



SOUTHERN WILLAMETTE VALLEY GROUNDWATER MANAGEMENT AREAS

AUGUST 2018

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WHAT'S HAPPENING THIS SUMMER?

We are now into August, field sampling is in full swing and the heat is upon us. The EPA PINE Project group completed farmer interviews in March and is currently analyzing the results. Results of these interviews will be shared at an upcoming GWMA meeting. EPA also completed four years of nitrate leaching and soil sampling. EPA is currently preparing this study for

peer review and publication.

Master's student Cody Piscitelli, OSU Environmental Sciences Graduate Program, is examining changes in the DEQ well water nitrate concentrations over time in the management area, and comparing these changes with local information about land cover, crop types, soils and hydrogeology. His goal is to better understand how nitrate is released into the

groundwater, and how that water flows throughout the valley. He will also incorporate the stable isotopic data from Renée Brooks at EPA to understand the source of groundwater at each well over the seasons and years. Cody is in the process of developing his thesis proposal, which will be presented to his graduate committee, DEQ staff and GWMA Committee.

-Becky Anthony, DEQ

SPECIAL POINTS OF

- Farmer interviews
- Damage to monitoring well
- Nitrogen budgets
- Fertilizer study

Editor's Corner

We want to hear from you.

If you have a topic you'd like to read more about or would like to submit an article contact Basin Specialist Heather Tugaw at 541-776-6091 or tugaw.heather@deq.state.or.us. Please keep cover page articles to 500 words. All other submissions should be 200 words or less.

MONITORING WELL DAMAGE

During the annual groundwater well sampling, samplers identified severe damage to GW-8 and were unable to take a groundwater sample. The vault had been pulled out of the ground and rolled over. The ¾ inch diameter PVC well casing was broken off at the first joint, about one foot below the bottom of the vault (about two feet below ground level). Since the well is located in the right-of-way, it is suspected that a mower or grader caught the edge of the concrete and pulled the vault out of the ground.



The well is located in the gravel shoulder of Miller Drive and is in the open, not covered by grass/weeds.

DEQ is in the process of decommissioning this well

and installing a replacement well in an adjacent area where it is less likely for the well to be damaged by mowing or other maintenance activities.

-Becky Anthony, DEQ

NITROGEN BUDGET APPLICATION

Watershed nutrient budgets are of great interest to biogeochemists, but are increasingly being applied to inform reduction targets, prioritize source areas and other decisions where nutrients impact water quality. Ongoing research will explore the application of N budgets to local questions about nitrate management in Oregon's Willamette River Basin.

Increasingly, in areas where water quality goals are not being met, a watershed nutrient budget is used to inform reduction targets, prioritize source areas and other decisions. Nitrate contamina-

tion of private wells in Oregon's southern Willamette Valley led the state to embark on a multi-year, multi-stakeholder process by declaring the area a Groundwater Management Area in 2004. To inform this process, EPA is exploring information about watershed nitrogen balances at two scales – the entire Willamette River Basin and the tributary Calapooia River Basin. Locally-derived data on nitrogen inputs coupled with streamflow and chemistry were compiled to calculate nitrogen balances for 22 Willamette River Basin sub-watersheds and 58 Calapooia River Basin sub-watersheds. For both areas, 80-90 percent of total nitrogen input comes from agricultural sources. Detailed information about crop types in the Calapooia River Basin allowed us to calculate crop harvest, crop nutrient use efficiency and nitrogen surplus, which may be useful



metrics for managers. Across Calapooia River Basin tributary sub-watersheds, 19 percent of annual nitrogen inputs were exported by streams, and 40 percent of nitrogen inputs remained as nitrogen surplus, which then may be available for nitrogen leaching to groundwater.

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FERTILIZERS AND PROTECTING ENVIRONMENTAL QUALITY

In a new project that recently completed its first year of field monitoring, researchers from Portland State University and Oregon State University have been working with growers of grass seed crops (tall fescue) on optimizing grass seed production while protecting groundwater and air quality in the Southern Willamette Valley GWMA. Through an Oregon Department of Agriculture Fertilizer grant, one part of the study tests how enhanced

efficiency fertilizers (slow-release pellets) affect seed yield and nitrate leaching to groundwater. The other part of the study, supported by a USDA NRCS Oregon Conservation Innovation Grant, focuses on how water quality, air quality, and crop yield can change under different fertilizer rates. Three growers are participating in the study, and fertilizers are being applied in coordination with their schedules and requirements throughout

the year. For two years, measurements of groundwater nitrogen and greenhouse gas emissions are being made every two weeks during the growing season, with crop yields determined at harvest time.

This project builds on ongoing efforts and pre-existing partnerships with industry, farmers, and local management districts to provide tools and information to reduce nitrate leaching below the root zone and greenhouse gas

emissions from fields in the Southern Willamette Valley GWMA. Groundwater nitrate contamination affects thousands of households in the GWMA. Many factors affect the rate of nitrate leaching to groundwater and of nitrous oxide emission to the atmosphere, including crop type, soil conditions, weather and fertilizer source and application. Atmospheric nitrous oxide is a powerful greenhouse gas that

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ter, storage in soils and gaseous losses. In contrast to the 68 percent nutrient use efficiency observed for crops across the U.S. and Canada, crop harvest only removed 41 percent of nitrogen inputs in the Calapooia River Basin. Working with local farmers, crop advisers, fertilizer companies and university extension we will identify and share management practices that can reduce nitrogen sur-

plus prior to the fall and winter rains. EPA will present lessons learned from discussing the results with the farming, regulatory and conservation communities at the upcoming GWMA meeting in October. Their goal is to inform efforts that increase crop nutrient use efficiency, reduce nitrogen surplus and address local water quality goals.

-Jana Compton, EPA



If you would like to know more about this study , results will be presented at the October 18, 2018 GWMA meeting in Junction City.

FERTILIZERS AND PROTECTING ENVIRONMENTAL QUALITY, CONT. FROM PAGE 2

enhances the greenhouse effect and depletes the ozone layer. Agricultural fertilizer is a major source of nitrous oxide to the atmosphere. Effective timing, product choice, and application rate not only can save money and maximize

yields, they can help reduce greenhouse gas emissions and harmful nitrate runoff into groundwater.

- *Dr. Jen Morse, Portland State University*

A WARM WELCOME

Welcome to Heather Tugaw who is the new Western Region Basin Specialist and will be taking over as DEQ's lead facilitator in the Groundwater Management Area. Priscilla Woolverton and Seth Sadofsky will continue

their work with the team to ensure continued progress in the management area.

The next meeting is scheduled for Thursday, Oct. 18, 2018 at the Junction City Community Center.

