User Guide

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Domain: https://erams.com/account/

Water Irrigation Scheduler for Efficiency

CATENA ANALYTICS

One Water Solutions Institute

Colorado State University

CONTENTS

EXECUTIVE MESSAGE

Catena Analytics offers powerful platforms for building accessible and scalable analytical tools and simulation models that can be accessed via desktop or mobile devices. Our team has spent that last decade developing the Environmental Resource Assessment and Management System (eRAMS), an open source technology that provides cloud-based geospatially-enabled software solutions as online services and a platform for collaboration, development, and deployment of online tools. Our services are used to assist with strategic and tactical decision making for sustainable management of land, water and energy resources. Thank you for choosing Catena Analytics and the eRAMS platform to meet your data, modeling, analysis and geospatial needs.

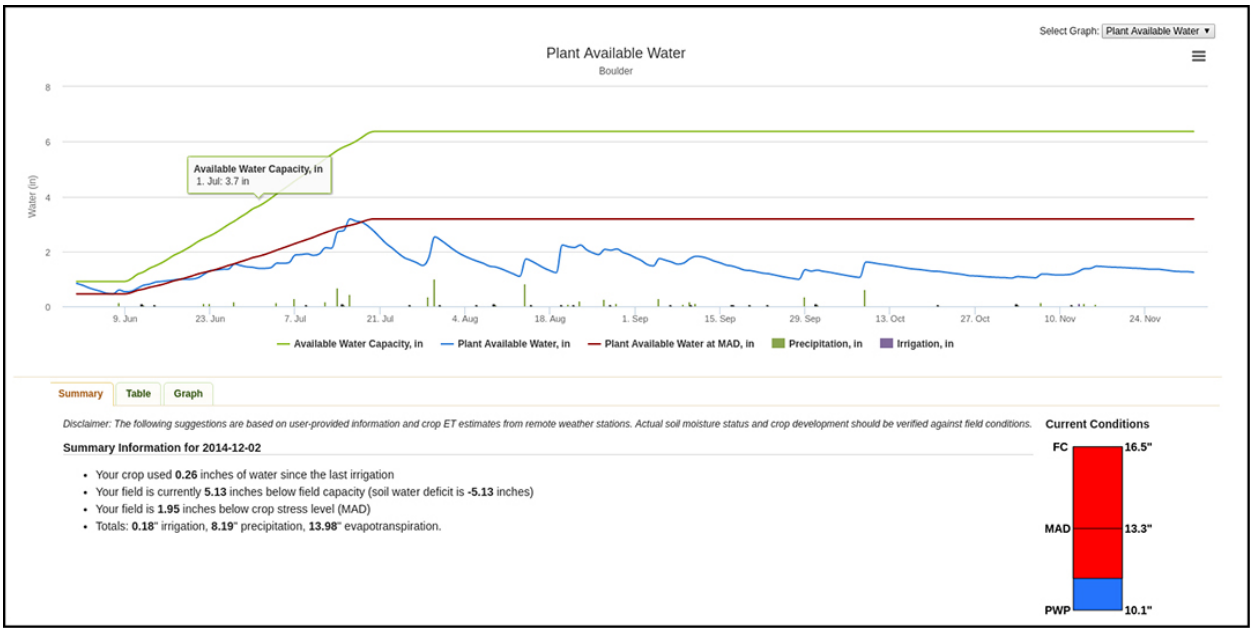
WHO SHOULD USE THIS GUIDE

This guide is a tutorial to get you started using eRAMS and Water Irrigation Scheduler for Efficiency (WISE). The guide provides instructions for commonly performed tasks and uses of the tool. This tool is intended for use by urban planners and water managers, academic groups, regulatory officials, consultants as well as state, local and federal agencies planning for the future of water resources.

NEED HELP?

After reviewing the guide if you need additional assistance we are here to help! This guide is designed to provide instruction on commonly performed operations and answers to many frequently asked questions. If you find any aspect of the tool challenging or missing information from this guide, please engage an eRAMS expert to guide you through any hurdles. Contact us at: eramsinfo@gmail.com

INTRODUCTION



PURPOSE

The Water Irrigation Scheduler for Efficiency (WISE) was created to make irrigation scheduling both convenient and cost-effective as possible by maximizing crop yield and minimizing excess irrigation.

DESCRIPTION

Produced by our team of experts, in cooperation with growers across the state of Colorado, the Water Irrigation Scheduler for Efficiency (WISE) Application is an award-winning tool that estimates optimal irrigation schedules for crop fields across much of the Western United States.

WISE was designed to make irrigation scheduling both convenient and as cost-effective as possible. Farmers, consultants, or researchers can quickly and easily learn how to maximize crop yield and minimize excess irrigation for crop fields with various soil types, climate, and irrigation practices.

SOFTWARE AVAILABILITY

Domain

https://erams.com/account/

***Note**: a user account required to access the WISE tool*

Documentation URL

https://erams.com/catena/tools/agricultural-resources/irrigation-advisor/

Reference

Irrigation Scheduling: The Water Balance Approach. Colorado State University, 8 January 2014 (Web: 23 April 2014).

Authorized Use Permission

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GETTING STARTED

Quick Start

Follow the steps below to get familiar with the WISE tool, draw a crop field, and generate a crop schedule in a few minutes.

1. Create a Crop Field
2. Add Weather Stations
3. Add Soil Data & Attributes
4. Generate a Schedule

System Requirements

A modern web-browser is required to connect and run this tool. Browser options include: Google Chrome v.69, Mozilla Firefox v.62, Safari v.11.1, and Microsoft Edge v.17.

USING THE TOOL

ACCESS THE TOOL

Create an eRAMS Account

A user account is required to create a WISE project using eRAMS. Follow the instructions below to create a free account: https://erams.com/account/

1. From the eRAMS Registration page, enter a username, password, your first and last name, and your email address. Click on the "Create Account"
    - eRAMS will display a popup box alerting you that an email confirmation has been sent to the provided email address
2. Open the email account provided in the registration form from either a new browser window or from your local email application.
    - Search for an email from eRAMS with the subject line "eRAMS Email Check"
3. Open this email and click on the provided link to confirm your email address.
    - ***Note**: If you do not see the confirmation email appear in your email inbox immediately, check your spam or junk email folder to ensure that the confirmation message wasn't automatically discarded. You may also need to wait a few moments to ensure the email is delivered successfully.*
4. Once you click on the provided email link, you should be redirected to eRAMS, where you'll be automatically logged in

Create a Project

1. Login to your eRAMS account here: https://erams.com/account/
2. Select the "Projects" tab from the left panel
    - ***Note**: You must be logged into your eRAMS account*
3. Select "Create Project" from the top toolbar (Figure 1)
4. Enter a Project Name
    - Alternatively, select a project from the list to access previous projects
5. Select "WISE Irrigation Scheduler" from the Project Type drop down
    - Optional: Select layers from previously saved project under the "Include Layers from Project" drop down
6. Click "OK"
7. Locate the name of the project you have created in the project list, click the link
    - The link will redirect you to the interface where you can conduct analysis and save work to your account

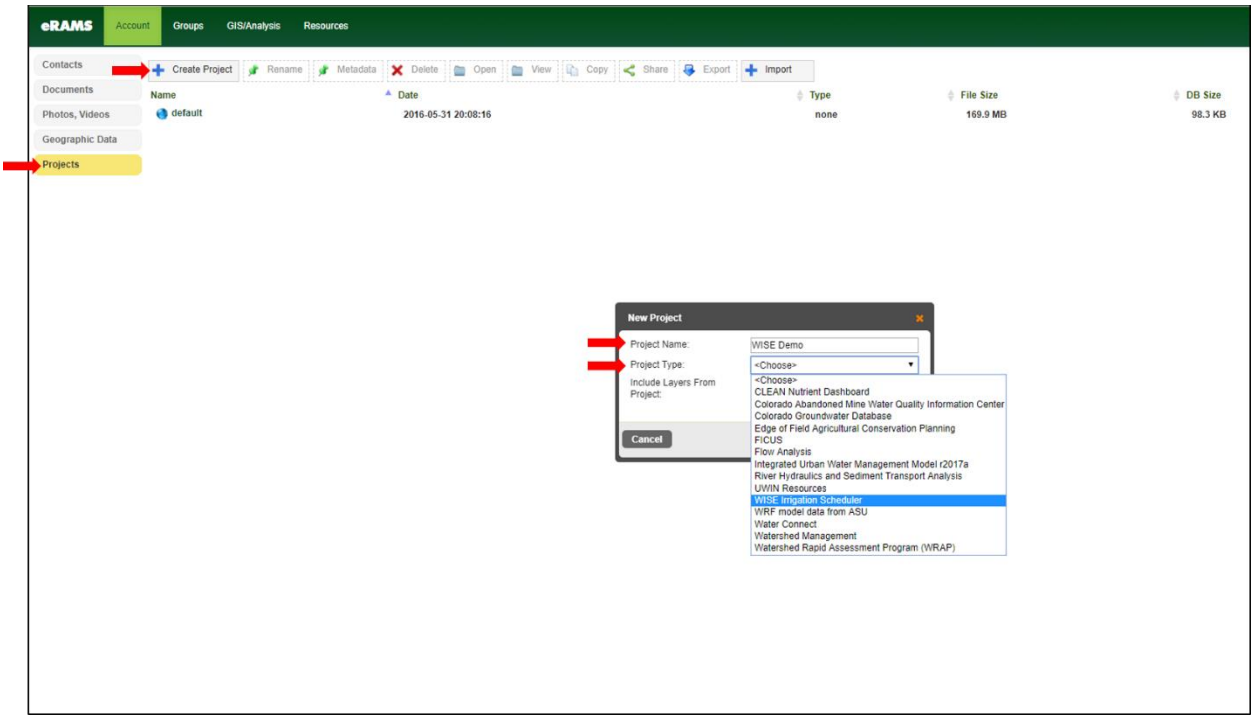

Figure 1: Registered user process for creating a WISE project in eRAMS

Step 1 – Create a Crop Field

Select Base Layer (optional)

With the WISE interface open, click the "Map" tab on the left dashboard

1. Select the "Base Layers" drop-down
2. Select the desired base layer

Define Crop Boundary

1. Select the "Fields" Tab from the left dashboard
2. Zoom to area of interest
    - Enter address/location in "Zoom To" box, *OR*
    - To use the zoom tool, click on the zoom tool button then click and drag your mouse across the map. Once you let go of your mouse, the map will zoom to the extent of the box that was previously drawn.
3. Create crop field (Figure 2)
    - Hover over the "Draw" button to display the options
        - Polygon: draw your crop field by making successive clicks on the map at each corner of your crop field. Double click to complete.
        - Draw Circle: click and hold your mouse in the center of the circle you wish to draw, then drag your mouse to the perimeter of the circle. Release your mouse to complete.

- Import: upload a shapefile

4. Enter a name for your crop filed when prompted, then click "OK"

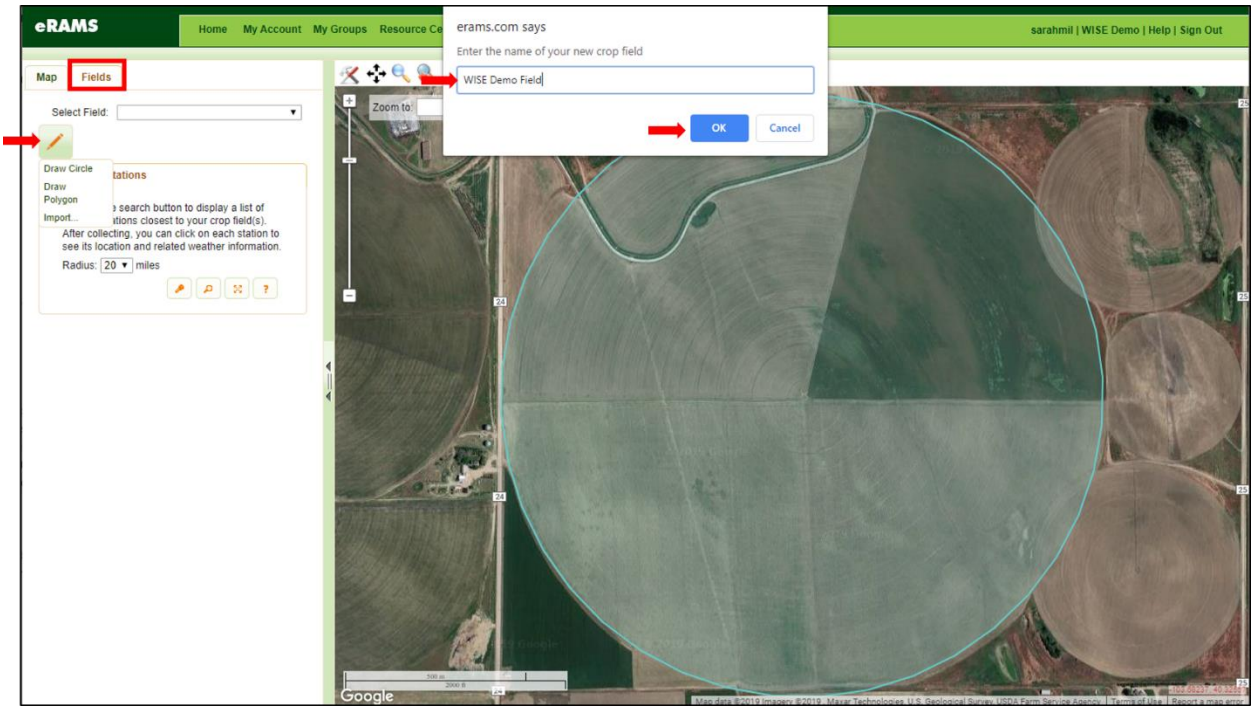

Figure 2: Define crop boundary

STEP 2 – ADD WEATHER STATIONS

Weather stations may have already been collected for your crop field, but if not, you can use the following steps to find weather stations nearest your crop field (Figure 3):

1. Click on the "Weather Stations" panel below the "Field" tab on the left side of the screen, if the panel has not already been opened.
2. Click on the "Search" icon to find closest applicable weather stations for your crop field. (Note: currently only Colorado CoAgMet and NCWCD weather stations exist).
3. Click on a weather station to see it on the map.
4. Click on the "Zoom to Full Extent" button to see all of the weather stations displayed on the map
    - Hover your mouse over a weather station marker on the map to see details about the weather station

Activate/Deactivate Station(s)

Activate or deactivate a weather station in the left column by clicking on the power button that appears next to a weather station name when you hover your mouse over the station (Figure 3)

View Weather Data

1. Click on a weather station in the list of search results
2. Pop up box will display on the map, select "See Current Weather"

Weather station video tutorial: https://youtu.be/TKIgtTnPGcw

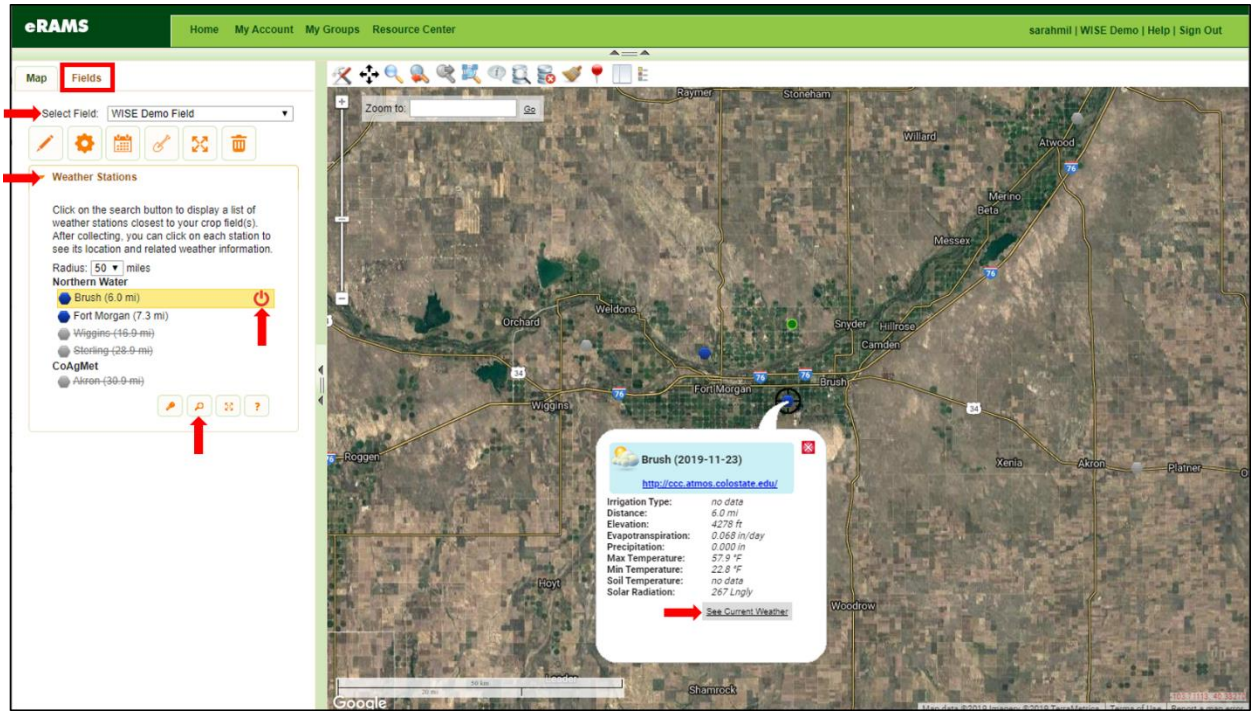

Figure 3: WISE weather stations and data

STEP 3 – ADD SOIL DATA & FIELD ATTRIBUTES

Soil Data

To select the soil within your field that has the available water content:

1. Select the shovel icon (Figure 4)
    a. The map view shows the soil texture outlines, soil name, soil type, percent of field and a NRCS number.
2. To select a specific soil and available water content, click on the check mark next to the selected soil
    a. If not selected the soil will default to the majority soil type.
3. Click on the back arrow to exit the soil information interface

Soil data video tutorial: https://www.youtube.com/watch?v=2RhfAG7chxQ&feature=youtu.be

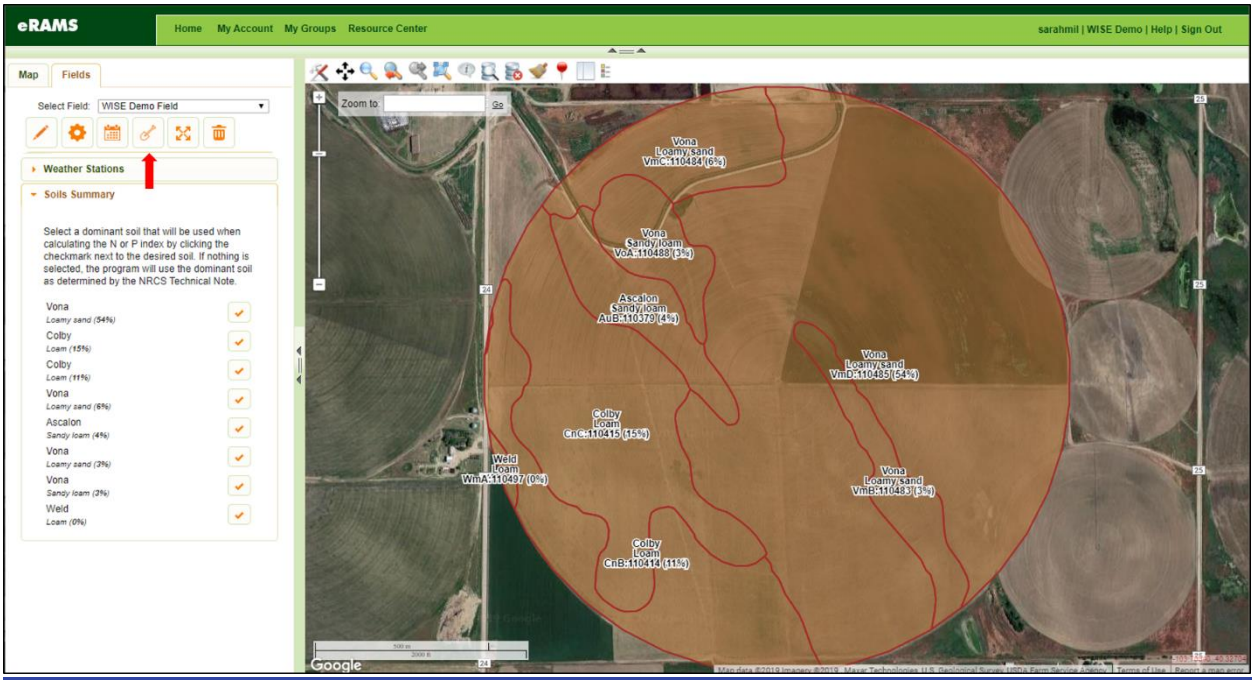

Figure 4: WISE soil information

Field Attributes

To select and modify crop field information:

1. Select set up/modify icon (gear)
2. Enter crop type, planting date, and emergence date for your field
    a. Optional – add estimated harvest date
3. Next, update the irrigation information by selecting type, method and desired level of efficiency
4. If desired, adjust available water content by double clicking the cell under the "AWC" column in the corresponding table (Figure 5)
5. Select "Update" to process selections, then click "Done" when prompted

Crop information video tutorial: https://youtu.be/vc5vIPMW1ds

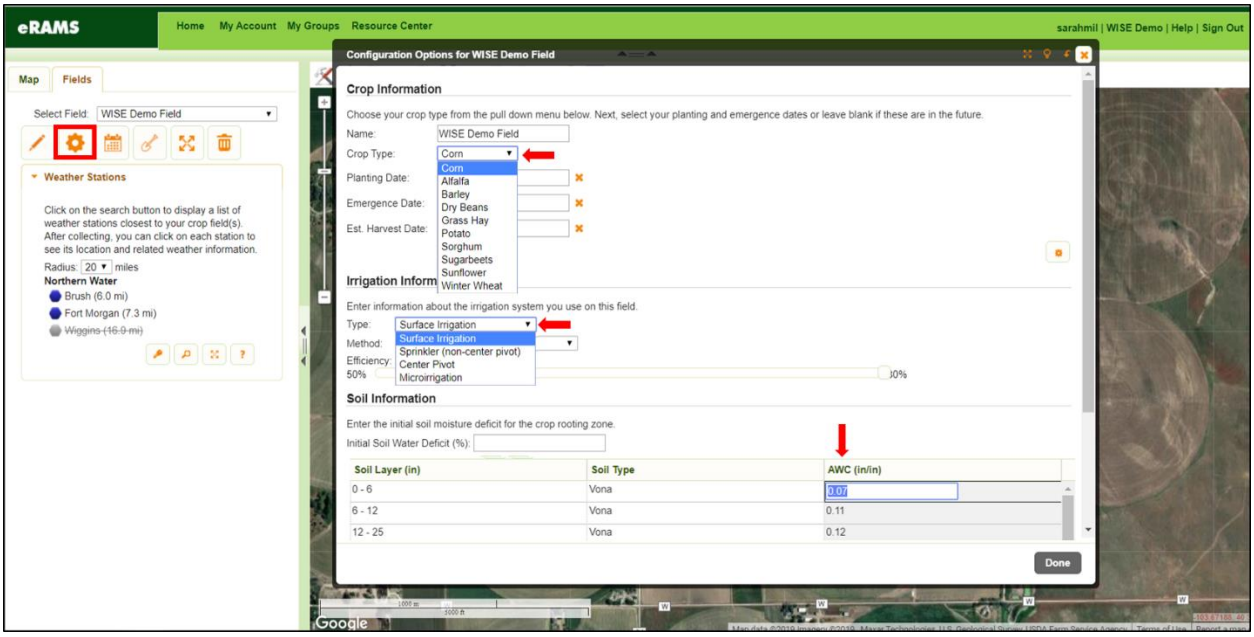

Figure 5: WISE crop field attributes

STEP 4 – GENERATE A SCHEDULE

To review the results of your irrigation analysis:

1. Click on the schedule icon (calendar)
2. A summary of your crop field irrigation needs, as well as a table and a graph of irrigation scheduling results will be displayed, click the corresponding tabs to toggle between information
3. Export results as an excel file, image or print directly (Figure 6)

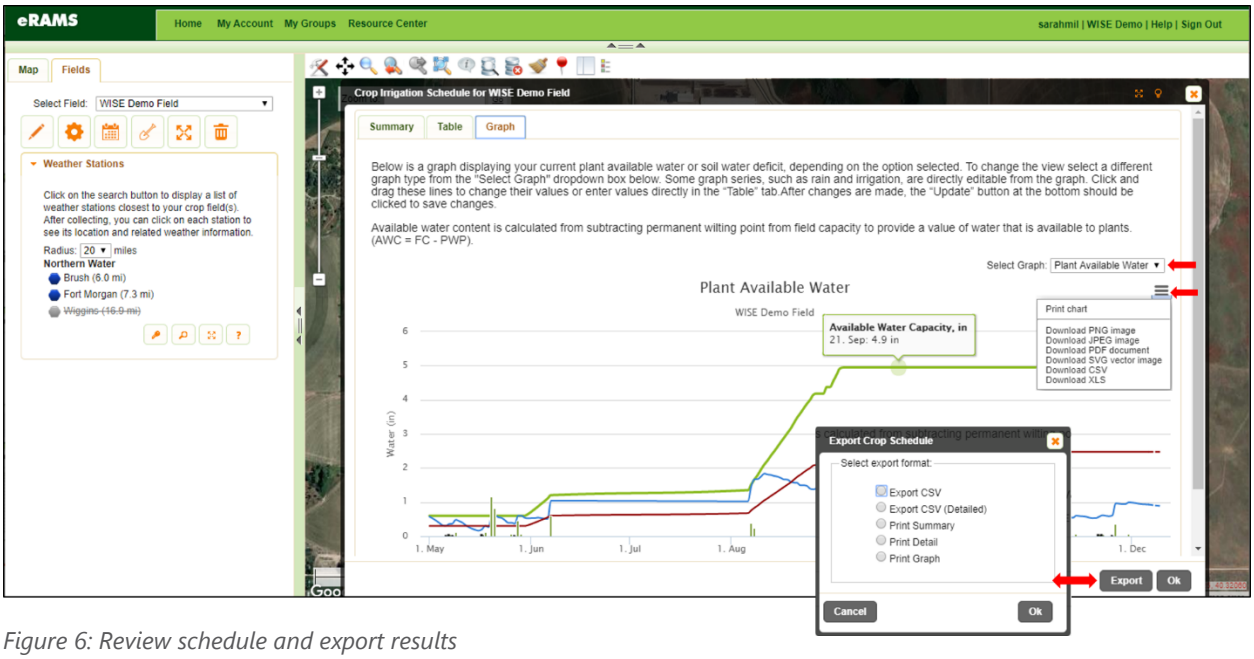

Figure 6: Review schedule and export results

Table

The "Table" tab will display daily crop and water balance information for your field. Double-click any shaded box to edit existing values, or hover over a column header to see more information about each column.

Graph

The graph will display your current plant available water or soil water deficit, depending on the option selected. To change the view select a different graph type from the "Select Graph" dropdown box below (Figure 6). Some graph series, such as rain and irrigation, are directly editable from the graph. Click and drag these lines to change their values or enter values directly in the "Table" tab. After changes are made, the "Update" button at the bottom should be clicked to save changes.

Available water content is calculated from subtracting permanent wilting point from field capacity to provide a value of water that is available to plants. (AWC = FC - PWP).

View schedule, add irrigations and export data video tutorial: https://youtu.be/t53M50qZY1U

Create Template for Future Use

Upon completion of a growing season a producer may desire to maintain the crop field within a project, while updating the crop attributes and irrigation with new information. In general, it is

recommended to save the previous data prior to starting a new project (Click "Schedule", then export as CSV file and save a hard copy on your machine).

Users can create a new project, but include layers from previously saved work in eRAMS by following these simple steps:

1. From the Home interface, Select "Project" from the left dashboard
2. Select "Create Project" from the project menu
3. Name the new project
4. Select "WISE Irrigation Scheduler" from the Project Type drop down
5. Select layers from previously saved project under the "**Include Layers from Project**" drop down
6. Open the newly created project
    a. The new project will automatically include the previous data and attributes, make modifications by repeating Step 4 of this guide

Create new project using previous season as template video tutorial: https://youtu.be/7fW-kbSAHmM