

NORTH COAST COMMUNITIES FOR WATERSHED PROTECTION

Wells, Streams, and Drinking Water in Clatsop and Tillamook Counties

A project report on the north coast drinking-water map: what we counted, creek by creek, and what the numbers can and cannot tell us.

96

creek-size areas touch
Tillamook or Clatsop

22,689

houses outside city limits

5,373

well logs

4,081

surface water points of
diversion

Prepared for North Coast Communities for Watershed Protection (NCCWP), healthywatershed.org

Prepared by Cara · October 2026 · Live map: graphicoregon.com/nccwp

About NCCWP

North Coast Communities for Watershed Protection (NCCWP) is a grassroots association of citizens from Rockaway Beach and surrounding communities on the North Oregon Coast. The group began in 2012 in response to clearcutting and aerial spraying in the Jetty Creek watershed, the source of drinking water for the City of Rockaway Beach. NCCWP now works with neighboring communities to help protect watersheds all along the North Oregon Coast.

NCCWP's stated goals are to educate citizens about the connection between forest practices and the quality of their air and drinking water; to advocate for forest practices that keep that air and water safe; to support communities working to protect their drinking watershed; and to end logging and pesticide spraying in drinking water sources, regardless of land ownership. Learn more at healthywatershed.org.

What we did

We built a public map of the creeks in Tillamook and Clatsop counties. You can see it at <https://graphicoregon.com/nccwp/>. The map divides the two counties into small watersheds, each about the size of a creek. For each creek-size area, the map counts three things:

- **Houses outside city limits**, from public county taxlot records.
- **Well logs**, from the Oregon Water Resources Department. This is every logged well, not only wells for homes.
- **Surface water points of diversion**, also from the Oregon Water Resources Department. These are places where a water right takes water from a stream. On the map they are called stream water rights.

Foley Creek, in Tillamook County, shows the size we used. It covers about 44 square kilometers. Ninety-six creeks of this size touch Clatsop County or Tillamook County.

The map shows creek areas and totals only. No single home, well, or diversion is drawn on it, and no owner name or address appears.

A companion page, graphicoregon.com/nccwp/about, explains how the map was made, and a public counts file, graphicoregon.com/nccwp/COUNTS.md, lists where the numbers come from.

Why

Some homes, mostly outside town, get drinking water from their own well or straight from a stream. Forestry pesticides and practices could affect that water. We wanted to show, creek by creek, how many homes may get drinking water this way.

A map at the creek scale lets neighbors, local leaders, and funders see where these homes are likely to be, using public records, without pointing at any one household.

Questions studied

The work started from a list of study questions about drinking water on the north coast. A companion study sheet records which of those questions the map data could answer. Some were answered directly, some only with stand-

in counts, and some are still open.

Topic	Question	Status	What the map data says
Watersheds	List the watersheds and the mix of drinking water sources in each	Answered	96 creek-size areas, each with its counts of houses, well logs, and stream diversions. The map does not assign each home to a well or a stream.
Where things cluster	Unique areas or patterns that county-wide data would miss	Answered	Creeks with the most well logs, stream diversions, and houses outside city limits. See Key findings.
Surface water	Houses on surface water compared with houses on wells	Stand-in only	4,081 stream diversions and 5,373 well logs. These are records, not people, and they were not matched to lots.
Well water	Where wells are, using Oregon Water Resources records	Answered	5,373 well logs across the 96 creeks. Geology and change over time were not part of this work.
Vulnerable areas	Creeks that lean on a single kind of source, or have many wells	Stand-in only	Well-heavy and stream-heavy creeks found with simple screening rules. See Key findings.
Watersheds	Share of each watershed's people who rely only on groundwater	Open	Cannot be answered yet. There is no match between houses and wells.
Rules and compliance	Share of water systems with violations in the last five years	Open	Not answered. The state drinking water records were not reached for this work.
Pesticides and herbicides	Trends over the past decade	Open	Not answered in this work.
Infrastructure	Condition of water systems and planned upgrades	Open	No new map data.
Other research	Geology, recharge, health, socioeconomic factors, climate, public perception, costs, Indigenous perspectives, energy and water, stakeholders, seasons, and fertilizer	Open	Outside what a map of public records can answer.

Methods and data sources

Creek areas

Creek outlines come from the USGS Watershed Boundary Dataset. We used the creek-scale level so the map shows many small creeks instead of a few giant river basins. A creek was included when its outline touches Clatsop County or Tillamook County.

Houses outside city limits

Public parcel records were used for Clatsop and Tillamook counties only. A lot was kept only when its center sits outside Oregon city limits. Twelve cities were used: Astoria, Bay City, Cannon Beach, Garibaldi, Gearhart, Manzanita, Nehalem, Rockaway Beach, Seaside, Tillamook, Warrenton, and Wheeler.

- **Clatsop County:** a lot was kept when its public tax class looks like a home. Farm and forest lots were left out.
- **Tillamook County:** the public taxlot file has no class that says a lot is a home. A lot was counted when it has a site address and is 80 acres or smaller. This is a rough rule built from the fields in the public file.

Wells and stream diversions

An Oregon well log was counted when its mapped point falls inside the creek. Each well log was counted once. A surface water point of diversion on the streams layer was counted the same way. Houses were not matched, lot by lot, to a well or a stream.

The two-county first pass

We also made a separate, simpler estimate for the two counties together. It takes the 2025 Census count of housing units and subtracts the taps (connections) that cities and water districts report to the Oregon Health Authority. Only community water systems were used. Parks, camps, and schools were left out.

Public data sources

Source	Public page
USGS Watershed Boundary Dataset (creek outlines)	usgs.gov/national-hydrography/watershed-boundary-dataset hydro.nationalmap.gov/arcgis/rest/services/wbd/MapServer/6
Oregon Water Resources Department well logs	gis.wrd.state.or.us/server/rest/services/dynamic/Wells_by_Theme_WGS84/FeatureServer/2
Oregon Water Resources Department surface points of diversion (streams layer)	gis.wrd.state.or.us/server/rest/services/dynamic/PODs_By_Source_WGS84/FeatureServer/3
Clatsop County taxlots	delta.co.clatsop.or.us/server/rest/services/Taxlots/FeatureServer/1
Tillamook County public taxlots (published by the Oregon Water Resources Department)	gis.wrd.state.or.us/server/rest/services/tax/Tax_Lots_Public_Query_WGS84/FeatureServer/2
Oregon city limits (Oregon Framework)	navigator.state.or.us/arcgis/rest/services/Framework/Admin_Bounds/MapServer/0
Oregon counties (Oregon Framework)	navigator.state.or.us/arcgis/rest/services/Framework/Admin_Bounds/MapServer/6
Census housing units, 2025	census.gov/programs-surveys/popest.html (U.S. Census Bureau population and housing unit estimates)
Oregon Health Authority community water systems (tap counts)	yourwater.oregon.gov

The creek counts were pulled from these sources on September 4, 2026.

Where the numbers come from: the public counts file

The map's public counts file, <https://graphicoregon.com/nccwp/COUNTS.md>, lists every headline number and its source. The tables below copy its numbers exactly as published. The last column checks each number against the map's own data file (summary.json in the map's code).

First pass (two counties together)

What	Number in COUNTS.md	Map data file
Houses (Census housing units, 2025)	43,247	Not in the data file
Taps reported by community water systems	about 35,000	Not in the data file
Houses not on a listed public system	about 8,000	Not in the data file
Registered well logs in these creeks	5,373	5,373 (matches)
Paper gap (no log, stream, truck, vacant, unit noise)	about 2,500*	Not in the data file

* As published in COUNTS.md. Well logs include every logged well, not only home wells, so subtracting them from house counts is only a rough comparison.

COUNTS.md adds: Clatsop 23,726 houses + Tillamook 19,521 houses = 43,247. The tap count covers about 21 Clatsop systems and 31 Tillamook systems, including Seaside 3,903, Astoria 4,126, Cannon Beach 1,813, Warrenton 3,737, Gearhart 1,600, Manzanita 1,904, Tillamook city 1,773, and Netarts 1,111, plus Youngs River-Lewis & Clark, Wickiup, Fairview, Neskowin, and the rest.

What the map is coloring

What	Number in COUNTS.md	Meaning (from COUNTS.md)	Map data file
Creeks	96	USGS watershed units at the creek scale that intersect either county	96 (matches)
Houses outside city limits	22,689	Residential taxlots outside city limits, assigned to a creek (10,202 Clatsop, 12,487 Tillamook)	22,689; 10,202; 12,487 (all match)
Registered wells	5,373	Unique Oregon well-log IDs inside those creeks	5,373 (matches)
Stream water rights	4,081	Unique Oregon stream points of diversion inside those creeks	4,081 (matches)

COUNTS.md also gives Foley Creek as about 44 km², which agrees with the data file (43.83 km²), and lists the same twelve cities. Every number that appears in both places agrees.

The two-county first pass, explained. This is a first-pass estimate from Census and state tap counts, not from the map. The 2025 Census estimate puts 43,247 housing units in Clatsop and Tillamook. Cities and water districts report about 35,000 taps. Subtracting the taps leaves roughly 8,200 houses, which the published notes round to about 8,000. These houses may be on a well, a stream, or water brought in by truck. It is a rough county-level estimate for the two counties together, and it is not split by creek.

Why 22,689 is bigger than 8,000. City limits are not a water district. Most houses outside town still sit on a district pipe. So the count of 22,689 houses outside city limits is much larger than the first-pass estimate of about 8,000 houses not on a public system. A building with many apartments is one taxlot and often many taps, but there are not enough of those here to change the 8,000.

What the map shows

Each shape on the map is one creek-size area. The creeks can be colored by houses outside city limits, by well logs, by stream water rights, or by well logs per house. Tapping a creek opens a popup with totals only: well logs, stream water rights, and houses outside city limits for that creek. Hovering over a creek shows its well-log count. The popup does not list homes.

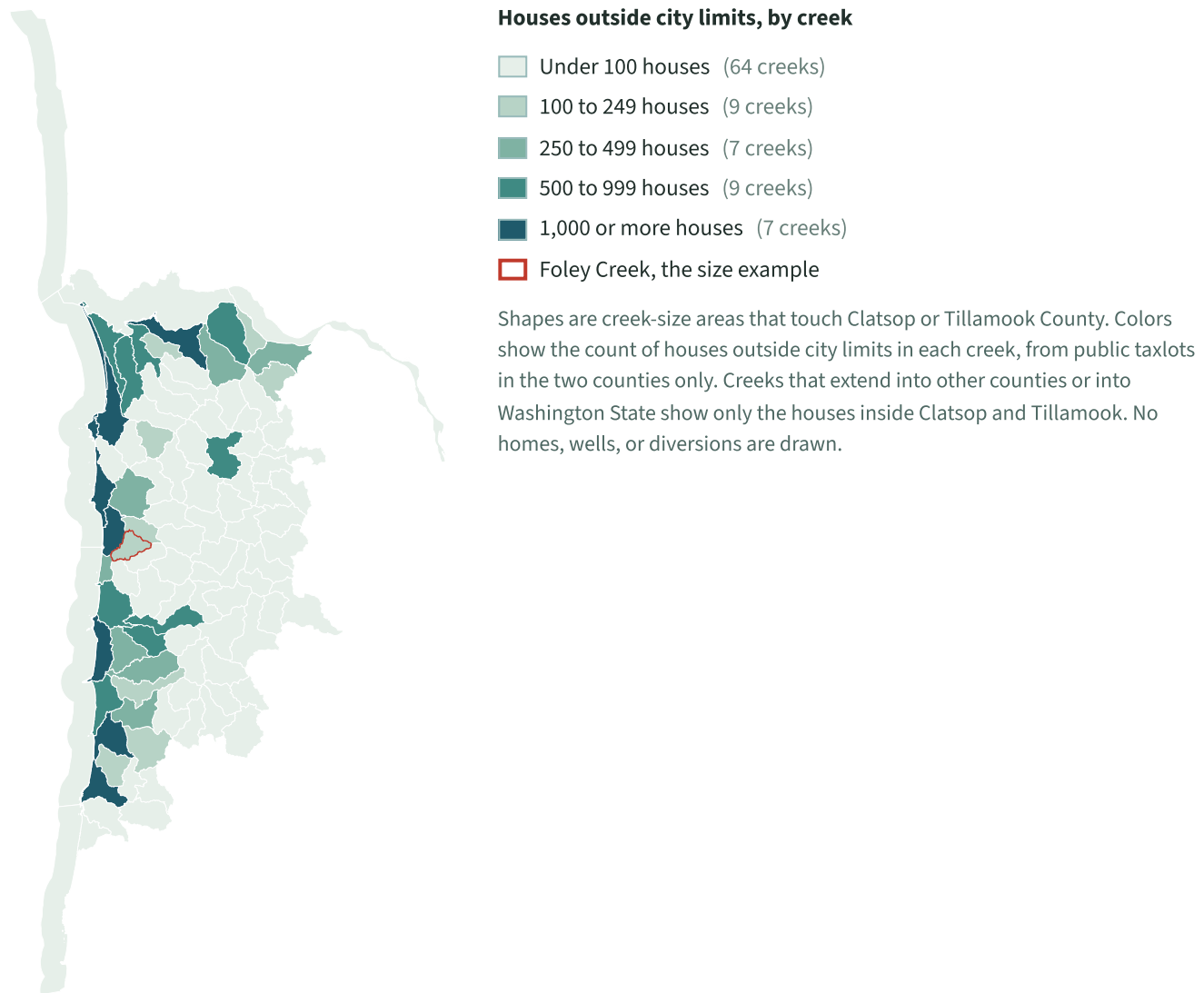


Figure 1. Static map of the 96 creek-size areas, shaded by houses outside city limits. Drawn from the map's creek outline file. Foley Creek, the size example, is outlined in red.

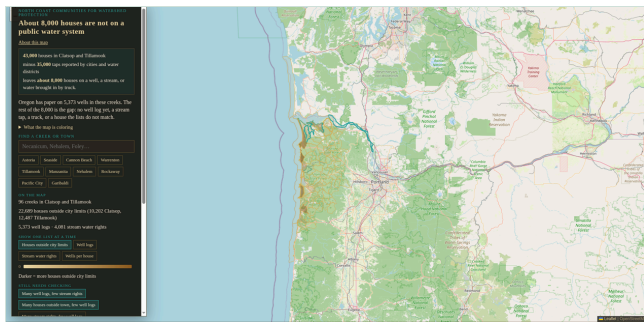


Figure 2. The live map. The side panel shows the two-county first pass and the controls for choosing which count colors the creeks.

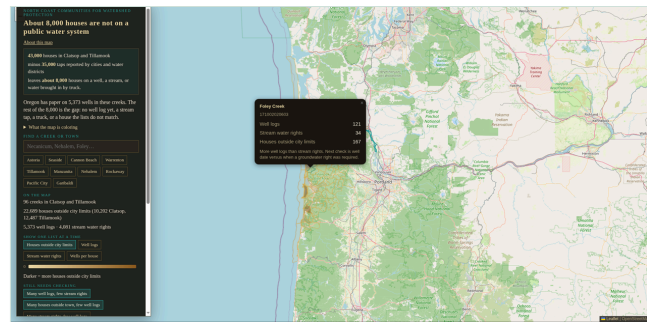


Figure 3. Tapping a creek opens a popup with totals only. Foley Creek shows 121 well logs, 34 stream water rights, and 167 houses outside city limits.

What we did

We built a public map of the creeks in Tillamook and Clatsop counties. For each creek-size area, it counts three things: houses outside city limits, logged wells, and surface water diversions, which are places where a water right takes water from a stream.

- 96 creek-size areas touch Tillamook or Clatsop.
- 22,689 houses sit outside city limits: 10,202 in Clatsop and 12,487 in Tillamook.
- 5,373 well logs. That is every logged well, not only wells for homes.
- 4,081 surface water diversions from streams.

The map shows creek areas and totals only. It does not show any single home, well, or diversion.

Why we did it

Some homes, mostly outside town, get drinking water from their own well or straight from a stream. Forestry pesticides and forestry practices could affect that water. We wanted to show how many homes may rely on it, creek by creek.

These counts are rough stand-ins. They are not people, and they are not proof of contamination. In Tillamook, a house is counted with a rough rule. Creeks that run outside the two counties are only partly counted.

Who NCCWP is

North Coast Communities for Watershed Protection (NCCWP) is a grass-roots group of citizens from Rockaway Beach and nearby communities. It started in 2012 after clearcutting and aerial spraying in the Jetty Creek watershed, the source of drinking water for Rockaway Beach, Oregon. Today it works with neighboring communities to help protect watersheds along the North Oregon Coast.

Its goals include teaching people how forest practices affect their air and drinking water, and ending logging and pesticide spraying in drinking water sources, no matter who owns the land.

Visit NCCWP at healthywatershed.org

The map

Each shape is one creek-size area. Tap a creek to see its counts.

Figure 4. The text sections of the live map page explain what was counted and why.

ABOUT THE DRINKING-WATER MAP

About the drinking-water map

[Back to the map](#)

WHY IT IS HERE

The map is a way to look, creek by creek, across Clatsop and Tillamook counties, and see how many homes may be getting drinking water that forestry pesticides and forestry practices could affect.

WHAT THE MAP SHOWS

The shapes are small watersheds, each about the size of a creek. Foley Creek, in Tillamook County, is the example of that size. It covers about 44 square kilometers. There are 96 of these creeks that touch Clatsop County or Tillamook County.

Color means a count. You can color the creeks by houses outside city limits, by well logs, by stream water rights, or by well logs per house. Tap a creek and the popup is totals only: well logs, stream water rights, and houses outside city limits for that creek. Hovering a creek shows the well-log count. The popup does not list homes.

WHAT WE FOUND

22,689 houses outside city limits (10,202 in Clatsop County, 12,487 in Tillamook County)

5,373 well logs inside these creeks

4,081 surface points of diversion inside these creeks. On the map these are the stream water rights.

Foley Creek itself has 167 houses outside city limits, 121 well logs, and 34 stream water rights.

These counts are proxies. They are not a count of people. They are not proof that any one home's water is contaminated.

The panel on the map also shows a separate first pass for the two counties together. Census housing units for 2025 put 23,726 houses in Clatsop County and 19,521 houses in Tillamook County, which is 43,247 houses. Cities and water districts report about 35,000 taps. Parks, camps, and schools were left off that tap count. That leaves about 8,000 houses on a well, a stream, or water brought in by truck. The opening line on the map is this same first pass, with the house total in round thousands. The figure of about 8,000 is for the two counties together. It is not split onto each creek. City limits are not a water district. Most houses outside town still sit on a district pipe, which is why 22,689 houses outside city limits is larger than about 8,000.

HOW IT WAS MADE

Public parcel records were kept for Clatsop and Tillamook counties, and only where the center of the lot sits outside city limits.

Figure 5. The companion page explains how the map was made and lists the public records it uses.

Key findings

96 creek-size areas touch Tillamook or Clatsop	22,689 houses outside city limits: 10,202 Clatsop, 12,487 Tillamook	5,373 well logs (every logged well)	4,081 surface water points of diversion
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- **The map counts 22,689 houses outside city limits** (10,202 in Clatsop and 12,487 in Tillamook), 5,373 well logs, and 4,081 surface water points of diversion across 96 creek-size areas.
- **A separate first-pass estimate puts about 8,000 houses in the two counties off a listed public water system.** It comes from Census and state tap counts, not from the map: 43,247 housing units (2025 Census estimate) minus about 35,000 city and district taps leaves roughly 8,200, which the published notes round to about 8,000. It is a rough county-level estimate and is not split by creek. The map counts and this estimate come from different methods and answer different questions: the map shows where houses sit outside city limits, while the estimate asks how many houses are not on a public water system.
- **Houses outside town are spread unevenly.** Five creeks each hold 1,380 or more houses outside city limits (Figure 6).
- **Wells cluster in a few creeks.** The most well logs are in Lower Salmon River (364), Lower Youngs River-Frontal Youngs Bay (335), Lower Wilson River (208), Sain Creek-Scoggins Creek (197), and Lower Necanicum River (186).
- **Stream diversions cluster too.** The most surface points of diversion are in Lower Salmon River (163), Farmer Creek-Nestucca River (153), Anderson Creek-Nehalem River (134), Lower Wilson River (126), and Nestucca River (124).
- **Foley Creek, the size example,** has 167 houses outside city limits, 121 well logs, and 34 stream water rights.

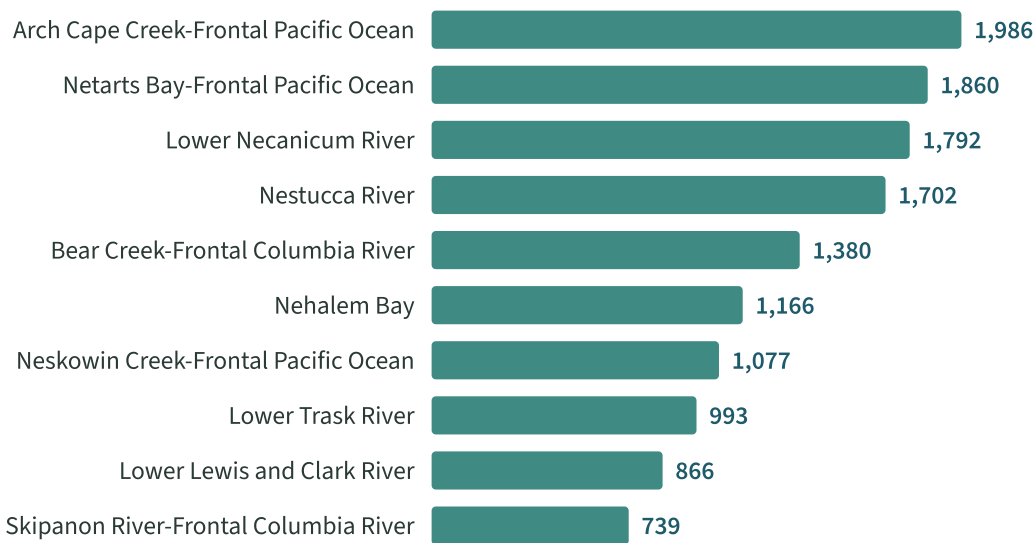


Figure 6. The ten creek-size areas with the most houses outside city limits. Arch Cape Creek-Frontal Pacific Ocean touches both counties. Source: map data file, September 4, 2026.

Creeks worth a closer look

Simple screening rules point to creeks that lean heavily on one kind of source. These are stand-ins for further study, not a finding that any water supply is at risk.

Screening rule	Creeks (well logs / stream diversions / houses)
Many well logs, few stream rights (at least 50 well logs and at least three times as many well logs as stream diversions)	Lower Youngs River-Frontal Youngs Bay 335 / 58; Skipanon River-Frontal Columbia River 161 / 22; Bear Creek-Frontal Columbia River 154 / 33; Foley Creek 121 / 34; Cathlamet Channel-Columbia River 91 / 19; Lower Lewis and Clark River 88 / 25
Many stream rights, few well logs (at least 20 stream diversions and 5 or fewer well logs)	Baker Bay-Columbia River 1 / 61; Lost Creek-Nehalem River 4 / 33; Wolf Creek 1 / 22; East Fork South Fork Trask River 1 / 20
Many houses outside town, few well logs (at least 200 houses and 30 or fewer well logs)	Netarts Bay-Frontal Pacific Ocean 1,860 houses / 17 wells; Gnat Creek-Frontal Columbia River 525 / 26; Spring Creek-Frontal Pacific Ocean 429 / 13; Big Creek 408 / 14; Wallooskee River 227 / 6

Creeks with many houses but few well logs may be served by a water district, may have wells with no log on file, or may draw from streams. The map cannot tell which.

Limits

These counts are rough stand-ins. They are not a count of people, and they are not proof that any home's water is contaminated. A well record or a stream right is a paper trail. It does not mean "this house drinks from that."

- **Tillamook houses are counted with a rough rule.** The public taxlot file has no class that says a lot is a home, so a lot counts when it has a site address and is 80 acres or smaller. This can miss some homes and include some lots that are not homes.
- **Creeks that cross county lines are only partly counted.** House counts use parcels in Clatsop and Tillamook only. A creek that runs into Columbia, Washington, Yamhill, or Lincoln County, or into Washington State, is short on houses. Well logs and stream rights are counted for the whole creek.
- **Points are counted by location, not matched to homes.** A well or diversion counts when its point falls inside a creek area. No house was matched, lot by lot, to a well or a stream.
- **Well logs include every logged well.** Domestic wells were not counted separately.
- **City limits are not a water district.** Many houses outside city limits are still on a district pipe.
- **The figure of about 8,000 is a first-pass estimate** from Census and state tap counts, not from the map. It is a rough county-level estimate for the two counties together and is not split by creek. It will not be exact until someone checks lot by lot.
- **Not yet on the map:** year built, well date, pipes, and forestry spray.

Next steps

The items below are suggestions for possible future work. They are not commitments.

- **Suggested: a domestic-only well count.** Separating wells logged for household use from other wells would give a closer stand-in for homes on their own wells.
- **Suggested: complete counts for creeks that cross county lines.** Adding parcels from neighboring counties and Washington State would make house counts cover the same ground as well and stream counts.
- **Suggested: split the 8,000 estimate by creek.** This would connect the two-county first pass to the creek map.
- **Suggested: reconcile the first-pass estimate with the creek counts using the same data.** Today the two numbers come from different sources and methods.
- **Suggested: return to the open study questions,** such as water system violations in the last five years and pesticide trends over the past decade, using the state records named for them.

Credits

Map, data work, and report by Cara for North Coast Communities for Watershed Protection.

Study series: Demeter Design, <https://watershedmaps.com>.

Data from the U.S. Geological Survey, the Oregon Water Resources Department, Clatsop County, the Oregon Framework program, the U.S. Census Bureau, and the Oregon Health Authority. Live map background tiles from OpenStreetMap contributors.

Live map: <https://graphicoregon.com/nccwp/>

About the map: <https://graphicoregon.com/nccwp/about/>

Counts file: <https://graphicoregon.com/nccwp/COUNTS.md>

NCCWP: <https://healthywatershed.org/>