



Natural Resources Conservation Service

***RUSLE2 VERSION 2.5.9.0 GUIDANCE DOCUMENT
06/16/16***

RUSLE2 VERSION 2.5.9.0 GUIDANCE DOCUMENT

Objective

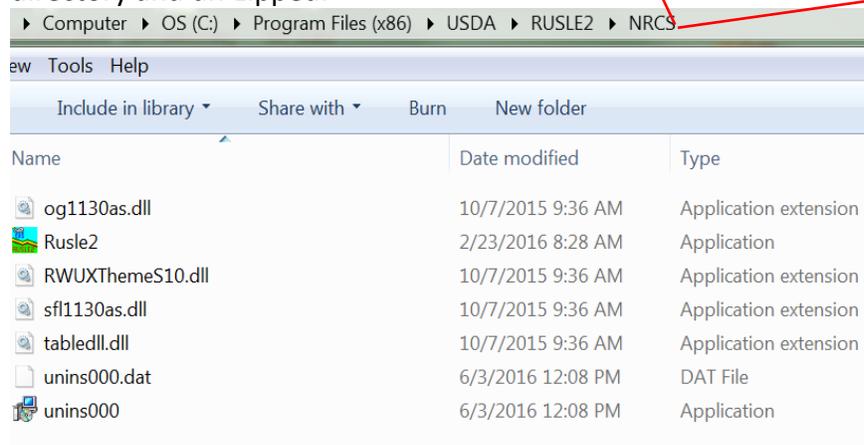
This document will instruct users on how to properly download R2 v2.5.9.0 in the proper Location and provide guidance when using an existing county specific database in R2 v2.5.9.0.

Note: Downloading the new release of R2 is applicable to external users, not NRCS staff. Close RUSLE 2, prior to performing the task as directed below. After all task are complete, users are instructed to open RUSLE 2 starting on page 6.

External Users (Partners)

The R2 v2.5.9.0 program zip file (exe. file) download location and file structure is *C: > Program Files (x86) > USDA > Rusle2 > NRCS*. External users (LCD, TSPs, and private consultants) must download the Rusle2 Installer NRCS (2.5.9.0).zip file located at:

<http://fargo.nserl.purdue.edu/RUSLE2 ftp/RUSLE2 Program File/>. Place the file in the NRCS directory and un-zipped.



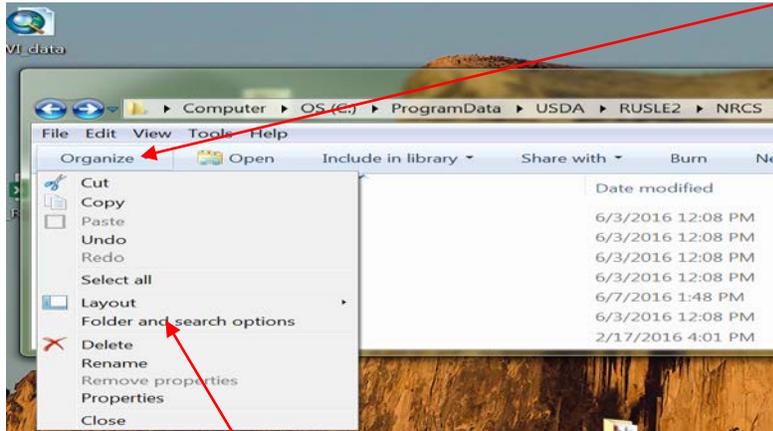
Partners using previous R2 version have the option of using their existing county specific Database or creating a new database. If no database exist, see page 7, for the location of the most current county specific databases developed January 2016. Proceed to the next section, when the user is inclined to assess and plan with an existing county specific database in the new version. If a new database will be created the user should follow the guidance in the publication “Database Update Instructions for use with RUSLE 2 updated June 2016” located at: <http://fargo.nserl.purdue.edu/RUSLE2 ftp/NRCS Base Database/>.

Locating Existing RUSLE 2 Databases

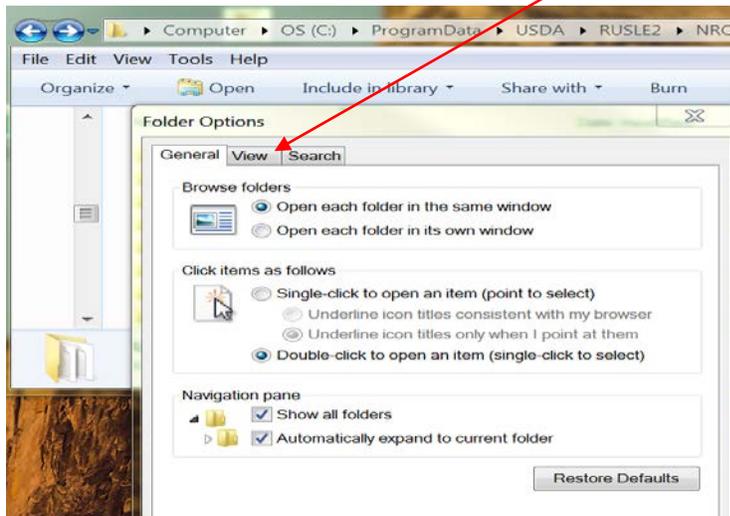
NOTE: Periodically during a download (un-install of the old version and re-install of a new version), directories or file folders may not be visible. The file structure (*C: > ProgramData > USDA > RUSLE2 > NRCS > Backup*) must be present to locate your existing databases. For example one or more folders/directories may disappear such as *ProgramData, USDA, RUSLE2, NRCS or the Backup folder/directory*. If the file structure is **correct**, proceed to page 4 to locate your existing database (s).

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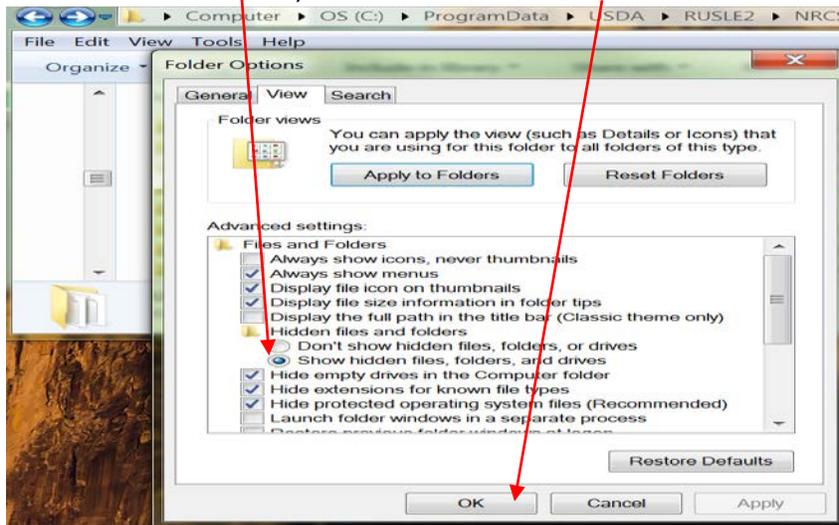
If the entire file structure is not visible, click on the following menu options: *Organize > Folder and Search Options > View > Show hidden files, folders or drives.*



Click on Folder and search options. Click on View.

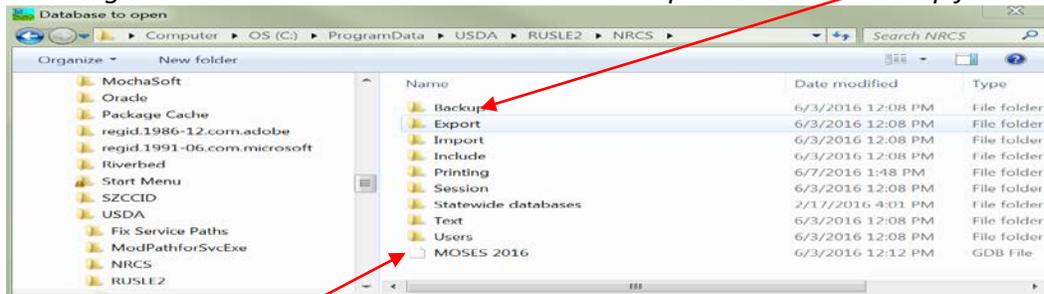


Click show hidden files, folders and drives. Click OK.



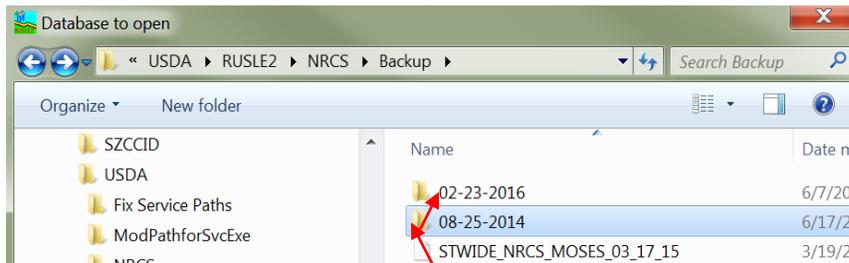
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Existing or previous RUSLE2 User Databases should be located at the following location:
C: > ProgramData > USDA > RUSLE2 > NRCS > Backup. Click on the *Backup folder >*.

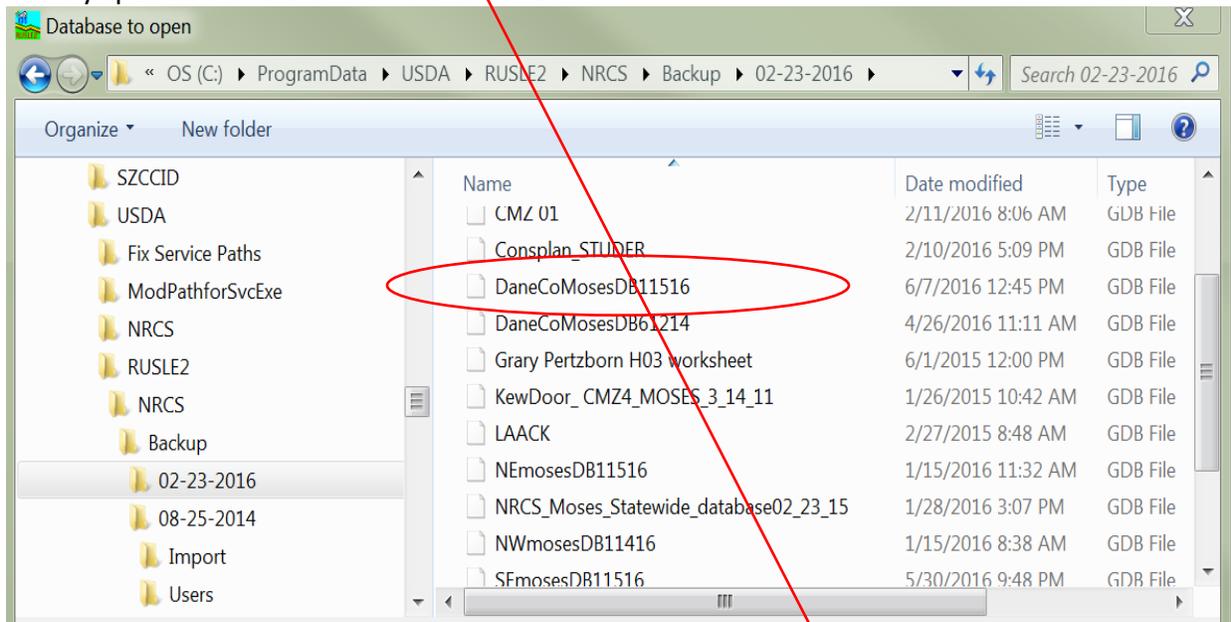


Note: The MOSES 2016 database is the database downloaded in the new release, does not contain the database components such as soils, managements, and climate information to run RUSLE 2.

The user's existing database (s) may reside outside or inside the folders dated 02-23-2016 or 08-25-14. Click on the folder dated 02-23-2016 > and or 08-25-14.



Select the database you are planning to use. In this example, DaneCoMosesDB11516 is the county specific database selected for use.

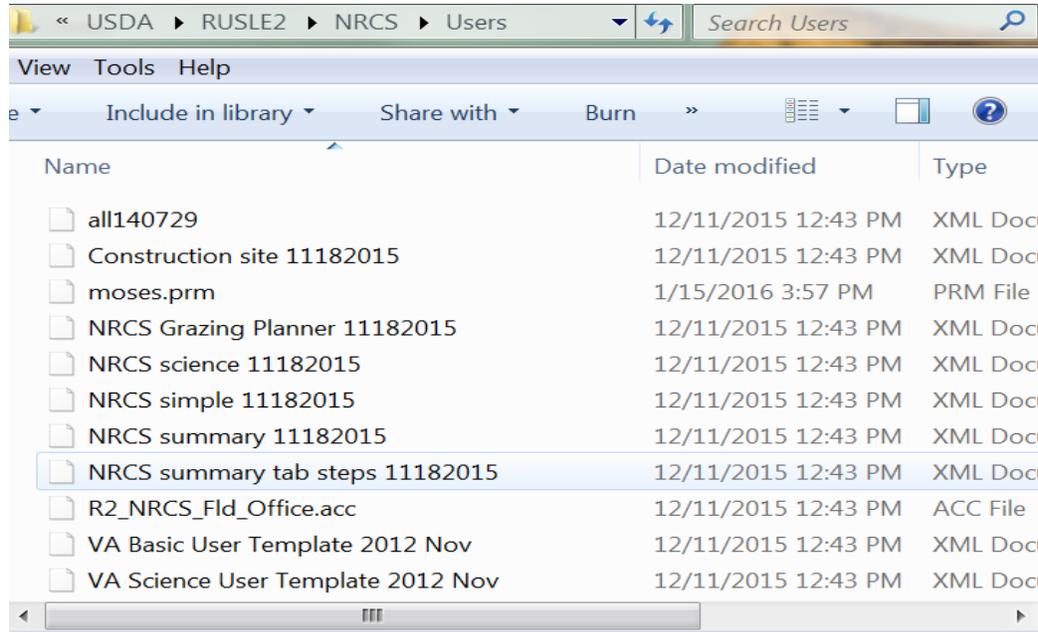


The recommendation is to move the DaneCoMosesDB11516 database and other applicable databases/files outside of these folders (02-23-2016, 08-25-2014) to the NRCS directory. Archive or delete databases/files that are obsolete and finally delete the (02-23-2016, 08-25-2014) folders.

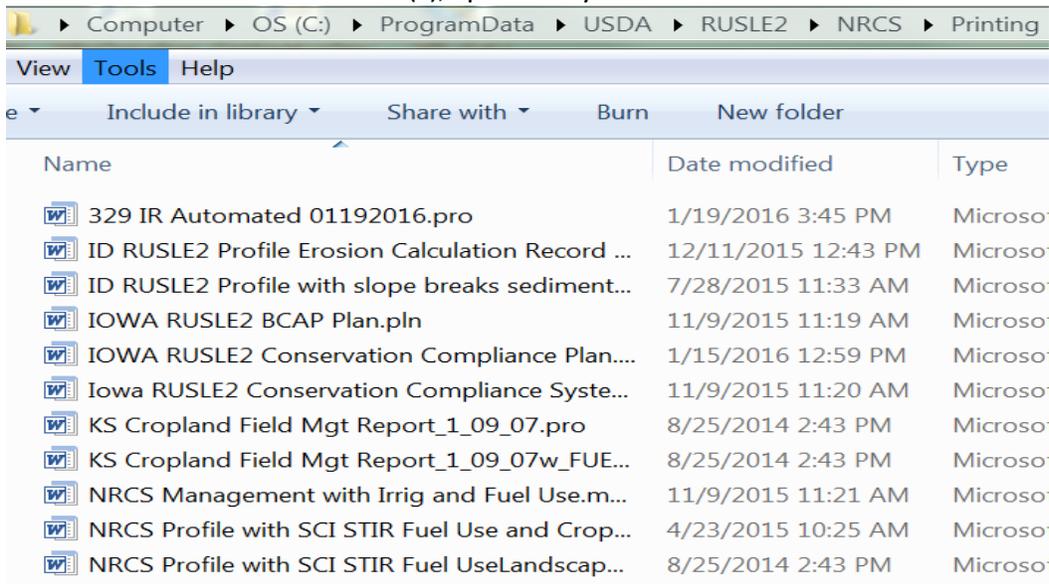
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Migrate to the NRCS directory to verify if the latest Printing and User Templates downloaded with the new release.

Verify by clicking on the Users folder. The User Templates are current based on the date of 12-11-15.



Verify by clicking on the Printing folder. The Printing Templates are current determined based on the date (s), specifically 01-19-2016.

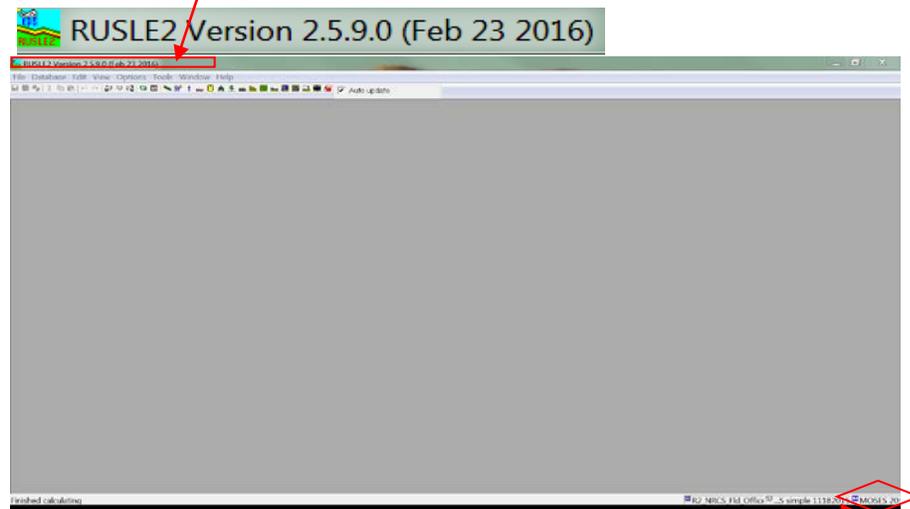


The download provided users with 39-42 printing templates. Users may delete printing templates that are not applicable to your county.

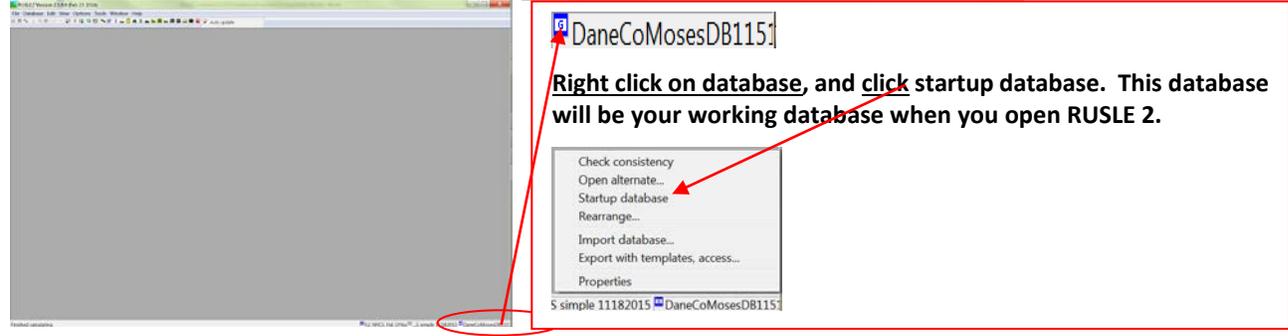
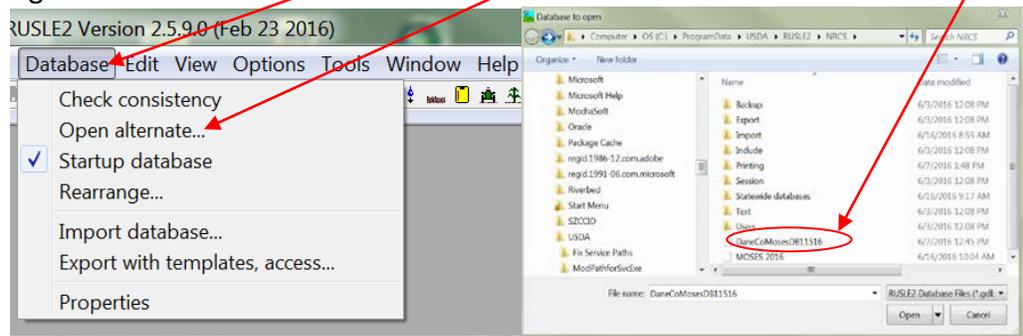
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Opening R2 v2.5.9.0, dated (Feb 23rd 2016) and loading an existing county specific database

Open RUSLE 2 v2.5.9.0. The correct version and date is verified at this location of the R2 user interface screen.



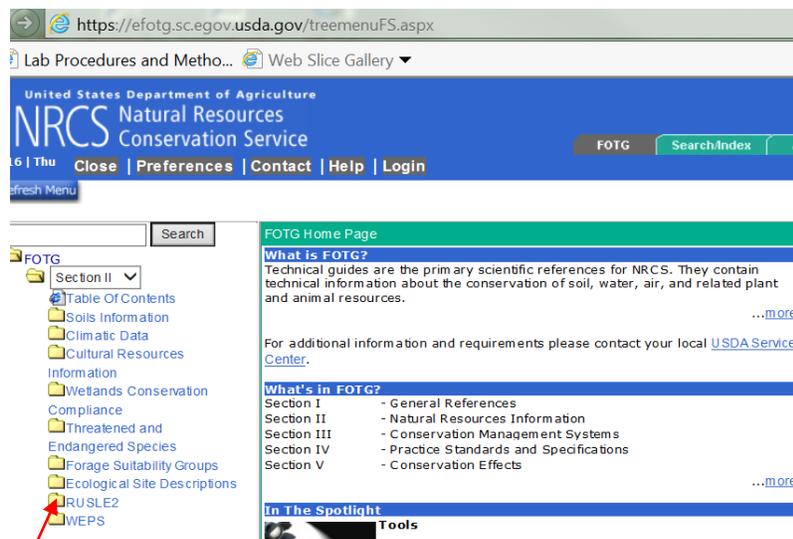
The MOSES 2016 database downloaded with the new release should be replaced with the existing database of choice. Click on Database > Open Alternate and select the working database of choice by navigating to the root folder or location, where the user saved the existing county specific database. Click open and the database selected should appear in the right bottom corner of user interface screen.



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In January of each year, county specific databases are developed to include the most current soils, crop managements, and operations data files as required by NRCS national policy. Each county specific database comprise of additional database information for counties contiguous to the home county, whereby users can utilize the home county database to compute soil losses for clients farming in contiguous counties. Users may download the January 2016 county specific databases located in Section II of the electronic Field Office Technical Guide under RUSLE 2 at:

<https://efotg.sc.egov.usda.gov/treemenuFS.aspx>.



Click on the RUSLE 2 folder > click on County Databases > click on 1 of the 4 Regions (Northeast-Northwest-Southeast-Southwest) > and download the county specific database of choice to the NRCS directory at C: > ProgramData > USDA > RUSLE2 > NRCS and un-zip the database file.



Any additional questions should be directed to the local Area Resource Conservationist.

Explanation of Modifications to RUSLE2 v2.5.2.11 (Aug. 18th 2014) and RUSLE2 v2.5.9.0 (Feb. 23rd 2016)

RUSLE2 v2.5.9.0 2016 Modifications

Minor bug fixes and updated user access files, user templates and print templates. The irrigation subroutine, inadvertently turned off on the previous version, was reactivated.

A new soil import procedure has been installed so that ALL users can import soils data directly from the official NRCS soil database. All new soils import into a new SSURGO soils folder. An internet connection is required for this process. This process eliminates the need for the state agronomist to create soils data exports for posting on the NRCS RUSLE2 website.

RUSLE 2 v2.5.9.0 Support Documents

The documents below dated 2016 were recently revised to support the release of R2 v2.5.9.0.

The file folders below are located at:

http://fargo.nserl.purdue.edu/RUSLE2_ftp/NRCS_Base_Database/

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 Parent Directory			-
 CSP presentation/	05-Apr-2006 18:55		-
 Farm Equipment presentations/	10-Jun-2016 15:39		-
 Latest Base Database and Updates/	10-Jun-2016 15:27		-
 Manure drymatter calclations/	24-Oct-2010 17:27		-
 Printing templates/	10-Jun-2016 14:05		-
 RUSLE2 Instructional Material/	10-Jun-2016 15:37		-
 Soil Removal tables for B&B Nursery and Sod farms/	22-Apr-2005 16:53		-
 Soil removal procedure for subsidence on Histosols/	10-Feb-2006 17:16		-
 Soils Database Procedures/	10-Jun-2016 15:51		-
 User_Screen_templates/	10-Jun-2016 14:19		-

The files below are located at:

http://fargo.nserl.purdue.edu/RUSLE2_ftp/RUSLE2_Program_File/

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 Parent Directory			-
 Changes in 2.5.2.11 and 2.5.9.0.rtf	10-Jun-2016 14:29	64K	
 Database Update Instructions for use with RUSLE2 updated June 2016.doc	07-Jun-2016 18:42	4.2M	
 Importing soils. climate and managements rev072006.doc	20-Jul-2006 15:55	565K	
 InstallRUSLE.pdf	20-Nov-2014 22:33	1.1M	
 RUSLE2_Science_Doc 2013.pdf	17-Jul-2014 14:26	3.1M	
 RUSLE2_User_Ref_Guide from ARS website 2008.pdf	17-Jul-2014 14:32	2.8M	
 ReSetting the path to the RUSLE2 database file.doc	31-May-2007 14:18	255K	
 Rusle2InstallerNRCS(2.5.9.0).zip	30-Mar-2016 00:03	30M	
 Some new things in RUSLE2 (2.5.2.11 and 2.5.9.0) June 2016.docx	10-Jun-2016 14:52	407K	

Explanation of Modifications to RUSLE2 v2.5.2.11 (Aug. 18th 2014) and RUSLE2 v2.5.9.0 (Feb. 23rd 2016)

RUSLE2 v2.5.2.11 2014 Modifications

This release of RUSLE2 contains several major enhancements including: (1) improved tools to develop and use annual and perennial vegetation descriptions, (2) tools to estimate runoff and develop a representative runoff event sequence, (3) tools to calculate and display tillage erosion on profiles with changing slope steepness, and (4) tools to make it easier to apply and remove permeable barrier systems commonly used on construction sites.

The existing documentation including [Science Documentation](#) and [User's Reference Guide](#) provide detailed descriptions of RUSLE2 as it existed in May, 2008. The changes made in the 2010 and 2014 versions are not yet embedded in these documents, but much of the new science is described in journal articles, and extensive additions have been made to the online HELP files. To access the on-line help associated with any parameter, by right-clicking while hovering the pointer over a variable name and select "help" from the menu that is displayed.

The science behind the new vegetation tool was described by [Dabney and Yoder \(2012\)](#). This information supplements information in the Science Documentation and replaces information in section 9.2.4 of that document. [Dabney et al. \(2014\)](#) describe the new forage removal process that was developed to interact with the new vegetation model. This information corresponds to information contained in the User's Reference Guide.

Documentation of how RUSLE2 calculates runoff was published by [Dabney et al. \(2011\)](#). The scheme basically predicts monthly runoff for combinations of soil, management, and climate descriptions. Also predicted are the number of runoff events per year and the gamma distribution parameters describing the population of event runoff depths. This scheme was modified by [Dabney et al. \(2012\)](#) who increased the gamma scale parameter equivalently to how Dabney et al. (2011) increased runoff during months with high erosivity density (rainfall intensity). In the 2014 release, except in Req. areas, the default erosion calculation approach was changed from the daily disaggregated method to one based on a representative runoff event sequence. This change allows RUSLE2 to estimate annual and monthly runoff as well as erosion and to calculate a representative runoff event sequence that is suitable for linkage with an ephemeral gully model. The default return period for the largest event in the runoff event series was set to one year, but provision was made to allow the user to change the return period of any event in the series (only one at a time) in order to evaluate the effects extreme events.

Documentation of the tillage translocation model were provided by [Vieira and Dabney \(2009\)](#) and [Vieira and Dabney \(2011\)](#). As implemented in the 2014 release of RUSLE2, tillage translocation (erosion or deposition) is only calculated when there are topographic breaks within contiguous management layers that include some degree of soil disturbance. The assumption is made that there is no soil transported across the upslope boundary of the first segment, nor across downslope boundary of a segment adjacent to a flow path channel or an untilled

Explanation of Modifications to RUSLE2 v2.5.2.11 (Aug. 18th 2014) and RUSLE2 v2.5.9.0 (Feb. 23rd 2016)

management. Thus, tillage translocation is reported to be zero for a one segment hillslope, but will be displayed if a tilled hillslope is broken up into multiple topographic segments.

The tillage translocation parameters (alpha forward, alpha right, beta forward, beta right) are contained with the description of the “disturb surface” process.

Processes to add and remove permeable barriers were added to RUSLE2 in this release. In previous releases, retardance barriers were modeled as vegetation that only became effective after a “begin growth” process. The new permeable differ from vegetative barriers in that upon placement they provide immediate retardance that doesn’t change over time, and their influence ends immediately upon removal. Permeable barriers are assumed to exist at the top of generally very small management segments that are normally created by cloning the management from the immediate upslope segment. A wizard to facilitate the creation of permeable barrier set has been created. The wizard acts in two steps. The upper part of the screen is a sediment barrier spacing wizard. Using this approach a "system" of barriers can be automatically placed on the hill slope based on either a selected number or spacing of barriers. When the upper part is complete the user applies this system with the upper “done” button and the barrier table at the bottom of the screen is filled out automatically by RUSLE2. Details of the lower table may be edited by the user. When satisfied, the user can use the second “done” button and “apply/close” to add the barrier system to the profile management list.

References

[Dabney, S.M. and D.C. Yoder. 2012. Improved descriptions of herbaceous perennial growth and residue creation for RUSLE2. *Agronomy Journal* 104\(3\): 771-784.](#)

[Dabney, S.M., D.C. Yoder, and G. Ferruzzi. 2014. Forage harvest representation in RUSLE2. *Agronomy Journal* 106:151–167.](#) [Dabney, S.M., D.C. Yoder, and D.A.N. Vieira. 2011. Enhancing RUSLE to include runoff-driven phenomena. *Hydrologic Processes*. 25: 1373–1390.](#)

[Dabney, S.M., D.C. Yoder, and D.A.N. Vieira. 2012. Application of RUSLE2 to evaluate conservation practices in alternative climate change scenarios. *J. Soil and Water Conservation* 67\(5\):343-353.](#)

[Vieira, D.A. and S.M. Dabney. 2009. Modeling landscape evolution due to tillage. *Trans. ASAE*. 52 \(5\): 1505-1521.](#)

[Vieira, D. A. N. and S.M. Dabney. 2011. Modeling edge effects of tillage erosion. *Soil and Tillage Research* 111: 197–207.](#)