
The background of the slide is a light gray gradient. It is decorated with numerous water droplets of various sizes and shapes, scattered across the top and bottom edges. The droplets are rendered with soft shadows and highlights, giving them a three-dimensional appearance.

CE 3372 WATER SYSTEMS DESIGN

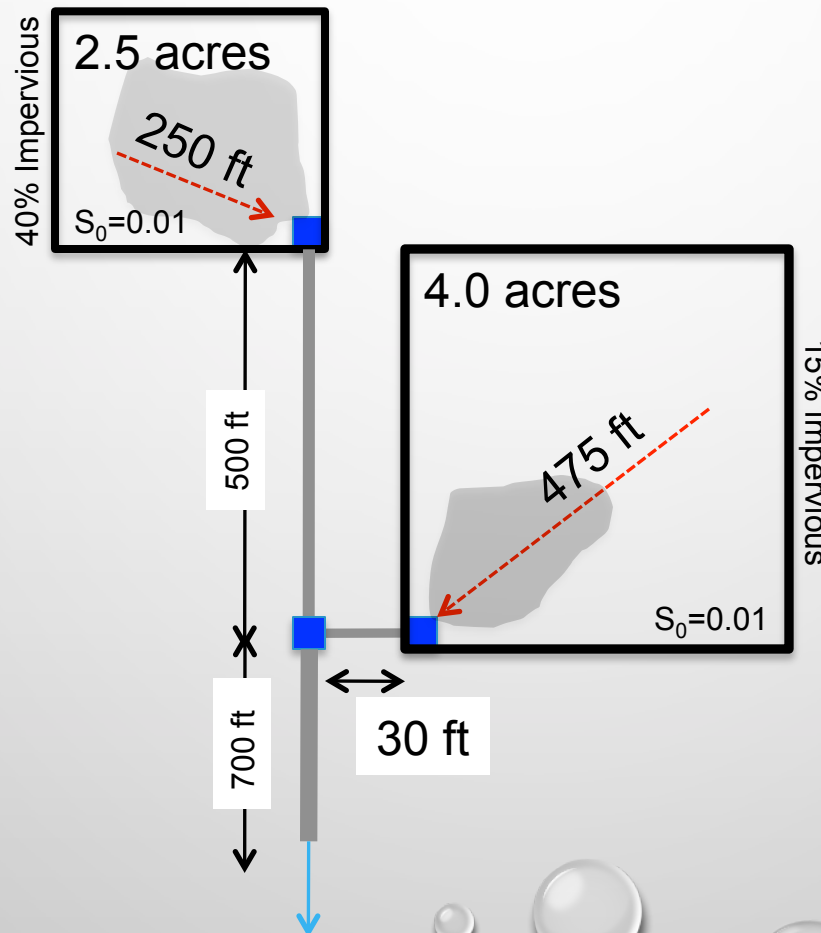
LECTURE 19: SWMM HYDROLOGY



SWMM AS HYDROLOGIC MODEL

- SUB-CATCHMENTS
 - INFILTRATION MODEL (RUNOFF GENERATION)
 - RAINGAGES
 - TIME-SERIES OF RAINFALL (HYETOGRAPH)
- 

SWMM AS HYDROLOGIC MODEL

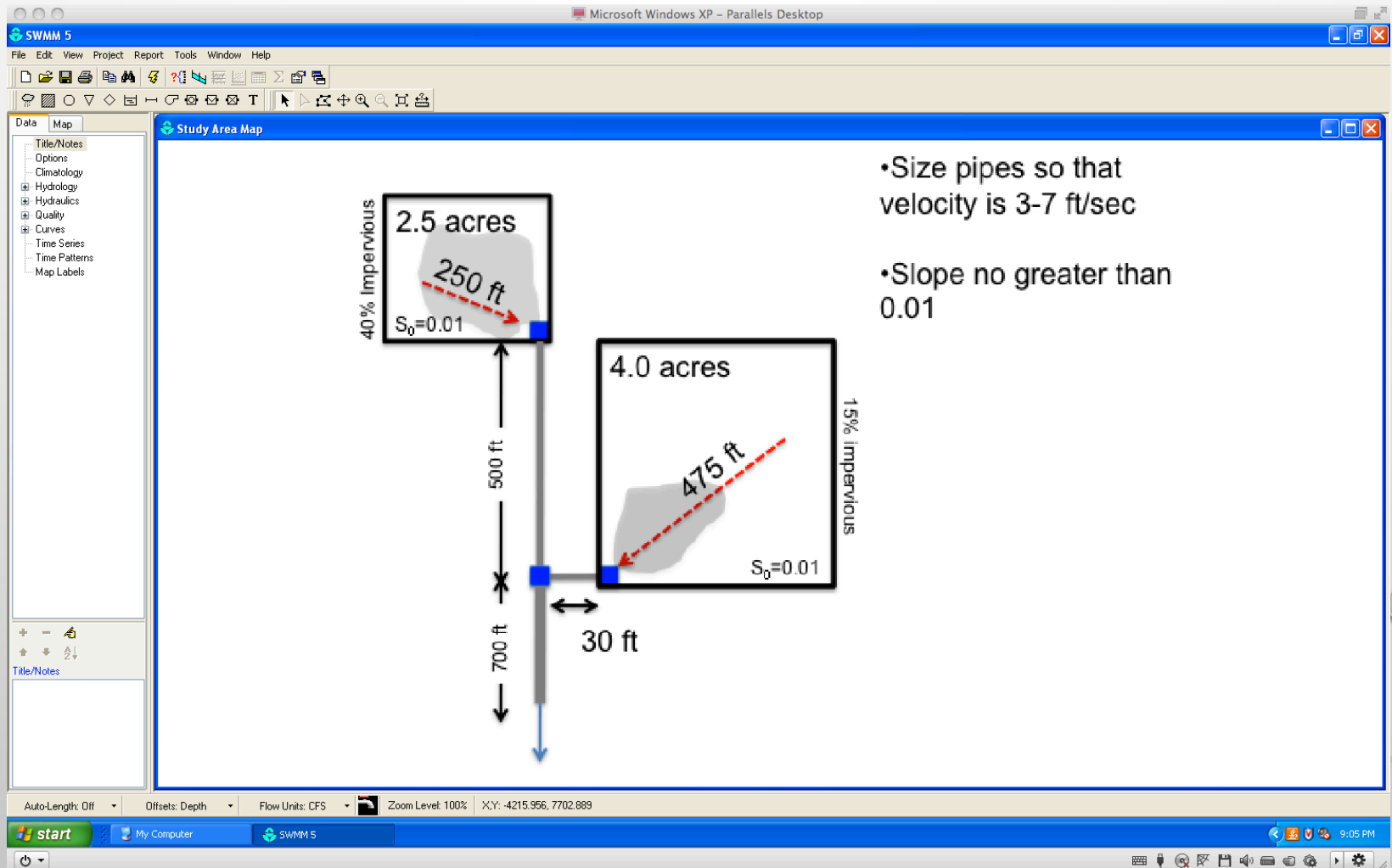


- Size pipes so that velocity is 3-7 ft/sec

- Slope no greater than 0.01

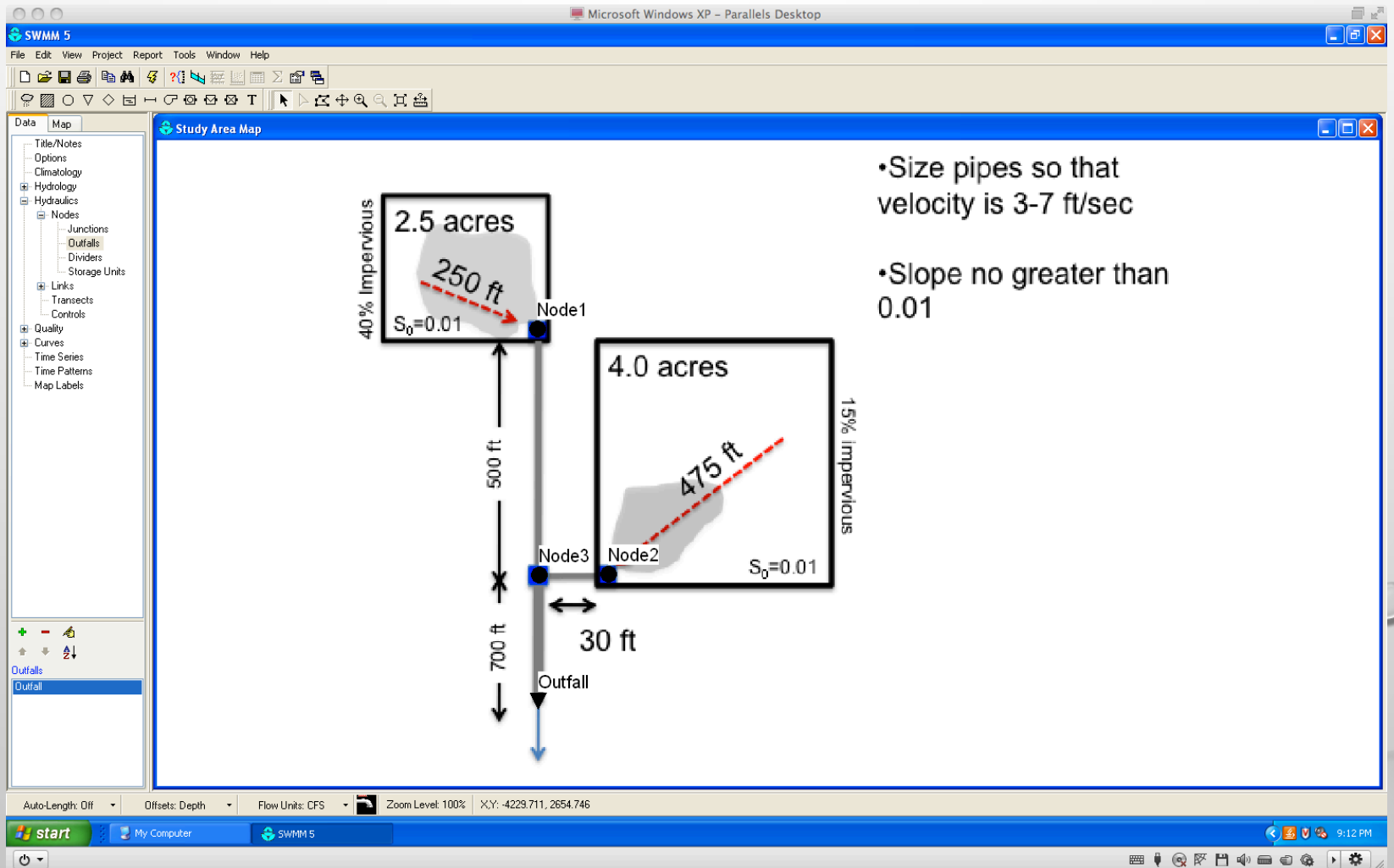
SWMM AS HYDROLOGIC MODEL

- LOAD THE PICTURE INTO SWMM



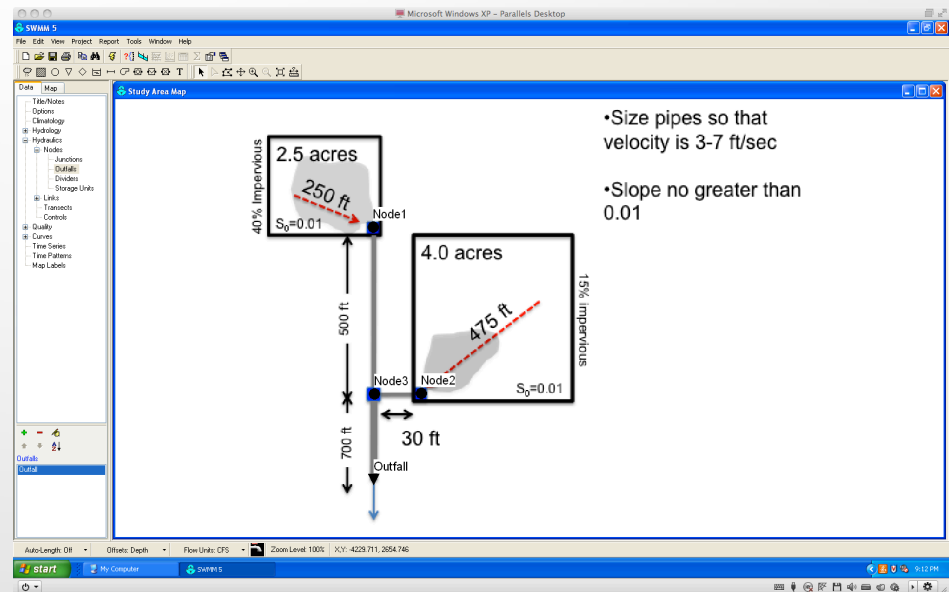
SWMM AS HYDROLOGIC MODEL

- 3 NODES + OUTFALL



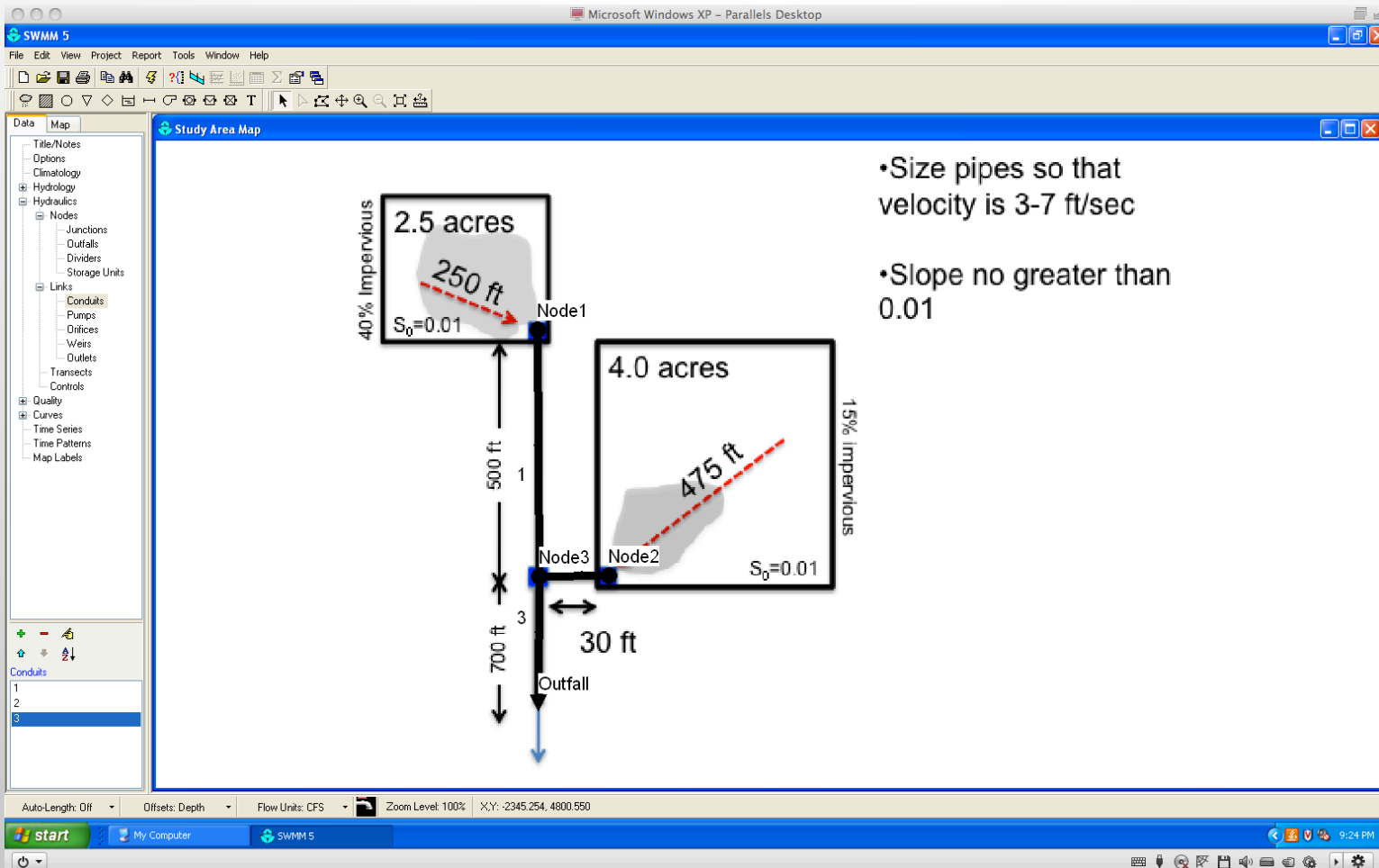
SWMM AS HYDROLOGIC MODEL

- INVERT ELEVATIONS
 - (EXAMPLE, THESE WOULD BE DESIGN VALUES, EXCEPT FOR OUTFALL, ADJUST TO GET VELOCITY)
 - OUTFALL = 0
 - NODE 3 = $700 * (0.01) = 7$ FT
 - OFFSET OF 2 FT
 - NODE 2 = $7 + 2 + 0.01(30) = 9.3$
 - NODE 1 = $7 + 2 + 0.01(500) = 14$



SWMM AS HYDROLOGIC MODEL

- 3 PIPES, 24" DIAMETER, CONCRETE (N=0.013)



SWMM AS HYDROLOGIC MODEL

- 2 SUB-CATCHMENTS

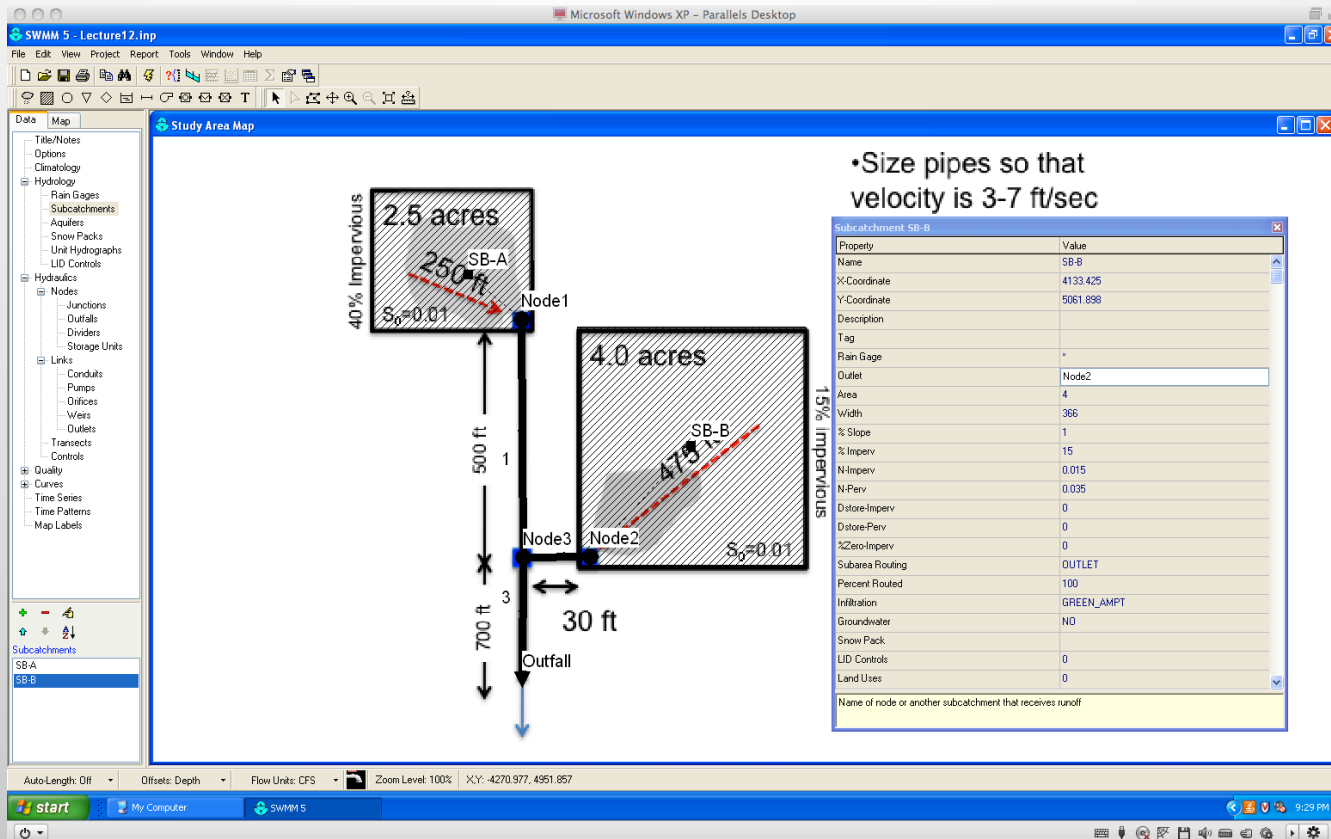
The screenshot displays the SWMM 5 software interface. The main window shows a 'Study Area Map' with two subcatchments, SB-A and SB-B, connected by a pipe network. SB-A is a 2.5-acre area with 40% imperviousness and a slope of $S_0 = 0.01$. SB-B is a 4.0-acre area with 15% imperviousness and a slope of $S_0 = 0.01$. The pipe network starts at Node 1 (located at the bottom of SB-A), goes down 500 ft to Node 3, then right 30 ft to Node 2 (located at the bottom of SB-B), and finally down 700 ft to an 'Outfall'. The pipe between Node 1 and Node 3 is labeled '1', and the pipe between Node 3 and Node 2 is labeled '3'. A text box on the right side of the map reads: "•Size pipes so that velocity is 3-7 ft/sec".

A 'Subcatchment: SB-B' property window is open, showing the following details:

Property	Value
Name	SB-B
X-Coordinate	4133.425
Y-Coordinate	5061.898
Description	
Tag	
Rain Gage	*
Outlet	Node2
Area	4
Width	366
% Slope	1
% Imperv	15
N-Imperv	0.015
N-Perv	0.035
Dstore-Imperv	0
Dstore-Perv	0
%Zero-Imperv	0
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Name of node or another subcatchment that receives runoff	

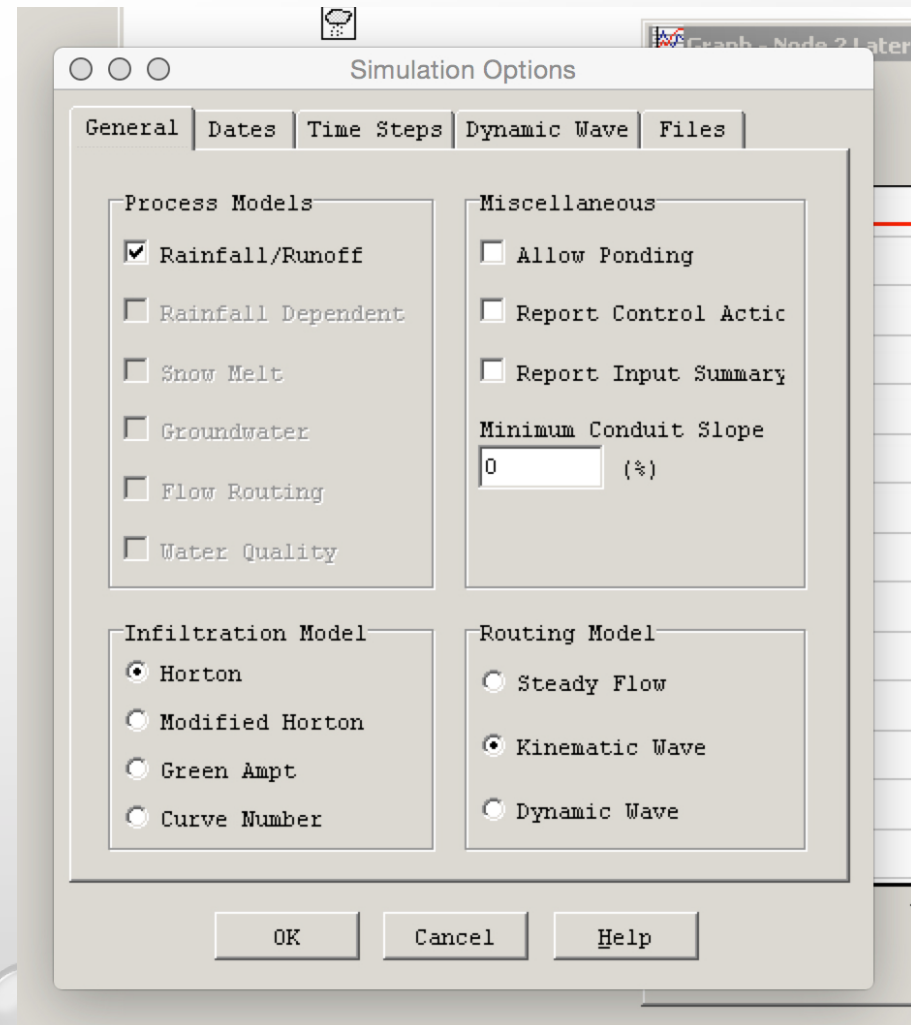
SWMM AS HYDROLOGIC MODEL

- CHOOSE A RUNOFF GENERATION MECHANISM!
 - FOR THIS SCALE RATIONAL IS LOGICAL, BUT NOT PART OF SWMM – NEED A HACK!



HACKING RATIONAL METHOD IN SWMM

- RUNOFF GENERATION
 - NO EXPLICIT RATIONAL METHOD FOR RUNOFF GENERATION
 - HORTON, GREEN-AMPT, AND CN.



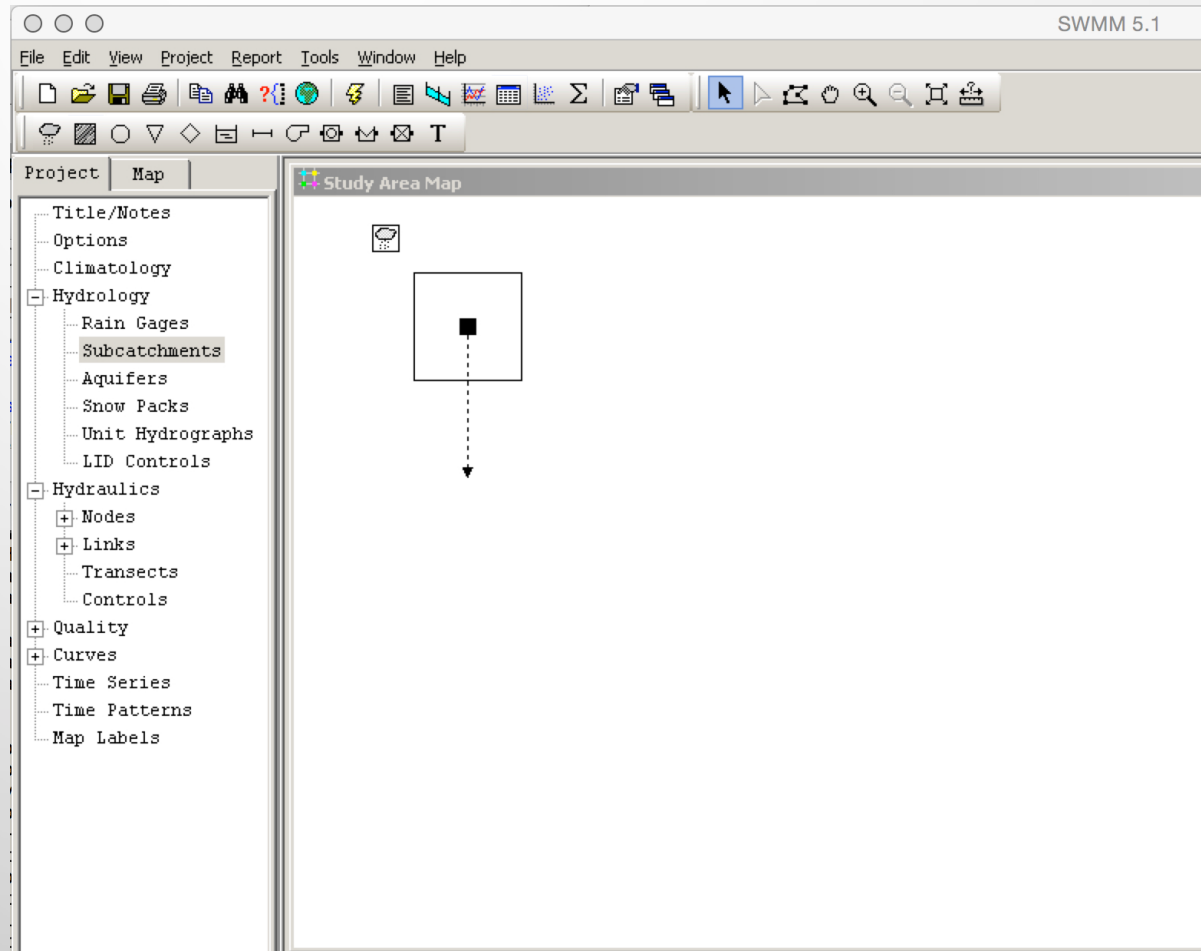
HACKING RATIONAL METHOD IN SWMM

- SUPPOSE WE WANT TO SIMULATE A 10.9 ACRE DRAINAGE AREA, WITH TC =49 MINUTES, AND C=0.32 AND APPLIED RAIN DEPTH IS 0.87 INCHES.
 - $I = 0.87\text{INCHES}/49\text{MIN} \times 60 \text{ MIN}/\text{HR} = 1.06 \text{ IN}/\text{HR}$
 - $QP = (0.32)(1.06)(10.9) = 3.7 \text{ CFS}$

HACKING RATIONAL METHOD IN SWMM

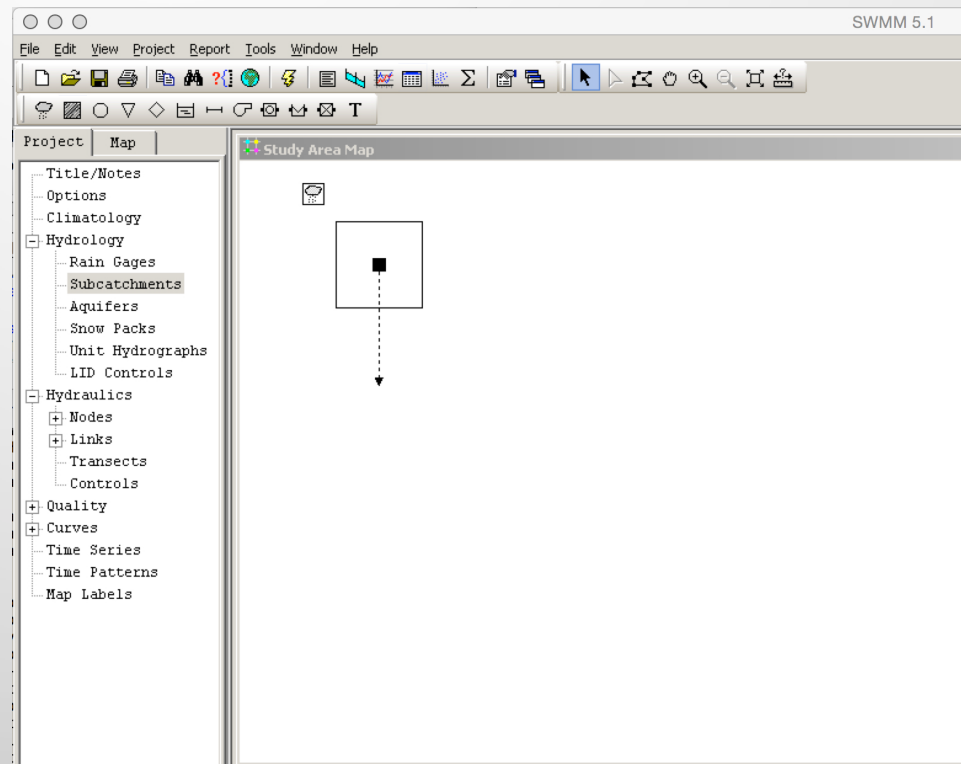
- EQUIVALENT SWMM MODEL:

- RAINGAGE
- CATCHMENT
- OUTLET



HACKING A RATIONAL METHOD IN SWMM

- EQUIVALENT SWMM MODEL:
 - RAINGAGE → CONSTANT INTENSITY OF 1.06 IN.HR
 - CATCHMENT → AREA = 10.9 ACRES
 - OUTLET



HACKING A RATIONAL METHOD IN SWMM

- RAINGAGE → CONSTANT INTENSITY OF 1.06 IN/HR

The screenshot displays the SWMM 5.1 interface with three main windows open:

- Property Window (Rain Gage 1):** Shows configuration for a rain gage named '1'. Key settings include:
 - Name: 1
 - X-Coordinate: -2153.680
 - Y-Coordinate: 9437.229
 - Rain Format: INTENSITY
 - Time Interval: 1:00
 - Snow Catch Factor: 1.0
 - Data Source: TIMESERIES
 - TIME SERIES: 1-IN-AN-HOUR
 - DATA FILE: File Name (*), Station ID (*), Rain Units (IN)
- Time Series Editor:** Shows the configuration for the time series '1-IN-AN-HOUR'. The 'Enter time series data in the table below' checkbox is checked. The table contains the following data:

Date (M/D/Y)	Time (H:M)	Value
0		1.06
1		1.06
2		1.06
3		1.06
4		1.06
5		1.06
6		1.06
- Time Series Viewer:** A line graph titled 'Time Series 1-IN-AN-HOUR' showing a constant intensity of 1.06 over a 7-hour period. The y-axis is labeled from 0 to 1, and the x-axis is 'Elapsed Time (hours)' from 0 to 7.

HACKING RATIONAL METHOD IN SWMM

- CATCHMENT → SET SIZE, SET TO 100% IMPERVIOUS

- RUN TO ADJUST WIDTH & SLOPE

- ARRIVAL TIME OF QP AT 50 MINUTES
- QP = 11.65 CFS (C=1)

The screenshot displays the SWMM 5.1 software interface. The main window shows the 'Subcatchment 1' properties, including Name (1), X-Coordinate (-1092.336), Y-Coordinate (8287.584), Area (10.9), Width (500), Slope (0.5), and various infiltration and routing parameters. A blue arrow points from the 'Width' property to the 'Width' field. Another blue arrow points from the 'Slope' property to the 'Slope' field. A third blue arrow points from the 'Subarea Routing' property to the 'OUTLET' value. The 'Table - Subcatch Runoff' window shows a runoff hydrograph with columns for Days, Hours, and Subcatch 1. The peak flow rate (QP) is highlighted in blue at 11.65 CFS at 01:05:00. The status bar at the bottom shows 'Flow Units: CFS', 'Zoom Level: 100%', and 'X,Y: 1503.067, 4335.378'.

Days	Hours	Subcatch 1
0	00:05:00	1.36
0	00:10:00	3.69
0	00:15:00	5.98
0	00:20:00	7.81
0	00:25:00	9.14
0	00:30:00	10.04
0	00:35:00	10.63
0	00:40:00	11.01
0	00:45:00	11.25
0	00:50:00	11.40
0	00:55:00	11.50
0	01:00:00	11.56
0	01:05:00	11.59
0	01:10:00	11.61
0	01:15:00	11.63
0	01:20:00	11.64
0	01:25:00	11.64
0	01:30:00	11.65
0	01:35:00	11.65
0	01:40:00	11.65
0	01:45:00	11.65
0	01:50:00	11.65

HACKING A RATIONAL METHOD IN SWMM

- CATCHMENT → SET SIZE, SET TO 100% IMPERVIOUS

- WIDTH = 1500
 - ARRIVAL TIME OF QP AT 50 MINUTES
- QP = 11.65 CFS (C=1)

The screenshot displays the 'Subcatchment 1' properties window in SWMM. The 'Width' property is set to 1500, indicated by a blue arrow. The 'Imperv' property is set to 100. The 'Table - Subcatch Runoff' window shows a table of runoff data for Subcatchment 1, with a blue arrow pointing to the row where the arrival time is 00:50:00 and the runoff is 11.65 CFS.

Property	Value
Name	1
X-Coordinate	-1092.336
Y-Coordinate	8287.584
Description	
Tag	
Rain Gage	1
Outlet	2
Area	10.9
Width	1500
% Slope	0.5
% Imperv	100
N-Imperv	0.01
N-Perv	0.1
Store-Imperv	0
Store-Perv	0
%Zero-Imperv	0
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	HORTON
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0
Initial Buildup	NONE
Curb Length	0
Width of overland flow path (ft)	

Days	Hours	Subcatch 1
0	00:05:00	3.53
0	00:10:00	7.60
0	00:15:00	9.89
0	00:20:00	10.93
0	00:25:00	11.36
0	00:30:00	11.54
0	00:35:00	11.61
0	00:40:00	11.63
0	00:45:00	11.64
0	00:50:00	11.65
0	00:55:00	11.65
0	01:00:00	11.65
0	01:05:00	11.65
0	01:10:00	11.65
0	01:15:00	11.65
0	01:20:00	11.65
0	01:25:00	11.65
0	01:30:00	11.65
0	01:35:00	11.65
0	01:40:00	11.65
0	01:45:00	11.65
0	01:50:00	11.65

HACKING A RATIONAL METHOD IN SWMM

- CATCHMENT → ADJUST
- INFILTRATION RATES TO BE LARGE
- SET %IMPERVIOUS = RUNOFF COEFFICIENT, C

The screenshot displays the SWMM 5.1 interface. The 'Subcatchment 1' properties window is open, showing various parameters. The 'Infiltration Editor' dialog is also open, showing the 'HORTON' method with 'Max. Infil. Rate' set to 10 and 'Min. Infil. Rate' set to 3.0. A runoff hydrograph table is visible in the background, showing runoff volume over time for Subcatchment 1. Annotations highlight the 'Max. Infil. Rate' and 'Min. Infil. Rate' values in the Infiltration Editor, and the 'Correct Qp' value in the hydrograph table. A text box explains that the rational method is being hacked by setting Q=CiA.

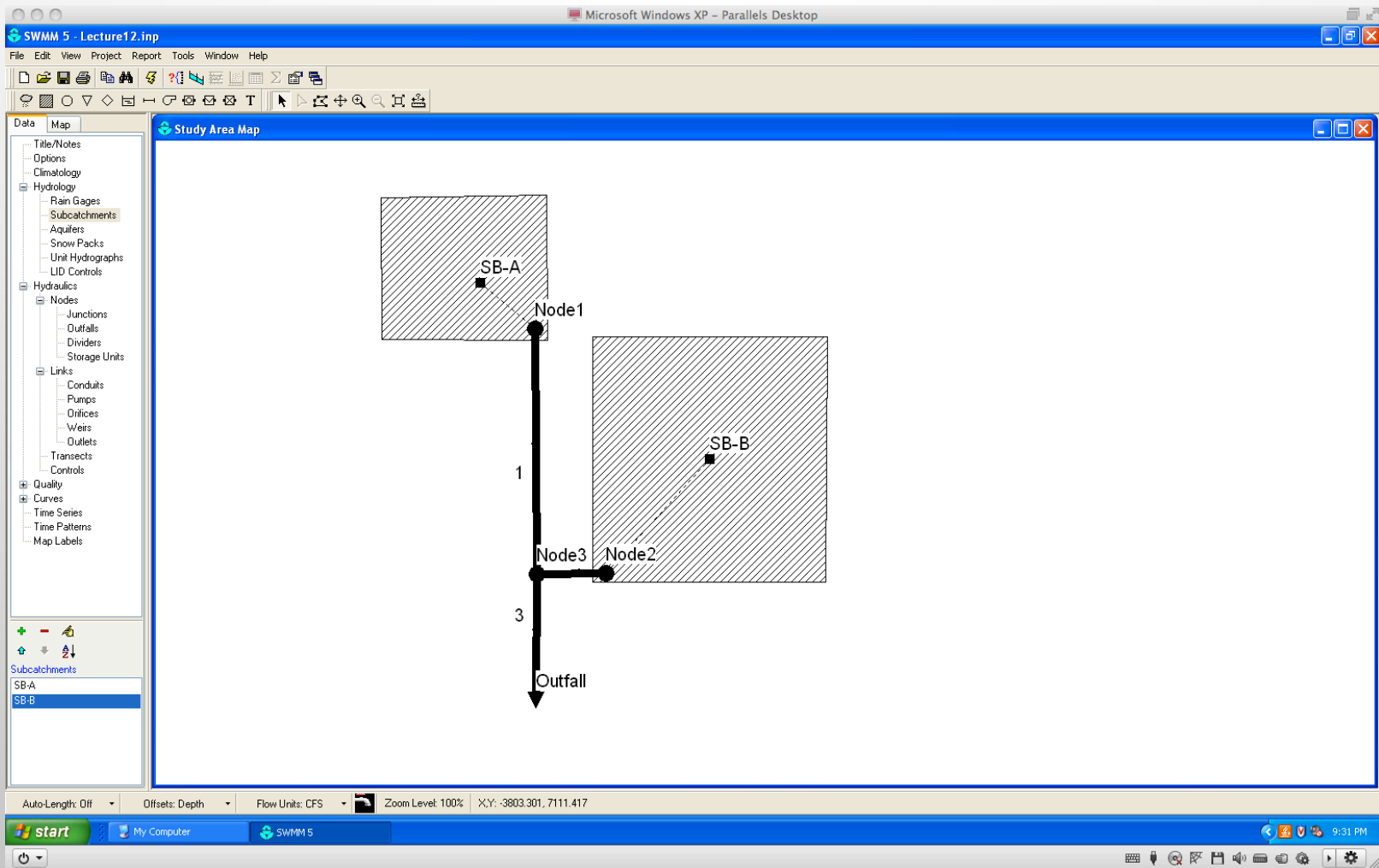
Days	Hours	Subcatch 1
0	00:00:00	2.41
0	00:10:00	3.49
0	00:20:00	3.69
0	00:25:00	3.73
0	00:30:00	3.73
0	00:35:00	3.73
0	00:40:00	3.73
0	00:45:00	3.73
0	00:50:00	3.73
0	00:55:00	3.73
0	01:00:00	3.73
0	01:05:00	3.73
0	01:10:00	3.73
0	01:15:00	3.73
0	01:20:00	3.73
0	01:30:00	3.73
0	01:35:00	3.73
0	01:40:00	3.73
0	01:45:00	3.73
0	01:50:00	3.73

Max and Min > 1.06 in/hr
Ensures all rain on pervious will infiltrate

Correct Qp
May want to adjust width once more to get timing about right - Just hacked Q=CiA into SWMM!

SWMM AS HYDROLOGIC MODEL

- SUPPRESS BACKGROUND, CHECK LAYOUT



SWMM AS HYDROLOGIC MODEL

• INSERT A RAINGAGE

The screenshot displays the SWMM 5 software interface. The 'Rain Gage Raingage' dialog box is open, showing the following properties:

Property	Value
Name	Raingage
X-Coordinate	4367.263
Y-Coordinate	8940.853
Description	
Tag	
Rain Format	CUMULATIVE
Time Interval	1:00
Snow Catch Factor	1.0
Data Source	TIMESERIES
TIME SERIES:	
- Series Name	TestSeries
DATA FILE:	
- File Name	*
- Station ID	*
- Rain Units	IN

The 'Time Series Editor' dialog box is also open, showing a table of time series data for 'TestSeries':

Date (M/D/Y)	Time (H:M)	Value
	0	0
	0.25	.2
	0.5	.8
	0.75	1
	1.0	1.1
	1.25	1.2
	1.5	1.2
	1.75	1.2
	2	1.7

The 'Time Series Viewer' dialog box is also open, showing a line graph of the time series data. The graph plots 'Value' (Y-axis, 0 to 2) against 'Elapsed Time (hours)' (X-axis, 0 to 2). The data points are: (0, 0), (0.25, 0.2), (0.5, 0.8), (0.75, 1), (1.0, 1.1), (1.25, 1.2), (1.5, 1.2), (1.75, 1.2), (2, 1.7).

SWMM AS HYDROLOGIC MODEL

- APPLY THE RAINGAGE TO THE SUB-CATCMENTS

The screenshot displays the SWMM 5 software interface. The main window shows a 'Study Area Map' with two subcatchments, SB-A and SB-B, represented by hatched areas. A rain gage is located above the map. A network of nodes and conduits is shown: Node1 is at the top, connected to Node3 by a vertical conduit labeled '1'. Node3 is connected to Node2 by a horizontal conduit labeled '3'. Node2 is connected to an 'Outfall' by a vertical conduit labeled '3'. The 'Rain gage' is positioned above the map.

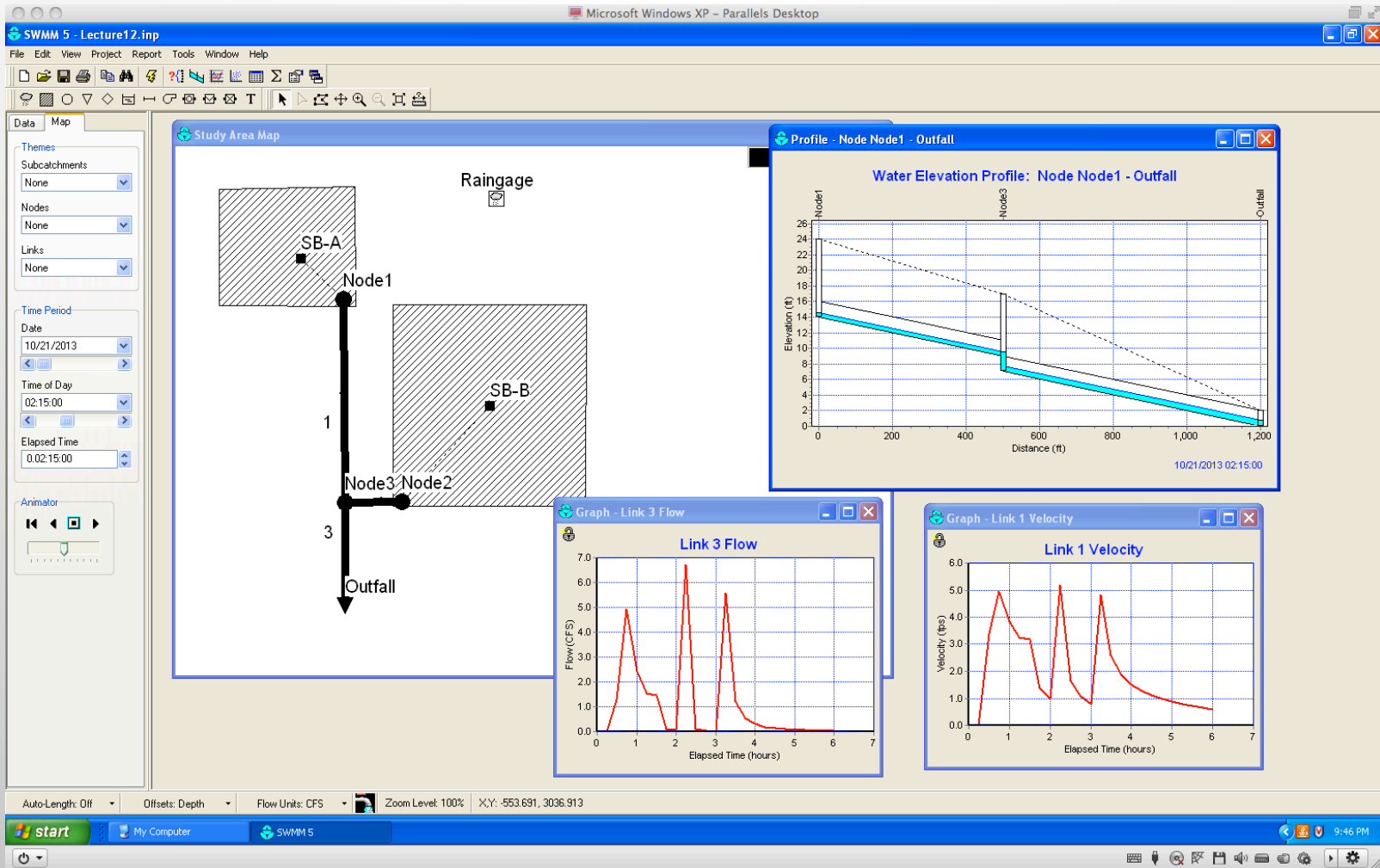
On the right side, the 'Subcatchment SB-B' properties window is open, showing the following table:

Property	Value
Name	SB-B
X-Coordinate	4160.935
Y-Coordinate	5089.409
Description	
Tag	
Rain Gage	Raingage
Outlet	Node2
Area	4
Width	366
% Slope	1
% Imperv	15
N-Imperv	0.015
N-Perv	0.035
Dstore-Imperv	0
Dstore-Perv	0
%Zero-Imperv	0
Subarea Routing	OUTLET
Percent Routed	100
Infiltration	GREEN_AMPT
Groundwater	NO
Snow Pack	
LID Controls	0
Land Uses	0

At the bottom of the properties window, a yellow message box states: 'Rain gage assigned to subcatchment'.

SWMM AS HYDROLOGIC MODEL

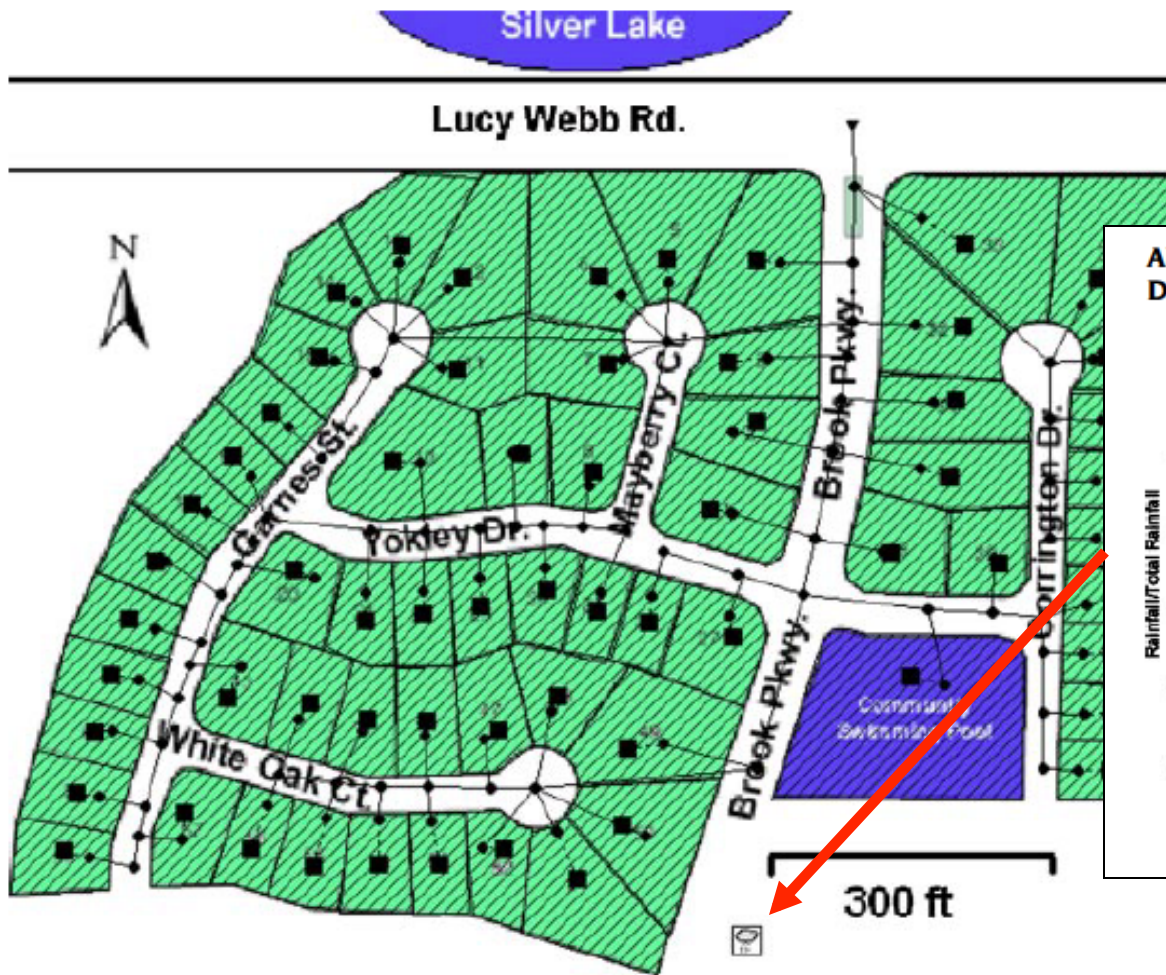
- SET THE TIME WINDOW, AND RUN THE MODEL



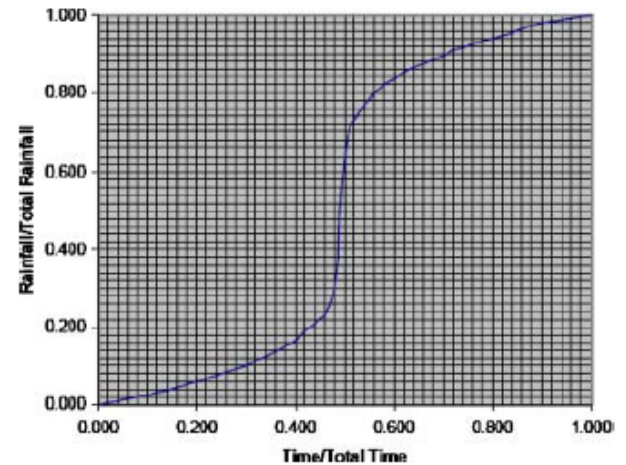
SWMM AS HYDROLOGIC MODEL

- FOR LARGER SCALE (LOTS OF SMALL CATCHMENTS) THERE WILL BE A DESIRE TO USE SCS STORMS OR EVEN HISTORICAL EVENTS TO EVALUATE THE DESIGN.
- THE NEXT EXAMPLE ILLUSTRATES HOW TO USE HEC-HMS AS A TOOL TO GENERATE RAINFALL FOR USE IN SWMM.

SWMM AS HYDROLOGIC MODEL



APPENDIX 4: SCS TYPE II STORM DISTRIBUTION



SWMM AS HYDROLOGIC MODEL

- ASSIGN A STORM TO A RAINGAGE
 - SUPPOSE INSTRUCTED TO USE SCS-TYPE II STORM AND PARAMETERIZE FOR SAN ANTONIO, TEXAS
 - SCS STORMS ARE BUILT-IN TO HEC-HMS, SO TAKE ADVANTAGE OF THAT TO GENERATE A RAINFALL TIME SERIES FOR SWMM

SWMM AS HYDROLOGIC MODEL

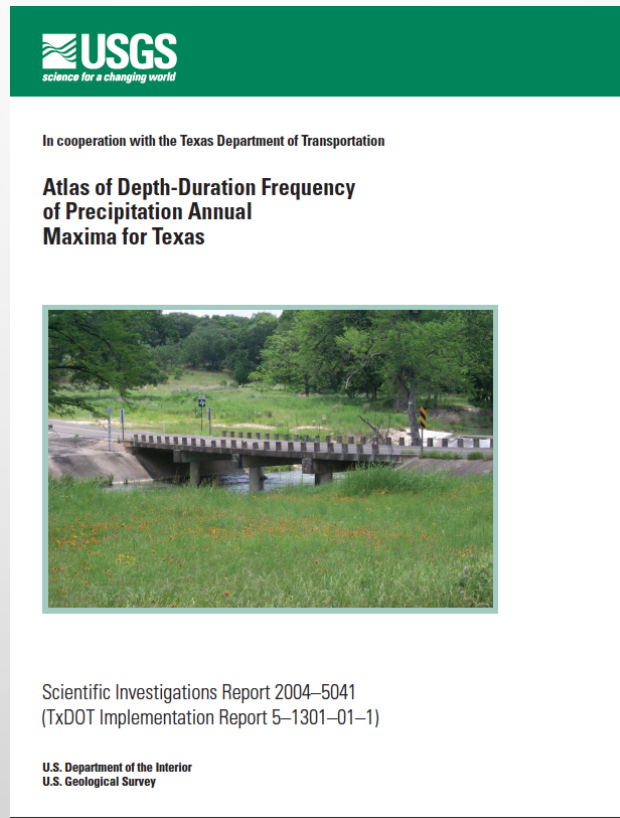
- HOW TO GENERATE SCS TYPE STORMS
 - SELECT ANNUAL EXCEEDANCE PROBABILITY (AEP) OR ANNUAL RECURRENCE INTERVAL (ARI)
 - LOOK UP 24 HOUR DEPTH FOR THE ARI AND LOCATION
 - GENERATE 24 HOUR STORM USING SCS TABULATIONS OR HEC-HMS
 - PUT THE TIME SERIES INTO SWMM AND RUN THE HYDRAULICS

SWMM AS HYDROLOGIC MODEL

- HOW TO GENERATE SCS TYPE STORMS
 - SELECT ANNUAL EXCEEDANCE PROBABILITY (AEP) OR ANNUAL RECURRENCE INTERVAL (ARI)
 - GIVEN IN THE PROJECT STATEMENT, A 10% CHANCE AEP OR 10-YEAR ARI (SAME PROBABILITY) IS SPECIFIED.

SWMM AS HYDROLOGIC MODEL

- HOW TO GENERATE SCS TYPE STORMS
 - LOOK UP 24 HOUR STORM DEPTH FOR THE AEP/ARI AND LOCATION



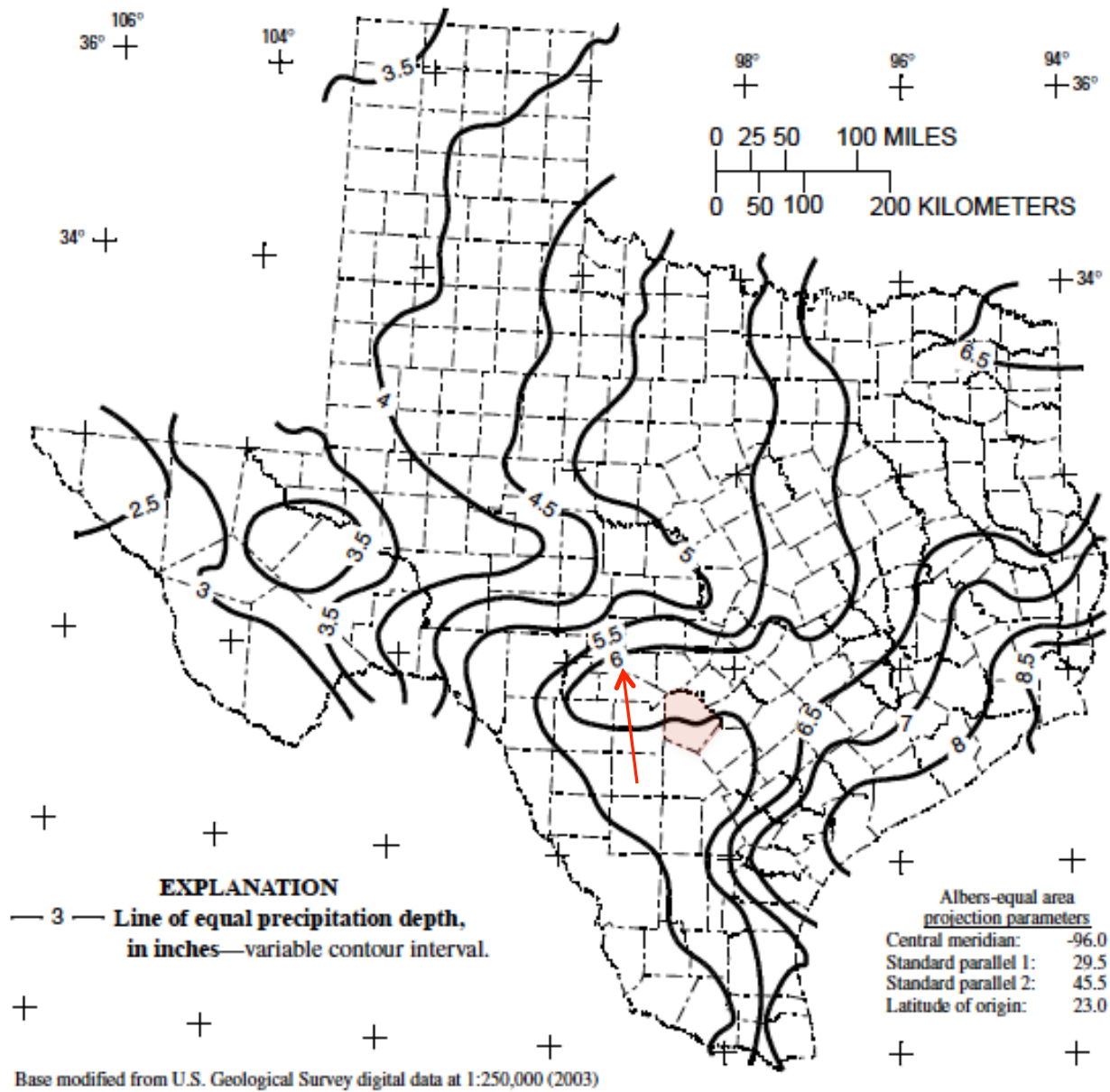


Figure 35. Depth of precipitation for 10-year storm for 1-day duration in Texas.

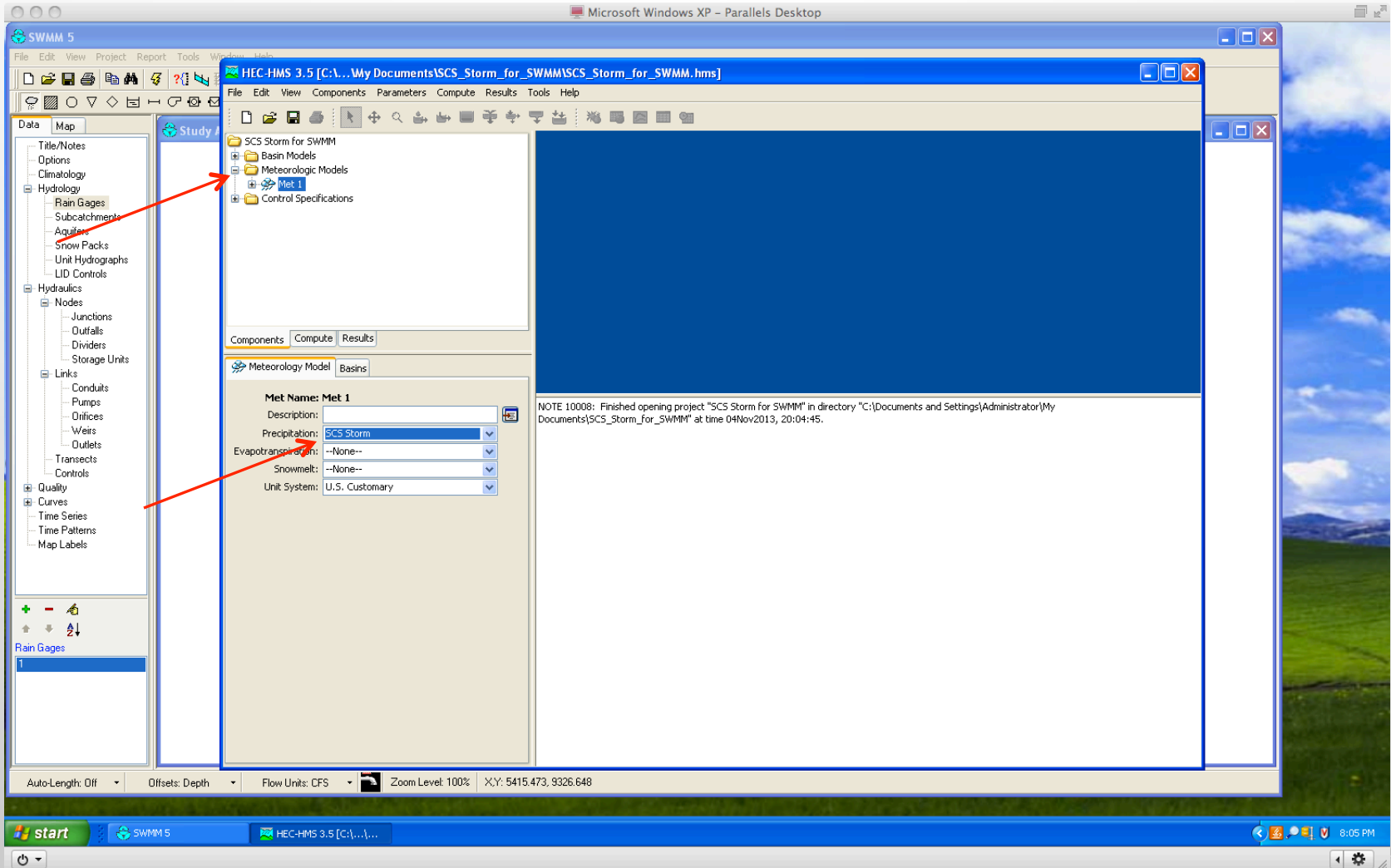
SWMM AS HYDROLOGIC MODEL

- HOW TO GENERATE SCS TYPE STORMS
 - SELECT ANNUAL EXCEEDANCE PROBABILITY (AEP) OR ANNUAL RECURRENCE INTERVAL (ARI)
 - LOOK UP 24 HOUR DEPTH FOR THE ARI AND LOCATION
 - 6 INCHES FOR BEXAR COUNTY, TX

SWMM AS HYDROLOGIC MODEL

- HOW TO GENERATE SCS TYPE STORMS
 - GENERATE 24 HOUR STORM USING SCS TABULATIONS OR HEC-HMS
 - GET THE SWMM MODEL BUILT
 - OPEN HMS AND GENERATE A SCS STORM FROM THE METEOROLOGICAL MODEL

BUILD A MINIMAL HEC MODEL



BUILD A MINIMAL HEC MODEL

The screenshot displays the HEC-HMS 3.5 software interface within a Microsoft Windows XP Parallels Desktop environment. The main window is titled "HEC-HMS 3.5 [C:\...My Documents\SCS_Storm_for_SWMM\SCS_Storm_for_SWMM.hms]".

The interface is divided into several panes:

- Left Pane (Data Map):** A tree view showing the project structure. The "Rain Gages" folder is expanded, and "1" is selected. A red arrow points from this folder to the "SCS Storm" component in the main pane.
- Main Pane (Components):** A tree view showing the project components. The "SCS Storm" component is selected. A red arrow points from this component to the "Depth (IN)" input field in the "Precipitation" tab.
- Right Pane (Results):** A large blue area displaying a message: "NOTE 10008: Finished opening project 'SCS Storm for SWMM' in directory 'C:\Documents and Settings\Administrator\My Documents\SCS_Storm_for_SWMM' at time 04Nov2013, 20:04:45."

The "Precipitation" tab is active, showing the following settings:

- Met Name: Met 1
- Method: Type 2
- *Depth (IN): 6

The bottom status bar shows "Auto-Length: Off", "Offsets: Depth", "Flow Units: CFS", "Zoom Level: 100%", and "X,Y: -3624.642, 9670.487". The Windows taskbar at the bottom shows the Start button, the SWMM 5 application icon, and the HEC-HMS 3.5 application icon. The system tray on the right shows the time as 8:07 PM.

BUILD A MINIMAL HEC MODEL

The screenshot displays the HEC-HMS 3.5 software interface. The main window title is "HEC-HMS 3.5 [C:\...My Documents\SCS_Storm_for_SWMM\SCS_Storm_for_SWMM.hms]". The menu bar includes File, Edit, View, Components, Parameters, Compute, Results, Tools, and Help. The toolbar contains various icons for file operations and simulation control.

The left sidebar shows a project tree with the following structure:

- SCS Storm for SWMM
 - Basin Models
 - Basin 1
 - Subbasin-1
 - Meteorologic Models
 - Control Specifications
 - Control 1

Below the tree, the "Components" tab is active, showing a "Subbasin" element. The "Options" tab for "Subbasin" is selected, displaying the following configuration:

- Basin Name: Basin 1
- Element Name: Subbasin-1
- Description: [Empty text box]
- Downstream: --None--
- *Area (MI2): 1
- Canopy Method: --None--
- Surface Method: --None--
- Loss Method: --None--
- Transform Method: --None--
- Baseflow Method: --None--

The main workspace shows a "Basin Model [Basin 1] Current Run [Run 1]" view with a single "Subbasin-1" element represented by a blue icon with a water drop and a plus sign.

The bottom status bar displays the following log messages:

```
NOTE 10008: Finished opening project "SCS Storm for SWMM" in directory "C:\Documents and Settings\Administrator\My Documents\SCS_Storm_for_SWMM" at time 04Nov2013, 20:04:45.  
NOTE 10184: Began computing simulation run "Run 1" at time 04Nov2013, 20:09:39.  
NOTE 10171: Meteorologic model "Met 1" was not computed. No meteorology data required to compute selected elements in basin model "Basin 1".  
NOTE 40039: The basin model contains no elements to compute.  
NOTE 10185: Finished computing simulation run "Run 1" at time 04Nov2013, 20:09:39.  
NOTE 10184: Began computing simulation run "Run 1" at time 04Nov2013, 20:10:06.  
NOTE 20364: Found no parameter problems in meteorologic model "Met 1".  
NOTE 40049: Found no parameter problems in basin model "Basin 1".  
NOTE 10185: Finished computing simulation run "Run 1" at time 04Nov2013, 20:10:06.
```

RUN THE HEC MODEL

SWMM\SCS_Storm_for_SWMM.hms]

Tools Help

Time-Series Results for Subbasin "Subbasin-1"

Project: SCS Storm for SWMM
Simulation Run: Run 1 Subbasin: Subbasin-1

Start of Run: 03 Nov 2013, 00:00 Basin Model: Basin 1
End of Run: 04 Nov 2013, 01:00 Meteorologic Model: Met 1
Compute Time: 04 Nov 2013, 20:10:06 Control Specifications: Control 1

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Dirac... (CFS)	Base... (CFS)	Total... (CFS)
03Nov2013	00:00				0.0	0.0	0.0
03Nov2013	01:00	0.06	0.00	0.06	40.7	0.0	40.7
03Nov2013	02:00	0.07	0.00	0.07	44.5	0.0	44.5
03Nov2013	03:00	0.08	0.00	0.08	48.4	0.0	48.4
03Nov2013	04:00	0.08	0.00	0.08	52.3	0.0	52.3
03Nov2013	05:00	0.09	0.00	0.09	58.1	0.0	58.1
03Nov2013	06:00	0.10	0.00	0.10	65.8	0.0	65.8
03Nov2013	07:00	0.11	0.00	0.11	73.6	0.0	73.6
03Nov2013	08:00	0.13	0.00	0.13	81.3	0.0	81.3
03Nov2013	09:00	0.16	0.00	0.16	104.5	0.0	104.5
03Nov2013	10:00	0.20	0.00	0.20	131.6	0.0	131.6
03Nov2013	11:00	0.32	0.00	0.32	209.1	0.0	209.1
03Nov2013	12:00	2.57	0.00	2.57	1657.2	0.0	1657.2
03Nov2013	13:00	0.65	0.00	0.65	422.0	0.0	422.0
03Nov2013	14:00	0.29	0.00	0.29	185.9	0.0	185.9
03Nov2013	15:00	0.20	0.00	0.20	129.7	0.0	129.7
03Nov2013	16:00	0.16	0.00	0.16	102.6	0.0	102.6
03Nov2013	17:00	0.13	0.00	0.13	84.4	0.0	84.4
03Nov2013	18:00	0.12	0.00	0.12	74.3	0.0	74.3
03Nov2013	19:00	0.10	0.00	0.10	64.7	0.0	64.7
03Nov2013	20:00	0.09	0.00	0.09	55.4	0.0	55.4
03Nov2013	21:00	0.08	0.00	0.08	49.2	0.0	49.2
03Nov2013	22:00	0.07	0.00	0.07	47.6	0.0	47.6
03Nov2013	23:00	0.07	0.00	0.07	45.3	0.0	45.3
04Nov2013	00:00	0.07	0.00	0.07	43.8	0.0	43.8
04Nov2013	01:00	0.00	0.00	0.00	0.0	0.0	0.0

SWMM AS HYDROLOGIC MODEL

- NOW HAVE SCS TYPE II IN HEC-HMS, ONLY AFTER THE TWO COLUMNS IN THE TIME SERIES
- NOW GO TO THE SWMM MODEL AND BUILD A RAINGAGE TO ACCEPT THE TIME SERIES

SWMM RAINGAGE

The screenshot displays the SWMM 5 software interface. The main window is titled "Study Area Map" and shows a tree view on the left with categories like Hydrology, Hydraulics, and Quality. The "Time Series Editor" dialog box is open, allowing configuration for a rain gage named "SCS_Type-II".

Time Series Editor

Time Series Name: SCS_Type-II

Description: [Empty text box]

Use external data file named below

Enter time series data in the table below
No dates means times are relative to start of simulation.

Date (M/D/Y)	Time (H:M)	Value

Buttons: View..., OK, Cancel, Help

Rain Gage 1

Property

Name

X-Coordinate

Y-Coordinate

Description

Tag

Rain Format

Time Interval

Snow Catch Factor

Data Source

TIME SERIES:

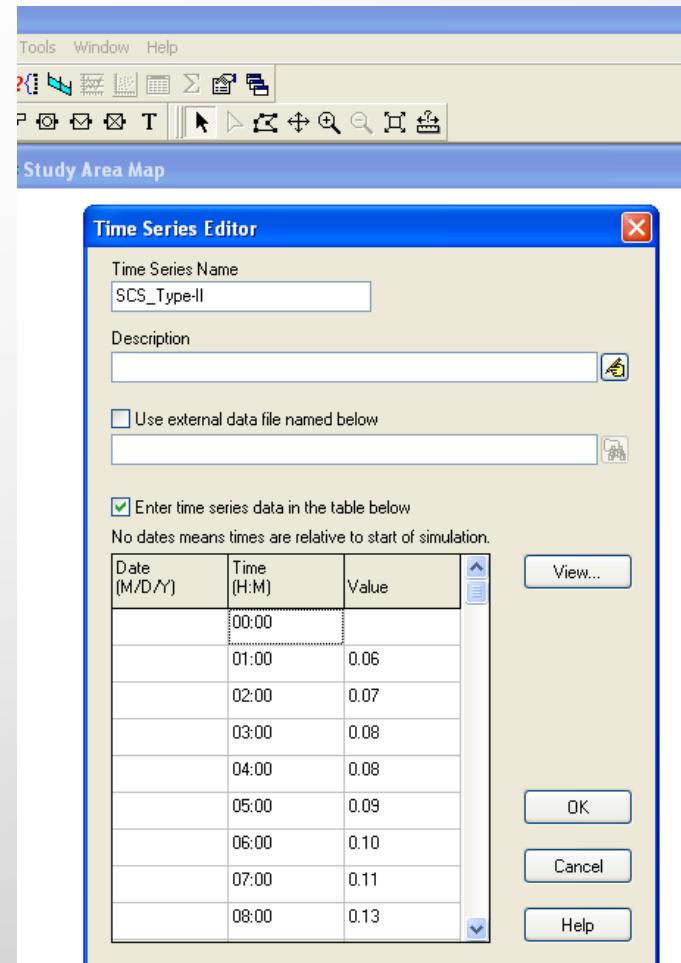
- Series Name

DATA FILE:

- File Name
- Station ID
- Rain Units

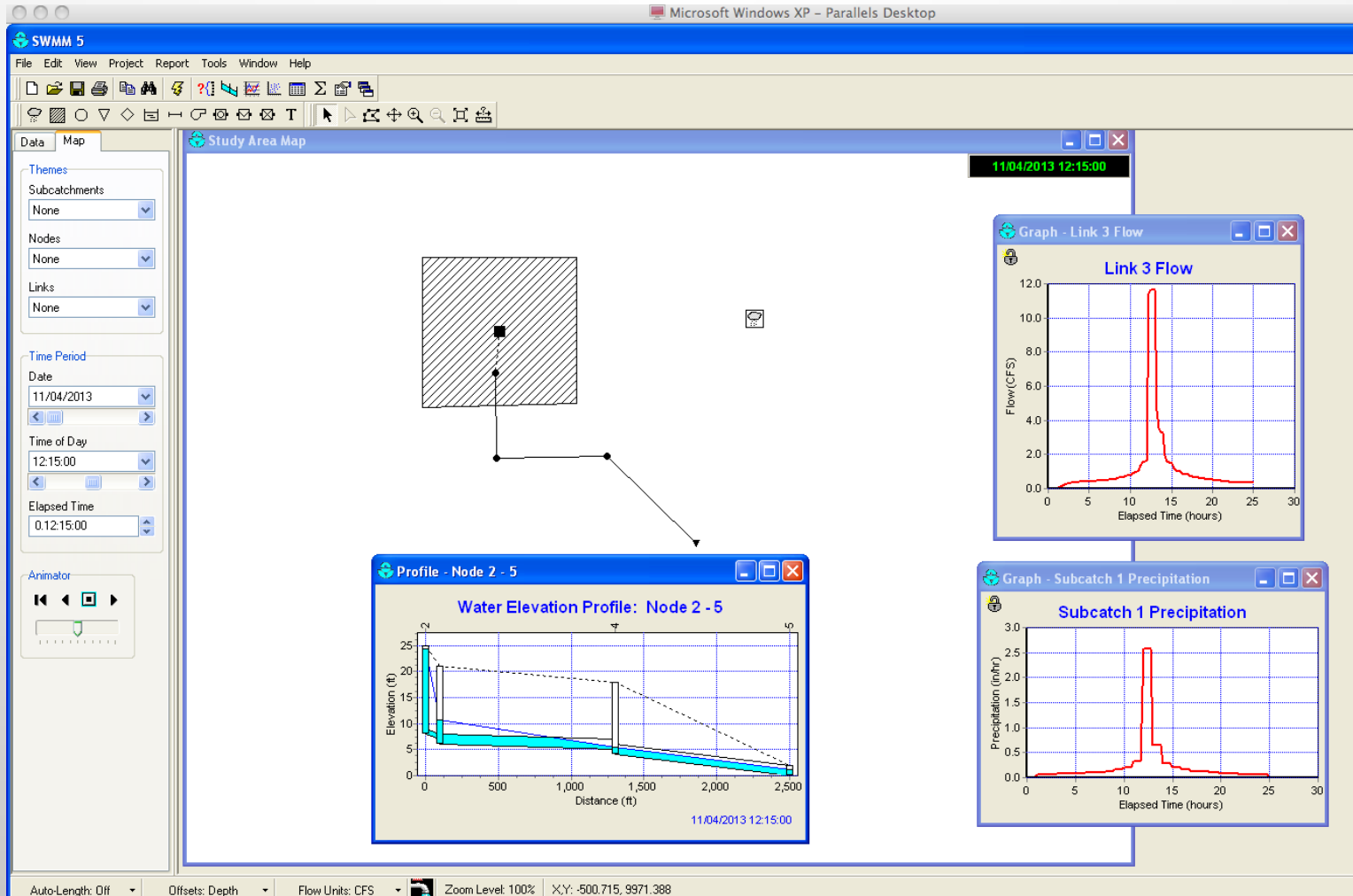
SWMM AS HYDROLOGIC MODEL

- NOW COPY-PASTE FROM HMS TO SWMM THE TWO COLUMNS
 - EDIT TO FIX THE FIRST VALUE
 - EDIT TO FIX THE 24TH AND 25TH HOURS
 - SET THE TIME WINDOW
 - RUN SWMM



SWMM AS HYDROLOGIC MODEL

- DONE! INTERPRET RESULTS



SWMM AS HYDROLOGIC MODEL

- SHOWED HOW TO USE HMS TO GENERATE SWMM INPUT.
- SWMM IS ALSO HANDY FOR GENERATING HMS INPUT
 - THE TIME ARITHMETIC IS MORE DEMANDING!

NEXT TIME

- CONDUITS IN SWMM
 - INVERT ELEVATIONS AND OFFSETS
 - DUAL DRAINAGE SYSTEMS