

### DRAINAGE DESIGN MANAGEMENT SYSTEM FOR WINDOWS VERSION 5.6.0

## TUTORIAL **# 23** UPDATING LOSSES FOR IMPORTED HEC-1 MODELS



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*This document contains step-by-step tutorials for updating infiltration losses for imported HEC-1 models.* 

#### **UPDATING LOSSES FOR IMPORTED HEC-1 MODELS**

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#### UPDATING LOSSES FOR IMPORTED HEC-1 MODELS DATE CREATED: MAY 17, 2018

This tutorial provides a working example in updating infiltration losses (i.e., Green-Ampt parameters) for imported HEC-1 Models. In this tutorial, a developed HEC-1 model file will be used. In order to update the losses (LG Card) in the model for all the sub-basin areas, three datasets are required. They are sub-basins, land use, and soils shapefiles. It is assumed that these three shapefiles have common projection systems so that when geoprocessing analyses are performed, no issues will be generated.

The following datasets are required in performing this tutorial:

- 1. HEC-1 Model file
- 2. Sub-basins dataset
- 3. Land Use dataset
- 4. Soils dataset

#### **1.0** CREATE A FOLDER FOR MODEL RUNS (FILE - PROJECT PATHS)

For this example, a new folder was created (i.e., "H:\FCDMC\DDMSW560A\ModIruns\ ImportAndUpdate").



#### 2.0 CREATE A NEW PROJECT (FILE → NEW PROJECT)

Go to File  $\rightarrow$  New Project and select the "Import HEC-1 Input File" radio button. Click OK.

	Direct Machanica
✓ Hydrology and Hydraulics	River Mechanics
⊖ Standard	
○ Custom Storm	
Import HEC-1 Input File	
	OK

#### **3.0** ENTER PROJECT INFO

On the Select Project form, enter the Project Info. For Reference, enter "IMPORTANDUPDATE". Click Save and OK.

Select Project	t		N				
	l	_ist	3		De <u>t</u> ails		
Project R	Reference						
Project ID	00056	Reference IMP	ORTANDUPDATE				
Title	Import HEC-1 M	lodel File and Up	dating Infiltration Lo	sses			
Location							
Agency	Flood Control D	istrict of Maricopa	a County				
	V Hydrology and	d Hydraulics Only	Custom	Storm Event			
			V Imported	d HEC-1 File			
This project	t is to test import	ing a HEC-1 Mod	lel and subsequent	ly 🔺			
updating th	ie losses using s	sub-basin, ianu u	se, and soils shape	emes.			
				-			
Modificatio	n Date 05/17/20	18		Info	P <u>r</u> int <u>D</u> elete	Add	<u>о</u> к

#### **4.0** Change Major Basin (*Hydrology* → *Major Basins*)

In this example, the default major basin ID is "01", however the major basin ID in the example is "MV". This was found in the Sub Basin shape file. After creating the project, the user needs to either change the default major basin ID from "01" to "MV" or add an additional major basin "MV" as follows:

Major Basins	
List Deta	ails
Major Basin         Major Basin ID         Description         Major Basin 01         Area (sq mi)         Rain ID         DEFAULT	Area     RE       1.
Modeling Options         Model This Major Basin ☑       Custom         Storms       Multiple       □         Duration       6 Hour       □         Tab Interval       5 ♀       □         No. Ordinates       2000 ♀       □         Output       5 ♀       □	<ol> <li>4.</li> <li>5.</li> <li>6.</li> <li>7.</li> <li>8.</li> <li>9.</li> <li>Custom</li></ol>
Return Period for Steps       Step RP	•
<mark>. ⊗Info</mark> Re <u>S</u> ort P <u>r</u> int <u>D</u> elete	Add <u>U</u> pdate <u>O</u> K

Go to Hydrology → Major Basins and change the default "01" to "MV"

#### 5.0 IMPORT HEC-1 FILE (HYDROLOGY → HEC-1 → IMPORT HEC-1 FILE)

Go to Hydrology  $\rightarrow$  HEC-1  $\rightarrow$  Import HEC-1 File.

Import HEC1 M	odel File - MB: MV	6	
Options			
Assumed RP	100 🔎		
Import File	H:\PROJECTS\DDMSW_PROJECTS\DDMSW_TESTING\HEC1_N	MODELS\MODEL_6H	R.DAT
	Import Hec-1 File	ew Created File	mport <u>O</u> K

After locating the HEC-1 model file, click "Import".

#### 6.0 CHANGE MODEL DEFAULTS (FILE → SELECT PROJECT)

Go to File→Select Project and uncheck "Custom Storm Event."

Select Project	t	N	
	<u>L</u> ist	4	Details
Project R	eference		
Project ID	00056 Reference	PORTANDUPDATE	
Title	Import HEC-1 Model File and U	pdating Infiltration Losses	
Location			
Agency	Flood Control District of Marico	oa County	
	W Hydrology and Hydraulics On	ly 📃 Custom Storm Ev	rent
		Imported HEC-1 F	File
This project	t is to test importing a HEC-1 Mo	del and subsequently	*
updating th	e losses using sub-basin, land	use, and soils snapefiles.	
			-
Modification	n Date 05/17/2018	Info	P <u>r</u> int <u>D</u> elete <u>A</u> dd <u>O</u> K

#### 7.0 ENABLE UPDATING SUB BASIN DATA (HYDROLOGY - SUB BASINS)

After importing the HEC-1 file, all the Custom Check boxes are checked on the Sub Basins form (Hydrology  $\rightarrow$  Sub Basins). These need to be unchecked to allow the data to be updated. Click the custom check box for "IA" and then click "Custom". This will uncheck all custom check boxes.

Sub Basins - MB	8: MV Edi	t					
	ļ	_ist				0	)e <u>t</u> ails
Sub Basin Rainfall Losses -				ses - Gre	en-Ampt	Quality	
Major Basin 👖	٨V	$\geqslant$	14 (in)	value	Default	Custom	
Sub Basin 🤮	SC1		IA(III)	0.00			1 and
Sort	0 🚔		DIHEIA	0.34			
			PSIF (in)	6.60			
			XKSAT	0.160			
			RTIMP (%)	9			
			XKSAT (Bar	e Ground)		All Custom	
			Avg Vege	tation (%)			
Sub Basin Pa	rameters	- S-Graph				Data impo	orted from HEC-1 file:
Area (sq mi)	0.562	S-Gra	bh		-	MODEL_6	HR.DAT 05/17/2018
Length (mi)		Lca (n	ni)				
USGE (ft)		Lag (mi	n)				
DSGE (ft)		Velocity (f/	s)	Default	Custom		
Slope (ft/mi)		ŀ	(n				-
		Save	<u>C</u> ancel	P <u>r</u> int	Delete	Add	MB Update OK

Sub Basins - MB: MV				N				
	List			45	[	De <u>t</u> ails		
Sub Basin		Rainfall Los	ses - Gre	en-Ampt	0			
Major Basin MV	$\left \right\rangle$		Value	Default	Custom			
Sub Basin SC1		IA (in)	0.00					
Sort 0		DTHETA	0.34					
		PSIF (in)	6.60					
		XKSAT	0.160					
		RTIMP (%)	9					
		XKSAT (Bar	e Ground)		All Custom			
		Avg Vege	tation (%)					
⊤ Sub Basin Parame	eters - S-Graph							
Area (sq mi) 0.5	562 S-Gra	aph		-	MODEL 6	orted from SHR.DAT	HEC-1 file: 05/17/2018	
Length (mi)	Lca (	mi)			-			
USGE (ft)	Lag (n	nin)						
DSGE (ft)	Velocity (	f/s)	Default	Custom				
Slope (ft/mi)	_	Kn						
								*
	<u>.</u> €§Info	Re <u>S</u> ort I	P <u>r</u> int	<u>D</u> elete	Add	MB	Update	<u>0</u> K

#### **8.0** UPDATE LAND USE AND SOILS (MAPS -> UPDATE HYDROLOGY)

Go to Maps → Update Hydrology and enter the location of the Sub Basins, Land use, and Soils shapefiles and then click "Update".

Update hydrology from GIS - MB: MV											
Name and Path of Maps for Hydrology											
Sub Basins	s H:\PROJECTS\DDMSW_PROJECTS\DDMSW_TESTING\HEC1_MODELS\DRNBSN.SHP										
Land Use	H:\PROJECTS\DDMSW_PROJECTS\DDMSW_TESTING\HEC1_MODELS\LANDUSE.SHP	<b>?</b>									
Soils	H:\PROJECTS\DDMSW_PROJECTS\DDMSW_TESTING\HEC1_MODELS\SOILS.SHP	<b>?</b>									
L											
Lca											
	Required Map Fi	elds									
Update Op Sub Bas Land Us Soils L Lca	Major Basin       Sub Basins Default         See       S-Graph Valley         Major Basin MV       Multiple         Major Basin MV       Multiple         Major Basin MV       Multiple         Major Basin MV       Multiple         See       Multiple         Map File Key Field Name       Land Use Code         Lucode       Lucode										
	Info Check Log Update	<u>o</u> k									

Because Tc is not updated, the sub basin data will not be updated here. The Land Use and Soils are updated.

#### 9.0 UPDATE SUB BASINS DATA (HYDROLOGY - SUB BASINS)

Sub Basins - MB: I	MV				<u>A</u>				
	List						De <u>t</u> ails		
┌ Sub Basin ──			Rainfall Los	ses - Gre	en-Ampt				
Major Basin MV	/			Value	<u>Default</u>	Custom			
Sub Basin SC	21		IA (in)	0.00					
Sort	0 🚔		DTHETA	0.34					
	• •		PSIF (in)	6.60					
			XKSAT	0.160					
			RTIMP (%)	9					
			XKSAT (Bar	e Ground)		All Custom			
			Avg Vege	tation (%)					
┌ Sub Basin Para	ameters	- S-Graph				Data ima	at a d face		
Area (sq mi)	0.562	S-Grap	h Valley		-	WICEX06	H.DAT	05/17/2018	
Length (mi)		Lca (m	ni)						
USGE (ft)		Lag (mi	n)						
DSGE (ft)		Velocity (f/	s)	Default	Custom				
Slope (ft/mi)		ĸ	(n						
			I						•
		<mark>.</mark> €§_Info	Re <u>S</u> ort	P <u>r</u> int	Delete	Add	MB	Update	<u>о</u> к

Go to Hydrology→Sub Basins and click "Update".

During the process, you may get a Warning Message about Slope as shown below. Ignore this message as this is irrelevant in the update of the infiltration losses.



Also, you may get a message similar to the one below indicating that the update was not complete. Ignore this message as well as this is irrelevant to our goal of updating ONLY the infiltration losses.



# **10.0** UPDATE HEC-1 DATA WITH NEW LOSS RATES (HYDROLOGY → HEC-1 → UPDATE HEC-1 LOSS RATE)

Go to Hydrology →HEC-1→Update HEC-1 Loss Rate

If you do not see it, then go back to File  $\rightarrow$  Select Project and uncheck "Custom Storm Event".

Click "Update"

To facilitate review and comparison with the updated sub Basin data, click "Filter Loss Rate".

🛃 HE	EC-1 Data	- MB: MV											×
			<u>L</u> ist				De <u>t</u> ails						
Find	J Next												
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Sort	Special Code ID	
KK	SC1	BASIN									250		
LG	0.24	0.28	6.54	0.171	16						270		
KK	SC2	BASIN									400		
LG	0.31	0.23	6.54	0.151	8						420		
KK	SC3	BASIN									520		
LG	0.28	0.25	6.34	0.164	7						540		
KK	SC4	BASIN									700		
LG	0.33	0.25	7.00	0.121	22						720		
KK	SC5	BASIN									790		
LG	0.33	0.36	6.34	0.161	35						810		
KK	SC6	BASIN							ч	2	1120		
LG	0.21	0.22	6.34	0.192	41						1140		ļ
KK	SN1	BASIN									1240		
LG	0.28	0.27	6.00	0.191	19						1260		ļ
KK	SN2	BASIN									1540		
LG	0.30	0.27	6.00	0.191	7						1560		-
•												+	
									F	ilter All	<u>U</u> pdate	<u>о</u> к	<b>_</b> :

#### **11.0** RUN MODEL (*HYDROLOGY* → *HEC-1* → *MODEL*)

Go to Hydrology  $\rightarrow$  HEC-1 $\rightarrow$  >Model

Note that with an Imported File, there is NO update of data.

Run HEC-1 Model - Imported Hec-1 File	
	Options
	Major Basin MV
	Delete Prior Results Select Custom Folder Update Conveyance Flows
<mark>. ⊘Info</mark> Schematic O <u>u</u> tput Storag	e <u>R</u> esults Run <u>M</u> odel <u>O</u> K

This ends the tutorial.