

Yakima Air Winter Nitrate Study (YAWNS)

The Department of Ecology (Ecology) monitors air quality in Washington to ensure it meets federal health-based air quality standards. Recent monitoring data show the air in the Yakima area has higher than usual levels of fine particle pollution ($PM_{2.5}$) that contains nitrate. Ecology hired Washington State University (WSU) and Central Washington University (CWU) to study Yakima's air to better understand why nitrate levels are high in the area. This study is called the Yakima Air Winter Nitrate Study (YAWNS).

The air pollution of concern

$PM_{2.5}$ is particles of soot, dust, and unburned fuel suspended in the air. In Yakima, much of the $PM_{2.5}$ comes from wood burning. $PM_{2.5}$ is highest in the wintertime due to increased wood burning and weather conditions.

Aerosol nitrate (nitrate in the air) is an ingredient of $PM_{2.5}$. It is not released by any one source, but forms in the air when certain gases (ammonia and oxides of nitrogen) react together under the right weather conditions. At times, nitrate accounts for one quarter of the wintertime $PM_{2.5}$ in the Yakima area. This is more nitrate than we've seen in other parts of Washington.

Air quality agencies already know the source of most $PM_{2.5}$ in Yakima (wood burning). The Yakima Regional Clean Air Agency (YRCAA) calls indoor and outdoor burn bans as needed to control $PM_{2.5}$ from wood burning. But nitrate is harder to control because it is not directly released by any one source. To control it, we need a better understanding of where it is coming from.

WHY IT MATTERS

$PM_{2.5}$ can cause or worsen heart and lung diseases, and even cause death. The federal Environmental Protection Agency (EPA) sets health-based air quality standards for $PM_{2.5}$. If an area of a state does not meet the standards, that area can be required to have strict air pollution controls that are costly for businesses and industries.

Ecology and local governments want to reduce $PM_{2.5}$ in the Yakima area before it reaches levels that can threaten health or require costly regulations.

Contact information

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The study

Ecology worked with YRCAA and the Yakama Nation to conduct YAWNS. WSU and CWU studied air pollution in Yakima and Toppenish for three weeks in January 2013. Findings include:

- The most likely cause of high nitrate levels is ammonia from agricultural activities interacting with oxides of nitrogen from motor vehicles during the right weather conditions.
- Usually, air from both upper and lower Yakima valleys gradually mixes between the two areas. During cold, stagnant periods however, that mixing is restricted; existing pollution remains in place and new pollution from nearby sources does not disperse easily.
- Possible leaks from food storage facilities in the area using industrial freezers account for less than 10 percent of the ammonia in Yakima.

What's next?

Ecology and local agencies want to reduce PM_{2.5} and nitrate in the Yakima area to protect public health and prevent possible new regulatory requirements in the area. Now that we understand how nitrate in the area is being formed, we need to determine what kind of actions will work best to reduce it.

Get more information

Ecology is committed to keeping you up-to-date on what we're doing to improve your air quality. In the coming months, Ecology will offer opportunities for government agencies, other interested parties, and the public to learn more about the study and ask questions about it.

Please contact Ecology with questions about our outreach efforts or about the study itself:

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