



Innovative Approaches for Watershed Protection

Corina Hayes and Janet Cherry
Office of Drinking Water

PUBLIC HEALTH
ALWAYS WORKING FOR A SAFER AND
HEALTHIER COMMUNITY



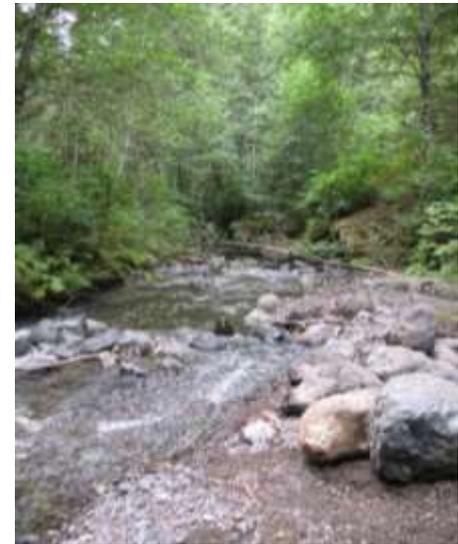
Office of Drinking Water's Mission

To protect the health
of the people of
Washington State
by ensuring safe
and reliable
drinking water.



What is Source Water Protection?

- The practices of preventing contamination from entering a source or potential source of drinking water.
- Multiple barrier approach includes source, treatment, delivery, and outreach.
- Focus today will be on watershed protection.





Reasons for Watershed Protection

- Strong reliance on treatment
- Changes in land cover lead to changes in water quality – increasing cost of treatment
- Increasing exposure and risk

Reasons for Watershed Protection (cont.)

- September 2014 AWWA Journal
 - *Protecting forested watershed is smart economics for water utilities, Gartner, et al*
 - EPA study: On average \$1 spent on source water protection saved an average of \$27 in water treatment costs
- AWWA conducted recent survey on costs

Reasons for Watershed Protection (cont.)

- Every treatment plant has a limit of turbidity it can treat:
 - Slow sand: 10 NTU with roughing filter.
 - Contact adsorption clarifier and filtration: 30 NTU.
 - Membranes: 80 to 100 NTU.



Approaches to Watershed Protection

- Regulations
- Land acquisition or easements
- Collaborative management and agreements
- Watershed planning and emergency response

Approaches to Watershed Protection (cont.)

- **Regulations**
- Land acquisition or easements
- Collaborative management and agreements
- Watershed planning and emergency response

Regulatory Overlap

- Department of Health—Safe Drinking Water Act
- Department of Ecology—Clean Water Act
- Department of Natural Resources—Forest Practice Act
- Department of Agriculture—Pesticide Control Act and Pesticide Application Act
- Counties—Land use ordinances

Regulatory Context

- Safe Drinking Water Act 1974
 - 1986 amendment – Wellhead Protection Program
 - 1996 amendments– Source Water Assessment Program (SWAP)
- Washington drinking water regulations
 - Surface and groundwater under the influence of surface water (GWI) systems must have watershed control plan (WAC 246-290-135 and 246-290-668)

Regulatory Context (cont.)

- Clean Water Act 1972
 - Clean Water Act 1987 Amendment – water quality
- Washington State Water Quality Standards
 - WAC 173-201A - Surface Waters
 - Antidegradation policy –restores and maintains the highest possible quality of the surface water of Washington



Regulatory Context (cont.)

- Washington Forest Practices Act (FPA)
 - Enacted in 1974 – Title 222 WAC and chapter 76.09 RCW
- Protects public resources while maintaining a viable timber industry.
- Public resources include:
 - Water.
 - Fish.
 - Wildlife.
 - Capital improvements.
- FPARS



Regulatory Context (cont.)

- Pesticide Application Act
 - RCW 17.21
 - Regulates application and control of the use of various pesticides.
- Pesticide Control Act
 - RCW 15.58
 - Regulates formulation, distribution, storage, transportation, and disposal of any pesticide and dissemination of accurate scientific information for proper use, or nonuse, of any pesticide.



Regulatory Context (cont.)

- County ordinances
 - Zoning
 - Development regulations
 - Critical Areas
 - Critical Aquifer Recharge Area
- Can use permitting process to restrict or condition certain activities.

City of Olympia Watershed

- Mixed use includes low residential use, vacant land, forested, and agricultural.
- In early 1990s, Thurston County enacted special zoning.
 - Includes limited high density residential and commercial development.
 - Developed more stringent standards for on-site wastewater systems in the designated geologic sensitive area .

City of Olympia Watershed (cont.)

- Source water protection area lies outside city limits.
 - City works with county environmental health.
 - Extensive review of new developments under county review, including hydrogeologic assessment.



Approaches to Watershed Protection

- Regulations
- **Land acquisition or easements**
- Collaborative management and agreements
- Watershed planning and emergency response

Land Protection Tools

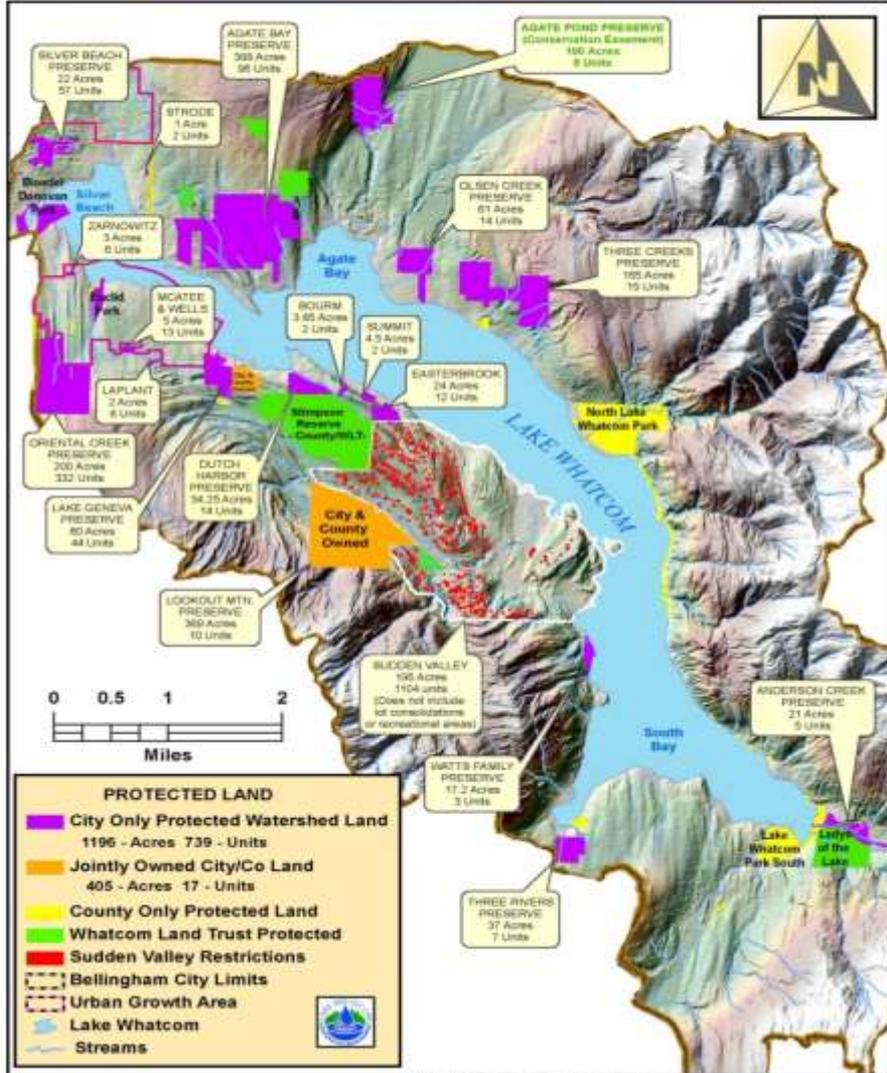
- Fee-simple land acquisition
- Conservation easements
 - Agricultural
 - Forestry
 - Recreational
 - Wildlife habitat
- Deed restrictions
- Conservation leases
- MOA, voluntary land agreements



Bellingham Source Water Protection

- Surface water watershed
- Source water protection program emphasizes:
 - Land acquisition—protection.
 - Landowner agreements.
 - Surveillance.
 - Education.
- Funded with \$12 per month fee.

**PROTECTED PROPERTY
IN THE LAKE WHATCOM WATERSHED
(As of 4-16-2012)**

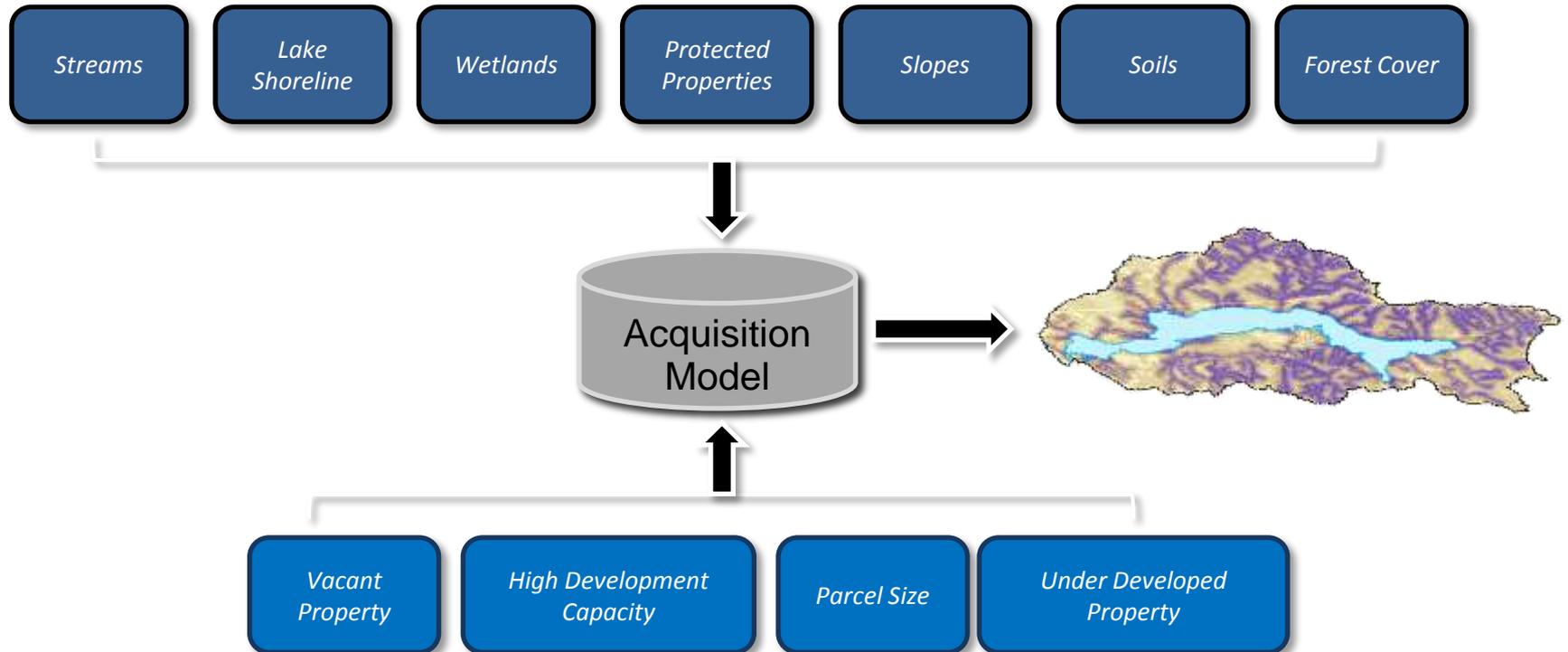


LWR 4-16-2012 Acquisition land w full labels

Bellingham

- 30,000 acre watershed
- 1,600 protected acres
- Focus land acquisition around surface water

Lake Whatcom Watershed: GIS Acquisition Model



Bellingham Source Water Protection

- Landowner agreements
 - DNR agreement = Lake Whatcom Landscape Plan (compliments acquisition program)
 - Enhanced forest practices to ensure protection
 - Logging
 - Road building
 - Aerial spraying of pesticides/herbicides
 - Informal agreements with other landowners.
 - Considering formalizing agreements in line with DNR Landscape Plan.



Town of Carbonado

- Small rural low-income town
- Surface water system – springs and stream
- White River School District owns the watershed
- History of logging and mining
- Future forest practices could harm water supply

Town of Carbonado (cont.)

- \$30,000 grant from the agency to:
 - Negotiate with landowner.
 - Develop source water protection plan.
 - Begin implementing priority protection actions.
- Results
 - Watershed control plan identified sensitive protection areas.
 - Draft conservation easement developed through negotiations with the landowner.

Approaches to Watershed Protection

- Regulations
- Land acquisition or easements
- **Collaborative management and agreements**
- Watershed planning and emergency response

City of Aberdeen

- 7,400 acre watershed
- City owns 1,200 acres near intake and dam
- Remainder owned by Simpson, Rayonier, and U.S. Forest Service

City of Aberdeen (cont.)



City of Aberdeen (cont.)

- 1971: City worked with Grays Harbor County to pass ordinance.
- 1978: Developed agreement with U.S. Forest Service.
- Early 1990s: Developed agreements with private timber companies.
 - Initially done to gain filtration avoidance.
 - Useful today to make sure activities in the watershed do not result in excessive turbidity.

City of Aberdeen

County Ordinance

- 1971: City worked with Grays Harbor County to pass an ordinance protecting entire watershed.
- Prohibits:
 - Unlawful entry.
 - Dumping or other activities that pollute the watershed and water bodies.
- Grays Harbor County Sheriff's office has authority to enforce.
- Defines penalties for violation (fines or jail time).

City of Aberdeen

Forest Service Agreement

- 1978: Agreement executed.
- Objective is to maintain high quality water from the Wishkah River Municipal Watershed.
 - U. S. Forest Service (USFS) responsible for administration of forest lands, but will not patrol on behalf of city.
 - City responsible for all improvements and operations of the water system.

City of Aberdeen

Forest Service Agreement (cont.)

- City and U. S. Forest Service mutually agree to:
 - Annual meeting to review previous year and discuss future year's activities.
 - Consultation meetings, if necessary or desired by either party.



City of Aberdeen

U.S. Forest Service Agreement (cont.)

- City agrees to:
 - Inform USFS of any changes that affect the watershed.
 - Obtain USFS permits to erect gates, signs, or any other improvements.
 - Provide feedback to USFS within 30 day on USFS proposals.
 - Notify USFS of unauthorized entry.
 - City not allowed to take law enforcement action.

City of Aberdeen

U.S. Forest Service Agreement (cont.)

- Forest Service agrees to:
 - Hunting and fishing controlled by Washington Department of Fish and Wildlife (WDFW).
 - If WDFW closes the watershed to hunting or fishing, USFS will support the decision.
 - Gate and sign USFS roads that ingress and egress into USFS administered lands and restrict off-road vehicles.

City of Aberdeen

Forest Service Agreement (cont.)

- U.S. Forest Service agrees to:
 - Conduct and schedule timber harvesting while protecting water quality.
 - Prompt revegetation of bare areas.
 - Control number of acres disturbed.
 - Notify city if herbicides used.



City of Aberdeen

Rayonier and Simpson Agreements

- Agreements are similar in nature.
- Agreements were signed in 1993 and 1994 in an effort to obtain filtration avoidance.
- Reference county ordinance.
- Grants the owner (Rayonier or Simpson) the right to enter the watershed for harvest activities and management of its properties.
- City granted use of its road in return for acceptance of restrictions in the agreement.

City of Aberdeen

Rayonier and Simpson Agreements (cont.)

- Allowed activities include:
 - Forest management and harvest.
 - Growing, protecting, cultivating, and producing timber, trees, and forest growth.
 - Constructing, maintaining, and using roads, trails, and other improvements.
- Any other activities not allowed without prior written consent by the city.
- Notify city of activities and meet regularly.

Boistfort Valley Water

- Primary surface water source is Stillman/Little Mill Creek.
- Treated by Wildwood Water Treatment Plant (WTP) constructed in 1993.
 - CAC/filter package plant.
- Up to 2007, used intake on Stillman Creek.
 - Lost intake in 2007 floods.
 - Relocated main intake on Little Mill Creek above the confluence of Stillman and Little Mill Creeks.

Boistfort Valley Water (cont.)



Boistfort Valley Water (cont.)

- Stillman/Little Mill Creek watershed is 27 square miles, mostly forested.
- Multiple landowners, major land owner is Weyerhaeuser who actively harvests in this area.
- Boistfort Valley Water (BVW) has good relationship with Weyerhaeuser and has relied on verbal agreements.
 - Weyerhaeuser granted easements to BVW for intakes and roads at no cost.

Boistfort Valley Water (cont.)

- Gated entrance- Weyerhaeuser controls locks on gate.
- Limited hunting allowed by leases granted by Weyerhaeuser.
- No overnight camping allowed.

Boistfort Valley Water (cont.)

- Many changes in watershed and source turbidity.
 - Flooding
 - Logging/road construction
 - Land sloughing
- Current watershed control plan very weak.



Boistfort Valley Water (cont.)

- BVW has invested over one million dollars in constructing presedimentation facilities.
- Wildwood WTP still periodically shut down due to high turbidity.
- CAC/filter plant difficult to operate, if influent turbidity exceeds 30 NTU.



Boistfort Valley Water (cont.)



Boistfort Valley Water (cont.)



Boistfort Valley Water (cont.)



Boistfort Valley Water (cont.)

- November 2012, BVW alerted that Weyerhaeuser harvesting 100-acre plot in watershed.
- Heavy rains had just occurred, resulting in increased turbidity in Little Mill Creek.
- BVW requested Weyerhaeuser not to log.
- Health, Weyerhaeuser, DNR, and BVW met; Weyerhaeuser agreed to postpone logging.

Boistfort Valley Water (cont.)

- Weyerhaeuser logs this watershed in the winter due to low elevation and continued access during winter.
- Weyerhaeuser had received approved Forest Practice Application/Notification from DNR to log this site.
 - BVW would have benefited from using FPARS to track this application.

Boistfort Valley Water (cont.)

- Worked with BVW to obtain a source water grant to characterize the watershed and develop a written agreement with Weyerhaeuser.
 - Lewis County sponsored BVW for this grant.
- BVW hired contractors to negotiate with Weyerhaeuser, conduct watershed characterization (geotech), and update watershed control plan.

Boistfort Valley Water (cont.)

- Options being considered by BVW include:
 - Compensate Weyerhaeuser financially not to log certain areas of the watershed.
 - Purchase the land.
 - Negotiate with Weyerhaeuser on larger riparian buffers.
 - Install another presedimentation basin.
 - Upgrade water treatment plant.

Boistfort Valley Water (cont.)

- Two meetings with Weyerhaeuser, BVW, DNR, Health, and Lewis County.
- Weyerhaeuser working with BVW.
 - Agreed to postpone logging on 100-acre parcel until January 2015.
 - Agreed to larger buffers on steep slopes.
 - Closely coordinating with BVW on hunting leases.
 - Designated contact person for BVW to call.
 - Offered to help with re-locating intake.

Boistfort Valley Water (cont.)



Approaches to Watershed Protection

- Regulations
- Land acquisition or easements
- Collaborative management and agreements
- **Watershed planning and emergency response**

Watershed Planning

- All public water supplies required to have a watershed control plan.
 - Identify boundaries, landowners, and activities.
 - Present control measures (monitoring, patrols, agreements).
 - Operations and emergency provisions.
- Implement the plan.
- Update in the Water System Plan at a minimum.

Watershed Planning (cont.)

- Level of watershed control influences treatment selection
 - Watershed ownership and control allows some systems to achieve filtration avoidance.
 - Seattle and Bremerton
 - High quality sources and watershed control through agreements or other efforts allow less costly treatment
 - Camas
 - Systems with little control over watershed activities need treatment or in some cases, supplemental sources.
 - Castle Rock

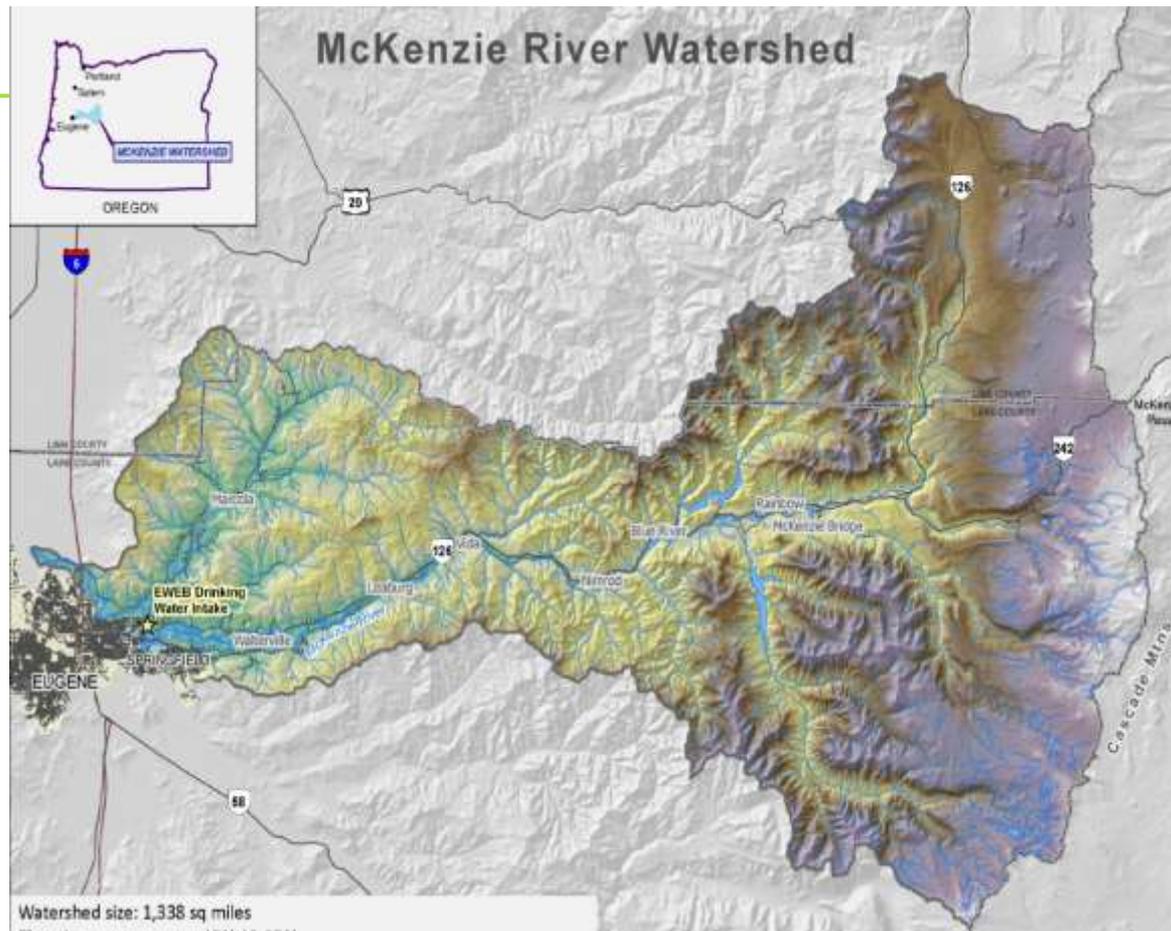


Emergency Response Planning

- Knowing the risks can help prepare for, mitigate, or potentially avoid an emergency.
- Source water protection includes an emergency plan that:
 - Emphasizes prevention.
 - Identifies main threats.
 - Details response procedures.
 - Determines replacement options (contingencies).
- Great tools are available on our website at www.doh.wa.gov/drinkingwater

Eugene, OR Emergency Response Plan

- McKenzie River watershed
- Sole source
- Very large watershed (1,338 square miles)
- Limited control and multiple land uses



Source: Karl Morgenstern, EWEB, PNW AWWA Conference, May 2014

Eugene, OR Emergency Response Plan (cont.)

- Sheds located along the river equipped with pumps, booms, sorbent pads, containment barrels, compressors, boats, and other materials needed to address a spill.
- Conduct drills with all agencies: Fish and Wildlife, Transportation, Ecology, Office of Drinking Water, local health, fire department, state and local police, USFS.

Contamination is Expensive

- A community may spend millions of dollars responding to contamination.
- Responding to contamination is about 200 times more costly than prevention.



Case Study: Elk River Spill, January 2014

- 10,000 gallons of crude Methylcyclohexanemethanol (MCHM) leaked into the Elk River 1.5 miles upstream of the West Virginia American Water intake.



■ Affected counties



- 300,000 customers
- Six-nine day “do not drink” order
- Replaced all treatment plant filters
- Cost \$1.2 million

City of Olympia

- The city:
 - Has a spill prevention and response program to address spills on the public roadways and railways that transect the watershed.
 - Conducts weekly inspections.
 - Works with large landowners on best management practices.
 - Installed “No Trespassing” signs on perimeter of surrounding area.

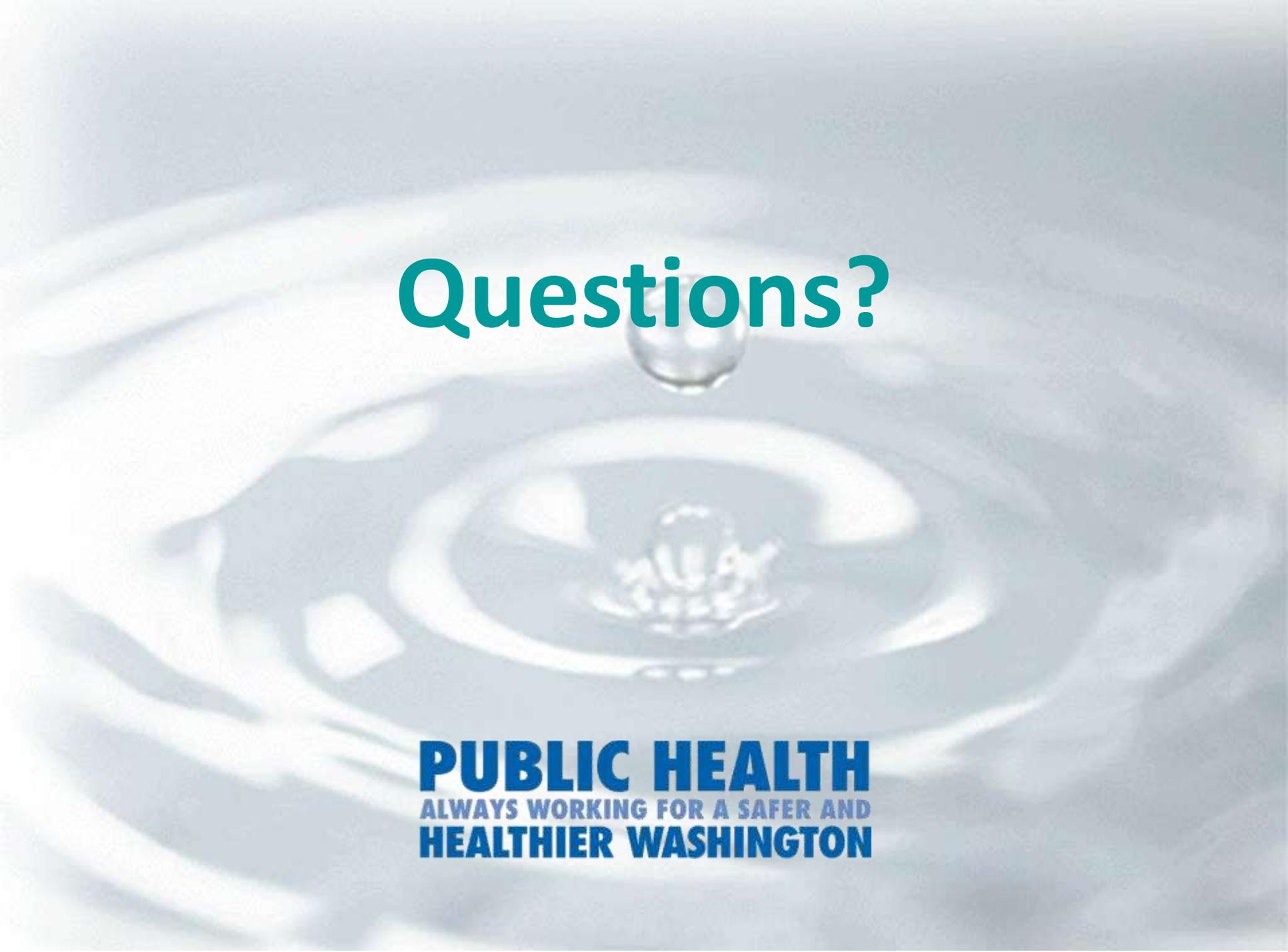
Oil Transportation



- Risk
 - Ecology tasked with evaluating public health, safety, and environmental impacts of oil transportation due to increase in oil moving through the state.
 - In addition to increase in marine and rail transport, there is also a large quantity of oil and fuel transported by pipelines.
- Response
 - Be aware of risks and incorporate them into emergency response planning.
 - Communicate with local responders; help them understand the impacts a spill or fire to your system.

Funding

- Source Water Protection Grants
 - Up to \$30,000 per eligible study
- Examples
 - Ilwaco
 - Boistfort
 - Carbonado
 - Port Townsend



Questions?

PUBLIC HEALTH
ALWAYS WORKING FOR A SAFER AND
HEALTHIER WASHINGTON