

Oregon DEQ AQ-Technical Services

Competing Source Emission Inventories for Air Quality Analysis

April 15, 2015
EPA 2015 International Emission Inventory Conference
San Diego, CA

Overview

- What are we talking about here?
- Background
 - Why ODEQ should do Competing Source Inventories?
 - Statement of the Issues
 - Purpose of Project
- About the Case Study
- Screening Process Design and Application
- Recommendations

What are we talking about here?

- What is a competing source emission inventory?
- Why is it needed?
- Who is considered a competing source?

Background

- Inherited task of preparing competing source emission inventories for permit modeling
- Opportunity to more clearly define emission inventory's role in air quality analysis

Why ODEQ should develop competing source emission inventories?

- direct access to permitting databases and files
- more familiar with types and location of permitted sources in the state
- access to emission inventory references and tools
- direct access to permit writers for assistance

Statement of the Issues

- Regardless if emission inventory was done in-house or not, a list of competing sources would still need to be provided by ODEQ
- Limited timeframes for permit modeling projects
- Key information is not always available to prepare competing source list
- Large volume of sources with air operating permits may get pulled into list
- 1 FTE for developing point source emission inventories

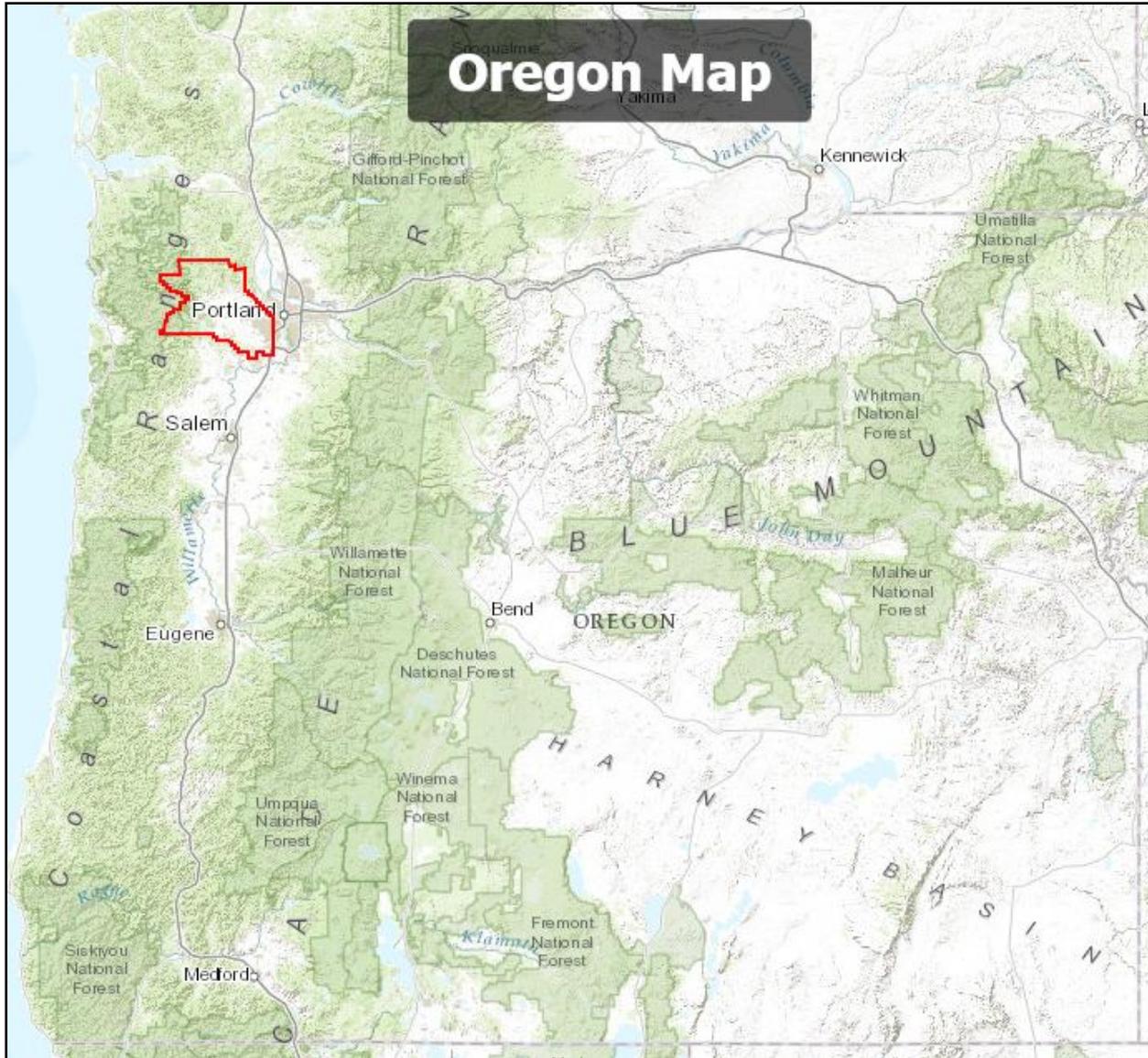
Purpose for the Project

- Design screening process to identify sources to include in competing source emission inventories
- Apply the new screening process to a Case Study from Washington County, Oregon

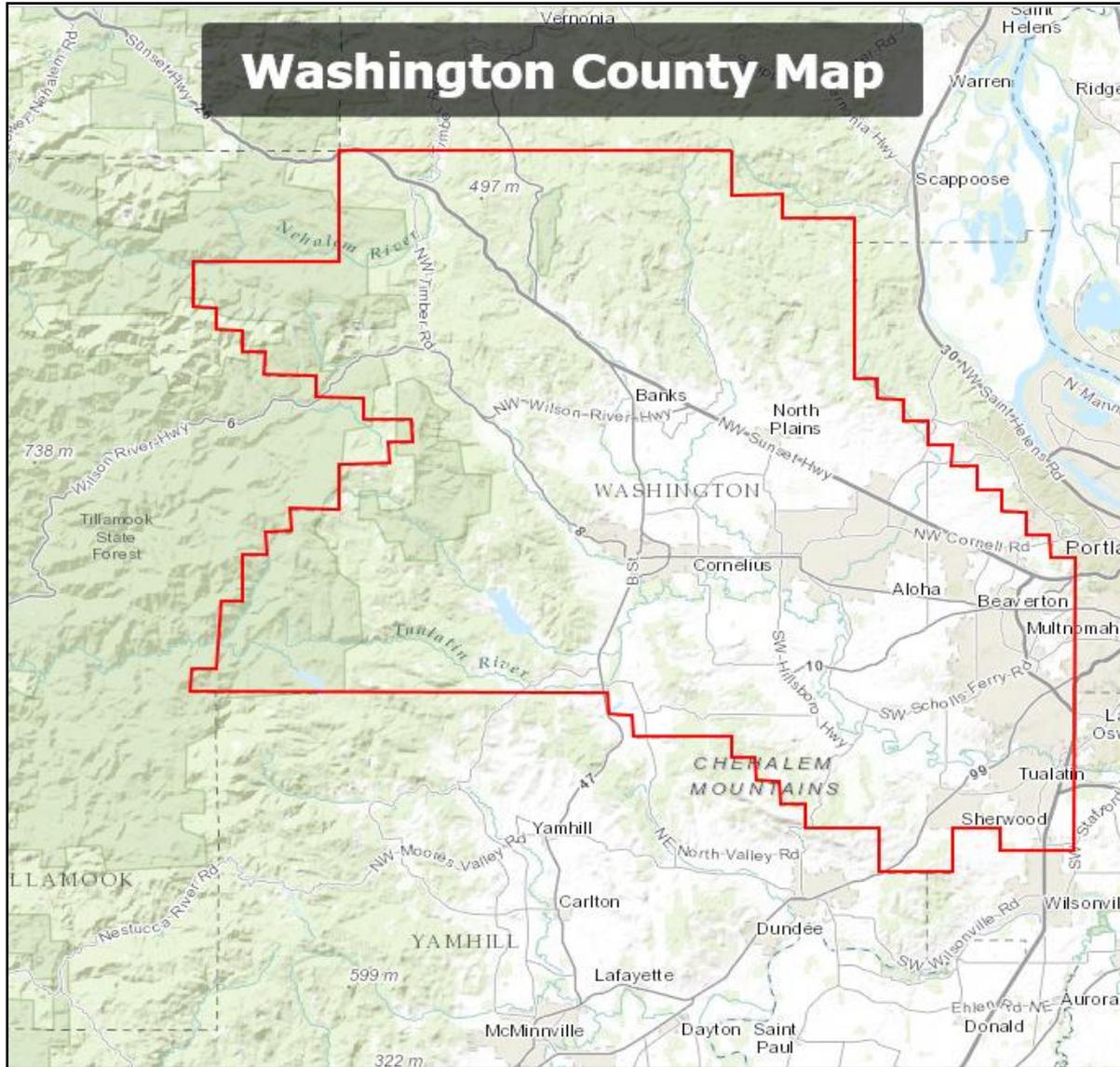
About the Case Study

A CASE STUDY FOR COMPETING SOURCE DETERMINATION FOR WASHINGTON COUNTY, OREGON

Where is Washington County?



Where is Washington County?



Area: 726 sq miles

Population: 562,998

Major Industries:

- Agriculture
- Lumber
- Manufacturing
- Food Processing
- Electronics

Why Choose Washington County for a Case Study?

- Demonstrate the large volume of nearby sources that may be pulled in for competing source determination in urban areas
- Unique topographical features that creates localized meteorological conditions within the county and obstructs pollutant transport

About the Case Study Subject

- Facility is located in Hillsboro, Oregon
- Proposed emission increases will raise allowable emission limits
- Apply for a permit that requires a Prevention of Significant Deterioration (PSD) analysis
- CO, NO₂, PM₁₀, and PM_{2.5} are pollutants of concern

Case Study: Competing Source Determination

Screening Process Design and Application

Case Study: Competing Source Determination

4 step screening process:

- 1) Develop initial list of nearby sources
- 2) “Range of Influence” (ROI) screening method
- 3) Topography and Meteorological Assessment
- 4) Evaluate remaining nearby sources for background rather than inventorying

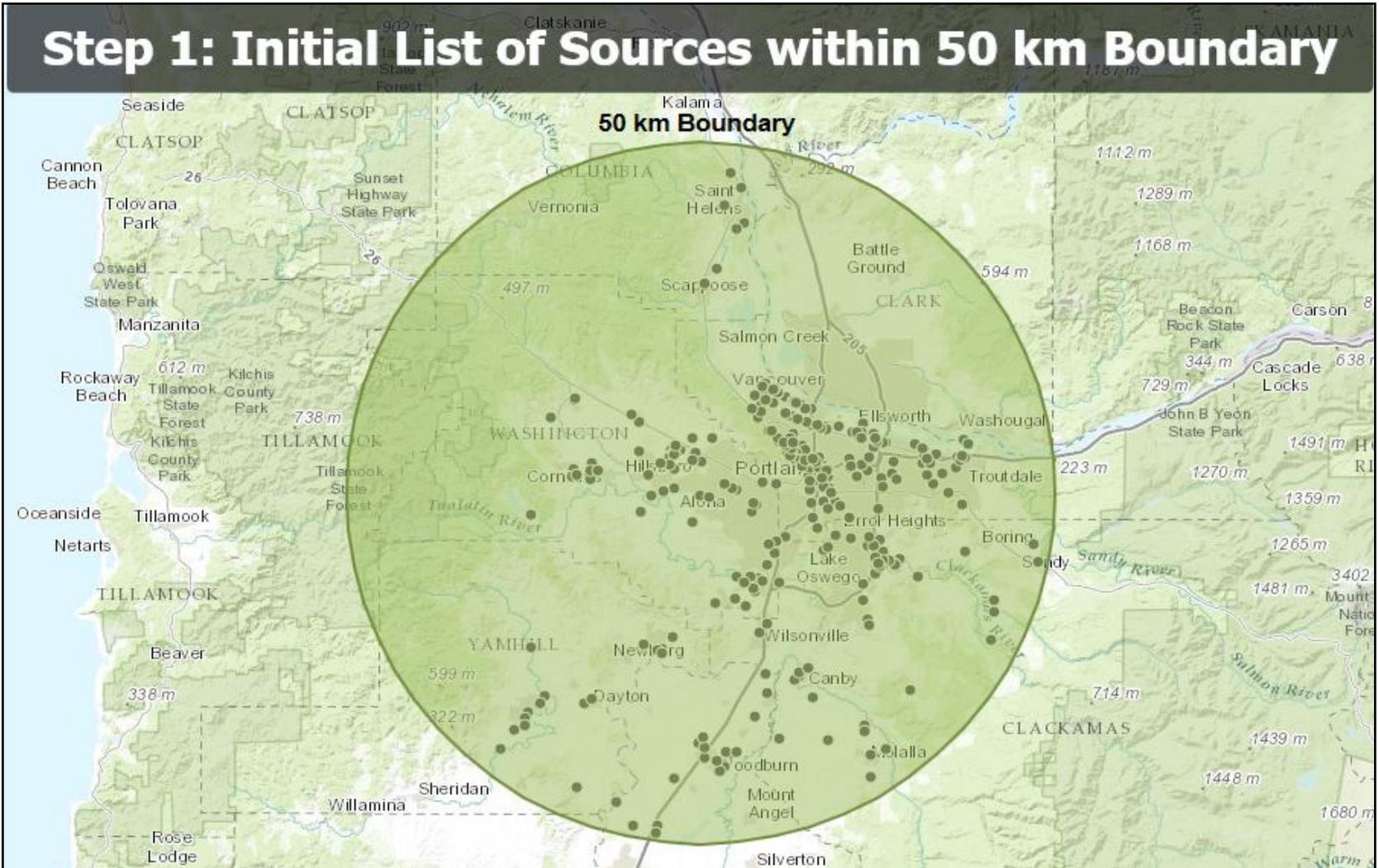
Case Study: Competing Source Determination

Step 1: Develop initial list of sources

- Map new or modified source centered in area with a 50 km radius
- Identify counties within 50 km boundary
- Query permitting database for all nearby stationary and portable sources within boundary that have:
 - ✓ Title V or Air Contaminant Discharge Permit (ACDP) and allowable limits for pollutants being modeled
- Add existing sources to map with new or modified source

Case Study: Competing Source Determination

Step 1: Initial List of Sources within 50 km Boundary



Case Study: Competing Source Determination

- Six counties: Clackamas, Columbia, Marion, Multnomah, Washington, and Yamhill
- 2 counties not included in inventory: Tillamook County Oregon and Clark County Washington
- 329 nearby stationary sources were added to map
- 151 portables not included on map
- Federal and state air operating permit programs

Breakdown of Nearby Sources by Permit Type

Permit Program	Permit Type	# of Sources
ACDP	Basic	23
ACDP	Generals	318
ACDP	Simples	52
ACDP	Standards	57
Title V	Title V	30
Total Sources		480

Case Study: Competing Source Determination

Step 2: Range of Influence (ROI) Screening Method

- Oregon rules provide a methodology for identifying nearby sources to include in competing source modeling
- The ROI estimates the distance from a source that emissions can have a significant impact
- The modeled Source Impact Area (SIA) of the new or modified source is used to define significance
- SIA is not always available at the time the inventory is initially developed but will be to refine the inventory for final modeling

Case Study: Competing Source Determination

Step 2: Range of Influence (ROI) Screening Method

- Revised ROI method to work without SIA
 - add new or modified source and nearby source annual allowable emissions together for each pollutant
 - calculate ROI for total annual allowable emissions for both sources

- Compare combined ROI to the distance from the nearby source to new or modified source
 - ROI > than distance keep on list
 - ROI < than distance remove from list

Case Study: Competing Source Determination

- 115 sources removed by the ROI screening method
- The most number of sources removed from the list are Generals and Simples
- The least number of sources removed from the list are Title V
- 214 sources are still a large undertaking to inventory each at process-level

Comparison of Nearby Sources Remaining by Screening Step

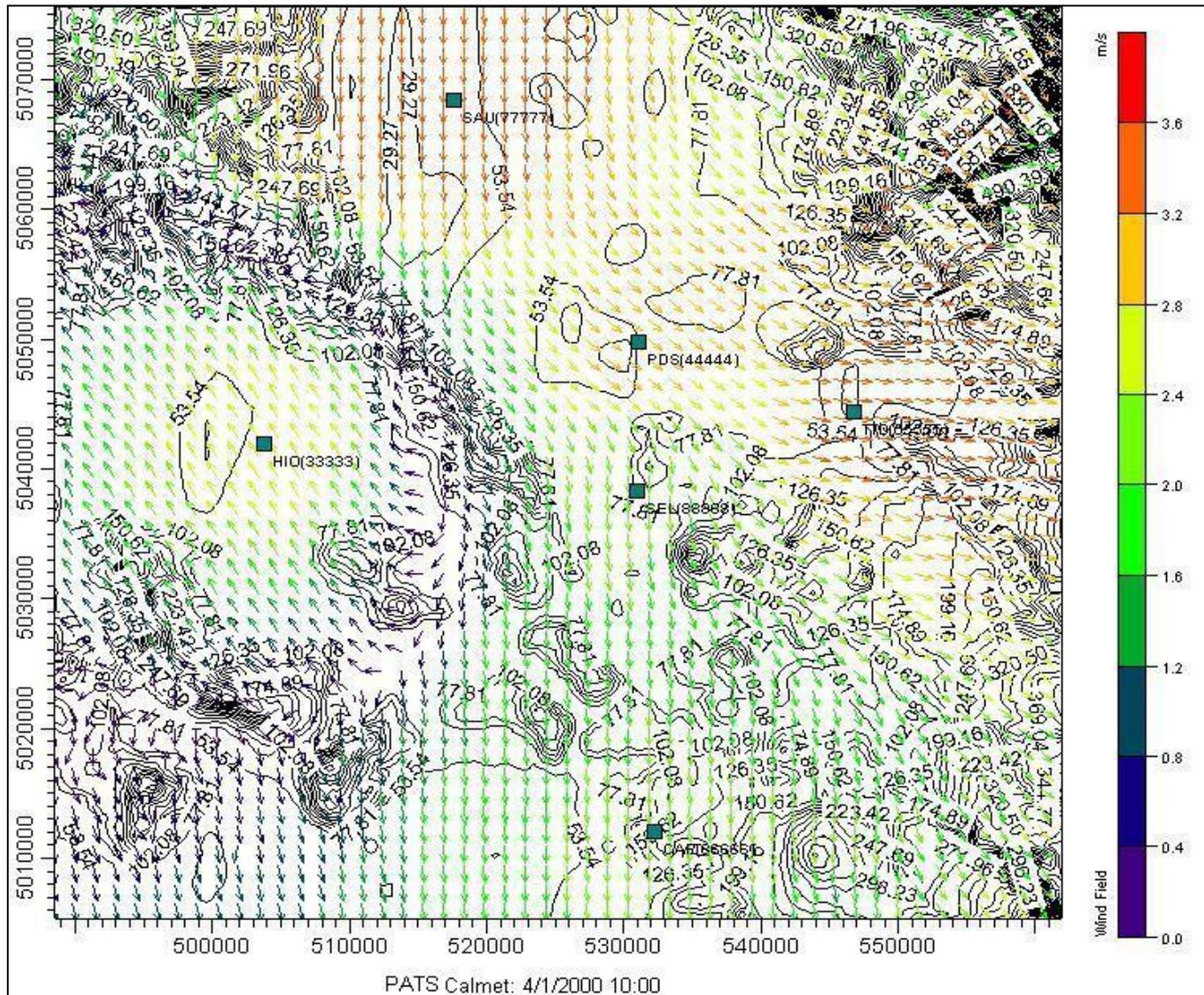
Permit Type	Step 1: 50 km boundary	Step 2: ROI Screening Method
Title V	30	25
ACDP:		
Basics	10	7
Generals	182	114
Simples	50	28
Standards	57	40
	329	214

Case Study: Competing Source Determination

Step 3: Topography and Meteorological Assessment

- Analyze natural and artificial features surrounding the new or modified source and nearby sources
- Topography can cause unique meteorological conditions
 - localized weather patterns: stagnant days, prevailing winds
 - act as a barrier for pollutant transport

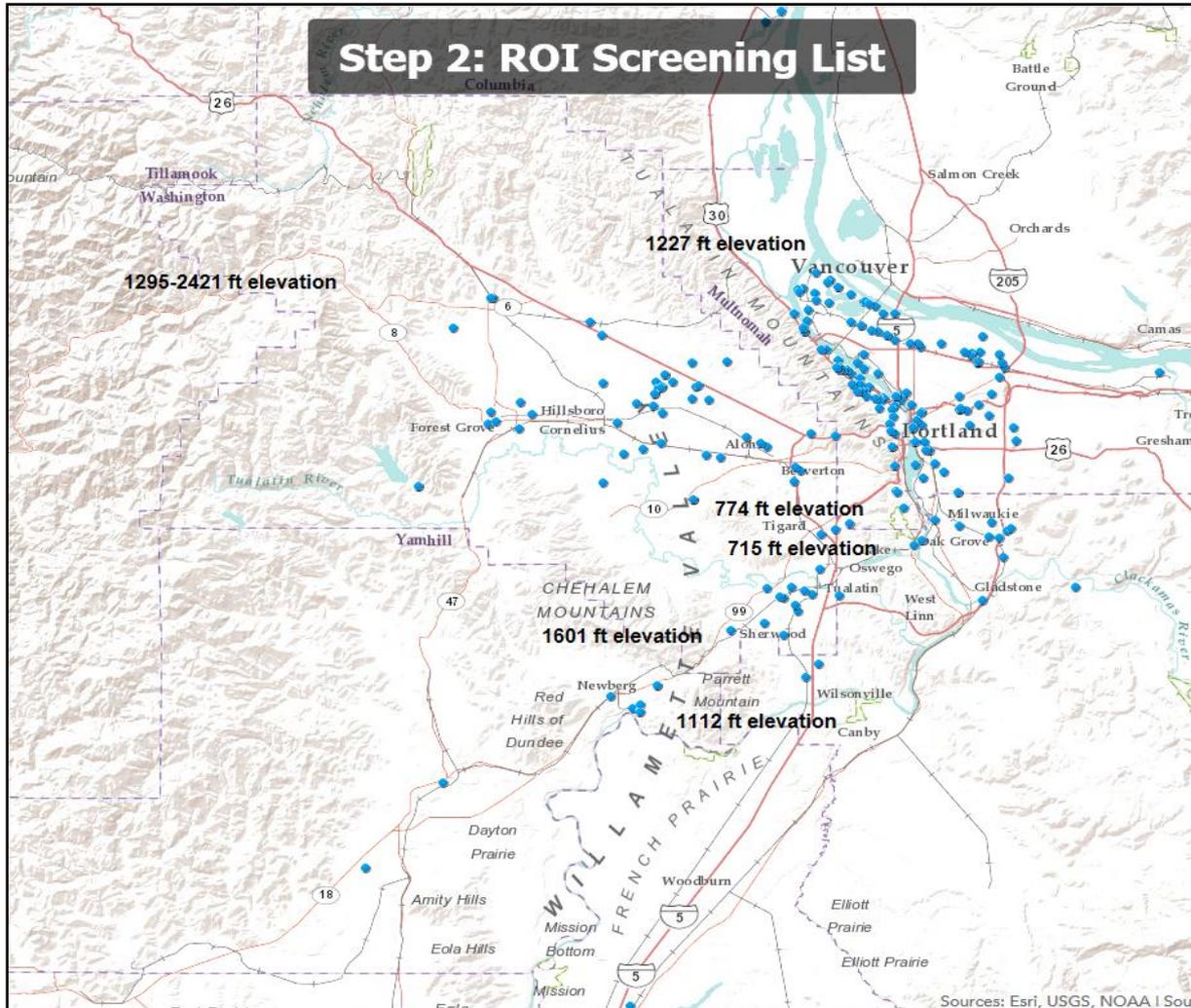
Case Study: Competing Source Determination



Case Study: Competing Source Determination



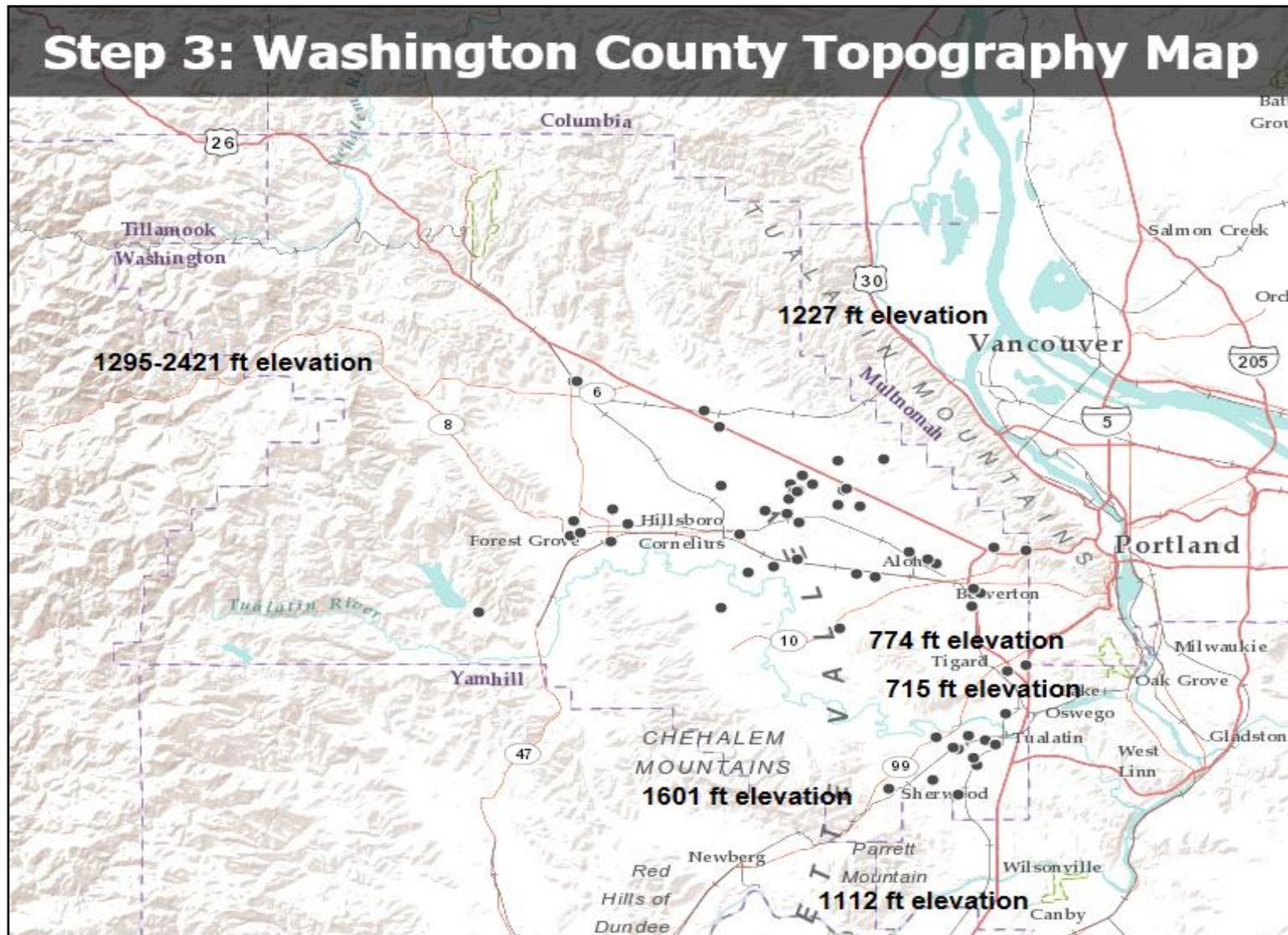
Case Study: Competing Source Determination



Natural Features:

- Bull Mtn- 715 ft
- Coastal Range- 1295-2421 ft
- Cooper Mtn- 774 ft
- Chehalem Mtns- 1601 ft
- Parrett Mtn- 1112 ft
- Tualatin Mtns- 1227 ft

Case Study: Competing Source Determination

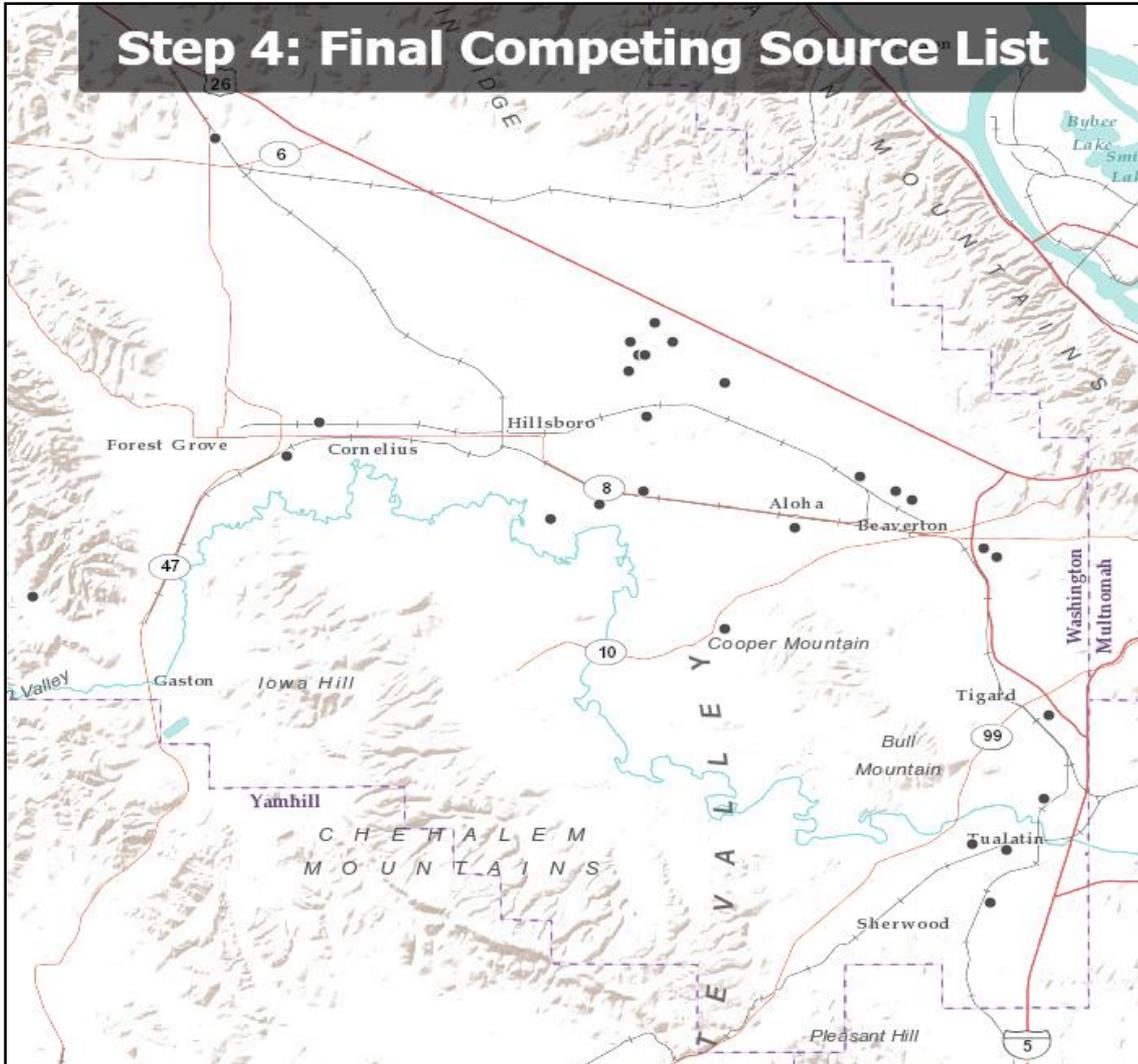


Case Study: Competing Source Determination

Step 4: Considerations for removing sources from emission inventory

- Small or intermittent sources do not operate at the same time as the new or modified source
- Source that do not emit a pollutant of concern
- Portable sources
- Source's actual emissions are substantially lower than the allowable emission limit and not expected to operate close to the assigned limit:
 - Apply a 5 km cutoff to basic and general permit types
 - Sources located over 5 km away not included on list
 - Assume small or insignificant sources are represented in the background

Case Study: Competing Source Determination



Step 4: Sources Removed Because

- Small or Intermittent Sources (8)
- Not emit pollutant of concern (3)
- >5 km cutoff (22)
- Portables removed from the beginning (151)

➤ Conclude:

Step 1: 329 sources to start

Sources Removed by Each Step:

Step 2: 115 sources (214 remain)

Step 3: 152 sources (62 remain)

Step 4: 33 sources (29 remain)

Total removed: 300 sources

Recommendations

- Screening process can be used for different areas in the state
- Use 50 km boundary for the initial list
- Use screening ROI method
- Use 5 km cut-off for Basic and General ACDP Permits
- Use SIA when it becomes available to revise initial inventory

Questions?

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