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## Thurston County Recharge Expansion for WWHM3 7 July 2009

## Purpose

Currently WWHM3 does not track recharge information. Recharge is considered infiltration into the groundwater layer from either pervious soils or infiltration facilities. Clear Creek Solutions has modified WWHM3 to track and compute all inflow to the groundwater level and sum these values based on each point of compliance (POC).

## **Model Operation**



To use the recharge calculation feature simply set up your model normally and then before running the model go to the View, Options menu item and bring up the Options window.

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S	🗗 Options 🛛 🔀												
	Select Point of	Criteria Checker Timestep Water Tags Recharge Duration Criteria Scaling Factors_Water Duality C											
Ê	Compliance Rechar												
Γ	● Analyze Durations for 50 percent of the 2 yr												
E		to the 50 yr 🗨											
5		Durations Rased on User Defined Flow Values											
F	Durations Based on User Defined Flow Values												
		Dens /Failtheashalt [10] %											
5		Pass/Fail threshold: 110 %											
F		Altering the flow duration criteria will change the mitigation requirements for the selected point of compliance only. These changes will impact all duration analysis											
	related to the POC including automatic facility sizing and any flow duration analysis run on this specific POC												
	Hestore Defaults	Update											

Select the "Recharge" tab.



Check the "Compute Recharge" box to turn on recharge calculations. Then select the specific elements for which you want to compute recharge. Click the "Select All" button to select all elements. This turns on the recharge calculations for all the elements you are interested in. (Note: elements with an arrow ("->") in front of their names are Mitigated scenario elements.) Then click Update and return to the Schematic screen where you can simply run the model as usual.

After running the model you need to go to the Analysis window so you can perform the duration analysis and summary analysis for the recharge data.

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Analysis													
Durations	FlowFreeders	Water Quality	Hydrograph										
Wetland Fluctuation	Recharge Duration	Recharge Predeveloped	Recharge Mitigated										
Analyze datasets													
1 PUYALLUP DAILY EVAP W/JE 2 SEATAC SEE WORD FILE I: VE All Datasets Flow Stage Prec	NSEN-HAISE FF\PRECIP\DATADOC.RAN	Duration Bounds 0.01 Min 2 Max C Seasonal Durations (mm/dd) C Set Dates (yyyy/mm/dd) Start Date End Date											

From here you can then perform the analysis you wish to perform. Simply select the "Recharge Duration" tab and then select the POC 1 tab to perform POC duration analysis on the selected POC and the model will perform the recharge duration analysis.



You can also view monthly and annual summaries of the recharge data by selecting either the "Recharge Predeveloped" for the predeveloped recharge data or "Recharge Mitigated" for the mitigated recharge data.

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6	3h		28	P				5		S			H ID				
A	Analysis																
	Year	Jan	Feb	Mar	Apr	Mau	Jun	Jul	Aua	Sep	Oct	Nov	Dec	Total	~	DECHDES Flaments	
	1948		100	- Hai		- may	o di i		ring	cop	0.104	1.237	2.176	3.517		POC Number: 1 Predeveloped	
1 STA	1949	0.287	1.787	0.977	0.14	0.175	0.	0.001	0.	0.003	0.06	1.186	1.842	6.457		Monthly Volume: Acre Feet	
	1950	3.074	1.915	2.077	0.532	0.	0.	0.002	0.007	0.008	0.636	2.379	2.603	13.234			
	1951	2.328	2.306	0.905	0.100	0.051	0.014	0.001	0.001	0.004	0.404	0.005	0.359	9.106 4.107			
	1953	4.167	1.27	0.857	0.227	0.311	0.233	0.037	0.001	0.029	0.377	2.093	2.065	11.667			
	1954	2.732	1.4	0.516	0.47	0.198	0.164	0.204	0.001	0.002	0.006	0.916	1.719	8.328			
	1955	1.162	1.111	0.858	0.944	0.214	0.018	0.012	0.	0.001	0.377	2.734	2.981	10.413			
	1956	2.955	0.598	1.489	0.025	0.051	0.265	0.	0.001	0.004	0.572	0.306	1.701	7.967			
	1957	2.944	1.946	0.397	0.369	0.143	20.0	0.015	0.004	U. 0	0.045	1.671	2,692	6.864			
	1959	2.044	1.300	1 15	0.842	0.03	0.036	0.033	0.	0.047	0.06	1.783	2.633	10.4			
	1960	1.897	1.268	1.033	0.588	0.317	0.042	0.	0.001	0.001	0.071	1.73	1.223	8.171			
	1961	2.755	2.891	1.337	0.362	0.517	0.028	0.065	0.	0.	0.025	0.439	1.579	9.999			
	1962	0.686	0.645	0.803	0.346	0.352	0.	0.012	0.012	0.006	0.163	2.27	1.716	7.011			
	1963	0.691	1.407	0.957	0.759	0.204	0.193	0.022	0.	0.	0.13	2.647	2.045	9.054			
	1964	3.382	0.462	0.662	0.19	0.002	0.045	0.052	0.027	0.01	0.005	0.462	2.016	9.32			
	1363	1.031	1.437	0.047	0.634	0.140	0.040	0.	0.004	0.	0.013	1 000	2.231	0.072	×		
	Wetland Fluctuation Recharge Duration Recharge Predeveloped									edevelor	ped	Recharge Mitigated					-
		Duratio	ons		Flo	w Freque	ency		Wate	r Quality		Hydrograph					
Ana	lyze da	atasets															
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	1002 PDC 1 Recharge Mitigated																
Duration Chart																	
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Once the analysis has been conducted the results will also show up in the report.

## Summary

Recharge data analysis has been added to the Thurston County version of the WWHM3. These data can be viewed in the form of a duration analysis or in the form of monthly and yearly summaries. Recharge analysis can be turned on or off by the user through the view/options menu item.