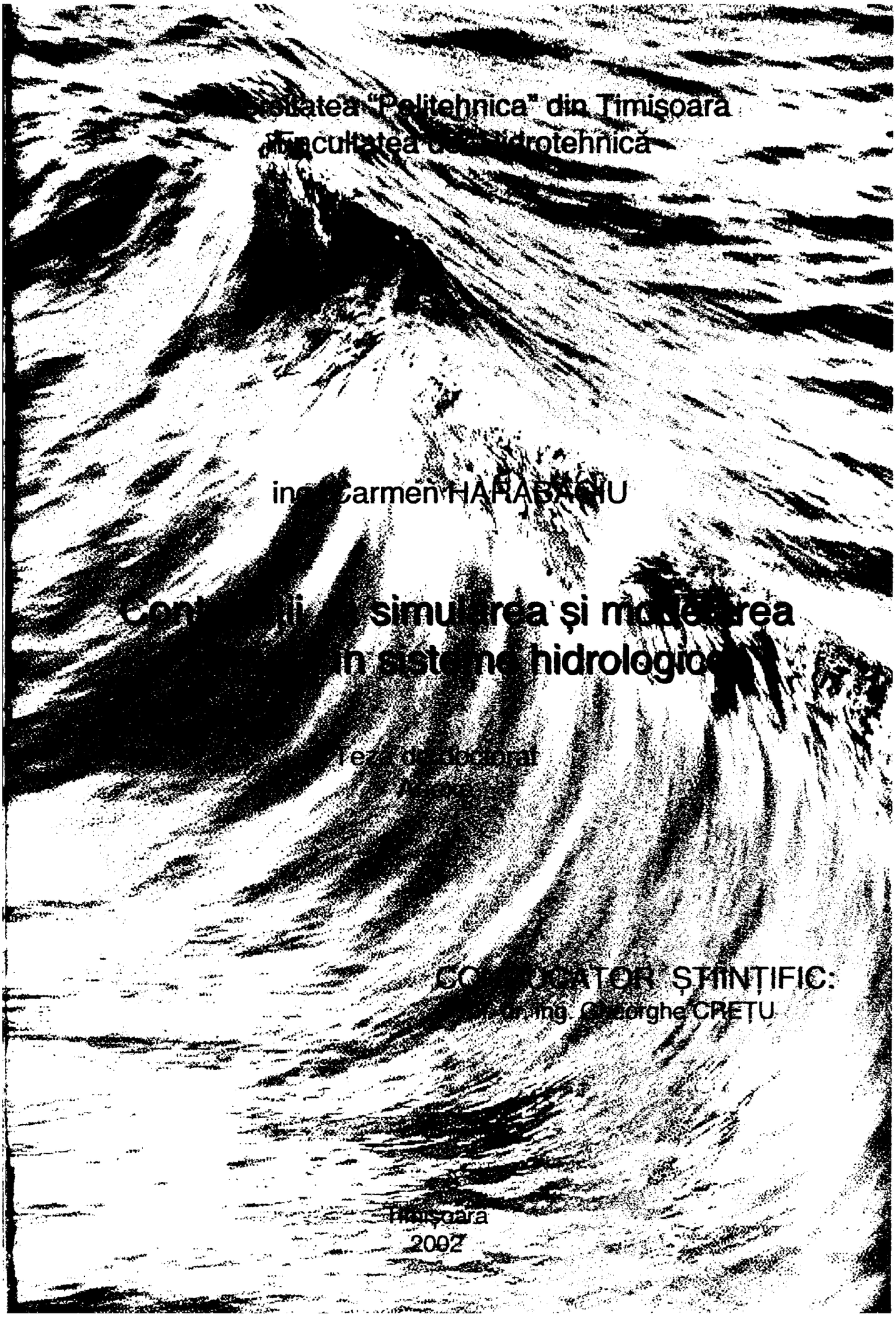

Universitatea "Politehnica" din Timişoara
Facultatea de Hidrotehnică

ing. Carmen HARABAGIU

Contribuţii la simularea şi modelarea în sisteme hidrologice

Rezumat

teză de doctorat

CONDUCĂTOR ŞTIINŢIFIC:
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Timişoara
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Cuprins

Anexa 1

Anexa 2

Anexa 3

Anexa 1

Tabelul 1.

Lacuri de acumulare

Nr. crt.	Acumularea	Bazinul hidrografic	Râul	Volumul la NNR (mil. m^3)	Volumul total (mil. m^3)	Categoria de folosință
1	Pișchia	Bega Veche	Bega Veche	1,16	14,4	nepermanentă
2	Murani	Bega Veche	Măgheruș	1,47	6,24	complexă
3	Sânandrei	Bega Veche	Ier	1,03	1,51	nepermanentă
4	Mănăștur	Bega Veche	Apa Mare	2,66	10,2	nepermanentă
5	Izvorân	Bega Veche	Izvorân	1,80	6,64	nepermanentă
6	Satchinez	Bega Veche	Sicso	0,81	3,35	nepermanentă
7	Cenei	Bega Veche	Bega Veche	-	4,30	nepermanentă
8	Surduc	Bega	Gladna	51,0	66,3	complexă
9	Iosifălău	Bega	Iosifălău	0,32	0,99	nepermanentă
10	Coșarii II	Bega	Coșari	0,46	2,00	nepermanentă
11	Coșarii I	Bega	Coșari	0,17	0,32	nepermanentă
12	Repaș	Bega	Repaș	0,40	1,60	nepermanentă
13	Hodoș	Bega	Hodoș	0,19	0,88	nepermanentă
14	Șuștra	Bega	Lipari	0,33	0,92	nepermanentă
15	Topolovăț	Bega	Bega	1,41	4,20	nepermanentă
16	Recaș	Bega	Bega	0,16	0,52	nepermanentă
17	Ianova	Bega	Gherteamoș	3,35	5,50	nepermanentă
18	Giarmata	Bega	Unu	0,96	1,34	nepermanentă
19	Dumbrăvița	Bega	Behela	0,52	1,32	nepermanentă
20	Trei Ape	Timiș	Timiș	4,76	6,34	complexă
21	Hitiaș	Bega-Timiș	Timiș	-	20,0	nepermanentă
22	Știuca	Timiș	Știuca	0,75	3,00	nepermanentă
23	Herendești	Timiș	Fața	0,63	1,60	nepermanentă
24	Pădureni	Timiș	Timiș	-	35,0	nepermanentă
25	Sălcia	Timiș	Sălcia	0,81	1,52	nepermanentă
26	Silagiu	Timiș	Fădimac	0,41	1,38	nepermanentă
27	Cadar-Duboz	Timiș	Pogăniș	11,2	41,4	nepermanentă
28	Nanoviște	Timiș	Nanoviște	0,20	0,37	nepermanentă
29	Boculundia	Timiș	Boculundia	0,05	0,13	nepermanentă
30	Porcăreața	Timiș	Porcăreața	0,08	0,20	nepermanentă
31	Prunii	Timiș	Pruni	0,04	0,10	nepermanentă
32	Lățunaș	Timiș	Lățunaș	0,35	0,81	nepermanentă
33	Gad	Timiș	Lanca-Birda	-	20,5	nepermanentă
34	Moravița	Timiș	Moravița	1,37	11,4	nepermanentă
35	Poiana Ruscăi	Timiș	Râul Rece	45,7	62,9	energie
36	Poiana Mărului	Timiș	Bistra Mărului	89,0	110	energie
37	Gozna	Bârzava	Bârzava	10,1	12,0	complexă
38	Văliug	Bârzava	Bârzava	0,96	1,13	complexă
39	Secu	Bârzava	Bârzava	7,96	15,5	complexă
40	Ghertenis I	Bârzava	Bârzava	-	7,30	nepermanentă
41	Ghertenis II	Bârzava	Bârzava	-	10,4	nepermanentă
42	Partoș	Bârzava	Bârzava	3,46	3,46	piscicolă
43	Vărădia	Caraș	Caraș	-	3,44	nepermanentă
44	Lișava I	Caraș	Lișava	-	9,45	nepermanentă
45	Greoni	Caraș	Caraș	2,22	2,22	piscicolă
46	Valea lui Iovan	Cerna	Cerna	120	126	complexă
47	Herculane	Cerna	Cerna	14,7		complexă

Tabelul 2.

Alimentări cu apă

Nr. crt.	Secțiunea de control	Număr captări	Debit instalat (l/s)	Volum total captat (mii m^3)
1	Bega la graniță	53	8472	107.571
2	Bega Veche la graniță	54	920	9.487
3	Timiș la graniță	98	4520	54.799
4	Bârzava la graniță	36	8766	76.468
5	Moravița la graniță	5	23	326
6	Caraș la graniță	30	956	2.877
	TOTAL	276	22.664	252.528
7	Nera la vărsare	10	1238	1.250

Tabelul 3.

Derivații

Nr. crt.	Denumirea	Derivația	Capacitatea maximă (m^3/s)	Tip
1	Coștei	Timiș – Bega	40	canal
2	Topolovăț	Bega – Timiș	490	canal
3	Coșava	Nera – Bârzava	1,43	canal
4	Prislop	Timiș – Bârzava	1,90	canal
5	Sasca	Nera – Caraș	0,20	conductă

Tabelul 4

Îndiguiri

Nr. crt.	Secțiunea de control	Număr de îndiguiri	Lungime (km)
1	Bega la graniță	33	188,1
2	Bega Veche la graniță	7	102,0
3	Timiș la graniță	55	413,6
4	Bârzava la graniță	27	119,8
5	Moravița la graniță	12	50,5
6	Caraș la graniță	21	88,2
	TOTAL	155	962,2
7	Nera	2	3,2

Tabelul 5.

Lucrări hidrotehnice pentru protecția albiei și malurilor

Nr. crt.	Secțiunea de control	Apărări de maluri		Regularizări	
		număr	lungime (km)	număr	lungime (km)
1	Bega la graniță	262	41,1	16	112,5
2	Bega Veche la graniță	2	0,2	11	136,9
3	Timiș la graniță	521	70,1	7	28,5
4	Bârzava la graniță	102	23,8	12	8,9
5	Moravița la graniță	-	-	6	41,9
6	Caraș la graniță	60	76,9	6	8,5
7	Nera	106	6,3	5	3,6

Staţiile hidrometrice din Banat

Nr. crt.	Râul	Staţia hidrometrică	L (km)	F (km^2)	H_{med} (m)	I_{bazin} (m/km)	Perioada cu observaţii
	Aranca		**114**	**1080**	**87**		
1	Aranca	Satu Mare	17,0	155	104		IV 1979 - 1998
	Bega		**170**	**2362**	**230**	**103**	
2	Bega	Luncani	16,0	73,5	775	362	1953 - 1955 1958 - 1999
	Saşa		**35,0**	**173**	**610**		
3	Saşa	Poieni	18,0	80,0	763	318	1966 - 1999
4	Bega	Făget	44,0	474	470	199	1953 - 1958 1974 - 1999
	Gladna		**34,0**	**173**	**282**		
5	Gladna	Fârdea	13,5	57,0	456		1980 - 1999
	Hăuzeasca		**9,0**	**30,0**	**364**		
6	Hăuzeasca	Fârdea	8,50	29,0	364		1980 - 1999
	Munişel		**7,0**	**26,0**	**256**		
7	Munişel	Mâtnicu Mic	4,75	23,0	261		1980 - 1998
8	Gladna	Surduc	18,0	130	376	142	1953 - 1976
	Cladova		**19,0**	**61,0**	**194**		
9	Cladova	Cladova	13,0	15,0	164		1980 - 1998
10	Bega	Balinţ	71,0	1064	335	138	1958 - 1999
	Chizdia		**34,0**	**233**	**187**		
11	Chizdia	Ghizela	31,0	226	194	121	1966 - 1971 1974 - 1999
12	Bega	Chizătău	80,0	1660	278		1967 - 1999
13	Bega	Topolovăţ	92,0	1685	270		IV 1967 -1999
14	Bega	Remetea	112	1940	253		1968 - 1999
	Bega Veche		**107**	**2108**	**116**	**22**	
15	Bega Veche	Pişchia	44,0	265	188		1964 - 1999
16	Bega Veche	Beregsău	6,00	1351	139	-	1957 - 1987
17	Bega Veche	Cenei	100,2	1592	126	24	1962 - 1999
	Apa Mare		**69,0**	**770**	**113**		
18	Apa Mare	Satchinez	38,0	322	129		1987 - 1999
19	Apa Mare	Becicherec	65,0	740	115		1959 - 1999
	Timiş		**244**	**5673**	**390**	**151**	
20	Timiş	Teregova	39,0	167	901	187	1953 - 1999
	Râul Rece		**38,0**	**184**	**1134**		
21	Râul Rece	Rusca	33,5	163	1184	439	1951 - 1999
	Râul Alb		**25,0**	**134**	**932**		
22	Râul Alb	Feneş	21,2	125	973		1964 - 1999
23	Timiş	Sadova	50,0	560	936	309	1959 - 1999
	Goleţ		**16,0**	**46,0**	**751**		
24	Goleţ	Goleţ	12,0	41,0	751		1982 - 1999
	Sebeş		**30,0**	**147**	**737**		
25	Sebeş	Turnu Ruieni	21,0	122	819		1964 - 1999
26	Timiş	Caransebeş	73,0	1072	765	286	1952 - 1956 1974 - 1999

Nr. crt.	Râul	Staţia hidrometrică	L (km)	F (km^2)	H_{med} (m)	I_{bazin} (m/km)	Perioada cu observaţii
	Bistra		**60,0**	**919**	**867**		
27	Bistra	Bucova	20,7	66,6	1236		1981 - 1999
28	Bistra	Voislova Bucova	35,4	232	892	379	IV 1950 - 1999
29	Bistra	Voislova	36,5	404	827	379	IV1955 - 1999
	Bistra Mărului		**35,0**	**293**	**1162**		
30	Bistra Mărului	Poiana Mărului	13,9	79,0	1442	501	X 1950 - 1999
	Şucu		**16,0**	**79,0**	**1428**		
31	Şucu	Poiana Mărului	15,5	77,0	1430	387	IX 1950 - 1999
32	Bistra	Obreja	53,0	863	880		1982 - 1999
	Nădrag		**29,0**	**135**	**522**		
33	Nădrag	Nădrag	11,9	35,0	742	491	1963 - 1999
	Spaia		**17,0**	**63,0**	**219**		
34	Spaia	Găvojdia	16,6	63,0	219		1982 - 1998
35	Timiş	Lugoj	129	2706	666	258	1950 - 1999
	Cinca		**22,0**	**90,0**	**194**		
36	Cinca	Vişag	11,5	19,0	217		1981 - 1999
	Timişana		**47,0**	**434**			
37	Timişana	Racoviţa	44,0	434	176		1976 - 1999
	Şurgani		**31,0**	**195**			
38	Şurgani	Chevereş	22,0	156	141	22	1962 - 1999
39	Timiş	Brod	181	3682	569		1969 - 1999
	Pogăniş		**107**	**671**	**240**		
40	Poganiş	Ohabiţa	17,0	17,0	467		1977 - 1999
	Tău		**27,0**	**117**			
41	Tău	Soceni	9,20	14,5	375		1982 - 1999
42	Poganiş	Brebu	23,2	97,0	386	175	1965 - 1999
43	Poganiş	Valeapai	57,8	406	295		1965 - 1999
44	Poganiş	Otveşti	94,4	644	245	95	1955 - 1998
45	Timiş	Şag	174,0	4493	477	175	1961 - 1999
46	Timiş	Grăniceri					1961 - 1973
	Bârzava		**154**	**1202**	**289**	**100**	
47	Bârzava	Crivaia	16,0	41,0	970		1966 - 1998
48	Bârzava	Secu	43,5	140	604		1981 - 1999
49	Bârzava	Reşiţa	53,5	191	574		III 1968 - 1999
	Valea Mare		**6,00**	**24,0**	**574**		
50	Valea Mare	Reşiţa	5,80	25,0	574		1969 – 1999
	Valea Doman		**5,00**	**11,0**	**453**		
51	Valea Doman	Reşiţa	4,90	11,0	455		1969 - 1999
	Ţerova		**15,0**	**39,0**	**344**		
52	Ţerova	Ţerova	11,0	30,0	344		1970 - 1999
53	Bârzava	Moniom	58,1	309	570	223	1950 - 1999
	Moraviţa		**14,0**	**35,0**	**347**		
54	Moravita	Bocşa Română	13,0	35,0	347		VI 1986 –1998
	Vornic		**13,0**	**46,0**			
55	Vornic	Ramna	9,00	14,2	292		VI 1981 –1999
	Fizeş		**26,0**	**74,0**			
56	Fizeş	Tirol	13,6	26,5	239		1981 - 1999
57	Bârzava	Gătaia	99,4	721	359	132	1957 - 1999
58	Bârzava	Partoş	125,3	933	293	104	1962 - 1999
	Moraviţa		**47,0**	**445**	**120**	**10**	

Nr. crt.	Râul	Stația hidrometrică	L (km)	F (km^2)	H_{med} (m)	I_{bazin} (m/km)	Perioada cu observații
59	Moravita	Șemlacu Mare	35,0	80,1	158	18	V 1959 – 1961 1963 – 1999
60	Moravița	Moravița	45,6	352	125	10	1959 – 1999
	Caraș		**79,0**	**1280**	**301**	**105**	
61	Caraș	Carașova	10,2	131	615	160	1953 1959-1999
	Gârliște		**20,0**	**59,0**	**535**		
62	Gârliște	Gârliște	16,0	55,5	514		V 1976 – 1999
	Dognecea		**24,0**	**96,0**	**337**		
63	Dognecea	Secășeni	23,5	90,0	337		V 1976 - 1999
	Jitin		**23,0**	**67,0**	**457**		
64	Jitin	Jitin	16,0	52,0	431		1977 – 1999
	Cernovăț		**33,0**	**129**	**208**		
65	Cernovăț	Comorâște	23,0	91,2	228	80	1959 – 1999
	Lișava		**27,0**	**151**	**267**		
66	Lișava	Brădișorul de Jos	16,0	28,0	422		VIII 1986 -1990
67	Caraș	Vărădia	53,5	877	347	116	1958 – 1999
	Ciclova		**33,0**	**121**	**227**		
68	Ciclova	Vrăniuț	24,0	95,9	265	127	1959 – 1999
	Vicinic		**41,0**	**157**	**222**		
69	Vicinic	Milcoveni	34,0	123	257	114	1959 – 1999
	Nera		**143**	**1380**	**576**	**217**	
70	Nera	Pătaș	40,0	145	869	267	1968 – 1999
	Prigor		**33,0**	**153**			
71	Prigor	Prigor	31,0	155	729	247	1966 - 1999
	Miniș		**36,0**	**250**			
72	Miniș	Bozovici	34,0	221	701		1964 - 1999
73	Nera	Dalboșeț	68,0	862	676	223	1952 - 1999
74	Nera	Sasca	94,5	1164	626	225	1951 - 1999
75	Nera	Naidăș	115,0	1319	590		1968 - 1999
	Cerna		**79,0**	**1360**	**737**		
76	Cerna	Cerna Izvoare	11,0	43,0	1222		
	Cărbunelui		**11,0**	**41,0**	**1436**		
77	Cărbunelul	Cărbunelui	11,0	41,0	1436		
	Valea lui Iovan		**11,0**	**31**	**1338**		
78	Valea lui Iovan						
79	Cerna	Cerna Sat	25,0	170	1247		1948 – 1999
	Balmez		**10,0**	**24,0**	**1228**		
80	Balmez	Balmez	3,3	7,0	800		
	Olanu		**13,0**	**47,0**	**1294**		
81	Olanu	Gura Olanului	12,0	47,0	1294	342	1967 – 1999
	Craiova		**16,0**	**38,0**	**1252**		
82	Craiova	Schitul Craiovei	15,9	37,0	1252		1967 – 1999
83	Cerna	Slătinic	37,0	352	1100	367	1951 – 1999
84	Cerna	Km 10	47,0	425	940		1990 – 1999
85	Cerna	7 Izvoare	52,0	488	927		1991 – 1999
86	Cerna	Pecinișca	62,0	545	911	385	1950 – 1999
87	Cerna	Topleț	65,0	1324	754	312	1966 – 1999
	Bela Reca		**36,0**	**713**	**673**		
88	Bela Reca	Bogâltin	13,5	120	985	343	1951 – 1999
89	Bela Reca	Mehadia	31,0	691	676	252	1931 – 1999

Nr. crt.	Râul	Stația hidrometrică	L (km)	F (km^2)	H_{med} (m)	I_{bazin} (m/km)	Perioada cu observații
	Mehadica		**46,0**	400	614		
90	Mehadica	Cuptoare	32,0	120	727	239	1954 – 1999
	Radimna		**27,0**				
91	Radimna	Radimna	24,0	74,0	439	199	1966 - 1999
	Berzasca		**46,0**				
92	Berzasca	Berzasca	44,5	216	568	302	VII 1958 - 1999

Anexa 2

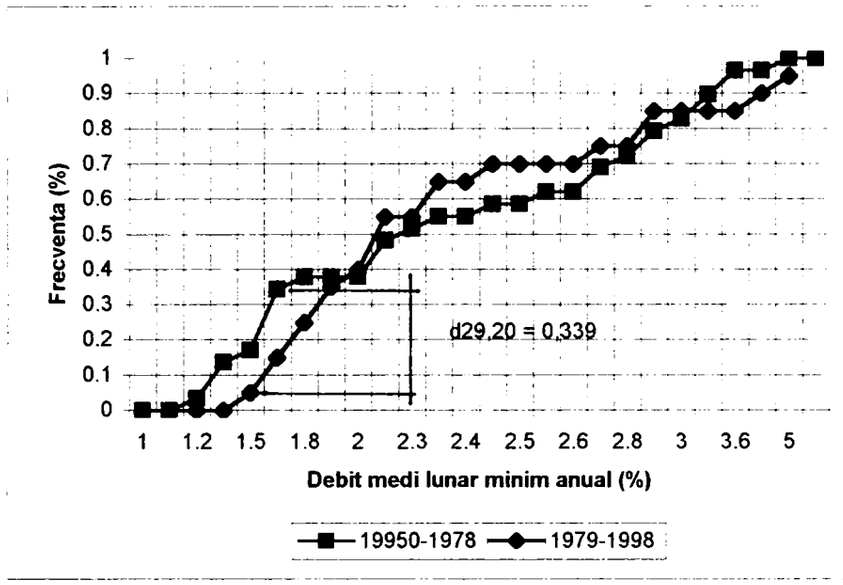


Figura 1. Curbele de frecvență cumulată a debitelor medii lunare minime anuale în regim modificat trasate pentru investigarea omogenității seriei de date. Râul Bega, stația hidrometrică Balinț.

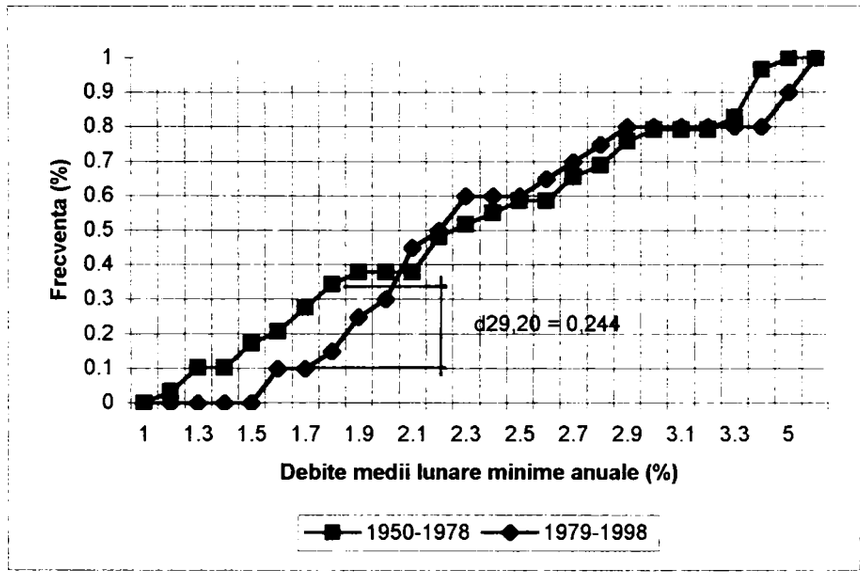


Figura 2. Curbele de frecvență cumulată a debitelor medii lunare minime anuale în regim natural trasate pentru investigarea omogenității seriei de date. Râul Bega, stația hidrometrică Balinț.

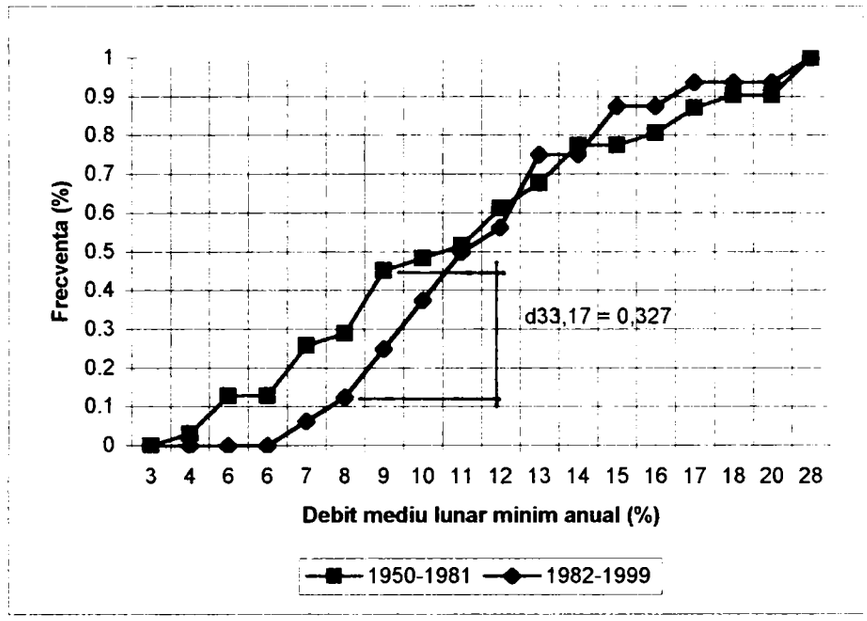


Figura 3. Curbele de frecvență cumulată a debitelor medii lunare minime anuale în regim modificat trasate pentru investigarea omogenității seriei de date. Râul Timiș, stația hidrometrică Lugoj.

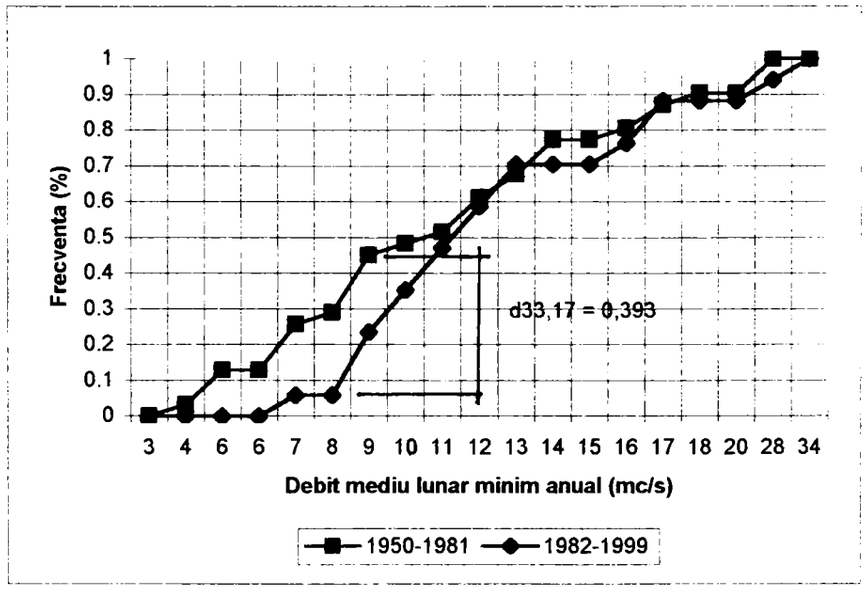


Figura 4. Curbele de frecvență cumulată a debitelor medii lunare minime anuale în regim natural trasate pentru investigarea omogenității seriei de date. Râul Timiș, stația hidrometrică Lugoj.

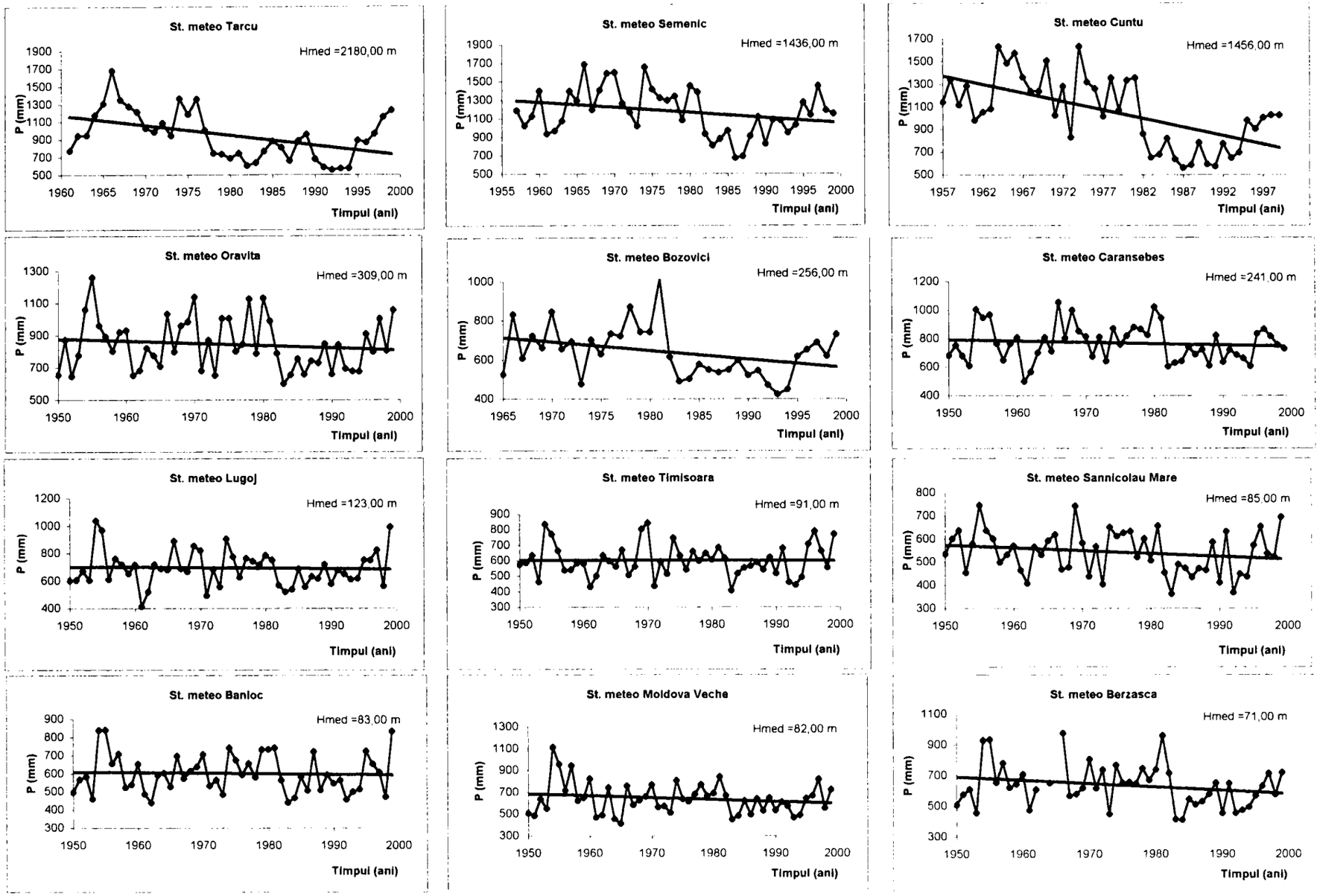


Figura 5. Variația cantităților anuale de precipitații și tendința de lungă durată înregistrată la stațiile meteorologice din Banat

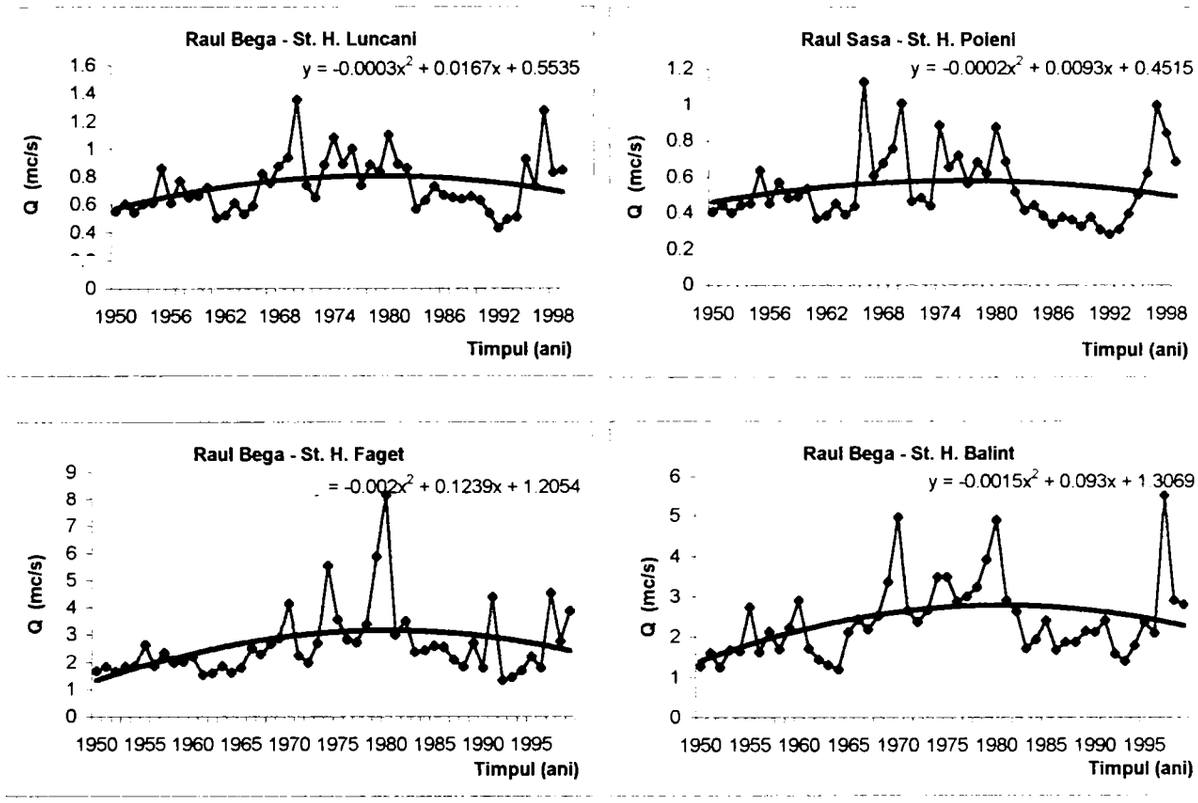


Figura 6. Tendințele debitelor medii lunare minime anuale. Râul Bega.

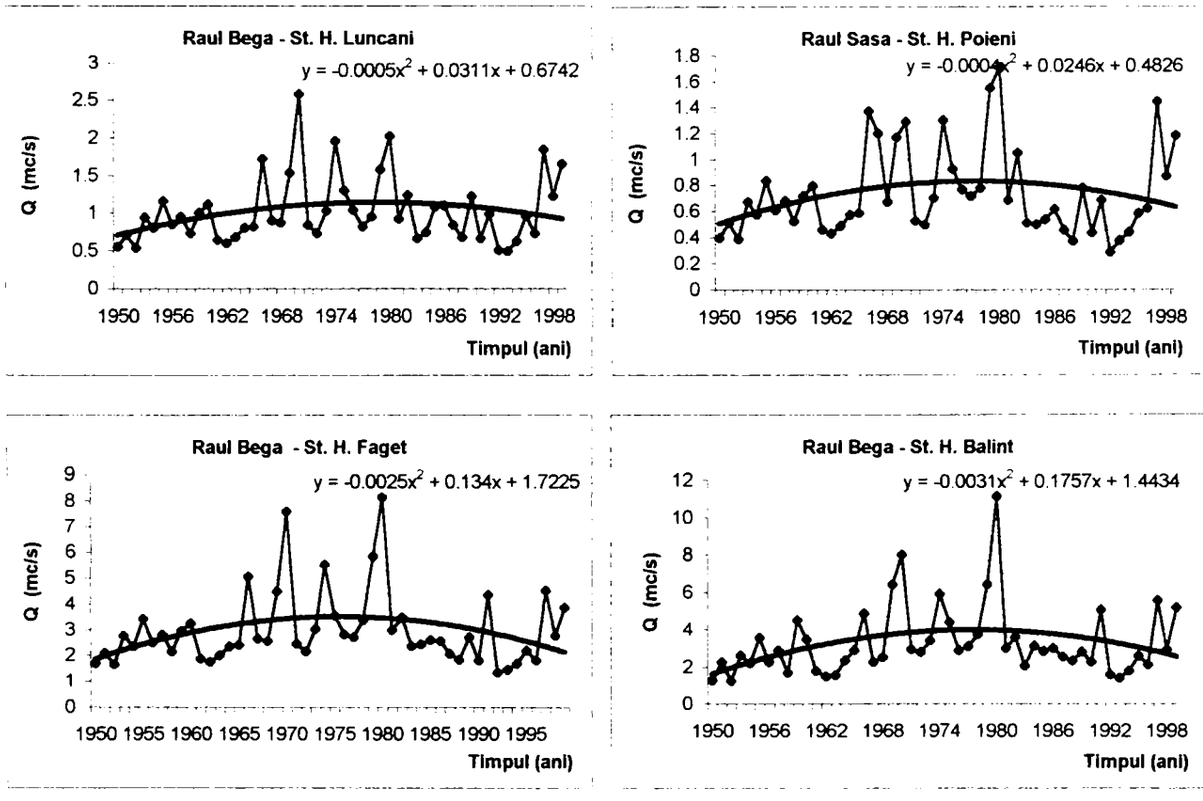


Figura 7. Tendințele debitelor medii lunare minime anuale din perioada VI - VIII. Râul Bega.

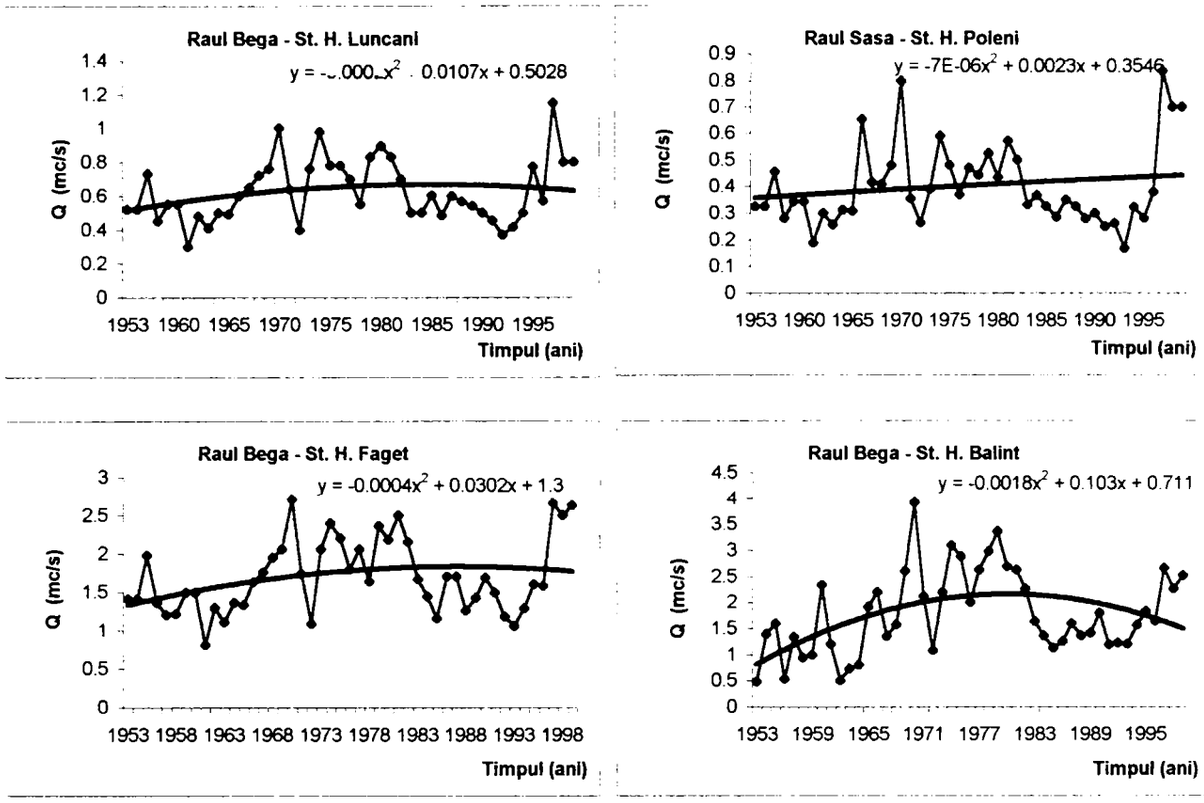


Figura 8. Tendințele debitelor medii zilnice minime anuale. Râul Bega.

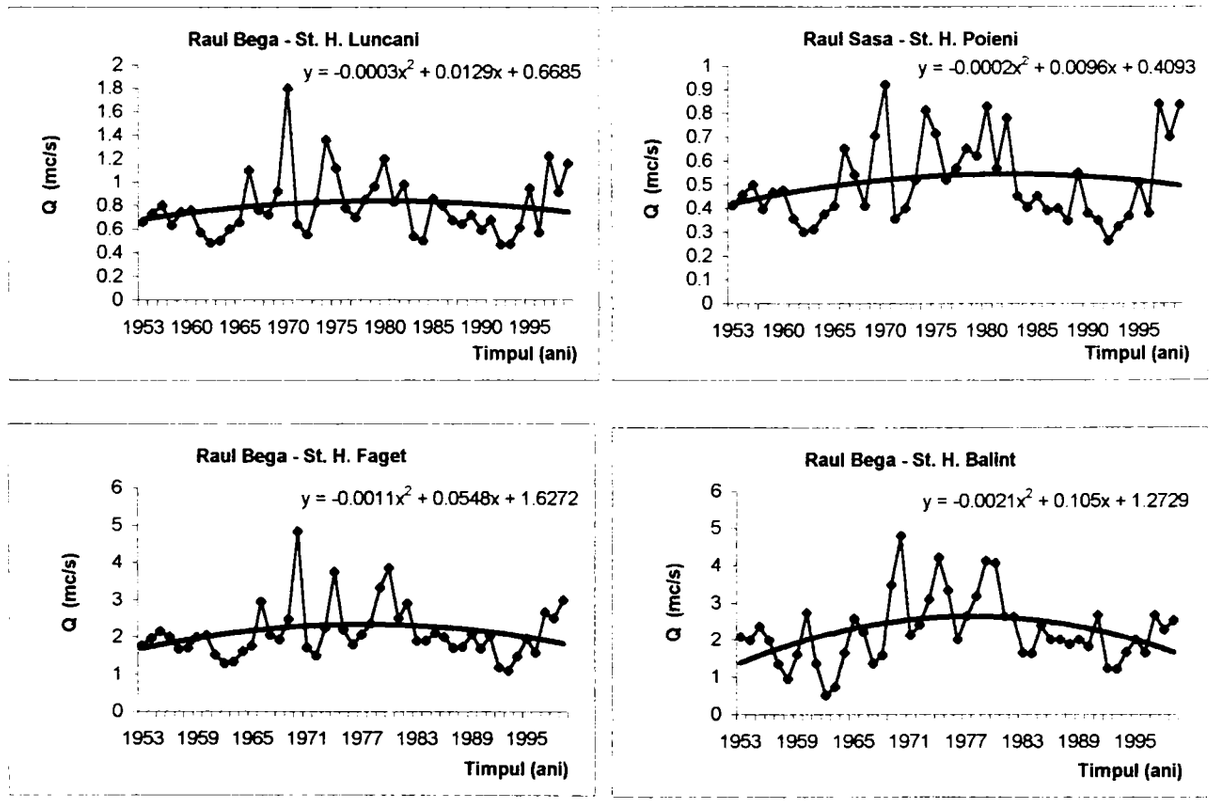


Figura 9. Tendințele debitelor medii zilnice minime anuale din perioada VI - VIII. Râul Bega.

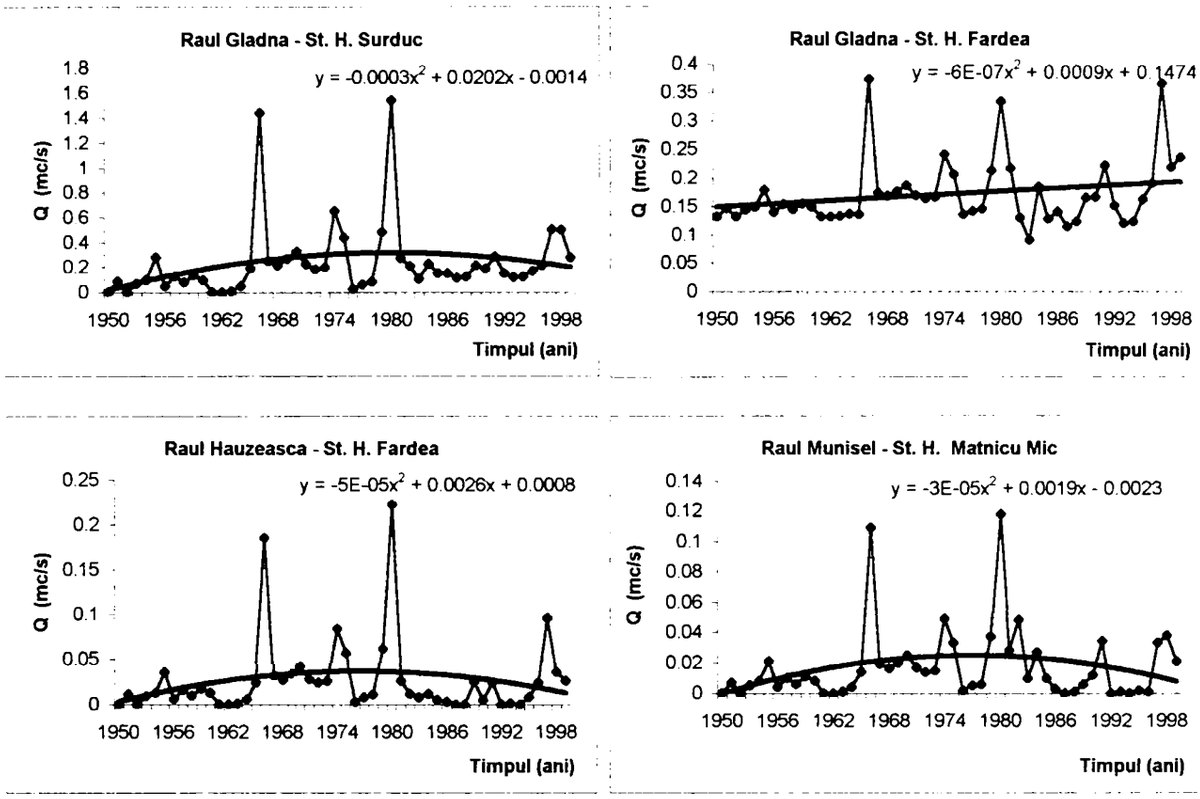


Figura 10. Tendințele debitelor medii lunare minime anuale. Râul Gladna.

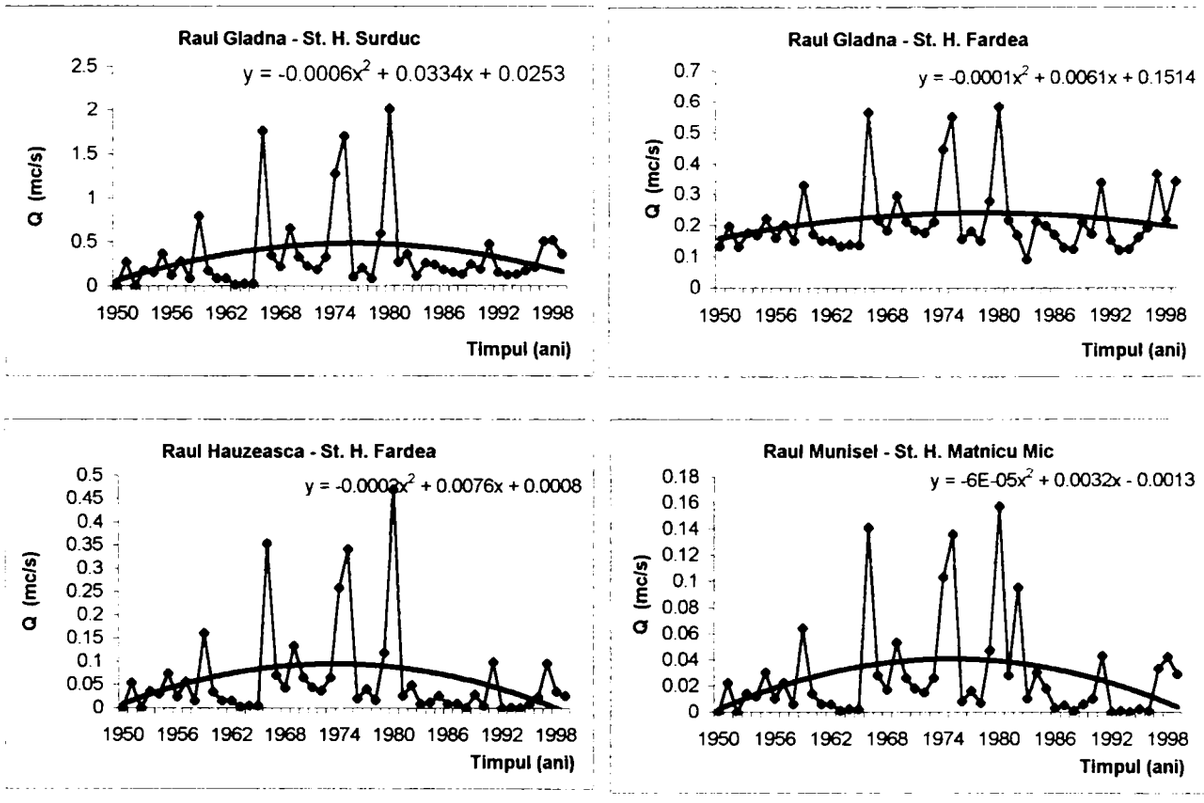


Figura 11. Tendințele debitelor medii lunare minime anuale din perioada VI - VIII. Râul Gladna.

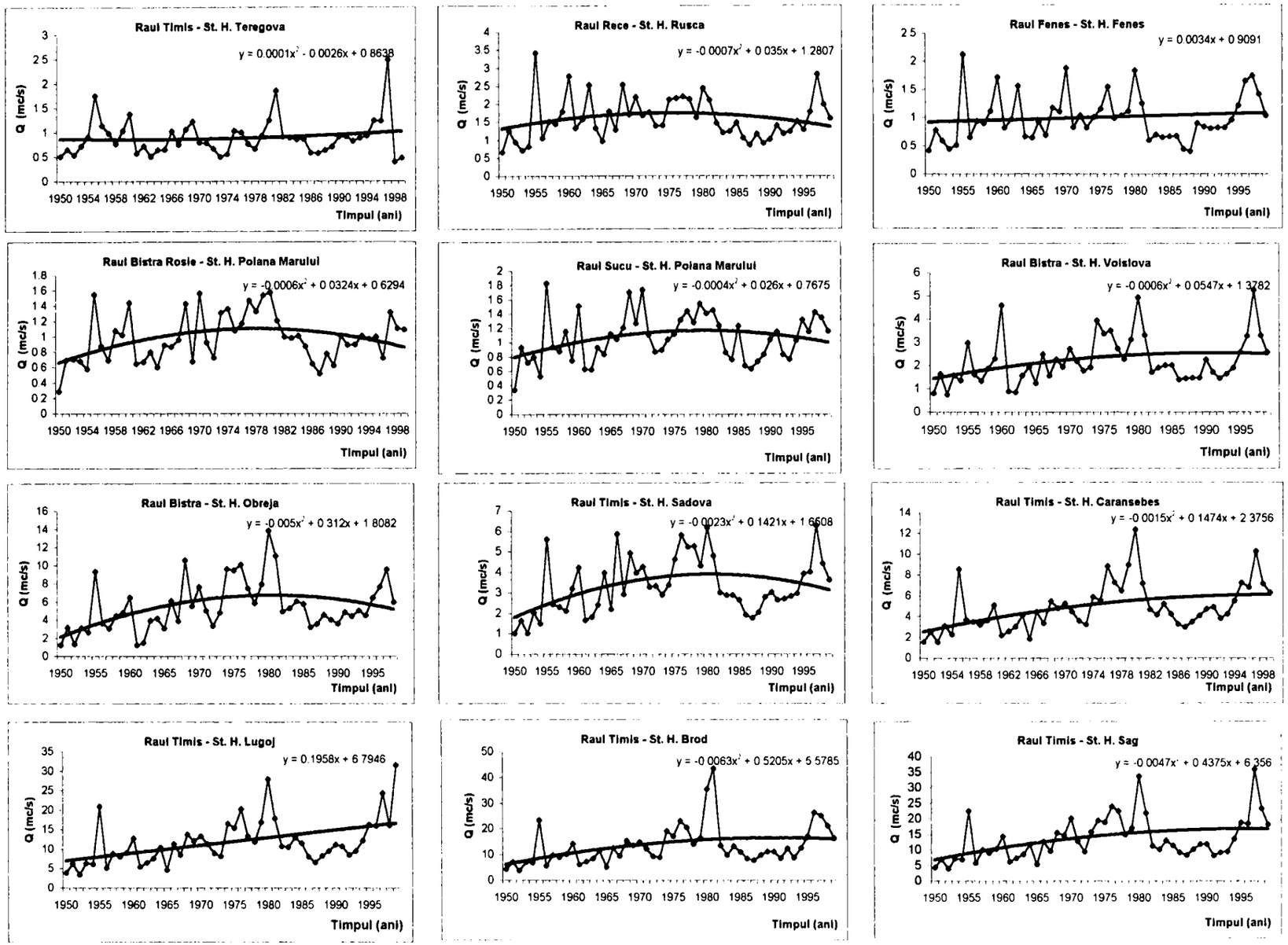


Figura 12. Tendințele debitelor medii lunare minime anuale. Bazinul hidrografic Timiș.

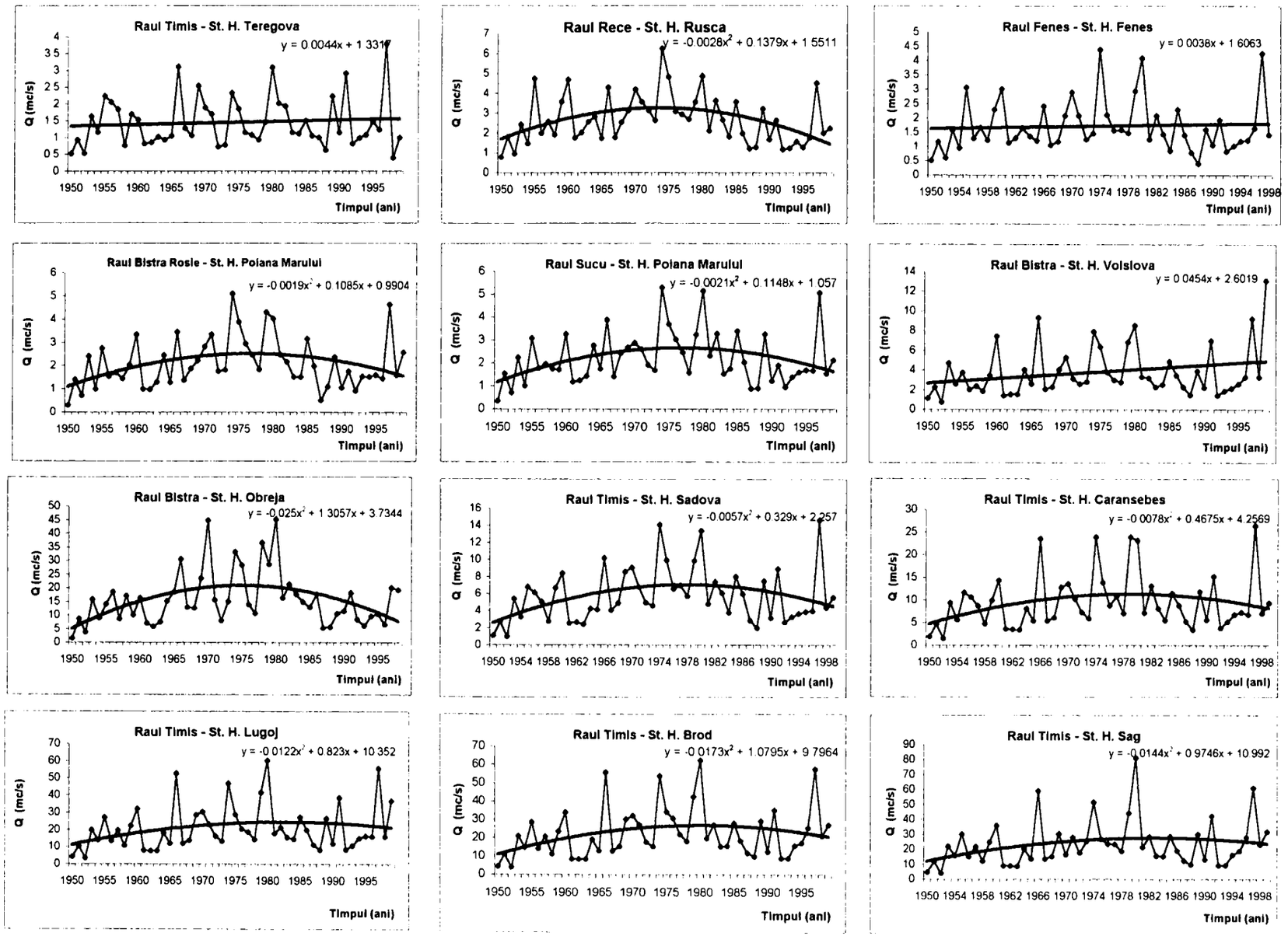


Figura 13. Tendințele debitelor medii lunare minime anuale din perioada VI-VIII. Bazinul hidrografic Timiș.

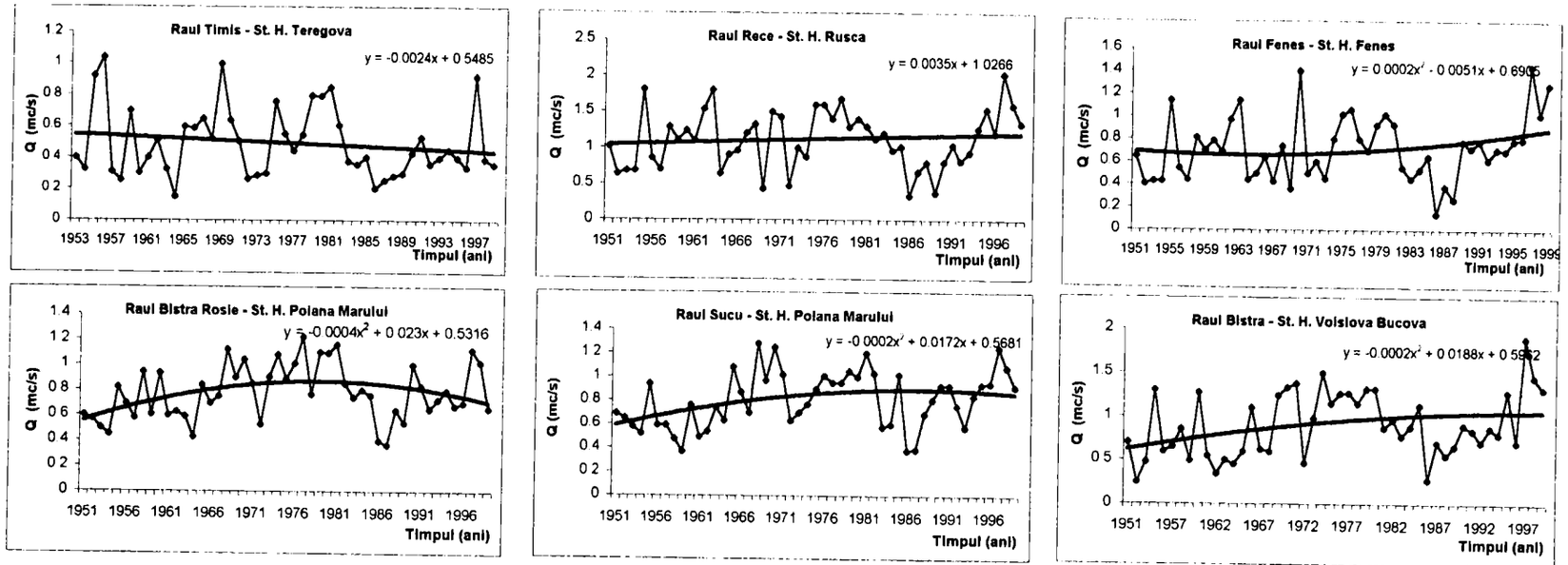


Figura 14. Tendințele debitelor medii zilnice minime anuale. Bazinul hidrografic Timiș.

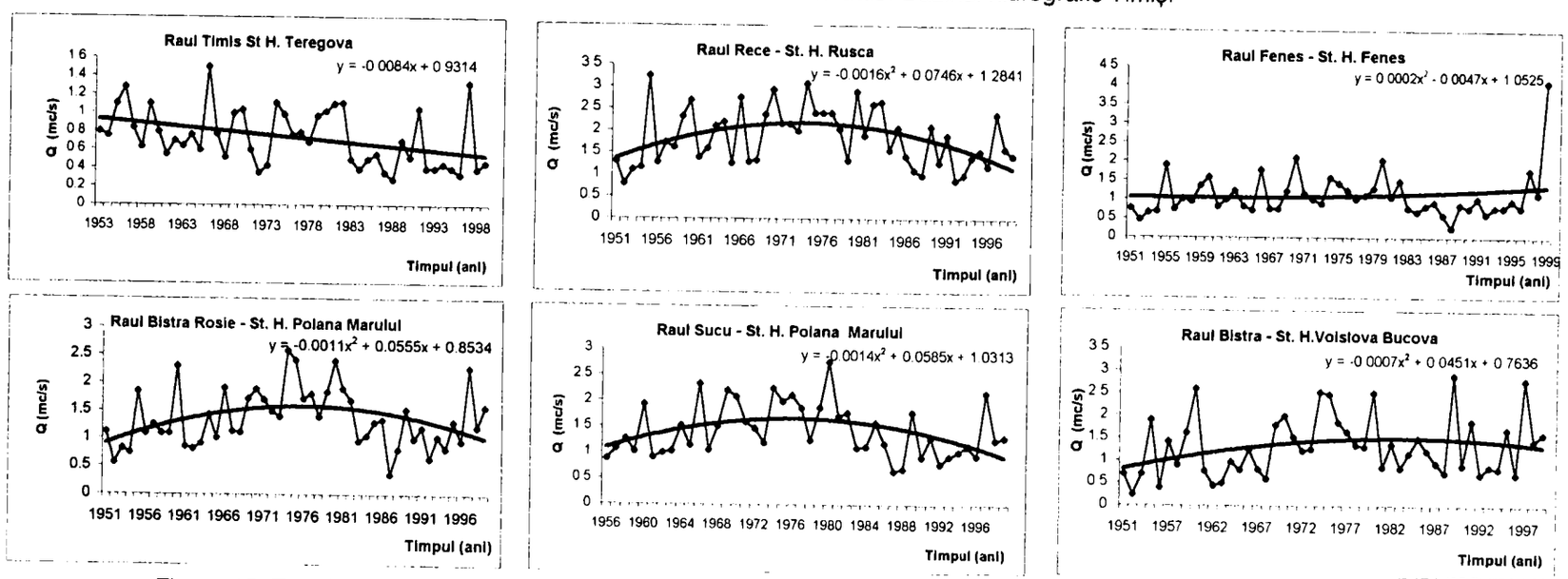


Figura 15. Tendințele debitelor medii zilnice minime anuale din perioada VI-VIII. Bazinul hidrografic Timiș.

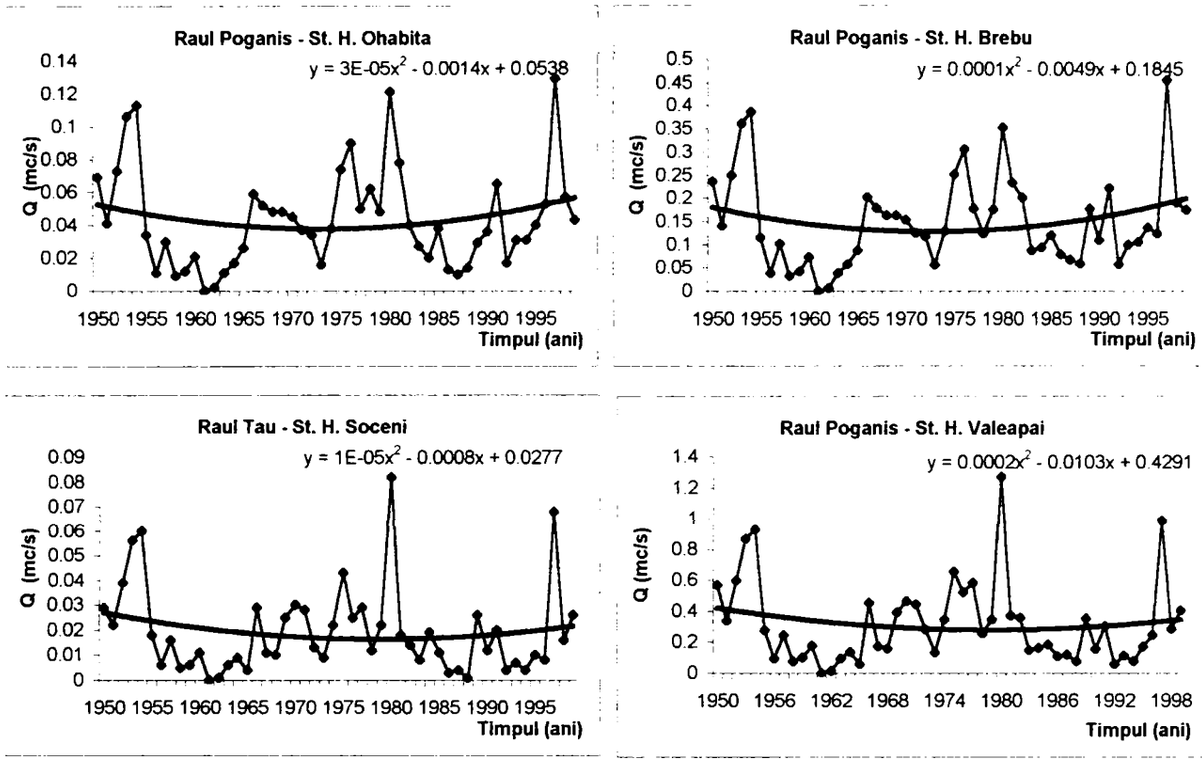


Figura 16. Tendințele debitelor medii lunare minime anuale. Bazinul hidrografic Pogăniș.

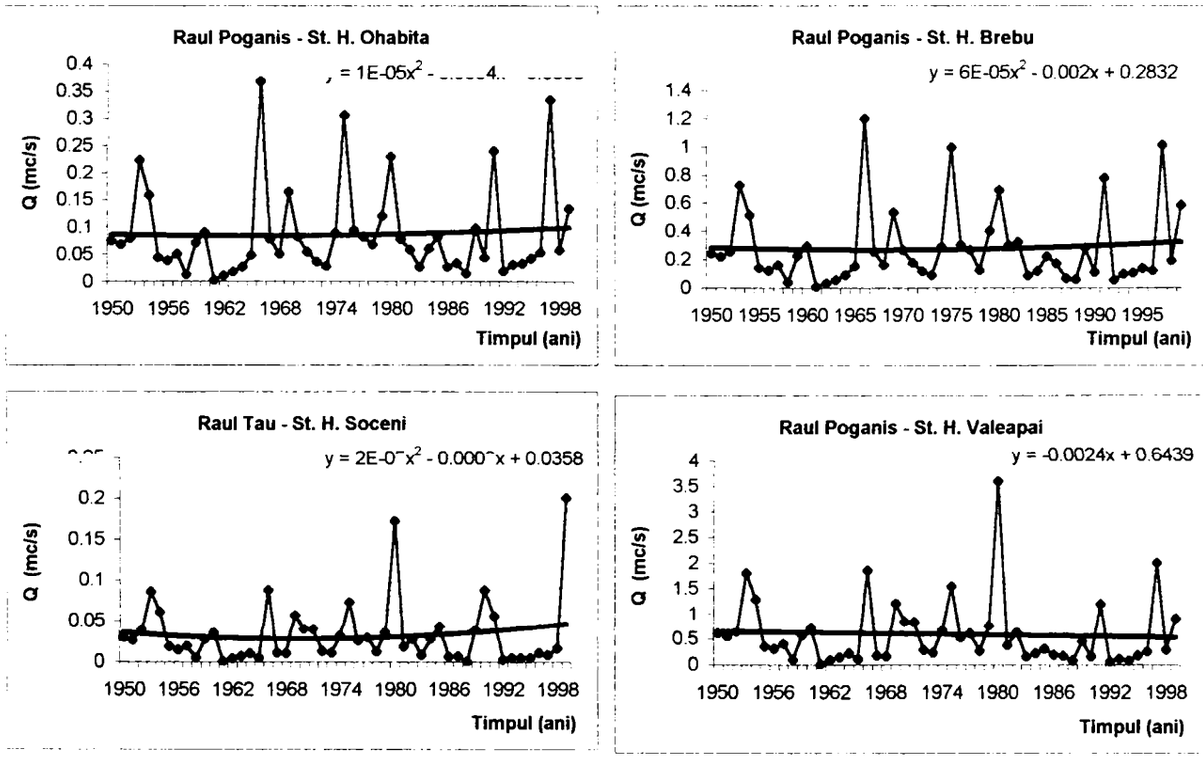


Figura 17. Tendințele debitelor medii lunare minime anuale din perioada VI-VIII .
Bazinul hidrografic Pogăniș

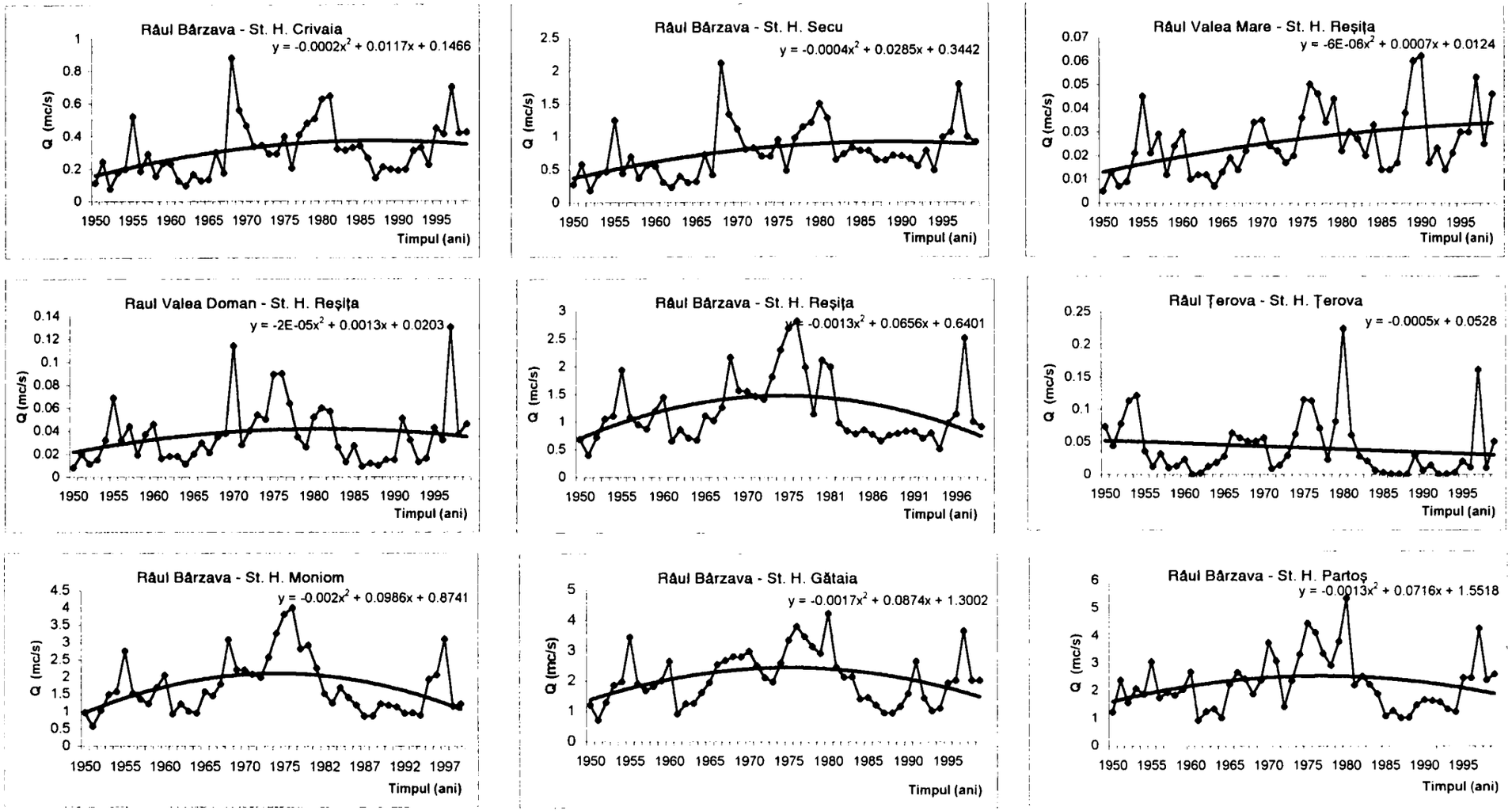


Figura 18. Tendinţele debitelor medii lunare minime anuale. Bazinul hidrografic Bârzava.

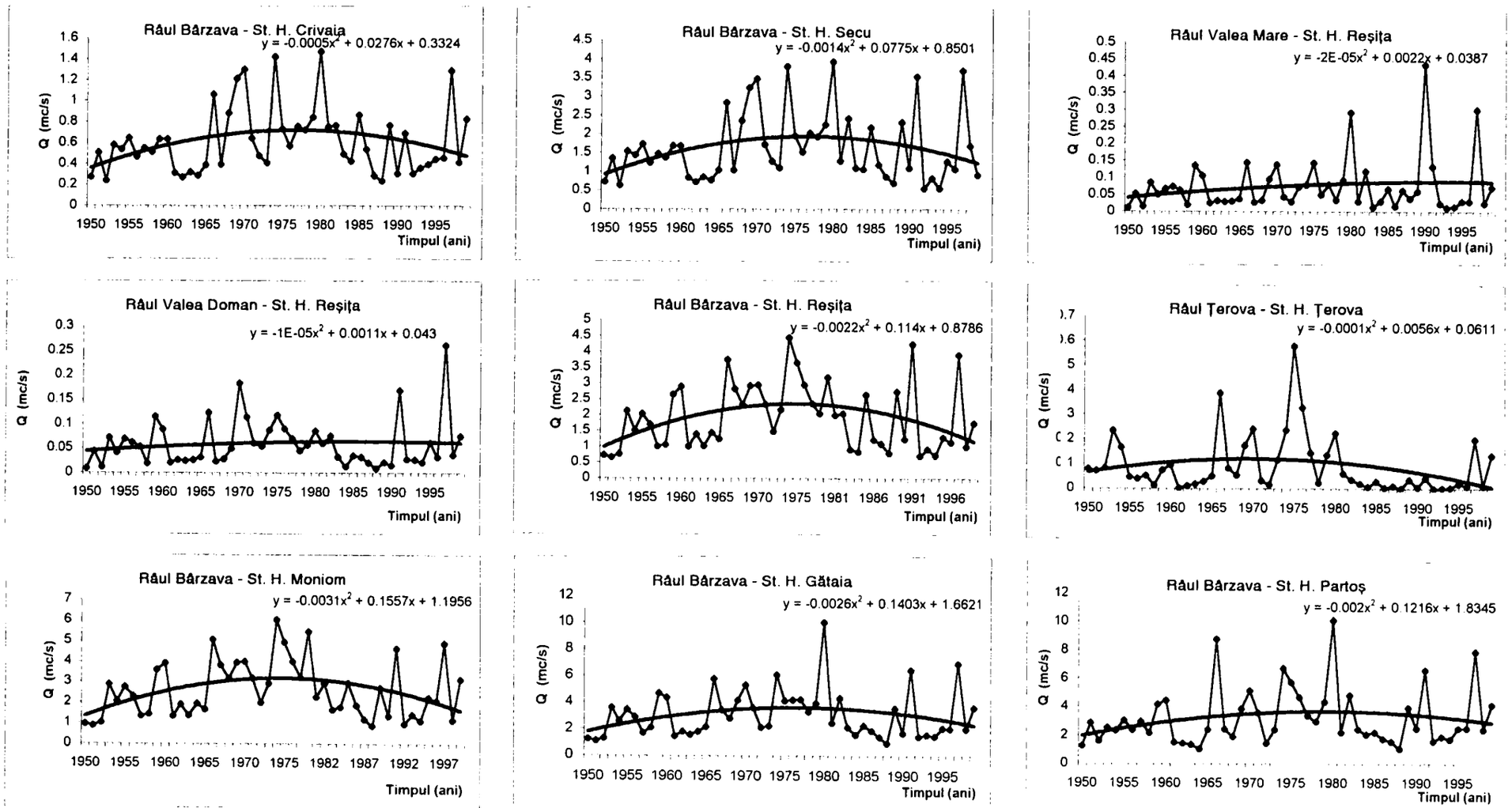


Figura 19. Tendinţele debitelor medii lunare minime anuale din perioada VI - VIII. Bazinul hidrografic Bârzava.

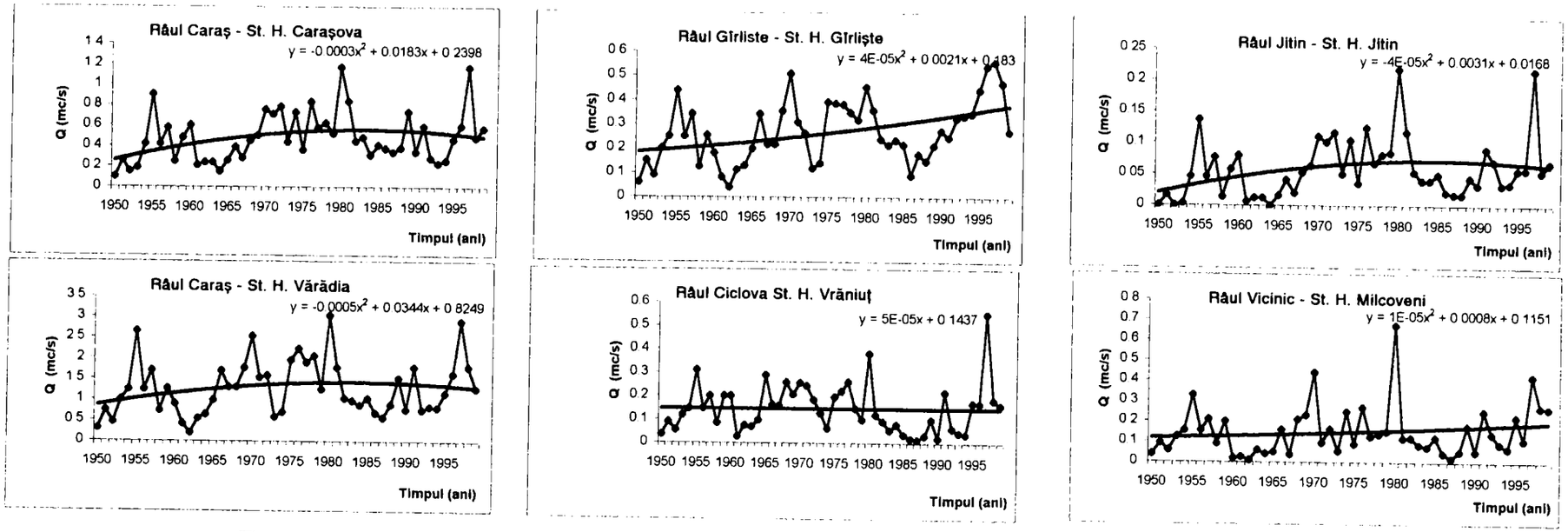


Figura 20. Tendinţele debitelor medii lunare minime anuale. Bazinul hidrografic Caraş.

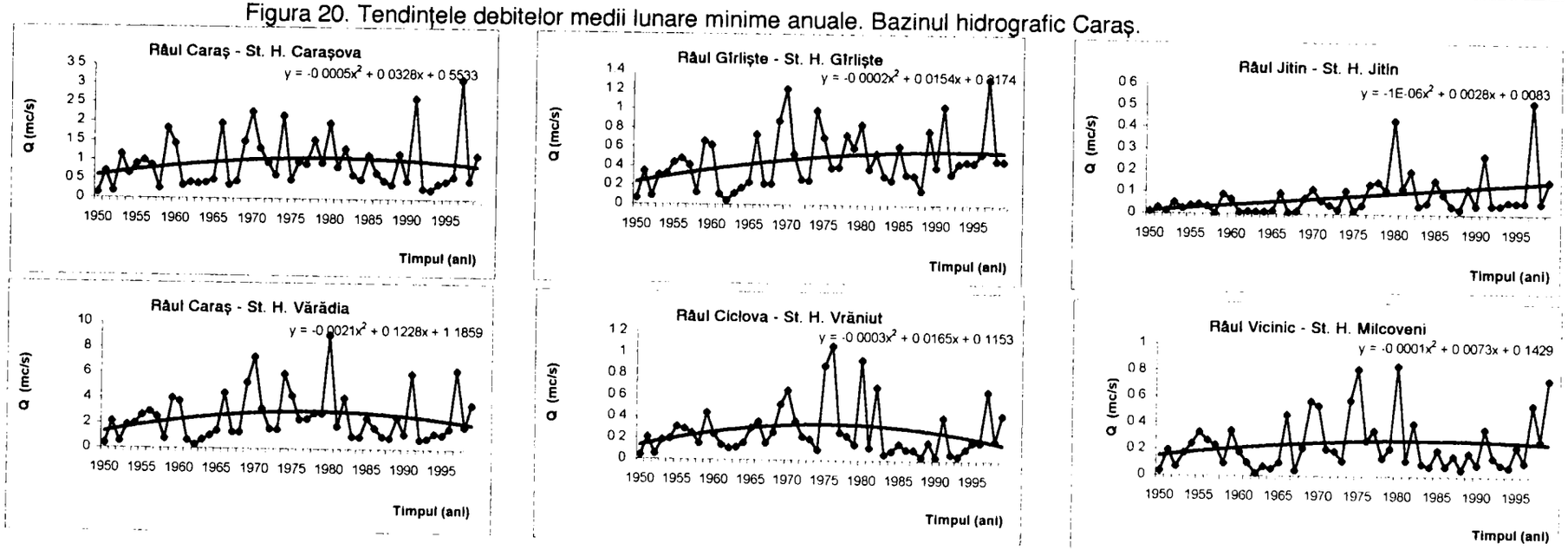


Figura 21. Tendinţele debitelor medii lunare minime anuale din perioada VI - VIII. Bazinul hidrografic Caraş.

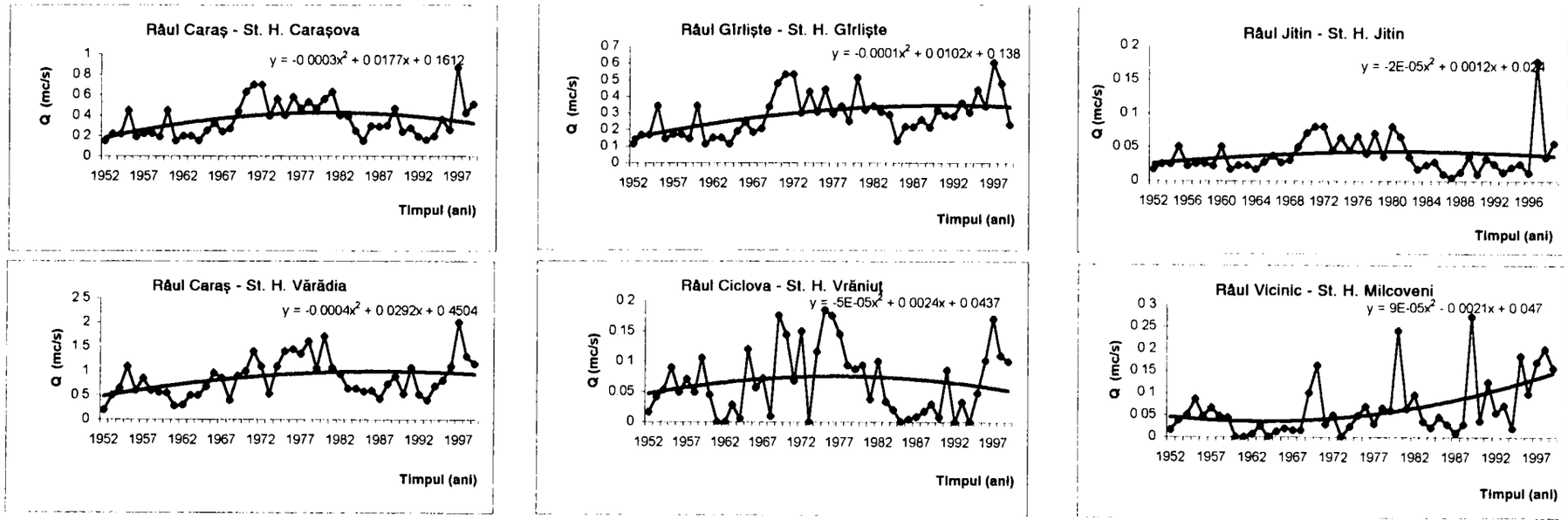


Figura 22. Tendinţele debitelor medii zilnice minime anuale. Bazinul hidrografic Caraş.

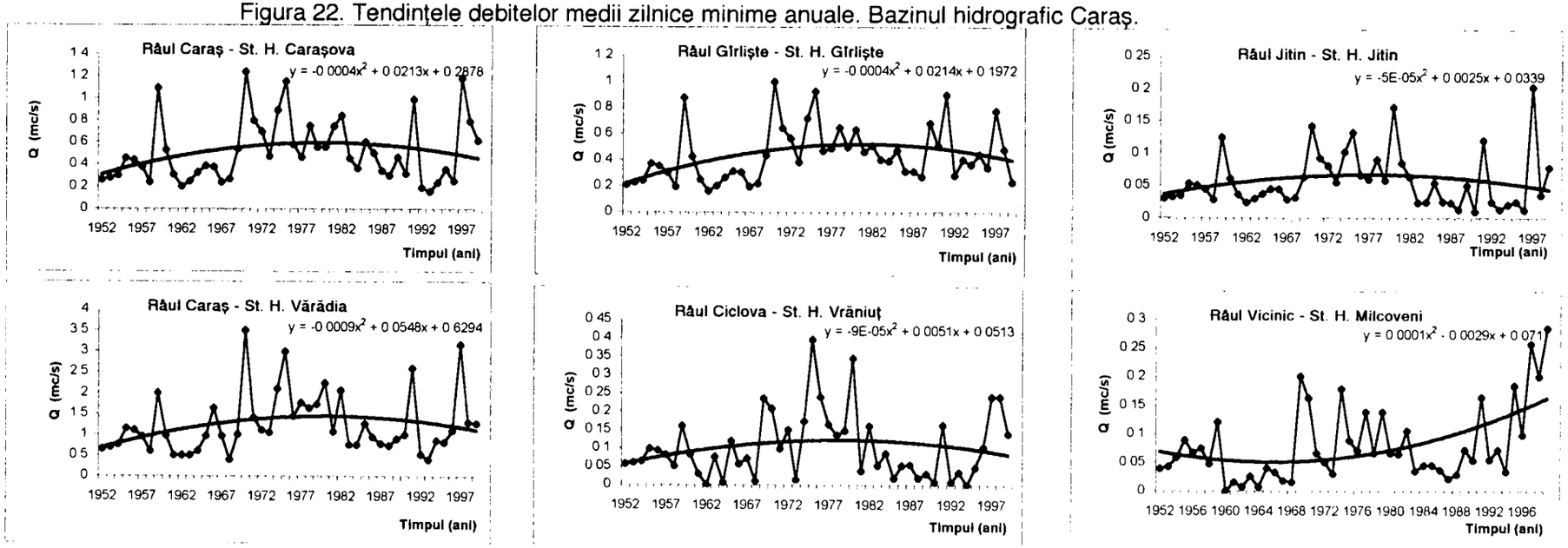


Figura 23. Tendinţele debitelor medii zilnice minime anuale din perioada VI - VIII. Bazinul hidrografic Caraş.

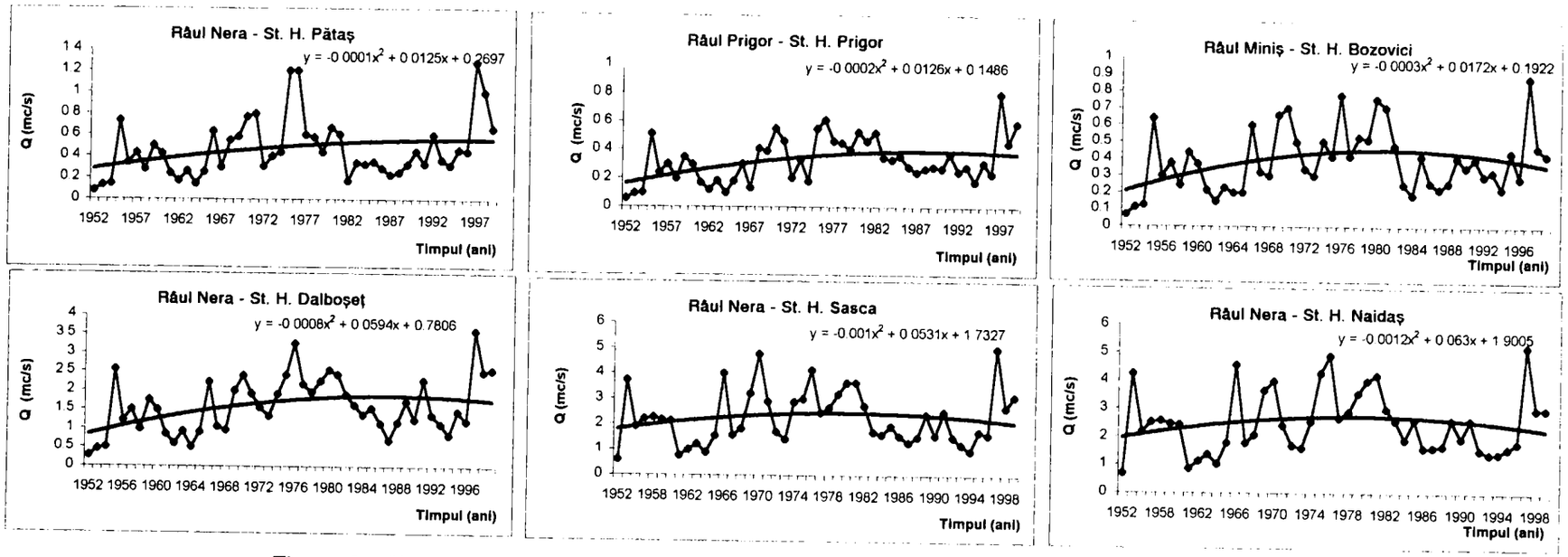


Figura 24. Tendinţele debitelor medii lunare minime anuale. Bazinul hidrografic Nera.

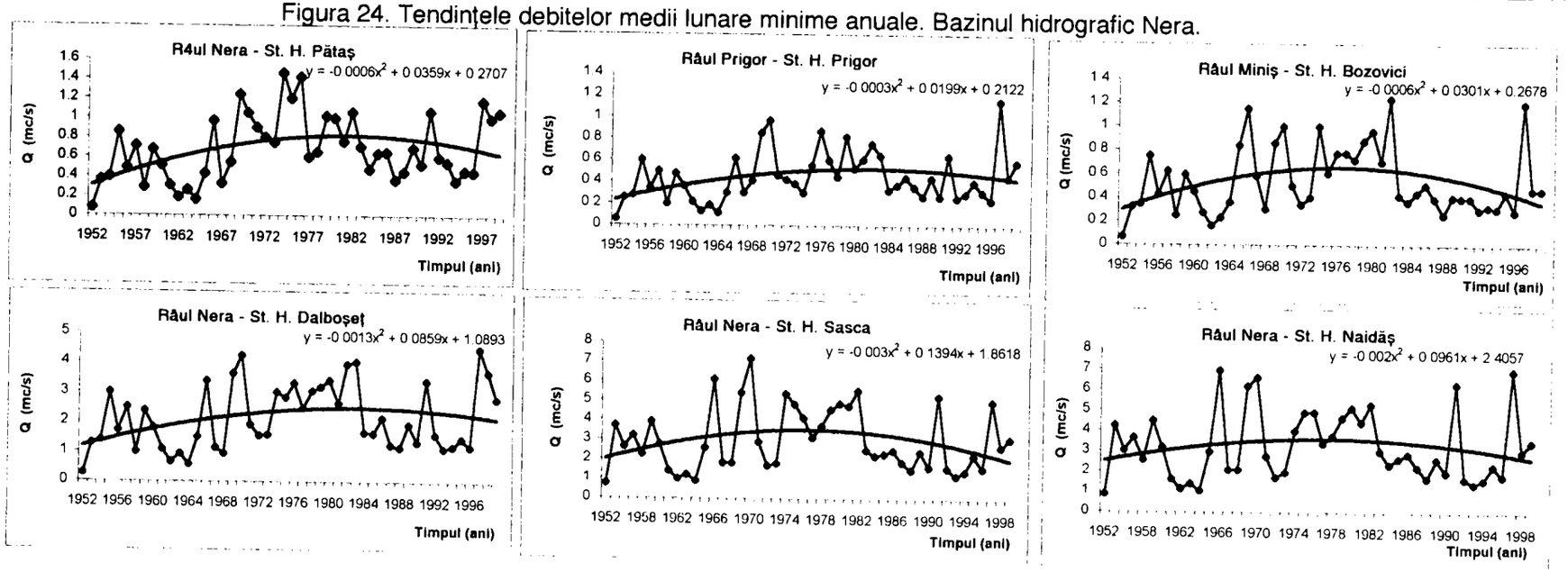


Figura 25. Tendinţele debitelor medii lunare minime anuale din perioada VI - VIII. Bazinul hidrografic Nera.

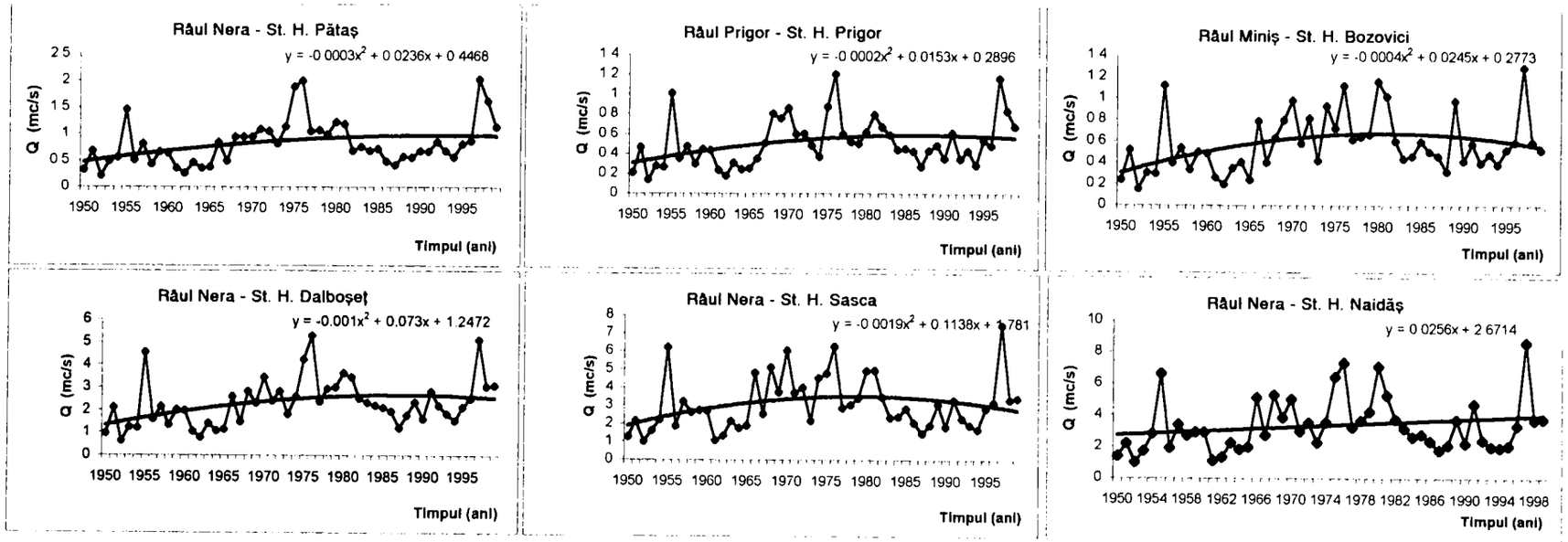


Figura 26. Tendinţele debitelor medii zilnice minime anuale. Bazinul hidrografic Nera.

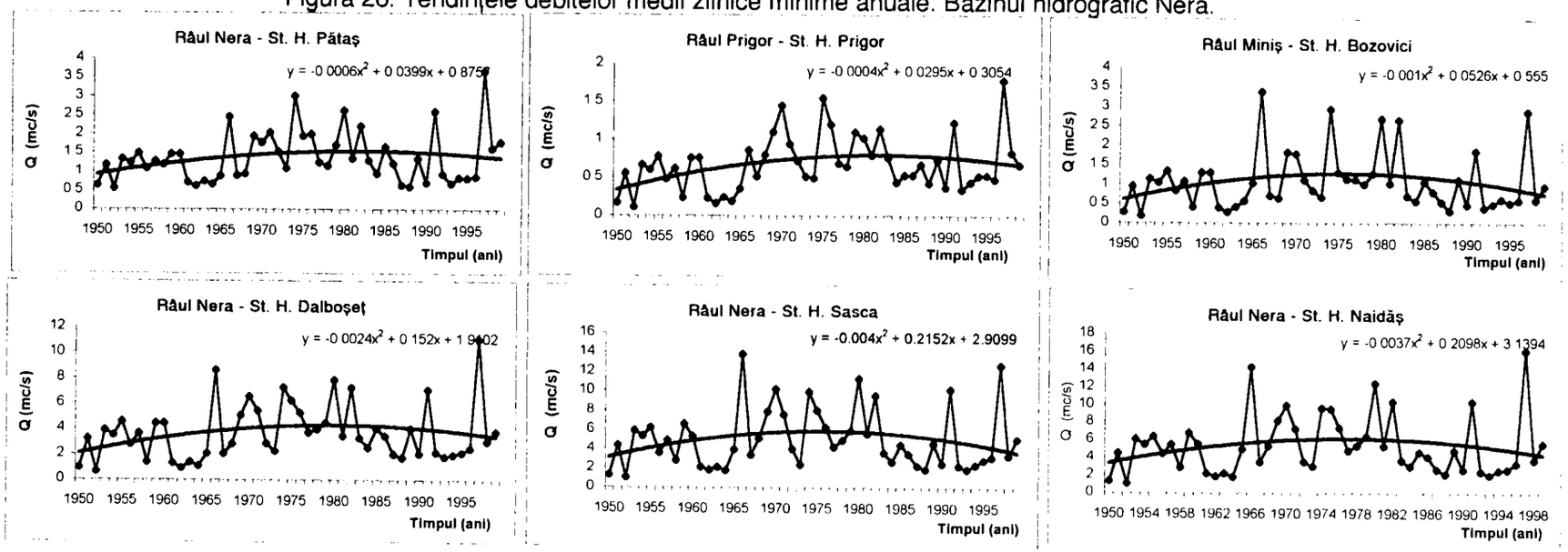


Figura 27. Tendinţele debitelor medii zilnice minime anuale din perioada VI - VIII. Bazinul hidrografic Nera.

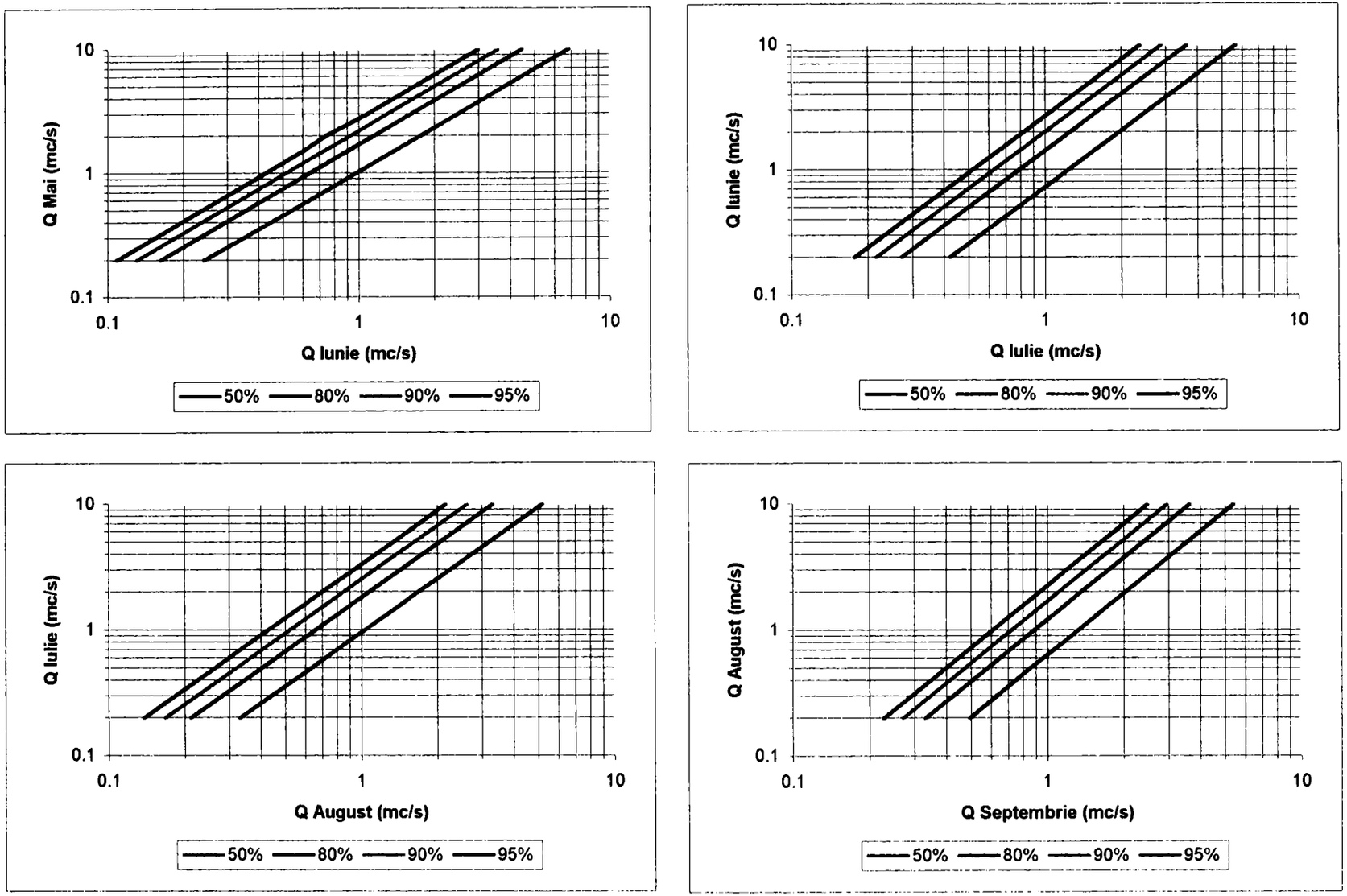


Figura 28. Debite condiţionate. Râul Nera, staţia hidrometrică Dalboşeţ

Tabelul 1.

Raul Nera

St. H. Dalboşeţ

Debite conditionate luna iunie în funcţie de luna mai

Nr.	Anul	Y =Mai	X= Iun.	X_i =logX	Y_i=logY	X_i-X_{med}	$(X_i-X_{med})^2$	Y_i-Y_{med}	$(Y_i-Y_{med})^2$	$(X_i-X)(Y_i-Y)$	$(Y_i-Y)q_{x/y}$	Xy_i	$t_i=X_i-X_{yi}$	t_i^2
1	1950	2.80	1.67	0.222716	0.447158	-0.724614	0.525065	-0.683915	0.46774	0.495574	-0.57996	0.36737	-0.144654	0.020925
2	1951	12.0	12.4	1.093422	1.079181	0.146092	0.021343	-0.051892	0.002693	-0.007581	-0.044004	0.903326	0.190096	0.036136
3	1952	6.70	3.80	0.579784	0.826075	-0.367546	0.13509	-0.304998	0.093024	0.112101	-0.258638	0.688692	-0.108908	0.011861
4	1953	10.4	15.1	1.178977	1.017033	0.231647	0.05366	-0.11404	0.013005	-0.026417	-0.096706	0.850624	0.328353	0.107815
5	1954	35.0	23.5	1.371068	1.544068	0.423738	0.179554	0.412995	0.170565	0.175002	0.35022	1.29755	0.073518	0.005405
6	1955	11.5	4.55	0.658011	1.060698	-0.289319	0.083705	-0.070375	0.004953	0.020361	-0.059678	0.887652	-0.22964	0.052735
7	1956	28.0	14.6	1.164353	1.447158	0.217023	0.047099	0.316085	0.09991	0.068598	0.26804	1.21537	-0.051017	0.002603
8	1957	36.2	18.3	1.262451	1.558709	0.315121	0.099301	0.427636	0.182872	0.134757	0.362635	1.309965	-0.047514	0.002258
9	1958	10.8	3.69	0.567026	1.033424	-0.380304	0.144631	-0.097649	0.009535	0.037136	-0.082807	0.864523	-0.297497	0.088505
10	1959	10.7	9.50	0.977724	1.029384	0.030394	0.000924	-0.101689	0.010341	-0.003091	-0.086232	0.861098	0.116626	0.013602
11	1960	7.32	6.00	0.778151	0.864511	-0.169179	0.028621	-0.266562	0.071055	0.045097	-0.226045	0.721285	0.056866	0.003234
12	1961	15.9	6.97	0.843233	1.201397	-0.104097	0.010836	0.070324	0.004945	-0.007321	0.059635	1.006965	-0.163732	0.026808
13	1962	8.91	2.57	0.409933	0.949878	-0.537397	0.288795	-0.181195	0.032832	0.097374	-0.153654	0.793676	-0.383743	0.147259
14	1963	8.86	7.63	0.882525	0.947434	-0.064805	0.0042	-0.183639	0.033723	0.011901	-0.155726	0.791604	0.090921	0.008267
15	1964	8.55	3.17	0.501059	0.931966	-0.446271	0.199158	-0.199107	0.039644	0.088856	-0.168843	0.778487	-0.277428	0.076966
16	1965	17.3	16.8	1.225309	1.238046	0.277979	0.077272	0.106973	0.011443	0.029736	0.090713	1.038043	0.187266	0.035069
17	1966	25.3	20.8	1.318063	1.403121	0.370733	0.137443	0.272048	0.07401	0.100857	0.230696	1.178026	0.140037	0.01961
18	1967	18.4	11.8	1.071882	1.264818	0.124552	0.015513	0.133745	0.017888	0.016658	0.113416	1.060746	0.011136	0.000124
19	1968	5.84	2.82	0.450249	0.766413	-0.497081	0.247089	-0.36466	0.132977	0.181266	-0.309232	0.638098	-0.187849	0.035287
20	1969	9.02	38.3	1.583199	0.955207	0.635869	0.404329	-0.175866	0.030929	-0.111828	-0.149135	0.798195	0.785004	0.616231
21	1970	22.5	17.2	1.235528	1.352183	0.288198	0.083058	0.22111	0.048889	0.063723	0.187501	1.134831	0.100698	0.01014
22	1971	6.69	7.07	0.849419	0.825426	-0.097911	0.009586	-0.305647	0.09342	0.029926	-0.259189	0.688141	0.161278	0.026011
23	1972	10.8	3.42	0.534026	1.033424	-0.413304	0.17082	-0.097649	0.009535	0.040359	-0.082807	0.864523	-0.330497	0.109228
24	1973	17.4	7.48	0.873902	1.240549	-0.073428	0.005392	0.109476	0.011985	-0.008039	0.092836	1.040166	-0.166264	0.027644
25	1974	23.1	15.3	1.184691	1.363612	0.237361	0.05634	0.232539	0.054074	0.055196	0.197193	1.144523	0.040168	0.001613
26	1975	25.6	14.9	1.173186	1.40824	0.225856	0.051011	0.277167	0.076822	0.0626	0.235038	1.182368	-0.009181	8.43E-05
27	1976	16.4	21.8	1.338456	1.214844	0.391126	0.15298	0.083771	0.007018	0.032765	0.071038	1.018368	0.320089	0.102457
28	1977	10.5	4.95	0.694605	1.021189	-0.252725	0.06387	-0.109884	0.012074	0.02777	-0.093181	0.854149	-0.159543	0.025454
29	1978	52.3	31.6	1.499687	1.718502	0.552357	0.305098	0.587429	0.345072	0.32447	0.49814	1.44547	0.054218	0.00294
30	1979	14.2	13.6	1.133539	1.152288	0.186209	0.034674	0.021215	0.00045	0.00395	0.017991	0.965321	0.168218	0.028297

31	1980	30.8	19.9	1.298853	1.488551	0.351523	0.123568	0.357478	0.12779	0.125662	0.303141	1.250471	0.048382	0.002341
32	1981	23.7	19.1	1.281033	1.374748	0.333703	0.111358	0.243675	0.059378	0.081315	0.206637	1.153967	0.127067	0.016146
33	1982	12.3	7.66	0.884229	1.089905	-0.063101	0.003982	-0.041168	0.001695	0.002598	-0.03491	0.91242	-0.028191	0.000795
34	1983	8.78	7.62	0.881955	0.943495	-0.065375	0.004274	-0.187578	0.035186	0.012263	-0.159067	0.788263	0.093692	0.008778
35	1984	11.9	5.46	0.737193	1.075547	-0.210137	0.044158	-0.055526	0.003083	0.011668	-0.047086	0.900244	-0.163051	0.026586
36	1985	14.1	6.56	0.816904	1.149219	-0.130426	0.017011	0.018146	0.000329	-0.002367	0.015388	0.962718	-0.145814	0.021262
37	1986	10.0	6.05	0.781755	1	-0.165575	0.027415	-0.131073	0.01718	0.021702	-0.11115	0.83618	-0.054425	0.002962
38	1987	33.8	14.5	1.161368	1.528917	0.214038	0.045812	0.397844	0.15828	0.085154	0.337371	1.284701	-0.123333	0.015211
39	1988	10.0	8.43	0.925828	1	-0.021502	0.000462	-0.131073	0.01718	0.002818	-0.11115	0.83618	0.089647	0.008037
40	1989	22.5	22.7	1.356026	1.352183	0.408696	0.167032	0.22111	0.048889	0.090367	0.187501	1.134831	0.221195	0.048927
41	1990	10.7	5.50	0.740363	1.029384	-0.206967	0.042835	-0.101689	0.010341	0.021046	-0.086232	0.861098	-0.120735	0.014577
42	1991	20.3	10.4	1.017033	1.307496	0.069703	0.004859	0.176423	0.031125	0.012297	0.149607	1.096937	-0.079903	0.006385
43	1992	5.18	8.16	0.91169	0.71433	-0.03564	0.00127	-0.416743	0.173675	0.014853	-0.353398	0.593932	0.317758	0.10097
44	1993	8.82	3.11	0.49276	0.945469	-0.45457	0.206634	-0.185604	0.034449	0.08437	-0.157393	0.789937	-0.297177	0.088314
45	1994	7.25	9.87	0.994317	0.860338	0.046987	0.002208	-0.270735	0.073297	-0.012721	-0.229583	0.717747	0.27657	0.076491
46	1995	14.2	10.7	1.029384	1.152288	0.082054	0.006733	0.021215	0.00045	0.001741	0.017991	0.965321	0.064063	0.004104
47	1996	21.3	4.60	0.662758	1.32838	-0.284572	0.080981	0.197307	0.03893	-0.056148	0.167316	1.114646	-0.451888	0.204203
48	1997	12.8	10.3	1.012837	1.10721	0.065507	0.004291	-0.023863	0.000569	-0.001563	-0.020236	0.927094	0.085743	0.007352
49	1998	12.0	5.98	0.776701	1.079181	-0.170629	0.029114	-0.051892	0.002693	0.008854	-0.044004	0.903326	-0.126625	0.016034
		779.42	547.89	46.41916	55.42257		4.560458		2.997943	2.595666				2.314041
				0.94733	1.131073									

$$\bar{X} = 0{,}947 \qquad \sigma_x = \sqrt{\frac{4{,}560458}{48}} = 0{,}308 \qquad \sigma_{X/Y} = \sqrt{\frac{2{,}314041}{48}} = 0{,}219$$

$$\bar{Y} = 1{,}13 \qquad \sigma_y = \sqrt{\frac{2{,}997943}{48}} = 0{,}25$$

$$R_{XY} = \frac{2{,}595666}{49 \cdot 0{,}308 \cdot 0{,}25} = 0{,}688 \qquad \rho_{X/Y} = 0{,}688 \cdot \frac{0{,}308}{0{,}25} = 0{,}848$$

$$X_0 = 0{,}947 - 0{,}848\ 1{,}13 = -0{,}011$$

Tabelul 2.

Raul Nera

St. H. Dalboşeţ

Debite conditionate luna iulie în funcţie de luna iunie

Nr.	Anul	Y =Iun.	X= Iul.	X_i =logX	Y_i=logY	X_i-X_{med}	$(X_i-X_{med})^2$	Y_i-Y_{med}	$(Y_i-Y_{med})^2$	$(X_i-X)(Y_i-Y)$	$(Y_i-Y)q_{x/y}$	Xy_i	$t_i=X_i-X_{yi}$	t_i^2
1	1950	1.67	1.25	0.09691	0.222716	-0.622165	0.387089	-0.724614	0.525065	0.450829	-0.481868	0.237207	-0.140297	0.019683
2	1951	12.4	5.04	0.702431	1.093422	-0.016644	0.000277	0.146092	0.021343	-0.002432	0.097151	0.816226	-0.113795	0.012949
3	1952	3.80	1.52	0.181844	0.579784	-0.537231	0.288618	-0.367546	0.13509	0.197457	-0.244418	0.474657	-0.292813	0.085739
4	1953	15.1	5.20	0.716003	1.178977	-0.003072	9.44E-06	0.231647	0.05366	-0.000712	0.154045	0.87312	-0.157117	0.024686
5	1954	23.5	4.50	0.653213	1.371068	-0.065862	0.004338	0.423738	0.179554	-0.027908	0.281786	1.000861	-0.347648	0.120859
6	1955	4.55	6.41	0.806858	0.658011	0.087783	0.007706	-0.289319	0.083705	-0.025397	-0.192397	0.526678	0.28018	0.078501
7	1956	14.6	12.0	1.079181	1.164353	0.360106	0.129677	0.217023	0.047099	0.078151	0.14432	0.863395	0.215786	0.046564
8	1957	18.3	6.2	0.792392	1.262451	0.073317	0.005375	0.315121	0.099301	0.023104	0.209556	0.928631	-0.136239	0.018561
9	1958	3.69	3.46	0.539076	0.567026	-0.179999	0.0324	-0.380304	0.144631	0.068454	-0.252902	0.466173	0.072903	0.005315
10	1959	9.50	8.10	0.908485	0.977724	0.18941	0.035876	0.030394	0.000924	0.005757	0.020212	0.739287	0.169198	0.028628
11	1960	6.00	5.87	0.768638	0.778151	0.049563	0.002457	-0.169179	0.028621	-0.008385	-0.112504	0.606571	0.162067	0.026266
12	1961	6.97	2.41	0.382017	0.843233	-0.337058	0.113608	-0.104097	0.010836	0.035087	-0.069225	0.64985	-0.267833	0.071735
13	1962	2.57	1.53	0.184691	0.409933	-0.534384	0.285566	-0.537397	0.288795	0.287176	-0.357369	0.361706	-0.177015	0.031334
14	1963	7.63	2.40	0.380211	0.882525	-0.338864	0.114829	-0.064805	0.0042	0.02196	-0.043096	0.675979	-0.295768	0.087479
15	1964	3.17	1.75	0.243038	0.501059	-0.476037	0.226611	-0.446271	0.199158	0.212441	-0.29677	0.422305	-0.179267	0.032137
16	1965	16.8	4.02	0.604226	1.225309	-0.114849	0.01319	0.277979	0.077272	-0.031926	0.184856	0.903931	-0.299705	0.089823
17	1966	20.8	11.3	1.053078	1.318063	0.334003	0.111558	0.370733	0.137443	0.123826	0.246538	0.965613	0.087466	0.00765
18	1967	11.8	4.01	0.603144	1.071882	-0.115931	0.01344	0.124552	0.015513	-0.014439	0.082827	0.801902	-0.198758	0.039505
19	1968	2.82	3.22	0.507856	0.450249	-0.211219	0.044614	-0.497081	0.247089	0.104993	-0.330559	0.388516	0.11934	0.014242
20	1969	38.3	19.5	1.290035	1.583199	0.57096	0.325995	0.635869	0.404329	0.363055	0.422853	1.141928	0.148107	0.021936
21	1970	17.2	24.9	1.396199	1.235528	0.677124	0.458497	0.288198	0.083058	0.195146	0.191652	0.910727	0.485472	0.235683
22	1971	7.07	8.34	0.921166	0.849419	0.202091	0.040841	-0.097911	0.009586	-0.019787	-0.065111	0.653964	0.267202	0.071397
23	1972	3.42	2.86	0.456366	0.534026	-0.262709	0.069016	-0.413304	0.17082	0.108579	-0.274847	0.444228	0.012138	0.000147
24	1973	7.48	4.35	0.638489	0.873902	-0.080586	0.006494	-0.073428	0.005392	0.005917	-0.04883	0.670245	-0.031756	0.001008
25	1974	15.3	8.47	0.927883	1.184691	0.208808	0.043601	0.237361	0.05634	0.049563	0.157845	0.87692	0.050963	0.002597
26	1975	14.9	14.1	1.149219	1.173186	0.430144	0.185024	0.225856	0.051011	0.097151	0.150194	0.869269	0.27995	0.078372
27	1976	21.8	5.28	0.722634	1.338456	0.003559	1.27E-05	0.391126	0.15298	0.001392	0.260099	0.979174	-0.25654	0.065813
28	1977	4.95	4.18	0.621176	0.694605	-0.097899	0.009584	-0.252725	0.06387	0.024741	-0.168062	0.551013	0.070163	0.004923
29	1978	31.6	19.7	1.294466	1.499687	0.575391	0.331075	0.552357	0.305098	0.317821	0.367317	1.086392	0.208074	0.043295
30	1979	13.6	6.02	0.779596	1.133539	0.060521	0.003663	0.186209	0.034674	0.01127	0.123829	0.842904	-0.063307	0.004008

31	1980	19.9	11.7	1.068186	1.298853	0.349111	0.121878	0.351523	0.123568	0.122721	0.233763	0.952838	0.115348	0.013305
32	1981	19.1	5.31	0.725095	1.281033	0.00602	3.62E-05	0.333703	0.111358	0.002009	0.221913	0.940988	-0.215893	0.04661
33	1982	7.66	8.06	0.906335	0.884229	0.18726	0.035066	-0.063101	0.003982	-0.011816	-0.041962	0.677113	0.229222	0.052543
34	1983	7.62	7.02	0.846337	0.881955	0.127262	0.016196	-0.065375	0.004274	-0.00832	-0.043474	0.675601	0.170737	0.029151
35	1984	5.46	2.77	0.44248	0.737193	-0.276595	0.076505	-0.210137	0.044158	0.058123	-0.139741	0.579334	-0.136854	0.018729
36	1985	6.56	3.68	0.565848	0.816904	-0.153227	0.023479	-0.130426	0.017011	0.019985	-0.086733	0.632342	-0.066494	0.004421
37	1986	6.05	8.47	0.927883	0.781755	0.208808	0.043601	-0.165575	0.027415	-0.034573	-0.110107	0.608968	0.318916	0.101707
38	1987	14.5	3.40	0.531479	1.161368	-0.187596	0.035192	0.214038	0.045812	-0.040153	0.142335	0.86141	-0.329931	0.108855
39	1988	8.43	2.86	0.456366	0.925828	-0.262709	0.069016	-0.021502	0.000462	0.005649	-0.014299	0.704776	-0.24841	0.061707
40	1989	22.7	5.82	0.764923	1.356026	0.045848	0.002102	0.408696	0.167032	0.018738	0.271783	0.990858	-0.225935	0.051047
41	1990	5.50	4.37	0.640481	0.740363	-0.078594	0.006177	-0.206967	0.042835	0.016266	-0.137633	0.581442	0.05904	0.003486
42	1991	10.4	8.86	0.947434	1.017033	0.228359	0.052148	0.069703	0.004859	0.015917	0.046353	0.765428	0.182006	0.033126
43	1992	8.16	5.80	0.763428	0.91169	0.044353	0.001967	-0.03564	0.00127	-0.001581	-0.0237	0.695375	0.068053	0.004631
44	1993	3.11	2.14	0.330414	0.49276	-0.388661	0.151058	-0.45457	0.206634	0.176674	-0.302289	0.416786	-0.086372	0.00746
45	1994	9.87	3.68	0.565848	0.994317	-0.153227	0.023479	0.046987	0.002208	-0.0072	0.031246	0.750321	-0.184474	0.034031
46	1995	10.7	4.45	0.64836	1.029384	-0.070715	0.005001	0.082054	0.006733	-0.005802	0.054566	0.773641	-0.125281	0.015695
47	1996	4.60	2.27	0.356026	0.662758	-0.363049	0.131805	-0.284572	0.080981	0.103314	-0.18924	0.529835	-0.173809	0.030209
48	1997	10.3	26.8	1.428135	1.012837	0.70906	0.502766	0.065507	0.004291	0.046449	0.043562	0.762637	0.665497	0.442887
49	1998	5.98	8.30	0.919078	0.776701	0.200003	0.040001	-0.170629	0.029114	-0.034126	-0.113468	0.605607	0.313471	0.098264
				35.23466	46.41916		4.628511		4.560458	3.095158				2.528699
				0.719075	0.94733									

$$\bar{X} = 0{,}719 \qquad \sigma_x = \sqrt{\frac{4{,}628511}{48}} = 0{,}31 \qquad \sigma_{X/Y} = \sqrt{\frac{2{,}528699}{48}} = 0{,}229$$

$$\bar{Y} = 0{,}947 \qquad \sigma_y = \sqrt{\frac{4{,}460458}{48}} = 0{,}308$$

$$R_{XY} = \frac{3{,}095158}{49 \cdot 0{,}31 \cdot 0{,}308} = 0{,}66 \qquad \rho_{X/Y} = 0{,}688 \cdot \frac{0{,}31}{0{,}308} = 0{,}665$$

$$X_0 = 0{,}719 - 0{,}665\ 0{,}947 = 0{,}089$$

Tabelul 3.

Raul Nera

St. H. Dalboşeţ

Debite conditionate luna august în funcţie de luna iulie

Nr.	Anul	Y =Iul.	X= Aug.	X_i =logX	Y_i=logY	X_i-X_{med}	$(X_i-X_{med})^2$	Y_i-Y_{med}	$(Y_i-Y_{med})^2$	$(X_i-X)(Y_i-Y)$	$(Y_i-Y)q_{x/y}$	Xy_i	$t_i=X_i-X_{yi}$	t_i^2
1	1950	1.25	0.96	-0.017729	0.09691	-0.535927	0.287217	-0.622165	0.387089	0.333435	-0.438253	0.079945	-0.097674	0.00954
2	1951	5.04	3.22	0.507856	0.702431	-0.010342	0.000107	-0.016644	0.000277	0.000172	-0.011724	0.506474	0.001382	1.91E-06
3	1952	1.52	0.62	-0.207608	0.181844	-0.725806	0.526795	-0.537231	0.288618	0.389926	-0.378426	0.139772	-0.347381	0.120673
4	1953	5.20	3.90	0.591065	0.716003	0.072867	0.00531	-0.003072	9.44E-06	-0.000224	-0.002164	0.516034	0.07503	0.00563
5	1954	4.50	3.50	0.544068	0.653213	0.02587	0.000669	-0.065862	0.004338	-0.001704	-0.046394	0.471804	0.072264	0.005222
6	1955	6.41	20.9	1.320146	0.806858	0.801948	0.643121	0.087783	0.007706	0.070397	0.061834	0.580032	0.740114	0.547769
7	1956	12.0	2.79	0.445604	1.079181	-0.072594	0.00527	0.360106	0.129677	-0.026141	0.253659	0.771857	-0.326253	0.106441
8	1957	6.2	3.64	0.561101	0.792392	0.042903	0.001841	0.073317	0.005375	0.003146	0.051644	0.569842	-0.008741	7.64E-05
9	1958	3.46	1.38	0.139879	0.539076	-0.378319	0.143125	-0.179999	0.0324	0.068097	-0.126791	0.391407	-0.251528	0.063266
10	1959	8.10	4.44	0.647383	0.908485	0.129185	0.016689	0.18941	0.035876	0.024469	0.13342	0.651618	-0.004235	1.79E-05
11	1960	5.87	4.45	0.64836	0.768638	0.130162	0.016942	0.049563	0.002457	0.006451	0.034912	0.55311	0.09525	0.009073
12	1961	2.41	1.33	0.123852	0.382017	-0.394346	0.155509	-0.337058	0.113608	0.132918	-0.237424	0.280774	-0.156923	0.024625
13	1962	1.53	0.93	-0.031517	0.184691	-0.549715	0.302187	-0.534384	0.285566	0.293759	-0.37642	0.141778	-0.173295	0.030031
14	1963	2.40	1.40	0.146128	0.380211	-0.37207	0.138436	-0.338864	0.114829	0.126081	-0.238696	0.279502	-0.133374	0.017789
15	1964	1.75	1.08	0.033424	0.243038	-0.484774	0.235006	-0.476037	0.226611	0.23077	-0.33532	0.182878	-0.149454	0.022336
16	1965	4.02	2.06	0.313867	0.604226	-0.204331	0.041751	-0.114849	0.01319	0.023467	-0.0809	0.437298	-0.123431	0.015235
17	1966	11.3	8.64	0.936514	1.053078	0.418316	0.174988	0.334003	0.111558	0.139719	0.235272	0.75347	0.183044	0.033505
18	1967	4.01	2.07	0.31597	0.603144	-0.202228	0.040896	-0.115931	0.01344	0.023444	-0.081662	0.436536	-0.120566	0.014536
19	1968	3.22	12.7	1.103804	0.507856	0.585606	0.342934	-0.211219	0.044614	-0.123691	-0.148783	0.369415	0.734388	0.539326
20	1969	19.5	5.07	0.705008	1.290035	0.18681	0.034898	0.57096	0.325995	0.106661	0.402184	0.920382	-0.215374	0.046386
21	1970	24.9	6.57	0.817565	1.396199	0.299367	0.089621	0.677124	0.458497	0.202709	0.476966	0.995164	-0.177599	0.031541
22	1971	8.34	5.45	0.736397	0.921166	0.218199	0.047611	0.202091	0.040841	0.044096	0.142353	0.660551	0.075846	0.005753
23	1972	2.86	5.68	0.754348	0.456366	0.23615	0.055767	-0.262709	0.069016	-0.062039	-0.185052	0.333146	0.421203	0.177412
24	1973	4.35	2.26	0.354108	0.638489	-0.16409	0.026925	-0.080586	0.006494	0.013223	-0.056765	0.461433	-0.107325	0.011519
25	1974	8.47	7.28	0.862131	0.927883	0.343933	0.11829	0.208808	0.043601	0.071816	0.147085	0.665283	0.196849	0.038749
26	1975	14.1	6.25	0.79588	1.149219	0.277682	0.077107	0.430144	0.185024	0.119443	0.302994	0.821192	-0.025311	0.000641
27	1976	5.28	5.67	0.753583	0.722634	0.235385	0.055406	0.003559	1.27E-05	0.000838	0.002507	0.520705	0.232878	0.054232
28	1977	4.18	3.74	0.572872	0.621176	0.054674	0.002989	-0.097899	0.009584	-0.005352	-0.06896	0.449238	0.123633	0.015285
29	1978	19.7	3.67	0.564666	1.294466	0.046468	0.002159	0.575391	0.331075	0.026737	0.405306	0.923504	-0.358838	0.128764
30	1979	6.02	4.23	0.62634	0.779596	0.108142	0.011695	0.060521	0.003663	0.006545	0.042631	0.560829	0.065511	0.004292

31	1980	11.7	7.50	0.875061	1.068186	0.356863	0.127351	0.349111	0.121878	0.124585	0.245914	0.764112	0.11095	0.01231
32	1981	5.31	3.12	0.494155	0.725095	-0.024043	0.000578	0.00602	3.62E-05	-0.000145	0.00424	0.522438	-0.028284	0.0008
33	1982	8.06	6.97	0.843233	0.906335	0.325035	0.105648	0.18726	0.035066	0.060866	0.131906	0.650104	0.193129	0.037299
34	1983	7.02	3.05	0.4843	0.846337	-0.033898	0.001149	0.127262	0.016196	-0.004314	0.089643	0.607841	-0.123542	0.015263
35	1984	2.77	2.34	0.369216	0.44248	-0.148982	0.022196	-0.276595	0.076505	0.041208	-0.194834	0.323364	0.045852	0.002102
36	1985	3.68	5.67	0.753583	0.565848	-0.235385	0.055406	-0.153227	0.023479	-0.036067	-0.107933	0.410265	0.343318	0.117867
37	1986	8.47	3.10	0.491362	0.927883	-0.026836	0.00072	0.208808	0.043601	-0.005604	0.147085	0.665283	-0.173921	0.030248
38	1987	3.40	1.76	0.245513	0.531479	-0.272685	0.074357	-0.187596	0.035192	0.051155	-0.132143	0.386055	-0.140543	0.019752
39	1988	2.86	1.55	0.190332	0.456366	-0.327866	0.107496	-0.262709	0.069016	0.086133	-0.185052	0.333146	-0.142814	0.020396
40	1989	5.82	4.04	0.606381	0.764923	0.088183	0.007776	0.045848	0.002102	0.004043	0.032295	0.550493	0.055888	0.003123
41	1990	4.37	2.08	0.318063	0.640481	-0.200135	0.040054	-0.078594	0.006177	0.015729	-0.055361	0.462837	-0.144773	0.020959
42	1991	8.86	6.43	0.808211	0.947434	-0.290013	0.084108	0.228359	0.052148	0.066227	0.160856	0.679054	0.129157	0.016682
43	1992	5.80	2.03	0.307496	0.763428	-0.210702	0.044395	0.044353	0.001967	-0.009345	0.031242	0.54944	-0.241944	0.058537
44	1993	2.14	1.70	0.230449	0.330414	-0.287749	0.0828	-0.388661	0.151058	0.111837	-0.273773	0.244425	-0.013976	0.000195
45	1994	3.68	1.84	0.264818	0.565848	-0.25338	0.064202	-0.153227	0.023479	0.038825	-0.107933	0.410265	-0.145447	0.021155
46	1995	4.45	1.97	0.294466	0.64836	-0.223732	0.050056	-0.070715	0.005001	0.015821	-0.049812	0.468386	-0.17392	0.030248
47	1996	2.27	2.79	0.445604	0.356026	-0.072594	0.00527	-0.363049	0.131805	0.026355	-0.255732	0.262466	0.183138	0.03354
48	1997	26.8	16.6	1.220108	1.428135	0.70191	0.492678	0.70906	0.502766	0.497696	0.499462	1.01766	0.202448	0.040985
49	1998	8.30	3.05	0.4843	0.919078	-0.033898	0.001149	0.200003	0.040001	-0.00678	0.140882	0.65908	-0.17478	0.030548
				25.39172	35.23466		4.96865		4.628511	3.317394				2.591677
				0.518198	0.719075									

$$\bar{X} = 0{,}518 \qquad \sigma_x = \sqrt{\frac{4{,}96865}{48}} = 0{,}32 \qquad \sigma_{X/Y} = \sqrt{\frac{2{,}591677}{48}} = 0{,}232$$

$$\bar{Y} = 0{,}719 \qquad \sigma_y = \sqrt{\frac{4{,}628511}{48}} = 0{,}31$$

$$R_{XY} = \frac{3{,}317394}{49 \cdot 0{,}32 \cdot 0{,}31} = 0{,}682 \qquad \rho_{X/Y} = 0{,}682 \cdot \frac{0{,}312}{0{,}31} = 0{,}704$$

$$X_0 = 0{,}518 - 0{,}704\ 0{,}719 = 0{,}012$$

Tabelul 4.

Raul Nera

St. H. Dalboşeţ

Debite conditionate luna septembrie în funcţie de luna august

Nr.	Anul	Y =Aug.	X= Sept.	X_i =logX	Y_i=logY	X_i-X_{med}	$(X_i-X_{med})^2$	Y_i-Y_{med}	$(Y_i-Y_{med})^2$	$(X_i-X)(Y_i-Y)$	$(Y_i-Y)q_{x/y}$	Xy_i	$t_i=X_i-X_{yi}$	t_i^2
1	1950	0.96	0.98	-0.008774	-0.017729	-0.445927	0.198851	-0.535927	0.287217	0.238984	-0.328523	0.10863	-0.117404	0.013784
2	1951	3.22	2.52	0.401401	0.507856	-0.035752	0.001278	-0.010342	0.000107	0.00037	-0.00634	0.430813	-0.029413	0.000865
3	1952	0.62	1.00	0	-0.207608	-0.437153	0.191103	-0.725806	0.526795	0.317288	-0.444919	-0.007766	0.007766	6.03E-05
4	1953	3.90	2.35	0.371068	0.591065	-0.066085	0.004367	0.072867	0.00531	-0.004815	0.044667	0.48182	-0.110752	0.012266
5	1954	3.50	1.68	0.225309	0.544068	-0.211844	0.044878	0.02587	0.000669	-0.00548	0.015858	0.453011	-0.227702	0.051848
6	1955	20.9	4.73	0.674861	1.320146	0.237708	0.056505	0.801948	0.643121	0.19063	0.491594	0.928747	-0.253886	0.064458
7	1956	2.79	1.59	0.201397	0.445604	-0.235756	0.055581	-0.072594	0.00527	0.017114	-0.0445	0.392653	-0.191256	0.036579
8	1957	3.64	2.82	0.450249	0.561101	0.013096	0.000172	0.042903	0.001841	0.000562	0.0263	0.463453	-0.013204	0.000174
9	1958	1.38	1.34	0.127105	0.139879	-0.310048	0.09613	-0.378319	0.143125	0.117297	-0.231909	0.205244	-0.078139	0.006106
10	1959	4.44	2.50	0.39794	0.647383	-0.039213	0.001538	0.129185	0.016689	-0.005066	0.07919	0.516343	-0.118403	0.014019
11	1960	4.45	1.96	0.292256	0.64836	-0.144897	0.020995	0.130162	0.016942	-0.01886	0.079789	0.516942	-0.224686	0.050484
12	1961	1.33	1.06	0.025306	0.123852	-0.411847	0.169618	-0.394346	0.155509	0.16241	-0.241734	0.195419	-0.170113	0.028938
13	1962	0.93	0.78	-0.107905	-0.031517	-0.545058	0.297089	-0.549715	0.302187	0.299627	-0.336975	0.100178	-0.208083	0.043299
14	1963	1.40	1.88	0.274158	0.146128	-0.162995	0.026567	-0.37207	0.138436	0.060646	-0.228079	0.209074	0.065084	0.004236
15	1964	1.08	1.62	0.209515	0.033424	-0.227638	0.051819	-0.484774	0.235006	0.110353	-0.297167	0.139986	0.069529	0.004834
16	1965	2.06	1.35	0.130334	0.313867	-0.306819	0.094138	-0.204331	0.041751	0.062693	-0.125255	0.311898	-0.181564	0.032966
17	1966	8.64	4.73	0.674861	0.936514	0.237708	0.056505	0.418316	0.174988	0.099437	0.256428	0.693581	-0.018719	0.00035
18	1967	2.07	2.16	0.334454	0.31597	-0.102699	0.010547	-0.202228	0.040896	0.020769	-0.123966	0.313187	0.021266	0.000452
19	1968	12.7	13.6	1.133539	1.103804	0.696386	0.484953	0.585606	0.342934	0.407808	0.358976	0.796129	0.33741	0.113845
20	1969	5.07	3.92	0.593286	0.705008	0.156133	0.024378	0.18681	0.034898	0.029167	0.114515	0.551668	0.041619	0.001732
21	1970	6.57	3.55	0.550228	0.817565	0.113075	0.012786	0.299367	0.089621	0.033851	0.183512	0.620665	-0.070437	0.004961
22	1971	5.45	3.55	0.550228	0.736397	0.113075	0.012786	0.218199	0.047611	0.024673	0.133756	0.570909	-0.02068	0.000428
23	1972	5.68	7.60	0.880814	0.754348	0.443661	0.196835	0.23615	0.055767	0.104771	0.14476	0.581913	0.2989	0.089341
24	1973	2.26	1.82	0.260071	0.354108	-0.177082	0.031358	-0.16409	0.026925	0.029057	-0.100587	0.336566	-0.076495	0.005851
25	1974	7.28	2.93	0.466868	0.862131	0.029715	0.000883	0.343933	0.11829	0.01022	0.210831	0.647984	-0.181117	0.032803
26	1975	6.25	5.68	0.754348	0.79588	0.317195	0.100613	0.277682	0.077107	0.088079	0.170219	0.607372	0.146976	0.021602
27	1976	5.67	13.5	1.130334	0.753583	0.693181	0.4805	0.235385	0.055406	0.163164	0.144291	0.581444	0.54889	0.30128
28	1977	3.74	2.76	0.440909	0.572872	0.003756	1.41E-05	0.054674	0.002989	0.000205	0.033515	0.470668	-0.029759	0.000886
29	1978	3.67	4.83	0.683947	0.564666	0.246794	0.060907	0.046468	0.002159	0.011468	0.028485	0.465638	0.218309	0.047659
30	1979	4.23	2.76	0.440909	0.62634	0.003756	1.41E-05	0.108142	0.011695	0.000406	0.066291	0.503444	-0.062535	0.003911

31	1980	7.50	3.35	0.525045	0.875061	0.087892	0.007725	0.356863	0.127351	0.031365	0.218757	0.65591	-0.130865	0.017126
32	1981	3.12	3.26	0.513218	0.494155	0.076065	0.005786	-0.024043	0.000578	-0.001829	-0.014739	0.422414	0.090803	0.008245
33	1982	6.97	2.87	0.457882	0.843233	0.020729	0.00043	0.325035	0.105648	0.006738	0.199246	0.636399	-0.178517	0.031868
34	1983	3.05	2.62	0.418301	0.4843	-0.018852	0.000355	-0.033898	0.001149	0.000639	-0.02078	0.416373	0.001928	3.72E-06
35	1984	2.34	2.10	0.322219	0.369216	-0.114934	0.01321	-0.148982	0.022196	0.017123	-0.091326	0.345827	-0.023608	0.000557
36	1985	5.67	3.27	0.514548	0.753583	0.077395	0.00599	0.235385	0.055406	0.018218	0.144291	0.581444	-0.066896	0.004475
37	1986	3.10	1.80	0.255273	0.491362	-0.18188	0.033081	-0.026836	0.00072	0.004881	-0.016451	0.420702	-0.16543	0.027367
38	1987	1.76	0.931	-0.03105	0.245513	-0.468203	0.219214	-0.272685	0.074357	0.127672	-0.167156	0.269997	-0.301047	0.090629
39	1988	1.55	2.10	0.322219	0.190332	-0.114934	0.01321	-0.327866	0.107496	0.037683	-0.200982	0.236171	0.086048	0.007404
40	1989	4.04	6.72	0.827369	0.606381	0.390216	0.152269	0.088183	0.007776	0.034411	0.054056	0.491209	0.33616	0.113003
41	1990	2.08	1.62	0.209515	0.318063	-0.227638	0.051819	-0.200135	0.040054	0.045558	-0.122683	0.31447	-0.104955	0.011016
42	1991	6.43	3.04	0.482874	0.808211	0.045721	0.00209	0.290013	0.084108	0.01326	0.177778	0.614931	-0.132057	0.017439
43	1992	2.03	2.32	0.365488	0.307496	-0.071665	0.005136	-0.210702	0.044395	0.0151	-0.12916	0.307993	0.057495	0.003306
44	1993	1.70	2.49	0.396199	0.230449	-0.040954	0.001677	-0.287749	0.0828	0.011784	-0.17639	0.260763	0.135437	0.018343
45	1994	1.84	1.42	0.152288	0.264818	-0.284865	0.081148	-0.25338	0.064202	0.072179	-0.155322	0.281831	-0.129543	0.016781
46	1995	1.97	4.32	0.635484	0.294466	0.198331	0.039335	-0.223732	0.050056	-0.044373	-0.137148	0.300005	0.335478	0.112546
47	1996	2.79	11.8	1.071882	0.445604	0.634729	0.402881	-0.072594	0.00527	-0.046077	-0.0445	0.392653	0.679229	0.461352
48	1997	16.6	5.38	0.730782	1.220108	0.293629	0.086218	0.70191	0.492678	0.206101	0.430271	0.867424	-0.136642	0.018671
49	1998	3.05	4.92	0.691965	0.4843	0.254812	0.064929	-0.033898	0.001149	-0.008638	-0.02078	0.416373	0.275592	0.075951
				21.42052	25.39172		3.97021		4.96865	3.108623				2.026103
				0.437153	0.518198									

$$\bar{X} = 0{,}437 \qquad \sigma_x = \sqrt{\frac{3{,}97021}{48}} = 0{,}288 \qquad \sigma_{X/Y} = \sqrt{\frac{2{,}026103}{48}} = 0{,}205$$

$$\bar{Y} = 0{,}518 \qquad \sigma_y = \sqrt{\frac{4{,}96865}{48}} = 0{,}32$$

$$R_{XY} = \frac{3{,}108623}{49 \cdot 0{,}288 \cdot 0{,}32} = 0{,}640 \qquad \rho_{X/Y} = 0{,}64 \cdot \frac{0{,}288}{0{,}32} = 0{,}576$$

$$X_0 = 0{,}437 - 0{,}613\ 0{,}518198 = 0{,}119$$

Tabelul 5.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera — Ianuarie

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	138	42.0	27.9	12.5	5.85	3.86	2.96	2.73	2.10
2	74.6	43.1	31.2	12.4	5.64	4.06	3.02	2.75	2.10
3	49.7	34.8	28.6	12.7	5.19	4.07	3.24	2.53	2.20
4	37.0	26.0	22.9	15.6	4.98	3.72	2.90	2.53	2.40
5	51.7	31.1	25.2	11.6	5.07	3.61	2.83	2.23	1.80
6	29.9	25.6	18.8	11.4	4.45	3.61	2.88	2.07	1.90
7	29.6	22.9	21.0	13.4	5.40	3.39	2.73	2.03	1.90
8	28.8	22.3	18.4	11.4	5.13	3.52	2.70	1.97	1.90
9	20.7	17.2	15.6	9.93	5.50	3.37	2.35	2.17	1.90
10	20.7	15.6	13.8	10.3	4.91	3.63	2.65	2.22	2.20
11	18.0	14.7	12.4	8.48	5.52	3.28	2.79	2.30	2.10
12	18.4	16.3	13.5	9.38	5.50	3.21	2.63	2.45	1.90
13	31.7	15.6	12.6	9.40	5.79	3.56	2.52	2.17	1.80
14	30.4	16.2	13.9	9.21	6.09	3.00	2.15	1.77	1.59
15	20.2	13.2	11.0	8.44	5.59	3.20	1.82	1.64	1.43
16	17.0	13.5	13.0	8.28	5.03	3.19	1.73	1.57	1.47
17	47.8	16.0	10.7	8.44	4.78	3.12	1.77	1.53	1.38
18	38.4	14.4	11.3	8.09	5.39	3.04	2.09	1.76	1.45
19	25.8	11.9	10.8	7.60	5.44	3.06	2.30	1.89	1.78
20	20.2	11.5	10.4	7.09	5.39	3.06	2.16	2.02	1.70
21	14.1	12.2	10.3	7.25	5.19	3.04	2.43	1.90	1.60
22	15.1	12.8	10.3	7.13	4.79	2.93	2.36	1.78	1.60
23	22.2	12.4	9.32	7.61	4.61	3.00	2.36	2.22	1.80
24	17.1	14.9	10.1	7.35	5.23	3.49	2.34	2.23	1.80
25	32.4	17.0	15.3	9.17	5.90	3.36	2.35	2.28	2.10
26	50.6	28.4	22.0	9.43	5.53	3.45	2.33	2.22	2.10
27	46.6	16.1	15.2	9.07	5.83	3.80	2.33	1.97	1.87
28	34.6	21.3	11.6	8.58	6.30	3.71	2.27	2.07	1.90
29	39.4	24.4	11.7	8.32	5.86	3.45	2.36	2.26	1.90
30	105	23.1	13.0	8.00	6.05	3.70	2.39	2.18	1.80
31	59.4	21.2	14.8	8.33	5.68	3.47	2.42	2.18	1.80

Tabelul 6.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera — Februarie

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	42.6	18.8	15.6	7.80	5.80	3.40	2.65	2.12	1.80
2	30.8	19.8	12.6	7.61	5.83	3.30	2.53	2.22	1.80
3	28.5	23.3	12.8	8.38	5.70	3.60	2.52	2.18	1.90
4	40.7	25.8	11.3	8.65	6.25	3.53	2.76	2.26	2.10
5	44.4	27.4	13.0	9.40	6.60	4.35	2.86	2.29	2.10
6	44.0	38.1	29.0	9.11	6.47	4.59	2.89	2.25	2.10
7	44.1	35.0	28.2	8.69	6.54	4.83	2.66	2.42	2.10
8	32.6	31.8	25.3	11.2	6.40	4.64	2.91	2.42	2.10
9	32.5	30.5	29.2	19.8	6.51	4.05	2.72	2.38	2.10
10	62.1	33.1	27.6	18.3	6.80	4.34	3.10	2.42	1.70
11	73.6	68.3	32.7	17.8	6.70	5.06	3.13	2.68	1.90
12	110	45.2	37.8	18.5	6.35	4.64	3.56	2.88	1.60
13	90.4	48.7	27.7	15.5	6.37	5.01	4.25	2.98	1.80
14	77.3	44.3	24.0	14.9	6.94	5.41	4.38	2.81	2.20
15	61.6	45.1	34.4	12.8	7.12	5.37	3.88	2.81	2.20
16	56.5	53.7	41.5	14.0	9.33	5.30	3.70	2.72	2.10
17	46.4	38.3	33.4	24.1	9.53	5.27	4.13	2.66	2.10
18	58.2	30.5	23.7	16.2	9.39	5.08	4.04	2.77	1.90
19	30.5	29.3	26.2	13.8	8.67	5.69	3.52	2.75	2.10
20	57.3	26.2	24.4	14.9	7.99	6.13	3.41	2.71	2.20
21	52.2	31.6	23.1	13.6	8.47	5.48	3.34	2.86	2.28
22	28.5	27.4	24.7	15.0	8.50	5.16	3.66	3.08	2.55
23	111	25.2	23.5	14.7	8.10	5.55	3.64	3.46	2.82
24	52.4	30.2	22.6	14.5	8.24	5.75	4.09	3.59	2.86
25	52.0	26.2	23.1	13.2	7.33	6.10	4.16	3.66	2.48
26	57.0	29.0	22.5	13.3	8.25	6.26	4.52	3.86	2.93
27	82.8	32.6	24.8	15.6	8.49	5.70	5.05	3.63	2.67
28	38.0	28.8	25.3	16.2	8.28	5.66	5.02	3.77	2.80

Tabelul 7.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera Martie

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	39.2	31.4	21.6	12.9	9.70	6.21	4.66	4.30	2.93
2	57.9	36.8	23.9	12.9	8.78	5.74	4.41	3.97	2.93
3	41.4	34.1	26.1	13.1	8.54	5.77	4.28	3.84	2.93
4	52.8	33.2	24.8	13.2	8.57	5.83	3.81	3.60	2.93
5	63.1	40.4	22.2	13.5	8.46	4.98	4.00	3.49	2.80
6	90.0	27.8	23.9	13.0	8.05	5.84	4.25	3.60	2.67
7	69.9	28.1	22.6	13.8	9.15	6.21	4.63	3.41	2.67
8	57.2	38.0	23.0	13.3	9.47	5.84	4.38	3.31	2.67
9	46.5	32.4	24.9	12.8	9.32	6.67	4.27	3.45	2.67
10	38.0	32.3	22.4	12.2	9.34	6.83	4.23	3.36	2.67
11	61.7	27.1	23.4	13.4	8.90	7.15	4.45	3.22	3.06
12	93.9	28.7	20.5	13.8	8.83	7.31	4.86	3.98	3.02
13	123	29.9	20.7	12.8	8.48	7.39	4.65	3.71	3.02
14	108	27.4	21.7	13.3	8.68	7.12	4.83	3.36	3.20
15	78.6	28.8	26.4	14.2	8.71	7.33	5.04	3.83	3.20
16	59.0	40.4	28.9	15.7	10.4	6.73	5.07	4.40	3.40
17	54.8	46.8	32.7	18.6	10.4	6.63	4.90	4.18	3.40
18	52.6	45.6	35.9	18.7	11.3	6.77	5.12	4.30	3.40
19	63.6	43.1	34.4	17.9	10.7	7.43	5.98	4.88	4.00
20	62.8	36.0	26.8	17.8	10.6	7.83	6.38	5.79	4.79
21	46.9	28.1	24.5	15.7	11.1	8.43	6.42	5.67	4.79
22	40.2	28.8	22.7	16.4	11.8	8.38	6.38	5.25	4.35
23	40.8	36.4	30.8	18.6	11.3	9.04	6.32	5.28	4.48
24	121	55.1	45.1	26.2	13.7	9.05	6.46	5.47	4.37
25	43.9	39.0	38.0	22.4	13.2	9.14	6.65	5.23	4.58
26	47.9	37.9	32.4	26.6	14.2	9.60	6.64	5.36	4.64
27	56.4	48.3	34.7	27.1	15.8	9.53	6.75	5.75	4.50
28	59.6	57.9	47.1	31.3	17.9	9.32	7.31	6.42	4.79
29	68.2	46.0	41.3	29.6	20.7	9.33	6.99	6.08	4.64
30	90.3	47.1	39.4	35.7	23.0	9.56	6.80	6.35	4.79
31	146	106	79.3	34.0	23.7	8.77	6.68	5.57	4.64

Tabelul 8.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera Aprilie

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	142	76.0	53.9	32.1	22.1	9.03	6.58	5.73	4.93
2	118	55.9	44.3	33.9	21.6	11.2	7.26	6.17	4.79
3	77.0	58.6	47.2	33.1	23.7	12.3	8.07	6.69	4.93
4	91.0	58.1	54.2	31.1	23.0	12.3	8.28	6.30	4.79
5	94.7	52.9	47.0	30.5	21.9	12.0	8.19	6.04	4.79
6	81.2	50.3	45.1	31.4	20.0	11.8	8.03	5.97	4.62
7	65.9	51.4	43.7	30.2	21.6	11.6	7.91	5.97	4.62
8	53.5	48.0	44.2	31.3	21.7	11.4	8.15	5.95	4.44
9	80.5	47.2	43.7	34.5	19.8	11.8	8.08	5.59	4.25
10	76.3	41.6	39.1	30.9	18.3	10.8	8.04	5.38	4.25
11	59.2	41.2	35.1	28.4	19.2	10.8	7.65	5.24	4.25
12	60.3	42.3	34.8	27.4	20.7	14.3	7.92	6.70	3.92
13	76.3	39.5	32.0	25.9	19.8	12.2	8.39	6.29	3.92
14	58.6	45.6	32.9	25.6	18.8	12.8	8.60	7.34	5.00
15	72.3	57.7	34.7	24.2	18.3	11.8	8.66	7.37	4.99
16	64.2	50.1	39.0	23.7	16.7	12.6	8.61	7.64	4.99
17	60.4	49.0	42.6	25.4	17.5	12.4	8.45	7.63	5.37
18	161	50.1	41.6	27.8	18.1	11.5	8.75	8.09	6.48
19	112	58.6	36.5	26.8	16.8	11.8	9.94	9.29	7.46
20	74.2	57.8	35.4	26.3	17.3	11.7	9.86	8.76	7.89
21	71.9	58.5	48.9	25.7	16.7	11.1	9.73	9.20	7.50
22	98.9	50.6	38.2	23.4	17.7	11.7	9.57	9.29	7.10
23	62.9	40.3	34.0	23.7	18.4	12.1	9.93	9.78	7.00
24	47.1	43.4	38.8	25.6	18.3	14.0	9.78	9.41	9.12
25	60.4	47.0	39.9	29.3	17.4	13.8	10.1	9.11	9.06
26	54.0	39.2	37.9	30.1	16.7	13.0	10.7	9.71	8.54
27	46.4	35.2	32.0	27.6	15.8	12.7	10.1	9.46	8.30
28	48.3	43.1	28.3	24.5	15.9	12.0	10.3	9.44	7.90
29	51.5	40.2	28.8	24.2	14.9	11.5	9.57	8.91	7.40
30	52.9	36.5	31.1	22.9	14.1	11.3	9.21	8.41	7.96

Tabelul 9.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera Mai

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	41.2	30.0	27.7	22.5	15.4	10.2	8.81	7.78	7.38
2	33.4	25.1	23.9	20.0	14.9	10.7	8.06	7.48	6.80
3	34.2	26.0	20.7	19.3	13.9	10.7	8.75	7.67	6.28
4	41.2	24.9	20.9	17.7	15.3	10.7	8.57	7.22	6.02
5	34.4	33.6	22.1	16.8	14.5	10.2	7.76	6.46	5.76
6	51.2	28.0	24.6	17.0	13.9	10.1	7.39	6.15	5.76
7	76.4	31.3	23.6	18.6	13.5	10.0	7.80	5.84	5.32
8	67.9	48.5	24.6	16.9	13.1	9.48	8.31	6.75	4.66
9	137	37.1	30.9	17.5	13.1	9.43	8.41	6.75	4.00
10	65.9	49.8	33.4	18.2	13.2	10.6	7.91	6.68	4.00
11	59.2	47.4	43.2	19.5	13.8	10.6	7.76	6.30	4.00
12	84.5	68.8	34.4	21.8	13.6	10.3	8.10	6.24	3.60
13	61.4	45.4	41.7	22.5	13.5	9.31	7.45	5.90	3.20
14	79.1	41.7	33.5	20.4	13.5	8.85	7.15	6.36	4.37
15	48.8	32.8	27.4	18.9	13.0	9.44	6.87	6.33	4.22
16	64.5	33.6	28.1	21.0	13.2	8.84	6.33	6.17	3.94
17	69.5	37.2	29.8	21.9	11.6	8.34	6.27	5.75	3.94
18	44.5	37.8	29.6	18.2	11.0	7.45	5.65	5.45	4.37
19	32.4	31.3	29.3	16.5	10.3	6.91	5.55	5.33	5.10
20	30.8	27.9	26.1	15.7	9.89	6.75	5.38	5.05	4.67
21	46.0	34.6	23.7	13.6	9.80	6.49	5.38	4.95	4.22
22	131	44.7	28.4	16.6	9.40	6.26	5.12	4.80	3.80
23	94.2	50.9	33.9	18.8	9.20	5.94	5.33	4.77	4.00
24	69.5	51.7	33.0	17.4	9.10	5.69	4.75	4.43	2.84
25	77.1	52.6	47.2	14.7	9.00	5.91	5.19	4.22	3.40
26	49.7	47.4	35.5	13.1	7.94	5.72	4.55	3.54	3.40
27	39.3	38.8	33.2	12.3	8.00	5.59	4.59	4.00	3.40
28	51.4	31.3	28.9	11.8	7.70	5.64	4.20	4.00	3.28
29	109	35.2	26.2	11.1	8.20	6.24	4.00	3.87	3.40
30	187	38.7	31.8	11.1	7.75	5.91	3.79	3.63	3.40
31	156	52.4	156	9.88	7.43	5.68	3.64	3.55	3.15

Tabelul 10.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera lunie

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	88.8	85.5	43.4	11.6	7.11	5.56	3.69	3.53	2.90
2	59.4	56.0	30.6	14.7	7.50	5.50	3.94	3.45	2.90
3	43.7	39.8	27.6	18.9	6.73	5.34	4.67	3.55	2.90
4	89.5	32.5	28.9	16.5	7.03	5.42	3.86	3.41	2.90
5	53.5	28.8	26.4	15.0	7.21	5.48	4.66	4.03	3.20
6	51.0	31.7	28.0	16.5	6.71	5.38	4.71	4.22	2.68
7	59.8	30.3	27.2	24.1	8.65	5.04	4.22	3.60	2.68
8	91.1	43.0	24.2	19.7	9.75	4.91	4.03	3.81	2.52
9	94.9	36.4	23.7	18.0	9.47	5.03	4.33	3.41	2.52
10	72.2	28.3	20.1	17.2	9.45	5.27	4.00	3.22	2.52
11	45.3	24.1	19.7	15.2	7.89	5.18	3.75	3.21	2.52
12	30.5	25.1	19.6	15.2	8.76	5.08	3.57	3.27	2.68
13	35.6	20.1	19.0	14.4	9.08	5.49	4.24	3.45	2.68
14	28.1	18.5	16.8	13.9	8.74	5.54	3.60	3.36	3.00
15	85.4	27.1	16.3	13.4	9.30	5.61	4.00	3.10	2.68
16	121	18.0	15.4	12.4	9.26	5.16	3.93	2.92	2.68
17	82.0	26.1	17.4	12.0	9.24	5.70	4.12	3.58	2.52
18	57.3	37.6	18.9	10.9	8.75	5.99	3.63	3.50	2.52
19	116	36.6	19.8	10.9	8.65	5.78	3.72	3.13	2.52
20	52.2	39.1	22.7	11.6	8.47	5.18	3.21	2.90	2.52
21	32.6	29.2	25.6	12.7	7.30	5.20	3.01	2.68	2.30
22	69.2	43.3	22.3	11.0	7.65	5.05	3.52	2.80	2.17
23	62.4	29.5	18.3	10.5	7.89	5.85	4.02	2.70	2.17
24	32.2	22.4	16.1	10.9	7.94	5.83	3.76	2.42	2.17
25	25.8	21.0	14.9	10.4	7.71	5.18	3.84	2.42	2.17
26	24.4	23.3	16.3	9.78	7.25	5.04	3.75	2.63	2.04
27	28.2	18.4	15.5	10.7	6.78	4.74	3.64	2.34	2.08
28	21.6	16.8	14.9	10.6	6.51	4.94	3.58	2.78	2.04
29	18.7	14.3	12.1	9.42	6.41	4.78	3.20	2.58	1.88
30	91.4	24.4	18.5	10.6	6.45	4.64	3.11	2.30	1.56

Tabelul 11.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera — Iulie

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	37.2	19.8	11.8	9.20	7.27	4.80	3.08	2.14	1.56
2	36.2	23.6	12.9	8.66	6.60	4.57	3.01	1.97	1.25
3	48.7	23.1	15.1	9.51	6.46	4.71	2.88	1.92	1.25
4	31.7	15.9	10.4	9.69	6.18	4.51	2.80	2.23	1.77
5	24.6	15.4	12.5	8.94	5.63	4.28	2.86	1.82	1.56
6	23.6	16.1	13.8	8.12	5.60	4.71	3.20	2.47	1.25
7	56.6	18.8	16.4	7.47	5.44	4.32	2.98	2.42	0.950
8	30.8	23.0	15.3	8.24	5.73	3.93	2.61	2.36	0.950
9	75.0	25.0	17.0	9.99	5.10	3.51	2.61	2.22	0.950
10	55.8	22.0	14.8	8.47	5.20	3.46	2.58	1.91	0.950
11	33.9	28.4	16.1	7.56	5.02	3.68	2.66	1.87	0.950
12	51.2	19.0	11.7	7.28	5.81	4.06	2.44	1.78	0.950
13	43.8	18.1	11.7	7.02	5.02	3.92	2.60	2.06	0.950
14	36.1	17.9	12.4	6.64	4.84	3.58	2.50	2.06	0.950
15	33.3	13.0	10.6	7.16	4.69	3.23	2.36	2.06	0.950
16	25.4	10.2	8.97	7.52	4.55	3.05	2.23	1.99	1.72
17	22.9	14.1	8.33	6.24	4.27	3.19	2.52	2.00	1.77
18	23.5	13.3	9.28	6.39	4.23	3.15	2.16	1.96	1.63
19	154	15.6	7.57	5.84	4.08	2.92	2.47	2.30	1.42
20	103	11.5	9.31	6.12	4.22	3.17	2.33	2.14	1.42
21	55.5	13.1	10.1	5.54	3.99	3.04	2.33	2.04	1.42
22	37.8	12.6	9.88	5.43	4.40	3.03	2.34	2.17	1.93
23	27.4	18.2	14.6	8.74	4.51	2.94	2.27	2.07	1.82
24	26.7	24.8	17.2	6.84	4.18	2.77	2.21	1.97	1.82
25	35.6	23.8	17.7	7.38	3.94	2.76	2.07	1.87	1.80
26	62.5	24.1	20.1	6.88	3.68	2.50	2.07	1.90	1.72
27	79.9	18.8	15.9	7.01	3.89	2.80	2.41	2.16	1.72
28	47.8	23.4	20.3	6.38	4.07	2.74	2.23	2.02	1.61
29	67.0	36.3	22.2	6.89	3.90	2.49	2.13	1.81	1.42
30	54.6	42.3	27.4	8.94	4.03	2.46	2.10	1.86	1.35
31	115	38.6	24.8	6.81	3.80	2.38	2.02	1.76	1.27

Tabelul 12.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera August

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	45.2	29.1	23.8	5.77	3.80	2.28	1.95	1.76	1.20
2	74.0	20.7	13.9	6.80	3.92	2.45	1.95	1.70	1.12
3	50.7	15.9	11.9	6.86	3.51	2.20	1.98	1.70	1.12
4	33.0	13.0	9.69	6.52	3.96	2.50	1.98	1.72	1.60
5	25.4	12.6	11.3	6.92	3.76	2.18	1.83	1.72	1.51
6	22.6	12.7	10.2	6.03	3.51	2.07	1.72	1.59	1.51
7	19.1	11.6	8.99	5.03	3.35	2.05	1.63	1.57	1.35
8	15.6	9.39	8.50	5.39	3.42	1.98	1.69	1.47	1.35
9	23.0	18.1	8.18	5.55	3.36	2.11	1.73	1.53	1.40
10	23.3	17.8	10.3	6.10	3.41	2.27	1.63	1.53	1.30
11	14.8	11.3	8.23	5.81	3.21	2.25	1.72	1.53	1.30
12	14.0	12.2	7.58	5.67	3.87	2.00	1.63	1.38	1.30
13	46.5	9.77	6.60	5.76	3.64	2.02	1.54	1.33	1.30
14	20.6	9.03	6.59	5.50	3.46	1.90	1.52	1.38	1.20
15	13.7	10.1	6.84	4.96	3.46	2.44	1.54	1.46	1.35
16	22.4	10.5	8.99	5.18	3.43	2.29	1.68	1.35	1.20
17	13.4	9.89	7.68	5.49	3.19	2.19	1.58	1.30	1.20
18	8.89	8.10	7.60	5.43	3.32	2.12	1.57	1.45	1.20
19	32.1	8.60	7.05	5.31	3.26	2.09	1.54	1.41	1.30
20	24.3	12.7	6.88	5.18	3.33	1.95	1.63	1.42	1.20
21	36.1	24.1	6.06	4.68	3.03	2.03	1.64	1.31	1.20
22	30.7	16.3	5.68	4.66	3.24	1.93	1.52	1.26	1.20
23	16.6	12.2	9.78	5.22	3.33	1.94	1.57	1.28	1.20
24	13.4	9.15	7.11	4.60	2.86	2.12	1.56	1.39	1.15
25	11.3	8.50	6.55	4.60	3.05	2.05	1.59	1.38	1.15
26	10.8	9.32	7.88	5.29	3.39	2.10	1.61	1.53	1.19
27	15.2	9.81	6.64	4.95	2.88	2.40	2.10	1.49	1.45
28	16.7	12.1	5.85	4.74	3.48	2.18	1.81	1.55	1.40
29	26.9	12.8	10.1	4.98	3.31	2.06	1.61	1.55	1.40
30	17.4	15.4	10.2	4.39	3.18	2.03	1.54	1.42	1.20
31	14.0	11.4	11.1	4.00	2.95	2.00	1.46	1.35	1.20

Tabelul 13.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera Septembrie

S.H. Dalboşeţ

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	20.8	17.3	13.1	5.64	3.21	1.89	1.49	1.33	1.20
2	19.4	14.6	10.8	5.66	3.02	1.82	1.49	1.30	1.18
3	18.8	13.1	8.49	6.10	3.30	1.93	1.52	1.30	1.18
4	16.6	11.4	8.24	4.60	3.35	2.38	1.49	1.35	1.10
5	28.1	12.4	9.64	5.18	3.58	2.37	1.50	1.36	1.10
6	30.7	15.9	7.20	4.66	3.50	2.32	1.50	1.39	1.10
7	29.1	17.8	8.67	4.36	3.13	1.99	1.52	1.42	1.00
8	24.6	17.0	7.14	4.27	3.06	1.99	1.42	1.30	1.00
9	21.0	14.5	8.75	4.22	2.86	2.12	1.41	1.26	1.00
10	21.5	7.57	6.13	4.19	2.86	2.10	1.32	1.26	1.00
11	16.6	9.18	5.64	4.80	2.83	1.90	1.32	1.13	0.900
12	14.2	10.6	8.34	4.32	3.05	1.90	1.32	1.12	0.900
13	16.8	9.56	6.06	3.95	3.17	2.29	1.42	1.24	0.900
14	22.0	11.1	8.13	4.70	2.85	2.22	1.41	1.24	0.900
15	20.6	10.4	8.85	4.78	2.95	2.24	1.32	1.23	0.800
16	15.4	10.5	6.86	4.88	3.27	2.21	1.32	1.26	0.800
17	16.6	9.44	7.87	5.15	3.20	2.24	1.43	1.24	0.800
18	13.4	9.97	7.18	4.78	3.10	2.40	1.43	1.30	0.800
19	48.3	9.84	8.97	4.51	3.12	2.32	1.63	1.51	0.800
20	26.5	8.41	7.42	4.46	2.87	2.25	1.74	1.59	0.800
21	18.5	7.93	6.37	4.32	2.72	1.93	1.63	1.55	0.800
22	15.3	9.15	5.98	4.06	2.55	1.90	1.60	1.46	0.800
23	33.1	9.55	6.63	3.73	2.50	2.06	1.60	1.49	0.700
24	26.3	9.46	6.29	3.58	2.55	2.13	1.60	1.48	0.700
25	19.8	10.7	6.41	3.58	2.57	2.01	1.52	1.43	0.700
26	15.0	10.6	6.62	3.42	2.51	2.06	1.53	1.40	0.700
27	13.0	10.1	8.43	3.40	2.54	1.86	1.47	1.33	0.700
28	17.8	9.12	7.51	3.34	2.59	2.20	1.61	1.40	0.900
29	11.6	9.43	7.77	3.69	2.60	2.23	1.54	1.40	1.29
30	16.8	9.31	7.64	3.83	2.67	2.10	1.48	1.39	1.20

Tabelul 14.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera Octombrie

S.H. Dalboşeţ

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	33.9	7.94	6.69	3.77	2.77	1.93	1.47	1.30	1.20
2	14.6	7.85	7.22	4.45	2.74	1.93	1.43	1.29	1.20
3	8.70	6.98	6.75	5.42	2.70	2.12	1.60	1.34	1.10
4	11.3	8.25	6.40	4.96	2.75	2.32	1.61	1.34	1.10
5	21.4	7.60	6.32	4.38	2.67	2.16	1.61	1.34	1.10
6	57.8	7.03	6.27	4.18	2.76	2.18	1.61	1.51	1.00
7	55.2	6.05	5.71	4.60	2.69	2.05	1.57	1.45	1.00
8	80.4	5.47	5.18	3.92	2.59	2.09	1.60	1.45	1.00
9	60.0	5.42	5.36	4.28	2.69	2.33	1.66	1.50	1.30
10	47.1	9.36	5.42	4.32	2.71	2.21	1.61	1.44	1.40
11	71.1	26.2	11.0	4.71	2.70	2.03	1.50	1.38	1.02
12	53.8	16.0	8.91	4.82	2.78	2.03	1.60	1.44	1.30
13	38.1	17.3	8.44	4.41	2.80	2.10	1.50	1.44	1.10
14	57.4	34.3	21.4	4.42	2.68	1.93	1.50	1.37	1.20
15	39.0	22.1	13.6	6.18	2.68	2.03	1.47	1.42	1.25
16	29.7	23.5	12.3	5.25	2.82	2.18	1.50	1.44	1.25
17	24.3	17.7	9.32	5.27	2.69	2.12	1.50	1.36	1.20
18	21.2	13.5	10.2	5.34	2.68	1.95	1.53	1.40	1.20
19	19.0	10.7	9.09	6.16	2.75	2.12	1.47	1.34	1.10
20	16.8	12.5	9.93	5.67	2.79	2.18	1.51	1.34	1.10
21	14.7	12.4	11.0	7.11	2.67	2.10	1.77	1.57	1.10
22	32.9	18.7	11.0	6.85	3.01	2.12	1.80	1.54	1.10
23	22.8	13.6	8.87	5.86	2.76	2.10	1.74	1.50	1.10
24	40.7	26.2	8.78	6.40	3.18	2.10	1.74	1.54	1.00
25	34.4	23.5	7.99	6.30	3.37	2.10	1.72	1.54	1.00
26	23.5	20.6	11.6	5.87	2.78	2.10	1.65	1.47	1.20
27	22.0	16.0	8.30	5.68	2.53	2.00	1.63	1.47	1.30
28	45.2	17.1	7.34	5.43	2.70	1.93	1.71	1.50	1.30
29	33.5	15.8	6.97	5.24	2.70	2.01	1.77	1.43	1.30
30	21.4	18.1	7.64	5.10	3.20	2.03	1.74	1.50	1.20
31	19.0	16.6	9.13	5.40	2.76	1.95	1.73	1.62	1.20

Tabelul 15.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera Noiembrie

S.H. Dalboșeț

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	29.2	14.4	8.04	4.90	3.13	2.20	1.74	1.49	1.20
2	40.3	12.7	10.3	4.73	2.88	2.12	1.71	1.55	1.20
3	26.6	11.5	9.47	4.69	2.93	2.20	1.70	1.54	1.20
4	21.8	10.4	8.46	4.58	2.92	2.22	1.73	1.65	1.20
5	19.0	9.65	8.01	4.61	2.73	2.16	1.90	1.68	1.20
6	18.7	9.06	7.86	4.79	3.27	2.33	1.76	1.68	1.20
7	18.4	11.4	10.2	5.98	3.53	2.18	1.76	1.62	1.30
8	19.7	14.2	10.6	6.09	3.06	2.18	1.76	1.62	1.40
9	30.0	11.0	9.89	5.02	3.19	2.10	1.76	1.68	1.40
10	24.7	11.4	9.05	4.92	3.38	2.06	1.73	1.58	1.40
11	21.1	17.3	8.28	5.90	3.45	1.95	1.73	1.57	1.02
12	17.0	13.0	11.4	5.77	3.55	1.99	1.74	1.67	1.36
13	15.2	12.5	10.7	5.77	3.44	2.18	1.71	1.67	1.51
14	18.8	15.5	9.79	7.84	3.31	2.18	1.70	1.63	1.50
15	22.2	17.7	13.1	7.54	3.45	2.39	1.76	1.62	1.30
16	44.6	15.6	11.3	7.48	3.24	2.33	1.76	1.63	1.46
17	33.8	15.1	12.6	8.71	3.98	2.46	1.90	1.83	1.42
18	22.7	19.9	12.7	9.09	4.53	2.30	1.90	1.83	1.42
19	23.8	18.8	14.5	9.45	4.18	2.10	1.77	1.70	1.42
20	17.3	15.8	14.5	10.6	4.38	2.29	1.83	1.70	1.42
21	27.8	15.1	13.9	10.2	4.53	2.70	1.77	1.68	1.60
22	23.5	19.8	13.8	8.86	5.10	2.46	1.72	1.65	1.60
23	32.1	23.9	12.5	9.23	6.82	2.43	1.65	1.61	1.60
24	42.2	29.0	17.7	8.73	6.52	2.56	1.87	1.68	1.60
25	42.3	21.7	15.4	8.39	6.71	2.60	1.79	1.61	1.60
26	28.9	17.6	13.3	8.81	5.99	2.50	1.81	1.62	1.57
27	23.1	18.0	13.9	8.31	6.38	2.45	1.82	1.65	1.60
28	18.6	15.5	11.9	8.37	6.40	2.96	1.93	1.68	1.60
29	16.8	15.1	13.3	7.72	6.05	2.79	2.10	1.83	1.33
30	24.9	14.4	12.7	8.18	5.30	3.06	2.20	1.95	1.33

Tabelul 16.

Debite medii zilnice multianuale de diverse asigurări

Râul Nera Decembrie

S.H. Dalboşeţ

Data\asig	1%	5%	10%	25%	50%	75%	90%	95%	100%
1	43.1	16.8	13.1	8.10	6.01	3.02	2.01	1.61	1.33
2	56.9	13.5	12.5	9.25	5.88	2.87	2.05	1.61	0.830
3	34.7	25.7	16.8	9.97	5.44	2.62	2.02	1.77	0.960
4	29.4	24.8	20.2	9.95	5.58	2.50	2.03	1.88	1.27
5	26.3	22.5	19.2	8.70	5.61	2.45	1.96	1.90	1.80
6	21.5	18.1	16.5	8.15	5.62	2.38	1.97	1.87	1.40
7	40.2	17.8	15.5	8.78	5.51	2.86	1.97	1.82	1.40
8	31.3	23.2	16.7	8.70	4.81	3.00	2.04	1.90	1.60
9	58.8	26.6	20.1	8.17	5.55	3.30	2.33	2.16	1.90
10	43.8	26.1	20.6	7.91	5.34	2.93	2.27	1.97	1.60
11	39.3	32.2	17.3	7.48	4.72	3.17	2.43	2.10	1.20
12	67.4	26.0	15.0	8.31	4.85	3.41	2.10	1.83	1.20
13	85.0	20.0	14.8	9.74	4.75	3.21	1.85	1.70	1.10
14	55.5	21.1	17.7	7.52	5.36	3.56	2.29	1.83	1.30
15	36.7	28.1	22.7	8.74	6.32	3.95	2.26	2.11	1.50
16	48.6	28.7	20.1	8.65	5.88	3.43	2.20	2.17	1.55
17	30.2	25.4	18.0	12.2	4.99	3.17	2.13	2.00	1.71
18	25.1	17.3	14.6	11.8	5.04	3.29	2.40	2.00	1.70
19	21.8	17.5	16.1	10.2	5.36	3.53	2.25	1.90	1.60
20	26.7	22.6	18.7	10.0	5.37	3.47	2.73	2.03	1.22
21	25.8	23.4	17.2	10.6	4.88	3.42	2.75	2.06	1.60
22	23.4	21.1	16.9	9.51	4.95	3.29	2.75	2.24	1.60
23	78.9	33.2	16.2	10.2	5.73	3.96	2.74	2.48	1.80
24	65.5	34.0	32.2	8.87	5.14	3.58	2.53	2.07	1.90
25	99.3	35.0	23.4	9.62	5.28	3.65	2.46	1.94	1.56
26	84.5	48.1	18.4	10.4	6.36	3.87	2.05	1.98	1.80
27	64.7	40.0	25.6	14.0	6.28	3.64	2.01	2.00	1.67
28	58.2	29.6	21.7	14.3	5.33	3.63	2.23	2.07	1.95
29	40.5	22.1	21.1	12.2	5.45	3.44	2.50	2.33	2.02
30	47.2	22.0	19.0	11.3	5.95	3.44	2.70	2.16	1.56
31	54.3	33.7	15.9	9.60	5.90	3.96	3.18	2.86	2.40

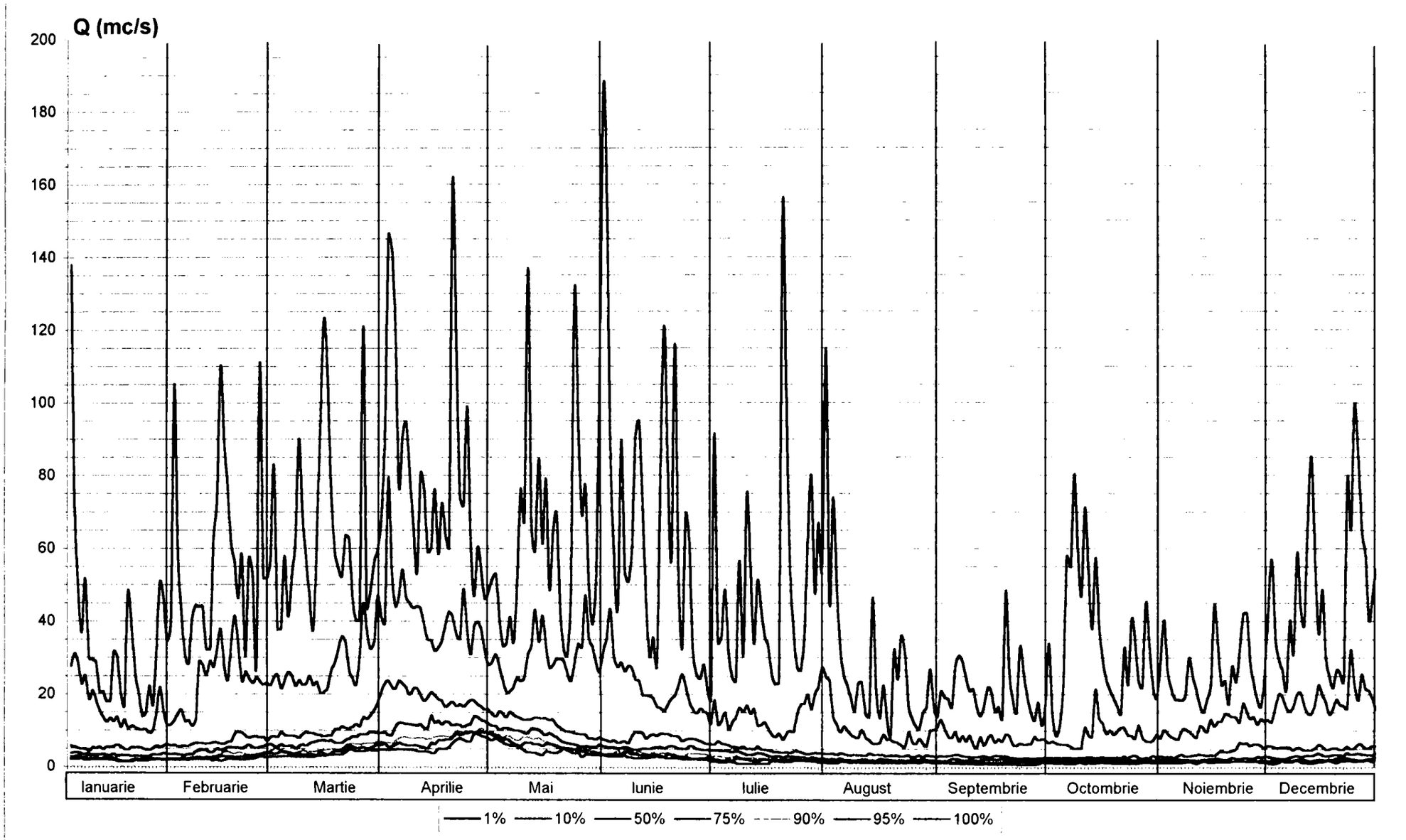


Figura 29. Debite medii zilnice multianuale de diverse asigurări. Râul Nera la stația hidrometrică Dalboşeț

Tabelul 17.

Debit mediu lunar minim anual 1950 - 1999

Nr. crt.	Staţia hidrometrică	Râul	Hmed (m)	F (kmp)	Qmin (mc/s)	Cv	Debit minim asigurare 80%	90%	95%	Perioada VI-VIII Qmin (mc/s)	Cv	Debit minim asigurare 80%	90%	95%
1	Luncani	Bega	775	73.5	0.738	0.264	0.768	0.520	0.500	1.02	0.425	0.680	0.600	0.540
2	Poieni	Saşa	763	80.0	0.543	0.363	0.386	0.340	0.313	0.738	0.458	0.489	0.395	0.376
3	Făget	Bega	470	474	2.65	0.479	1.81	1.62	1.53	2.98	0.230	1.88	1.69	1.65
4	Fârdea	Gladna	456	57.0	0.171	0.340	0.132	0.123	0.120	0.216	0.522	0.137	0.129	0.123
5	Fârdea	Hăuzeasca	364	29.0	0.026	1.59	0.001	0.000	0.000	0.061	1.58	0.005	0.000	0.000
6	Mâtnicu Mic	Munisel	261	23.0	0.017	1.39	0.001	0.000	0.000	0.027	1.37	0.002	0.002	0.000
7	Surduc	Gladna	376	130	0.236	1.46	0.080	0.050	0.000	0.349	1.25	0.100	0.080	0.000
8	Balinţ	Bega	335	1064	2.41	0.391	1.64	1.40	1.27	3.28	0.560	2.04	1.54	1.40
9	Teregova	Timiş	901	167	0.893	0.420	0.579	0.510	0.504	1.44	0.508	0.860	0.731	0.540
10	Rusca	Rece	1184	163	1.60	0.368	1.05	0.908	0.820	2.66	0.454	1.68	1.24	1.08
11	Feneş	Râul Alb	973	125	0.995	0.437	0.651	0.444	0.411	1.67	0.534	1.06	0.825	0.559
12	Sadova	Timiş	936	560	3.34	0.407	2.05	1.67	1.26	5.78	0.540	2.87	2.57	1.58
13	Caransebeş	Timiş	765	1072	4.87	0.462	3.10	2.27	1.72	9.47	0.625	5.20	3.54	2.66
14	Voislova Bucovei	Bistra	892	232	1.34	0.432	0.870	0.680	0.500	2.26	0.575	1.20	0.900	0.695
15	Voislova Gara	Bistra	827	404	2.21	0.455	1.46	1.25	0.835	3.76	0.667	2.03	1.49	1.26
16	Poiana Mărului	Şucu	1430	77.0	1.06	0.306	0.760	0.633	0.575	2.21	0.501	1.39	0.955	0.803
17	Poiana Mărului	Bistra R.	1442	79.0	0.977	0.315	0.680	0.626	0.580	2.09	0.509	1.29	0.980	0.730
18	Obreja	Bistra	880	863	5.50	0.501	3.24	2.65	1.30	15.8	0.612	8.09	5.89	4.58
19	Găvojdia	Spaia	219	63.0	0.023	0.624	0.008	0.006	0.003	0.033	0.837	0.014	0.008	0.004
20	Lugoj	Timiş	666	2706	11.8	0.493	6.64	5.55	4.31	20.9	0.623	10.9	8.16	5.96
21	Brod	Timiş	569	3682	13.4	0.562	7.87	6.22	4.82	22.5	0.600	11.4	8.60	6.45
22	Şag	Timiş	477	4493	13.5	0.504	8.19	6.24	4.85	23.4	0.640	12.1	9.12	6.66
23	Soceni	Tău	375	17.8	0.019	0.917	0.006	0.004	0.001	0.032	1.22	0.006	0.004	0.001
24	Brebu	Pogăniş	386	97.0	0.149	0.667	0.059	0.038	0.019	0.280	0.965	0.090	0.057	0.036
25	Valeapai	Pogăniş	295	406	0.314	0.853	0.100	0.074	0.036	0.582	1.13	0.148	0.098	0.066
26	Crivaia	Bârzava	970	41.0	0.313	0.545	0.173	0.125	0.104	0.612	0.512	0.318	0.272	0.254

Nr.			Hmed	F	Qmin		Debit minim asigurare			Perioada VI-VIII Qmin		Debit minim asigurare		
crt.	Staţia hidrometrică	Râul	(m)	(kmp)	(mc/s)	Cv	80%	90%	95%	(mc/s)	Cv	80%	90%	95%
27	Secu	Bârzava	750	140	0.765	0.516	0.421	0.301	0.249	1.63	0.558	0.847	0.719	0.589
28	Reşiţa	Bârzava	734	191	1.23	0.505	0.756	0.667	0.580	1.95	0.555	0.996	0.760	0.710
29	Reşiţa	ValeaMare	552	25.0	0.026	0.543	0.013	0.010	0.007	0.074	1.09	0.025	0.014	0.013
30	Reşiţa	Valea Domar	442	11.0	0.036	0.723	0.015	0.011	0.010	0.058	0.836	0.022	0.015	0.010
31	Ţerova	Bârzava	344	30.0	0.041	1.12	0.006	0.001	0.000	0.089	1.65	0.011	0.002	0.001
32	Moniom	Bârzava	570	309	1.73	0.469	1.01	0.930	0.873	2.59	0.519	1.35	1.03	0.919
33	Gataia	Bârzava	359	721	2.09	0.400	1.25	1.02	0.940	3.05	0.583	1.55	1.38	1.29
34	Partos	Bârzava	293	933	2.27	0.436	1.34	1.09	1.03	3.20	0.620	1.60	1.42	1.15
35	Moravița	Moravița	125	352	0.026	1.56	0.000	0.000	0.000	0.090	1.98	0.000	0.000	0.000
36	Caraşova	Caraş	615	131	0.478	0.506	0.260	0.210	0.150	0.931	0.715	0.397	0.283	0.216
37	Gîrlişte	Garliste	514	55.5	0.267	0.481	0.150	0.111	0.084	0.460	0.630	0.216	0.116	0.078
38	Jitin	Jitin	431	52.0	0.058	0.620	0.018	0.012	0.007	0.126	0.881	0.041	0.024	0.015
39	Vărădia	Caraş	347	877	1.27	0.519	0.697	0.550	0.360	2.48	0.769	0.942	0.70	0.475
40	Vrăniuţ	Ciclova	265	95.9	0.145	0.720	0.053	0.030	0.019	0.265	0.810	0.101	0.054	0.036
41	Milcoveni	Vicinic	257	123	0.148	0.840	0.053	0.037	0.020	0.238	0.847	0.074	0.053	0.038
42	Pătaş	Nera	869	145	0.819	0.512	0.473	0.350	0.290	1.38	0.488	0.735	0.644	0.616
43	Prigor	Prigor	729	155	0.509	0.476	0.287	0.273	0.192	0.675	0.539	0.375	0.350	0.162
44	Bozovici	Miniş	701	221	0.575	0.469	0.346	0.262	0.214	1.06	0.700	0.481	0.390	0.277
45	Dalboşeţ	Nera	676	862	2.29	0.449	1.34	1.08	0.870	3.69	0.594	2.00	1.33	0.945
46	Sasca	Nera	626	1164	3.06	0.476	1.84	1.45	1.17	4.95	0.614	2.27	1.90	1.50
47	Naidăş	Nera	596	1319	3.32	0.504	1.98	1.70	1.21	5.28	0.626	2.50	2.01	1.54
48	Radimna	Radimna	439	74.0	0.096	0.772	0.043	0.030	0.025	0.139	0.730	0.060	0.039	0.026
49	Berzasca	Berzasca	568	216	0.469	0.516	0.248	0.198	0.178	0.667	0.704	0.286	0.20	0.179

Tabelul 18.

Debit mediu zilnic minim anual 1953 - 1999

Nr. crt.	Staţia hidrometrică	Râul	Hmed (m)	F (kmp)	Qmin (mc/s)	Cv	Debit minim asigurare 80%	90%	95%	Perioada VI-VIII Qmin (mc/s)	Cv	Debit minim asigurare 80%	90%	95%
1	Luncani	Bega	775	73.5	0.627	0.288	0.487	0.415	0.384	0.791	0.333	0.570	0.500	0.476
2	Poieni	Sasa	763	80.0	0.401	0.377	0.282	0.262	0.219	0.510	0.331	0.367	0.350	0.306
3	Făget	Bega	470	474	1.70	0.282	1.29	1.16	1.100	2.12	0.339	1.68	1.48	1.24
4	Balinţ	Bega	335	1064	1.79	0.440	1.19	0.800	0.520	2.23	0.403	1.60	1.22	0.835
5	Teregova	Timis	901	167	0.492	0.444	0.302	0.265	0.230	0.730	0.41	0.415	0.391	0.347
6	Rusca	Rece	1184	163	1.11	0.355	0.700	0.636	0.406	1.81	0.341	1.29	1.11	0.945
7	Voislova Bucovei	Bistra	892	232	0.902	0.410	0.554	0.497	0.344	1.35	0.501	0.740	0.600	0.448
8	Poiana Mărului	Şucu	1430	77.0	0.808	0.282	0.580	0.940	0.388	1.42	0.351	1.00	0.895	0.745
9	Poiana Mărului	Bistra R.	1442	79.0	0.779	0.276	0.590	0.500	0.419	1.36	0.376	0.920	0.810	0.610
10	Brebu	Pogăniş	386	97.0	0.065	0.700	0.023	0.014	0.000	0.128	1.37	0.038	0.020	0.015
11	Şemlacu Mare	Moravița	158	80.1	0.001	1.32	0.000	0.000	0.000	0.002	1.25	0.000	0.000	0.000
12	Moravița	Moravița	125	352	0.012	1.66	0.000	0.000	0.000	0.019	1.42	0.000	0.000	0.000
13	Caraşova	Caraş	615	131	0.322	0.547	0.200	0.155	0.150	0.516	0.541	0.270	0.240	0.195
14	Gîrlişte	Gîrlişte	514	55.5	0.288	0.429	0.168	0.145	0.115	0.437	0.476	0.249	0.209	0.193
15	Jitin	Jitin	431	52.0	0.038	0.744	0.017	0.013	0.010	0.057	0.742	0.025	0.020	0.012
16	Vărădia	Caraş	347	877	0.849	0.486	0.500	0.300	0.230	1.23	0.598	0.650	0.500	0.350
17	Vrăniuţ	Ciclova	265	95.9	0.066	0.826	0.009	0.000	0.000	0.102	0.865	0.030	0.008	0.003
18	Milcoveni	Vicinic	257	123	0.064	0.993	0.016	0.007	0.000	0.079	0.830	0.030	0.015	0.007
19	Pătaş	Nera	869	145	0.467	0.589	0.250	0.175	0.127	0.682	0.376	0.366	0.286	0.173
20	Prigor	Prigor	729	155	0.326	0.481	0.181	0.120	0.095	0.445	0.510	0.269	0.200	0.122
21	Bozovici	Miniş	701	221	0.387	0.478	0.225	0.199	0.119	0.539	0.519	0.308	0.280	0.196
22	Dalboşeţ	Nera	676	862	1.58	0.466	0.880	0.600	0.440	2.14	0.507	1.60	0.950	0.860
23	Sasca	Nera	626	1164	2.24	0.462	1.36	1.00	0.840	2.96	0.525	1.60	1.20	0.950
24	Naidaş	Nera	596	1319	2.49	0.438	1.60	1.37	0.945	3.21	0.507	1.69	1.40	1.08
25	Radimna	Radimna	439	74.0	0.043	0.950	0.012	0.007	0.000	0.074	1.24	0.024	0.007	0.000
26	Berzasca	Berzasca	568	216	0.309	0.537	0.140	0.100	0.068	0.377	0.530	0.200	0.195	0.104

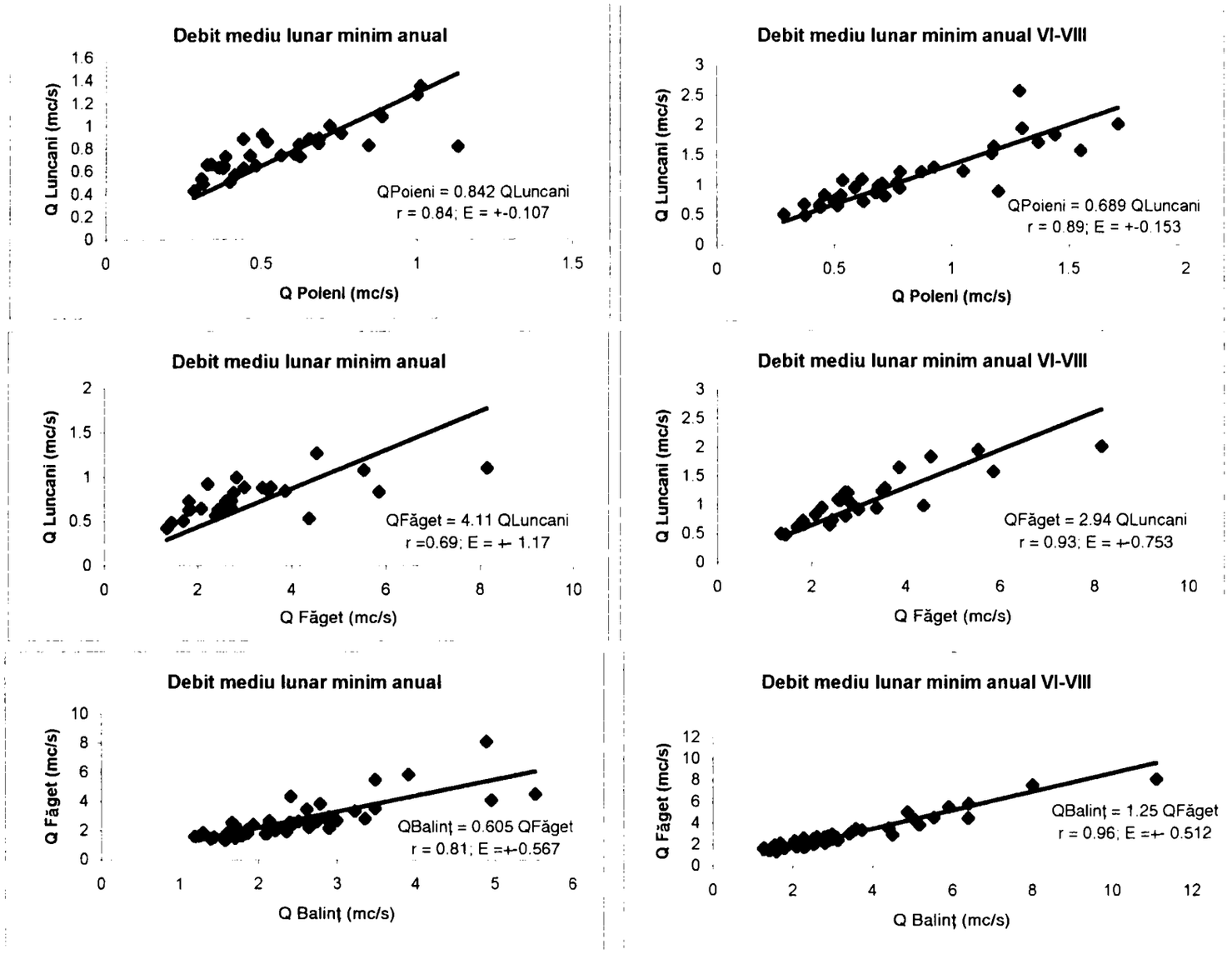


Figura 30. Corelaţii între staţiile hidrometrice. Bazinul hidrografic Bega.

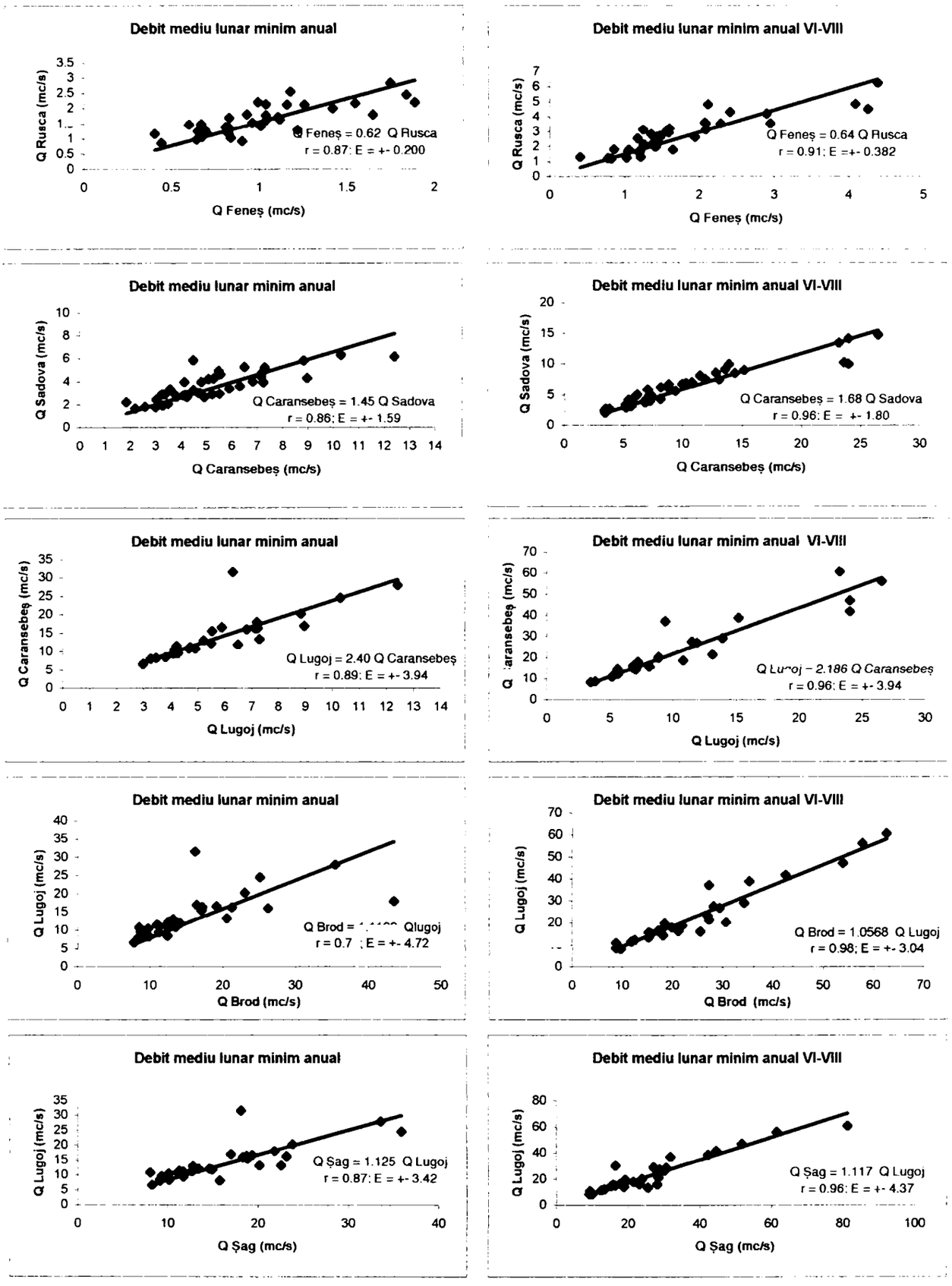


Figura 31. Corelații între stațiile hidrometrice. Bazinul hidrografic Timiș.

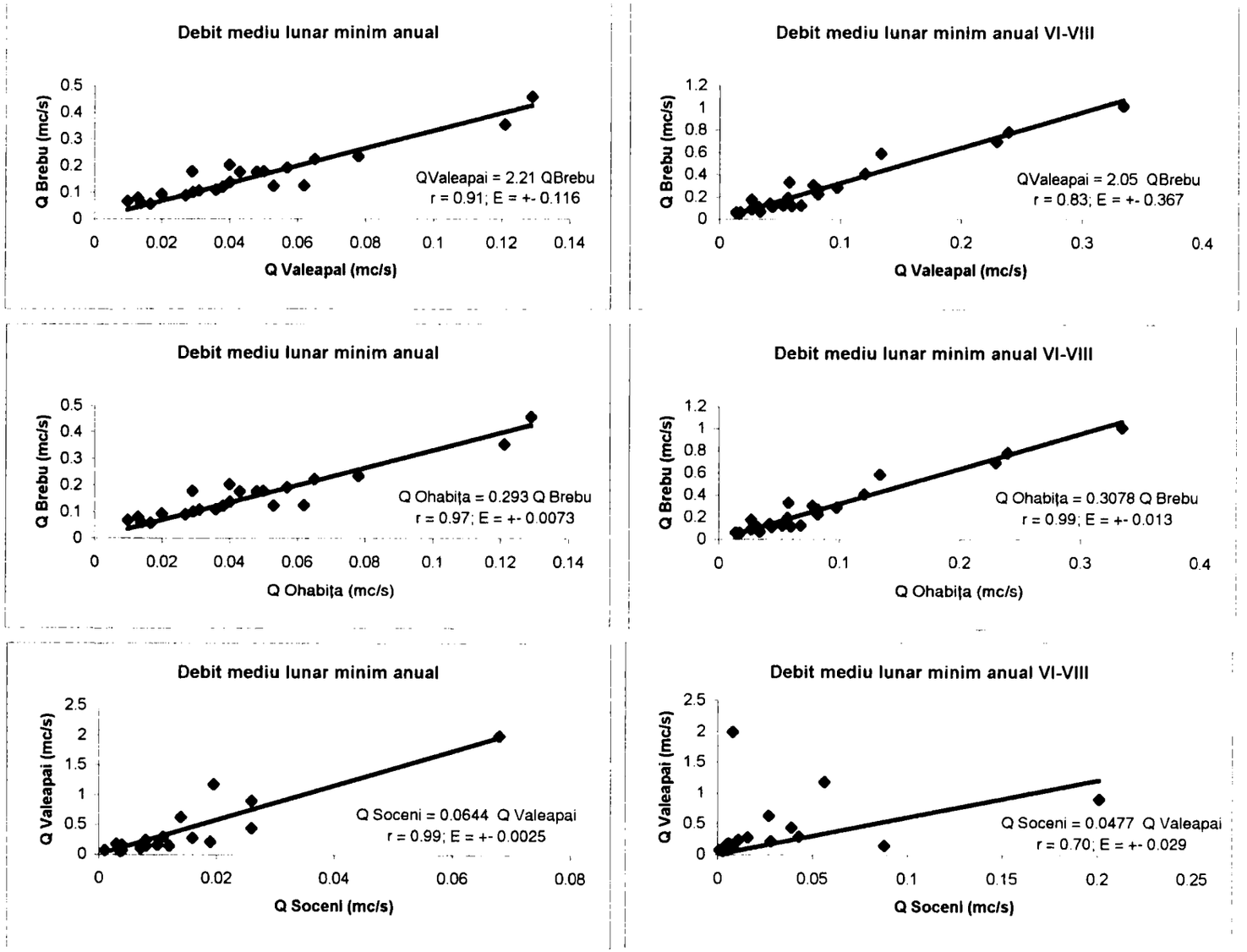


Figura 32. Corelaţii între staţiile hidrometrice. Bazinul hidrografic Pogăniş.

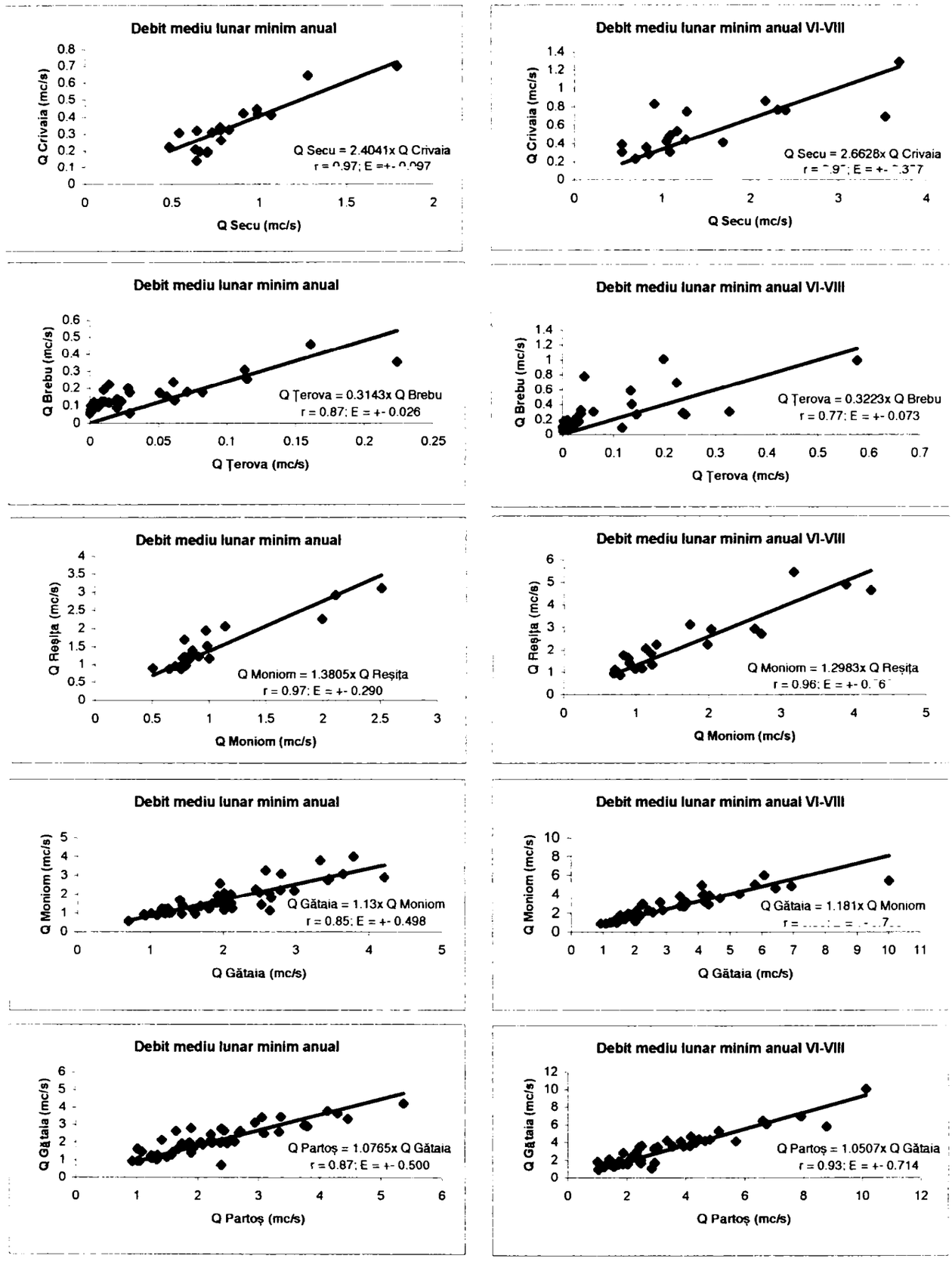
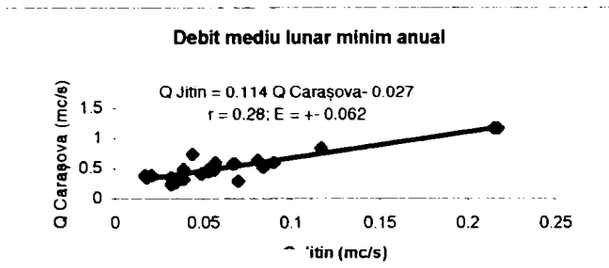
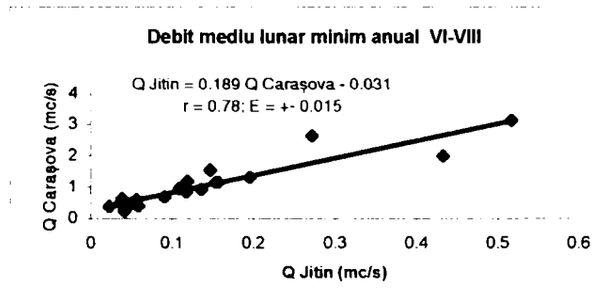
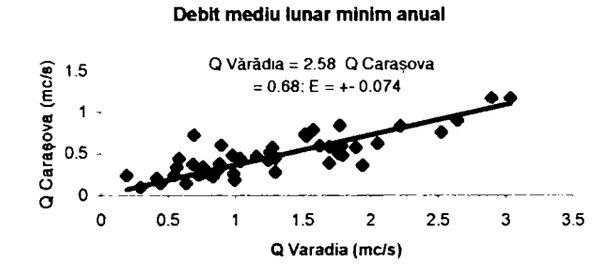
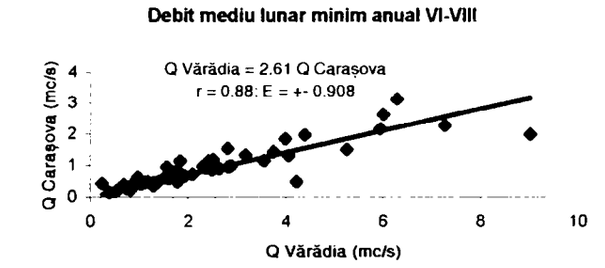


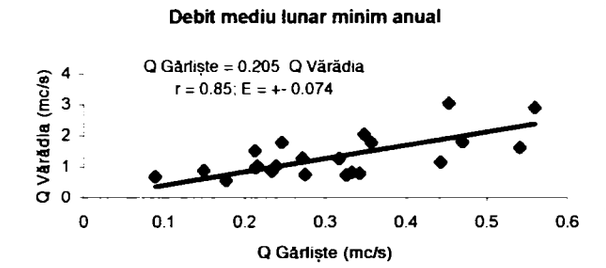
Figura 33. Corelaţii între staţiile hidrometrice. Bazinul hidrografic Bârzava.

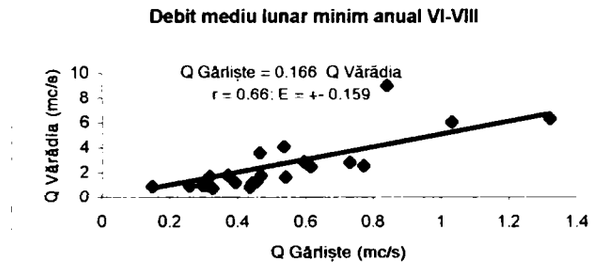


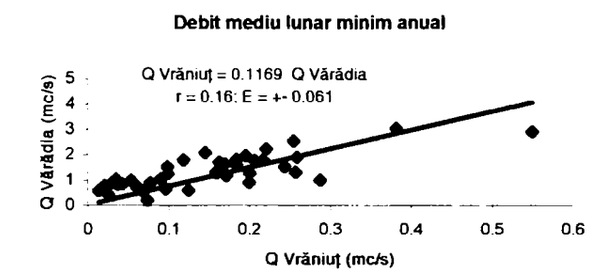


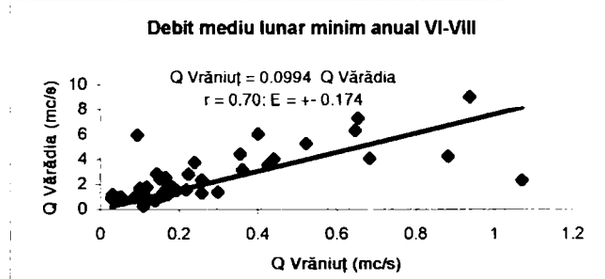


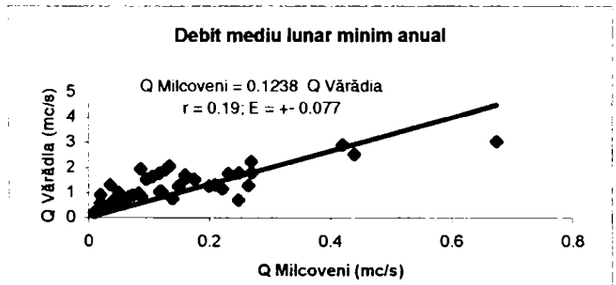












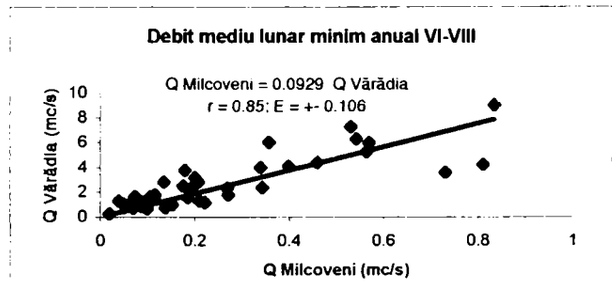


Figura 34. Corelații între stațiile hidrometrice. Bazinul hidrografic Caraș.

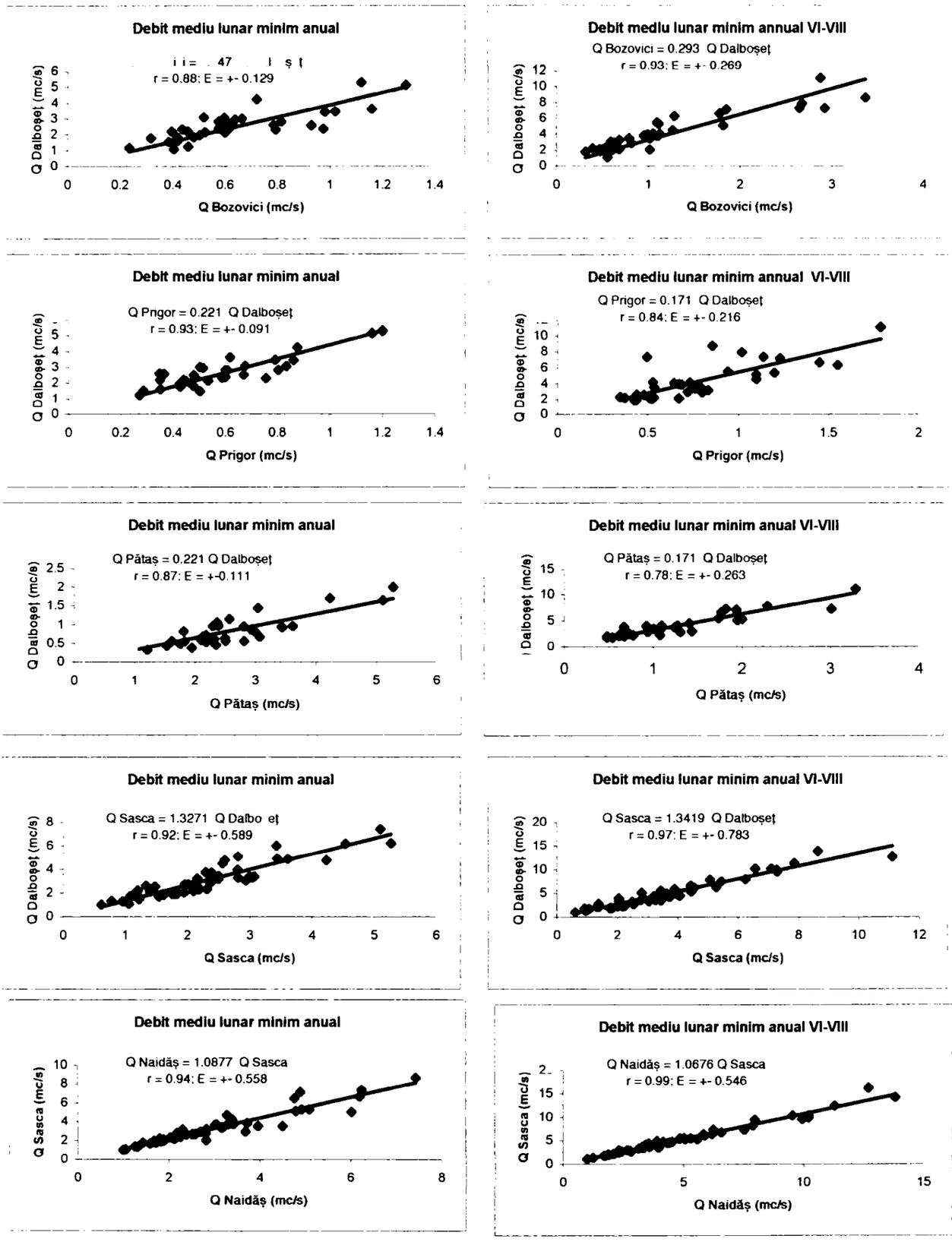


Figura 35. Corelaţii între staţiile hidrometrice. Bazinul hidrografic Nera.

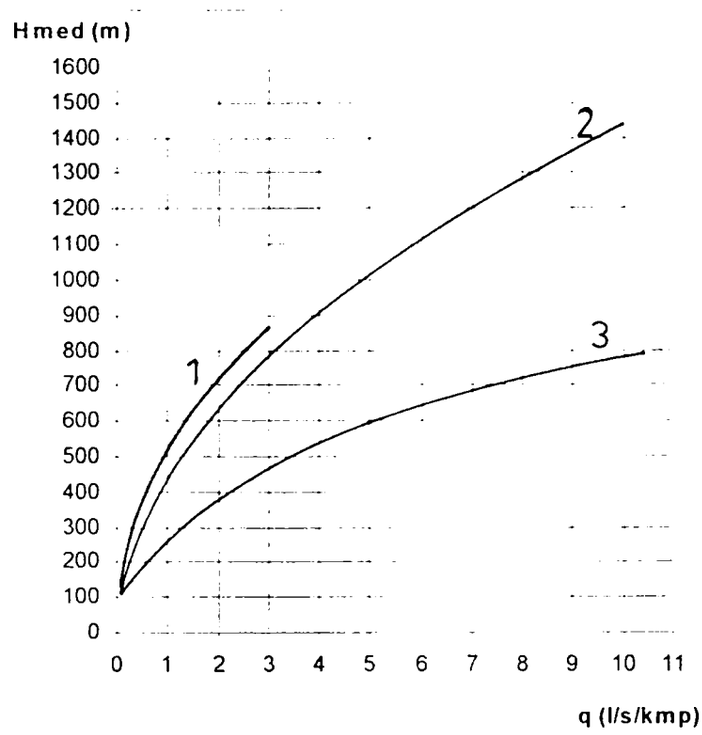


Figura 36. Legătura valorilor debitelor specifice medii lunare minime anuale de asigurare 80% și altitudinea medie a bazinelor a bazinelor hidrografice: I - Nera și afluenții Dunării; II - Timiș, Bistra,Pogăniș, Bârzava superioară și Caraș; III - Bega, Bârzava inferioară.

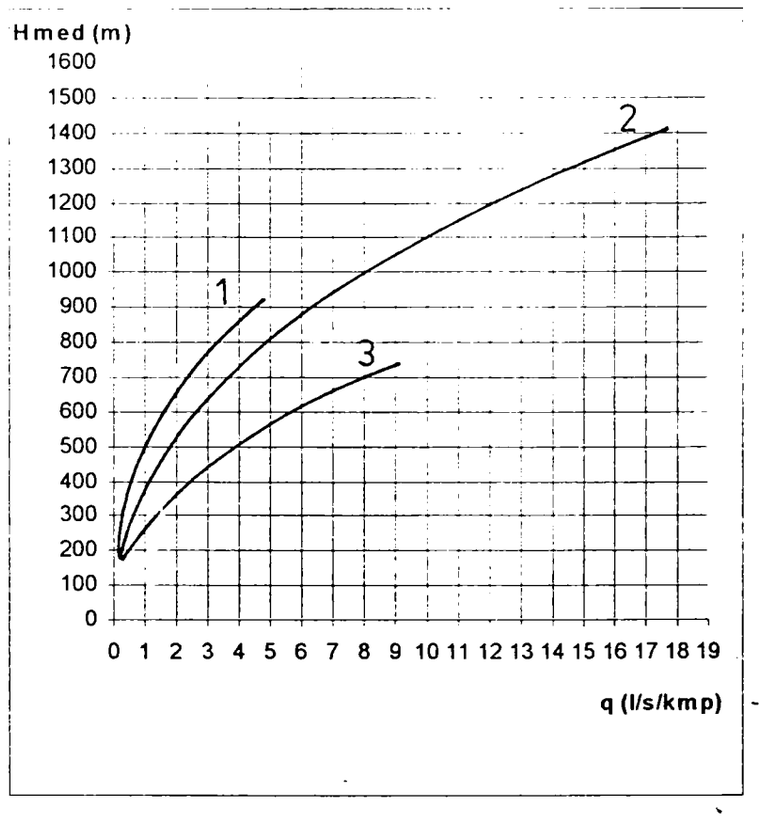


Figura 37. Legătura valorilor debitelor specifice medii lunare minime anuale de asigurare 80% din perioada VI-VIII și altitudinea medie a bazinelor hidrografice: I - Nera și afluenții Dunării; II - Timiș, Bistra, Pogăniș, Bârzava superioară. și Caraș; III - Bega, Bârzava inferioară.

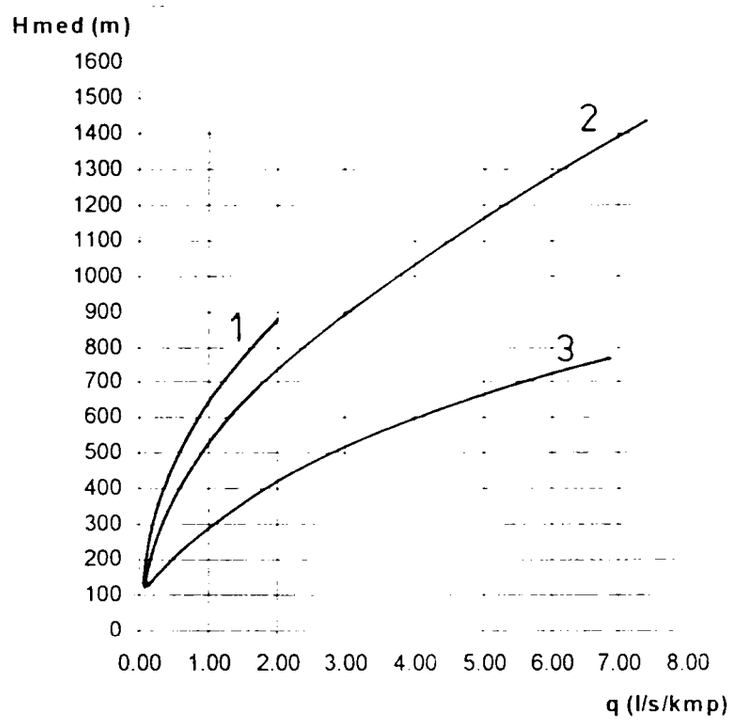


Figura 38. Legătura valorilor debitelor specifice medii lunare minime anuale de asigurare 95% și altitudinea medie a bazinelor hidrografice: I - Nera și afluenții Dunării; II - Timiș, Bistra, Pogăniș, Bârzava superioară și Caraș; III - Bega, Bârzava inferioară.

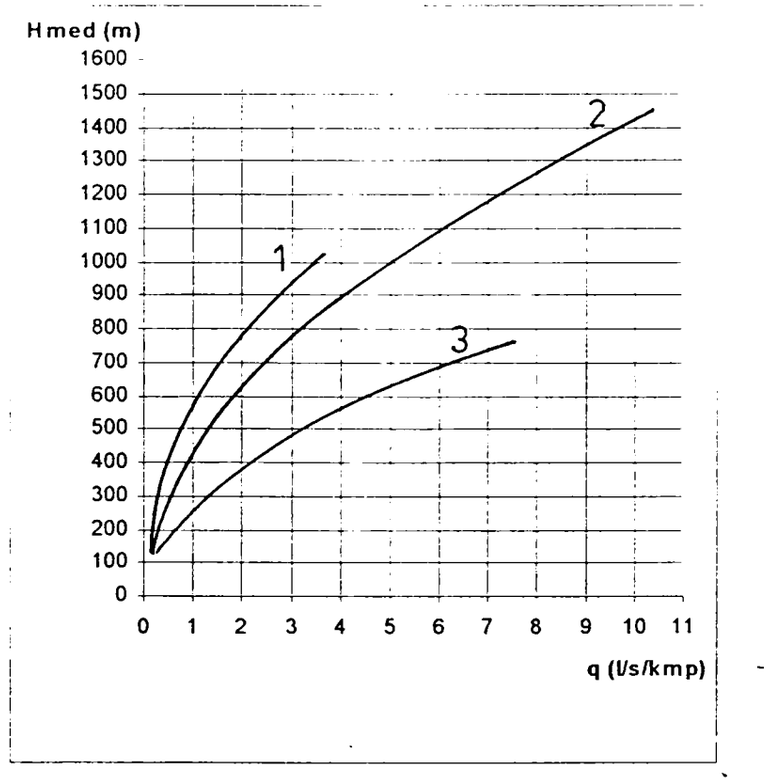


Figura 39. Legătura valorilor debitelor specifice medii lunare minime anuale de asigurare 95% din perioada VI-VIIIși altitudinea medie a bazinelor hidrografice: I - Nera și afluenții Dunării; II - Timiș, Bistra, Pogăniș, Bârzava superioară și Caraș; III - Bega, Bârzava inferioară.

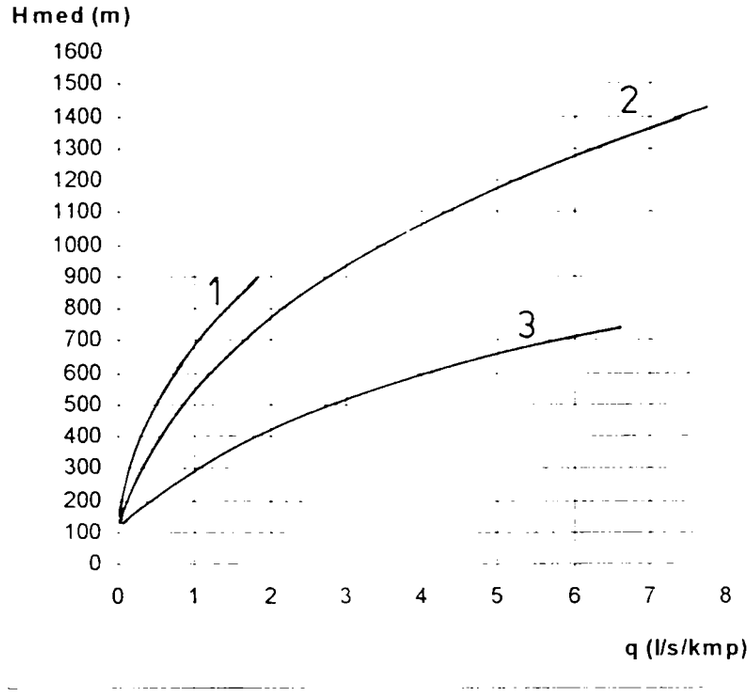


Figura 40. Legătura valorilor debitelor specifice medii zilnice minime anuale de asigurare 80% și altitudinea medie a bazinelor hidrografice: I - Nera și afluenții Dunării; II - Timiș, Bistra, Pogăniș, Bârzava superioară și Caraș; III - Bega, Bârzava inferioară.

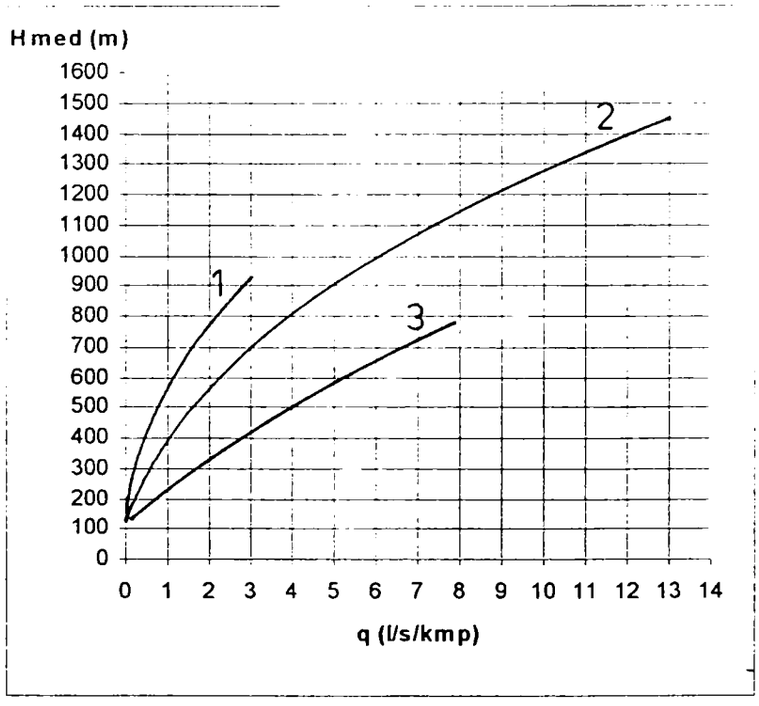


Figura 41. Legătura valorilor debitelor specifice medii zilnice minime anuale de asigurare 80% din perioada VI-VIII și altitudinea medie a bazinelor hidrografice: I - Nera și afluenții Dunării; II - Timiș, Bistra, Pogăniș, Bârzava superioară și Caraș; III - Bega, Bârzava inferioară.

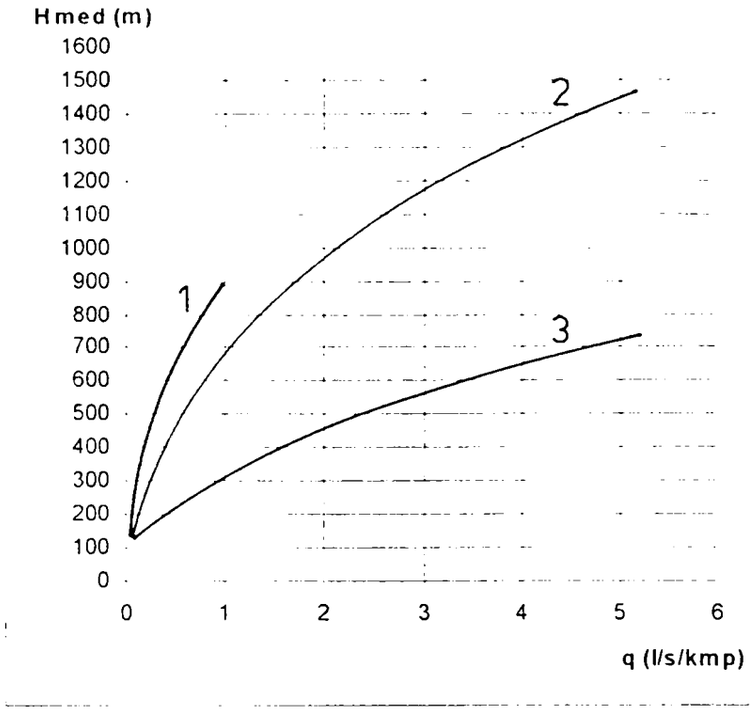


Figura 42. Legătura valorilor debitelor specifice medii lunare minime anuale de asigurare 95% și altitudinea medie a bazinelor hidrografice: I - Nera și afluenții Dunării; II - Timiș, Bistra, Pogăniș, Bârzava superioară și Caraș; III - Bega, Bârzava inferioară.

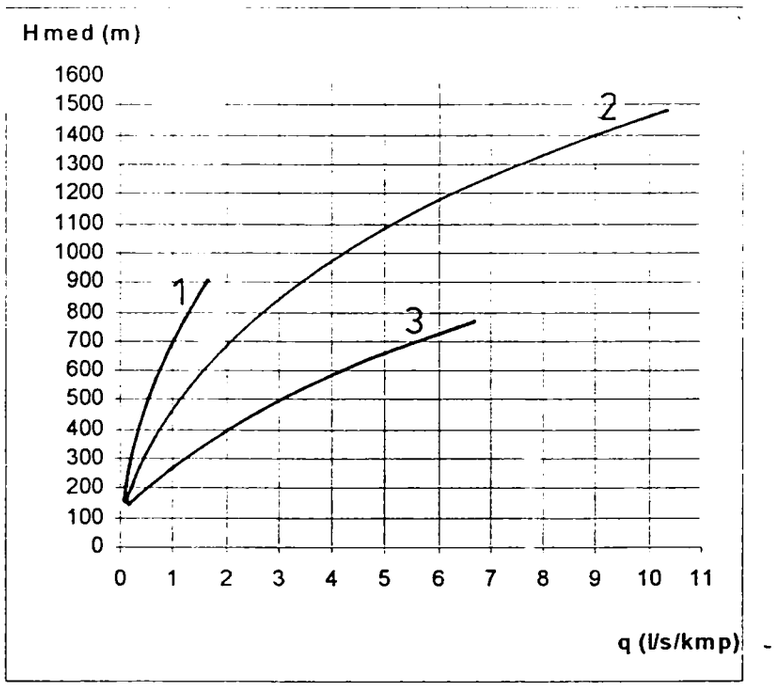


Figura 43. Legătura valorilor debitelor specifice medii lunare minime anuale de asigurare 95% din perioada VI-VIII și altitudinea medie a bazinelor hidrografice: I - Nera și afluenții Dunării; II - Timiș, Bistra, Pogăniș, Bârzava sup. și Caraș; III - Bega, Bârzava inf.și Moravița

Anexa 3

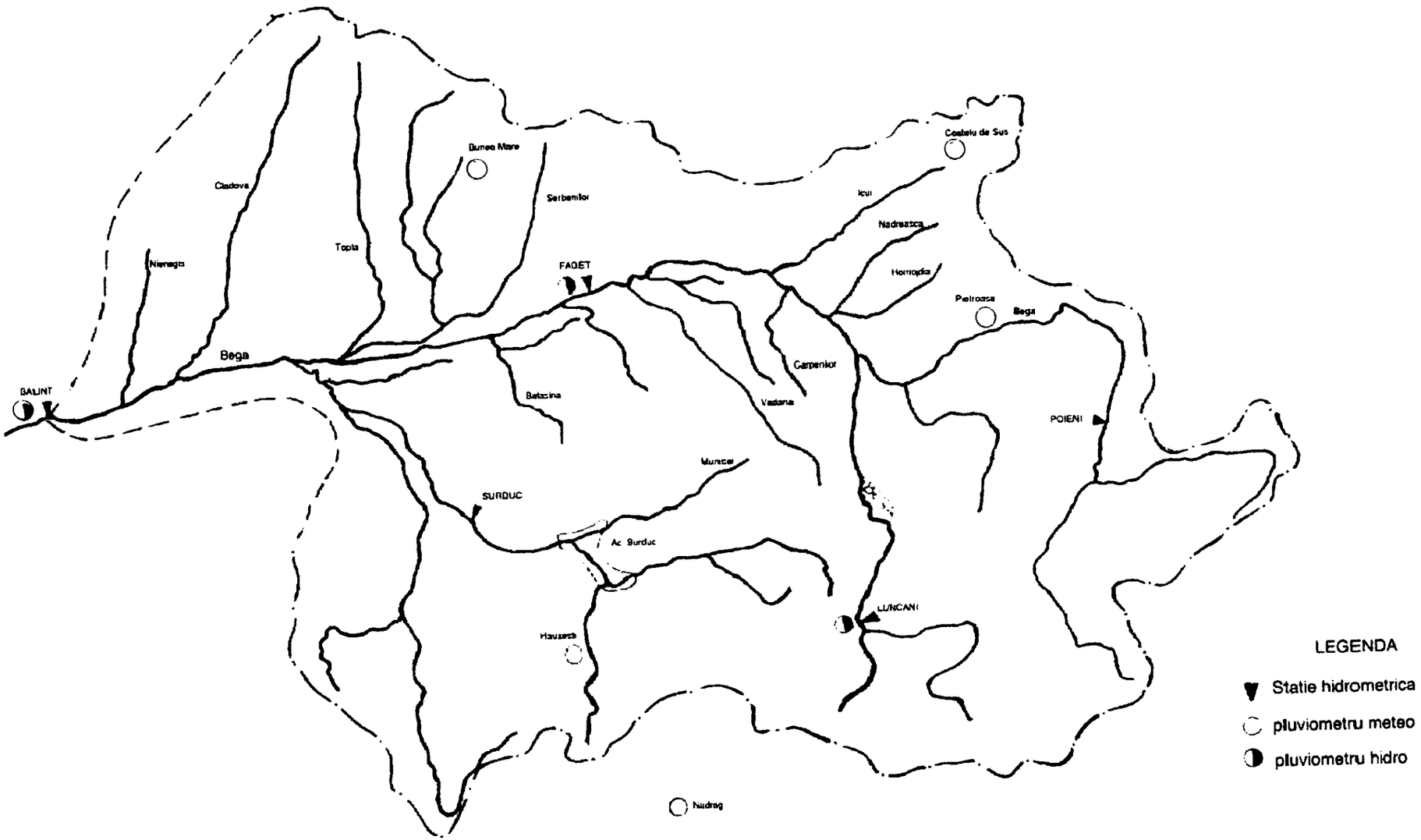


Figura 1. Bazinul hidrografic Bega pâna la staţia hidrometrică Balinţ.

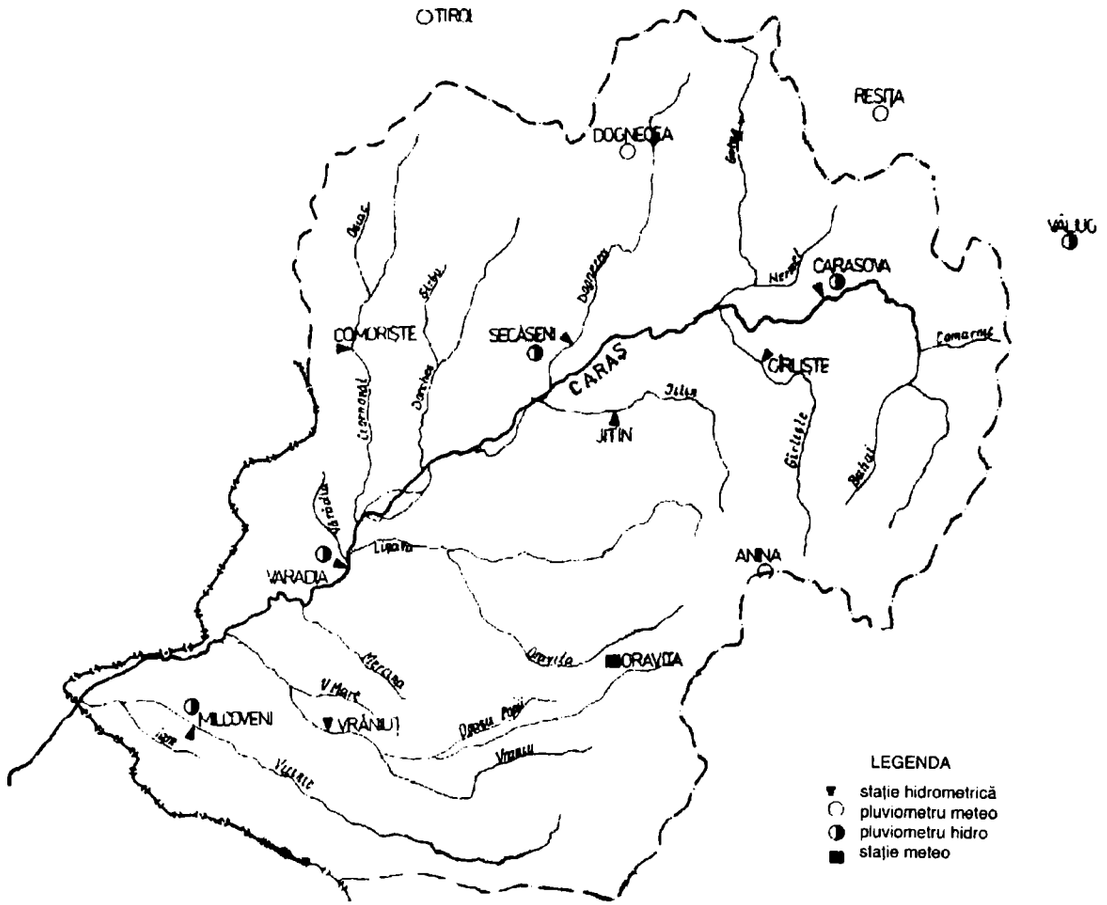


Figura 2. Bazinul hidrografic Caraș

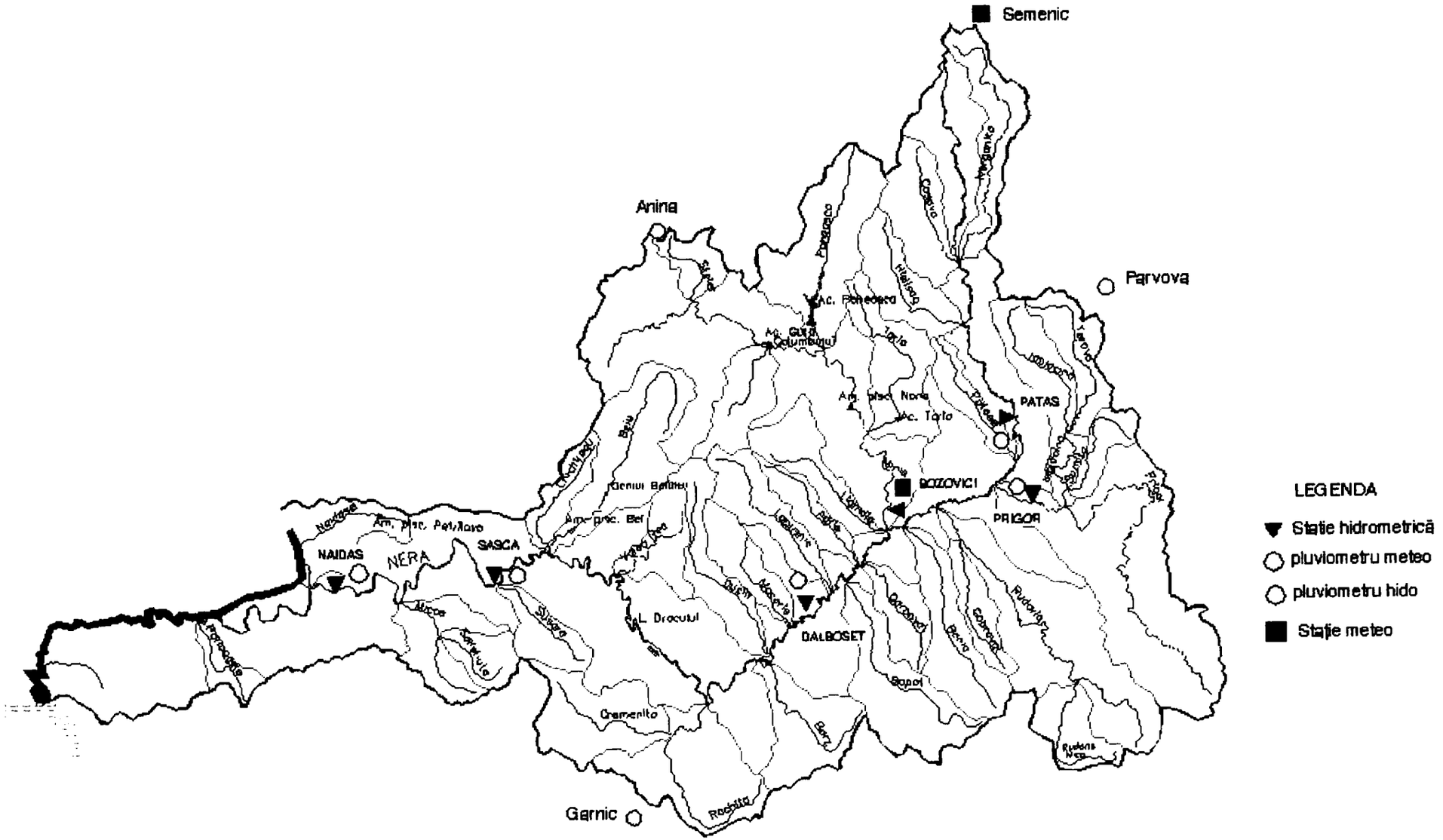


Figura 3. Bazinul hidrografic Nera

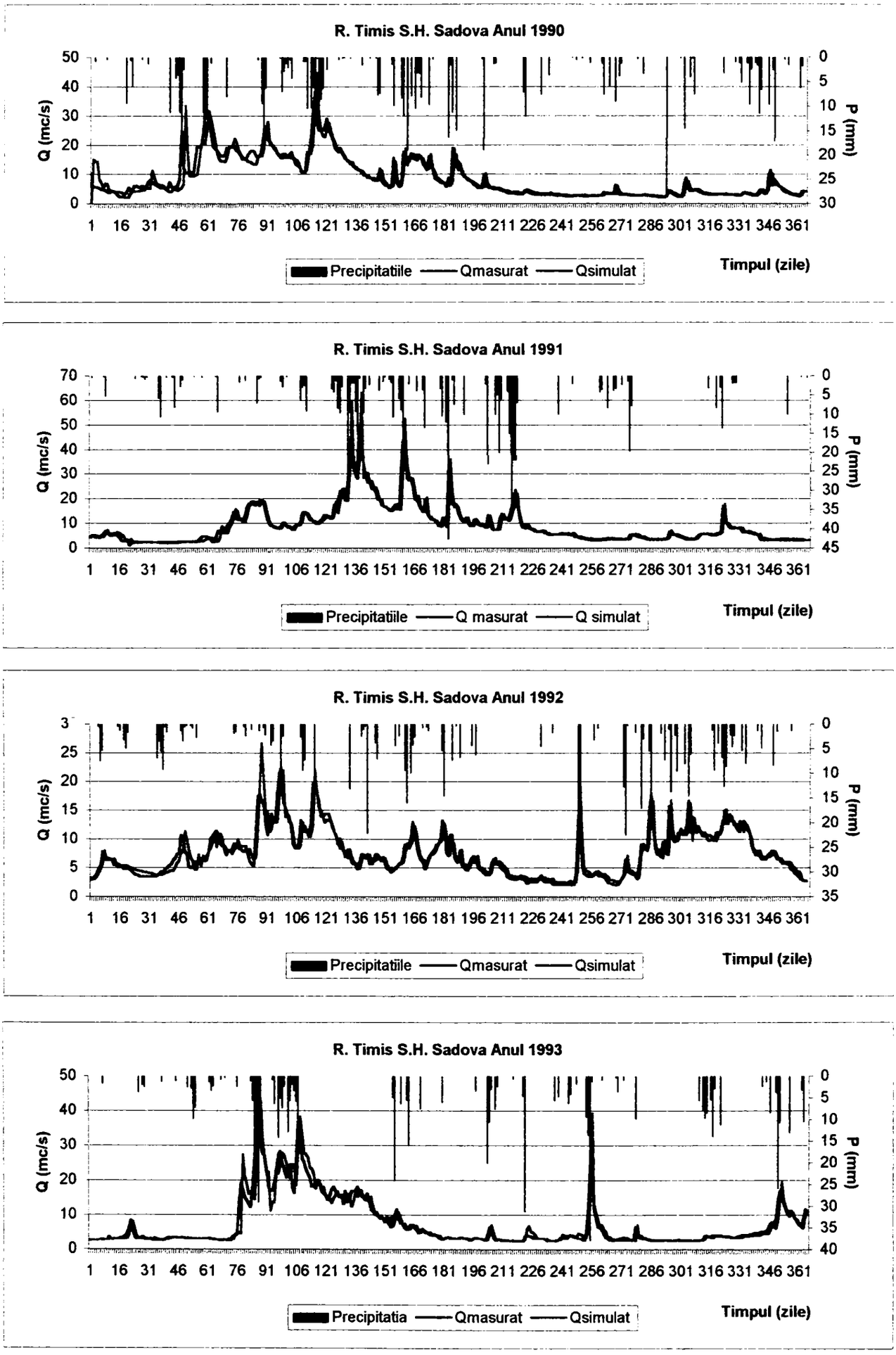


Figura 4. Hidrografele debitelor zilnice observate şi simulate cu modelul ARMA

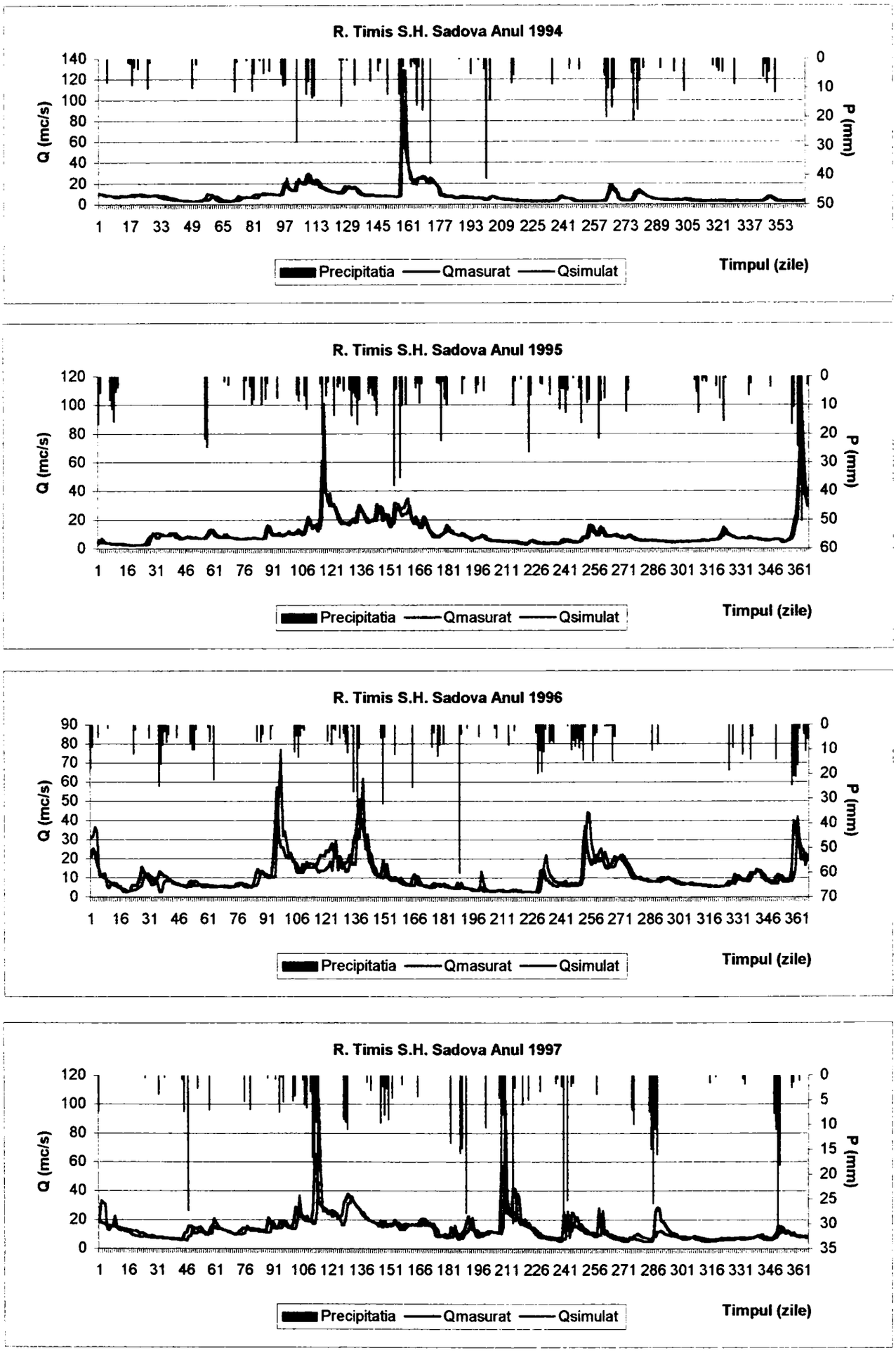
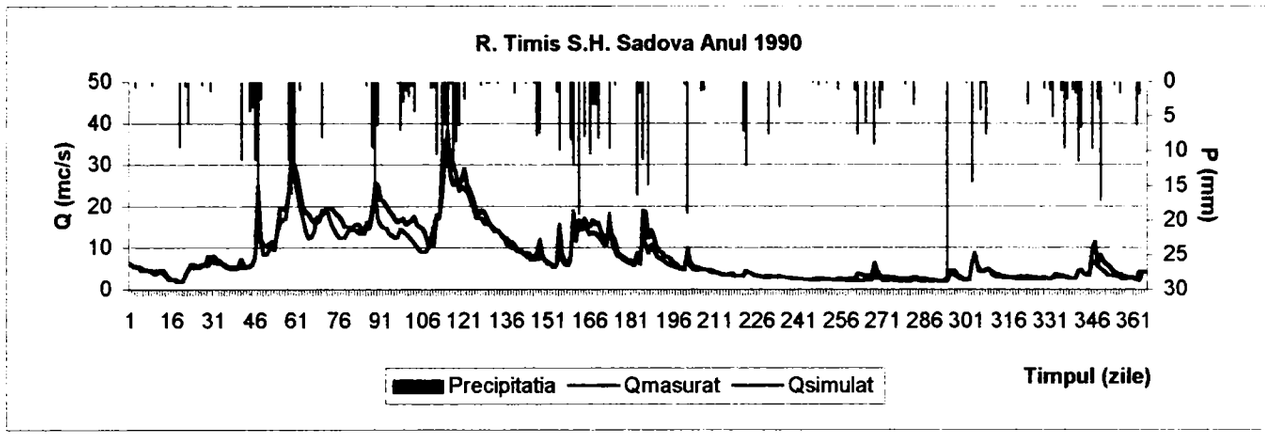
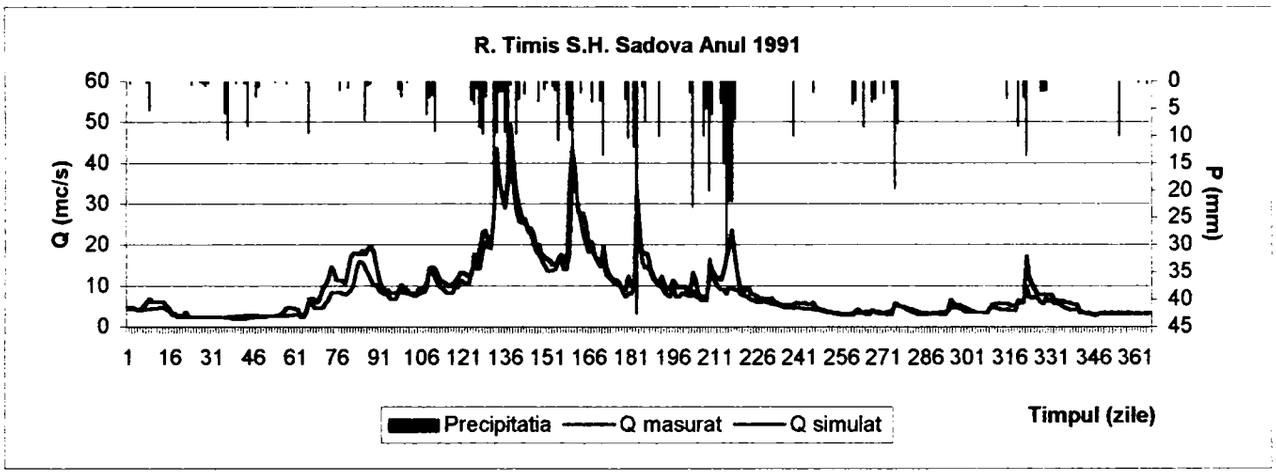
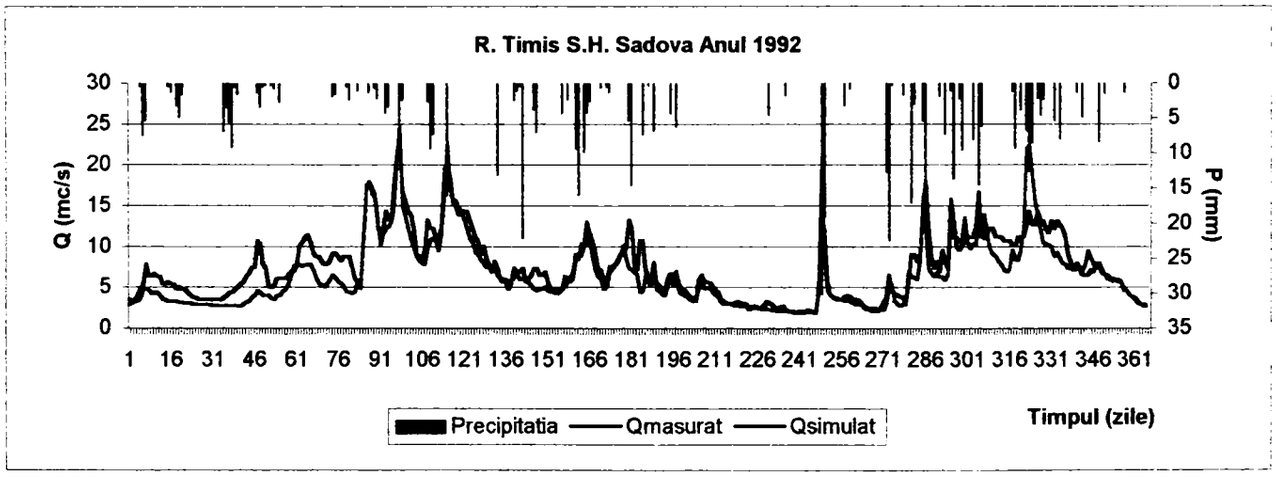


Figura 5. Hidrografele debitelor zilnice observate și simulate cu modelul ARMA







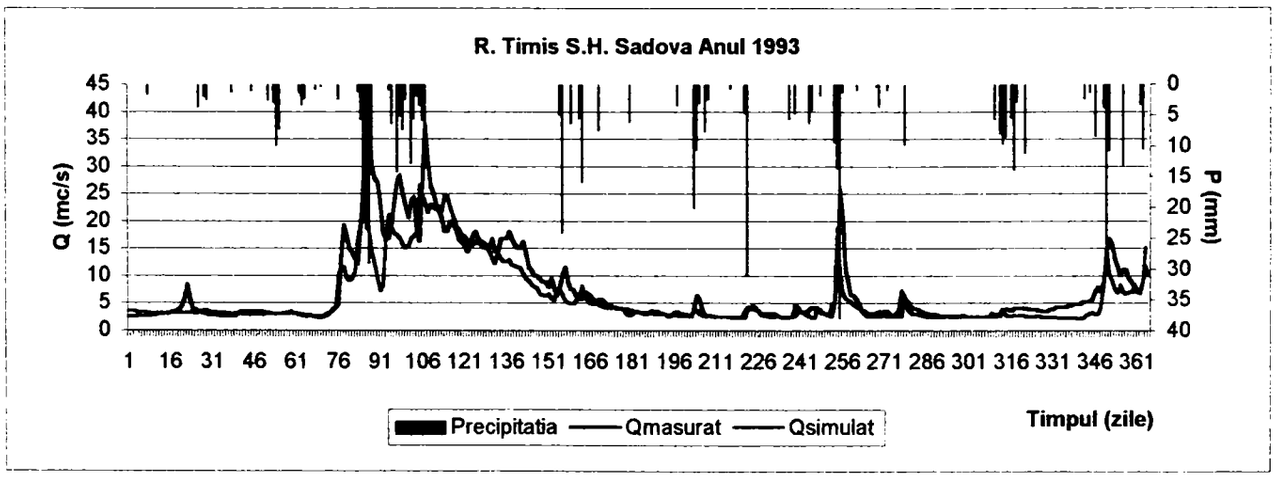
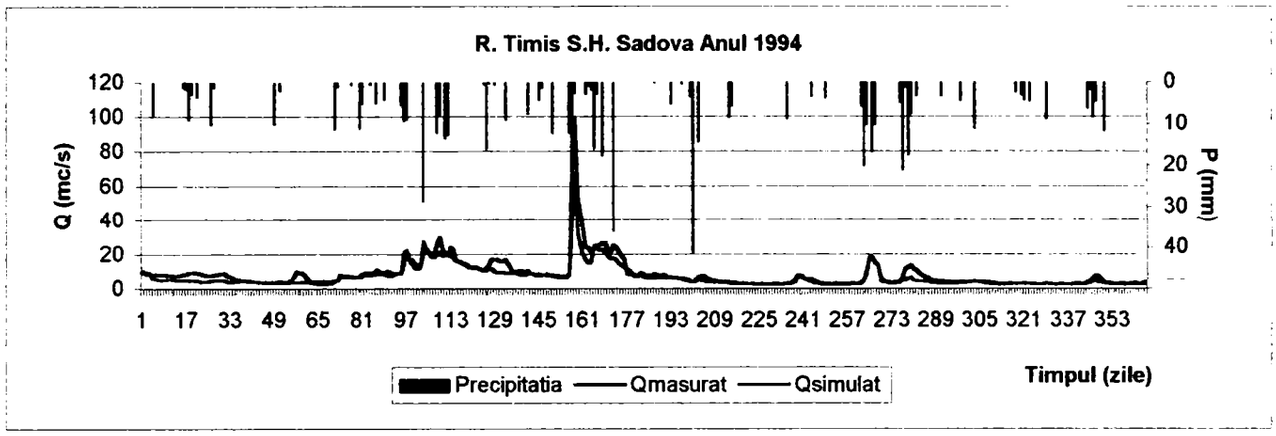
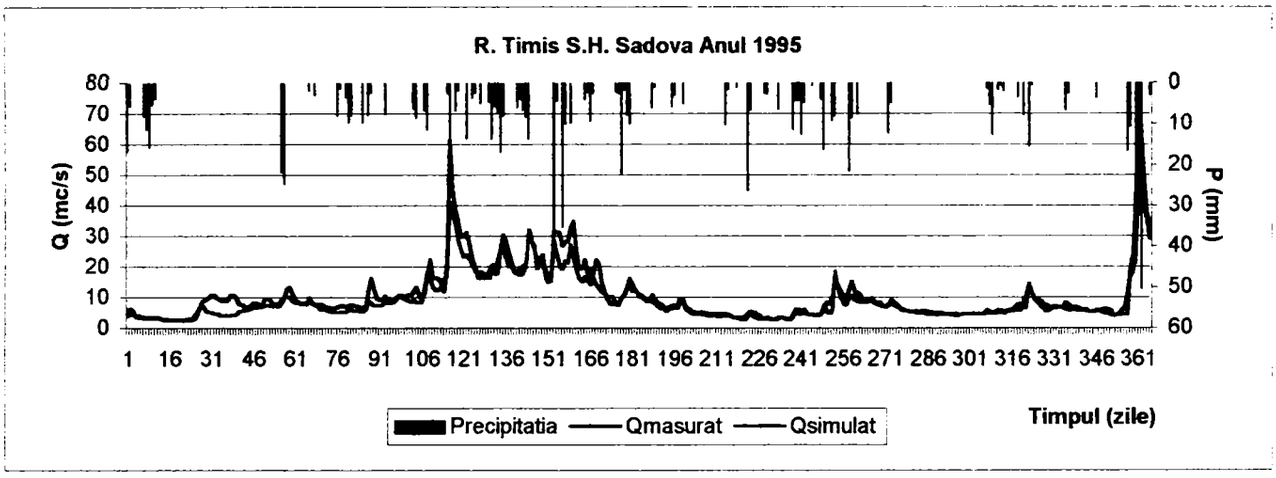
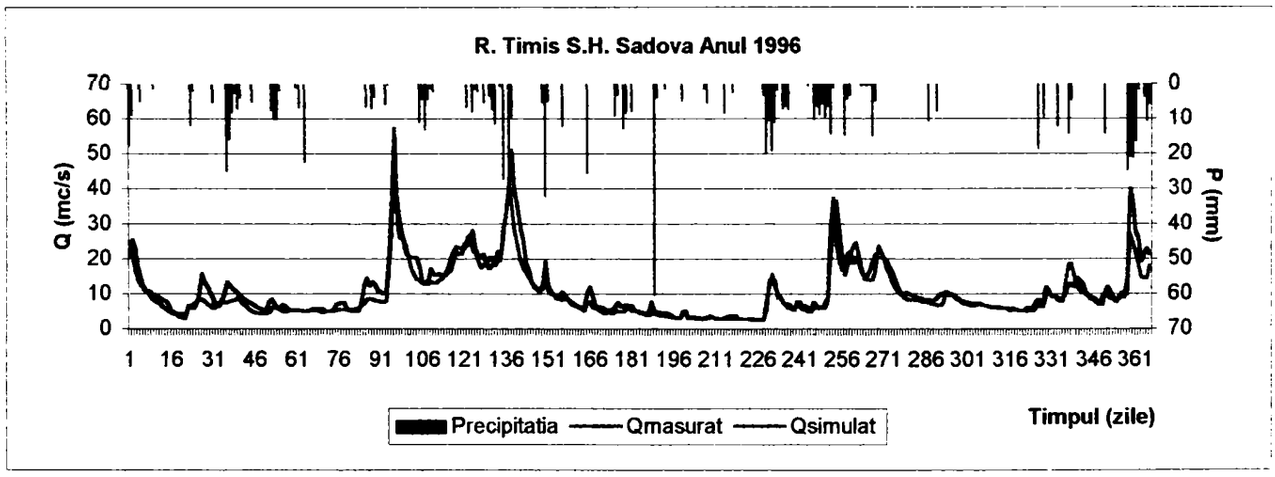


Figura 6. Hidrografele debitelor medii zilnice observate şi simulate cu modelul DLCM







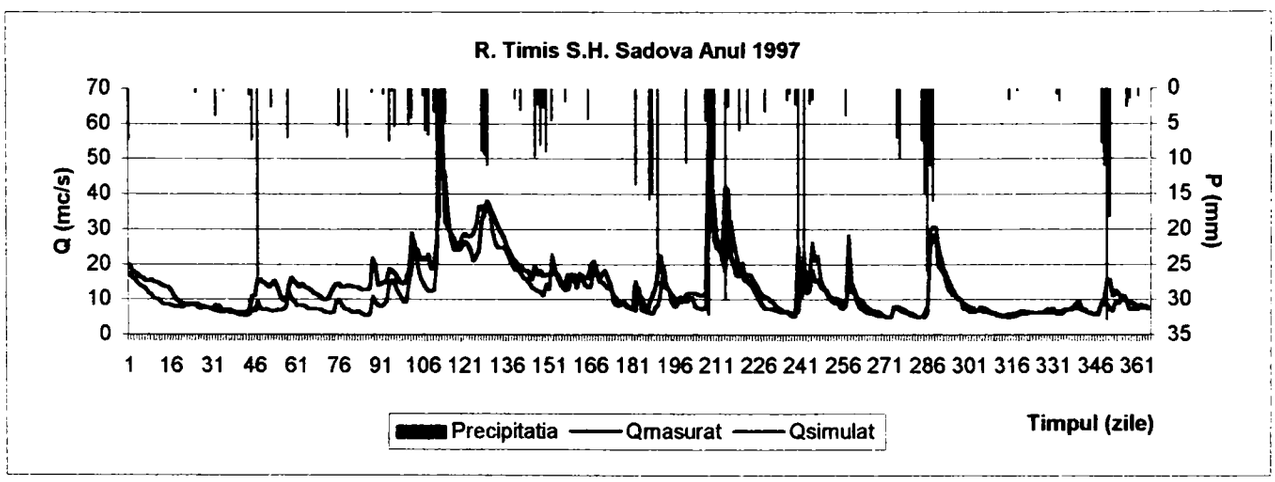
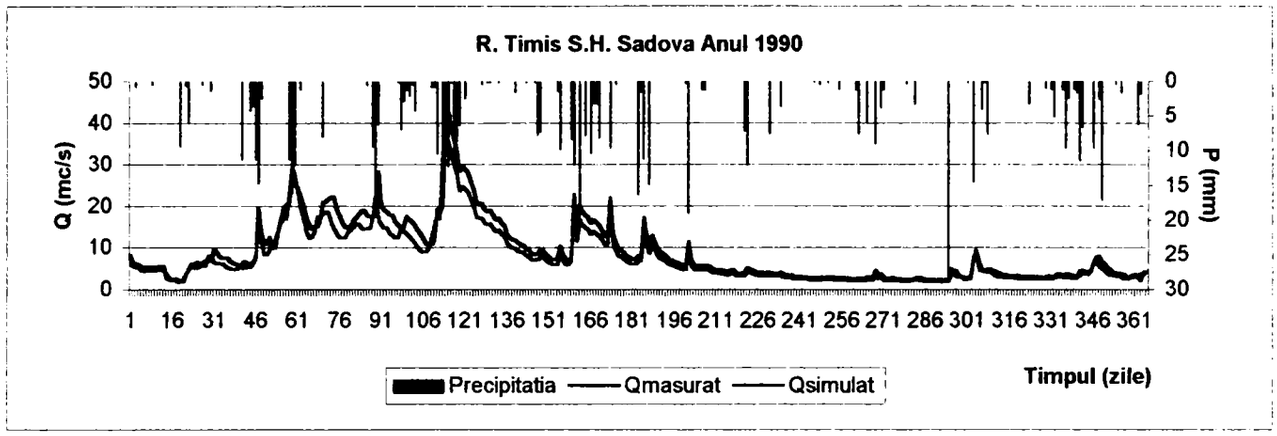
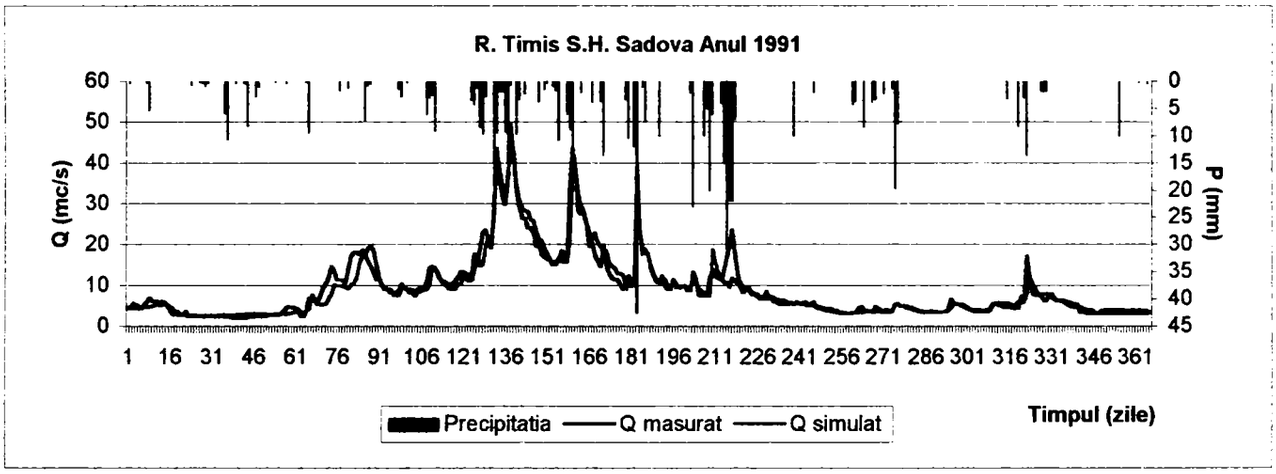
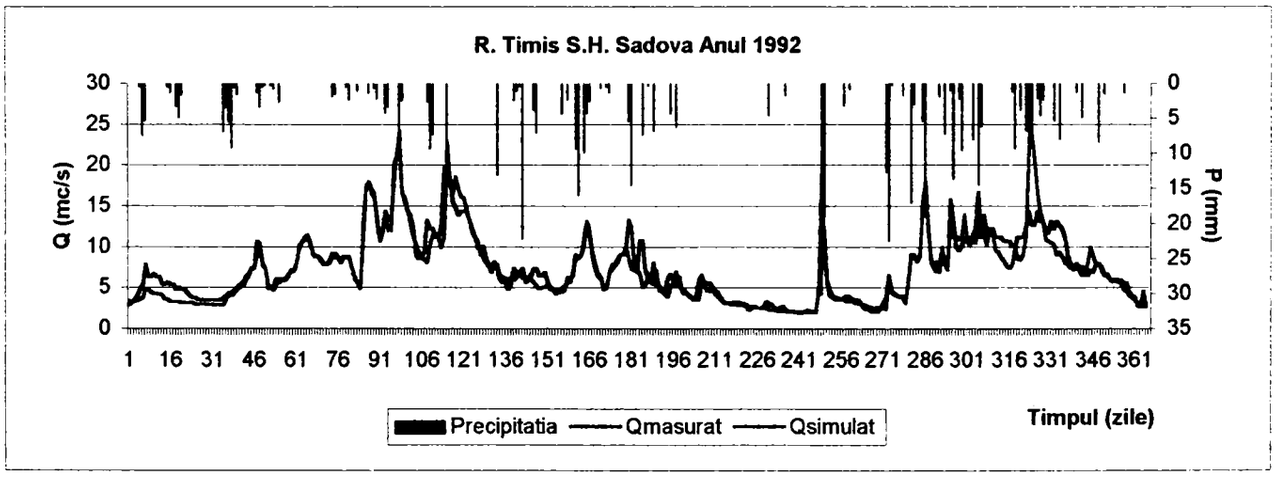


Figura 7. Hidrografele debitelor medii zilnice observate şi simulate cu modelul DLCM







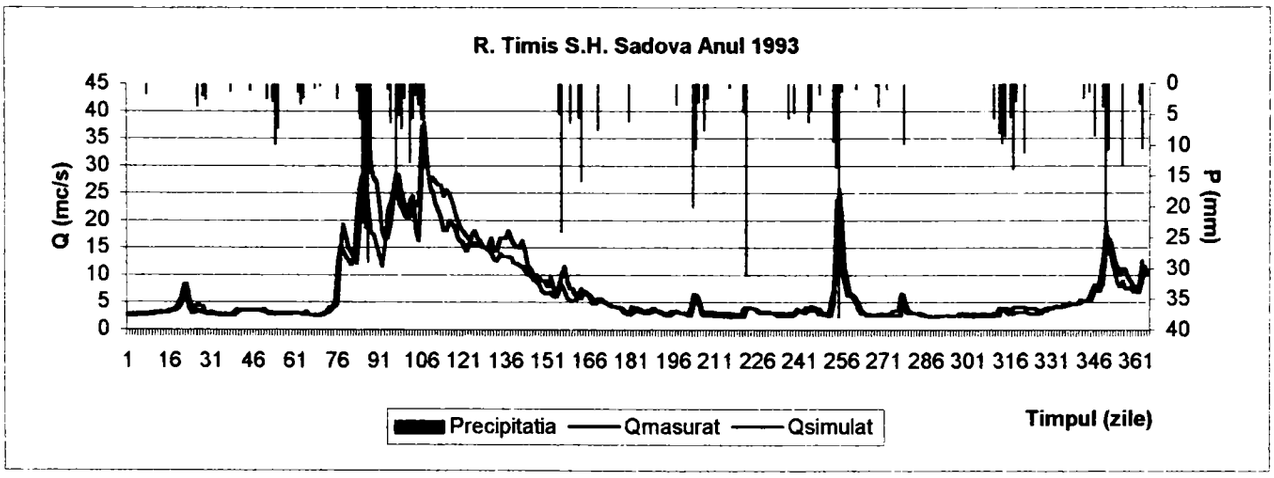


Figura 8. Hidrografele debitelor medii zilnice observate şi simulate cu modelul LINREG

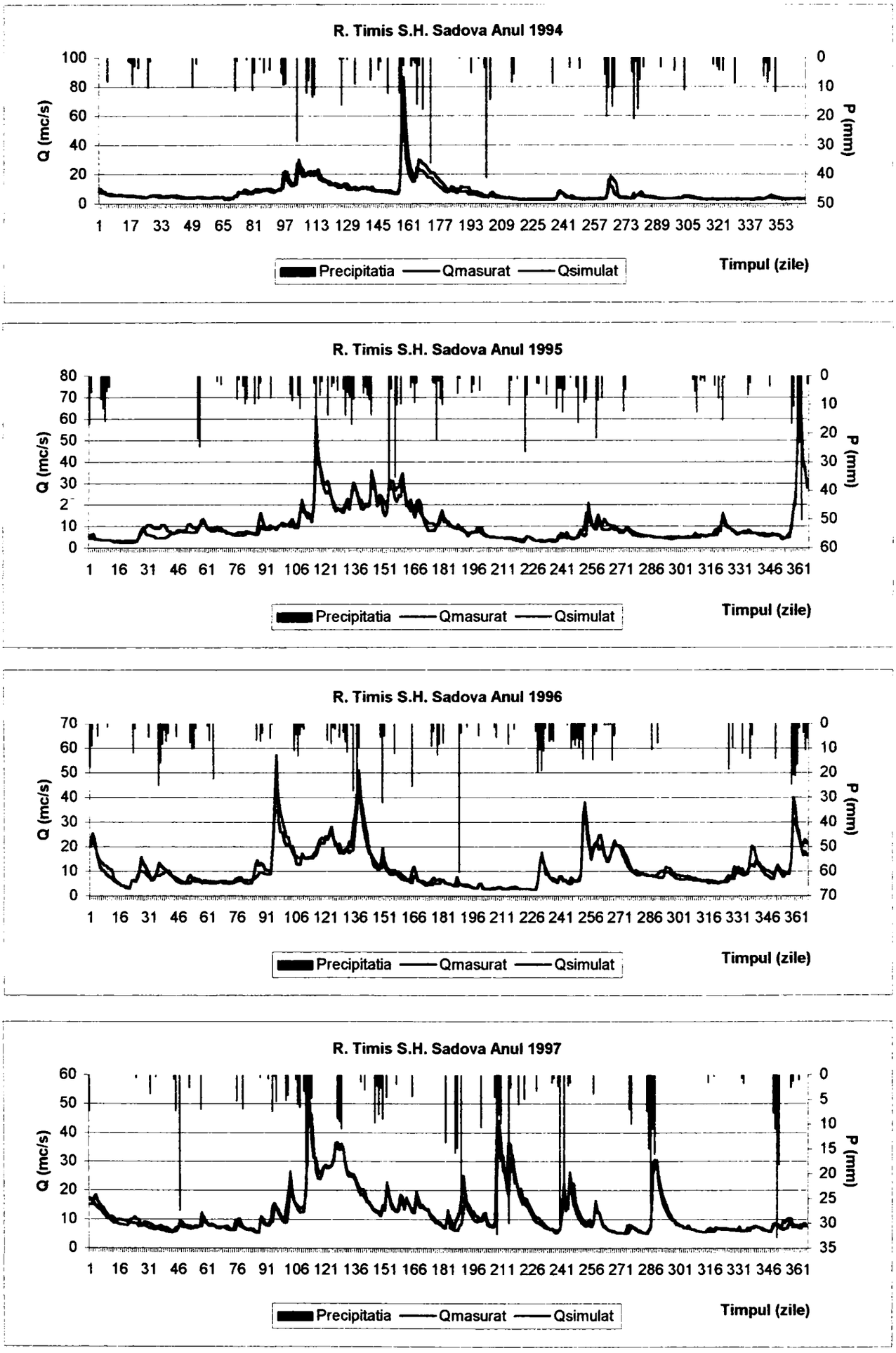


Figura 9. Hidrografele debitelor medii zilnice observate şi simulate cu modelul LINREG

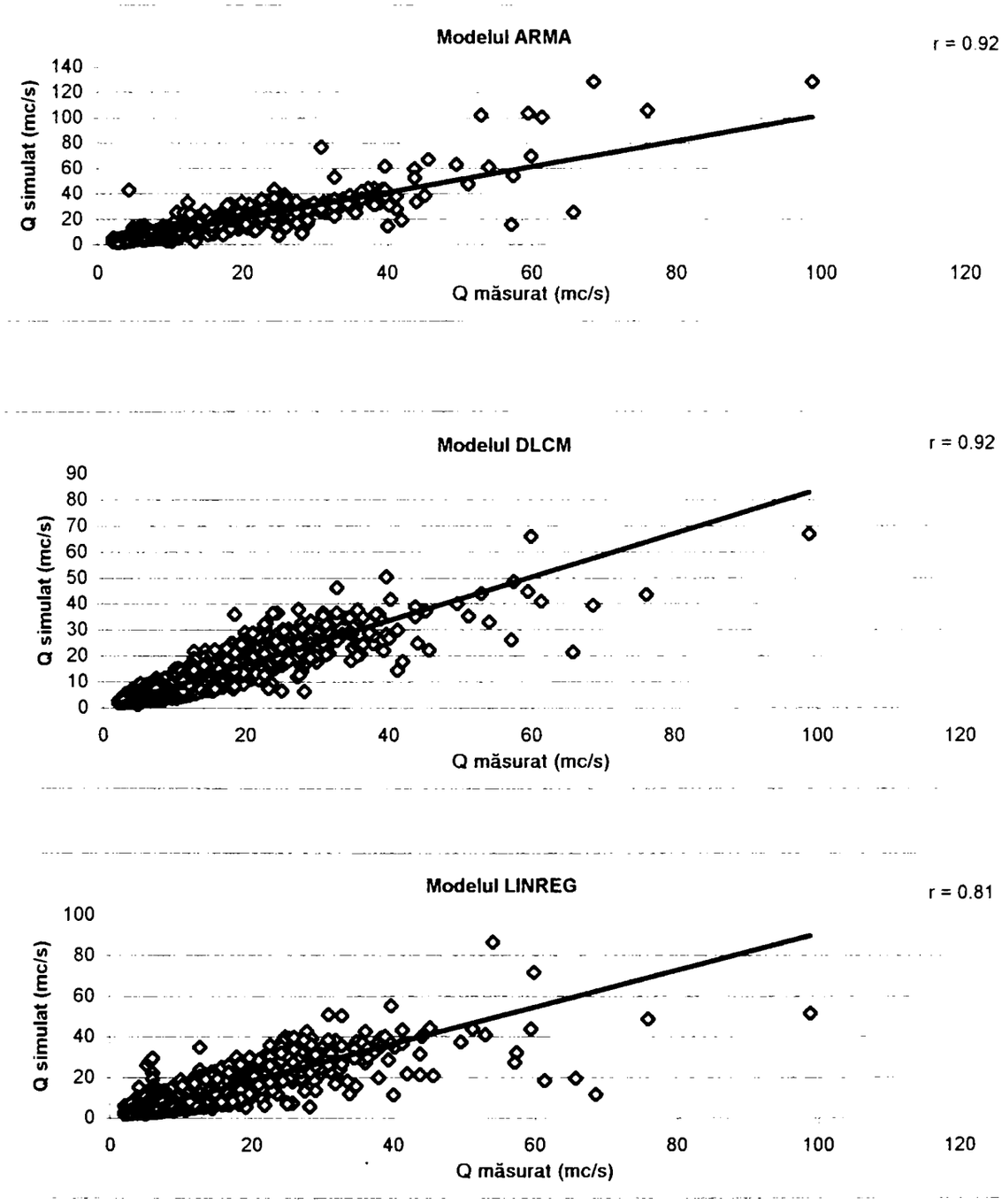
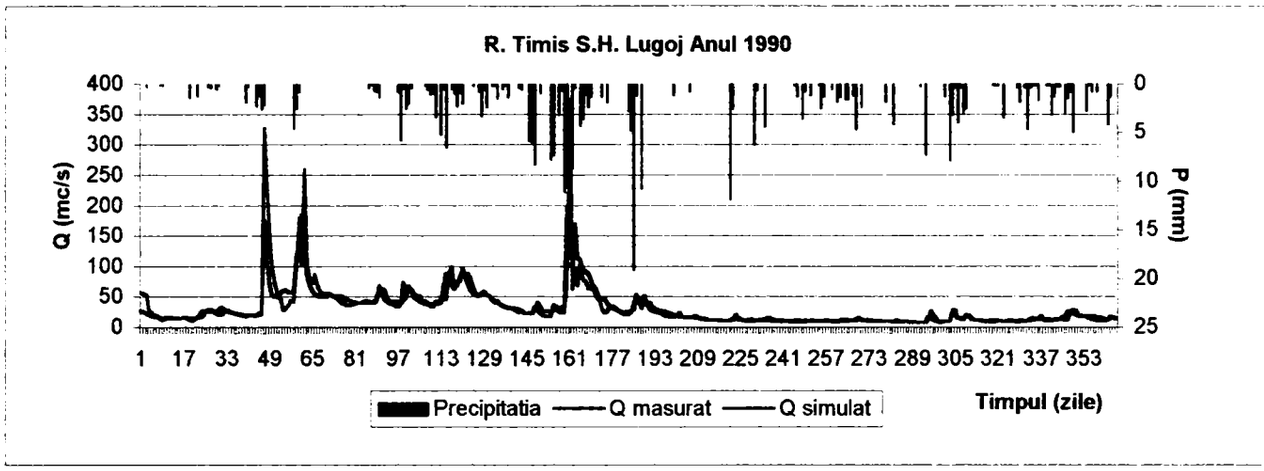
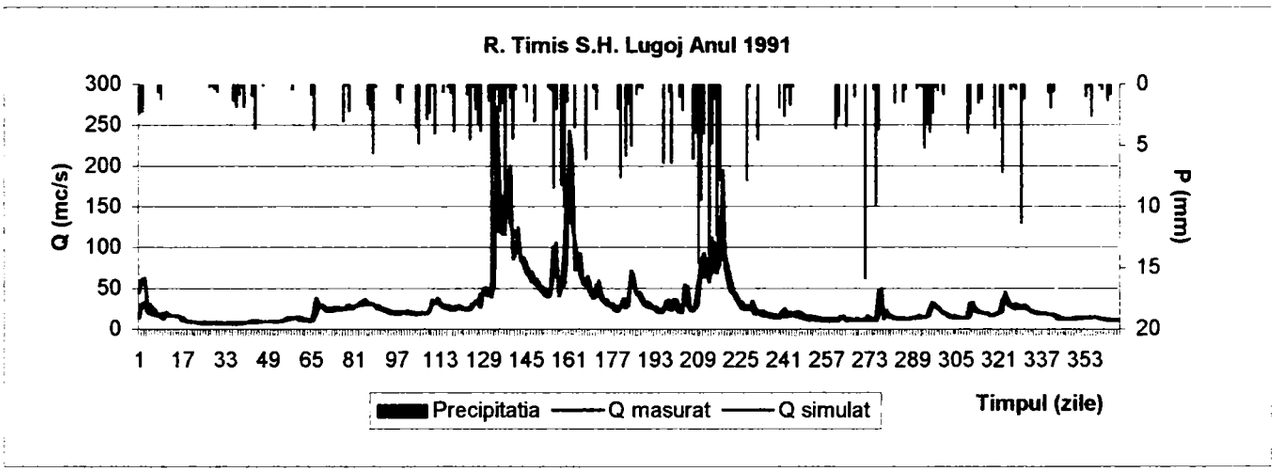
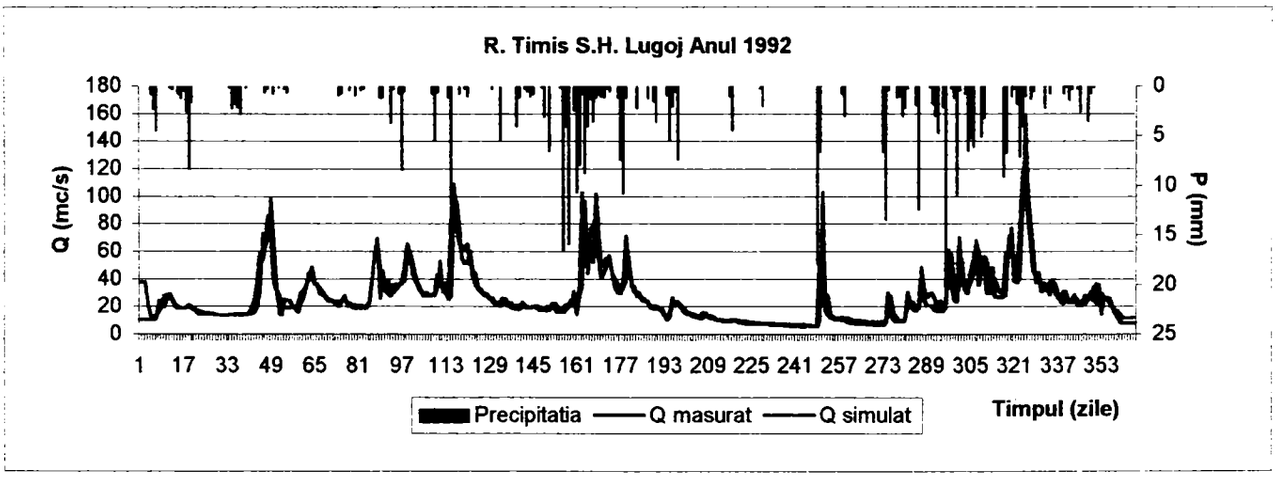


Figura 10. Corelațiile dintre debitele medii zilnice observate și simulate în perioada 1990 - 1997 pentru râul Timiș la stația hidrometrică Sadova.







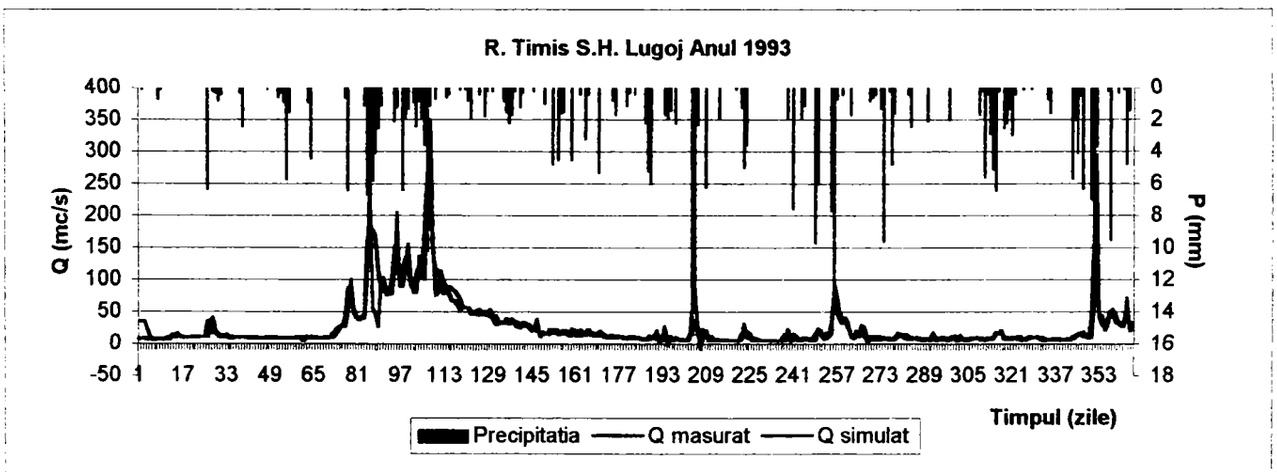


Figura 11. Hidrografele debitelor medii zilnice observate şi simulate cu modelul ARMA

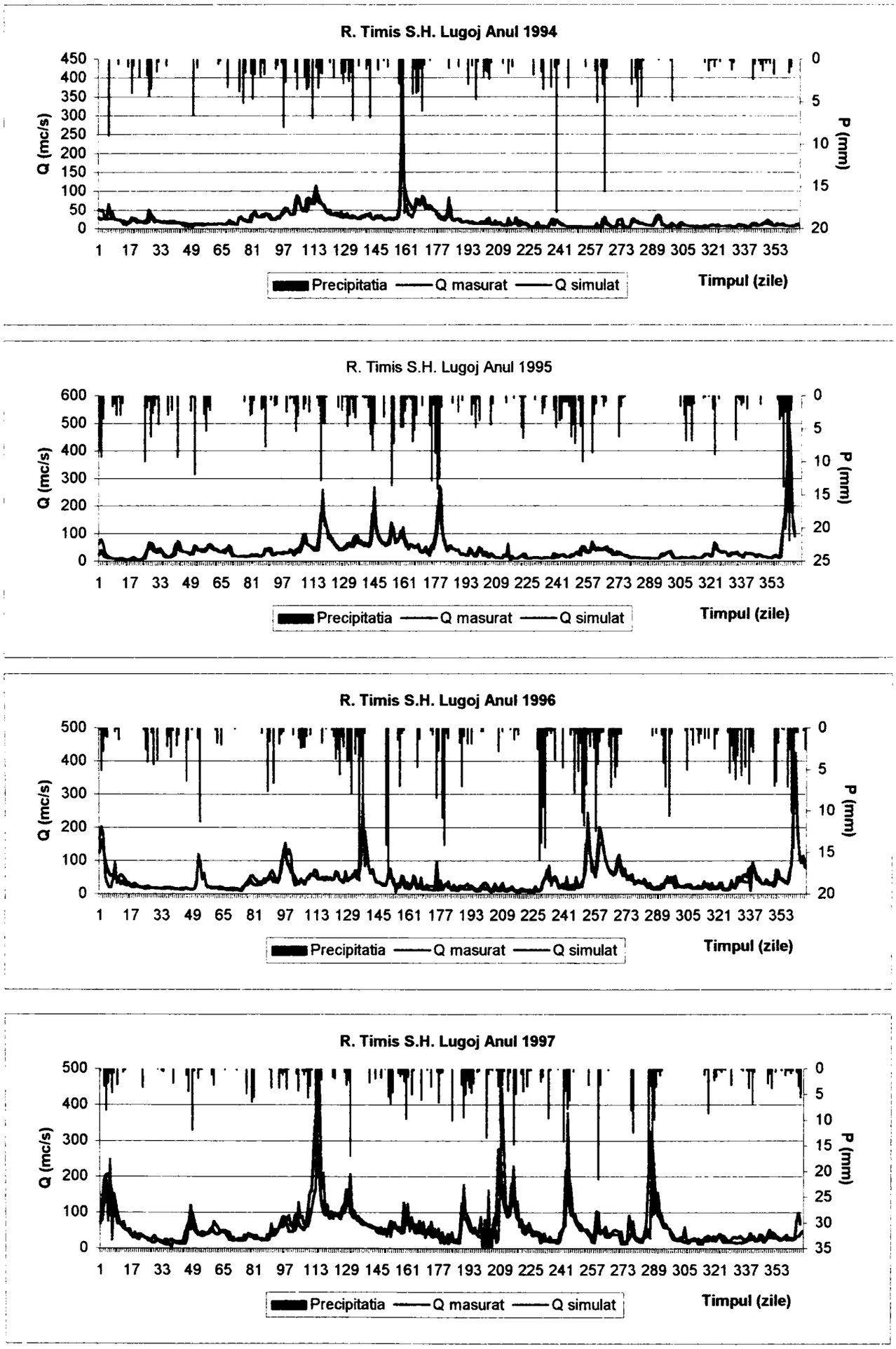
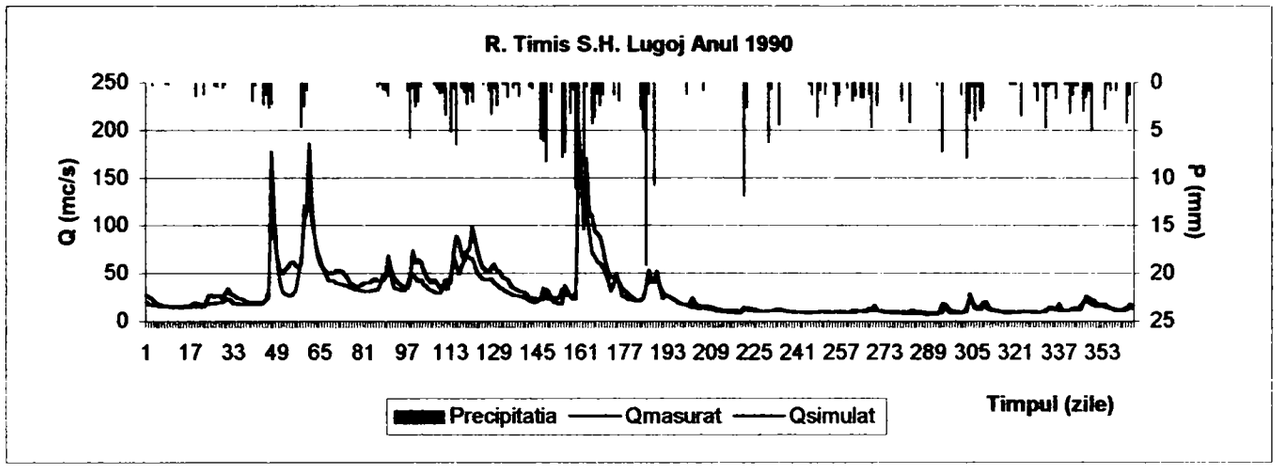
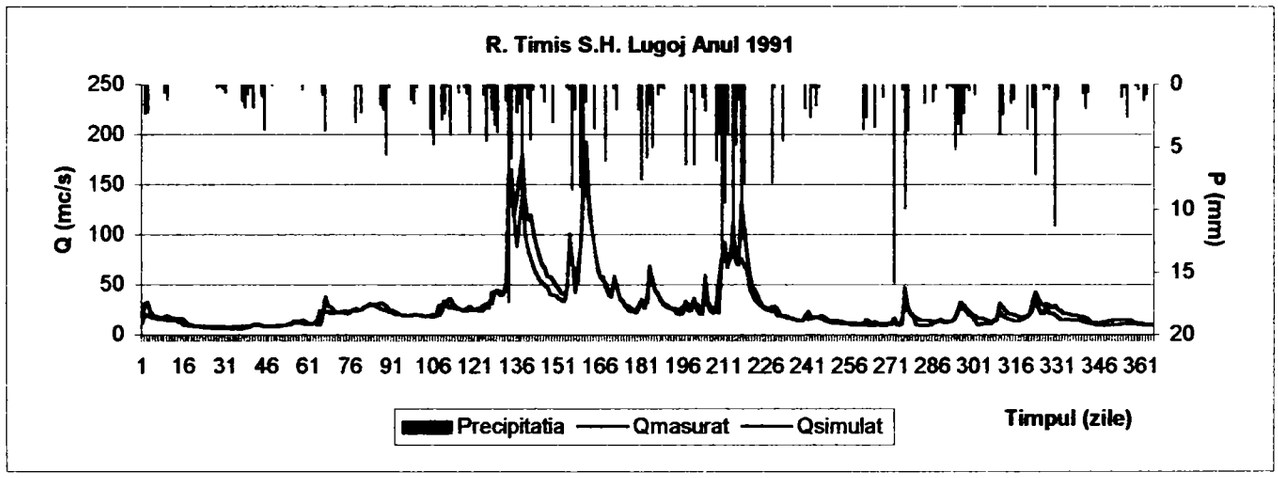
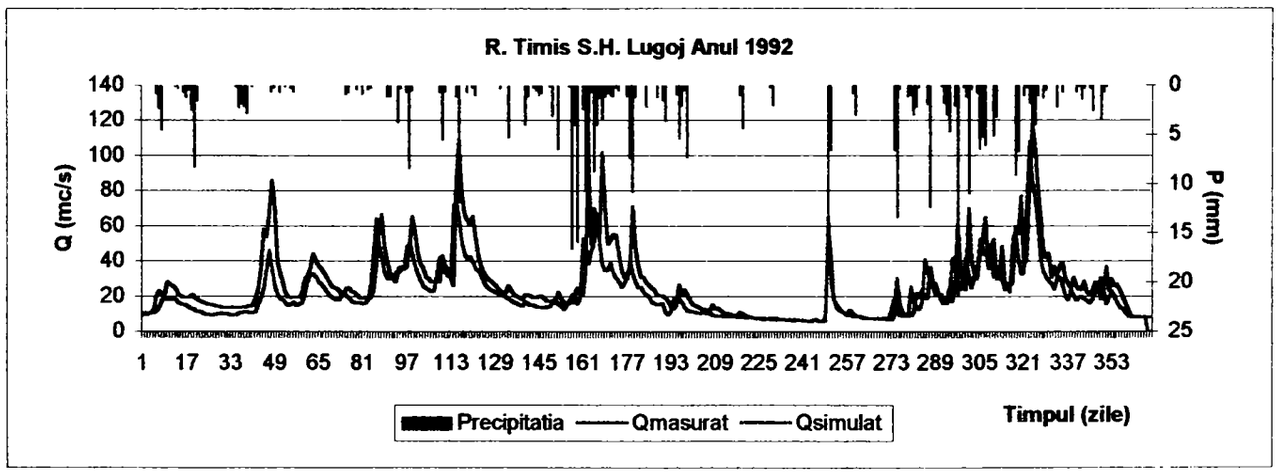


Figura 12. Hidrografele debitelor medii zilnice observate şi simulate cu modelul ARMA







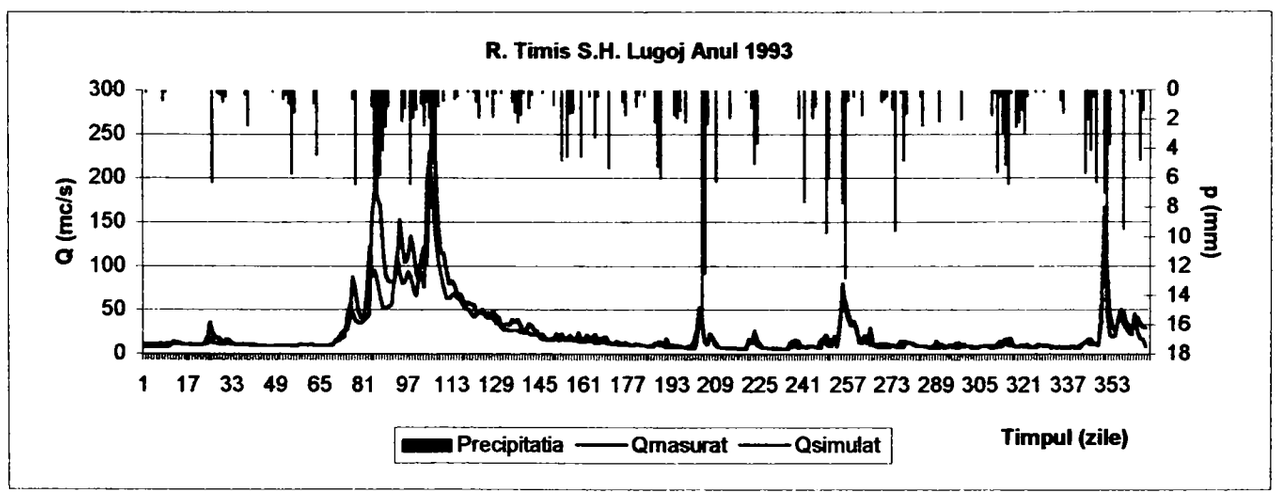
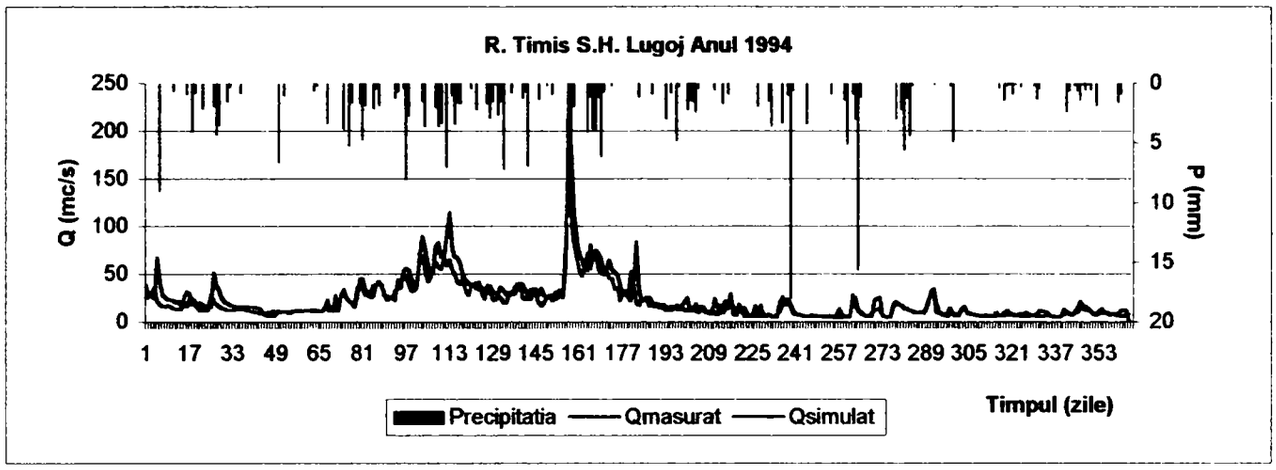
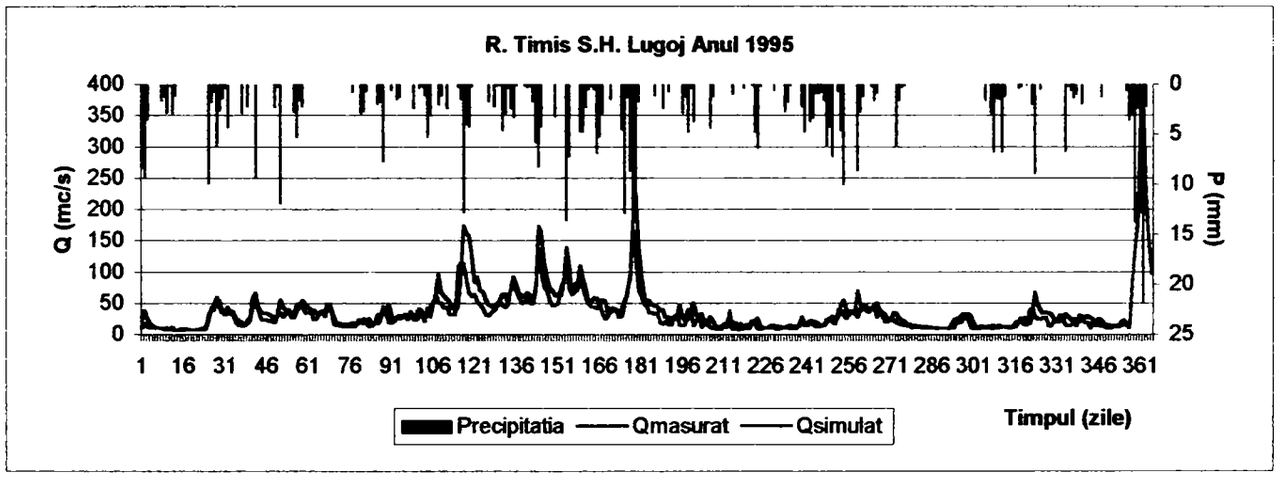
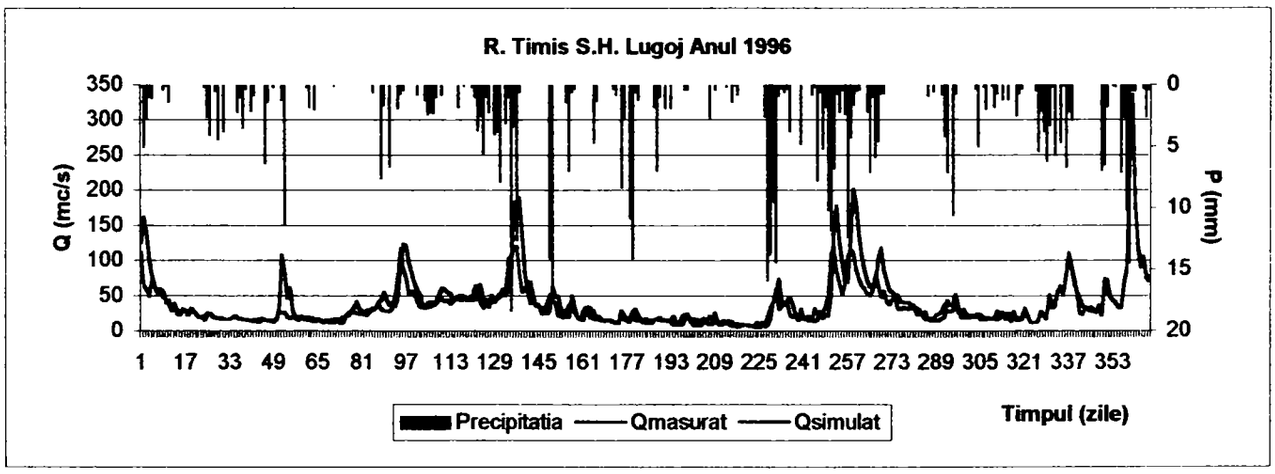


Figura 13. Hidrografele debitelor medii zilnice observate şi simulate cu modelul DLCM







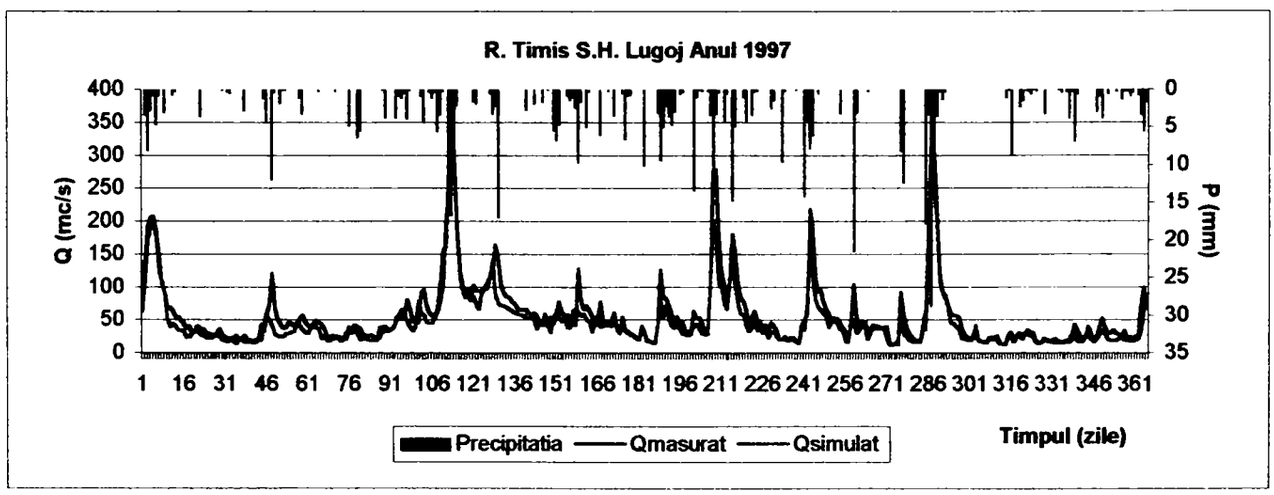
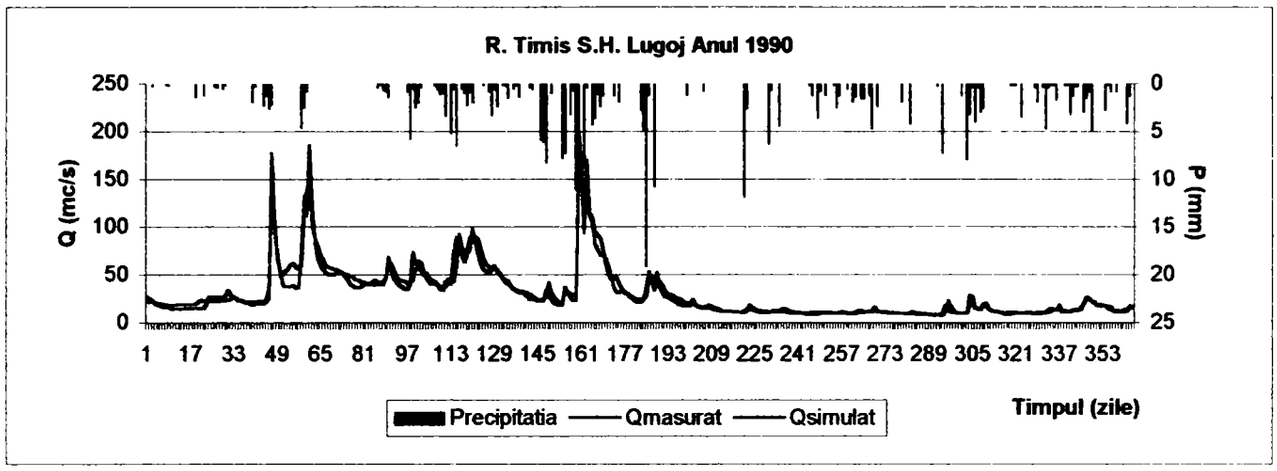
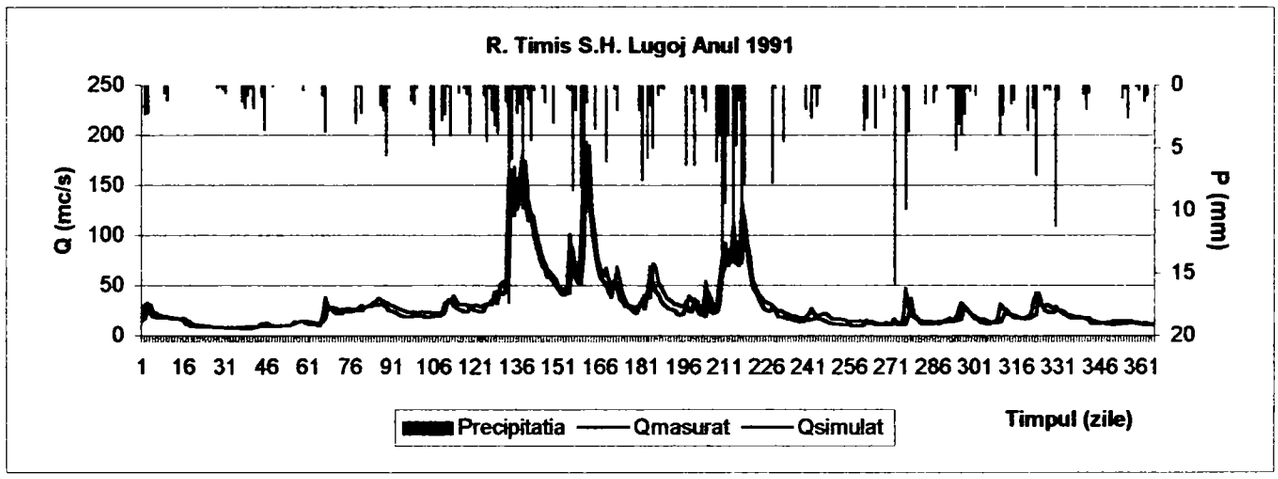
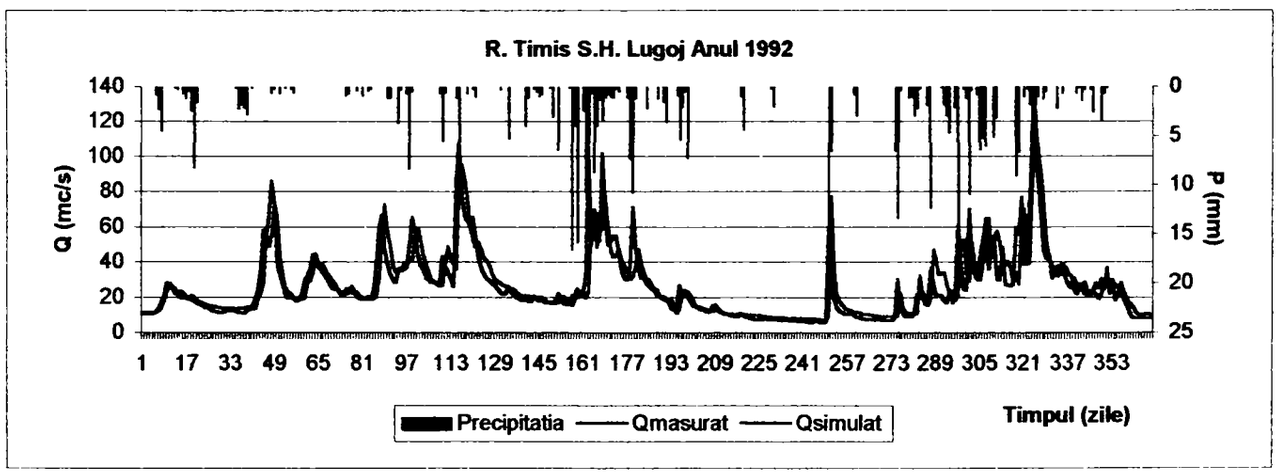


Figura 14. Hidrografele debitelor medii zilnice observate şi simulate cu modelul DLCM







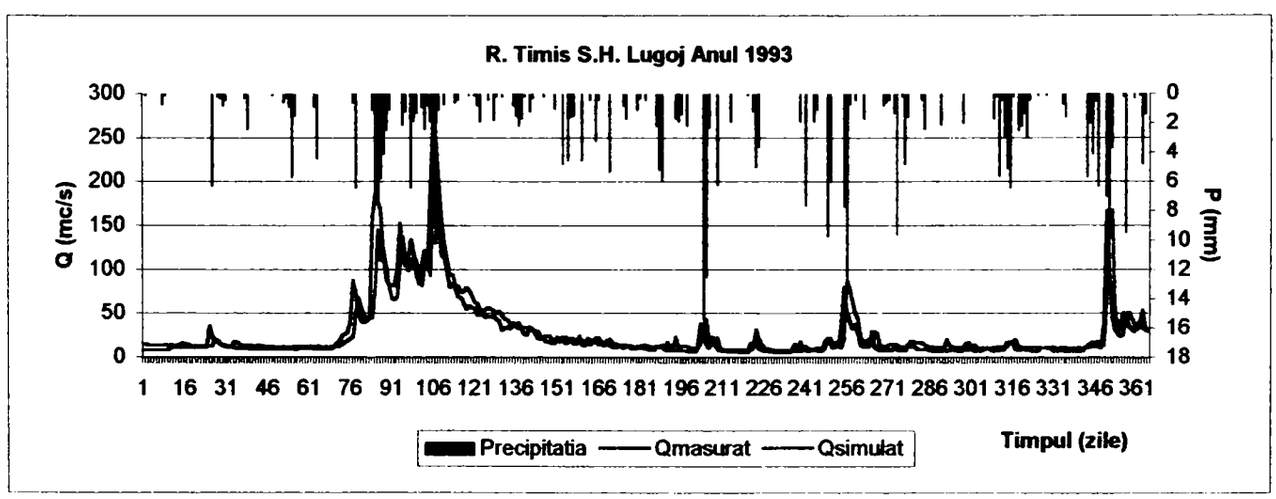
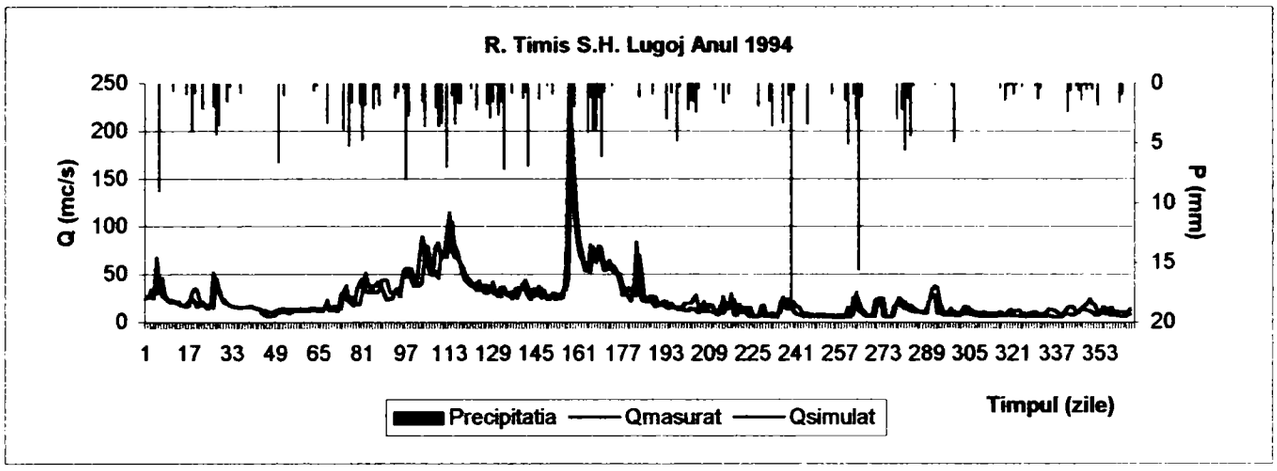
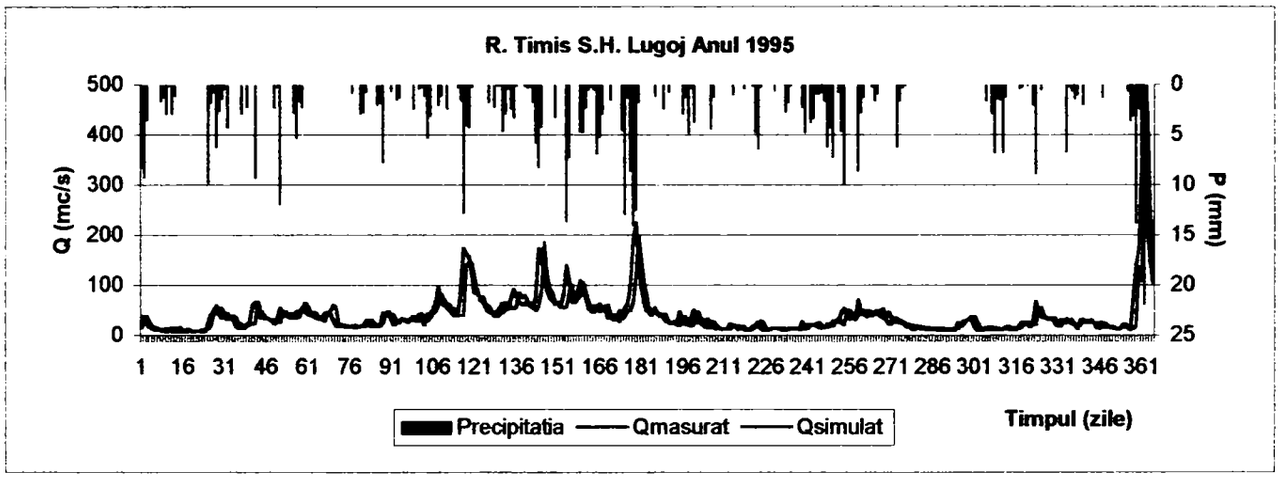
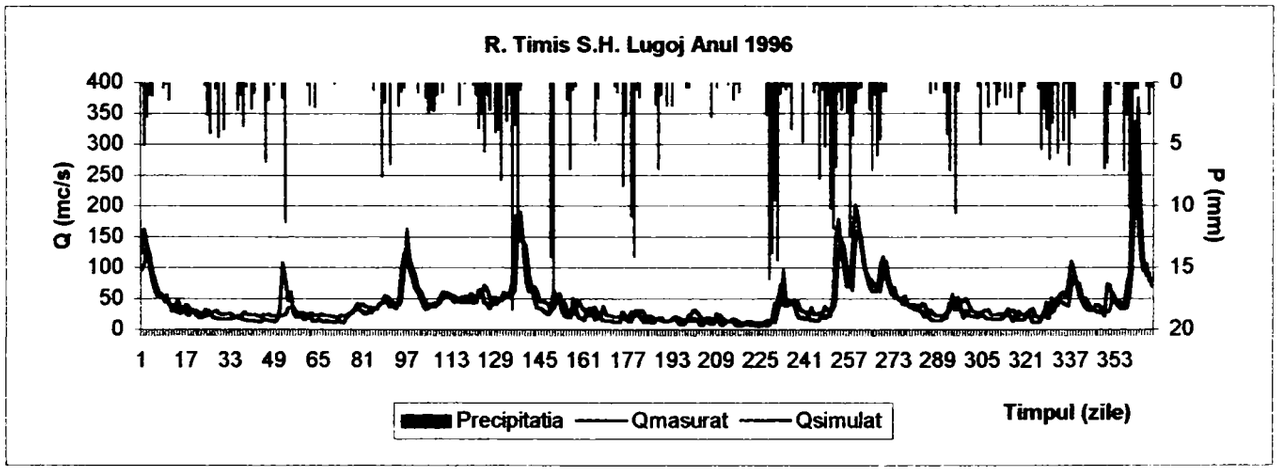


Figura 15. Hidrografele debitelor medii zilnice observate şi simulate cu modelul LINREG







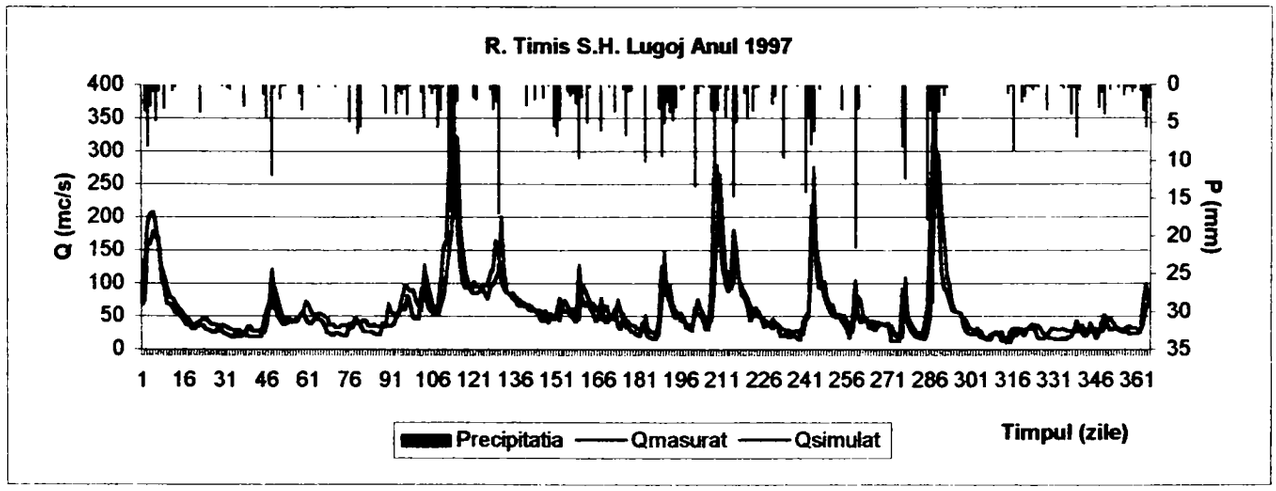


Figura 16. Hidrografele debitelor medii zilnice observate şi simulate cu modelul LINREG

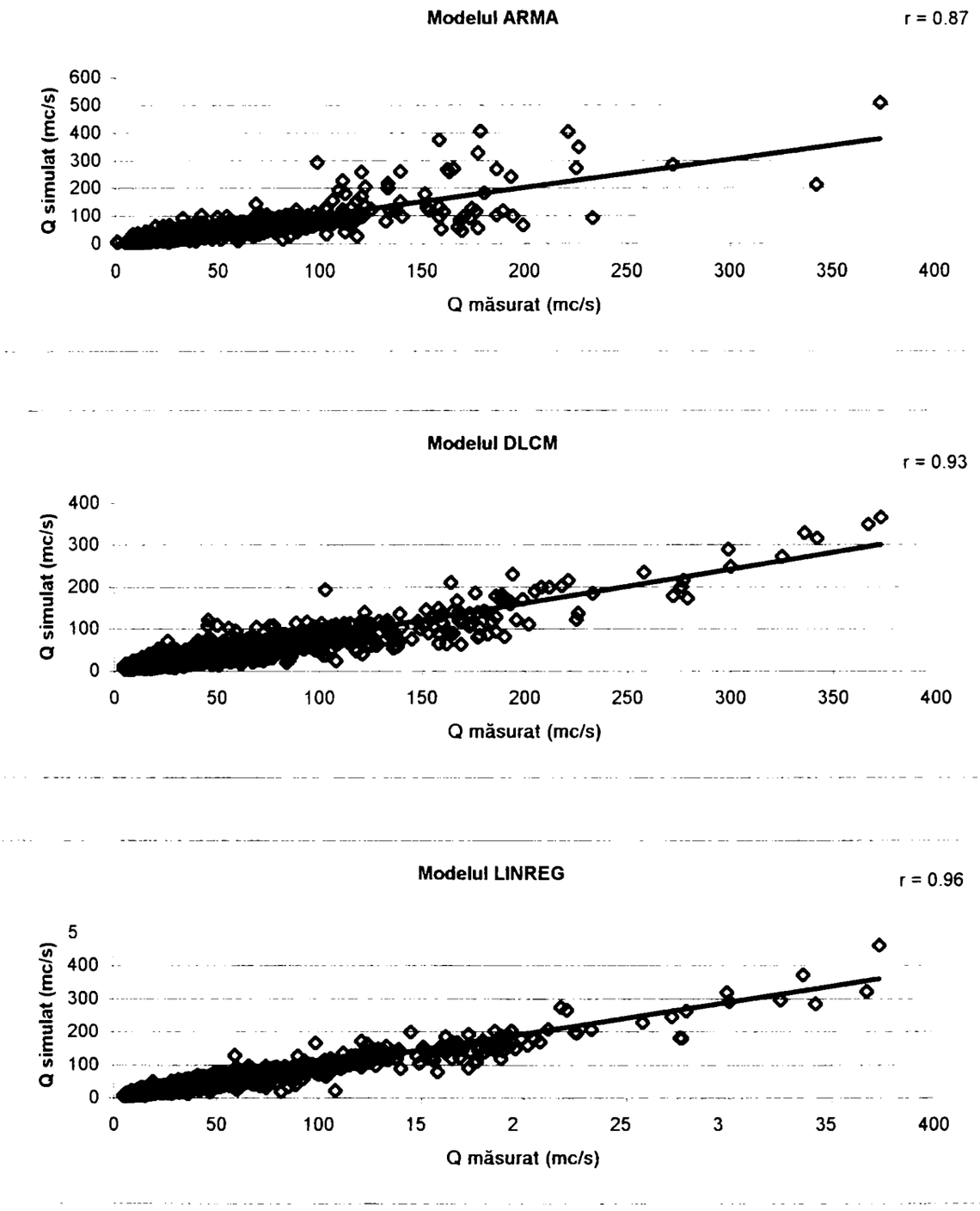


Figura 17. Corelațiile dintre debitele medii zilnice observate și simulate în perioada 1990 - 1997 pentru râul Timiș la stația hidrometrică Lugoj.

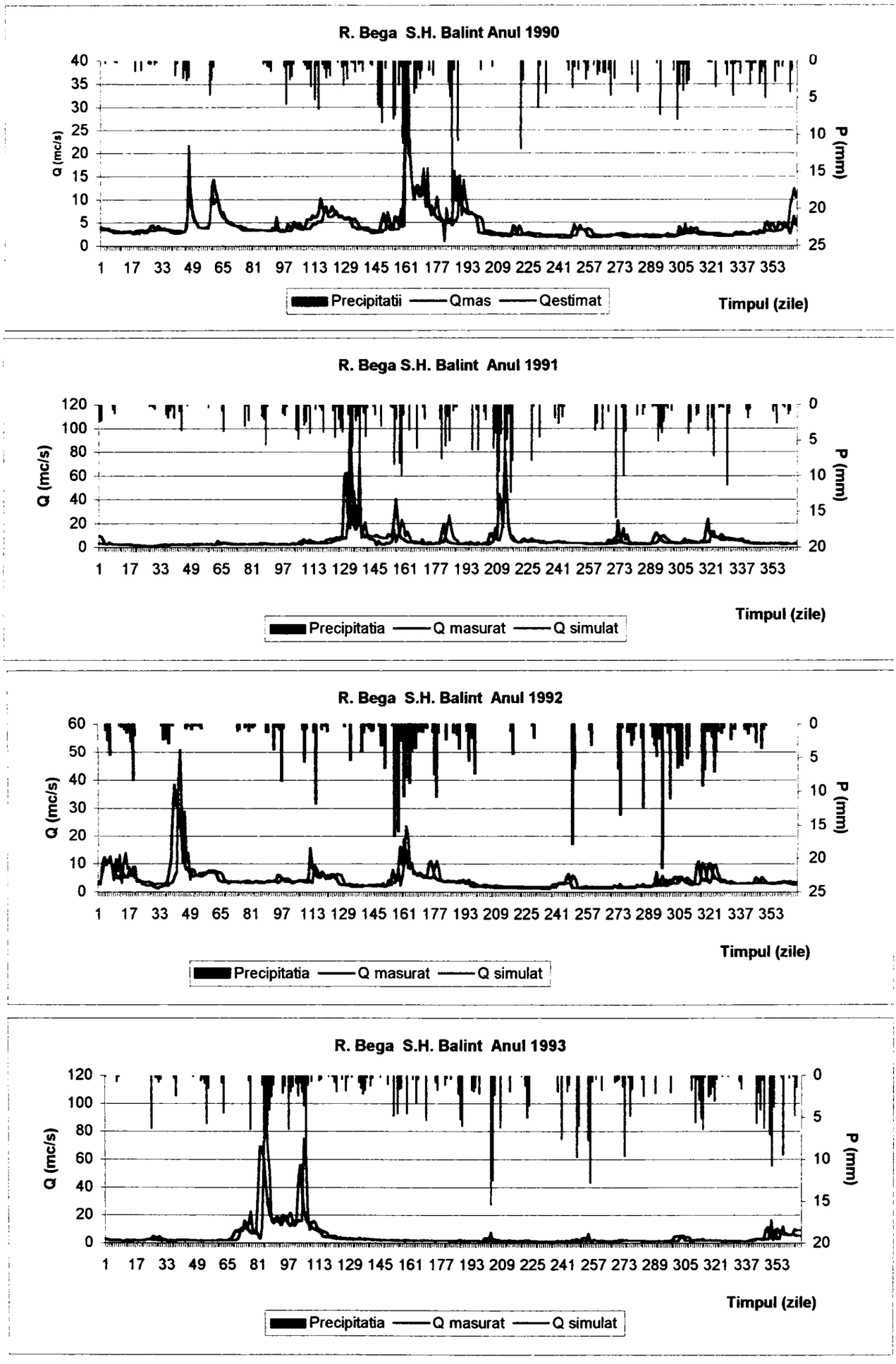


Figura 18 a. Hidrografele debitelor zilnice observate şi simulate cu modelul ARMA

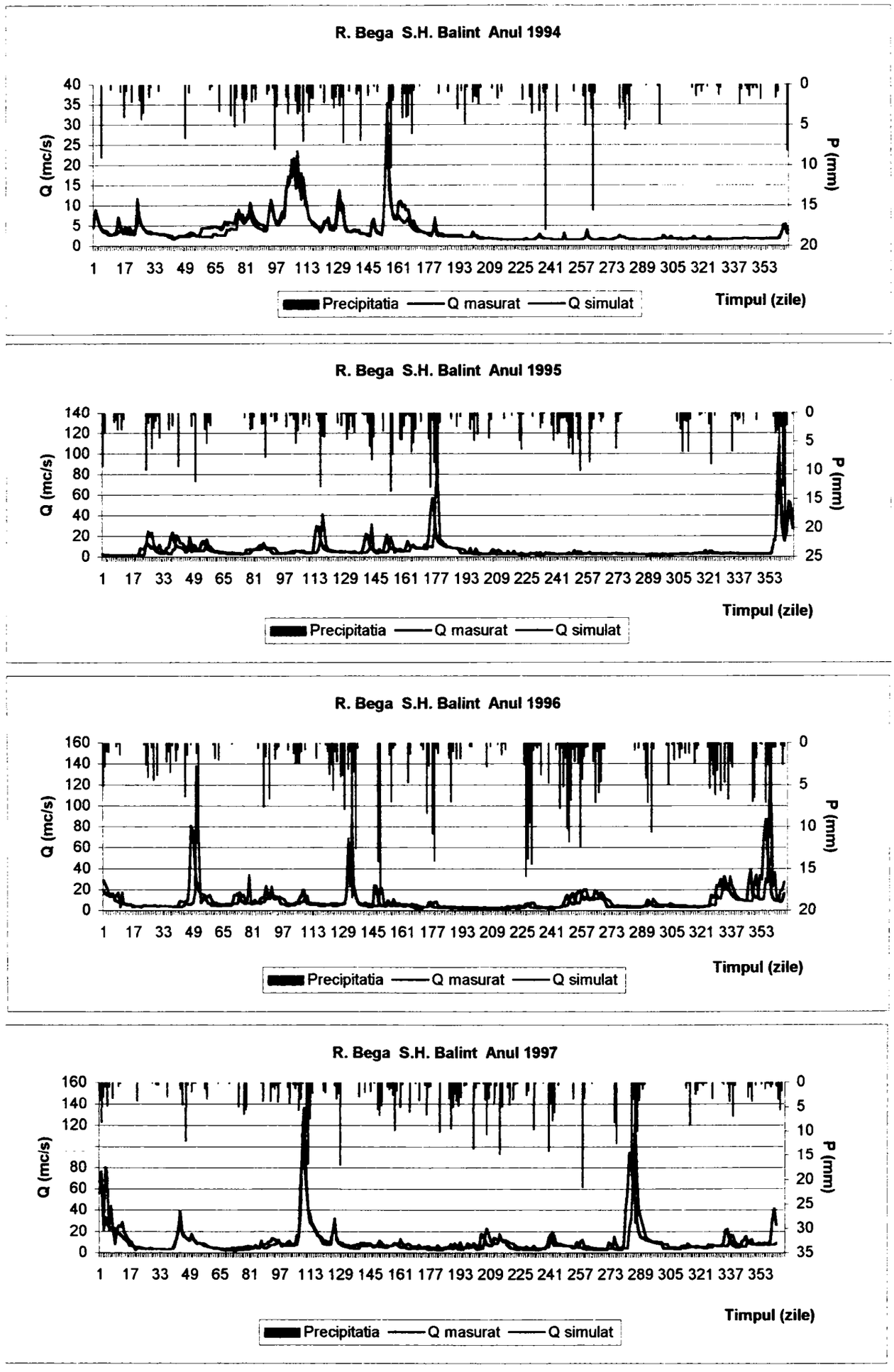


Figura 18 b. Hidrografele debitelor zilnice observate şi simulate cu modelul ARMA

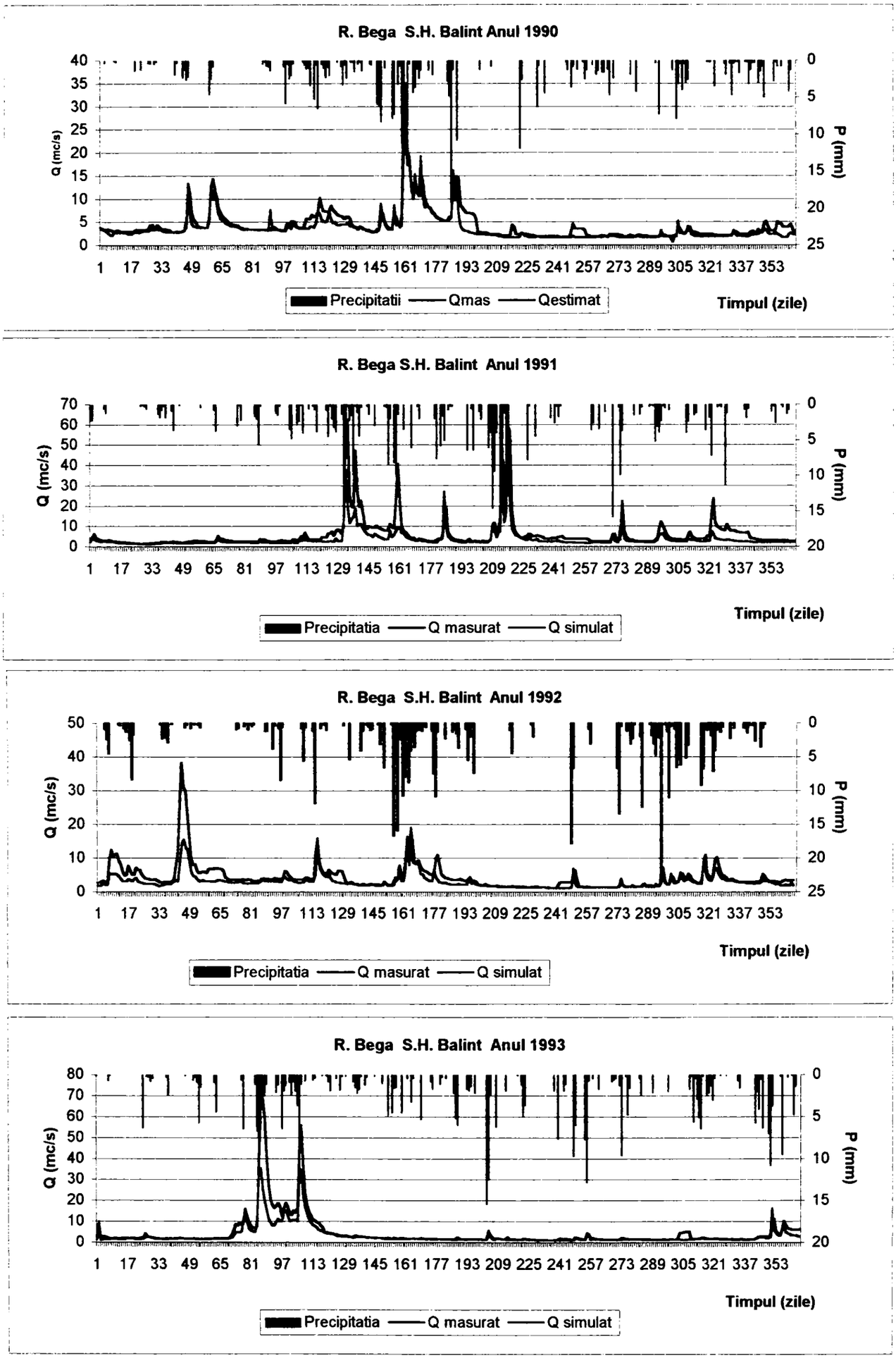


Figura 19 a. Hidrografele debitelor zilnice observate și simulate cu modelul DLCM

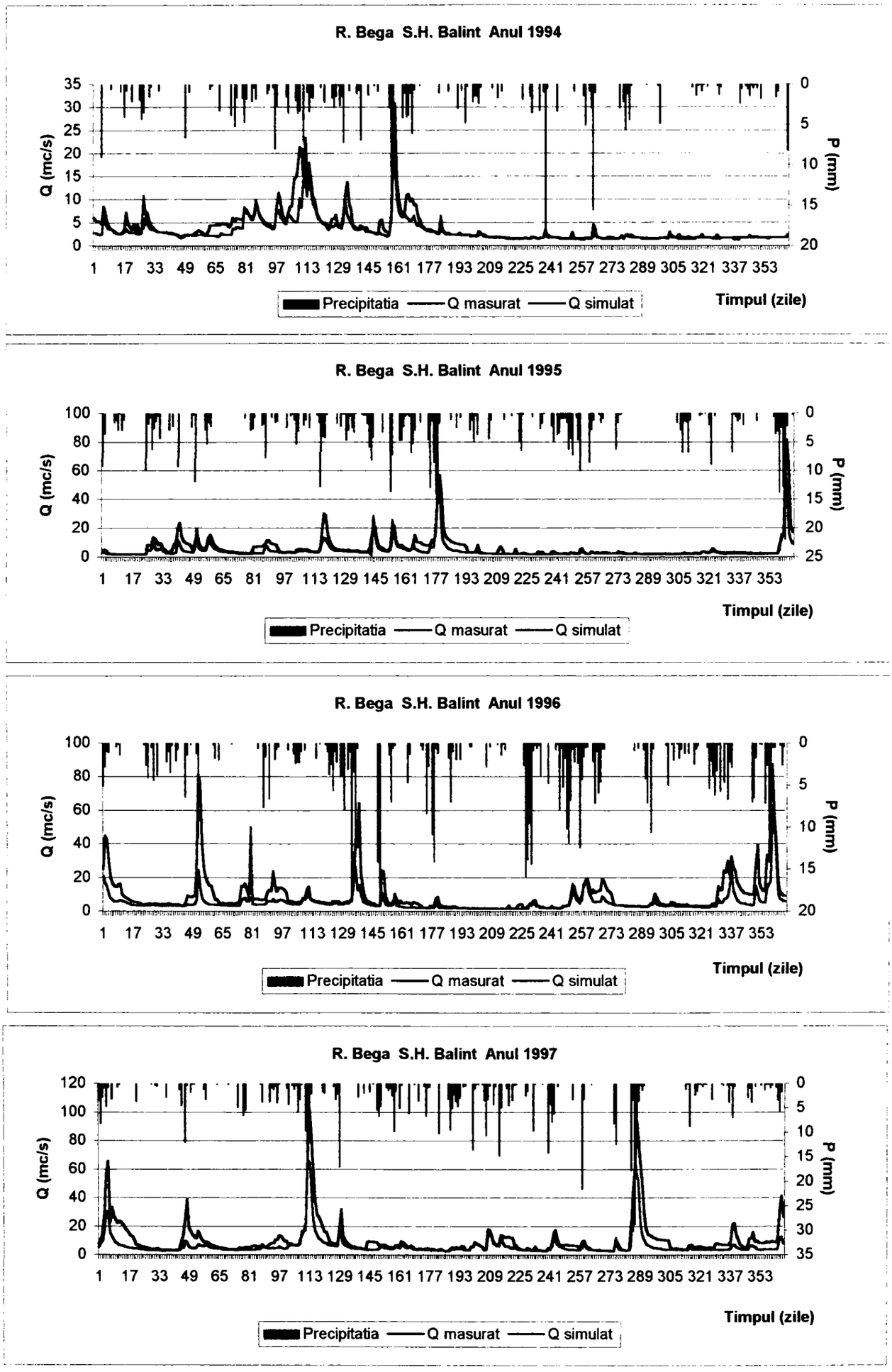


Figura 19 b. Hidrografele debitelor zilnice observate și simulate cu modelul DLCM

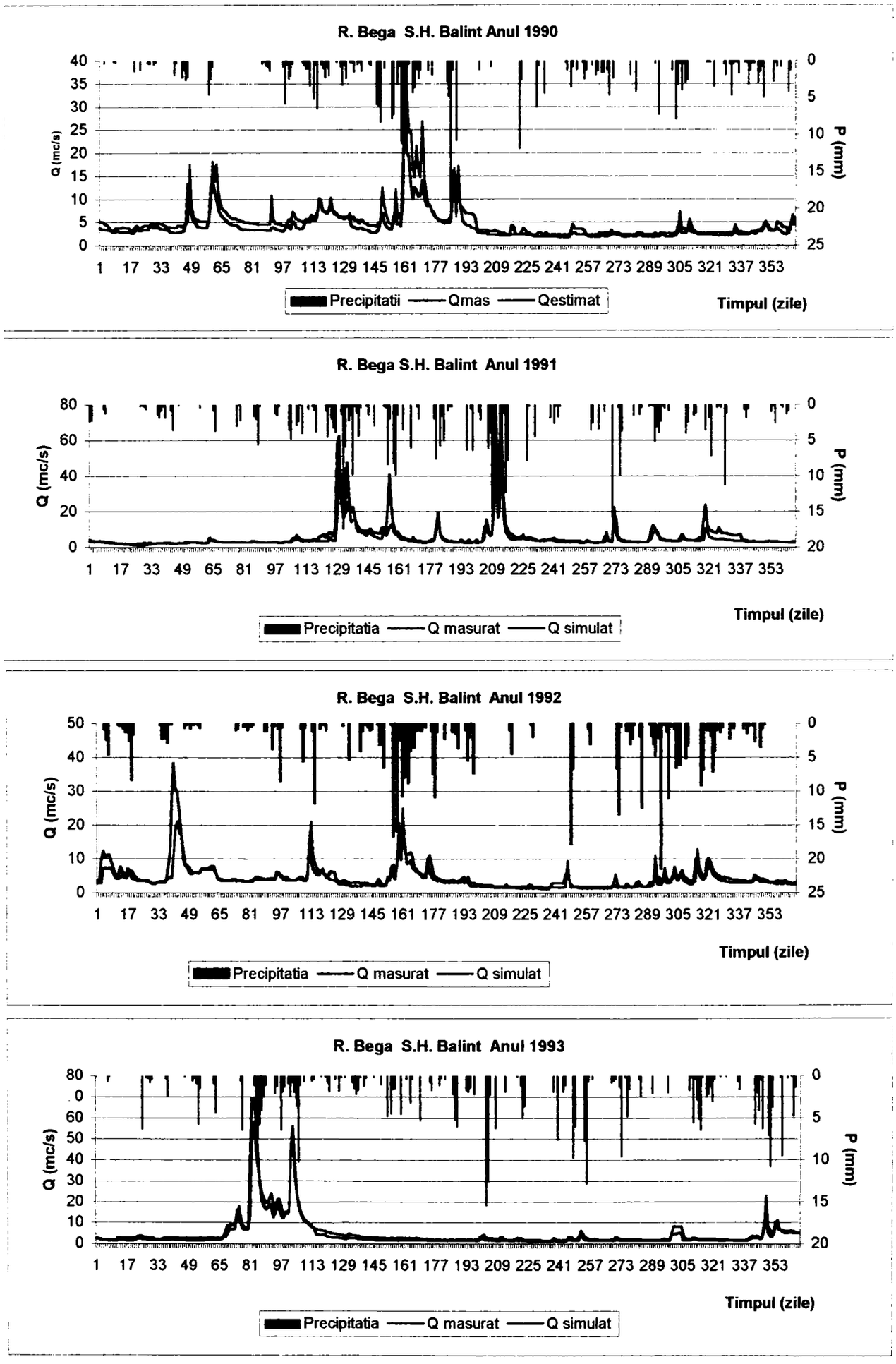


Figura 20. Hidrografele debitelor zilnice observate şi simulate cu modelul LINREG

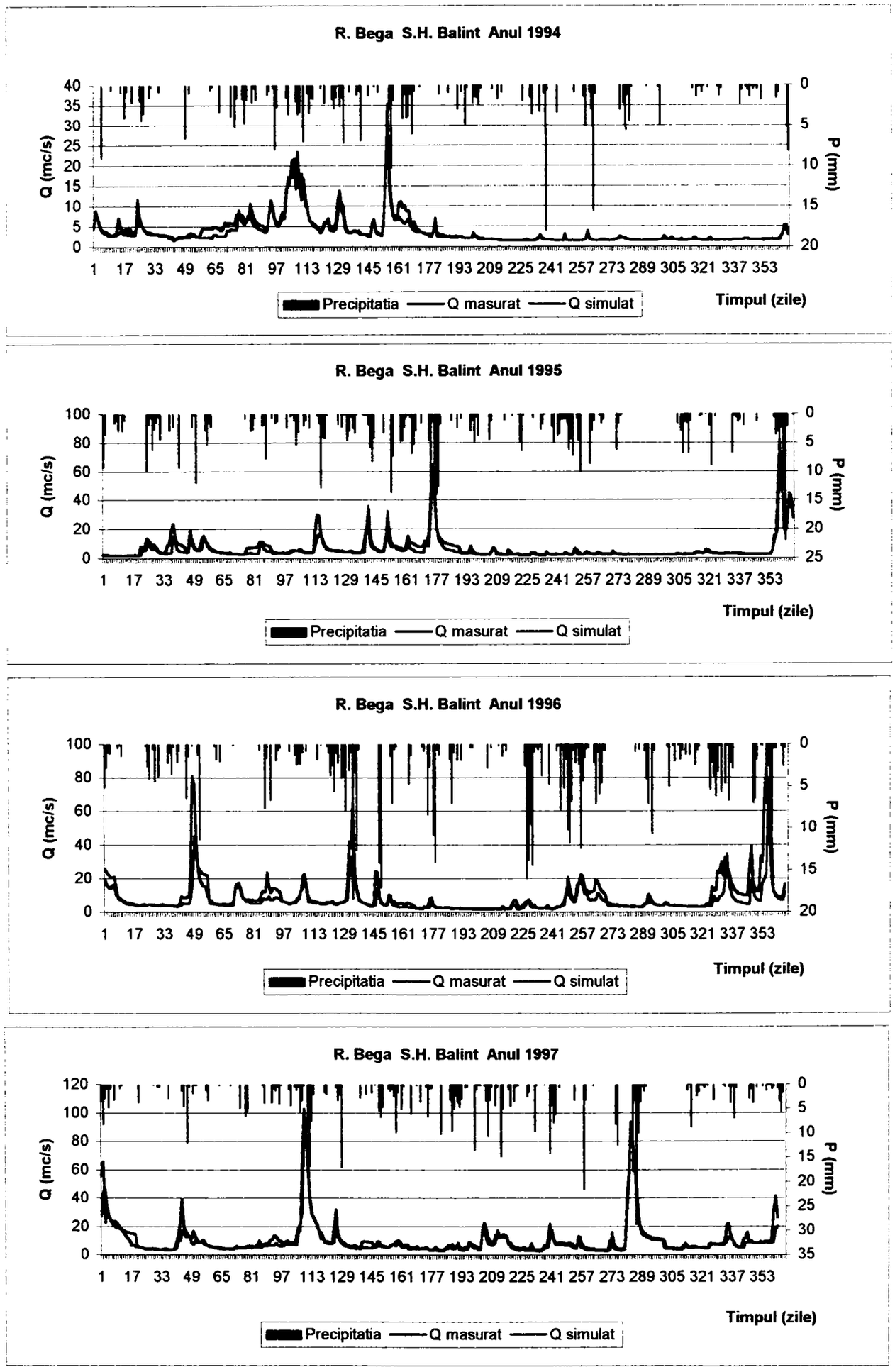
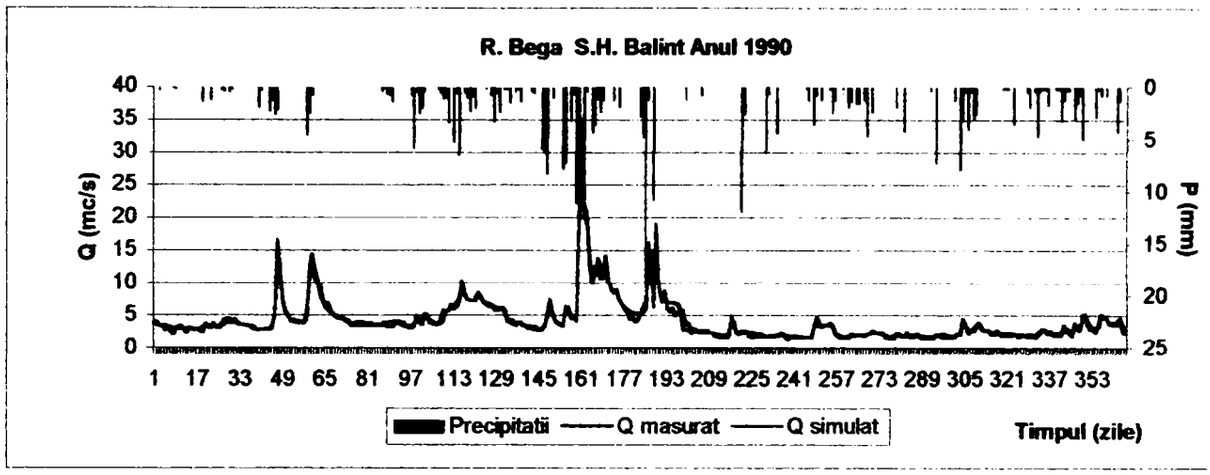
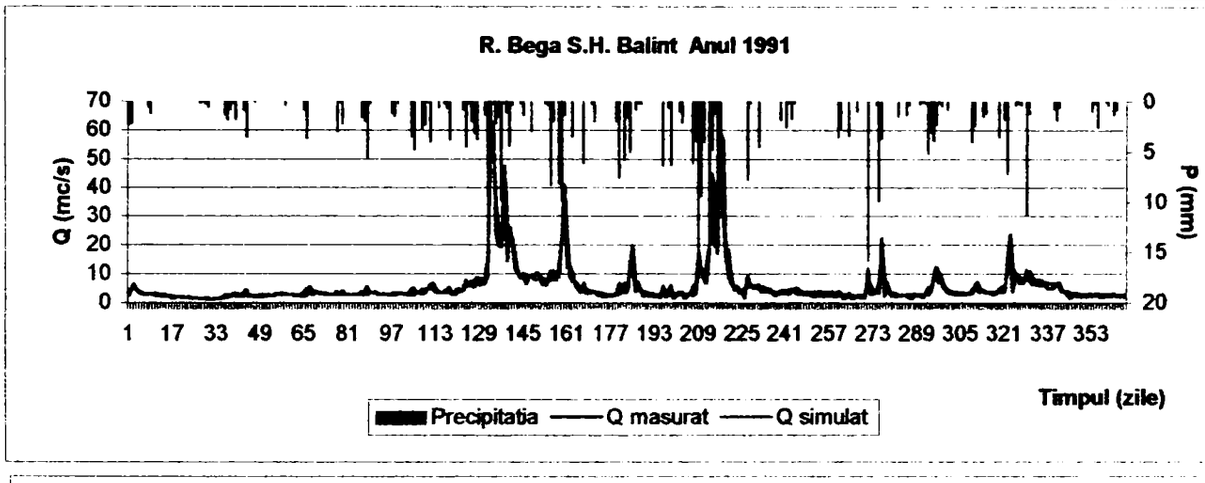
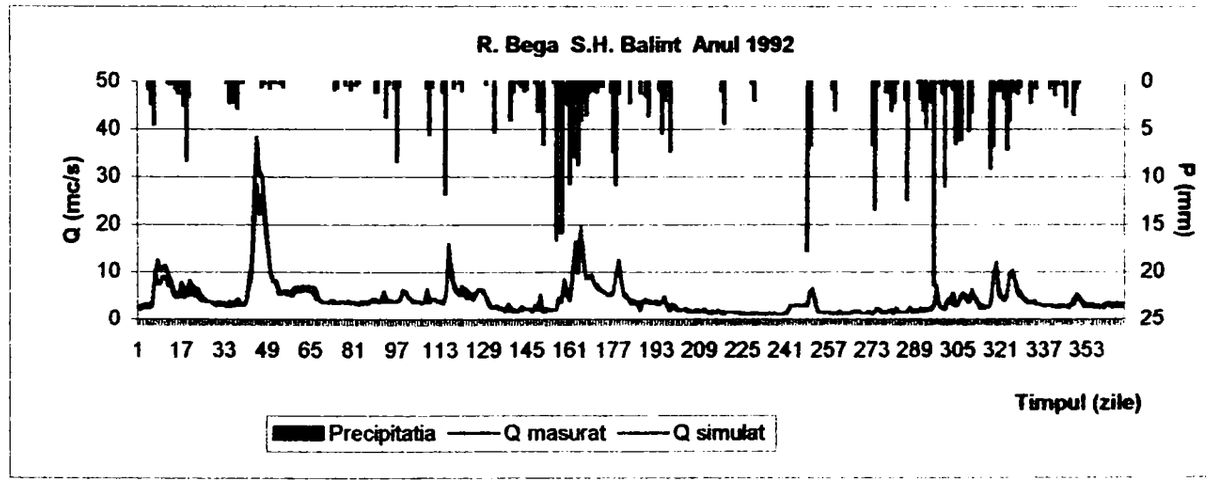


Figura 21. Hidrografele debitelor zilnice observate şi simulate cu modelul LINREG







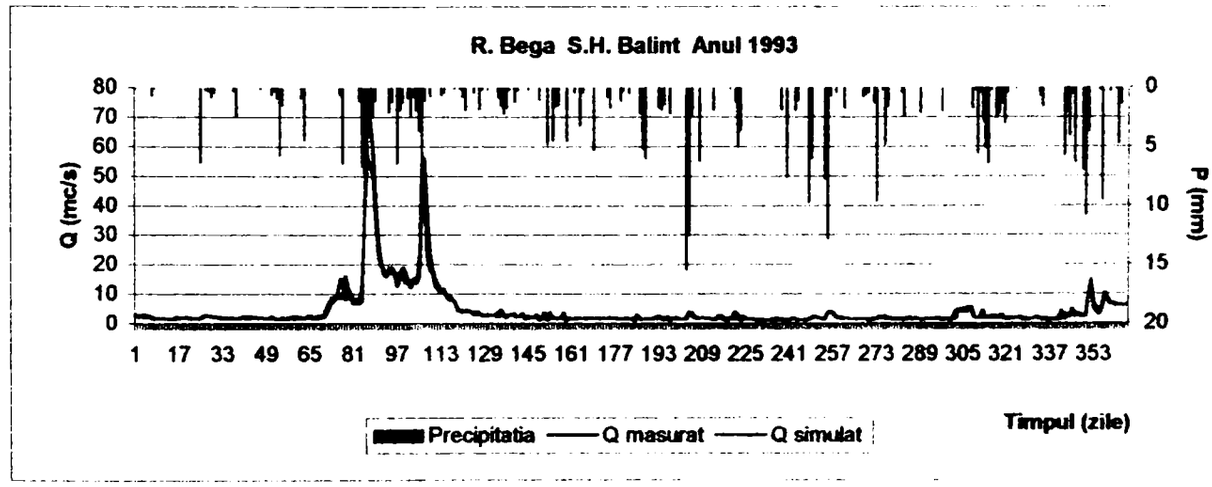
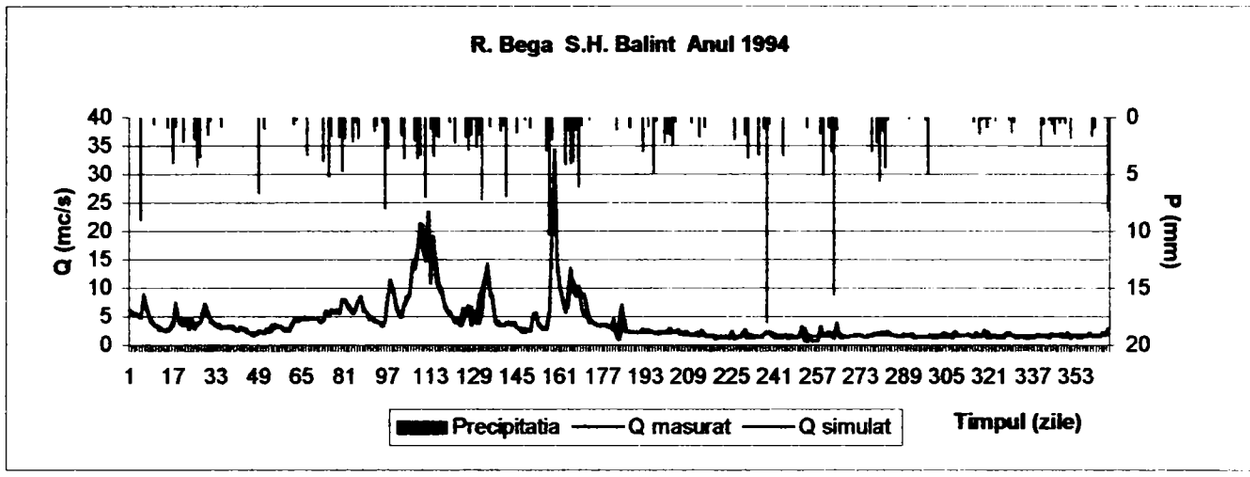
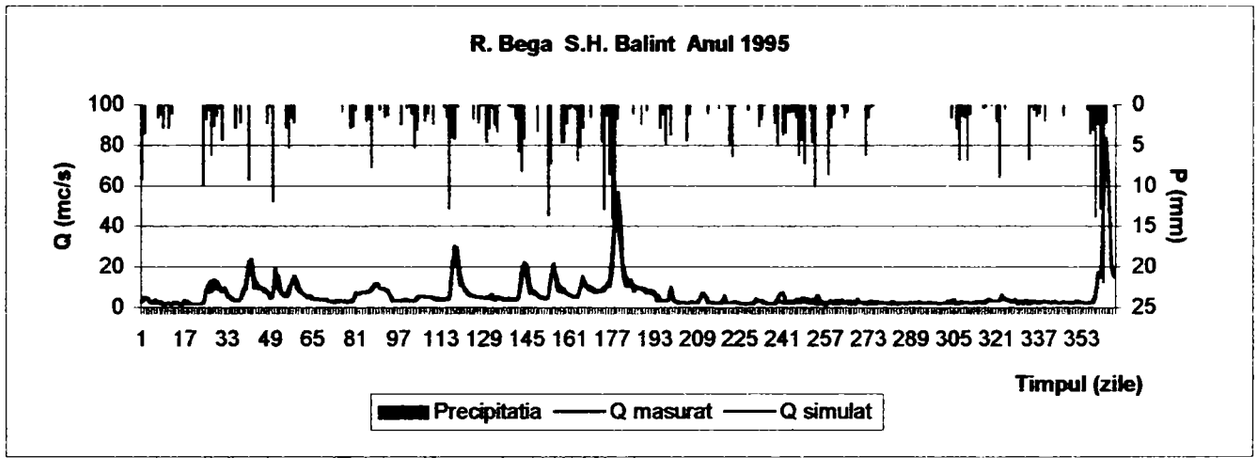
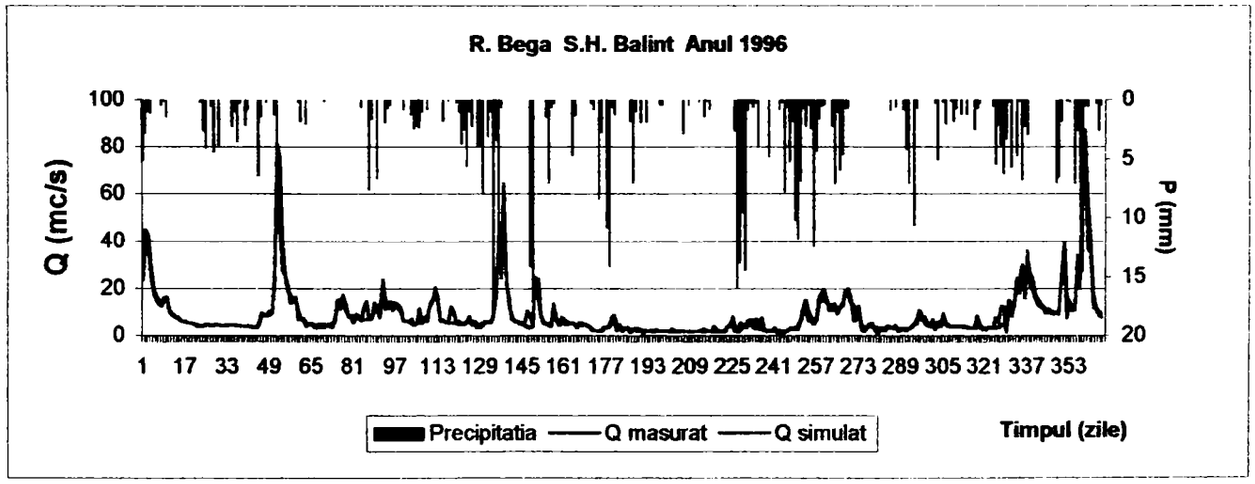


Figura 22. Hidrografele debitelor observate şi simulate cu modelul LPM







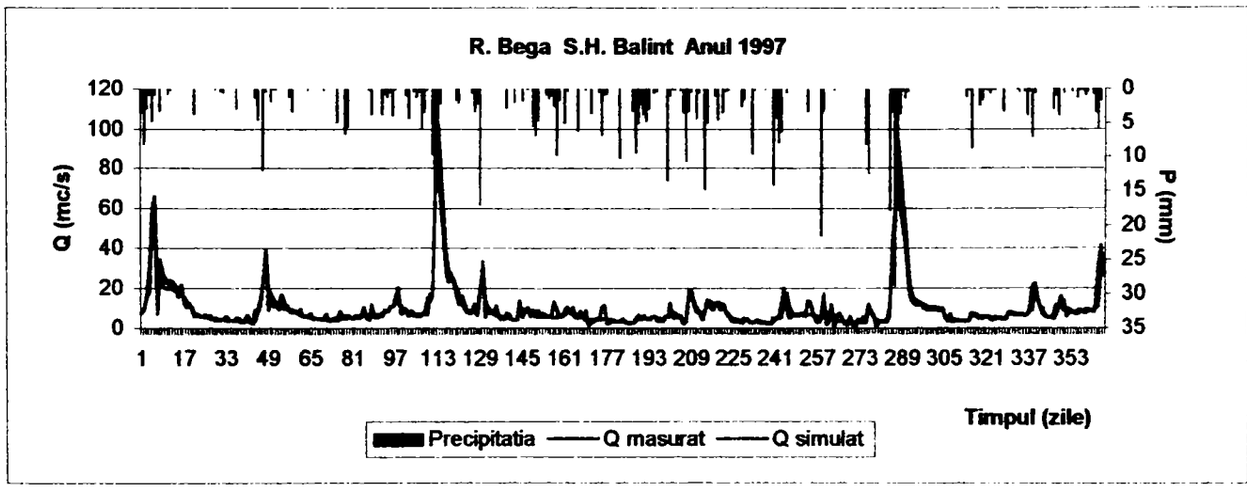
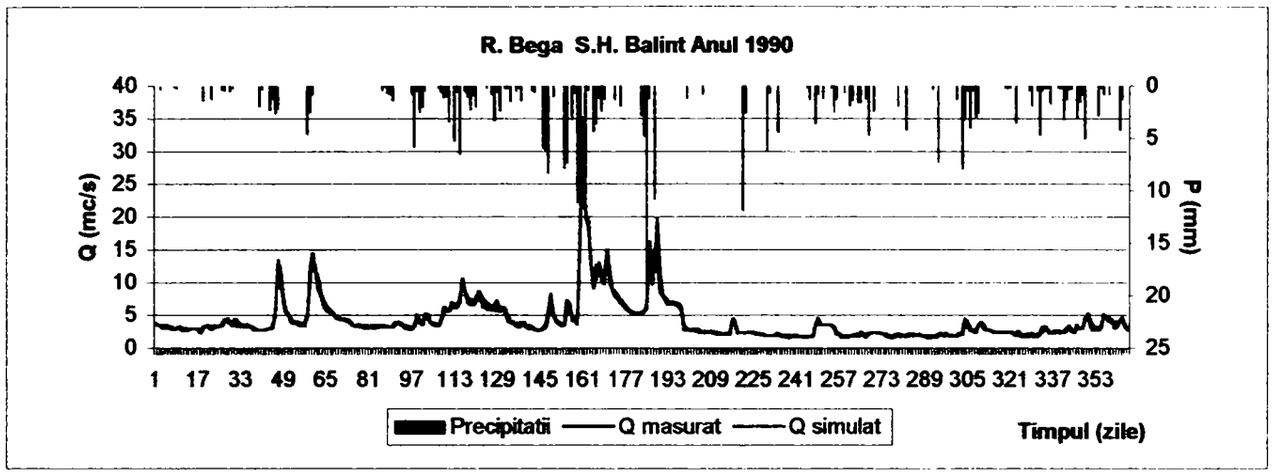
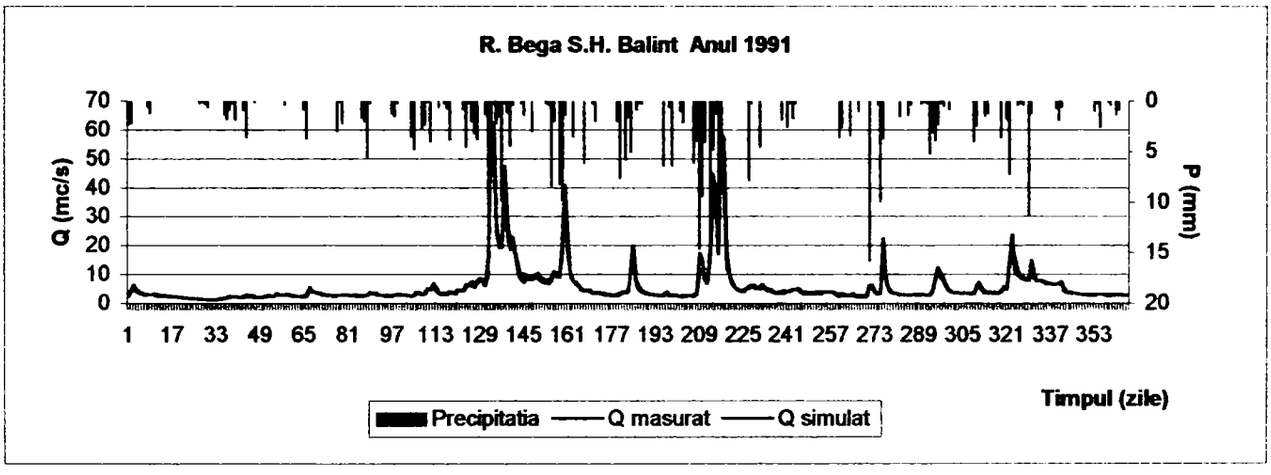
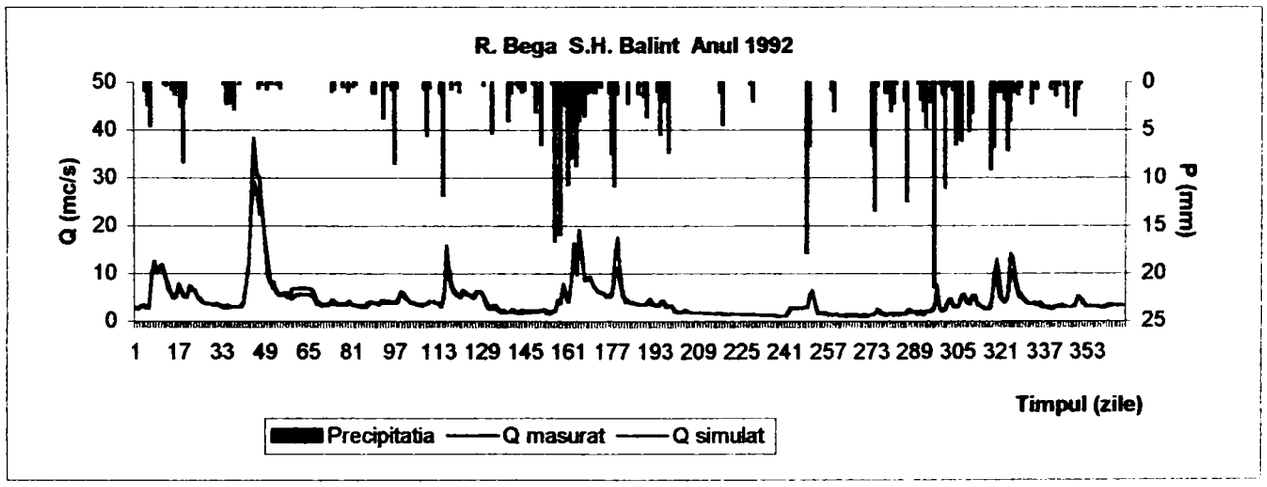


Figura 23. Hidrografele debitelor observate şi simulate cu modelul LPM







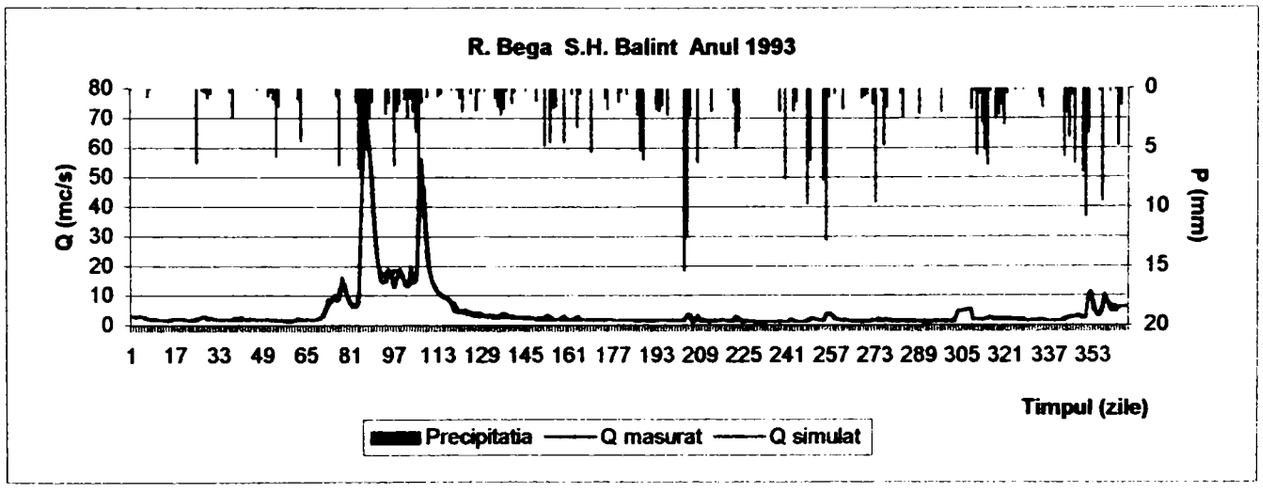
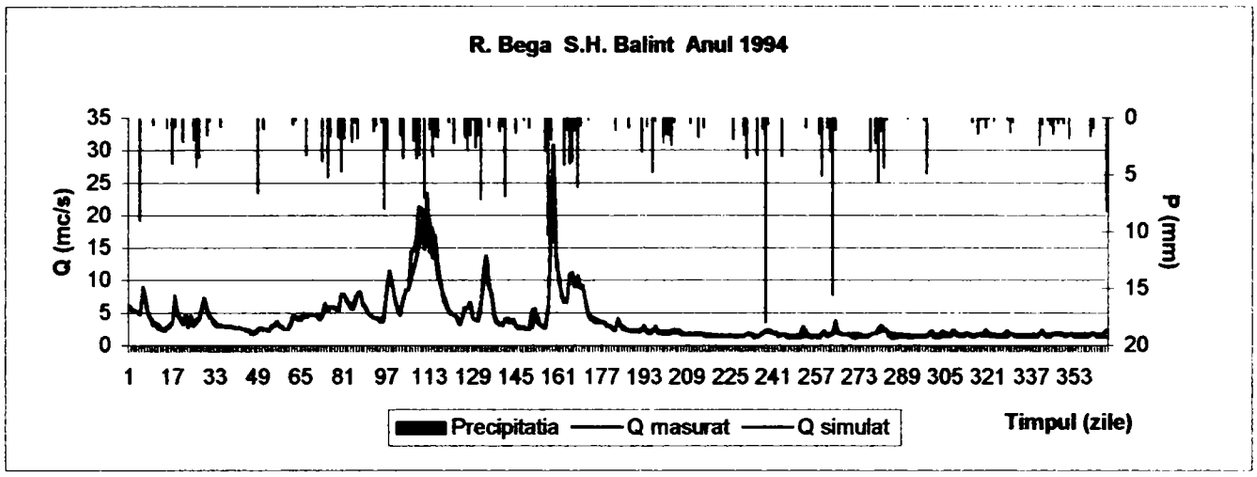
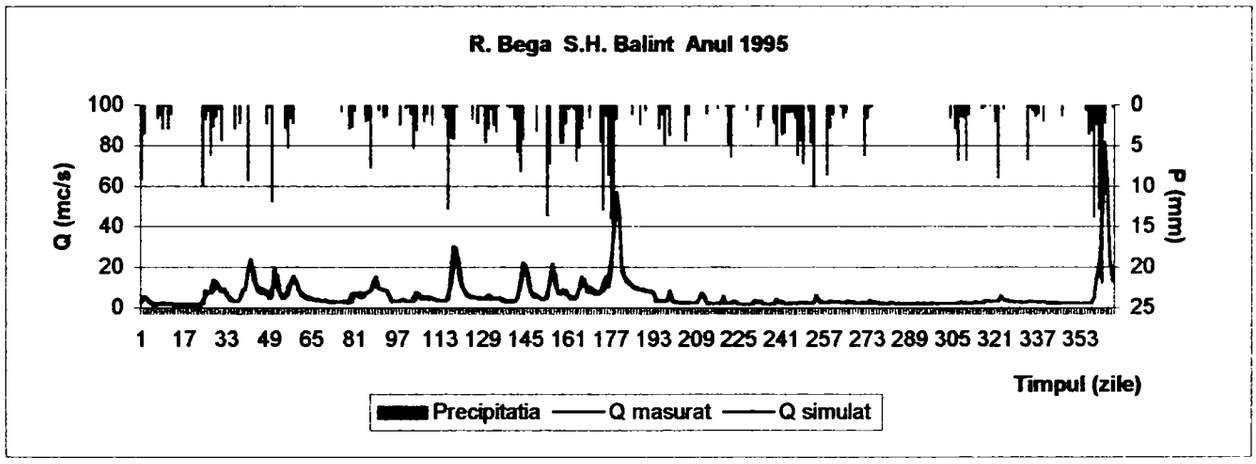
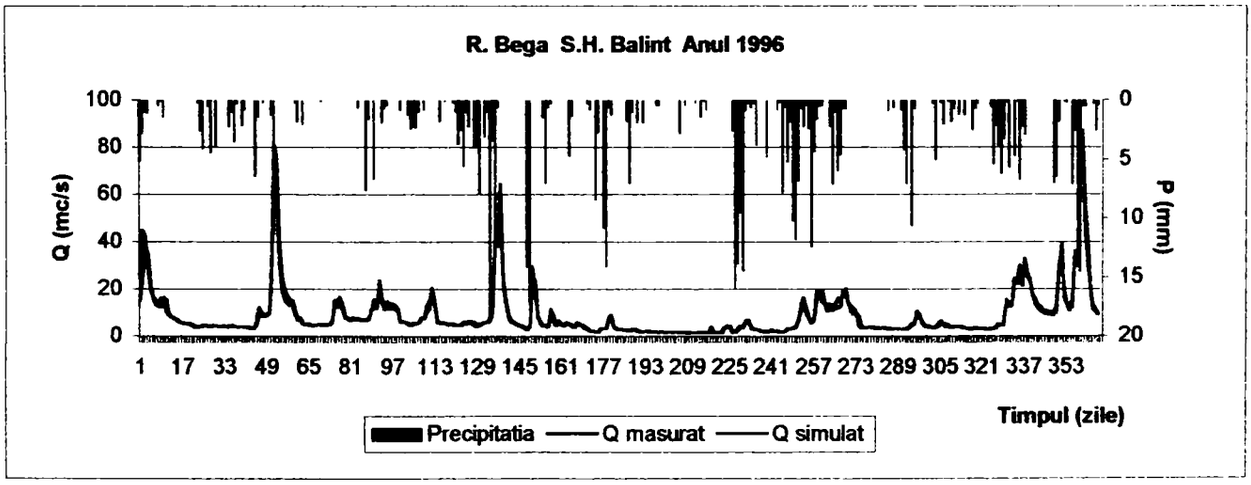


Figura 24. Hidrografele debitelor observate şi simulate cu modelul SMAR







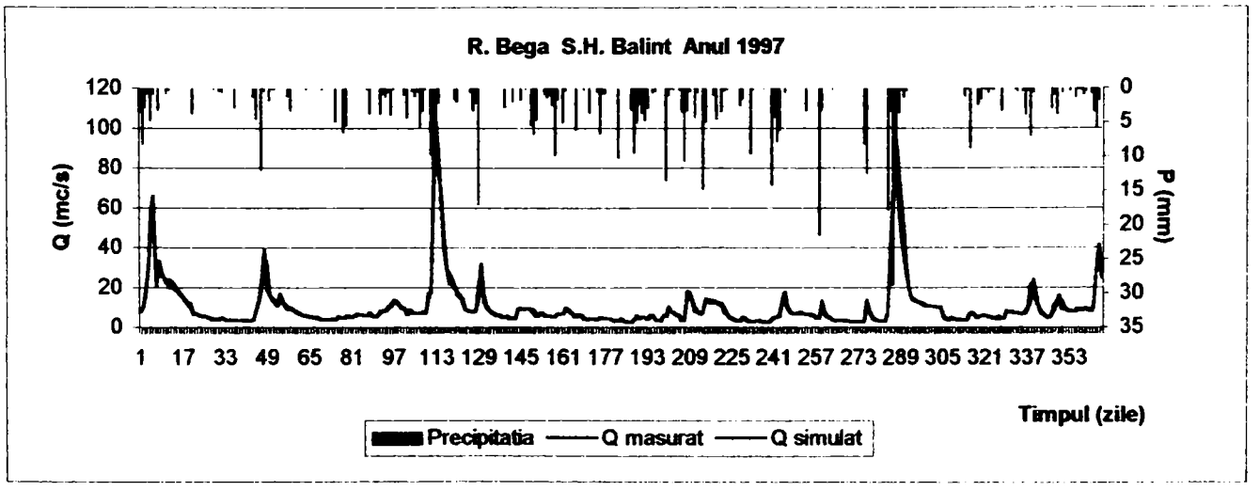
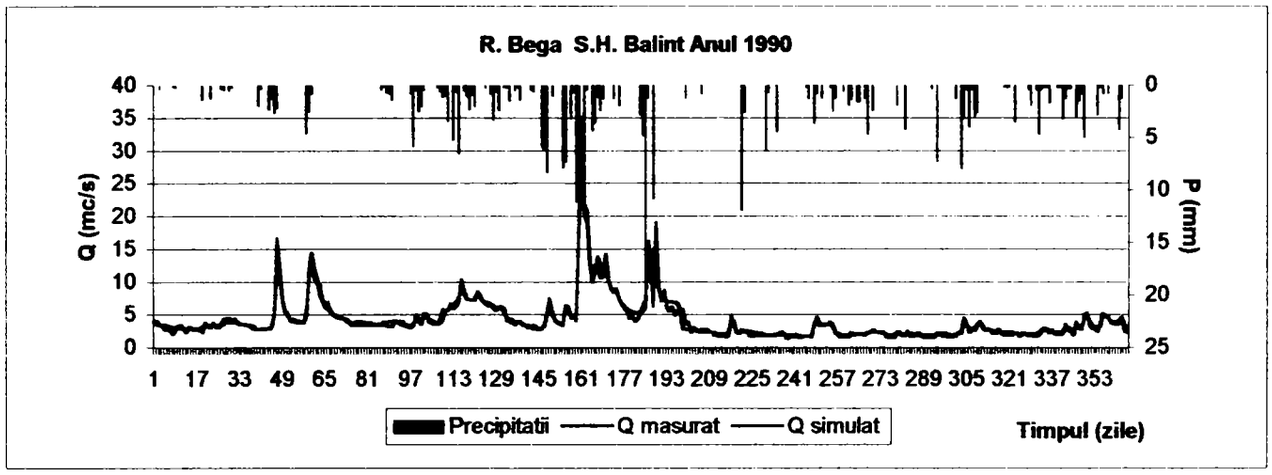
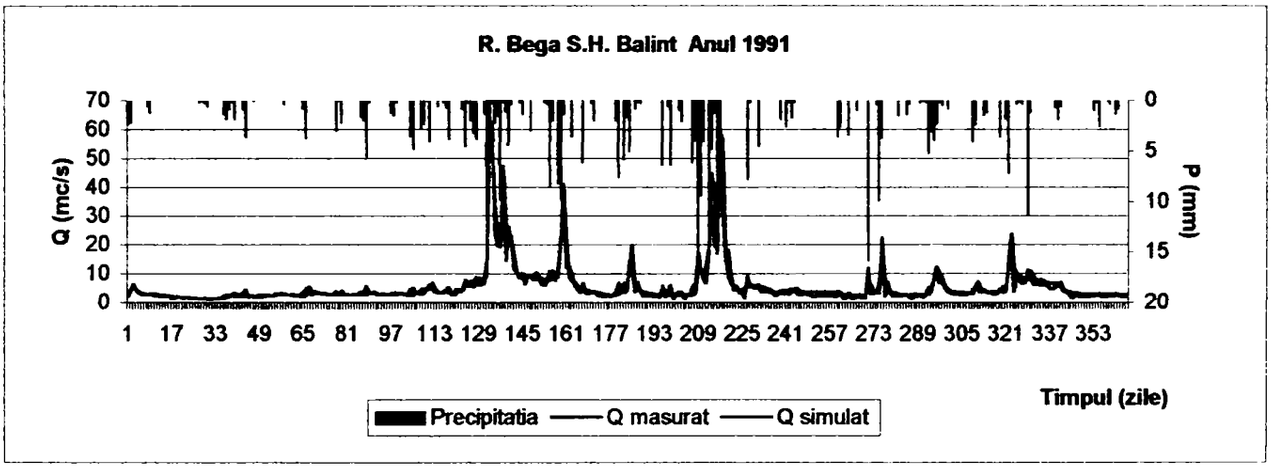
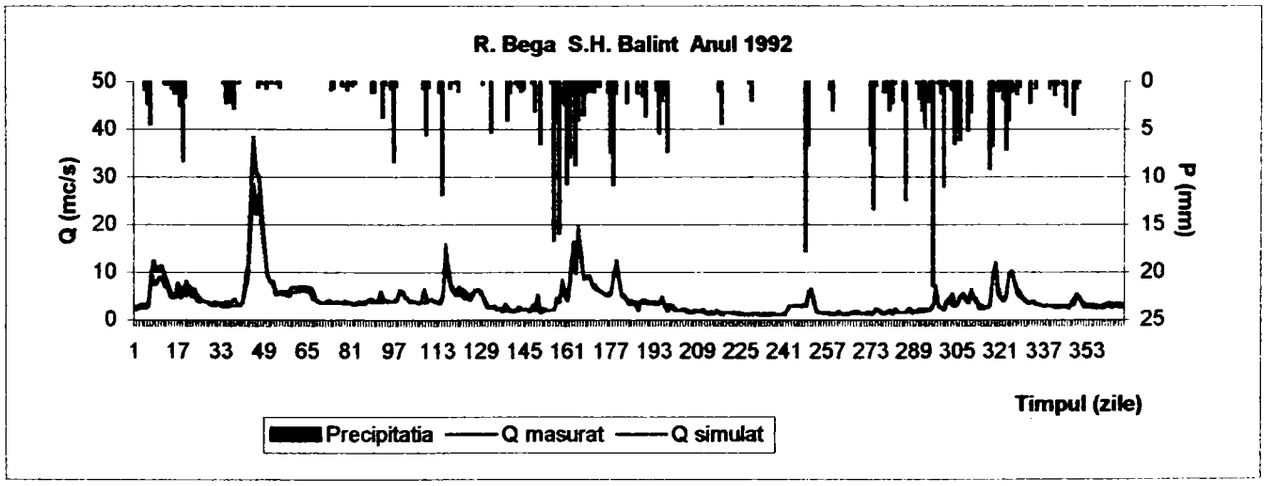


Figura 25. Hidrografele debitelor observate şi simulate cu modelul SMAR







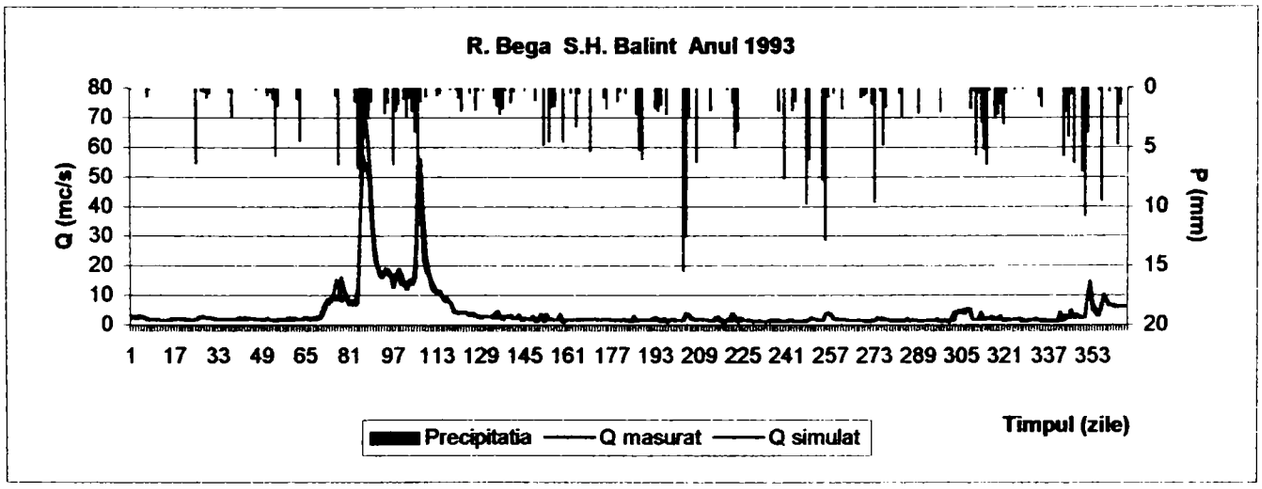


Figura 26. Hidrografele debitelor observate şi simulate cu modelul HEC-HMS

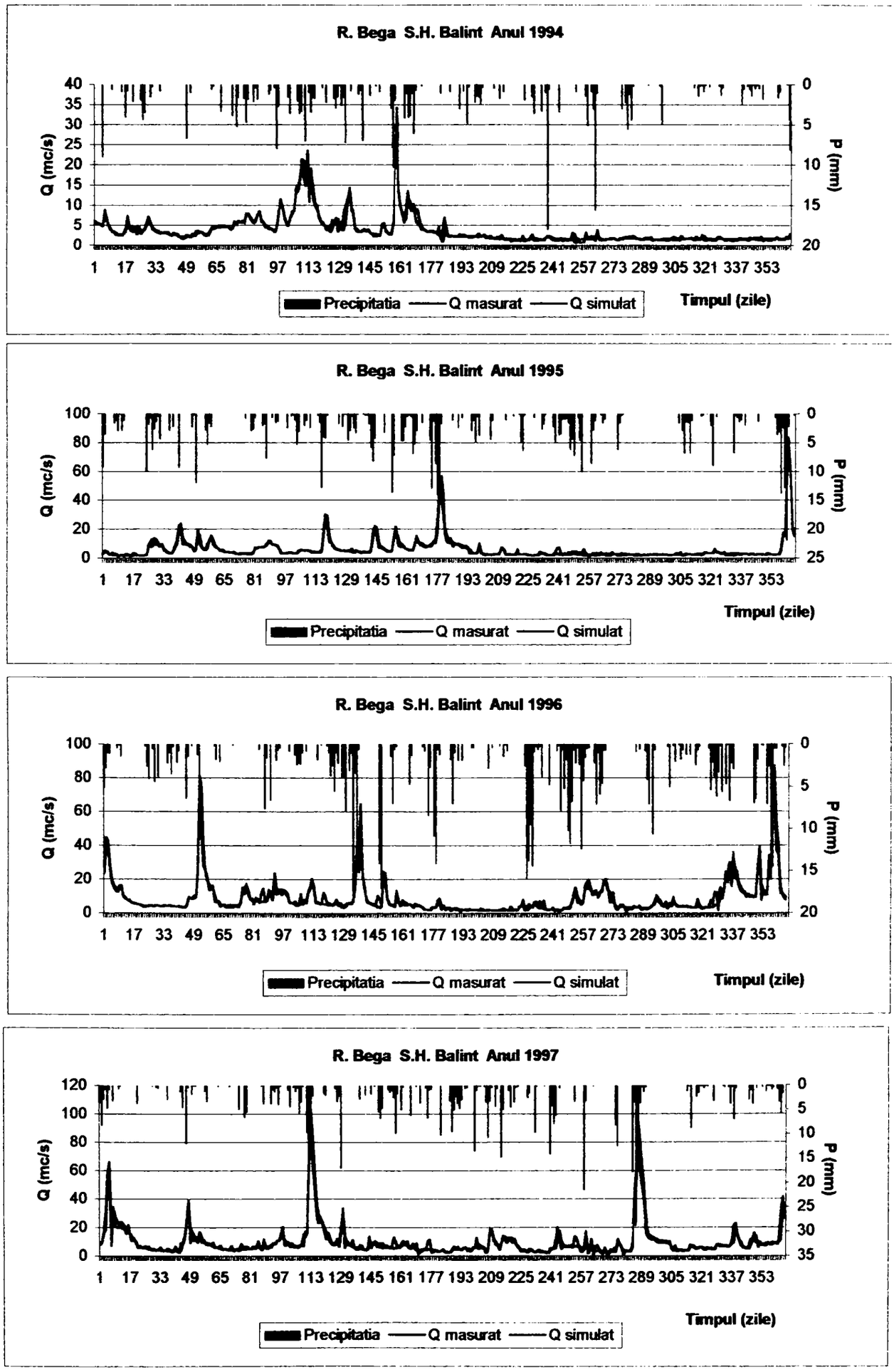


Figura 27. Hidrografele debitelor observate şi simulate cu modelul HEC-HMS

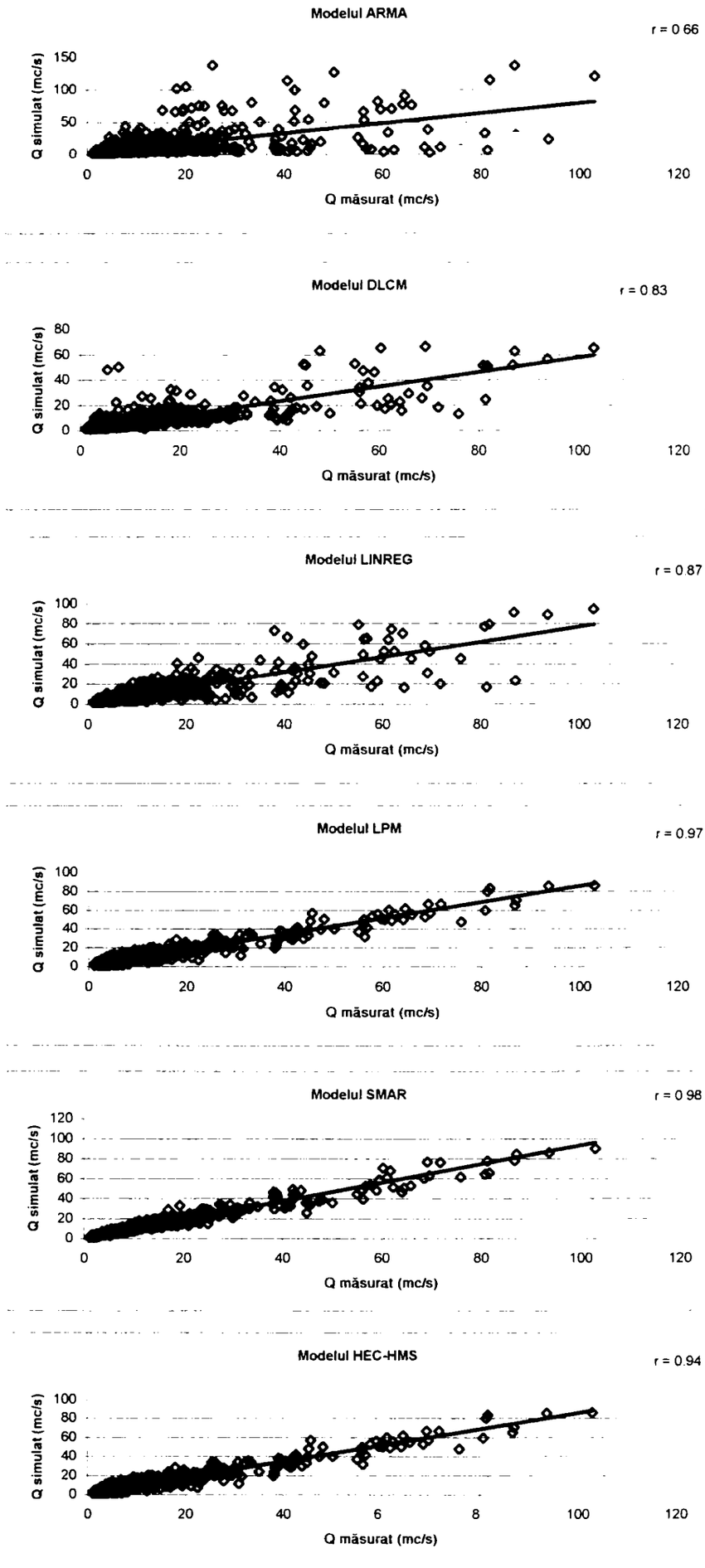


Figura 28. Corelațiile dintre debitele medii zilnice observate și simulate în perioada 1990 -1997 pe râul Bega la stația hidrometrică Balint.

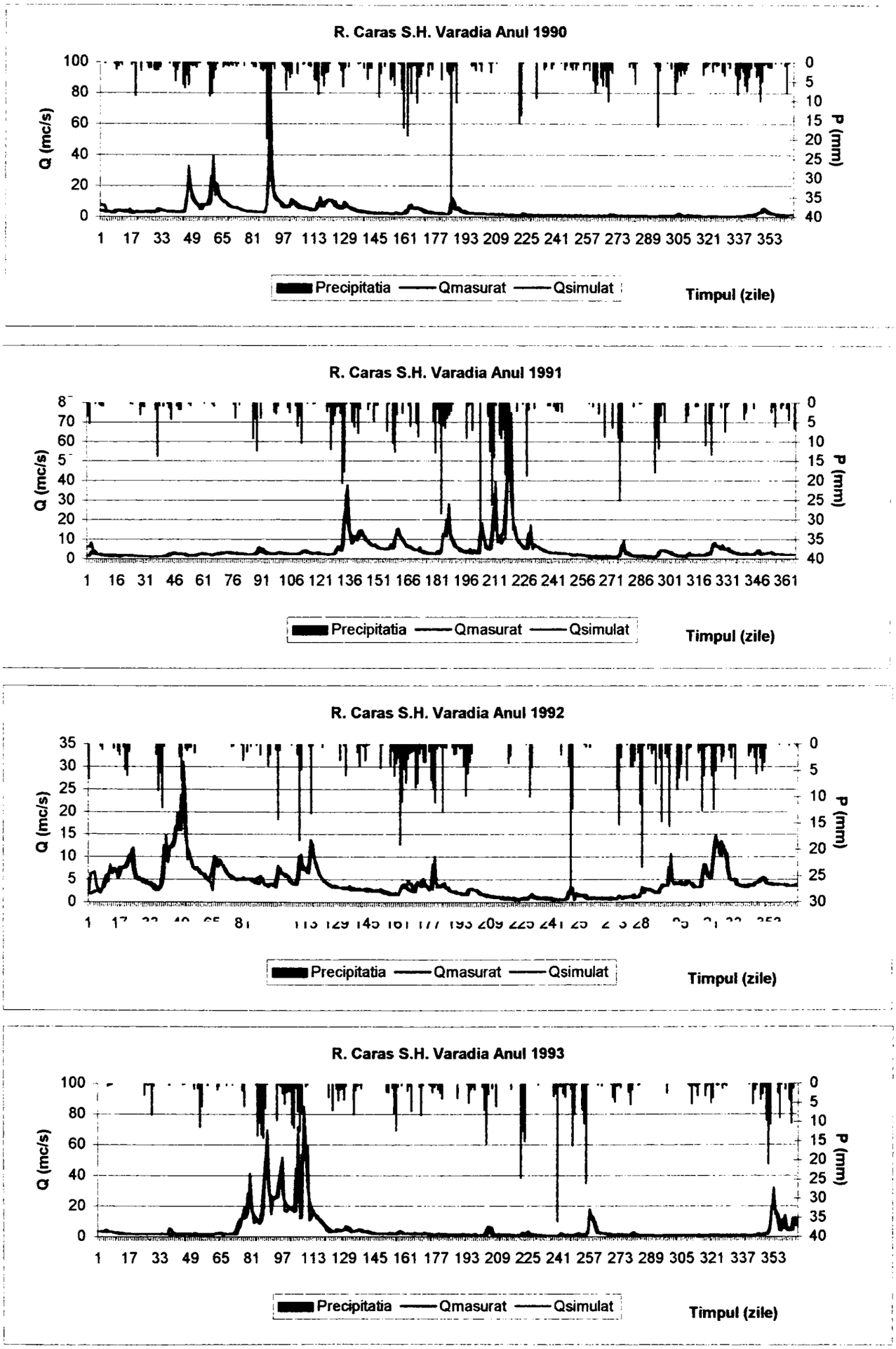


Figura 29. Hidrografele debitelor observate şi simulate cu modelul ARMA

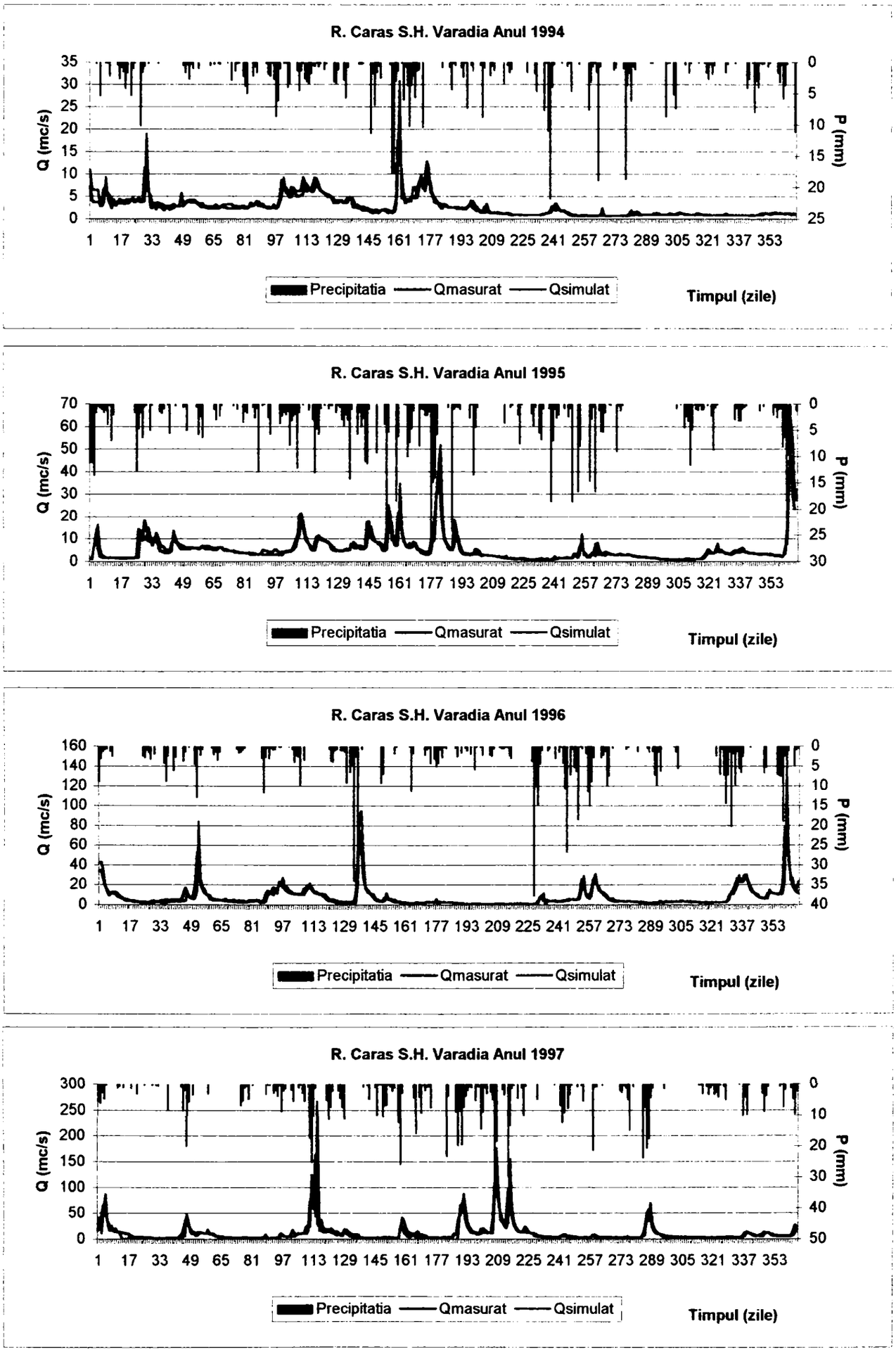


Figura 30. Hidrografele debitelor observate şi simulate cu modelul ARMA

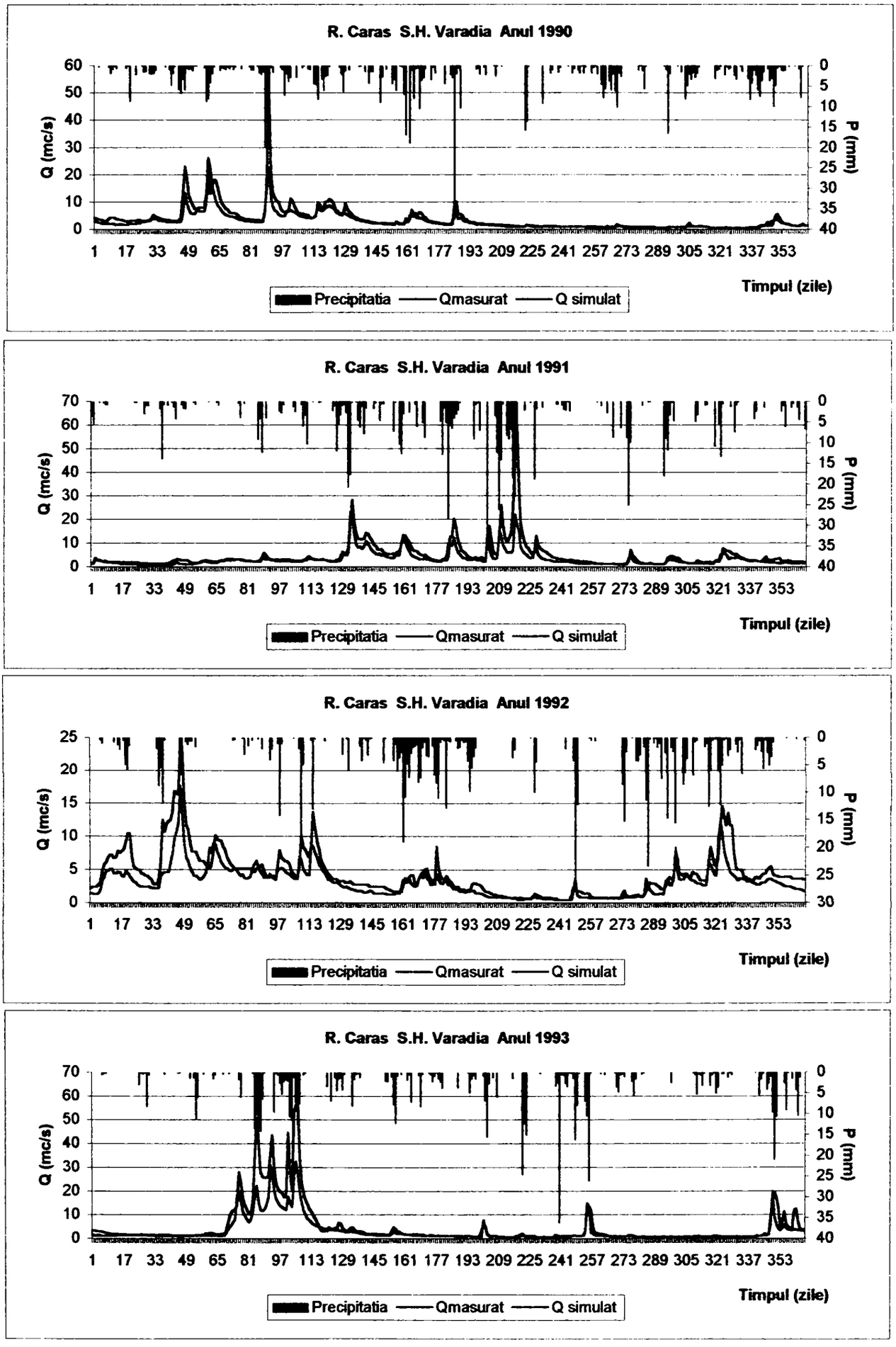


Figura 31. Hidrografele debitelor zilnice observate şi simulate cu modelul DLCM

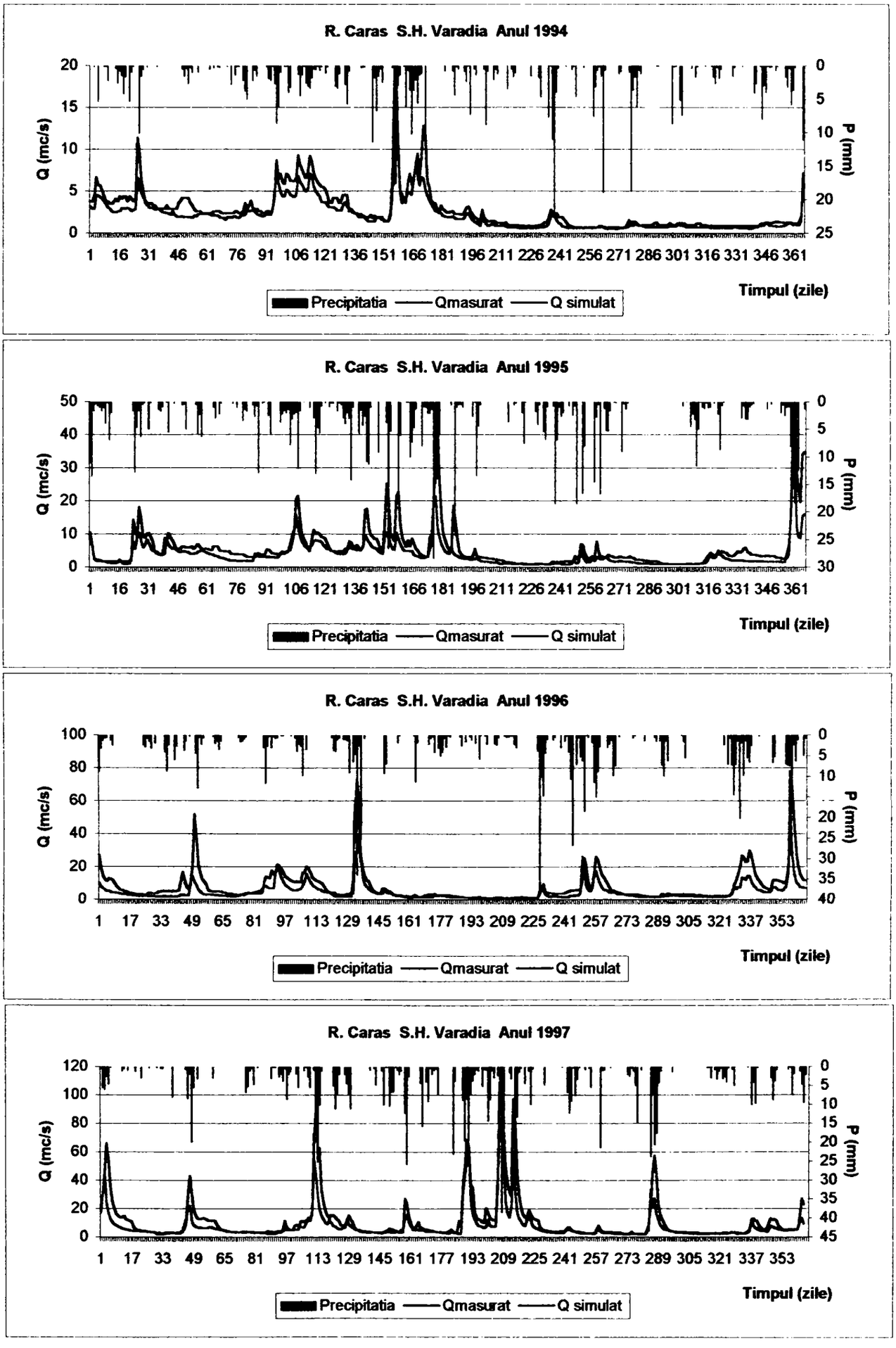


Figura 32. Hidrografele debitelor zilnice observate şi simulate cu modelul DLCM

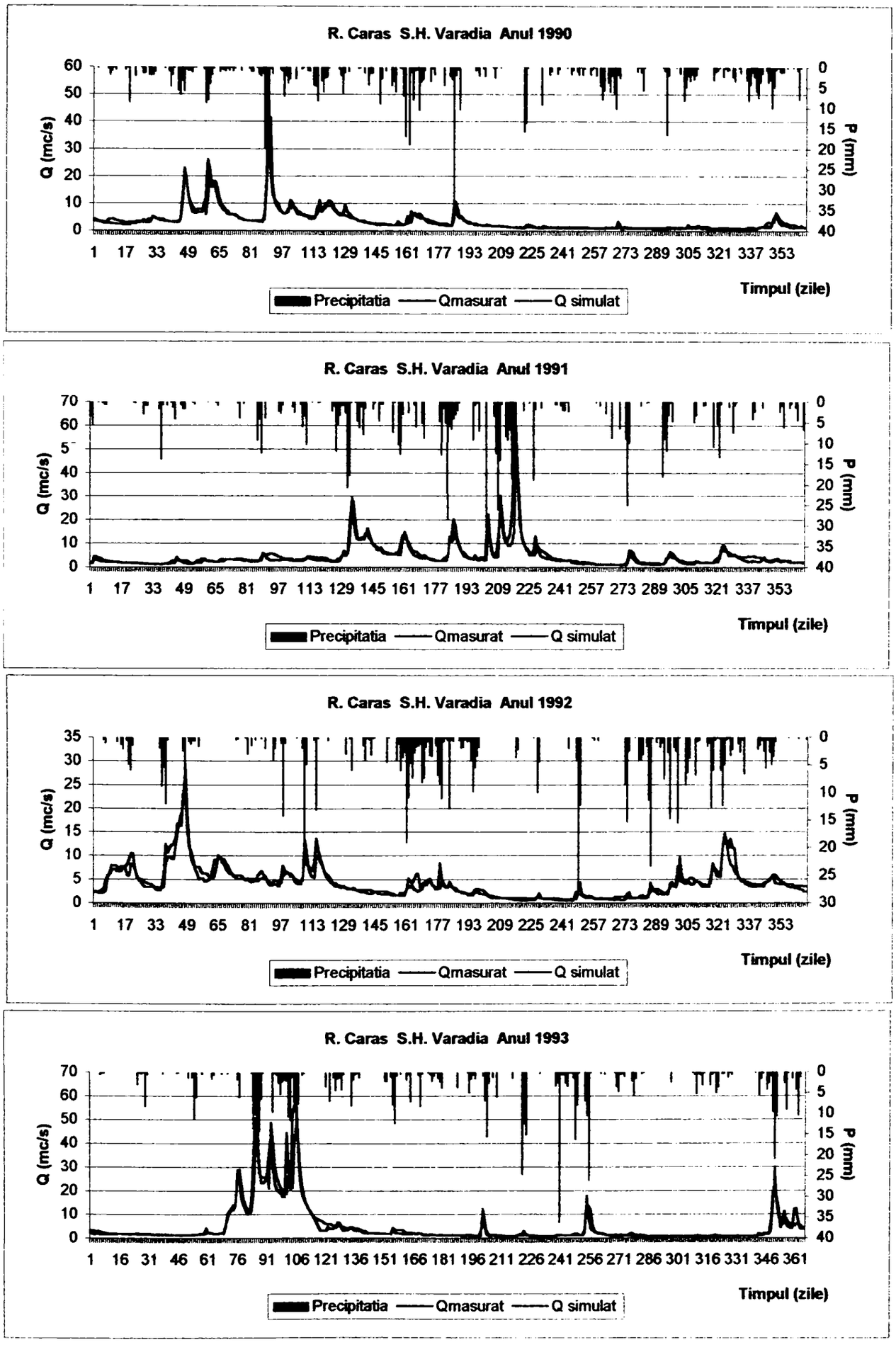


Figura 33. Hidrografele debitelor zilnice observate şi simulate cu modelul LINREG

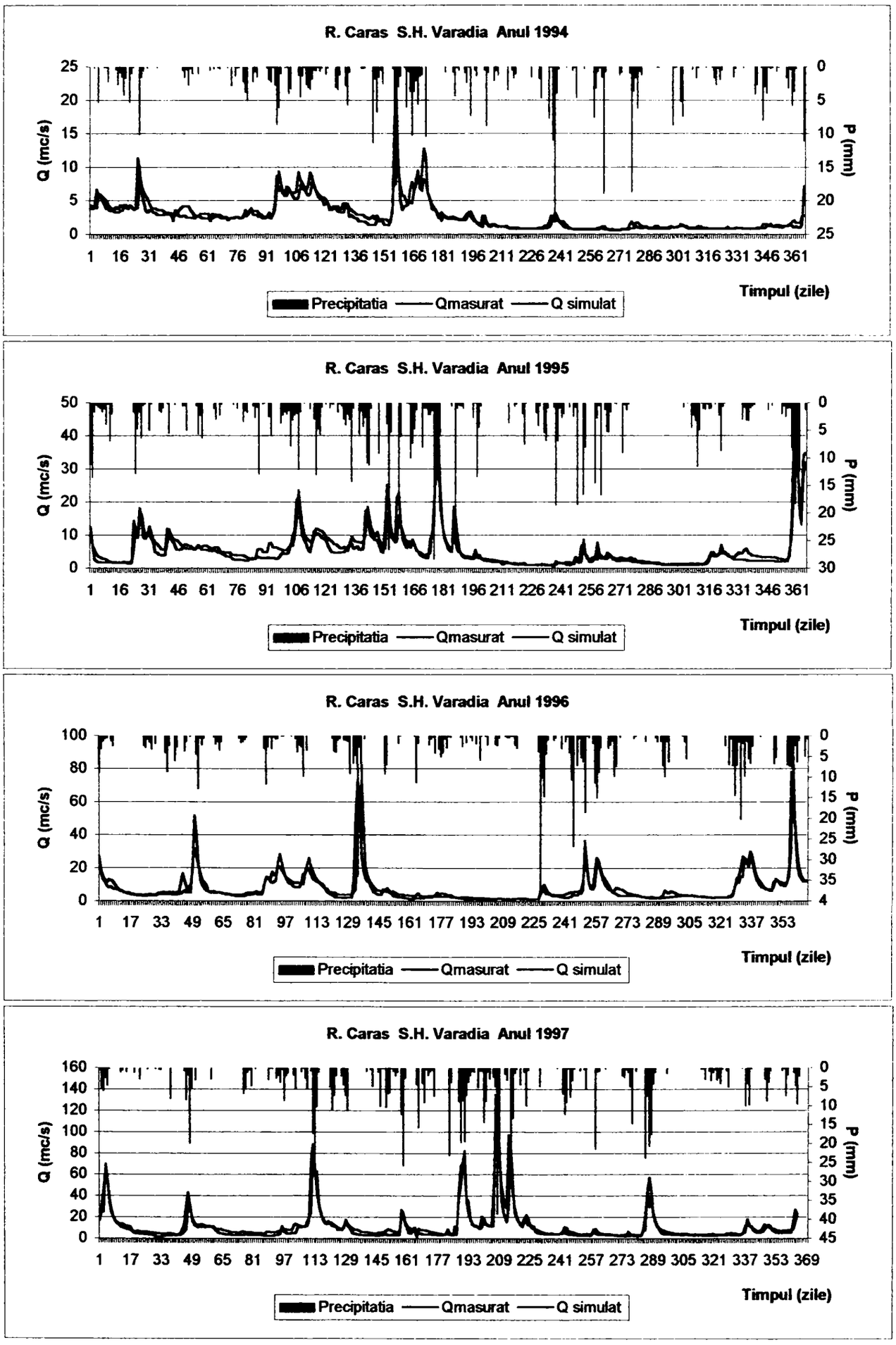


Figura 34. Hidrografele debitelor zilnice observate şi simulate cu modelul LINREG

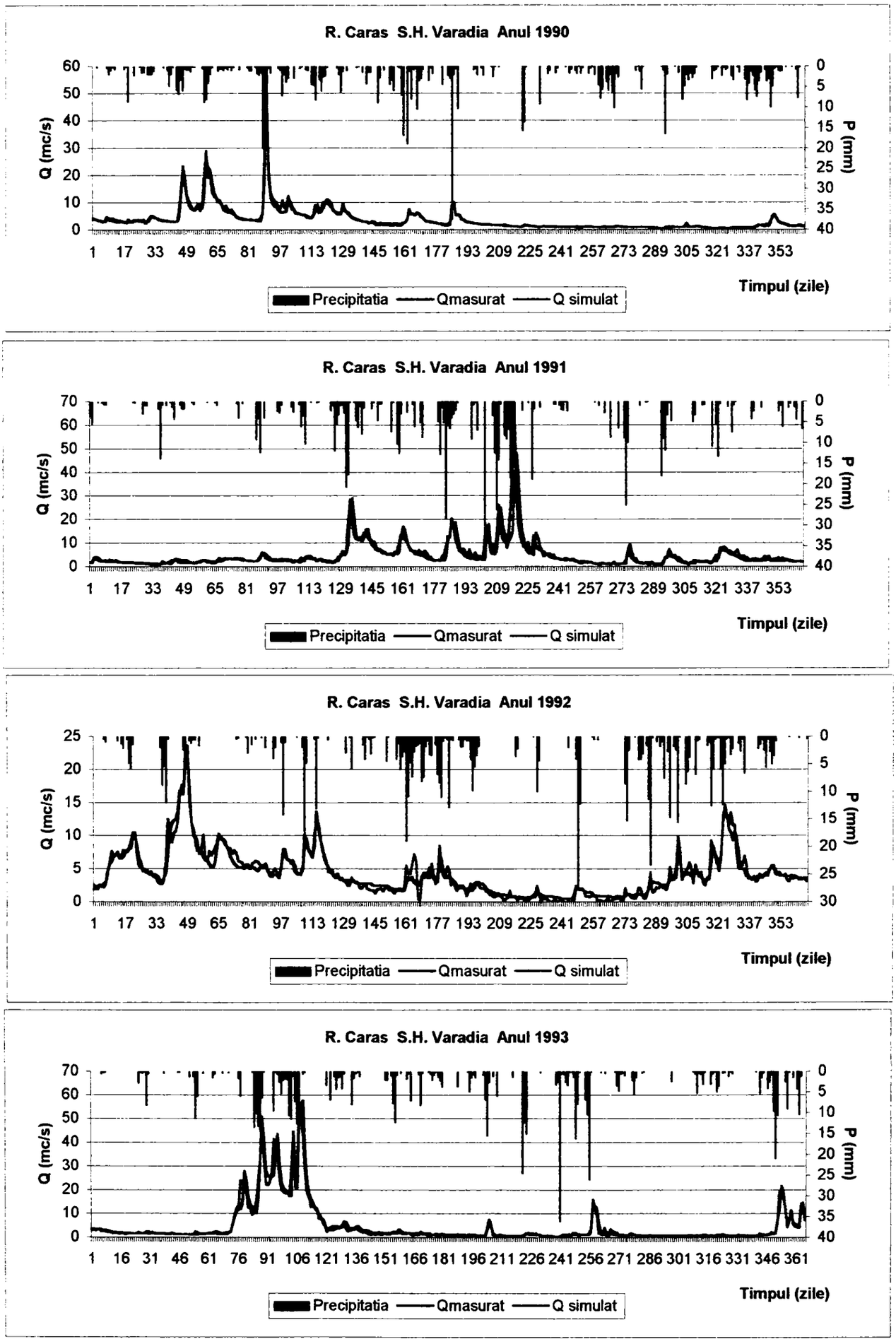


Figura 35. Hidrografele debitelor medii zilnice observate și simulate cu modelul LPM

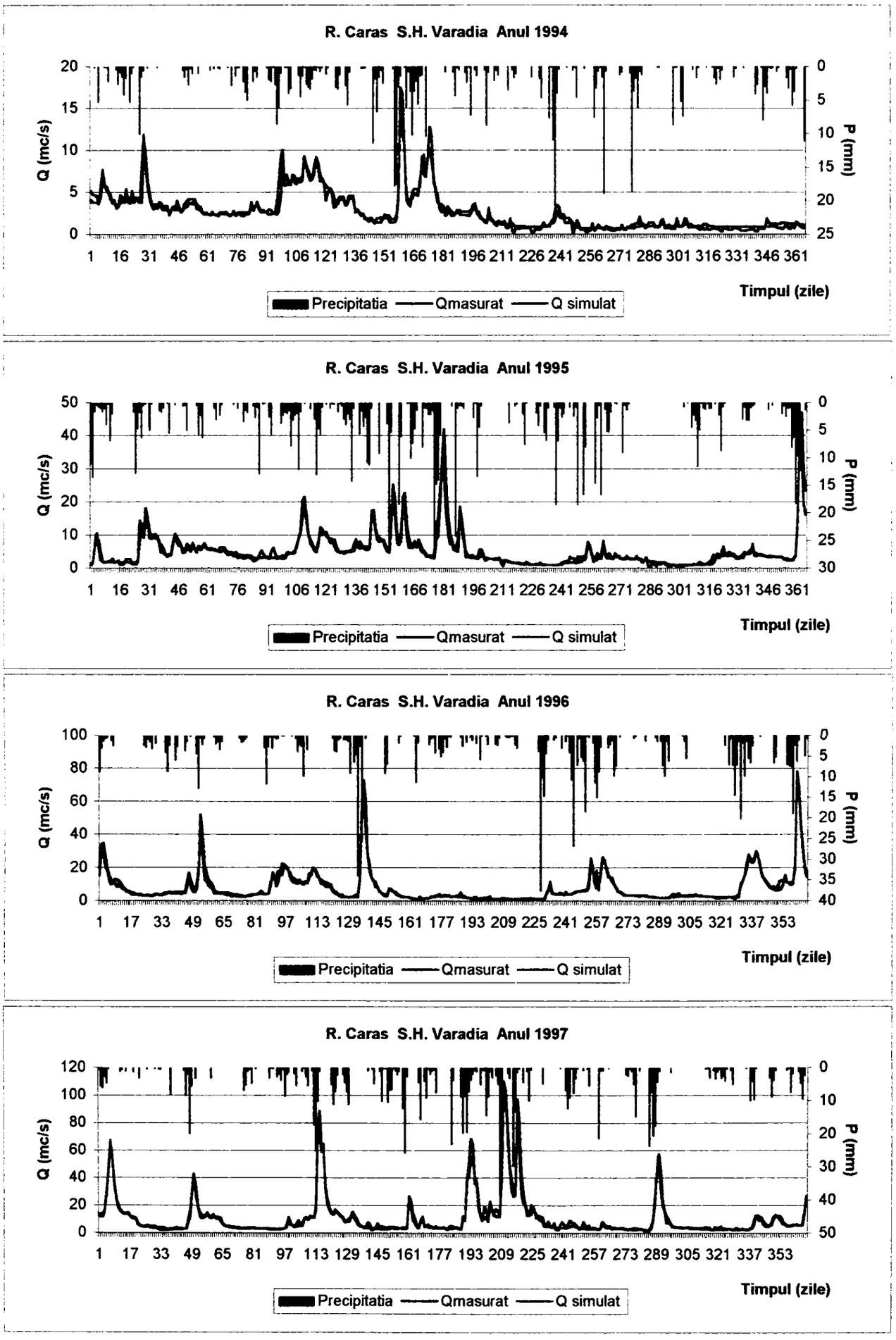
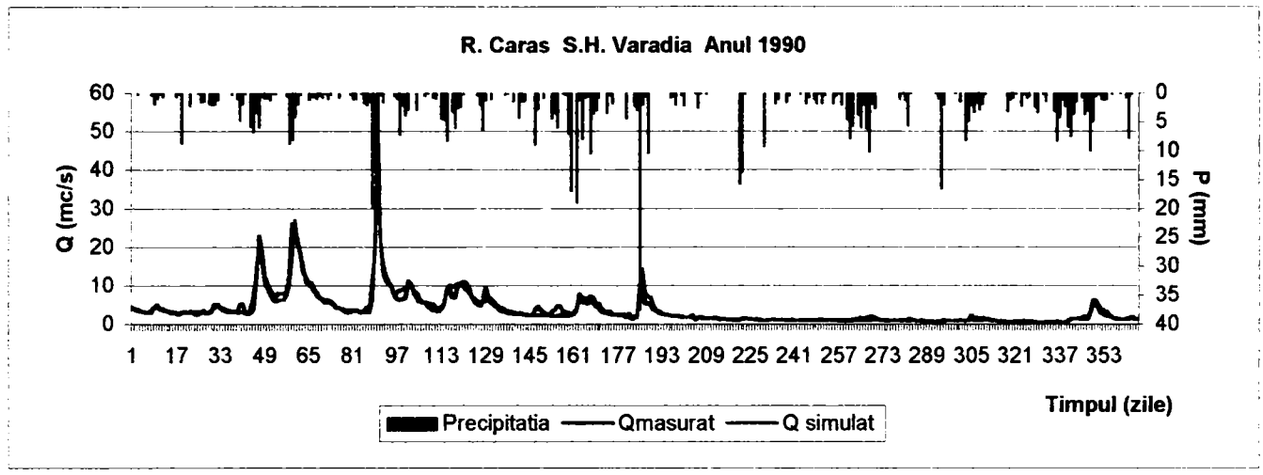
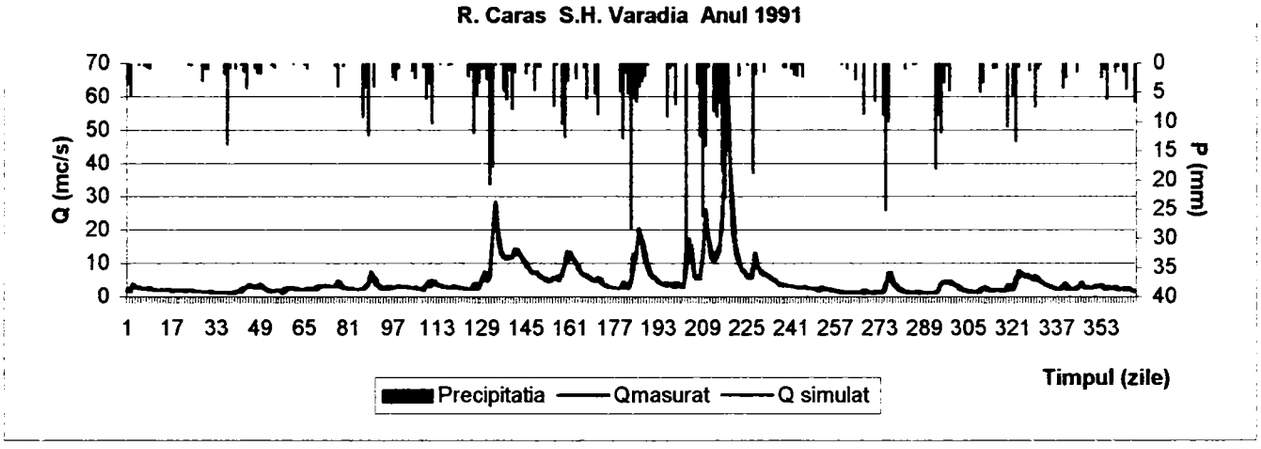
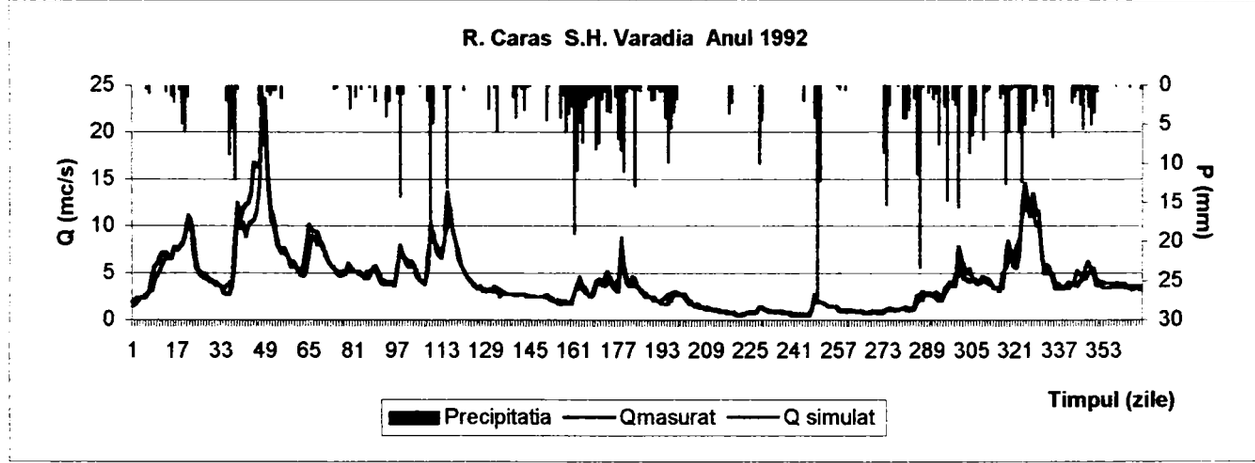


Figura 36. Hidrografele debitelor medii zilnice observate şi simulate cu modelul LPM







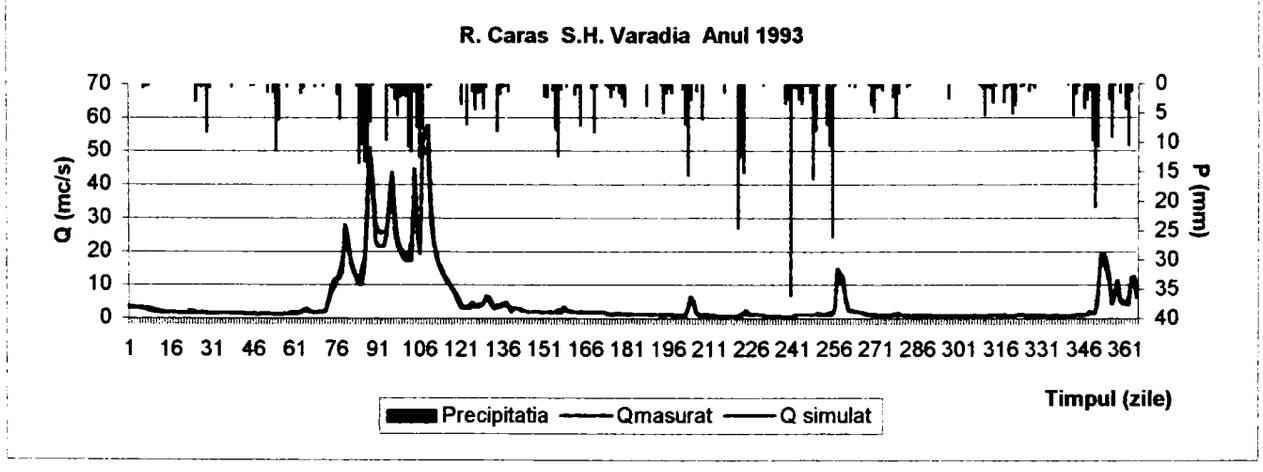


Figura 37. Hidrografele debitelor medii zilnice observate şi simulate cu modelul SMAR

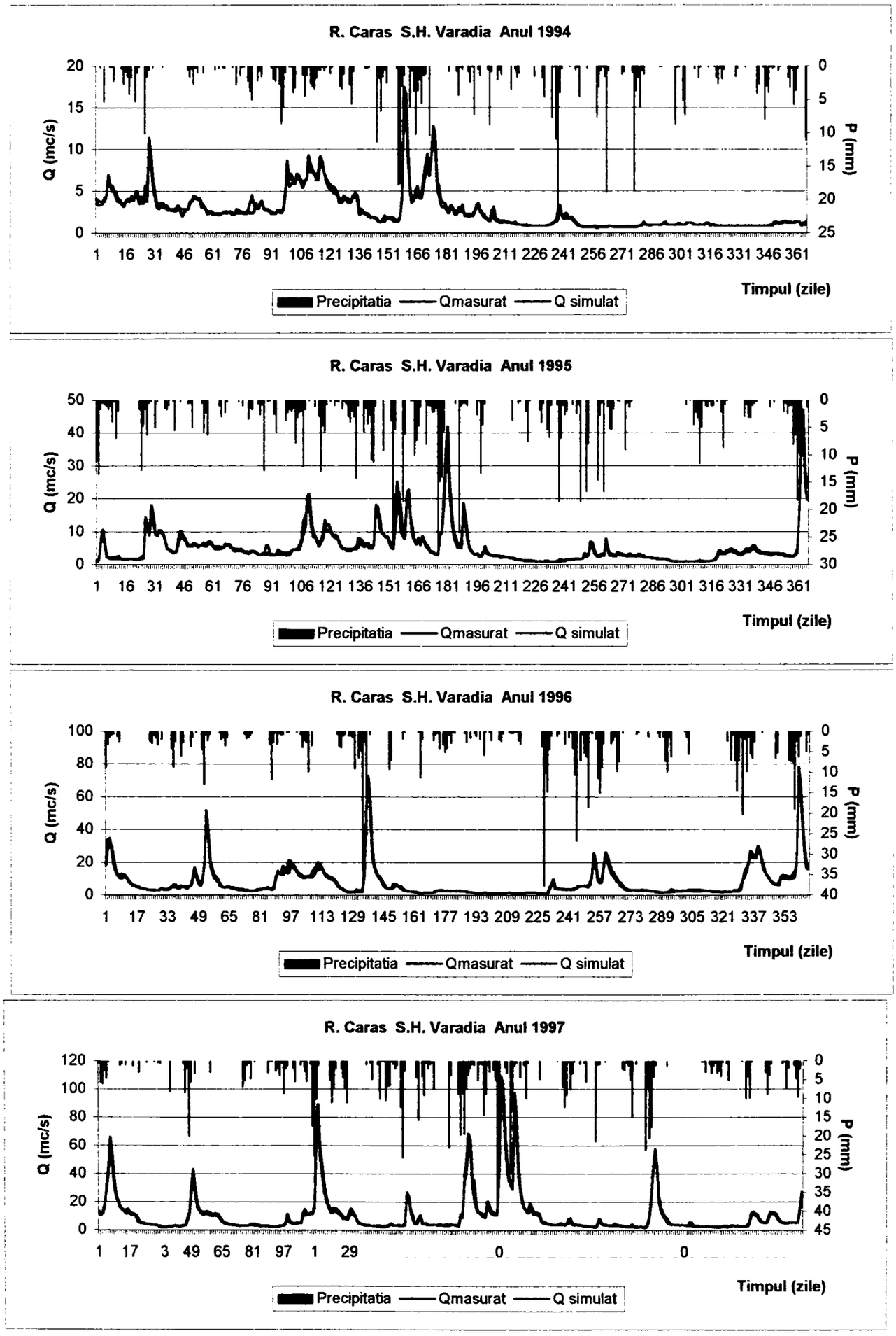


Figura 38. Hidrografele debitelor medii zilnice observate şi simulate cu modelul SMAR

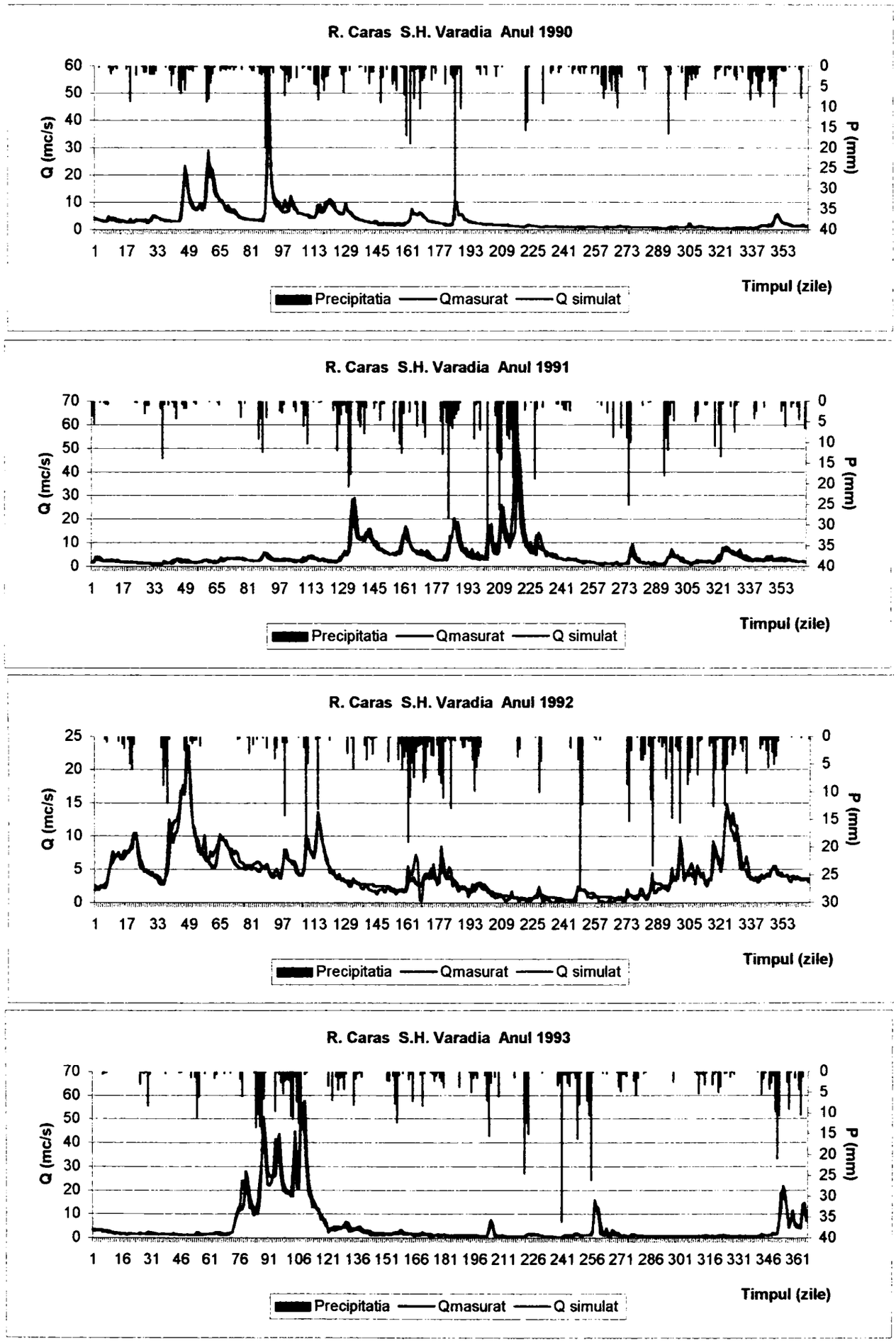


Figura 39. Hidrografele debitelor medii zilnice observate şi simulate cu modelul HEC-HMS

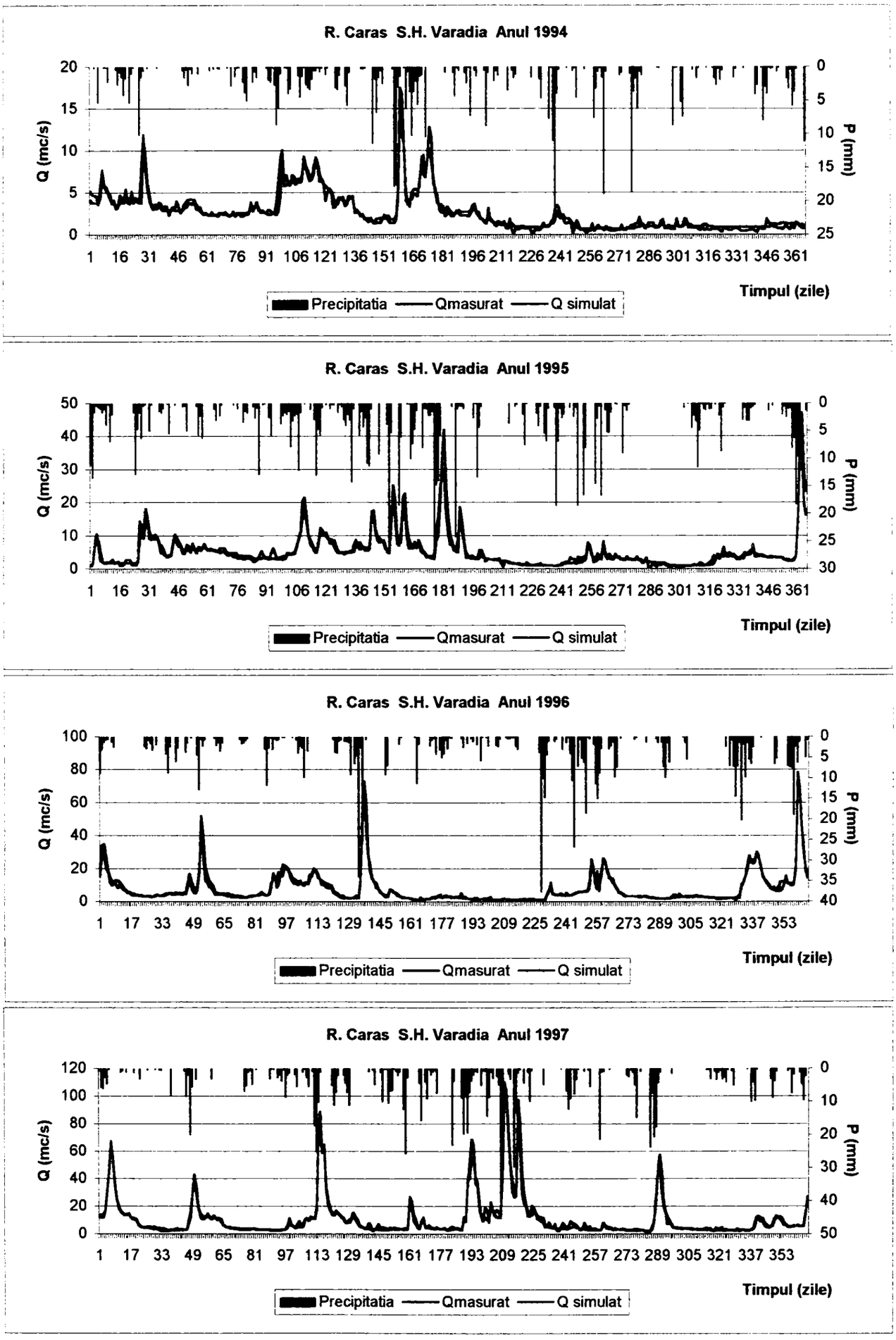


Figura 40. Hidrografele debitelor medii zilnice observate și simulate cu modelul HEC-HMS

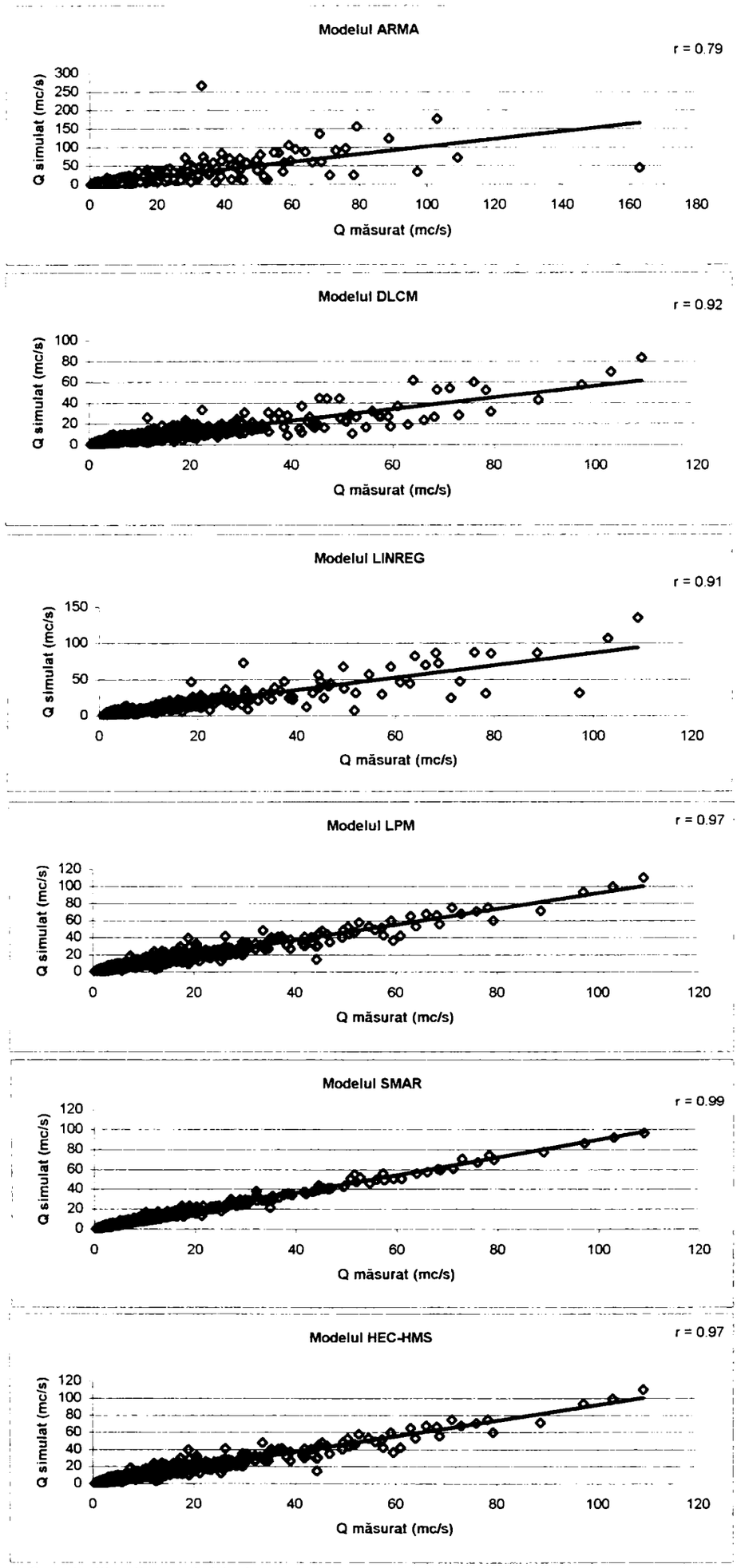


Figura 41. Corelaţiile dintre debitele medii zilnice observate şi simulate în perioada 1990 - 1997 pe râul Caraş la staţia hidrometrică Vărădia.

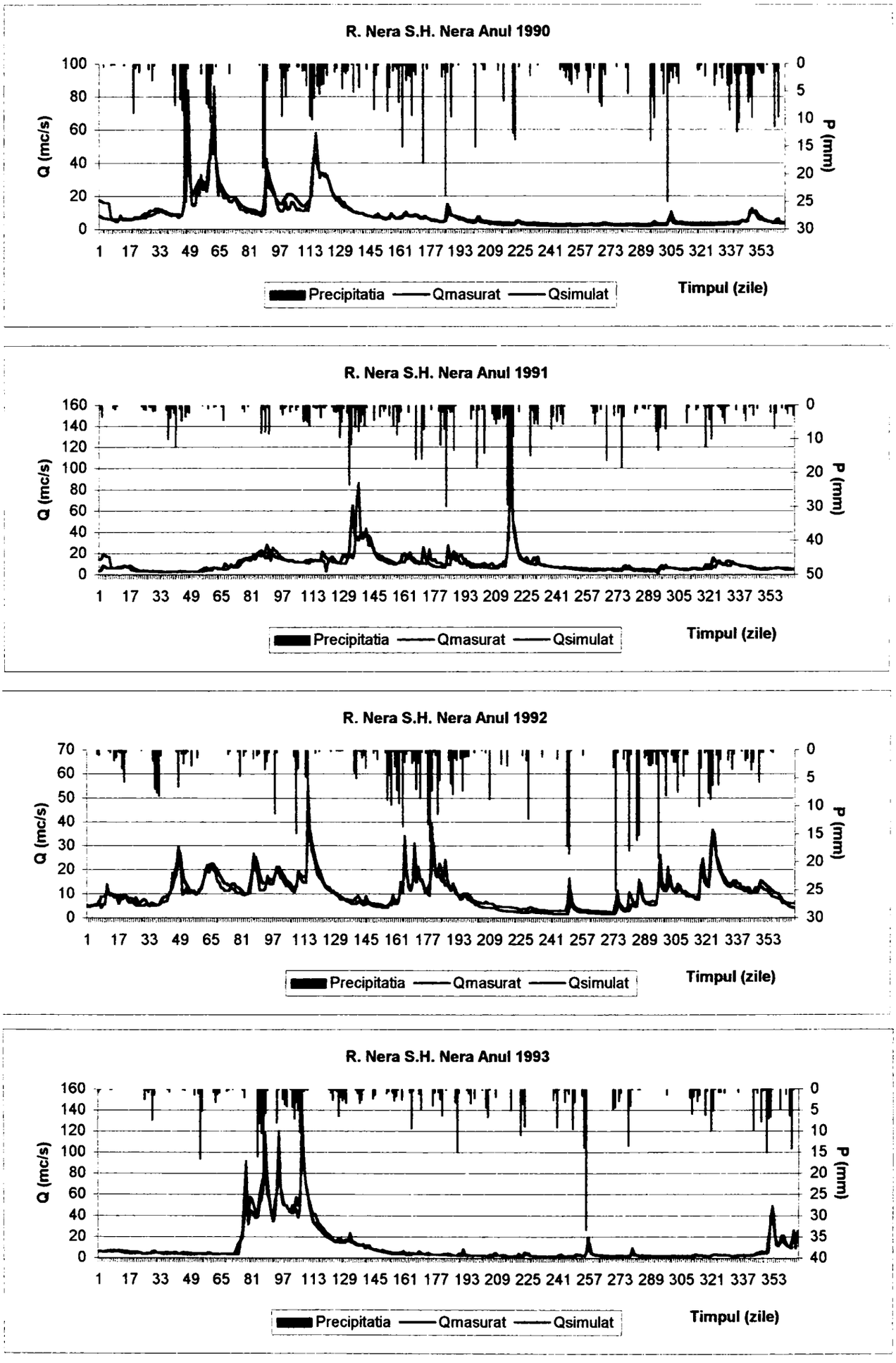
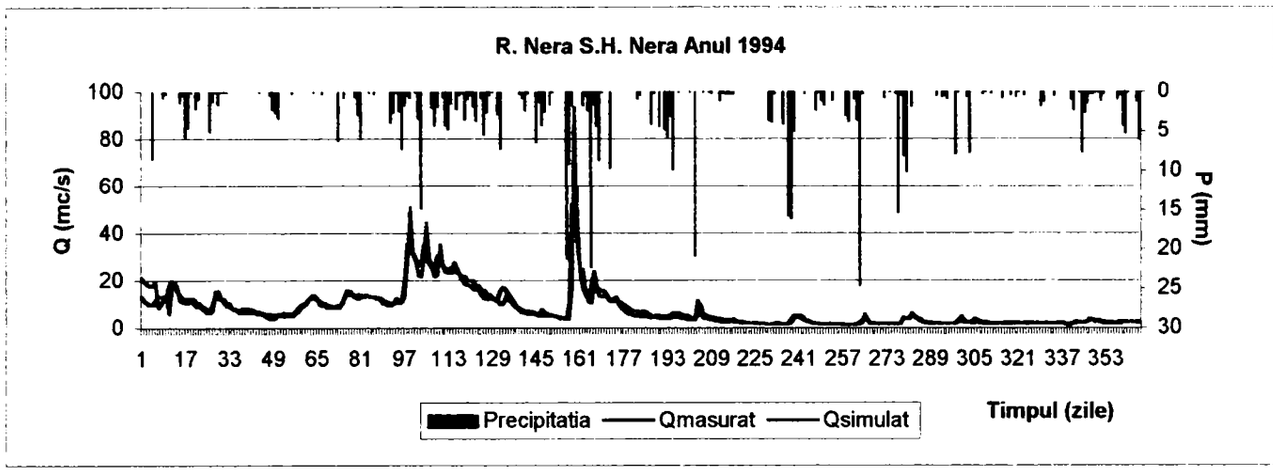
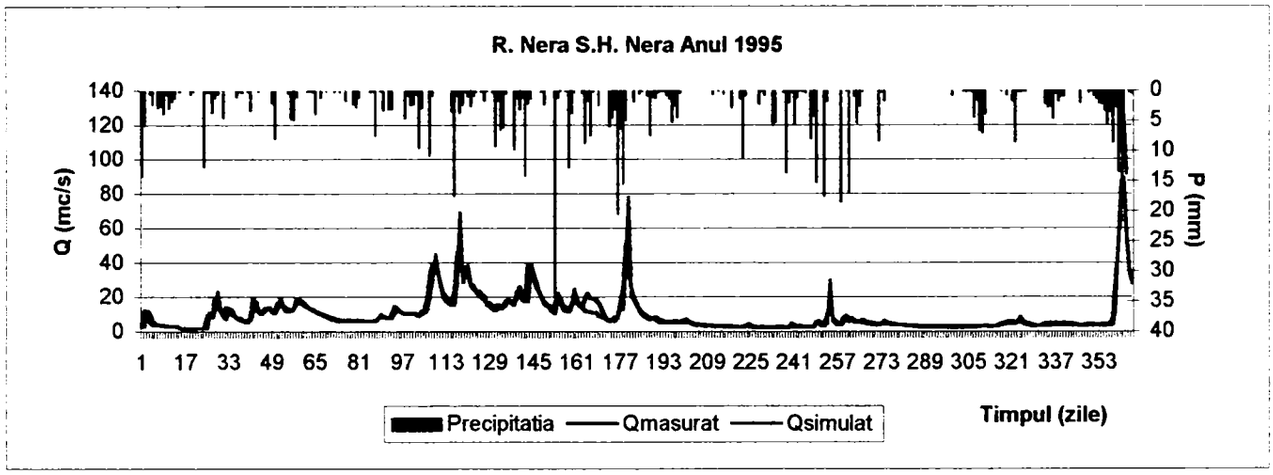
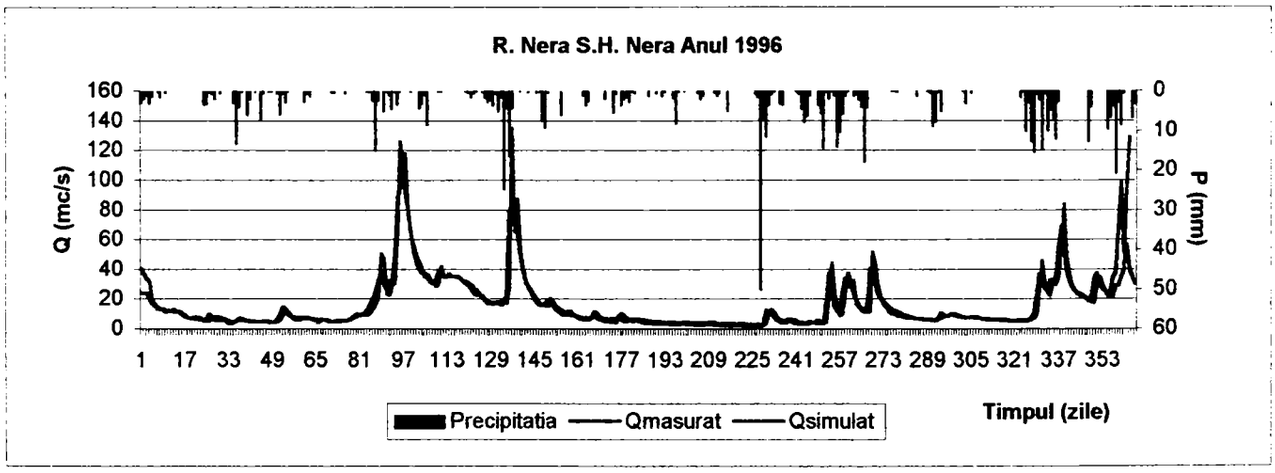


Figura 42. Hidrografele debitelor zilnice observate şi simulate şi modelul ARMA







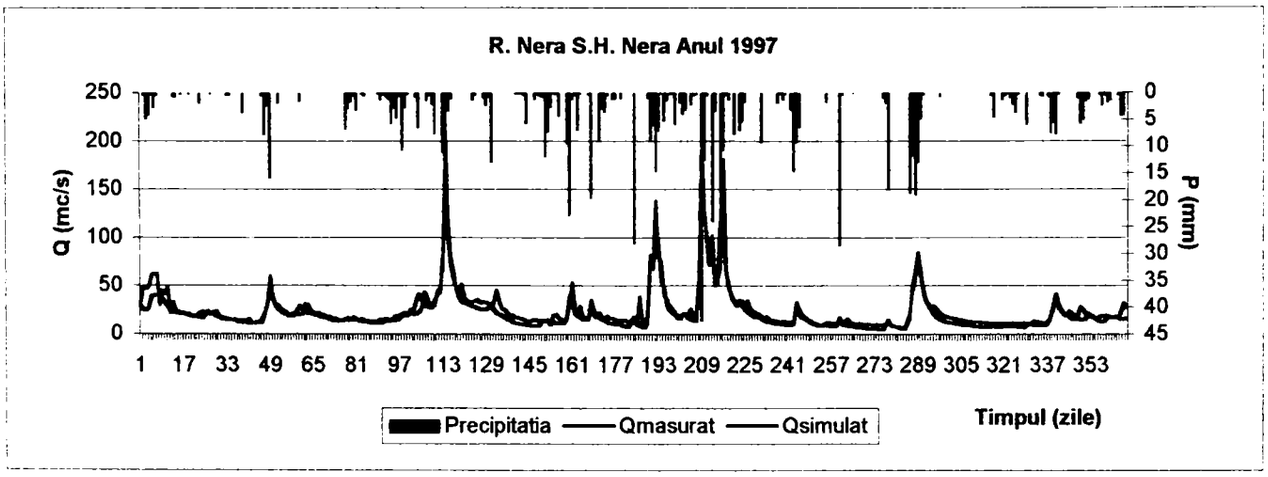


Figura 43. Hidrografele debitelor zilnice observate şi simulate şi modelul ARMA

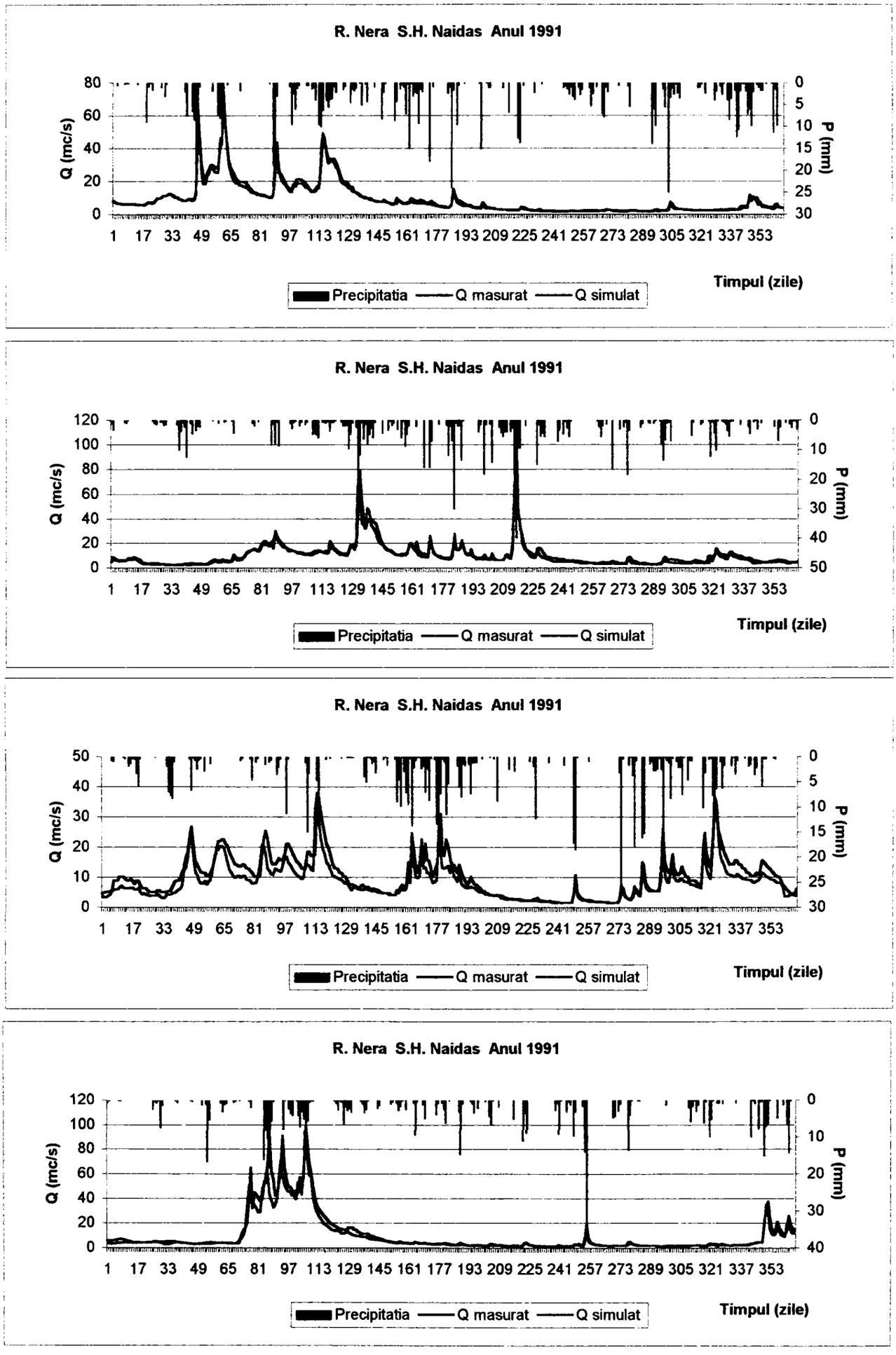


Figura 44. Hidrografele debitelor zilnice observate şi simulate cu modelul DLCM

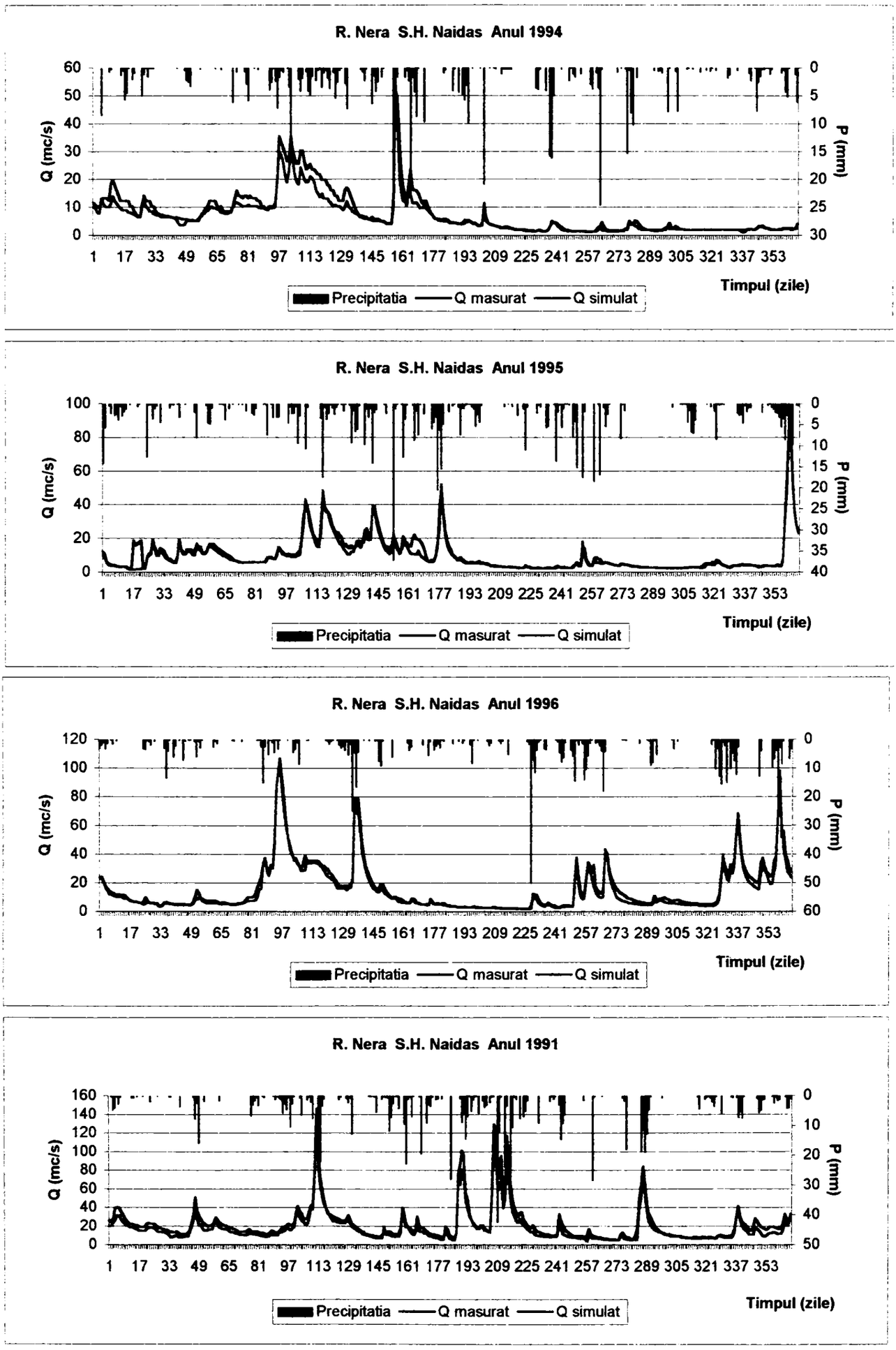


Figura 45. Hidrografele debitelor zilnice observate şi simulate cu modelul DLCM

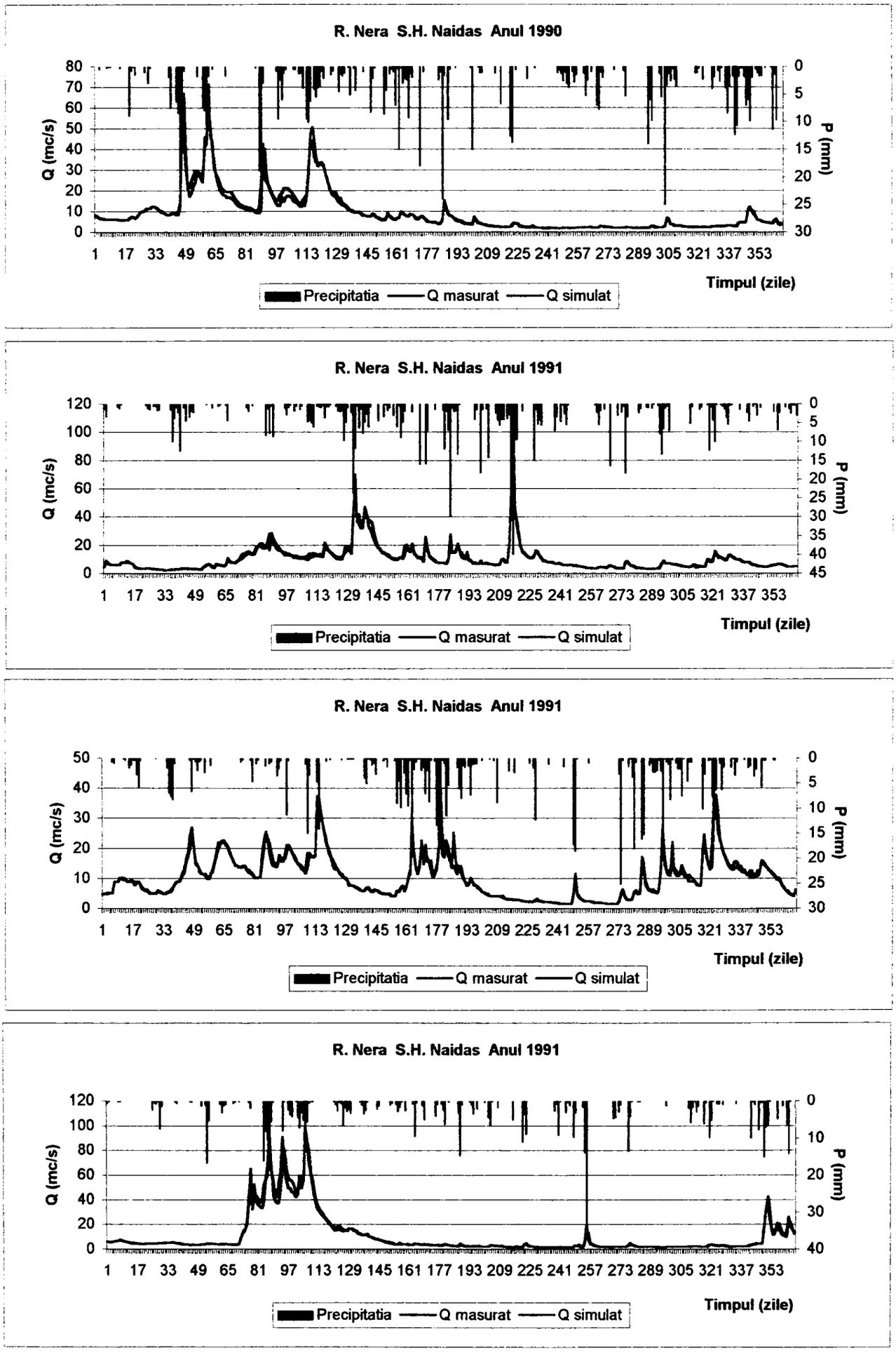


Figura 46. Hidrografele debitelor zilnice observate şi simulate cu modelul LINREG

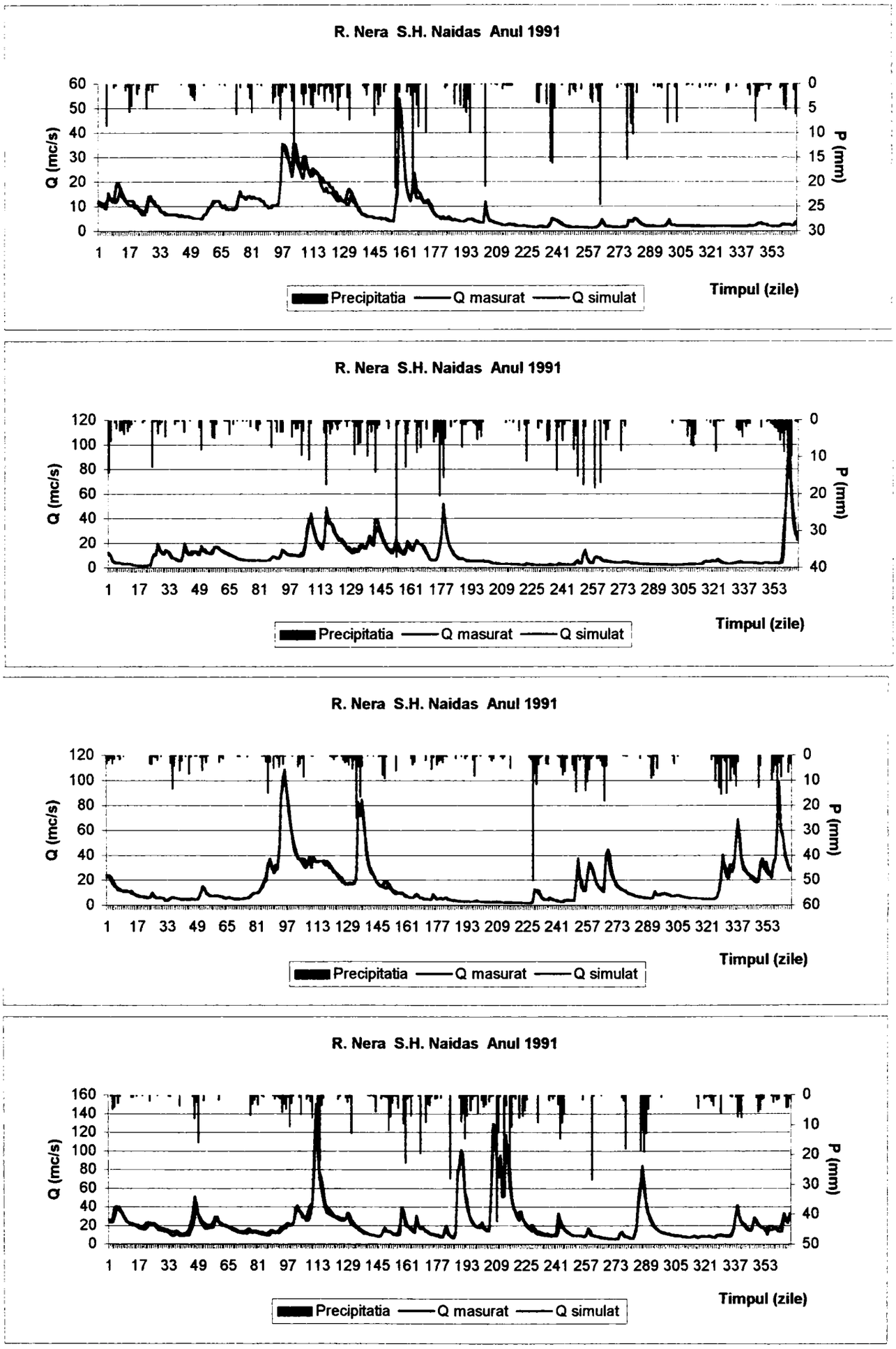
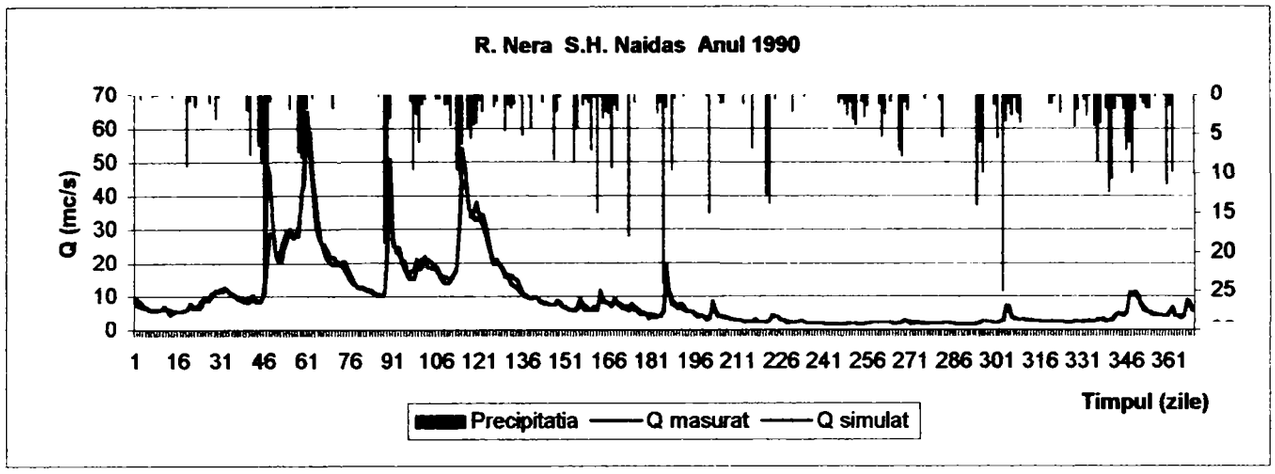
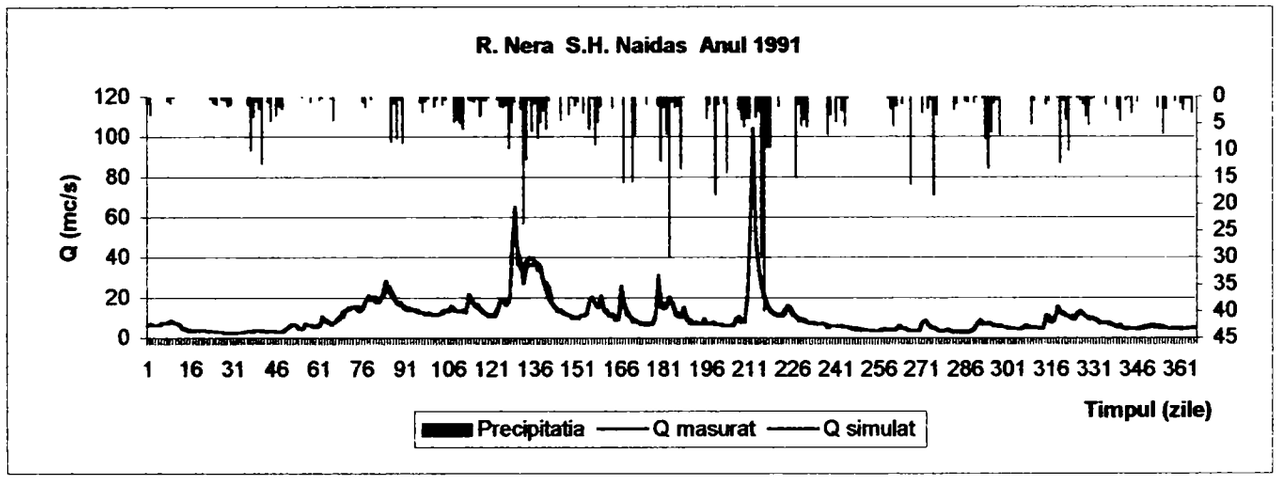
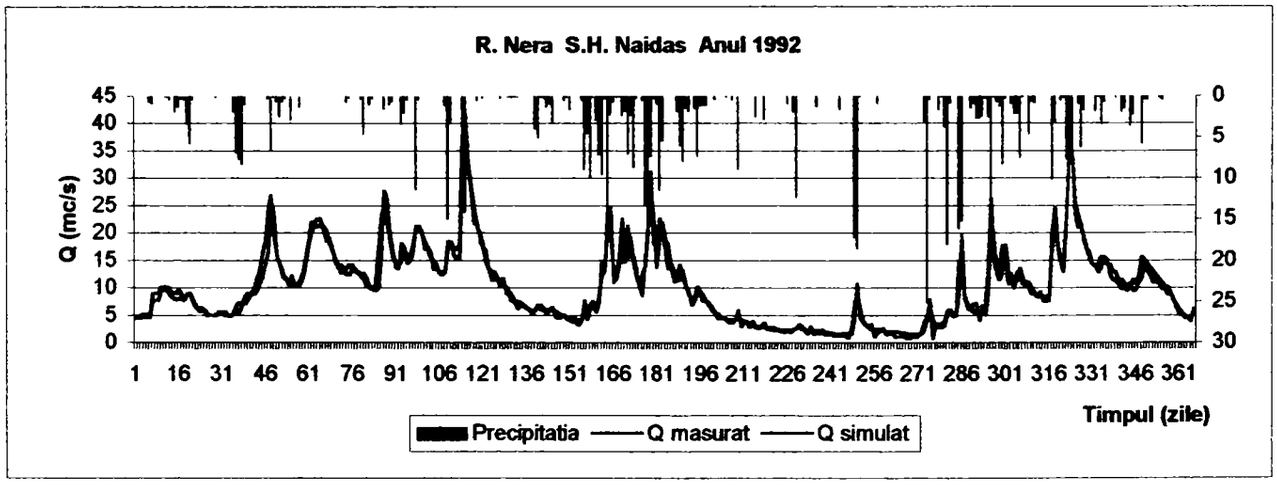


Figura 47. Hidrografele debitelor zilnice observate şi simulate cu modelul LINREG







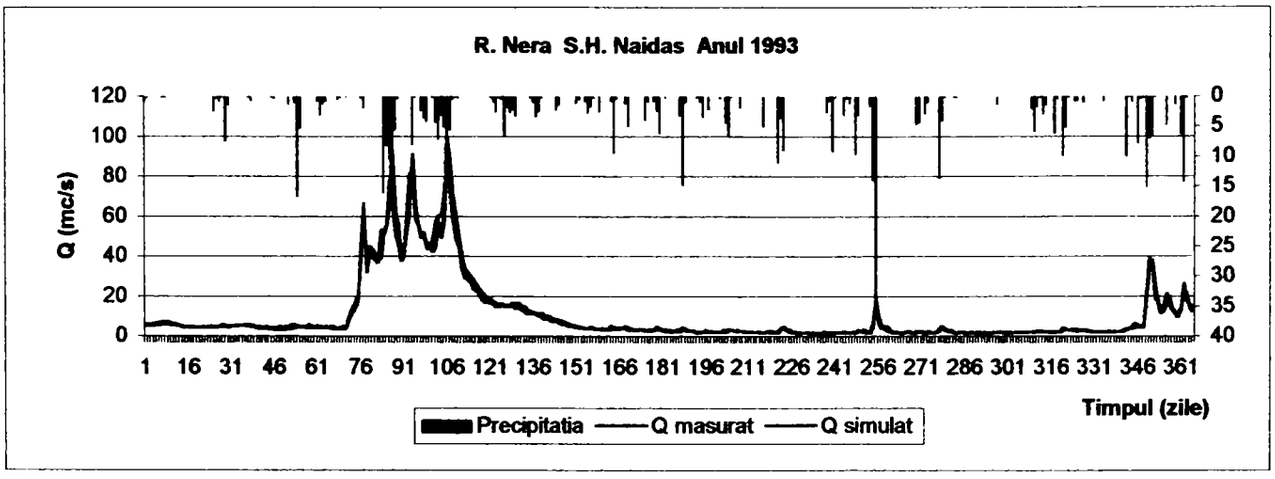
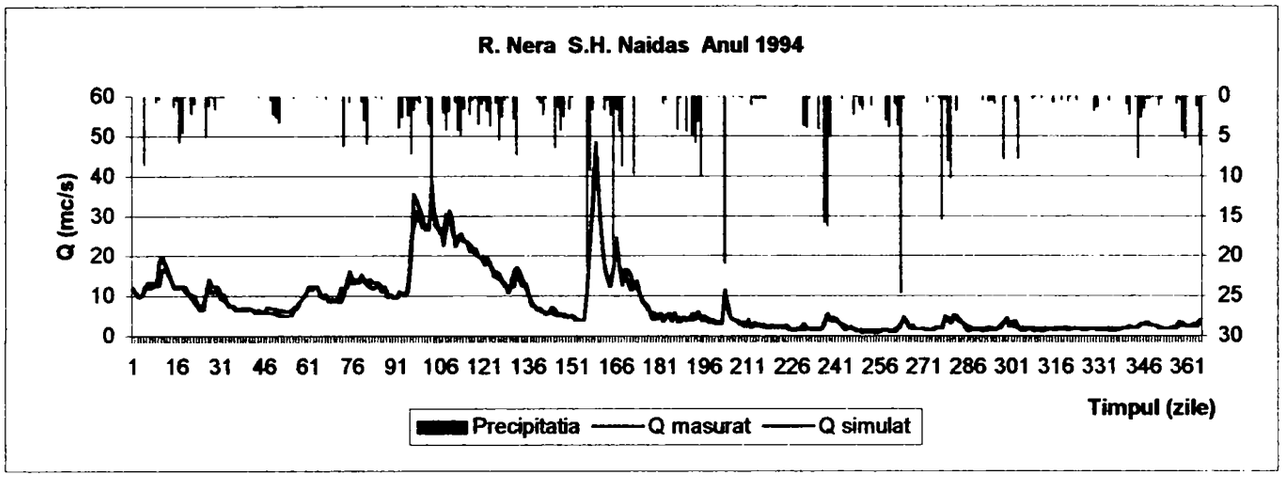
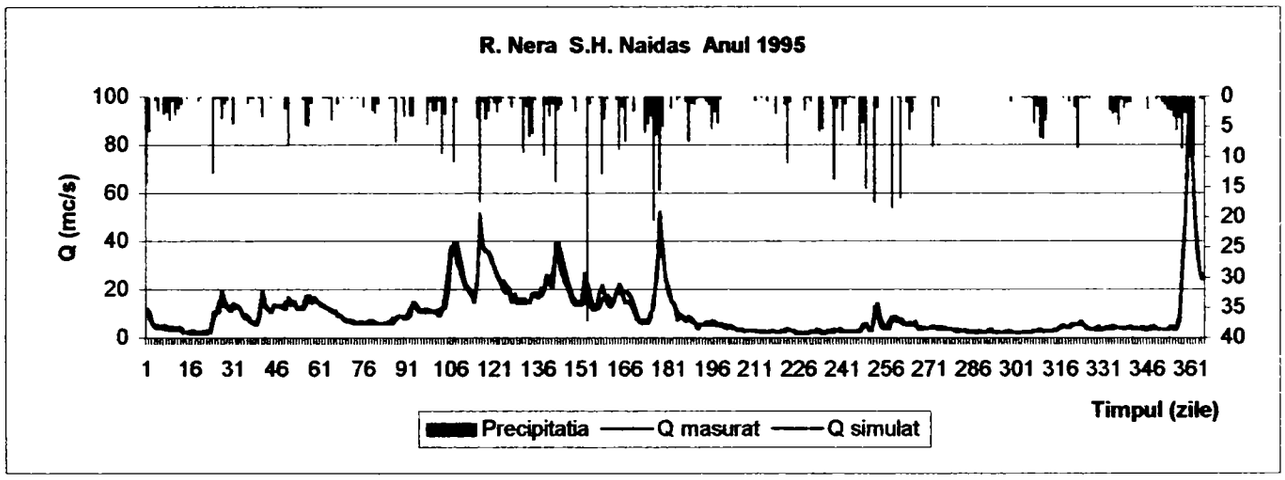
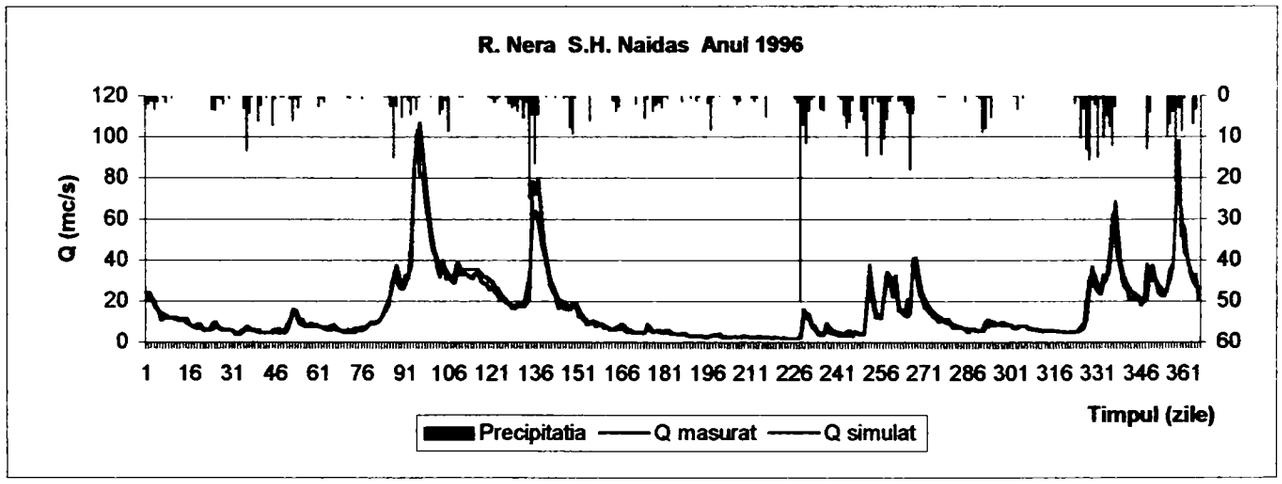


Figura 48. Hidrografele debitelor zilnice observate şi simulate cu modelul LPM







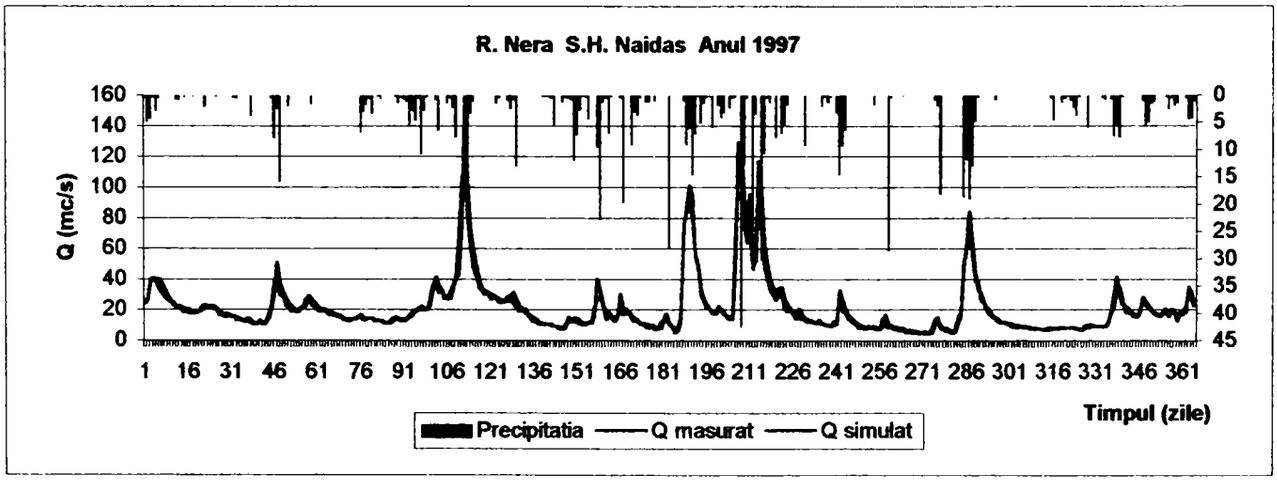
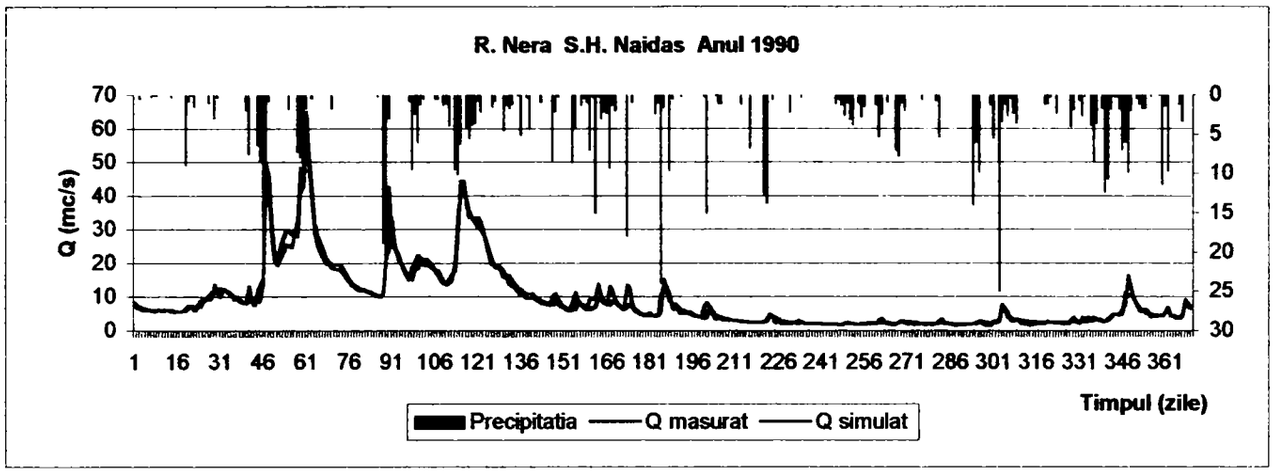
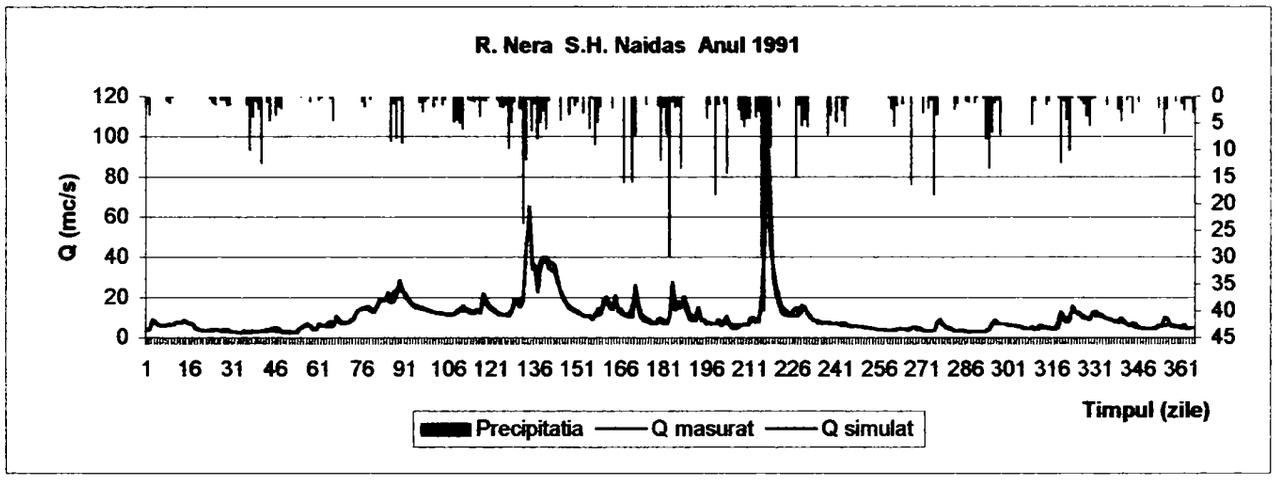
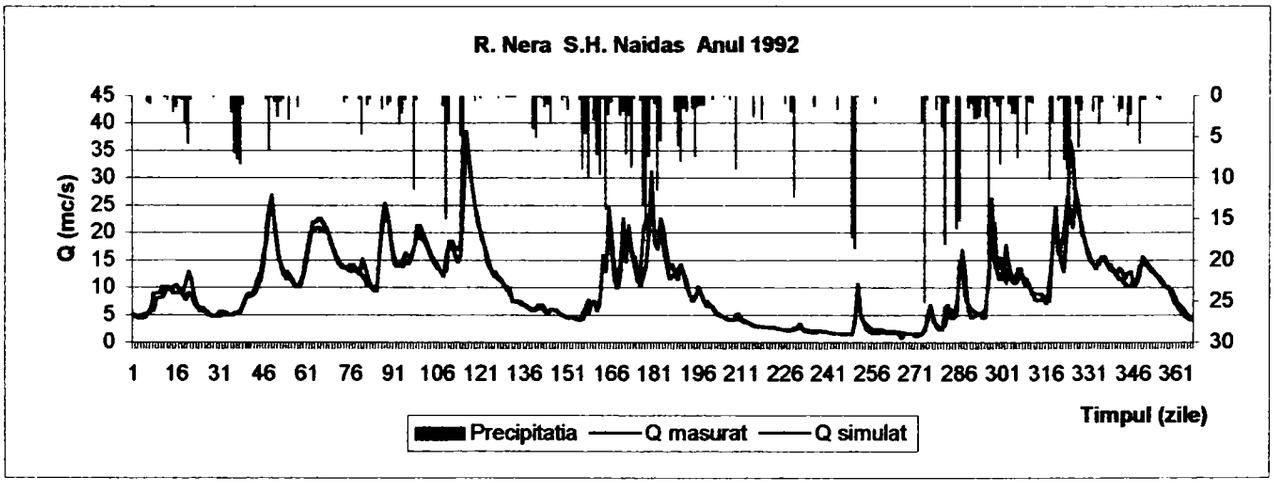


Figura 49. Hidrografele debitelor zilnice observate şi simulate cu modelul LPM







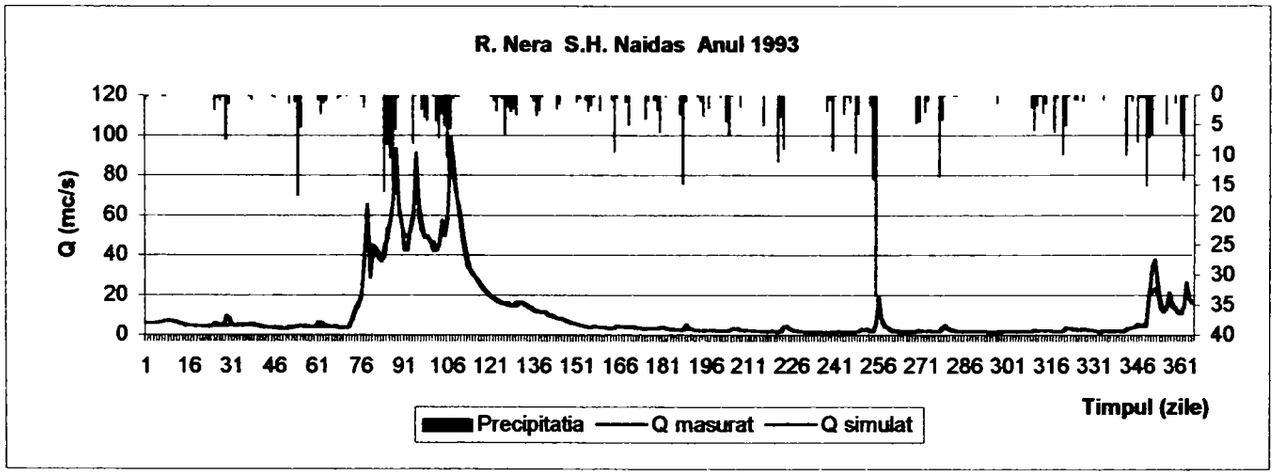


Figura 50. Hidrografele debitelor zilnice observate şi simulate cu modelul SMAR

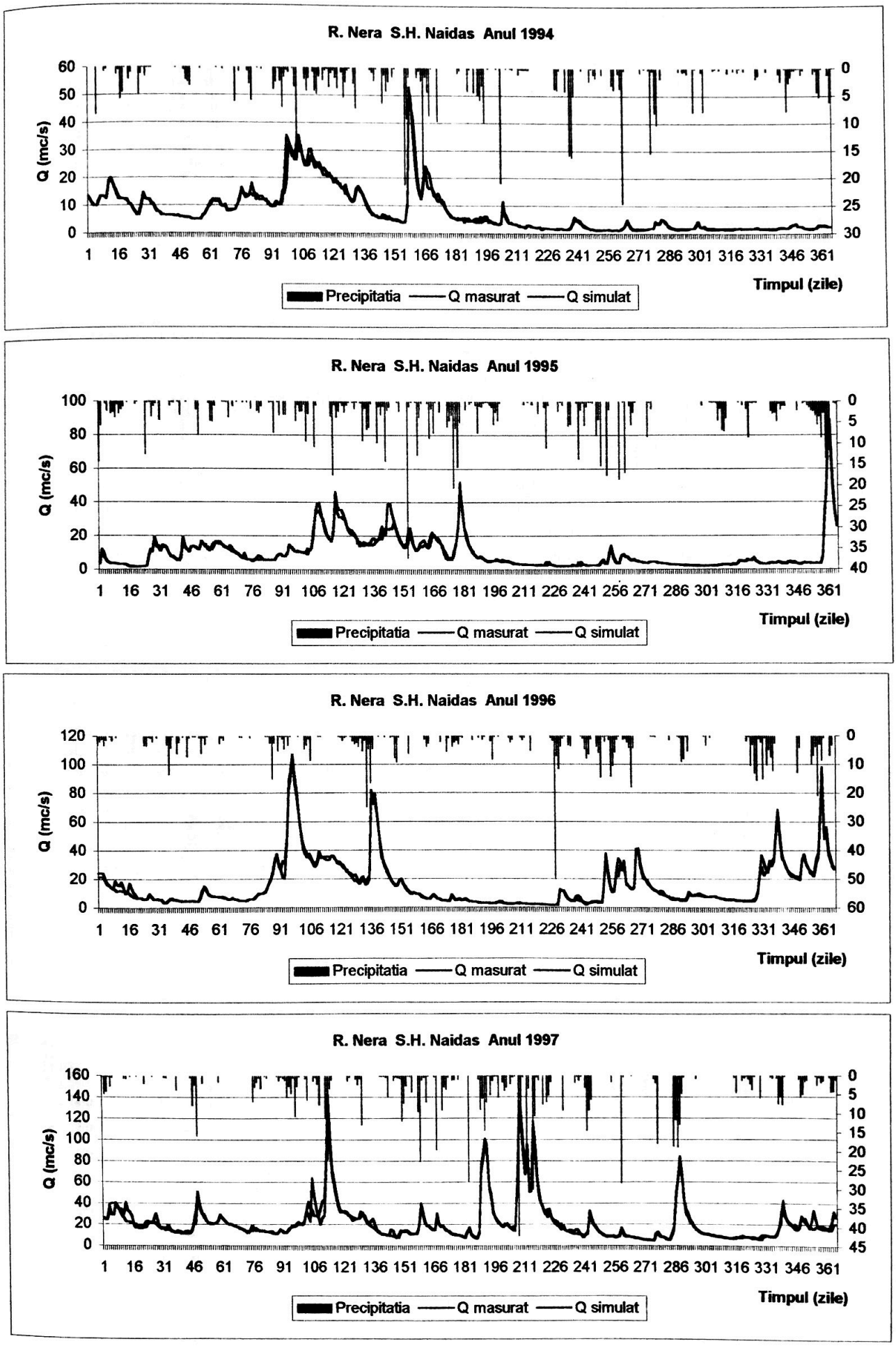
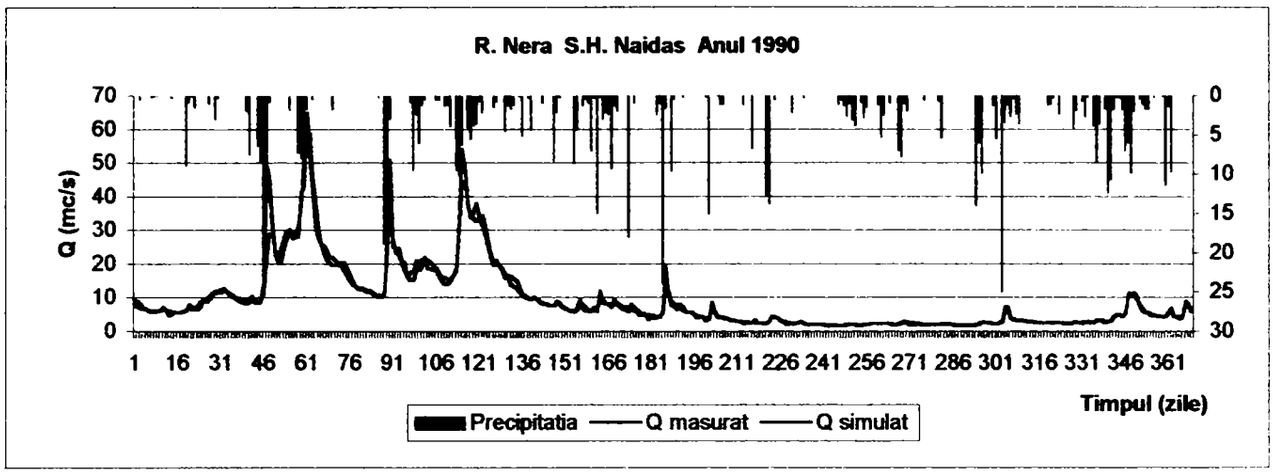
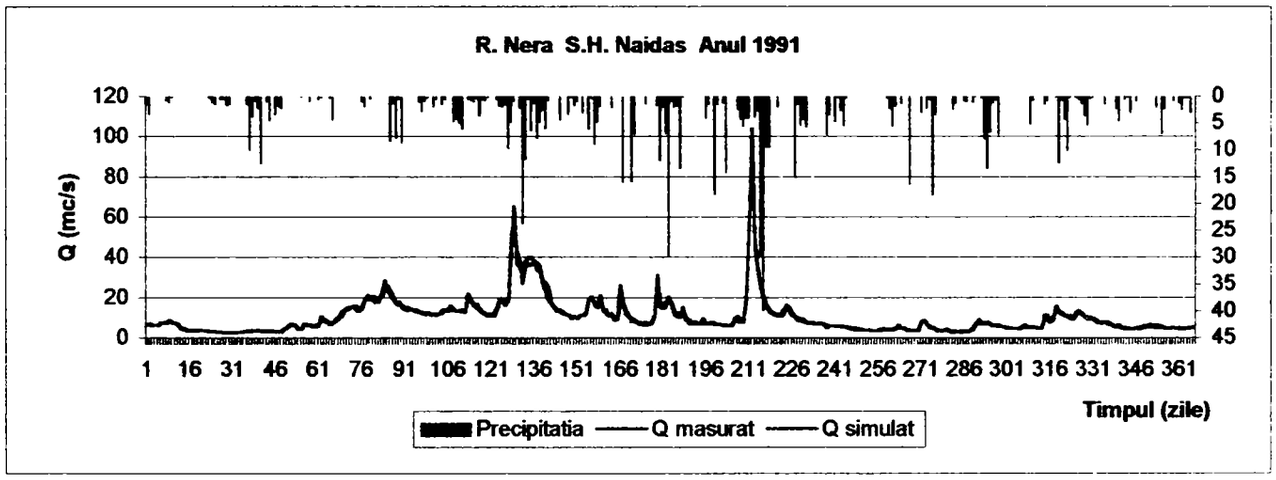
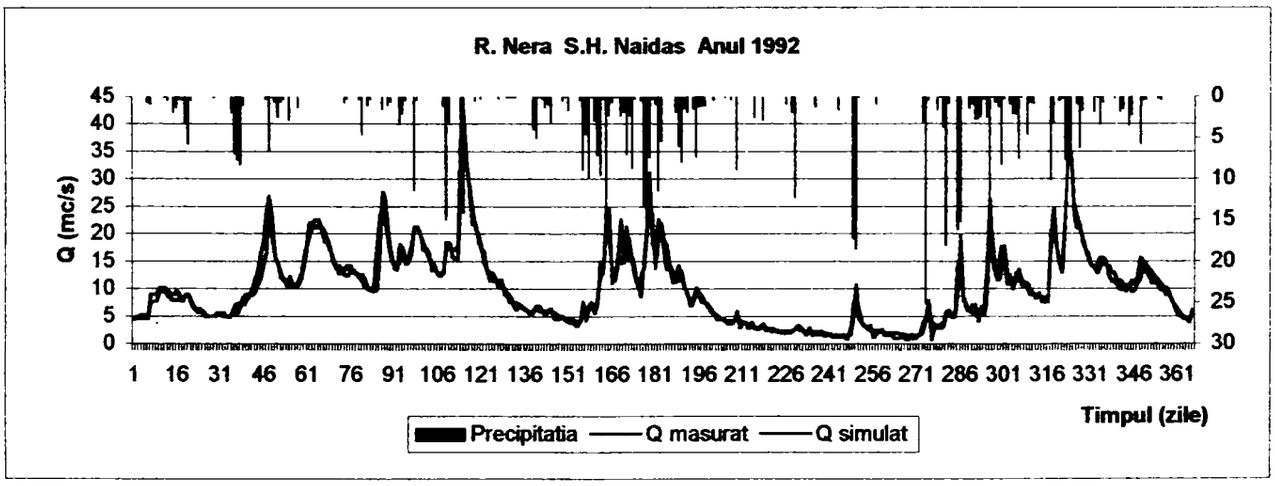


Figura 51. Hidrografele debitelor zilnice observate şi simulate cu modelul SMAR







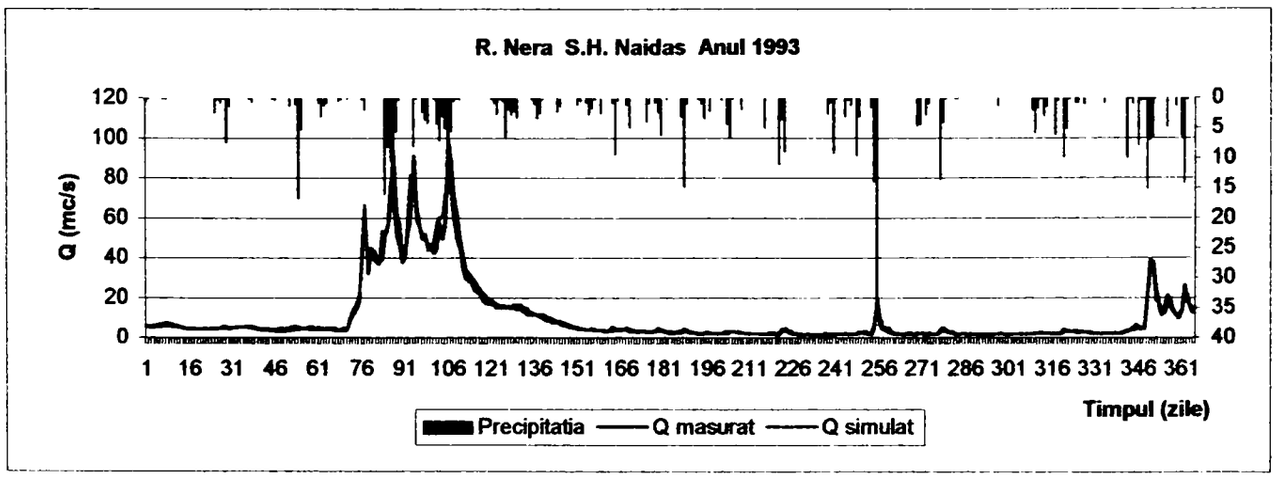
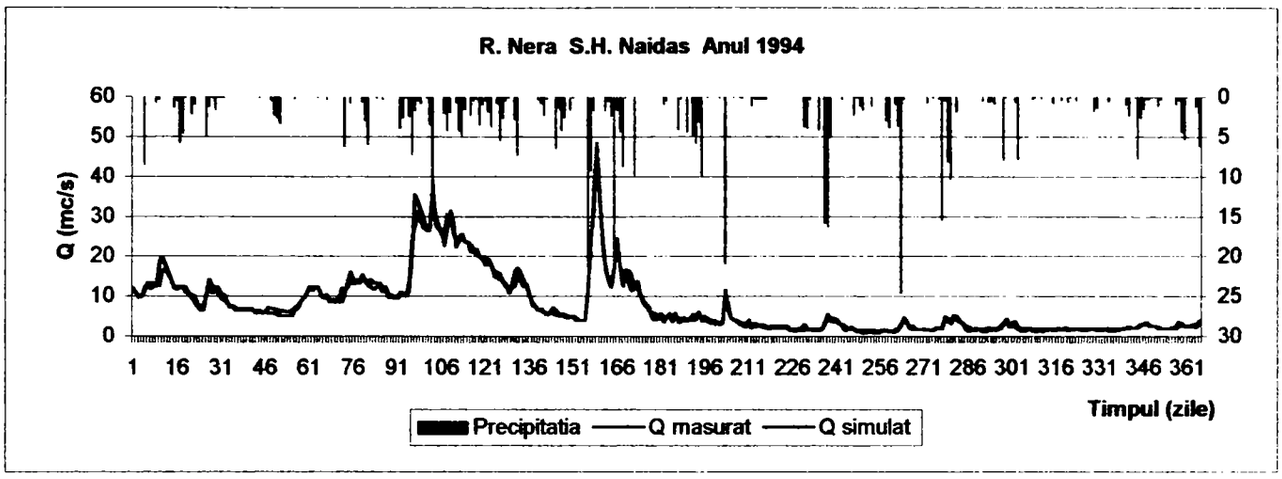
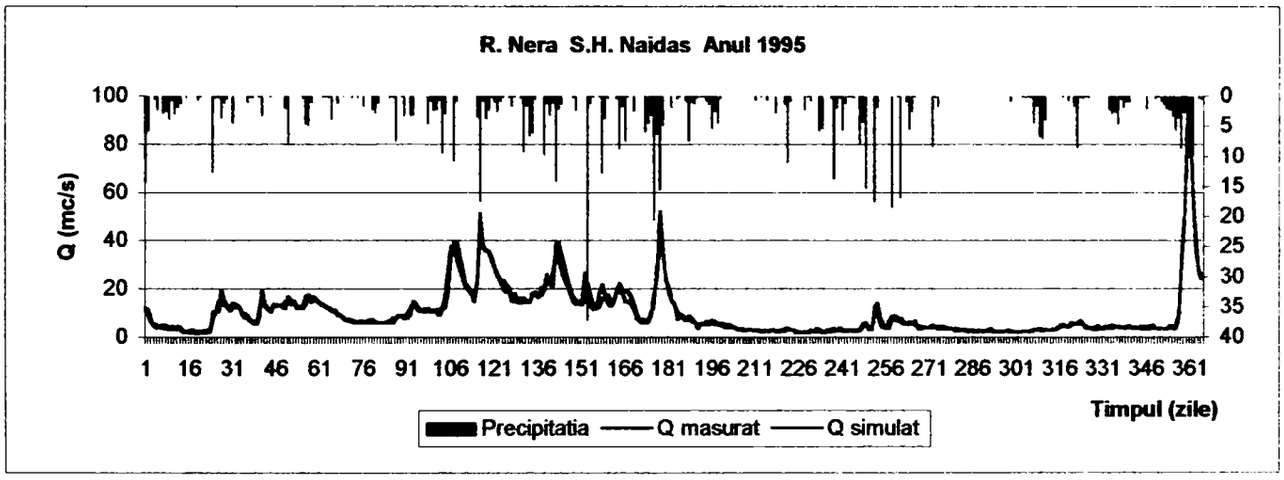
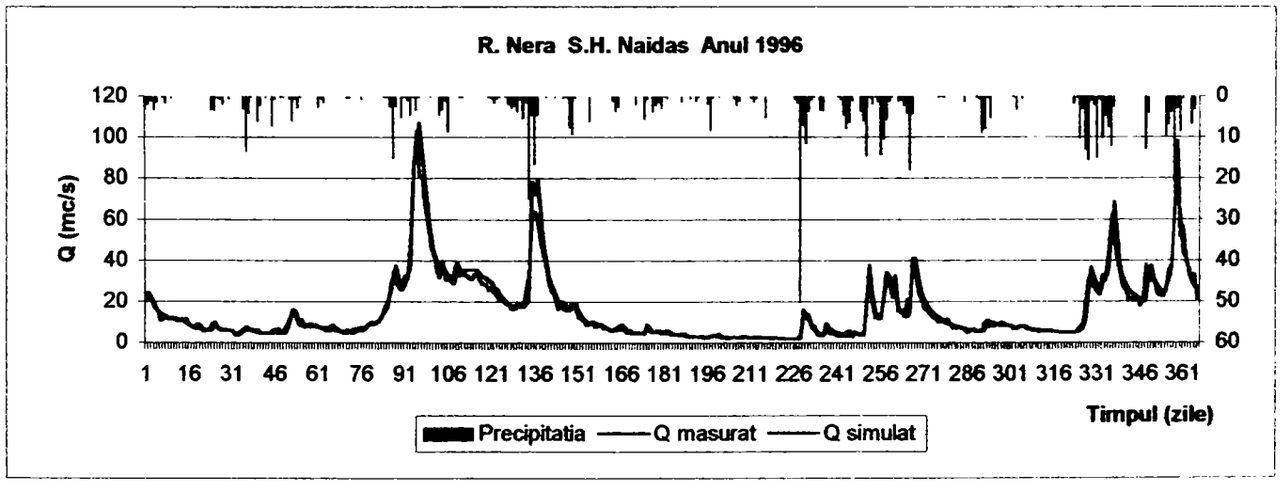


Figura 52. Hidrografele debitelor zilnice observate şi simulate cu modelul HEC-HMS







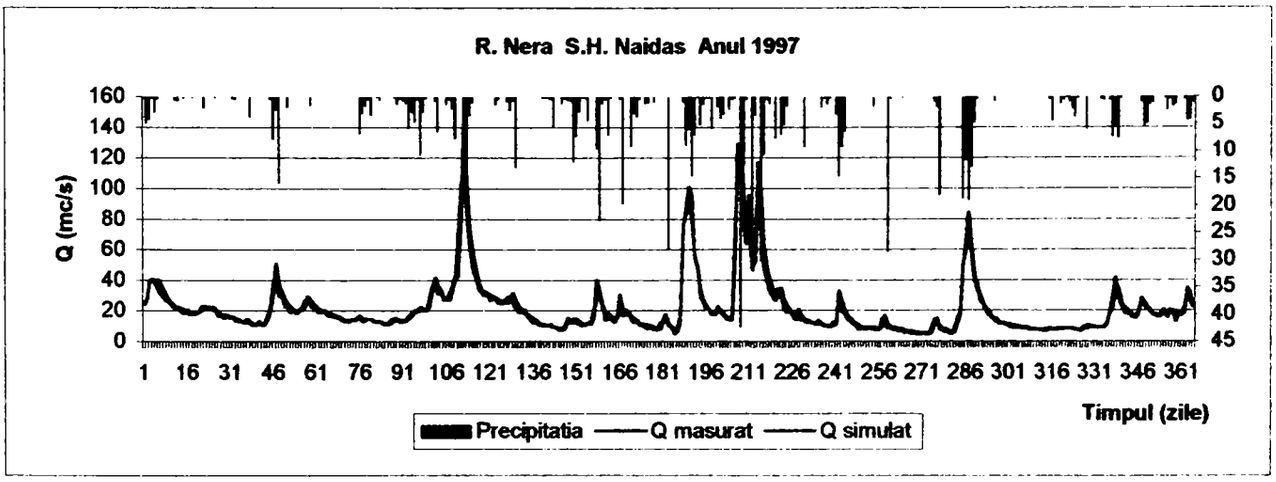


Figura 53. Hidrografele debitelor zilnice observate şi simulate cu modelul HEC-HMS

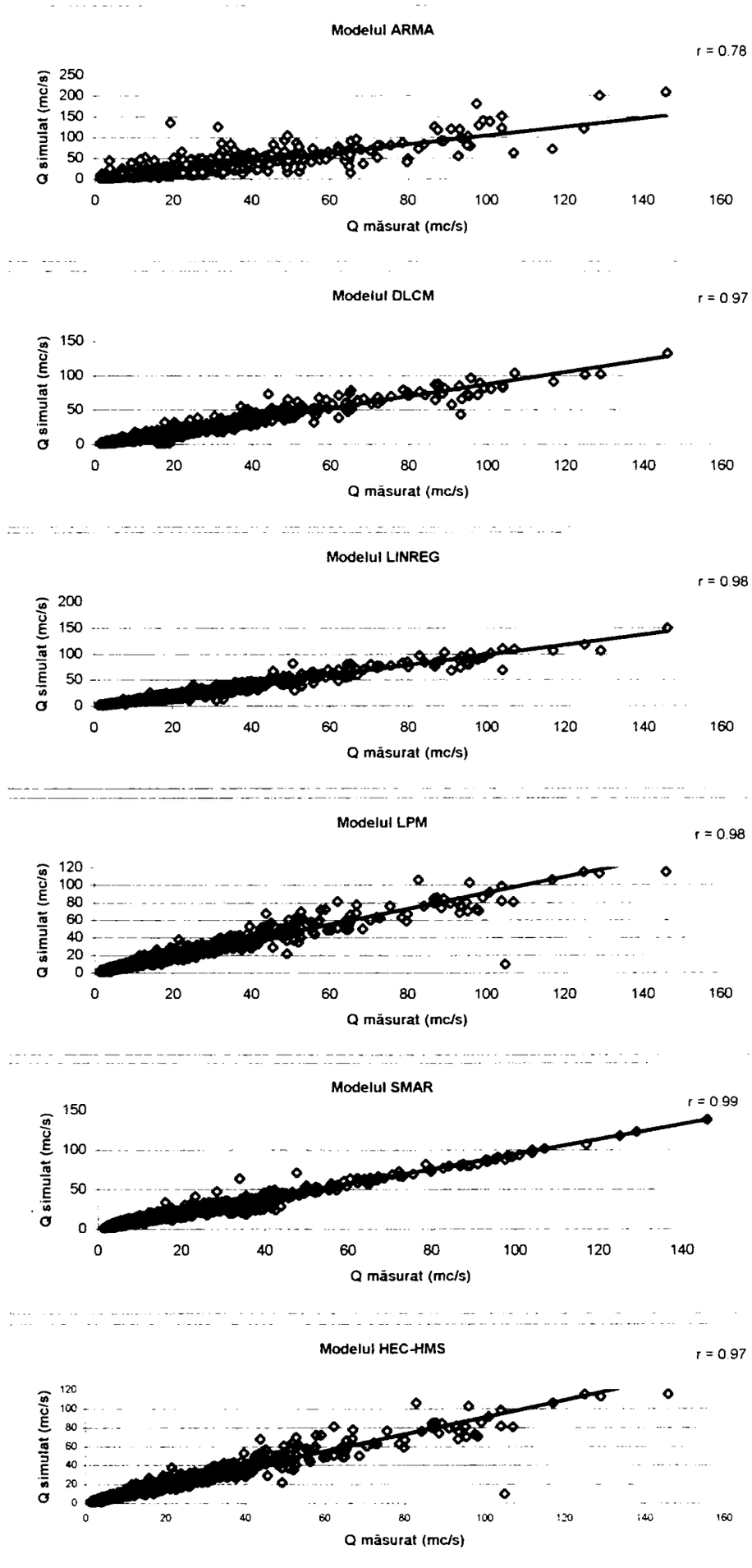


Figura 54. Corelațiile dintre debitele medii zilnice observate și simulate în perioada 1990 - 1997 pe râul Nera la stația hidrometrică Naidăș.

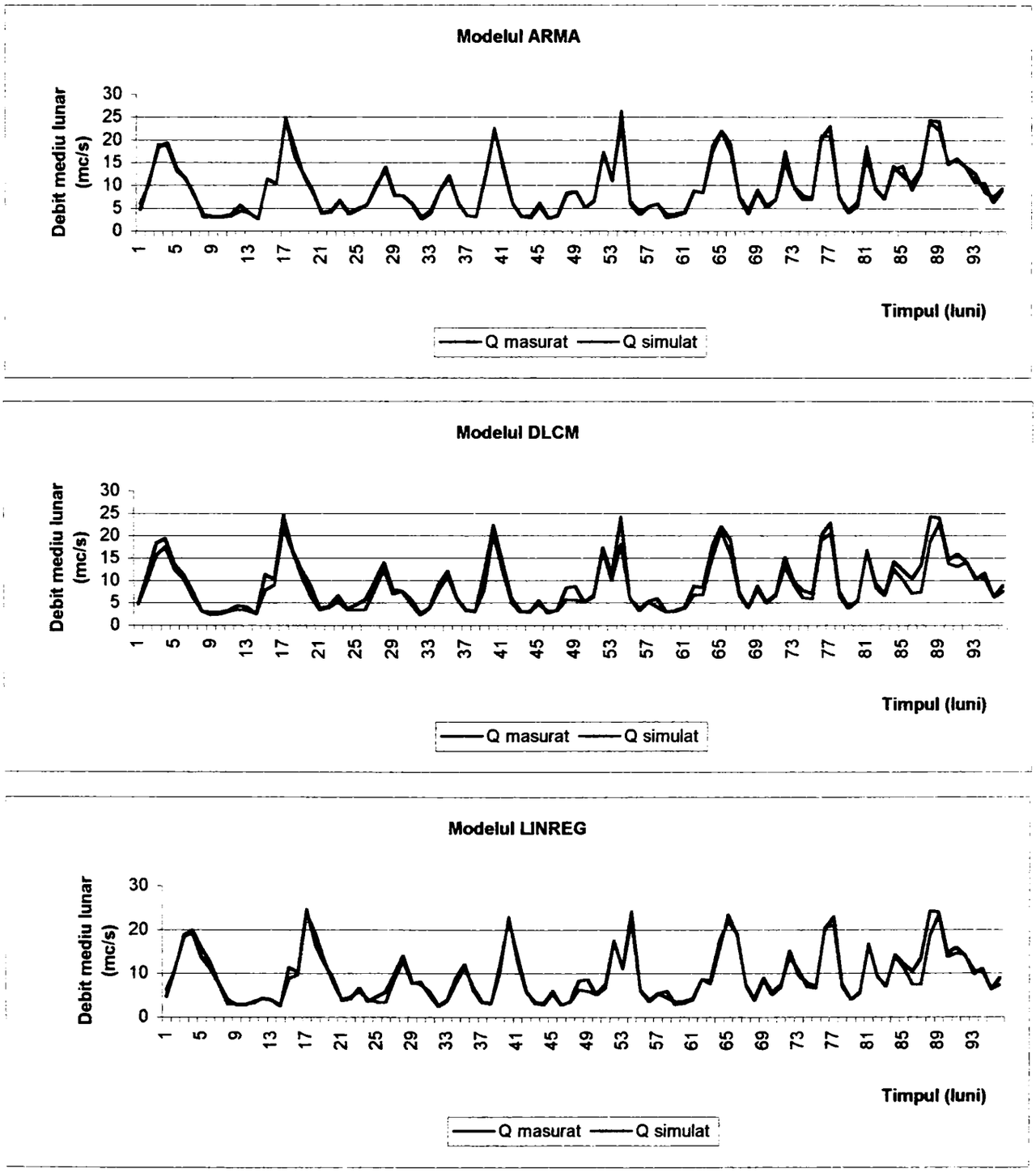


Figura 55. Hidrografele debitelor medii lunare observate și simulate în perioada 1990 - 1997 pe râul Timiș la stația hidrometrică Sadova.

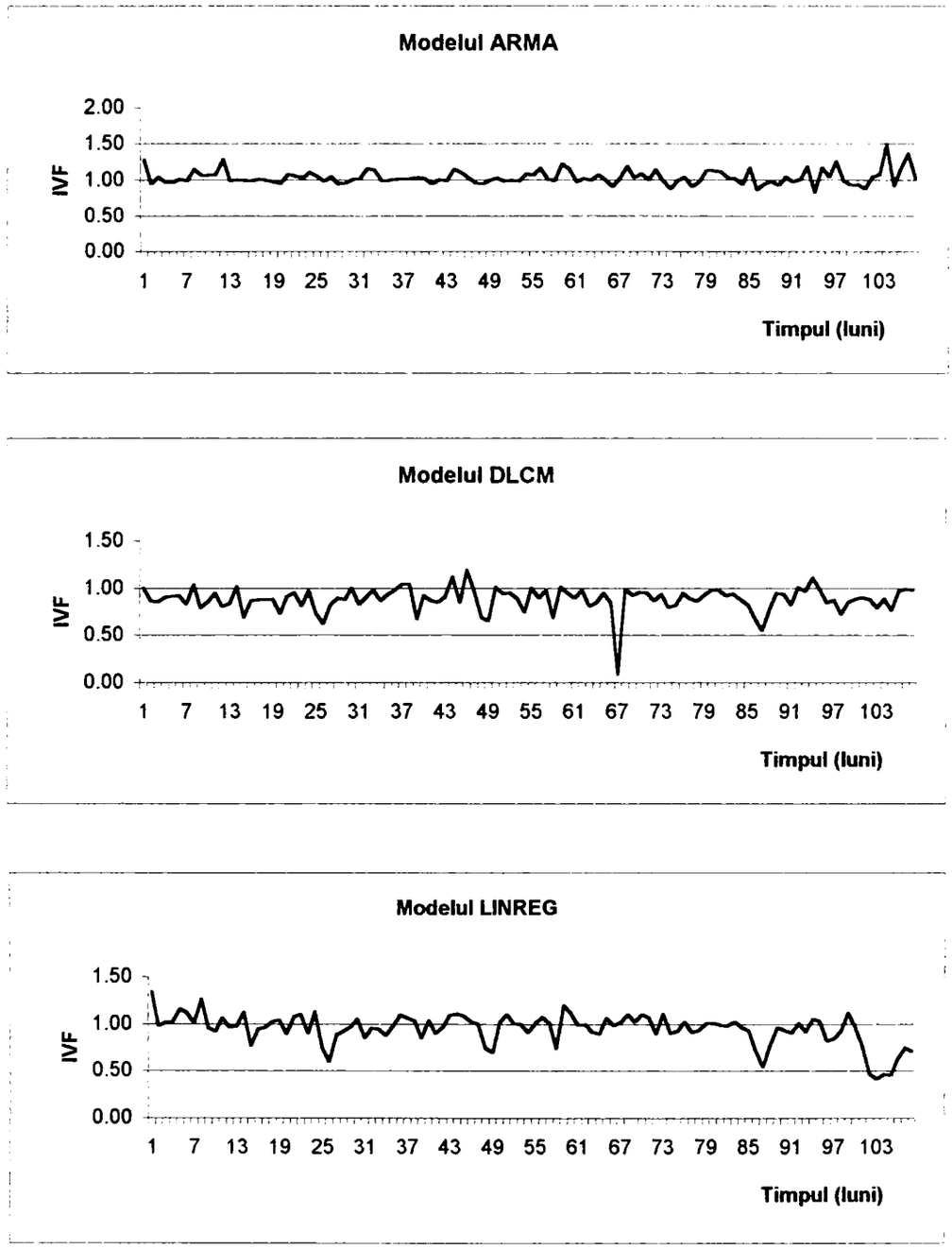


Figura 56. Indexul volumetric IVF ca măsură pentru exprimarea gradului de acuratețe a volumelor scurgerii simulate față de scurgerea observată în perioada 1990 - 1997 și în anul 2000 pe râul Timiș la stația hidrometrică Sadova.

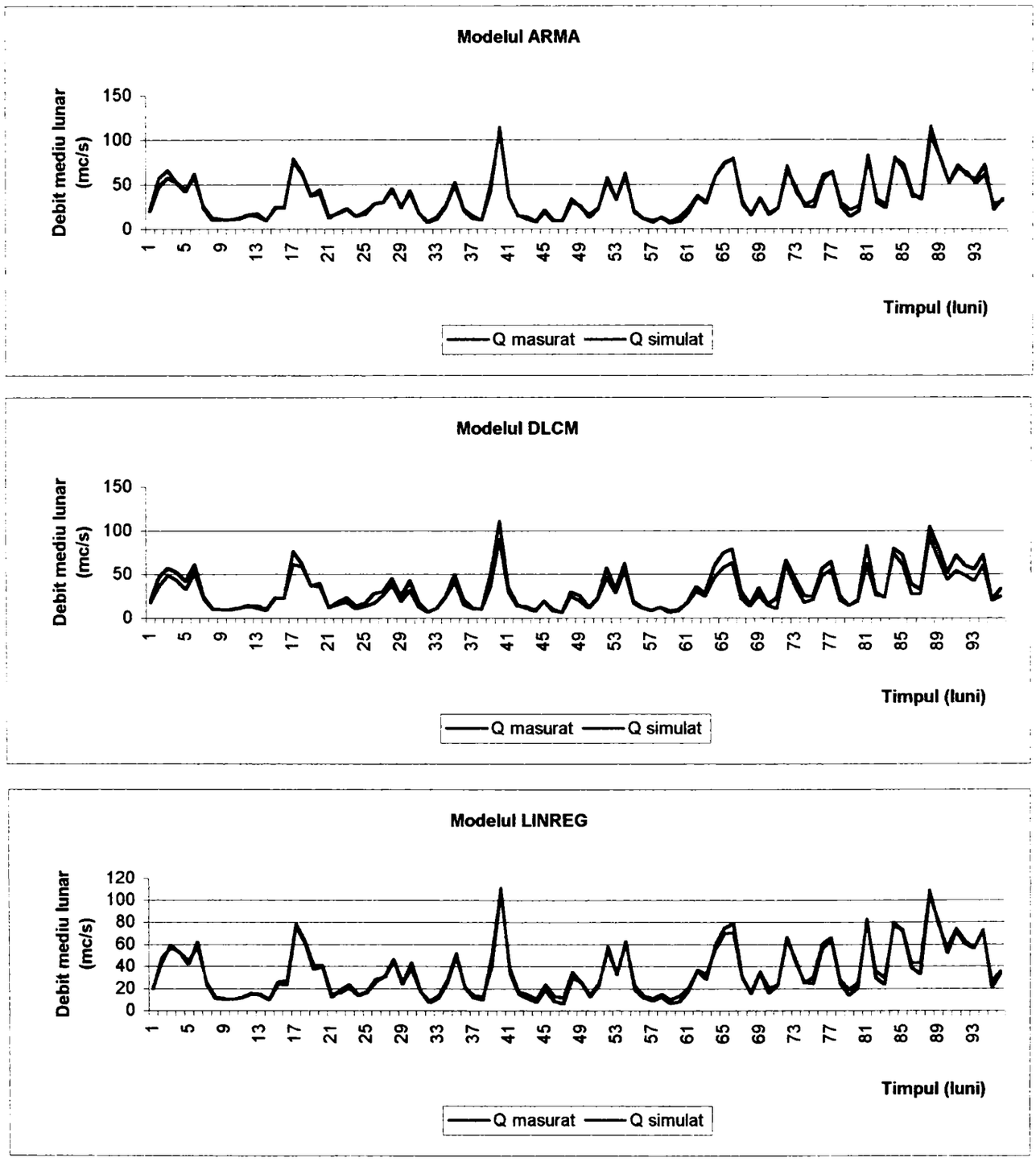


Figura 57. Hidrografele debitelor medii lunare observate şi simulate în perioada 1990 - 1997 pe râul Timiş la staţia hidrometrică Lugoj.

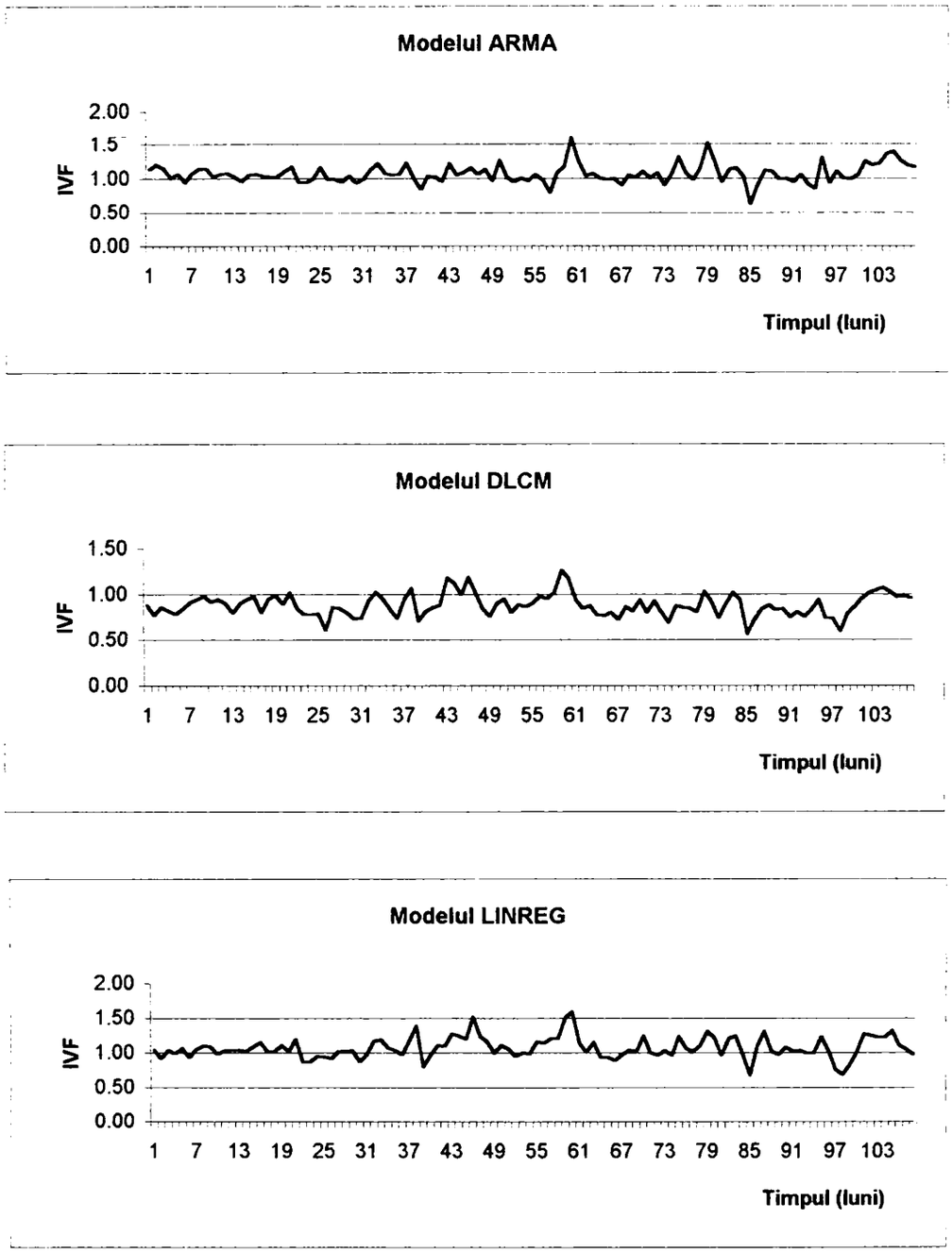
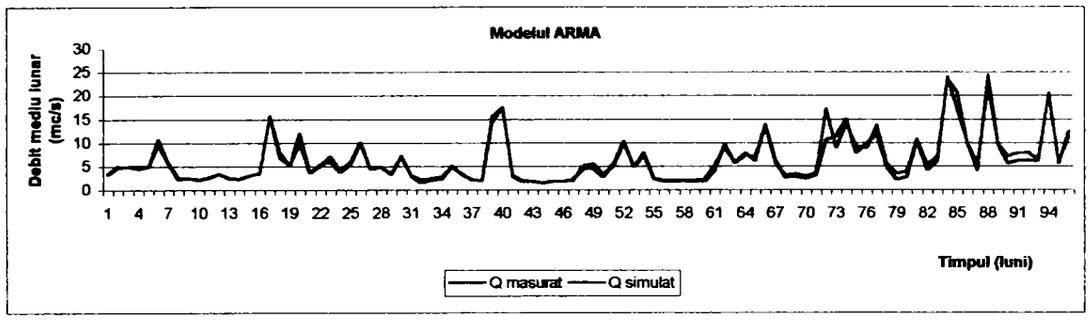
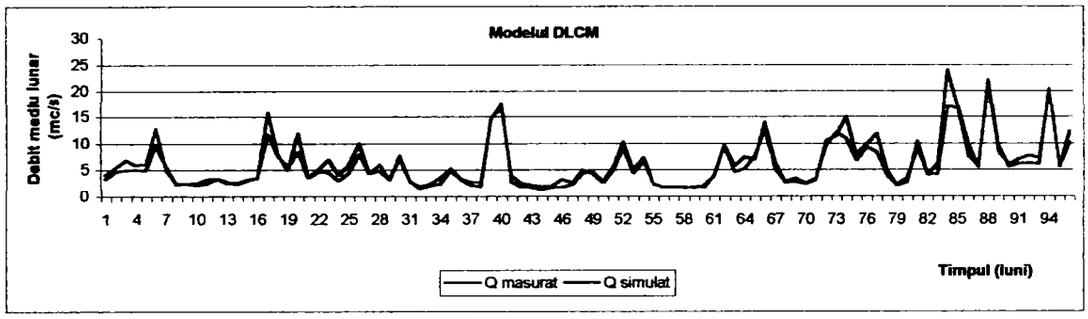
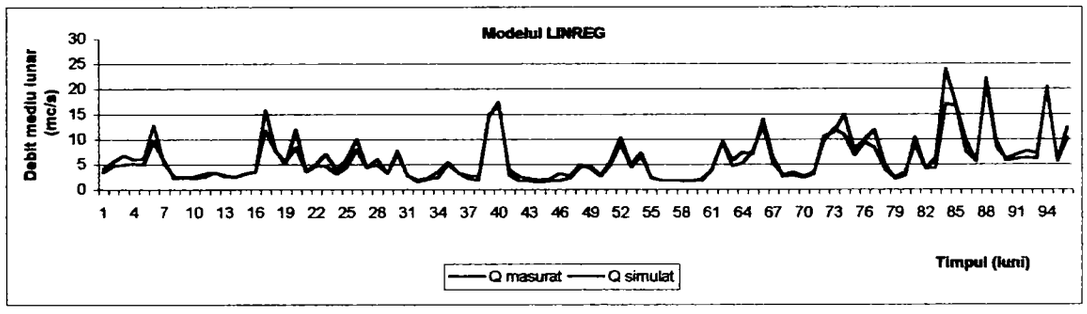
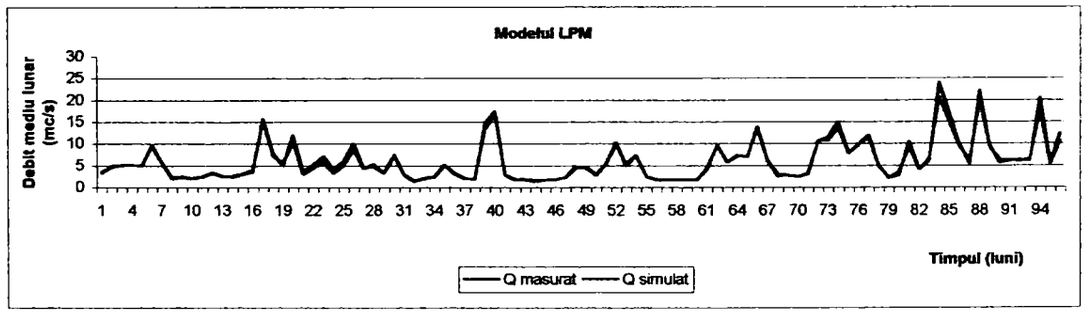


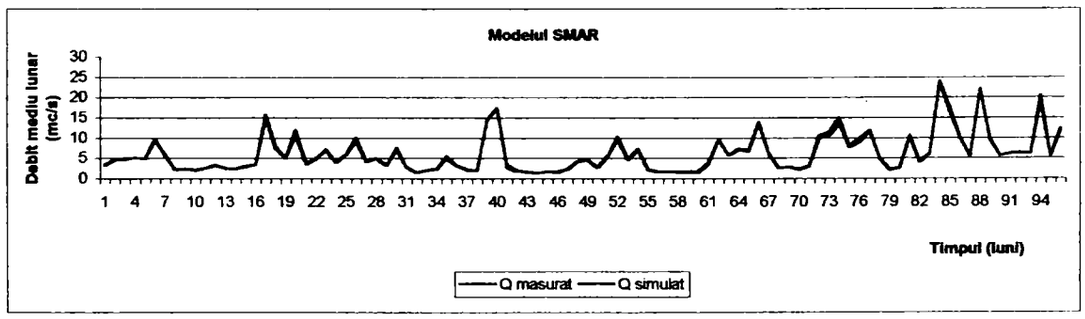
Figura 58. Indexul volumetric IVF ca măsură pentru exprimarea gradului de acurateţe a volumelor scurgerii simulate faţă de scurgerea observată în perioada 1990 - 1997 şi în anul 2000 pe râul Timiş la staţia hidrometrică Lugoj.











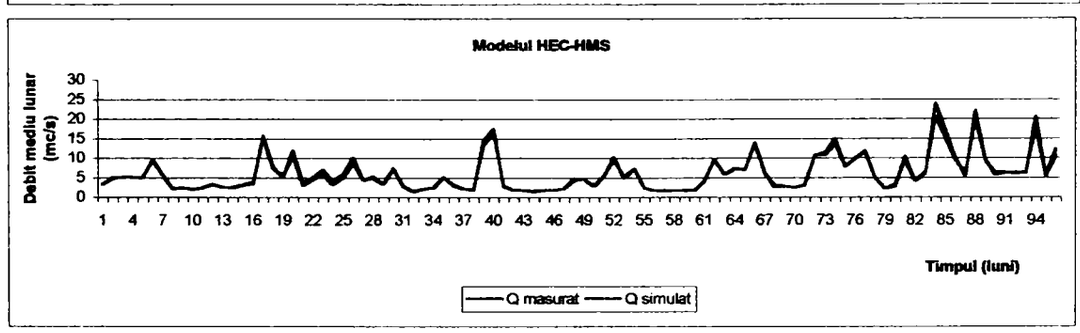


Figura 59. Hidrografele debitelor medii lunare observate şi simulate în perioada 1990 - 1997 pe râul Bega la staţia hidrometrică Balinţ

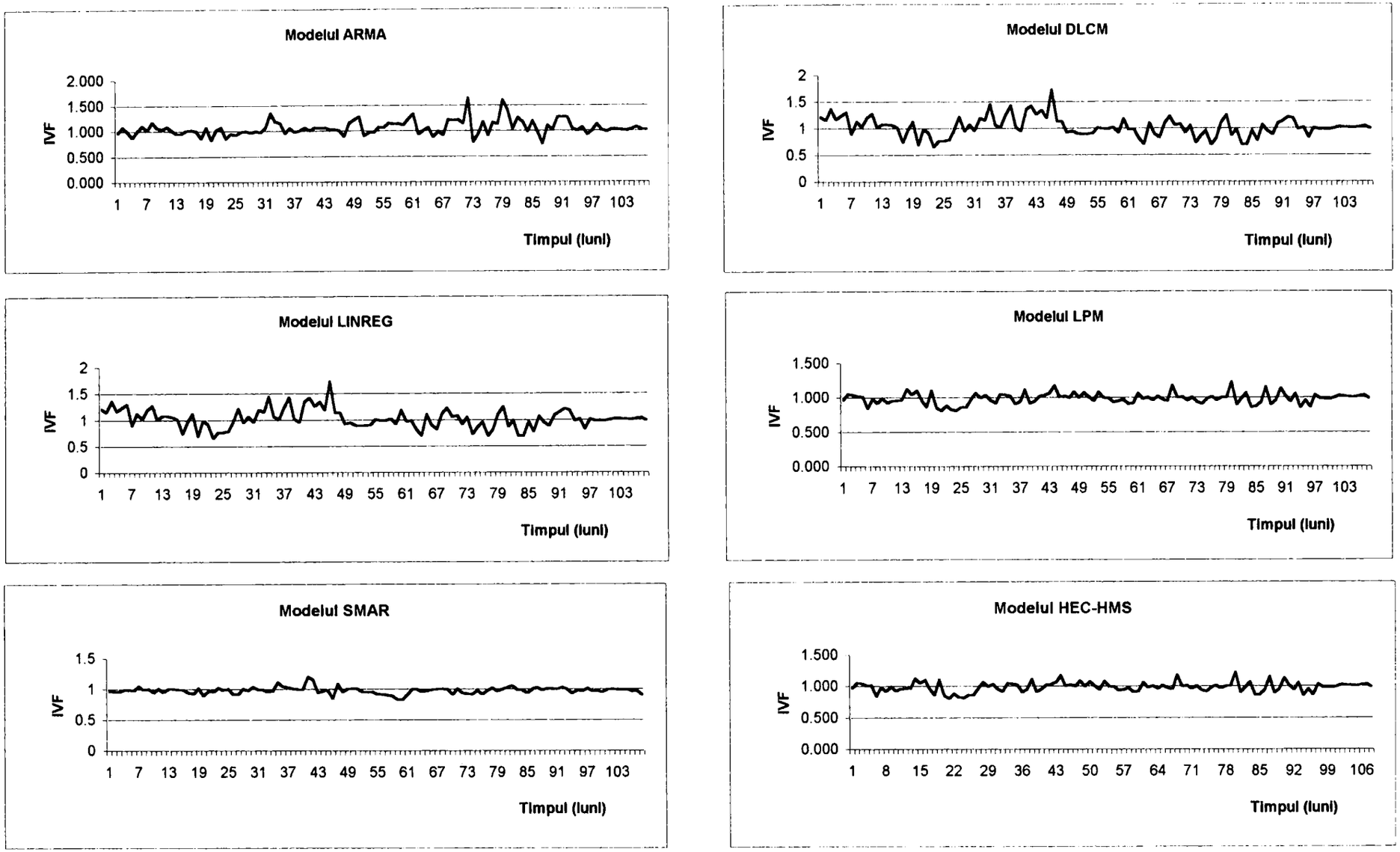


Figura 60. Indexul volumetric IVF ca măsură pentru exprimarea gradului de acurateţe a volumelor scurgerii simulate faţă de scurgerea observată în perioada 1990 - 1997 şi în anul 2000 pe râul Bega la staţia hidrometrică Balinţ.

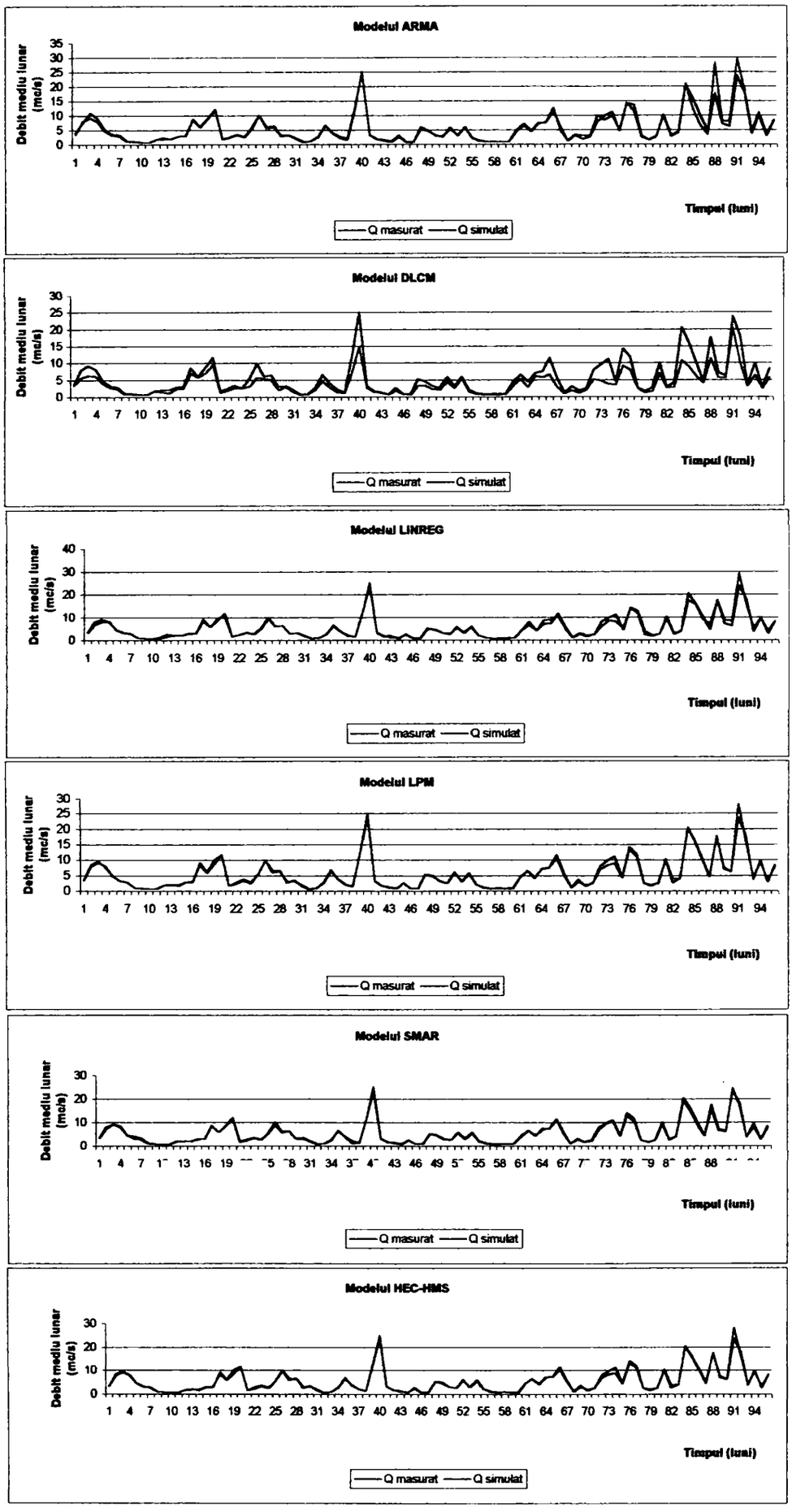


Figura 61. Hidrografele debitelor medii lunare observate şi simulate în perioada 1990 - 1997 pe râul Caraş la staţia hidrometrică Vărădia.

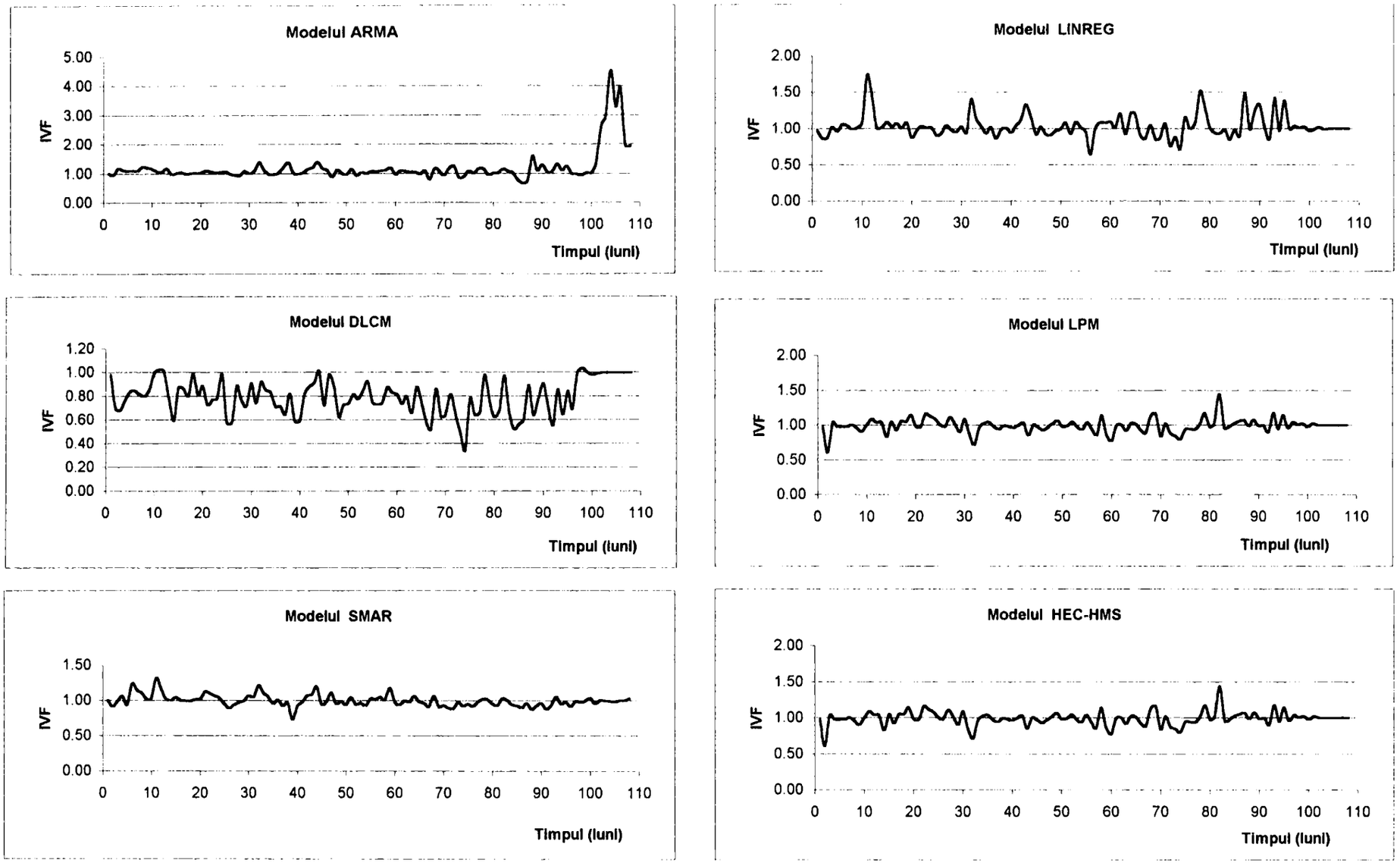
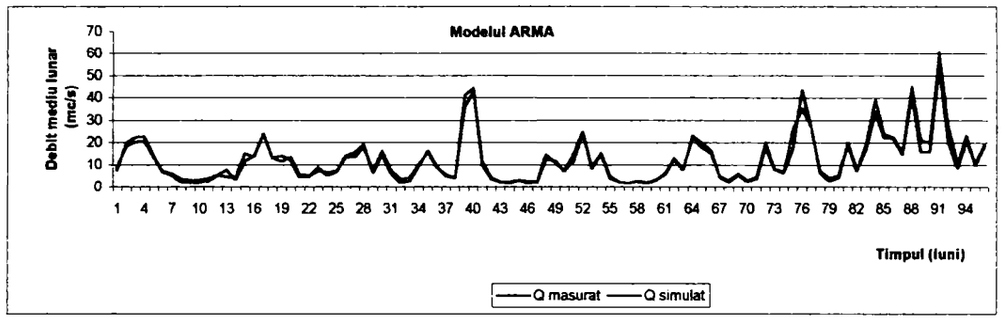
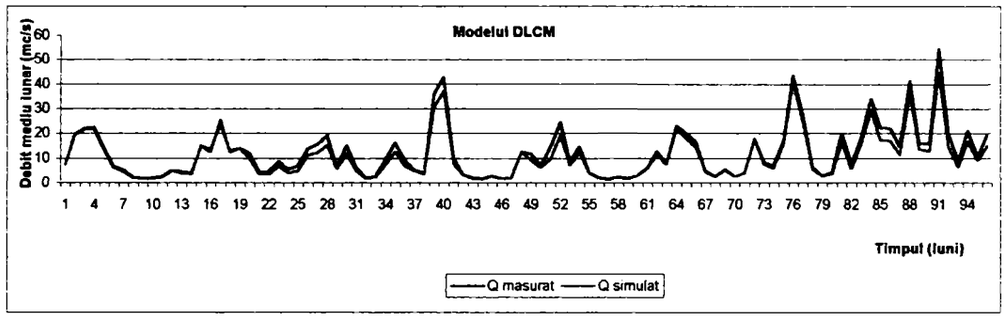
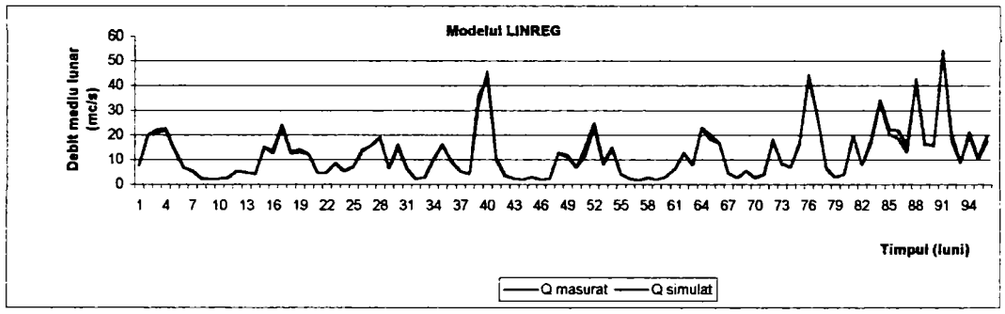
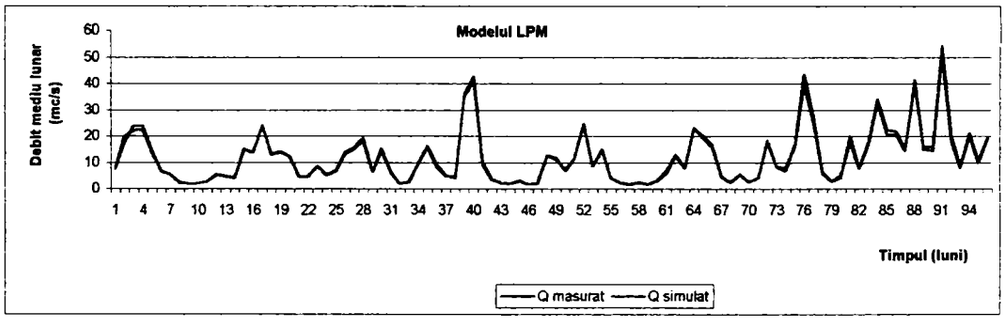


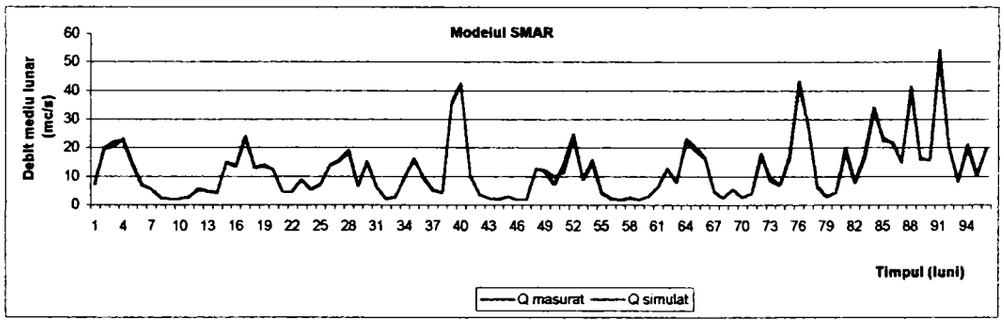
Figura 62. Indexul volumetric IVF ca măsură pentru exprimarea gradului de acuratețe a volumelor scurgerii simulate față de scurgerea observată în perioada 1990 - 1997 și în anul 2000 pe râul Caraș la stația hidrometrică Vărădia.











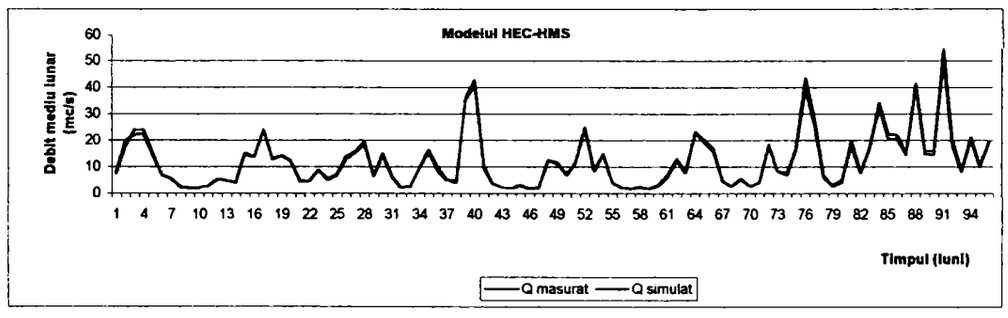


Figura 63. Hidrografele debitelor medii lunare observate şi simulate în perioada 1990 - 1997pe râul Nera la staţia hidrometrică Naidăş.

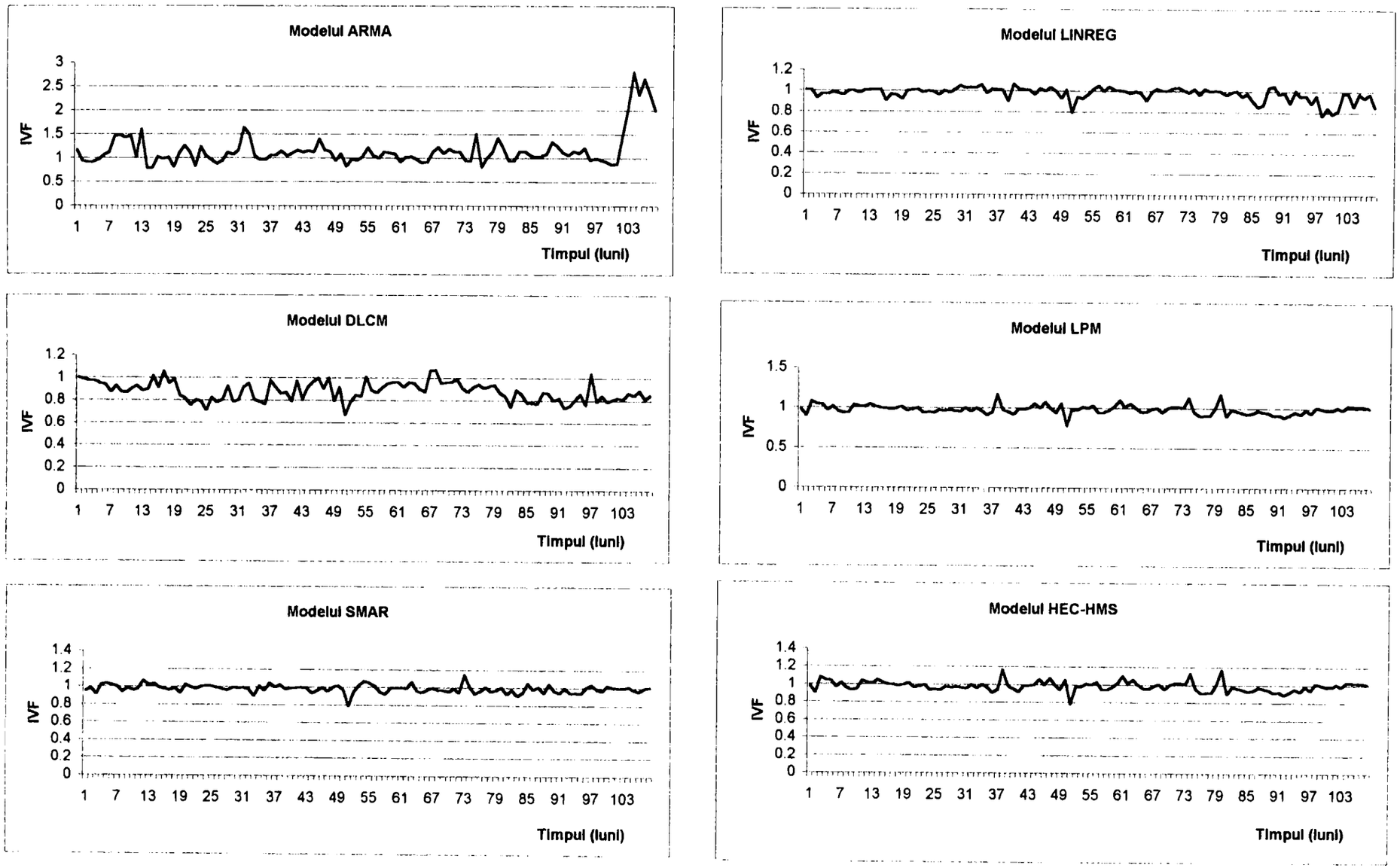


Figura 64. Indexul volumetric IVF ca măsură pentru exprimarea gradului de acurateţe a volumelor scurgerii simulate faţă de scurgerea observată în perioada 1990 - 1997 şi în anul 2000 pe râul Nera la staţia hidrometrică Naidaş.

Tabelul 1.

Indicii de eficiență R^2, IVF și MSE a modelelor de simulare a debitelor medii zilnice pentru perioada 1990 - 1997

Bazinul	Stația hidrom.	Perioada de testare	Model	R^2 (%)	IVF	MSE (m^3/s)
Timiș	Sadova	Calibrare	ARMA	89,1	1,02	2,52
			DLCM	85,7	0,87	2,88
			LINREG	92,4	0,99	3,63
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
		Verificare	ARMA	60,8	1,01	5,20
			DLCM	78,3	0,89	3,87
			LINREG	84,4	0,92	3,29
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
	Lugoj	Calibrare	ARMA	66,6	1,03	18,1
			DLCM	93,3	1,02	8,10
			LINREG	83,1	0,86	12,9
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
		Verificare	ARMA	64,5	1,03	28,0
			DLCM	91,2	1,05	13,9
			LINREG	82,3	0,84	19,8
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
Bega	Balinț	Calibrare	ARMA	10,9	1,03	6,13
			DLCM	72,4	0,78	3,70
			LINREG	79,0	1,00	6,37
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
			LPM	82,9	1,00	2,68
			SMAR	82,8	1,00	2,70
			HEC	79,5	0,99	5,90
		Verificare	ARMA	9,66	1,07	11,4
			DLCM	54,6	0,60	8,60
			LINREG	70,6	0,90	12,2
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
			LPM	81,7	1,02	5,62
			SMAR	84,8	1,03	5,13
			HEC	96,8	1,03	2,53

Bazinul	Stația hidrom.	Perioada de testare	Model	R^2 (%)	IVF	MSE (m^3/s)
Caras	Vărădia	Calibrare	ARMA	73,6	1,05	2,88
			DLCM	68,9	0,71	3,13
			LINREG	85,5	0,99	2,13
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
			LPM	89,0	1,00	1,87
			SMAR	84,5	1,00	2,24
			HEC	84,5	1,00	3,46
		Verificare	ARMA	20,6	1,04	12,9
			DLCM	67,7	0,65	7,65
			LINREG	80,8	1,00	5,90
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
			LPM	86,6	1,04	5,27
			SMAR	78,6	1,06	6,67
			HEC	78,8	1,06	5,87
Nera	Naidaș	Calibrare	ARMA	83,2	1,04	4,44
			DLCM	91,6	0,84	3,14
			LINREG	96,2	0,99	2,10
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
			LPM	93,2	1,00	2,79
			SMAR	88,6	1,00	3,63
			HEC	87,6	1,00	3,77
		Verificare	ARMA	64,6	1,08	11,3
			DLCM	93,5	0,84	4,85
			LINREG	97,4	0,97	3,09
			REACH	Modelul nu funcționează		
			NONLIN	Modelul nu funcționează		
			LPM	92,9	1,05	5,68
			SMAR	82,2	1,02	9,04
			HEC	94,2	1,02	5,07

Tabelul 2.

Indicii de eficiență a modelelor pentru fiecare dintre anii considerați.
Râul Timiș, stația hidrometrică Sadova

Modelul	Anul	$Q_{măs.}$ (m^3/s)	$Q_{sim.}$ (m^3/s)	R^2 (%)	IVF	MSE (m^3/s
ARMA	1990	8,64	8,90	82,5	1,03	2,92
	1991	9,38	9,42	96,2	1,00	1,55
	1992	7,56	7,59	94,7	1,00	0,927
	1993	7,36	7,42	95,3	1,01	1,54
	1994	8,42	8,74	81,7	1,04	3,74
	1995	10,7	11,0	88,0	1,03	3,19
	1996	11,1	11,1	70,9	1,00	4,31
	1997	13,8	13,8	50,4	1,00	5,92
DLCM	1990	8,64	7,79	91,5	0,90	2,05
	1991	9,38	8,05	90,5	0,86	2,50
	1992	7,56	6,64	77,3	0,88	1,97
	1993	7,36	6,15	80,9	0,83	3,15
	1994	8,42	7,21	82,9	0,85	3,65
	1995	10,7	9,43	86,0	0,88	3,48
	1996	11,1	10,1	86,5	0,91	2,96
	1997	13,8	12,1	71,2	0,87	4,62
LINREG	1990	8,64	9,10	92,9	1,05	1,85
	1991	9,38	9,25	92,7	0,99	2,16
	1992	7,56	7,25	84,5	0,96	1,59
	1993	7,36	7,20	93,0	0,98	1,88
	1994	8,42	8,29	90,9	0,98	2,64
	1995	10,7	10,6	94,0	0,99	2,26
	1996	11,1	10,9	91,9	0,98	2,28
	1997	13,8	12,3	77,4	0,88	4,06

Tabelul 3.

Indicii de eficiență a modelelor pentru fiecare dintre anii considerați.
Râul Timiș, stația hidrometrică Lugoj

Modelul	Anul	$Q_{măs.}$ (m^3/s)	$Q_{sim.}$ (m^3/s)	R^2 (%)	IVF	MSE (m^3/s
ARMA	1990	30,4	32,7	43,3	1,07	6,81
	1991	30,1	31,3	74,8	1,03	14,5
	1992	27,0	27,7	68,4	1,01	10,9
	1993	26,9	27,5	78,8	1,04	17,0
	1994	23,7	24,0	51,6	1,01	16,7
	1995	40,6	41,2	75,8	1,01	20,3
	1996	40,9	43,4	76,5	1,06	19,0
	1997	58,3	58,7	72,0	1,01	11,0
DLCM	1990	30,4	25,9	88,6	0,85	9,73
	1991	30,1	26,8	90,9	0,89	8,98
	1992	27,0	21,9	60,8	0,81	12,5
	1993	26,9	23,4	97,8	0,87	17,1
	1994	23,7	21,2	80,8	0,89	10,5
	1995	40,6	33,8	85,5	0,83	16,0
	1996	40,9	35,3	75,0	0,86	18,9
	1997	58,3	47,8	86,9	0,82	19,2
LINREG	1990	30,4	30,7	94,6	1,01	6,60
	1991	30,1	31,0	97,3	1,03	4,82
	1992	27,0	27,1	90,3	1,00	6,01
	1993	26,9	28,5	92,9	1,06	9,79
	1994	23,7	25,3	99,3	1,06	5,62
	1995	40,6	40,1	90,6	0,99	12,8
	1996	40,9	43,4	91,3	1,06	11,4
	1997	58,3	61,0	99,1	1,05	15,4

Tabelul 4

Indicii de eficiență a modelelor pentru fiecare dintre anii considerați.
Râul Bega, stația hidrometrică Balint

Modelul	Anul	$Q_{măs.}$ (m^3/s)	$Q_{sim.}$ (m^3/s)	R^2 (%)	IVF	MSE (m^3/s
ARMA	1990	4,28	4,44	63,3	1,04	2,00
	1991	6,05	5,95	0,00	0,99	8,65
	1992	4,42	4,51	11,7	1,01	3,82
	1993	4,52	4,66	6,60	1,03	8,11
	1994	3,90	3,80	89,6	0,97	1,17
	1995	6,25	6,54	18,0	1,05	7,29
	1996	9,20	9,83	0,00	1,07	12,7
	1997	10,6	11,3	41,0	1,07	10,0
DLCM	1990	4,28	4,39	0,00	1,03	6,27
	1991	6,05	3,86	58,0	0,64	5,14
	1992	4,42	3,17	54,3	0,72	2,74
	1993	4,52	3,45	70,8	0,76	4,54
	1994	3,90	3,27	65,5	0,84	2,12
	1995	6,25	4,53	68,2	0,72	4,54
	1996	9,20	5,30	39,2	0,58	8,75
	1997	10,6	6,60	57,2	0,62	8,44
LINREG	1990	4,28	5,06	59,0	1,18	2,17
	1991	6,05	5,31	64,5	0,88	4,74
	1992	4,42	4,41	61,4	0,98	2,53
	1993	4,52	5,08	91,8	1,12	2,40
	1994	3,90	4,20	89,8	1,08	3,67
	1995	6,25	5,79	83,9	0,92	3,24
	1996	9,20	7,56	51,1	0,82	7,96
	1997	10,6	10,2	72,4	0,96	4,86
LPM	1990	4,28	4,26	91,4	0,99	0,964
	1991	6,05	5,68	88,2	0,94	2,73
	1992	4,42	4,28	92,4	0,97	1,12
	1993	4,52	4,45	94,2	0,98	2,02
	1994	3,90	3,85	95,0	0,99	0,812
	1995	6,25	6,24	94,7	0,99	1,85
	1996	9,20	8,72	92,8	0,95	3,03
	1997	10,6	9,84	91,6	0,93	3,75
SMAR	1990	4,28	4,24	97,0	0,99	0,574
	1991	6,05	5,83	94,4	0,96	1,88
	1992	4,42	4,40	94,1	0,99	0,980
	1993	4,52	4,57	97,3	1,01	1,38
	1994	3,90	3,70	93,0	0,95	0,959
	1995	6,25	6,10	94,8	0,98	1,83
	1996	9,20	8,96	96,0	0,97	2,27
	1997	10,6	10,3	96,3	0,98	2,50
HEC-HMS	1990	4,28	4,40	90,4	0,98	1,39
	1991	6,05	5,46	86,2	0,94	2,91
	1992	4,42	4,20	90,4	0,97	1,81
	1993	4,52	4,45	92,2	0,98	2,02
	1994	3,90	3,84	93,0	0,99	1,63
	1995	6,25	6,12	92,7	0,99	1,77
	1996	9,20	9,06	90,8	0,94	2,86
	1997	10,6	9,94	89,6	0,91	4,05

Tabelul 5.

Indicii de eficienţă a modelelor pentru fiecare dintre anii consideraţi.
Râul Caraş, staţia hidrometrică Vărădia

Modelul	Anul	$Q_{măs.}$ (m^3/s)	$Q_{sim.}$ (m^3/s)	R^2 (%)	IVF	MSE (m^3/s
ARMA	1990	3,78	4,18	72,8	1,11	2,42
	1991	4,73	4,91	67,6	1,04	3,21
	1992	4,34	4,38	86,2	1,01	1,33
	1993	4,88	5,10	68,8	1,04	4,97
	1994	2,75	2,81	65,9	1,02	1,40
	1995	5,40	5,69	83,8	1,05	2,33
	1996	8,07	8,26	59,0	1,02	6,53
	1997	11,2	12,1	6,38	1,05	17,0
DLCM	1990	3,78	2,89	76,7	0,76	2,27
	1991	4,73	3,31	61,8	0,70	3,59
	1992	4,34	3,15	67,0	0,73	2,10
	1993	4,88	3,18	73,4	0,65	4,67
	1994	2,75	2,21	83,0	0,80	1,01
	1995	5,40	3,75	67,0	0,69	3,46
	1996	8,07	4,87	60,5	0,60	6,72
	1997	11,2	7,60	73,0	0,68	8,49
LINREG	1990	3,78	3,82	82,2	1,01	1,95
	1991	4,73	4,67	82,2	0,99	2,37
	1992	4,34	4,25	88,8	0,98	1,16
	1993	4,88	4,85	87,0	0,99	3,21
	1994	2,75	2,75	85,7	1,00	0,906
	1995	5,40	5,38	84,3	0,99	2,30
	1996	8,07	7,78	71,5	0,96	5,44
	1997	11,2	11,7	84,2	1,04	6,33
LPM	1990	3,78	3,81	95,2	1,01	1,01
	1991	4,73	4,92	69,1	1,04	3,13
	1992	4,34	4,34	91,8	1,00	0,990
	1993	4,88	4,66	93,8	0,95	2,24
	1994	2,75	2,73	91,0	0,99	0,714
	1995	5,40	5,22	90,8	0,97	1,76
	1996	8,07	7,62	95,8	0,94	2,09
	1997	11,2	11,2	97,1	1,00	2,71
SMAR	1990	3,78	3,95	94,3	1,04	1,11
	1991	4,73	4,84	96,5	1,02	1,05
	1992	4,34	4,23	93,8	0,98	0,866
	1993	4,88	4,74	98,1	0,97	1,22
	1994	2,75	2,69	96,1	0,97	0,469
	1995	5,40	5,20	95,7	0,96	1,21
	1996	8,07	7,68	97,6	0,95	1,56
	1997	11,2	10,3	97,6	0,92	2,44
HEC-HMS	1990	3,78	3,98	94,2	1,01	1,74
	1991	4,73	5.02	66,1	1,04	3,36
	1992	4,34	4,34	90,6	1,00	1,73
	1993	4,88	4,66	92,4	0,95	2,65
	1994	2,75	2,73	90,0	0,99	1,23
	1995	5,40	5,18	92,5	0,96	1,76
	1996	8,07	7,60	95,8	0,94	2,28
	1997	11,2	11,2	96,1	1,00	2,71

Tabelul 6.

Indicii de eficienţă a modelelor pentru fiecare dintre anii consideraţi.
Râul Nera, staţia hidrometrică Naidăş

Modelul	Anul	$Q_{măs.}$ (m^3/s)	$Q_{sim.}$ (m^3/s)	R^2 (%)	IVF	MSE (m^3/s
ARMA	1990	9,53	9,69	79,6	1,02	4,45
	1991	10,6	10,9	61,2	1,03	6,02
	1992	10,4	10,7	83,1	1,02	2,84
	1993	10,6	11,8	92,5	1,11	4,60
	1994	7,95	8,12	78,1	1,02	3,69
	1995	10,4	10,5	84,8	1,01	4,28
	1996	16,4	17,2	44,5	1,05	13,0
	1997	22,5	24,9	79,5	1,10	9,07
DLCM	1990	9,53	9,14	96,9	0,96	1,73
	1991	10,6	9,89	90,1	0,93	3,05
	1992	10,4	8,40	80,9	0,80	3,15
	1993	10,6	9,20	92,0	0,86	4,75
	1994	7,95	6,72	89,8	0,84	2,55
	1995	10,4	9,84	93,2	0,94	2,85
	1996	16,4	15,0	97,1	0,89	2,96
	1997	22,5	18,2	90,9	0,81	6,19
LINREG	1990	9,53	9,31	95,5	0,98	2,09
	1991	10,6	10,3	93,9	0,97	2,38
	1992	10,4	10,5	95,7	1,01	1,43
	1993	10,6	10,7	96,8	1,01	2,97
	1994	7,95	7,74	97,1	0,97	1,33
	1995	10,4	10,2	96,7	0,98	2,00
	1996	16,4	16,4	98,9	1,00	1,80
	1997	22,5	21,6	96,1	0,96	3,97
LPM	1990	9,53	9,65	94,7	1,01	2,27
	1991	10,6	10,6	98,2	1,00	1,30
	1992	10,4	10,1	93,5	0,96	1,76
	1993	10,6	10,4	96,7	0,98	3,05
	1994	7,95	7,82	97,8	0,99	1,15
	1995	10,4	10,4	96,3	1,00	2,11
	1996	16,4	15,6	94,6	0,94	4,07
	1997	22,5	21,2	94,4	0,94	4,76
SMAR	1990	9,53	9,54	96,3	1,00	1,90
	1991	10,6	10,4	96,1	0,99	1,91
	1992	10,4	10,3	92,0	0,99	1,95
	1993	10,6	10,4	98,8	0,98	1,81
	1994	7,95	7,94	96,4	0,99	1,48
	1995	10,4	10,1	96,9	0,97	1,94
	1996	16,4	15,9	98,6	0,97	2,07
	1997	22,5	22,0	95,9	0,97	4,06
HEC-HMS	1990	9,53	9,62	95,6	1,01	2,14
	1991	10,6	10,6	98,4	1,00	1,30
	1992	10,4	9,41	93,5	0,97	1,76
	1993	10,6	9,97	95,7	0,98	3,15
	1994	7,95	7,84	97,8	0,99	1,15
	1995	10,4	10,4	96,7	1,00	1,94
	1996	16,4	15,5	94,6	0,94	3,92
	1997	22,5	21,4	93,4	0,94	5,07

Tabelul 7

Rezultatele obținute în urma calibrării modelului LPM în bazinul hidrografic Bega la stația hidrometrică Balinț

Catchment: Bega Balint
Model : LPM <Multiple Input-Single Output>

Smoothed seasonal mean for input no. 1

Number of Harmonics	Fourier Coefficients a(j)	b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.16	0.33	43.95
2	0.11	-0.21	19.13
3	0.05	0.02	1.01
4	0.08	-0.05	3.13

Coefficient a0 (the mean) = 1.09
The initial variance = 0.15
Negative volume as % total = 0.00

Smoothed seasonal mean for input no. 2

Number of Harmonics	Fourier Coefficients a(j)	b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.10	0.17	25.90
2	-0.11	-0.05	10.08
3	0.05	-0.01	1.49
4	0.04	-0.05	2.76

Coefficient a0 (the mean) = 0.72
The initial variance = 0.07
Negative volume as % total = 0.00

Smoothed seasonal mean for input no. 3

Number of Harmonics	Fourier Coefficients		Variance accounted by the jth. harmonics

	a(j)	b(j)	c(j) %
1	-0.39	-0.04	6.98
2	0.10	-0.27	3.78
3	0.02	0.12	0.66
4	0.07	-0.11	0.74

Coefficient a0 (the mean) = 1.08
The initial variance = 1.10
Negative volume as % total = 0.00

Smoothed Seasonal Mean Observed Discharge

Number of Harmonics	Fourier Coefficients a(j)	Fourier Coefficients b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.78	2.33	36.98
2	0.19	-0.86	4.77
3	0.06	-0.19	0.23
4	0.40	-0.11	1.05

Coefficient a0 (the mean) = 4.91
The initial variance = 8.19
Negative volume as % total = 0.00

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)
Input number = 1

NUMBER	ORDINATES	STANDARD ERROR
1	0.5366	0.0942
2	0.8877	0.1210
3	0.1796	0.1215
4	-0.1910	0.1224
5	0.0505	0.1246
6	0.0800	0.1391
7	-0.1424	0.1431
8	-0.1379	0.1435

```
   9          0.1475       0.1444
  10         -0.0304       0.1459
  11         -0.0162       0.1460
  12         -0.0113       0.1459
  13         -0.1465       0.1454
  14         -0.0434       0.1437
  15         -0.1626       0.1095
  16          0.0000       0.0000
  17          0.0000       0.0000
  18          0.0000       0.0000
  19          0.0000       0.0000
  20          0.0000       0.0000
-----------------------------------------
 GAIN FACTOR (Dimensioned) =          2.9
-----------------------------------------


The Estimated Pulse Response Function
-----------------------------------------

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
      (Multiple Input-Single output System)
Input number =   2
-----------------------------------------
  NUMBER    ORDINATES     STANDARD
                           ERROR
-----------------------------------------
   1          1.3774       0.4580
   2          1.4196       0.6002
   3         -0.9024       0.6049
   4         -0.5849       0.6059
   5          0.3745       0.6062
   6          0.4739       0.6086
   7         -0.6974       0.6088
   8         -0.0952       0.6090
   9          0.4175       0.6091
  10          0.3960       0.6097
  11         -0.3796       0.6094
  12         -0.0223       0.6100
  13          0.0888       0.6113
  14         -0.1659       0.6089
  15         -0.7000       0.4641
  16          0.0000       0.0000
  17          0.0000       0.0000
  18          0.0000       0.0000
  19          0.0000       0.0000
  20          0.0000       0.0000
-----------------------------------------
 GAIN FACTOR (Dimensioned) =          0.6

The Estimated Pulse Response Function
-----------------------------------------
METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
      (Multiple Input-Single output System)
Input number =   3
```

NUMBER	ORDINATES	STANDARD ERROR
1	0.0141	0.0218
2	0.2505	0.0224
3	0.1627	0.0224
4	0.0716	0.0224
5	0.0704	0.0225
6	0.0586	0.0225
7	0.0368	0.0225
8	0.0498	0.0225
9	0.0342	0.0225
10	0.0245	0.0225
11	0.0160	0.0226
12	-0.0042	0.0225
13	0.0038	0.0225
14	0.0097	0.0224
15	0.0369	0.0211
16	0.0431	0.0211
17	0.0240	0.0209
18	-0.0033	0.0207
19	0.0153	0.0207
20	0.0072	0.0207

GAIN FACTOR (Dimensioned) = 2.0

Non dimensional gainfactor for input 1 is 2.9013
Non dimensional gainfactor for input 2 is 0.6222
Non dimensional gainfactor for input 3 is 0.1606

<<< Calibration period result >>>

4.897	<1>.Mean of the outflow in calibration Qm
4.912	<2>.Mean of the observed series Qbro
4.877	<3>.Mean of the estimated series Qbre
1.007	<4>.Ratio of the Qbro / Qbre
81.700	<5>.Maximum of Q-observed (Min= 1.2)
68.943	<6>.Maximum of Q-estimated (Min= 0.0)
41.8	<7>.Initial Variance per unit time f0
7.2	<8>.Residual Variance per unit time f
82.877	<9>.Model efficiency (R^2 %)

<<< Verification period result >>>

4.897	<1>.Mean of the outflow in calibration Qm
9.855	<2>.Mean of the observed series Qbro
9.262	<3>.Mean of the estimated series Qbre
1.064	<4>.Ratio of the Qbro / Qbre
103.000	<5>.Maximum of Q-observed (Min= 1.6)
86.954	<6>.Maximum of Q-estimated (Min= 0.0)
172.4	<7>.Initial Variance per unit time f0
31.5	<8>.Residual Variance per unit time f
81.745	<9>.Model efficiency (R^2 %)

Tabelul 8

Rezultatele obținute în urma calibrării modelului LPM în bazinul hidrografic Caraș la stația hidrometrică Vărădia

Catchment: Caras Varadia
Model : LPM <Multiple Input-Single Output>

Smoothed seasonal mean for input no. 1

Number of Harmonics	Fourier Coefficients a(j)	Fourier Coefficients b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.18	0.79	3.19
2	0.07	-0.44	0.96
3	-0.16	-0.58	1.74
4	-0.11	-0.19	0.24

Coefficient a0 (the mean) = 1.64
The initial variance = 10.24
Negative volume as % total = 0.00

Smoothed seasonal mean for input no. 2

Number of Harmonics	Fourier Coefficients a(j)	Fourier Coefficients b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.08	0.41	65.53
2	-0.05	-0.09	4.27
3	0.03	-0.09	3.43
4	0.08	0.01	2.28

Coefficient a0 (the mean) = 0.96
The initial variance = 0.13
Negative volume as % total = 0.00

Smoothed seasonal mean for input no. 3

Number of	Fourier Coefficients	Fourier Coefficients	Variance accounted

Number of Harmonics	Fourier Coefficients a(j)	b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.08	0.09	26.91
2	-0.07	0.02	9.59
3	0.01	-0.07	8.75
4	0.03	0.02	2.45

Coefficient a0 (the mean) = 0.24
The initial variance = 0.03
Negative volume as % total = 0.00

Smoothed seasonal mean for input no. 4

Number of Harmonics	Fourier Coefficients a(j)	b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.67	-0.12	8.50
2	0.12	-0.21	1.09
3	0.09	0.00	0.16
4	0.21	-0.18	1.41

Coefficient a0 (the mean) = 1.80
The initial variance = 2.73
Negative volume as % total = 0.00

Smoothed Seasonal Mean Observed Discharge

Number of Harmonics	Fourier Coefficients a(j)	b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.31	2.74	54.62
2	-0.23	-0.27	0.93
3	0.21	-0.74	4.28
4	0.58	0.17	2.62

Coefficient a0 (the mean) = 4.34
The initial variance = 6.94
Negative volume as % total = 0.00

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)
Input number = 1

NUMBER	ORDINATES	STANDARD ERROR
1	0.0820	0.0758
2	0.0623	0.0758
3	0.0389	0.0757
4	0.0506	0.0758
5	0.0658	0.0758
6	0.0674	0.0757
7	0.0675	0.0757
8	0.0593	0.0758
9	0.0651	0.0758
10	0.0817	0.0757
11	0.0800	0.0757
12	0.0794	0.0757
13	0.0699	0.0757
14	0.0688	0.0757
15	0.0614	0.0757
16	0.0000	0.0000
17	0.0000	0.0000
18	0.0000	0.0000
19	0.0000	0.0000
20	0.0000	0.0000

GAIN FACTOR (Dimensioned) = 0.1

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)
Input number = 2

NUMBER	ORDINATES	STANDARD ERROR
1	0.4998	0.0361
2	0.3261	0.0482
3	0.0291	0.0487
4	0.0631	0.0488
5	-0.0292	0.0488
6	-0.0291	0.0491
7	-0.0128	0.0491
8	-0.0376	0.0491
9	-0.0687	0.0491
10	0.1640	0.0492
11	0.0419	0.0488
12	-0.0266	0.0488
13	0.1465	0.0487

14	0.0139	0.0483
15	-0.0805	0.0366
16	0.0000	0.0000
17	0.0000	0.0000
18	0.0000	0.0000
19	0.0000	0.0000
20	0.0000	0.0000

GAIN FACTOR (Dimensioned) = 6.5

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)
Input number = 3

NUMBER	ORDINATES	STANDARD ERROR
1	0.5616	0.0952
2	0.4831	0.1120
3	-0.2959	0.1120
4	-0.0150	0.1120
5	-0.0300	0.1121
6	0.0654	0.1126
7	-0.0983	0.1129
8	0.1446	0.1128
9	0.1675	0.1129
10	0.1076	0.1129
11	-0.1109	0.1129
12	0.0252	0.1130
13	-0.1291	0.1131
14	0.0255	0.1132
15	0.0987	0.0962
16	0.0000	0.0000
17	0.0000	0.0000
18	0.0000	0.0000
19	0.0000	0.0000
20	0.0000	0.0000

GAIN FACTOR (Dimensioned) = 2.7

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)
Input number = 4

NUMBER	ORDINATES	STANDARD ERROR
1	0.0077	0.0540

```
          2          0.3149       0.0562
          3          0.3084       0.0561
          4          0.1984       0.0560
          5          0.1992       0.0561
          6          0.1187       0.0561
          7          0.1305       0.0561
          8          0.0999       0.0562
          9          0.1259       0.0562
         10          0.0419       0.0562
         11         -0.0717       0.0562
         12         -0.0323       0.0563
         13         -0.0366       0.0563
         14         -0.1390       0.0563
         15         -0.0329       0.0522
         16         -0.0324       0.0520
         17         -0.0269       0.0511
         18         -0.0460       0.0506
         19         -0.0426       0.0506
         20         -0.0249       0.0505
       ----------------------------------------
        GAIN FACTOR (Dimensioned) =          0.3
       ----------------------------------------

  Non dimensional gainfactor for input 1 is    0.0933
  Non dimensional gainfactor for input 2 is    6.4826
  Non dimensional gainfactor for input 3 is    2.6688
  Non dimensional gainfactor for input 4 is    0.0305


  <<< Calibration period result >>>
  4.320          <1>.Mean of the outflow in calibration Qm
  4.236          <2>.Mean of the observed  series Qbro
  4.258          <3>.Mean of the estimated series Qbre
  0.995          <4>.Ratio   of   the   Qbro  /  Qbre
 59.600          <5>.Maximum of Q-observed  (Min=   0.4)
 57.725          <6>.Maximum of Q-estimated (Min=   0.0)
   31.4          <7>.Initial Variance per unit time f0
    3.5          <8>.Residual Variance per unit time f
 88.957          <9>.Model  efficiency  ( R^2 % )

  <<< Verification period result >>>
  4.320          <1>.Mean of the outflow in calibration Qm
  9.613          <2>.Mean of the observed  series Qbro
  9.289          <3>.Mean of the estimated series Qbre
  1.035          <4>.Ratio   of   the   Qbro  /  Qbre
109.000          <5>.Maximum of Q-observed  (Min=   1.1)
109.467          <6>.Maximum of Q-estimated (Min=   0.0)
  207.3          <7>.Initial Variance per unit time f0
   27.8          <8>.Residual Variance per unit time f
 86.602          <9>.Model  efficiency  ( R^2 % )
```

Tabelul 9

Rezultatele obținute în urma calibrării modelului LPM în bazinul hidrografic Nera la stația hidrometrică Naidăș

Catchment: Nera Naidas
Model : LPM <Multiple Input-Single Output>

Smoothed seasonal mean for input no. 1

Number of Harmonics	Fourier Coefficients a(j)	Fourier Coefficients b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.57	1.37	55.99
2	-0.30	-0.78	17.66
3	0.41	-0.22	5.56
4	0.32	0.09	2.76

Coefficient a0 (the mean) = 1.96
The initial variance = 1.96
Negative volume as % total = 0.00

Smoothed seasonal mean for input no. 2

Number of Harmonics	Fourier Coefficients a(j)	Fourier Coefficients b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.08	0.77	53.58
2	-0.30	-0.20	11.61
3	0.11	-0.30	9.20
4	0.26	0.06	6.63

Coefficient a0 (the mean) = 1.16
The initial variance = 0.56
Negative volume as % total = 0.00

Smoothed seasonal mean for input no. 3

Number of Harmonics	Fourier Coefficients a(j)	Fourier Coefficients b(j)	Variance accounted by the jth. harmonics c(j) %

	a(j)	b(j)	c(j) %
1	-0.13	1.41	55.70
2	-0.41	-0.49	11.43
3	0.23	-0.38	5.47
4	0.31	0.06	2.81

Coefficient a0 (the mean) = 1.90
The initial variance = 1.81
Negative volume as % total = 0.00

Smoothed seasonal mean for input no. 4

Number of Harmonics	Fourier Coefficients a(j)	b(j)	Variance accounted by the jth. harmonics c(j) %
1	-0.55	-0.04	6.93
2	0.08	-0.27	1.84
3	-0.05	0.03	0.08
4	0.23	-0.12	1.57

Coefficient a0 (the mean) = 1.58
The initial variance = 2.17
Negative volume as % total = 0.00

Smoothed Seasonal Mean Observed Discharge

Number of Harmonics	Fourier Coefficients a(j)	b(j)	Variance accounted by the jth. harmonics c(j) %
1	-1.05	7.60	64.34
2	-2.20	-2.32	11.18
3	1.29	-2.05	6.41
4	1.29	0.59	2.20

Coefficient a0 (the mean) = 9.91
The initial variance = 45.71
Negative volume as % total = 0.00

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)

Input number = 1

NUMBER	ORDINATES	STANDARD ERROR
1	-0.3031	0.1780
2	1.0294	0.2226
3	0.6719	0.2242
4	-0.0910	0.2252
5	-0.2036	0.2255
6	0.0420	0.2248
7	0.0608	0.2347
8	-0.0920	0.2425
9	0.4052	0.2425
10	-0.1694	0.2388
11	-0.0859	0.2354
12	-0.0286	0.2354
13	-0.1941	0.2351
14	-0.0073	0.2340
15	-0.0345	0.1852
16	0.0000	0.0000
17	0.0000	0.0000
18	0.0000	0.0000
19	0.0000	0.0000
20	0.0000	0.0000

GAIN FACTOR (Dimensioned) = 0.7

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)
Input number = 2

NUMBER	ORDINATES	STANDARD ERROR
1	0.0610	0.1454
2	1.2227	0.1769
3	-0.4673	0.1767
4	0.0847	0.1766
5	0.4255	0.1799
6	-0.0710	0.1832
7	0.1367	0.1836
8	-0.2149	0.1846
9	0.0207	0.1848
10	-0.0621	0.1852
11	0.2491	0.1859
12	-0.0989	0.1859
13	-0.1515	0.1857
14	0.0533	0.1856
15	-0.1879	0.1518
16	0.0000	0.0000
17	0.0000	0.0000
18	0.0000	0.0000
19	0.0000	0.0000
20	0.0000	0.0000

GAIN FACTOR (Dimensioned) = 1.2

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)
Input number = 3

NUMBER	ORDINATES	STANDARD ERROR
1	0.3548	0.0313
2	0.2843	0.0396
3	0.0375	0.0400
4	0.0667	0.0402
5	0.0052	0.0403
6	0.0158	0.0405
7	0.0025	0.0405
8	0.0676	0.0407
9	-0.0100	0.0407
10	0.0468	0.0406
11	0.0004	0.0407
12	-0.0039	0.0407
13	0.0461	0.0405
14	0.0485	0.0400
15	0.0377	0.0321
16	0.0000	0.0000
17	0.0000	0.0000
18	0.0000	0.0000
19	0.0000	0.0000
20	0.0000	0.0000

GAIN FACTOR (Dimensioned) = 3.3

The Estimated Pulse Response Function

METHOD: Ordinary Least Squares
DATA: Concurrent Time Series
(Multiple Input-Single output System)
Input number = 4

NUMBER	ORDINATES	STANDARD ERROR
1	0.0688	0.0259
2	0.2206	0.0267
3	0.1520	0.0269
4	0.0898	0.0269
5	0.0606	0.0270
6	0.0420	0.0270
7	0.0858	0.0278
8	0.0544	0.0279
9	0.0228	0.0279
10	0.0157	0.0280
11	0.0331	0.0280
12	0.0322	0.0280
13	0.0370	0.0280

```
        14          0.0129       0.0281
        15          0.0295       0.0261
        16         -0.0047       0.0254
        17         -0.0067       0.0245
        18         -0.0129       0.0242
        19          0.0216       0.0241
        20         -0.0235       0.0240
      -----------------------------------------
       GAIN FACTOR (Dimensioned) =          1.0
      -----------------------------------------

  Non dimensional gainfactor for input 1 is    0.7183
  Non dimensional gainfactor for input 2 is    1.2266
  Non dimensional gainfactor for input 3 is    3.2620
  Non dimensional gainfactor for input 4 is    0.0643


  <<< Calibration period result >>>

   9.881          <1>.Mean of the outflow in calibration Qm
   9.626          <2>.Mean of the observed  series Qbro
   9.604          <3>.Mean of the estimated series Qbre
   1.002          <4>.Ratio   of   the   Qbro  /  Qbre
 104.000          <5>.Maximum of Q-observed  (Min=   1.4)
  98.487          <6>.Maximum of Q-estimated (Min=   0.4)
   114.3          <7>.Initial Variance per unit time f0
     7.8          <8>.Residual Variance per unit time f
  93.191          <9>.Model  efficiency  ( R^2 % )


  <<< Verification period result >>>
   9.881          <1>.Mean of the outflow in calibration Qm
  19.529          <2>.Mean of the observed  series Qbro
  18.608          <3>.Mean of the estimated series Qbre
   1.049          <4>.Ratio   of   the   Qbro  /  Qbre
 146.000          <5>.Maximum of Q-observed  (Min=   1.8)
 115.161          <6>.Maximum of Q-estimated (Min=   1.8)
   455.6          <7>.Initial Variance per unit time f0
    32.3          <8>.Residual Variance per unit time f
  92.909          <9>.Model  efficiency  ( R^2 % )
```

Tabelul 10

Rezultatele obţinute în urma calibrării modelului SMAR în bazinul hidrografic Bega la staţia hidrometrică Balinţ

```
                Simulated Results by the SMAR Model
            ************************************************

        Catchmenr :Bega  Balint
         Method:      Updated forecast by AR model
        Data series:   8 years  <begin at 1990- 1- 1>
        Calibration period:     1====>2191      <  6 years >
        Verification period: 2192====>2920      <  2 years >

                      Values of Parameter
             C     Z     Y        H      T      G     N      NK     KG
Original    .52 400.00 200.00   .26    .52    .83   1.92   2.34  36.50
Opitmised   .52 400.00 200.00   .23    .52    .79   1.70   2.35  49.85

    <<< Initial condition Qb=     .0   Nwarm= 60.  Memory length= 20. >>>

                      Unit Hydrograph ( Surface runoff )
     .1057  .2879  .2399  .1567  .0935  .0532  .0294  .0159  .0085  .0045
     .0023  .0012  .0006  .0003  .0002  .0001  .0000  .0000  .0000  .0023

                  <<<   Statistical listing    >>>

    1. Calibration period:
    4.915          <1>.Mean of the outflow in calibration Qm
    4.931          <2>.Mean of the observed  series Qbro
    4.903          <3>.Mean of the estimated series Qbre
    1.006          <4>.Ration   of   the   Qbro  /  Qbre
   82.100          <5>.Q-observed :  Min=   1.2         Max=
   65.768          <6>.Q-estimated:  Min=    .4         Max=
     42.4          <7>.Initial Variance per unit time f0=
      7.3          <8>.Residual Variance per unit time f=
   82.773          <9>.Model  efficiency  ( R sqr. % )  =


    2. Verification period:
    4.915          <1>.Mean of the outflow in calibration Qm
    9.866          <2>.Mean of the observed  series Qbro
    9.746          <3>.Mean of the estimated series Qbre
    1.012          <4>.Ration   of   the   Qbro  /  Qbre
  103.500          <5>.Q-observed :  Min=   1.6         Max=
   90.210          <6>.Q-estimated:  Min=    .8         Max=
    173.7          <7>.Initial Variance per unit time f0=
     26.4          <8>.Residual Variance per unit time f=
   84.788          <9>.Model  efficiency  ( R sqr. % )  =


    3. The whole series period:
    4.915          <1>.Mean of the outflow in calibration Qm
    6.197          <2>.Mean of the observed  series Qbro
    6.146          <3>.Mean of the estimated series Qbre
    1.008          <4>.Ration   of   the   Qbro  /  Qbre
  103.500          <5>.Q-observed :  Min=   1.2         Max=
   90.210          <6>.Q-estimated:  Min=    .4         Max=
     76.1          <7>.Initial Variance per unit time f0=
     12.2          <8>.Residual Variance per unit time f=
   83.953          <9>.Model  efficiency  ( R sqr. % )  =
```

Rezultatele obținute în urma calibrării modelului SMAR în bazinul hidrografic Caraș la stația hidrometrică Vărădia

```
            Simulated Results by the SMAR Model
         ************************************************

          Catchment :Caras - Varadia
           Method:      Updated forecast by AR model
          Data series:   8 years  <begin at 1990- 1- 1>
          Calibration period:     1====>2191      <  6 years >
          Verification period: 2192====>2920      <  2 years >

                        Values of Parameter
              C     Z      Y        H      T      G     N      NK     KG
Original     .75 400.00 200.00     .24    .94    .77   1.00   4.71 599.99
Opitmised    .75 400.00 200.00     .24    .94    .77   1.00   4.71 599.99

    <<< Initial condition Qb=     .0   Nwarm= 60.  Memory length= 20. >>>

                        Unit Hydrograph ( Surface runoff )
     .1030  .1715  .1387  .1122  .0907  .0734  .0594  .0480  .0388  .0314
     .0254  .0205  .0166  .0134  .0109  .0088  .0071  .0057  .0046  .0121

                   <<<   Statistical listing    >>>

    1. Calibration period:
    4.353          <1>.Mean of the outflow in calibration Qm
    4.270          <2>.Mean of the observed  series Qbro
    4.287          <3>.Mean of the estimated series Qbre
     .996          <4>.Ration   of   the   Qbro  /  Qbre
   59.900          <5>.Q-observed :  Min=    .4         Max=
   51.918          <6>.Q-estimated:  Min=    .6         Max=
     32.1          <7>.Initial Variance per unit time f0=
      5.0          <8>.Residual Variance per unit time f=
   84.483          <9>.Model  efficiency  ( R sqr. % )  =


    2. Verification period:
    4.353          <1>.Mean of the outflow in calibration Qm
    9.636          <2>.Mean of the observed  series Qbro
    9.135          <3>.Mean of the estimated series Qbre
    1.055          <4>.Ration   of   the   Qbro  /  Qbre
  109.500          <5>.Q-observed :  Min=   1.1         Max=
   96.198          <6>.Q-estimated:  Min=    .3         Max=
    208.3          <7>.Initial Variance per unit time f0=
     44.5          <8>.Residual Variance per unit time f=
   78.634          <9>.Model  efficiency  ( R sqr. % )  =


    3. The whole series period:
    4.353          <1>.Mean of the outflow in calibration Qm
    5.647          <2>.Mean of the observed  series Qbro
    5.532          <3>.Mean of the estimated series Qbre
    1.021          <4>.Ration   of   the   Qbro  /  Qbre
  109.500          <5>.Q-observed :  Min=    .4         Max=
   96.198          <6>.Q-estimated:  Min=    .3         Max=
     77.3          <7>.Initial Variance per unit time f0=
     15.1          <8>.Residual Variance per unit time f=
   80.439          <9>.Model  efficiency  ( R sqr. % )  =
```

Rezultatele obținute în urma calibrării modelului SMAR în bazinul hidrografic Nera la stația hidrometrică Naidas

```
                Simulated Results by the SMAR Model
            ************************************************

        Catchmenr :Nera - Naidas
         Method:      Updated forecast by AR model
        Data series:   8 years  <begin at 1990- 1- 1>
        Calibration period:     1====>2191      <  6 years >
        Verification period: 2192====>2920      <  2 years >

                        Values of Parameter
             C     Z      Y        H      T      G     N      NK     KG
Original     .33 332.38 198.25    .26    .68   1.00   1.13   4.28  37.03
Opitmised    .33 368.05 171.17    .26    .68   1.00   1.10   4.30  37.04

    <<< Initial condition Qb=    .0   Nwarm= 60.  Memory length= 20. >>>

                        Unit Hydrograph ( Surface runoff )
     .0963  .1791  .1503  .1215  .0969  .0768  .0606  .0476  .0374  0293
     .0229  .0179  .0140  .0109  .0085  .0066  .0052  .0040  .0031  0120

                   <<<   Statistical listing    >>>

    1. Calibration period:
    9.925          <1>.Mean of the outflow in calibration Qm
    9.669          <2>.Mean of the observed  series Qbro
    9.665          <3>.Mean of the estimated series Qbre
    1.000          <4>.Ration   of   the   Qbro  /  Qbre
  104.500          <5>.Q-observed :  Min=   1.4         Max=
  101.288          <6>.Q-estimated:  Min=    .8         Max=
    115.5          <7>.Initial Variance per unit time f0=
     13.2          <8>.Residual Variance per unit time f=
   88.554          <9>.Model  efficiency  ( R sqr. % )  =


    2. Verification period:
    9.925          <1>.Mean of the outflow in calibration Qm
   19.608          <2>.Mean of the observed  series Qbro
   19.123          <3>.Mean of the estimated series Qbre
    1.025          <4>.Ration   of   the   Qbro  /  Qbre
  146.700          <5>.Q-observed :  Min=   1.8         Max=
  137.965          <6>.Q-estimated:  Min=   1.6         Max=
    460.4          <7>.Initial Variance per unit time f0=
     81.8          <8>.Residual Variance per unit time f=
   82.230          <9>.Model  efficiency  ( R sqr. % )  =


    3. The whole series period:
    9.925          <1>.Mean of the outflow in calibration Qm
   12.220          <2>.Mean of the observed  series Qbro
   12.093          <3>.Mean of the estimated series Qbre
    1.011          <4>.Ration   of   the   Qbro  /  Qbre
  146.700          <5>.Q-observed :  Min=   1.4         Max=
  137.965          <6>.Q-estimated:  Min=    .8         Max=
    204.1          <7>.Initial Variance per unit time f0=
     30.8          <8>.Residual Variance per unit time f=
   84.892          <9>.Model  efficiency  ( R sqr. % )  =
```

Tabelul 13.

Erorile relative ale debitului maxim anual calculat pentru râul Timiş
la staţia hidrometrică Sadova

Setul de date	Anul	$\Delta Q = (Q_e - Q_0)$ (m^3/s)			Eroarea relativă ($\Delta Q/Q_0$)(%)		
		ARMA	DLCM	LINREG	ARMA	DLCM	LINREG
Calibrarea	1990	6,30	-2,70	4,40	16,5	7,06	11,5
	1991	13,7	-9,40	-6,00	27,7	19,0	12,1
	1992	21,0	2,30	1,70	93,3	10,2	7,55
	1993	17,1	-17,3	-8,90	43,5	44,0	22,6
	1994	30,3	-31,8	-12,0	30,7	41,9	15,8
	1995	30,1	-32,8	4,00	39,6	42,6	5,27
	Eroarea relativă medie(ARE)				41,9	27,5	12,5
Verificare	1996	19,5	-8,80	-6,50	34,0	15,3	11,3
	1997	38,3	-11,2	-15,2	58,3	17,0	23,1
	Eroarea relativă medie (ARE)				46,2	16,2	17,2
1990 - 1997	Eroarea relativa medie (ARE)				43,0	24,6	13,6

Tabelul 14.

Erorile relative ale debitului maxim anual calculat pentru râul Timiş
la staţia hidrometrică Lugoj

Setul de date	Anul	$\Delta Q = (Q_e - Q_0)$ (m^3/s)			Eroarea relativă ($\Delta Q/Q_0$)(%)		
		ARMA	DLCM	LINREG	ARMA	DLCM	LINREG
Calibrarea	1990	175	-29,0	-19,0	88,1	14,5	9,55
	1991	79,0	-34,0	-4,00	40,9	17,6	2,07
	1992	40,0	-10,0	10,0	33,9	8,47	8,47
	1993	78,0	-42,0	-26,0	28,7	15,4	9,56
	1994	174	-48,0	-26,0	74,7	20,6	11,2
	1995	135	-57,0	90,0	36,2	15,3	24,1
	Eroarea relativă medie(ARE)				50,4	15,0	10,8
Verificare	1996	89,0	-101	37,0	26,5	30,0	11,0
	1997	90,0	-152	-44,0	24,5	41,4	12,0
	Eroarea relativă medie (ARE)				25.5	35,7	11,5
1990 - 1997	Eroarea relativa medie (ARE)				44,1	20,4	11,0

Tabelul 15.

Erorile relative ale debitului maxim anual calculat pentru râul Bega la stația hidrometrică Balint

Setul de date	Anul	$\Delta Q = (Q_e - Q_0)$ (m^3/s)						Eroarea relativă ($\Delta Q/Q_0$)(%)					
		ARMA	DCLM	LINREG	LPM	SMAR	HEC	ARMA	DLCM	LINREG	LPM	SMAR	HEC
Calibrarea	1990	15,8	-3,50	9,10	-10,8	-4,00	3,50	45,0	10,0	25,9	30,8	11,3	9,91
	1991	42,6	-24,6	-9,60	-6,80	-8,60	8,60	68,0	39,4	15,3	10,9	13,7	13,7
	1992	12,4	-22,8	-17,3	-9,80	-11,0	-4,20	32,2	59,4	45,0	25,5	28,4	10,9
	1993	30,4	-32,2	-10,0	-8,90	-6,80	-7,80	43,6	48,4	14,4	12,8	9,70	11,2
	1994	1,20	2,00	4,60	-3,40	-7,30	6,30	3,90	6,50	14,9	11,0	23,6	20,4
	1995	50,9	-9,30	-2,30	-12,5	-17,4	15,4	62,3	16,4	2,82	15,2	21,2	17,7
	Eroarea relativă medie(ARE)							42,5	30,0	19,7	17,7	17,9	14,0
Verificare	1996	27,9	-24,4	-7,90	-1,90	-2,40	-6,40	32,0	28,0	9,07	2,20	2,74	7,34
	1997	34,0	-37,8	-8,10	-19,0	-13,9	16,9	33,0	36,7	7,90	18,4	13,4	16,4
	Eroarea relativă medie (ARE)							32,5	32,4	8,48	10,3	9,44	11,9
1990 - 1997	Eroarea relativa medie (ARE)							40,0	30,6	16,9	15,8	15,5	13,4

Tabelul 16.

Erorile relative ale debitului maxim anual calculat pentru râul Caraş la staţia hidrometrică Vărădia

Setul de date	Anul	$\Delta Q = (Q_e - Q_0)$ (m^3/s)						Eroarea relativă ($\Delta Q/Q_0$)(%)					
		ARMA	DCLM	LINREG	LPM	SMAR	HEC	ARMA	DLCM	LINREG	LPM	SMAR	HEC
Calibrarea	1990	30,0	-27,9	-9,10	2,30	-7,60	9,60	59,3	55,1	18,0	4,50	14,9	19,0
	1991	15,2	-37,6	-6,90	-11,3	-7,90	9,00	25,5	63,1	11,6	18,9	13,2	15,1
	1992	7,40	-6,10	5,70	-0,90	-1,00	5,10	31,2	25,7	24,0	3,80	4,20	21,5
	1993	27,4	-22,2	-5,50	0,10	-6,00	6,00	47,6	38,5	9,55	0,20	10,4	10,4
	1994	13,3	2,00	2,40	-2,50	-2,70	-3,70	76,0	11,4	13,7	14,3	15,3	21,1
	1995	14,3	-22,4	-2,90	-9,60	-6,00	6,00	30,4	47,6	6,17	20,4	12,7	12,7
	Eroarea relativă medie(ARE)							45,0	40,2	13,8	10,4	11,8	16,6
Verificare	1996	57,7	-26,0	8,50	-3,20	-4,80	6,70	73,7	33,2	10,8	4,10	6,10	8,55
	1997	104	-25,8	32,0	0,00	12,8	18,8	63,8	23,7	29,4	0,00	11,7	17,2
	Eroarea relativă medie (ARE)							68,8	28,4	20,1	2,05	8,90	12,9
1990 - 1997	Eroarea relativa medie (ARE)							50,9	37,2	15,4	8,27	11,1	15,7

Tabelul 17.

Erorile relative ale debitului maxim anual calculat pentru râul Nera la staţia hidrometrică Naidăş

Setul de date	Anul	$\Delta Q = (Q_e - Q_0)$ (m^3/s)						Eroarea relativă ($\Delta Q/Q_0$)(%)					
		ARMA	DCLM	LINREG	LPM	SMAR	HEC	ARMA	DLCM	LINREG	LPM	SMAR	HEC
Calibrarea	1990	18,6	9,70	6,70	-10,6	-6,30	12,3	28,6	14,9	10,3	16,3	9,66	19,0
	1991	47,0	-21,50	-14,9	-5,50	-3,00	12,0	45,2	20,7	14,3	5,30	2,88	10,8
	1992	19,7	0,600	-1,80	5,00	0,600	-2,60	52,2	1,60	4,80	13,3	1,59	6,90
	1993	39,8	-17,0	-6,00	-13,7	-8,20	8,20	40,1	17,1	6,05	13,8	8,22	8,27
	1994	41,1	2,50	2,00	3,90	-6,80	7,80	78,7	4,79	3,83	7,47	12,9	14,9
	1995	35,8	-2,20	13,8	4,70	-9,00	11,0	40,1	2,47	15,5	5,26	10,0	12,2
	Eroarea relativă medie(ARE)							47,5	10,3	9,13	10,2	7,54	12,0
Verificare	1996	28,0	-3,00	2,00	-4,00	-6,00	17,0	26,2	2,80	1,87	3,74	5,56	15,8
	1997	63,0	-14,0	4,00	-40,0	-9,00	23,6	43,2	9,60	2,73	27,4	6,12	16,2
	Eroarea relativă medie (ARE)							34,7	6,20	2,30	15,6	5,84	16,0
1990 - 1997	Eroarea relativa medie (ARE)							44,3	9,24	7,42	11,6	7,11	13,0

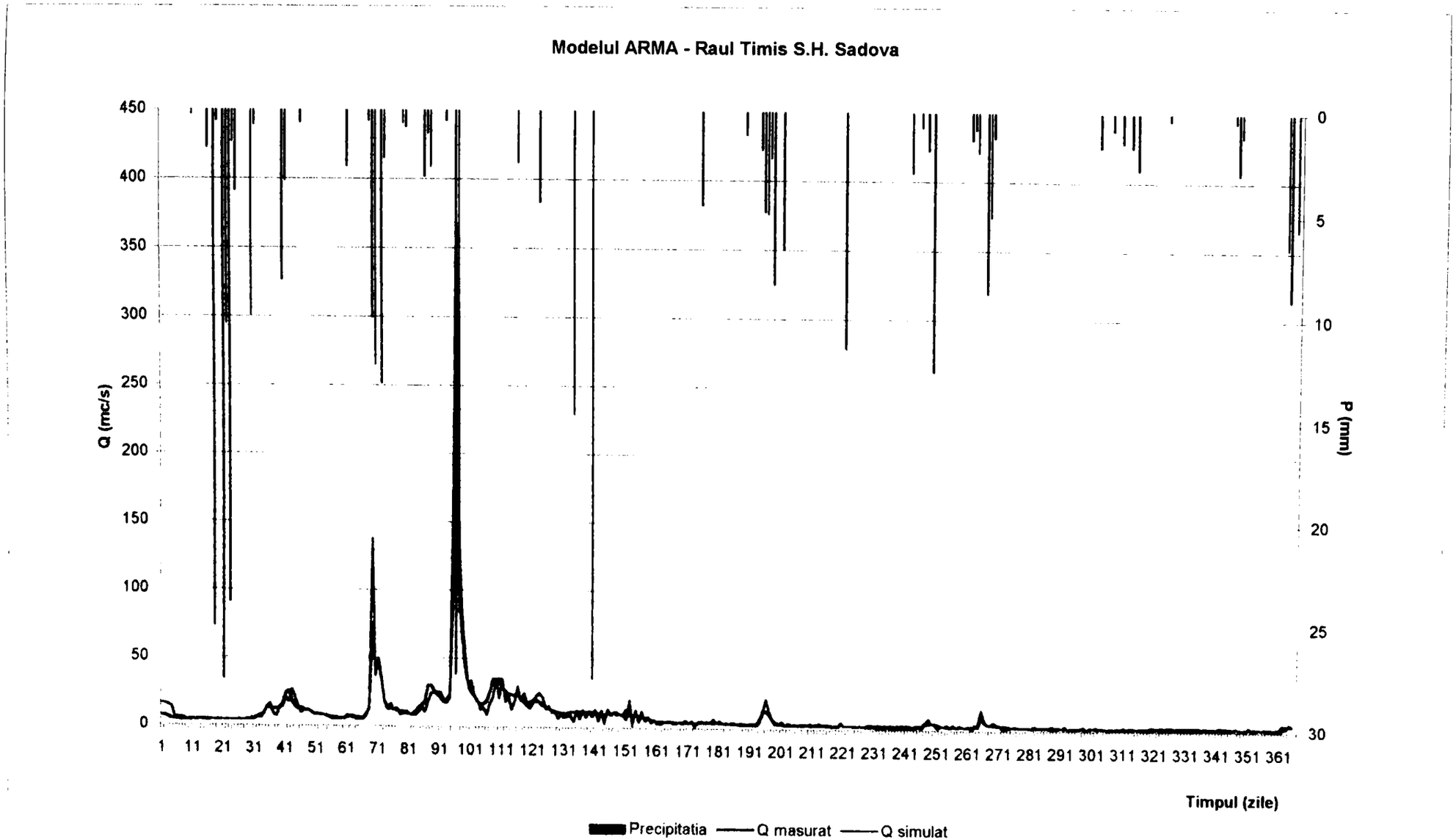


Figura 65. Hidrografele debitelor medii zilnice simulate cu modelul ARMA şi observate în anul 2000 pe râul Timiş la staţia hidrometrică Sadova.

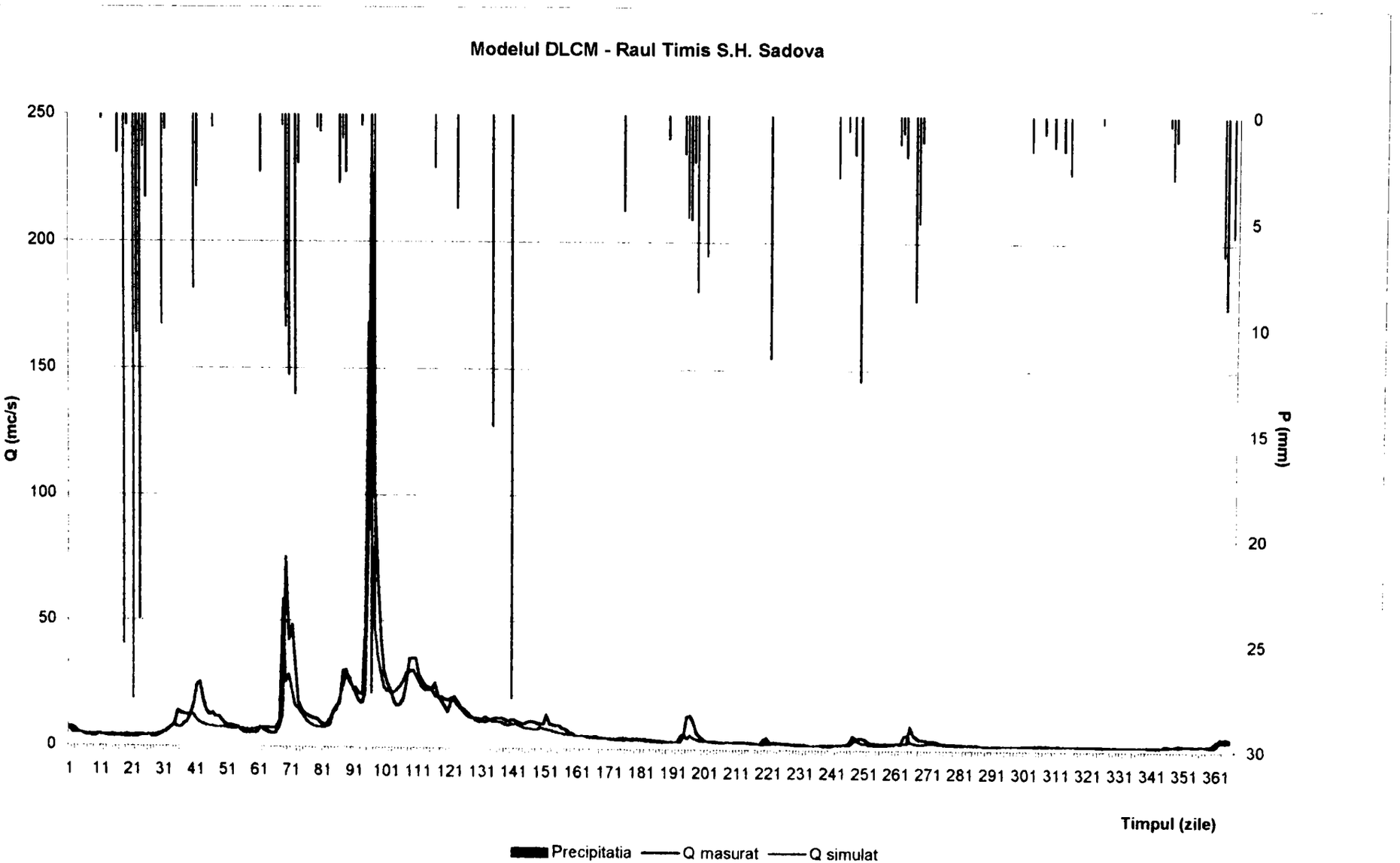


Figura 66. Hidrografele debitelor medii zilnice simulate cu modelul DLCM şi observate în anul 2000 pe râul Timiş la staţia hidrometrică Sadova.

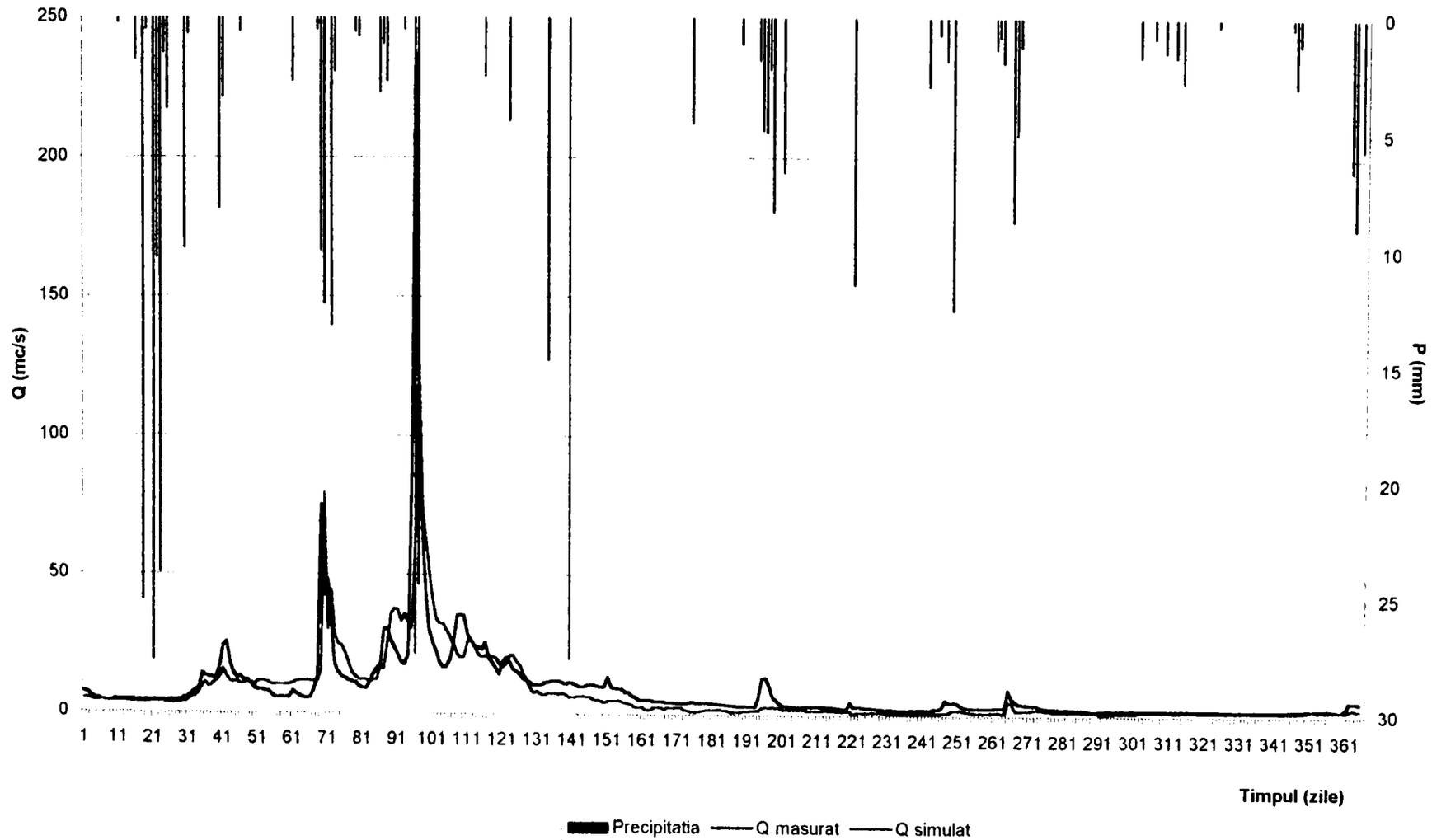


Figura 67. Hidrografele debitelor medii zilnice simulate cu modelul LINREG și observate în anul 2000 pe râul Timiș la stația hidrometrică Sadova.

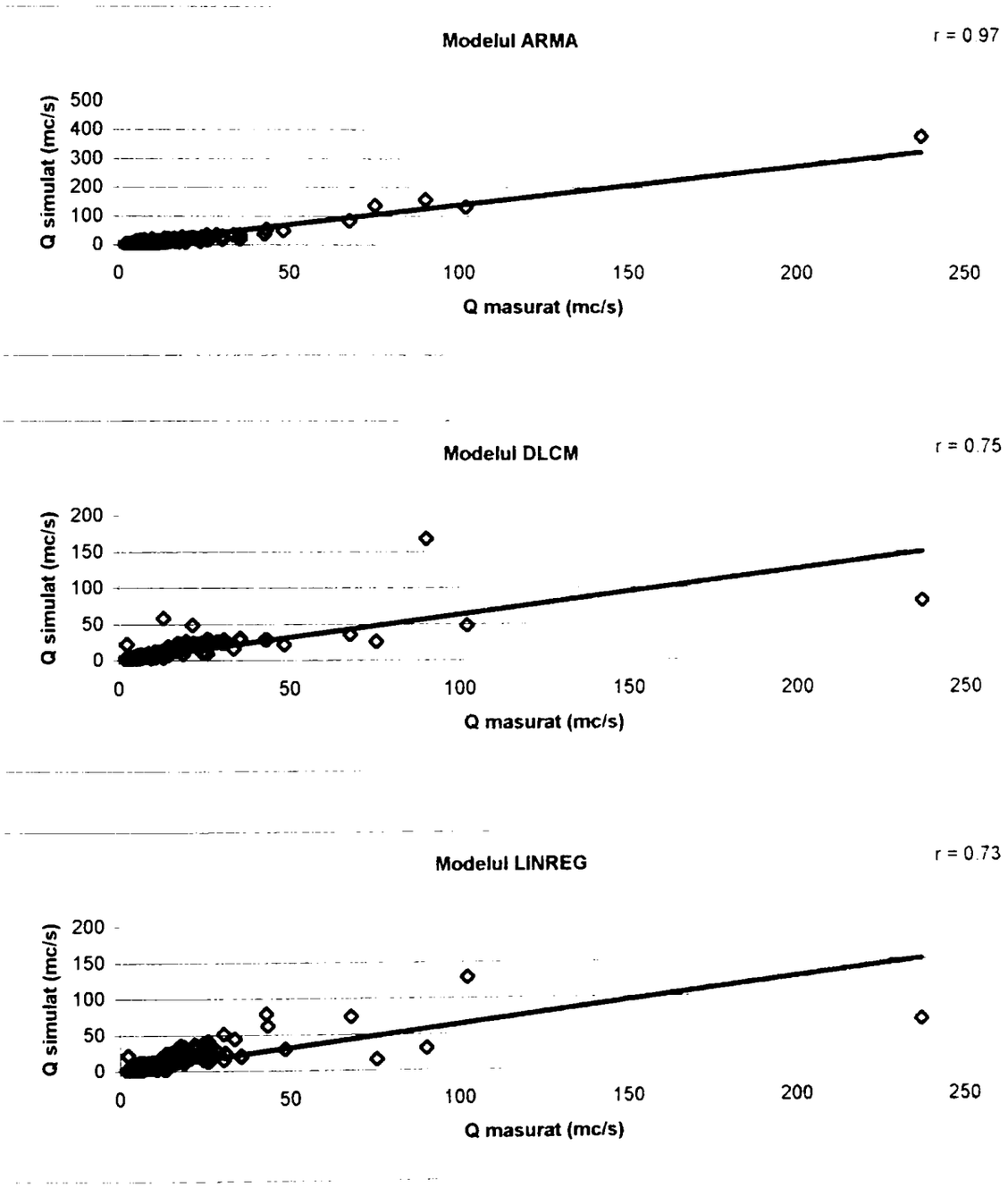


Figura 68. Corelațiile dintre debitele medii lunare observate și simulate în anul 2000 pe râul Timiș la stația hidrometrică Sadova.

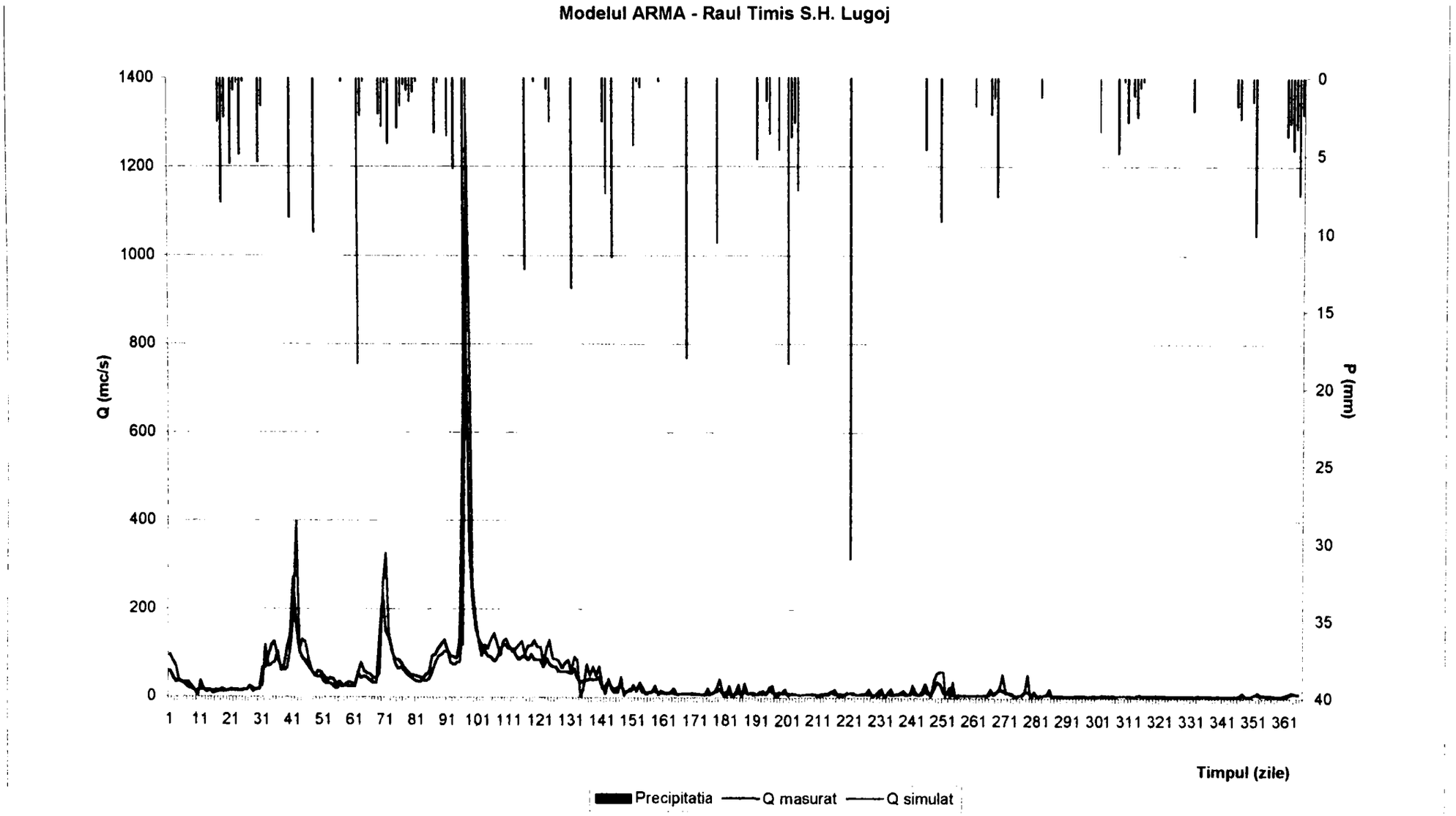


Figura 69. Hidrografele debitelor medii zilnice simulate cu modelul ARMA și observate în anul 2000 pe râul Timiș la stația hidrometrică Lugoj.

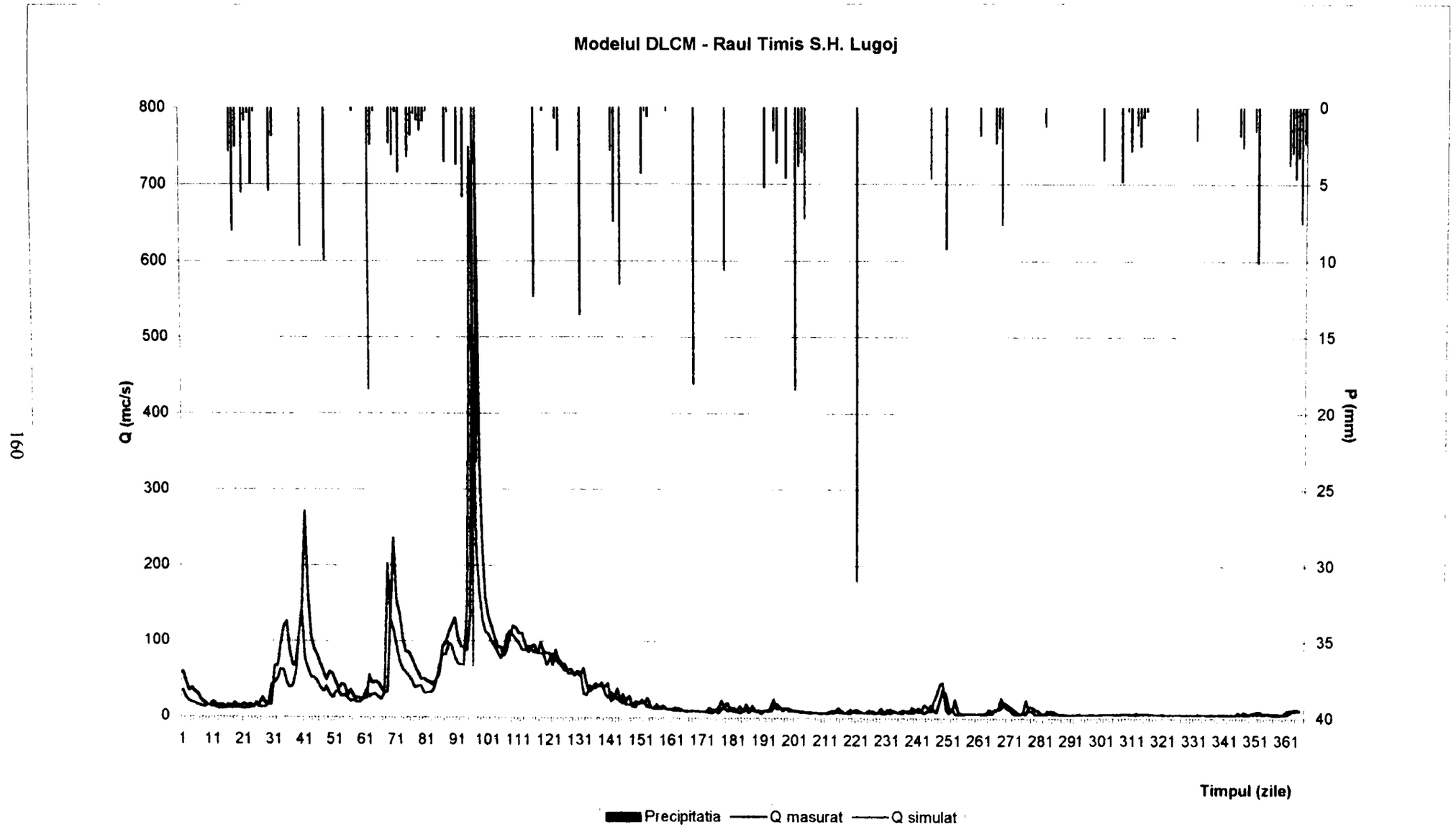


Figura 70. Hidrografele debitelor medii zilnice simulate cu modelul DLCM şi observate în anul 2000 pe râul Timiş la staţia hidrometrică Lugoj.

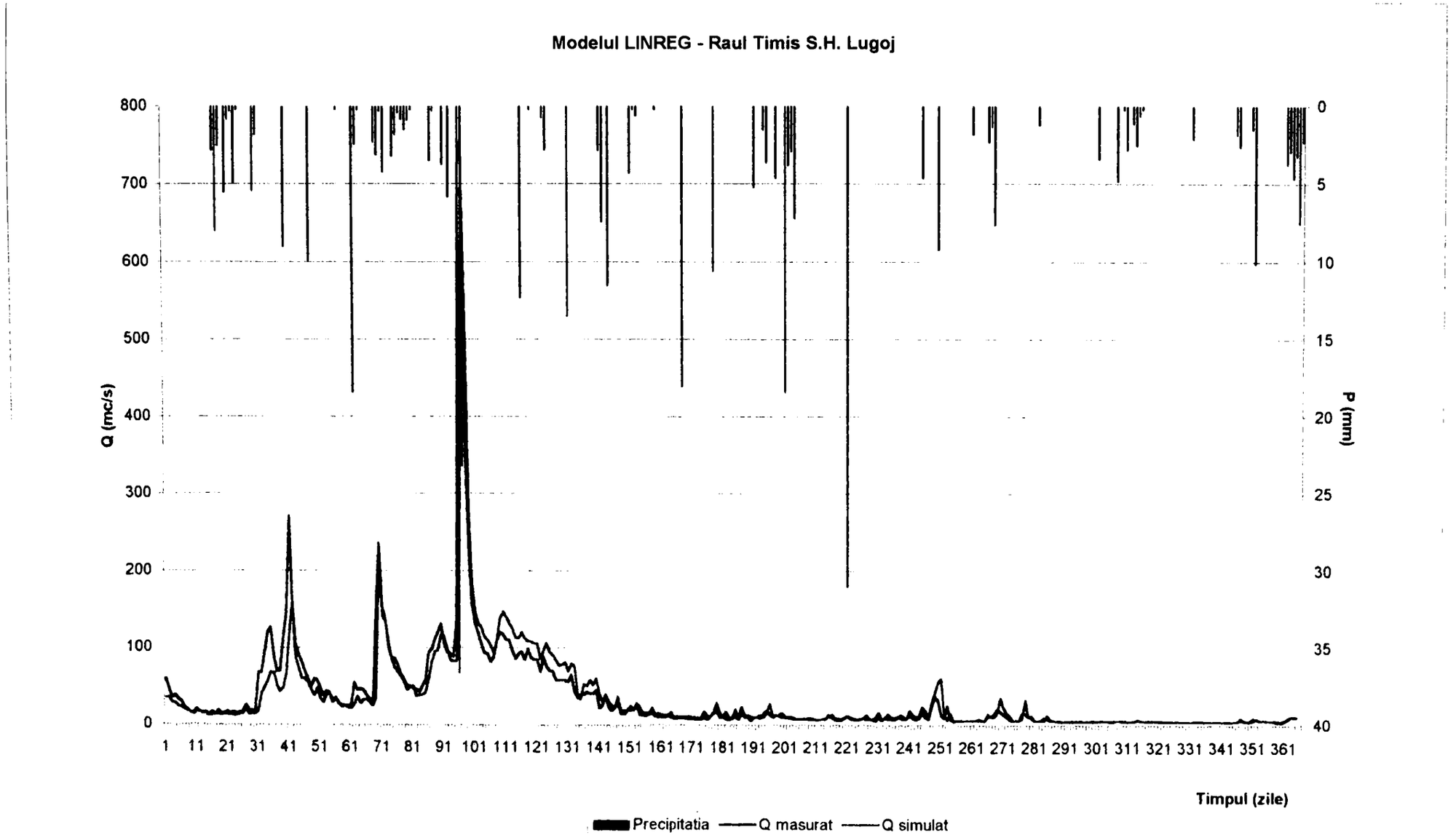


Figura 71. Hidrografele debitelor medii zilnice simulate cu modelul LINREG și observate în anul 2000 pe râul Timiș la stația hidrometrică Lugoj.

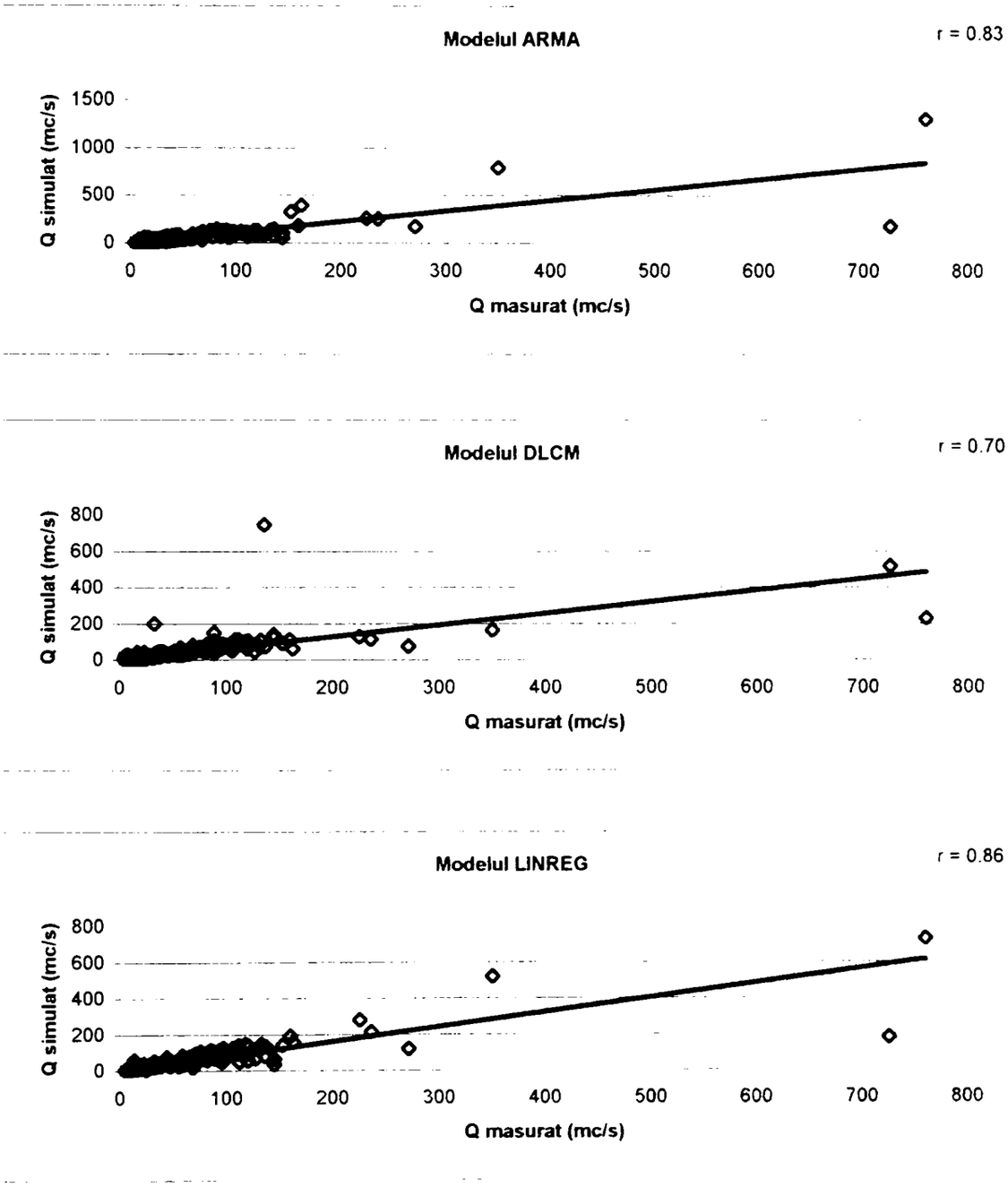


Figura 72. Corelațiile dintre debitele medii lunare observate și simulate în anul 2000 pe râul Timiș la stația hidrometrică Lugoj

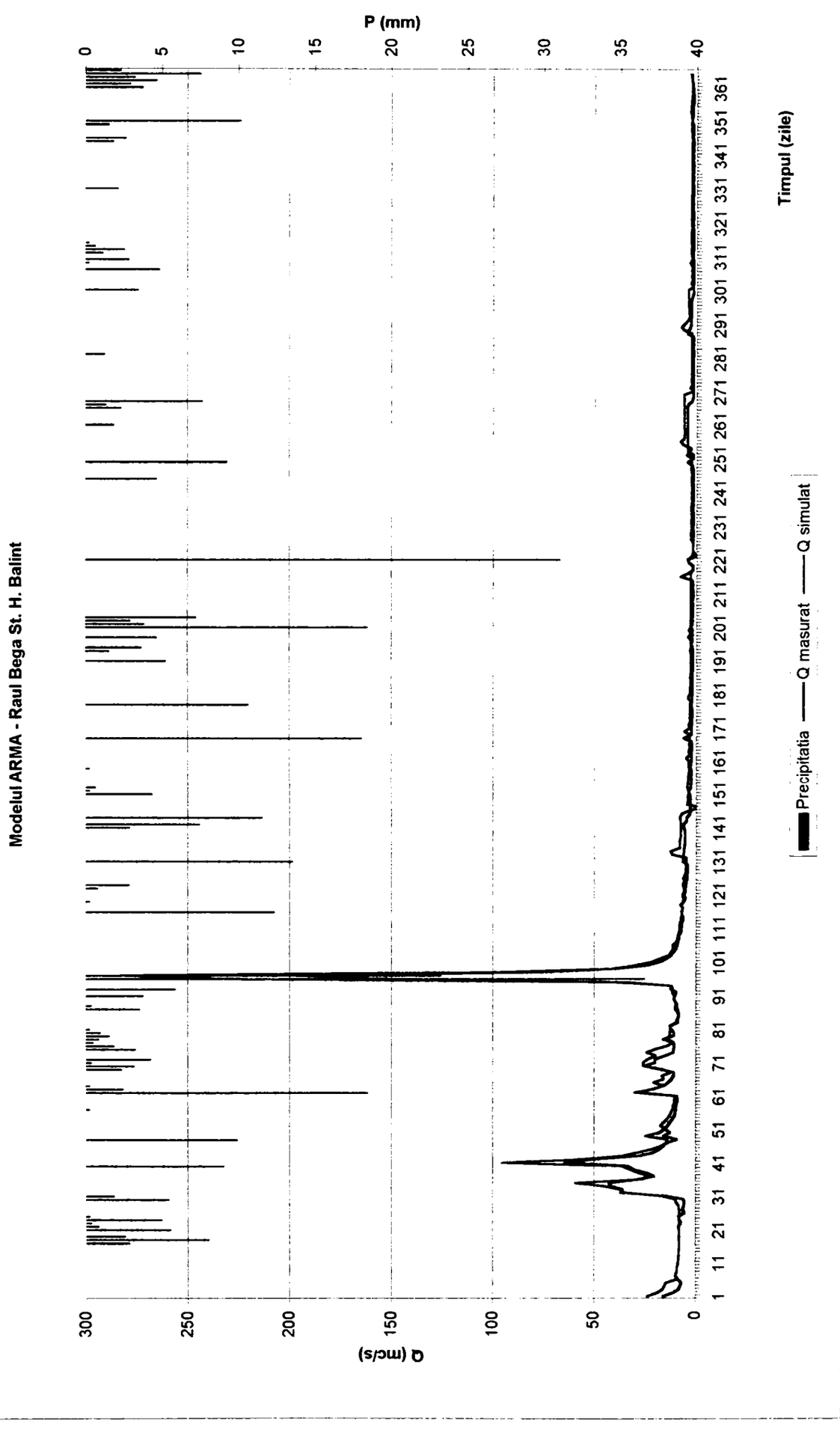


Figura 73. Hidrografele debitelor medii zilnice simulate cu modelul ARMA și observate în anul 2000 pe râul Bega la stația hidrometrică Balinț.

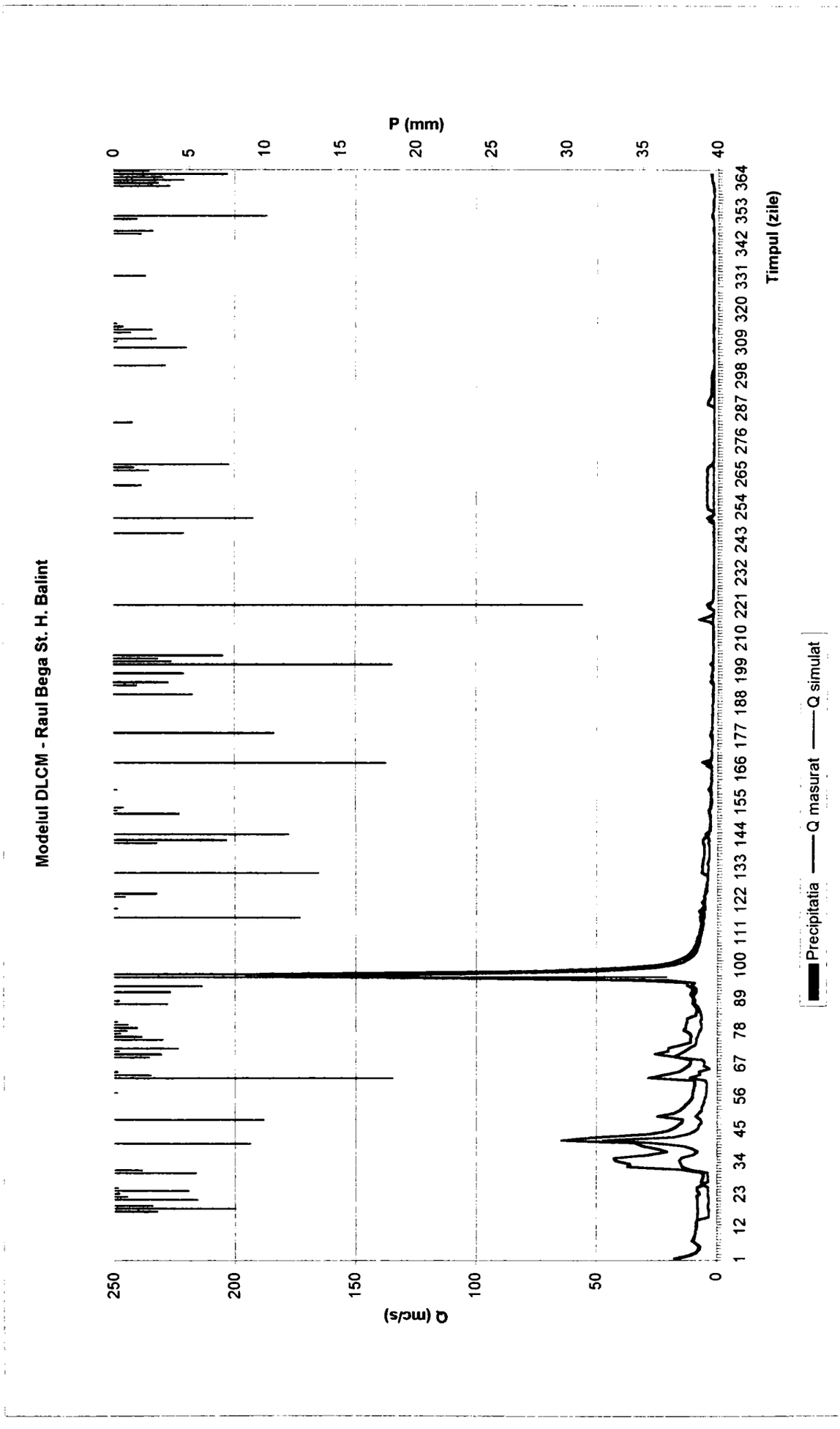


Figura 73 a. Hidrografele debitelor medii zilnice simulate cu modelul DLCM şi observate în anul 2000 pe râul Bega la staţia hidrometrică Balinţ.

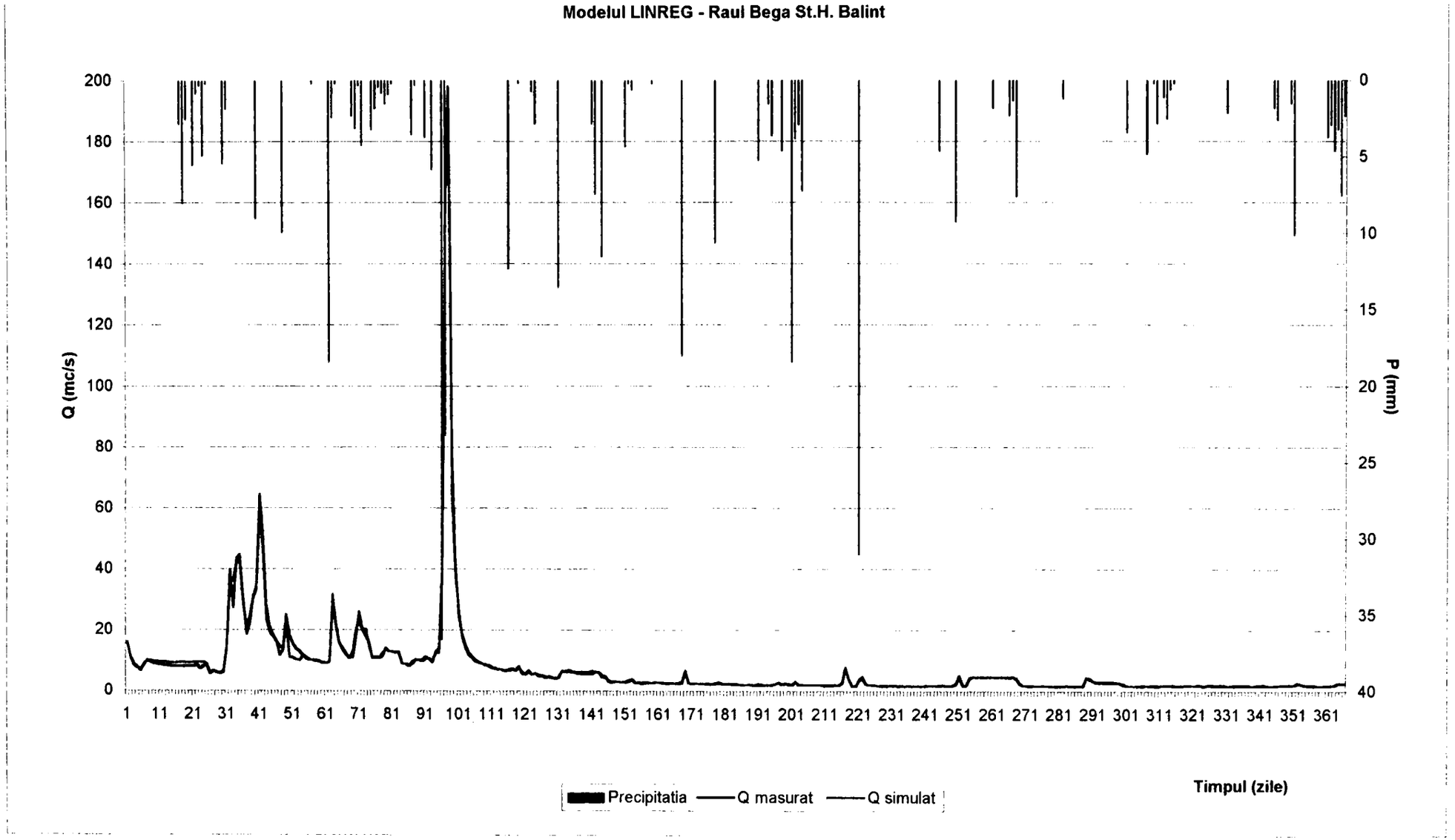


Figura 74. Hidrografele debitelor medii zilnice simulate cu modelul LINREG şi observate în anul 2000 pe râul Bega la staţia hidrometrică Balinţ.

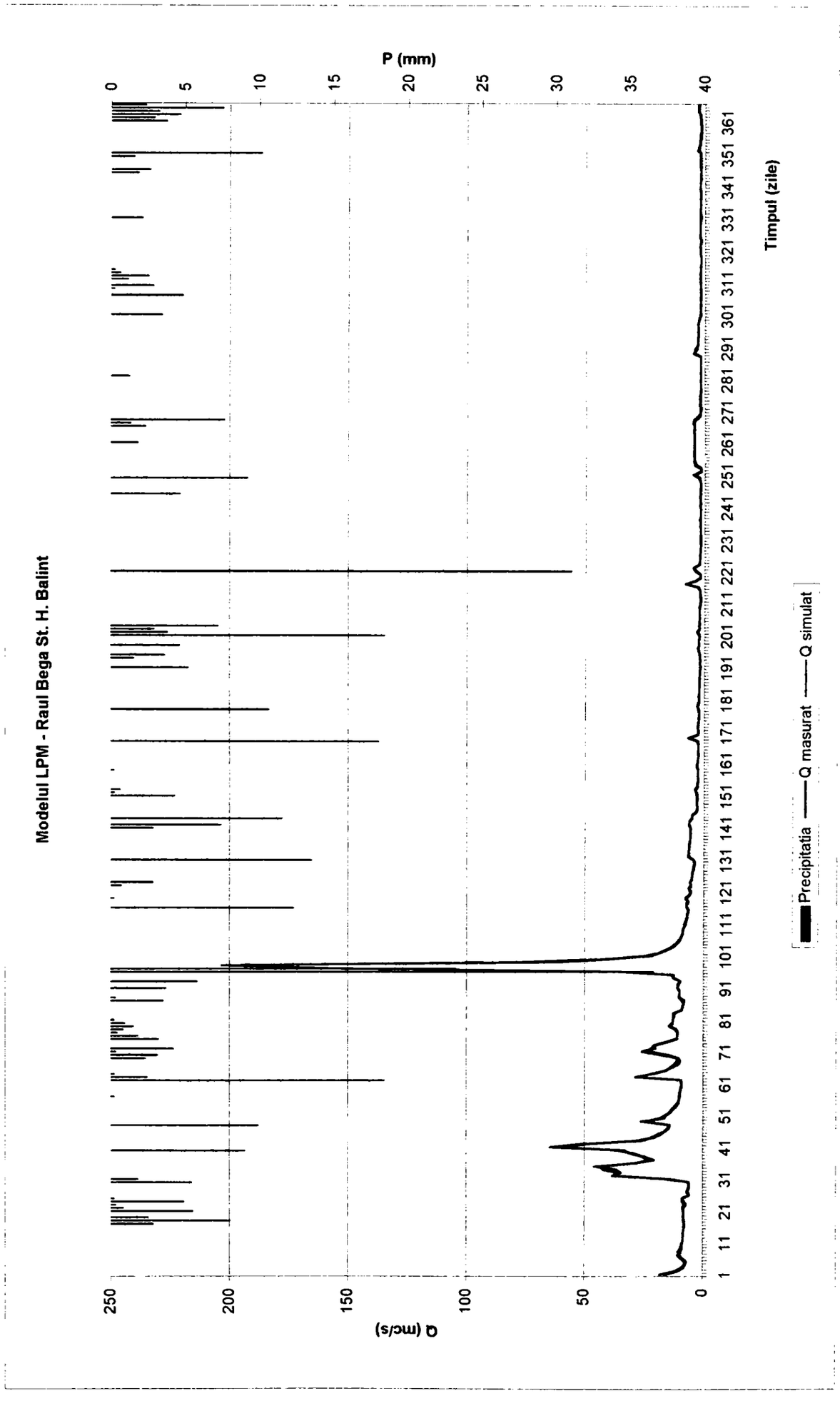


Figura 75. Hidrografele debitelor medii zilnice simulate cu modelul LPM și observate în anul 2000 pe râul Bega la stația hidrometrică Balint.

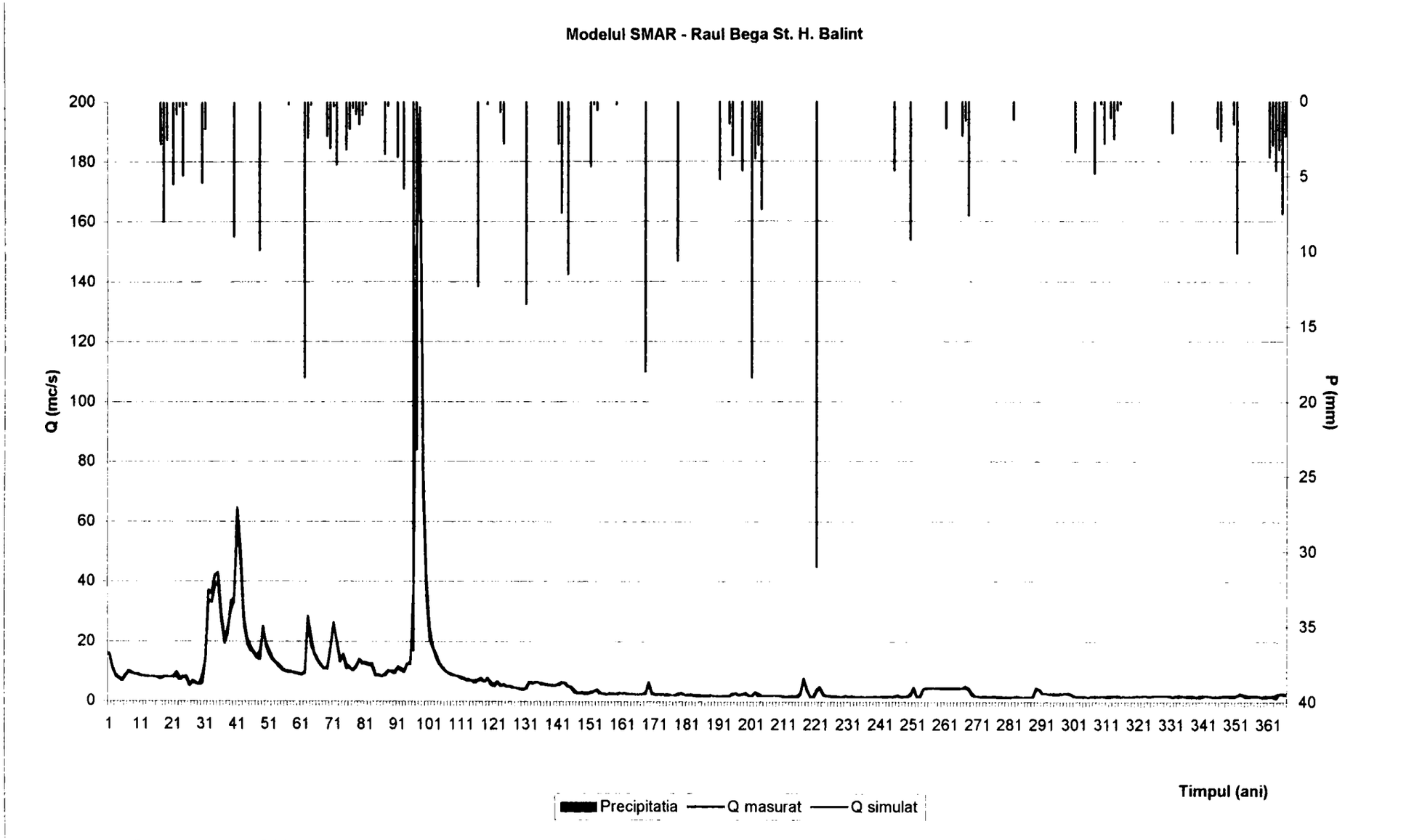


Figura 76. Hidrografele debitelor medii zilnice simulate cu modelul SMAR și observate în anul 2000 pe râul Bega la stația hidrometrică Balinț.

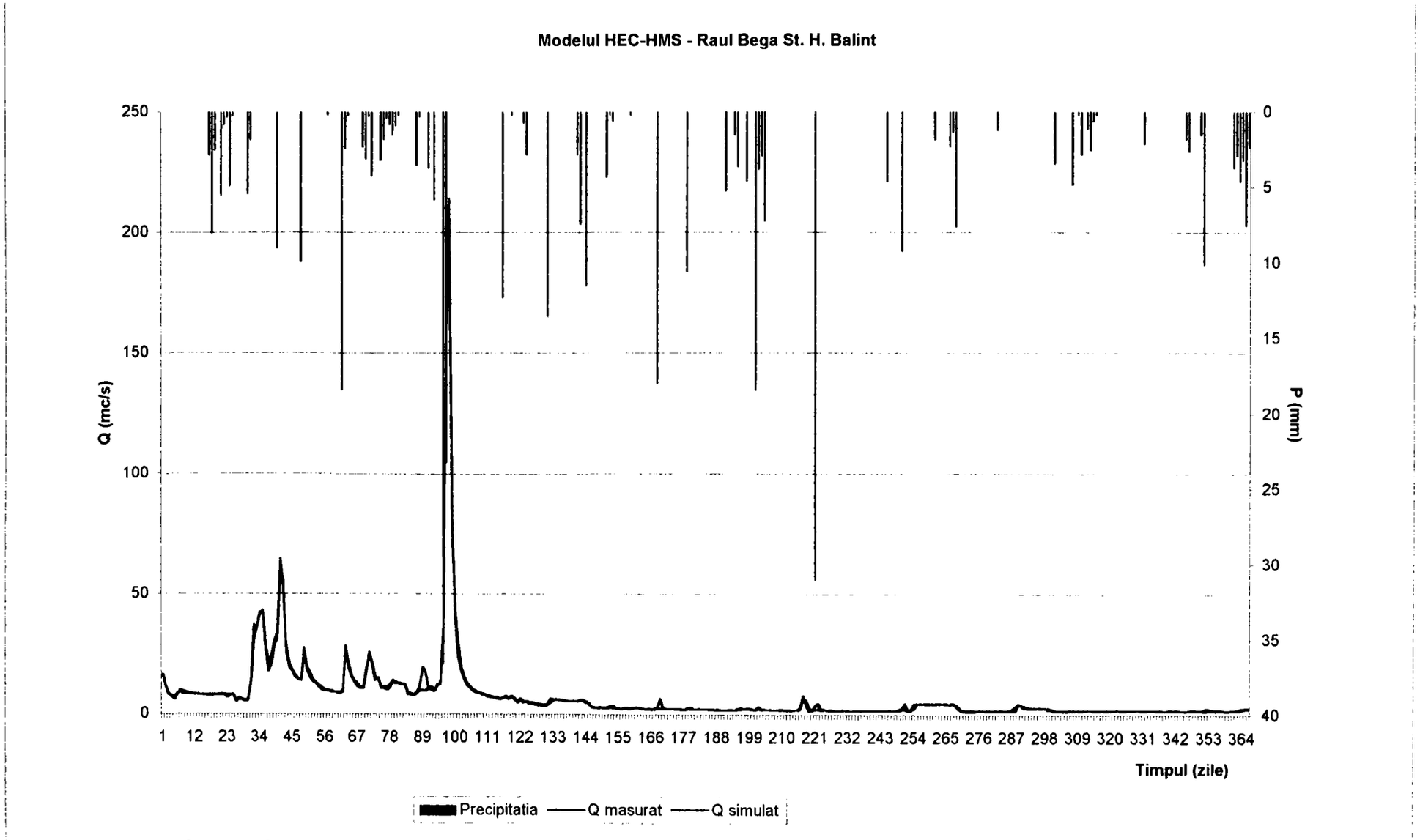


Figura 77. Hidrografele debitelor m dii zilnice simulate cu modelul HEC-HMS şi observate în anul 2000 pe râul Bega la staţia hidrometrică Balinţ.

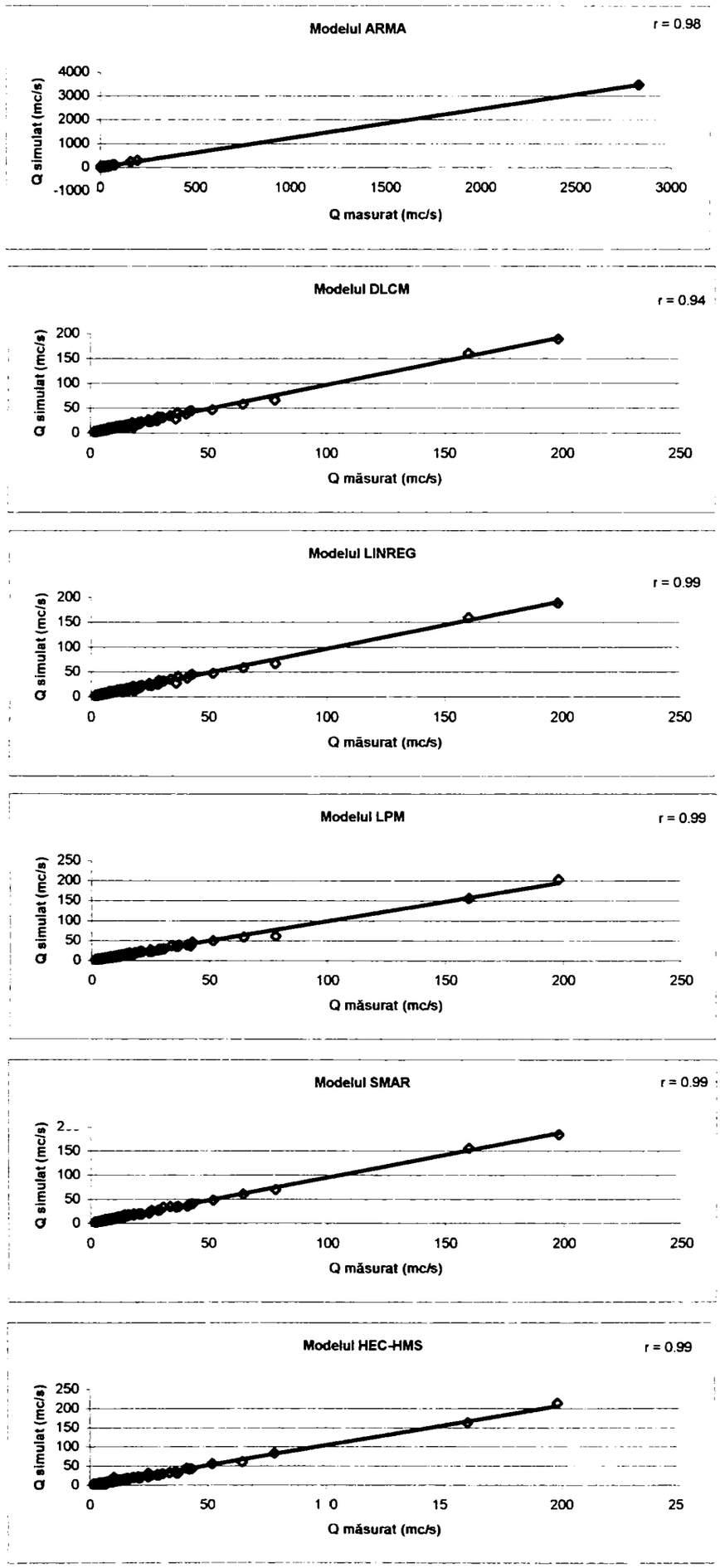


Figura 78. Corelațiile dintre debitele medii lunare observate şi simulate în anul 2000 pe râul Bega la stația hidrometrică Balint.

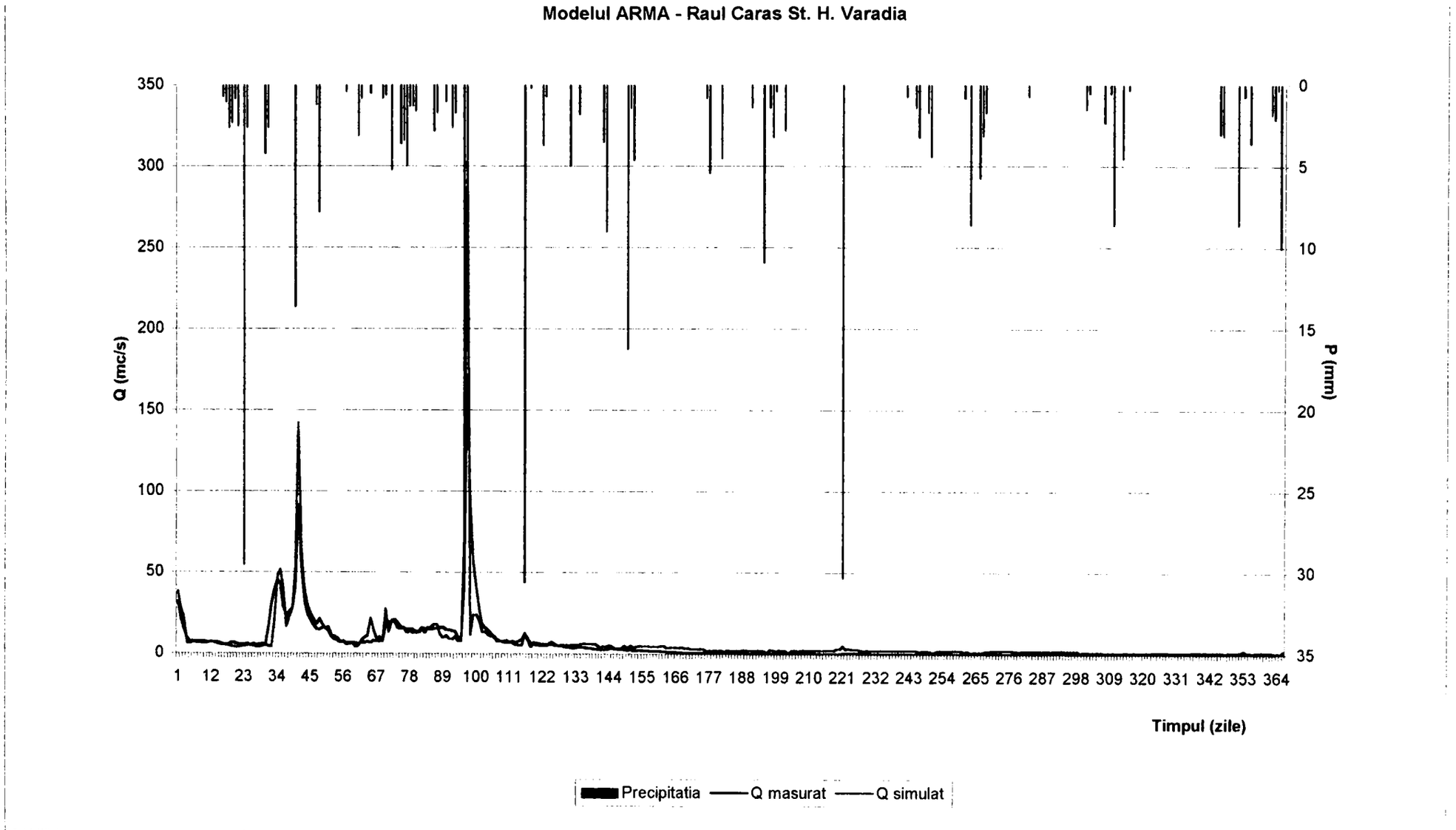


Figura 79. Hidrografele debitelor medii zilnice simulate cu modelul ARMA şi observate în anul 2000 pe râul Caraş la staţia hidrometrică Vărădia.

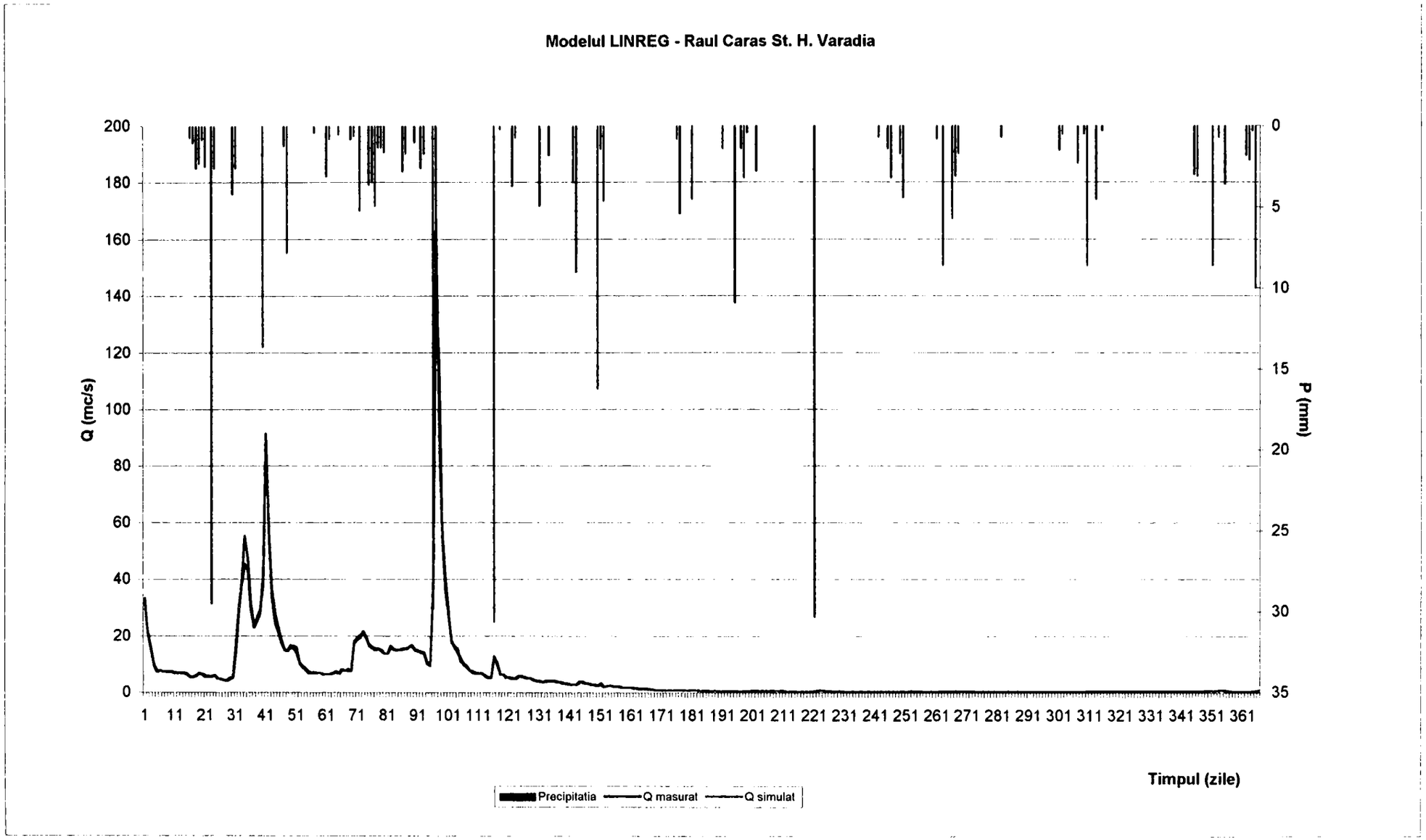


Figura 80. Hidrografele debitelor medii zilnice simulate cu modelul LINREG şi observate în anul 2000 pe râul Caraş la staţia hidrometrică Vărădia.

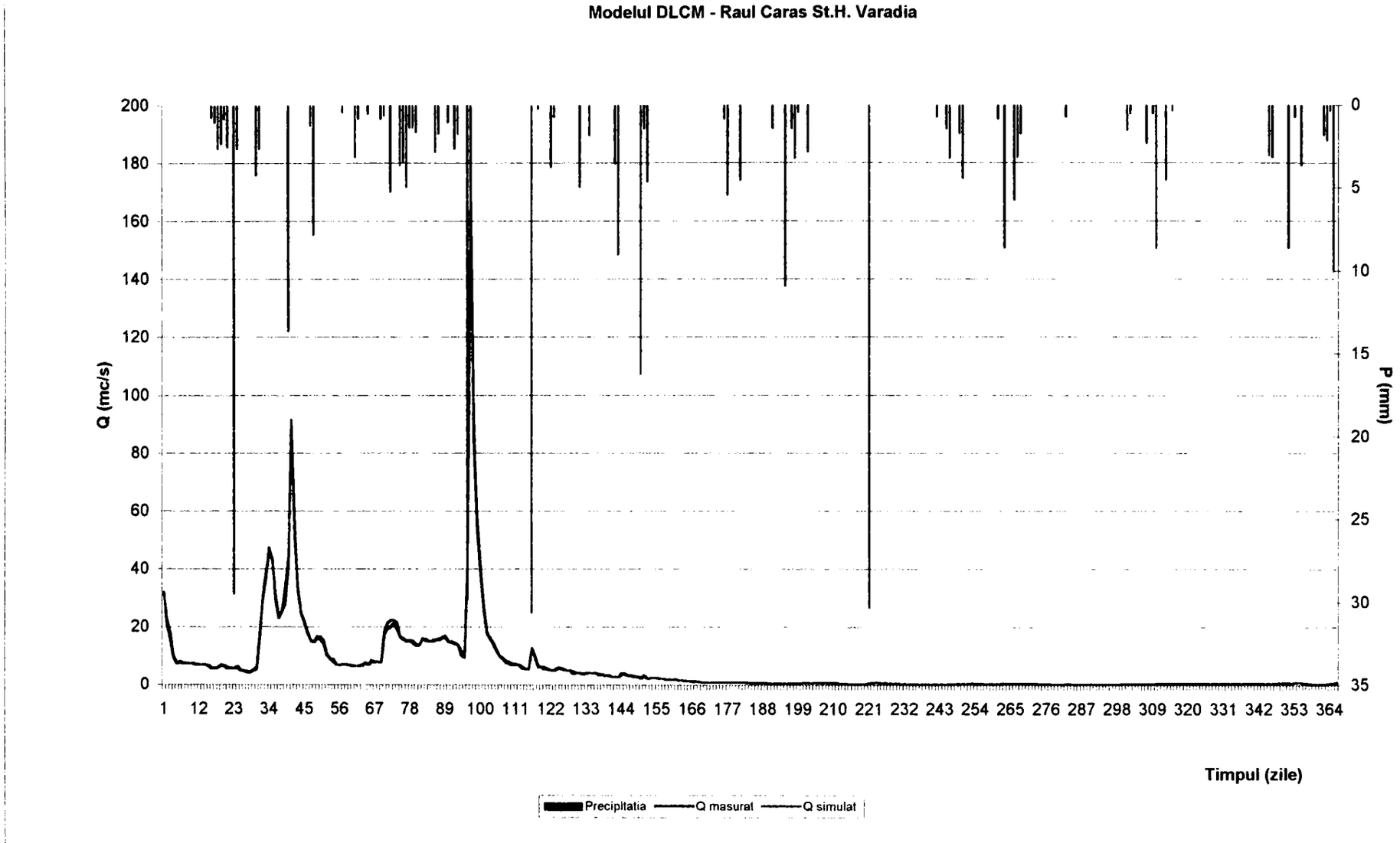


Figura 81. Hidrografele debitelor medii zilnice simulate cu modelul DLCM şi observate în anul 2000 pe râul Caraş la staţia hidrometrică Vărădia.

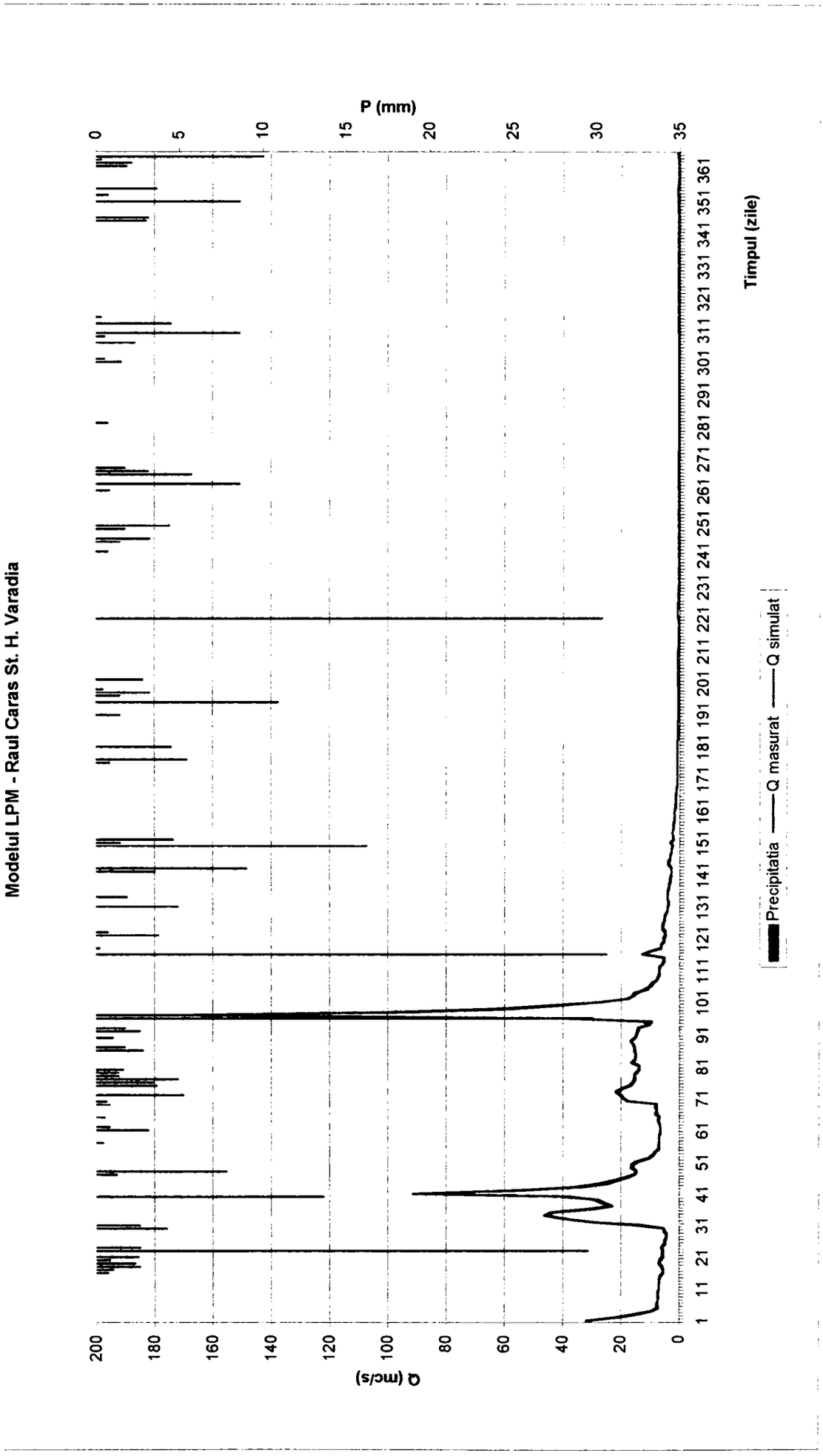


Figura 82. Hidrografele debitelor medii zilnice simulate cu modelul LPM și observate în anul 2000 pe râul Caraș la stația hidrometrică Vărădia.

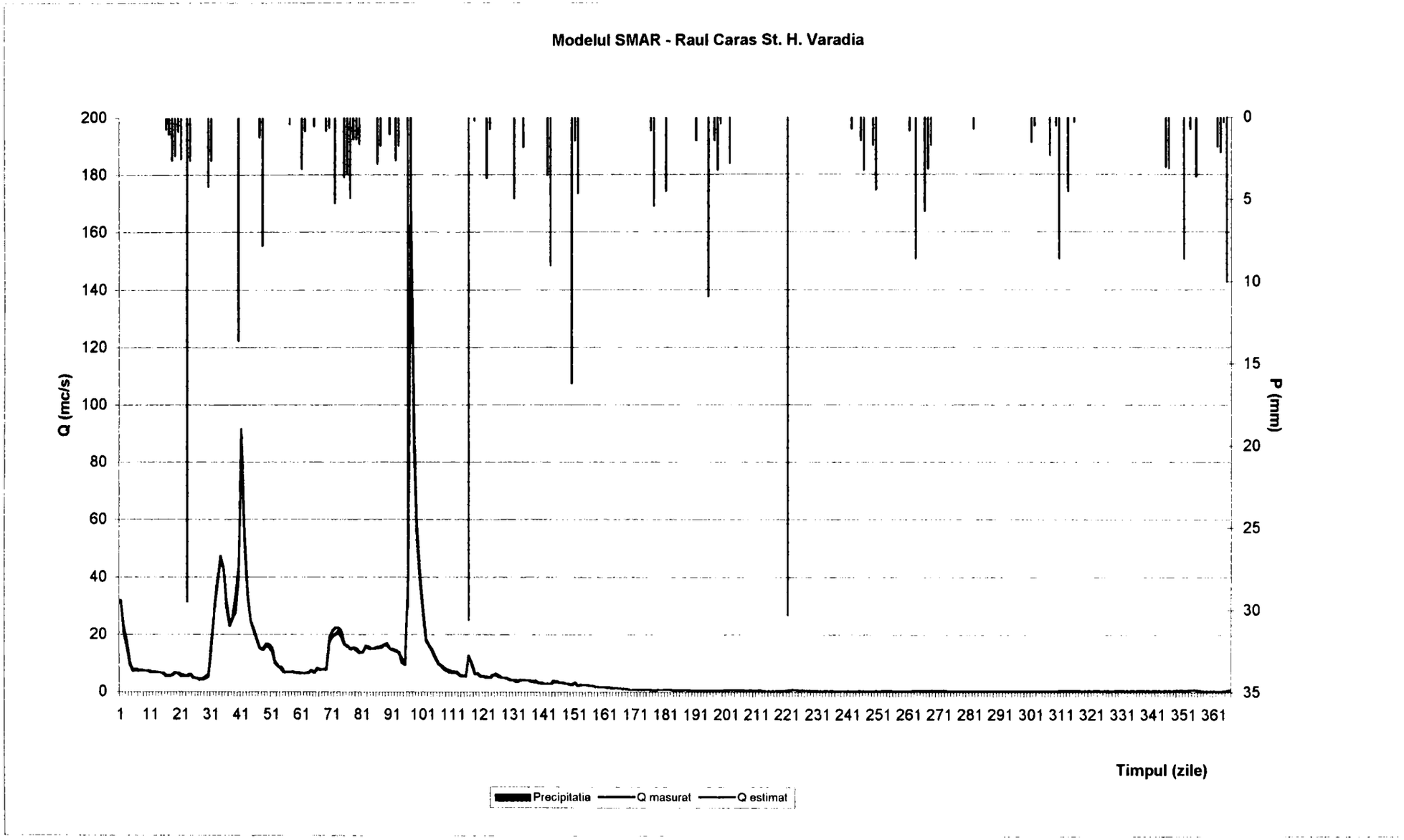


Figura 83. Hidrografele debitelor medii zilnice simulate cu modelul SMAR şi observate în anul 2000 pe râul Caraş la staţia hidrometrică Vărădia.

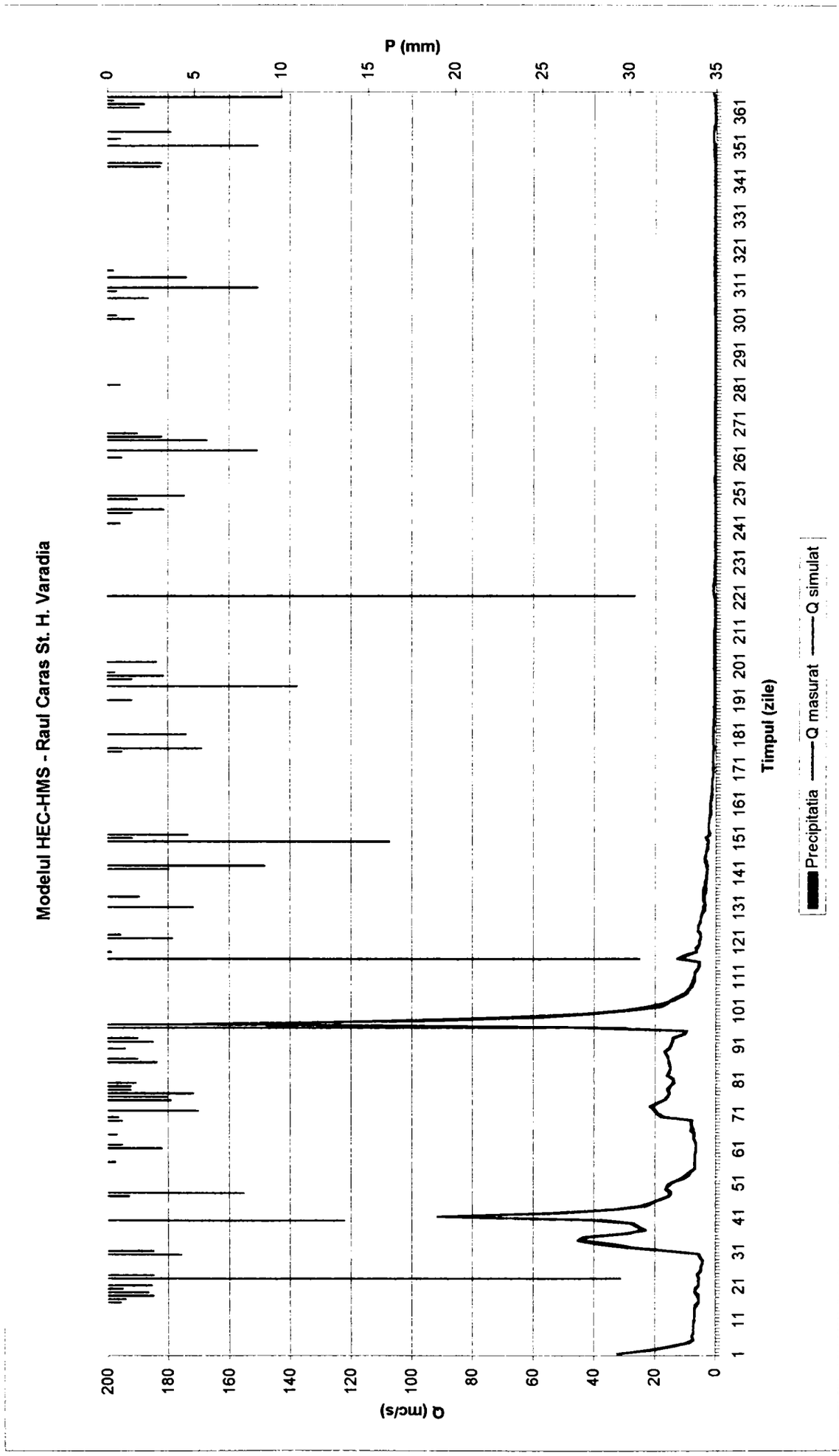


Figura 84. Hidrografele debitelor medii zilnice simulate cu modelul HEC-HMS și observate în anul 2000 pe râul Caraș la stația hidrometrică Vărădia.

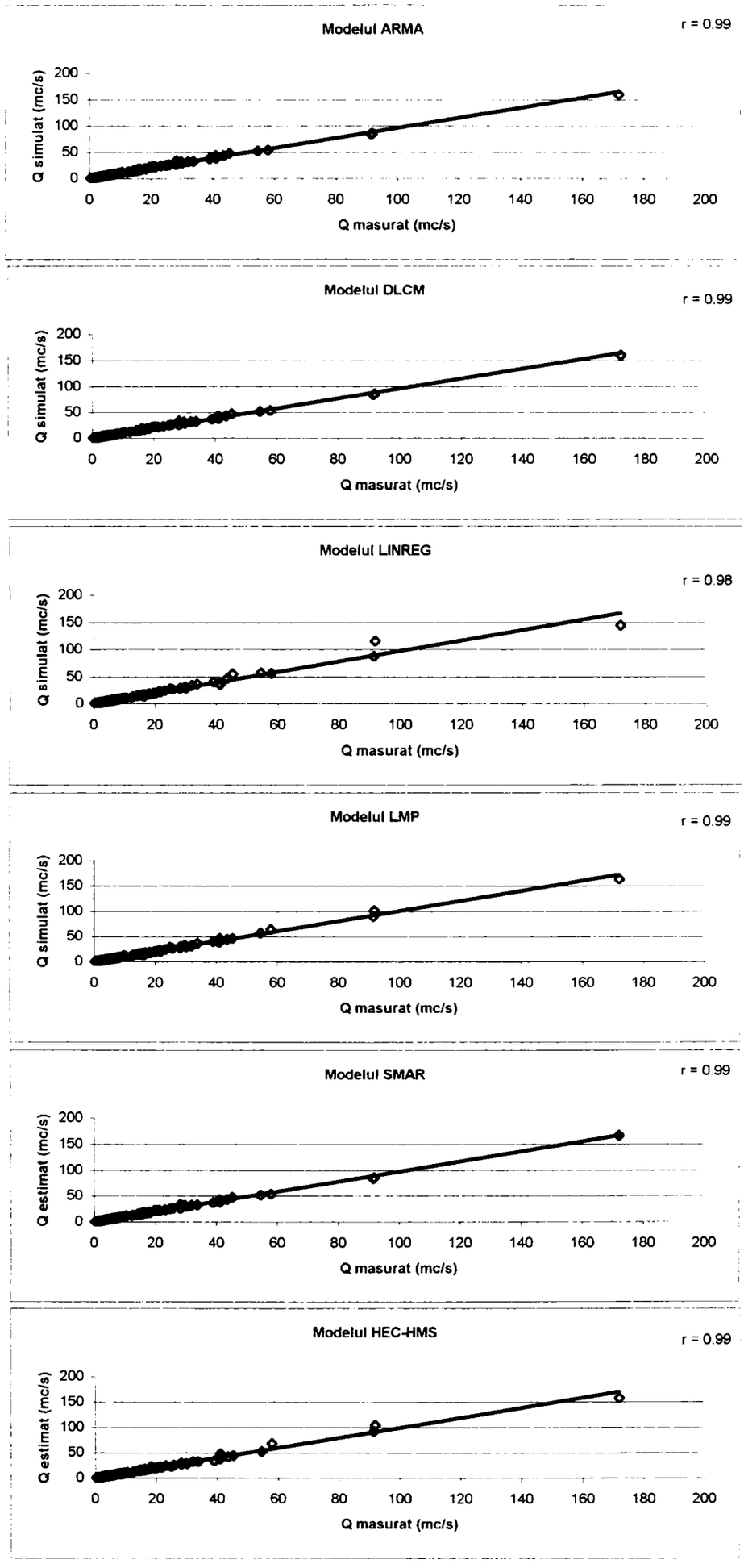


Figura 85. Corelațiile dintre debitele medii lunare observate şi simulate în anul 2000 pe râul Caraş la stația hidrometrică Vărădia.

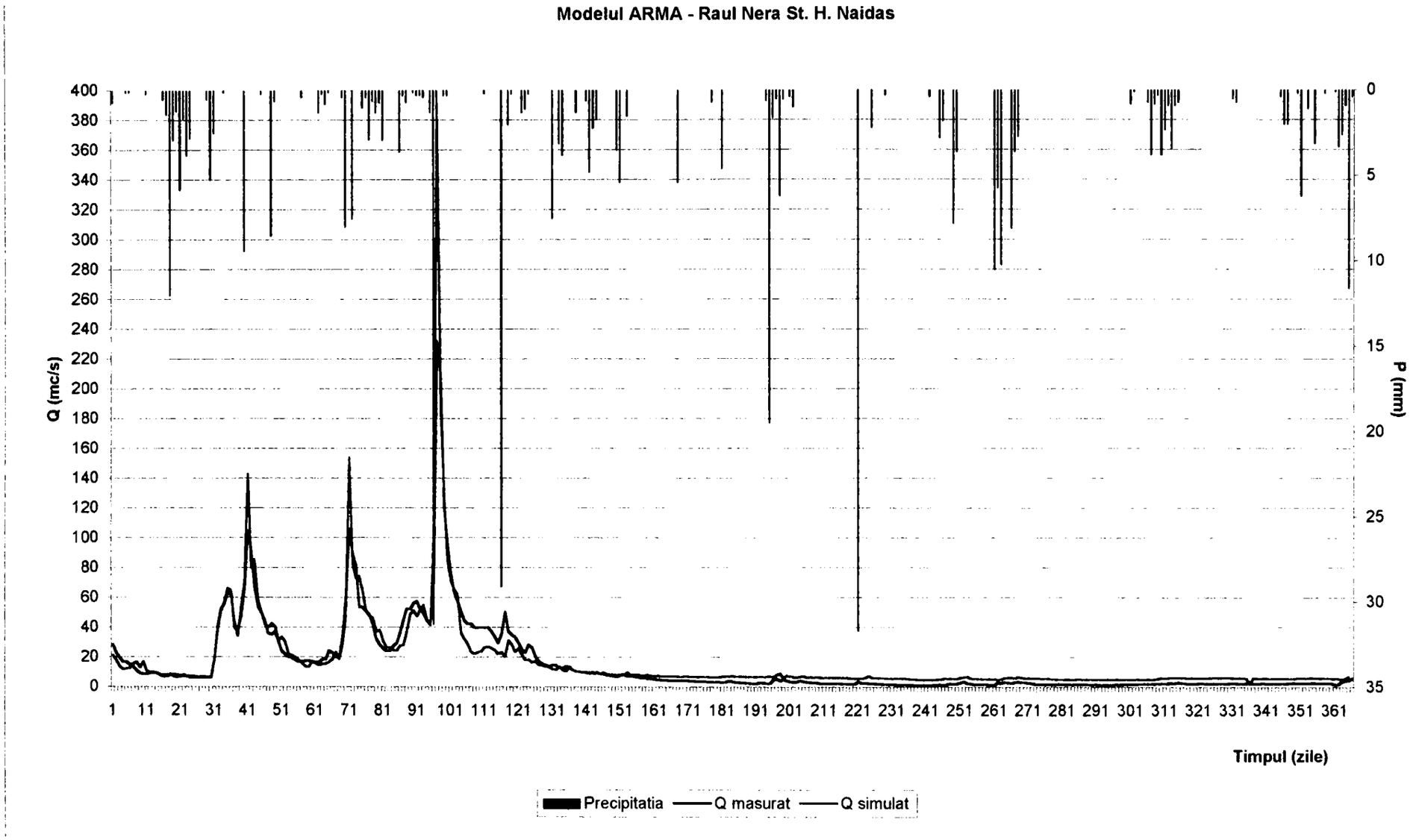


Figura 86. Hidrografele debitelor medii zilnice simulate cu modelul ARMA şi observate în anul 2000 pe râul Nera la staţia hidrometrică Naidăş.

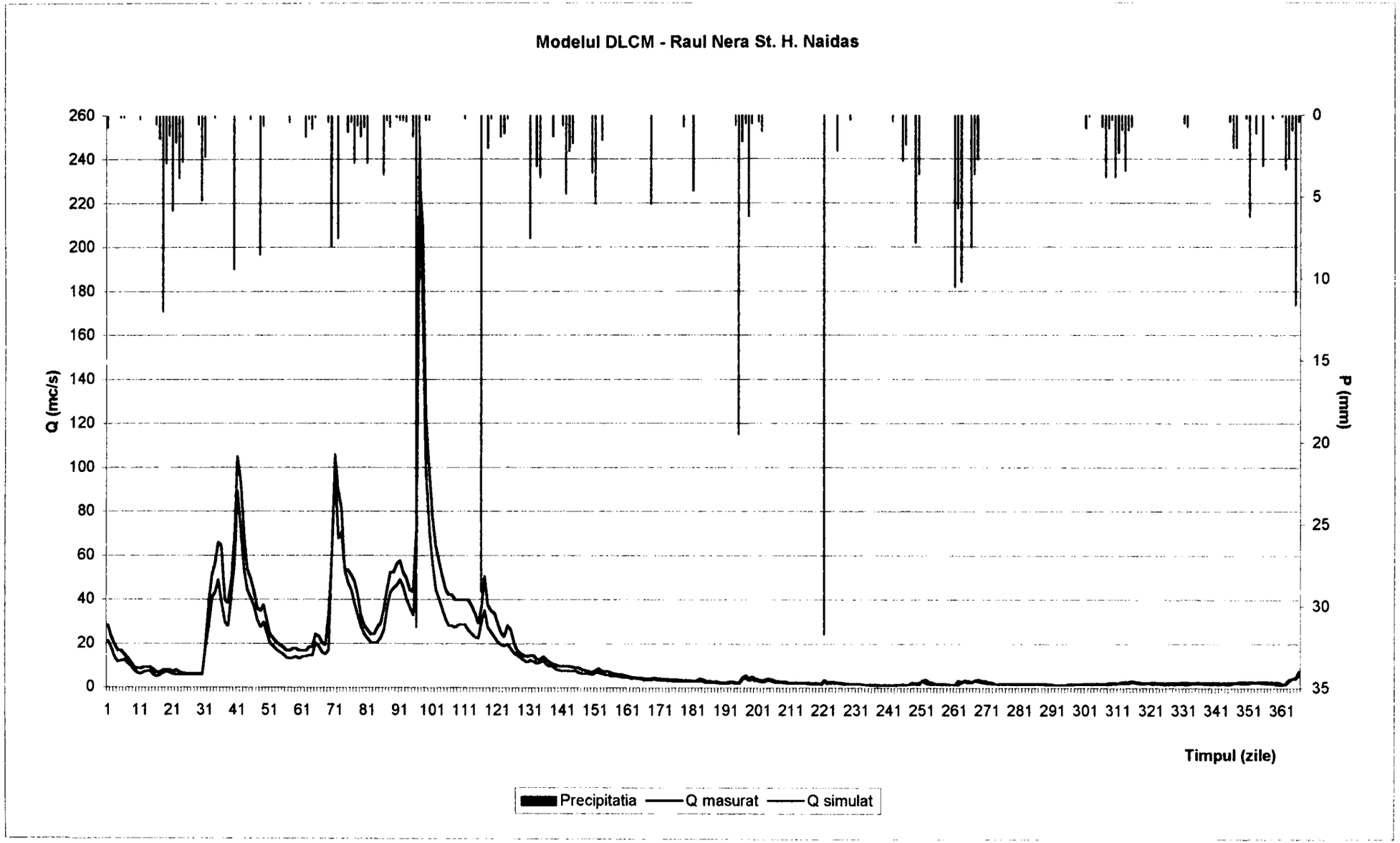


Figura 87. Hidrografele debitelor medii zilnice simulate cu modelul DLCM şi observate în anul 2000 pe râul Nera la staţia hidrometrică Naidăş.

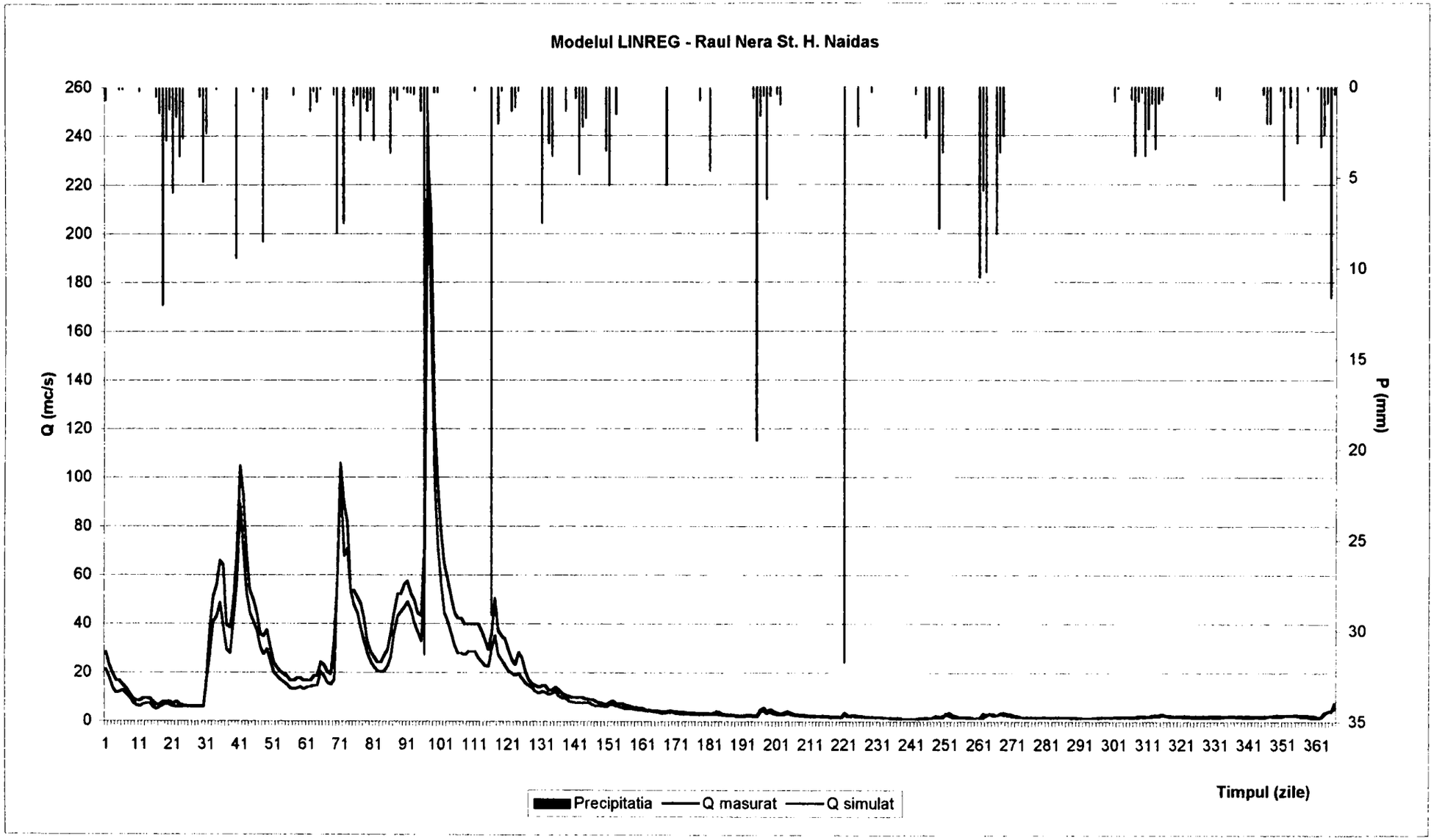


Figura 88. Hidrografele debitelor medii zilnice simulate cu modelul LINREG şi observate în anul 2000 pe râul Nera la staţia hidrometrică Naidăş.

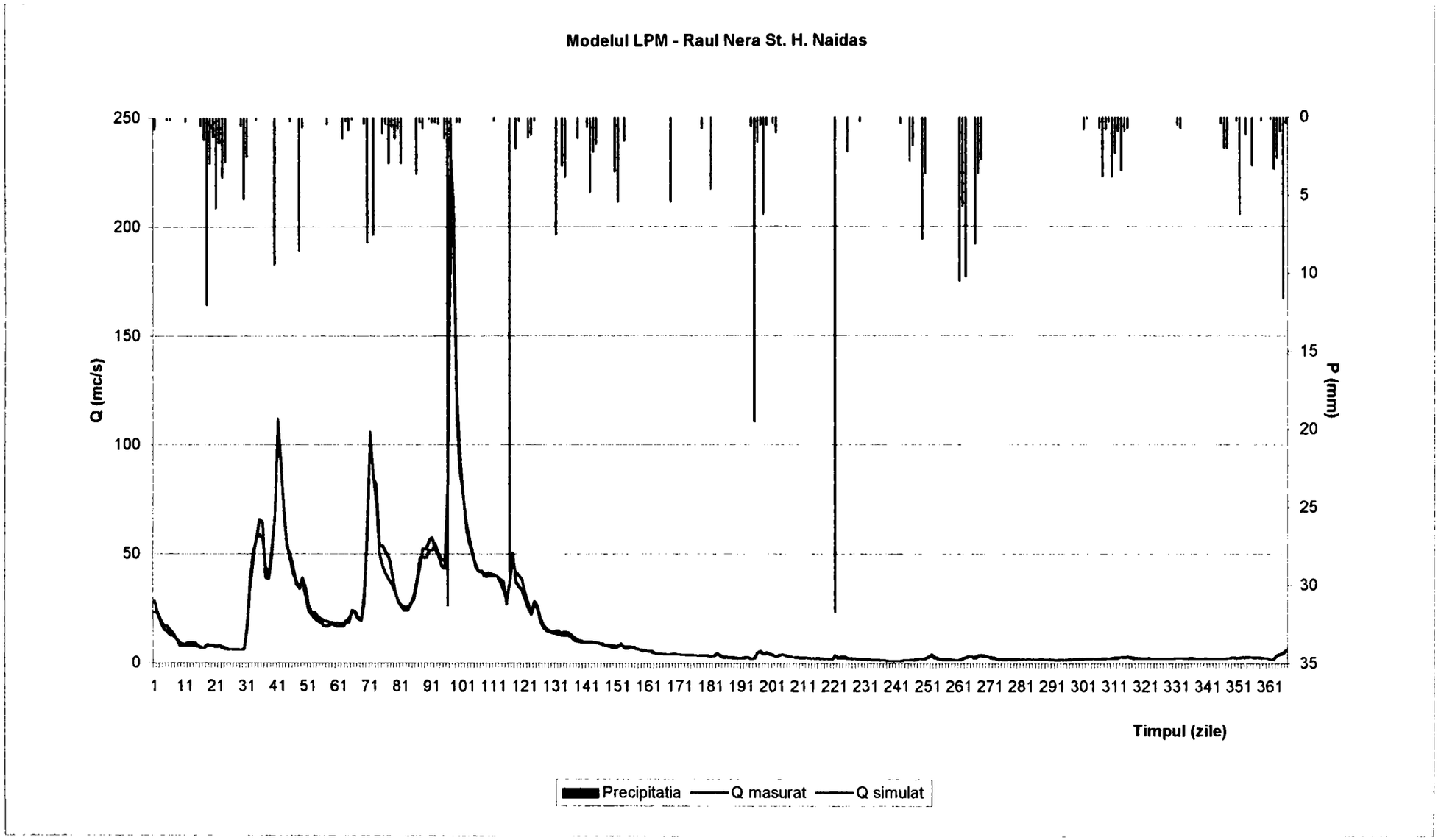


Figura 89. Hidrografele debitelor medii zilnice simulate cu modelul LPM și observate în anul 2000 pe râul Nera la stația hidrometrică Naidăș.

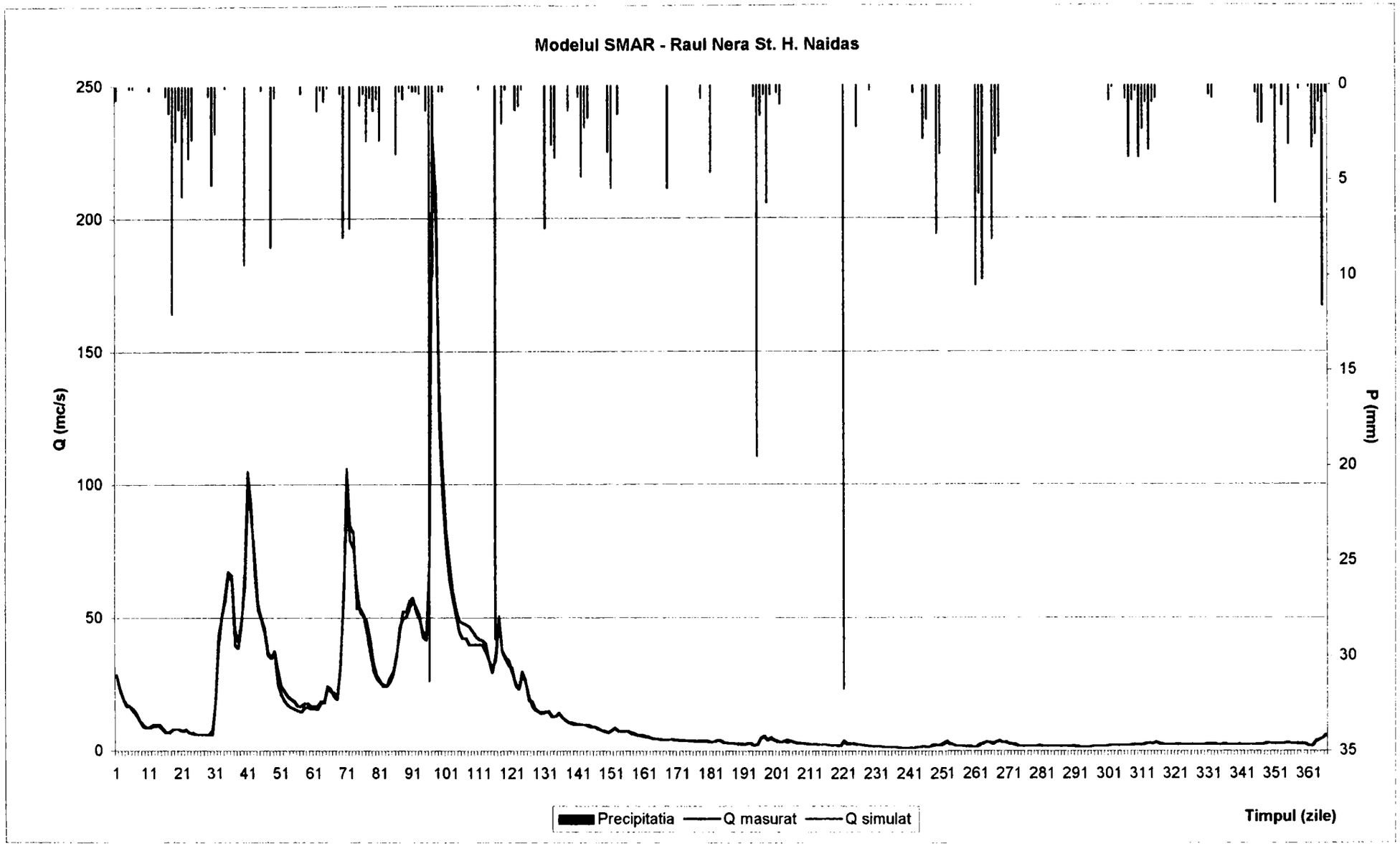


Figura 90. Hidrografele debitelor medii zilnice simulate cu modelul SMAR şi observate în anul 2000 pe râul Nera la staţia hidrometrică Naidăş.

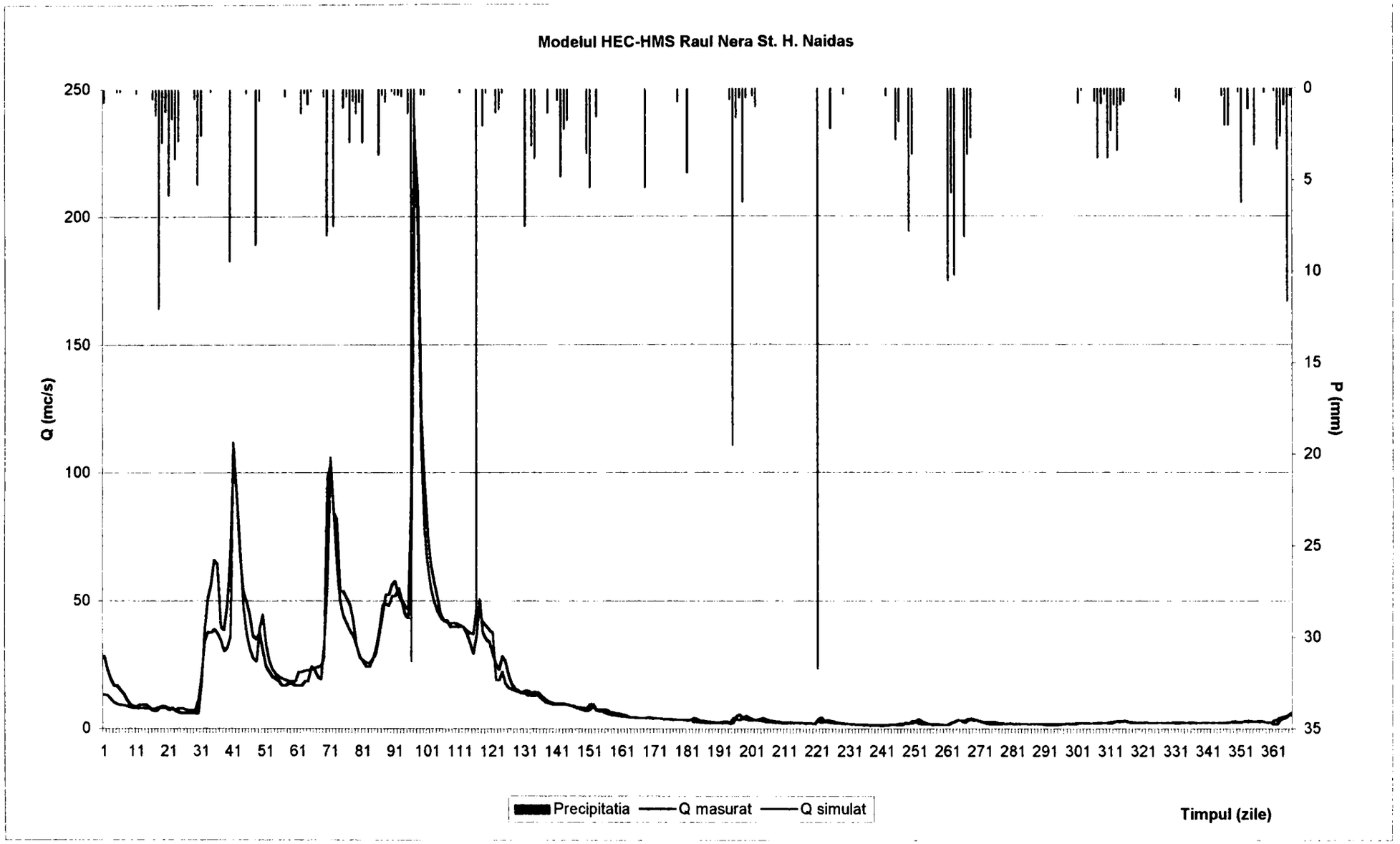


Figura 91. Hidrografele debitelor medii zilnice simulate cu modelul HEC-HMS şi observate în anul 2000 pe râul Nera la staţia hidrometri ă Naidăş.

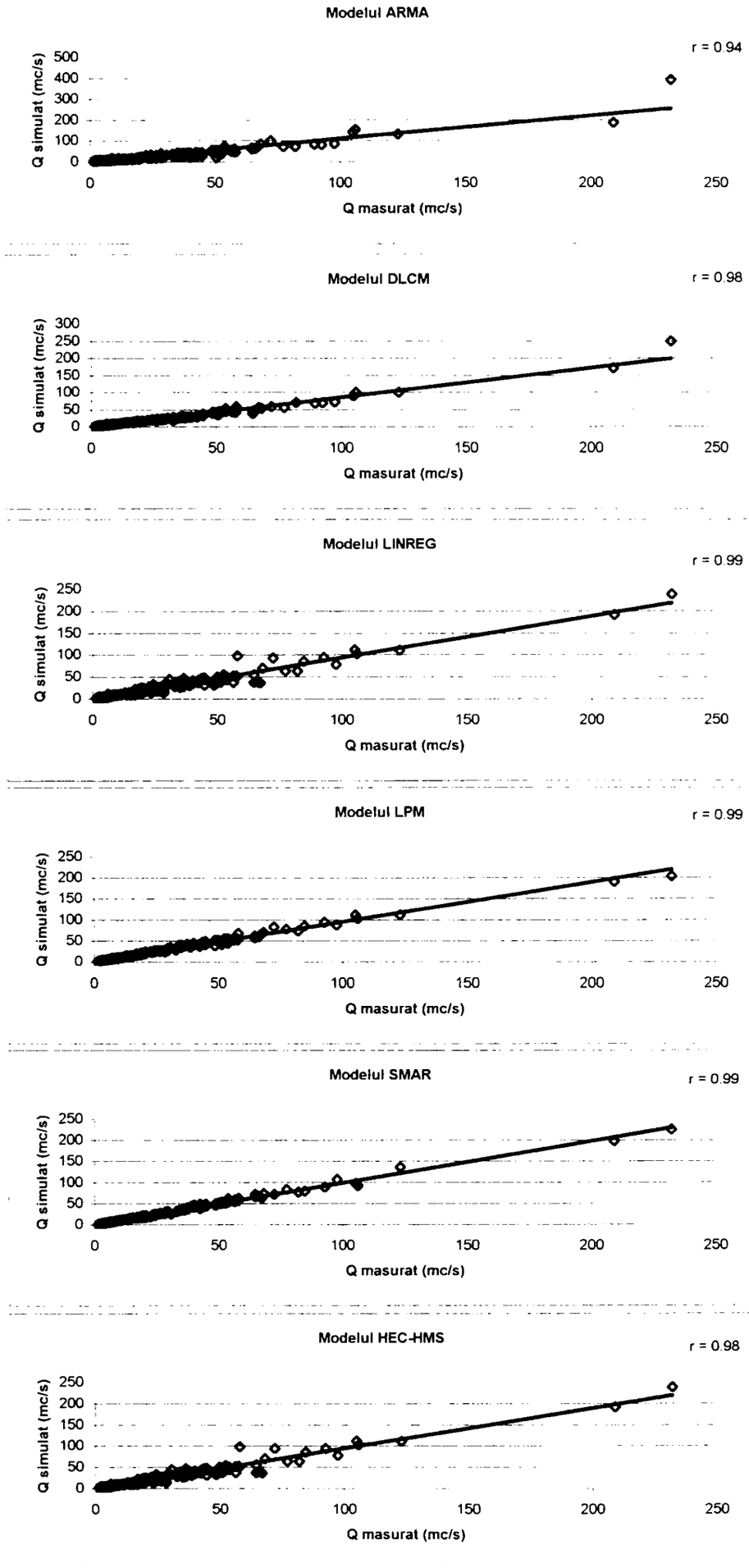


Figura 92. Corelațiile dintre debitele medii lunare observate și simulate în anul 2000 pe râul Nera la stația hidrometrică Naidăș

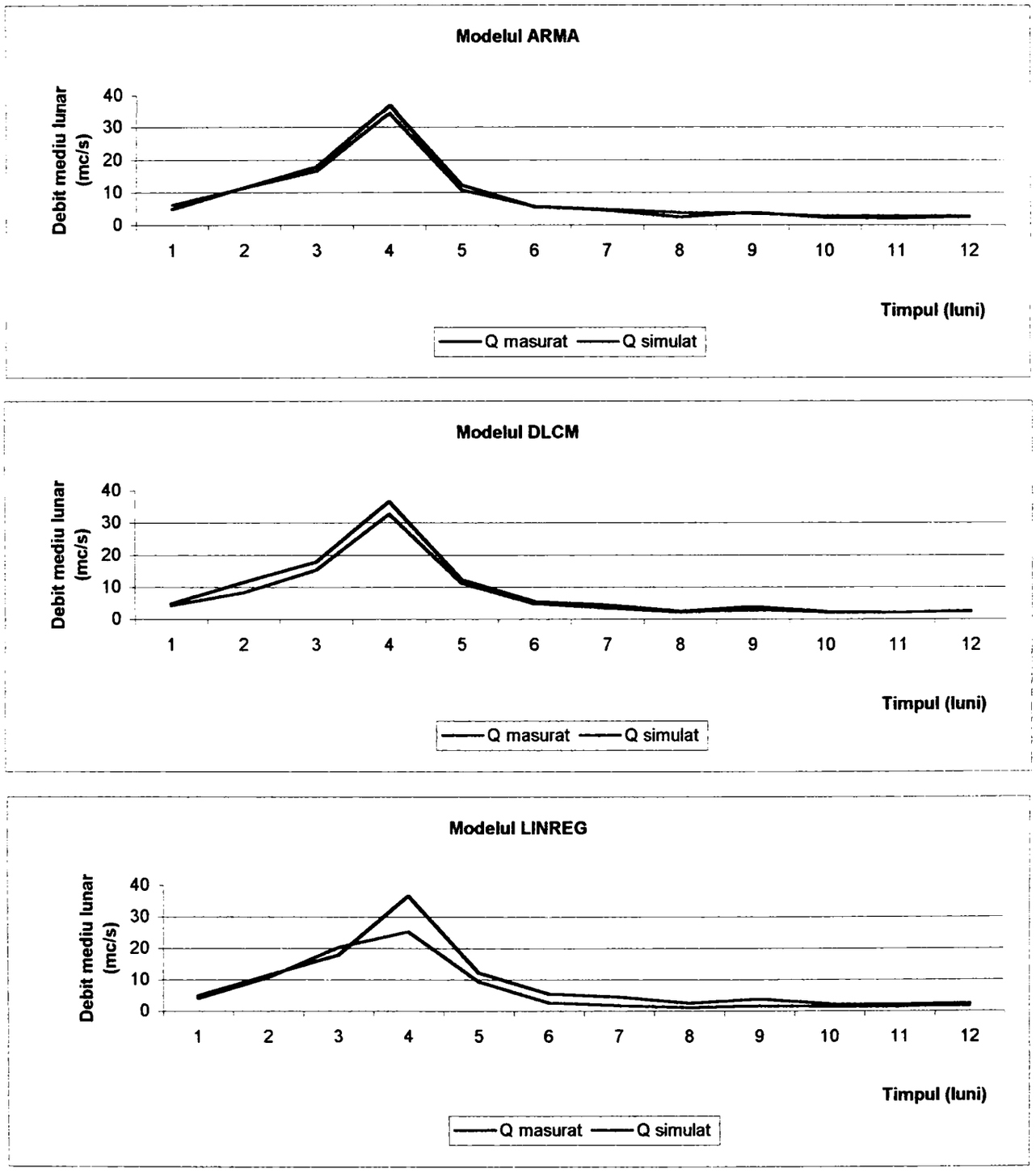


Figura 93. Hidrografele debitelor medii lunare observate şi simulate în anul 2000 pe râul Timiş la staţia hidrometrică Sadova.

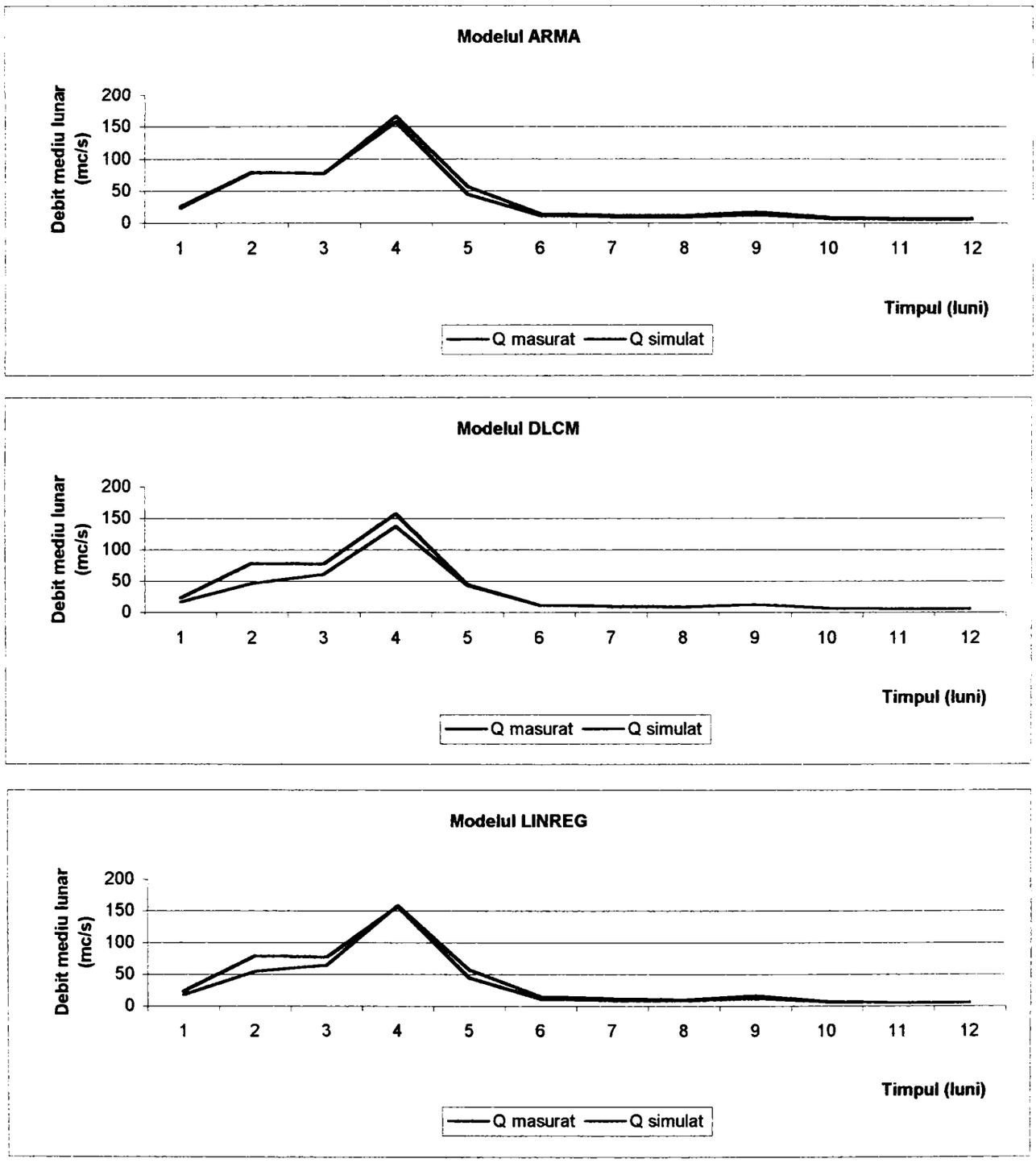


Figura 94. Hidrografele debitelor medii lunare observate și simulate în anul 2000 pe râul Timiș la stația hidrometrică Lugoj.

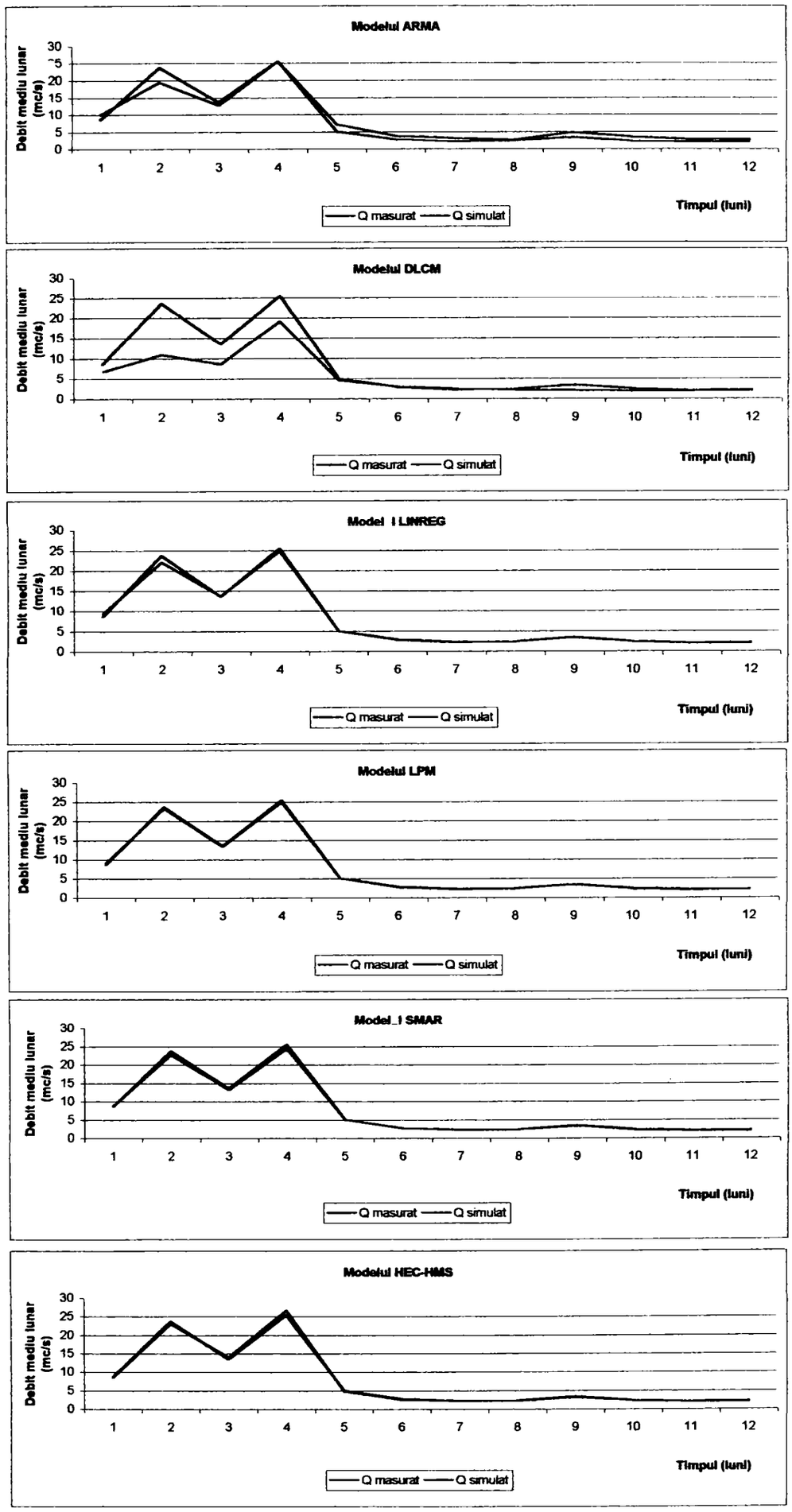


Figura 95. Hidrografele debitelor medii lunare observate şi simulate în anul 2000 pe râul Bega la staţia hidrometrică Balinţ

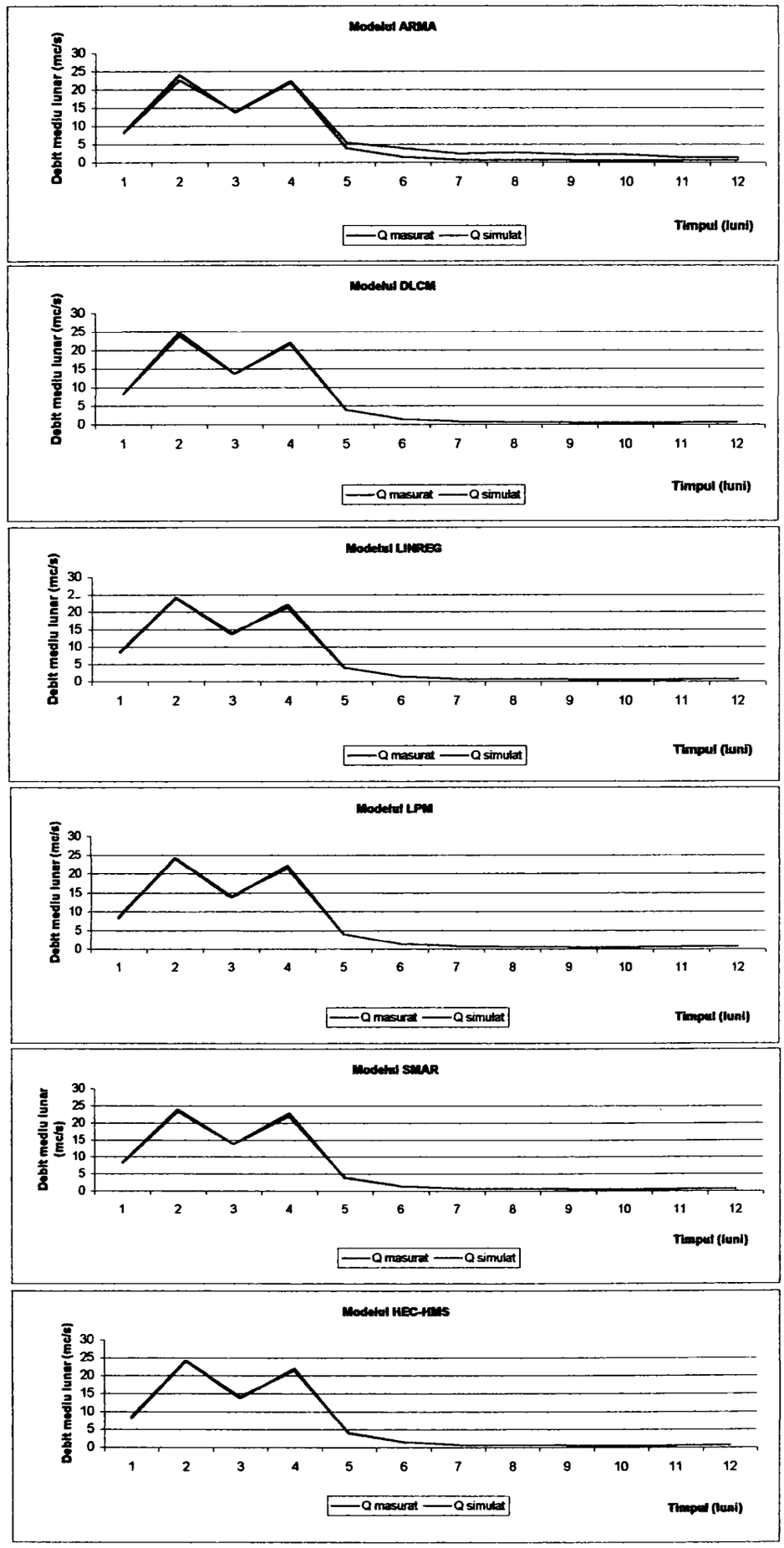
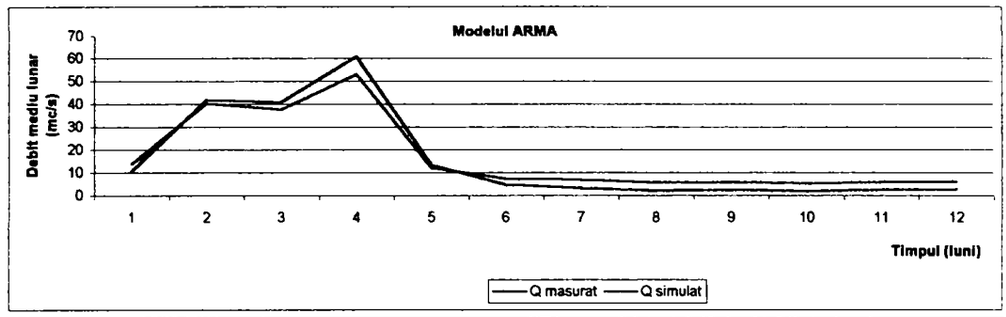
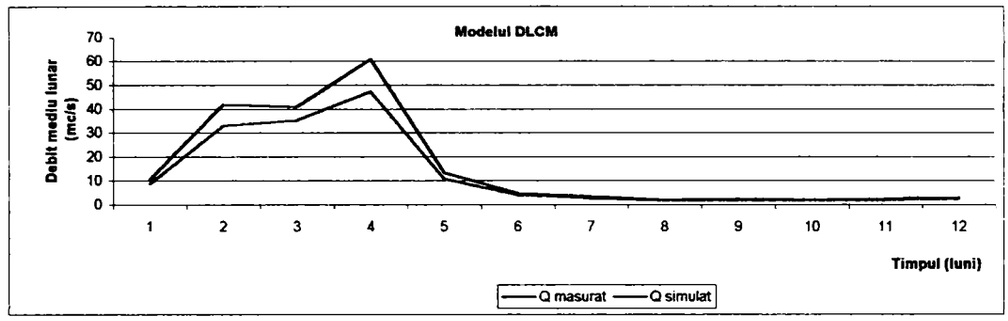
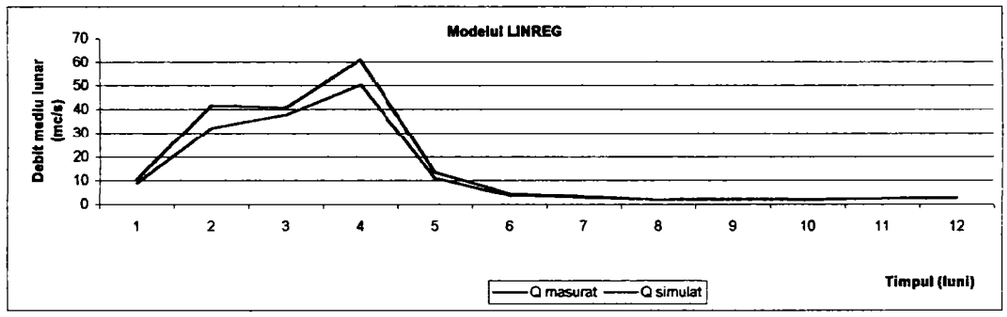
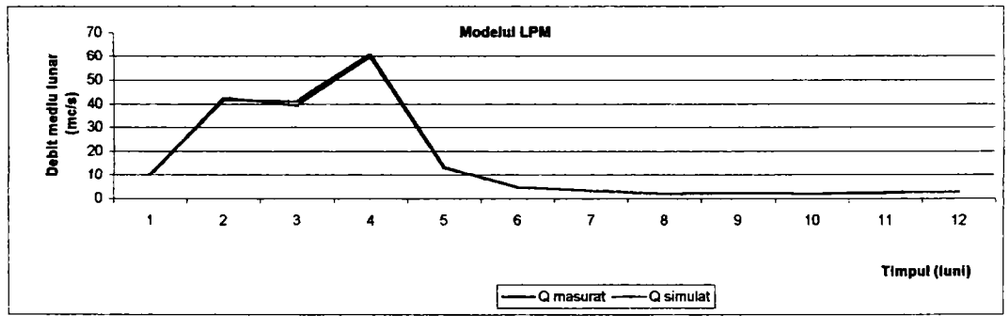


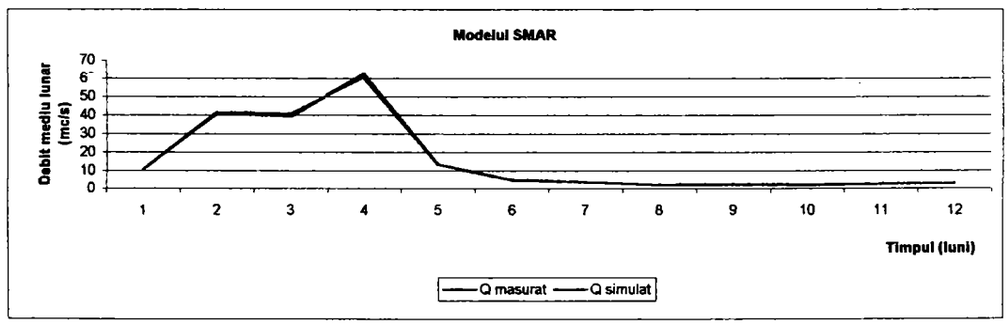
Figura 96. Hidrografele debitelor medii lunare observate şi simulate în anul 2000 pe râul Caraş la staţia hidrometrică Vărădia.











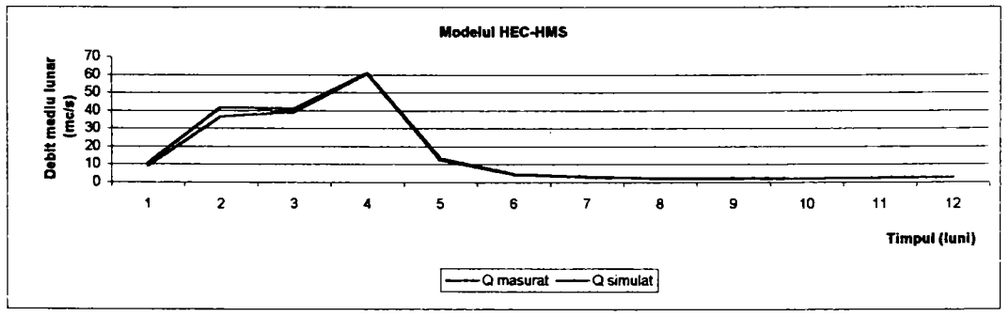


Figura 97. Hidrografele debitelor medii lunare observate şi simulate în anul 2000 pe râul Nera la staţia hidrometrică Naidăş.

Tabelul 12.

Indicii de eficiență R^2, IVF și MSE a modelelor de simulare a debitelor medii zilnice pentru anul 2000

Bazinul	Stația hidrom.	Modelul	$Q_{măs}$ (m^3/s)	$Q_{sim.}$ (m^3/s)	R^2 (%)	IVF	MSE (m^3/s)
Timiș	Sadova	ARMA	8,87	10,0	64,6	1,19	9,72
		DLCM	8,87	7,70	55,8	0,86	10,7
		LINREG	8,87	7,64	52,9	0,86	11,2
	Lugoj	ARMA	36,8	41,4	42,4	1,13	16,4
		DLCM	36,8	30,6	47,5	0,83	15,7
		LINREG	36,8	35,5	74,9	0,96	10,8
Bega	Balinț	ARMA	7,77	8,06	0,00	1,03	2,28
		DLCM	7,77	5,38	81,4	0,69	6,69
		LINREG	7,77	7,69	99,3	1,00	1,30
		LPM	7,77	7,78	99,4	1,00	1,15
		SMAR	7,77	7,54	99,4	1,00	1,16
		HEC	7,77	7,60	99,2	1,00	1,40
Caras	Vărădia	ARMA	6,41	7,66	54,6	1,20	9,36
		DLCM	6,41	6,42	99,5	1,00	0,985
		LINREG	6,41	6,45	97,8	1,00	2,06
		LPM	6,41	6,50	95,9	0,99	2,81
		SMAR	6,41	6,45	99,7	1,00	0,800
		HEC	6,41	6,42	99,1	1,00	1,30
Nera	Naidaș	ARMA	15,6	16,6	5,51	1,07	7,81
		DLCM	15,6	12,6	94,5	0,81	5,92
		LINREG	15,6	13,1	81,1	0,84	11,0
		LPM	15,6	15,4	98,8	1,00	2,73
		SMAR	15,6	15,6	99,4	1,00	2,01
		HEC	15,6	15,0	95,9	1,00	5,15

Tabelul 19

Erorile relative ale debitului maxim anual calculat pentru anul 2000

Bazinul hidrografic	Staţia hidrom.	$\Delta Q = (Q_e - Q_0)$ (m^3/s)						Eroarea relativă $(\Delta Q/Q_0)(\%)$					
		ARMA	DCLM	LINREG	LPM	SMAR	HEC	ARMA	DLCM	LINREG	LPM	SMAR	HEC
Timiş	Sadova	147	-69,0	108	-	-	-	62,0	29,1	45,5	-	-	-
Timiş	Lugoj	555	-11,0	-29,0	-	-	-	73,1	1,44	3,82	-	-	-
Bega	Balinţ	- 12,0	39,0	- 9,00	5,00	- 8,00	16,0	6,06	24,5	4,54	2,52	4,04	8,10
Caraş	Vărădia	131	- 12,0	- 27,0	- 8,00	- 5,00	-14,0	76,2	7,00	15,7	4,65	2,91	8,13
Nera	Naidăş	18	- 18,0	- 18,0	- 29,0	- 7,00	6,00	7,75	7,76	7,76	12,5	3,01	2,58

Tabelul 20.

Compararea debitelor medii lunare simulate şi măsurate pe râul Timiş la staţia hidrometrică Sadova în cursul anului 2000

Modelul		1	2	3	4	5	6	7	8	9	10	11	12	Anual
ARMA	Q măs.	4.96	11.6	18.0	36.8	12.3	5.62	4.52	2.55	3.91	2.34	2.08	2.64	8.87
	Q sim.	6.24	11.5	16.8	34.4	10.8	5.84	4.86	3.81	3.59	2.75	2.84	2.71	10.0
	Er (%)	25.8	-0.86	-6.67	-6.52	-12.2	3.91	7.52	49.4	-8.18	17.5	36.5	2.65	12.7
DLCM	Q măs.	4.96	11.6	18.0	36.8	12.3	5.62	4.52	2.55	3.91	2.34	2.08	2.64	8.87
	Q sim.	4.34	8.41	15.5	32.8	11.2	4.95	3.57	2.27	3.00	2.28	2.07	2.59	7.70
	Er (%)	-12.5	-27.5	-13.9	-10.9	-8.94	-11.9	-21.0	-11.0	-23.3	-2.56	-0.48	-1.89	-13.2
LINREG	Q măs.	4.96	11.6	18	36.8	12.3	5.62	4.52	2.55	3.91	2.34	2.08	2.64	8.87
	Q sim.	4.21	10.8	20.4	25.4	9.48	2.66	1.9	1.19	1.78	1.49	1.55	1.87	7.64
	Er (%)	-15.1	-6.90	13.3	-31.0	-22.9	-52.7	-58.0	-53.3	-54.5	-36.3	-25.5	-29.2	-13.9

Tabelul 21.

Compararea debitelor medii lunare simulate şi măsurate pe râul Timiş la staţia hidrometrică Lugoj în cursul anului 2000

Modelul		1	2	3	4	5	6	7	8	9	10	11	12	Anual
ARMA	Q măs.	23.6	79.6	77.8	158	45.2	12.2	10.1	8.81	12.7	6.99	5.64	6.66	36.8
	Q sim.	26.0	80.2	77.0	167	56.6	14.6	12.3	12.0	17.6	8.82	6.71	7.79	41.4
	Er (%)	10.2	0.75	-1.03	5.70	25.2	19.7	21.8	36.2	38.6	26.2	19.0	17.0	12.5
DLCM	Q măs.	23.6	79.6	77.8	158	45.2	12.2	10.1	8.81	12.7	6.99	5.64	6.66	36.8
	Q sim.	17.5	47.4	61.1	138	43.3	12.4	10.5	9.45	13.0	6.79	5.55	6.39	30.6
	Er (%)	-25.8	-40.5	-21.5	-12.7	-4.20	1.64	3.96	7.26	2.36	-2.86	-1.60	-4.05	-16.8
LINREG	Q măs.	23.6	79.6	77.8	158	45.2	12.2	10.1	8.81	12.7	6.99	5.64	6.66	36.8
	Q sim.	18.0	55.0	64.7	159	58.0	15.3	12.4	10.8	16.8	7.77	5.92	6.52	35.5
	Er (%)	-23.7	-30.9	-16.8	0.63	28.3	25.41	22.77	22.6	32.28	11.2	4.96	-2.10	-3.53

Tabelul 22.

Compararea debitelor medii lunare simulate şi măsurate pe râul Bega la staţia hidrometrică Balinţ în cursul anului 2000

Modelul		1	2	3	4	5	6	7	8	9	10	11	12	Anual
ARMA	Q măs.	8.69	23.7	13.6	25.5	5.09	2.83	2.24	2.39	3.45	2.37	2.01	2.19	7.77
	Q sim.	10.1	19.4	12.7	25.5	7.27	3.90	3.20	2.69	4.85	3.59	2.83	2.81	8.06
	Er (%)	16.2	-18.1	-6.62	0.0	42.8	37.8	42.9	12.6	40.7	51.5	40.8	28.31	3.73
DLCM	Q măs.	8.69	23.7	13.6	25.5	5.09	2.83	2.24	2.39	3.447	2.37	2.01	2.19	7.77
	Q sim.	6.78	11.0	8.60	19.2	4.61	2.94	2.36	2.14	2.13	1.90	2.02	2.12	5.38
	Er (%)	-22.0	-53.6	-36.8	-24.7	-9.43	3.89	5.36	-10.5	-38.2	-19.8	0.5	-3.20	-30.8
LINREG	Q măs.	8.69	23.7	13.6	25.5	5.09	2.83	2.24	2.39	3.447	2.37	2.01	2.19	7.77
	Q sim.	9.33	22.1	13.7	24.8	5.04	2.95	2.34	2.44	3.54	2.42	2.02	2.1	7.69
	Er (%)	7.36	-6.75	0.74	-2.75	-0.98	4.24	4.46	2.09	2.70	2.11	0.50	-4.11	-1.03
LPM	Q măs.	8.69	23.7	13.6	25.5	5.09	2.83	2.24	2.39	3.447	2.37	2.01	2.19	7.77
	Q sim.	9.01	23.4	13.4	25.0	5.10	2.91	2.28	2.42	3.45	2.42	2.08	2.17	7.78
	Er (%)	3.68	-1.27	-1.47	-1.96	0.20	2.83	1.79	1.26	0.09	2.11	3.48	-0.91	0.13
SMAR	Q măs.	8.69	23.7	13.6	25.5	5.09	2.83	2.24	2.39	3.45	2.37	2.01	2.19	7.77
	Q sim.	8.79	22.8	13.3	24.4	5.04	2.83	2.23	2.36	3.43	2.27	1.96	1.98	7.54
	Er (%)	1.15	-3.80	-2.21	-4.31	-0.98	0.0	-0.45	-1.26	-0.49	-4.22	-2.49	-9.59	-2.96
HEC-HMS	Q măs.	8.69	23.7	13.6	25.5	5.09	2.83	2.24	2.39	3.447	2.37	2.01	2.19	7.77
	Q sim.	8.67	23.2	14.1	26.7	4.85	2.59	2.22	2.28	3.24	2.38	2.00	2.00	7.60
	Er (%)	-0.23	-2.11	3.68	4.71	-4.72	-8.48	-0.89	-4.60	-6.01	0.42	-0.50	-8.68	-2.19

Tabelul 23.

Compararea debitelor medii lunare simulate şi măsurate pe râul Caraş la staţia hidrometrică Vărădia în cursul anului 2000

Modelul		1	2	3	4	5	6	7	8	9	10	11	12	Anual
ARMA	Q măs.	8.37	24.0	13.8	22.1	4.03	1.49	0.829	0.623	0.650	0.539	0.687	0.745	6.41
	Q sim.	8.17	22.7	14.1	22.5	5.47	3.92	2.47	2.82	2.14	2.12	1.35	1.44	7.66
	Er (%)	-2.39	-5.57	2.17	1.81	35.7	163	198	353	229	293	96.5	93.3	19.5
DLCM	Q măs.	8.37	24.0	13.8	22.1	4.03	1.49	0.829	0.623	0.650	0.539	0.687	0.745	6.41
	Q sim.	8.35	24.9	13.8	21.7	3.99	1.49	0.829	0.623	0.650	0.539	0.687	0.745	6.42
	Er (%)	-0.24	3.58	0.0	-1.81	-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.16
LINREG	Q măs.	8.37	24.0	13.8	22.1	4.03	1.49	0.829	0.623	0.650	0.539	0.687	0.745	6.41
	Q sim.	8.71	24.2	14.2	21.3	4.00	1.53	0.82	0.623	0.650	0.539	0.687	0.745	6.45
	Er (%)	4.06	0.67	2.90	-3.62	-0.74	2.68	-1.21	0.0	0.0	0.0	0.0	0.0	0.62
LPM	Q măs.	8.37	24.0	13.8	22.1	4.03	1.49	0.829	0.623	0.650	0.539	0.687	0.745	6.41
	Q sim.	8.70	24.2	14.2	21.5	4.12	1.50	0.829	0.623	0.650	0.539	0.687	0.745	6.50
	Er (%)	3.94	0.67	2.90	-2.71	2.23	0.67	0.0	0.0	0.0	0.0	0.0	0.0	1.40
SMAR	Q măs.	8.37	24.0	13.8	22.1	4.03	1.49	0.829	0.623	0.650	0.539	0.687	0.745	6.41
	Q sim.	8.30	23.5	13.8	22.9	3.87	1.5	0.829	0.619	0.637	0.539	0.687	0.767	6.45
	Er (%)	-0.84	-2.25	0.0	3.62	-3.97	0.67	0.0	-0.64	-2.00	0.0	0.0	2.95	0.62
HEC-HMS	Q măs.	8.37	24.0	13.8	22.1	4.03	1.49	0.829	0.623	0.65	0.539	0.687	0.745	6.41
	Q sim.	8.70	24.2	14.2	21.5	4.12	1.50	0.829	0.623	0.650	0.539	0.687	0.745	6.42
	Er (%)	3.94	0.67	2.90	-2.71	2.23	0.67	0.0	0.0	0.0	0.0	0.0	0.00	0.16

Tabelul 24.

Compararea debitelor medii lunare simulate şi măsurate pe râul Nera la staţia hidrometrică Naidăş în cursul anului 2000

Modelul		1	2	3	4	5	6	7	8	9	10	11	12	Anual
ARMA	Q măs.	10.8	42.0	40.9	60.9	13.5	4.92	3.47	2.10	2.59	2.01	2.62	2.97	15.6
	Q sim.	13.8	40.4	37.9	53.2	13.8	7.50	7.10	5.89	6.05	5.37	6.16	6.10	16.6
	Er (%)	27.8	-3.81	-7.33	-12.6	2.22	52.4	105	180	134	167	135	105	6.41
DLCM	Q măs.	10.8	42.0	40.9	60.9	13.5	4.92	3.47	2.10	2.59	2.01	2.62	2.97	15.6
	Q sim.	8.78	33.2	34.5	47.3	12.0	4.13	2.83	1.82	2.20	1.79	2.15	2.53	12.6
	Er (%)	-18.7	-21.0	-15.6	-22.3	-11.1	-16.1	-18.4	-13.3	-15.1	-10.9	-17.9	-14.8	-19.2
LINREG	Q măs.	10.8	42.0	40.9	60.9	13.5	4.92	3.47	2.10	2.59	2.01	2.62	2.97	15.6
	Q sim.	9.15	32.3	37.9	50.6	11.3	3.88	3.12	2.01	2.43	1.87	2.66	2.81	13.1
	Er (%)	-15.3	-23.1	-7.33	-16.9	-16.3	-21.1	-10.1	-4.29	-6.18	-6.97	1.53	-5.39	-16.0
LPM	Q măs.	10.8	42.0	40.9	60.9	13.5	4.92	3.47	2.10	2.59	2.01	2.62	2.97	15.6
	Q sim.	10.2	42.7	39.4	59.9	13.3	5.00	3.42	2.18	2.68	2.07	2.69	2.99	15.4
	Er (%)	-5.56	1.67	-3.67	-1.64	-1.48	1.63	-1.44	3.81	3.47	2.99	2.67	0.67	-1.28
SMAR	Q măs.	10.8	42.0	40.9	60.9	13.5	4.92	3.47	2.10	2.59	2.01	2.62	2.97	15.6
	Q sim.	11.0	41.4	39.6	62.8	13.7	5.04	3.47	2.14	2.55	1.94	2.62	3.00	15.6
	Er (%)	1.85	-1.43	-3.18	3.12	1.48	2.44	0.00	1.90	-1.54	-3.48	0.0	1.01	0.00
HEC-HMS	Q măs.	10.8	42.0	40.9	60.9	13.5	4.92	3.47	2.10	2.59	2.01	2.62	2.97	15.6
	Q sim.	9.27	36.9	39.4	60.8	12.5	4.74	2.92	2.34	2.62	2.20	2.65	3.12	15.0
	Er (%)	-14.2	-12.1	-3.67	-0.16	-7.4	-3.66	-15.9	11.4	1.16	9.45	1.15	5.05	-3.85