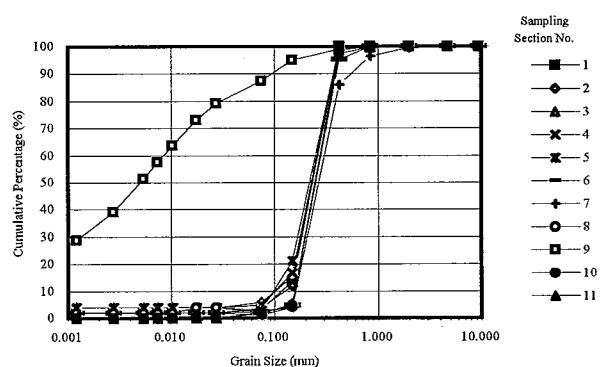
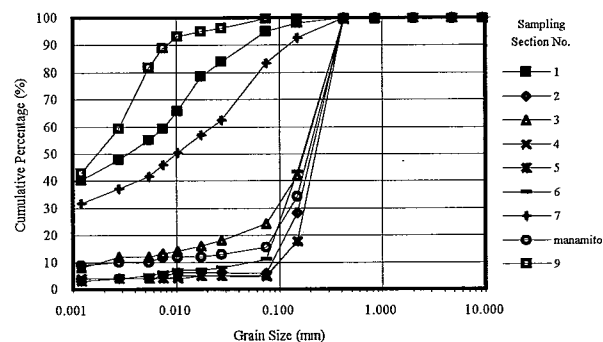


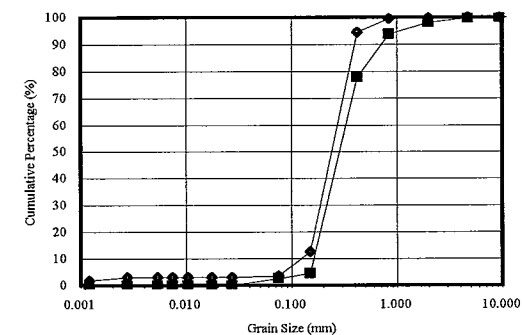
Grain Size Distributions in Macareo Channel
December 1998



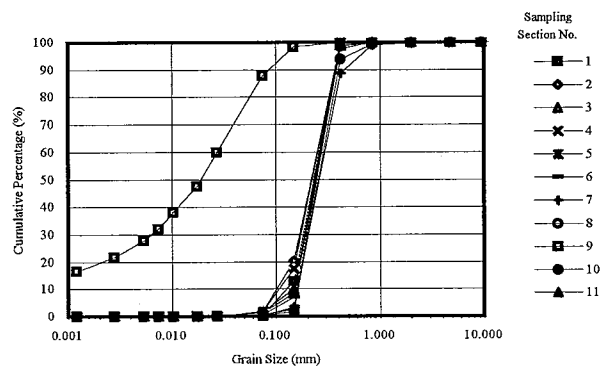
Grain Size Distributions in Manamo Channel
December 1998



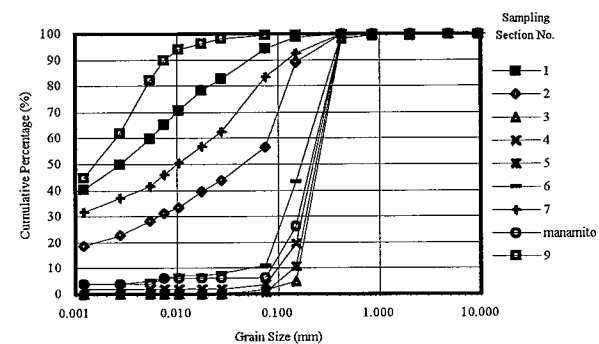
Grain Size Distributions in Orinoco Channel
December 1998



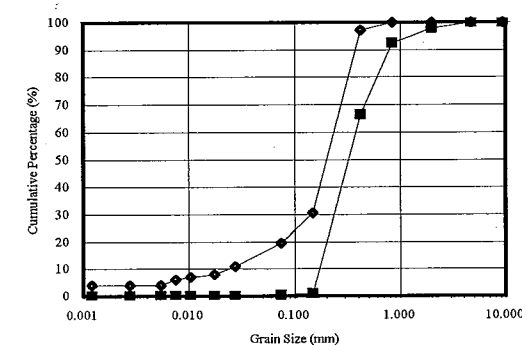
Grain Size Distributions in Macareo Channel
January 1999



Grain Size Distributions in Manamo Channel
January 1999



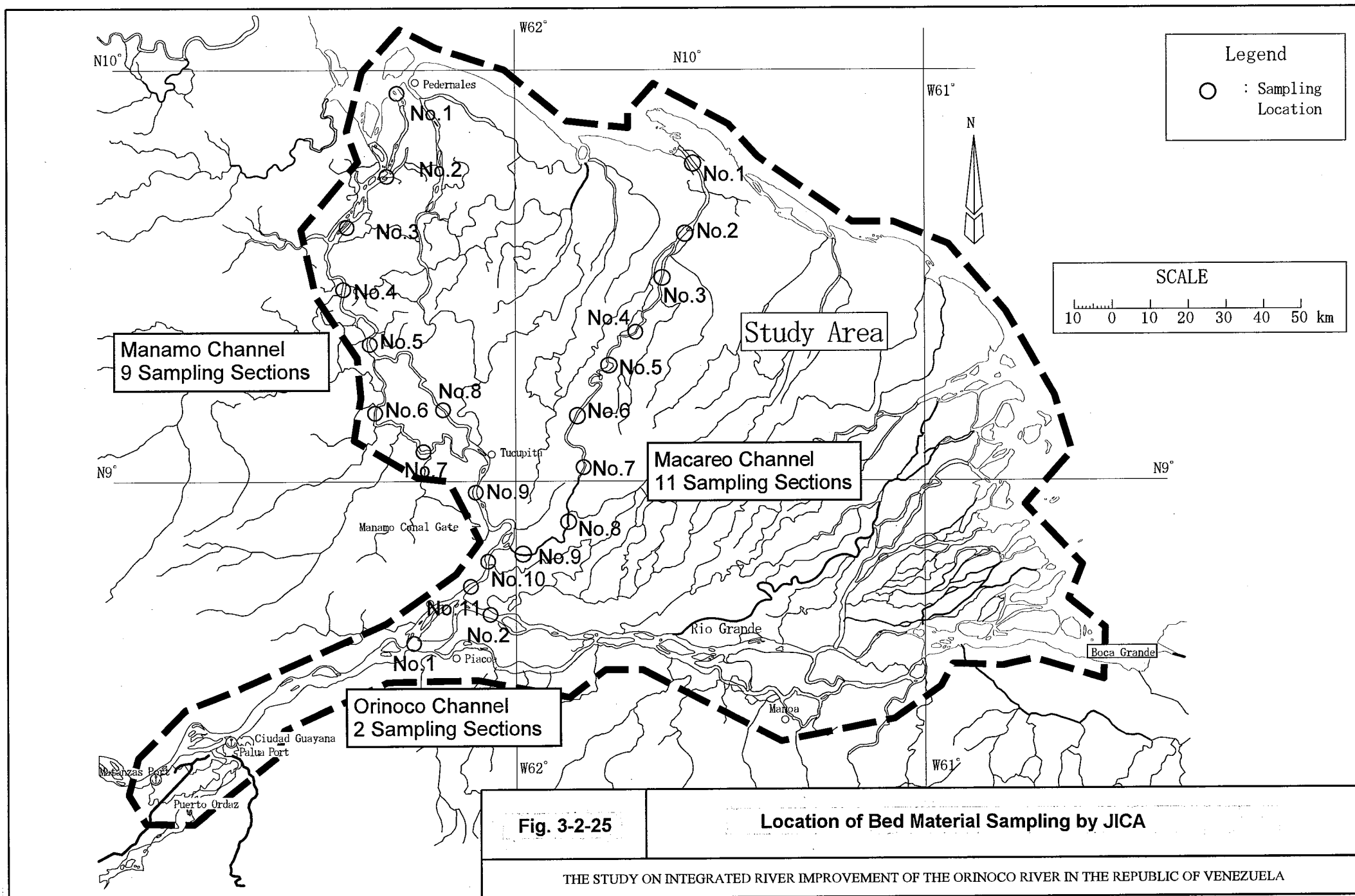
Grain Size Distributions in Orinoco Channel
January 1999



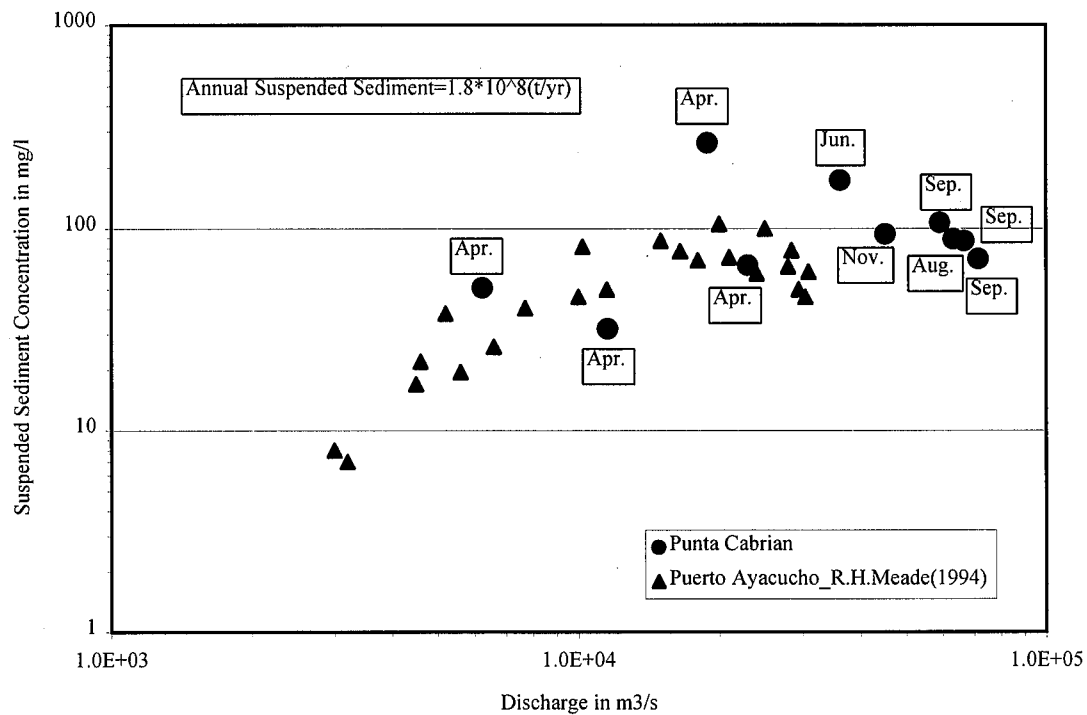
Source: JICA 1999

Fig. 3-2-24

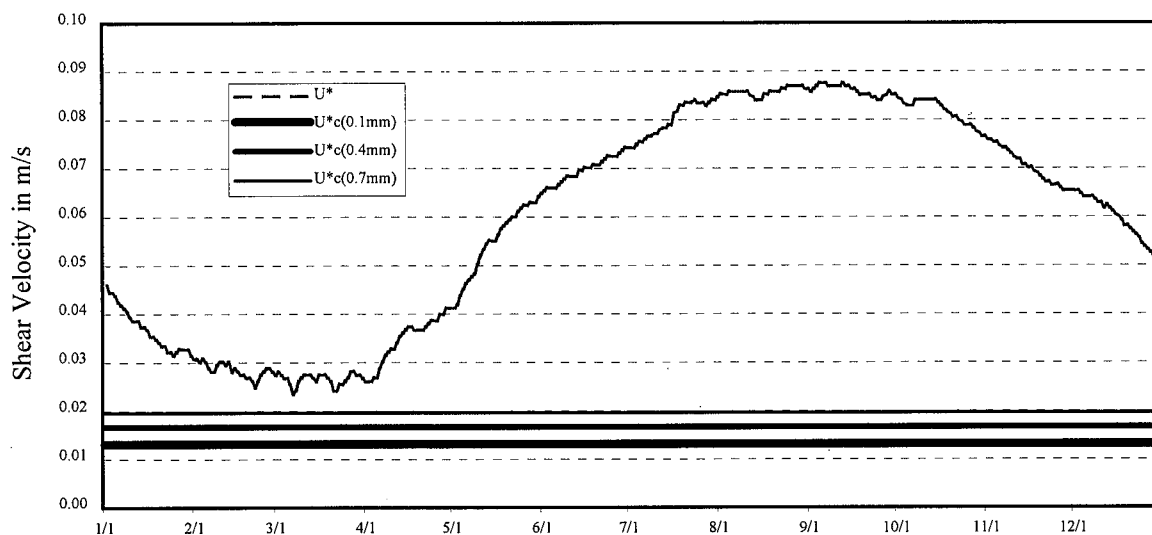
Grading Curves of Riverbed Material of Manamo,
Macareo and Rio Grande Channels



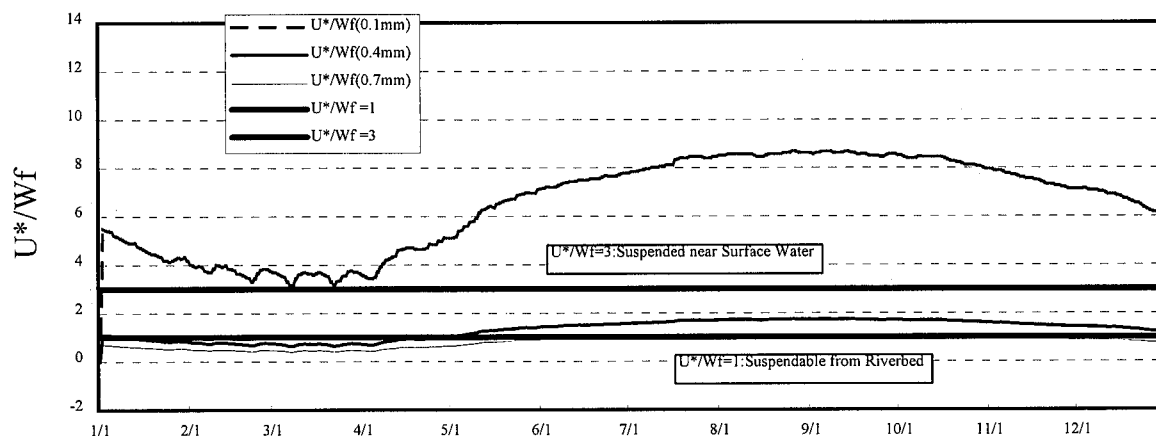
RELATION BETWEEN SUSPENDED SEDIMENT AND WATER DISCHARGE AT P. CABRIAN
(1993-1997 Measurement by INC-MARNR)



Shear Velocity and Critical Shear Velocity



270km(Guarguapo-Barrancas)



90km(Noina)

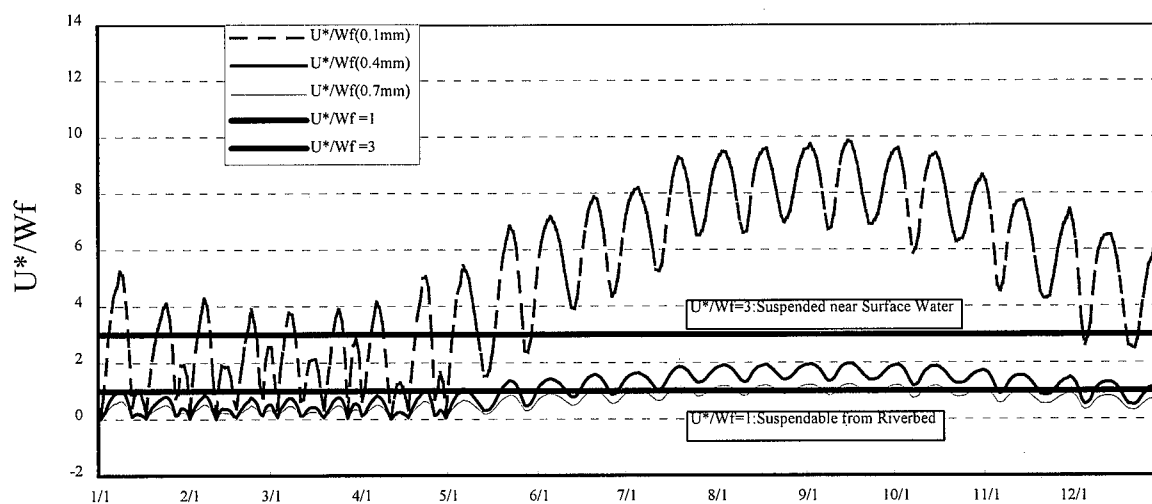
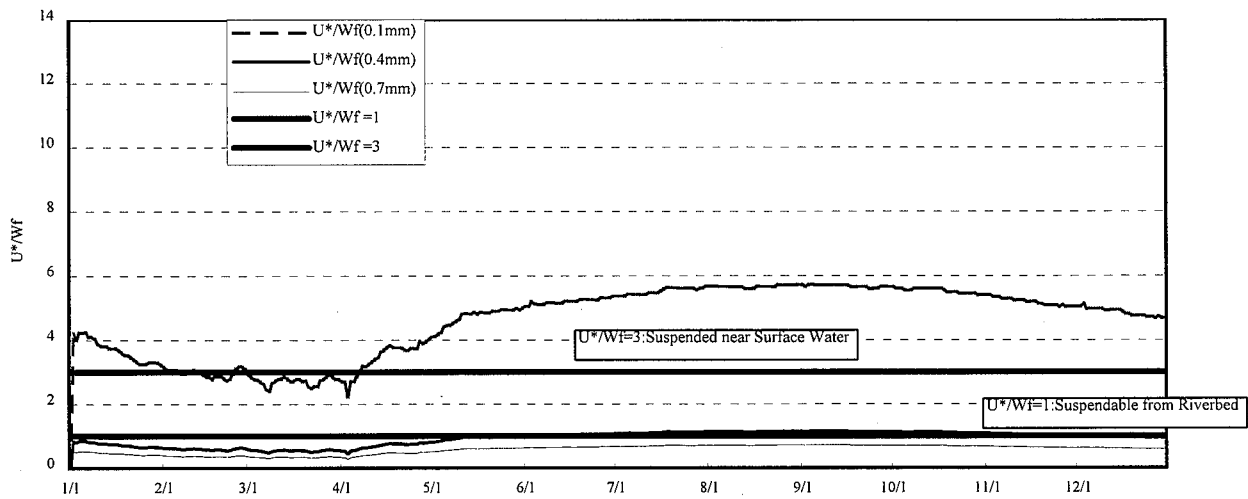


Fig. 3-2-27 Annual Variation of Ratio of Shear Velocity to Falling Velocity (1/2)

Macareo Channel(185km)



Manamo Channel(170km)

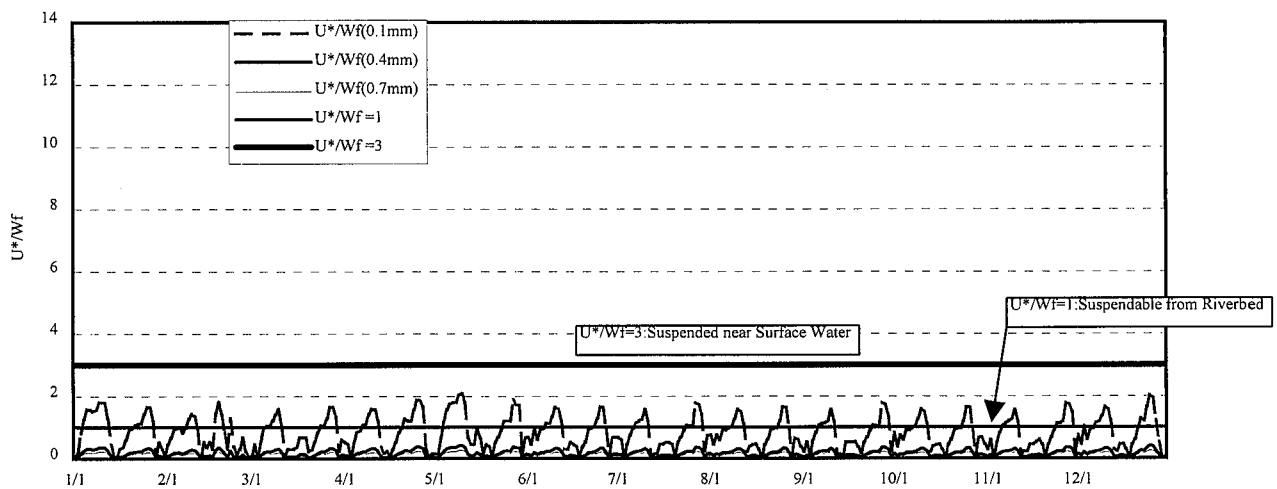


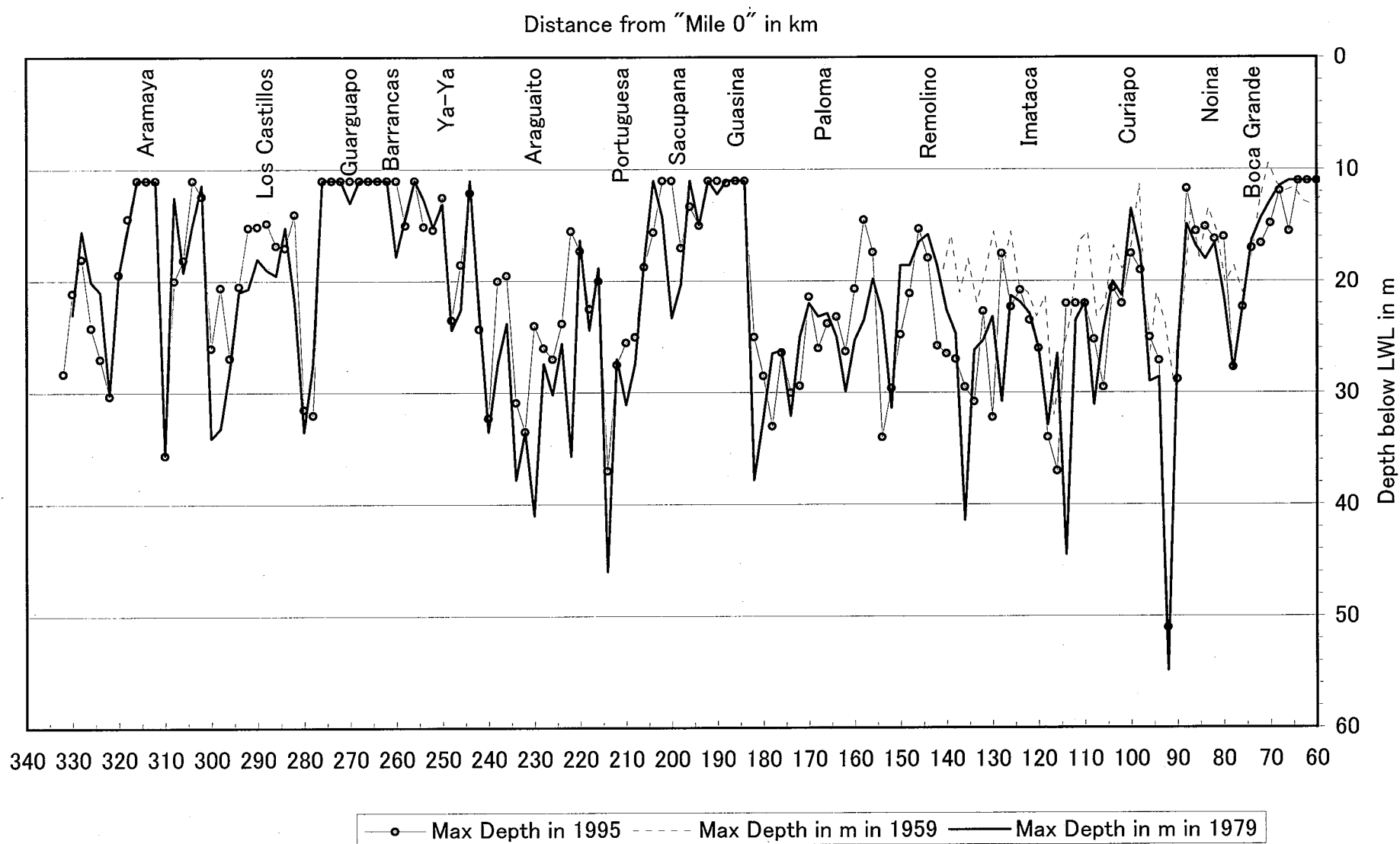
Fig. 3-2-27 Annual Variation of Ratio of Shear Velocity to Falling Velocity (2/2)

Figure 1 is a line graph showing the elevation of the left bank of the River of Pisuerga in 1998. The x-axis represents the 'Distance from left Bank (m)' from 0 to 1500. The y-axis represents the 'Elevation above L.W.L. (m)' from -30 to 5. Two lines represent the bank profile: a thin line for August and a thick line for November. Both lines show a deep channel around 400m. Vertical dashed lines indicate the 'Canal Margin' and 'Canal Margin'.

Figure 1 is a line graph showing the elevation above EWL (m) on the y-axis (ranging from -30 to 5) versus the distance from the left bank (m) on the x-axis (ranging from 0 to 1500). The graph displays two data series: 1998 Aug (solid line) and 1998 Nov (dashed line). Both series show a significant depression in elevation around 500m distance, indicating a channel. The 1998 Nov data shows a deeper depression than the 1998 Aug data. The canal margin is indicated by a vertical dashed line at approximately 500m distance.

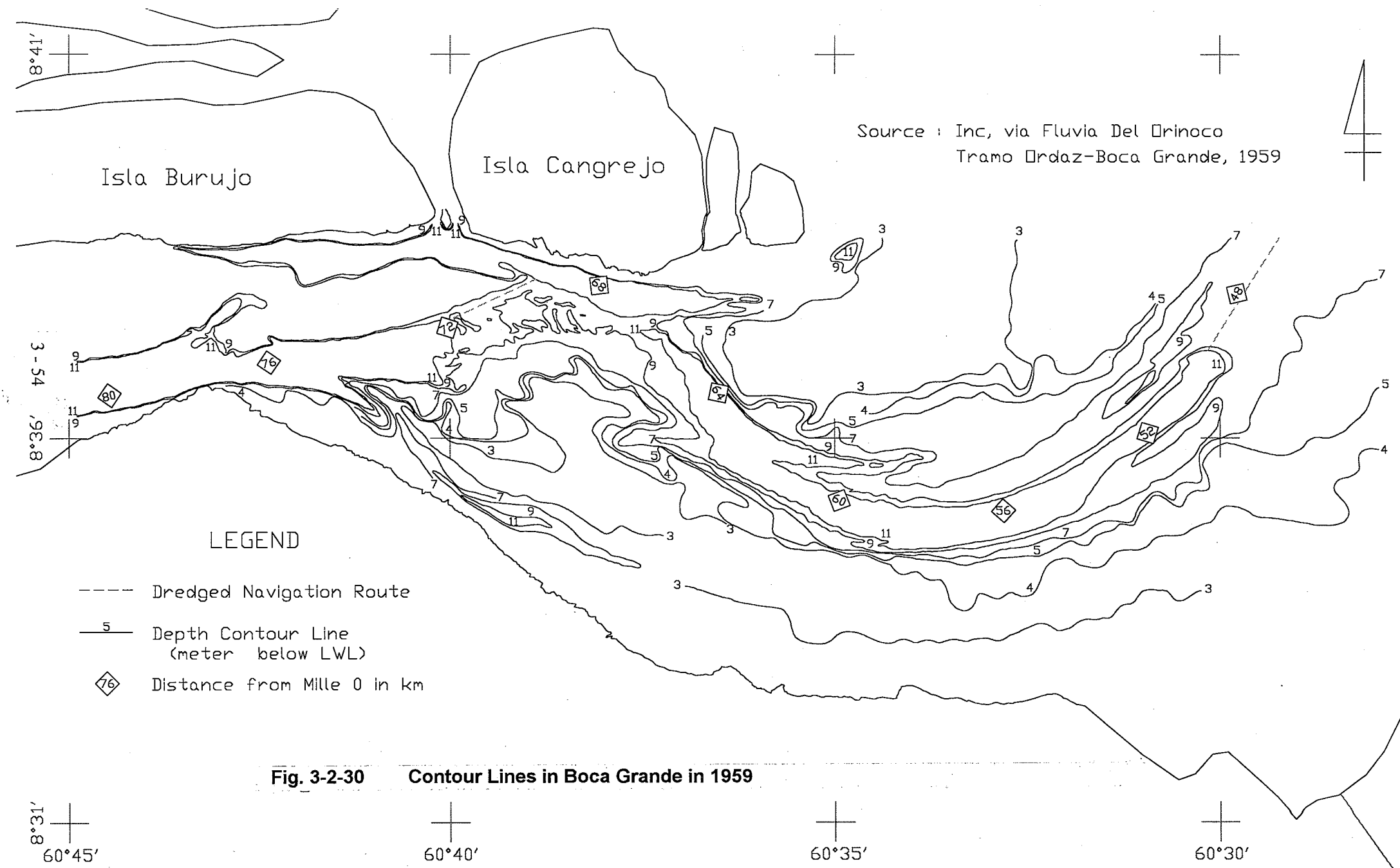
Figure 1 is a line graph showing the elevation of the left bank of the Sacramento River above LWR (m) versus distance from the left bank (m). The graph includes data for 1998 Jul., 1998 Aug., and 1998 Nov., along with the Canal Margin. The elevation ranges from -30 to 5 m, and the distance ranges from 0 to 1500 m. The 1998 Nov. data shows a significant drop in elevation around 500 m, indicating a breach or erosion.

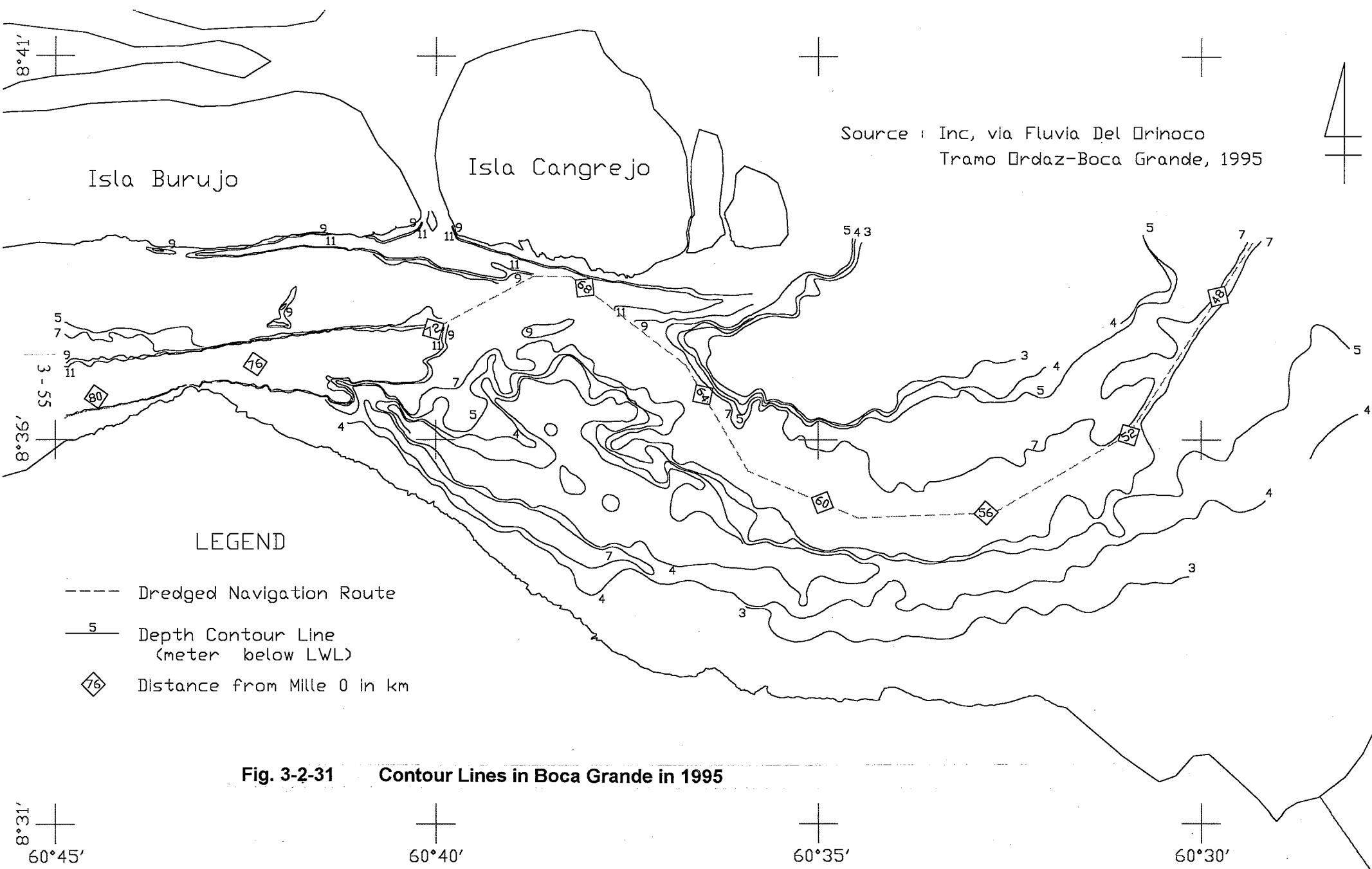
Cross Section Change of Guarguapo Section



Source: Navigation Charts of 1995, 1979 and 1959 by INC

Fig. 3-2-29 Comparison of Longitudinal Profiles of Rio Grande Channel





LEGEND

- Dredged Navigation Route
- 5 Depth Contour Line
(meter below LWL)
- ◇ Distance from Mille 0 in km

Fig. 3-2-31 Contour Lines in Boca Grande in 1995

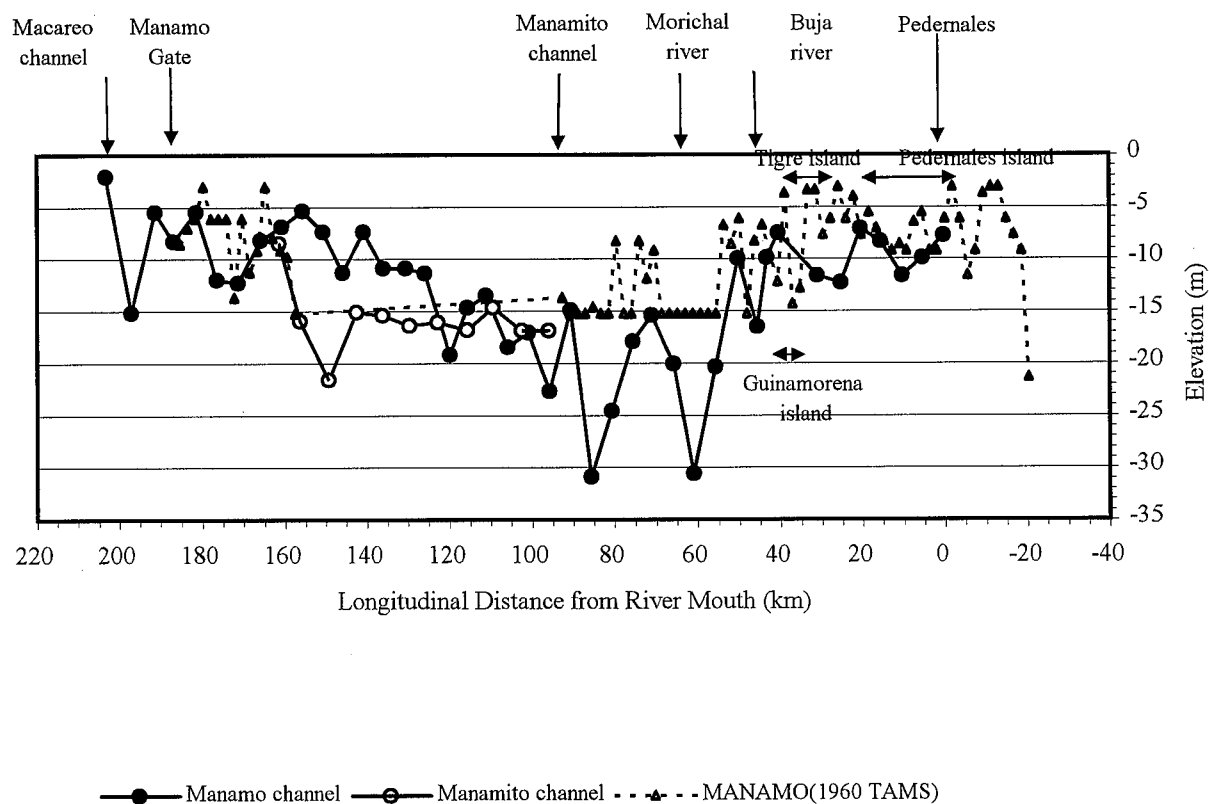
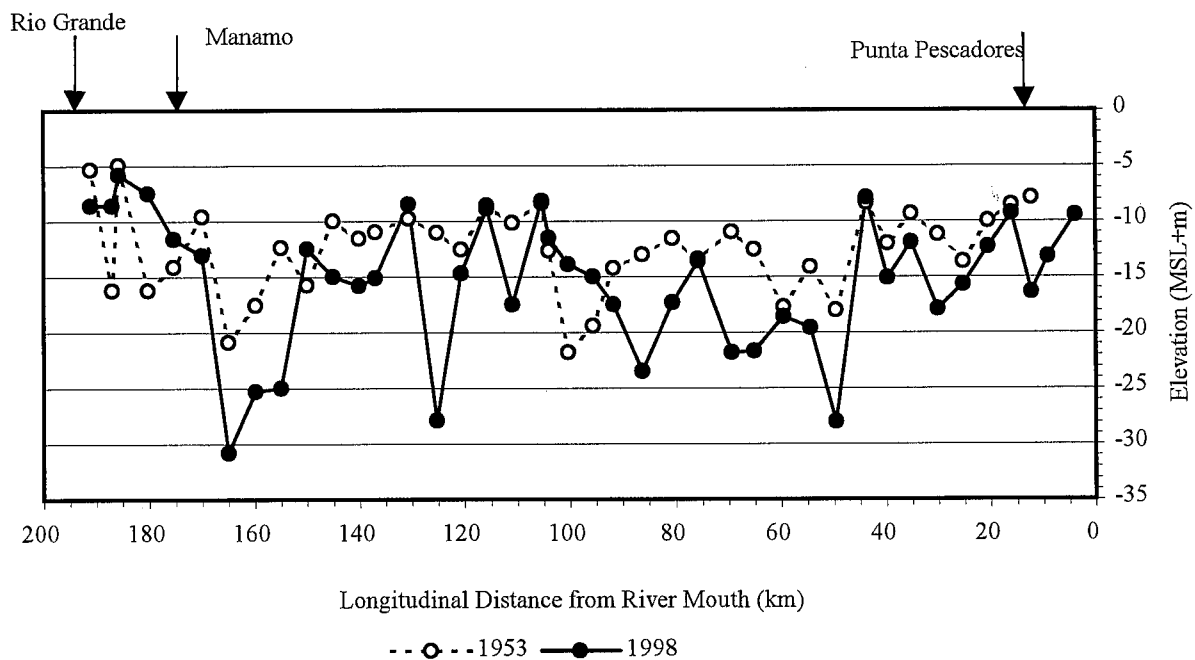
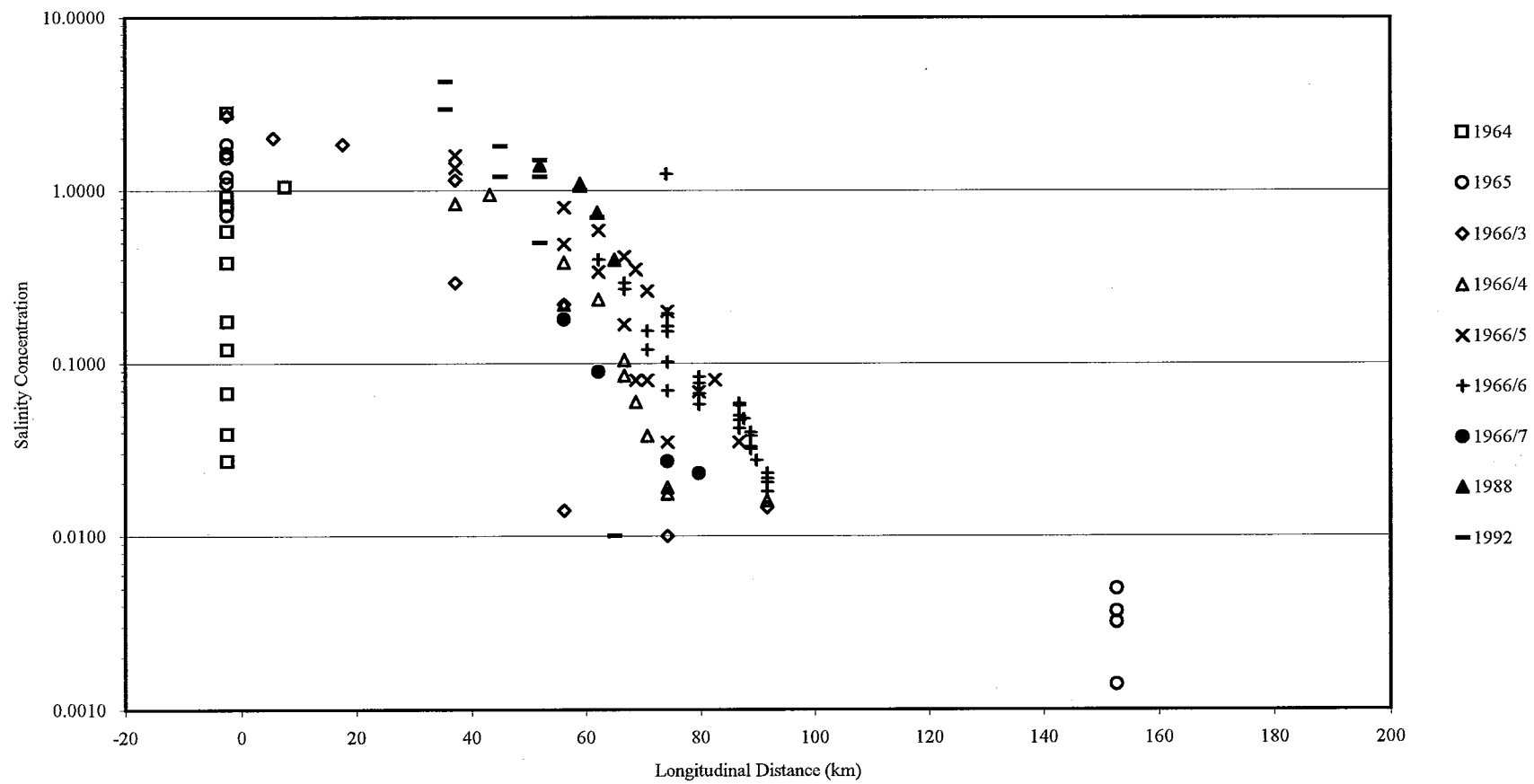


Fig. 3-2-32

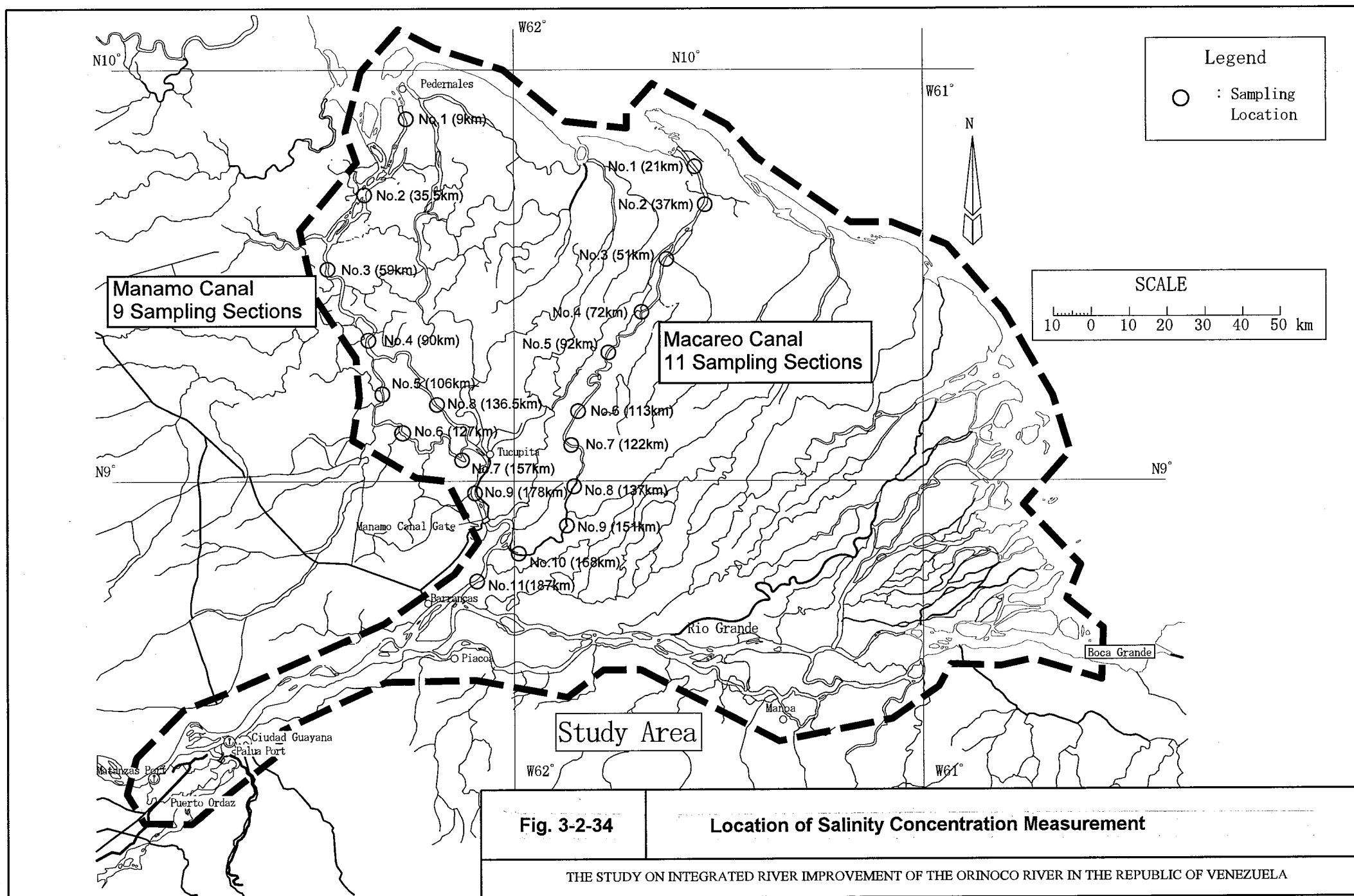
Longitudinal Profile Variations of Macareo and Manamo Channels



Source: IV-11 Average Salinity Measurements, Preliminary Report Orinoco Delta Project, CVG, July 1966

Fig. 3-2-33

Longitudinal Profile of Salinity Concentration in Manamo Channel
(1964 - 1992)



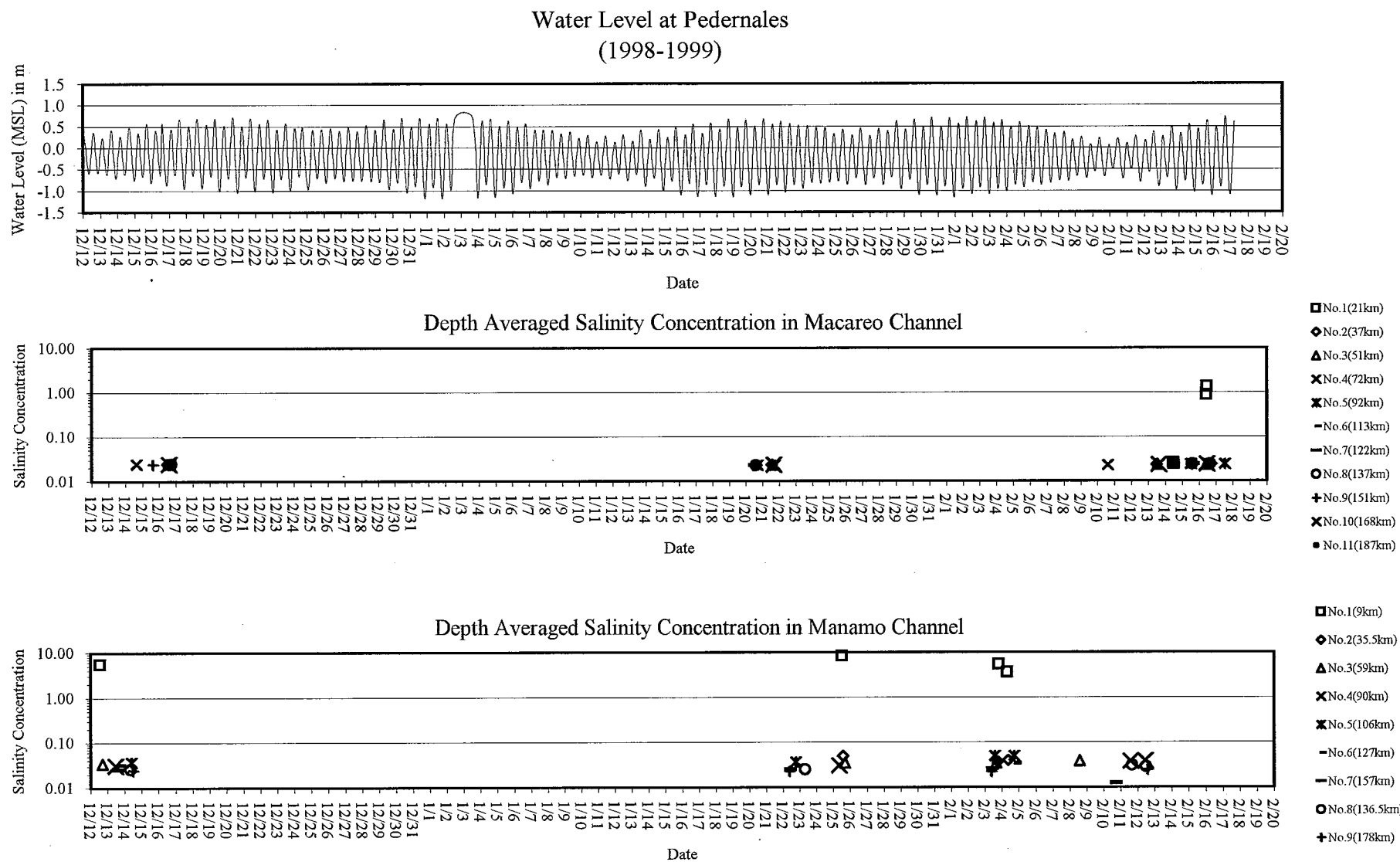
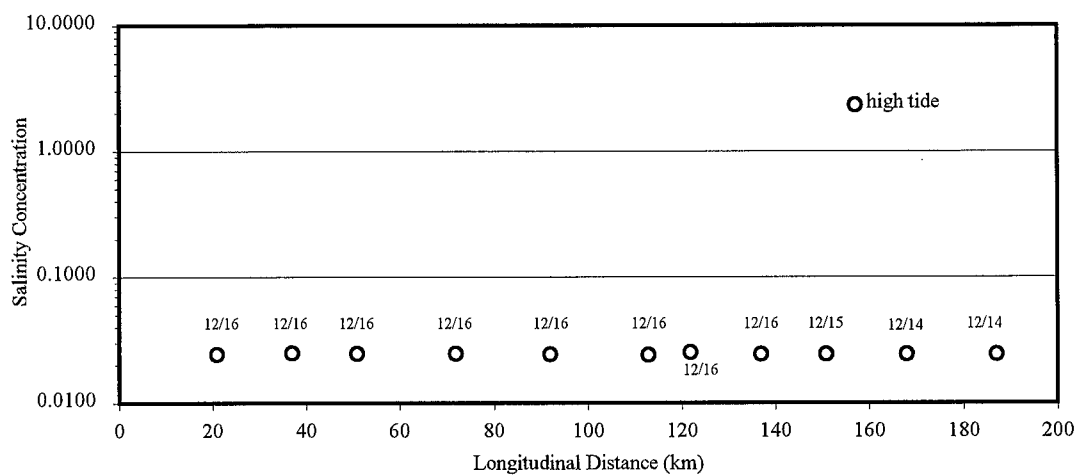


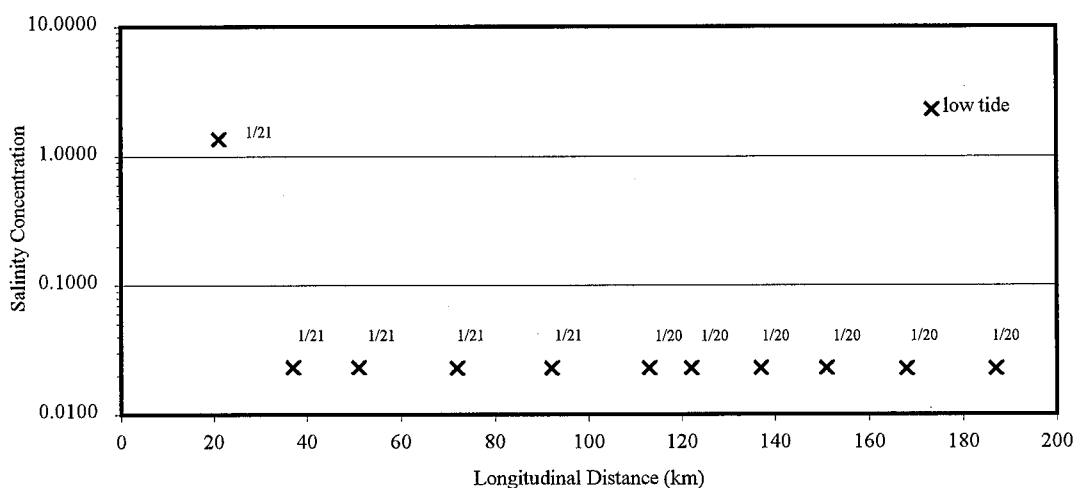
Fig. 3-2-35

**Time Series of Depth Averaged Salinity Concentration
in Macareo and Manamo Channels**

December 1998



January 1999



February 1999

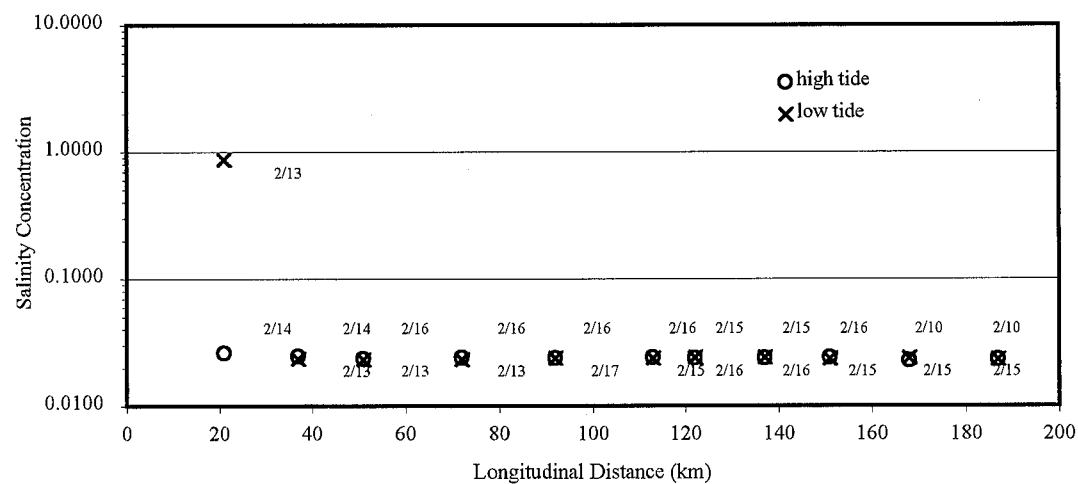
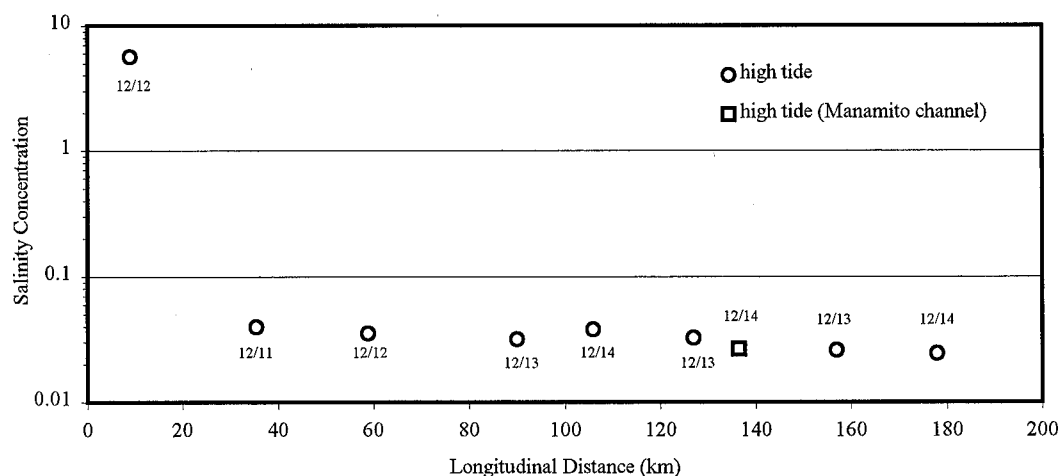


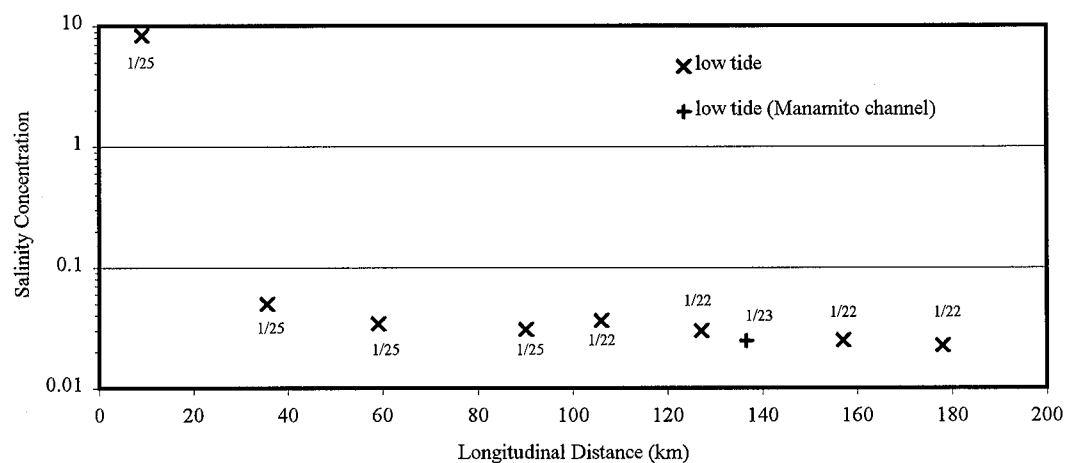
Fig. 3-2-36

Longitudinal Profile of Salinity Concentration in Macareo Channel

December 1998



January 1999



February 1999

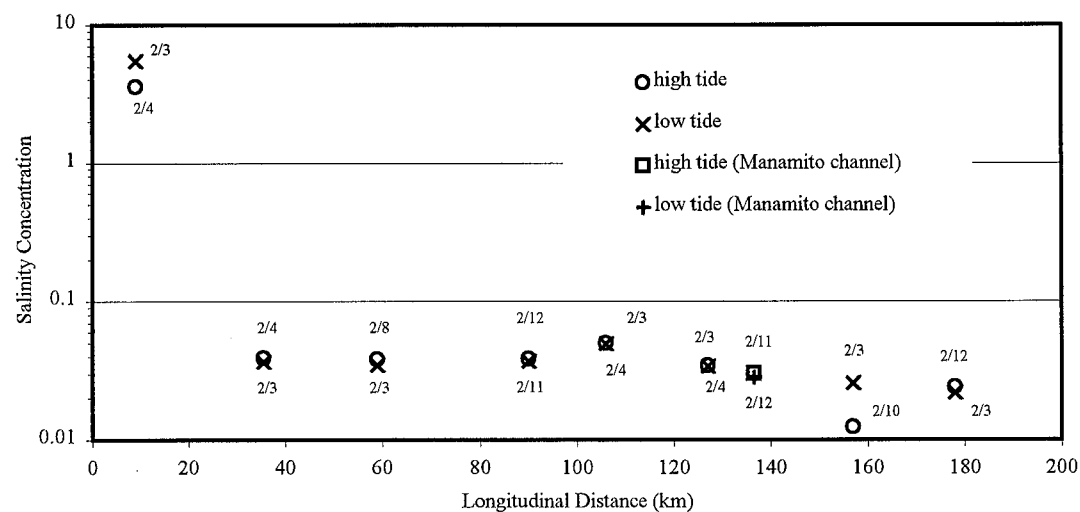
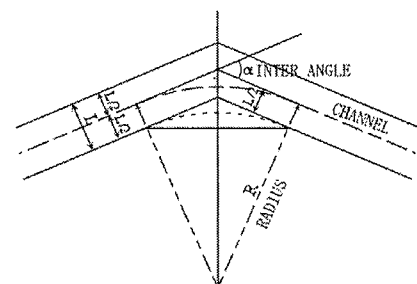
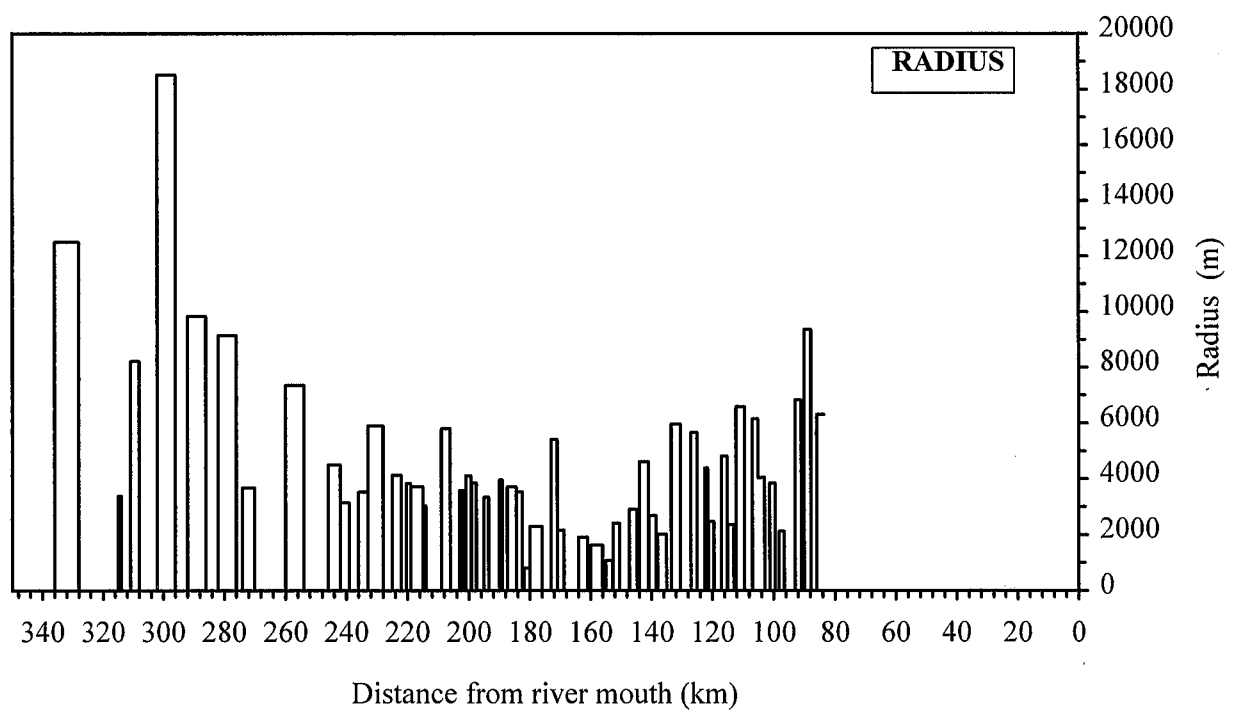
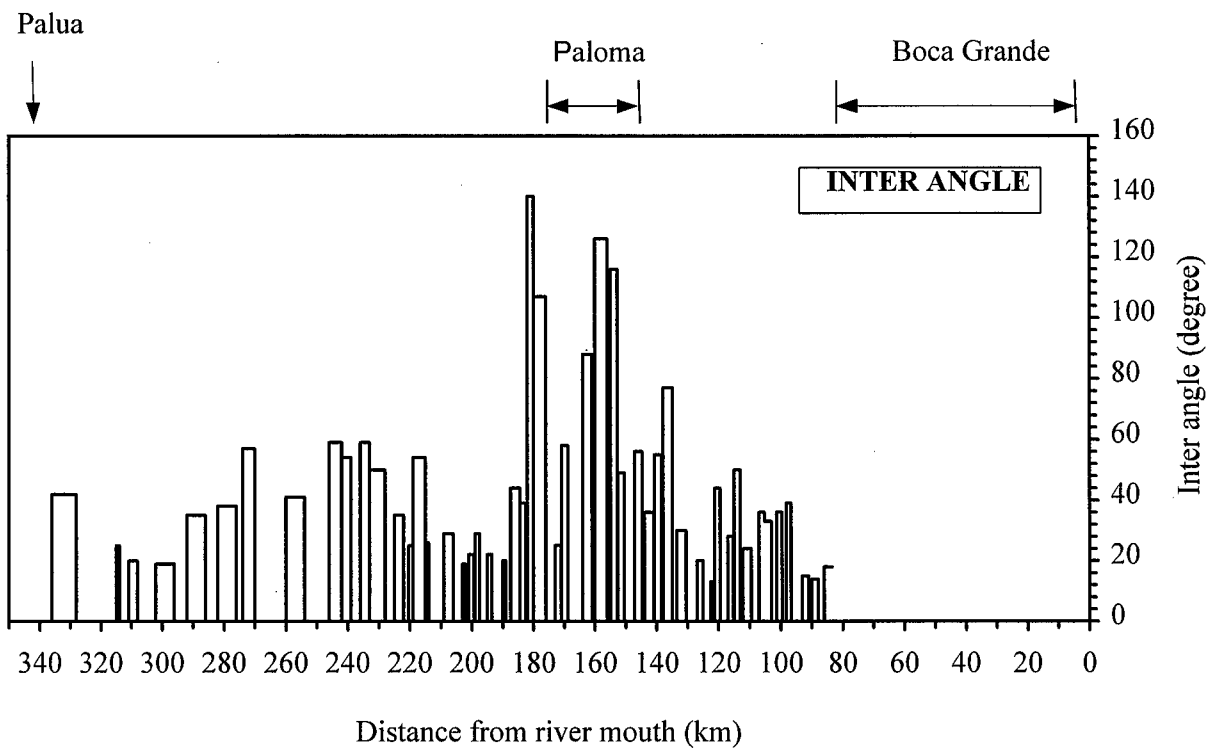


Fig. 3-2-37

Longitudinal Profile of Salinity Concentration in Manamo Channel



Definition of RADIUS and INTER ANGLE

Fig. 3-2-38

Inter Angle and Radius of Rio Grande Channel

Rio Grande Manamo Channel

River mouth

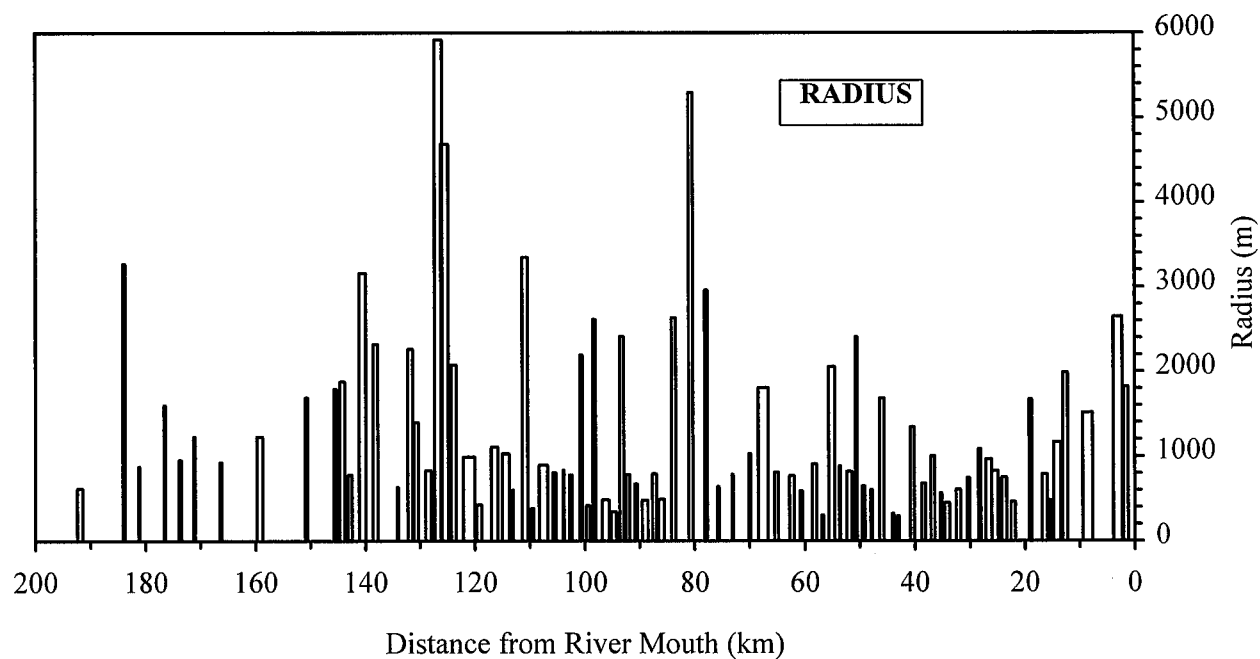
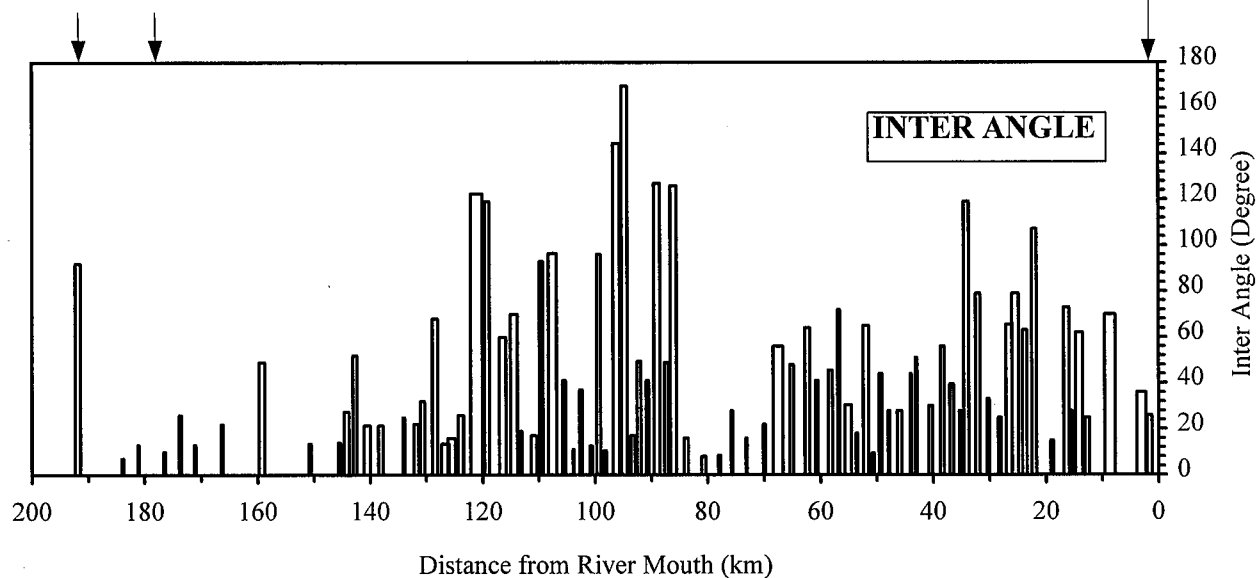


Fig. 3-2-39

Inter Angle and Radius of Macareo Channel

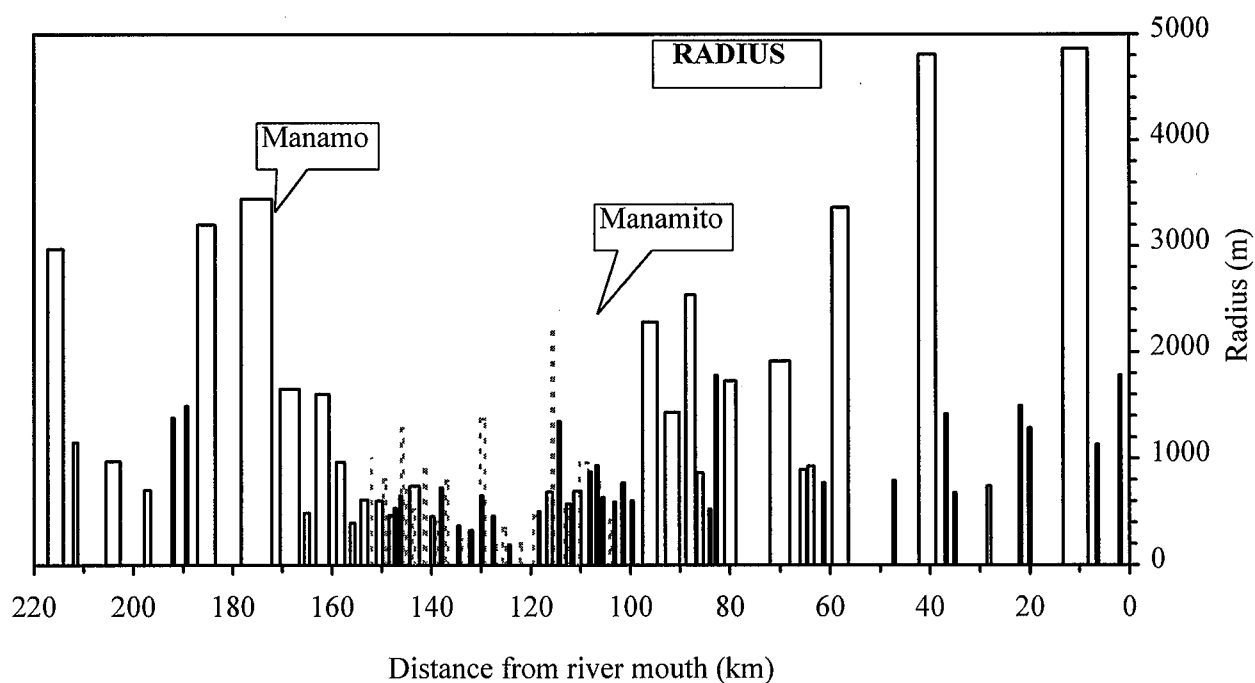
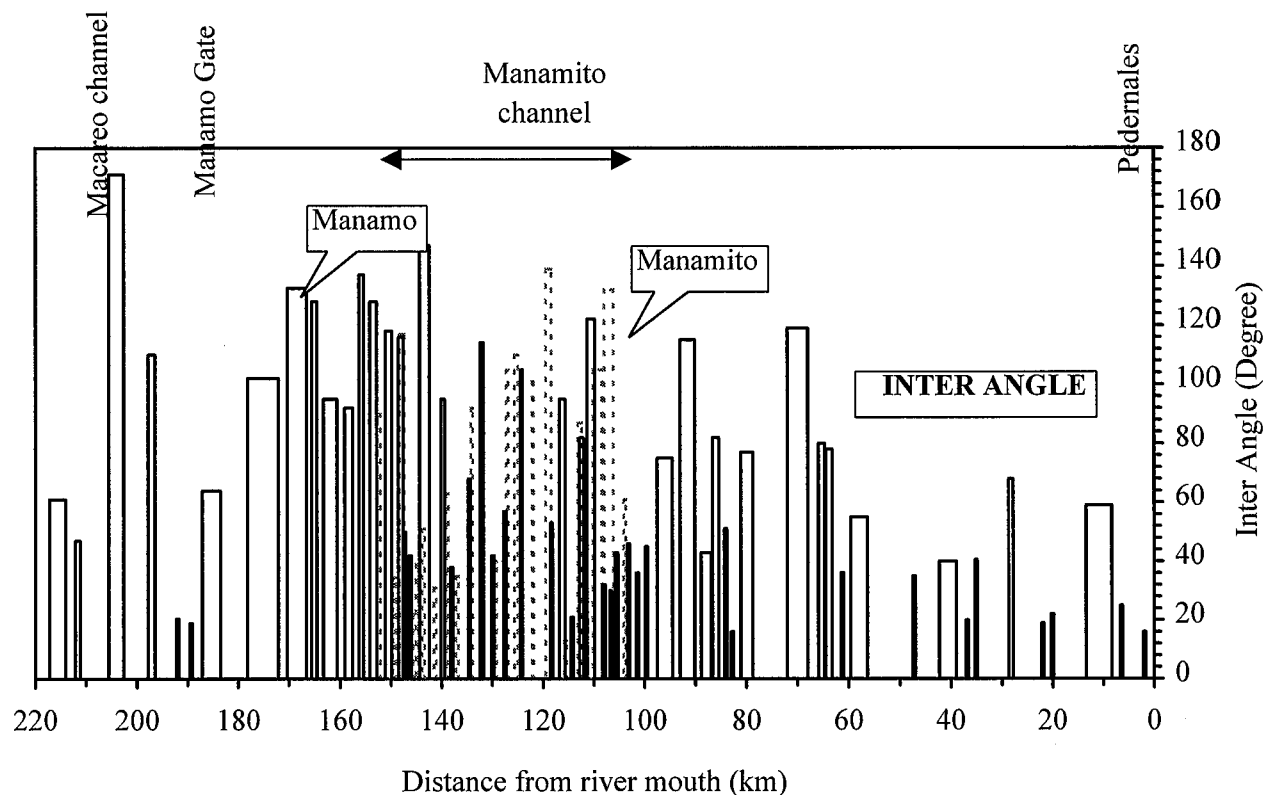


Fig.3-2-40

Inter Angle and Radius of Manamo Channel

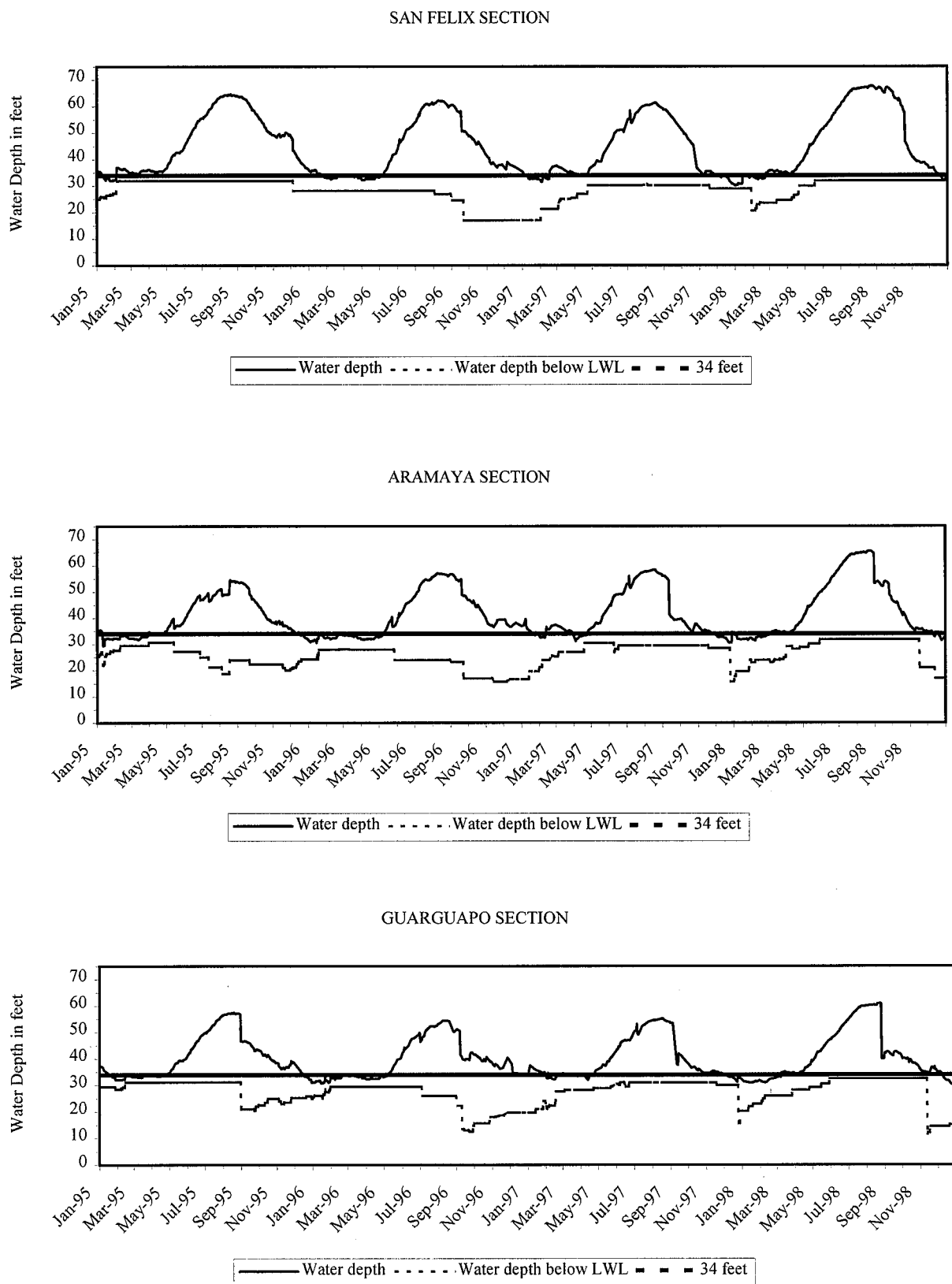


Fig. 3-2-41 Seasonal Variation in Depth Below LWL in Rio Grande Channel (1/2)

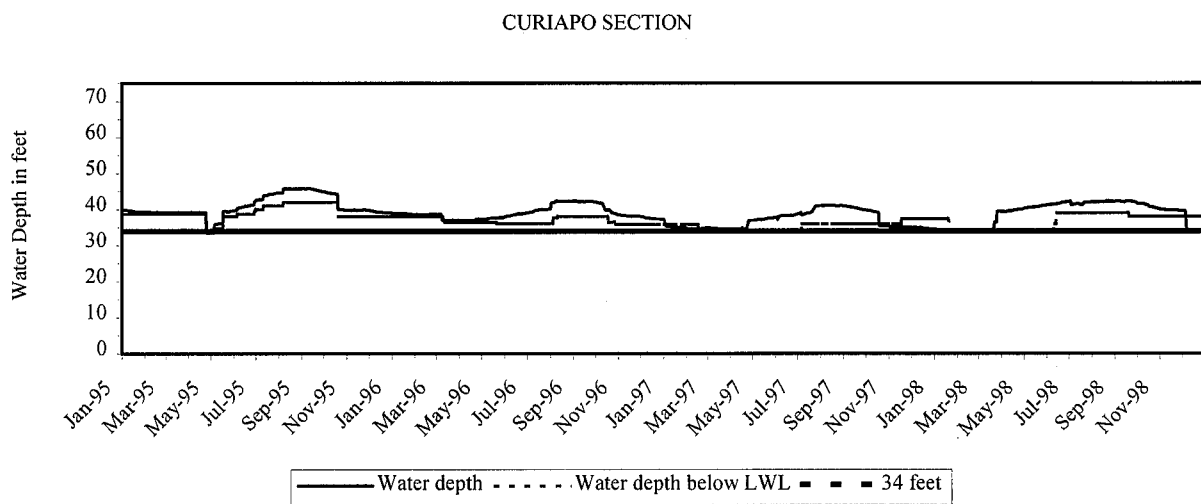
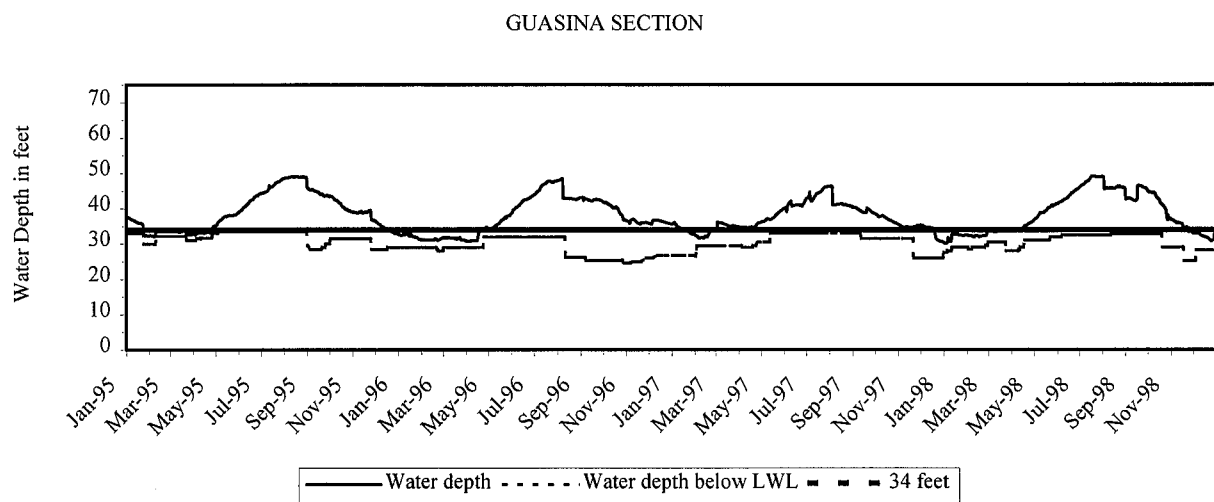


Fig. 3-2-41 Seasonal Variation in Depth Below LWL in Rio Grande Channel (2/2)

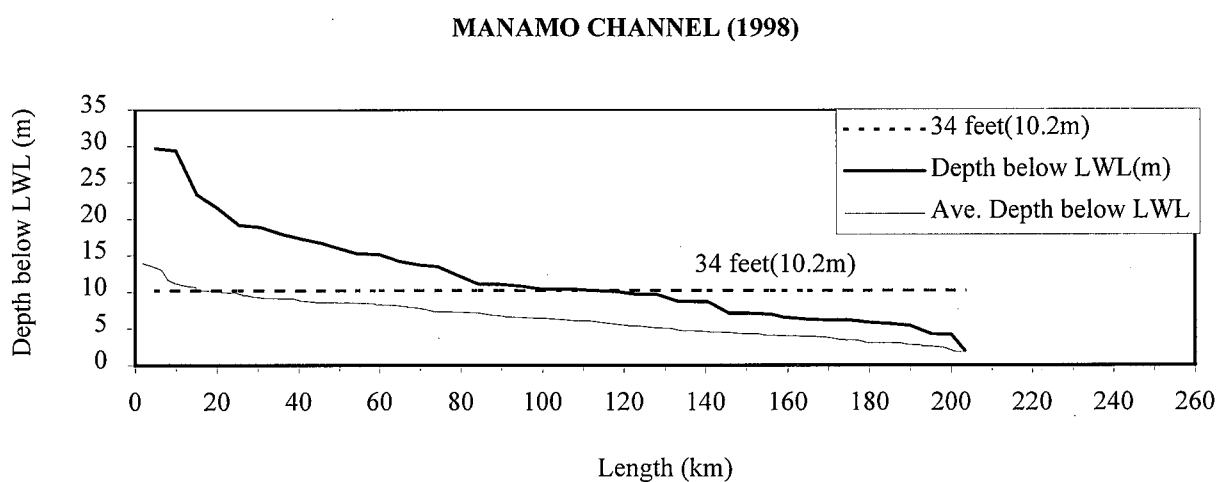
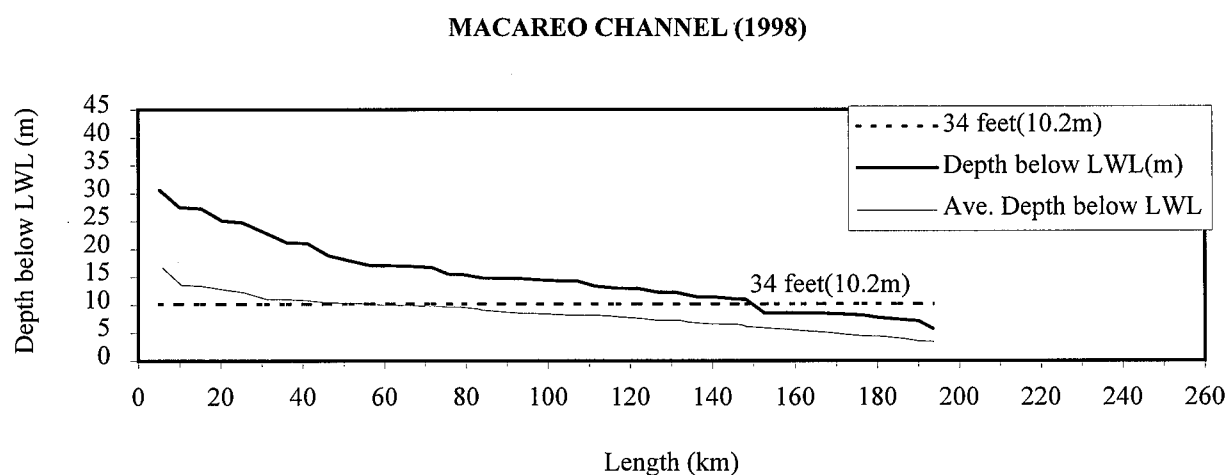
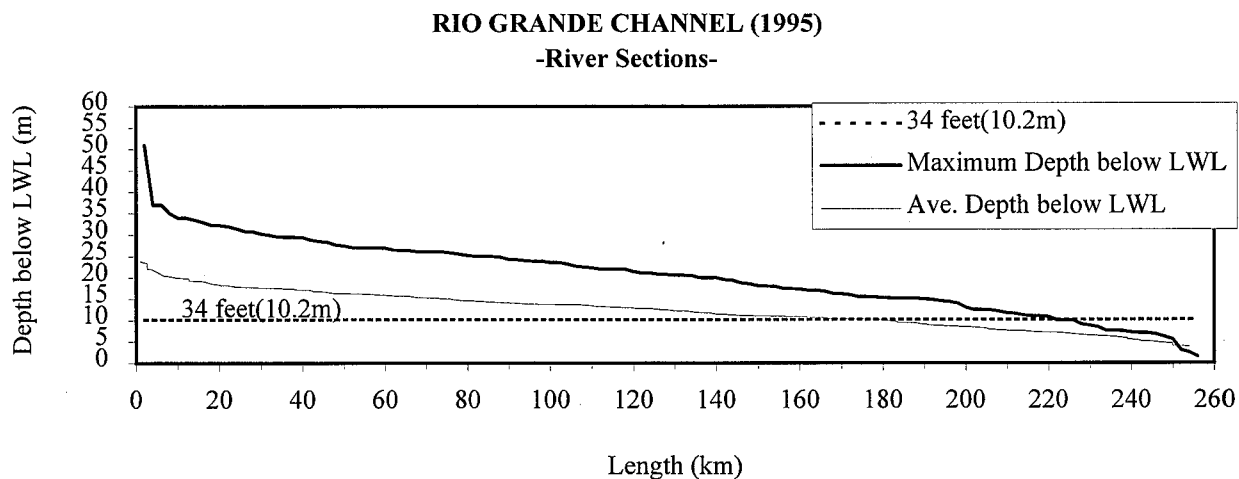
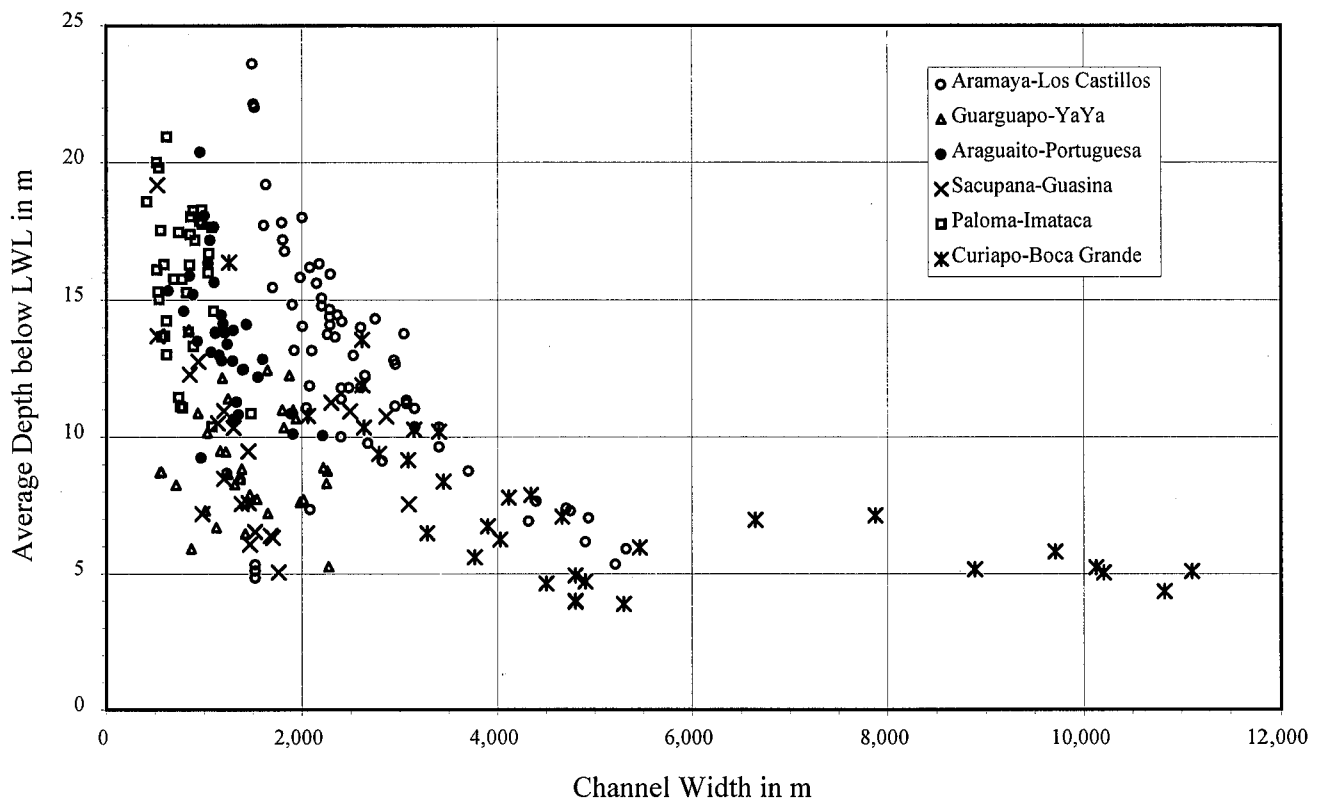


Fig. 3-2-42 Statistical Distribution of Maximum Depth Below LWL

RIO GRANDE BY SECTION



MACAREO AND MANAMO CHANNELS

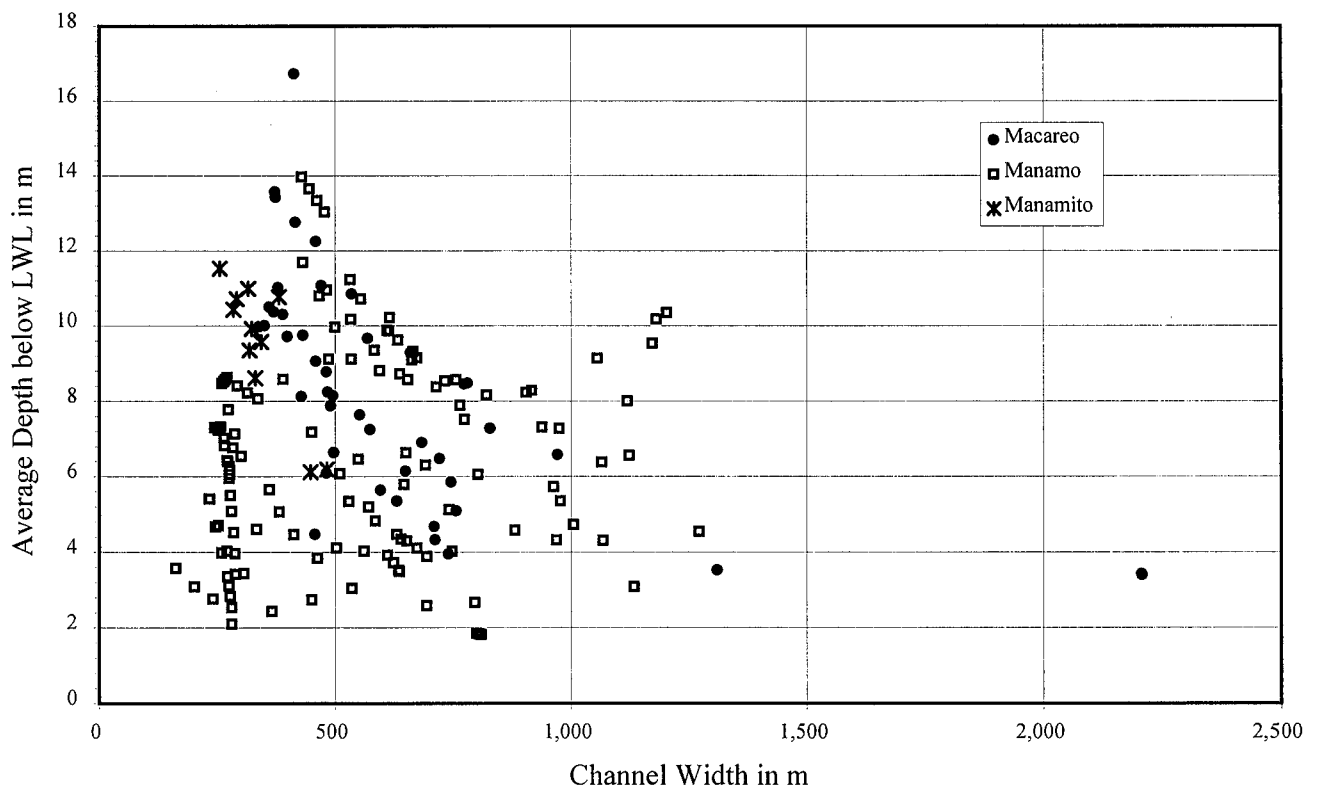


Fig. 3-2-43

Relations Between Channel Width and Average Depth Below LWL