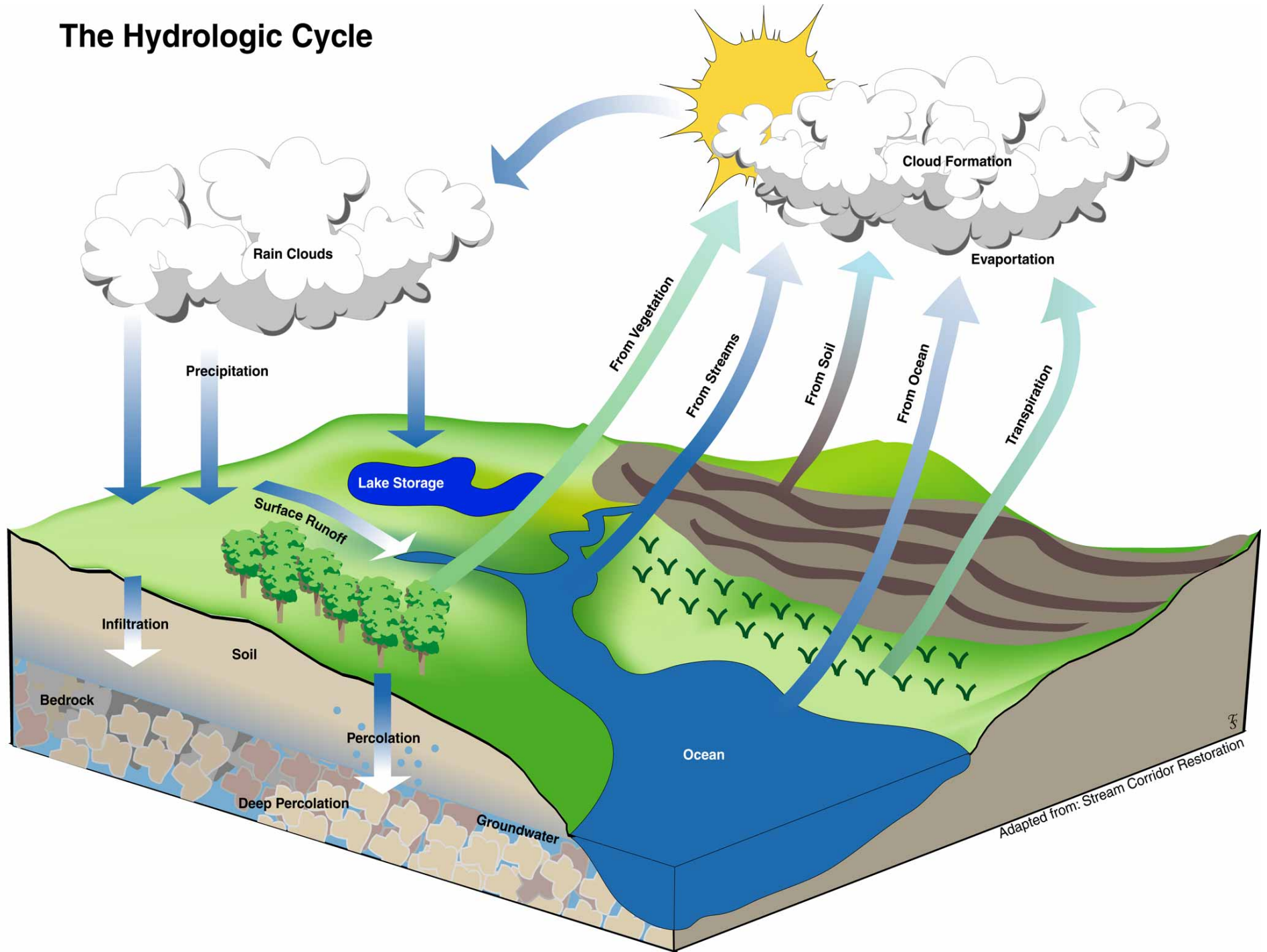


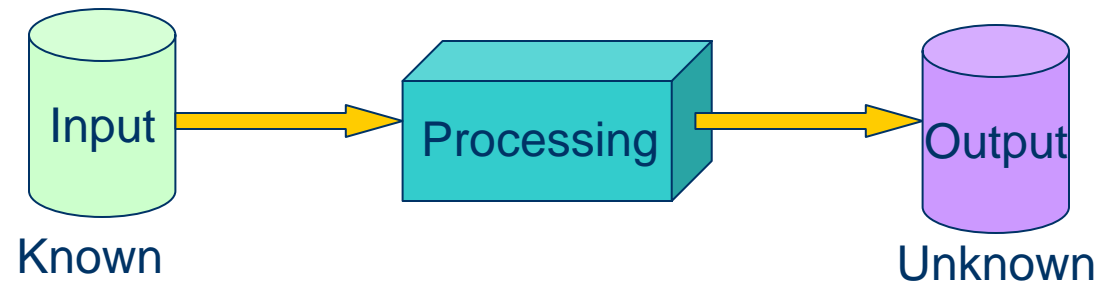


Hydrologic Modeling System HEC-HMS

The Hydrologic Cycle



Model !! What is it ?



Hydrologic Models

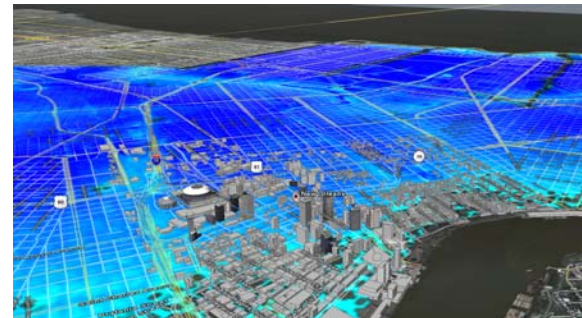


- *Analog Models: Uses electricity*
- *Physical Models: Constructed in Lab*



- *Numerical Models: Phenomenon described by the set of mathematical equations*

HEC-HMS is a numerical model



Model Categorization

- Continuous and Event based models

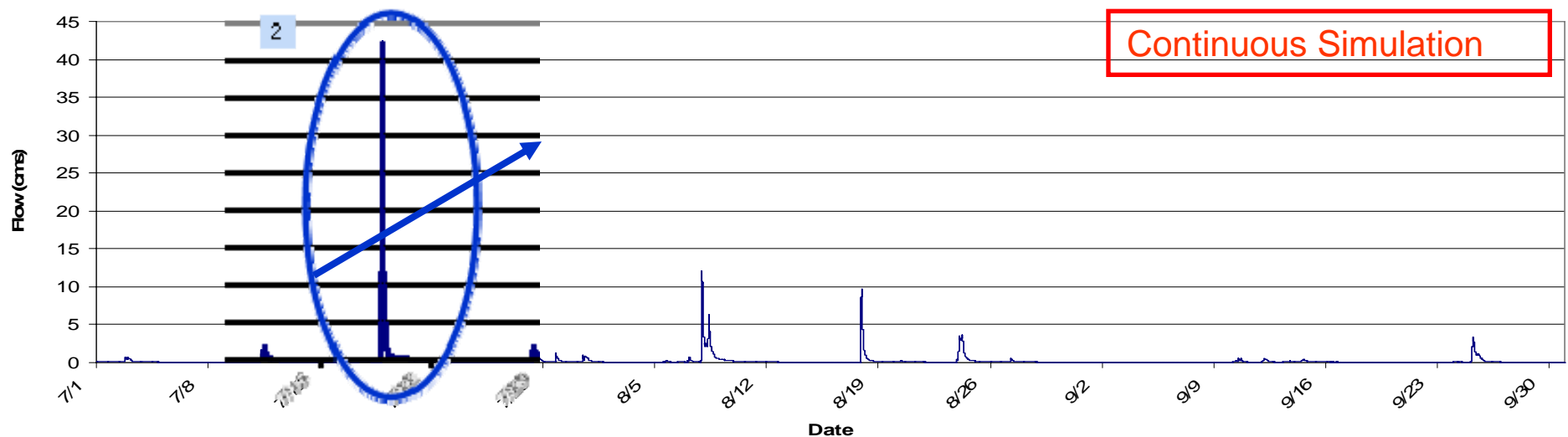
Continuous simulates long term response of the watershed

Event Simulation

And

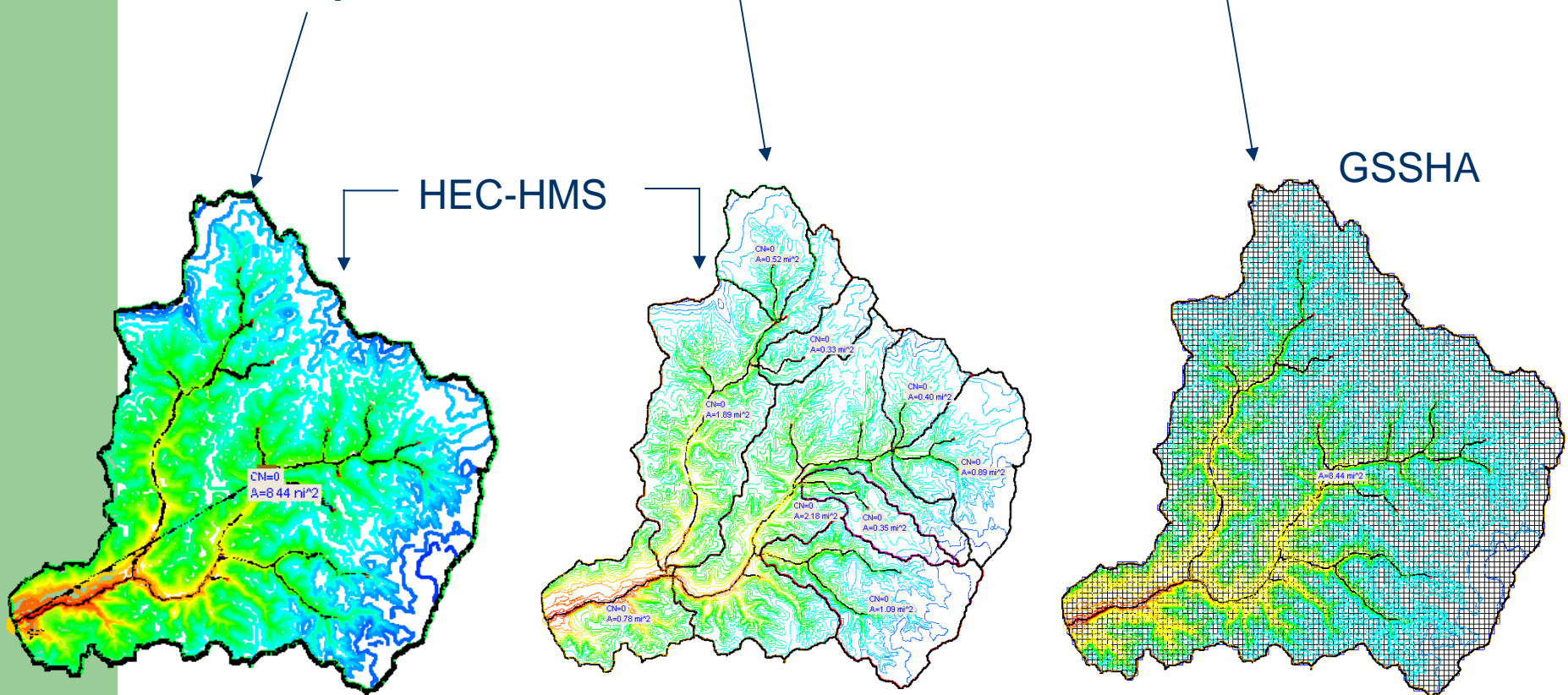
Event model simulates the response to each event

3 Month Recorded Flow



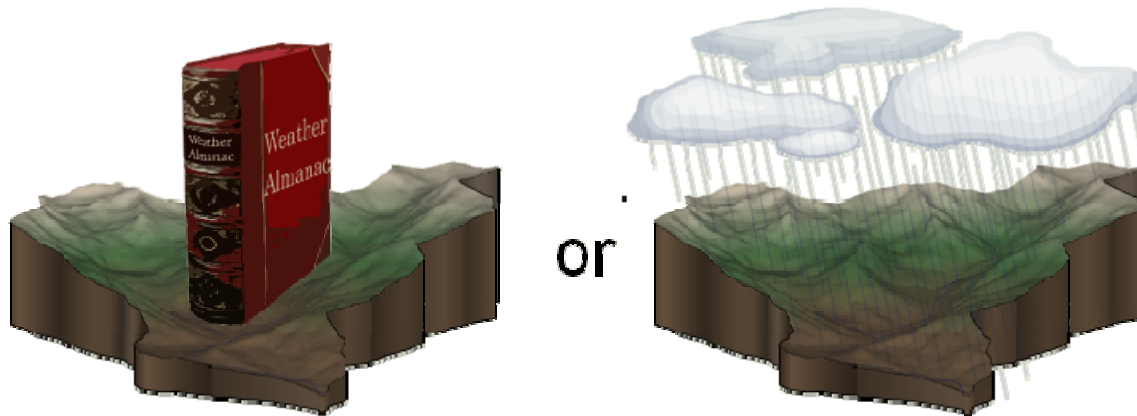
Model Categorization

- Lumped, Quasi-distributed and Distributed



Model Categorization

- Deterministic and Stochastic

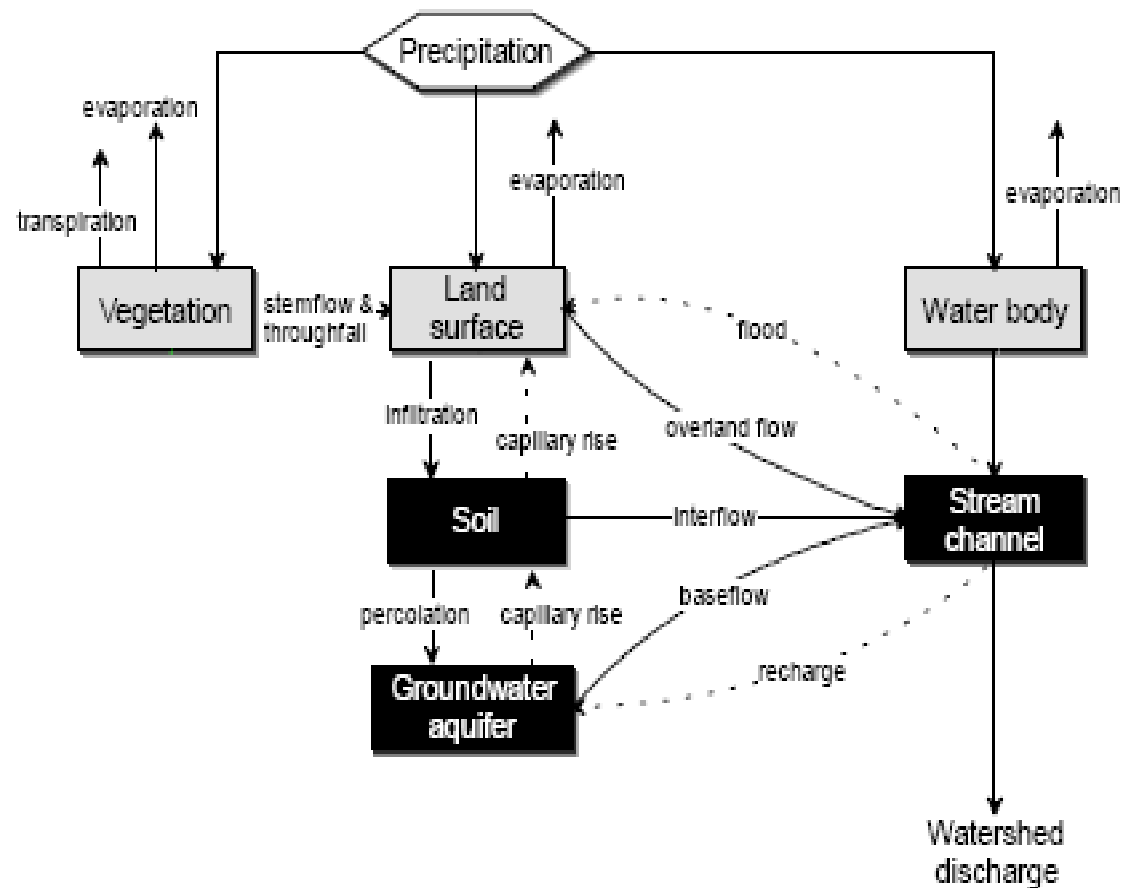


- Empirical and Conceptual
- Measured Parameter and Fitted Parameter

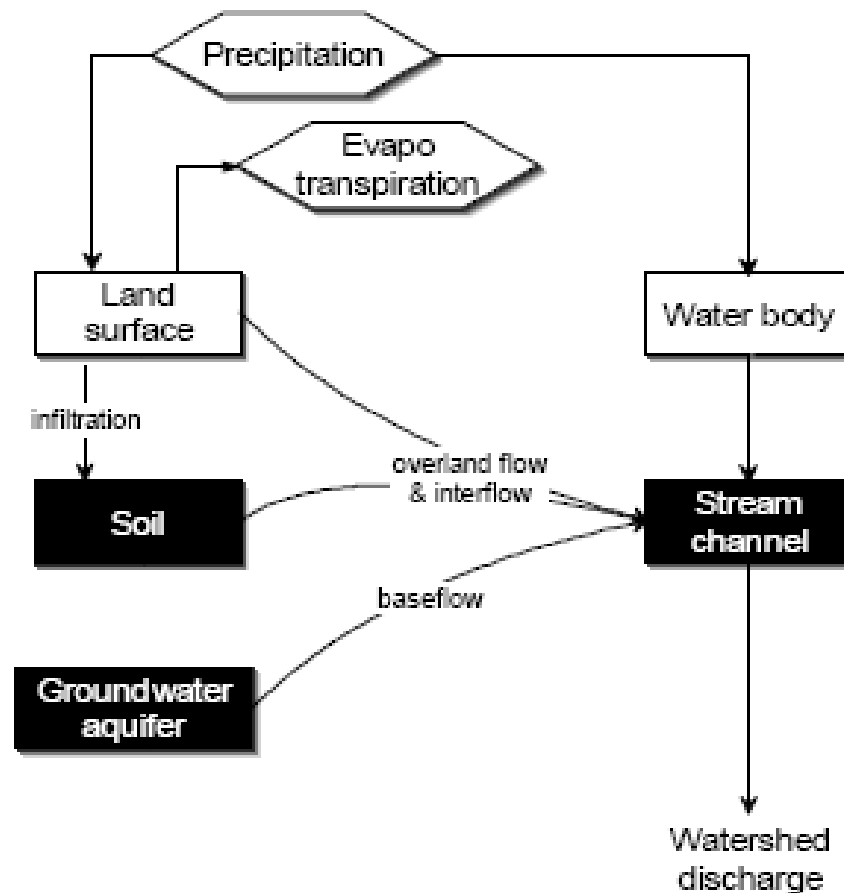
Constituents of Model

- State variables
- Parameters
- Boundary Conditions
- Initial Conditions

HEC-HMS Representation of Watershed



Typical HEC-HMS Representation



HEC-HMS and HEC-1

- Both the models are developed by US Army Corps of Engineers, Hydrologic Engineering Center (HEC)
- HEC-HMS is the advanced version of HEC-1 model
- HEC-1 is a lumped parameter hydrologic model
- HEC-HMS is lumped + quasi-distributed model

HEC-HMS components

- Basic components
 - Basin Model
 - Meteorologic Model
 - Control Specification
- Comprehensive modeling includes following components too
 - Time series data
 - Paired data
 - Grid Data

HEC-HMS 3.1.0 [C:\Documents and Settings\mpaudel\Desktop\HMSTutWorks\Ch2\JudysRoute.hms]

File Edit View Components Parameters Compute Results Tools Help

JudysRoute

Basin Models

Judys Branch

3C

3R

4C

Left

Right

Meteorologic Models

Judys Branch Meteorologic Data

Control Specifications

Judys Branch

Components Compute Results

Basin Model

Name: Judys Branch

Description:

Grid Cell File:

Local Flow: No

Flow Ratios: No

Replace Missing: No

Unit System: U.S. Customary

Basin Model [Judys Branch]

NOTE 10008: Finished opening project "JudysRoute" in directory "C:\Documents and Settings\mpaudel\Desktop\HMSTutWorks\Ch2" at time 24Jan2008, 11:12:46.

NOTE 10179: Opened basin model "Judys Branch" at time 24Jan2008, 11:12:48.

Desktop

Watershed Explorer

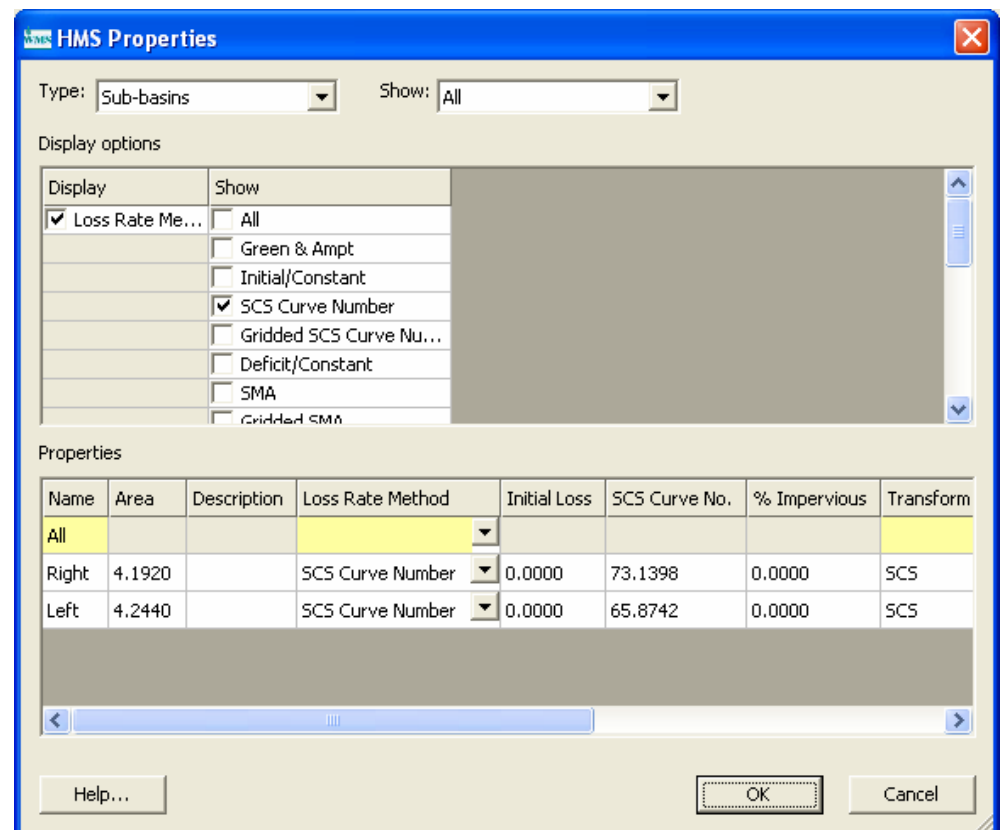
Component Editor

Message Log

WMS Interface for Preparing HMS Input file

- **Basin Model** is generated from WMS watershed.
- And to input other basin characteristics

HEC-HMS | Edit Parameters



HMS Properties

Type: Sub-basins Show: All

Display options

Display	Show
<input checked="" type="checkbox"/> Loss Rate Me...	<input type="checkbox"/> All
<input type="checkbox"/>	<input type="checkbox"/> Green & Ampt
<input type="checkbox"/>	<input type="checkbox"/> Initial/Constant
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> SCS Curve Number
<input type="checkbox"/>	<input type="checkbox"/> Gridded SCS Curve Nu...
<input type="checkbox"/>	<input type="checkbox"/> Deficit/Constant
<input type="checkbox"/>	<input type="checkbox"/> SMA
<input type="checkbox"/>	<input type="checkbox"/> Gridded SMA

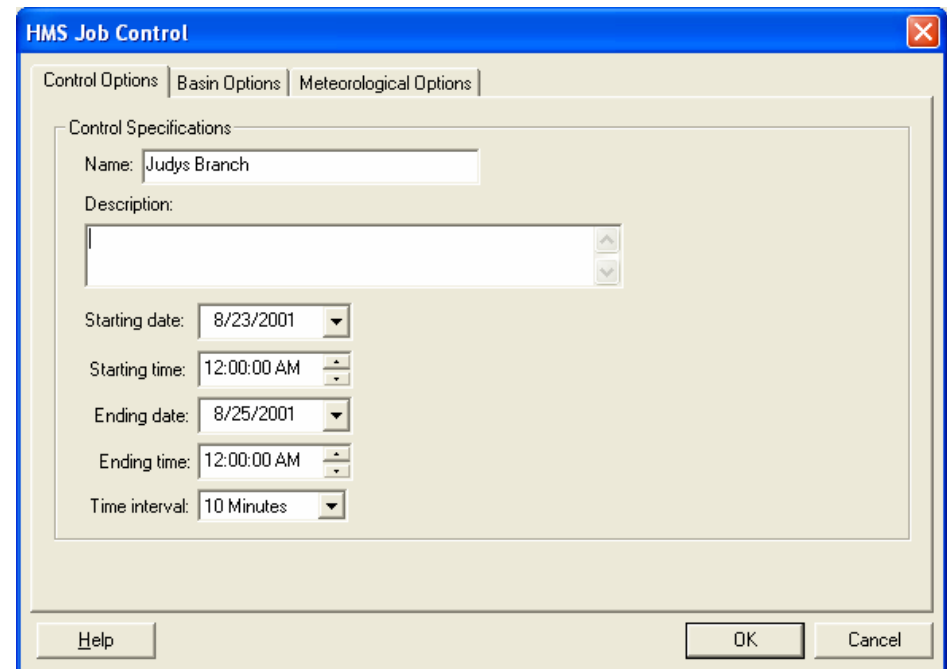
Properties

Name	Area	Description	Loss Rate Method	Initial Loss	SCS Curve No.	% Impervious	Transform
All							
Right	4.1920		SCS Curve Number	0.0000	73.1398	0.0000	SCS
Left	4.2440		SCS Curve Number	0.0000	65.8742	0.0000	SCS

Help... OK Cancel

WMS Interface for Preparing HMS Input file

- For control specification:
HEC-HMS | Job Control



The screenshot displays the 'HMS Job Control' dialog box, which is used for configuring simulation parameters. The dialog has a blue title bar and three tabs: 'Control Options' (selected), 'Basin Options', and 'Meteorological Options'. The 'Control Specifications' section contains the following fields:

- Name:** A text box containing 'Judys Branch'.
- Description:** A text box with a vertical scrollbar, currently empty.
- Starting date:** A date picker set to '8/23/2001'.
- Starting time:** A time picker set to '12:00:00 AM'.
- Ending date:** A date picker set to '8/25/2001'.
- Ending time:** A time picker set to '12:00:00 AM'.
- Time interval:** A dropdown menu set to '10 Minutes'.

At the bottom of the dialog, there are three buttons: 'Help', 'OK', and 'Cancel'.

WMS Interface for Preparing HMS Input file

- For **Meteorologic Model**
HEC-HMS | Meteorologic
Parameters

HMS Meteorological Model

Precipitation Method:

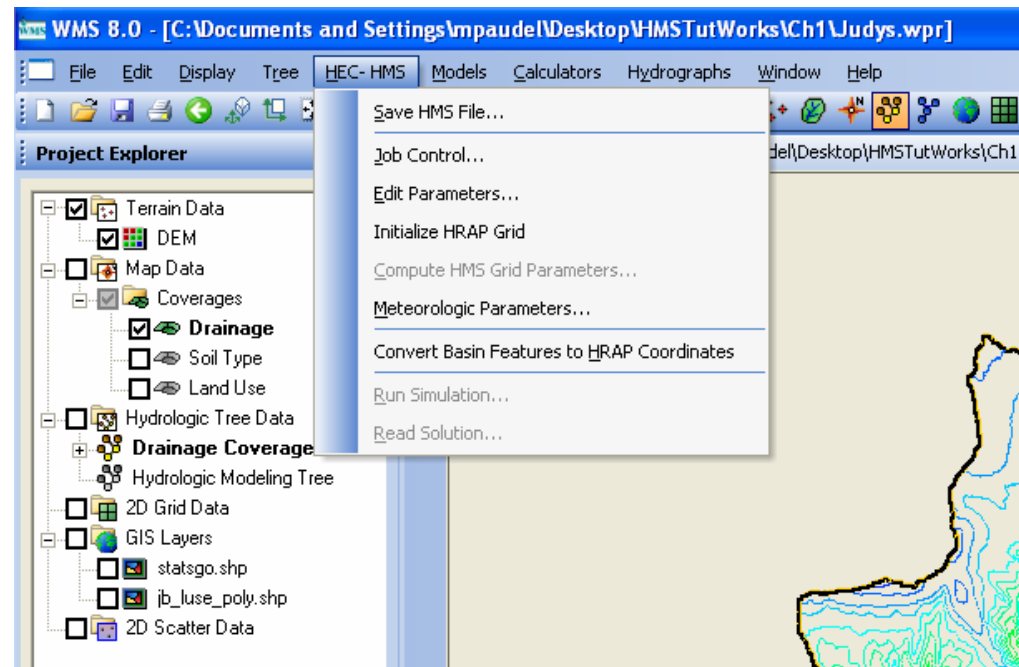
Precipitation Data

Sub-basin	Hyetograph	Total Depth (in)
Right	XY Series...	0.0
Left	XY Series...	0.0

Help OK Cancel

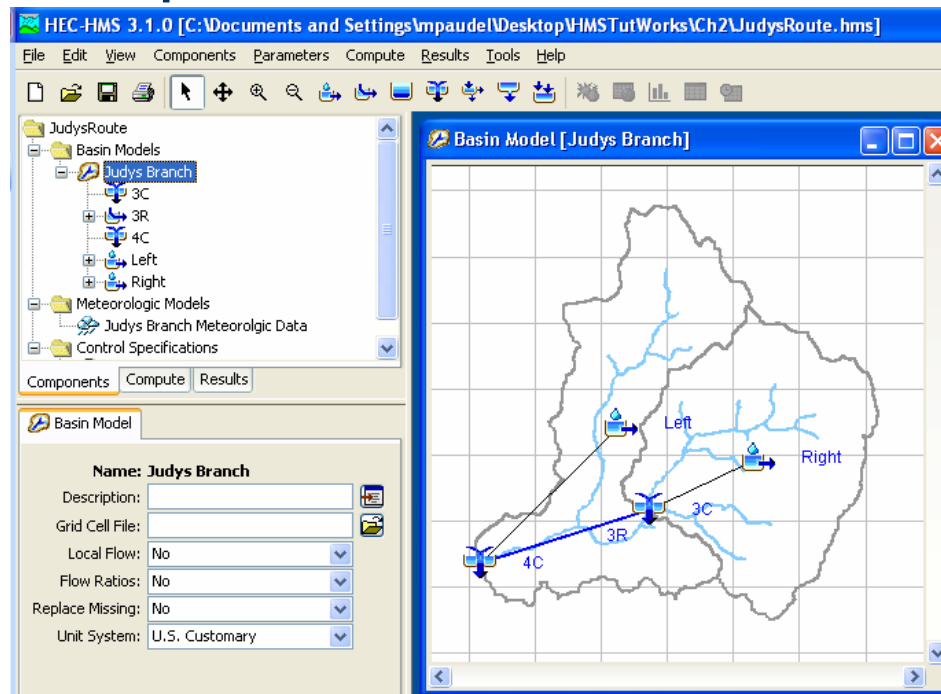
Running HEC-HMS

- Save HEC-HMS file from WMS

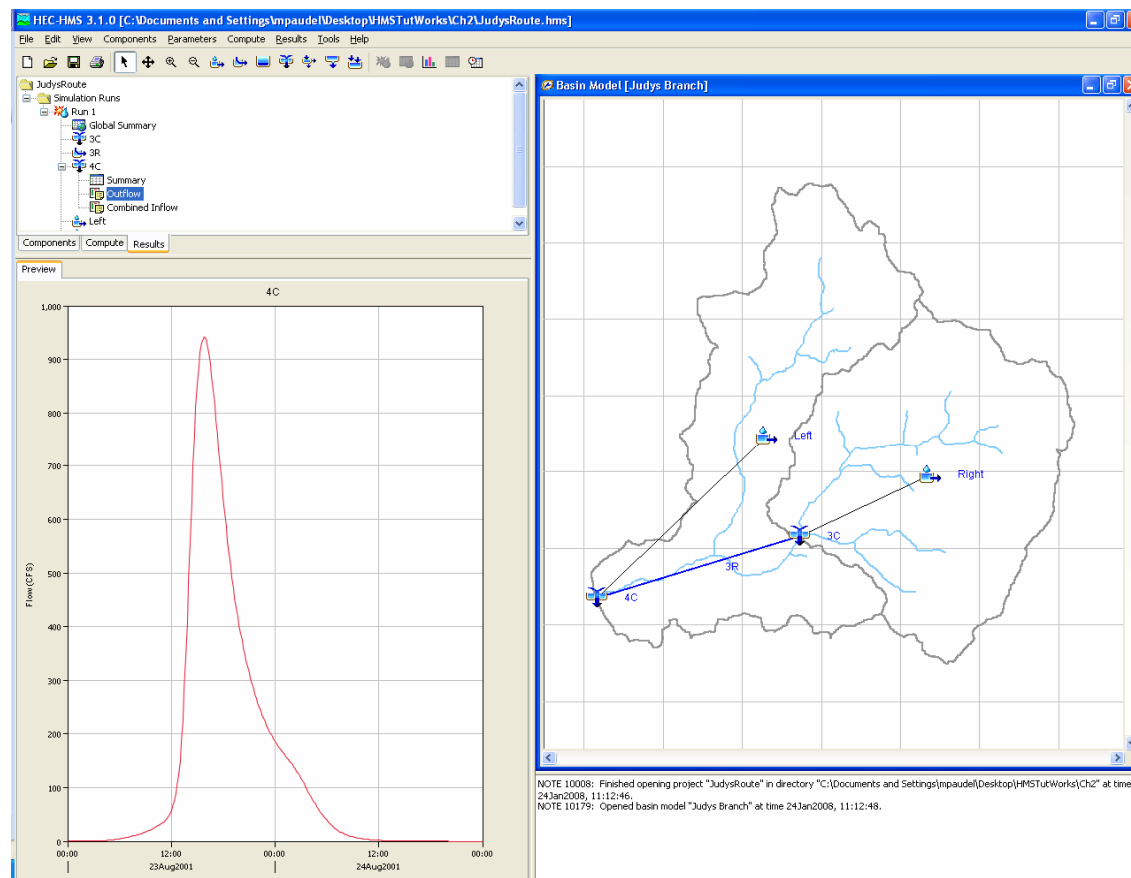


Running HEC-HMS

- Open the file saved in WMS it will create all the three components of HMS Model.



Viewing Results



Demonstration

