

Depletion Accounting for Irrigation Water Rights in Utah: A Review of Potential Agricultural Depletion Accounting Methods

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Focus Question: How can quantification of available water supply and agricultural use be improved to increase water productivity and improve water management?

Key Finding: Ground-based and remote sensing technology exists to provide water users and water managers with the water diversion, application, and depletion information they need.

Producers asked the State of Utah to consider a new means of administering water rights by depletion rather than the historical method of irrigation diversion duty and number of acres irrigated. This requires an accurate, effective, and defensible means to measure and account for actual depletion. With numerous available and emerging methodologies, the Agricultural Water Optimization Task Force sought to evaluate and identify the most practical, effective, and defensible means of measuring and accounting for actual depletion in Utah. Depletion accounting provides a means to quantify water use and incentivize and enable water optimization at the field scale and basin scale. The objectives of this project were to identify, evaluate, and recommend available methodologies for depletion accounting to be validated for use in Utah via a pilot program. Is it possible to quantify actual consumptive use of water in agriculture? How?

Methods

An Expert Panel was formed in January 2020 to identify and evaluate numerous available and emerging methodologies to measure and account for actual depletion. Eight ground-based methods and three remote sensing methods were investigated in detail and organized for each of three applications: (1) Ground-based Methods for Field-scale Depletion Reporting, (2) Ground-based Methods for Field-scale Depletion Validation, and (3) Remote Sensing Methods for Field-scale to Basin-scale Depletion Assessment. The Expert Panel also discussed the benefits and disadvantages of each method and provided recommendations for implementation in Utah and for validation in a Case Study (Figure 1).

Recommendations

The Expert Panel developed and recommended a layered approach that identifies the most effective depletion accounting method for a given application and provides validation of results from the other applications (Figure 1). The approach integrates the applications to provide scalability and defensibility and maximize value to water users, water managers, and the State of Utah over time. For example, the State of Utah could implement the three methods in the following order: (1) Ground-based Methods for Field-scale Depletion Reporting, (2) Remote Sensing Methods for Field-scale to Basin-scale Depletion Assessments, and as funds become available, (3) Ground-based Methods for Field-scale Depletion Validation. All three applications are complementary and provide additional utility and defensibility as they are each implemented.

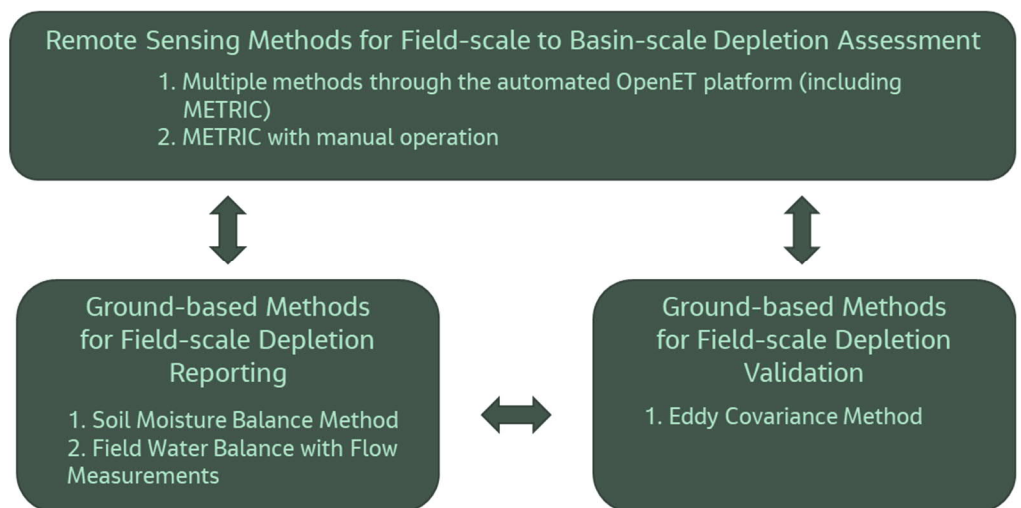


Figure 1. Recommended Layered Approach and Depletion Accounting Methods to be Validated in the Case Study for Use in Utah (2021-2022)

The Expert Panel narrowed the list of alternative methods, made final recommendations for methods to measure and account for actual depletion of agricultural water use in Utah (Figure 1), and recommended a Case Study designed to validate the recommended methodologies for use in Utah. The Case Study was initiated in 2020 and is expected to be completed in 2022.