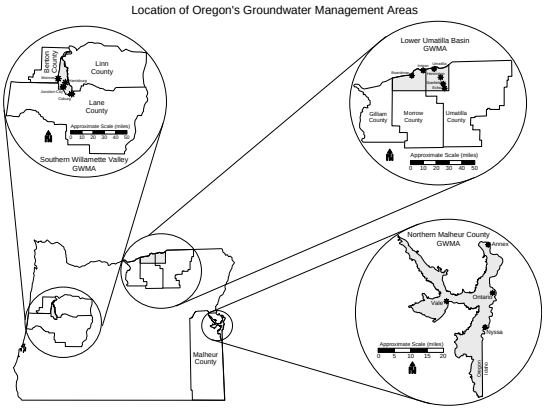
Lower Umatilla Basin GWMA

- **550 square mile area**
- **Declared in 1990**
- **Nitrate in groundwater > 7 mg/l**
- **Nonpoint source pollution**
- **Contributions from multiple land use**



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Where Are We? How Did We Get Here?

Oregon's Groundwater Protection Act requires DEQ to declare a GWMA if groundwater contamination (resulting from nonpoint source activities) exceeds certain trigger levels.
In most cases, the trigger level is 50% of a federal drinking water standard.
In the case of nitrate, the trigger level is 70% of the 10 ppm federal drinking water standard (i.e., 7 ppm).

How Does the LUB GWMA Work?

- The 1997 Action Plan was developed by a local Citizen Advisory Committee with DEQ and ODA oversight.
- The Action Plan details a voluntary program led by the local SWCDs.
- The goal of the plan is to reduce nitrate to less than 7 mg/l.
- **If the goal is not met, regulatory measures will be considered.**

LUB GWMA Nitrate Sources

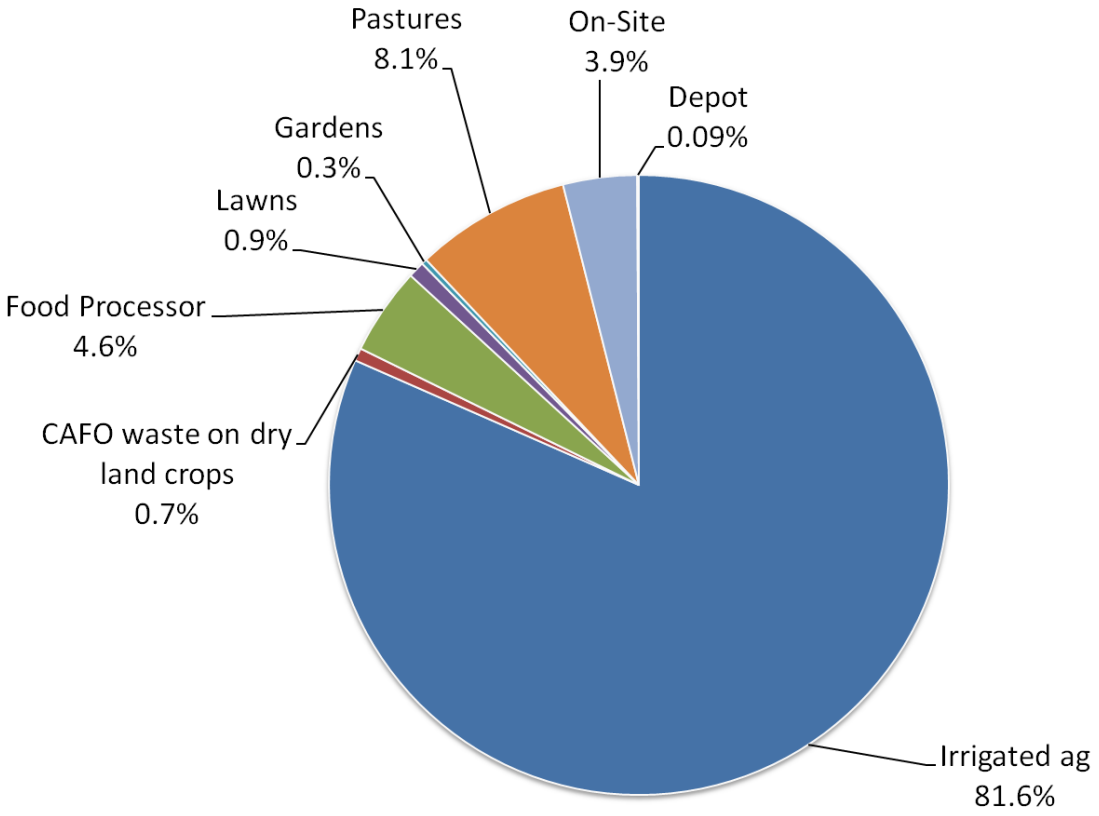
The 1995 technical report titled "Hydrogeology, Groundwater Chemistry, & Land Use in the Lower Umatilla Basin Groundwater Management Area" identified five significant sources of nitrate loading to groundwater:

- Confined Animal Feeding Operations,
- Irrigated Agriculture—Most use either center pivot or drip irrigation
- Land Application of Food Processing Water
- Septic Systems (rural residential areas), and
- Umatilla Chemical Depot Washout Lagoon

Where Does the Nitrate Come From?

DEQ (with input from ODA and OSU Experiment Station) produced an estimate of nitrate loading. The document describes an estimate of the sources of nitrogen (N), the amount of nitrogen applied (i.e., introduced into the environment), and nitrogen leached to groundwater within the LUB GWMA. The estimate can be used to identify areas in which changes in management practices have the greatest potential to improve groundwater quality on a regional scale.

Figure 3
Estimation of Nitrogen Leached to Groundwater



Assumed efficiencies:

- 98% = lawns and CAFO waste on dry land crops
- 96.5% = good and excellent quality pastures
- 95% = food processors
- 90% = irrigated agriculture
- 50% = gardens
- 20% = poor quality pastures
- 15% = on-site systems
- 0% = Depot washout lagoon

DEQ's response to this information

Changes in management practices within the irrigated agriculture community have the greatest potential to improve groundwater quality on a regional scale; solutions to reduce nitrogen in the groundwater must reduce nitrogen fertilizer and irrigation water application rates. BMPs recommended to address nitrate contamination include those to manage the amount, form, placement, and timing of applications of plant nutrients.

What is Irrigated Agriculture doing?

The Action Plan addresses both irrigation management and nutrient management. The target established in the Action Plan for 2009 is: 95% of the irrigated acreage is implementing an accepted system of BMPs or are covered by an implementation plan and the recommendations are in place and being used. A grower survey completed in early 2009 defined the accepted system of BMPs and indicates that the goal is being met.

Irrigation management BMPs are based on irrigation system management and irrigation scheduling. Water use models have been developed to refine crop water use and assist decision-making. Modern technology has resulted in at least a 30% reduction in water use and for some crops a reduction of up to 75%. The Lower Umatilla Basin growers have access to the most sophisticated irrigation water monitoring network in the world.

Nutrient management BMPs are based on matching available nutrients with crop demand. BMPs include: routine soil and tissue sampling, fertilizer recommendations, and calculating nutrient credits from irrigation water, OM, crop residue and crop rotations.

Evaluation of Action Plan Progress and Success

Evaluations are at 4, 8, and 12 years after Action Plan adoption.

The 1st and 2nd evaluations of Action Plan success concluded "sufficient progress has been made to continue the voluntary nature of the Action Plan."

The end of 2009 marks the end of the 12-year Action Plan (12 years is the first quantitative evaluation of groundwater quality improvement). DEQ will evaluate the data collected during the 12 years of bi-monthly well sampling (30-38 wells), 3 area-wide synoptic sampling events (100-200 wells), and yearly monitoring reports from the permitted land application sites to determine the trendline of nitrate concentration. Yearly trendlines appear to be flat or very slightly upward (.0006%). The Action Plan calls for a downward trendline as a measure of success for the implementation of the Plan.

Where are we now?

The Action Plan states: **"If after a scheduled evaluation point, DEQ determines that the voluntary approach is not effective, then mandatory requirements may become necessary."** Discussions are taking place to determine what, if any, reporting or regulation can be done and by whom.

Future Actions Plans will probably focus on developing more precise plant uptake curves for more of the crops grown in the area, more intensive deep soil sampling (5 ft) to account for any nutrients and water left in the ground after harvest and increasing the monitoring network to better define the areas affected by high nitrate concentration.