Open-Channel Hydraulics
H.W.#8. Kinematic Wave

Jun. 5, 2024

Take the hydrograph given below and use different methods to route it through a prismatic rectangular concrete channel 300 ft wide and 10,000 ft long with a bed slope of 0.015. Assume n = 0.020 and the initial condition is a uniform flow of 500 cfs.

t (min)	0	20	40	60	80	100	120	140	160
Q (cfs)	500	1402	9291	11576	10332	5458	2498	825	569

(a) By analytical method

(b) By linear finite difference method ($\Delta t = 1$ min. and $\Delta x = 2,000$ ft)

(c) By non-linear finite difference method ($\Delta t = 1$ min. and $\Delta x = 2,000$ ft)