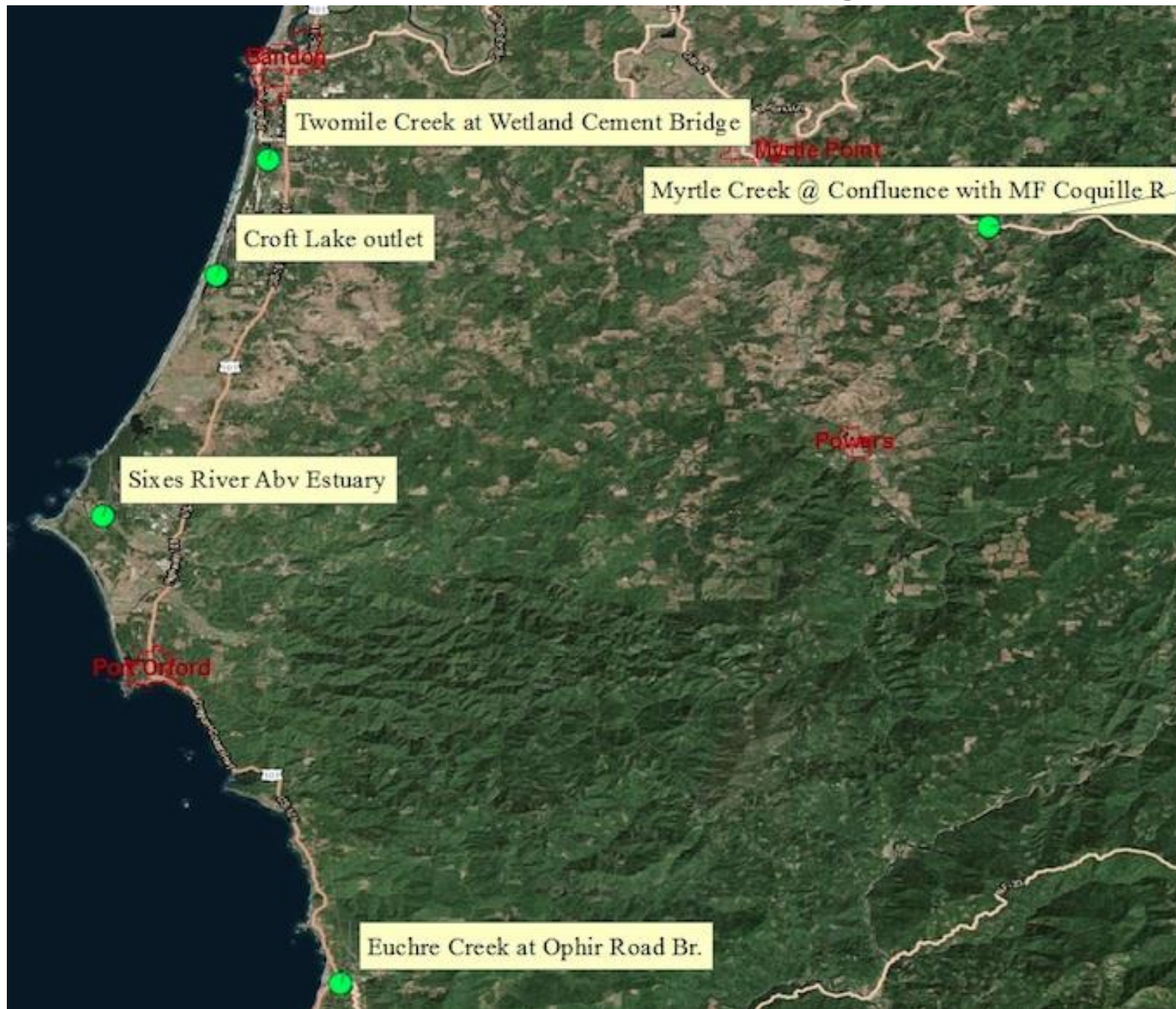
Potential New Sub-Basins/Watersheds for 2014-2015

Key criteria: Pesticide use & major land use categories (ag, urban, forestry, ROW) represented

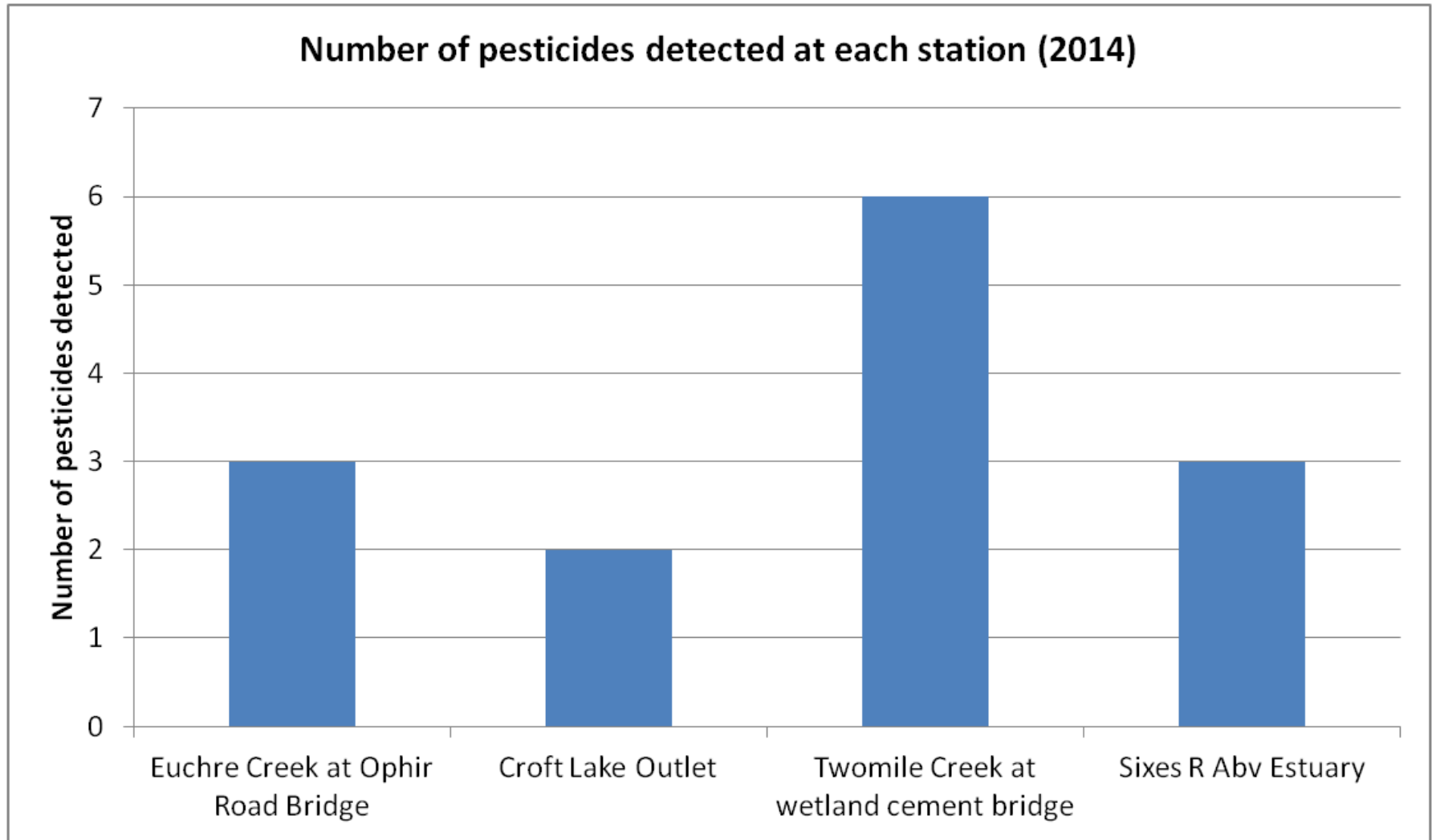


Goal:
Identify two
additional watersheds
for full PSP status
in 2015

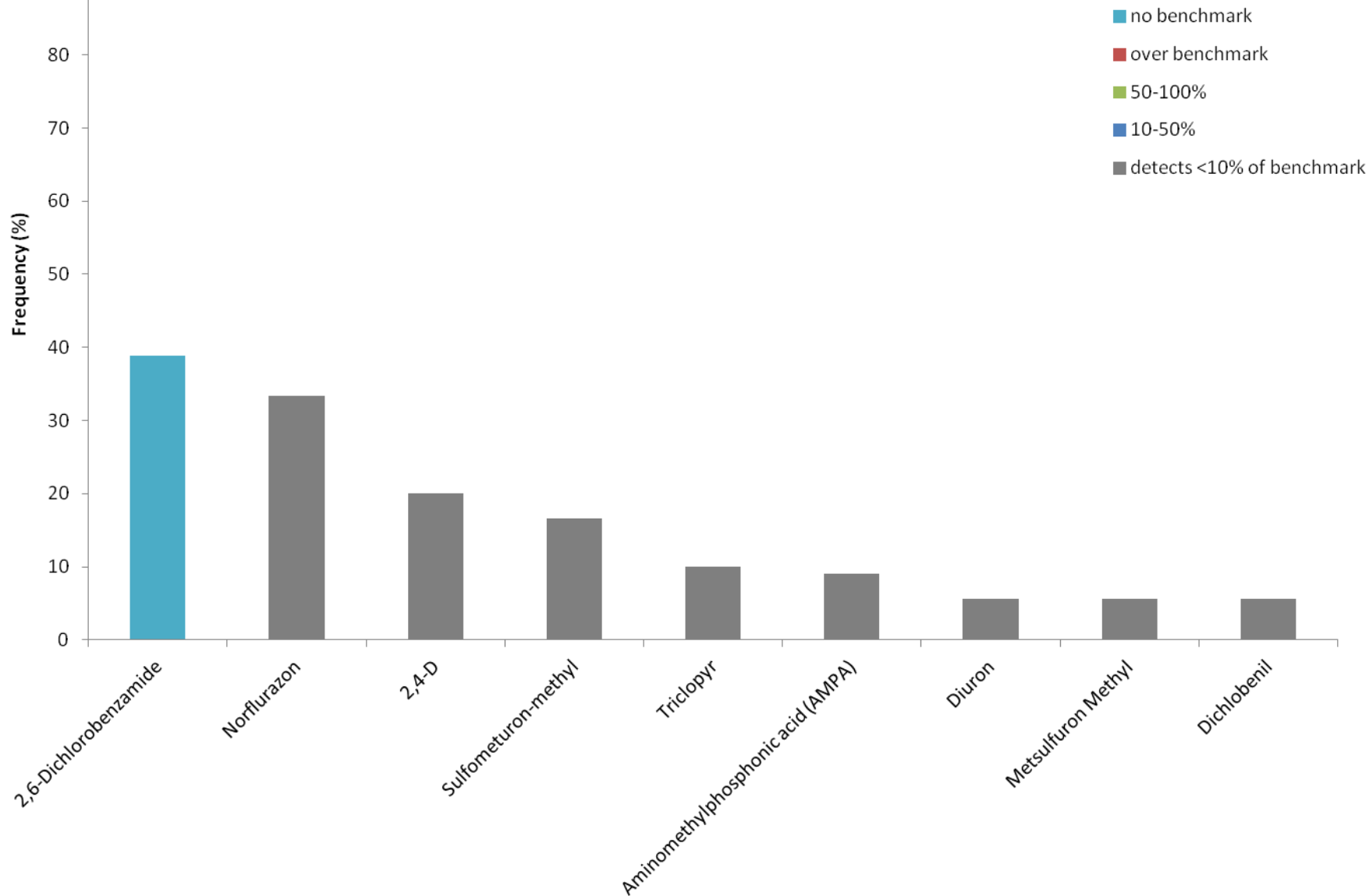
South Coast PSP Pilot Monitoring Sites



South Coast PSP Pilot Monitoring Fall 2014

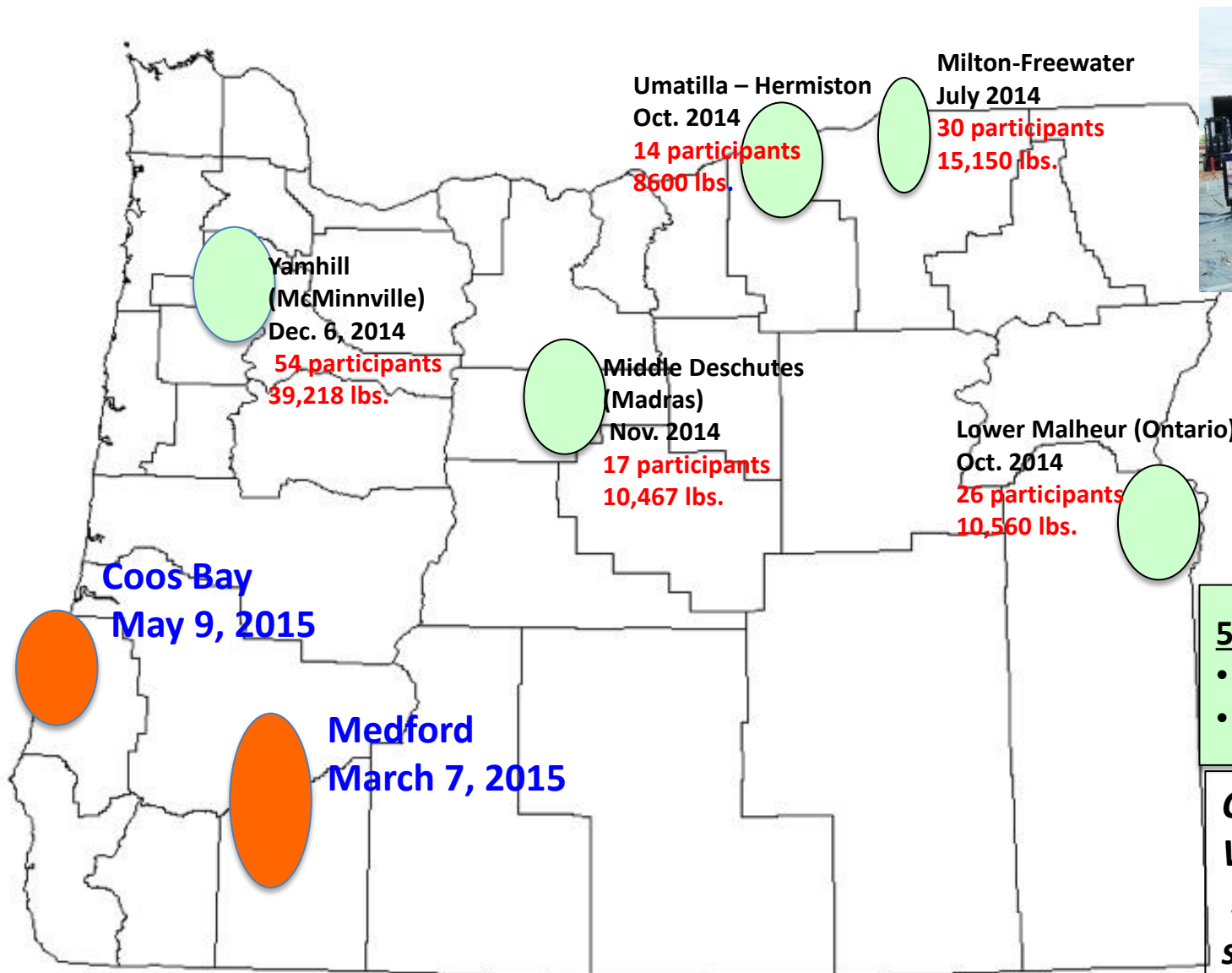


Detection Frequency in South Coast Basin 2014



Waste Pesticide Collection: Oregon PSP Program

Pesticide Collection Events 2014-2015



5 events held in 2014

- 141 participants
- 83,941 lbs.

**Compare to
WA State:
>2.8 million lbs.
since 1988**

Technical Assistance in Existing PSP Watersheds

2014 Theme: Spray Optimization/Drift Reduction

A. OSU Extension: Orchard Spray Optimization & Calibration Project (Hood River, OR)



The Patternator

Plans to expand to Wasco and Walla Walla PSPs

B. Yamhill SWCD: "Tunnel Sprayer" for spray optimization & drift reduction on small fruit

Tunnel Sprayer Demonstrations and Field Testing

- * Proven technology in Vineyards to reduce 99% of drift and reduce chemical usage by 35%
- * Purchasing demonstration unit to run preliminary tests in caneberries and blueberries



C. Launched a Pesticide Stewardship Grant Program



-Thank You - Questions



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Pesticide Labels and Water Quality

- **How Pesticide Labels Can Help You Understand Risk**
- **Buffers**
 - **On Pesticide Labels**
 - **Lawsuit-driven**

Pesticide Labels and Protecting Water Quality

Understanding RISK



**Some pesticide labels allow applicators to
assess some risk of off-target movement**

Risk Factors

Off-Target Movement into Water

Pesticide Properties

Persistence.....Toxicity.... Solubility....
Soil binding.....Formulation type....etc.



Physical / Environmental Conditions

- . Soil properties.....Depth of water table.....Rain events, irrigation practices.....Application methods.....Slope of the field.....Vegetative cover, buffer areas.....etc.

Formal risk assessments use models with data

but....

Typical pesticide users do not have the data or the models

Assessing Risk of Off-Target Movement

Good Pesticide Labels can help pull some risk factors together...



1. Environmental Hazard Statements

- Surface Water vs. Ground Water
- Advisory vs. Mandatory Statements

2. Vegetative Buffers and “No-Spray” Buffers



Putting the Risk Factors Together

Environmental Hazards Statements

Narrative Risk Advisories derived from data & modeling

Surface Water Advisories

“ This product **may** contaminate water through drift of spray in wind. This product has a [medium or high] potential* for runoff for several [days, weeks or months or more]** after application. Poorly draining soils and soils with shallow water tables are more prone to runoff that contains this product. ”

“A level well maintained vegetative buffer strip between areas where this product is applied and surface water....**will reduce** the potential for contamination of water from rainfall-runoff. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted within 48 hours. ”

* *Dependent on soil binding properties*

** *Dependent on persistence:*

Half-life: days: <8 days; weeks: 8-30 days; months: >30 days

Environmental Hazards Statement

Ground Water Advisories

If no monitoring data...

“ This product has properties.....associated with chemicals detected in ground water. This chemical may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow. ”

or

If monitoring data...

*“This product is known to leach through soil into ground water under certain circumstances as a result of label use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, **may** result in ground water contamination ”*

Environmental Hazards Statement

Alias[®] 2F FLOWABLE INSECTICIDE

ENVIRONMENTAL HAZARDS

This product is highly toxic to aquatic invertebrates. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops/plants or weeds. Do not apply this product or allow it to drift to blooming crops/plants or weeds if bees are foraging.


This chemical demonstrates the properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Apply this product only as specified on this label. Extreme care must be taken to avoid runoff. Apply only to soil or other fill substrate that will accept the solution at the specified rate. Do not treat soil that is water-saturated or frozen or in any conditions where run-off or movement from the treated area (site) is likely to occur.

PROTECTION OF POLLINATORS



APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.

Look for the bee hazard icon  in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

Environmental Hazards Statement



This product is toxic to aquatic invertebrates and wildlife. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwater or rinsate.

Groundwater Advisory

Chlorothalonil is known to leach through soil into groundwater under certain conditions as a result of label use. This chemical may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow.

Surface Water Advisory

This chemical can contaminate surface water through spray drift. Under some conditions, it may also have a high potential for runoff into surface water for several days to weeks after application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas over-laying extremely shallow groundwater, areas with infield canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and areas over-laying tile drainage systems that drain to surface water.

But....Some Pesticide Labels leave you wondering....not enough information

DIURON 80DF

DRY FLOWABLE HERBICIDE

ENVIRONMENTAL HAZARDS

For terrestrial uses, do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Cover or incorporate spills.

Moisture is required to activate the herbicide. Best results occur if rainfall (or sprinkler irrigation) occurs within 2 weeks of application.

Two General Types of **Pesticide Buffers** for Protection of Water

- Buffers **on pesticide labels**
 - No-Spray “Untreated” and/or Vegetative Buffers
 - Mixing/Loading Buffers
 - Enforced by ODA/EPA under FIFRA
- Court Ordered Buffers from Washington Toxics Coalition (WTC) v. EPA lawsuit & Biological Opinions
 - ENDANGERED SPECIES ACT (ESA)
 - **Not on pesticide labels (referenced only)**
 - No-Spray Buffers
 - Not enforceable under FIFRA

Buffers

May be on labels as:

- No Spray or “Untreated” Buffers
- Vegetative Buffers

They can be confusing and are often scattered in various locations on pesticide labels:

- Environmental Hazards Statement
- Buffer Section
- Endangered Species Protection
- Spray Drift Section





(Chlorpyrifos)

Label Buffer

Environmental Hazards

This pesticide is toxic to fish, aquatic invertebrates, small mammals and birds. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in water

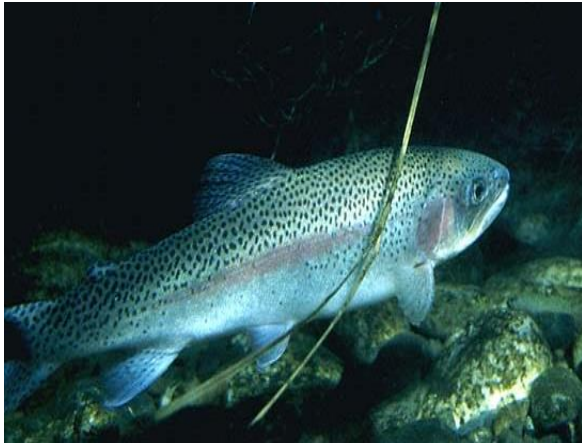
Spray Drift Management

The following treatment setbacks or buffer zones must be utilized for applications around the above-listed aquatic areas with the following application equipment:

Application Method	Required Setback (Buffer Zone) (feet)
ground boom	25
chemigation	25
orchard airblast	50
aerial (fixed wing or helicopter)	150

THREATENED & ENDANGERED SALMONIDS

CURRENT STATUS OF LAWSUIT DRIVEN BUFFERS



Court Ordered Buffers

ENDANGERED SPECIES ACT OF 1973

Section 7 of the Endangered Species Act (ESA):

- Requires federal agencies such as EPA **to ensure that any action they authorize, fund, or carry out (like registering a pesticide) will not.... jeopardize the continued existence of any listed species, or destroy or adversely modify any critical habitat.....**
- Determining that the action is likely to have an adverse effect requires the agency to **formally consult with the appropriate Service (NMFS/NOAA Fisheries or US Fish and Wildlife Service).**



Land Area Affected by Endangered Species Act Listings of Salmon & Steelhead

- * 28 distinct population segments:
5 endangered, 23 threatened
- * 176,000 sq. miles in Washington,
Oregon, Idaho & California
- * 61% of Washington's land area,
55% of Oregon's, 26% of Idaho's, &
32% of California's



October 2010

Endangered Salmonid Lawsuits

Early History

It all started 14 Years AGO!



GROUPS SUE EPA TO PROTECT SALMON IN NORTHWEST FROM PESTICIDES

Commercial fishermen joined forces with two environmental groups to sue the Environmental Protection Agency (EPA) for failure to protect salmon from the harmful effects of pesticides.

January 30, 2001

The Washington Toxics Coalition (WTC), in association with other groups, **filed suit against the EPA for failing to consult under Section 7 of the Endangered Species Act with the National Marine Fisheries Service (NMFS/NOAA)** with respect to salmonids and pesticides.

Endangered Species Lawsuits

Early History

2002

- The court found that EPA violated its obligations under Section 7 of the Endangered Species Act (failed to consult with the Service - NMFS/NOAA)
- Court ordered EPA to complete the effects determinations for **54 pesticides** and consult NMFS

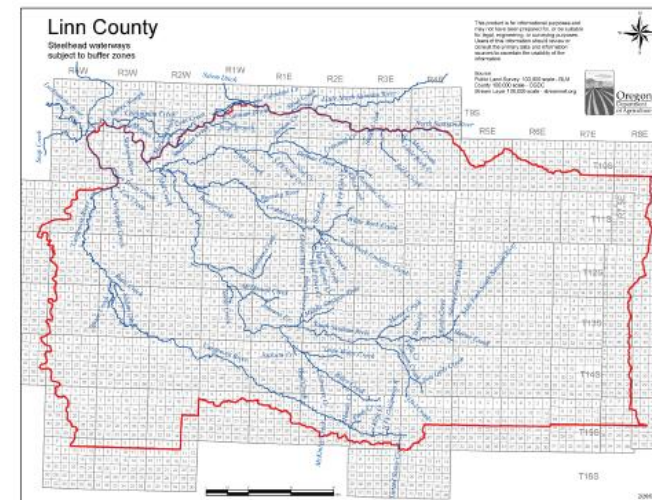
2004

- Court Ordered streamside “no-spray” buffer zones as a protective measure (**not on labels**) for all 54 pesticides.

2004 Court Ordered WTC Buffers

OR, WA and CA

- **Buffers around *salmon supporting waters***
 - Ground applications: 60 feet
 - Aerial applications: 300 feet
 - Some exceptions
- **Buffers remain in effect until:**
A determination is made that consultation is not needed, or consultation is completed
(Biological Opinion completed)




Streamnet database

EPA and ODA do not have authority to enforce a court ordered buffer requirement

ESA EPA-NMFS Consultation Timeline

EPA determined that in Oregon, 26 of the 54 pesticides were likely to “effect” listed salmonids.



EPA initiated consultation with National Marine Fisheries Service (NMFS) (completed December 2004)



However, NMFS did not develop the required Biological Opinions (BiOp's) **and they were sued** by the Northwest Center for Alternatives to pesticides (NCAP).



July 2008, NMFS settles lawsuit and agrees to complete consultations for 37 pesticides on a court-ordered schedule for salmon and steelhead listed as threatened or endangered.

NMFS First Two (of Seven) Biological Opinions (BiOps)

**Court Ordered Buffers no longer in effect
once a Biological Opinion is issued**

Pesticide Type	Ground Application	Aerial Application
Organophosphates (2008) <ul style="list-style-type: none">- Chlorpyrifos- Malathion- Diazinon	500 feet	1000 feet
Carbamates (2009) <ul style="list-style-type: none">- Carbaryl- Methomyl- Cabofuran	<ul style="list-style-type: none">• Methomyl – 50 ft.• Carbaryl & Carbofuran<ul style="list-style-type: none">• 200-600 ft. based on use rate	1000 feet

NMFS/NOAA Pesticide Biological Opinions

BiOp #3: 12 Active Ingredients (August 2010)

- Azinphos-methyl, Dimethoate, Disulfoton, Ethoprop, Fenamiphos, Methamidaphos, Methidathion, Methyl parathion, Naled, Phorate, Phosmet, Bensulide

BiOp #4: 6 Active Ingredients (June 2011)

- Captan, Chlorothalanil, 2,4-D, Diuron, Linuron, Triclopyr BEE

BiOp #5: 3 Active Ingredients (May 2012)

- Oryzalin, Pendimethalin, Trifluralin

**Did Not Specify Buffers – only Max. Pesticide Concentrations Limits
in Salmonid Habitat**

BiOp #6: Thiobencarb for rice (July 2012)

BiOp #7: Seven pesticides (Pending)

Current Status

**EPA did not take action on the BiOps
Did not implement the NMFS buffer mandates**

- **EPA SUED AGAIN** by Northwest Center for Alternatives to Pesticides (NCAP) and others.
- **Court ordered injunction reinstating the no-spray buffer zones** that were originally established in prior litigation (WTC ruling)
- **Buffers will not be included as labeling requirements under FIFRA.**

Reinstatement of no-spray Buffers to Protect Threatened & Endangered Pacific Salmon & Steelhead

Original buffers of 60 feet for ground and 300 feet for aerial applications

- **3 Organophosphate & 2 Carbamate Insecticides**
 - **Chlorpyrifos** (*Lorsban*), **Diazinon**, **Malathion**
 - **Methomyl** (*Lannate*) **Carbaryl** (*Sevin*),
 - Carbofuran registration cancelled
- **Plus 7 still pending - NMFS BiOp #7**
 - **1,3-D** (*Telone*), **Bromoxynil** (*Buctril*), **Diflubenzuron** (*Dimilin*), **Fenbutatin-oxide** (*Vendex*), **Prometryn** (*Caparol*), **Propargite** (*Omite/Comite*), **Metolachlor** (*Dual*)
- Buffers do not apply for pesticides in BiOps 3,4 & 5.

<http://www.oregon.gov/ODA/programs/Pesticides/Water/Pages/Buffers.aspx>
www.epa.gov/oppfead1/endanger/litstatus/ncap-v-epa.html

Impact of Buffers under 2014 Injunction

- Buffer will remain in place until EPA has completed implementation of any mitigation actions, based on reinitiated consultations with NMFS
- The reinitiated consultation will be nationwide in scope and will include **2,000 listed species!** (aquatic and terrestrial)
- Reinstated buffers are not included on labels – but are part of a final court order (*enforced by Federal Marshals since it's a federal court*)
- EPA has started **Salmon Mapper**

You are here: [EPA Home](#) » [Endangered Species](#) » Salmon Mapper

Salmon Mapper

"Salmon Mapper" – Pesticide Use Limitations in California, Oregon and Washington State

[Background](#)[Online Help](#)[Viewing Options](#)

The "Salmon Mapper" GeoPlatform Application is intended to assist pesticide users' understanding of the spatial extent of certain pesticide use limitations to protect endangered or threatened salmon and steelhead in:

- California;
- Oregon; and
- Washington.

The hydrologic data used in this interactive map application were downloaded from the:

- [National Hydrography Dataset \(NHD\)](#) in California, managed by the U.S Geological Survey (USGS); and
- [StreamNet Dataset](#) [Exit](#) in Washington and Oregon, managed by the Pacific States Marine Fisheries Commission.

Pesticide users should visit this site prior to the time of pesticide use to determine whether the Court-ordered limitations apply to your use of a specific pesticide.

To determine specific waters and pesticide use limitations that may apply to your use of a pesticide, from the list at the right:

1. Select the state in which you intend to apply a pesticide;
2. Select the specific pesticide active ingredient you intend to use; and
3. Click the "Submit" button.

Questions regarding the "Salmon Mapper" may be submitted by email to [EPA's Endangered Species mailbox](#).

Salmon Mapper Application

[On-line Help](#)**State:**

Select a state

California

Oregon

Washington

Pesticide: (optional)

Select a pesticide

1,3-dichloropropene

bromoxynil

carbaryl

chlorpyrifos

diazinon

diflubenzuron

fenbutatin oxide

malathion

methomyl

metolachlor

prometryn

propargite

[Submit](#)[Clear Form](#)



(Chlorpyrifos)

Label Buffer

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-Thank You - Questions



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