

Fig.3-1

Location of Rio Grande, Macareo and Manamo Channels

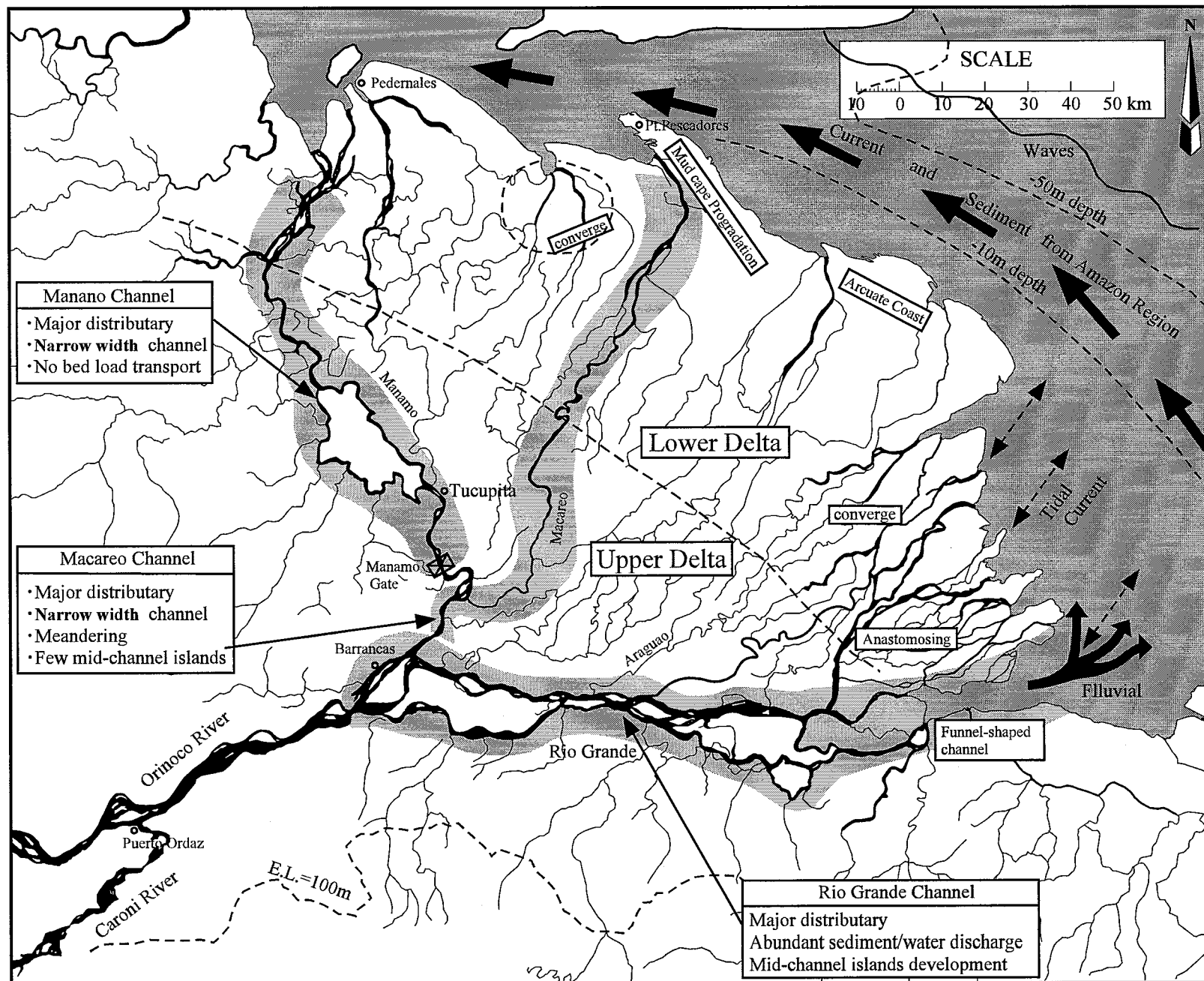
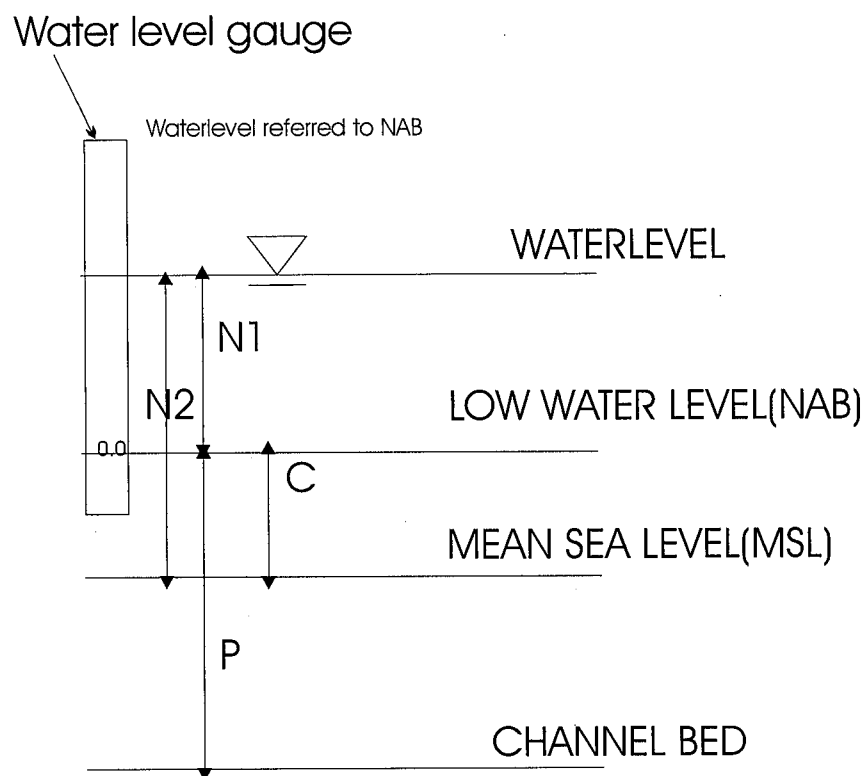


Fig.3-2-1 MORPHOLOGICAL CHARACTERISTICS OF THE ORINOCO DELTA



N1: Water Level referred to LWL(NAB)

N2: Water Level referred to MSL

P: Depth referred to LWL(NAB)

C = N2 - N1 : Relation between LWL(NAB) and MSL

Table WATERLEVEL GAUGE STATION IN RIO GRANDE

Serial	Gauge	Loation		Latitude	Longitude	Install	Elevation of Datum (N.A.B. or B.M.M.V.) above M.	
		mile	km				feet	meter
13	Boca Grande	13.5	25.0	8 47 33	60 22 25	1956		-0.975
34	Tercera Island	34.8	64.5	8 37 17	60 36 11	1956	-3.20	-0.976
63	Domingo Perez	63.0	116.7	8 32 55	61 0 49	1956	-2.28	-0.695
111	Socoroco	111.0	205.7	8 35 48	61 41 37	1955	-0.82	-0.250
137	Ya-Ya	137.0	253.9	8 41 55	62 5 43	1967	0.05	-0.016
152	Punta Cabrian	152.0	281.7	8 34 31	62 15 49	1959	0.53	0.16
169	Aramaya	169.0	313.2	8 30 40	62 30 20	1974	0.30	0.30
181	Palua	181.0	335.4	8 21 49	62 41 31	1943	1.41	0.43
186	Puerto Ordaz	186.0	344.7	8 20 32	62 42 51	1950	1.41	0.43
192	P Cuchillo	192.0	355.8	8 19 0	62 48 50	1964		0.57
222	Rosario	222.0	411.4	8 16 43	63 15 20	1963		0.93

source:INC

Fig. 3-2-2 Definition of Channel Water Level

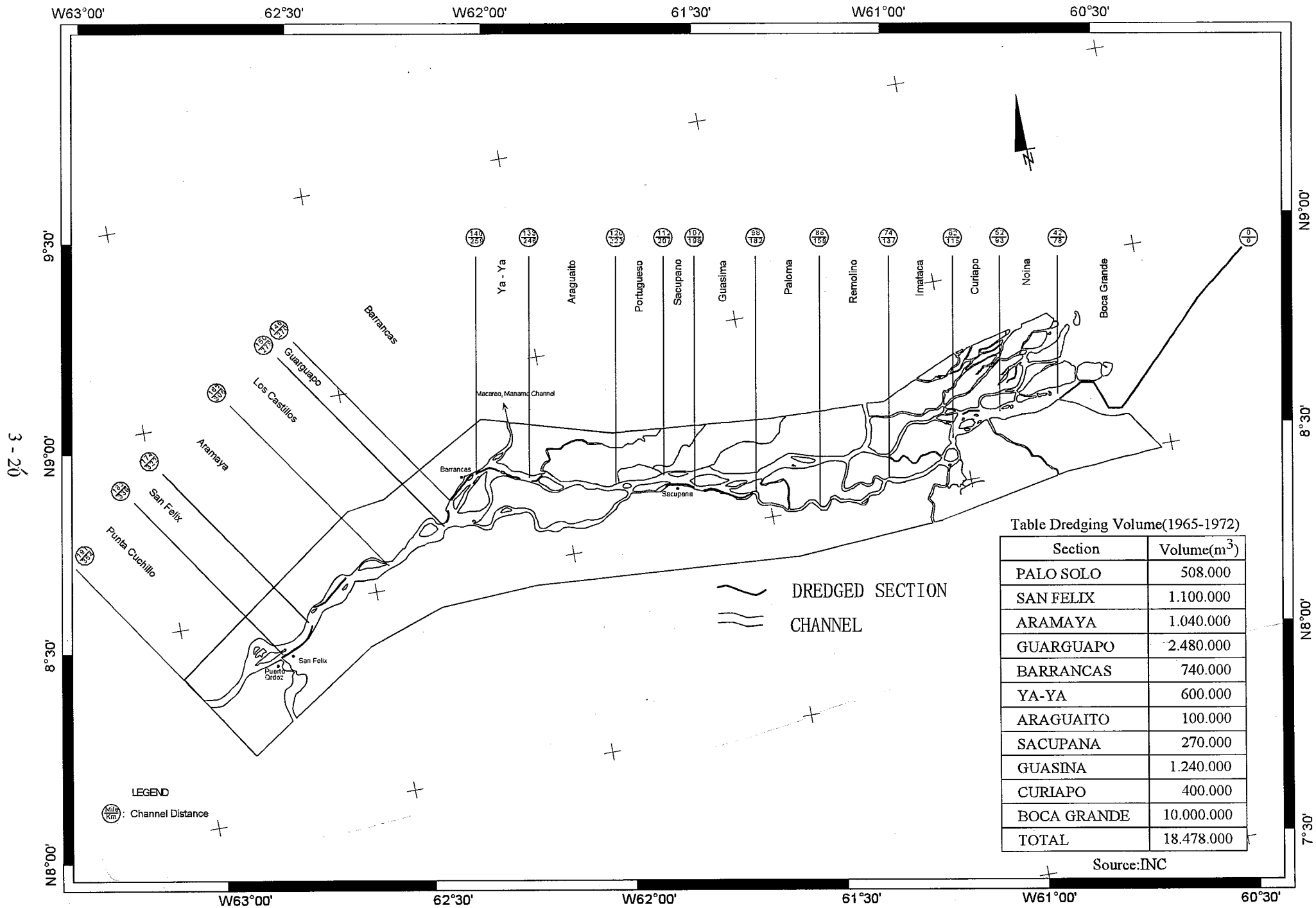


Fig. 3-2-3 Rio Grande Channel

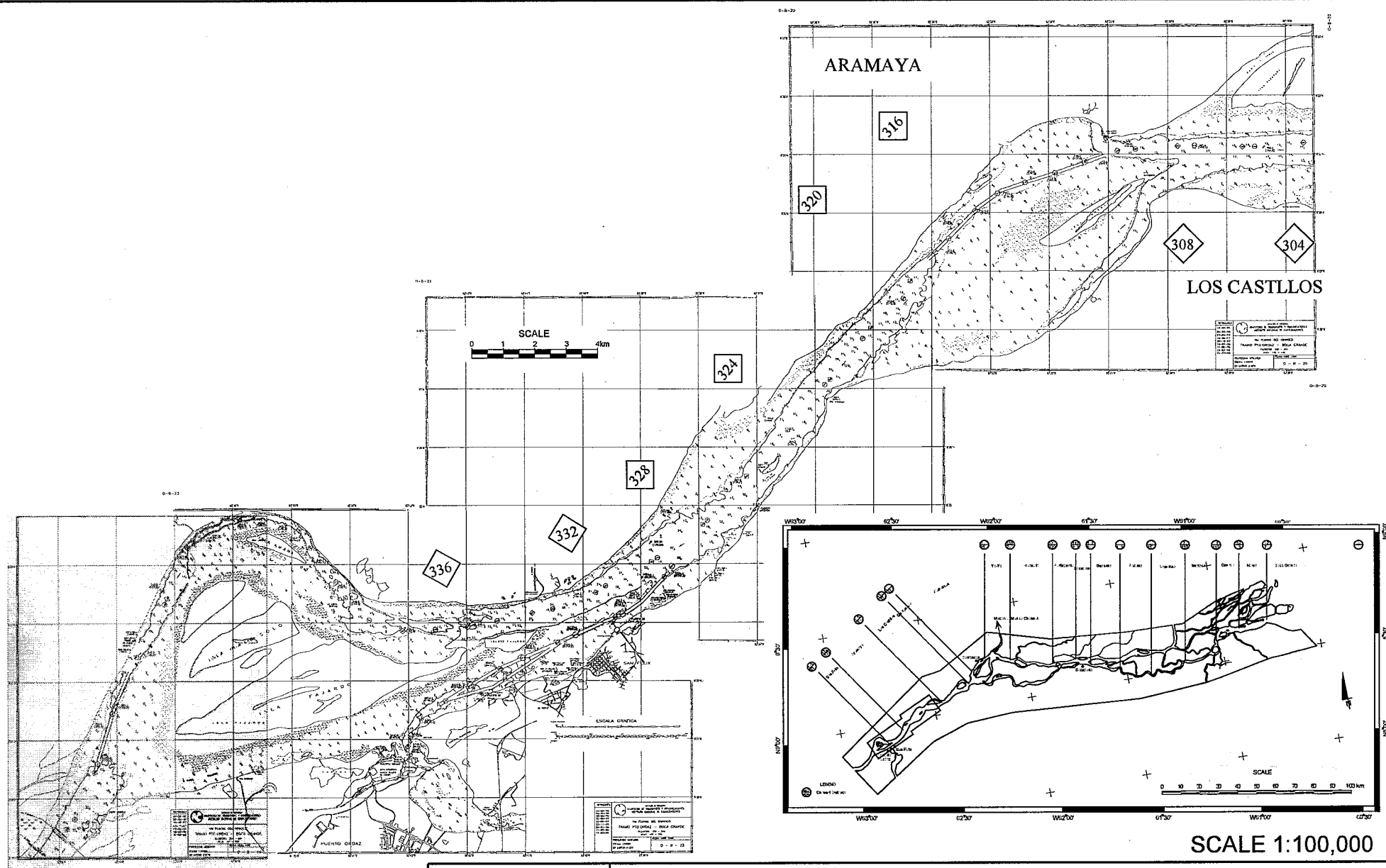


Fig. 3-2-4

NAVIGATION CHART OF ARAMAYA SECTION

THE STUDY ON INTEGRATED RIVER IMPROVEMENT OF THE ORINOCO RIVER IN THE REPUBLIC OF VENEZUELA

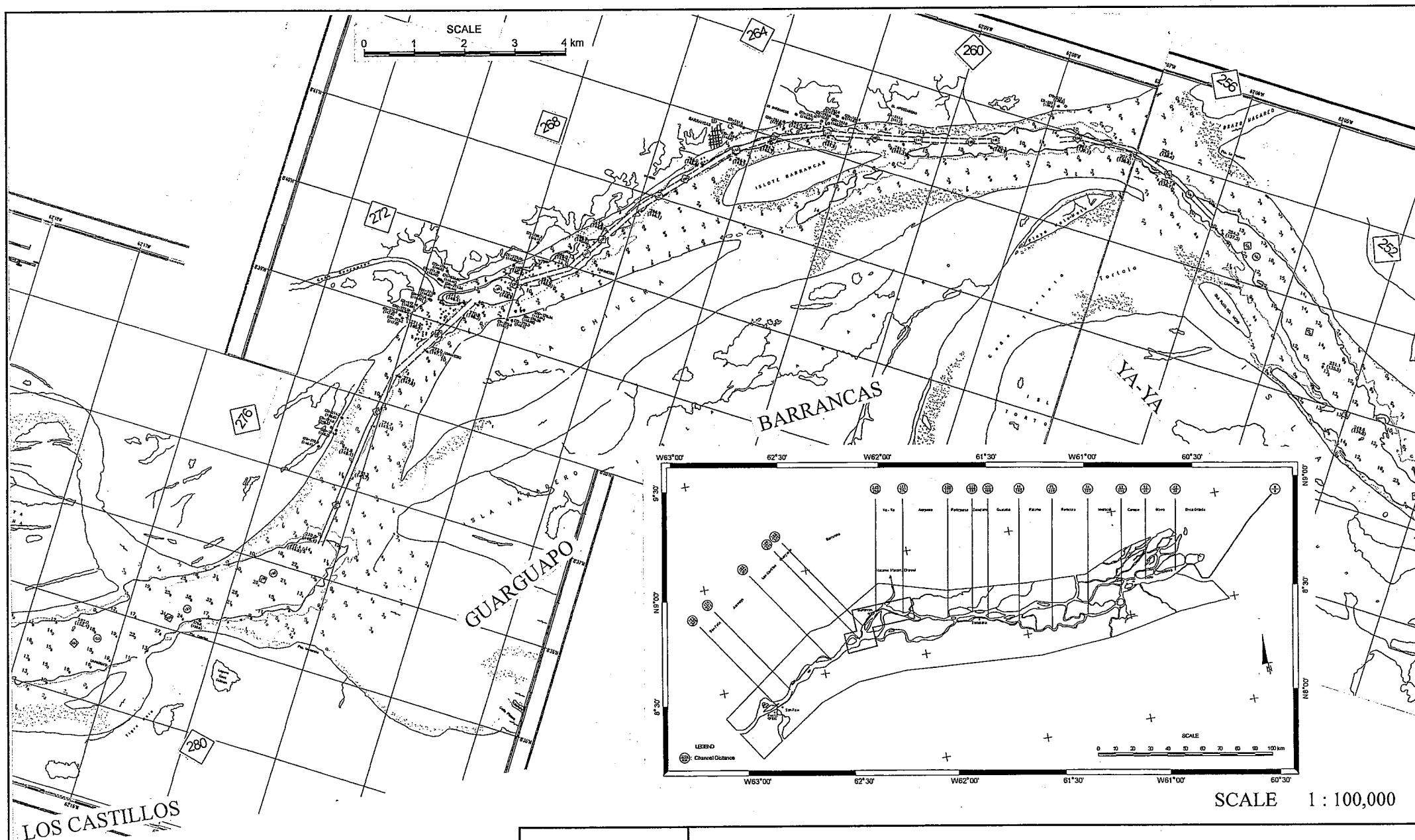


Fig. 3-2-5

Navigation Chart of Guarguapo-Barrancas Section

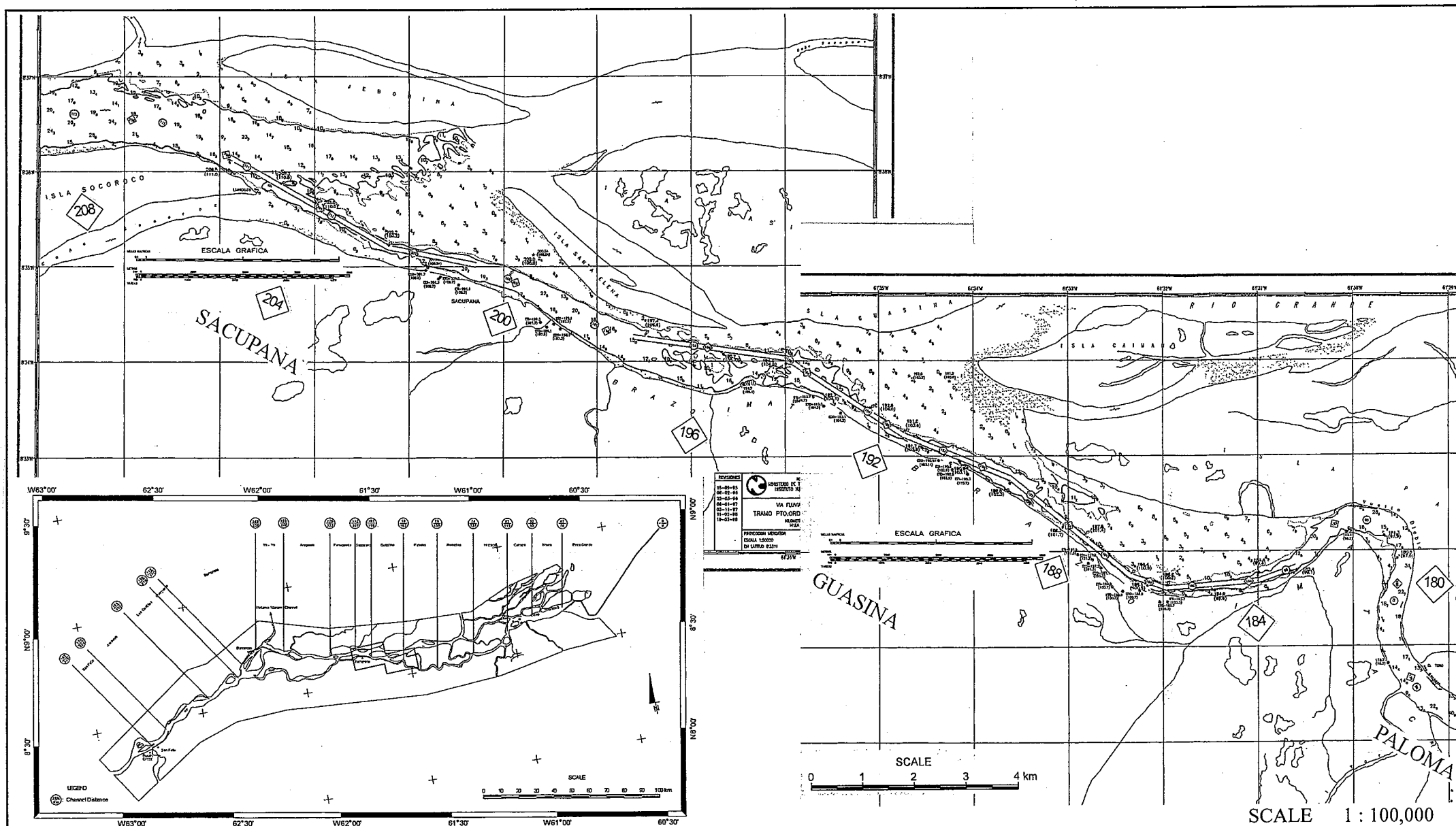
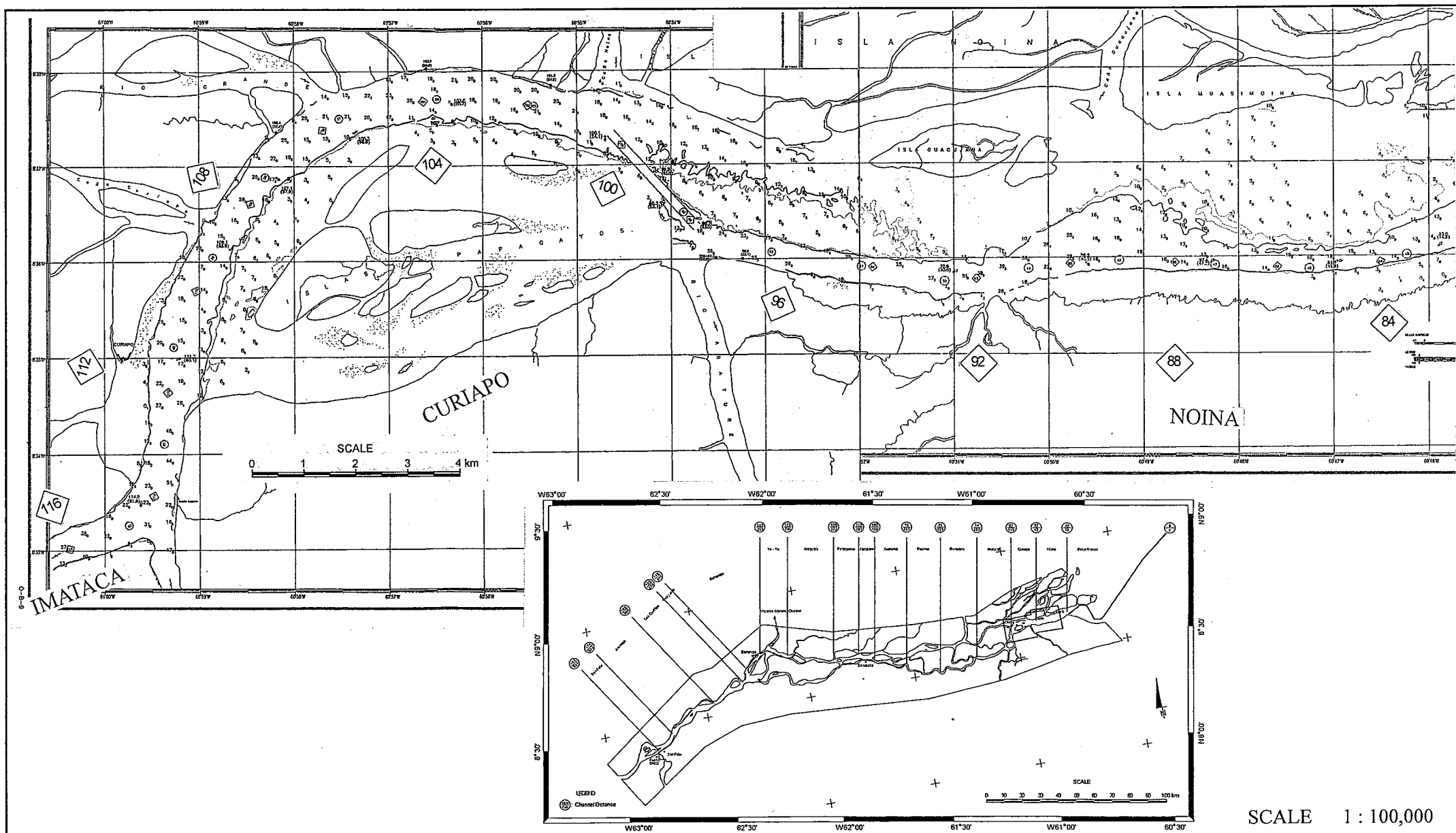
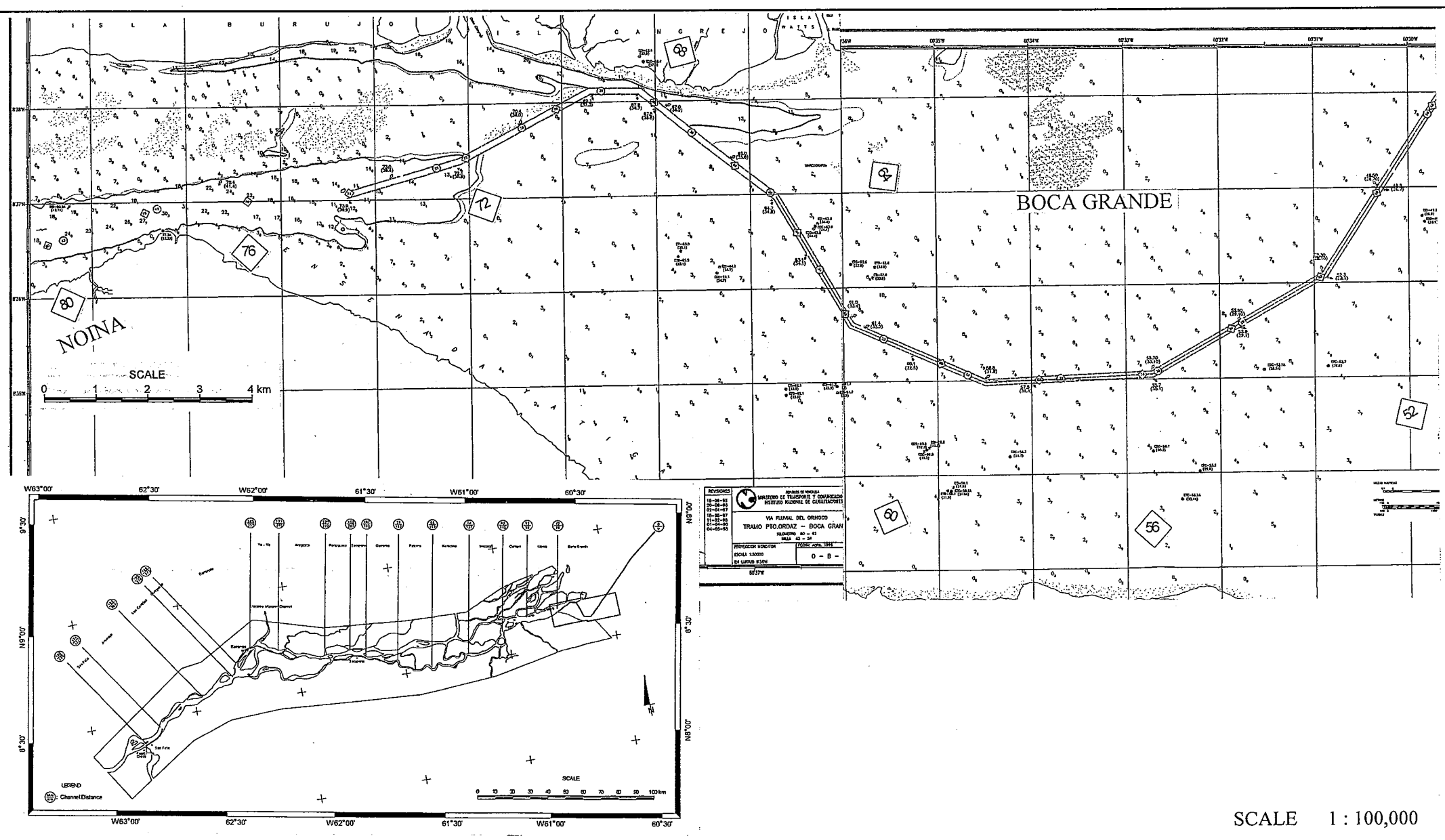


Fig. 3-2-6

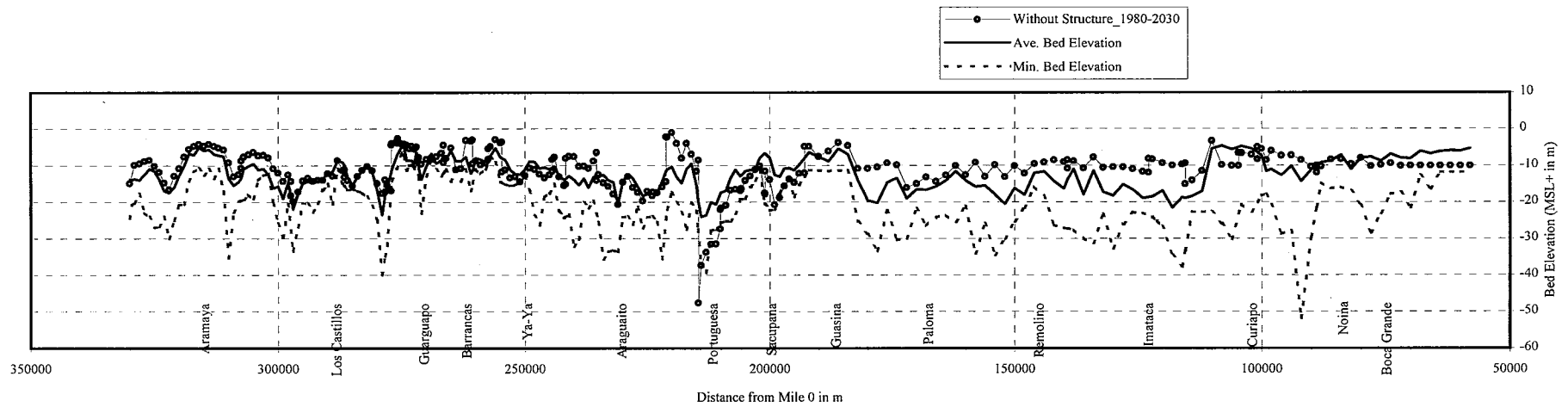
Navigation Chart of Sacupana Guasina Section

THE STUDY ON INTEGRATED RIVER IMPROVEMENT OF THE ORINOCO RIVER IN THE REPUBLIC OF VENEZUELA





LONGITUDINAL PROFILE OF BED ELEVATION IN RIO GRANDE CHANNEL



Channel Width and Channel Width / Depth

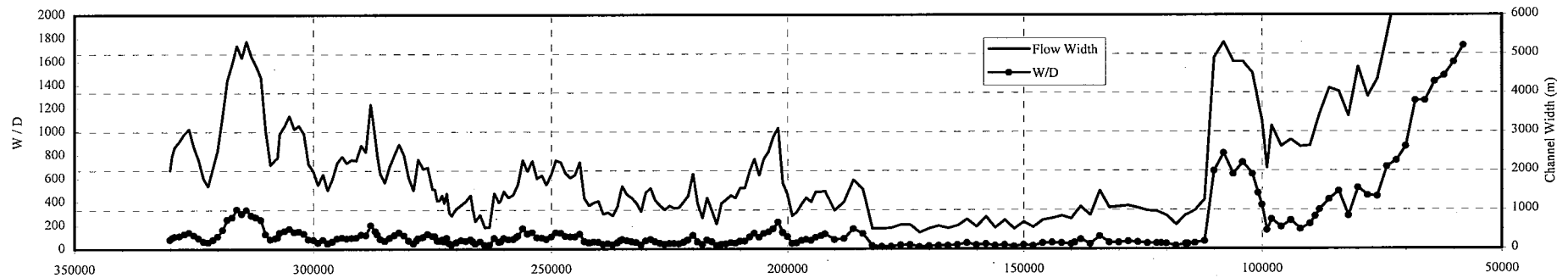


Fig. 3-2-9 Longitudinal Profiles of Rio Grande Channel (1/3)