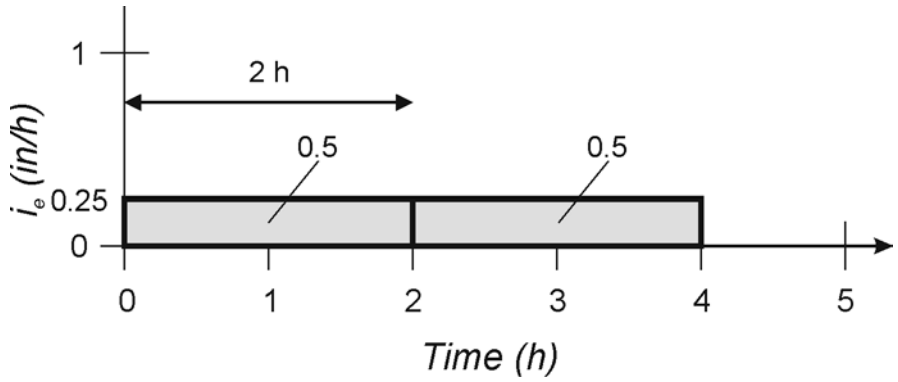
Lesson 23: Changing Unit Hydrograph Durations
Case #1 Example: Integer Multiple Method

Change a 2-hour UH to a 4-hour UH

Determine the pattern of P_e for a 4-hour UH using a 2-hour time step



Predict the DRH for a 4-hour UH using the 2-hour UH

	4-hr UH	(Given)	0.5 × UH	0.5 × UH	(Find)
Time	P_e	2-hr UH	DRH_0	DRH_1	4-hr UH
(h)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
0		0	0.0		0.0
	0.5				
2		45	22.5	0.0	22.5
	0.5				
4		60	30.0	22.5	52.5
6		36	18.0	30.0	48.0
8		18	9.0	18.0	27.0
10		5	2.5	9.0	11.5
12		0	0.0	2.5	2.5
14				0.0	0.0

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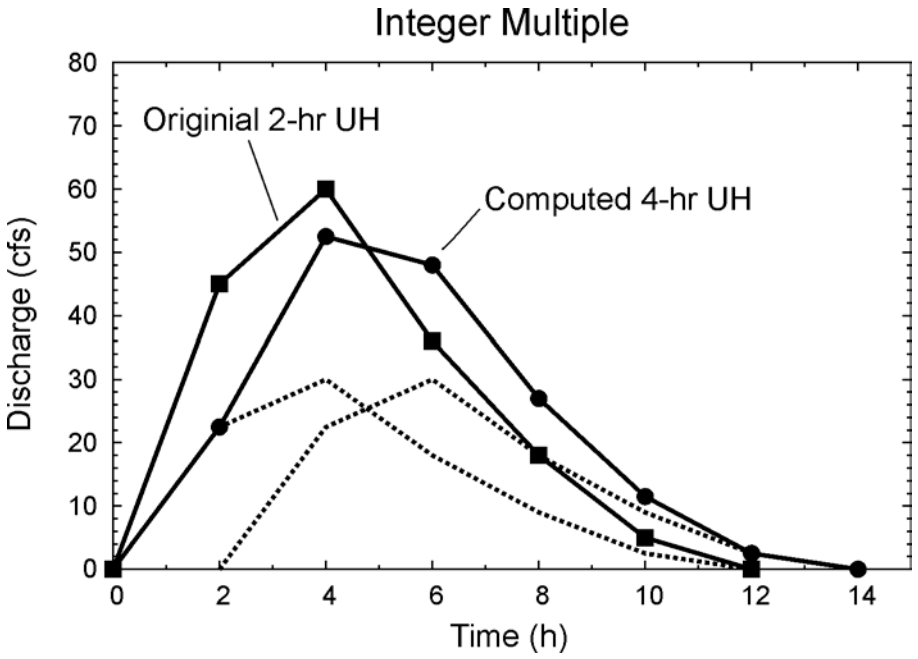
Case #1 Example: Integer Multiple Method

Change a 2-hour UH to a 4-hour UH

Predict the DRH for a 4-hour UH using the 2-hour UH

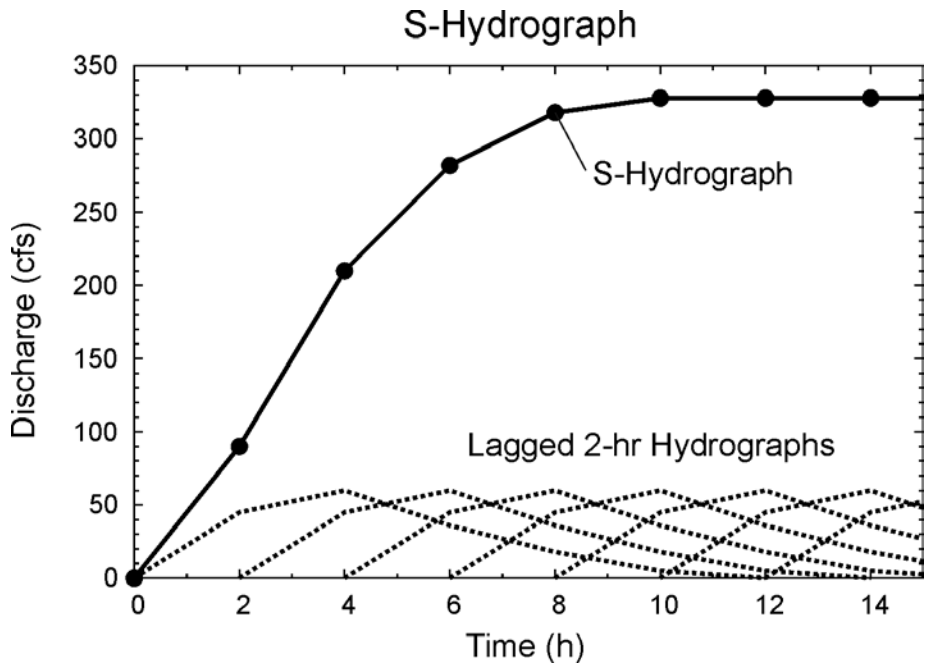


Lesson 23: Changing Unit Hydrograph Durations
Case #2 Example: S-Hydrograph Method

Change a 2-hour UH to a 5-hour UH

Compute the S-Hydrograph (Using the 2-hour UH)

	(Given)	2 × UH	Lag-1	Lag-2	Lag-3	Lag-4	Lag-5	Lag-6	(Find)
Time	2-hr UH	2-hr Hyd	2-hr Hyd	2-hr Hyd	2-hr Hyd	2-hr Hyd	2-hr Hyd	2-hr Hyd	S-Hyd
(h)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
0	0	0							0
2	45	90	0						90
4	60	120	90	0					210
6	36	72	120	90	0				282
8	18	36	72	120	90	0			318
10	5	10	36	72	120	90	0		328
12	0	0	10	36	72	120	90	0	328
14			0	10	36	72	120	90	328
:				:	:	:	:	:	:
∞									328



Lesson 23: Changing Unit Hydrograph Durations
Case #2 Example: S-Hydrograph Method

Compute the 5-hour UH from the S-Hydrograph

Time (h)	(Given) S-Hyd (cfs)	Lag by 5-hr S-Hyd (cfs)	5-hr Hyd (cfs)	Divide by 5 5-hr UH (cfs)
0	0		0	0.0
1	45		45	9.0
2	90		90	18.0
3	150		150	30.0
4	210		210	42.0
5	246	0	246	49.2
6	282	45	237	47.4
7	300	90	210	42.0
8	318	150	168	33.6
9	323	210	113	22.6
10	328	246	82	16.4
11	328	282	46	9.2
12	328	300	28	5.6
13	328	318	10	2.0
14	328	323	5	1.0
15	328	328	0	0.0