

Water Use Measurement

Fact Sheet on the Trout Creek Ranch Pilot

What is water use measurement?

The measurement of deliberately applied water for a specified use, such as growing crops.

Why is it important?

Water use measurement helps irrigators improve water use efficiency, minimize related costs, and maximize crop productivity. It also helps communities use water sustainably and may be required for voluntary agreements or regulatory reasons in some parts of Oregon.

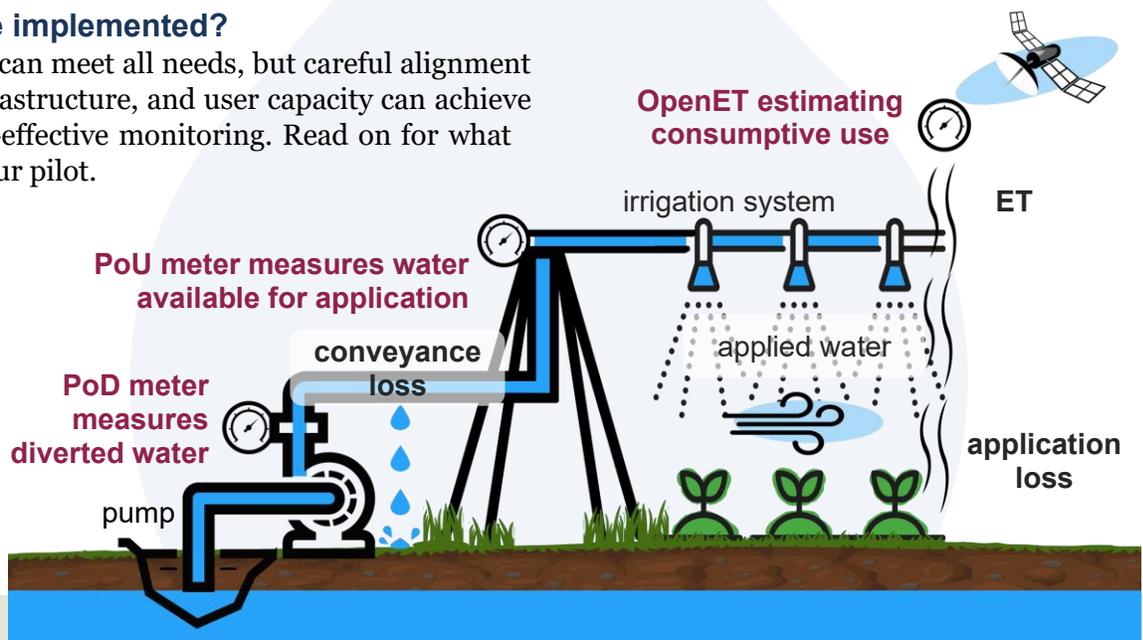
Where might it be implemented?

Irrigators have three options when choosing the measurement location to measure water use:

1. **Point of diversion (PoD)** – Install a flow meter at the pump, or whatever apparatus removes water from an aquifer or surface water source. Preferred location. Data collected before conveyance and application losses.
2. **Place of use (PoU)** – Install a flow meter on the irrigation pipe near the sprinklers, or whatever apparatus applies water to the land. Useful when PoD measurement is infeasible. Data collected before application loss.
3. **Consumptive use** – Use remote-sensing technology (e.g., OpenET) to measure plant transpiration, water evaporation, or other removals from the land that prevent water from returning to the aquifer or surface water. OpenET is a publicly available, standardized dataset; you only need a computer, internet, and the app.

How would it be implemented?

No single method can meet all needs, but careful alignment of technology, infrastructure, and user capacity can achieve accurate and cost-effective monitoring. Read on for what we learned from our pilot.



- **Use OpenET when** field conditions are unlikely to be impacted by nearby streams or when installing a meter is impractical.
- **Use propeller meters when** the capacity for managing technology and data is limited. They are appropriate for smaller operations with fewer wells and simple irrigation configurations.
- **Use electromagnetic flow meters for** more detailed data. Large operations with many wells or complex irrigation systems would benefit most from telemetered, continuous data.
- **PoD measurement is ideal but not always practical** (e.g., no access to pipes). **When impractical, install a PoU meter** if an irrigation system meets the right conditions (e.g., a 1:1 pump-to-pivot ratio).
- **Test hybrid approaches** (meter + OpenET) for cross-validation and monitoring resilience.

tech options
pros
cons



Propeller meter

- easy to install
 - cost-effective
 - easy to read
- accuracy may degrade in high-sediment systems
 - on-site readings are likely required
 - existing infrastructure may not allow installation (e.g., not enough straight-run pipe)



Electromagnetic meter

- more detailed data than from a propeller meter
 - data may be telemetered to phone or computer
- tech expertise required
 - prone to installation or data access errors
 - existing infrastructure may not allow installation (e.g., not enough straight-run pipe)

OPENET

OpenET

- low cost
 - no on-site equipment or readings required
- field conditions (e.g., grazing, infrastructure leaks, or subsurface flow) can skew ET readings
 - technical training needed to determine diversion use based on consumptive use

Public Cost-Share Funding and Technical Assistance

Cost-share funding and grant programs are available to reduce the cost of meter purchase and installation to irrigators.

- The Oregon Water Resources Department (OWRD) has a [Water Use Measurement Cost Share Program](#) that may cover up to 50% of the total cost.
- Irrigators who want to install a meter device alongside an irrigation efficiency project may consider using [EQIP WaterSMART](#) grants through the U.S. Natural Resources Conservation Service (NRCS).
- [OpenET](#) is free to use and publicly available.

Keep in mind that irrigation contractors are not widely available in rural Oregon, so the distance from a contractor to the installation site or PoU should be factored into costs. Government, academic, and/or nonprofit institutions could enhance technical assistance by offering training programs for both contractors and irrigators.

Background

For the 2023 and 2024 irrigation seasons, The Nature Conservancy and partners compared flow meters to evaluate water use measurement technologies for agricultural operations. We also assessed satellite-based evapotranspiration estimates from OpenET. Four center pivot irrigated fields at Trout Creek Ranch were outfitted with both McCrometer propeller meters and Seametrics electromagnetic meters, with telemetry installed on the latter. We also collected qualitative observations on irrigation, maintenance, and land management practices (e.g., grazing, haying), and we documented installation, infrastructure, and funding considerations.

For more details about our pilot project, read the full report *Trout Creek Ranch Water Use Measurement Report: Findings From a Two-Year Pilot Project*.