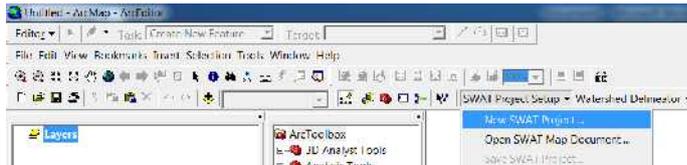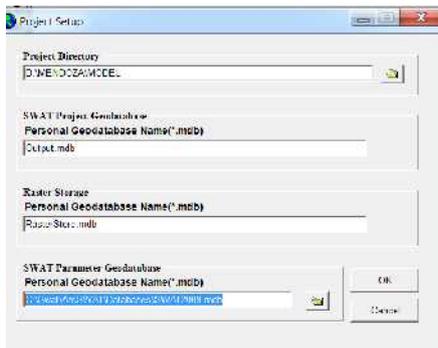[Step 1: Project Setup]

- Inside MENDOZA folder there should be DATA-MODEL-CALIBRATION-OUTPUTMAPS folders.
- Open ArcMap and take a new empty map.

- Click on SWAT Project Setup and then New SWAT Project there will be a window pop up saying 'Save Current Document'..? Click No.

- There will be a window pop up for project setup. The project directory will be [D:\MENDOZA\MODEL] and SWAT Parameter Geodatabase will be [D:\MENDOZA\MODEL\GeoData.mdb]
- Click 'ok' and there will be a new window pop up saying project setup is done. Click ok and we are ready to start!
- There will be some newly created folder after setting up the project. Which can be seen from[D:\MENDOZA\MODEL]
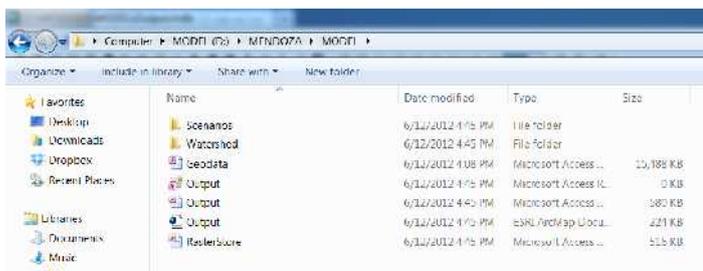
[Step 2: Watershed Delineation]
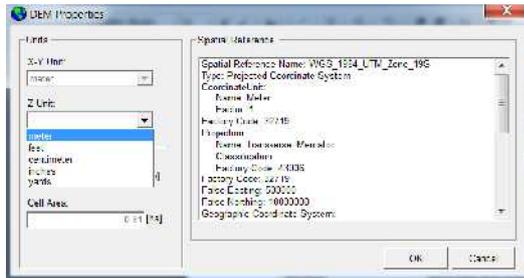
2.1 DEM SETUP

- Click on Watershed Delineator and then click on Automatic Watershed Delineator

- Click on Watershed Delineator and then click on Automatic Watershed Delineator. A window will pop up.
- DEM Setup: locate the DEM using Load from Disk from [D:\MENDOZA\DATA\GISData\Clipdem]
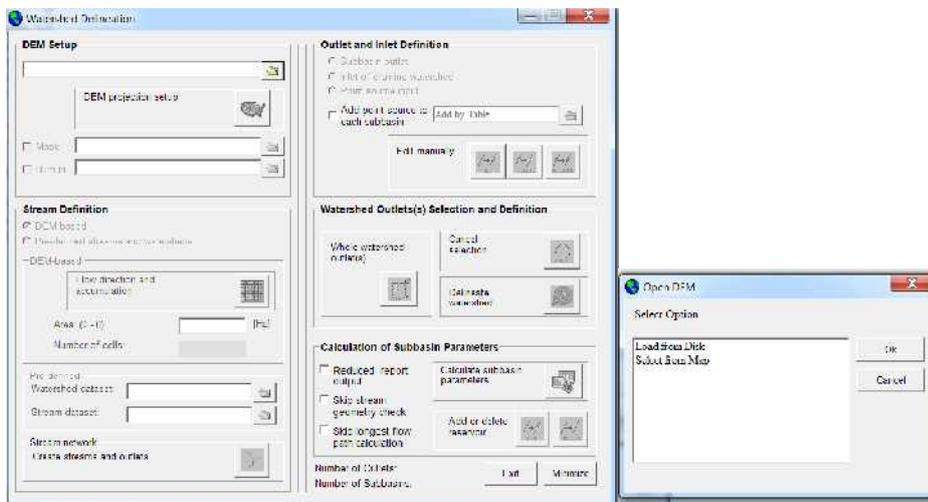

- Click on the DEM projection setup clicking the US map box.
- Select **meter** for Z unit and keep all other unchanged.

- Now burn the river map in to the DEM. The river shape file is located at **D:\MENDOZA\DATA\GISData\River\Rivmendoza**

2.2 STREAM DEFINATION

- For the Stream Definition the default is DEM based. Click on the grid box ▦ . Wait a while it may take some time depending the cell size of the DEM. After it finish it will end up with a message 'End of DEM Preprocessing'. Click ok
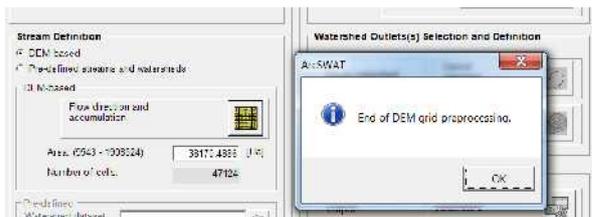
- For this exercise we will keep the area default.
- Click the joint sign for stream processing ⌐ . There will be another message saying End of stream processing.

2.3 OUTLET and INLET DEFINATION:

- Add outlet table from **D:\MENDOZA\DATA\GISData\Outlets\outlets.dbf**
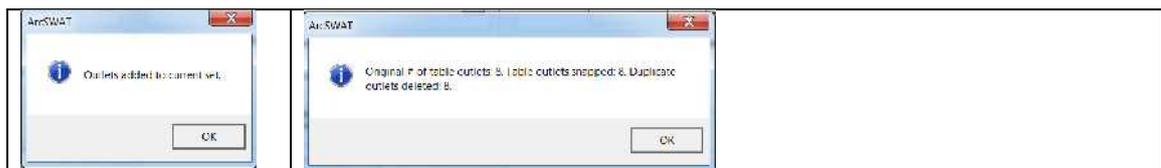
- Press ok both the cases

2.4 WATERSHED OUTLET SELECTION AND DEFINATION

- Click the icon ⊞ with the mouse and make a box at the last point of the watershed. Make a square box with the help of mouse selection.

- Click 🐸 which will start basin delineation process and give a watershed boundary. After finishing the process there will be a message "watershed delineation is done"

[Note: Now we can have a look to the attribute tables of reach-watershed-basin features from the left panel. There will be 11 columns in the watershed feature and 5 columns in the reach file and one complete polygon for the watershed we are focusing]

2.5 CALCULATION OF SUBBASIN PARAMETER

- Click 🖩 for calculating sub basin parameter. It will end up with a message" Sub basin parameter calculation successfully done ". Click ok.

[Note: Now we can have a look to the reach file- right click-properties-symbology-putting value field as 'wid2' and setting graduated symbol in quantities in the left panel.]

- If we have reservoir we can add using the 🗺 button. One all the process is done click ⬚ Exit button. It will clean up all unnecessary streams.

[**Note:** DO NOT cross the window in the corner!! Make sure you save the project and took a backup before going to the next step!!]
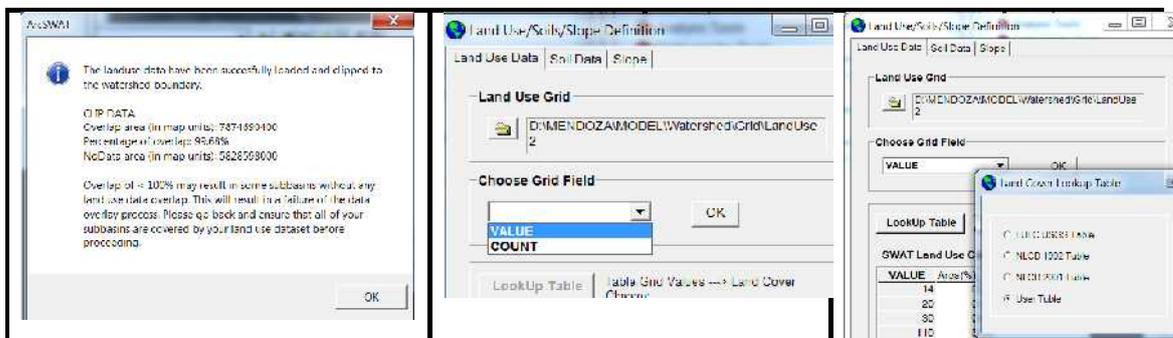
[Step 3 HRU analysis]

Adding Land Use data

- Click HRU analysis and then LandUse/Soils/Slope Definition. A window will pop up like this.
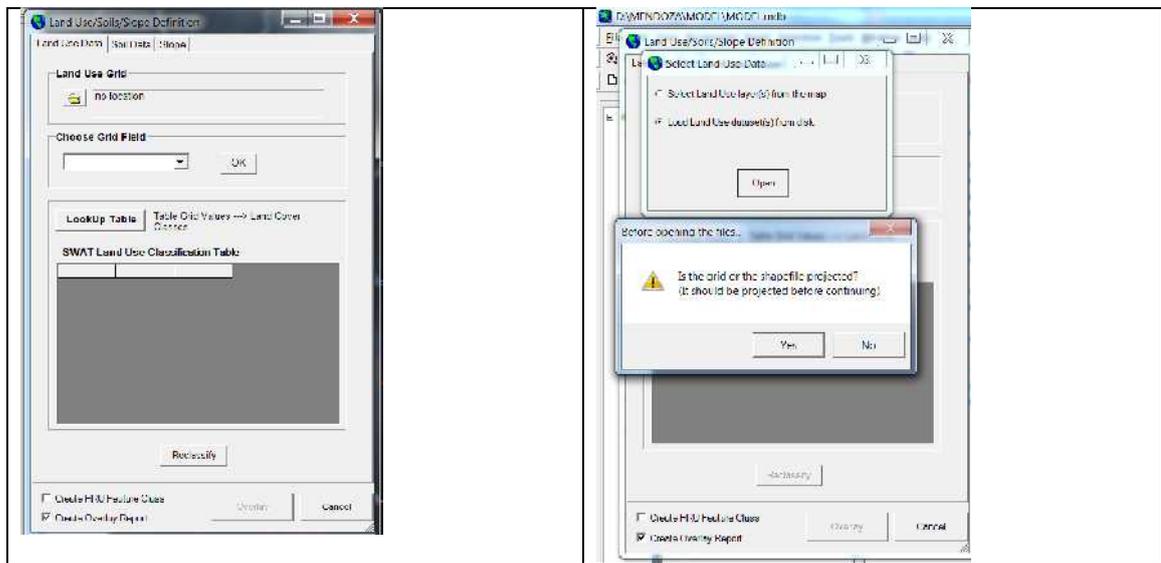
- Locate the Land Use map from [D:\MENDOZA\DATA\GISData\Landuse\lu]. While doing this step it will ask where to select land use data. Use "Load Land Use dataset(s) from disk". After that another message will pop up with the message Is the grid or the shape file projected? Click YES!

There will be another window pop with the overlap information. In the 'Choose Grid Field' click "value"-ok. Click lookup table-user table from [D:\MENDOZA\DATA\GISData\Landuse\lutable]

- Click on RECLASSIFY button. Press ok with the message appears.

ADDING SOIL DATA

- Click on soil data tag. Load soil dataset from disk and locate [D:\MENDOZA\DATA\GISData\Soil\soilutm]
- In the 'option' tag click name
- In the 'Choose Grid Field' click value and click lookup table-user table from [D:\MENDOZA\DATA\GISData\Soil\soiltable]
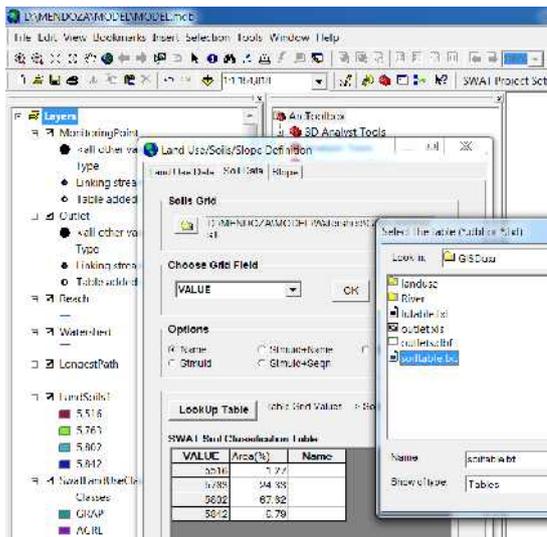

- Click reclassify button

SETTING SLOPE VALUES:

- Click on slope tag and use multiple slope. Use 3 slope class, put 1 in the current slope class drop box and put 30 then click on the [Add] button. Similarly for slope class 2 use 40 and for 3 use the rest.
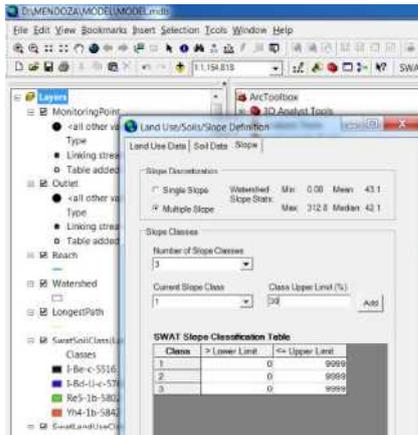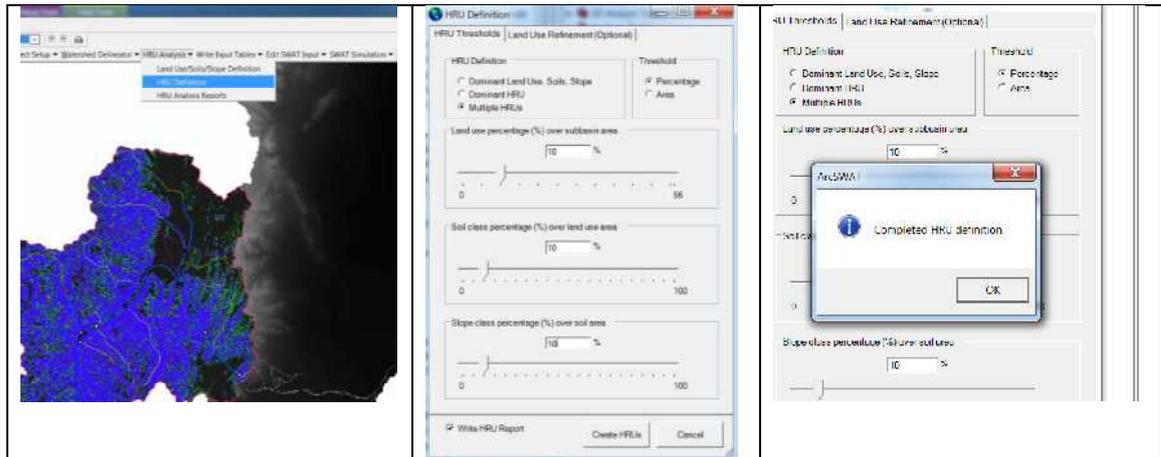
- Click Reclassify button.
- Finally use Overlay button. It will end up with the message "Finished Land Use/Soils/Slope Definition. Click ok
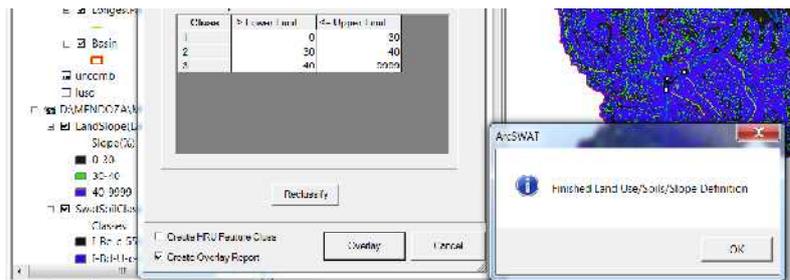

HRU DEFINATION

- Click on HRU definition under the HRU Analysis tag. Use Multiple slope
- Use 10%, 10%, 10% for Land Use Soil and Slope percentage. And click Create HRUs

[Note: **Now we can see the summary table of each sub basin and each HRU comparing two table. Make sure you save the project at this stage once again**]
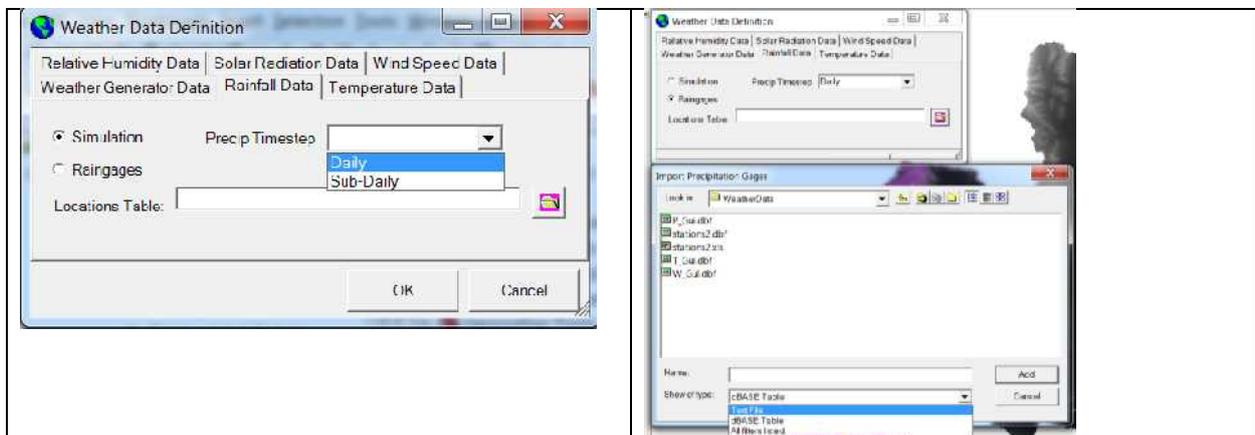
[Step 4 Write input tables]

Under the write input table click on weather stations. It will pop up with the window below
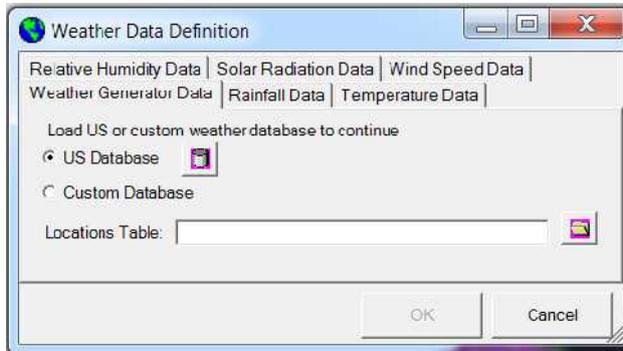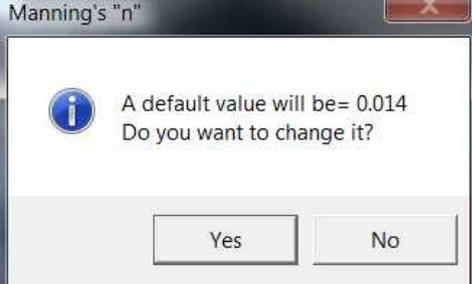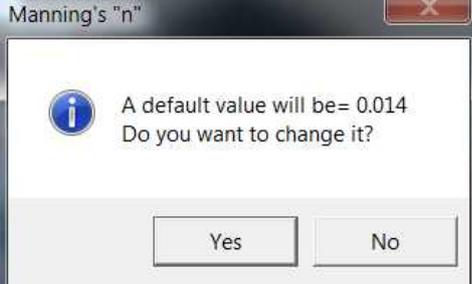

Here we are going to use data outside from US so click "Custom Database" and locate Station2.dbf from [**D:\MENDOZA\DATA\WeatherData\Station2.dbf**]

Click Rainfall Data tag and use daily in the drag and drop menu. Locate the rainfall data from [**D:\MENDOZA\DATA\WeatherData\P_Gages.txt**]

- Similarly add the temperature data selecting txtfile [**D:\MENDOZA\DATA\WeatherData\T_Gages**]. Click ok there will be a message saying "Finish setup weather data"
- Similarly add the windspeed data selecting txtfile [**D:\MENDOZA\DATA\WeatherData\W_Gages**].
- Click write all

|	
ArcSWAT ⊠ Will you be using default Manning's N and heat unit inputs (U.S. only)? [Yes] [No]	NO
Manning's "n" ⊠ ⓘ A default value will be= 0.014 Do you want to change it? [Yes] [No]	NO
Manning's "n" ⊠ ⓘ A default value will be= 0.014 Do you want to change it? [Yes] [No]	NO
Management Data Options ⊠ ⚠ Plant growth heat units may be: 1) Estimated for each land cover using local climatic data 2) Set to default values The climatic data base used to estimate plant heat units contains data for the US only. Estimate? [Yes] [No]	YES

[NOTE: Now we can have a look to the input files in the txtinout folder. In this phase we can have a look to the Edit SWAT input tag. Like basin file sub basin file how to choose different method like Penman-Hargraves etc etc. Especially sub basin file and General basin parameters. Incase if we change something we have to re write the input files once again.]

SWAT SIMULATION:

- Modify the ending date to 12/31/2004. Click on Daily and use 3 in the NYSKIP
- Click Setup SWAT Run and then Run SWAT.
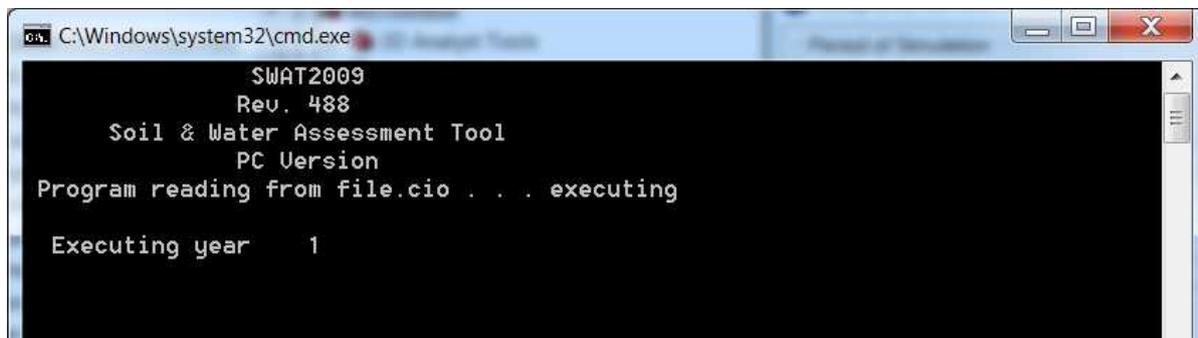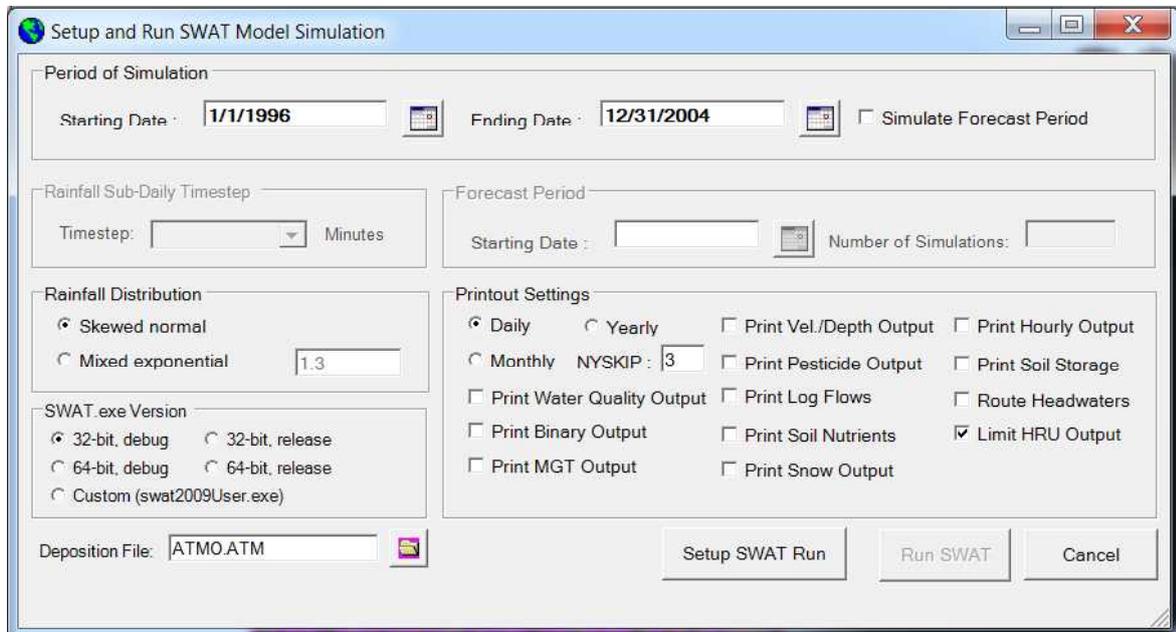
- There will be a message saying "SWAT run Successful"
- Save the result from read swat output under swat simulation tag.
- There will be window where check the boxes for output.rch-output.sub-output.hru.
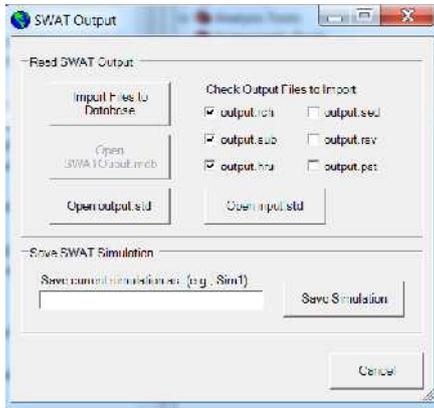
- Click on Import files to Database and give a name "FirstSimDaily"
- Make one more simulation with the same criteria with monthly time step and save FirstSimMonthly.