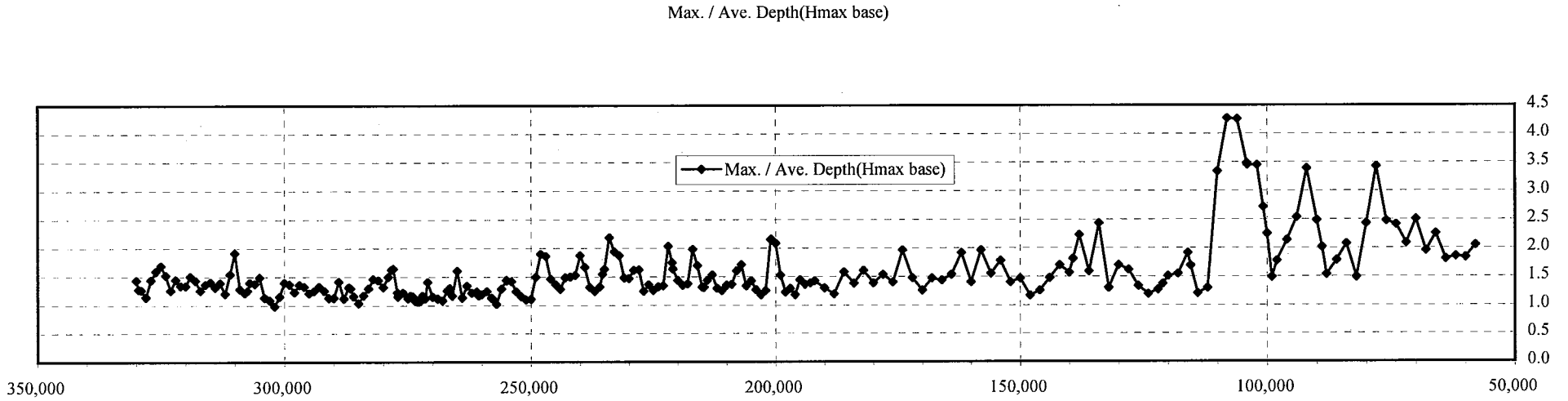


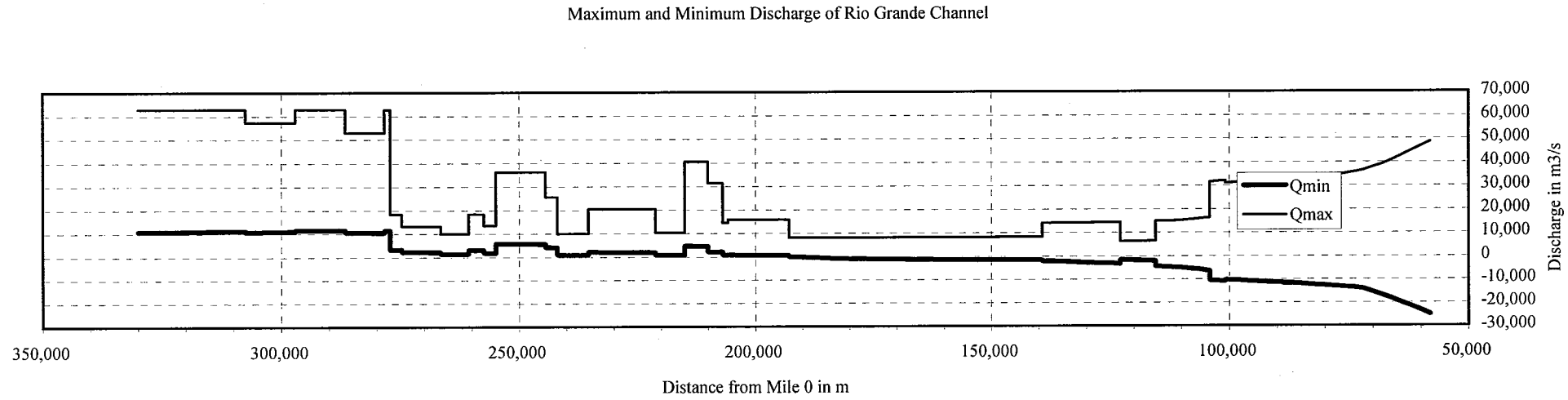
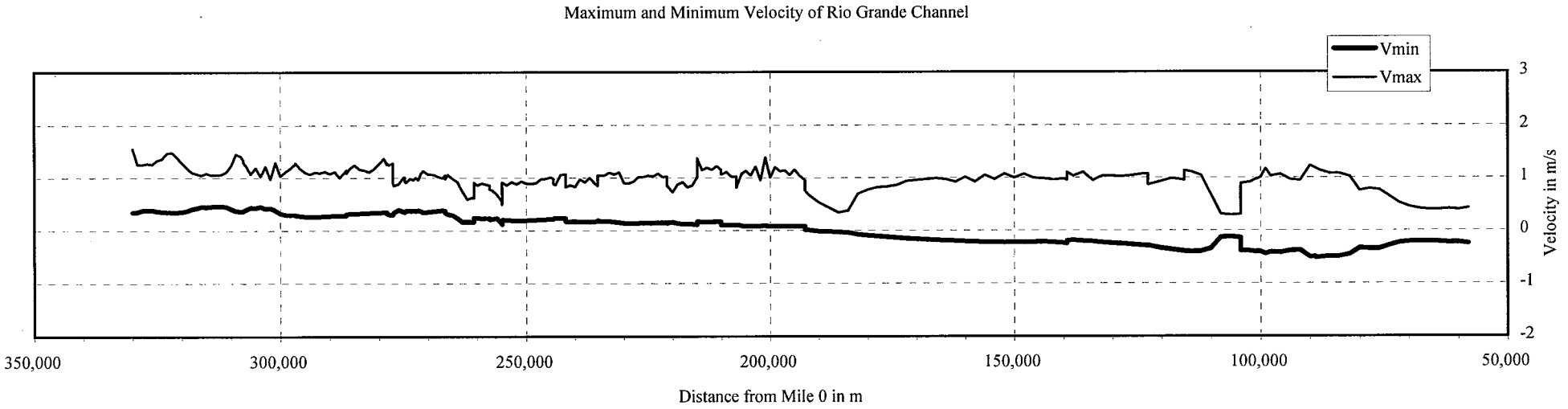


Fig. 3-2-9 Longitudinal Profiles of Rio Grande Channel (2/3)



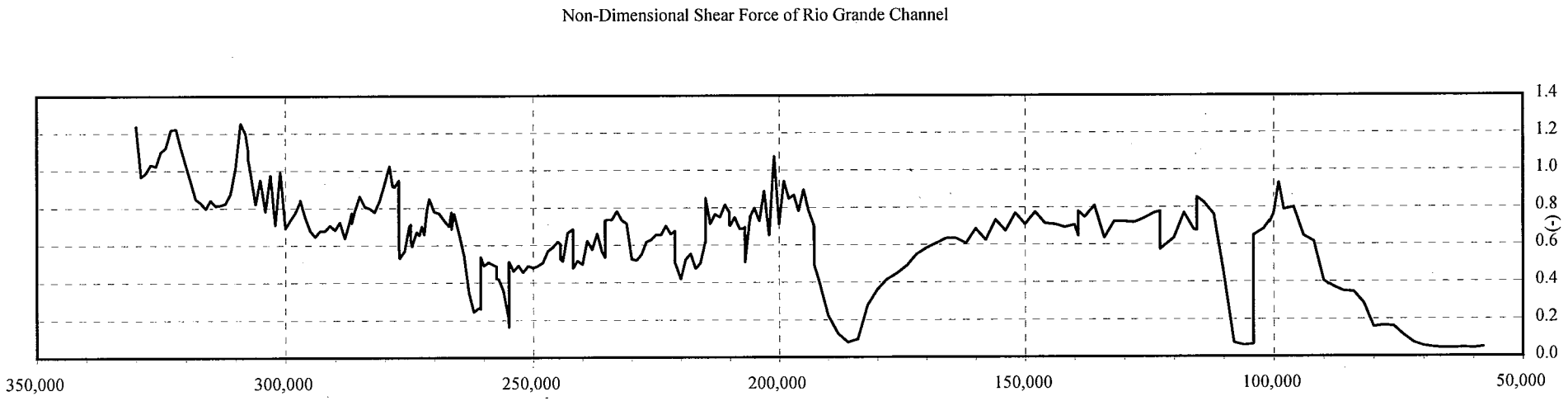


Fig. 3-2-9 Longitudinal Profiles of Rio Grande Channel (3/3)

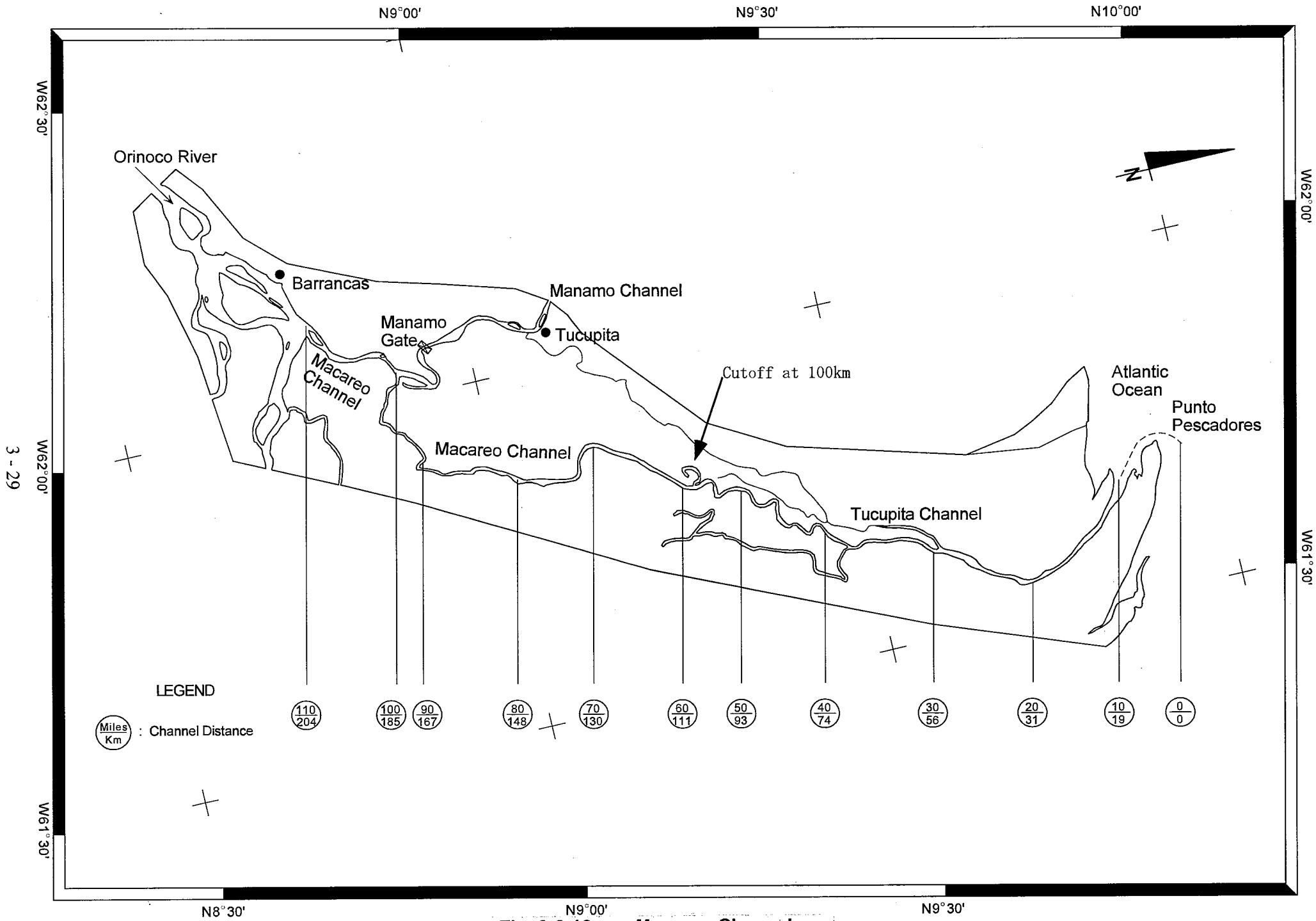
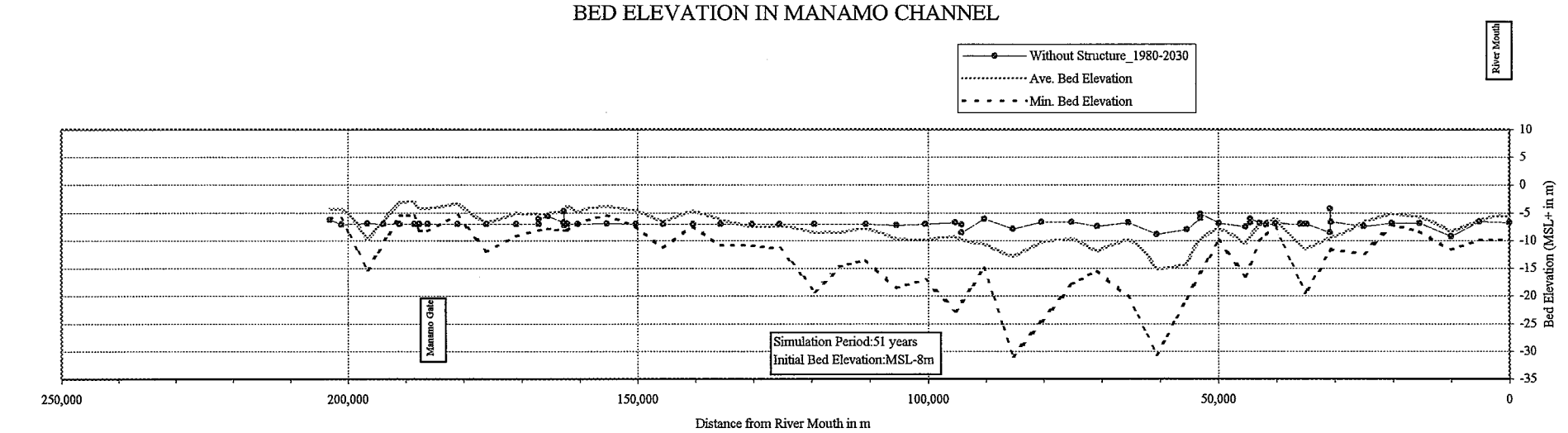


Fig. 3-2-10 Macareo Channel



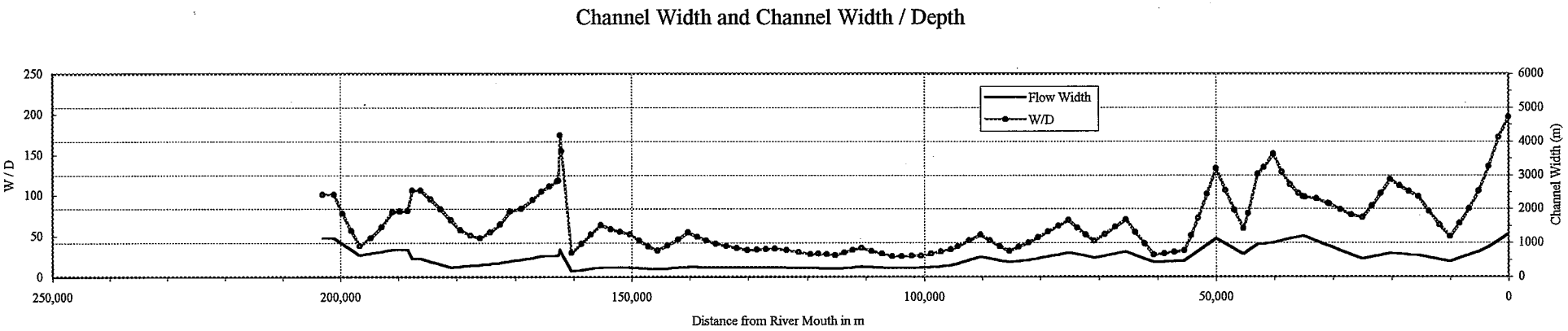
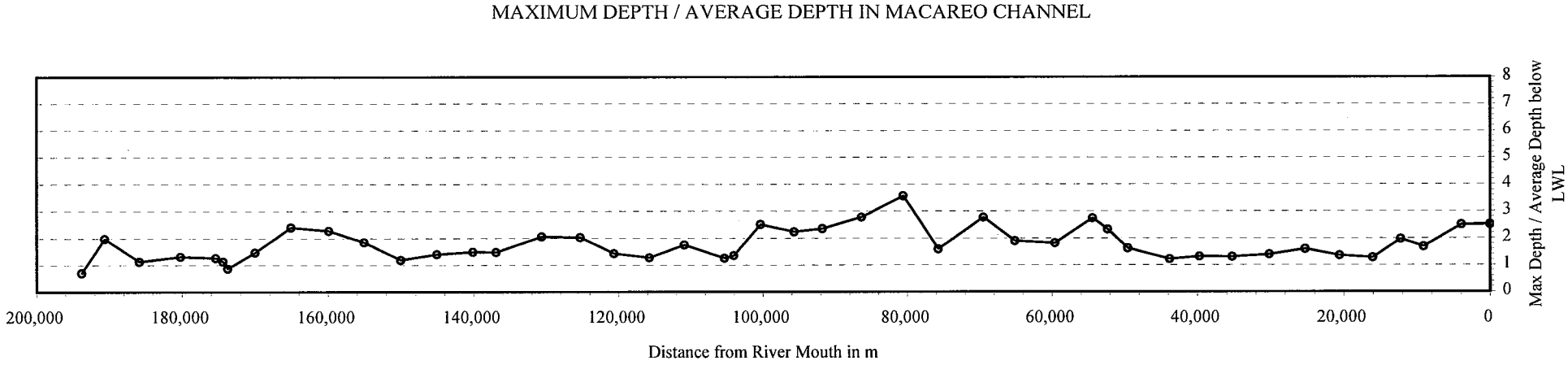


Fig. 3-2-11 Longitudinal Profiles of Macareo Channel (1/3)



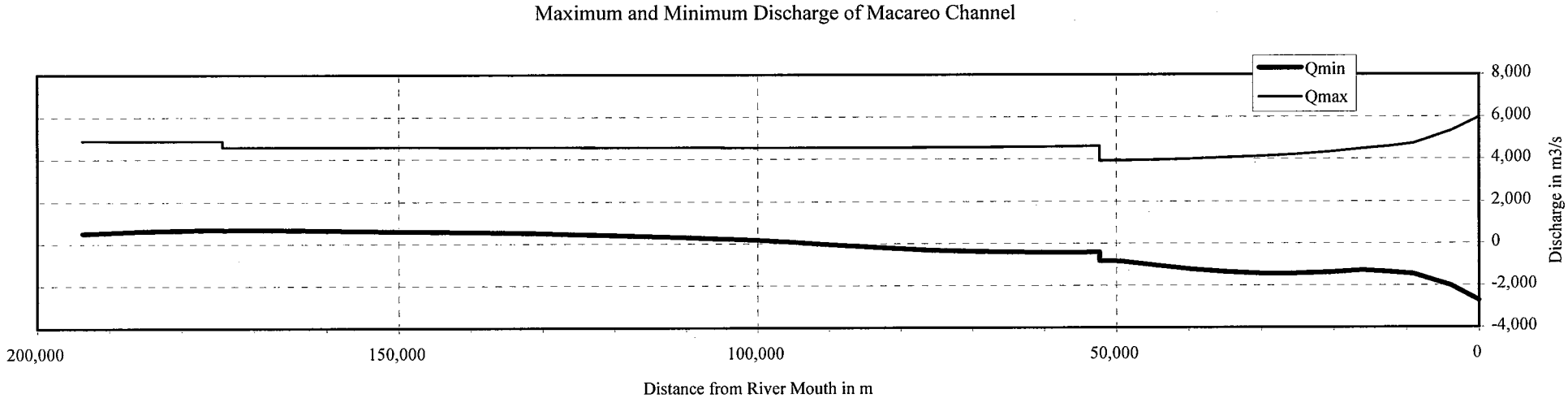
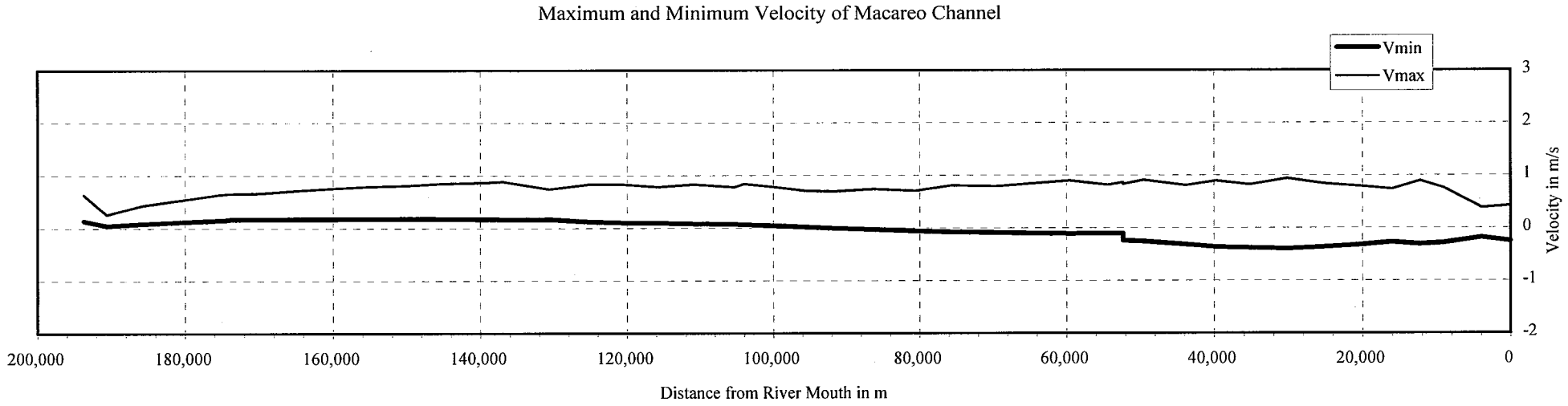


Fig. 3-2-11 Longitudinal Profiles of Macareo Channel (2/3)



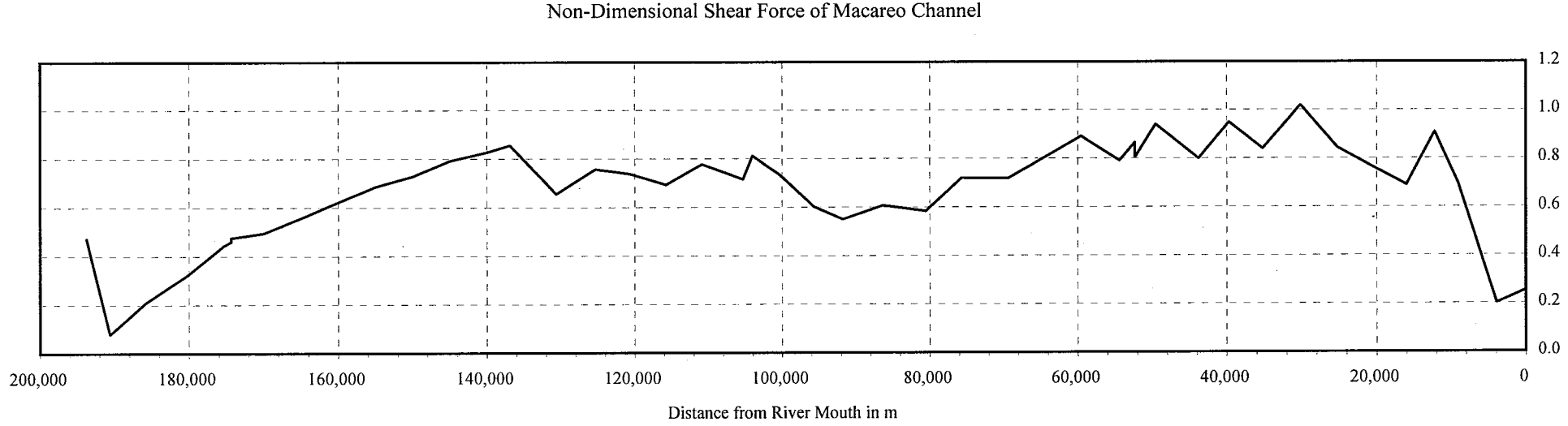
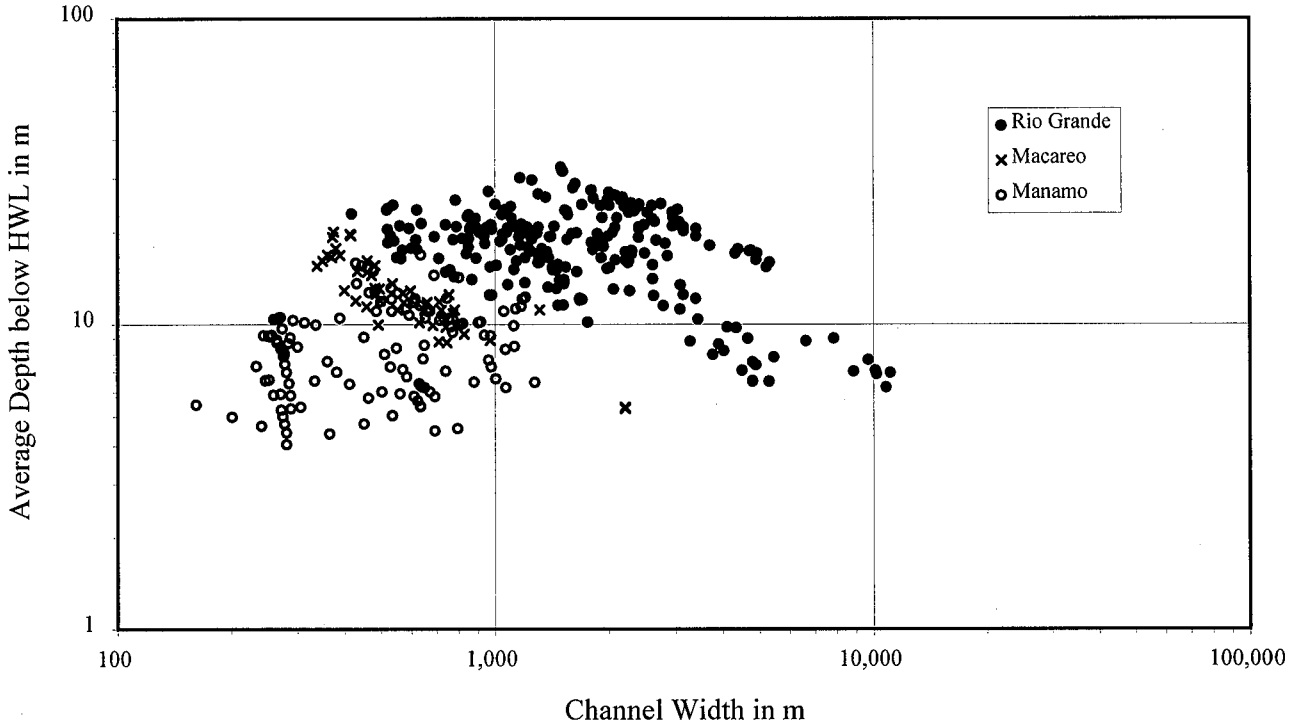


Fig. 3-2-11 Longitudinal Profiles of Macareo Channel (3/3)

RELATIONS BETWEEN CHANNEL WIDTH AND AVERAGE DEPTH



RIO GRANDE BY SECTION

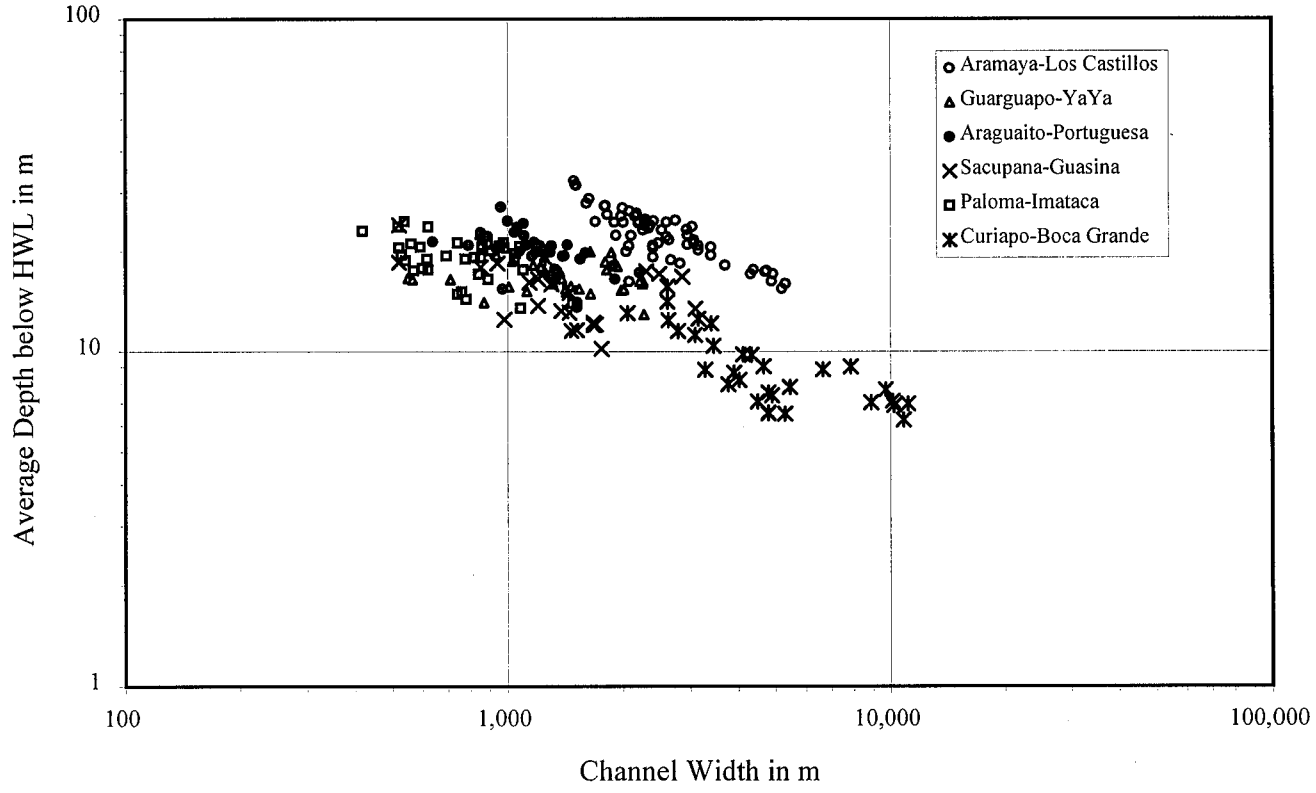
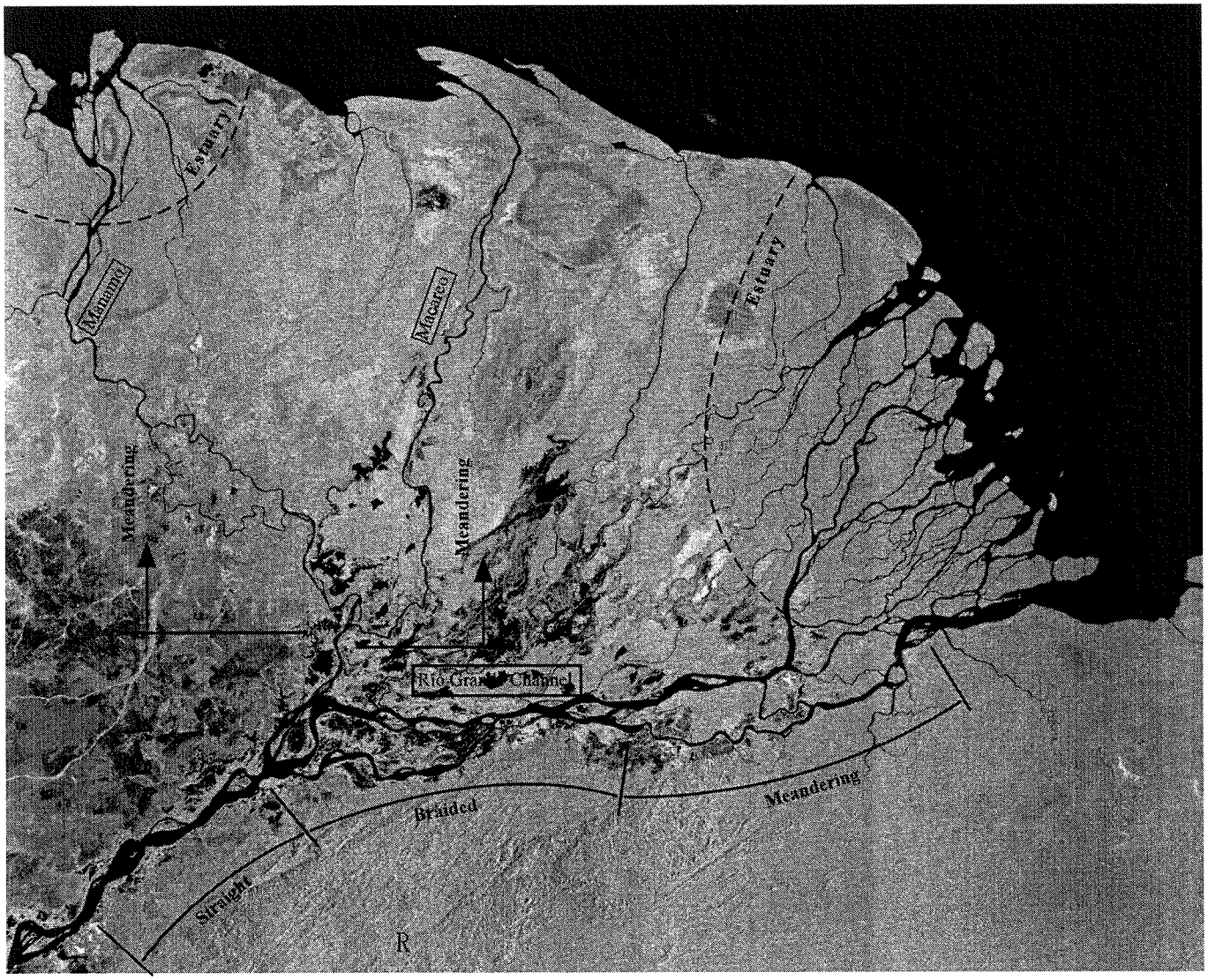


Fig. 3-2-12	Relations Between Channel Width and Average Depth



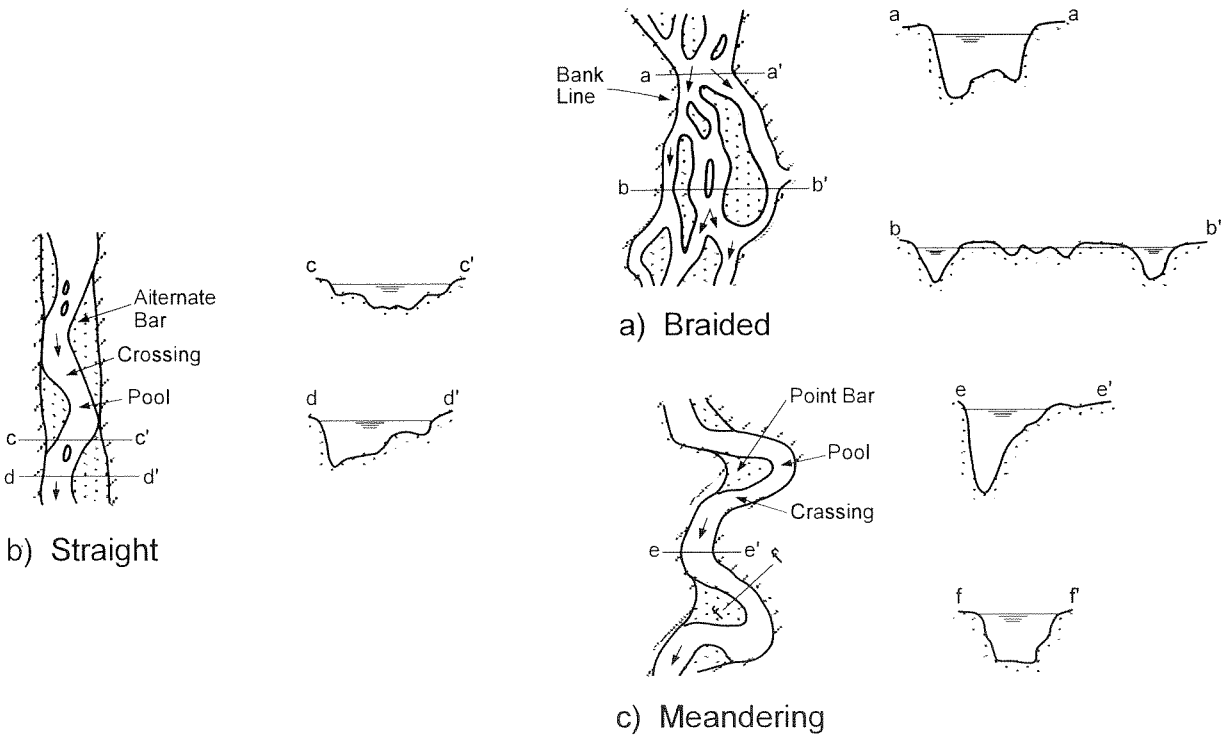


Fig. 3-2-13 Typical Channel Patterns of the Orinoco Delta

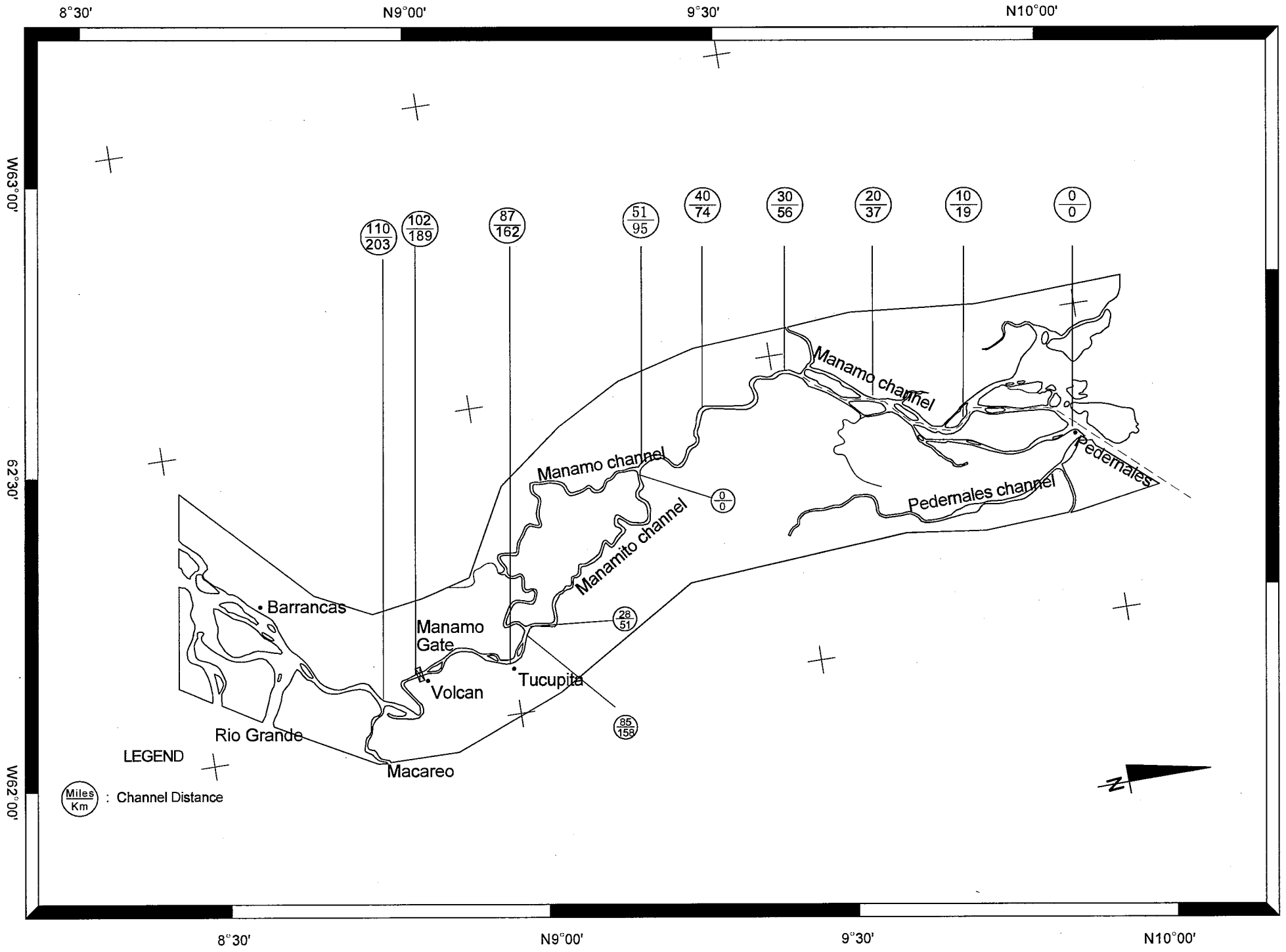


Fig. 3-2-14 Manamo Channel

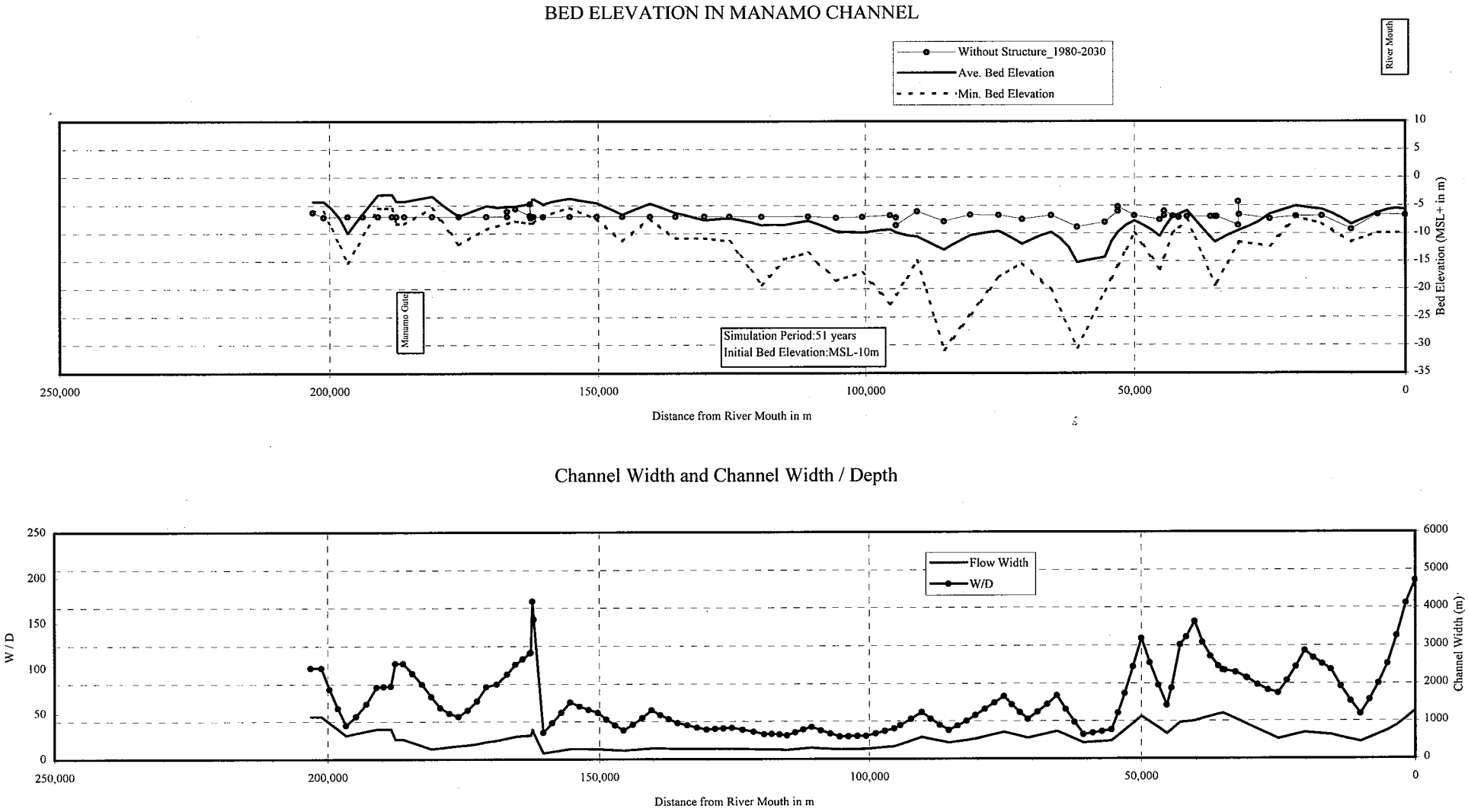
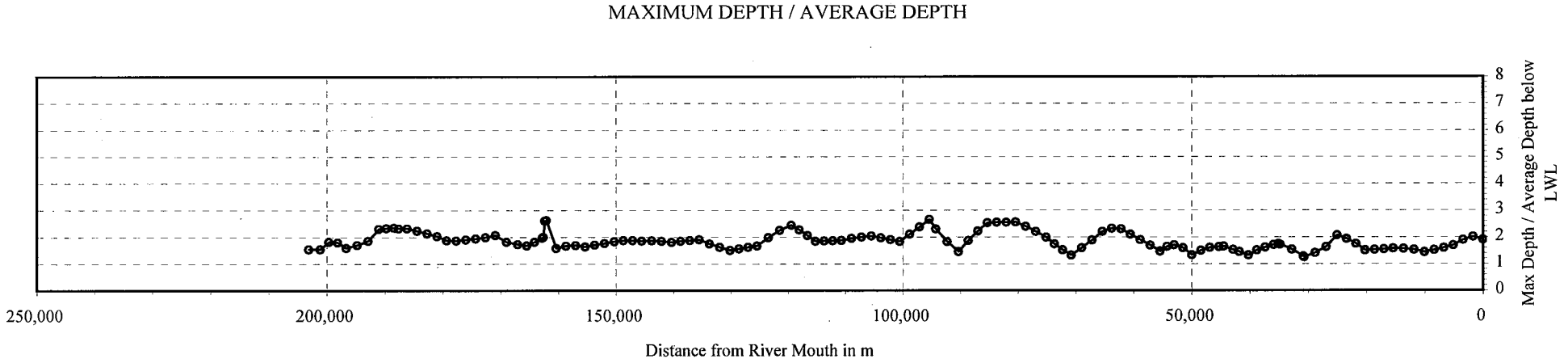


Fig. 3-2-15 Longitudinal Profiles of Manamo Channel (1/3)



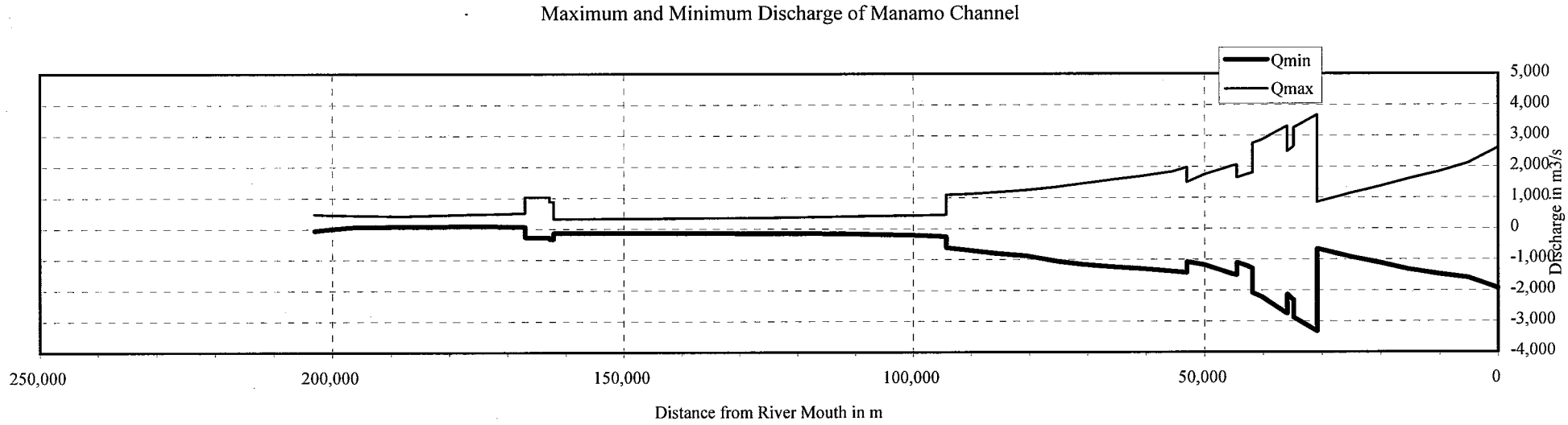
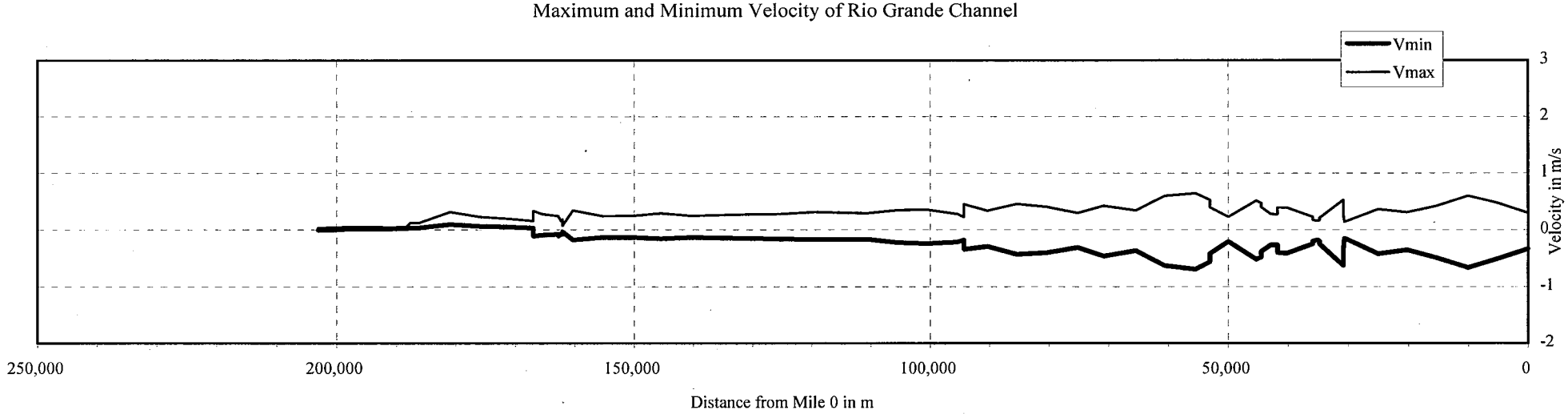


Fig. 3-2-15 Longitudinal Profiles of Manamo Channel (2/3)



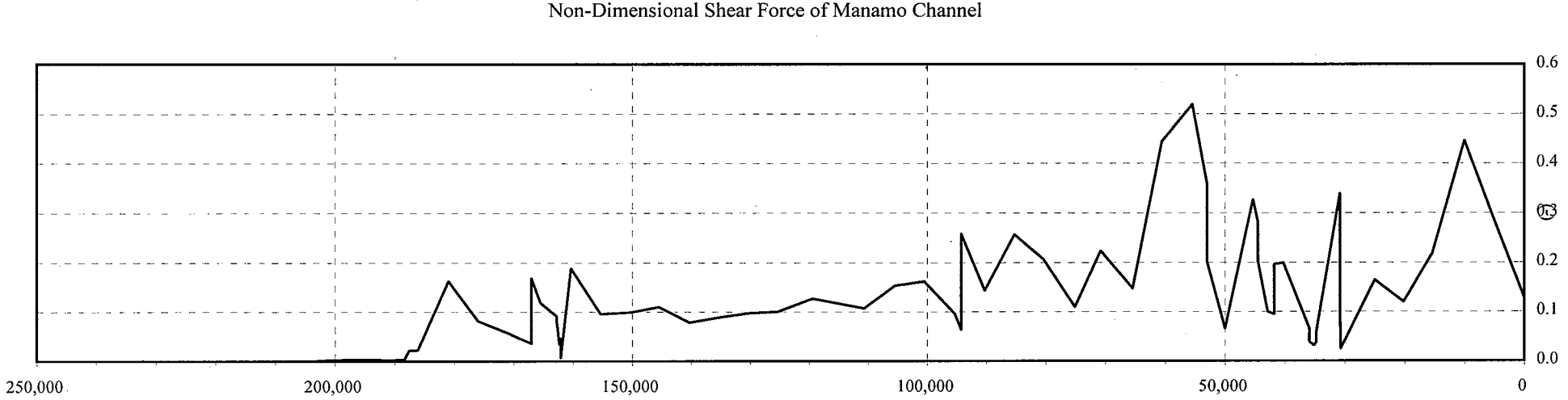
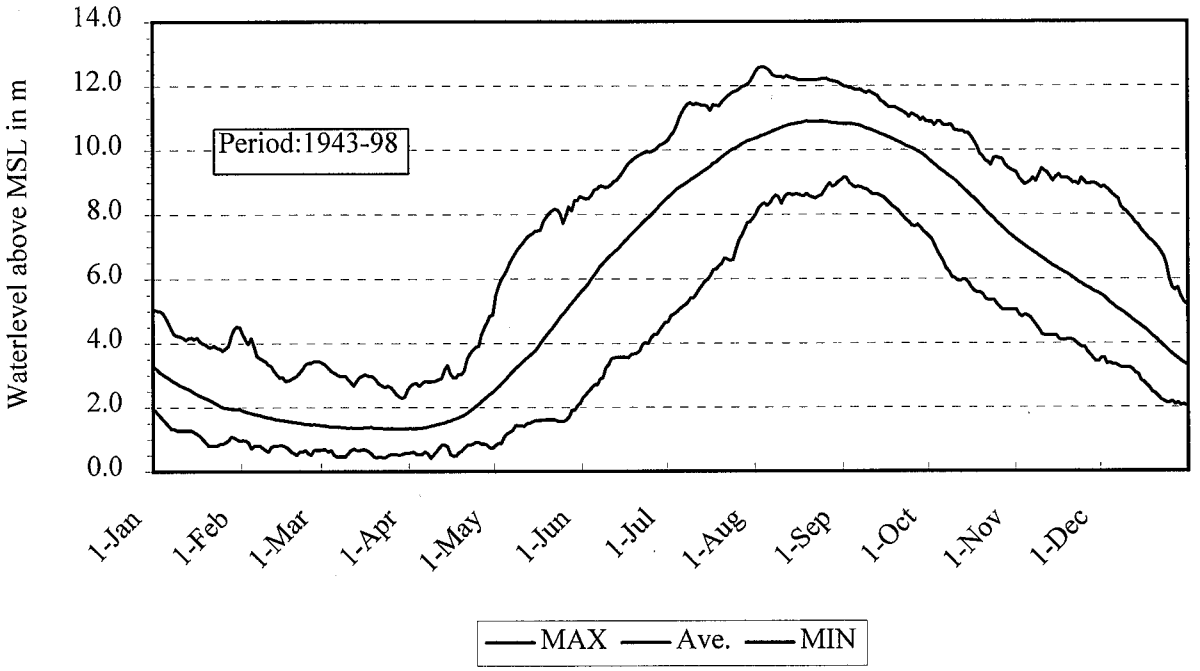
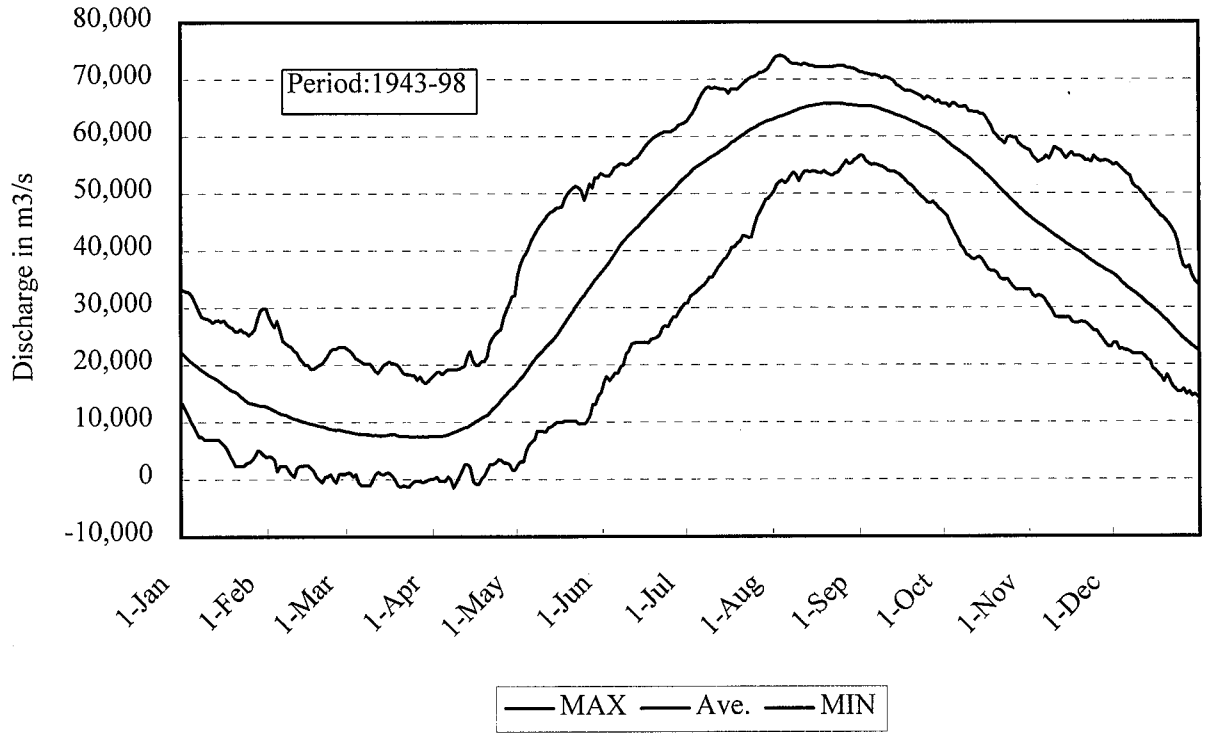


Fig. 3-2-15 Longitudinal Profiles of Manamo Channel (3/3)





Note: Discharge is calculated based on the relation between Cerro Hacha Discharge and Palua Waterlevel.

	Date	Waterlevel	Discharge
Maximum	1976/8/4	MSL+12.58	74,117
Minimum	1964/4/8	MSL+0.41	- 1,522

Fig. 3-2-16 Waterlevel and Discharge at Palua Station

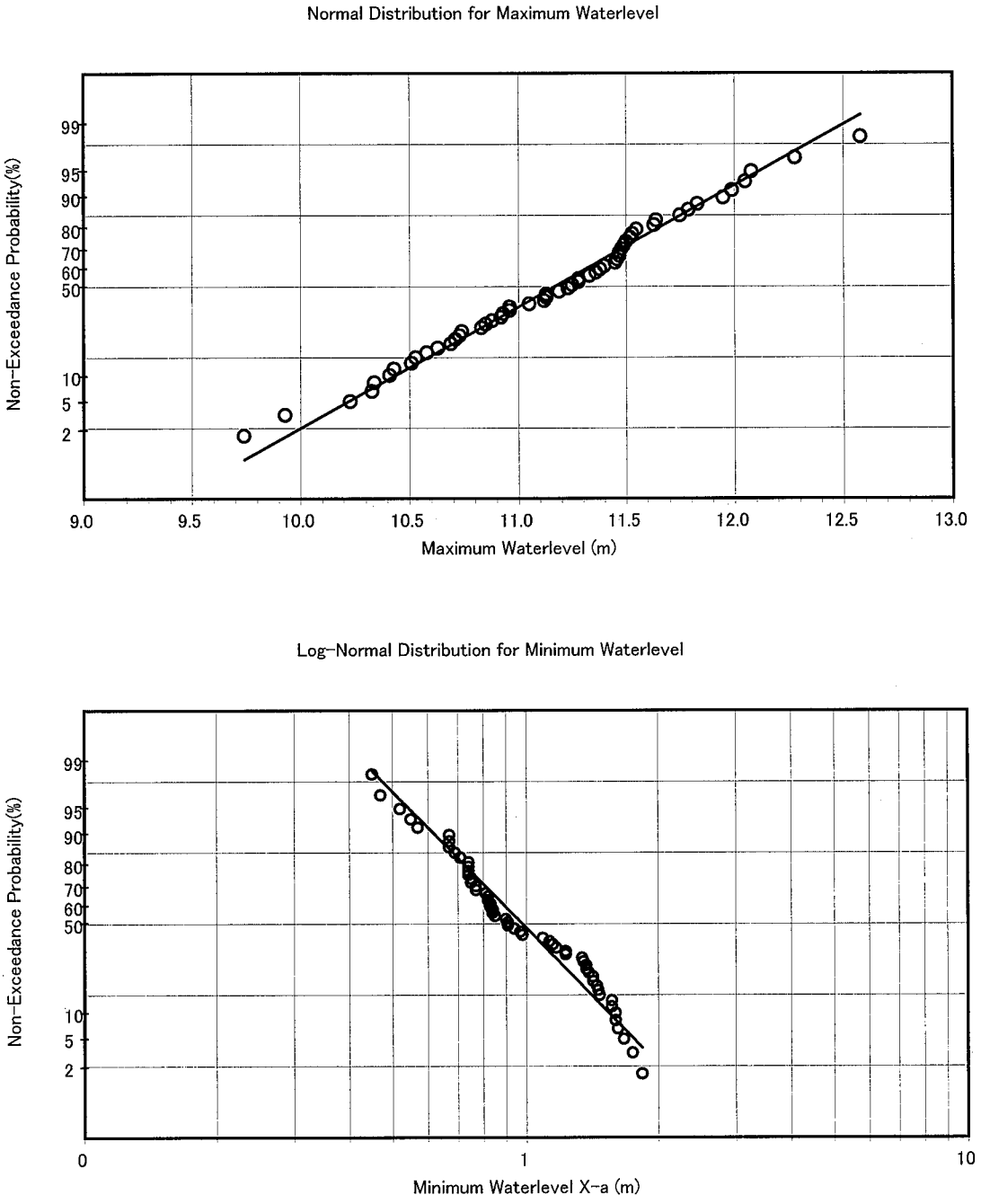
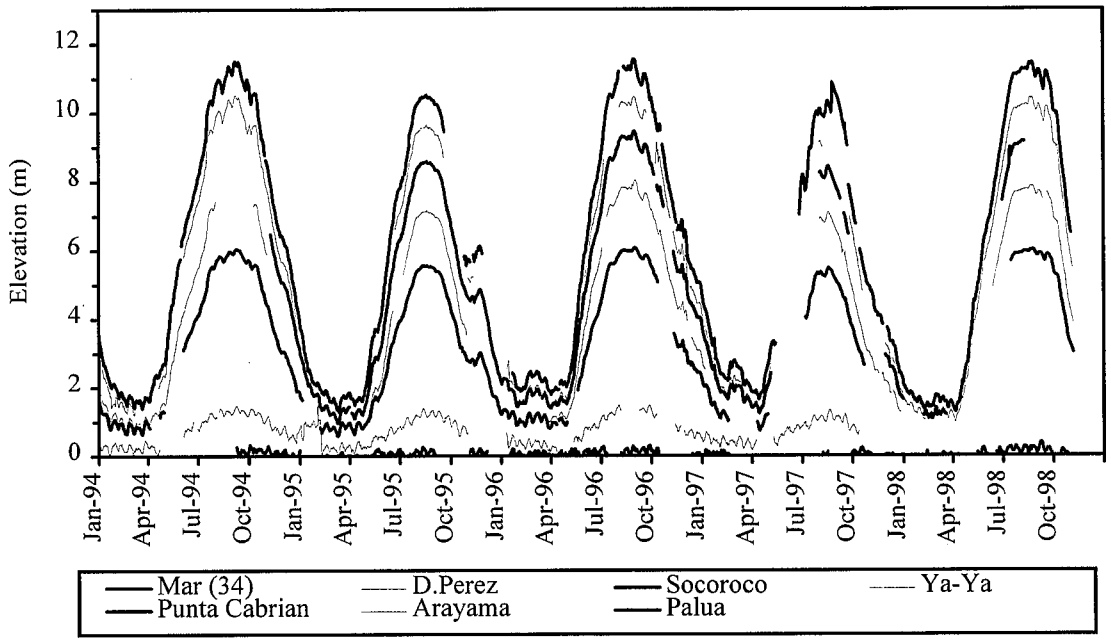


Fig. 3-2-17 Cumulative Frequency of Normal Distributions on Waterlevel at Paula

Water elevation variation in Rio Grande channel



Unit:MSL+m

Station	Item \ Year	1994	1995	1996	1997	1998
Mar(34)	Maximum	0.33	-	0.69	0.24	0.35
	Minimum	-	-0.08	-0.98	-	0.03
	Average	0.10	0.10	0.13	0.08	0.14
Domingo Perez	Maximum	1.48	1.48	1.48	1.34	-
	Minimum	-0.08	0.05	-0.70	0.17	-
	Average	0.76	0.72	0.72	0.70	-
Socoroco	Maximum	6.05	5.56	6.07	5.48	6.01
	Minimum	0.64	-0.25	-0.25	-	-
	Average	3.15	2.79	3.19	3.29	5.36
Ya-Ya	Maximum	-	7.15	8.03	-	7.86
	Minimum	0.75	-	-	-	-
	Average	3.17	4.50	4.90	4.22	6.76
Punta Cabrian	Maximum	-	8.59	9.45	-	9.16
	Minimum	-	0.96	0.16	1.17	1.07
	Average	4.79	4.29	4.96	3.39	5.19
Aramaya	Maximum	10.52	9.65	10.46	-	10.42
	Minimum	-	-	0.30	1.32	0.99
	Average	6.33	8.34	5.14	2.99	5.50
Palua	Maximum	11.50	10.52	11.55	10.87	11.45
	Minimum	1.39	1.29	0.43	1.65	1.28

Fig. 3-2-18 Waterlevel Variation in Rio Grande Channel

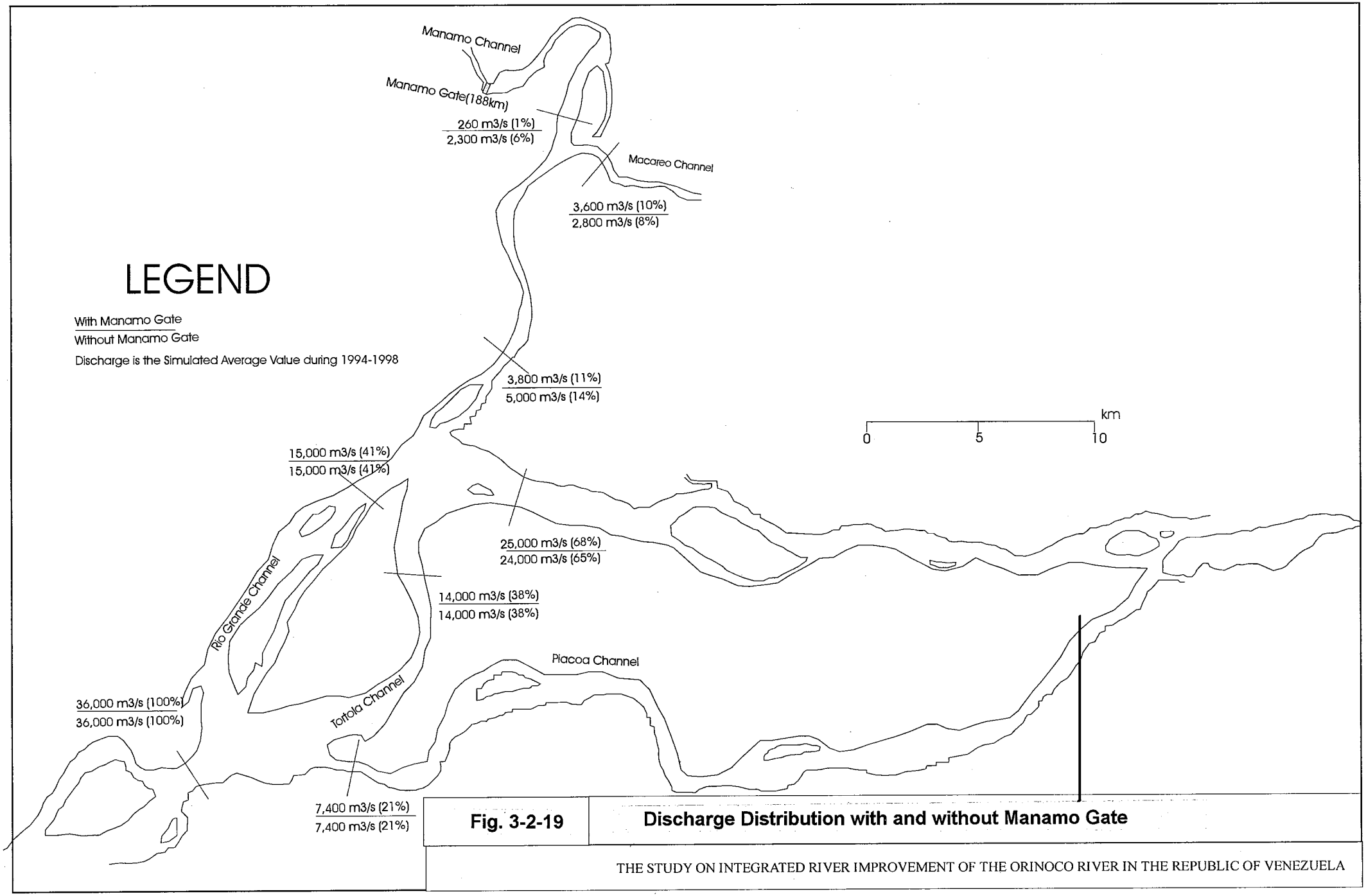
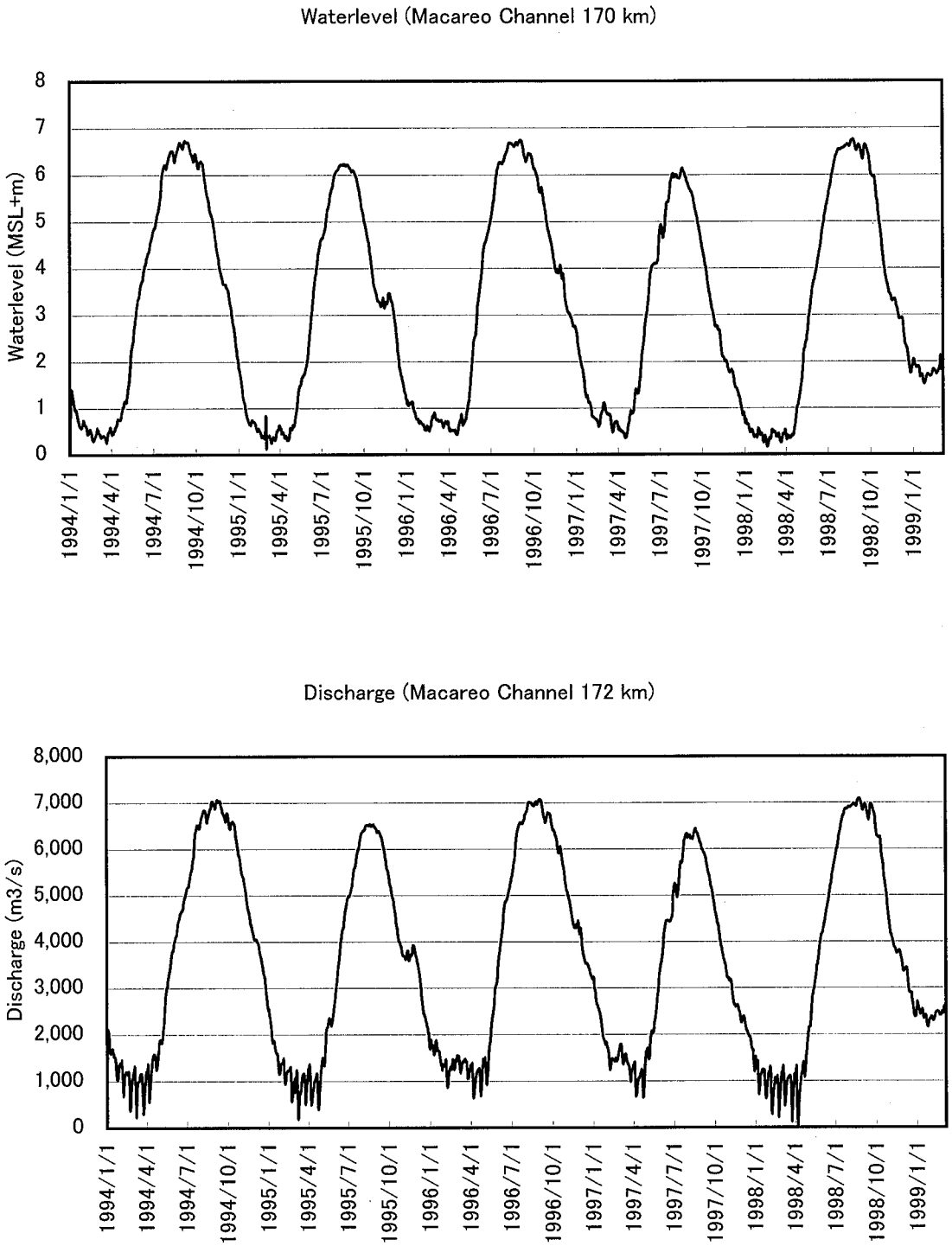


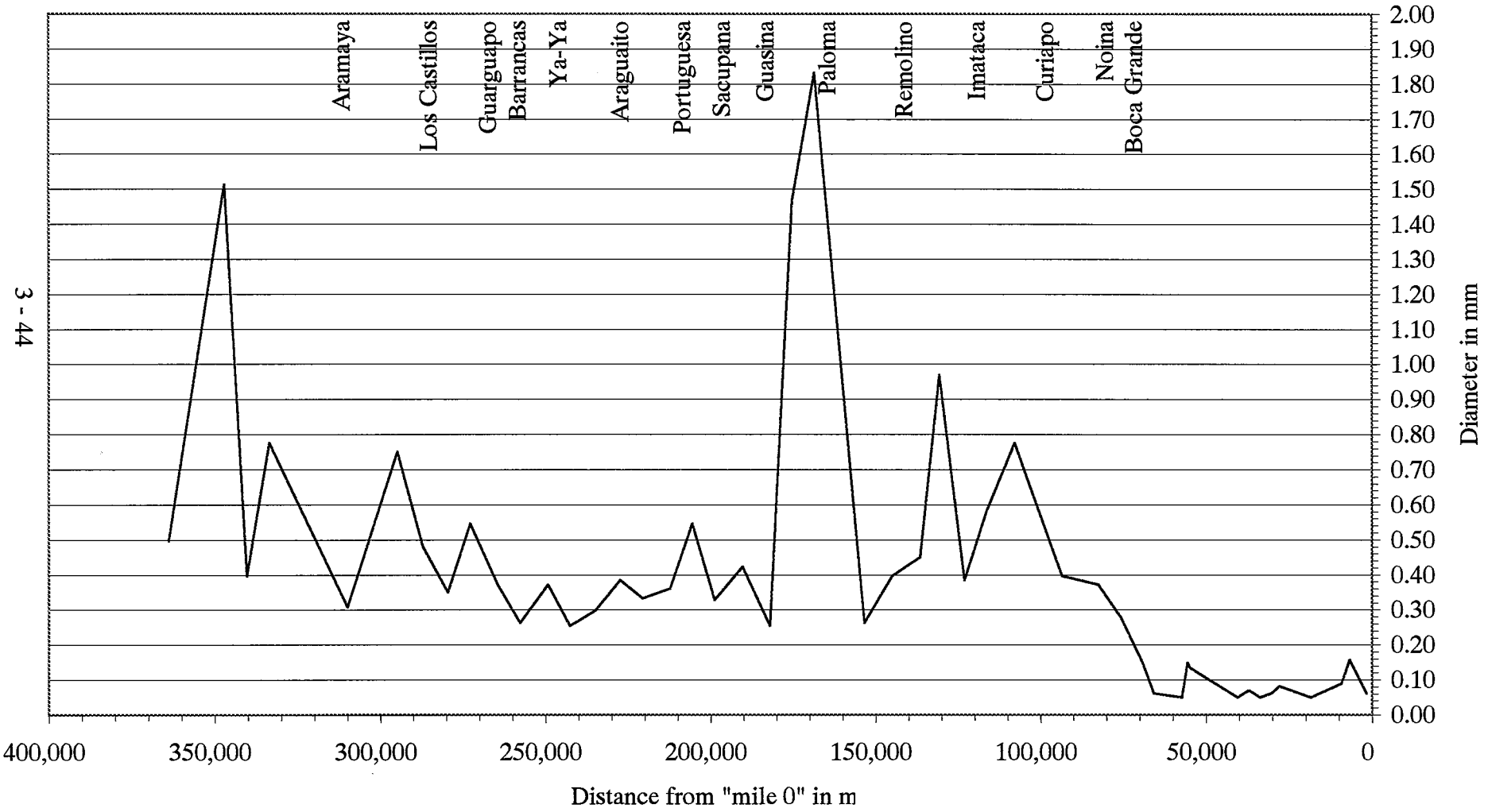
Fig. 3-2-19 **Discharge Distribution with and without Manamo Gate**



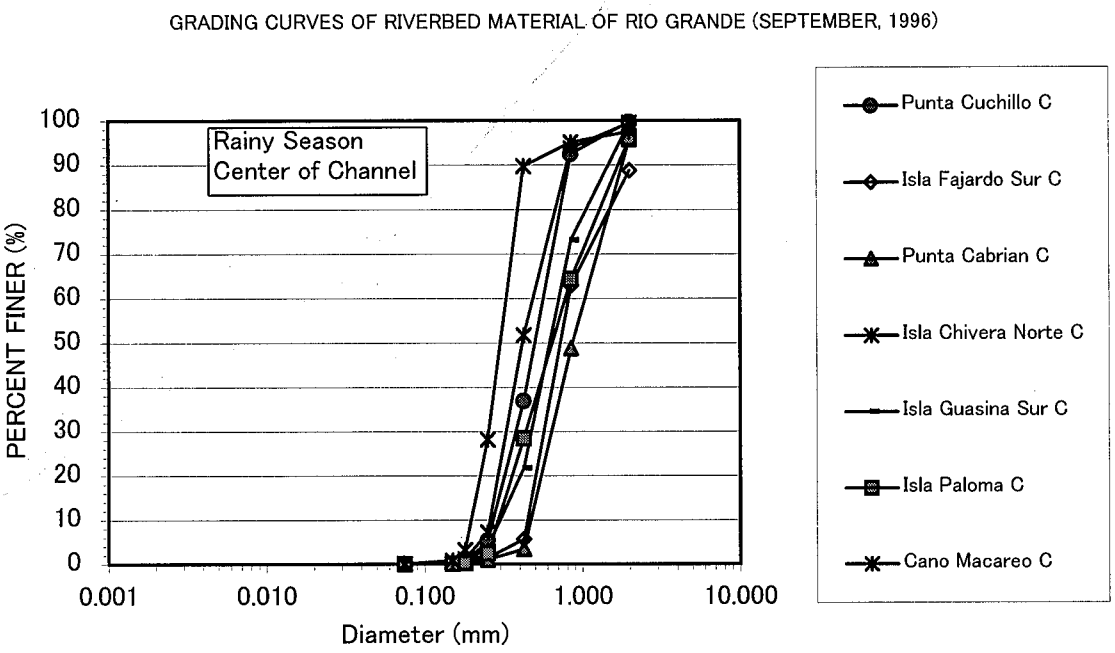
Note: Simulated Data based on 1-D Simulation Analysis

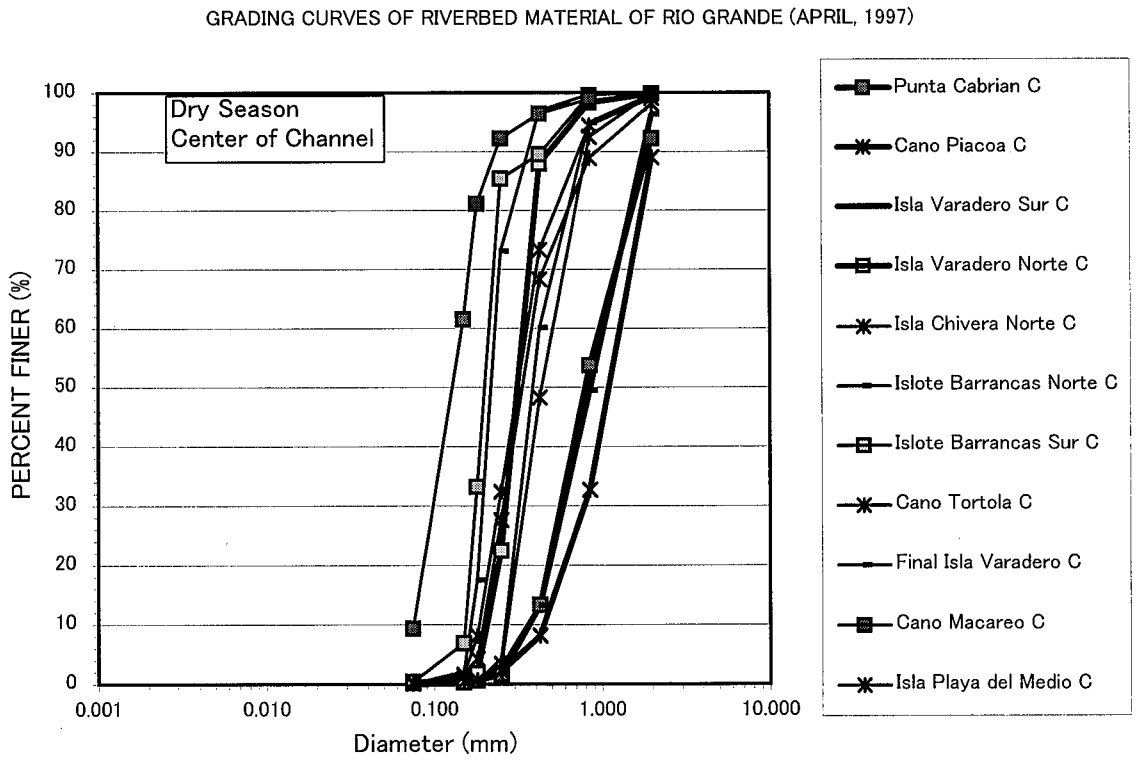
Fig. 3-2-20 Waterlevel and Discharge in Macareo Channel

Fig.3-2-21 RIVERBED MATERIAL DISTRIBUTION OF RIO GRANDE CHANNEL



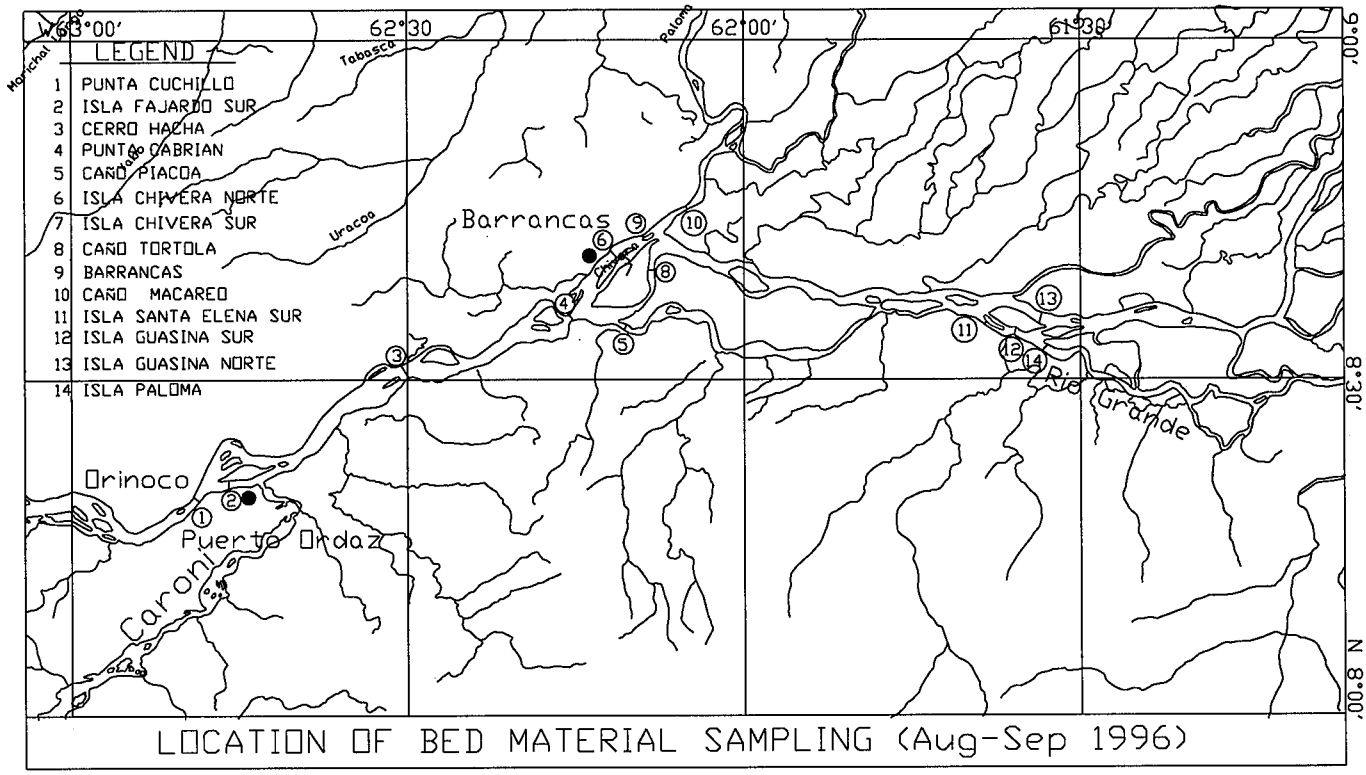
source:INC, El Dragado con Brazo en Venezuela, 1979





Source:MARNR-INC

Fig. 3-2-22 Riverbed Material Grading Curves of Rio Grande Channel



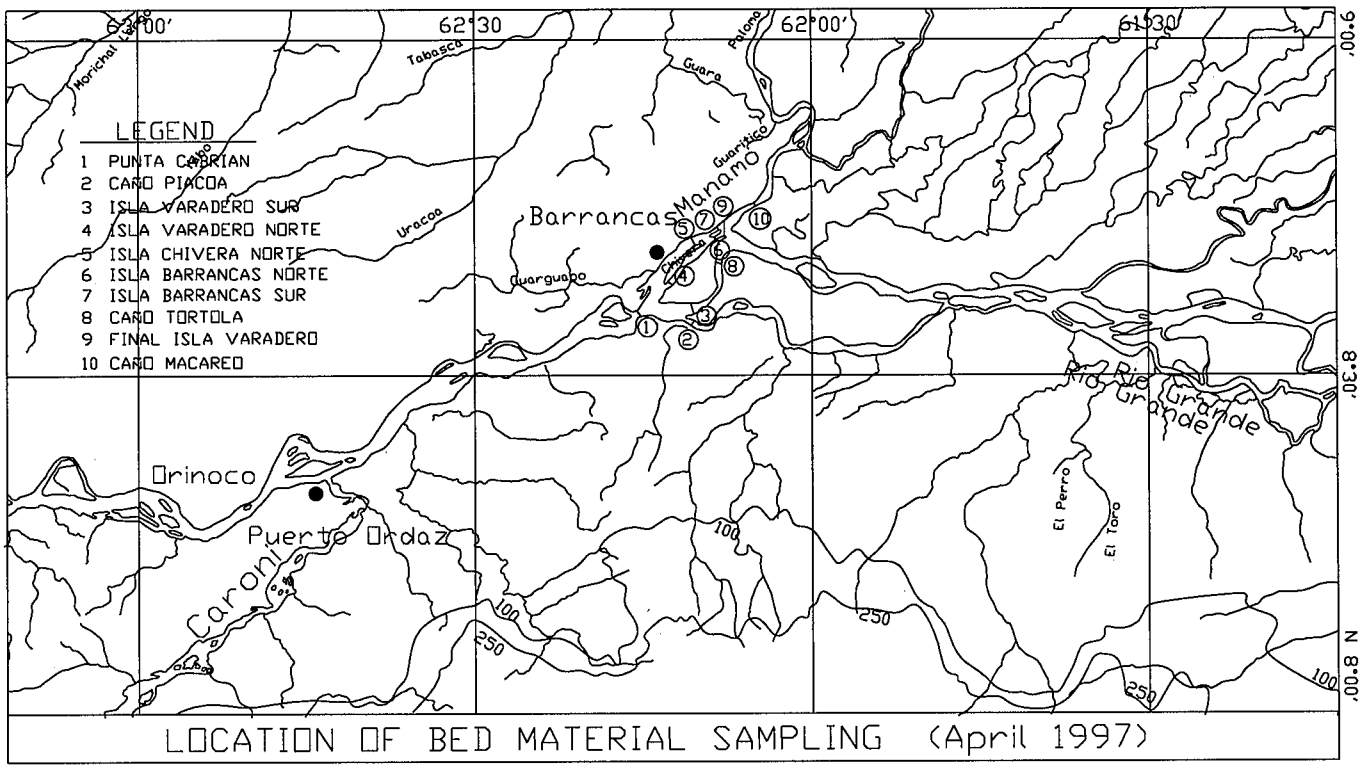


Fig. 3-2-23 Location of Riverbed Material Sampling By MARN-INC