

Rainfall Excess Prediction Using the f-Index

Time (hours)	Incr.			Incr.			Incr. P_e (in)
	P (in)	i (in/hr)	f (in/hr)	f (in/hr)	F (in)	i_e (in/hr)	
0							
2	1.0	0.5	0.6	0.5	1.0	0.0	0.0
4	2.0	1.0	0.6	0.6	1.2	0.4	0.8
6	4.0	2.0	0.6	0.6	1.2	1.4	2.8
8	1.0	0.5	0.6	0.5	1.0	0.0	0.0
	8.0				4.4		3.6

Effective duration (t_r):

$$t_r = 4 \text{ hours (between hours 2 and 6)}$$

Depth of direct runoff (r_d):

$$r_d = \sum P_e = 0.8 + 2.8 = 3.6 \text{ inches}$$

Volume of direct runoff (V_d):

$$\begin{aligned} V_d &= r_d A \\ &= (3.6 \text{ in})(1 \text{ mi}^2)(640 \text{ ac/mi}^2)/(12 \text{ in/ft}) \\ &= 192 \text{ ac - ft} \end{aligned}$$

