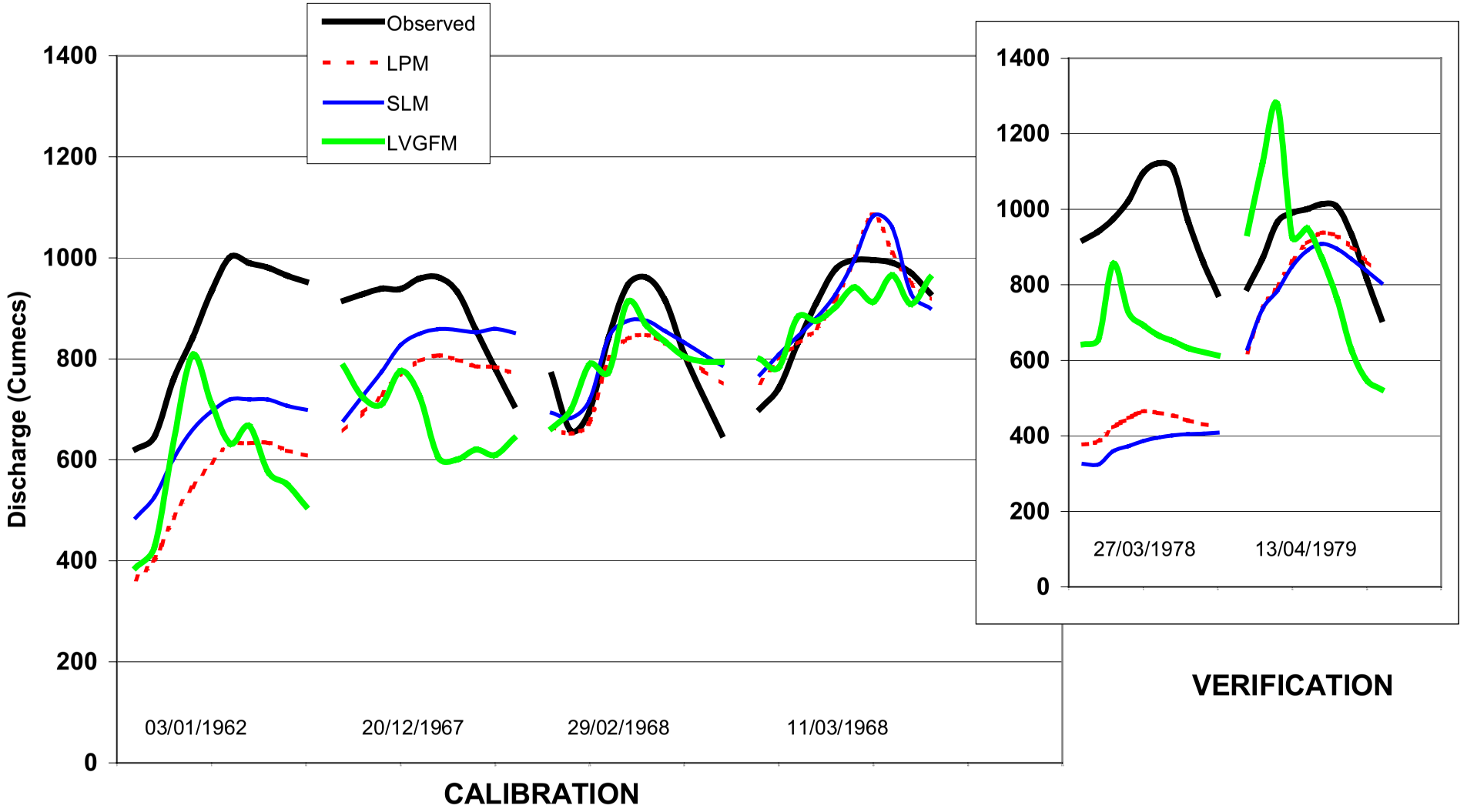
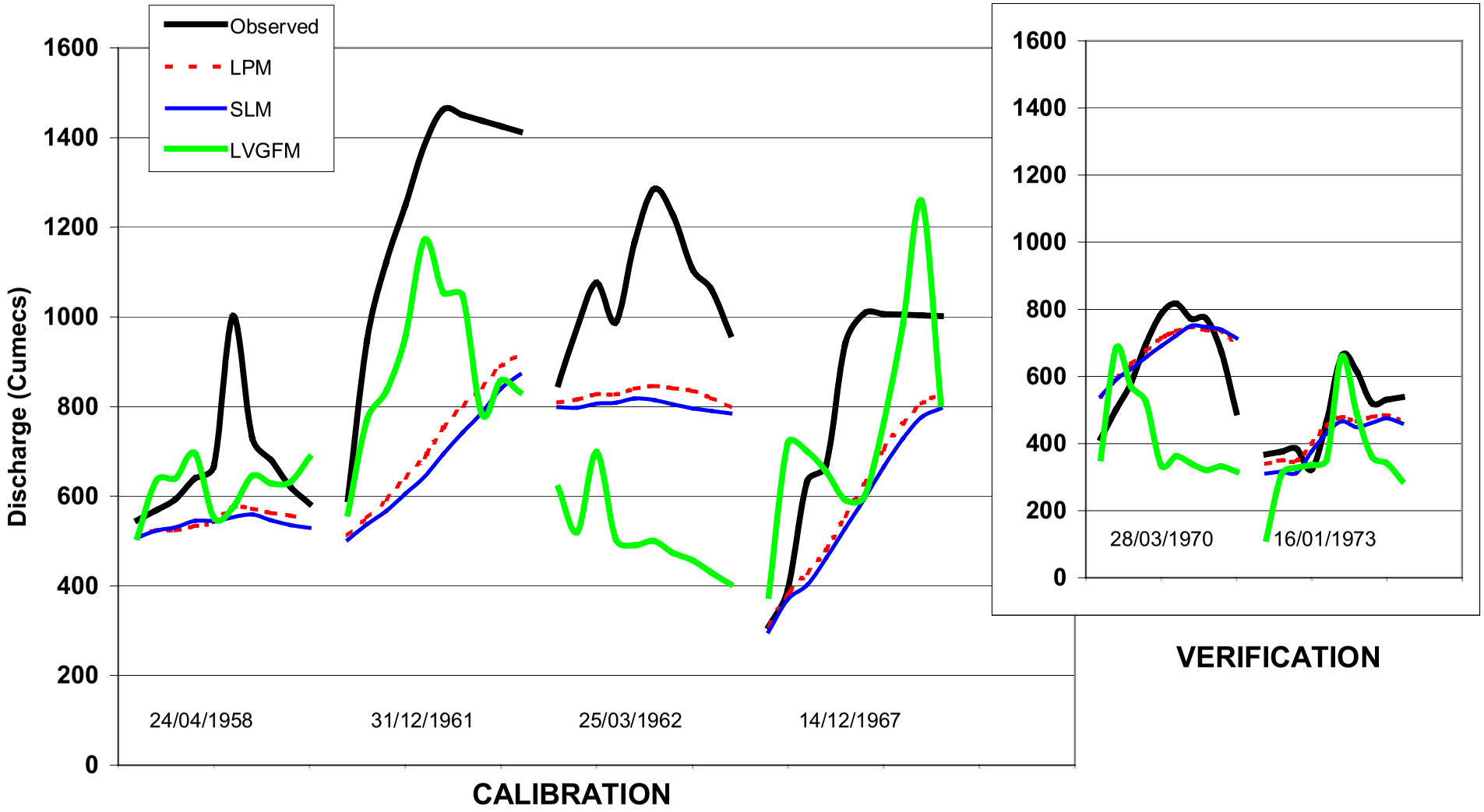
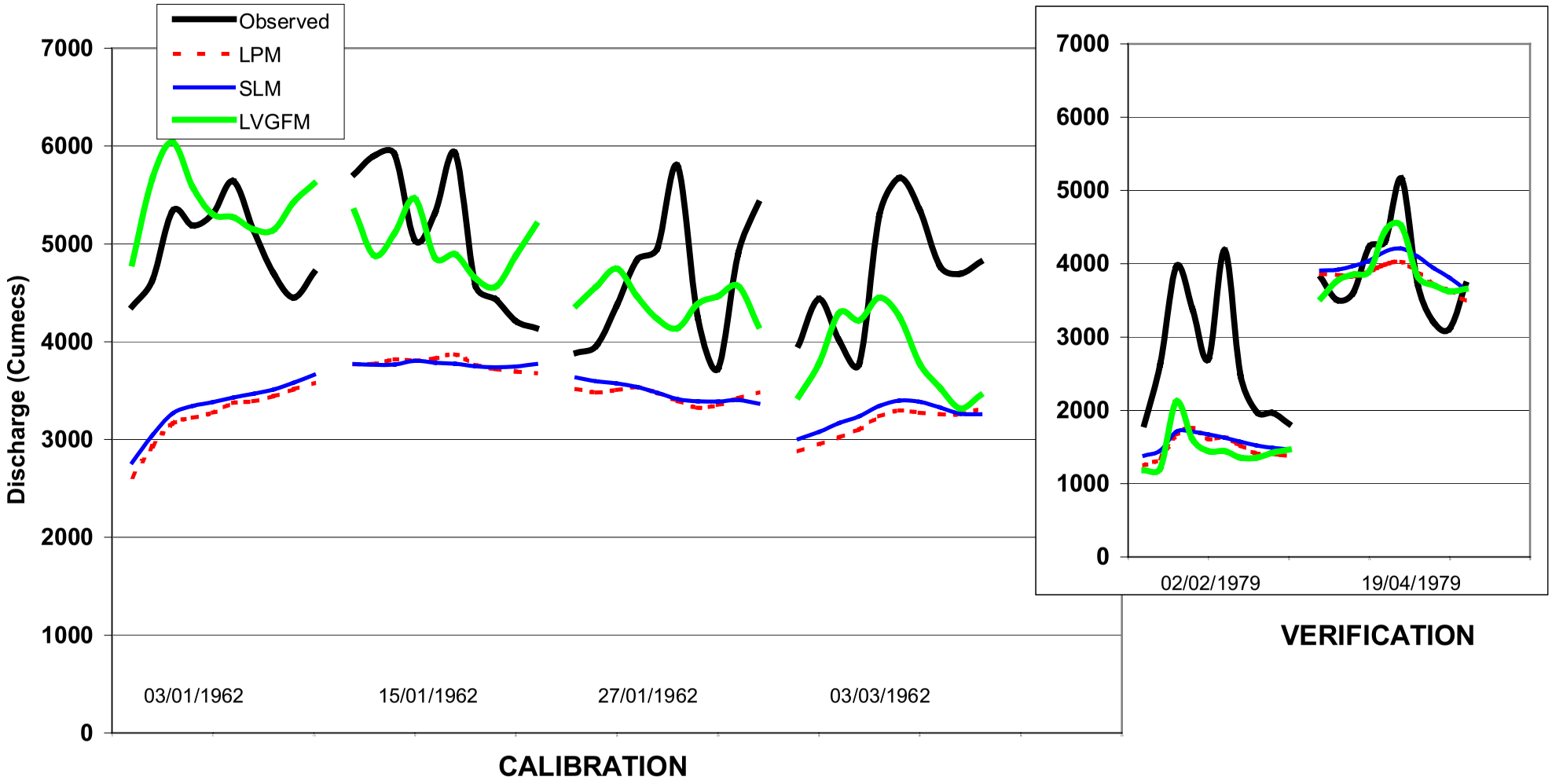
Appendix A7.3: Observed and Estimated Peak Flows Diagrams



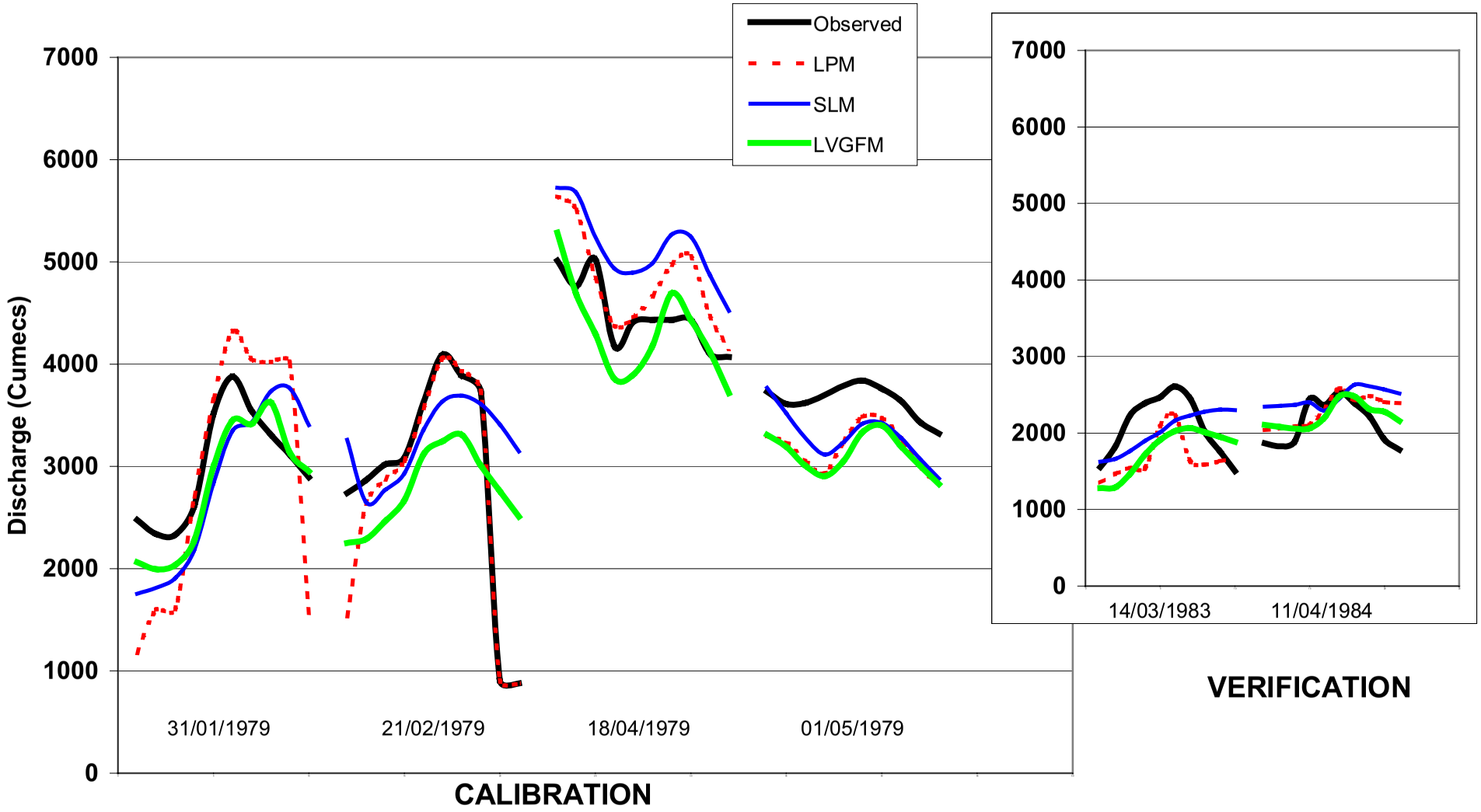
Comparison of observed and estimated peak hydrographs for 1ka5 (Mtera); Input: 1ka31, 1ka59 and 1ka42



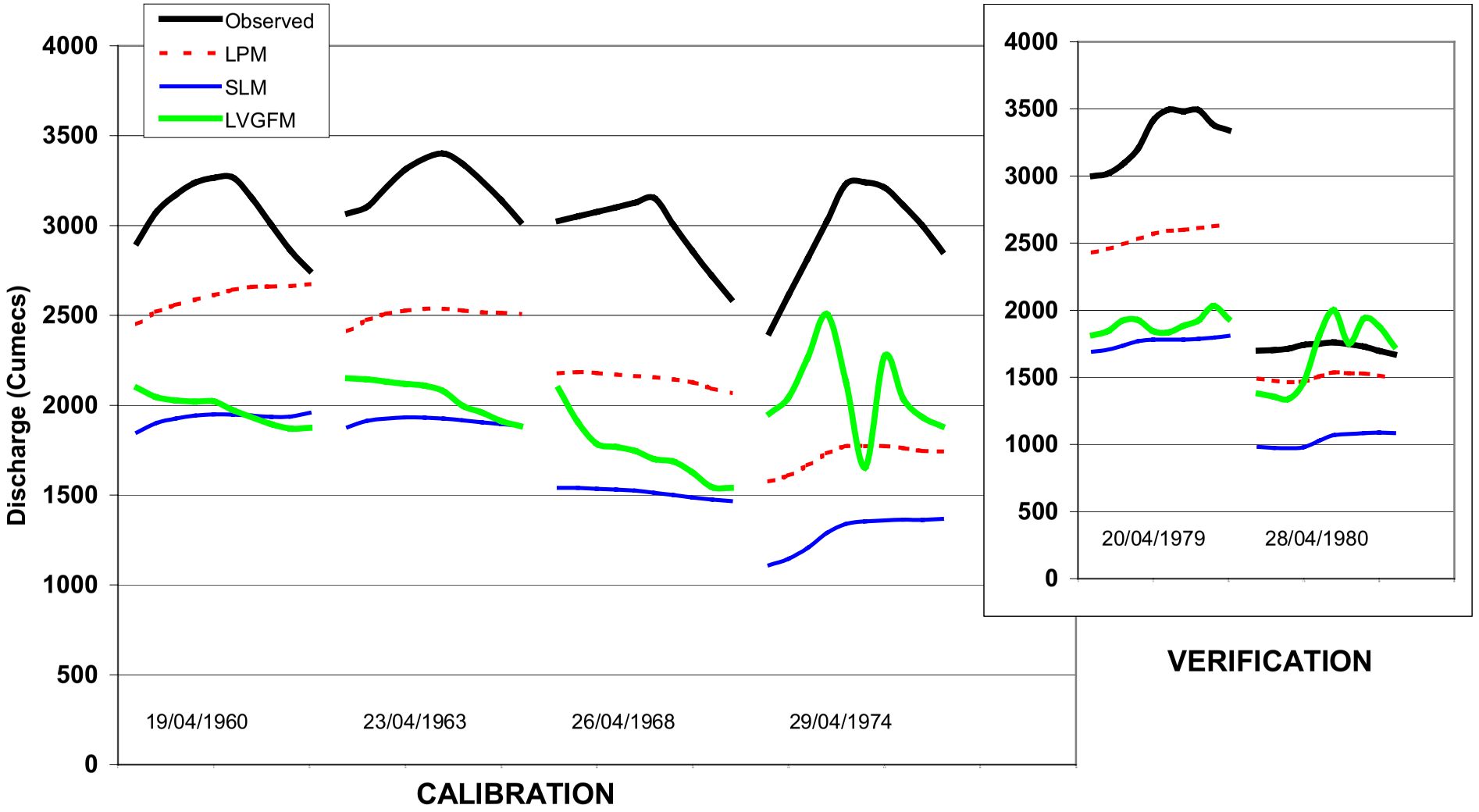
Comparison of observed and estimated peak hydrographs for 1ka3 (Kidatu) ; Inputs: 1ka5, 1ka38, and intervening catchment average rainfall



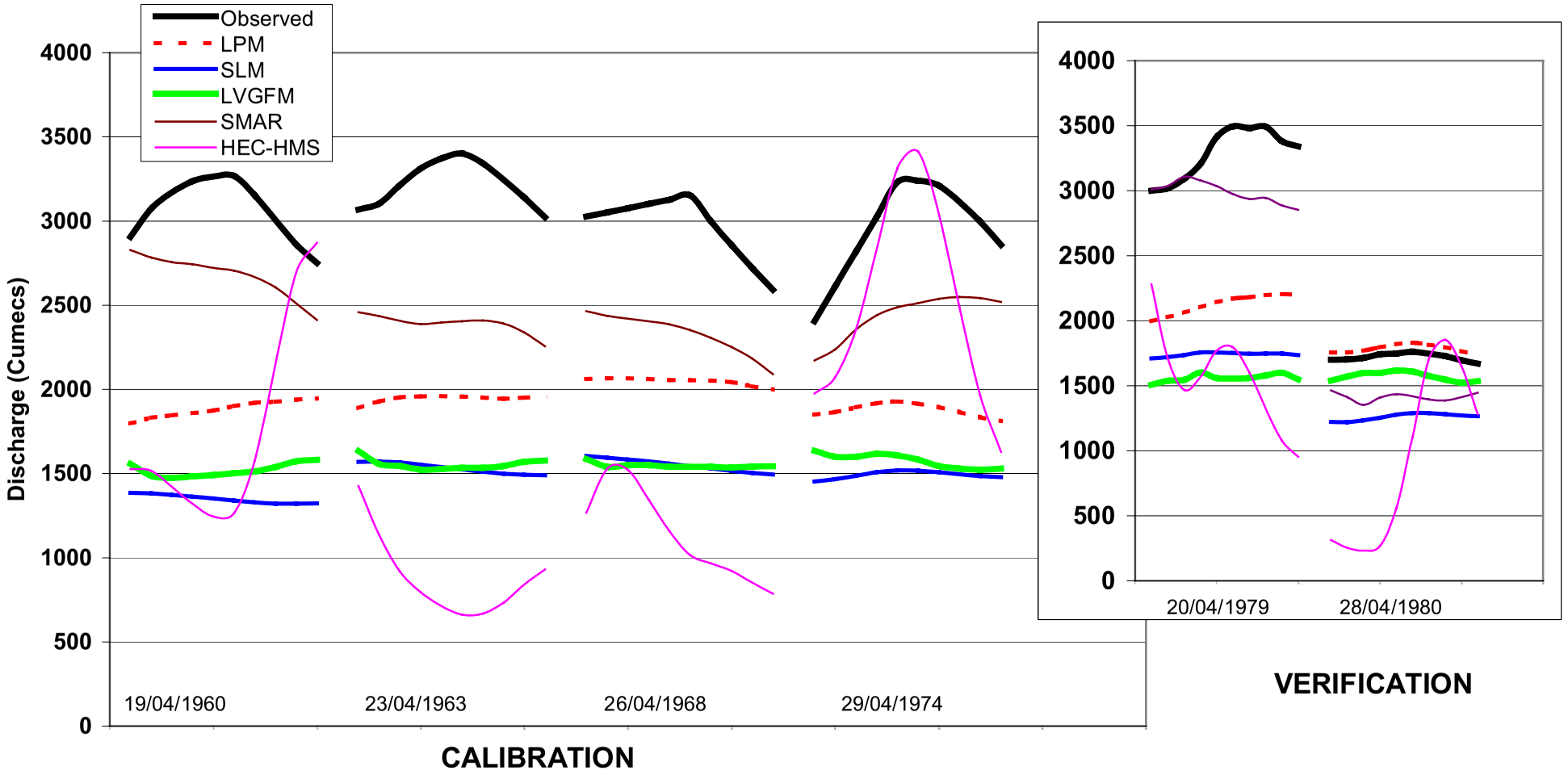
Comparison of observed and estimated peak hydrographs for 1k3 (Stiegler's Gorge) ; Inputs: 1kb17(Kilombero), 1ka3(Kidatu) and intervening catchment average rainfall



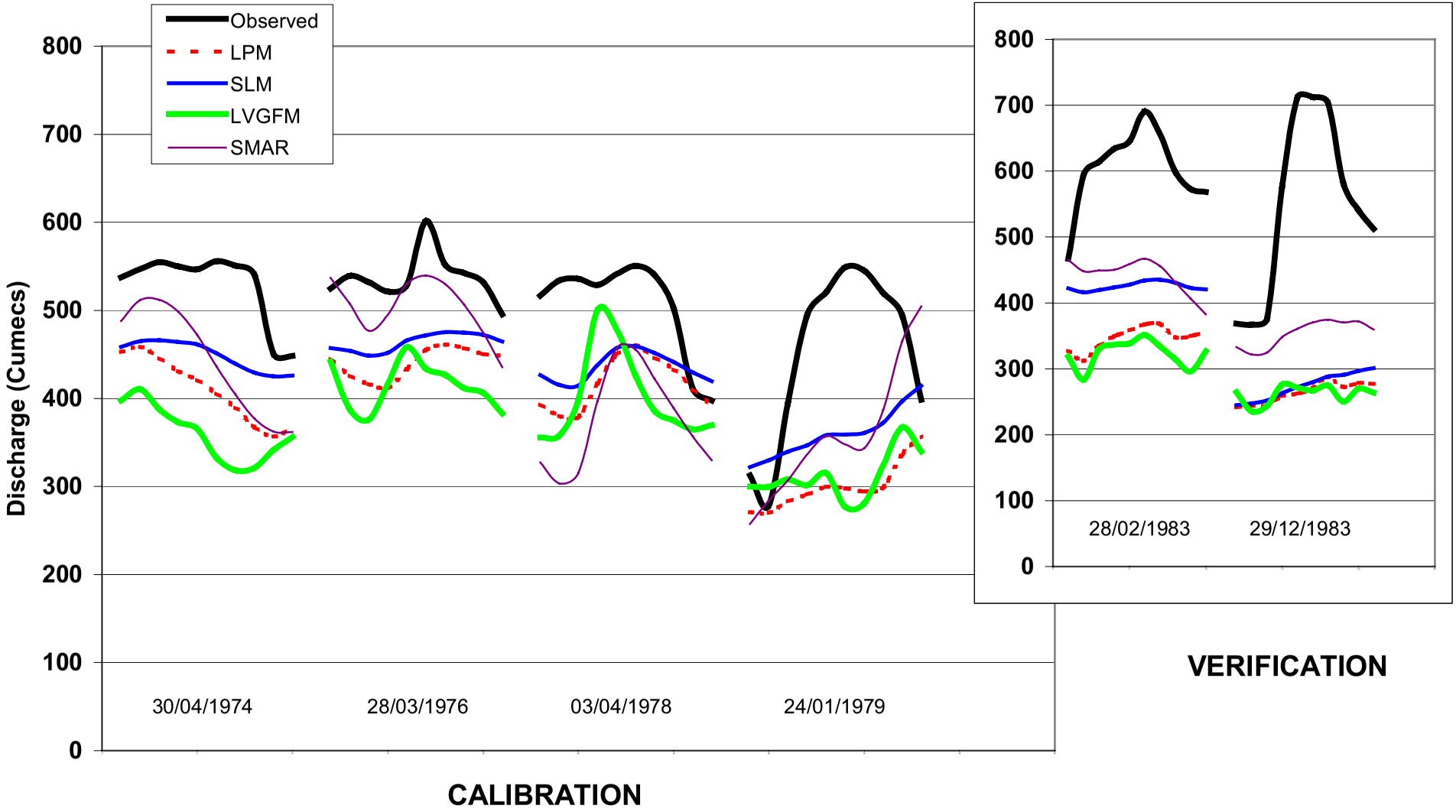
Comparison of observed and estimated peak hydrographs at Mloka (1k4); Input: Observed flows at Stiegler's Gorge (1k3)



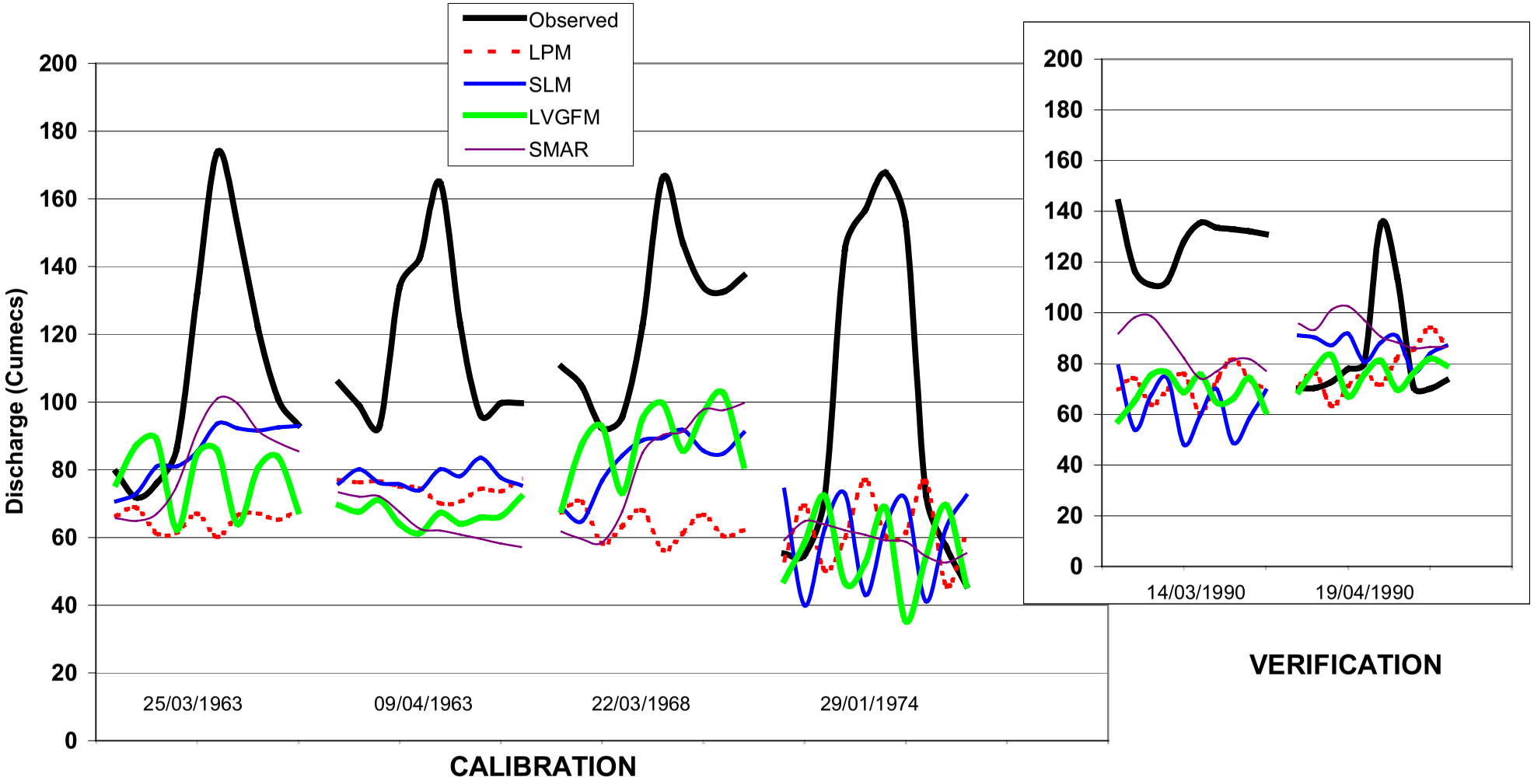
Comparison of observed and estimated peak hydrographs for 1kb17; Inputs: 1kb4, 1kb15a, 1kb14 and intervening catchment average rainfall



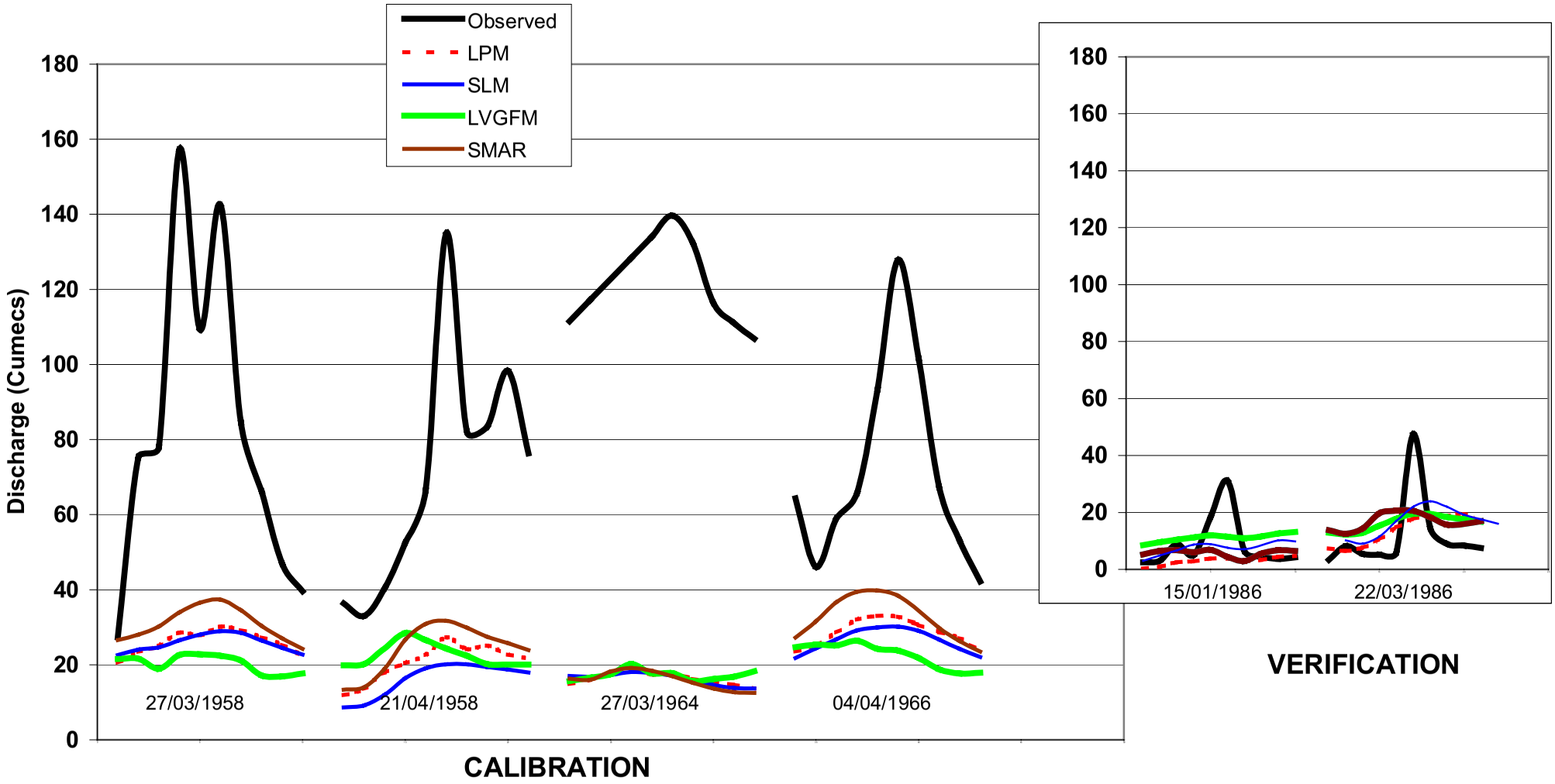
Comparison of observed and estimated peak hydrographs for 1kb17 (Kilombero); Input: Average catchment rainfall for Linear Models with Pot.evaporation as an additional input for the Conceptual Model



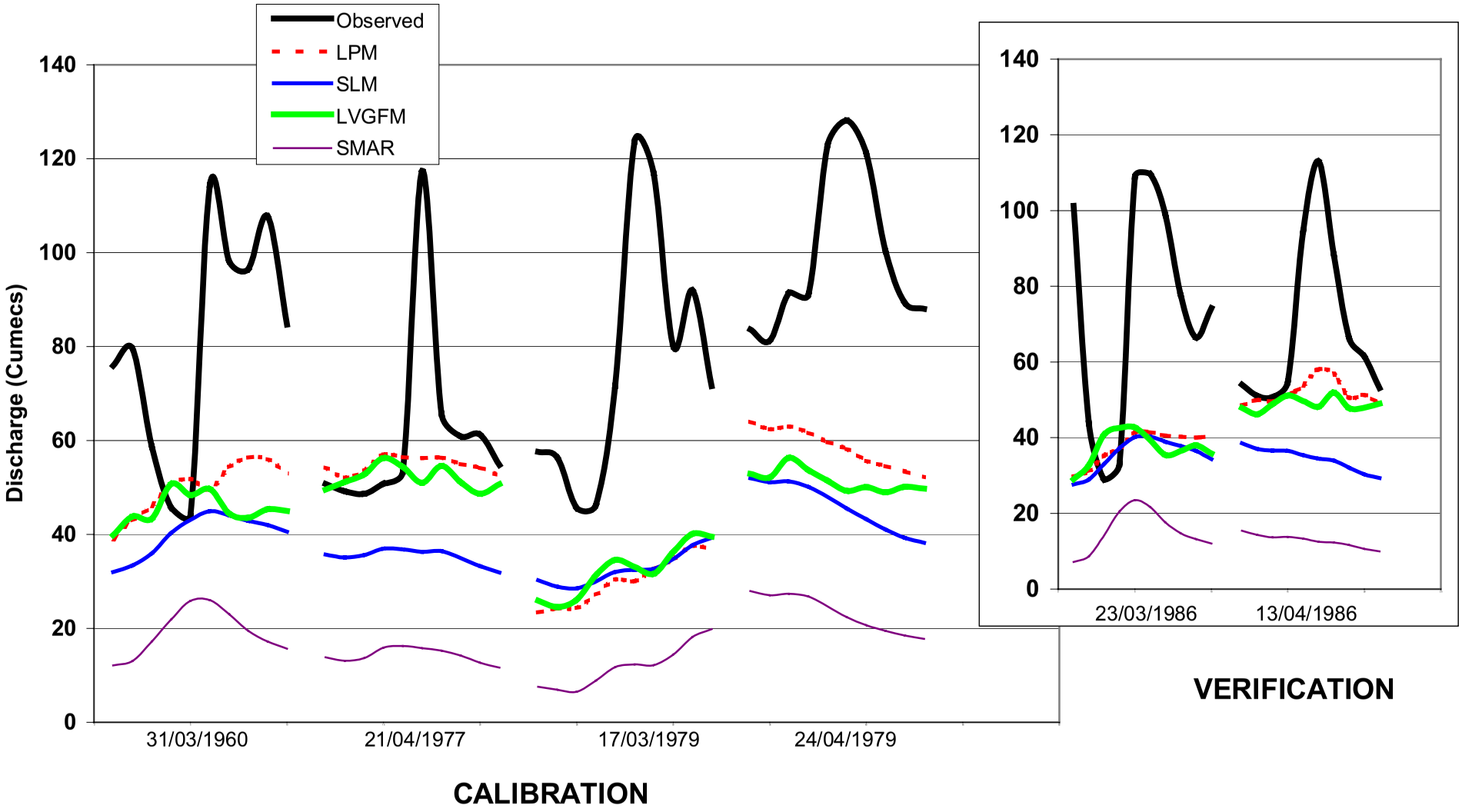
Comparison of observed and estimated peak hydrographs for 1kb10; Input: Average catchment rainfall for Linear Models with an additional of Pot. Evaporation for Conceptual Model (SMAR)



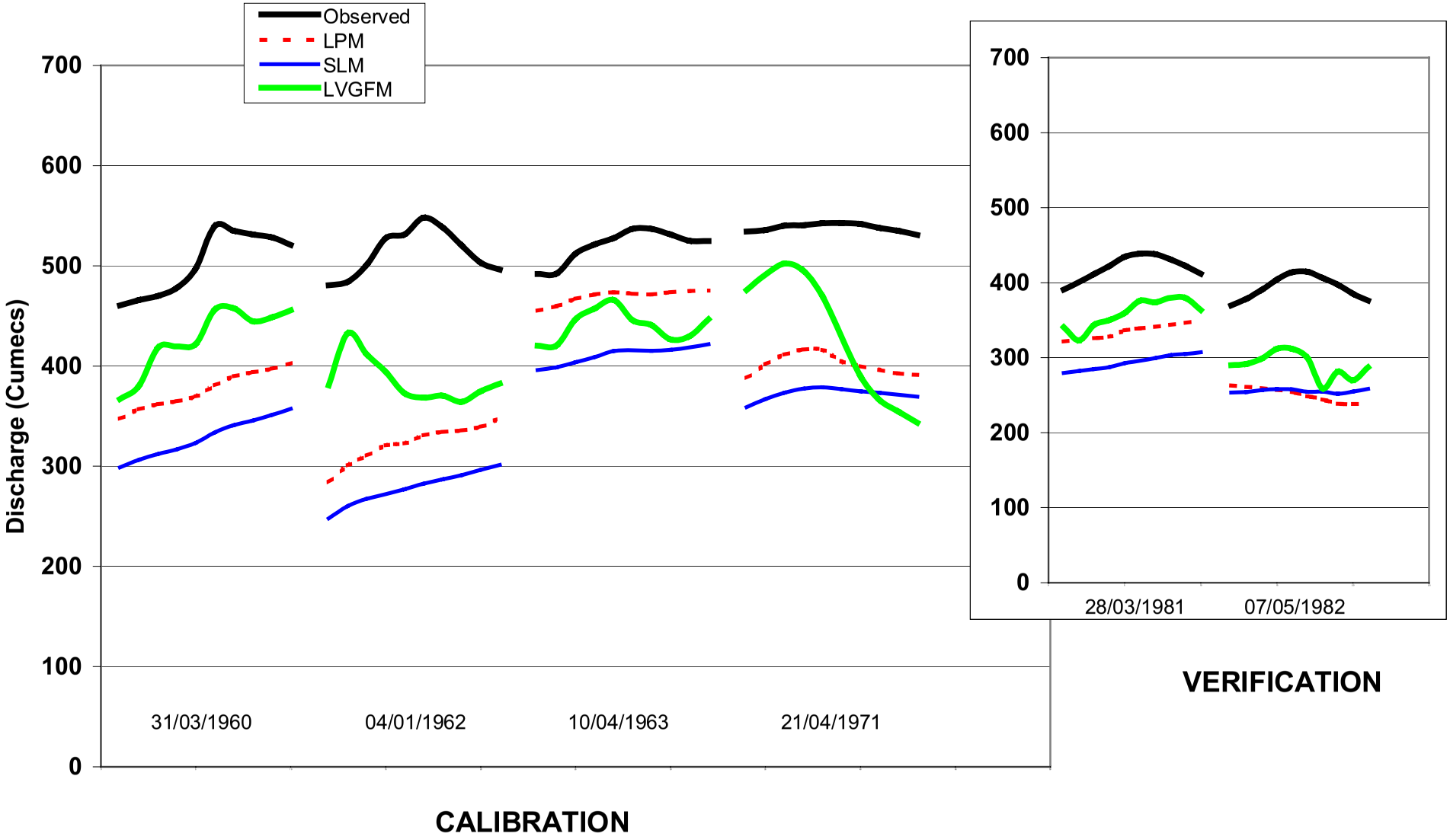
Comparison of observed and estimated peak hydrographs for 1kb8; Input: Average catchment rainfall for Linear Models with an additional of Pot. Evaporation for Conceptual Model (SMAR)



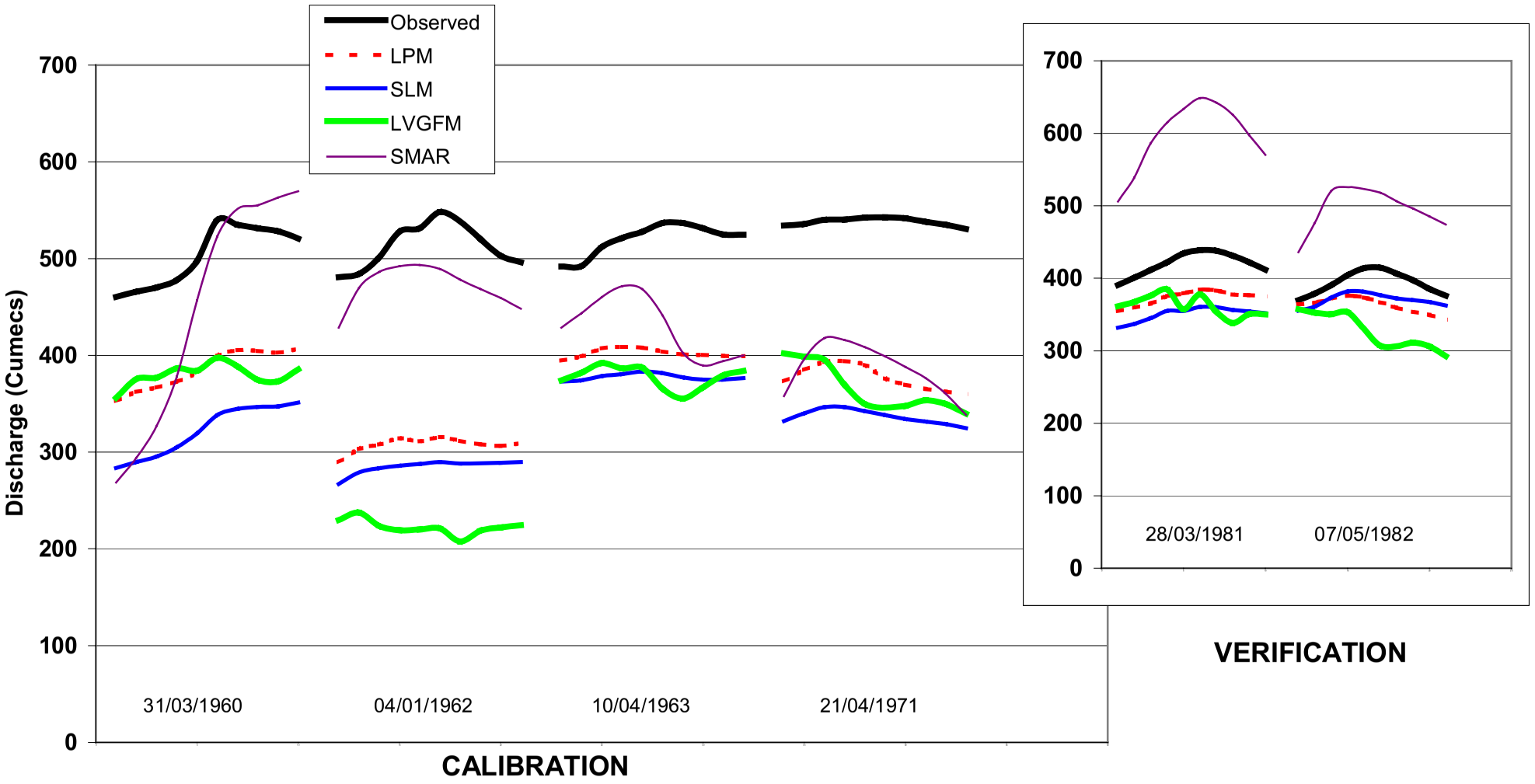
Comparison of observed and estimated peak hydrographs for 1kb14; Input: Average catchment rainfall for Linear Models with additional of Pot. Evaporation for Conceptual Model (SMAR)



Comparison of observed and estimated peak hydrographs for 1kb15a; Input: average catchment rainfall for Linear Models with an additiuoanl of Pot. Evaporation for Conceptual Model (SMAR)

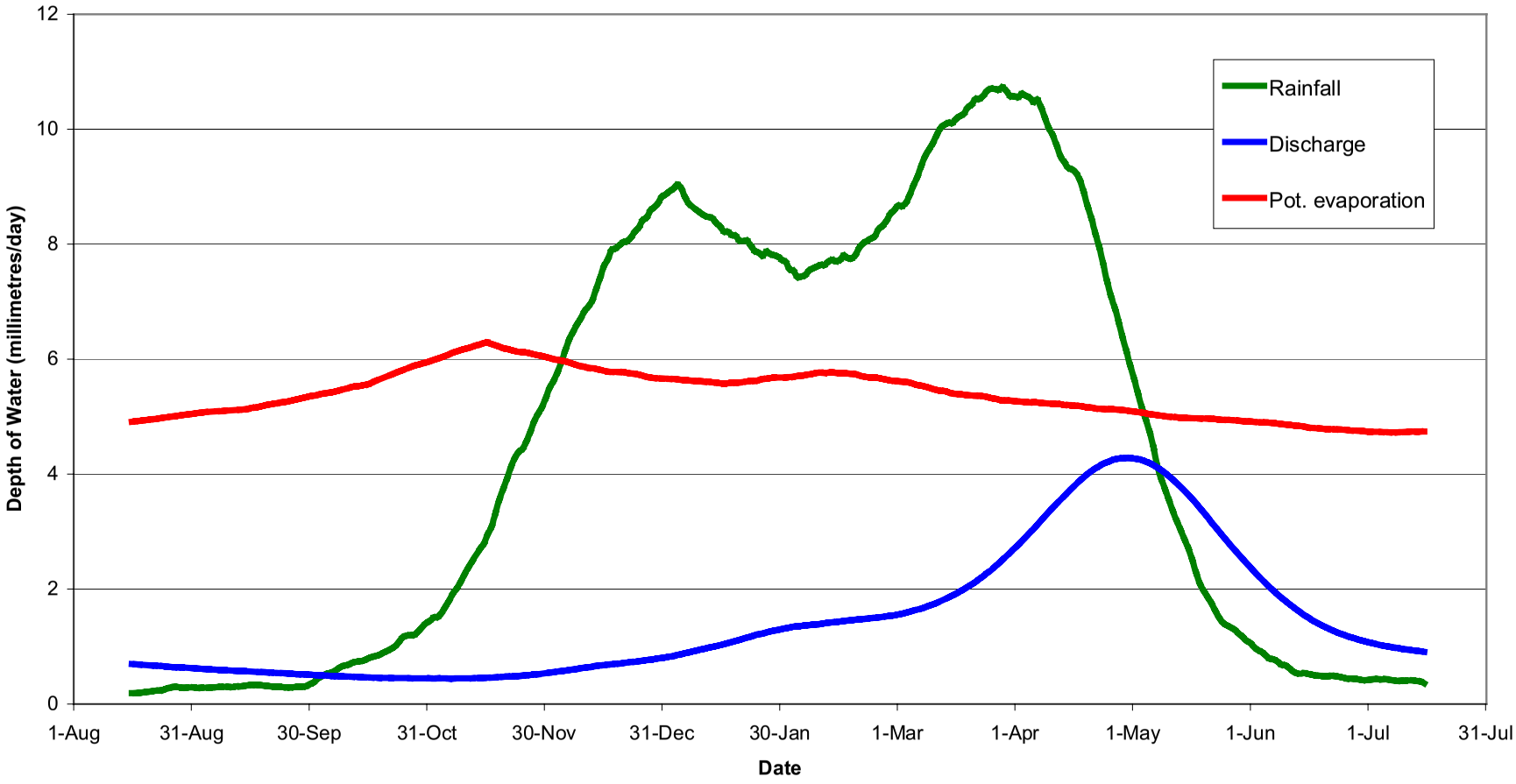


Comparison of observed and estimated peak hydrographs for 1kb4; Inputs: 1kb8 and 1kb10

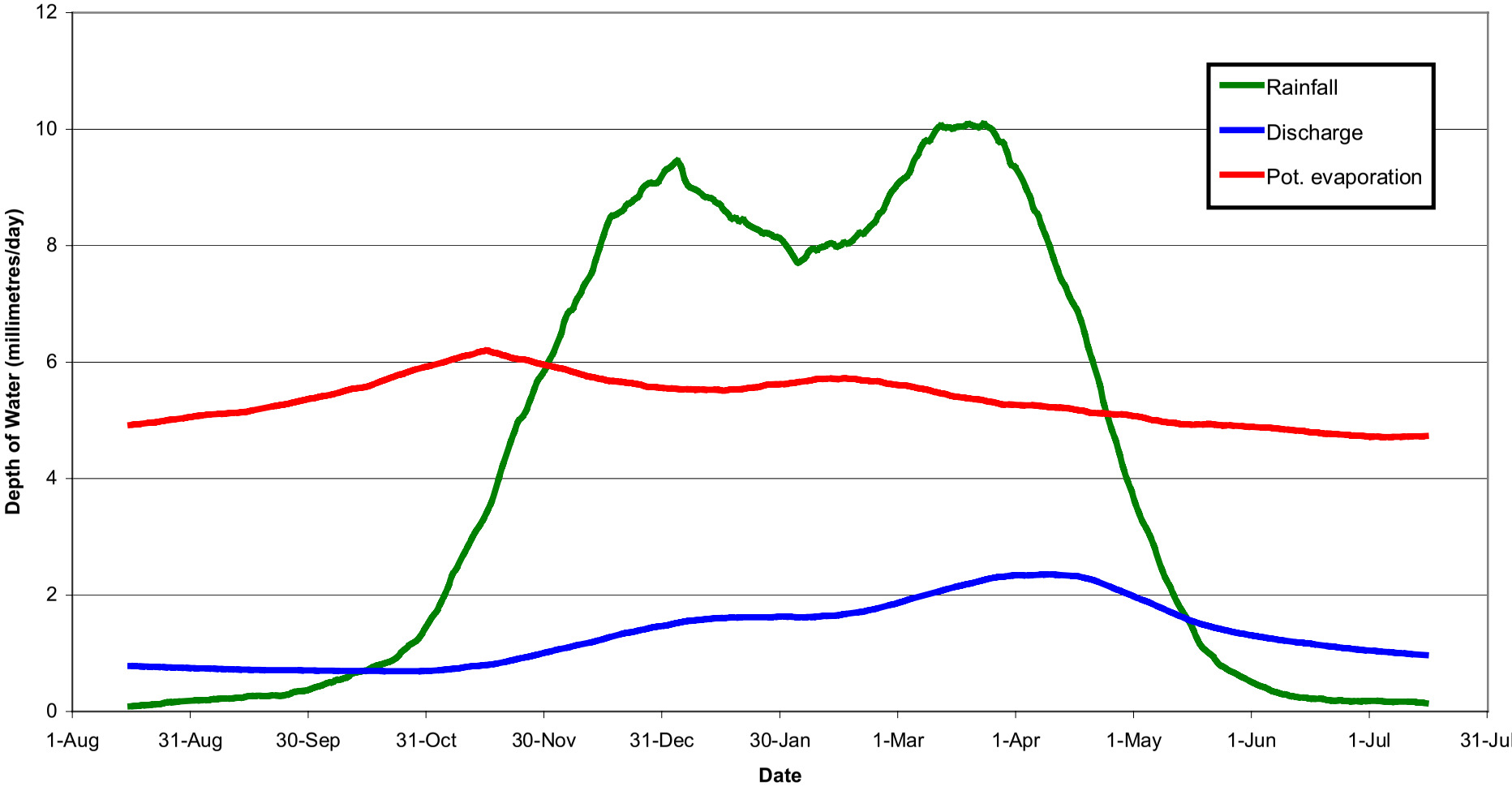


Comparison of observed and estimated peak hydrographs for 1kb4; Input: Average catchment rainfall for Linear Models with an additional of Pot. Evaporation for Conceptual Model (SMAR)

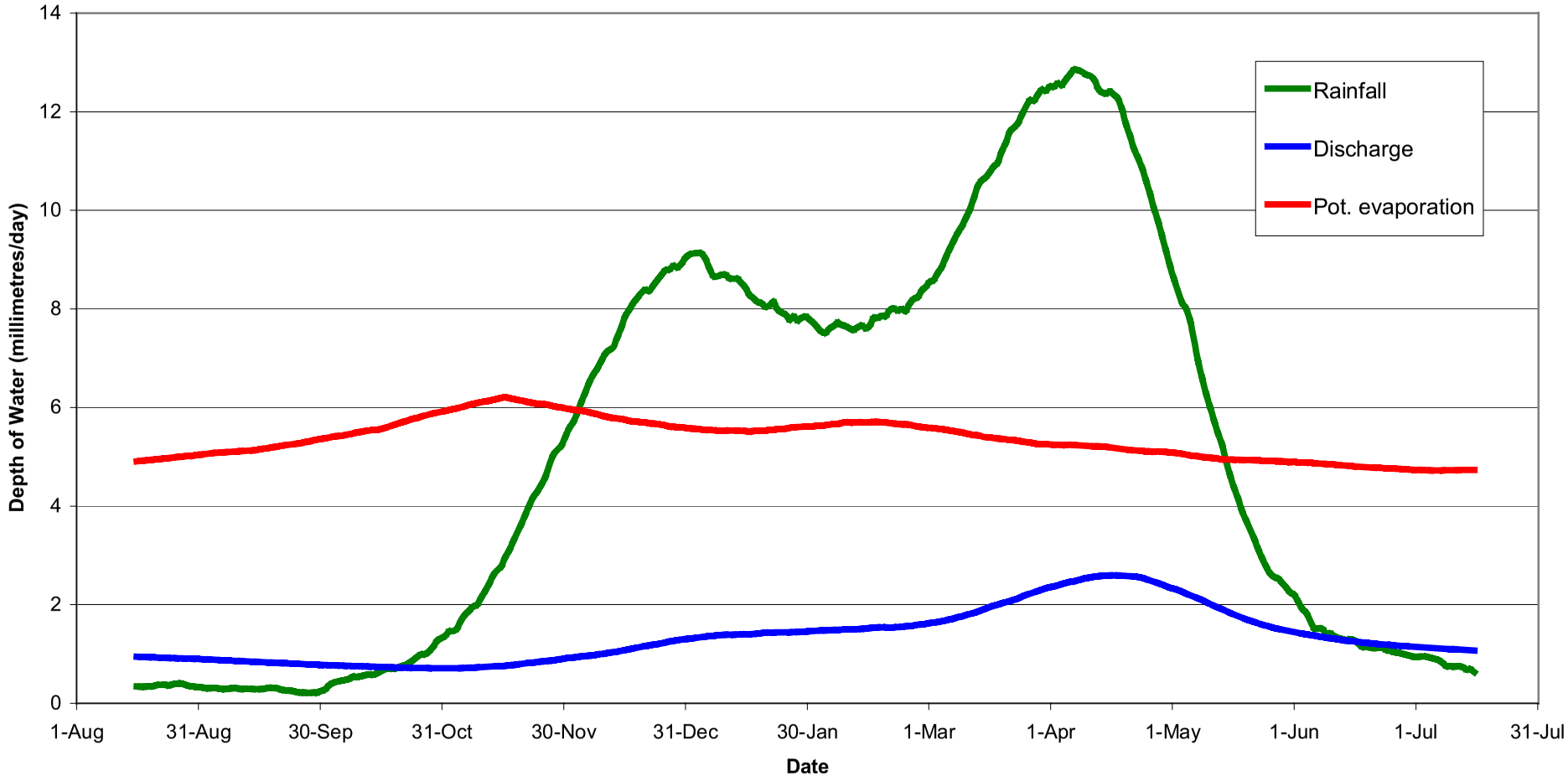
Appendix A7.4: Seasonal Hydrological Diagrams for Sub-Catchments in the Kilombero Sub-Basin



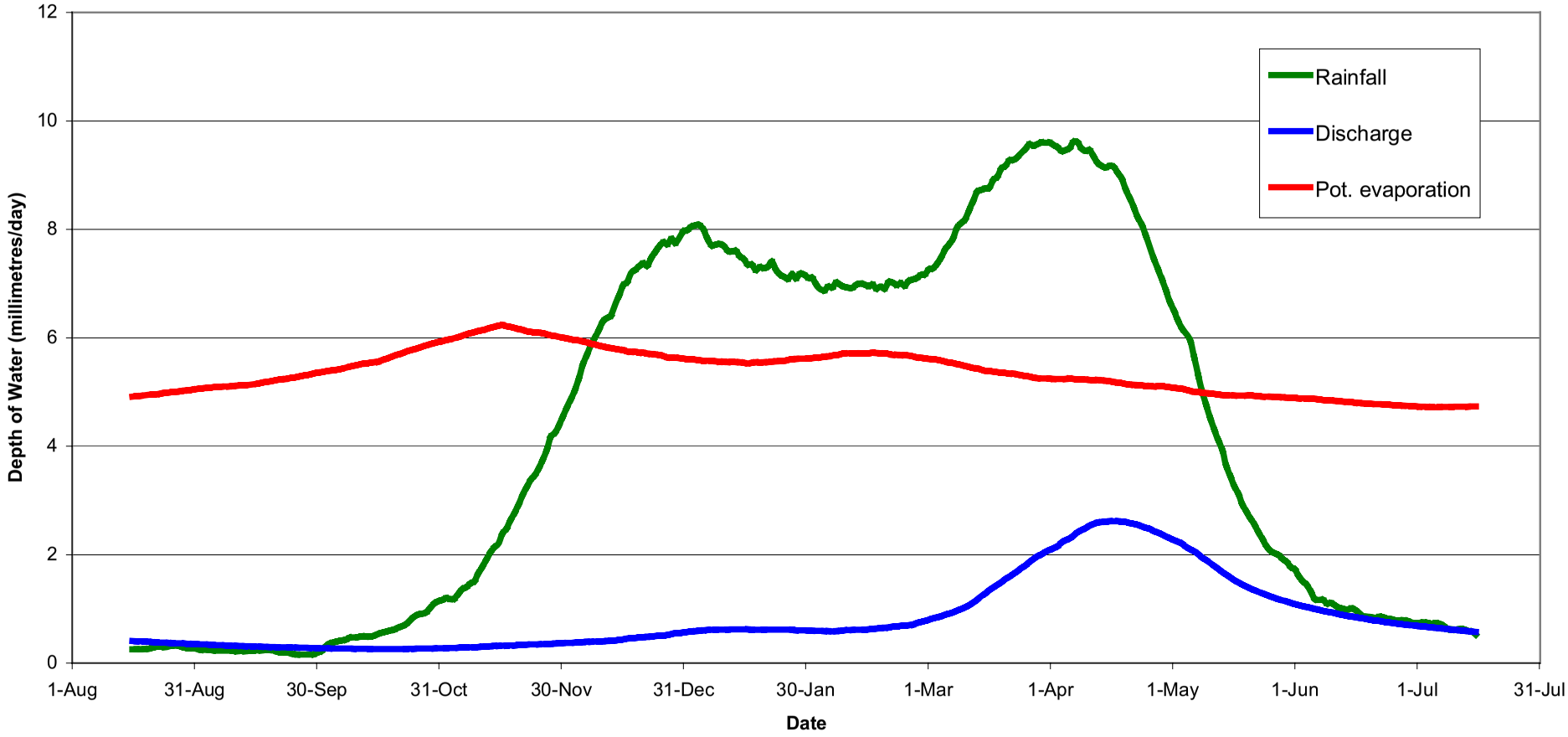
Seasonal variation of rainfall, discharge and evaporation on Kilombero (1kb17) catchment (using 31-Day Moving Average: 1960-1982)



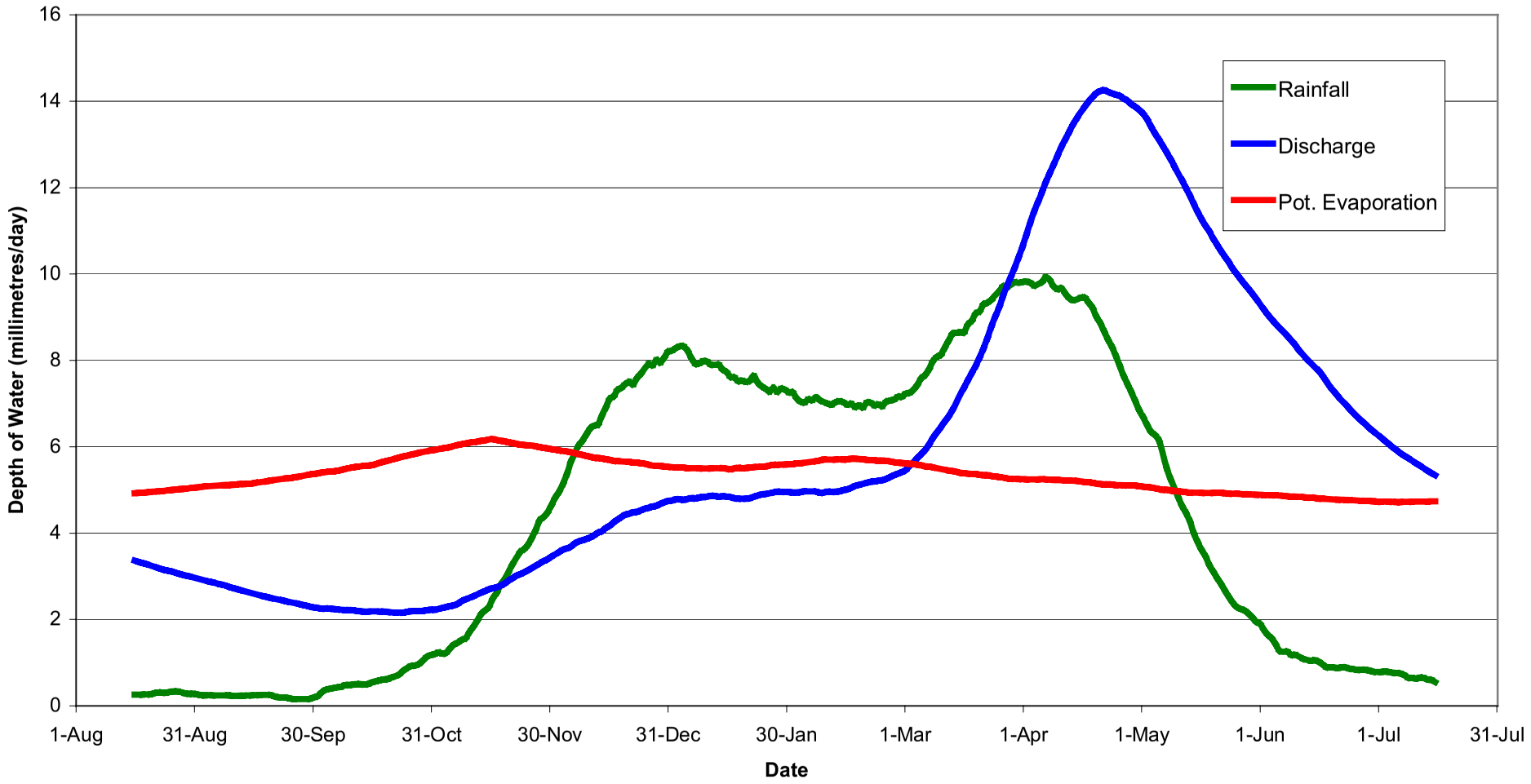
Seasonal mean variation of rainfall, discharge and evaporation on 1kb10 catchment (smoothed using 31-Day Moving Average : 1960-1987)



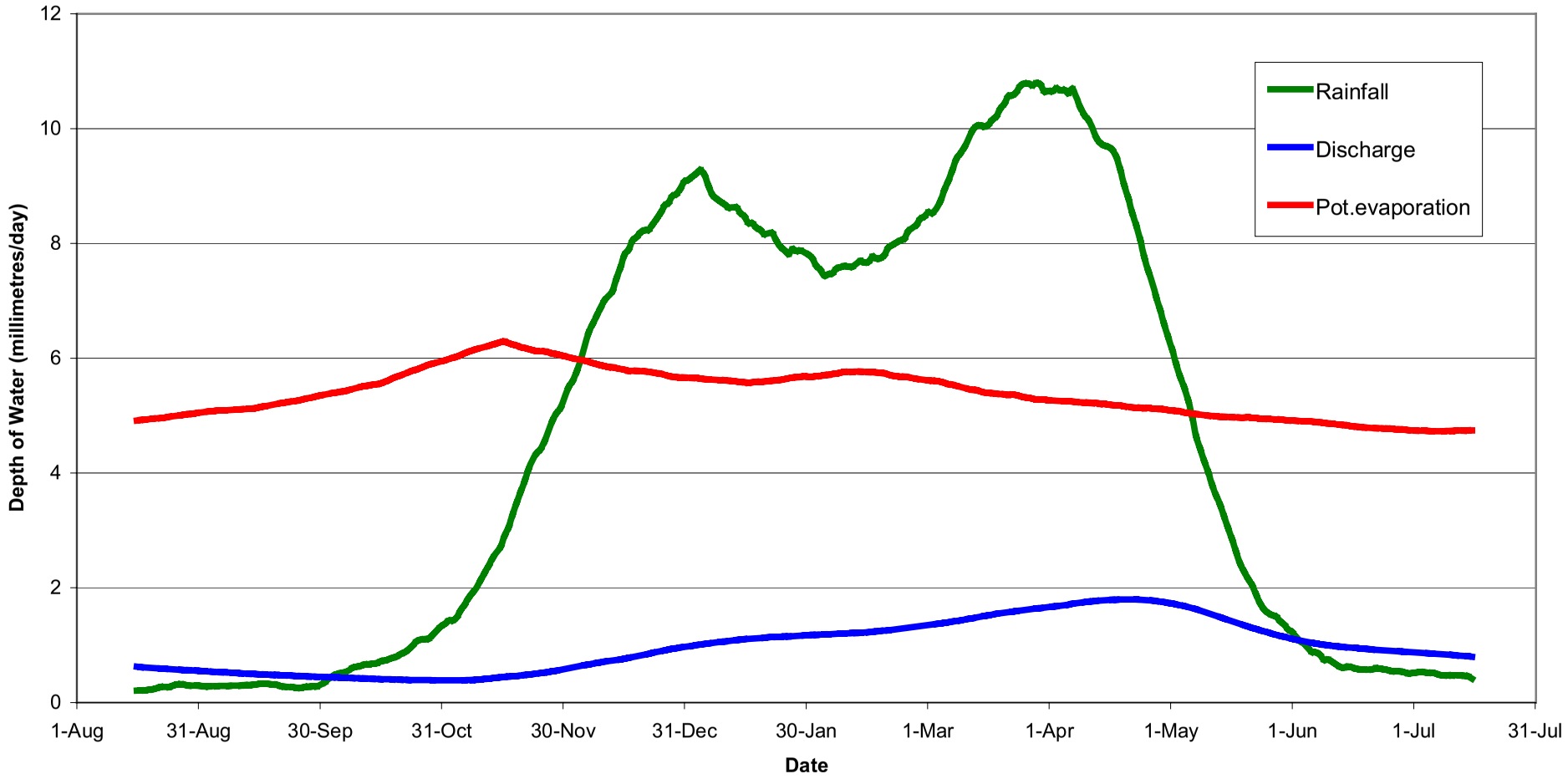
Seasonal variation of rainfall, discharge and evaporation on 1kb8 catchment (using 31-Day Moving Average: 1957-1990)



Seasonal variation of rainfall, discharge and evaporation on 1kb14 catchment (smoothed using 31-Day Moving Average: 1958-1988)



Seasonal variation of rainfall, discharge and evaporation on 1kb15a catchment (smoothed using 31-Day Moving Average: 1960-1989)



Seasonal variation of rainfall, discharge and evaporation on 1kb4 catchment (using 31-Day Moving Average: 1960-1982)

Appendix A7.5: Optimal Parameters attained using HEC-HMS to model the Kilombero Sub-Basin

Element	Method	Parameter	Value
1kb8 sub-catchment	Loss Method of Initial and Constant	Initial Loss (mm)	500.00
		Constant Rate (mm/hr)	0.025
1kb10 sub-catchment	Loss Method of Initial and Constant	Initial Loss (mm)	36.93
		Constant Rate (mm/hr)	0.34889
1kb14 sub-catchment	Loss Method of Initial and Constant	Initial Loss (mm)	500.00
		Constant Rate (mm/hr)	0.33
1kb15a sub-catchment	Loss Method of Initial and Constant	Initial Loss (mm)	500.00
		Constant Rate (mm/hr)	0.37
Intervening of 1kb4	Loss Method of Initial and Constant	Initial Loss (mm)	36.58
		Constant Rate (mm/hr)	4.719
Intervening of 1kb17	Loss Method of Initial and Constant	Initial Loss (mm)	5.00
		Constant Rate (mm/hr)	1.04
1kb8 Reach	Lag Method	Lag Model (hours)	4131.4
1kb10 Reach	Lag Method	Lag Model (hours)	14441.7
1kb4 Reach	Lag Method	Lag Model (hours)	5732.0
1kb14 Reach	Lag Method	Lag Model (hours)	4272.0
1kb15a Reach	Lag Method	Lag Model (hours)	251.9
Reach from 1kb4 and 1kb15a	Lag Method	Lag Model (hours)	2712.6
Reach from 1kb4 and 1kb15a	Lag Method	Lag Model (hours)	2712.6
Reach from 1kb4, 1kb14 and 1kb15a	Lag Method	Lag Model (hours)	7134.9
		Calibration	Verification
Observed Hydrograph	Peak Discharge	3,400.2 Cumecs	3,493.3 Cumecs
	Time	28th April 1963	25th April 1979
	Total Observed Discharge	9,358.1 mm	2,871.6 mm
Computed Hydrograph	Peak Outflow	3,413.4 Cumecs	4,198.0 Cumecs
	Time	04th May 1974	17th April 1979
	Total Computed Outflow	9,573.8 mm	3,167.9 mm
Result	Average Absolute Residual	300.8 Cumecs	432.4 Cumecs
	Total Residual	216.6 mm	298.1 mm

Note: Transform method of SCS Unit Hydrograph of Lag 5,000 minutes and Baseflow Method of Constant Monthly values are used in each sub-basin.