Pesticide Root Zone Model Field and Orchard Crop Metadata for NMC Scenarios

April 5, 2006

INTRODUCTION

A fundamental construct for using data in any number of electronic environments, whether they are databases, models, or the World Wide Web, is to have an understanding of the data or information that make up its essential parts. Metadata is literally the "data about data." Metadata is the information used by a variety of groups to design, create, describe, preserve, and use information resources and systems. The crucial, non pesticide specific elements of each Pesticide Root Zone Model (PRZM) field and orchard scenario is recorded as a means of preserving an authoritative and reproducible record of the design, construct, and source of each element of the scenario.

In general, the information assembled to create each scenario will have three basic features: content, context, and structure; all of which are reflected through metadata. The data content relates to what each scenario contains or is about and is intrinsic to the field or orchard being modeled. Content reflects the element by which the designer authenticates and completes the content of the field or orchard scenario. For example, content is the date of a crop's maturation, the organic content of a particular soil, or the rate at which snow melts in the location of the scenario. Contexts are those aspects associated with the scenario's creation, such as the how or from where the soil characteristics were selected, where the weather station is located, or what cropping practices were chosen and why. The structure relates to the associations within and among the individual parameters that make up the scenario. An example of the structure would be the relationship of the depth of the total soil profile to the individual soil horizons. All three aspects of metadata are essential components of a scenario and have been captured and described in following pages.

In short, in an environment where immediate access to underlying information used to govern the construct of a PRZM field or orchard scenario, metadata:

- certifies the authenticity and degree of completeness of the scenario's content;
- establishes and documents the context of the scenario's content;
- identifies the structural relationships that exist between and within a parameter of the scenario;
- provides an access point for a diverse range of users of the scenario; and
- assembles electronically the information the developer might have ordinarily provided in a physical reference.

The following descriptions of each PRZM field and orchard scenario used in the assessment of drinking water exposures derived from surface water sources reflect the basic principles of establishing administrative and descriptive "metadata." However, it remains vitally important to understand that metadata is the "data about the data" and acting as umbrellas to this information are the established Agency procedures for ensuring the quality of that information. This is accomplished through the basic tenants of Quality Assurance and Quality Control in the selection of parameters that constitutes the field and orchard scenario.

Meteorological stations for individual scenarios have been selected based on proximity to the area represented by each scenario. A list of available weather stations containing the required data for PRZM can be found at http://www.epa.gov/ceampubl/tools/metdata/index.htm). If a more geographically distant station was chosen to represent a scenario, the choice of the more distant station is documented in the metadata for each file.

Users should note that to date, EFED has not incorporated irrigation into these scenarios. EFED is currently evaluating a standardized approach for determining when a scenario should include irrigation and this will be reflected in future revisions to these scenarios.

There are a number of input parameters which are generally not documented in this metadata file. Many of these represent parameter flags which are default values and do not change from scenario to scenario. Others are captured in the scenario file and have not been transferred to the metadata file. Finally, there are others (such as parameters for furrow irrigation) which are not currently used. A listing of the parameters which are generally not captured in this metadata file are listed below in table 1. Future updates to the metadata will include these parameters when applicable.

Table 1. Input parameters not typically recorded in metadata.

Record #	Variable Name	Variable Full Name
1	TITLE	Title of Input File
2	HTITLE	File Description
3	DSN (x5)	DSN (x5)
3	IPEIND	Flag-Pan Factor
9	GDUSLEC	Day of month to start USLEC and Manning's N factor
9	GMUSLEC	Month to start USLEC and Manning's N factor
9	HTMAX	Max Canopy Ht
9	ICNCN	ICNCN-Crop Number
9	NUSLEC	Number of USLEC factors (up to 32)
11	IYREM	Integer year of crop emergence
11	IYRMAT	Integer year of crop maturation
11	IYRHAR	Integer year of crop harvest
20	BDFLAG	Flag-Bulk Density
20	BIOFLG	Flag-Biodegradation
20	HSWZT	Flag-Drainage
20	IDFLAG	Flag-ThermalCond/HeatCapacity
20	ITFLAG	Flag-Soil Temp Sim
20	KDFLAG	Flag-Soil Adsorption Coeff
20	MOC	Flag-Method of Characteristics
20	THFLAG	Flag-FC and WP
28	BT	Bottom Width of Furrow
28	EN	Manning's N for Furrow
28	Q0	Flow Rate of Water Entering Furrow
28	SF	Slope of Furrow

Table 1. Input parameters not typically recorded in metadata.		
Record #	**Variable Name**	**Variable Full Name**
28	X2	Length of Furrow
28	XFRAC	Location of the Furrow
28	ZRS	Side Slope of Furrows
29	HF	Infiltration Suction Parameter
29	KS	Sat Hyd Cond
34	AD	Soil Drainage param
34	ADL	Lateral Soil Drainage
34	DISP	Hydrodynamic Solute Disp Coeff
40	CFLAG	Flag-Conversion
40	ILP	Flag-Initial Pest.Level

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FLORIDA POTATO

The field used to represent potato production in Florida is located in St. John's County innortheast Florida within MLRA 155. The meteorological file, Jacksonville, Florida, represents the MLRA region 153A. Florida produces 3 - 6% of the U.S. commercially grown supply and the value of potatoes is the 4th highest in the United States. The Northeast region of Florida has the highest potato crop production. St. Johns county produces 47% of the harvested potatoes in Florida. The potatoes are planted between October and February. Seeds are planted at a depth of 3 - 4 inches in rows 36 - 42 inches apart with 6 - 12 inches between plants (NSF 1999). The soil selected to simulate the field is the benchmark soil, Placid sand. The Placid series is sandy, siliceous, hyperthermic Typic Humaquepts. The Placid sands are characterized by deep, poorly drained, permeable soils on low flats and flood plains of the Lower Coastal Plain . Slopes typically range from 0 to 2 percent. Placid fine sand is a Hydrologic Group D soil (USDA 2004).

Table 1. PRZM 3.12 Climate and Time Parameters for St. Johns County, Florida - Potato

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Jacksonville, FL (W13889)
Ending Date	December 31, 1990	Meteorological File - Jacksonville, FL (W13889)
Pan Evaporation Factor (PFAC)	0.76	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	25 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for St Johns County, Florida - Potato		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.1 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/), St. Johns County, Florida: Placid fine sand
USLE LS Factor (USLELS)	0.20	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.3 (EPA 2004).
USLE P Factor (USLEP)	1	From PRZM Scenario Guidance (2004)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	1%	Midpoint of range (0-2 %) (USDA 2004) (EPA 2004).
Hydraulic Length (HL)	600 m	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for St Johns County, Florida - Potato

Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (.EPA 2004)
Initial Surface Condition (ISCOND)	1	Taken from ID potato scenario
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data. Meteorological File - Jacksonville, FL (W13889)
Maximum rainfall interception storage of crop (CINTCP)	0.1 cm	Table 5.4 PRZM Manual, consistent with other potato scenarios.
Maximum Active Root Depth (AMXDR)	30 cm	Median value (15-45 cm) (Table 5-9. EPA 1998). Value may be inconsistent with different potato scenarios due to different sources.
Maximum Canopy Coverage (COVMAX)	40	Consistent with ID and ME potato scenarios.
Soil Surface Condition After Harvest (ICNAH)	3	From ID potato scenario
Date of Crop Emergence (EMD, EMM, IYREM)	01/01/61	Value set to approximate planting cycle. Potatoes are planted at the beginning of the year in Florida. University of Florida, Florida Crop Extension Service, Institute of Food and Agriculture Sciences (UF/IFAS) website: http://edis.ifas.ufl.edu/BODY_CV280
Date of Crop Maturity (MAD, MAM, IYRMAT)	01/04/61	Value set to approximate planting cycle. Potato plants mature approximately 110 days after seeding in Florida. University of Florida, Florida Crop Extension Service, Institute of Food and Agriculture Sciences (UF/IFAS) website: http://edis.ifas.ufl.edu/BODY_CV280
Date of Crop Harvest (HAD, HAM, IYRHAR)	01/05/6	Value set to approximate planting cycle. University of Florida, Florida Crop Extension Service, Institute of Food and Agriculture Sciences (UF/IFAS) website: http://edis.ifas.ufl.edu/BODY_CV280)
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	91, 89, 90	Gleams Manual Table H-4, Pasture/Range, Non-CNT, Poor (USDA, 1990)

Manning's N Value (MNGN)	.014	RUSLE Project (Taken from Tampa, Florida RUSLE Factors for tobacco crop)
USLE C Factor (USLEC)	.548 .576 .607 .640 .672 .701 .761 .780 .768 .753 .665 .450 .241 .172 .182 .237 .314 .333 .400 .451 .480 .432 .461 .490 .520	RUSLE Project (Taken from Tampa, Florida RUSLE Factors for tobacco crop)

Table 4. PRZM 3.12 Placid Fine Sand Parameters for St Johns County, Florida - Potato

Parameter	Value	Verification Source
Total Soil Depth (CORED)	203 cm	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Number of Horizons (NHORIZ)	3	
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 20 cm (HORIZN = 2) 173 cm (HORIZN = 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/
Bulk Density (BD)	1.3 g cm^{-3} (HORIZN = 1) 1.3 g cm^{-3} (HORIZN = 2) 1.45 g cm^{-3} (HORIZN = 3)	
Initial Water Content (THETO)	0.18 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	Field Capacity values, PRZM Scenario Guidance (EPA 2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 5 cm (HORIZN = 2) 1 cm (HORIZN = 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/
Field Capacity (THEFC)	0.18 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	GLEAMS Table H-3 (USDA 1990) (Fine Sand)
Wilting Point (THEWP)	0.03 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	GLEAMS Table H-3 (USDA 1990) (Fine Sand)
Organic Carbon Content (OC)	3 % (HORIZN = 1) 3 % (HORIZN = 2) 0.25 % (HORIZN = 2)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship %OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

NSF Center for Integrated Pest Management. 1999. Crop Profile for Potato Production in Florida. Information taken from the website: http://www.ipmcenters.org/cropprofiles/docs/FLpotatoes.html.

University of Florida. 2004. Florida Crop Extension Service, Institute of Food and Agriculture Sciences (UF/IFAS) Information taken from the website: http://edis.ifas.ufl.edu/BODY_CV280.

USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S. Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA. NRCS. 2004. Soil Data Mart. Information taken from the website: http://soildatamart.nrcs.usda.gov/.

USDA. NRCS. 2004. Soil Classification. Information taken from the website: http://soils.usda.gov/technical/classification/.

ILLINOIS ALFALFA

Alfalfa production in Illinois represents 2.2% of the alfalfa production in the United States. Alfalfa is harvested in late May to mid-June with successive cuttings occurring every 28 to 34 days until September or October (IPM, 2004). The Varna soil series was selected to represent the Illinois Alfalfa crop scenario. This soil type is a silt loam with the largest spatial extent in McLean County, Illinois, the region selected to represent alfalfa production in Illinois. The Varna soil is very deep, moderately well drained, slowly permeable soil located on till plains. It is a fine, illitic, mesic Oxyaquic Argiudolls soil. The typical pedon is located on a northwest-facing convex slope of 3 percent at an elevation of 722 feet. The weather record is obtained from Peoria, Illinois located in the MLRA region of 108 (USDA 2004).

Table 1. PRZM 3.12 Climate and Time Parameters for McLean County, Illinois - Alfalfa

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File -Peoria, IL (W14842)
Ending Date	December 31, 1990	Meteorological File - Peoria, IL (W14842)
Pan Evaporation Factor (PFAC)	0.77	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.36 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	17.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for McLean County, Illinois - Alfalfa		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.28 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/), McLean County, Illinois: Varna Silt Loam
USLE LS Factor (USLELS)	3.63	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.5 (EPA 2004).
USLE P Factor (USLEP)	1	PRZM Scenario Guidance (Rev., July 2004)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	12	Range: 1-18% (USDA 2004). Maximum of the range is >12, the SLP for a field crop should be set to 12% (EPA 2004).
Hydraulic Length (HL)	600 m	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	PRZM Scenario Guidance (2004)
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for McLean County, Illinois - Alfalfa

Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (.EPA 2004)
Initial Surface Condition (ISCOND)	1	PRZM Scenario Guidance (EPA, 2004)
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data. Meteorological File - Moline, IL (W14923)
Maximum rainfall interception storage of crop (CINTCP)	0.25 cm	Maximum recommended value for grass (Carsel 1998); PRZM Manual Table 5.4
Maximum Active Root Depth (AMXDR)	152 cm	Set to maximum soil depth. Roots may grow to 20 feet (USDA 2000a). Parameter value may be inconsistent with different alfalfa scenarios due to different sources.
Maximum Canopy Coverage (COVMAX)	100%	Taken from Minnesota Alfalfa scenario
Soil Surface Condition After Harvest (ICNAH)	3	Taken from Minnesota Alfalfa scenario
Date of Crop Emergence (EMD, EMM, IYREM)	1/6/61	Taken from Minnesota Alfalfa scenario
Date of Crop Maturity (MAD, MAM, IYRMAT)	25/8/61	Taken from Minnesota Alfalfa scenario
Date of Crop Harvest (HAD, HAM, IYRHAR)	30/8/61	Taken from Minnesota Alfalfa scenario
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	82, 85, 87	Gleams Manual Table H-4, Close-seeded legumes or rotation meadow, straight row, poor (USDA, 1990)
Manning’s N Value (MNGN)	.110 .	RUSLE Project, File Code: MA5HLHLC (Carbondale, IL, Hay legume)
USLE C Factor (USLEC)	.015 .015 .015 .016 .016 .018 .012 .006 .002 .007 .004 .002 .007 .006 .003 .001 .005 .003 .003 .005 .009 .013 .014 .014 .015 .015	RUSLE Project, File Code: MA5HLHLC (Carbondale, IL, Hay legume)

Table 4. PRZM 3.12 Varna Soil Parameters for McLean County, Illinois - Alfalfa		
Parameter	Value	Verification Source
Total Soil Depth (CORED)	152 cm	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Number of Horizons (NHORIZ)	5 (top horizon split in 2)	
First, Second, Third, and Fourth Soil Horizons (HORIZN = 1,2,3,4)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 20 cm (HORIZN = 2) 38 cm (HORIZN = 3) 31 cm (HORIZN = 4) 53 cm (HORIZN = 5)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.5 g cm^{-3} (HORIZN = 1) 1.5 g cm^{-3} (HORIZN = 2) 1.45 g cm^{-3} (HORIZN = 3) 1.6 g cm^{-3} (HORIZN = 4) 1.8 g cm^{-3} (HORIZN = 5)	
Initial Water Content (THETO)	0.32 cm^3 H_20 cm^{-3} soil (HORIZN = 1 -5)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 5 cm (HORIZN = 2) 2 cm (HORIZN = 3) 1 cm (HORIZN = 4) 1 cm (HORIZN = 5)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.32 cm^3 H_20 cm^{-3} soil (HORIZN = 1 -5)	GLEAMS Table H-3 (1990) (Silt loam)
Wilting Point (THEWP)	0.12 cm^3 H_20 cm^{-3} soil (HORIZN = 1 -5)	GLEAMS Table H-3 (1990) (Silt loam)
Organic Carbon Content (OC)	1.5% (HORIZN = 1) 1.5% (HORIZN = 2) 0.6% (HORIZN = 3) 0.18% (HORIZN = 4) 0.15% (HORIZN = 5)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship % OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

IPM. 2004. Crop Profile for Hay in Illinois. Written October 2000. Information taken from the website: http://www.ipmcenters.org/cropprofiles/docs/ILhay.html.

USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S. Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA. 2000.a. Crop Profile for Alfalfa in Minnesota. U.S. Department of Agriculture, NSF Center for Integrated Pest Management. Information from the website: http://www.ipmcenters.org/cropprofiles/.

USDA. NRCS. 2004. Soil Classification. Information taken from the website: http://soils.usda.gov/technical/classification/.

USDA. NRCS. 2004. Soil Data Mart. Information taken from the website: http://soildatamart.nrcs.usda.gov/.

ILLINOIS BEANS

The Illinois Bean scenario represents the environmental conditions for snap bean, green pea, and lima bean production in Illinois. Lima beans are typically planted in June or July after a pea crop. Lima beans may be planted between May and July (IPM, 2004 a). Snap bean seedlings are started in the greenhouse in March and April, then transplanted to the field in June. Snap beans prefer well drained soils and a soil pH ranging from 5.5 to 6.0. Snap beans are planted 3/4 to 1 inch deep at the end of the frost season for harvest in the spring. Snap beans may also be planted in early summer for harvest in late fall before the first frost. Snap bean seedlings are planted in rows 2 inches wide with 18 to 36 inches between the rows (IPM, 2004 b). Green peas are planted in rows 6 to 7 inches apart. Planting occurs in early spring. Green peas must be harvested prior to hot, dry weather of mid to late summer (IPM, 2004 c). The Varna soil series was selected to represent the Illinois Beans crop scenario. This soil type is a silt loam with the largest spatial extent in McLean County, Illinois, the region selected to represent bean production in Illinois. The Varna soil is very deep, moderately well drained, slowly permeable and located on till plains. It is a fine, illitic, mesic Oxyaquic Argiudolls soil. The typical pedon is located on a northwest-facing convex slope of 3 percent at an elevation of 722 feet. The weather record from Peoria, Illinois is located in the MLRA region of 108 (USDA, 2004).

Table 1. PRZM 3.12 Climate and Time Parameters for McLean County, Illinois - Beans

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Peoria, IL (W14842)
Ending Date	December 31, 1990	Meteorological File - Peoria, IL (W14842)
Pan Evaporation Factor (PFAC)	0.77	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.36 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	17.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for McLean County, Illinois - Beans		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.28 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/), McLean County, Illinois: Varna Silt Loam
USLE LS Factor (USLELS)	1.34	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.5 (EPA 2004).
USLE P Factor (USLEP)	1	PRZM Scenario Guidance (2004)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	6	Range: 1-18% (USDA 2004). Maximum of the range is >12, the SLP for a row crop should be set to 6% (EPA 2004).
Hydraulic Length (HL)	600 m	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
Irrigation Type (IRTYP)	Not applicable	
Leaching Factor (FLEACH)	Not applicable	
Fraction of Water Capacity when Irrigation is Applied (PCDEPL)	Not applicable	
Maximum Rate at which Irrigation is Applied (RATEAP)	Not applicable	
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for McLean County, Illinois - Beans		
Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (. EPA 2004)
Initial Surface Condition (ISCOND)	1	PRZM Scenario Guidance (2004)
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data. Meteorological File - Moline, IL (W14923)
Maximum rainfall interception storage of crop (CINTCP)	0.1 cm	Taken from Oregon Snapbeans scenario
Maximum Active Root Depth (AMXDR)	38 cm	Taken from OR Snapbeans scenario
Maximum Canopy Coverage (COVMAX)	100	Taken from Oregon Snapbeans scenario
Soil Surface Condition After Harvest (ICNAH)	1	Taken from Oregon Snapbeans scenario
Date of Crop Emergence (EMD, EMM, IYREM)	16/6/61	Taken from Oregon Snapbeans scenario
Date of Crop Maturity (MAD, MAM, IYRMAT)	18/8/61	Taken from Oregon Snapbeans scenario
Date of Crop Harvest (HAD, HAM, IYRHAR)	2/9/61	Taken from Oregon Snapbeans scenario
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	92, 89, 90	Gleams Manual Table H-4, Close-seeded legumes, fallow, ST/CT, poor (USDA, 1990)
Manning’s N Value (MNGN)	0.014	RUSLE Project, File Code: Ma1SBCGC Chicago, IL, Soybean
USLE C Factor (USLEC)	.086 .089 .092 .095 .100 .109 .124 .145 .168 .278 .292 .342 .372 .395 .381 .326	RUSLE Project, File Code: Ma1SBCGC Chicago, IL, Soybean

	.199 .067 .072 .054 .073 .093 .046 .047 .193 .219 .242 .258 .270	

Table 4. PRZM 3.12 Varna Soil Parameters for McLean County, Illinois - Beans

Parameter	Value	Verification Source
Total Soil Depth (CORED)	152 cm	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Number of Horizons (NHORIZ)	5 (top horizon split in 2)	
First, Second, Third, and Fourth Soil Horizons (HORIZN = 1,2,3,4)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 20 cm (HORIZN = 2) 38 cm (HORIZN = 3) 31 cm (HORIZN = 4) 53 cm (HORIZN = 5)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.5 g cm^{-3} (HORIZN = 1) 1.5 g cm^{-3} (HORIZN = 2) 1.45 g cm^{-3} (HORIZN = 3) 1.6 g cm^{-3} (HORIZN = 4) 1.8 g cm^{-3} (HORIZN = 5)	
Initial Water Content (THETO)	0.32 cm^3 H_20 cm^{-3} soil (HORIZN = 1 -5)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 5 cm (HORIZN = 2) 2 cm (HORIZN = 3) 1 cm (HORIZN = 4) 1 cm (HORIZN = 5)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.32 cm^3 H_20 cm^{-3} soil (HORIZN = 1 -5)	GLEAMS Table H-3 (1990) (Silt loam)
Wilting Point (THEWP)	0.12 cm^3 H_20 cm^{-3} soil (HORIZN = 1 -5)	GLEAMS Table H-3 (1990) (Silt loam)
Organic Carbon Content (OC)	1.5% (HORIZN = 1) 1.5% (HORIZN = 2) 0.6% (HORIZN = 3) 0.18% (HORIZN = 4) 0.15% (HORIZN = 5)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship % OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of

Research and Development, U.S. Environmental Protection Agency, Athens, GA.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

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IPM. 2004 a. Crop Profile for Beans (Lima) in Delaware. Written June 1999. Information taken from the website: http://www.ipmcenters.org/cropprofiles/docs/debeans-lima.html.

IPM. 2004 b. Crop Profile for Beans (Snap) in Michigan. Written August 1999. Information taken from the website: http://www.ipmcenters.org/cropprofiles/docs/mibeans-snap.html.

IPM. 2004 c. Crop Profile for Peas (Green) in Idaho. Written June 2000. Information taken from the website: http://www.ipmcenters.org/cropprofiles/docs/IDpeas-green.html.

USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

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USDA. NRCS. 2004. Soil Classification. Information taken from the website: http://soils.usda.gov/technical/classification/.

USDA. NRCS. 2004. Soil Data Mart. Information taken from the website: http://soildatamart.nrcs.usda.gov/.

PENNSYLVANIA VEGETABLE (Potatoes & Pumpkins)

The Pennsylvania Vegetable crop/field scenario represents the typical potato and pumpkin crop/field conditions in southeastern Pennsylvania. Potatoes are grown in Pennsylvania from mid-July to September and mid-September to mid-May. Potato seeds are placed 7 to 12 inches apart in rows. Soil is ridged over the seed rows or hilling in order to prevent greening and to control weeds before seedlings bloom. Potatoes are fertilized twice, during planting using a band treatment along side the seedling rows and during cultivation or hilling. Potatoes are typically harvested from mid-July to October in Pennsylvania. 80% of the potato crop production occurs in Erie, Cambria, Schuykill, Lancaster, and Potter counties (IPM, 2004a). Pennsylvania is ranked 2nd in the United States for pumpkin production in the United States, making up 10% of total pumpkin production in the United States. The majority of pumpkin production in Pennsylvania occurs in the southeastern region. Pumpkins are mostly direct seeded with conventional tillage preparation. Pumpkins are grown in silts, gravely loams, and clays. Planting typically occurs between early June and July (IPM, 2004b).

The Clarksburg soil series was selected to represent the Pennsylvania Vegetable scenario. Clarksburg soils are silt loams, the soil type where potato and pumpkin crops are typically grown. The Clarksburg soil series is a very deep, moderately well-drained soil formed in colluvium, glacial till or residuum from limestone, calcareous and non-calcareous shale and sandstone. This soil series is located on uplands with slopes ranging from 0 to 25 percent. Soil permeability is slow to moderately slow. This taxonomic class is described as fine-loamy, mixed, super-active, mesic Oxyaquic Fragiudalfs. The typical pedon is a silt loam located on a 5 percent northeast facing slope in a cultivated field. The Harrisburg, Pennsylvania weather record is selected to represent meteorological conditions for the Pennsylvania Vegetable scenario. This is the MLRA 148 region (USDA, 2004).

Table 1. PRZM 3.12 Climate and Time Parameters for Lancaster County, Pennsylvania - Vegetable

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Harrisburg, PA, W14751
Ending Date	December 31, 1990	Meteorological File - Harrisburg, PA, W14751
Pan Evaporation Factor (PFAC)	0.79	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.36 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	17.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Lancaster County, Pennsylvania - Vegetable		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.37 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/), Lancaster County, Pennsylvania - Vegetable: Clarksburg silt loam
USLE LS Factor (USLELS)	1.34	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.5 (EPA 2004).
USLE P Factor (USLEP)	1	From PRZM Scenario Guidance (2004) and ID potato scenario
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	6%	Range: 0-25%. Since maximum value is >12%, value is set to 6% for row crops (EPA 2004).
Hydraulic Length (HL)	600 m	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for Lancaster County, Pennsylvania - Vegetable		
Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (.EPA 2004)
Initial Surface Condition (ISCOND)	1	PRZM Scenario Guidance (2004)
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data. Meteorological File - Lancaster, PA
Maximum rainfall interception storage of crop (CINTCP)	0.1cm	Consistent with potato scenarios. Value may be inconsistent with different vegetable scenarios because they represent different types of vegetables.
Maximum Active Root Depth (AMXDR)	30 cm	Median value (15-45 cm) (Table 5-9. EPA 1998). May be inconsistent with different potato scenarios due to different sources. Value may be inconsistent with different vegetable scenarios because they represent different types of vegetables.
Maximum Canopy Coverage (COVMAX)	40	Consistent with WA potato scenario. Value is not consistent with other vegetable scenarios because they represent different types of vegetables.
Soil Surface Condition After Harvest (ICNAH)	3	From ID potato scenario
Date of Crop Emergence (EMD, EMM, IYREM)	10/5/61	From ID potato scenario
Date of Crop Maturity (MAD, MAM, IYRMAT)	1/10/61	From ID potato scenario
Date of Crop Harvest (HAD, HAM, IYRHAR)	10/10/61	From ID potato scenario
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	89, 86, 87	Gleams Manual Table H-4, Pasture/Range, Non-CNT, Poor (USDA, 1990)
Manning’s N Value (MNGN)	.014 .	RUSLE Project , PA Potato (Irish), York County, File Code: S65P1PC
USLE C Factor (USLEC)	.694 .698 .701 .705 .713 .728 .746 .767 .736 .842 .870 .872 .809 .568 .392	RUSLE Project , PA Potato (Irish), York County, File Code: SB5P1PC

	.282 .118 .057 .052 .213 .534 .593 .635 .663 .679 .689	

Table 4. PRZM 3.12 Clarksburg Soil Parameters for Lancaster County, Pennsylvania - Vegetable		
Parameter	Value	Verification Source
Total Soil Depth (CORED)	152 cm	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Number of Horizons (NHORIZ)	4	
First, Second, Third, and Fourth Soil Horizons (HORIZN = 1,2,3,4)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 12 cm (HORIZN = 2) 34 cm (HORIZN = 3) 96 cm (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.3 g cm-3 (HORIZN = 1) 1.3 g cm-3 (HORIZN = 2) 1.4 g cm^{-3} (HORIZN = 3) 1.6 g cm^{-3} (HORIZN = 4)	
Initial Water Content (THETO)	0.32cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 4 cm (HORIZN = 2) 2 cm (HORIZN = 3) 4 cm (HORIZN = 4)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.32 cm^3 H_20 cm^{-3} soil (HORZIN = 1-4)	GLEAMS Table H-3 (1990)
Wilting Point (THEWP)	0.21 cm^3 H_20 cm^{-3} soil (HORZIN = 1-4)	GLEAMS Table H-3 (1990)
Organic Carbon Content (OC)	1.8% (HORIZN = 1) 1.8% (HORIZN = 2) 0.24% (HORIZN = 3) 0.09% (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship % OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated

Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.

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Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

IPM. 2004a. Crop Profile for Potatoes in Pennsylvania. Written March 17, 1999. Information taken from the website: http://www.ipmcenters.org/cropprofiles/docs/papotatoes.html.

IPM. 2004b.Crop Profile for Pumpkins in Pennsylvania. Written September 14, 1998. Information taken from the website: http://www.ipmcenters.org/cropprofiles/docs/papumpkins.html.

USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S. Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA. NRCS. 2004. Soil Classification. Information taken from the website: http://soils.usda.gov/technical/classification/.

USDA. NRCS. 2004. Soil Data Mart. Information taken from the website: http://soildatamart.nrcs.usda.gov/.

SOUTH TEXAS CORN

The field used to represent corn production in South Texas is representative of a field in Hildago and Cameron counties, located in the Lower Rio Grande Valley region. The meteorological file, Brownsville, TX, represents the MLRA region 83D. Texas produces 2 percent of the U.S. commercially grown corn (NSF 1999). The Northern High Plains grows approximately 66 percent of Texas corn with less than 12 percent being grown in the Lower Valley region. In the Lower Valley region of Texas, corn is planted between late January and Late February. In the Northern parts of the state, planting dates are significantly different, being mid April to early May. Corn is generally planted in 30 inch rows at rates of 28,000 - 34,000 seeds/ acre. Corn is generally irrigated andharvested in the lower valley between late June and Mid July (NSF 1999). The soil in Hildago and Cameron counties is alluvial, being derived from the Rio Grande (USDA 1997). Thus there is no dominant soil type (range of coverages: 0.1-13.2%). For this scenario, Harlingen Clay was selected as a representative soil type because it has significant yields of corn and has the largest percent coverage of a hydrologic group C or D soil for Hildago (4.8 %) and Cameron (6.6 %) counties (USDA 2004). Harlingen Clay is a hydrologic group D soil that is classified as very-fine, smectitic, hyperthermic sodic haplusterts. The Harlingen series of soils is deep, moderately well drained, very slowly permeable soils that formed in clayey sediments. These soils have slopes of 0-1 percent and occur on stream terraces and deltas along the lower portions of the Rio Grande River and its tributaries in south Texas and Mexico. This soil is mostly used for irrigated crop land including cotton and cool season vegetables (USDA1997).

Table 1. PRZM 3.12 Climate and Time Parameters for Hidalgo/Cameron Counties, Texas - Corn

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Brownsville, Cameron County, Texas: W12919
Ending Date	December 31, 1990	Meteorological File - Brownsville, Cameron County, Texas: W12919
Pan Evaporation Factor (PFAC)	0.69	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.0 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	32.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Hidalgo/Cameron Counties, Texas - Corn

Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.32 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	0.15	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.3 (EPA 2004).
USLE P Factor (USLEP)	1	contour plowing is not common due to 0-1% slope (consulted with extension agent). PRZM Manual Table 5.6 (EPA, 1998)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	0.5%	From http://soils.usda.gov/ official soil series description (slope range = 0-1%)
Hydraulic Length (HL)	356 (pond) 600 (reservoir)	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for Hidalgo/Cameron Counties, Texas - Corn

Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (.EPA 2004)
Initial Surface Condition (ISCOND)	2	PRZM Scenario Guidance (2004). 2 = cover crop; consulted with extension agent, crops are rotated.
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.25 cm	Maximum recommended value for grass (Carsel et al. 1998)
Maximum Active Root Depth (AMXDR)	90 cm	Median value (60-120 cm) (Table 5-9. EPA 1998).
Maximum Canopy Coverage (COVMAX)	100	Taken from IL corn. Also consistent with default value cited in guidance (EPA 2004).
Soil Surface Condition After Harvest (ICNAH)	2	PRZM Manual (Carsel et al., 1998), 2 = cover crop; consulted with extension agent, crops are rotated
Date of Crop Emergence (EMD, EMM, IYREM)	1/3/61	corn is planted late January-Late February (TX extension crop profile) + emergence of 5-15 days (PRZM manual)
Date of Crop Maturity (MAD, MAM, IYRMAT)	15/6/61	mature 110-130 days from planting (PRZM manual)
Date of Crop Harvest (HAD, HAM, IYRHAR)	1/7/61	corn is harvested between late June and mid July (http://pestdata.ncsu.edu/cropprofiles)
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	88, 89, 90	Gleams Manual Table H-4, (Hydrological soil D) Row Crop, SR, good hydrologic condition (moderately well drained soil) (USDA, 1990)
Manning’s N Value (MNGN)	.014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014	RUSLE Project, TX Galveston Corn, (T95CGSBC)

USLE C Factor (USLEC)	.536 .581 .622 .654 .680 .705 .800 .829 .843 .821 .774 .602 .452 .371.311.282 .285 .287 .288 .307 .369 .388 .039 .042 .133 .173 .215 .257	RUSLE Project, TX Galveston Corn, (T95CGSBC)

Table 4. PRZM 3.12 Soil Parameters for Harlingen Clay in Hidalgo/Cameron Counties, Texas - Corn

Parameter	Value	Verification Source
Total Soil Depth (CORED)	180 cm	http://soils.usda.gov/ (71 inches)
Number of Horizons (NHORIZ)	4 (top HORIZN split in 2)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, and Third Soil Horizons (HORIZN = 1,2,3)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 18 cm (HORIZN = 2) 61 cm (HORIZN = 3) 91 cm (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.45g cm^{-3} (HORIZN = 1) 1.45g cm^{-3} (HORIZN = 2) 1.40 g cm^{-3} (HORIZN = 3) 1.55 g cm^{-3} (HORIZN = 4)	
Initial Water Content (THETO)	0.39 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 3 cm (HORIZN = 2) 1 cm (HORIZN = 3) 1 cm (HORIZN = 4)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.39 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	GLEAMS Table H-3 (1990)
Wilting Point (THEWP)	0.28 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	GLEAMS Table H-3 (1990)
Organic Carbon Content (OC)	1.2% (HORIZN = 1) 1.2% (HORIZN = 2) 0.9% (HORIZN = 3) 0.45% (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship % OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

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USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S. Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA. 2004. Natural Resources Conservation Service. Soil Data Mart. Information from website: http://soildatamart.nrcs.usda.gov/.

SOUTH TEXAS COTTON

The field used to represent cotton production in South Texas is representative of a field in Hildago and Cameron counties, located in the Lower Rio Grande Valley region. The meteorological file, Brownsville, TX, represents the MLRA region 83D. Texas ranks first in production of cotton in the U.S. Cotton is the leading cash crop in Texas with a total economic impact of 5.2 billion dollars in the state (NSF 1999). Agricultural methods (irrigation, planting times, cotton types, harvesting methods) vary significantly from region to region. The Northern High Plains grows approximately 64 percent of Texas corn with 3 percent being grown in the Lower Rio Grande Valley region. In the Lower Rio Grande Valley region of Texas, cotton is planted between February and March. Corn is generally irrigated. Cotton is harvested in Texas between August and December (NSF 1999). The soil in Hildago and Cameron counties is alluvial, being derived from the Rio Grande (USDA 1997). Thus there is no dominant soil type (range of coverages: 0.1-13.2%). For this scenario, Harlingen Clay was selected as a representative soil type because it has significant yields of cotton and has the largest percent coverage of a hydrologic group C or D soil for Hildago (4.8 %) and Cameron (6.6 %) counties (USDA 2004). Harlingen Clay is a hydrologic group D soil that is classified as very-fine, smectitic, hyperthermic sodic haplusterts. The Harlingen series of soils is deep, moderately well drained, very slowly permeable soils that formed in clayey sediments. These soils have slopes of 0-1 percent and occur on stream terraces and deltas along the lower portions of the Rio Grande River and its tributaries in south Texas and Mexico. This soil is mostly used for irrigated crop land including cotton and cool season vegetables (USDA1997).

Table 1. PRZM 3.12 Climate and Time Parameters for Hidalgo/Cameron Counties, Texas - Cotton

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Brownsville, Cameron County, Texas: W12919
Ending Date	December 31, 1990	Meteorological File - Brownsville, Cameron County, Texas: W12919
Pan Evaporation Factor (PFAC)	0.69	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.0 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	32.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Hidalgo/Cameron Counties, Texas - Cotton		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.32 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	0.15	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.3 (EPA 2004).
USLE P Factor (USLEP)	1	contour plowing is not common due to 0-1% slope (consulted with extension agent). PRZM Manual Table 5.6 (EPA, 1998)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	0.5%	From http://soils.usda.gov/ official soil series description (slope range = 0-1%)
Hydraulic Length (HL)	600 m (reservoir)	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for Hidalgo/Cameron Counties, Texas - Cotton		
Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (EPA 2004)
Initial Surface Condition (ISCOND)	2	PRZM Scenario Guidance (2004). 2 = cover crop; consulted with extension agent, crops are rotated
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.20 cm	PRZM Manual (Carsel et al., 1998)
Maximum Active Root Depth (AMXDR)	65 cm	Value from CA cotton. Consistent with PRZM manual, table 5-9 (EPA 1998) which cites range of 30-90 cm.
Maximum Canopy Coverage (COVMAX)	100%	Consistent with advice of Kerry Arroues USDA-NRCS for development of CA cotton scenario. Also, consistent with EPA 2004 guidance of default value of 100 of row crops.
Soil Surface Condition After Harvest (ICNAH)	2	PRZM Manual (Carsel et al., 1998), 2 = cover crop; consulted with extension agent, crops are rotated
Date of Crop Emergence (EMD, EMM, IYREM)	16/3/61	PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/
Date of Crop Maturity (MAD, MAM, IYRMAT)	20/7/61	PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/
Date of Crop Harvest (HAD, HAM, IYRHAR)	15/10/61	PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/ harvest from August 1 to December 20
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	88, 89, 90	Gleams Manual Table H-4, (Hydrological soil D) Row Crop, SR, good hydrologic condition (USDA, 1990)
Manning’s N Value (MNGN)	.014	RUSLE Project, TX Galveston Cotton, (T95CTCTC)
USLE C Factor (USLEC)	.628 .654 .678 .697 .712 .727 .743 .784 .809 .808 .776 .639 .506 .384 .299 .295	RUSLE Project, TX Galveston Cotton, (T95CTCTC)

	.337 .412 .432 .358 .442 .494 .542 .585 .621	

Table 4. PRZM 3.12 Soil Parameters for Harlingen Clay in Hidalgo/Cameron Counties, Texas - Cotton

Parameter	Value	Verification Source
Total Soil Depth (CORED)	180 cm	http://soils.usda.gov/
Number of Horizons (NHORIZ)	4 (top HORIZN split in 2)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, and Third Soil Horizons (HORIZN = 1,2,3)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 18 cm (HORIZN = 2) 61 cm (HORIZN = 3) 91 cm (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/
Bulk Density (BD)	1.45g cm^{-3} (HORIZN = 1) 1.45g cm^{-3} (HORIZN = 2) 1.40 g cm^{-3} (HORIZN = 3) 1.55 g cm^{-3} (HORIZN = 4)	
Initial Water Content (THETO)	0.39 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 3 cm (HORIZN = 2) 1 cm (HORIZN = 3) 1 cm (HORIZN = 4)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.39 cm^3 H_20 cm^{-3} soil	GLEAMS Table H-3 (1990)
Wilting Point (THEWP)	0.28 cm^3 H_20 cm^{-3} soil	GLEAMS Table H-3 (1990)
Organic Carbon Content (OC)	1.2% (HORIZN = 1) 1.2% (HORIZN = 2) 0.9% (HORIZN = 3) 0.45% (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship % OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.
EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.*

Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.
NSF Center for Integrated Pest Management. 1999. Crop Profile for Cotton in Texas. Information from the website: http://www.ipmcenters.org/cropprofiles/TXcotton.html.

USDA 1997. Official Series Description. Harlingen Series. Information from the website: http://ortho.ftw.nrcs.usda.gov/osd/dat/H/HARLINGEN.html

USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S. Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA. 2004. Natural Resources Conservation Service. Soil Data Mart. Information from website: http://soildatamart.nrcs.usda.gov/.

SOUTH TEXAS GRAPEFRUIT

The field used to represent grapefruit production in South Texas is representative of a field in Hildago and Cameron counties, located in the Lower Rio Grande Valley region. The meteorological file, Brownsville, TX, represents the MLRA region 83D. In 2004, Texas ranked second behind Florida in acres producing Grapefruit. Texas contained 16 percent of the total acres of grapefruit production (USDA 2004). Grapefruit trees are planted in rows 24-25 feet apart. Crops are irrigated (Texas A&M 2002) and pruned to maintain a height of approximately 15 feet. In the Lower Rio Grande Valley region of Texas, grapefruit trees bloom from March 10-20. Fruit matures between October and December and is harvested from October to May (Personal communication 2004). The soil in Hidalgo and Cameron counties is alluvial, being derived from the Rio Grande (USDA 1997). Thus there is no dominant soil type (range of coverages: 0.1-13.2%). In the Lower Rio Grande Valley region, several soil types support citrus production (Brennan, Delfinia, Hidalgo, Willacy) (Texas A&M 2002). For this scenario, Hidalgo sandy clay loam was selected as a representative soil type because it has significant yields of citrus and was recommended by an extension agent as being the most commonly associated soil with citrus (Personal communication 2004). Hidalgo sandy clay loam is a hydrologic group B soil that is classified as fine-loamy, mixed, active, hyperthermic typic calciustolls. The Hidalgo series of soils is deep, well drained, moderately permeable and formed in calcareous loamy sediments. These soils occur on nearly level to gently sloping uplands with slopes of 0-5 percent. This soil type occurs on the Rio Grande Plain of Texas and Mexico (possibly). This soil is mostly used for irrigated crop production including cotton, grain sorghum, vegetables, sugar cane and citrus (USDA1997).

Table 1. PRZM 3.12 Climate and Time Parameters for Hidalgo/Cameron Counties, Texas - Grapefruit

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Brownsville, Cameron County, Texas: W12919
Ending Date	December 31, 1990	Meteorological File - Brownsville, Cameron County, Texas: W12919
Pan Evaporation Factor (PFAC)	0.69	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	32.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Hidalgo/Cameron Counties, Texas - Grapefruit

Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.32 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	0.37	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.3 (EPA 2004).
USLE P Factor (USLEP)	1	contour plowing is not common due to 0-5% slope (consulted with extension agent). PRZM Manual Table 5.6
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	2.5%	From http://soils.usda.gov/ official soil series description (slope range = 0-5%)
Hydraulic Length (HL)	600 m (reservoir)	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)

* EI = 100 ft-tons * in/ acre*hr

Table 3. PRZM 3.12 Crop Parameters for Hidalgo/Cameron Counties, Texas - Grapefruit

Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (EPA 2004)
Initial Surface Condition (ISCOND)	3	PRZM Scenario Guidance (2004)
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.25 cm	PRZM Manual (Carsel et al., 1998)
Maximum Active Root Depth (AMXDR)	160 cm	Consulted extension agent (Max rooting depth = 5 - 8 ft). Set to CORED.
Maximum Canopy Coverage (COVMAX)	75%	Consulted extension agent
Soil Surface Condition After Harvest (ICNAH)	3	PRZM Manual (Carsel et al., 1998), 3 = residue
Date of Crop Emergence (EMD, EMM, IYREM)	16/3/61	Consulted extension agent
Date of Crop Maturity (MAD, MAM, IYRMAT)	1/11/61	Consulted extension agent
Date of Crop Harvest (HAD, HAM, IYRHAR)	1/2/61	Consulted extension agent
Maximum Dry Weight (WFMAX)	0.0	Set to "0" Not used in simulation
SCS Curve Number (CN)	67, 74, 78	Gleams Manual Table H-4, (Hydrological soil B) meadow (USDA, 1990)
Manning's N Value (MNGN)	.014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014	RUSLE Project, TX Galveston, Citrus, (T95CBCBC)
USLE C Factor (USLEC)	.374 .385 .383 .391 .407 .422 .423 .437 .458	RUSLE Project, TX Galveston, Citrus, (T95CBCBC)

	.456 .464 .475 .442 .424 .434 .439 .442 .325 .340 .352 .363 .371 .378 .384 .389 .362	

Table 4. PRZM 3.12 Soil Parameters for Hidalgo/Cameron Counties, Texas - Grapefruit

Parameter	Value	Verification Source
Total Soil Depth (CORED)	160 cm	http://soils.usda.gov/ (63 inches)
Number of Horizons (NHORIZ)	4 (top HORIZN split in 2)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, and Third Soil Horizons (HORIZN = 1,2,3)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 21 cm (HORIZN = 2) 25 cm (HORIZN = 3) 104 cm (HORIZN = 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/
Bulk Density (BD)	1.5g cm^{-3} (HORIZN = 1) 1.5 g cm^{-3} (HORIZN = 2) 1.325 g cm^{-3} (HORIZN = 3) 1.35 g cm^{-3} (HORIZN = 4)	
Initial Water Content (THETO)	0.30 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 3 cm (HORIZN = 2) 5 cm (HORIZN = 3) 4 cm (HORIZN = 4)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.30 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	GLEAMS Table H-3 (1990)
Wilting Point (THEWP)	0.18 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	GLEAMS Table H-3 (1990)
Organic Carbon Content (OC)	1.2% (HORIZN = 1) 1.2% (HORIZN = 2) 0.45% (HORIZN = 3) 0.18% (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship % OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting

Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

Personal Communication with Julian Sauls, Extension Horticulturist, Texas A & M University System. November 29, 2004.

Texas A & M University, Department of Horticulture. 2002. Author: Julian Sauls. Texas Citrus and Subtropical Fruits. Information from the website: http://aggie-horticulture.tamu.edu/citrus/citrus.htm

USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA 1997. Official Series Description. Hidalgo Series. Information from the website: http://soils.usda.gov/technical/classification/osd/index.html

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S. Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA 2004. Citrus Fruits 2004 Summary. Information from the website: http://usda.mannlib.cornell.edu/reports/nassr/fruit/zcf-bb/cfrt0904.tx

USDA. 2004. Natural Resources Conservation Service. Soil Data Mart. Information from website: http://soildatamart.nrcs.usda.gov/.

SOUTH TEXAS MELON

The field used to represent melon production in South Texas is representative of a field in Hildago and Cameron counties, located in the Lower Rio Grande Valley region. The meteorological file, Brownsville, TX, represents the MLRA region 83D. Specifically, the melon scenario represents cantaloupe, honeydew melon and watermelon production in the state. Texas produces 9 percent and 10 percent of the U.S. commercially grown cantaloupe and honeydew melon, respectively (NSF 1999). Approximately 50 percent of the state's cantaloupe and honeydew melon is grown in the Lower Rio Grande Region. Seeds are planted ½ -1 inch deep 8-12 inches apart in 78-80 inch beds or 12-24 inches apart in 2 lines on 78-80 inch beds. Planting is from the third week in January to the second week of February. Second and third plantings are done two weeks after the previous plantings. Cantaloupe and honeydew melon are harvested 85-95 days after planting (NSF 2000). Texas produces 20 percent of the U.S. commercially grown watermelons, ranking number one in the country (NSF 1999). Hildago is the number one county in Texas for watermelon production. Seeds are planted 3/4 -1 inch deep 3 feet apart on 6 foot beds (NSF 2003). The soil in Hildago and Cameron counties is alluvial, being derived from the Rio Grande (USDA 1997). Thus there is no dominant soil type (range of coverages: 0.1-13.2%). For this scenario, Harlingen Clay was selected as a representative soil type because it supports melon growth and has the largest percent coverage of a hydrologic group C or D soil for Hildago (4.8 %) and Cameron (6.6 %) counties (USDA 2004). Harlingen Clay is a hydrologic group D soil that is classified as very-fine, smectitic, hyperthermic sodic haplusterts. The Harlingen series of soils is deep, moderately well drained, very slowly permeable soils that formed in clayey sediments. These soils have slopes of 0-1 percent and occur on stream terraces and deltas along the lower portions of the Rio Grande River and its tributaries in south Texas and Mexico. This soil is mostly used for irrigated crop land including cotton and cool season vegetables (USDA1997).

Table 1. PRZM 3.12 Climate and Time Parameters for Hidalgo/Cameron Counties, Texas - Melon

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Brownsville, Cameron County, Texas: W12919
Ending Date	December 31, 1990	Meteorological File - Brownsville, Cameron County, Texas: W12919
Pan Evaporation Factor (PFAC)	0.69	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	32.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Hidalgo/Cameron Counties, Texas - Melon

Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.32 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	0.15	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.3 (EPA 2004).
USLE P Factor (USLEP)	1	contour plowing is not common due to 0-1% slope (consulted with extension agent). PRZM Manual Table 5.6 (EPA, 1998).
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	0.5%	From http://soils.usda.gov/ official soil series description (slope range = 0-1%)
Hydraulic Length (HL)	356 (pond) 600 (reservoir)	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)

* EI = 100 ft-tons * in/ acre*hr

Table 3. PRZM 3.12 Crop Parameters for Hidalgo/Cameron Counties, Texas - Melons		
Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (EPA. 2001)
Initial Surface Condition (ISCOND)	2	2=cover crop; crops are rotated according to Extension agent. PRZM Scenario Guidance (2004)
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.25 cm	PRZM Manual (Carsel et al., 1998)
Maximum Active Root Depth (AMXDR)	61 cm	Consulted extension agent
Maximum Canopy Coverage (COVMAX)	100%	Consulted extension agent
Soil Surface Condition After Harvest (ICNAH)	2	PRZM Manual (Carsel et al., 1998)
Date of Crop Emergence (EMD, EMM, IYREM)	1/2/61	Consulted extension agent, PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/
Date of Crop Maturity (MAD, MAM, IYRMAT)	1/5/61	Consulted extension agent, PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/
Date of Crop Harvest (HAD, HAM, IYRHAR)	7/5/61	Consulted extension agent, PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	88, 89, 90	Gleams Manual Table H-4, (Hydrological soil D), Row crop, SR, good hydrologic conditions (USDA, 1990)
Manning’s N Value (MNGN)	.011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011	RUSLE Project, TX Galveston, Citrus, Bare Ground (T95CBCBC)
USLE C Factor (USLEC)	.715 .746 .760 .698 .813 .816 .806 .785 .760 .726 .692 .590 .666 .729 .782	RUSLE Project, TX Galveston, Onion, Bare Ground (T95ONONC)

	.824 .857 .801 .902 .901 .885 .842 .786 .742 .699 .697 .712 .574 .623 .673	

Table 4. PRZM 3.12 Soil Parameters for Harlingen Clay in Hidalgo/Cameron Counties, Texas - Melon

Parameter	Value	Verification Source
Total Soil Depth (CORED)	180 cm	http://soils.usda.gov/ (71 inches)
Number of Horizons (NHORIZ)	4 (top HORIZN split in 2)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, and Third Soil Horizons (HORIZN = 1,2,3)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 18 cm (HORIZN = 2) 61 cm (HORIZN = 3) 91 cm (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.45g cm^{-3} (HORIZN = 1) 1.45g cm^{-3} (HORIZN = 2) 1.40 g cm^{-3} (HORIZN = 3) 1.55 g cm^{-3} (HORIZN = 4)	
Initial Water Content (THETO)	0.39 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 3 cm (HORIZN = 2) 1 cm (HORIZN = 3) 1 cm (HORIZN = 4)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.39 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	GLEAMS Table H-3 (1990)
Wilting Point (THEWP)	0.28 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	GLEAMS Table H-3 (1990)
Organic Carbon Content (OC)	1.2% (HORIZN = 1) 1.2% (HORIZN = 2) 0.9% (HORIZN = 3) 0.45% (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship % OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001;

Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

NSF Center for Integrated Pest Management. 2000. Crop Profile for Cantaloupes and Honeydew Melons in Texas. Information from the website: http://www.ipmcenters.org/cropprofiles/docs/txcanteloupesandhoneydewmelons.html

NSF Center for Integrated Pest Management. 2003. Crop Profile for Watermelons in Texas. Information from the website: http://www.ipmcenters.org/cropprofiles/docs/txwatermelons.html

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USDA. 2004. Natural Resources Conservation Service. Soil Data Mart. Information from website: http://soildatamart.nrcs.usda.gov/.

SOUTH TEXAS VEGETABLE

The field used to represent vegetable production in South Texas is representative of a field in Hildago and Cameron counties, located in the Lower Rio Grande Valley region. The meteorological file, Brownsville, TX, represents the MLRA region 83D. Specifically, the vegetable scenario represents carrot, onion and cabbage production in the state. Texas produces 3 percent of the U.S. commercially grown carrots. The Lower Rio Grande Region produces approximately 50 percent of Texas carrots. Carrot seed is often precision planted at 1/8-1/4 inches deep between July and November. They are mechanically harvested from December to May (NSF 2003 a). Texas produces 7 percent of the U.S. commercially grown onions. The Lower Rio Grande Region produces approximately 80 percent of Texas onions. Onion seed is often precision planted at 1/4-3/4 inches deep, on 38-40 inch raised beds in October. Mechanical harvest begins 120-210 days after planting, when the tops 50-80% of the tops fall over. They are mechanically harvested from December to May (NSF 2003 b). Texas produces 15 percent of the U.S. commercially grown cabbage. The Lower Rio Grande Region produces approximately 50 percent of Texas cabbage. Cabbage seed is often planted at 6-15 inches apart (NSF 2003 c). The soil in Hildago and Cameron counties is alluvial, being derived from the Rio Grande (USDA 1997). Thus there is no dominant soil type (range of coverages: 0.1-13.2%). For this scenario, Harlingen Clay was selected as a representative soil type because it supports vegetable production and has largest percent coverage of a hydrologic group C or D soil for Hildago (4.8 %) and Cameron (6.6 %) counties (USDA 2004). Harlingen Clay is a hydrologic group D soil that is classified as very-fine, smectitic, hyperthermic sodic haplusterts. The Harlingen series of soils is deep, moderately well drained, very slowly permeable soils that formed in clayey sediments. These soils have slopes of 0-1 percent and occur on stream terraces and deltas along the lower portions of the Rio Grande River and its tributaries in south Texas and Mexico. This soil is mostly used for irrigated crop land including cotton and cool season vegetables (USDA 1997).

Table 1. PRZM 3.12 Climate and Time Parameters for Hidalgo/Cameron Counties, Texas - Vegetable

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Brownsville, Cameron County, Texas: W12919
Ending Date	December 31, 1990	Meteorological File - Brownsville, Cameron County, Texas: W12919
Pan Evaporation Factor (PFAC)	0.69	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	32.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Hidalgo/Cameron Counties, Texas -Vegetable

Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.32 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	0.15	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.3 (EPA 2004).
USLE P Factor (USLEP)	1	contour plowing is not common due to 0-1% slope (consulted with extension agent). PRZM Manual Table 5.6 (EPA, 1998)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	0.5%	From http://soils.usda.gov/ official soil series description (slope range = 0-1%)
Hydraulic Length (HL)	356 (pond)	Shipman Reservoir (EPA 2004)

	600 (reservoir)	
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for Hidalgo/Cameron Counties, Texas - Vegetable

Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (.EPA 2004)
Initial Surface Condition (ISCOND)	2	Consulted extension agent, crops are rotated
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.25 cm	PRZM Manual (Carsel et al., 1998). Value may be inconsistent with different vegetable scenarios because they represent different types of vegetables.
Maximum Active Root Depth (AMXDR)	38.1 cm	Consulted extension agent. Value may be inconsistent with different vegetable scenarios because they represent different types of vegetables.
Maximum Canopy Coverage (COVMAX)	80%	Consulted extension agent. Value is not consistent with other vegetable scenarios because they represent different types of vegetables.
Soil Surface Condition After Harvest (ICNAH)	2	Consulted extension agent; crops are rotated. PRZM Manual (Carsel et al., 1998)
Date of Crop Emergence (EMD, EMM, IYREM)	1/10/61	Consulted extension agent, PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/
Date of Crop Maturity (MAD, MAM, IYRMAT)	1/3/61	Consulted extension agent, PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/
Date of Crop Harvest (HAD, HAM, IYRHAR)	15/3/61	Consulted extension agent, PRZM Manual, Table 5-19 and http://www.ipmcenters.org/cropprofiles/
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	88, 89, 90	Gleams Manual Table H-4, (Hydrological soil D), Row crop, SR, good hydrologic conditions (USDA,

		1990)
Manning's N Value (MNGN)	.011 .	RUSLE Project, TX Galveston, Onion (T95ONONC)
USLE C Factor (USLEC)	.623 .673 .715 .746 .760 .698 .813 .816 .806 .785 .760 .726 .692 .590 .666 .729 .782 .824 .857 .801 .902 .901 .885 .842 .786 .742 .699 .697 .712 .574	RUSLE Project, TX Galveston, Onion (T95ONONC)

Table 4. PRZM 3.12 Soil Parameters for Hidalgo/Cameron Counties, Texas - Vegetable

Parameter	Value	Verification Source
Total Soil Depth (CORED)	180 cm	http://soils.usda.gov/ (71 inches)
Number of Horizons (NHORIZ)	4 (top HORIZN split in 2)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, and Third Soil Horizons (HORIZN = 1,2,3)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 18 cm (HORIZN = 2) 61 cm (HORIZN = 3) 91 cm (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.45g cm^{-3} (HORIZN = 1) 1.45g cm^{-3} (HORIZN = 2) 1.40 g cm^{-3} (HORIZN = 3) 1.55 g cm^{-3} (HORIZN = 4)	
Initial Water Content (THETO)	0.39 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 3 cm (HORIZN = 2) 1 cm (HORIZN = 3)	PRZM Scenario Guidance (2004)

Table 4. PRZM 3.12 Soil Parameters for Hidalgo/Cameron Counties, Texas - Vegetable		
Parameter	Value	Verification Source
	1 cm (HORIZN = 4)	
Field Capacity (THEFC)	0.39 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	GLEAMS Table H-3 (1990)
Wilting Point (THEWP)	0.28 cm^3 H_20 cm^{-3} soil (HORIZN = 1-4)	GLEAMS Table H-3 (1990)
Organic Carbon Content (OC)	1.2% (HORIZN = 1) 1.2% (HORIZN = 2) 0.9% (HORIZN = 3) 0.45% (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship % OC = 0.6 x % Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

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NSF Center for Integrated Pest Management. 2003 b. Crop Profile for Onions in Texas. Information from the website: http://www.ipmcenters.org/cropprofiles/docs/TXonions.html.

NSF Center for Integrated Pest Management. 2003 c. Crop Profile for Cabbage in Texas. Information from the website: http://www.ipmcenters.org/cropprofiles/docs/TXcabbage.html.

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USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S.

Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA. 2004. Natural Resources Conservation Service. Soil Data Mart. Information from website: http://soildatamart.nrcs.usda.gov/.

WASHINGTON BEANS

The field used to represent bean production in Central Washington is located in Grant County in the Columbia Basin. The meteorological file, Yakima, WA represents the MLRA regions 7 and 8. Beans are planted in early summer and harvested in September. For this scenario, Ekrub fine sand was selected as a representative soil type because it supports bean crops. Ekrub fine sand is a hydrologic group C soil that is classified as sandy-skeletal, mixed, mesic, shallow xeric Haplodurids. The Ekrub series of soils is shallow, somewhat excessively drained, formed in eolian sands overlying a lime-silica indurated duripan. These soils occur on terraces with slopes of 0 to 25 percent. This soil type occurs in South-central Washington where itis mostly used for range (USDA 1996).

Table 1. PRZM 3.12 Climate and Time Parameters for Grant County, Washington - Beans

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Yakima, Grant County, Washington (W24243)
Ending Date	December 31, 1990	Meteorological File - Yakima, Grant County, Washington (W24243)
Pan Evaporation Factor (PFAC)	0.71	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.36 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	17.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Grant County, Washington - Beans		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.28 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	1.34	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.5 (EPA 2004).
USLE P Factor (USLEP)	0.5	Based on slope and guidance (EPA 2004)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	6%	Since maximum of slope range (0-25%) is >12%, value is set at 6% for row crops (EPA 2004).
Hydraulic Length (HL)	600 (reservoir)	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for Grant County, Washington - Beans		
Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (.EPA 2004)
Initial Surface Condition (ISCOND)	1	Consulted extension agent, crops are rotated
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.1 cm	Taken from OR snap beans scenario.
Maximum Active Root Depth (AMXDR)	38 cm	Taken from OR snap beans scenario
Maximum Canopy Coverage (COVMAX)	100%	Taken from OR snap beans scenario.
Soil Surface Condition After Harvest (ICNAH)	1	Taken from OR snap beans scenario.
Date of Crop Emergence (EMD, EMM, IYREM)	16/6/61	Taken from OR snap beans scenario.
Date of Crop Maturity (MAD, MAM, IYRMAT)	18/8/61	Taken from OR snap beans scenario.
Date of Crop Harvest (HAD, HAM, IYRHAR)	2/9/61	Taken from OR snap beans scenario.
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	84, 86, 87	Gleams Manual Table H-4, (Hydrological soil C), SR Conservation Tillage/poor, Cropping and Residue = Row Crop Contour/good (USDA, 1990)
Manning’s N Value (MNGN)	.011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011 .011	RUSLE Project (A04ONONC.dat) Onion fields in Centralia, WA

	.011 .011 .011 .011 .011 .011	
USLE C Factor (USLEC)	.806 .812 .818 .822 .827 .831 .836 .786 .885 .887 .869 .829 .778 .733 .691 .666 .690 .707 .554 .582 .617 .658 .702 .735 .759 .777 .790 .799	RUSLE Project (A04ONONC.dat) Onion fields in Centralia, WA

Table 4. PRZM 3.12 Soil Parameters for Ekrub fine sand in Grant County, Washington - Beans

Parameter	Value	Verification Source
Total Soil Depth (CORED)	45 cm	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Number of Horizons (NHORIZ)	3	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, and Third Soil Horizons (HORIZN = 1,2,3)		
Horizon Thickness (THKNS)	8 cm (HORIZN = 1) 22 cm (HORIZN = 2) 15 cm (HORIZN = 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.45 g cm^{-3} (HORIZN = 1) 1.55 g cm^{-3} (HORIZN = 2) 1.55 g cm^{-3} (HORIZN = 3)	
Initial Water Content (THETO)	0.18 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 2 cm (HORIZN = 2) 5 cm (HORIZN = 3)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.18 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	GLEAMS Table H-3(1990)
Wilting Point (THEWP)	0.03 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	GLEAMS Table H-3(1990)
Organic Carbon Content (OC)	0.15% (HORIZN = 1, 2, 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/);

		Adjusted using the relationship %OC = 0.6x%Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA. 1996. Official Series Description. Ekrub Series. Information from the website: http://soils.usda.gov/technical/classification/osd/index.html

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S. Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA. 2004. Natural Resources Conservation Service. Soil Data Mart. Information from website: http://soildatamart.nrcs.usda.gov/.

WASHINGTON ONIONS

The field used to represent onion production in Central Washington is representative of a field in Grant county. The meteorological file, Yakima, WA represents the MLRA region 7, 8. Washington produces 16.2 percent of the U.S. dry summer onions, ranking third in the U.S. Washington storage onion production is primairly in the central part of the state in Grant, Franklin, Benton and Adams counties. Onions are cool-season crops which can grow in a variety of soil types. Onions in Grant county are grown in 3 to 4 year rotations with carrots, sweet corn, cereals and potatoes. Onions are planted on beds in multiple rows (2-12). Seeds are planted 1/4 to ½ inch deep. Most onions are irrigated (NSF 2003). For this scenario, Ekrub fine sand was selected as a representative soil type because it supports onion crops. Ekrub fine sand is a hydrologic group C soil that is classified as sandy-skeletal, mixed, mesic, shallow xeric Haplodurids. The Ekrub series of soils is shallow, somewhat excessively drained, formed in eolian sands overlying a lime-silica indurated duripan. These soils occur on terraces with slopes of 0 to 25 percent. This soil type occurs in South-central Washington where it is mostly used for range (USDA 1996).

Table 1. PRZM 3.12 Climate and Time Parameters for Grant County, Washington - Onions

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Yakima, Grant County, Washington (W24243)
Ending Date	December 31, 1990	Meteorological File - Yakima, Grant County, Washington (W24243)
Pan Evaporation Factor (PFAC)	0.71	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.36 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD	17.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Grant County, Washington - Onions		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.28 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	1.34	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.5 (EPA 2004).
USLE P Factor (USLEP)	0.5	PRZM Manual Table 5.6 (EPA, 1998). Onions typically grown in rows on raised beds
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	6%	Since maximum of slope range (0-25%) is >12%, value is set at 6% for row crops (EPA 2004).
Hydraulic Length (HL)	600 (reservoir)	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for Grant County, Washington - Onions		
Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (EPA 2004)
Initial Surface Condition (ISCOND)	1	Consulted extension agent, crops are rotated
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.05 cm	Taken from CA onion scenario. Within range of Table 5.4 of PRZM Manual.
Maximum Active Root Depth (AMXDR)	35 cm	Taken from CA onion scenario.
Maximum Canopy Coverage (COVMAX)	80%	Taken from CA onion scenario.
Soil Surface Condition After Harvest (ICNAH)	1	Taken from CA onion scenario.
Date of Crop Emergence (EMD, EMM, IYREM)	1/6/61	Oregon State University Extension and Experiment Station http://eesc.orst.edu/agcomwebfile/edmat/html/pnw546/pnw546.html#anchor256349
Date of Crop Maturity (MAD, MAM, IYRMAT)	30/8/61	Oregon State University Extension and Experiment Station http://eesc.orst.edu/agcomwebfile/edmat/html/pnw546/pnw546.html#anchor256349
Date of Crop Harvest (HAD, HAM, IYRHAR)	10/9/61	Oregon State University Extension and Experiment Station http://eesc.orst.edu/agcomwebfile/edmat/html/pnw546/pnw546.html#anchor256349
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	84, 86, 87	Gleams Manual Table H-4, (Hydrological soil C), SR Conservation Tillage/poor, Cropping and Residue = Row Crop Contour/good (USDA, 1990)
Manning’s N Value (MNGN)	.011	RUSLE Project (A04ONONC.dat) Onion fields in Centralia, WA

USLE C Factor (USLEC)	.806 .812 .818 .822 .827 .831 .836 .786 .885 .887 .869 .829 .778 .733 .691 .666 .690 .707 .554 .582 .617 .658 .702 .735 .759 .777 .790 .799	RUSLE Project (A04ONONC.dat) Onion fields in Centralia, WA

Table 4. PRZM 3.12 Soil Parameters for Ekrub fine sand, Grant County, Washington - Onions

Parameter	Value	Verification Source
Total Soil Depth (CORED)	45 cm	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Number of Horizons (NHORIZ)	3	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, and Third Soil Horizons (HORIZN = 1,2,3)		
Horizon Thickness (THKNS)	8 cm (HORIZN = 1) 22 cm (HORIZN = 2) 15 cm (HORIZN = 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.45 g cm^{-3} (HORIZN = 1) 1.55 g cm^{-3} (HORIZN = 2) 1.55 g cm^{-3} (HORIZN = 3)	
Initial Water Content (THETO)	0.18 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 2 cm (HORIZN = 2) 5 cm (HORIZN = 3)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.18 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	GLEAMS Table H-3 (1990)
Wilting Point (THEWP)	0.03 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	GLEAMS Table H-3 (1990)
Organic Carbon Content (OC)	0.15% (HORIZN = 1, 2, 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship %OC = 0.6x%Organic Matter (Doucette 2000)

EPA. 1998. Carsel, R.F., J.C. Imhoff, P.R. Hummel, J.M. Cheplick, and A.S. Donigian, Jr. PRZM-3, A Model for Predicting Pesticide and Nitrogen Fate in the Crop Root and Unsaturated Soil Zones: Users Manual for Release 3.0. National Exposure Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens, GA.

EPA. 2004. Pesticide Root Zone Model (PRZM) Field and Orchard Crop Scenarios: Guidance for Selecting Field Crop and Orchard Scenario Input Parameters. November 15, 2001; Revisions July 2004.

Haan, C.T. and B.J. Barfield. 1978. *Hydrology and Sedimentology of Surface Mined Lands.* Office of Continuing Education and Extension, College of Engineering, University of Kentucky, Lexington, Kentucky 40506. pp. 286.

NSF Center for Integrated Pest Management. 2003. Crop Profile for Onions in Washington. Information from the website: http://www.ipmcenters.org/cropprofiles/docs/WAonions.html.

USDA. 1990. Davis, F.M., R.A. Leonard, W.G. Knisel. GLEAMS User Manual, Version 1.8.55. USDA-ARS Southeast Watershed Research Laboratory, Tifton GA. SEWRL-030190FMD.

USDA. 1996. Official Series Description. Edrub Series. Information from the website: http://soils.usda.gov/technical/classification/osd/index.html

USDA. 2000. Revised Universal Soil Loss Equation (RUSLE) EPA Pesticide Project. U.S. Department of Agriculture, National Resources Conservation Service (NRCS) and Agricultural Research Service (ARS).

USDA. 2004. Natural Resources Conservation Service. Soil Data Mart. Information from website: http://soildatamart.nrcs.usda.gov/.

WASHINGTON ORCHARD

The field used to represent orchard production in Central Washington is representative of a field in Grant county, located in the Columbia Basin. The meteorological file, Yakima, WA represents the MLRA region 7, 8. Washington produces 53 percent of U.S. apples, ranking first in the U.S. Apple production in the state of Washington occurs primarily in three regions: Yakima Basin, North Central, and Columbia Basin. Various types of apples, including red delicious, golden delicious, pink lady, granny smith, and more are grown in orchards in Washington (NSF 2001). Taunton silt loam chosen from Grant county. This soil was chosen over the Scoon silt loam even though more orchard crops are grown in the Scoon soil, since data are available for deeper depths. This is appropriate due to the large maximum rooting depth of apples and cherry trees. Taunton silt loam is a hydrologic group C soil that is classified as coarse-loamy, mixed, superactive, mesic xeric Haplodurids. The Taunton series of soils is moderately deep to duripan, well drained soils formed in alluvium. These soils occur on terraces and basalt plains, fan terraces and mesas with slopes of 0 to 45 percent. This soil type occurs in South-central Washington, north-central Oregon and Southern Idaho where it is used for livestock grazing and irrigated crop production (USDA 2001).

Table 1. PRZM 3.12 Climate and Time Parameters for Grant County, Washington - Orchard

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Yakima, Grant County, Washington (W24243)
Ending Date	December 31, 1990	Meteorological File - Yakima, Grant County, Washington (W24243)
Pan Evaporation Factor (PFAC)	0.71	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.16 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	17.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Grant County, Washington - Orchard		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.55 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	3.63	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.5 (EPA 2004).
USLE P Factor (USLEP)	1.0	PRZM Manual Table 5.6 (EPA, 1998)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	12%	Since maximum of slope range (0-45%) is >12%, value is set at 12% for orchard crops (EPA 2004).
Hydraulic Length (HL)	600 (reservoir)	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
Irrigation Type (IRTYP)	Not applicable	
Leaching Factor (FLEACH)	Not applicable	
Fraction of Water Capacity when Irrigation is Applied (PCDEPL)	Not applicable	
Maximum Rate at which Irrigation is Applied (RATEAP)	Not applicable	
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for Grant County, Washington - Orchard		
Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (.EPA 2004)
Initial Surface Condition (ISCOND)	3	Consulted extension agent, crops are rotated
Number of Different Crops (NDC)	1	Based on OR apple scenario.
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.25 cm	Based on OR apple scenario.
Maximum Active Root Depth (AMXDR)	68 cm	Set to maximum soil depth. Roots may grow up to 20 feet (OR Apple).
Maximum Canopy Coverage (COVMAX)	75	Based on OR apple scenario. Parameter value may be inconsistent with different apple scenarios due to different sources.
Soil Surface Condition After Harvest (ICNAH)	3	Based on OR apple scenario.
Date of Crop Emergence (EMD, EMM, IYREM)	1/4/61	Based on OR apple scenario.
Date of Crop Maturity (MAD, MAM, IYRMAT)	30/4/61	Based on OR apple scenario.
Date of Crop Harvest (HAD, HAM, IYRHAR)	31/10/61	Based on OR apple scenario.
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	79, 82, 84	Gleams Manual Table H-4, (Hydrological soil C) (USDA, 1990)
Manning’s N Value (MNGN)	.040	RUSLE Project (B060FOFN.dat)
USLE C Factor (USLEC)	.004 .005 .006 .006 .009 .010 .011 .011 .011 .010 .009 .008 .006 .005 .005	RUSLE Project (B060FOFN.dat)

	.005 .005 .005 .005 .005 .002 .003 .003 .003	

Table 4. PRZM 3.12 Soil Parameters for Taunton silt loam, Grant County, Washington - Orchard

Parameter	Value	Verification Source
Total Soil Depth (CORED)	68 cm	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Number of Horizons (NHORIZ)	4	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, Third, and Fourth Soil Horizons (HORIZN = 1,2,3, 4)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 10 cm (HORIZN = 2) 28 cm (HORIZN = 3) 20 cm (HORIZN = 4)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.25 g cm^{-3} (HORIZN = 1) 1.25 g cm^{-3} (HORIZN = 2) 1.40 g cm^{-3} (HORIZN = 3) 1.40 g cm^{-3} (HORIZN = 4)	
Initial Water Content (THETO)	0.32 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3)	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 5 cm (HORIZN = 2) 4 cm (HORIZN = 3) 5 cm (HORIZN = 4)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.32 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3, 4)	GLEAMS Table H-3(1990)
Wilting Point (THEWP)	0.12 cm^3 H_20 cm^{-3} soil (HORIZN = 1, 2, 3, 4)	GLEAMS Table H-3(1990)
Organic Carbon Content (OC)	0.45% (HORIZN = 1) 0.45% (HORIZN = 2) 0.15% (HORIZN = 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship %OC = 0.6x% Organic Matter (Doucette 2000)

Table 4. PRZM 3.12 Soil Parameters for Taunton silt loam, Grant County, Washington - Orchard		
Parameter	Value	Verification Source
	0.15% (HORIZN = 4)	

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WASHINGTON POTATO

The field used to represent potato production in Central Washington is located in Grant County in the Columbia Basin. The meteorological file, Yakima, WA represents the MLRA regions 7 and 8. Potatoes are planted in the spring and harvested in the summer and fall. Common potato varieties grown in Washington include russets, which are grown for french fries and fresh market. Other varieties include yellow, red and blue potatoes (WSPC 2004). For this scenario, Scoon silt loam was selected as a representative soil type because it supports potato crops in Grant county in Washington. Scoon silt loam is a hydrologic group D soil that is classified as loamy, mixed, superactive, mesic and shallow Xeric Haplodurids. The Scoon series of soils is shallow to a duripan, well drained, and formed in loess and silty alluvium over a duripan. These soils occur on terraces and alluvial fans with slopes of 0 to 30 percent. This soil type occurs on the in South-central Washington and Southern Idaho and is mostly used for irrigated crop production and range (USDA 2001).

Table 1. PRZM 3.12 Climate and Time Parameters for Grant County, Washington - Potato

Parameter	Value	Source
Starting Date	January 1, 1961	Meteorological File - Yakima, Grant County, Washington (W24243)
Ending Date	December 31, 1990	Meteorological File - Yakima, Grant County, Washington (W24243)
Pan Evaporation Factor (PFAC)	0.71	PRZM Manual Figure 5.1 (EPA, 1998)
Snowmelt Factor (SFAC)	0.36 cm C^{-1}	PRZM Manual Table 5.1 (EPA, 1998)
Minimum Depth of Evaporation (ANETD)	17.5 cm	PRZM Manual Figure 5.2 (EPA, 1998)

Table 2. PRZM 3.12 Erosion and Landscape Parameters for Grant County, Washington - Potato		
Parameter	Value	Source
Method to Calculate Erosion (ERFLAG)	4 (MUSS)	PRZM Manual (EPA, 1998)
USLE K Factor (USLEK)	0.55 tons EI^{-1*}	Taken from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
USLE LS Factor (USLELS)	1.34	Calculated according to Haan and Barfield (1978) equation: $LS = ((\lambda/72.6)^m)((430x^2 + 30x + 0.43)/6.613)$, where λ = slope length, x = SLP/100 and m = constant. In this case, λ = 400 m (default value) and m = 0.5 (EPA 2004).
USLE P Factor (USLEP)	0.5	Based on slope and guidance (EPA 2004)
Field Area (AFIELD)	172 ha	Area of Shipman Reservoir watershed (EPA 2004).
NRCS Hyetograph (IREG)	3	PRZM Manual Figure 5.12 (EPA, 1998)
Slope (SLP)	6%	Since maximum of slope range (0-30%) is >12%, value is set at 6% for row crops (EPA 2004).
Hydraulic Length (HL)	600 m (reservoir)	Shipman Reservoir (EPA 2004)
Irrigation Flag (IRFLAG)	0	From PRZM Scenario Guidance (2004)
Irrigation Type (IRTYP)	Not applicable	
Leaching Factor (FLEACH)	Not applicable	
Fraction of Water Capacity when Irrigation is Applied (PCDEPL)	Not applicable	
Maximum Rate at which Irrigation is Applied (RATEAP)	Not applicable	
* EI = 100 ft-tons * in/ acre*hr		

Table 3. PRZM 3.12 Crop Parameters for Grant County, Washington - Potato		
Parameter	Value	Source
Initial Crop (INICRP)	1	Set to one for all crops (EPA,2001)
Initial Surface Condition (ISCOND)	1	Consulted extension agent, crops are rotated
Number of Different Crops (NDC)	1	Set to crops in simulation - generally one
Number of Cropping Periods (NCPDS)	30	Set to weather data.
Maximum rainfall interception storage of crop (CINTCP)	0.1 cm	PRZM Manual (Carsel et al., 1998)
Maximum Active Root Depth (AMXDR)	30 cm	Consulted extension agent Consistent with median value (15-45 cm) (Table 5-9. EPA 1998). Parameter value may be inconsistent with different potato scenarios due to different sources.
Maximum Canopy Coverage (COVMAX)	40	Consulted extension agent
Soil Surface Condition After Harvest (ICNAH)	3	PRZM Manual (Carsel et al., 1998)
Date of Crop Emergence (EMD, EMM, IYREM)	1/5/61	PRZM Mannual, Table 5-19 and http://www.potatoes.com/GrowingPotatoes.cfm?Section=Growing-Growing.cfm Consulted extension agent
Date of Crop Maturity (MAD, MAM, IYRMAT)	15/9/61	
Date of Crop Harvest (HAD, HAM, IYRHAR)	1/10/61	
Maximum Dry Weight (WFMAX)	0.0	Set to “0" Not used in simulation
SCS Curve Number (CN)	91, 89, 90	Gleams Manual Table H-4, (Hydrological soil D) (USDA, 1990)
Manning’s N Value (MNGN)	.014 .	RUSLE Project (A04PIPC.dat)
USLE C Factor (USLEC)	.741 .753 .764 .774 .784 .795 .805 .750 .757 .858 .880 .811 .582 .389 .290 .125 .055 .050 .188 .486 .520 .582	RUSLE Project (A04PIPC.dat)

	.630 .666 .694 .713 .729	

Table 4. PRZM 3.12 Soil Parameters for Scoon siilt loam, Grant County, Washington - Potato

Parameter	Value	Verification Source
Total Soil Depth (CORED)	40 cm	http://soils.usda.gov/ Note: Only upper 16 inches of soil had data on physical properties.
Number of Horizons (NHORIZ)	3	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
First, Second, and Third Soil Horizons (HORIZN = 1,2,3)		
Horizon Thickness (THKNS)	10 cm (HORIZN = 1) 5 cm (HORIZN = 2) 25 cm (HORIZN = 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Bulk Density (BD)	1.25 g cm^{-3} (HORIZN = 1) 1.25 g cm^{-3} (HORIZN = 2) 1.4 g cm^{-3} (HORIZN = 3)	
Initial Water Content (THETO)	0.32 cm^3 H_20 cm^{-3} soil	Field Capacity values, PRZM Scenario Guidance (2004)
Compartment Thickness (DPN)	0.1 cm (HORIZN = 1) 5 cm (HORIZN = 2) 5 cm (HORIZN = 3)	PRZM Scenario Guidance (2004)
Field Capacity (THEFC)	0.32 cm^3 H_20 cm^{-3} soil	GLEAMS Table H-3(1990), NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Wilting Point (THEWP)	0.12 cm^3 H_20 cm^{-3} soil	GLEAMS Table H-3(1990), NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/)
Organic Carbon Content (OC)	0.45% (HORIZN = 1, 2) 0.15% (HORIZN = 3)	NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/); Adjusted using the relationship %OC = 0.6x%Organic Matter (Doucette 2000)

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