



**WebStart WEPS:  
Remote data access and model execution  
functionality added to WEPS**

---

**Larry E. Wagner**

**Mark E. Haas**

**Fred A. Fox**

**United States Department of Agriculture  
Agricultural Research Service**

**Rangeland Resources & Systems Research Unit  
Ft. Collins, Colorado**





## Major Users of WEPS

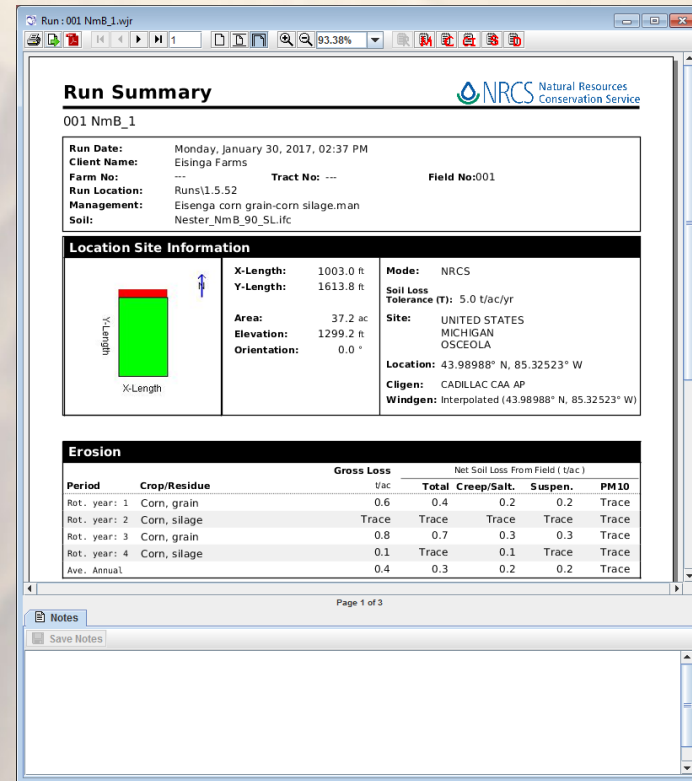
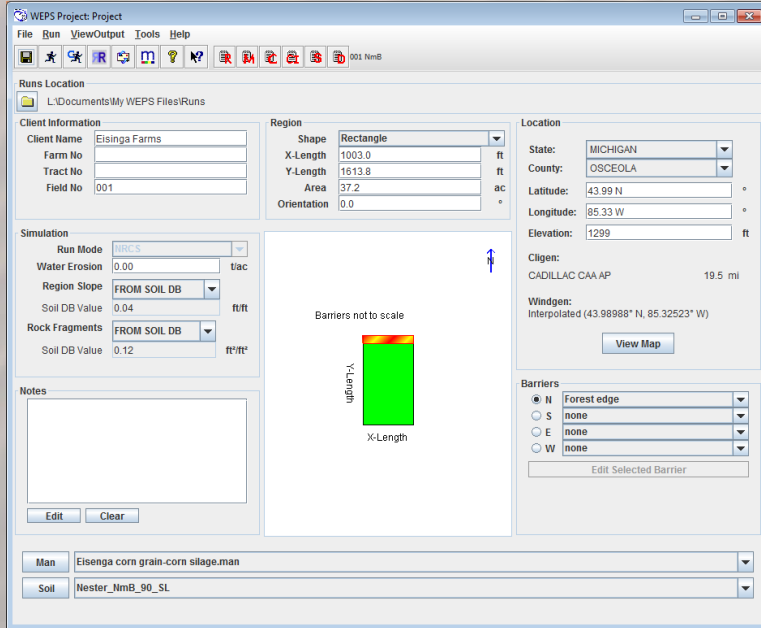
- **USDA-NRCS** (15,000 computers in 3,000 offices)
  - NRCS Current Release 1.5.52 WEPS
  - NRCS IET (Integrated Erosion Toolkit) WEPS
- **Field to Market** (<https://fieldtomarket.org>)  
Consortium of Retailers, Brands, Ingredient Processors, Ag Service Providers and Farmers
  - **FieldPrint Calculator (WEPS)**





# Current WEPS Status

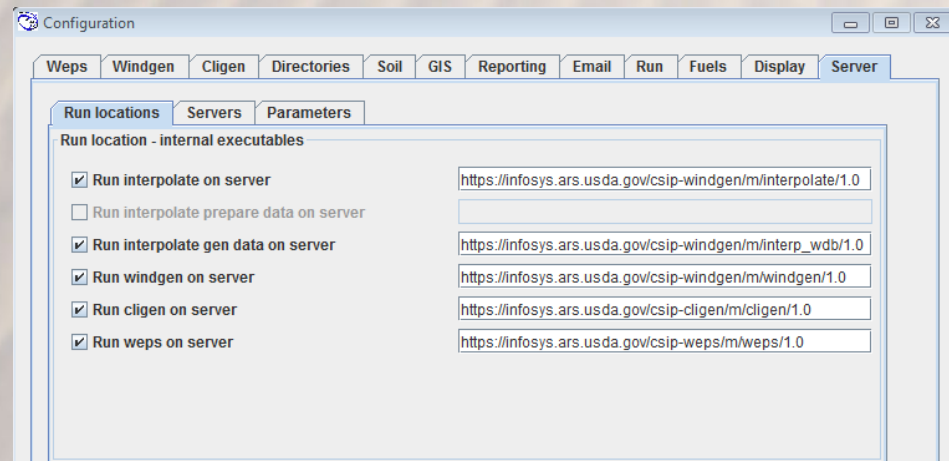
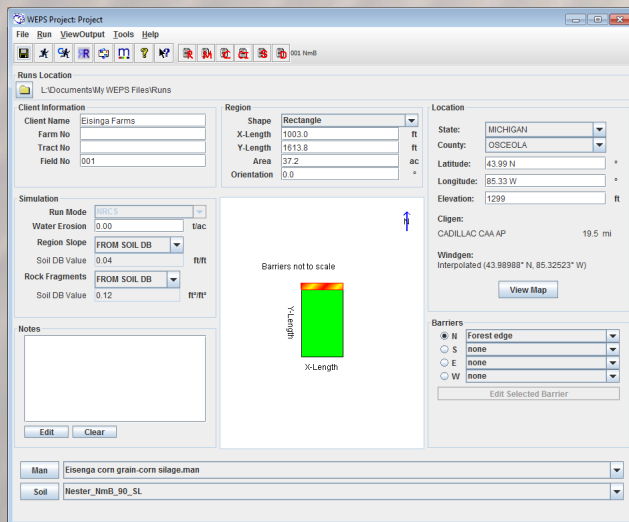
- **WEPS 1.5.52 (Released in December 2016)**
  - Public (full) release
  - NRCS release





## WEPS WebStart Goals (~2015)

- Provides remote access to data (CRLMOD access)
- Provides remote (server) execution of WEPS runs
- Allows access to WEPS application via a web browser
- Retains use of current WEPS desktop interface





## **What is a Java WebStart application?**

**Java Web Start**  
**(also known as JavaWS, javaws or JAWS)**  
**Framework developed by Sun Microsystems**  
**(now Oracle) that:**

**Allows users to start application software**  
**for the Java Platform**  
**directly from the Internet using a web browser**





---

## Java WebStart Application features

- **Provides internet browser access**
  - No “Administrator” install for WEPS required
- **Provides automated updating services**
  - User is always running latest WEPS release
- **Provide “offline” execution access**
  - Caches full copy of WEPS on local machine



## How WEPS Java WebStart application works

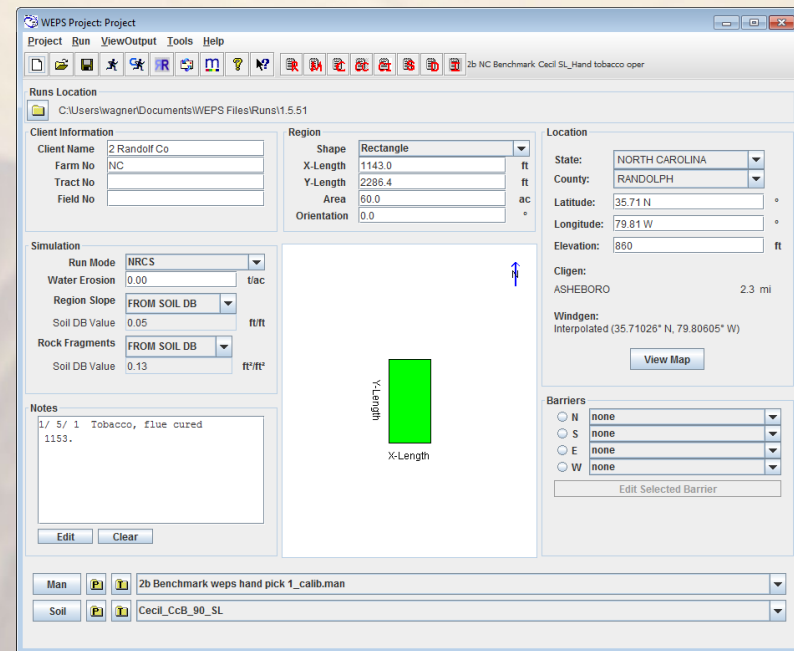


After clicking on the URL link for the first time in a browser, it will download the Java WebStart application (WEPS bootloader) and cache a copy on the local computer





# How WEPS Java WebStart application works



The Java WebStart WEPS bootloader will then finish downloading WEPS and bring up the application (WEPS) on the local computer





# How the WEPS Java WebStart application works

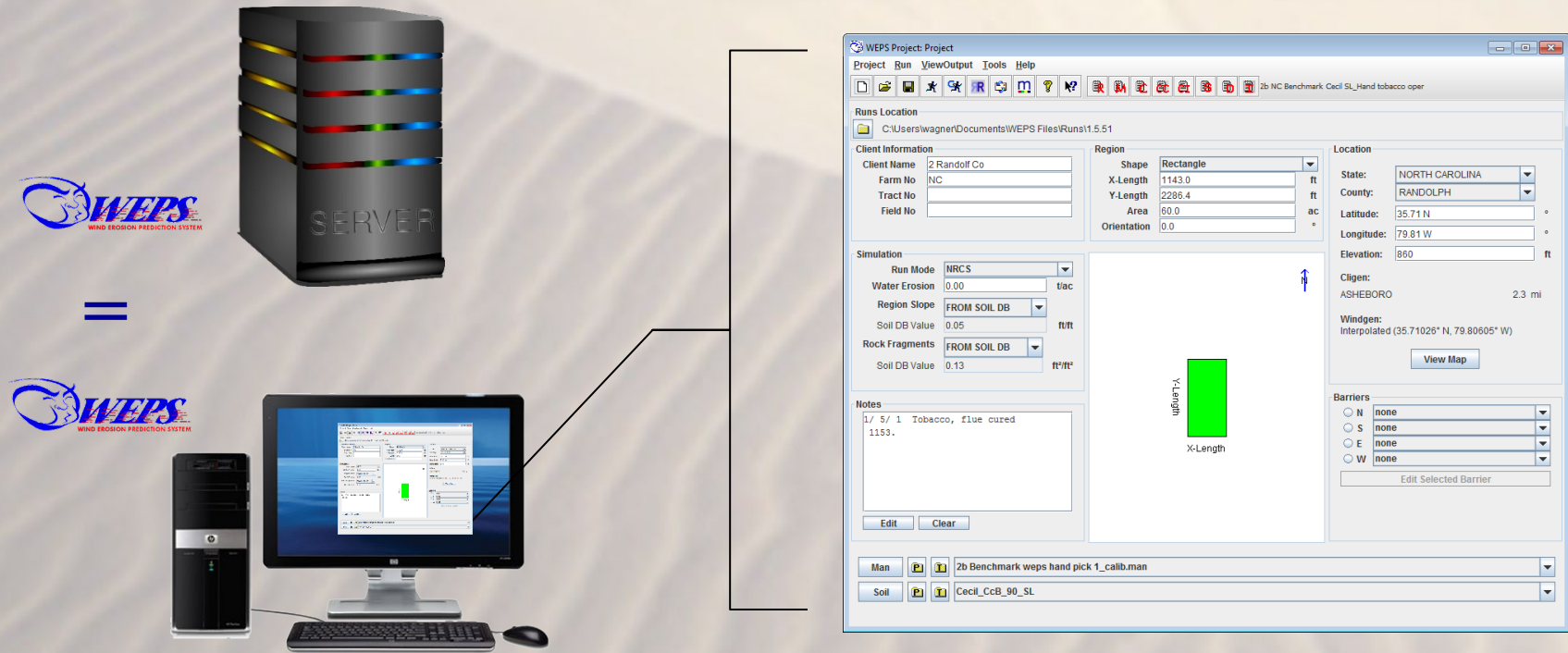


Subsequent clicks on the URL link in a browser will cause Java WebStart to check if the cached copy of the application (WEPS) is consistent with (same as) the current copy on the server





# How the WEPS Java WebStart application works



If so, it will immediately bring up the application (WEPS) from the cached copy on the local computer





# How to start up WEPS Java WebStart Application



≠

will download an updated

to starting up WEPS





## WEPS Java WebStart (MSI) application



Windows MSI  
install package for  
WEPS Bootloader

MSI package will “install” the WebStart WEPS  
bootloader, which will then download and install  
a copy of WebStart WEPS on the local computer





---

## Java WebStart (MSI) Application features

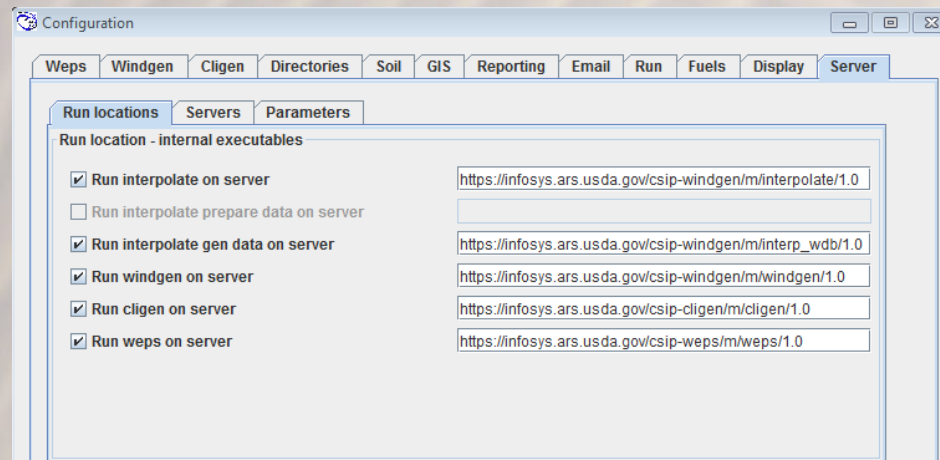
- **Does not**
  - Provide internet browser access to WEPS
- **Now requires**
  - An “Administrator” account install
- **Provides automated updating services**
  - User is always running the latest WEPS release
- **Provide “offline” execution access**
  - Caches copy of application on local machine





## WEPS WebStart Enhancements

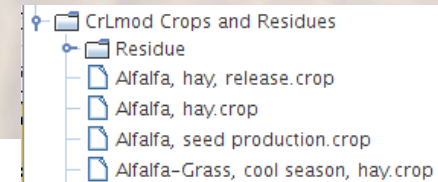
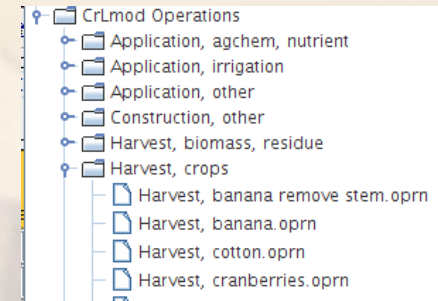
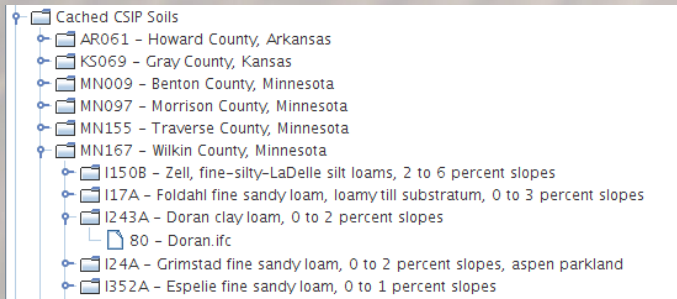
- CSIP services provide
  - Remote access to NRCS CRLMOD data
  - Remote access to NRCS Soil data
  - Remote (server) execution of Windgen/Cligen generators
  - Remote (server) execution of WEPS science model runs
  - WEPS configuration settings for CSIP endpoints provided





# WebStart WEPS Enhancements

- **Caching of remotely accessed data**
  - CSIP Soil Service
  - CRLMOD Management templates
  - CRLMOD Operation records (pre-populated)
  - CRLMOD Crop/Residue records (pre-populated)
- **Pre-population speeds up user access to data**





# WebStart WEPS Enhancements

- **Map Viewer used to locate field lat/lon**
  - Required for Soil CSIP service and Cligen PRISM adjusted data
- **Revised Map Viewer button text**
- **Added satellite imagery layer**

**Location**

State:

County:

Latitude:

Longitude:

Elevation:

**Location**

State:

County:

Latitude:

Longitude:

Elevation:

**Weps Map Viewer**

Position: -97.45710, 47.92183  
Country: United States  
State: North Dakota  
County: Grand Forks  
CMZ: 2

Visible	Layer
<input checked="" type="checkbox"/>	Current Location
<input type="checkbox"/>	Cached Soil Data
<input type="checkbox"/>	Cached Prism Data
<input type="checkbox"/>	Cligen Stations
<input type="checkbox"/>	Windgen Stations
<input type="checkbox"/>	cb_2013_us_county_500k
<input type="checkbox"/>	Reflected Windgen stations
<input type="checkbox"/>	Windgen interp. boundary
<input type="checkbox"/>	cb_2013_us_state_500k
<input type="checkbox"/>	Windgen triangulation boundaries
<input type="checkbox"/>	Windgen interp. & polygon regions
<input type="checkbox"/>	Cligen boundary
<input type="checkbox"/>	Cligen polygon regions
<input checked="" type="checkbox"/>	NRCS CMZ regions
<input checked="" type="checkbox"/>	Imagery - USGS
<input checked="" type="checkbox"/>	Open Street Maps
<input type="checkbox"/>	China Provinces
<input checked="" type="checkbox"/>	US counties
<input checked="" type="checkbox"/>	US states
<input checked="" type="checkbox"/>	World borders

Zoom Level:  0 10 20 30 40 50 60 70 80 90 100

Lat/Lon:

window size:







# WebStart WEPS Enhancements

- Uses new multi-subregion science code
  - Current interface still limits us to single subregion mode
- Added “NRCS Crop Interval” rotation mode to MCREW

MCREW(Management Crop Rotation Editor for WEPS)

File Edit View Tools Help

Rotation : C:\Users\wagner\Documents\My WEPS Files\Project.wpj\Wheat, winter, fallow, Conv, CMZ5.man  
Version: 1.7      Years in Rotation: 2

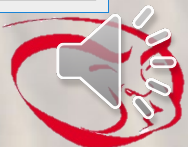
Date	Operation Name	Crop or Residue	Row/Ridge Dir. (Deg.)
May 01, 01	Chisel, sweep shovel		0
Jun 01, 01	Chisel, sweep shovel		0
Jul 01, 01	Rodweeder		0
Aug 15, 01	Rodweeder		0
Sep 01, 01	Cultivator, field 6-12 in sweeps		0
Sep 10, 01	Drill or air seeder, double disk	Wheat, winter...	0
Jul 10, 02	Harvest, killing crop 50pct standing stubble		0
Oct 20, 02	Chisel, sweep shovel		0

MCREW(Management Crop Rotation Editor for WEPS)

File Edit View Tools Help

Rotation : C:\Users\wagner\Documents\My WEPS Files\Project.wpj\Wheat, winter, fallow, Conv, CMZ5.man  
Version: 1.7      Years in Rotation: 2

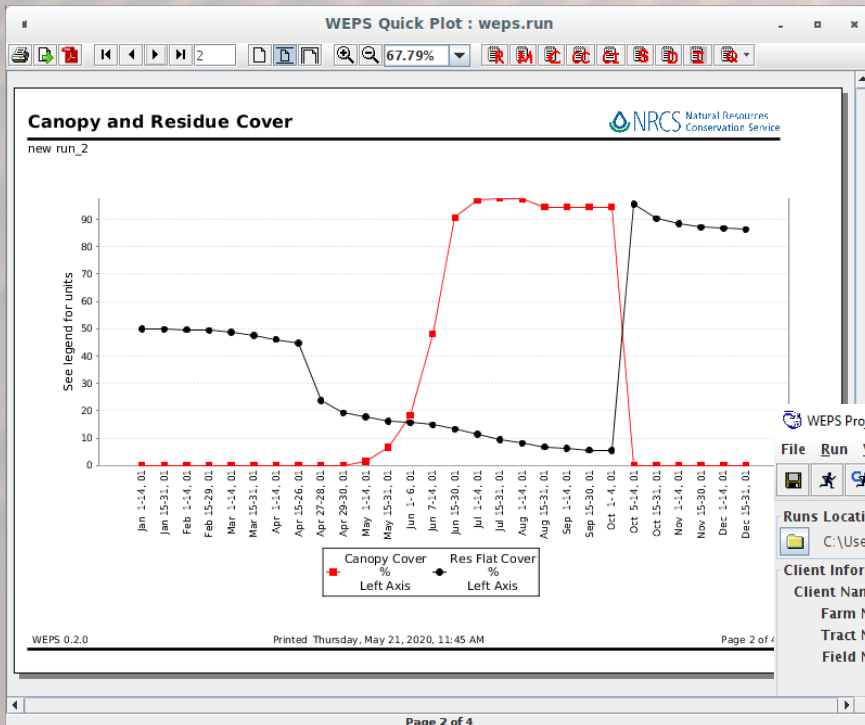
Date	Operation Name	Crop or Residue	Row/Ridge Dir. (Deg.)
Sep 10, 01	Drill or air seeder, double disk	Wheat, winter...	0
Jul 10, 02	Harvest, killing crop 50pct standing stubble		0
Oct 20, 02	Chisel, sweep shovel		0
May 01, 03	Chisel, sweep shovel		0
Jun 01, 03	Chisel, sweep shovel		0
Jul 01, 03	Rodweeder		0
Aug 15, 03	Rodweeder		0
Sep 01, 03	Cultivator, field 6-12 in sweeps		0





# WebStart WEPS Enhancements

- Added default QuickPlot access to WEPS GUI
- Revised/updated WEPS reports



**WEPS Project: Project**

File Run ViewOutput QuickPlots Tools Help

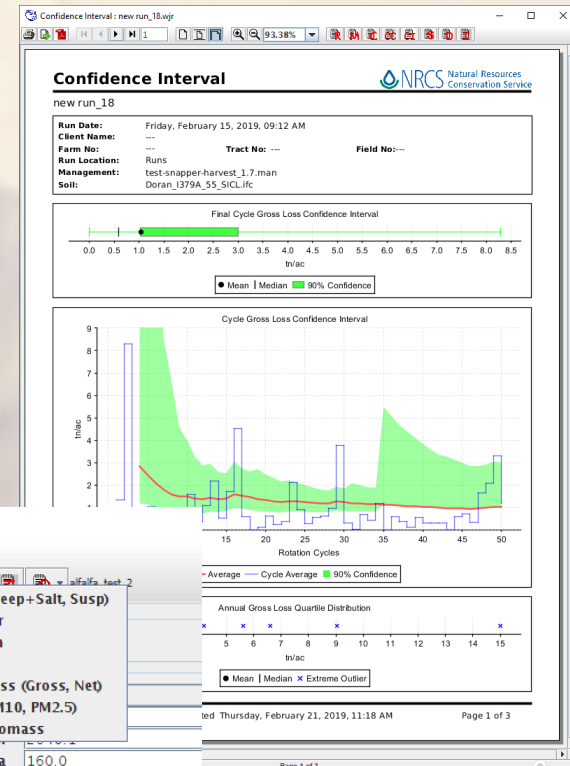
Most Recent Run  
Previous Run

Runs Location  
C:\Users\wagner\Documents\My WS\_WEP

Client Information  
Client Name Joe  
Farm No  
Tract No  
Field No

Wind Erosion Soil Loss (Creep+Salt, Susp)  
Canopy and Residue Cover  
Precipitation and Irrigation  
Wind Energy  
Total Wind Erosion Soil Loss (Gross, Net)  
Wind Erosion Soil Loss (PM10, PM2.5)  
Total Crop and Residue Biomass

Area 160.0  
Orientation 14.0





---

## WebStart WEPS Enhancements

- **Enhanced Windgen generator and its database**
  - Added Puerto Rico windgen stations
  - Added Alaska Windgen polygons
  - Updated Windgen to use a different random number generator
- **Updated Cligen database**
  - Updated to 40 year record Cligen database (2015)
- **Added PRISM adjustment feature to Cligen records**
  - 4k grid PRISM dataset
    - Monthly mean precipitation and max/min temperatures





---

**Questions?**

**Thank You**

---

