

Runoff Node Data

To enter or edit Node Data while in Runoff Mode, either; "double-click" on the node, select the node and choose the "DATA" command from the Edit Menu, or select the node and press the <Enter> key.

Sub-Catchments	1	2	3	4	5
Area	1.634	0.0	0.0	0.0	0.0
Imp. (%)	40.	0.0	0.0	0.0	0.0
Width	85.	0.0	0.0	0.0	0.0
Slope	0.03	0.0	0.0	0.0	0.0

Print Flows and Concentrations
 Save Results for Review

OK Cancel Gauged Data BMP

This dialog allows the entry of subcatchment data and node printing parameters.

There are five major types of Hydrograph Generation techniques available in Runoff. They are:

1. SWMM Runoff Non-linear Reservoir Method
2. Kinematic Wave Method
3. Laursen Non-linear Method/Rafts
4. SCS Unit Hydrograph Method
5. Other Unit Hydrograph methods, Nash, Snyder (Alameda), Snyder, Rational Formula, Time/area, and Santa Barbara Urban Hydrograph.

Depending on the option you choose, some data fields may have different meanings or may be ignored.

This page contains the following topics:

- [Subcatchment Flag](#)
- [Print Flows and Concentrations \(IPRNT\)](#)
- [Save Results for Review](#)
- [Gauged Data](#)
- [BMP \(Storage Treatment\)](#)
- [CUHP Node Data](#)
- [LA County Method Node Data](#)
- [Sacramento Method Node Data](#)

Subcatchment Flag

Flag for defining a subcatchment. If this flag is set al, the data in the given column must be entered, as well as the [data in the underlying dialog\(s\)](#). If the data exists and the flag is not active the subcatchment data will not be exported and the flows will not be generated for that node.

Subcatchment Area (WAREA)

Drainage area of subcatchment, acres [ha]. The same meaning for all hydrology methods.

Subcatchment Percent Impervious (WW3)

Percentage of subcatchment that is impervious.



When using the SCS and SBUH methods a curve number of 98 will be used for this amount of impervious area and a composite number will be generated internally. Use a value of 0 if you wish XPSWMM to use your composite number entered as the Pervious CN.

The impervious areas must be hydraulically (directly) connected to the drainage system. Rooftops draining onto adjacent pervious areas should not be treated as effective impervious areas.

The percent impervious data is used to split the subarea into respective impervious and pervious components. It should be noted that Horton or Green Ampt infiltration is only applied to pervious component. The only losses applied to impervious component are depression storage losses. To apply Horton type losses to both components requires the use of two subareas and the setting of both percent impervious values to zero. This will allow the Horton type infiltration to be applied to the full area of each subarea.

The following regression equation relating imperviousness to population density, known as the New Jersey equation (Stankowski, 1974), is perhaps the most representative:

$$I = 9.6 PD (0.53 - 0.0391 \log_{10} PD)$$

Where:

I = imperviousness, percent

PD = population density in developed portion of the urbanized area, persons/acre.

The "developed portion" excludes large segments of undeveloped lands that may lie within the area being simulated. The above relation was developed for large (city-wide) areas as a whole so its use may be tenuous for small subcatchments.

Subcatchment Width (WW1)

Width of subcatchment, ft [m]. This parameter is only applicable to the Runoff and Kinematic Wave routing methods. For all other methods enter any valid number (>0), the parameter will not impact the solution.

If overland flow is visualized as running down-slope off an idealized rectangular catchment, then the width of the subcatchment is the physical width of overland flow. Since real subcatchments will not be rectangular with properties of symmetry and uniformity other procedures are required.

The subcatchment width is a key calibration parameter, one of the few that can significantly alter the hydrograph shape, rather than just runoff volume. A good estimate for the width is the area of the subcatchment divided by the average path length of overland flow.

For rainfall durations less than the time of concentration, increasing the width increases the flow peak and decreases time to peak. For rainfall durations greater than the time of concentration, the peak flow is affected only marginally. The time of concentration is reduced slightly for larger widths.

Irregularly shaped catchments with drainage channels off-centre can be handled by computing a skew factor:

$$Sk = (A2 - A1) / A$$

$$W = (2 - Sk) * L$$

Where:

Sk = skew factor

A1 = area to one side of the channel

A2 = area to other side of the channel

A = total area

W = subcatchment width

L = length of main drainage channel

When using Laurenson Hydrology the subcatchment width is by default not used. The catchment roughness utilised when calculating the storage delay parameter "B" is taken from the pervious Manning "n" value for the sub-catchment included with the infiltration information. A second method is available by including the Configuration parameter RAFTS under the tools menu. This allows % imp to be set to 0 and 100 in the first two separate sub areas. This will allow the infiltration equation to be applied to the total subareas. Width is then used as a factor to control the "B" computation by inputting 0.0 and 100.0 respectively for the fully pervious and impervious sub areas. Appropriate infiltration can then be applied to the respective subareas.

Subcatchment Slope (WSLOPE)

Average slope of the subcatchment, non dimensional (m/m or ft/ft). For example a 1% slope is entered as 0.01. The subcatchment slope should reflect the average along the pathway of overland flow to inlet locations. For simple geometry, the calculation is simply the elevation difference divided by the length of flow. For more complex shapes, several overland flow paths may be delineated, their slopes determined, and a weighted slope computed using a path-length weighted average. Alternatively, it may be sufficient to simulate the hydrologically dominant slope for the conditions being simulated. It is possible to include a Configuration parameter to change the slope to a percentage if preferred.

To enter slope in percent use the CATSLOPE=% [Configuration Parameter](#). Read more about [Subcatchments](#).

Print Flows and Concentrations (IPRNT)

Print total inflows and concentrations through the node in the output file. The frequency the data is written to in the output file is controlled in the Job Control->Print Control: General Results. All printed values are instantaneous at the end of the preceding time step.

Save Results for Review

Save results for the node for later graphical post-processing. This option is provided locally for each node to allow minimizing of the intermediate results files generated which can be quite large. It is overridden by the Save ALL Results for Review flag in the [Runoff Job Control](#).

Gauged Data

View the [Gauged Data Section](#) to learn more about this parameter.

BMP (Storage Treatment)

View the [Sanitary Mode Storage Treatment Plant](#) section to learn more about this parameter.

CUHP Node Data

View the [CUHP Procedure](#) section for information on CUHP node data options.

LA County Method Node Data

View the [LA County Procedure](#) section for information on LA County Method node data options.

Sacramento Method Node Data

View the [Sacramento Hydrology Method](#) section for information on Sacramento Method node data options.