

Columbia River Basin Insights: New Satellite-Based ET Data in Oregon

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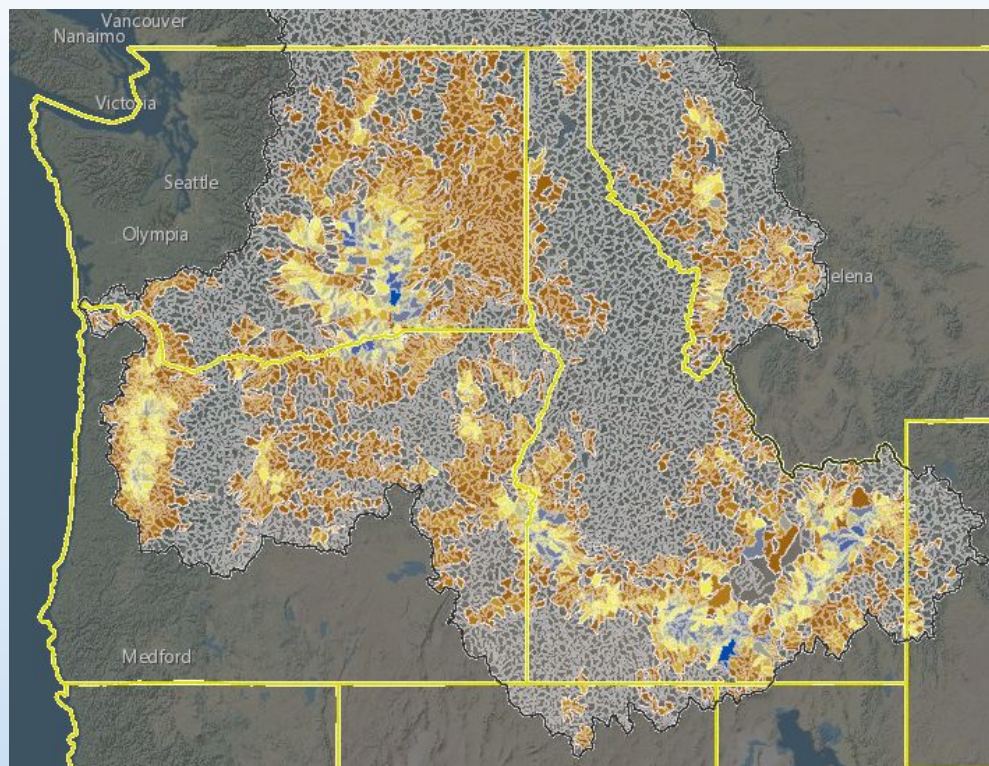
Overview

1. OWRD Data Uses
2. New Data for Oregon and CRB
3. Milestones
4. Data Validation
5. Challenges and Opportunities

Hard to manage what you don't measure

- Irrigated agriculture largest user of water in the CRB region
- Limited records of irrigation water use
- Need for updated and accurate comprehensive dataset – available to all

2021 Annual Evapotranspiration (OpenET Ensemble) HUC-12 Summaries for the Columbia River Basin (CRB)



https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=columbia_river_basin

OWRD uses ET data today in many applications:

- HB 2018 water budgets*
- Groundwater Basin Studies*
- Place-based Planning*
- Harney GW CREP*
- Water Availability
- Demand Forecasts
- Transfers

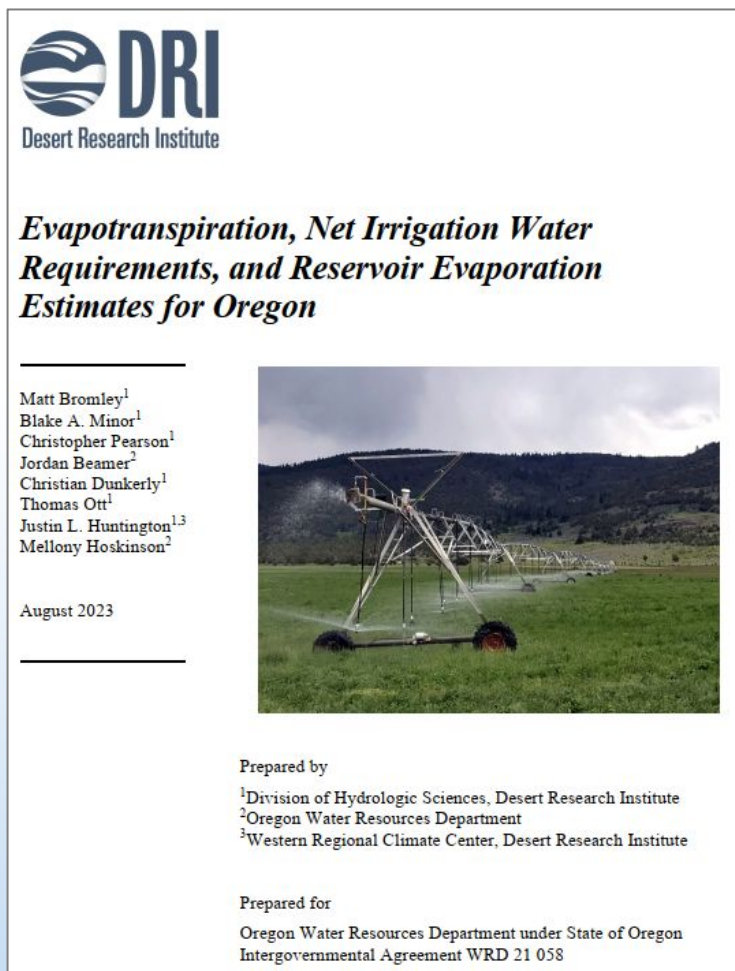
**OWRD is applying satellite-based ET*

New Datasets for WRD

Task	Purpose
Agricultural Field Boundary Dataset	Agricultural fields from aerial and satellite imagery (~259,000 fields!)
Field Attributes – Irrigation Data (Status, Source, System)	Info to determine if field was irrigated, and how
Weather-based ET Modeling	Partition ET into natural (rainfall) and applied irrigation
Open Water Evaporation Modeling	Operational evaporation from major lakes and reservoirs
Satellite-based ET Modeling and Data Review	Wall-to-wall ET data for each field and basin in state back to 1985
ET Station Network Expansion	Fill gaps in agricultural weather and ET measurement to assess and improve accuracy

Milestones - 2023-2024

Statewide ET data and report (DRI)



DRI
Desert Research Institute

Evapotranspiration, Net Irrigation Water Requirements, and Reservoir Evaporation Estimates for Oregon

Matt Bromley¹
Blake A. Minor¹
Christopher Pearson¹
Jordan Beamer²
Christian Dunkerly¹
Thomas Ott¹
Justin L. Huntington^{1,3}
Mellony Hoskinson²

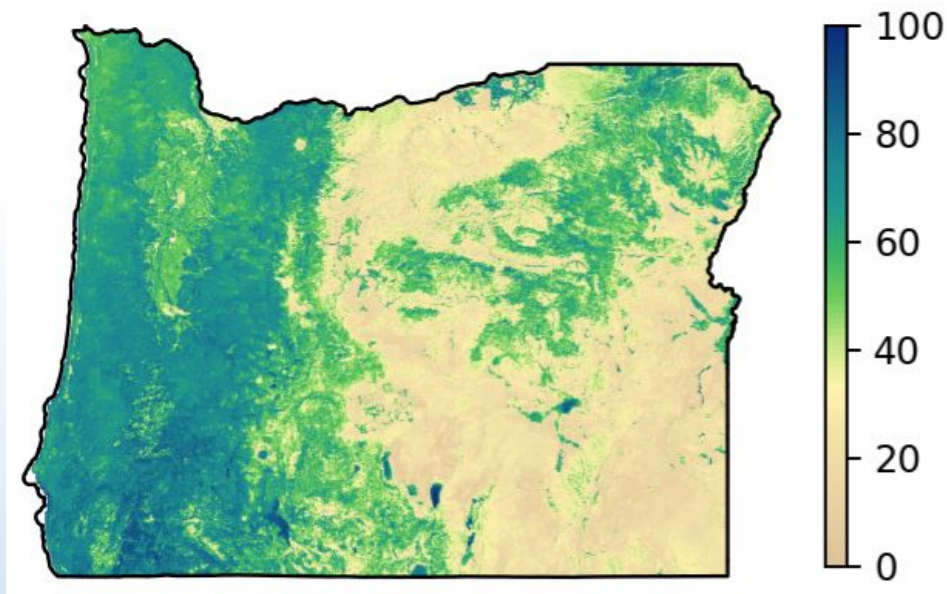
August 2023

Prepared by
¹Division of Hydrologic Sciences, Desert Research Institute
²Oregon Water Resources Department
³Western Regional Climate Center, Desert Research Institute

Prepared for
Oregon Water Resources Department under State of Oregon
Intergovernmental Agreement WRD 21 058

Delivery and Review of Historical ET data for Oregon (OpenET)

Evapotranspiration (mm month⁻¹)
ensemble 1990-2022 Mean



*Final reports and data set for June 2024

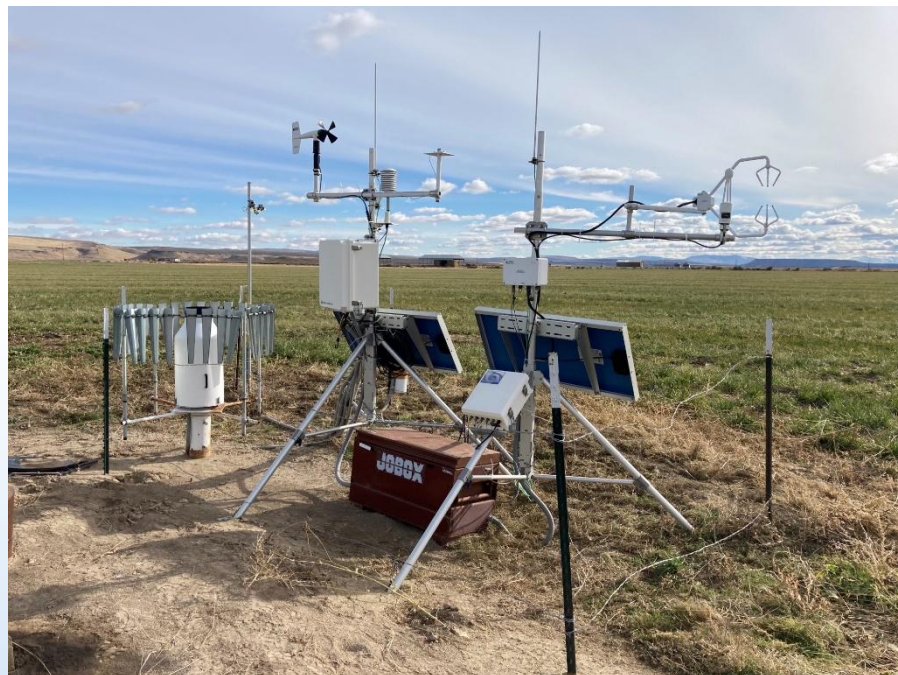
Opportunities to Improve OpenET in CRB

- Reference ET measurements from Agrimet stations can support bias correcting gridded forcing datasets
- Improved gap-filling and time integration approaches to move from satellite overpass -> daily & monthly ET values
- More on-ground actual ET observations can help the OpenET team evaluate and iteratively improve the OpenET modeling system

AgriMet Weather Station



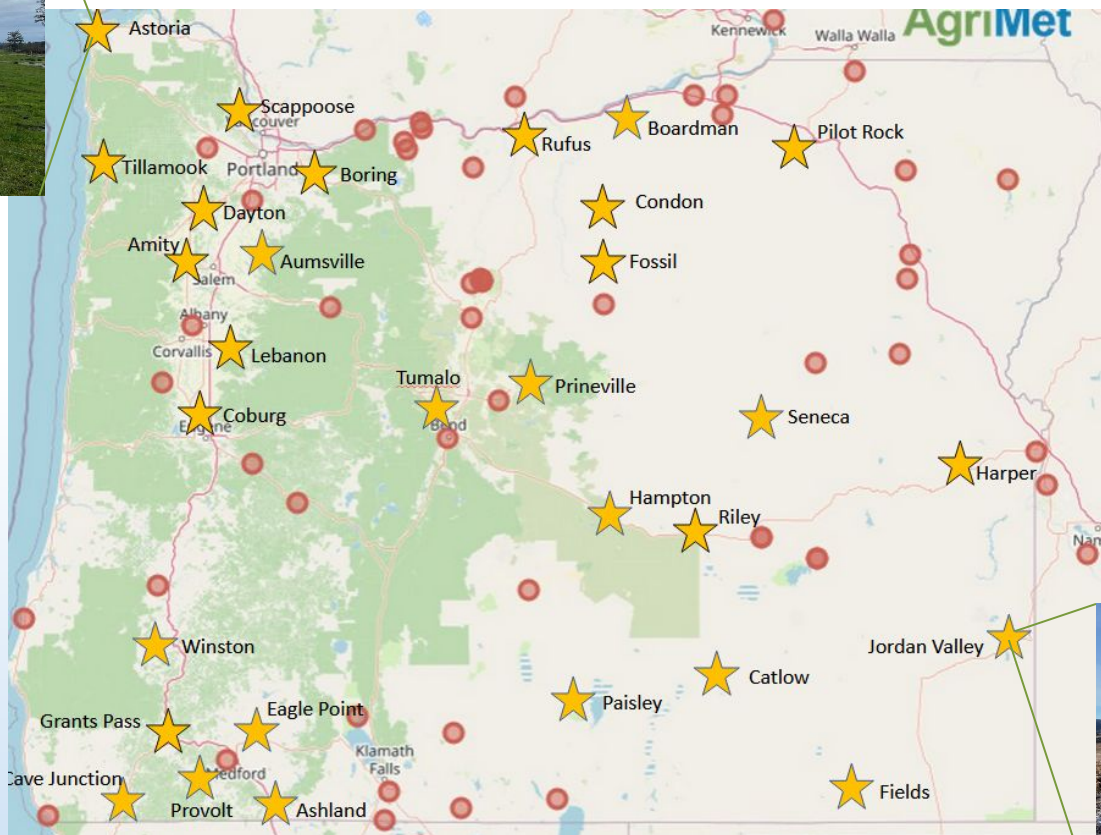
DRI Eddy Covariance Flux Station



Need more flux stations in PNW for satellite-based ET verification

Expanded Ag Weather and ET Network

ASTO



Key

- Existing
- ★ New (n=30)

County	Area
Crook	Prineville
Deschutes	Hampton
Deschutes	Bend
Douglas	Winston
Grant	Seneca
Harney	Catlow
Harney	Fields
Jackson	Ashland
Jackson	Eagle Point
Josephine	Cave Junction
Josephine	Provolt
Lake	Paisley
Malheur	Jordan Valley
Marion	Aumsville
Morrow	Boardman
Clatsop	Astoria
Columbia	Scappoose
Gilliam	Condon



JNVO

Updated map:

<https://www.usbr.gov/pn/agrimet/agrimetmap/agrimap.html>

Challenges

- Ground truthing and uncertainty
 - In-situ stations and field surveys are expensive, need to partner up to leverage other efforts in the region
- Technology transfer and technical support
 - Need to continue co-developing tools with the experts and have training opportunities for staff
- Internal policies and funding
 - Need guidance documents and advisory groups that identify acceptable uses and defensible procedures

We're Recruiting!

- Senior Hydrologist – ET/Water Use Program Coordinator
 - Lead team that performs water use analyses across state and manage ET data development and implementation
- Job will be posted to State of Oregon Job Opportunities
 - https://oregon.wd5.myworkdayjobs.com/SOR_External_Career_Site
- For questions about the position, contact Rachel LovellFord, Surface Water Section Manager:
 - Rachel.M.Lovellford@water.oregon.gov

Questions?

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