

Evaluating Wisconsin Irrigation Scheduling Program (WISP) accuracy and potential for improved water use efficiency



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Background

Irrigation scheduling is a potential tool to increase crop water use efficiency (WUE) and reduce agricultural water use in the WCS. The Wisconsin Irrigation Scheduling Program, or WISP, is a UW-Madison developed, freely available irrigation scheduler that has been promoted to growers since it was first developed in the 1980s^{1, 2}, but has never been formally validated on-farm. Grower adoption of WISP is low (8%), and 53% of producers do not use any objective scheduling aids.³

Research questions and methods

Validation

How accurate is WISP at simulating soil moisture and drainage?



Benefits

Does using WISP result in groundwater savings and crop WUE improvements?



Sensitivity

How sensitive is WISP to inputs?
What level of input precision is necessary?

Rooting Depth,
Field Capacity,
Maximum AD
Total AD



Preliminary Results: 2018 Potato

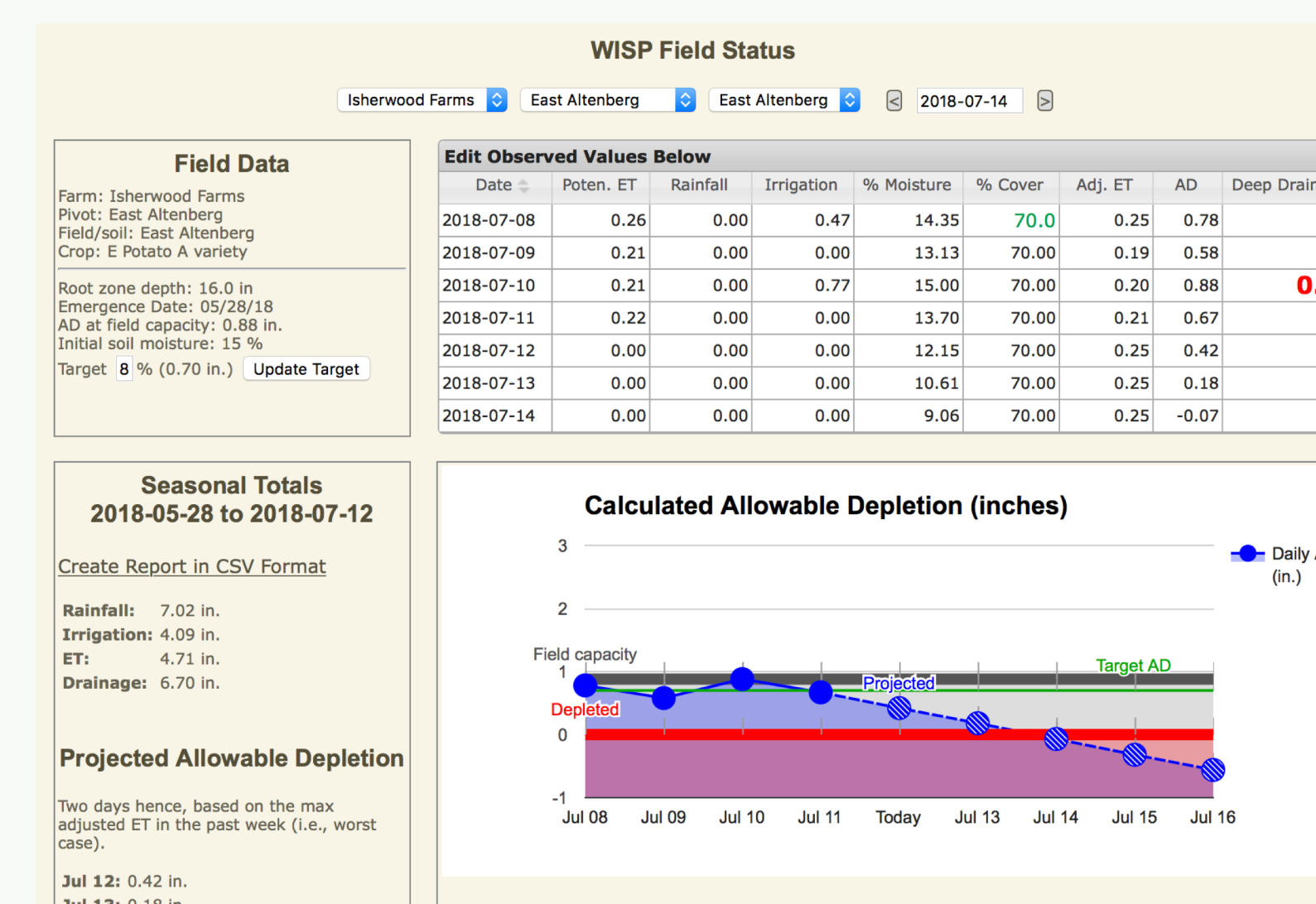
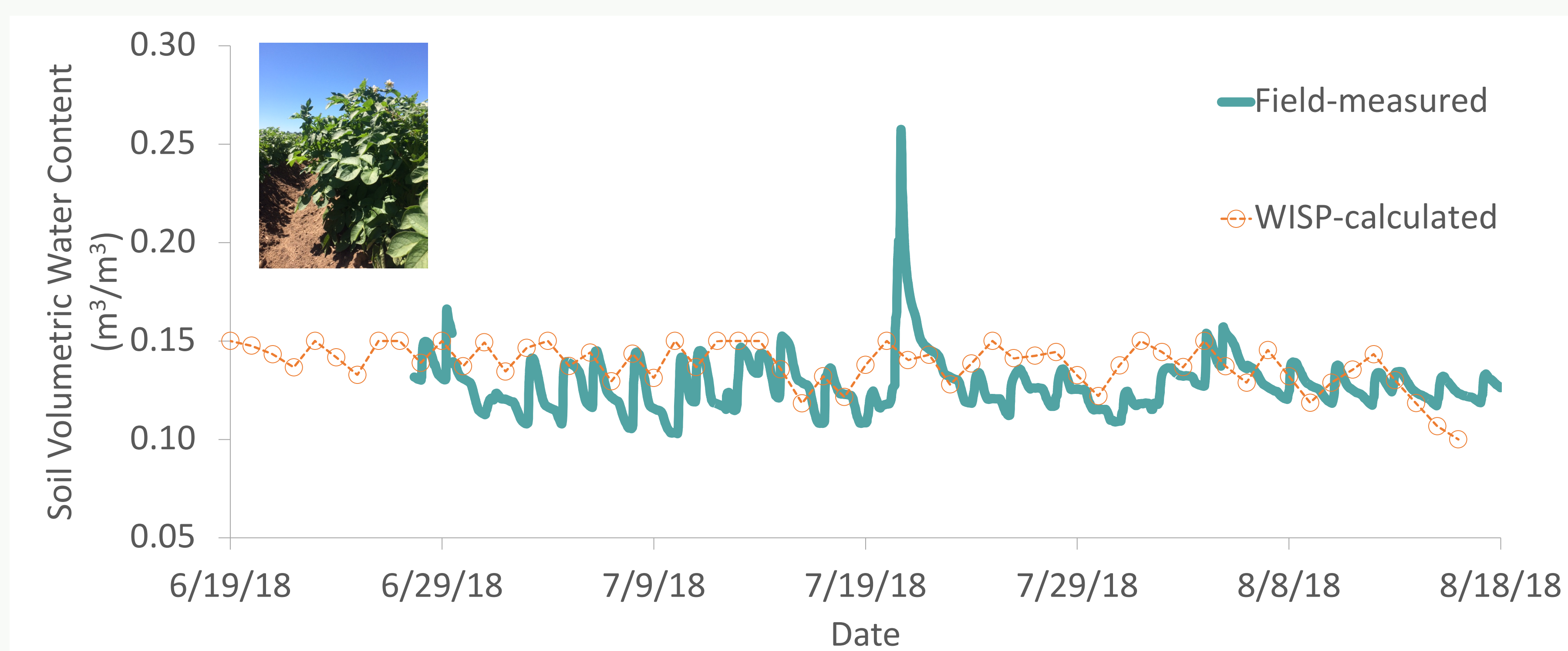


Figure 1: Left: Measured and WISP-modelled soil volumetric water content (VWC) in potatoes in 2018. Field VWC (green) is the average of 4 soil moisture probes at 10 and 30 cm depth. WISP (orange) calculates daily VWC values. WISP reasonably captured the general VWC range measured. Extreme events like the precipitation on July 20 are not reflected in the daily WISP VWC calculations, but are accounted for in the WISP deep drainage term. Right: snapshot of the WISP interface.

Future work

Data collection will continue in 2019 for a total of 3 field seasons across 4 crops (sweet corn, field corn, potatoes and peas). Potential groundwater savings will be quantified between WISP-irrigated and business-as-usual irrigation regimes. Feedback from farmers that use WISP will provide critical insight into WISP improvements.

References

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- Knuteson, D.L. 2015. *Irrigation and Conservation Practices Used by Wisconsin Potato and Vegetable Growers: Highlights from a baseline assessment – November, 2014.*