

DEPT. OCEANOGRAPHY
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Research on Sedimentation in Estuaries

THE SEDIMENTARY ECOLOGY OF THE SWARTKOPS ESTUARY

ROSIE REPORT No 1

By: JSV Reddering
K Esterhuysen

Project leader: IC Rust



Department of Geology
University of Port Elizabeth

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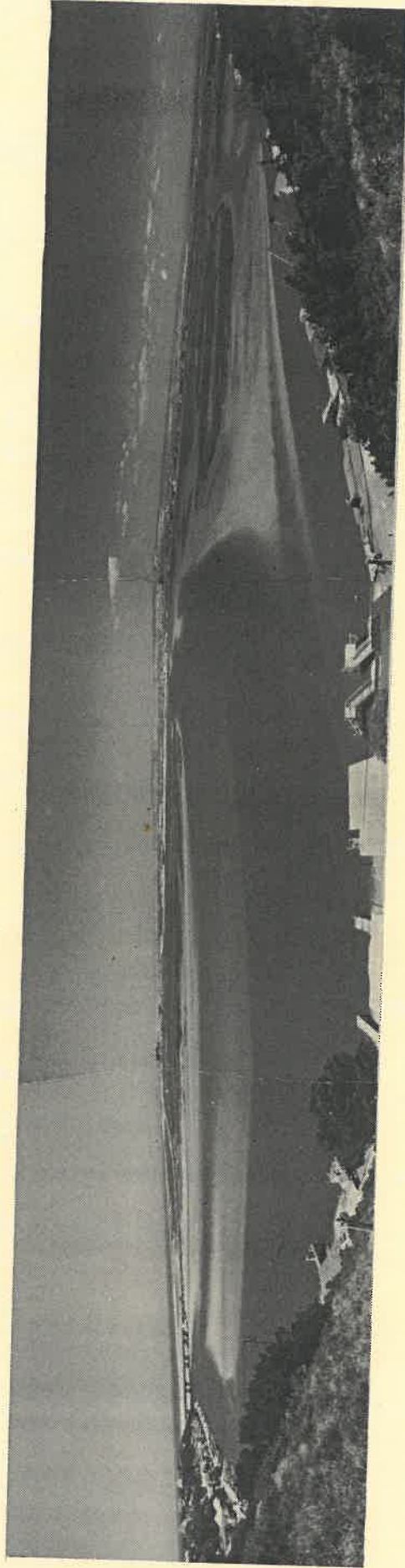


PLATE 1

A wide-angle mosaic of the Swartkops estuary photographed from Bluewater Bay. Settler's Bridge is left (east) while Tippers Creek (section 5.2) lies to the right. The Amsterdamhoek riverfront is in the foreground. The main tidal channel with the flood-tidal deltas is prominent while the extensive supra-tidal flats (section 2.2; fig 2-8) lie between the main channel and Tippers Creek. The light coloured sand bars to the right and in the distance are intertidal (section 2.2). The sediment in this area mainly originates from the sea and has been transported into the estuary by tidal action (section 3.2).

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THE SEDIMENTARY ECOLOGY OF THE SWARTKOPS ESTUARY

1. INTRODUCTION AND AIMS

The sedimentary ecology of the Swartkops estuary (figs 1-1, 1-2) was chosen for study because it lies in the Port Elizabeth metropolitan area and is under potential pressure from industrial and recreational activities. Sedimentological information on the Swartkops estuary is scanty.

Aims of this study are:

- 1.1 To establish baseline information regarding the distribution and origin of the sediment in the estuary. This is because concern has been expressed in the past that the estuaries of the Cape are being filled in with ecologically excessive volumes of sediment.
- 1.2 To determine from the available information whether long term sediment accumulation has already taken place in the Swartkops estuary.

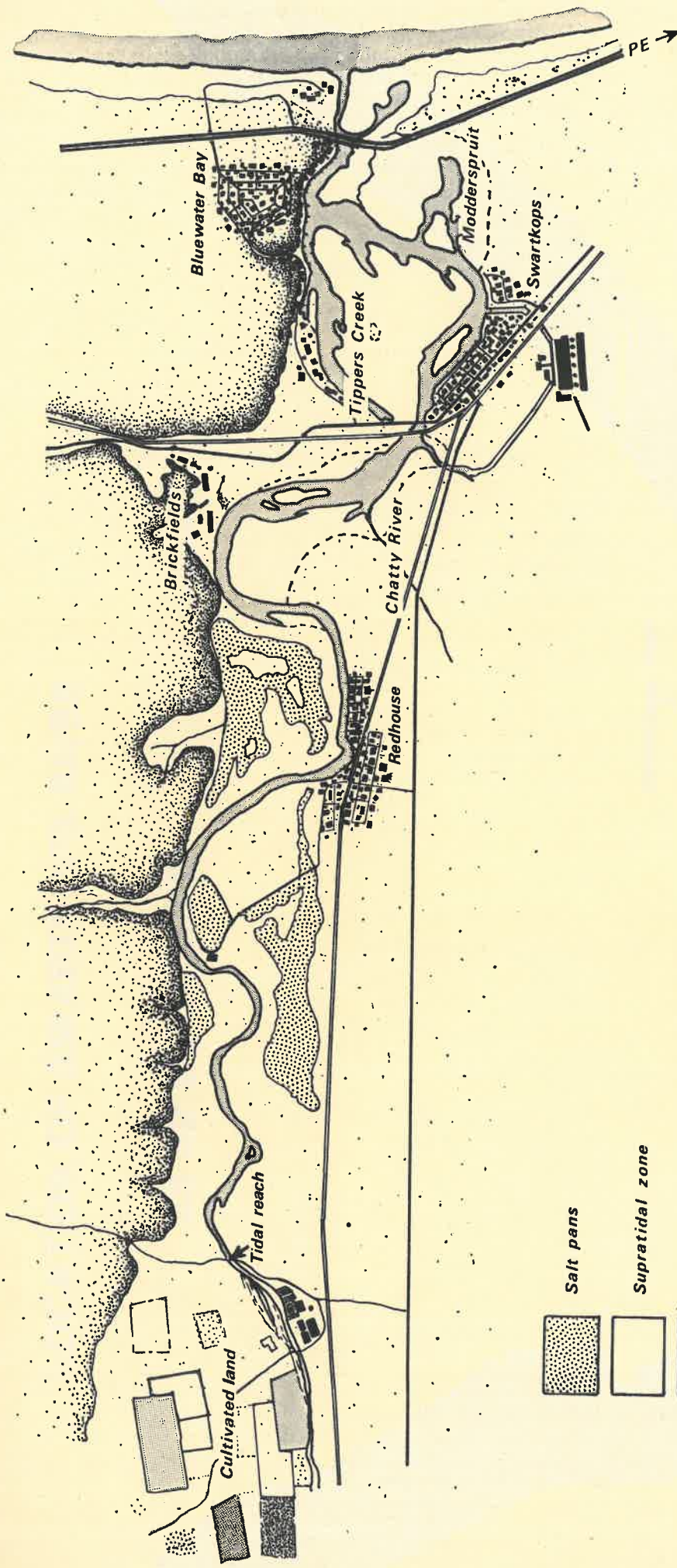
The term "siltation" is not loosely used here because it refers to a specific sedimentary process which is unimportant in the SE Cape estuaries. Siltation is the sedimentation of fine-grained material from suspension. The term "sedimentation" is preferred because it is more general and includes the deposition of sand which is volumetrically more important in most estuaries along the Cape coast. "Sedimentation" embraces the term "siltation".







2. BACKGROUND INFORMATION

2.1 Catchment area (fig 2-1)

The Swartkops and Elands Rivers originate on the slopes of the Groot Winterhoek Mountains to the west and south-west of Uitenhage at an altitude of about 1200m. From the foothills of the mountains the river follows a meandering seaward course for about 155km before discharging into the estuary.

TN



-  Salt pans
-  Supratidal zone
-  Sub- and Intertidal zone
-  Major Roads
-  Railway lines
-  Built-up areas



Swartkops Estuary

fig 1-1

LOCATION OF SWARTKOPS RIVER

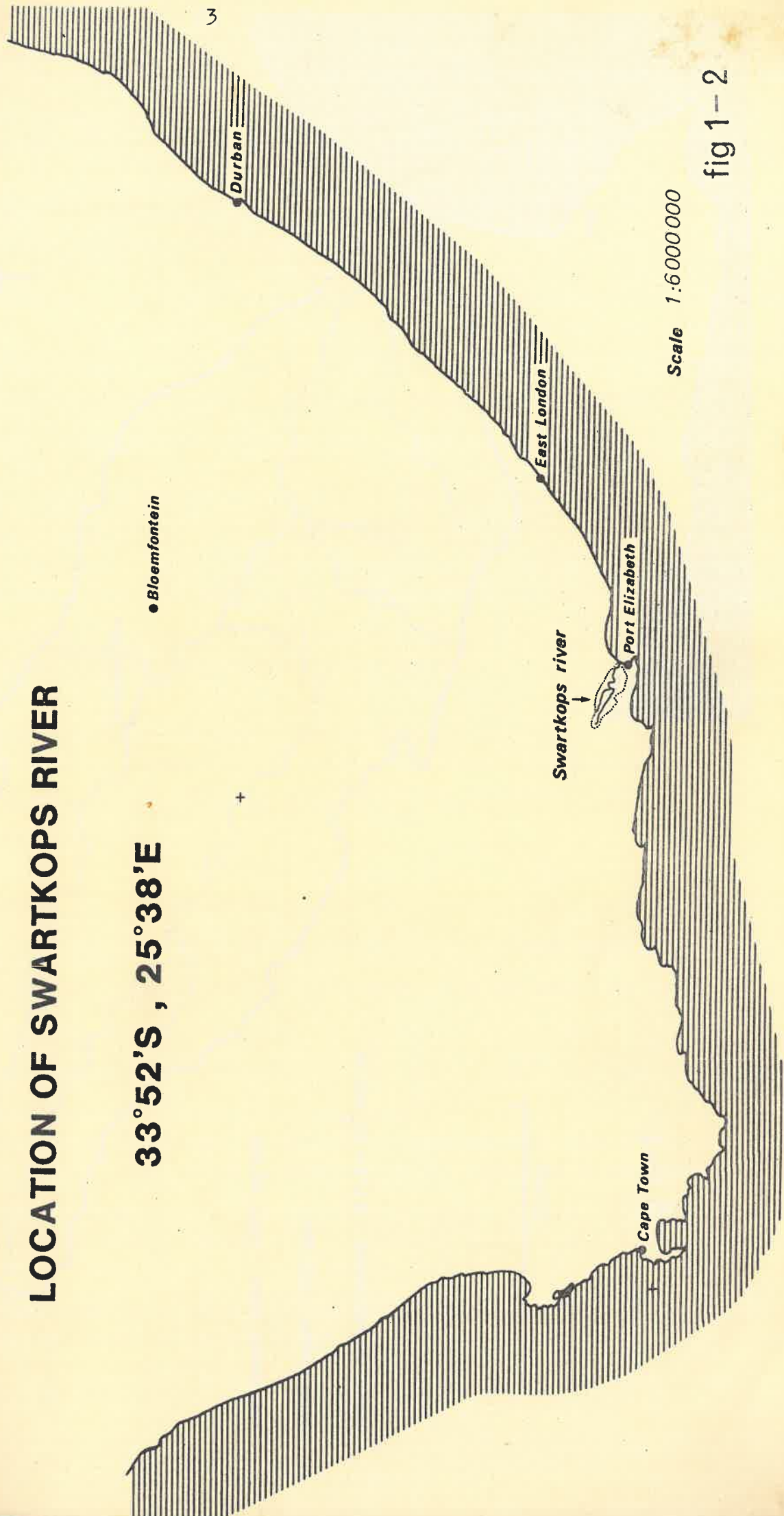
33°52'S , 25°38'E



● Johannesburg

● Bloemfontein

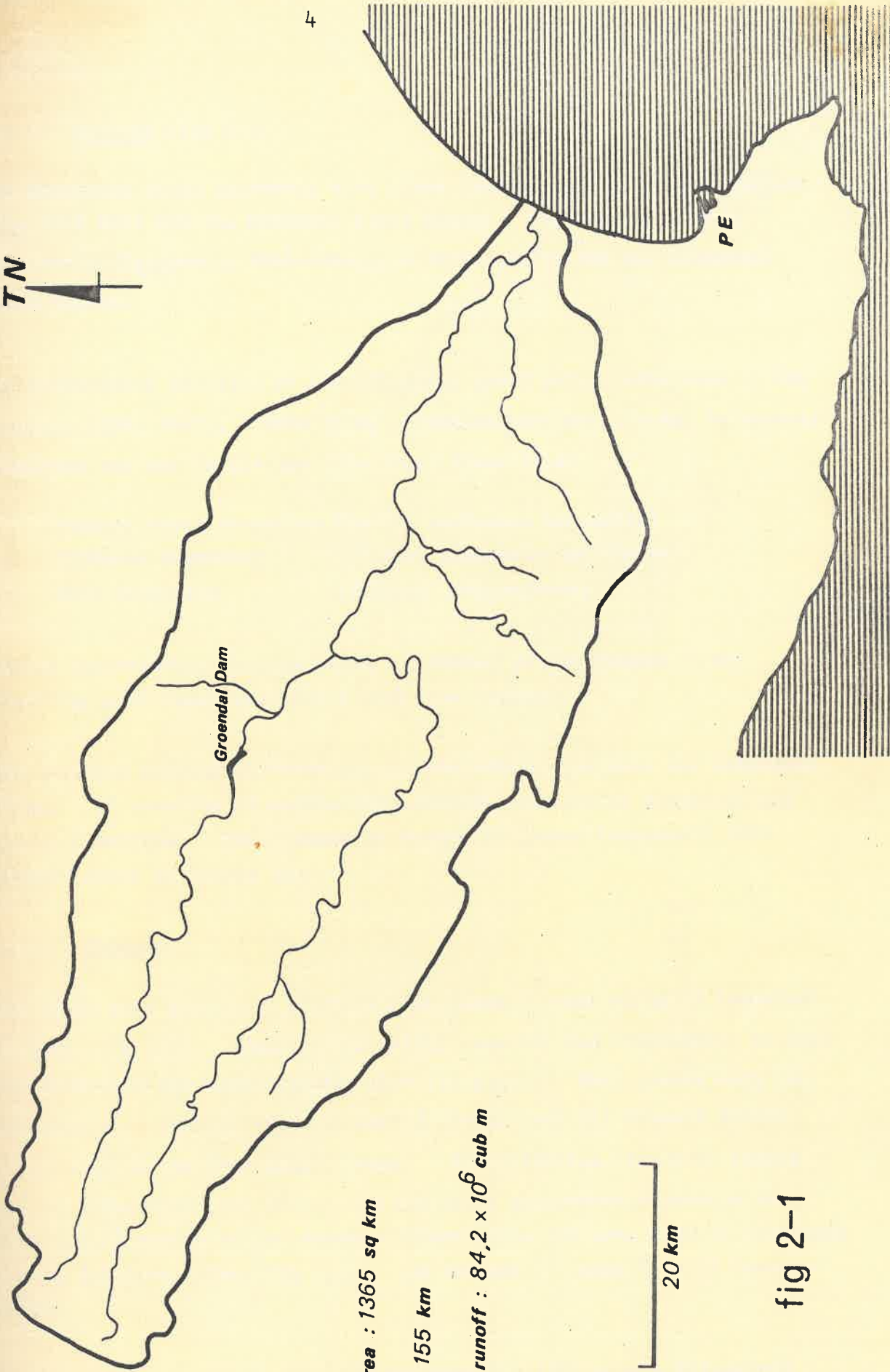
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Scale 1:6000000

fig 1--2

SWARTKOPS RIVER CATCHMENT AREA



Catchment area : 1365 sq km

River length : 155 km

Mean annual runoff : $84,2 \times 10^6$ cub m

20 km

fig 2-1

2.1.1 Geology (fig 2-2)

The Swartkops river catchment area flows through an area of the eastern Cape Fold Belt and the Mesozoic Algoa Basin. The Cape Fold Belt consists of Palaeozoic Table Mountain Group quartzites and Bokkeveld group slates.

The sedimentary deposits of the Uitenhage group were accumulated in the Mesozoic Algoa Basin. This group unconformably overlies the Palaeozoic substrate and can be divided into three formations;

3. Sundays River Formation (marine sandstone and shale)
2. Kirkwood Formation (fluvial sandstone and shale)
1. Enon Formation (fluvial conglomerate)

Marine invertebrate fossils which are common in the Sundays River Formation give these deposits a high lime content.

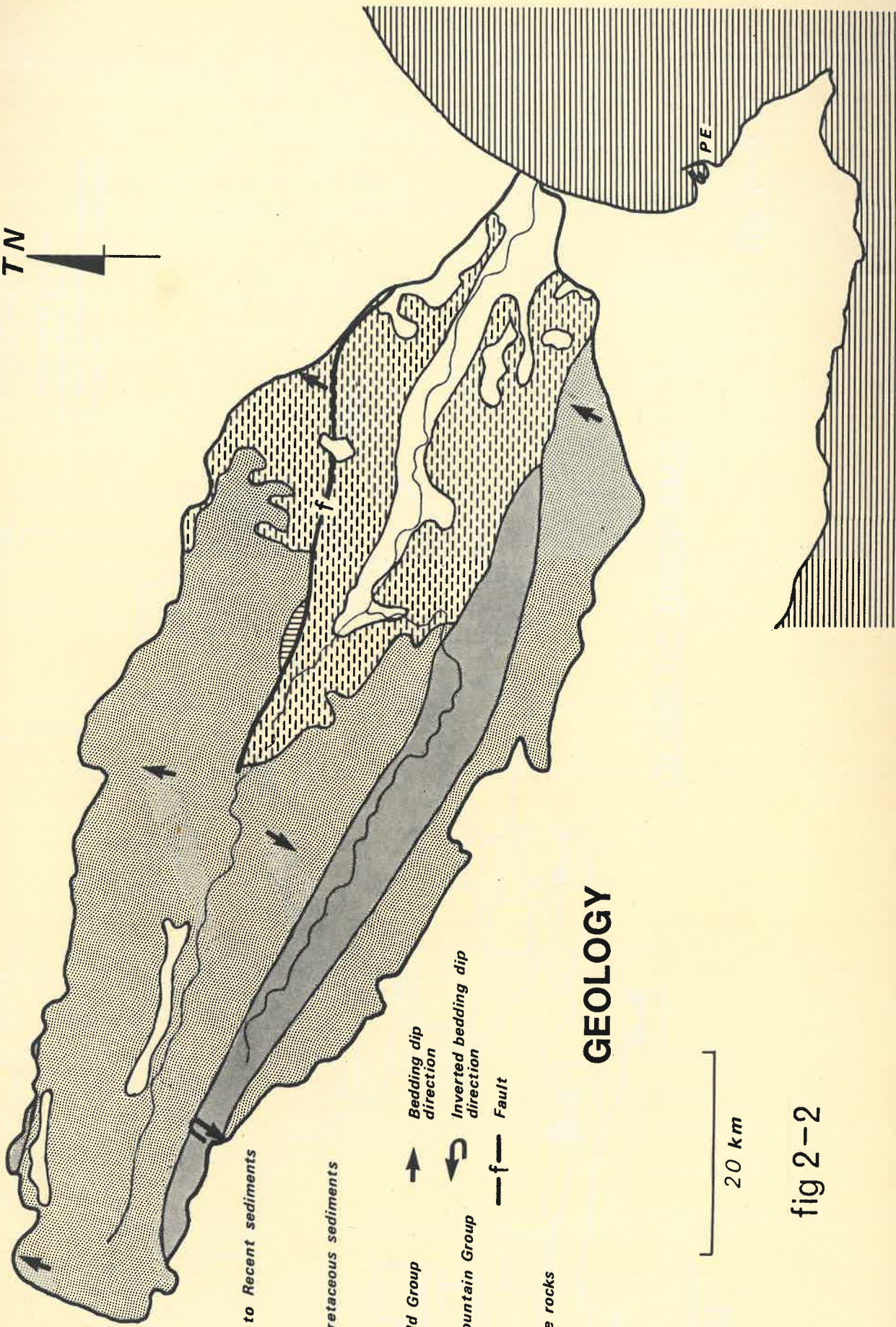
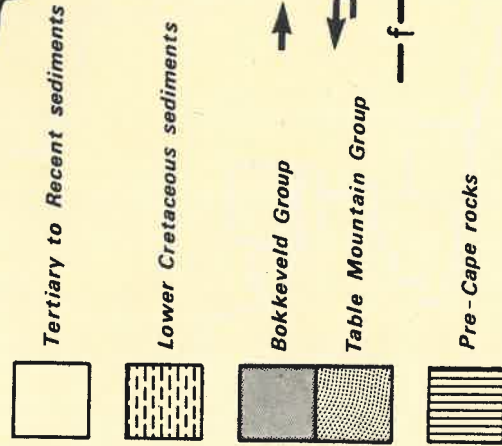
The Tertiary Alexandria Formation disconformably overlies the Uitenhage Group. It consists of marine conglomerate, calcareous sandstone and shelly limestone. The Alexandria Formation grades temporally into coastal dunes of recent age.

2.1.2 Climate

The study area lies in a southern Cape climatic zone which is temperate to warm (fig 2-3). Rainfall is mainly cyclonic and orographic, so that thunderstorms are comparatively rare (10 p.a.). Hail occurs very infrequently. Precipitation is spread evenly over all seasons though autumn and spring show slight peaks. Precipitation (fig 2-4) varies due to topography (fig 2-7). On the Groot Winterhoek Mountains the mean annual precipitation exceeds 1000mm while the area east of Uitenhage barely receives 500mm (fig 2-4). On average it rains 6 to 11 days per month.

The catchment covers an area of approximately 1360 square kilometres and with a mean annual precipitation of 636mm. The mean annual run-off

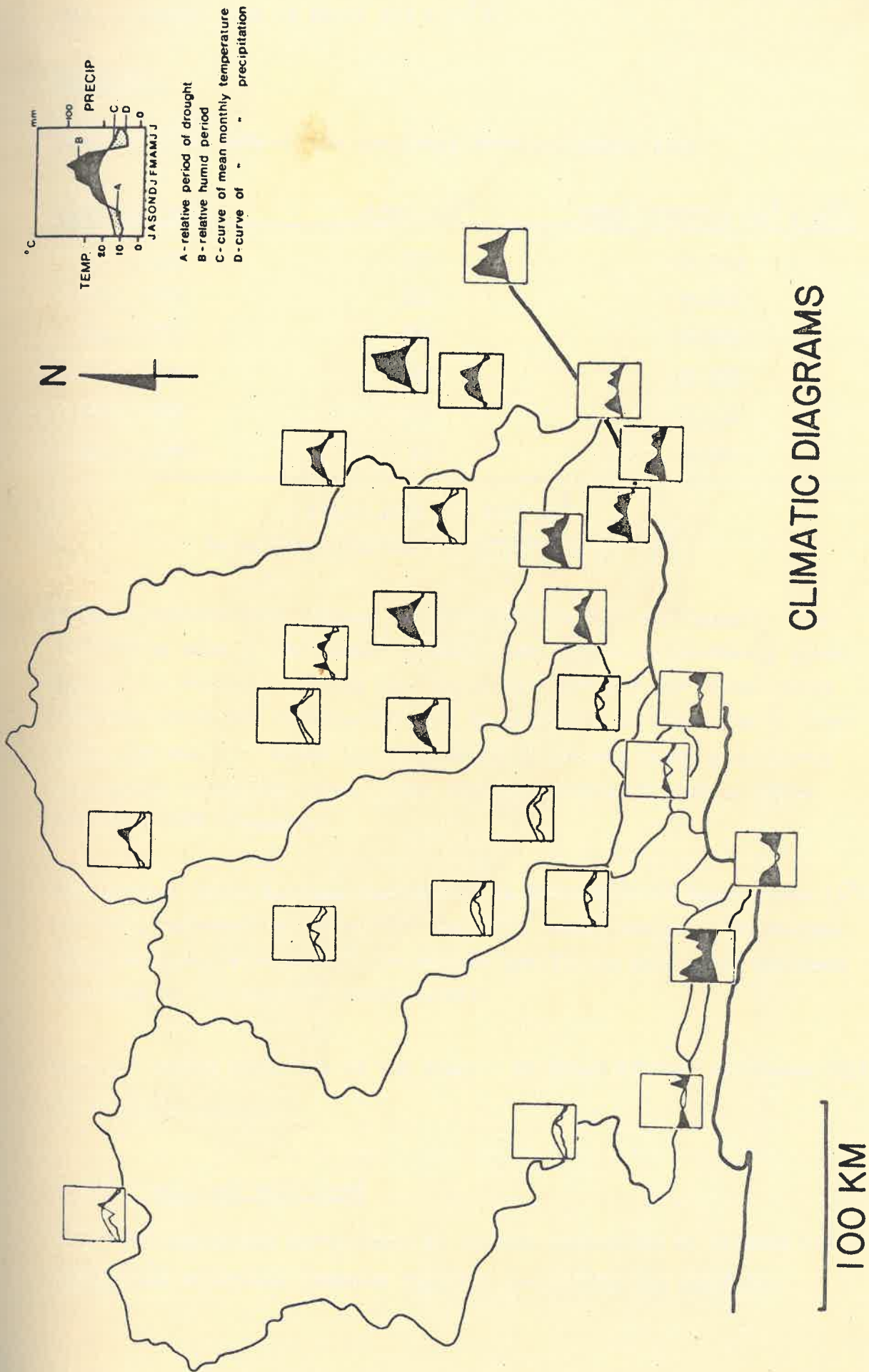
SWARTKOPS RIVER CATCHMENT AREA



GEOLOGY

20 km

fig 2--2



CLIMATIC DIAGRAMS

fig 2-3

is $84,2 \times 10^6$ cubic metres. The mean annual precipitation volume of the catchment area is about $277 \times 10^6 \text{ m}^3$.

TABLE 2.1

Precipitation data of the Swartkops River catchment area

ISOHYETS (mm)	AREA (km ²)	PRECIPITATION (m ³ x 10 ⁶)
400 - 500	249	24,929
500 - 600	300	45,021
600 - 700	385	80,826
700 - 800	347	97,288
800 - 900	59	21,102
900 - 1000	17	7,627

Total area : 1357 km²

Total precipitation : $276,793 \times 10^6 \text{ m}^3$

Frost is practically unknown but may occur in July and August. The prevailing wind in the summer is southeast, while southwesterly winds prevail in winter. During the late winter hot and dry "berg" winds from the north are experienced with an occurrence of about one to three blows per month. Winds are frequently strong and reach gale force, especially along the coast. The overall prevailing wind is southwesterly (18% frequency).

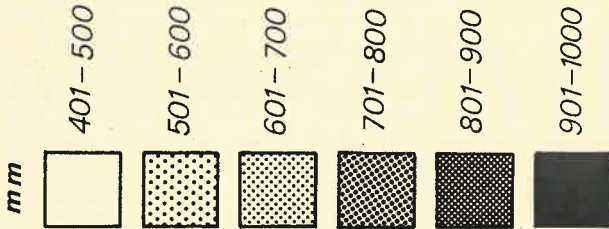
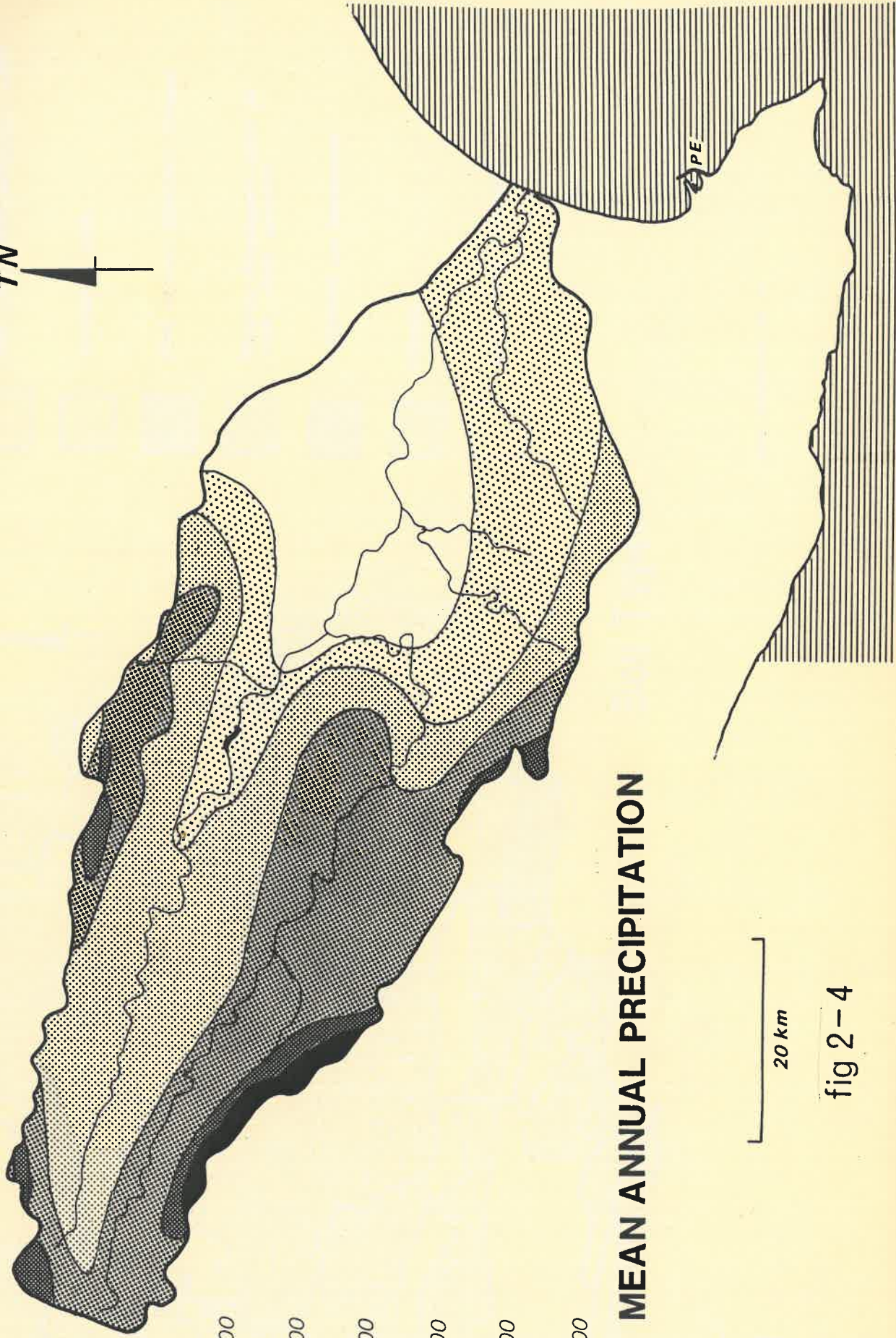
The average daily maximum temperature is about 26°C in January and 19°C in July, extremes may reach 42°C and 32°C respectively. The average daily minimum is about 15°C in January and 7°C in July while extremes can drop to 4°C and -3°C respectively.

The sun shines about 60% of the time. By South African standards this is a cloudy region.

2.1.3 Soil and veld types

Soil and vegetation development is clearly influenced by climate and the geological substrate (compare figs 2-5 and 2-6 to 2-2 and 2-3).

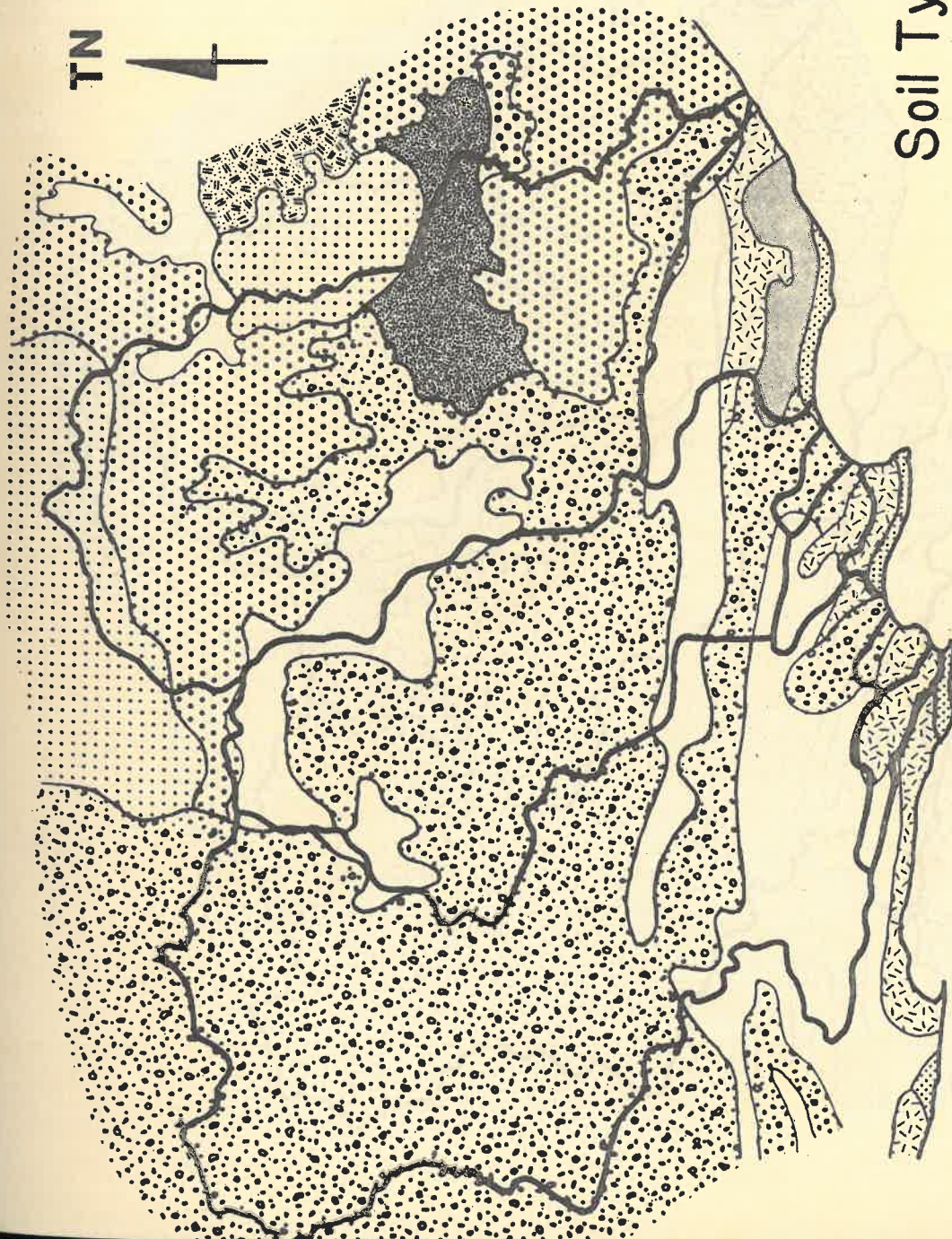
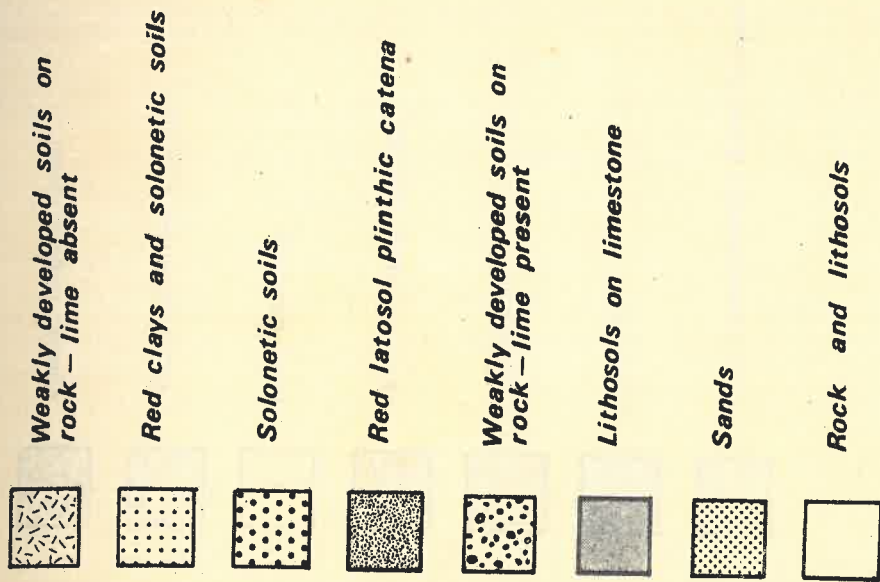
SWARTKOPS RIVER CATCHMENT AREA



MEAN ANNUAL PRECIPITATION

20 km

fig 2 - 4

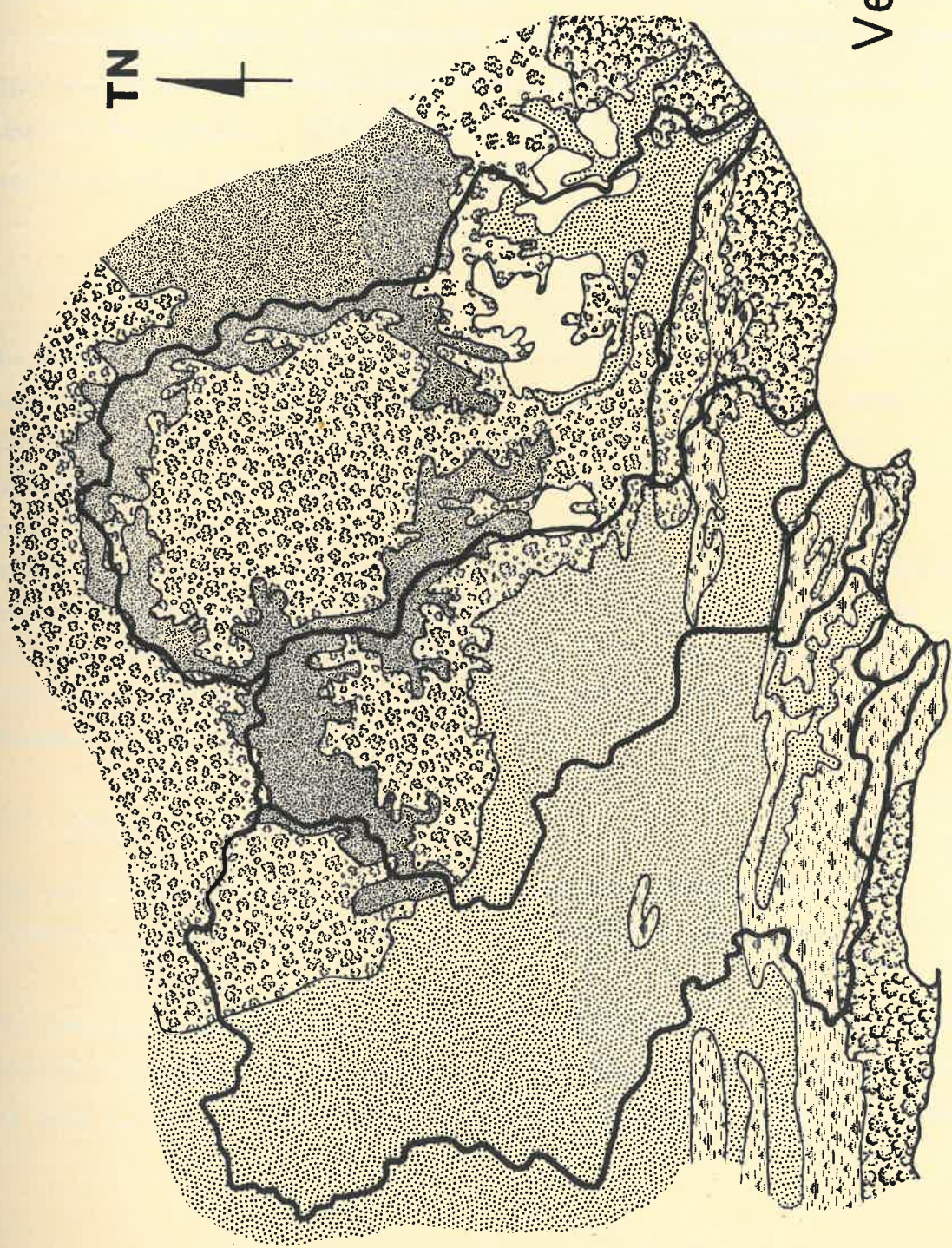


Soil Types

fig 2-5

After Macvivar et al

- Coastal Tropical Forest
- Temperate Forest & Scrub
- False Bushveld
- Karoo & Karroid Bushveld
- False Karoo
- Grassveld
- False Scherophyllous Bush (Fynbos)



Veld Types

fig 2-6

100 km

After Acocks

Quartzites of the Table Mountain Group in the western and northern parts of the drainage region weather to sandy soil with a loose texture which is readily leached by meteoric water. This soil is consequently acid and lacks macro-plant nutrients such as potassium, nitrates and phosphates (MacVicar, 1971). Scerophyllous plants (fynbos) which favour such conditions, occur in the areas where quartzite of the Table Mountain Group is found (figs 2-6 and 2-2) Acocks, 1975).

Soils in the drier eastern area of the catchment basin are mostly derived from poorly consolidated shale and sandstone, belonging either to the Uitenhage Group or Alexandria Formation. The presence of lime, finer source material and a lower precipitation, favour the growth of numerous succulents. These represent Karoo and Karroid Bushveld vegetation types (Acocks, 1975).

2.1.4 Geomorphology

The source of the Swartkops River is in the northern and western mountainous areas of its drainage basin (fig 2-7). In these areas the river course follows structural weaknesses and shale-filled synclines. The main flow along the trellis drainage pattern is eastward. After flowing out of the high mountainous areas the river meanders across a broad floodplain eroded into the poorly consolidated rocks of the Uitenhage Group (fig 2-2). This floodplain varies in altitude from about 150m above MSL west of Uitenhage to MSL at the tidal head 16km from the sea. The tidal head is at a 0,5m high causeway across the river.

2.2 Estuary

The estuary is underlain by older Holocene estuarine deposits, the Uitenhage Group and the Alexandria Formation (section 2.1.1).

The estuary meanders along its whole length (fig 2-8). In its upper reaches the channel of the estuary is confined between 4m high levees of sand and silt. The banks flatten into supratidal flats about 3km

SWARTKOPS RIVER CATCHMENT AREA



metres

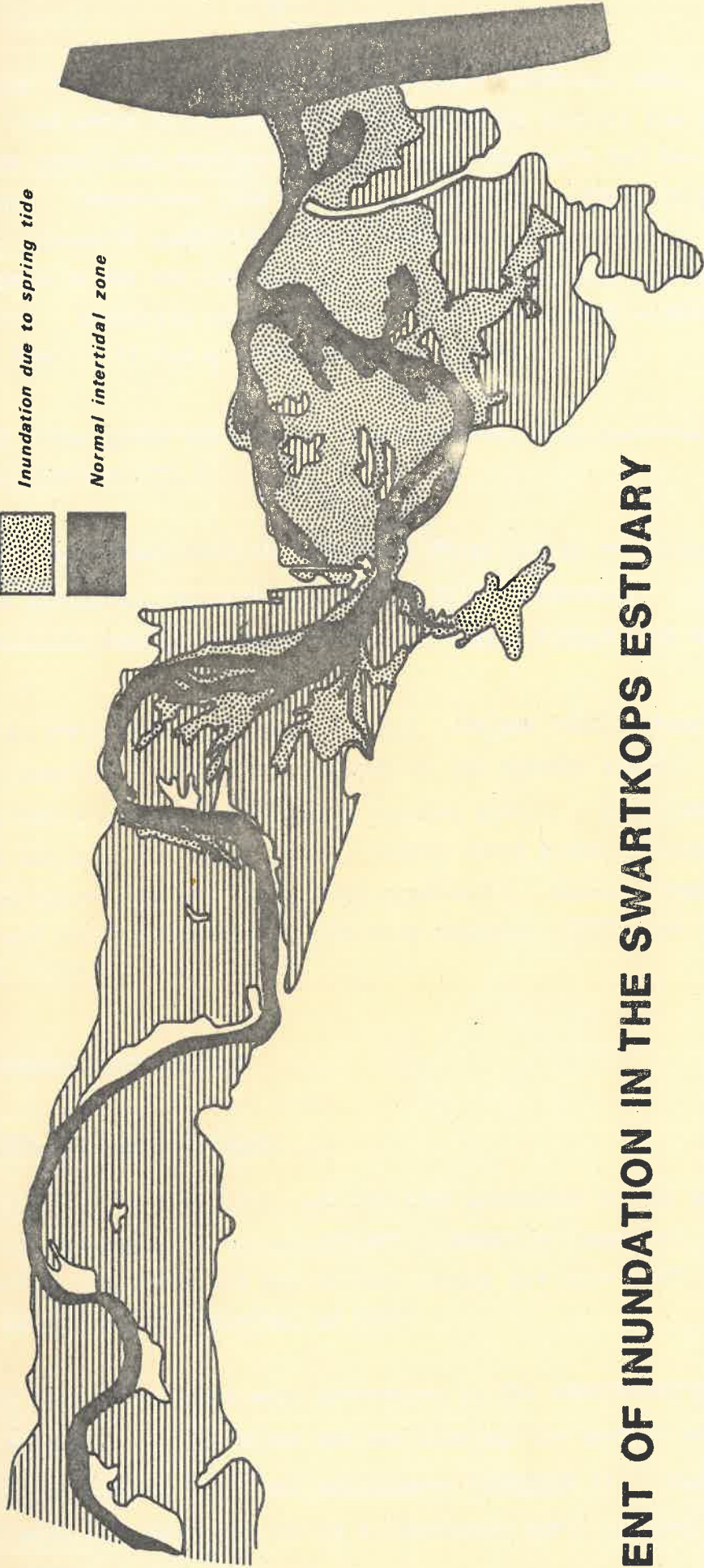
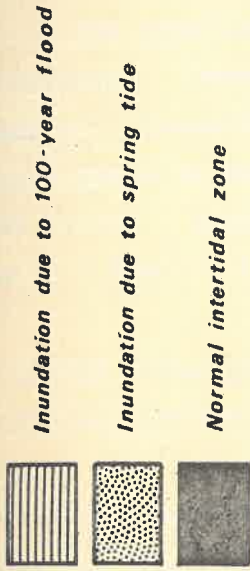


ELEVATION



fig 2-7





EXTENT OF INUNDATION IN THE SWARTKOPS ESTUARY

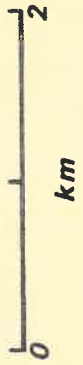


fig 2-8

down-estuary from Redhouse. The width of the intertidal area increases from about 5m at the tidal head to about 150m at the inlet. Most of the intertidal mudflats occur between the inlet and the brickfields. Downstream from the railway embankment the estuary widens and extensive supratidal flats are developed (fig 2-8). The estuary opens to the sea through an actively changing but permanent tidal inlet. Including the supratidal flats the estuary covers an area of $7,6\text{km}^2$. It has a tidal reach of 16,4km.

The Chatty river joins the estuary from the west, 800m up-estuary from the railway bridge (fig 1-1).

The estuary was formed when the Swartkops River valley was drowned during the Flandrian transgression in the late Pleistocene. It established its present configuration after being filled with sediment.

In the past the meanders migrated freely. Bridge construction and bank stabilization confined the channel to its present state. Meander migration still takes place but on a limited scale. In various places along the reach of the estuary bank erosion takes place. This erosion is usually associated with deposition elsewhere. Earlier meander courses have been determined for the City Engineer (1971) and by Callaghan (1978).

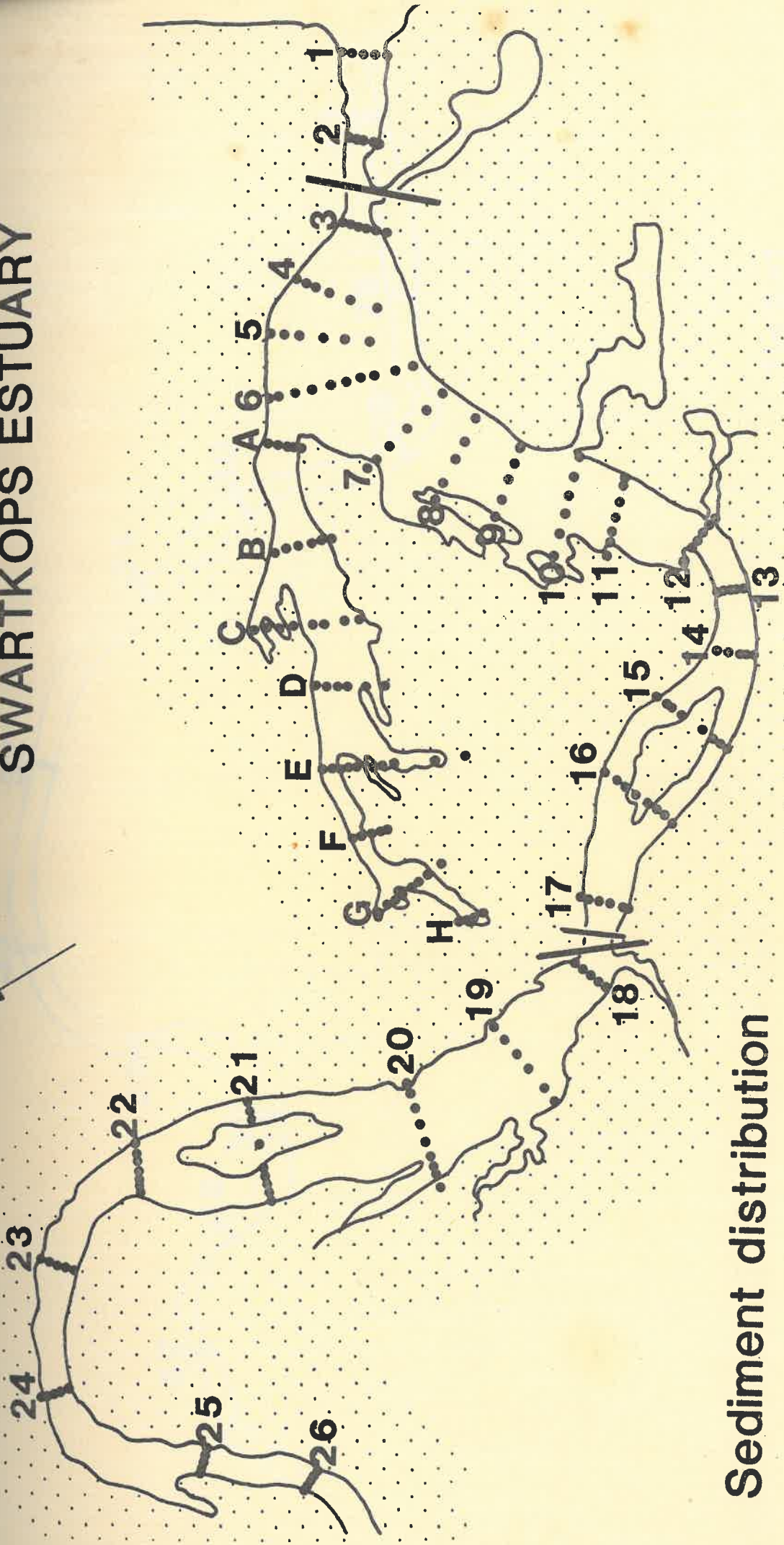
3. SEDIMENT DISTRIBUTION

3.1 Grain size distribution

The distribution of intertidal and subtidal sediments in the Swartkops estuary was determined after an extensive sampling programme. Sample lines between the inlet and the railway bridge are 250m apart (fig 3-1). Further up-estuary the interval is 500m.

The grain size proportions were determined in the laboratory by wet sieving through a 0,063mm sieve and dry sieving the coarser material. Grain size parameters were then calculated (APPENDIX 1). Carbonate analyses were done with the aid of a "carbonate bomb" (Schink et. al,

SWARTKOPS ESTUARY



Sediment distribution
sample sites

fig 3-1

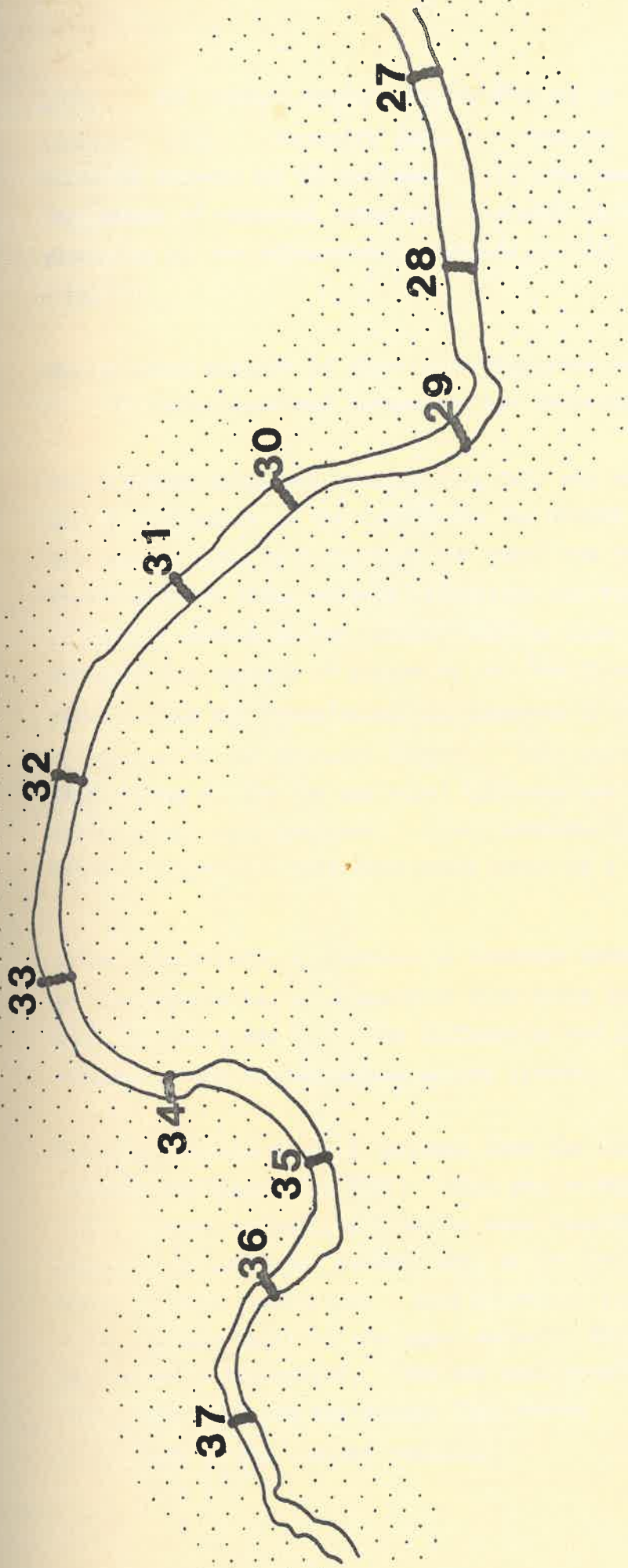


fig 3-1

1979). The organic content was determined by peroxide digestion (McCave, 1979). (Peroxide digestion does not oxidize all organic material present in the sediment. It does however give an idea of the amount of material which will probably influence the redox potential of the sedimentary substrate.) All data were handled by computer.

The detailed results of these determinations are tabulated in APPENDIX I. The more important parameters are contoured in figs 3-2 and 3-3.

The sediment dispersal pattern (fig 3-2) can be explained in terms of the hydrodynamics of the system and the nature of the source material. The coarser sand is found near the inlet and in the narrower channel sections where tidal current velocities are relatively high. The frictional stress at the channel base is high in these areas and the currents are capable of winnowing out the finer-grained sand. Up-estuary from the brickfields the presence of coarser material can be attributed to the sediment origin. This sand comes from the catchment area during floods and the tidal currents are not powerful enough to redistribute this sediment. Field observations confirm that very little movement of this sand takes place as a result of tidal action.

Little significant difference is observed between the sand distribution at the surface and at a depth of 0,5m below the sediment surface (compare fig 3-2 a and b). The differences are probably a result of local changes in the hydrodynamics of the system.

Mud distribution shows a decrease from the tidal head of the estuary towards its inlet (fig 3-3). This can be explained by the increased tidal current velocities from the head towards the inlet. Weaker currents in the upper estuary lead to the deposition of fine-grained material from suspension. This siltation is aided by the mixing of fresh and sea water in the upper estuary, which causes the clay particles to flocculate. The mud content also increases from the sub-tidal zone onto the supratidal flat areas. This also corresponds to a decrease in the current velocity.

Mean Grain Size - Surface

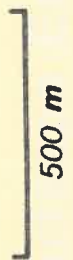
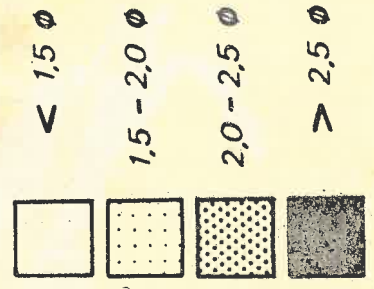
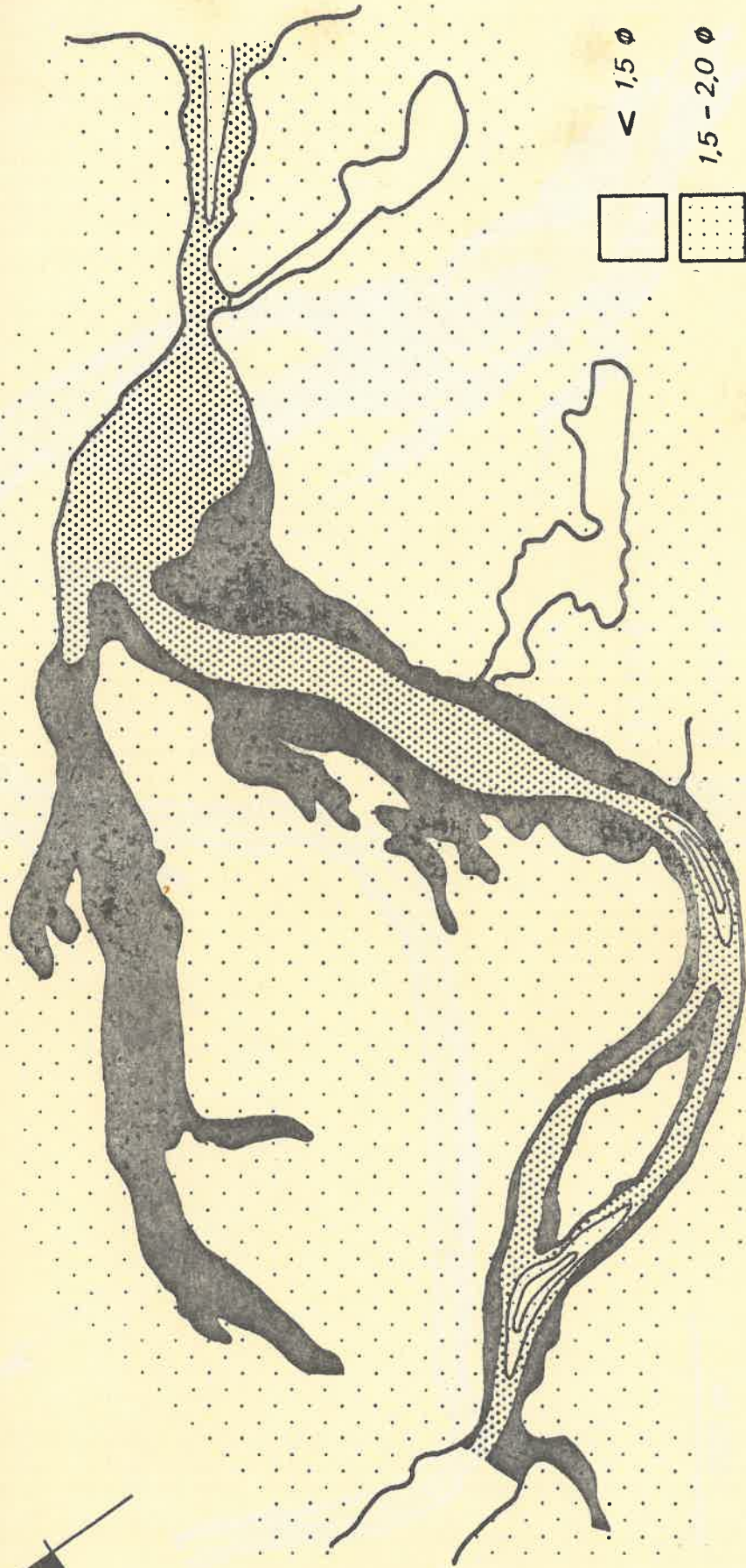
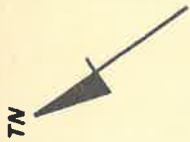
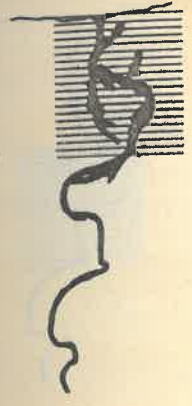
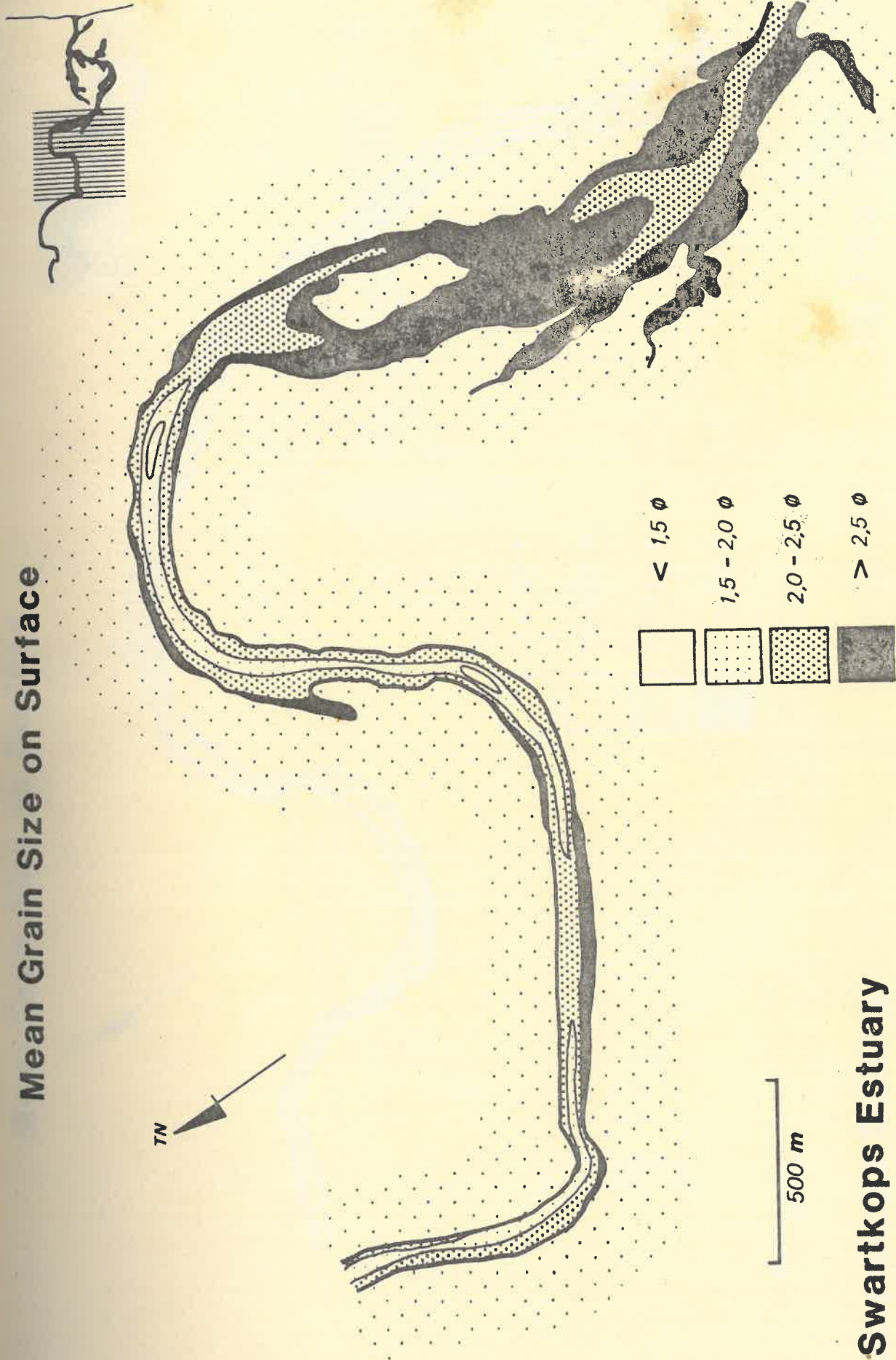


fig 3-2a

Swartkops Estuary



Mean Grain Size on Surface



Swartkops Estuary

fig 3-2a

Mean Grain Size on Surface

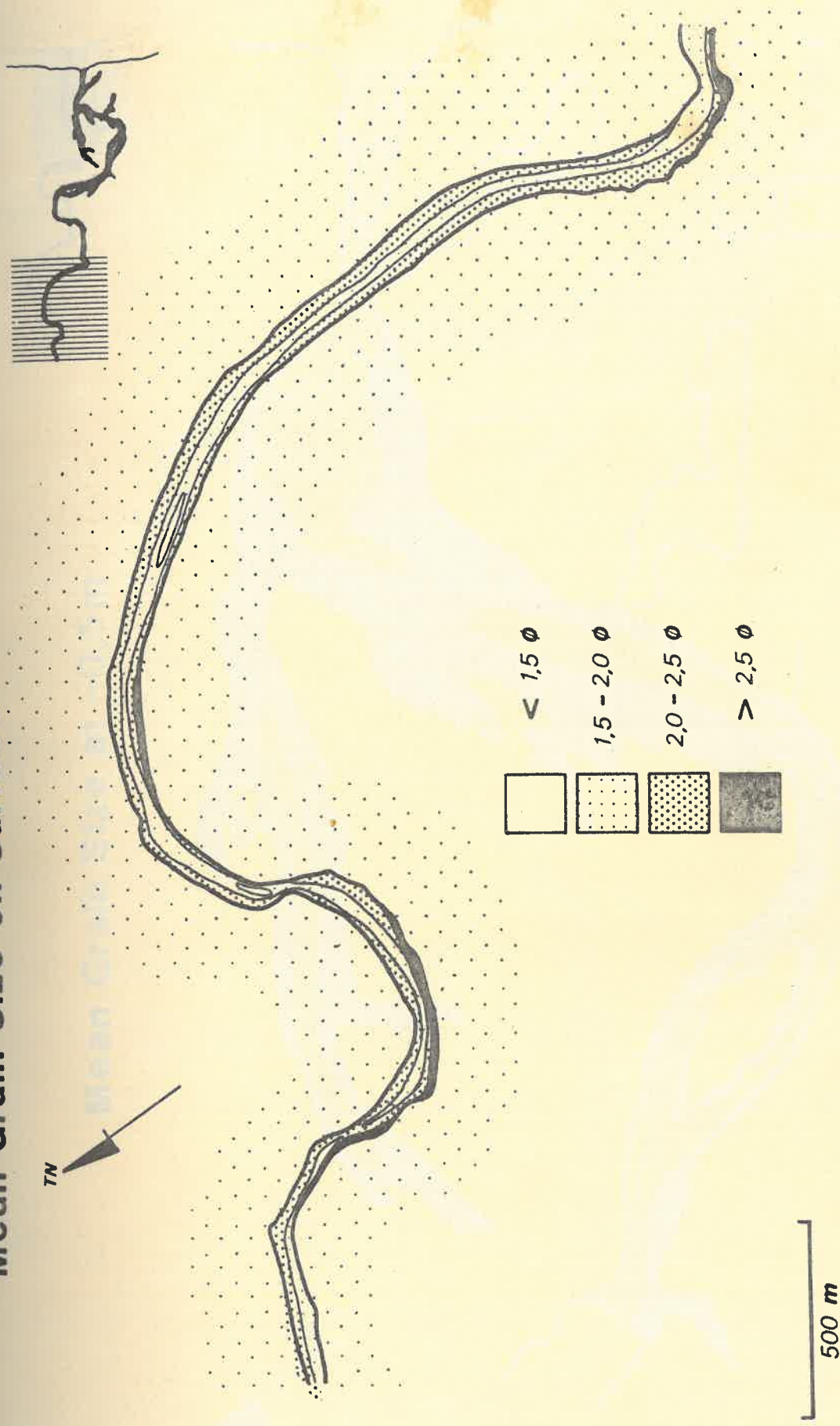


fig 3-2a

Swartkops Estuary

Mean Grain Size at -0,5m

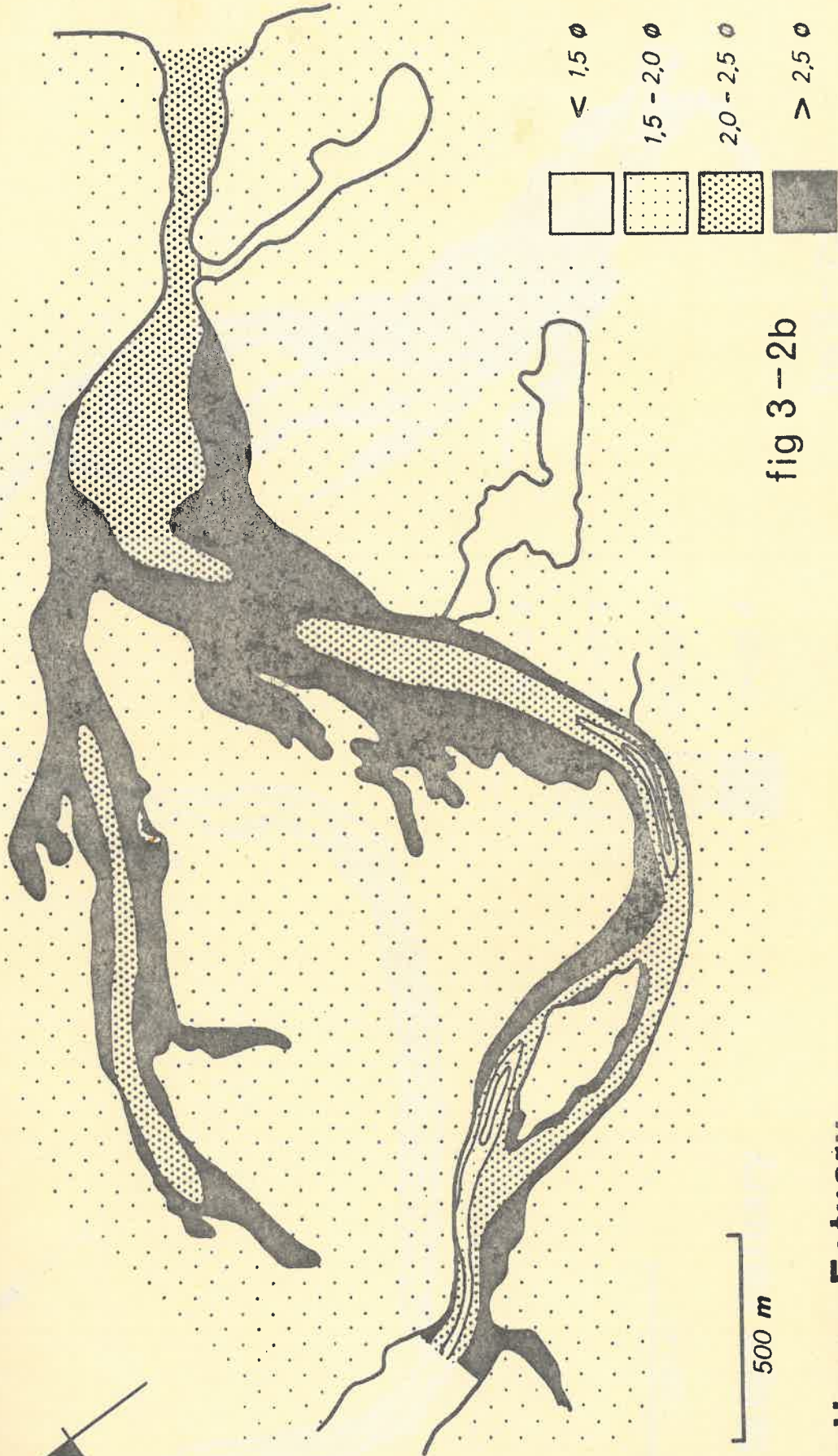
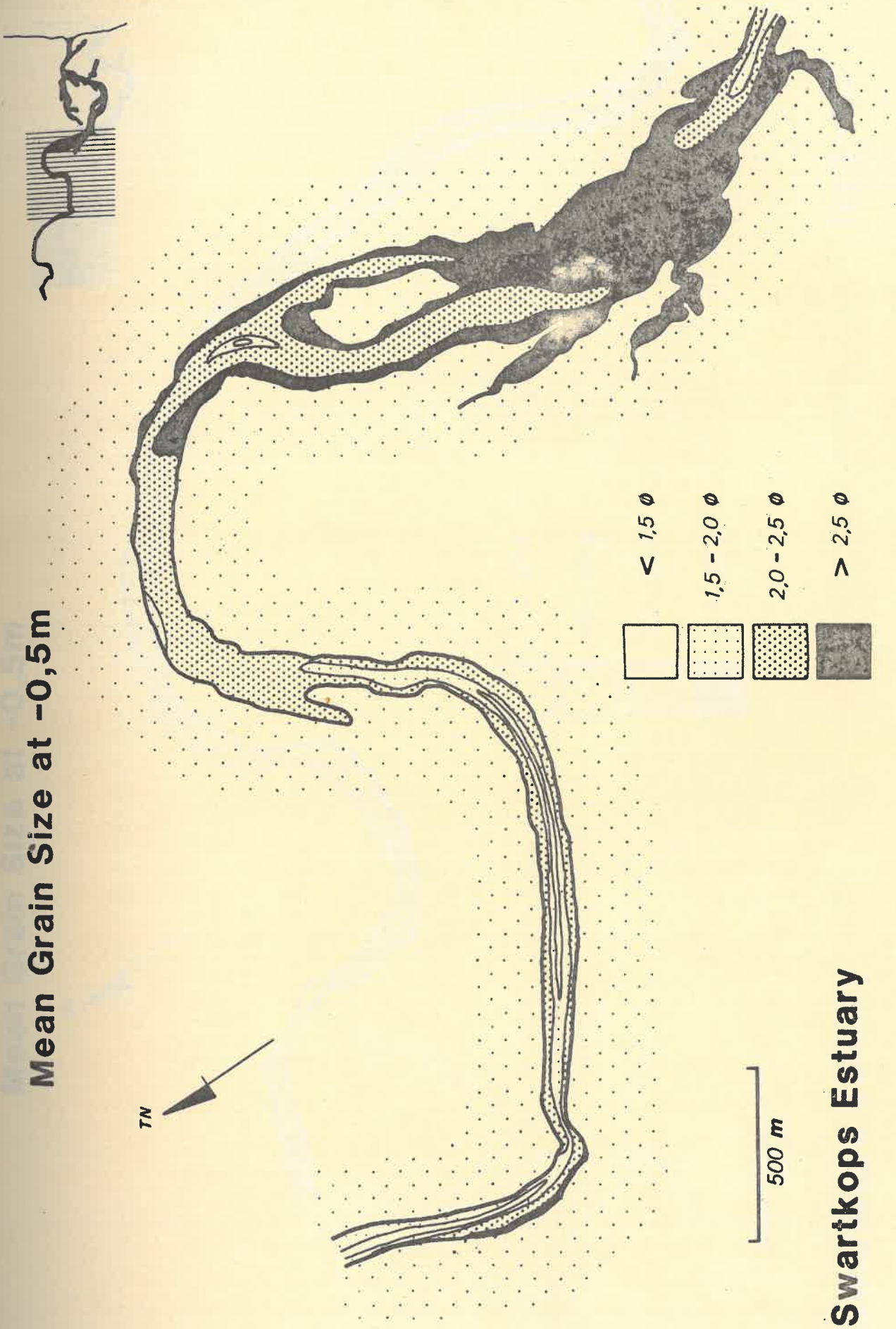


fig 3-2b

Swartkops Estuary



Mean Grain Size at -0,5m

Swartkops Estuary

fig 3 -- 2b

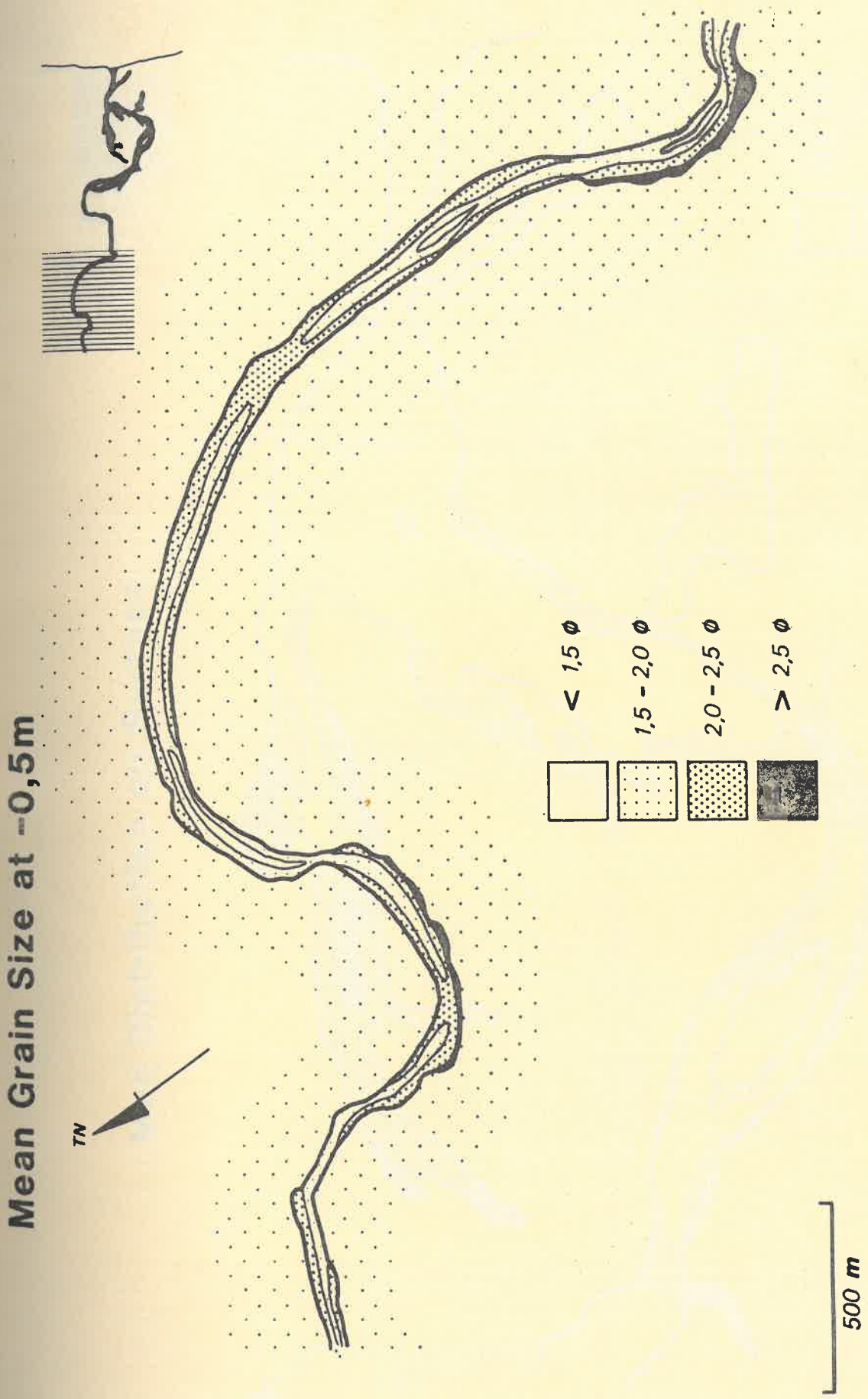


fig 3 - 2b

Swartkops Estuary

Mud Distribution on Surface

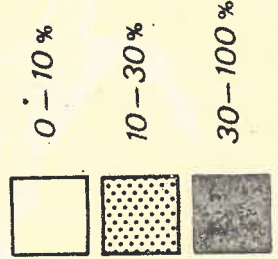
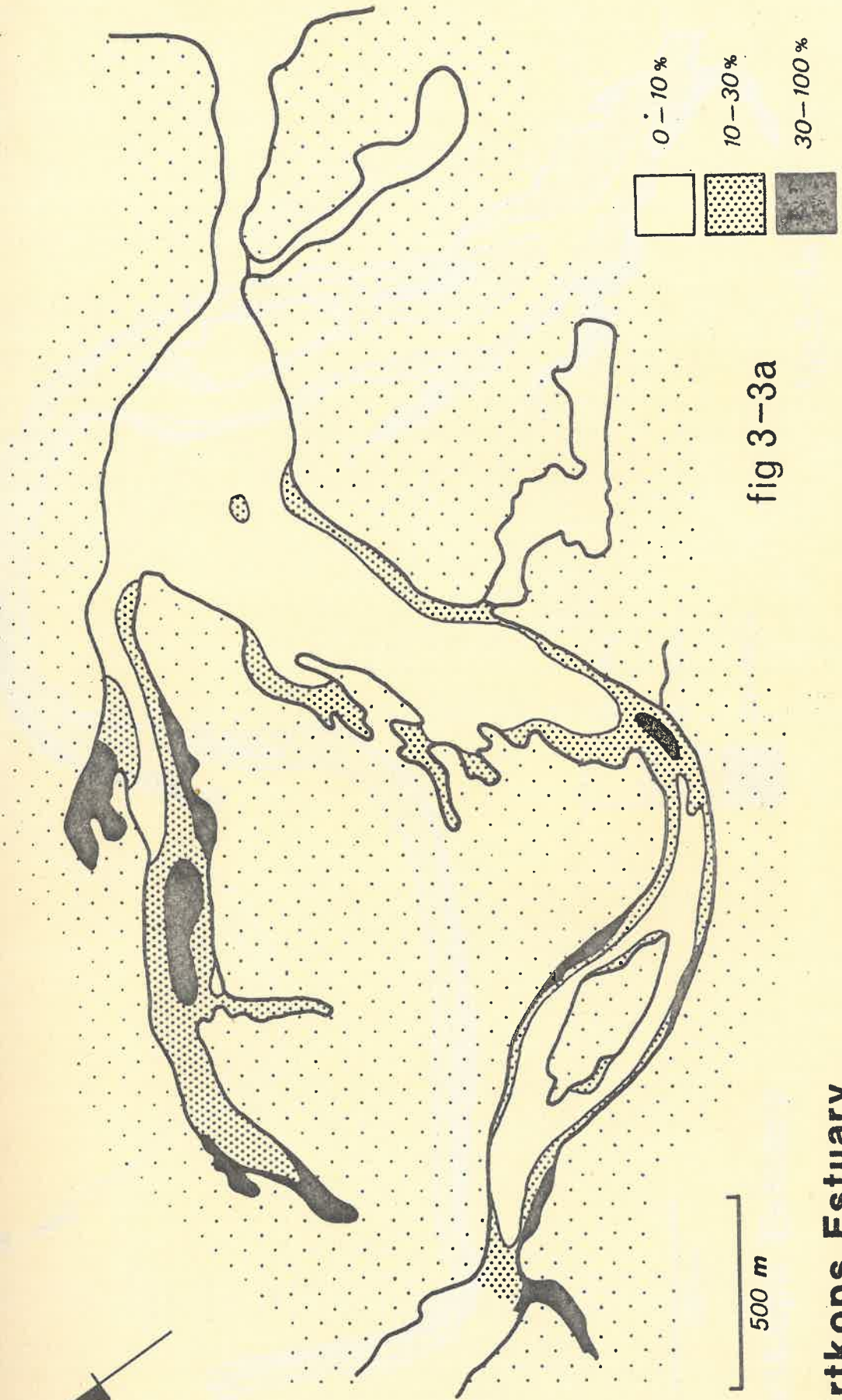
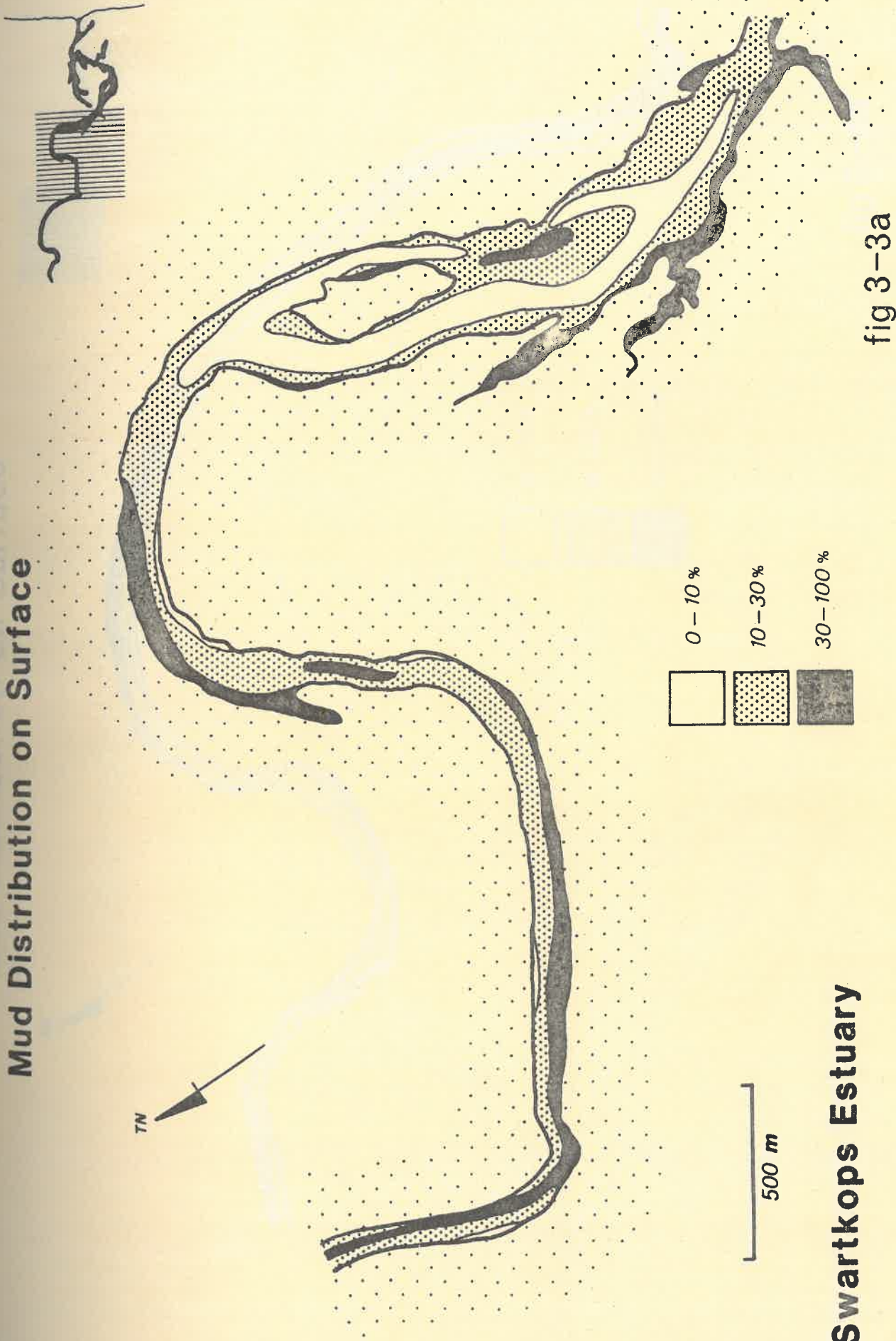


fig 3-3a

Swartkops Estuary

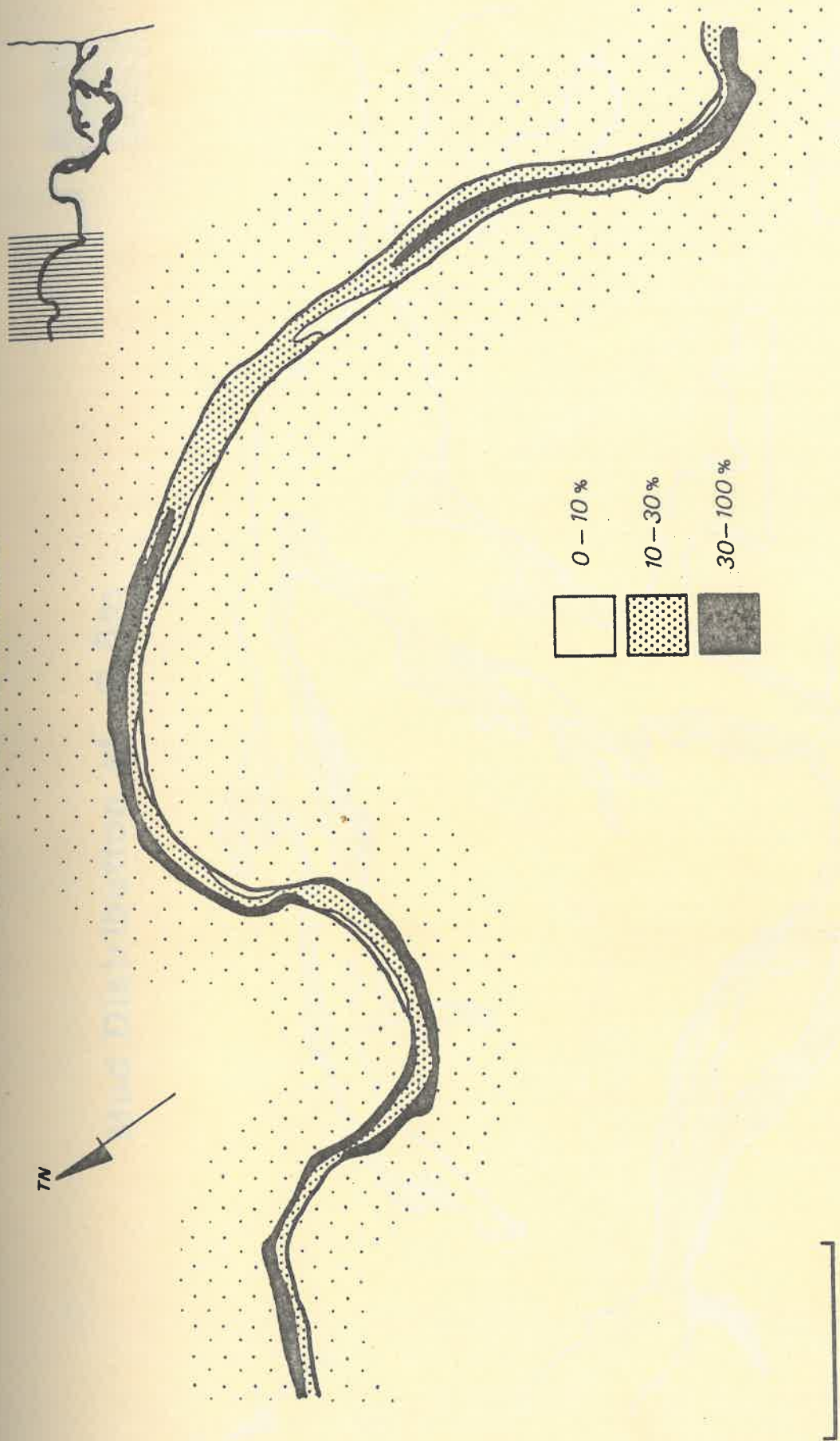
Mud Distribution on Surface



Swartkops Estuary

fig 3-3a

Mud Distribution on Surface



Swartkops Estuary

fig 3-3a

Mud Distribution at -0,5m

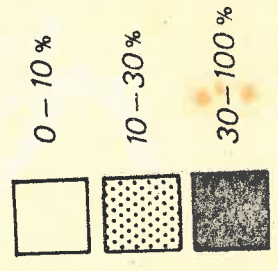
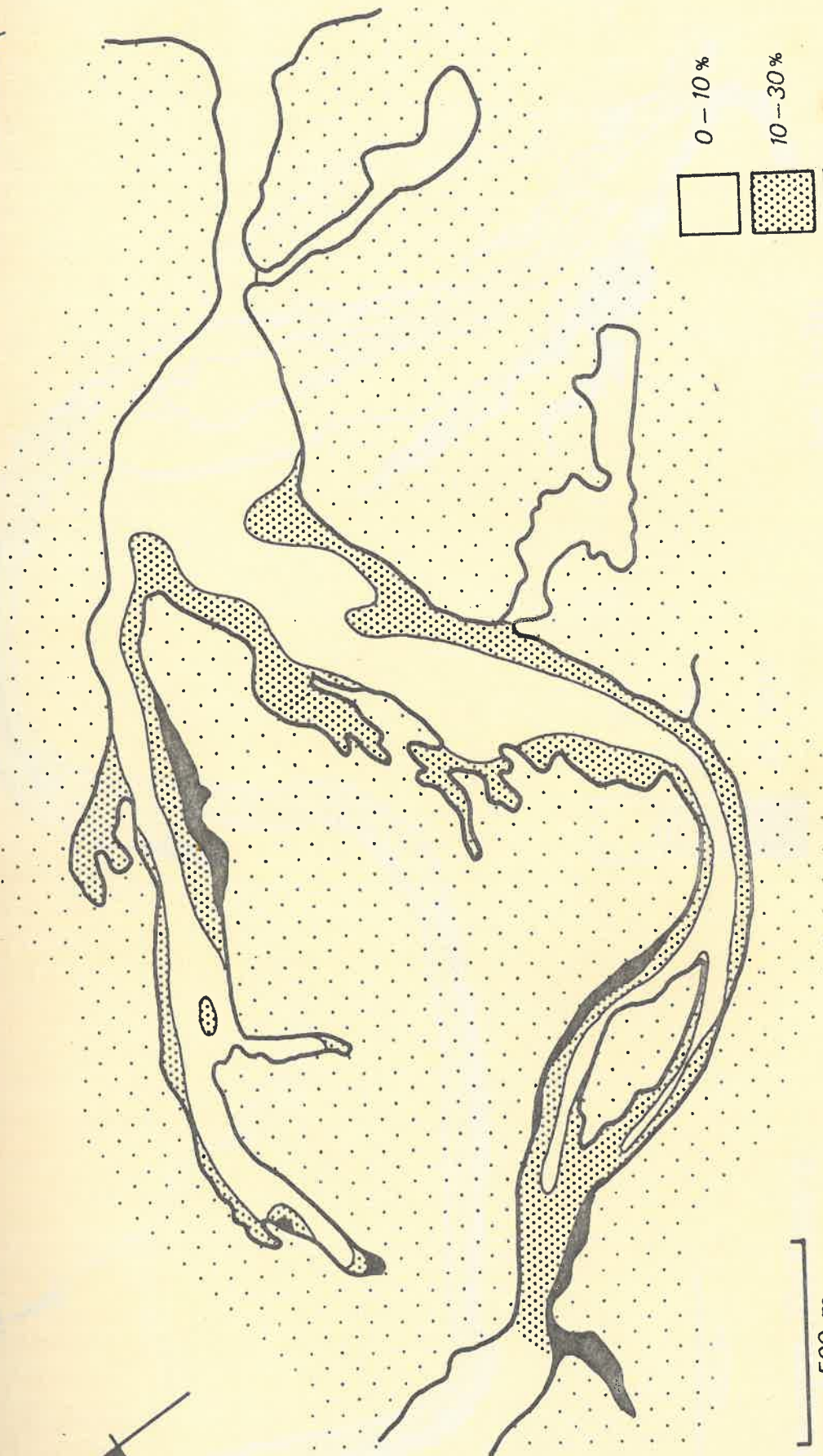
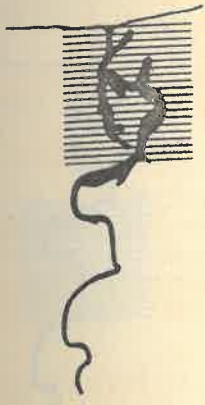
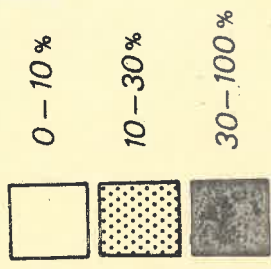
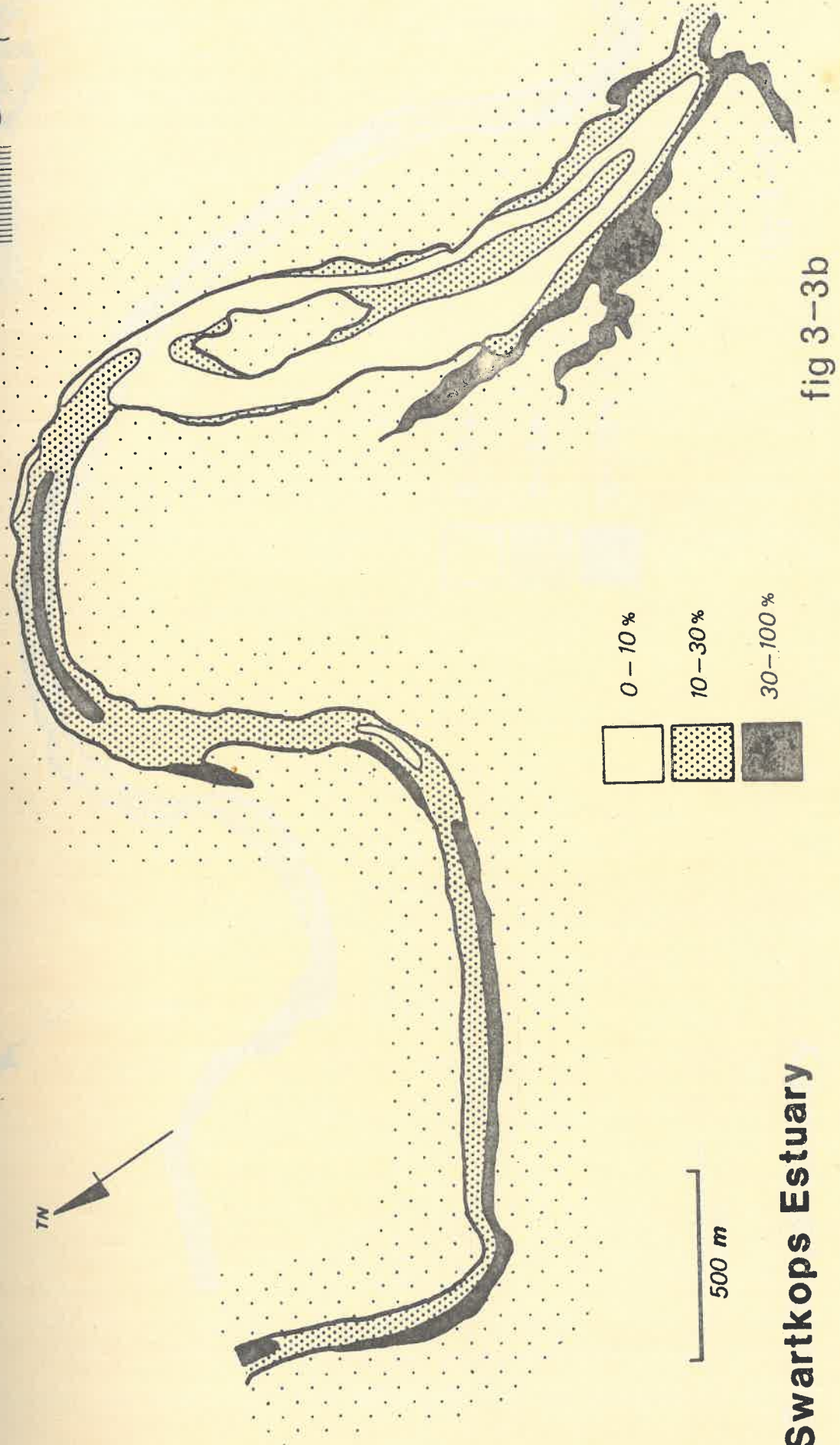


fig 3-3b

Swartkops Estuary



Mud Distribution at -0,5m.



500 m

Swartkops Estuary

fig 3-3b

Mud Distribution at -0,5m

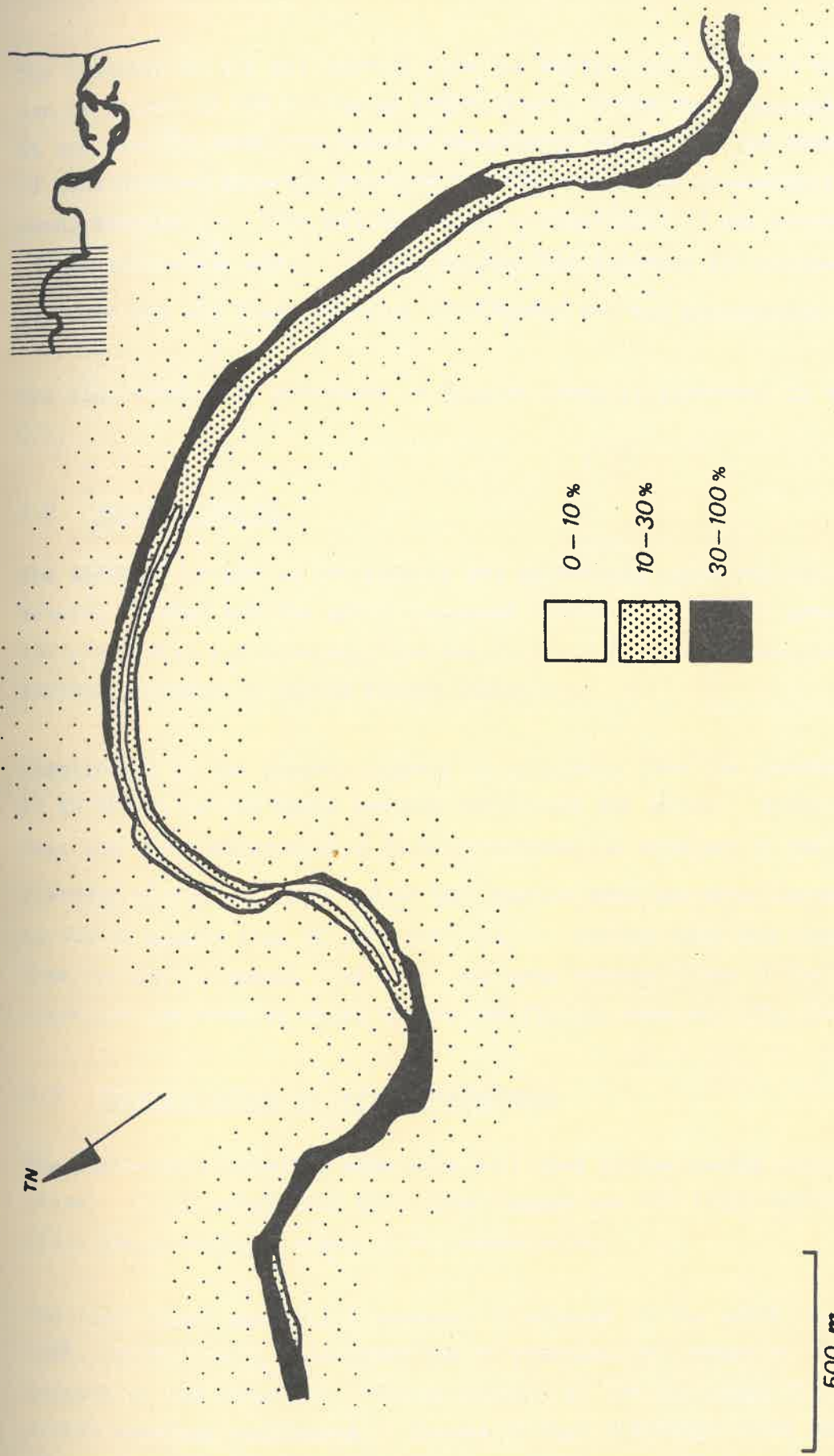


fig 3-3b

Swartkops Estuary

The increase in the mud content from the surface to 0,5m into the can be caused by the burrowing activities of estuarine organisms. It can also be caused by penecontemporaneous deposition and dispersal of fine-grained material into the interstices of the predominantly sandy substrate. This mud can occupy a large part of the porosity of the subsurface sand. At the surface the sediment is continuously reworked and the finer material is winnowed out and resuspended.

The distribution of sediments in Tippers Creek is discussed in section 5.2.

3.2 Sediment source

The sediment origin in the estuary was determined using various parameters. These are the grain roundness (Plate 2) of quartz grains, the grain size distribution (section 3.1) and the submicroscopic surface textures of quartz grains (plate 2).

Clastic mud in the estuary appears to originate from the catchment area. It is absent in the beach samples taken near the inlet. Grain roundness and the submicroscopic surface textures as revealed by the scanning electron microscope (SEM) shows that marine sand has moved up-estuary as far as sample line 22 (fig 3-4, 3-1). Fluvial sand was found as far down-estuary as sample line 14. The area between lines 14 and 22 is therefore the area in which marine and fluvial sand mix (fig 3-4).

3.3 Interpretation of aerial photographs

The photo-interpretation maps (fig 3-5) show little change over the years. Local areas that have shown change are the tidal inlet and areas where sediment seems to be accumulating.

The tidal inlet exhibits a tendency to migrate to the south (photo for 1968, fig 3-5 c). This migration is probably the result of the meander pattern of the channels. During periods of low discharge the stream course meanders southwards. Floods of high discharge cause the channel to straighten and the flood water erodes a channel through the spit in the inlet. The remnants of the southward trending channels are present

SWARTKOPS ESTUARY

Sediment Source

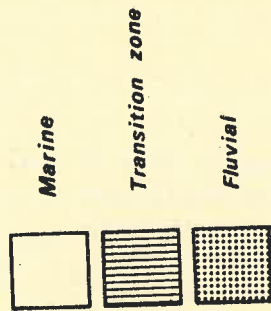
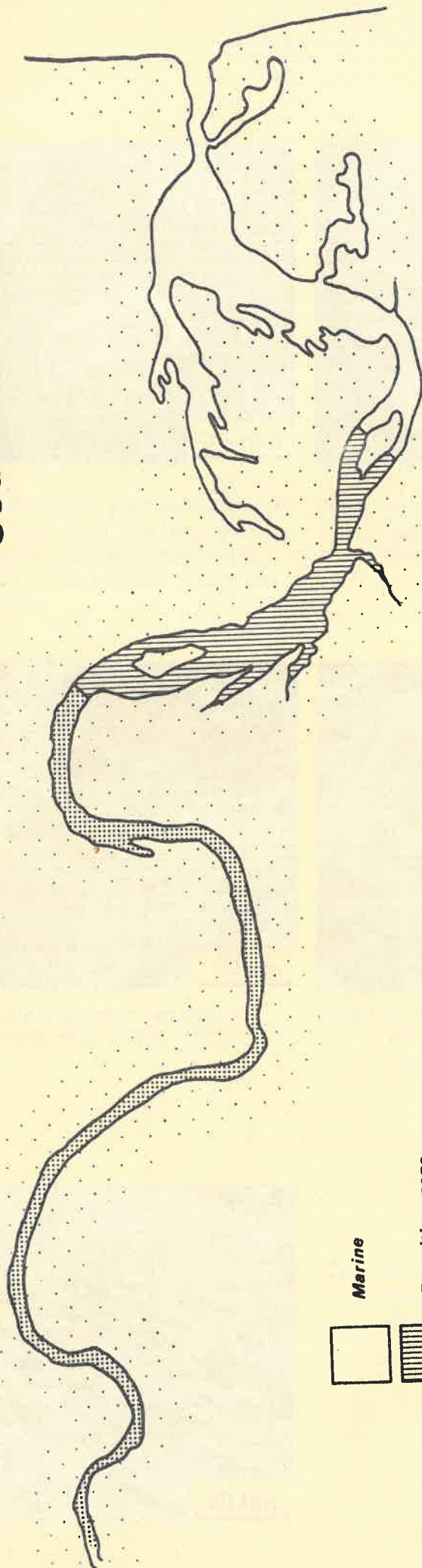
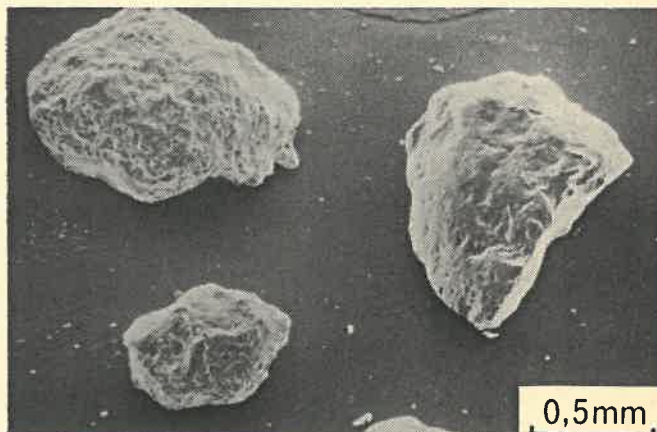


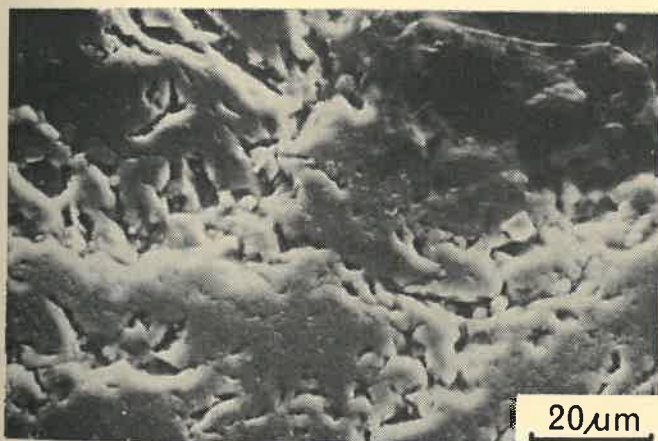
fig 3-4



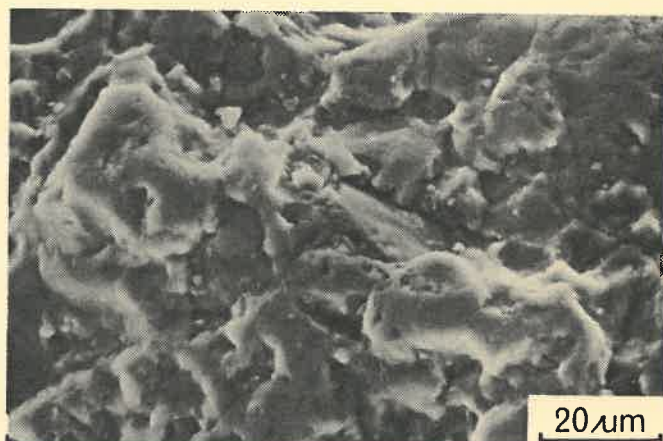
(a) A scanning electron photomicrograph of well rounded sand grains from the tidal inlet of the Swartkops estuary. This sand comes from the adjacent beach.



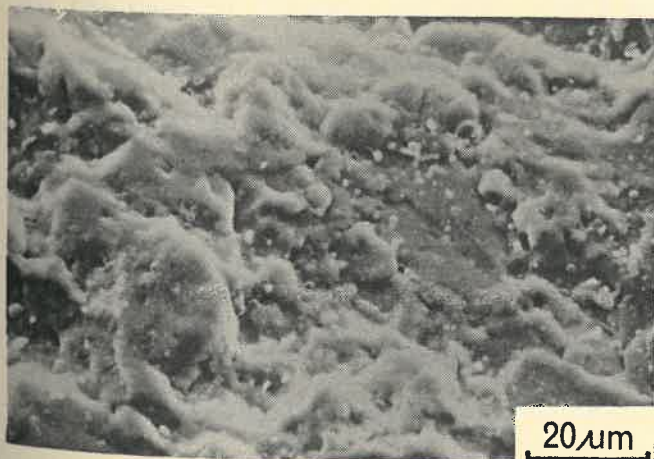
(b) Angular grains from the upper reaches of the estuary. These sand grains are of fluvial origin.



(c) The pitted surface of a marine sand grain from the tidal inlet.



(d) A slightly abraded fracture surface of a fluvial sand grain from the upper estuary.



(e) A thin diagenetic overgrowth covers the fracture surface of this fluvial sand grain. It has not been transported since the blocking of Tippers Creek in 1877.

on all the other maps (fig 3-5 a, b and d). The present "Blue hole" originated in this way.

The tendency of the inlet to migrate southward is not the result of longshore drift deposition on the northern bank of the inlet. The predominant drift direction is in fact northward.

Spit accretion on the northern inlet margin which is of course coupled to the southward migration has not taken place during the past few years, even during the relatively dry periods. This may result from the influence of the new freeway bridge which confines the channel to a fixed position. The trend of the estuary to meander is thereby restricted.

Northward migration of the inlet is prevented by a conglomerite outcrop on the northern inlet margin which resists erosion.

A more detailed history of the behaviour of the tidal inlet has been done by Callaghan (1978) who attempted to couple the migration tendency of the inlet to climatic cycles. This approach was not very successful owing to the many variables involved.

The areas where apparent sediment accumulation is taking place are the section of channel which extend 2km up-estuary from the railway bridge and the channel adjacent to Modderspruit.

Channels are flushed by floods but tidal action causes renewed shoaling in the periods between floods. This shoaling is the result of the interference of ebb-dominated and flood-dominated sections of the channel which is often found in channel bends. Here ebb and flood channels deposit sediment into each other. The resultant shoaling is evident at low tide. This navigational hazard is aggravated by the murkiness of the estuarine water at low tide.

The channel section between the railway bridge and the brickfields seems particularly prone to shoaling. This may be the result of

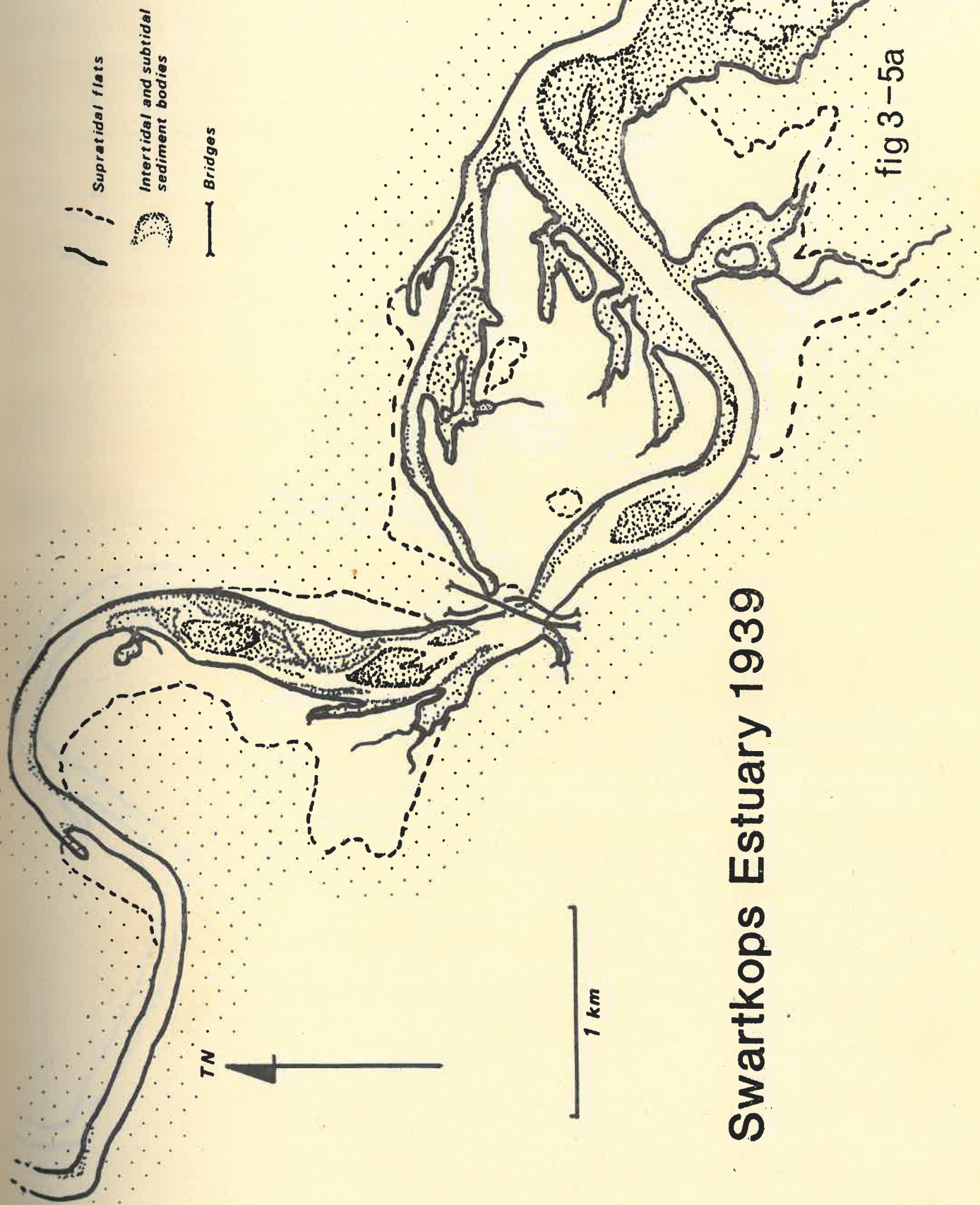
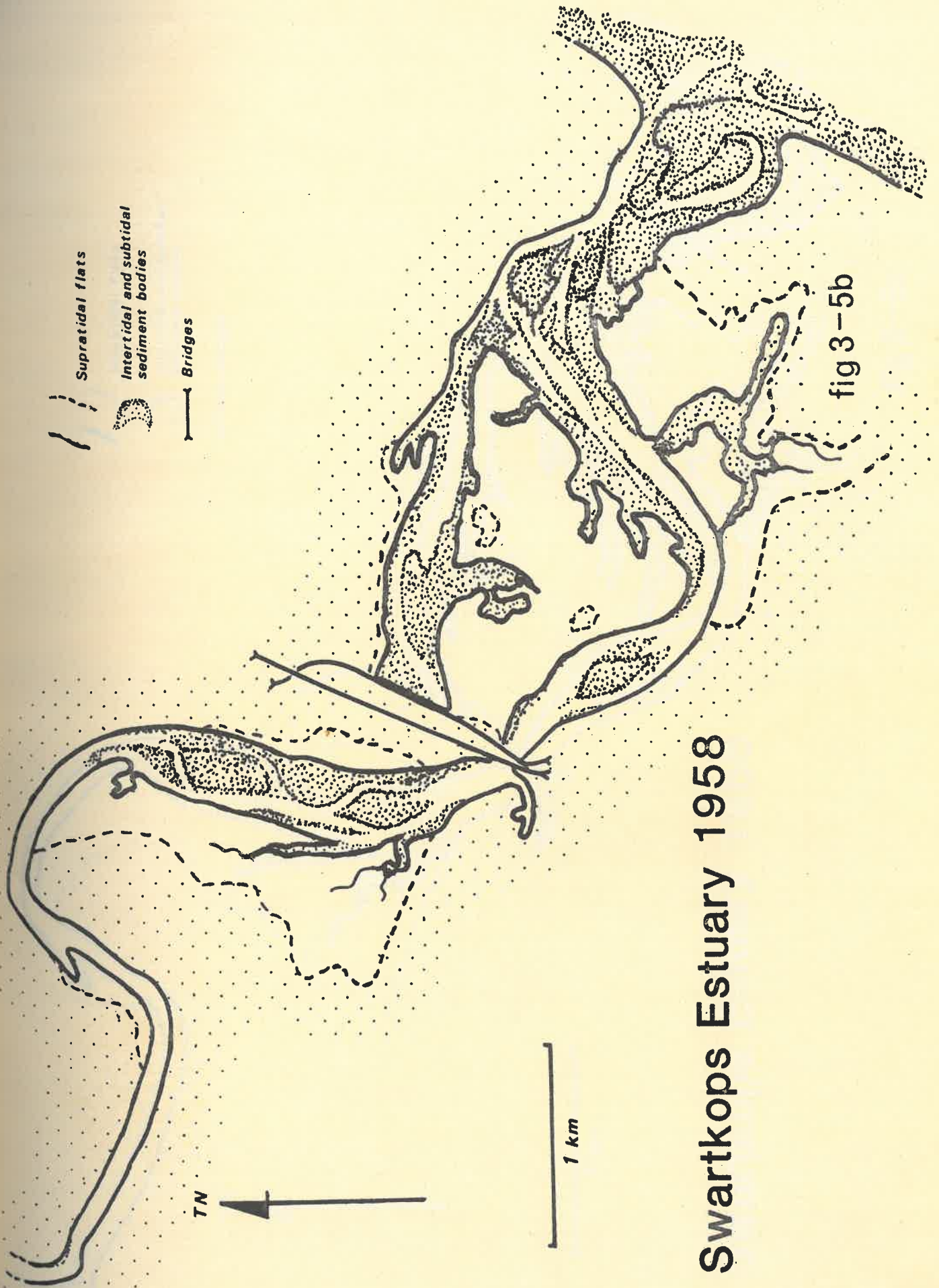


fig 3-5a

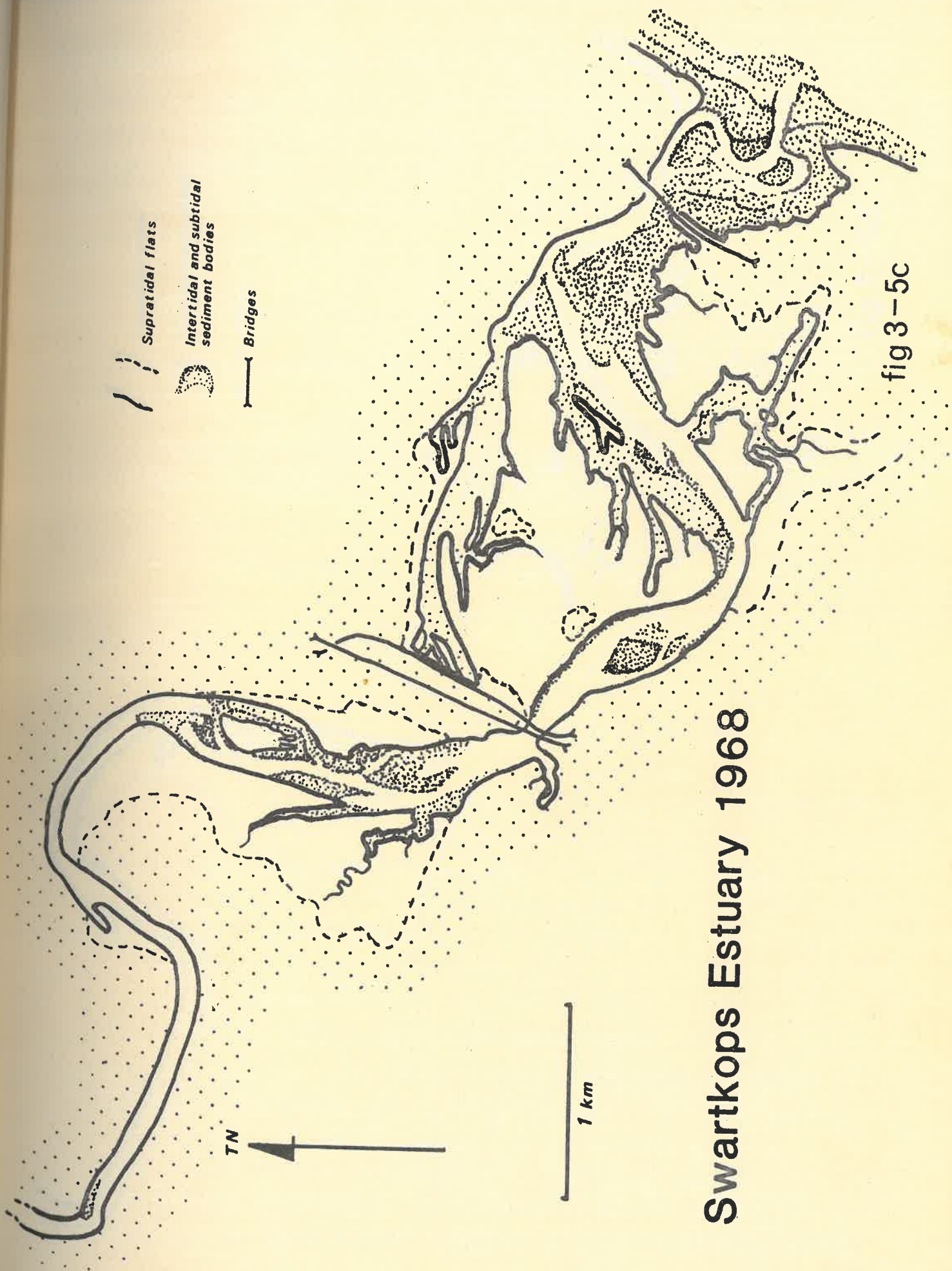
Swartkops Estuary 1939



Supratidal flats
Intertidal and subtidal sediment bodies
Bridges

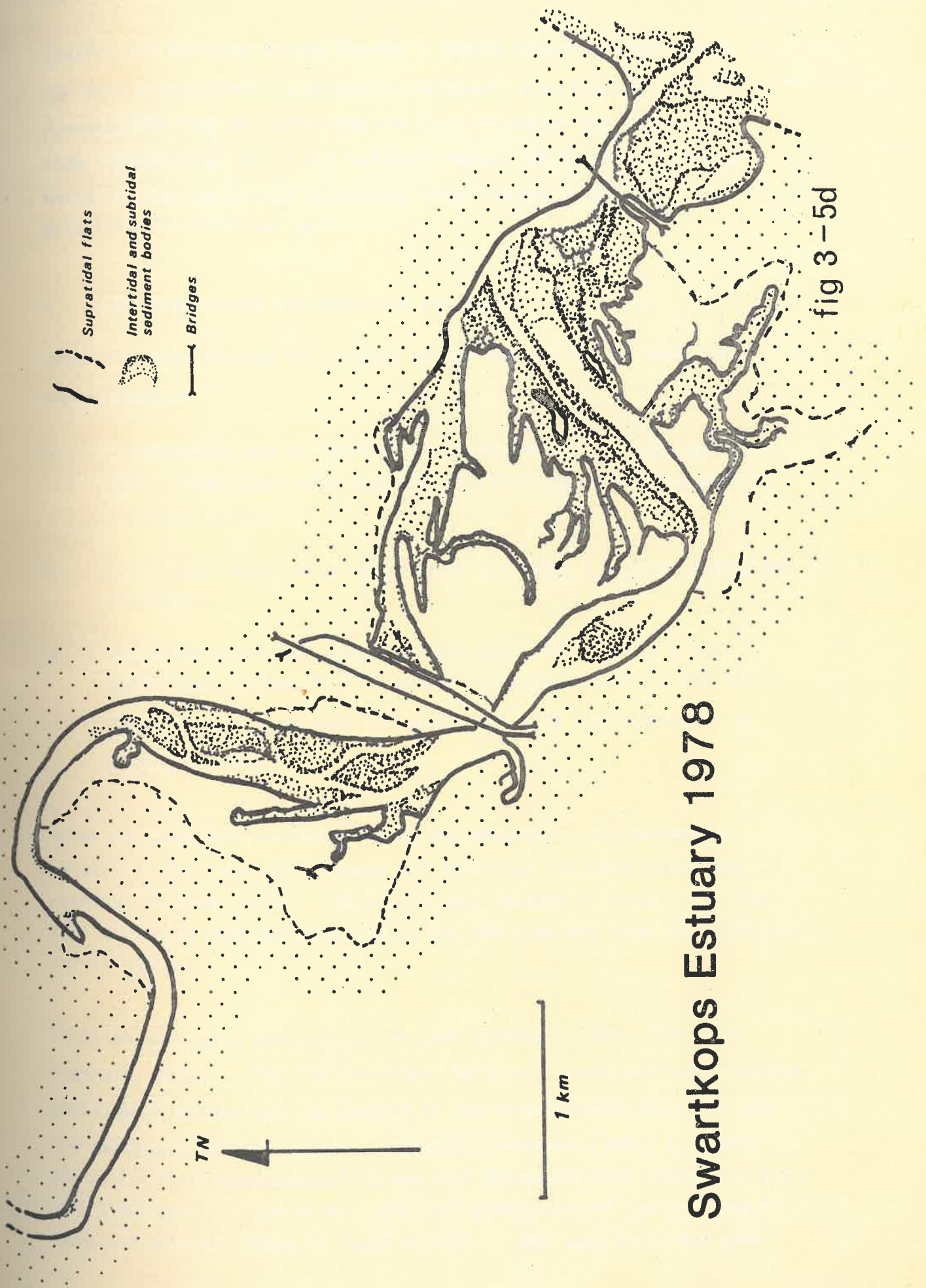
Swartkops Estuary 1958

fig 3-5b



Swartkops Estuary 1968

fig 3-5c



Supratidal flats
Intertidal and subtidal sediment bodies
Bridges

Swartkops Estuary 1978

fig 3-5d

ineffective scouring during floods. During high-discharge floods the main water-course is across the adjacent supratidal point bar. Flood-waters thus do not follow the main course of the channel but flow perpendicular to it and sediment removal is impeded. Levees which contain the floods up-estuary from prevent a similar situation in the latter area.

4. SECTIONS ACROSS THE ESTUARINE CHANNELS

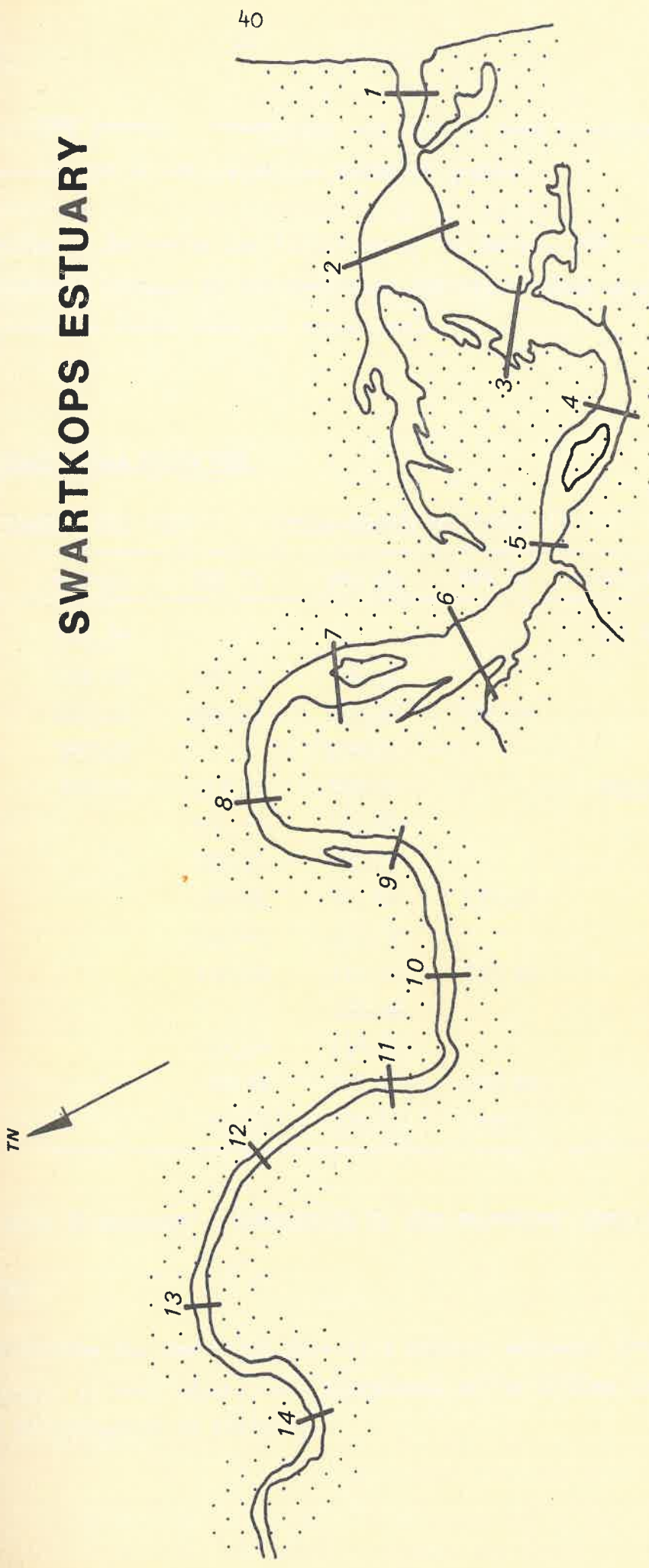
Cross sections through the channel of the estuary can be used for three purposes:

1. A comparison can be drawn between present and existing profiles. Such a comparison will indicate whether long term sedimentation is taking place.
2. A reliable baseline is established for doing a similar comparison in future.
3. The cross-sectional areas will be used (1982) to run a one-dimensional mathematical computer simulation model of the hydrodynamics of the estuary in conjunction with the Department of Zoology at UPE.

Cross sections were surveyed across the channel of the Swartkops estuary at 1km intervals between the inlet and the tidal head (fig 4-1) with MSL as datum level. This datum was determined locally for the Port Elizabeth City Engineer (1971) and was obtained from the existing survey beacons.

Profiles were also surveyed in the past (Methuen, 1903; The City Engineer, 1971). The 1903 sections (Table 4.1) were part of a harbour development scheme and are limited to the area between the inlet and the Swartkops railway bridge. The 1971 transects (table 4.1) were part of a study commissioned by the Port Elizabeth City Council to plan the development of the area. The 1903 profiles were recalculated to have the same MSL datum as those of 1971. The same level was also

SWARTKOPS ESTUARY



Cross sections surveyed

fig 4 - 1



used for the 1980 survey. These data can thus be used to follow the temporal development of the estuarine sediment system.

It was possible to determine the influence of the March, 1981 floods on the sedimentary ecology of the Swartkops estuary because sections measured before the flood could be remeasured.

TABLE 4.1

Cross-sectional areas below MSL

SECTION NUMBER (fig 4-1)	CROSS-SECTIONAL AREAS (m ²)				
	MAY 03	DEC 71	NOV 80	MAY 81	OCT 81
1	289,34				254,88
2	446,08	194,50	496,31		
3	252,22	535,28	211,83	286,16	
4	157,25		215,83		
5	166,73	313,89	363,25		365,51
6		300,75	181,88		
7		152,72	85,68		
8		148,91	161,81	159,15	
9		112,46	121,32		
10		110,02	144,14	179,72	
11			118,96		
12		118,66	130,91		
13		84,78	144,21	122,31	
14		75,74	184,16	159,47	

5. THE RATE OF SEDIMENT ACCUMULATION IN THE SWARTKOPS ESTUARY

5.1 General

Like all estuaries the Swartkops acts as a natural sediment trap. A dynamic process of both erosion and deposition in the system leads to an overall accumulation of sediment.

Deposition is generally a slow process whereby erosion products of the drainage basin enter the estuary at its head and marine sediment moves up-estuary under the influence of flood-dominant tidal currents.

Erosion takes place when high-discharge floods with a relatively low sediment load pass through the estuary. Flood water generally scours and deepens the estuarine channels.

This balance is easily disturbed by interference with any of the inter-playing factors which influence the estuarine sediment system. Dam construction will for example reduce the fluvial sediment load which enters the estuary but the reduced discharge will also be less effective in scouring existing sediment from the estuary.

Marine sand is the main component of the total sediment load which enters the Swartkops estuary. The shallowest parts of the estuary lie between the brickfields and the Swartkops village river-front. This area is the zone of mixing of the fluvial and marine sediments (section 3.2). Although the area may seem to be shoaling, the aerial photographs (section 3.3) do not indicate a significant change since 1939. The cross-sectional areas (table 4.1) also fail to point out a major change over the years. It can thus be concluded that although local shoaling does occur the long term sediment movement into the estuary is slow.

A natural human error of observation may also lead to the incorrect assumption that sediment build-up is taking place in the estuary. A long term (50 years, say) change in the meander pattern will cause erosion in some areas and deposition in others (section 2.2). If the deposition takes place in an area which was previously a deep channel it will naturally lead to the opinion that sediment accumulation is taking place. Such an error led to the erroneous observation that the channel at the Swartkops village river-front is shoaling. The far section of the channel is deepening at the same rate. Although this apparent shoaling at the river-front may appear to be serious, no net sediment accumulation has taken place!

5.2 Tippers Creek

When floods destroyed an existing wooden bridge in 1876, it was replaced by the "Wylde Bridge". This single carriage bridge was completed in 1879 (and is still in use). Its embankment blocked Tippers Creek and it ceased to be an open tidal channel in 1877 (fig 5-1).

The first railway bridge was constructed about 50m upstream from the Wylde Bridge in the 1880's (fig 5-1). This was repeatedly damaged by floods owing to its position and low height. It was also considered unsafe for use with the increasing rail traffic. Another bridge was built in 1900. This bridge saw service until 1957 when the railway lines were raised and re-routed. A new bridge was required and constructed parallel to the Wylde Bridge. As a result of these added constructions the road was diverted, causing further infilling of Tippers Creek.

This constriction of Tippers Creek led to siltation in this former flood-tidal channel (compare the sediment and mud distribution in the creek; figs 3-2 and 5-2, although the accumulation rate is slow (less than 300mm/century)).

5.3 Effects of bridges on sediment accumulation

Several bridges cross the estuary of the Swartkops River (figs 1-1, 5-1). These have little effect on the tidal dynamics of the system. Most of these bridges however have embankments which cross the supratidal flats of the estuary. Examples are the railway bridge at Swartkops village and the Settlers Bridge near the inlet. These embankments reduce the free flow of water across the supratidal flats which act as flood plains during high discharge floods. Water is thus effectively dammed up behind these embankments during floods. The result is that a part of the sediment load is deposited on the supratidal flats, usually as thin veneer of sand. The supratidal flats will eventually be elevated above the spring high tide level.

The ecology of the saltmarsh biota is highly dependent on the tidal exchange for proper functioning. It is generally accepted that the

Blockage of Tippers Creek

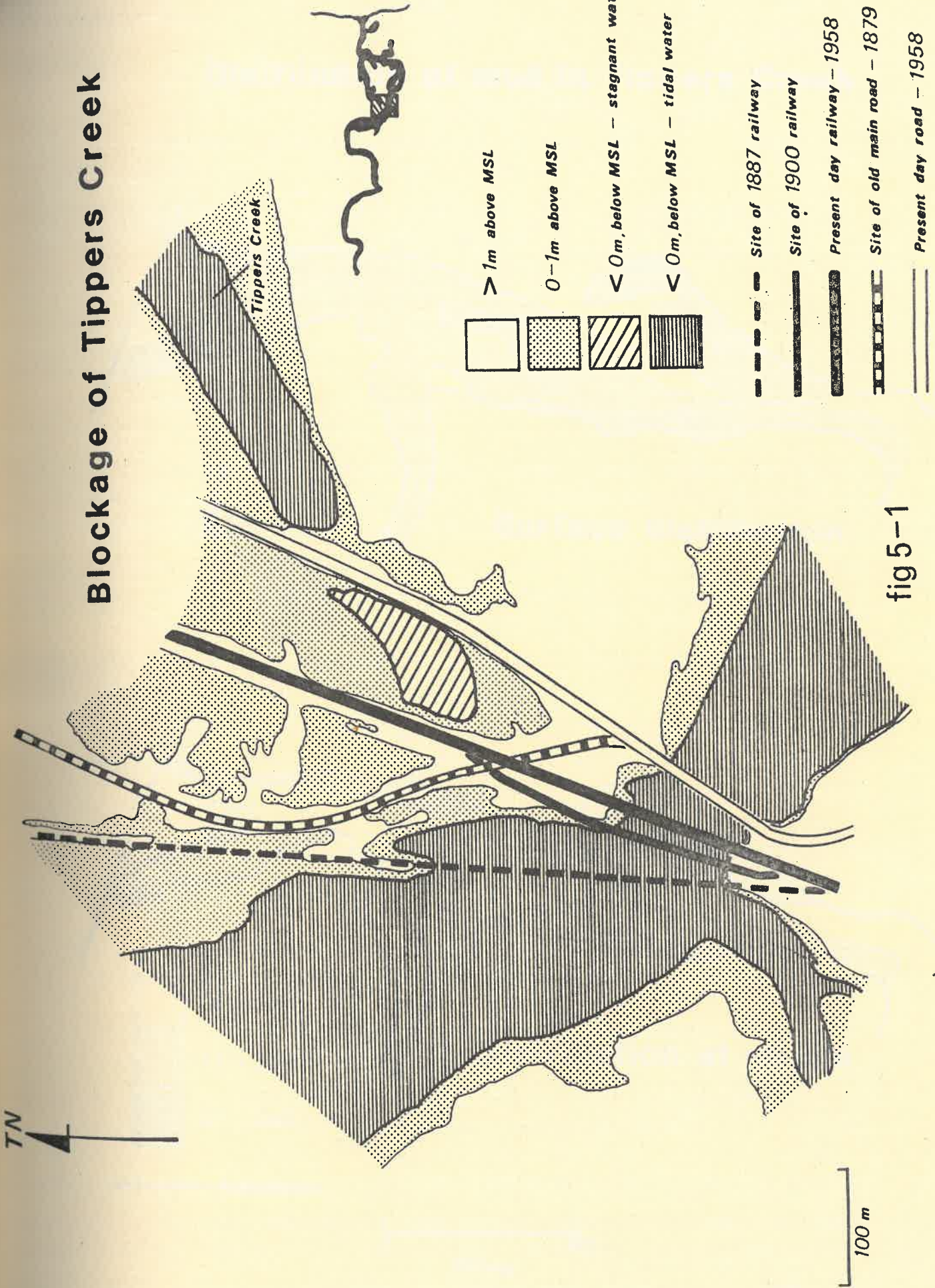
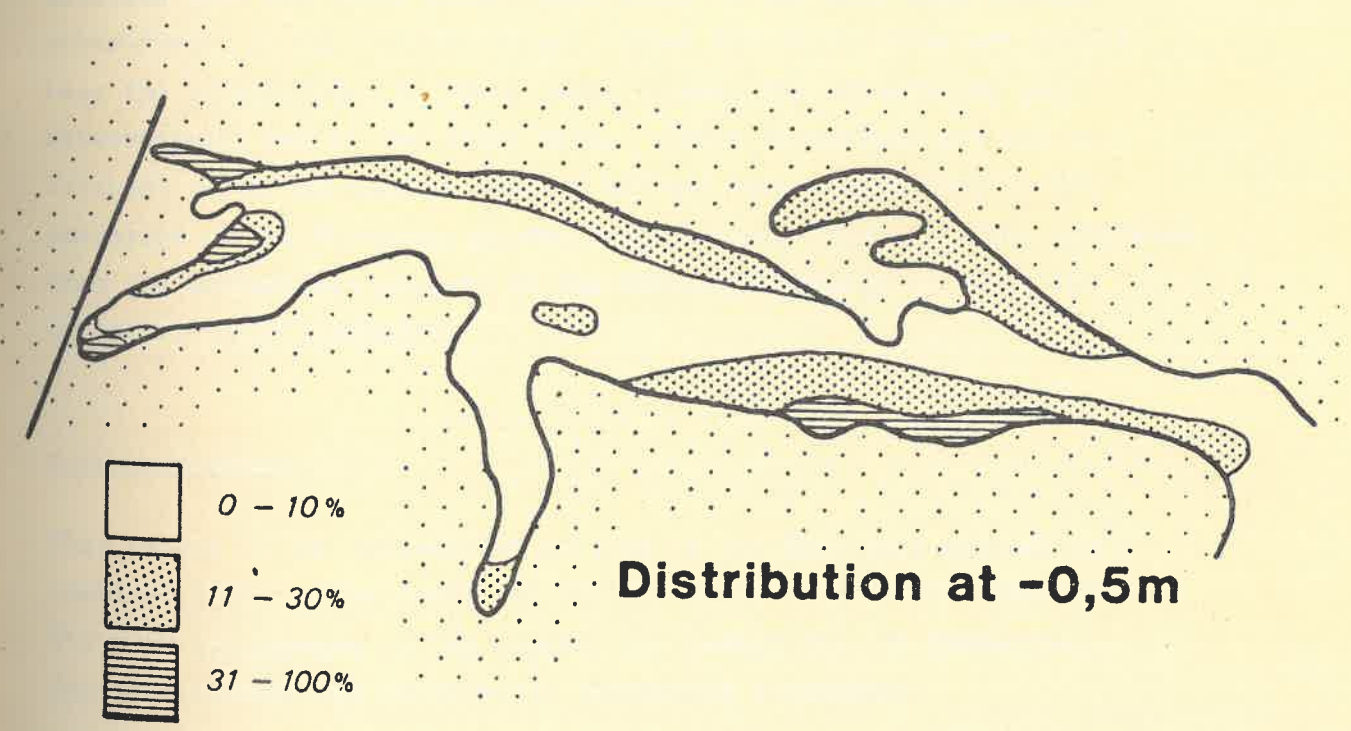
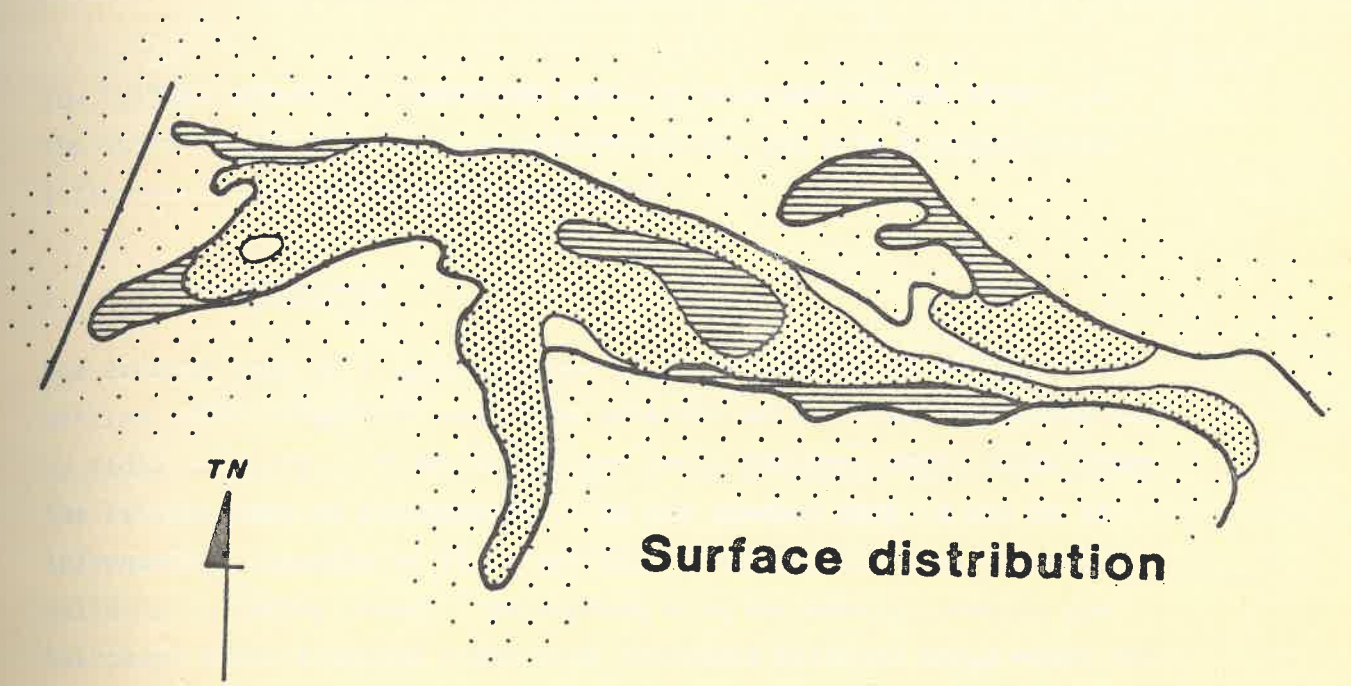


fig 5-1

Distribution of mud in Tippers Creek



— Embankment



fig 5-2

supratidal environment is the largest nutrient producer in whole estuarine biological system. This system will suffer from the adverse effects of the embankments in the long term.

The bridges across the Swartkops estuary thus have little effect on the subtidal and intertidal environments but can have a significant influence on the supratidal environment.

5.4 The erosion base

The erosion base of a tidal channel is characterized by an armour of pebbles, shell fragments and other material which cannot be transported by tidal currents. Tidal deposition could not have taken place where the erosion base is encountered. If the erosion base is not or is infrequently encountered it is probably an indication that sediment build-up is taking place. Encounters with the erosion base in the Swartkops estuary during field work coincided with the areas where the coarser-grained sand is found (fig 3-2). These include channel sections near the tidal inlet, some areas of the Swartkops village river-front, at the railway bridge, where the river banks are eroded near the brickfields, in river bends between the brickfields and Perseverance, and at the tidal head. These occurrences are not as frequent as in the Sundays estuary but are more common than in the estuaries of the Bushmans, Kromme and Keurbooms Rivers. This indicates that the sedimentary ecology of the Swartkops estuary is still in relatively good condition.

ACKNOWLEDGEMENTS

This report on the sedimentary ecology of the Swartkops estuary is a combined study of the ROSIE and SE Cape Marine Pollution Programmes. The work is financed by the Council for Scientific and Industrial Research through the Cooperative Scientific programmes.

The Port Elizabeth City Engineers Department supplied invaluable 1 : 2500 orthophoto maps and the 1903 Methuen chart of the lower Swartkops estuary. Messrs Rollo, Hemsley and Myrdal kindly supplied the survey data on which the cross section elevations are based. The committee

of the Swartkops Trust gave some valuable information regarding the estuary, especially by putting us on the track of the 1903 chart.

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APPENDIX 1

This section is a complete list of all the sediment parameters which were obtained from the samples of the Swartkops estuary. The sample lines are marked on fig 3-1. The positions of the sample stations can be found from the coded station numbers listed below. For example sample number Sw 1:2T originates from the Swartkops ("Sw") and was collected on line number 1 ("1", see fig 3-1). It was taken from the sediment surface ("T" denotes TOP) at position 2 on the line. This sampling spot (indicated as a dot, fig 3-1) is the second from the LEFT looking up-estuary. Samples were also collected 0,5m below the sediment surface by coring. These samples are indicated by a "B" (for BOTTOM) in the code.

All grain sizes that are listed below are in PHI-units and NOT in mm. (PHI = \log_2 (grain size in mm/ 1mm))

The parameters listed below are as follows:

VCS - Very coarse sand (grain diameters between 1mm and 2mm)
 CS - Coarse sand (grain diameters between 0,5mm and 1mm)
 MS - Medium sand (grain diameters between 0,25mm and 0,5mm)
 FS - Fine sand (grain diameters between 0,125mm and 0,25mm)
 VFS - Very fine sand (grain diameters between 0,063mm and 0,125mm)
 Mud - Silt + clay (grain diameters less than 0,063mm)

Median ϕ - The distribution median in PHI-units ($M_d = P_{50}$) *
 Mean ϕ - The mean grain size in PHI-units ($M = (P_{16} + P_{84})/2$)
 Sorting ϕ - The grain sorting in PHI-units ($Sorting = (P_{84} - P_{16})/2$)
 Skewness ϕ - The distribution skewness in PHI-units ($Sk = (M - M_d)/S$)
 Kurtosis ϕ - The distribution kurtosis in PHI-units
 ($K = ((P_{95} - P_5)/2 - S)/S$)

% CaCO₃ - The percentage (by mass) calcium carbonate in the sediment
 % Org C - The percentage (by mass) of peroxide digested organic material

* P_x = The Xth Percentile of the cumulative distribution.

All parameter formulas were obtained from Buller and McManus (1979).

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW01:1T	00,00	00,00	04,65	88,37	05,81	01,16	2,51	2,51	0,38	0,00	0,51	30,72	00,55
SW01:1B	00,40	00,79	10,71	84,92	02,78	00,40	2,45	2,45	0,40	0,00	1,03	34,02	00,32
SW01:2T	00,00	00,00	08,37	89,24	01,59	00,80	2,46	2,46	0,38	0,00	0,81	30,31	00,87
SW01:2B	03,50	03,11	21,40	69,65	01,56	00,78	2,31	2,11	0,68	-0,29	0,82	37,02	00,44
SW01:3T	32,67	06,77	27,49	31,87	00,40	00,80	1,37	1,00	1,51	-0,24	0,22	53,14	00,44
SW01:3B	SOLID	SUBSTRATE											
SW01:4T	05,53	04,35	42,29	47,04	00,40	00,40	1,94	1,91	0,76	0,00	0,97	37,43	00,65
SW01:4B	SOLID	SUBSTRATE											
SW01:5T	00,00	00,40	33,20	65,20	00,40	00,80	2,25	2,11	0,65	-0,20	0,38	29,46	00,75
SW01:5B	00,00	00,00	24,02	74,80	00,39	00,79	2,34	2,23	0,57	-0,20	0,53	30,59	00,73
SW02:1T	00,00	00,00	11,95	85,26	01,99	00,80	2,44	2,44	0,40	0,00	0,96	39,81	00,71
SW02:1B	00,00	00,80	32,27	64,54	01,59	00,80	2,26	2,12	0,66	-0,20	0,39	48,47	00,81
SW02:2T	00,00	00,40	38,65	60,16	00,40	00,40	2,18	2,07	0,67	-0,16	0,35	37,71	00,43
SW02:2B	00,80	00,40	11,95	85,66	00,40	00,80	2,43	2,43	0,39	0,00	1,07	32,42	00,51

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW02:3T	00,79	03,16	59,29	35,97	00,00	00,79	1,77	1,88	0,68	0,16	0,36	38,30	00,60
SW02:3B	SOLID SUBSTRATE												
SW02:4T	00,00	00,00	10,28	88,54	00,79	00,40	2,45	2,45	00,38	0,00	0,92	31,00	00,70
SW02:4B	SOLID SUBSTRATE												
SW02:5T	SOLID SUBSTRATE												
SW02:5B	SOLID SUBSTRATE												
SW03:1T	00,39	00,00	11,81	83,46	03,15	01,18	2,45	2,45	00,40	0,00	0,98	32,17	00,73
SW03:1B	00,40	00,00	10,40	86,40	02,00	00,80	2,45	2,45	00,39	0,00	0,96	33,04	00,76
SW03:2T	00,00	00,00	14,00	84,00	01,20	00,80	2,42	2,42	00,40	0,00	0,99	33,44	00,57
SW03:2B	00,39	00,00	16,86	80,78	01,18	00,78	2,40	2,37	00,45	-0,1	0,87	31,70	00,64
SW03:3T	01,19	00,79	43,87	52,57	00,40	01,19	2,07	2,01	00,70	-0,2	0,33	35,75	00,59
SW03:3B	01,97	01,97	33,86	60,24	01,18	00,79	2,20	2,05	00,70	-0,2	0,36	36,31	00,64
SW03:4T	00,40	00,40	44,44	53,97	00,00	00,79	2,08	2,02	00,68	-0,1	0,33	30,84	00,60
SW03:4B	00,00	00,41	43,39	54,96	00,41	00,83	2,11	2,04	00,68	-0,1	0,33	34,92	00,49

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW03:5T	00,00	00,00	21,57	77,25	00,39	00,78	2,36	2,27	0,53	-0,18	0,61	32,20	0,35
SW03:5B	00,00	00,40	29,08	70,12	00,00	00,40	2,29	2,15	0,62	-0,22	0,43	33,20	0,50
SW03:6T	SOLID	SUBSTRATE											
SW03:6B	SOLID	SUBSTRATE											
SW04:1T	00,00	00,00	06,75	90,08	02,78	00,40	2,48	2,48	0,38	0,00	0,65	33,12	0,55
SW04:1B	00,41	00,00	04,07	91,06	03,66	00,81	2,50	2,50	0,37	0,00	0,32	31,77	0,82
SW04:2T	00,00	00,00	17,46	80,56	01,19	00,79	2,40	2,36	0,45	-0,10	0,84	33,06	0,82
SW04:2B	00,00	00,79	26,59	71,03	00,79	00,79	2,31	2,18	0,61	-0,22	0,46	38,48	0,74
SW04:3T	00,00	00,00	15,38	80,97	02,43	01,21	2,42	2,42	0,41	0,00	0,99	32,73	0,57
SW04:3B	00,78	00,39	23,92	73,33	00,39	01,18	2,33	2,20	0,59	-0,22	0,51	33,79	0,57
SW04:4T	00,00	00,00	09,60	88,40	01,20	00,80	2,45	2,45	0,38	0,00	0,89	32,70	0,58
SW04:4B	00,00	00,41	43,39	54,96	00,41	00,83	2,11	2,04	0,68	-0,10	0,33	33,51	0,44
SW04:5T	00,00	00,00	21,57	77,25	00,39	00,78	2,36	2,27	0,53	-0,18	0,61	36,51	0,85
SW04:5B	00,00	00,40	29,08	70,12	00,00	00,40	2,29	2,15	0,62	-0,22	0,43	-	-

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW04:6T	SOLID	SUBSTRATE											
SW04:6B	SOLID	SUBSTRATE											
SW05:1T	00,00	00,00	06,75	90,09	02,78	00,40	2,48	2,48	0,38	0,00	0,65	31,80	01,00
SW05:1B	00,41	00,00	04,07	91,06	03,66	00,81	2,50	2,50	0,37	0,00	0,32	36,90	00,60
SW05:2T	00,00	00,00	17,46	80,56	01,19	00,79	2,40	2,36	0,45	-0,10	0,84	29,30	00,50
SW05:2B	00,00	00,79	26,59	71,03	00,79	00,79	2,31	2,18	0,61	-0,22	0,46	38,00	00,30
SW05:3T	00,00	00,00	15,38	80,97	02,43	01,21	2,42	2,42	0,41	0,00	0,99	29,40	00,40
SW05:3B	00,78	00,39	23,92	73,33	00,39	01,18	2,33	2,22	0,59	-0,22	0,51	35,70	00,40
SW05:4T	00,00	00,00	09,60	88,40	01,20	00,80	2,45	2,45	0,38	0,00	0,89	34,50	00,50
SW05:4B	00,00	00,00	19,84	78,57	00,79	00,79	2,38	2,30	0,50	-0,15	0,68	36,10	00,30
SW05:5T	00,00	00,00	09,96	88,45	00,80	00,80	2,45	2,45	0,38	0,00	0,91	32,30	00,50
SW05:5B	SOLID	SUBSTRATE											
SW05:6T	SOLID	SUBSTRATE											
SW05:6B	SOLID	SUBSTRATE											

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW06:-2T	00,69	00,36	01,72	65,74	19,38	12,11	2,63	2,72	0,55	0,18	0,59	26,50	01,20
SW06:-2B	02,70	00,81	03,78	66,22	14,32	12,16	2,55	2,56	0,46	0,00	1,68	39,30	01,70
SW06:-1T	00,00	00,00	01,89	86,79	10,06	01,26	2,55	2,55	0,39	0,00	0,91	26,60	06,00
SW06:-1B	00,67	00,49	02,27	57,95	25,00	13,64	2,69	2,81	0,63	0,20	0,43	24,20	01,90
SW06:-0T	00,37	00,00	02,23	56,13	23,05	18,22	2,68	2,81	0,62	0,20	0,44	30,40	01,50
SW06:-0B	00,26	00,26	04,45	78,53	08,12	08,38	2,52	2,52	0,40	0,00	0,92	29,00	05,00
SW06:1T	00,00	00,00	01,63	86,10	09,81	02,45	2,55	2,55	0,39	0,00	0,90	26,80	03,00
SW06:1B	00,00	00,34	03,78	83,51	09,97	02,41	2,53	2,53	0,40	0,00	0,89	32,20	07,00
SW06:2T	00,28	00,56	03,61	87,50	08,06	00,00	2,52	2,52	0,39	0,00	0,77	27,80	04,00
SW06:2B	00,00	00,00	01,49	79,76	09,82	08,93	2,55	2,55	0,39	0,00	0,93	31,90	06,20
SW06:3T	00,31	00,93	04,35	88,82	05,59	00,00	2,50	2,50	0,38	0,00	0,62	18,50	04,00
SW06:3B	02,21	01,38	09,39	82,32	02,76	01,63	2,44	2,44	0,41	0,00	0,1,26	22,90	03,00
SW06:4T	00,00	00,31	03,67	89,91	04,59	01,53	2,50	2,50	0,37	0,00	0,32	36,50	06,00
SW06:4B	08,22	01,37	08,56	63,36	05,14	13,36	2,40	2,18	0,68	-0,32	1,66	25,50	02,00

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW06:5T	00,50	00,25	02,73	87,10	07,94	01,49	2,53	2,53	0,38	0,00	0,77	36,70	04,00
SW06:5B	02,00	00,67	05,00	73,67	08,33	10,33	2,50	2,50	0,41	0,00	1,54	15,60	01,00
SW06:6T	01,51	01,51	14,44	77,16	02,59	02,80	2,40	2,35	0,48	-0,11	0,91	30,20	TR
SW06:6B	00,32	00,65	03,24	86,41	05,50	03,88	2,51	2,51	0,38	0,00	0,48	34,80	09,00
SW06:7T	SOLID	SUBSTRATE											
SW06:7B	SOLID	SUBSTRATE											
SW07:1T	00,62	00,31	02,49	75,08	12,77	08,72	2,56	2,56	0,41	0,00	0,97	22,10	09,00
SW07:1B	00,00	00,35	02,12	76,33	14,13	07,07	2,58	2,58	0,41	0,00	0,98	33,10	00,00
SW07:2T	01,17	00,47	07,94	88,79	00,47	01,17	2,45	2,45	0,38	0,00	1,03	29,60	05,00
SW07:2B	01,34	00,67	05,13	88,17	02,90	01,79	2,48	2,48	0,38	0,00	0,86	31,60	03,00
SW07:3T	01,95	00,73	05,35	89,54	01,22	01,22	2,46	2,46	0,38	0,00	1,05	29,80	03,00
SW07:3B	01,06	00,21	06,34	89,22	02,11	01,06	2,47	2,47	0,38	0,00	0,84	27,30	00,00
SW07:4T	06,35	01,34	06,35	75,25	10,37	00,33	2,48	2,48	0,45	0,00	3,15	33,70	01,00
SW07:4B	00,70	00,70	05,28	73,24	10,21	09,86	2,52	2,52	0,42	0,00	1,36	23,40	06,90

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW07:5T	00,55	00,55	01,94	71,19	19,94	05,82	2,62	2,71	0,54	0,16	0,62	31,40	1,00
SW07:5B	01,89	00,38	01,89	57,74	13,96	24,15	2,58	2,63	0,50	0,10	0,93	27,01	8,90
SW07:6T	00,31	00,00	01,23	57,06	28,22	13,19	2,73	2,86	0,65	0,20	0,39	21,00	1,70
SW07:6B	00,00	00,25	01,52	73,99	18,69	05,56	2,61	2,69	0,51	0,14	0,69	34,10	8,00
SW08:1T	00,40	00,40	02,39	84,46	09,56	02,79	2,54	2,54	0,39	0,00	0,88	23,40	0,40
SW08:1B	00,40	00,40	01,58	58,89	17,79	20,95	2,63	2,73	0,56	0,18	0,57	23,05	1,20
SW08:2T	11,11	01,19	09,13	76,98	00,40	01,19	2,36	2,09	0,71	-0,38	1,47	-	0,67
SW08:2B	02,01	00,80	04,02	86,35	05,22	01,61	2,49	2,49	0,39	0,00	0,98	30,91	0,59
SW08:3T	00,00	00,00	03,15	94,49	01,57	00,79	2,49	2,49	0,36	0,00	0,32	-	0,97
SW08:3B	01,94	01,56	06,64	57,81	11,33	20,70	2,51	2,51	0,47	0,00	1,77	25,86	1,20
SW08:4T	00,00	00,40	02,40	93,20	03,20	00,80	2,50	2,50	0,36	0,00	0,32	33,58	0,59
SW08:4B	03,56	01,19	04,35	81,03	05,93	03,95	2,48	2,48	0,40	0,00	1,70	29,96	0,50
SW08:5T	00,00	00,00	00,79	59,13	33,33	06,75	2,78	2,90	0,66	0,18	0,37	24,03	1,30
SW08:5B	00,82	00,41	01,63	60,41	25,31	11,43	2,69	2,81	0,63	0,20	0,44	-	0,50

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW09:1T	03,60	00,80	03,20	63,40	14,40	15,60	2,55	2,58	0,48	0,00	2,03	15,09	1,60
SW09:1B	03,04	01,76	04,15	46,96	25,24	18,85	2,67	2,79	0,70	0,16	1,33	21,60	2,70
SW09:2T	08,40	00,80	04,80	82,00	02,00	02,00	2,43	2,43	0,41	0,00	03,16	38,46	1,53
SW09:2B	29,20	02,00	06,80	54,40	05,20	02,40	2,46	2,46	0,43	0,00	1,16	50,59	1,00
SW09:3T	01,57	01,57	24,31	71,76	00,39	00,39	2,31	2,15	0,63	-0,25	0,48	28,52	1,03
SW09:3B	NOT RECORDED												
SW09:4T	00,00	00,00	01,59	85,92	11,90	01,19	2,56	2,56	0,39	0,00	0,96	27,62	1,05
SW09:4B	00,41	00,82	03,69	84,43	05,74	04,93	2,50	2,50	0,38	0,00	0,59	28,68	0,00
SW09:5T	00,00	00,41	00,41	88,52	09,43	01,23	2,55	2,55	0,38	0,00	0,88	31,17	0,00
SW09:5B	00,00	00,40	02,77	79,05	15,02	02,77	2,58	2,58	0,42	0,00	0,98	32,03	0,40
SW10:1T	09,69	00,98	05,06	67,56	09,69	07,02	2,46	2,38	0,55	-0,14	2,70	20,33	1,20
SW10:1B	00,40	00,40	01,61	56,05	21,77	19,76	2,67	2,80	0,61	0,20	0,46	14,54	1,90
SW10:2T	02,03	01,22	08,94	82,52	02,85	02,44	2,44	2,44	0,40	0,00	1,23	22,67	0,50
SW10:2B	02,02	01,61	09,27	81,85	02,28	02,42	2,44	2,44	0,41	0,00	1,27	34,67	0,50

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW10:3T	00,80	00,40	12,80	85,20	00,00	00,80	2,42	2,42	0,40	0,00	1,08	26,45	1,24
SW10:3B	NOT DONE											04,57	0,80
SW10:4T	00,40	00,40	11,95	86,06	00,40	00,80	2,43	2,43	0,39	0,00	1,04	17,79	0,90
SW10:4B	00,00	00,00	02,79	86,85	08,37	01,99	2,53	2,53	0,38	0,00	0,81	21,14	0,68
SW10:5T	00,17	00,17	02,05	75,09	19,28	03,24	2,61	2,69	0,51	0,14	0,68	23,70	0,90
SW10:5B	00,40	00,40	03,19	74,50	14,74	06,77	2,57	2,57	0,43	0,00	0,97	24,84	0,70
SW10:6T	01,08	00,72	03,25	68,35	23,87	02,71	2,64	2,75	0,60	0,19	0,56	16,17	1,80
SW10:6B	NOT DONE											21,93	0,40
SW11:1T	09,97	01,99	03,32	54,49	13,95	16,28	2,57	2,62	0,52	0,10	1,41	23,00	1,60
SW11:1B	06,09	00,96	02,24	45,51	17,95	27,24	2,60	2,70	0,65	0,16	2,23	16,60	6,20
SW11:2T	02,16	01,35	04,32	84,05	05,68	02,43	2,49	2,49	0,39	0,00	1,31	21,10	6,00
SW11:2B	04,61	04,22	18,04	70,44	00,77	01,93	2,31	2,08	0,70	-0,33	1,04	29,90	8,00
SW11:3T	00,00	00,23	21,44	75,40	01,35	01,58	2,37	2,27	0,54	-0,18	0,60	21,20	6,00
SW11:3B	02,56	01,37	10,07	80,20	02,22	03,58	2,43	2,43	0,41	1,36E-16	1,30	37,40	6,00

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW11:4T	00,00	00,00	02,29	40,00	05,21	02,50	2,52	2,52	0,37	0,00	0,41	20,70	05,00
SW11:4B	00,00	00,00	16,20	82,41	00,46	00,93	2,40	2,40	0,42	0,00	0,96	10,60	02,10
SW11:5T	00,00	00,32	04,53	73,14	12,94	09,06	2,56	2,56	0,42	0,00	1,03	20,30	01,10
SW11:5B	00,00	00,00	09,59	53,42	27,40	09,59	2,67	2,78	0,69	0,17	0,71	23,70	05,00
SW11:6T	00,32	00,00	01,27	64,01	24,20	10,19	2,68	2,80	0,60	0,21	0,47	21,80	01,60
SW11:6B	00,00	00,35	02,08	70,93	19,03	07,61	2,62	2,70	0,52	0,16	0,65	28,00	01,00
SW11:7T	00,25	00,25	01,75	44,25	14,00	39,50	2,63	2,74	0,57	0,18	0,55	13,40	01,90
SW11:7B	00,29	00,29	04,64	73,62	11,30	09,86	2,54	2,54	0,42	0,01	1,11	24,10	01,20
SW12:1T	02,06	00,52	02,58	65,98	18,56	10,31	2,60	2,68	0,54	0,15	0,86	19,70	01,10
SW12:1B	03,06	01,02	03,06	51,53	14,29	27,04	2,57	2,64	0,55	0,12	1,89	21,30	02,20
SW12:2T	00,53	00,53	03,74	43,32	22,46	29,41	2,70	2,82	0,67	0,18	0,62	17,90	02,40
SW12:2B	00,60	00,30	28,86	66,96	01,18	2,10	2,29	2,15	0,64	-0,22	0,42	27,40	26,10
SW12:3T	24,01	02,78	04,86	21,54	10,42	33,43	1,93	1,21	1,80	-0,40	0,27	47,30	02,60
SW12:3B	56,08	09,41	15,29	12,94	01,18	05,11	-0,15	0,60	1,33	0,57	0,37	66,90	01,00

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW12:4T	01,45	02,42	09,66	42,51	19,81	24,15	2,57	2,62	0,77	0,10	0,85	22,90	1,7
SW12:4B	04,66	02,19	19,18	72,05	00,55	01,35	2,32	2,13	0,66	-0,30	1,13	23,11	0,5
SW12:5T	00,00	00,00	02,70	73,35	13,51	10,42	2,57	2,57	0,42	0,00	0,98	20,90	1,4
SW12:5B	00,00	00,74	04,43	55,35	14,02	25,46	2,58	2,64	0,51	0,11	1,00	26,30	1,5
SW12:6T	00,00	00,00	04,50	65,50	08,50	21,50	2,53	2,53	0,41	0,00	1,04	12,90	1,6
SW12:6B	00,30	00,30	02,69	56,72	15,82	24,18	2,61	2,69	0,54	0,16	0,63	14,90	1,8
SW13:1T	13,70	03,46	07,13	39,52	11,45	25,27	2,34	1,45	1,54	-0,58	0,43	09,17	1,2
SW13:1B	SOLID	SUBSTRATE											
SW13:2T	37,96	01,84	09,21	42,21	03,97	04,82	1,85	1,07	1,67	-0,47	0,16	33,53	0,6
SW13:2B	SOLID	SUBSTRATE											
SW13:3T	13,46	03,76	13,15	39,28	09,08	21,28	2,23	1,42	1,49	-0,54	0,44	25,96	1,1
SW13:3B	18,30	02,92	19,36	47,61	02,92	08,89	2,10	1,28	1,48	-0,56	0,26	19,34	0,9
SW13:4T	03,32	01,88	26,73	66,62	00,43	01,01	2,26	2,08	0,69	-0,26	0,51	19,62	1,1
SW13:4B	00,79	00,63	06,34	86,53	02,06	03,65	2,47	2,47	0,38	0,00	0,89	19,44	0,9

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW13:5T	00,16	00,16	01,80	70,00	12,30	15,57	2,57	2,57	0,41	0,00	0,98	02,43	1,3
SW13:5B	00,28	00,14	01,51	72,76	10,04	15,27	2,56	2,56	0,40	0,00	0,95	08,39	0,9
SW14:1T	08,73	00,92	07,04	58,50	07,88	17,15	2,42	2,21	0,70	-0,31	1,86	07,38	1,4
SW14:1B	07,07	01,48	08,55	60,03	08,39	14,47	2,43	2,26	0,66	-0,26	1,96	27,80	1,0
SW14:2T	00,30	00,30	09,53	85,78	02,27	01,82	2,45	2,45	0,39	0,00	0,95	17,71	1,0
SW14:2B	10,36	01,26	11,90	65,97	03,78	06,72	2,35	2,05	0,78	-0,38	1,28	18,43	1,0
SW14:3T	00,18	00,18	02,67	89,27	06,81	00,90	2,52	2,52	0,38	0,00	0,66	16,73	0,5
SW14:3B	00,00	00,00	01,05	80,42	18,11	00,42	2,61	2,65	0,47	0,10	0,79	15,04	1,1
SW14:4T	00,86	01,00	11,02	84,69	01,86	00,57	2,43	2,43	0,40	0,00	1,11	09,45	0,9
SW14:4B	01,51	1,01	06,78	45,73	37,94	07,04	2,81	2,86	0,74	0,10	0,72	43,81	1,6
SW14:5T	00,51	00,17	01,53	70,92	16,50	10,37	2,60	2,65	0,48	0,10	0,77	12,47	1,4
SW14:5B	00,74	00,37	02,21	57,73	29,04	09,93	2,72	2,85	0,66	0,19	0,39	11,11	1,0

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW15:1T	01,94	01,16	10,47	51,94	13,18	21,32	2,50	2,48	0,57	0,00	1,30	07,65	00,68
SW15:1B	03,57	01,59	15,87	56,35	05,56	17,06	2,36	2,19	0,68	-0,26	1,14	16,61	01,36
SW15:2T	00,00	00,00	07,57	90,84	00,80	00,80	2,46	2,46	0,37	0,00	0,75	14,52	00,51
SW15:2B	08,53	03,88	17,83	49,22	05,81	14,73	2,25	1,96	0,89	-0,34	1,13	17,26	02,44
SW15:3T	00,41	00,00	03,28	72,13	15,98	08,20	2,59	2,62	0,46	0,10	0,83	13,65	00,00
SW15:3B	00,00	00,00	00,79	75,10	17,39	06,72	2,61	2,67	0,48	0,11	0,76	16,72	00,98
SW15:4T	00,39	00,39	05,51	75,20	11,02	07,48	2,53	2,53	0,42	0,00	1,25	16,74	01,57
SW15:4B	01,62	00,81	06,07	68,02	13,36	10,12	2,54	2,54	0,45	0,00	1,59	16,29	01,29
SW15:5T	00,00	00,39	05,06	72,37	10,12	12,06	2,53	2,53	0,41	0,00	1,15	14,37	01,27
SW15:5B	00,45	00,45	03,18	56,82	24,55	14,55	2,68	2,81	0,64	0,20	0,42	17,77	01,30
SW15:6T	05,08	01,95	21,48	68,75	00,78	01,95	2,30	2,09	0,69	-0,30	1,16	18,57	00,71
SW15:6B	02,35	02,75	14,12	78,43	01,57	00,78	2,39	2,29	0,53	-0,18	0,90	21,96	00,42
SW15:7T	00,40	00,79	04,35	67,19	15,42	11,86	2,57	2,61	0,48	0,10	1,06	04,89	01,73
SW15:7B	00,40	00,40	04,76	72,62	10,32	11,51	2,53	2,53	0,41	-0,01	1,18	15,27	01,93

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW15:8T	00,00	00,40	01,59	33,47	13,55	51,00	2,67	2,80	0,62	0,20	0,45	0,00	3,46
SW15:8B	00,40	00,40	01,59	33,33	13,49	50,79	2,67	2,79	0,63	0,20	0,45	06,28	3,0
SW16:1T	02,84	00,60	06,44	50,45	15,57	24,10	2,56	2,63	0,59	0,13	1,30	12,61	0,9
SW16:1B	SOLID	SUBSTRATE											
SW16:2T	10,00	19,44	43,89	25,08	00,37	01,30	1,45	1,34	1,04	-0,11	0,59	12,61	2,0
SW16:2B	03,74	00,93	10,28	81,00	02,65	01,40	2,42	2,42	0,41	1,34E-16	1,35	18,03	1,4
SW16:3T	06,21	01,24	08,69	52,84	14,18	16,84	2,48	2,37	0,69	-0,16	1,91	23,75	1,1
SW16:3B	00,18	00,18	05,16	72,19	12,34	09,94	2,55	2,55	0,42	0,00	1,16	18,03	0,4
SW16:4T	01,43	00,39	04,30	57,29	14,32	22,27	2,57	2,62	0,51	0,10	1,20	17,29	1,1
SW16:4B	03,45	01,73	10,71	65,63	08,64	09,84	2,44	2,39	0,52	-0,11	1,74	23,08	0,8
SW16:5T	01,02	00,17	03,74	56,37	12,90	25,81	2,57	2,60	0,48	0,10	1,13	06,64	0,5
SW16:5B	00,18	00,18	04,76	70,88	11,36	12,64	2,54	2,54	0,42	0,00	1,12	21,20	1,4
SW16:6T	02,59	01,63	19,29	74,23	00,97	01,30	2,35	2,20	0,60	-0,25	0,59	00,00	0,4
SW16:6B	04,74	04,91	23,69	60,24	01,35	05,08	2,23	2,00	0,77	-0,30	0,91	-	1,5

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW16:7T	00,94	00,38	05,64	84,96	06,39	01,69	2,50	2,50	0,39	0,00	1,02	0	1,4
SW16:7B	29,41	11,19	27,83	27,83	02,01	01,72	1,31	1,02	1,49	-0,19	0,25	0	1,5
SW16:8T	00,36	00,18	06,07	78,39	09,64	05,36	2,52	2,52	0,41	0,00	1,21	12,40	0,5
SW16:8B	01,13	00,94	06,95	47,93	17,67	25,38	2,59	2,69	0,63	0,16	1,02	0	1,1
SW17:1T	01,78	00,36	04,62	38,72	23,09	31,44	2,71	2,82	0,71	0,15	0,82	07,88	0,5
SW17:1B	01,82	01,52	07,01	36,10	20,26	33,25	2,64	2,74	0,73	0,14	0,95	09,88	2,1
SW17:2T	00,65	00,65	05,19	55,84	17,86	19,81	2,60	2,70	0,58	0,16	0,93	18,44	0,8
SW17:2B	SOLID	SUBSTRATE											
SW17:3T	22,52	03,75	10,46	46,65	08,31	08,31	2,20	1,21	1,61	-0,58	0,32	24,44	1,4
SW17:3B	SOLID	SUBSTRATE											
SW17:4T	01,10	01,77	09,27	72,19	08,61	07,06	2,48	2,48	0,44	0,00	1,59	19,32	1,2
SW17:4B	00,00	00,24	01,21	44,90	23,54	30,10	2,75	2,87	0,65	0,19	0,38	17,41	2,0
SW17:5T	00,34	00,23	02,15	25,68	67,87	03,73	3,29	3,13	0,64	-0,25	0,44	08,54	0,0
SW17:5B	12,14	01,43	05,71	48,10	13,10	19,52	2,44	1,77	1,25	-0,54	0,74	14,94	1,2

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW17:6T	04,56	00,80	04,02	73,99	09,92	06,70	2,50	2,50	0,43	0,00	2,96	10,51	1,3
SW17:6B	11,06	02,08	05,77	49,36	11,38	20,35	2,42	1,89	1,08	-0,49	0,98	11,85	0,8
SW18:1T	01,28	01,07	28,36	64,18	02,99	02,13	2,28	2,14	0,67	-0,22	0,41	14,13	1,2
SW18:1B	SOLID SUBSTRATE												
SW18:2T	02,20	01,47	08,79	39,56	19,05	28,94	2,58	2,64	0,76	0,10	0,89	11,29	2,0
SW18:2B	05,24	10,73	39,27	37,96	02,09	04,71	1,81	1,79	0,86	0,00	0,75	11,76	1,4
SW18:3T	01,03	01,03	03,61	60,31	17,01	17,01	2,59	2,67	0,55	0,14	0,99	11,81	0,9
SW18:3B	02,81	01,20	04,02	65,86	12,05	14,06	2,53	2,53	0,44	0,00	1,90	26,34	0,8
SW18:4T	06,42	02,14	05,20	40,06	18,96	27,22	2,56	2,49	0,90	-0,10	1,37	17,21	0,8
SW18:4B	SOLID SUBSTRATE												
SW18:5T	01,16	00,87	11,30	81,74	03,77	01,16	2,44	2,44	0,41	0,00	1,10	19,95	1,3
SW18:5B	05,05	01,35	07,74	63,97	09,09	12,79	2,46	2,45	0,47	0,00	2,86	16,39	1,5
SW19:1T	00,37	00,00	01,49	30,22	25,37	42,54	2,89	2,94	0,70	0,1	0,33	07,00	1,7
SW19:1B	00,00	00,48	01,90	35,71	25,71	36,19	2,83	2,91	0,69	0,12	0,34	06,40	1,9

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW19:2T	00,35	00,00	01,73	58,48	24,91	14,53	2,70	2,82	0,63	0,21	0,43	13,70	1,5
SW19:2B	00,00	00,00	00,51	28,93	35,03	35,53	3,08	3,02	0,68	-0,10	0,33	09,70	2,7
SW19:3T	00,71	01,43	17,86	75,36	02,86	01,79	2,39	2,29	0,53	-0,17	0,70	21,10	16,1
SW19:3B	00,56	00,00	02,25	83,99	11,52	01,69	2,55	2,55	0,40	0,00	0,94	18,60	6,0
SW19:4T	00,29	00,29	01,75	55,10	13,99	28,57	2,61	2,67	0,51	0,13	0,69	16,80	2,1
SW19:4B	01,28	00,43	03,85	61,54	17,52	15,38	2,60	2,68	0,55	0,15	0,92	17,10	22,1
SW19:5T	01,24	00,31	03,73	66,15	11,18	17,39	2,54	2,54	0,42	0,00	1,28	18,20	1,9
SW19:5B	01,25	00,42	04,57	85,03	05,61	03,12	2,50	2,50	0,39	0,00	0,86	30,70	1,2
SW19:6T	00,40	00,40	05,16	76,19	07,94	09,94	2,51	2,51	0,40	0,00	1,13	16,70	1,2
SW19:6B	00,32	00,00	04,43	70,25	08,23	16,77	2,52	2,52	0,40	0,00	1,02	20,51	1,4
SW20:1T	00,00	00,36	01,08	55,91	31,90	10,75	2,77	2,89	0,66	0,18	0,37	00,00	1,5
SW20:1B	00,00	00,00	00,84	43,28	41,18	14,71	2,97	2,98	0,69	0,00	0,32	00,00	1,7
SW20:2T	32,80	00,96	04,46	48,73	03,83	09,24	2,15	1,11	1,67	-0,62	0,15	41,20	1,1
SW20:2B	08,29	01,84	10,60	73,27	02,76	03,23	2,38	2,17	0,66	-0,32	1,56	32,10	0,6

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW20:3T	00,29	00,57	05,46	83,18	06,03	05,46	2,50	2,50	0,39	0,00	0,93	19,70	0,7
SW20:3B	00,23	00,00	02,80	83,68	10,96	02,33	2,55	2,55	0,40	0,00	0,92	24,10	0,5
SW20:4T	00,26	00,26	05,93	88,92	02,84	01,80	2,48	2,48	0,38	0,00	0,65	22,20	0,8
SW20:4B	00,00	00,00	02,08	83,86	12,47	02,60	2,56	2,56	0,40	0,00	0,97	21,70	0,5
SW20:5T	00,27	00,27	04,27	74,93	08,80	11,47	2,53	2,53	0,40	0,00	0,97	18,60	1,1
SW20:5B	00,81	00,27	02,70	65,68	10,27	20,27	2,55	2,55	0,41	0,00	0,95	16,00	1,4
SW20:6T	00,61	00,00	02,13	66,77	14,02	16,46	2,58	2,60	0,44	0,00	0,89	18,90	1,5
SW20:6B	01,96	00,33	02,94	64,71	11,44	18,63	2,55	2,55	0,43	0,00	1,38	22,60	1,6
SW20:7T	00,00	00,00	01,30	45,65	21,74	31,30	2,72	2,85	0,64	0,20	0,40	19,10	0,4
SW20:7B	00,00	00,00	01,63	52,44	23,98	21,95	2,71	2,84	0,64	0,20	0,41	19,60	1,2
SW20:8T	00,74	00,74	12,84	82,72	01,23	01,73	2,42	2,42	0,40	0,00	1,09	20,90	0,7
SW20:8B	00,21	00,21	02,29	91,48	03,95	01,87	2,51	2,51	0,36	0,00	0,32	22,70	0,0
SW20:9T	00,41	00,00	05,37	79,34	05,37	09,50	2,50	2,50	0,39	0,00	0,80	14,00	1,0
SW20:9B	00,20	00,20	05,23	85,31	04,63	04,43	2,49	2,49	0,38	0,00	0,52	18,70	1,1

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW21:1T	00,00	00,27	04,80	84,27	08,27	02,40	2,52	2,52	0,39	0,00	0,84	13,98	1,0
SW21:1B	00,83	00,28	05,25	76,24	12,71	04,70	2,54	2,54	0,43	0,00	1,27	16,00	0,9
SW21:2T	00,31	00,31	00,93	60,44	31,15	06,85	2,74	2,87	0,65	0,19	0,38	11,74	0,9
SW21:2B	00,38	00,38	03,41	74,24	15,91	05,68	2,58	2,60	0,45	0,00	0,88	19,83	1,4
SW21:3T	00,24	00,24	04,39	83,17	10,98	00,98	2,54	2,54	0,40	0,00	0,91	18,22	1,0
SW21:3B	00,56	00,56	09,27	80,62	05,62	03,37	2,47	2,47	0,41	0,00	1,13	21,96	1,4
SW21:4T	00,99	01,23	11,36	80,49	03,21	02,72	2,44	2,44	0,41	0,00	1,13	21,08	1,1
SW21:4B	06,21	01,13	06,78	78,53	03,67	03,67	2,43	2,43	0,42	0,00	2,85	24,87	1,0
SW21:5T	00,60	00,30	03,28	85,37	05,97	04,48	2,51	2,51	0,38	0,00	0,57	23,90	0,7
SW21:5B	00,26	00,26	04,17	75,26	12,50	07,55	2,55	2,55	0,42	0,00	0,97	28,21	0,9
SW21:6T	00,00	00,00	01,11	38,89	28,89	31,11	2,86	2,94	0,68	0,12	0,34	11,22	1,3
SW21:6B	00,55	00,55	04,97	65,75	08,01	20,17	2,51	2,51	0,41	0,00	1,33	14,60	2,2
SW21:7T	00,00	00,27	01,59	93,37	03,71	01,06	2,51	2,51	0,36	0,00	0,32	24,70	0,4
SW21:7B	00,32	00,32	01,92	92,33	01,60	03,51	2,49	2,49	0,36	0,00	0,32	23,90	0,9

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW21:8T	01,26	00,76	08,59	86,62	02,02	00,76	2,45	2,45	0,39	0,00	1,08	24,6	0,6
SW21:8B	00,28	00,28	05,11	90,06	01,99	02,27	2,48	2,48	0,37	0,00	0,52	25,2	0,0
SW21:9T	00,25	00,50	01,24	89,83	04,96	03,23	2,52	2,52	0,37	0,00	0,36	18,3	0,6
SW21:9B	00,00	00,00	03,16	92,53	03,45	00,86	2,50	2,50	0,36	0,00	0,32	36,8	0,6
SW22:1T	04,24	00,28	01,98	67,81	07,34	18,64	2,51	2,51	0,41	0,00	3,25	8,9	1,3
SW22:1B	00,00	00,60	05,07	74,63	14,63	05,07	2,56	2,56	0,43	0,00	1,15	9,2	1,4
SW22:2T	00,00	00,49	32,76	65,04	00,24	01,47	2,25	2,11	0,65	-0,20	0,38	14,2	0,5
SW22:2B	00,47	00,71	21,56	73,70	00,71	02,84	2,35	2,35	0,57	-0,21	0,57	14,1	0,9
SW22:3T	00,00	00,51	23,27	75,19	00,51	00,51	2,35	2,23	0,57	-0,21	0,54	14,6	0,9
SW22:3B	00,52	01,03	23,30	64,43	02,06	08,76	2,32	2,18	0,62	-0,23	0,47	17,4	0,6
SW22:4T	00,28	01,38	14,60	74,93	02,20	06,61	2,41	2,37	0,46	-0,10	0,91	18,5	1,0
SW22:4B	03,30	24,29	60,14	11,08	00,47	00,71	1,37	1,22	0,70	-0,20	0,79	5,6	0,9
SW22:5T	00,00	00,27	53,21	21,39	20,32	04,81	1,89	2,27	0,98	0,38	0,36	16,9	1,0
SW22:5B	00,29	00,29	17,49	68,51	00,87	12,54	2,37	2,29	0,52	-0,17	0,66	21,8	1,5

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW22:7T	00,00	00,00	14,14	78,39	05,08	02,12	2,44	2,44	0,42	0,00	1,00	24,8	1,7
SW22:7B	00,42	00,42	02,97	70,76	20,76	04,66	2,62	2,71	0,55	0,17	0,59	43,8	1,9
SW23:1T	00,46	00,46	06,85	52,51	13,24	26,48	2,55	2,59	0,52	0,10	1,24	5,9	1,7
SW23:1B	00,00	00,33	14,67	51,79	11,41	21,82	2,47	2,40	0,57	-0,11	1,10	8,1	2,1
SW23:2T	04,44	18,73	29,84	15,56	11,11	20,32	1,56	1,67	1,23	0,10	0,53	4,2	2,1
SW23:2B	02,85	00,95	03,90	72,92	08,31	11,16	2,50	2,50	0,41	0,00	1,77	5,0	1,3
SW23:3T	08,99	25,56	21,35	12,92	15,45	15,73	1,36	1,65	1,48	0,20	0,44	12,10	2,0
SW23:3B	00,67	01,34	39,26	12,42	08,72	37,58	1,74	2,05	0,85	0,36	0,54	8,6	1,8
SW23:4T	21,01	01,69	02,42	38,65	12,08	24,15	2,33	1,29	1,71	-0,61	0,32	22,20	2,3
SW23:4B	SOLID	SUBSTRATE											
SW23:5T	00,00	00,00	36,04	27,75	05,26	28,95	1,93	2,04	0,74	0,14	0,51	24,10	1,3
SW23:5B	00,57	00,57	04,00	87,14	04,00	03,71	2,49	2,49	0,38	0,00	0,43	33,20	0,6
SW24:1T	00,35	01,06	39,01	48,58	04,26	06,74	2,13	2,06	0,72	-0,10	0,33	9,4	0,9
SW24:1B	00,00	01,77	28,62	33,57	07,77	28,27	2,16	2,11	0,78	-0,10	0,6	5,1	1,4

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW24:2T	NOT RECORDED												
SW24:2B	00,60	02,40	16,77	12,57	05,99	61,68	1,96	2,09	0,9	0,14	0,74	11,1	2,6
SW24:3T	08,72	02,68	06,71	20,13	12,08	49,66	2,35	1,63	1,71	-0,42	0,32	10,5	3,3
SW24:3B	SOLID	SUBSTRATE											
SW24:4T	19,44	01,85	02,31	14,35	09,72	52,31	2,02	1,30	1,91	-0,37	0,21	18,1	1,8
SW24:4B	SOLID	SUBSTRATE											
SW24:5T	07,22	01,39	04,44	42,50	11,67	32,78	2,48	2,28	0,80	-0,25	1,66	18,1	1,7
SW24:5B	14,47	04,26	07,23	49,36	07,23	17,45	2,31	1,40	1,46	-0,62	0,40	27,5	1,2
SW25:1T	00,17	02,19	32,83	45,29	06,06	13,47	2,18	2,09	0,74	-0,12	0,51	4,5	0,8
SW25:1B	00,62	07,10	42,90	30,25	06,06	12,65	1,84	1,95	0,80	0,14	0,74	7,7	0,8
SW25:2T	00,55	01,65	19,78	26,92	14,29	36,81	2,36	2,35	0,95	0,00	0,44	5,2	1,9
SW25:2B	00,25	03,76	63,91	19,05	03,01	10,03	1,64	1,78	0,62	0,23	0,54	5,2	1,0
SW25:3T	00,66	04,59	61,64	20,66	03,28	09,18	1,65	1,80	0,65	0,23	0,60	4,1	1,4
SW25:3B	00,83	05,81	53,11	21,16	01,66	17,33	1,65	1,79	0,67	0,21	0,74	5,2	0,9

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Orig C
SW25:4T	00,00	01,32	19,74	61,18	08,55	09,21	2,40	2,29	0,62	-0,18	0,87	7,4	1,2
SW25:4B	0,66	04,64	50,99	27,81	02,32	13,58	1,74	1,88	0,71	0,19,	0,51	7,6	1,2
SW25:5T	00,36	02,16	32,37	43,53	06,37	15,11	2,17	2,09	0,75	-0,11	0,53	4,9	2,0
SW25:5B	02,61	05,22	08,70	21,74	10,43	51,30	2,36	2,12	1,13	-0,20	0,70	3,9	2,4
SW26:1T	NOT RECORDED												
SW26:1B	00,63	00,63	24,38	49,38	10,63	14,38	2,35	2,22	0,71	-0,17	0,73	8,4	1,5
SW26:2T	00,59	01,76	45,88	22,35	04,12	25,29	1,76	1,93	0,72	-0,23	0,43	6,8	1,9
SW26:2B	01,59	02,78	24,60	63,10	02,38	05,56	2,29	2,12	0,68	-0,25	0,43	19,9	1,4
SW26:3T	01,66	35,22	45,51	05,32	01,00	11,30	1,16	1,09	0,74	-0,10	0,55	3,9	1,6
SW26:3B	03,83	26,52	43,77	09,27	02,24	14,38	1,28	1,16	0,79	-0,16	0,75	5,5	1,0
SW26:4T	00,37	08,49	65,31	05,90	01,48	18,45	1,49	1,49	0,42	0,00	1,50	3,8	1,4
SW26:4B	01,04	11,40	58,03	06,22	01,55	21,76	1,46	1,46	0,46	0,00	1,58	4,2	1,3
SW26:5T	00,26	00,77	50,64	23,53	00,77	24,04	1,73	1,87	0,65	0,21	0,40	6,4	1,0
SW26:5B	00,68	00,68	18,37	23,81	14,97	41,30	2,40	2,41	0,97	0,00	0,40	7,8	1,7

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW27:1T	01,74	00,70	10,10	48,08	10,10	29,27	2,47	2,43	0,55	-0,10	1,32	9,0	1,7
SW27:1B	02,00	00,50	05,50	68,50	06,00	17,50	2,49	2,49	0,41	0,00	1,46	16,60	1,9
SW27:2T	00,72	02,16	07,19	31,65	14,75	43,53	2,57	2,62	0,77	0,10	0,85	7,5	1,3
SW27:2B	01,35	04,48	10,76	32,74	17,49	33,18	2,51	2,42	0,97	-0,10	0,74	3,6	0,0
SW27:3T	00,35	08,75	72,24	07,22	00,76	10,65	1,49	1,49	0,42	0,00	1,40	5,1	1,5
SW27:3B	01,49	18,91	56,72	07,96	01,00	13,93	1,40	1,28	0,63	-0,18	0,92	6,9	2,1
SW27:4T	00,00	00,38	52,26	32,33	01,13	13,91	1,82	1,93	0,68	0,17	0,35	4,6	2,6
SW27:4B	00,00	00,95	44,55	27,01	01,90	25,59	1,81	1,94	0,69	0,18	0,35	4,3	0,9
SW27:5T	00,00	00,52	13,40	45,36	16,49	24,23	2,53	2,57	0,70	0,10	0,81	8,4	2,2
SW27:5B	00,00	01,86	32,56	34,42	08,84	22,33	2,13	2,11	0,79	0,00	0,59	0,0	1,1
SW28:1T	00,50	00,50	05,45	24,26	26,73	42,57	2,92	2,88	0,77	0,00	0,65	6,4	1,2
SW28:1B	01,82	00,61	09,70	22,42	06,67	58,79	2,38	2,22	0,79	-0,20	1,08	5,7	1,2
SW28:2T	00,40	00,40	04,38	19,12	21,13	54,57	2,92	2,88	0,77	0,00	0,65	5,7	1,8
SW28:2B	00,54	01,63	10,81	32,97	18,38	35,68	2,58	2,60	0,84	0,00	0,62	7,0	0,60

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW28:3T	00,57	10,29	45,71	08,00	00,57	34,86	1,48	1,46	0,50	0,00	1,40	4,8	1,5
SW28:3B	00,76	18,32	53,82	07,63	01,15	18,32	1,40	1,30	0,62	-0,17	0,95	5,2	1,7
SW28:4T	01,53	00,51	13,78	24,49	08,16	51,53	2,34	2,23	0,82	-0,14	0,64	5,9	0,7
SW28:4B	01,18	05,12	53,54	20,87	03,15	16,14	1,67	1,82	0,69	0,23	0,72	3,6	0,9
SW28:5T	00,00	00,34	21,50	67,92	06,83	03,41	2,39	2,29	0,59	-0,17	0,78	4,1	1,2
SW28:5B	00,00	00,88	21,15	45,81	12,33	19,82	2,39	2,29	0,71	-0,16	0,77	6,6	2,2
SW29:1T	06,03	01,44	07,19	97,84	15,11	21,58	2,50	2,38	0,79	-0,15	1,64	3,9	1,6
SW29:1B	00,91	00,91	06,69	37,39	15,81	38,30	2,60	2,71	0,67	0,16	0,95	4,6	1,5
SW29:2T	00,58	01,16	09,88	22,09	11,05	55,23	2,49	2,45	0,90	0,00	0,52	7,1	0,5
SW29:2B	00,88	00,88	05,70	35,53	13,60	43,42	2,59	2,69	0,64	0,16	1,02	7,9	1,1
SW29:3T	00,45	02,26	22,62	15,84	02,71	56,11	1,85	1,96	0,77	0,14	0,57	4,9	1,1
SW29:3B	SOLID	SUBSTRATE											
SW29:4T	00,85	11,54	48,72	11,54	04,70	22,65	1,54	1,67	0,67	0,19	1,18	0,0	0,4
SW29:4B	01,37	20,27	54,98	09,28	03,44	10,65	1,42	1,30	0,67	-0,17	1,05	0,0	1,3

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW29:5T	00,00	00,88	38,94	51,92	05,60	02,65	2,17	2,09	0,72	-0,11	0,42	0,0	0,7
SW29:5E	00,00	06,80	56,46	23,13	06,12	07,48	1,70	1,88	0,74	0,25	0,73	0,0	1,3
SW30:1T	00,29	01,14	15,14	55,14	16,29	12,00	2,50	2,49	0,65	0,0	0,95	0,0	0,9
SW30:1E	00,53	04,21	36,32	38,68	03,42	16,84	2,01	1,99	0,75	0,0	0,40	0,0	1,7
SW30:2T	00,32	03,16	59,49	27,22	00,63	09,18	1,70	1,84	0,65	0,20	0,41	0,0	0,7
SW30:2E	00,57	25,43	61,71	04,29	00,57	07,43	1,33	1,20	0,64	-0,20	0,48	0,0	0,7
SW30:3T	00,67	08,08	65,32	11,11	00,67	14,14	1,52	1,52	0,45	0,00	1,49	0,0	0,5
SW30:3E	00,62	19,75	61,11	03,09	00,31	15,12	1,36	1,24	0,59	-0,20	0,53	0,0	1,2
SW30:4T	01,45	03,62	17,39	26,45	11,96	39,13	2,30	2,23	0,96	-0,10	0,72	6,7	1,4
SW30:4E	00,67	01,33	04,00	14,67	14,00	65,33	2,77	2,75	0,86	0,00	0,79	6,3	0,0
SW30:5T	01,04	07,99	42,36	32,64	07,64	08,33	1,87	1,97	0,83	0,11	0,79	0,0	0,4
SW30:5E	03,72	14,05	42,98	16,53	04,96	17,77	1,54	1,59	0,92	0,00	0,72	0,0	2,5
SW31:1T	00,35	00,71	07,09	68,09	18,09	05,67	2,57	2,63	0,53	0,11	1,09	0,0	1,3
SW31:1E	SOLID	SUBSTRATE											

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW31:2T	00,00	00,31	13,98	68,94	06,54	10,25	2,94	2,44	0,44	0,00	1,27	0,0	1,3
SW31:2B	00,15	00,61	15,42	29,62	39,69	14,50	2,90	2,75	0,91	-0,17	0,46	0,0	0,7
SW31:3T	00,00	04,56	84,41	02,28	00,38	08,37	1,49	1,49	0,37	0,00	0,32	0,0	0,7
SW31:3B	00,70	13,73	69,01	03,52	01,06	11,97	1,43	1,42	0,44	0,00	1,01	0,0	0,8
SW31:4T	00,47	01,18	15,57	31,37	20,52	30,90	2,55	2,53	0,93	0,00	0,46	0,0	0,0
SW31:4B	00,49	00,98	06,86	16,18	18,63	56,86	2,82	2,71	0,92	-0,12	0,51	4,0	0,5
SW31:5T	01,59	01,76	24,51	39,86	17,28	14,99	2,37	2,32	0,90	-0,10	0,51	0,0	0,0
SW31:5B	02,17	01,08	15,99	28,73	10,57	41,46	2,35	2,25	0,87	-0,12	0,75	4,8	1,8
SW32:1T	00,00	00,20	19,92	70,12	06,10	03,66	2,40	2,32	0,55	-0,15	0,79	0,0	1,8
SW32:1B	00,23	00,47	15,42	55,84	07,94	20,09	2,43	2,35	0,56	-0,14	1,02	0,0	0,8
SW32:2T	00,00	00,58	67,06	28,46	00,58	03,31	1,71	1,85	0,63	0,22	0,42	0,0	0,4
SW32:2B	00,24	00,71	64,85	24,23	00,95	09,03	1,69	1,82	0,61	0,22	0,46	0,0	1,0
SW31:3T	00,19	21,47	61,02	03,58	00,56	13,18	1,36	1,24	0,60	-0,20	0,50	0,0	0,5
SW31:3B	00,48	03,38	35,99	24,64	06,76	28,74	1,88	2,01	0,80	0,16	0,60	0,0	0,3

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW32:4T	00,46	02,52	15,56	18,99	19,45	43,02	2,52	2,46	1,07	-0,10	0,36	4,5	1,0
SW32:4B	00,83	00,41	04,56	20,75	26,14	47,30	2,99	2,90	0,78	-0,11	0,67	0,0	2,1
SW32:5T	01,31	04,87	31,65	27,15	13,11	21,91	2,04	2,12	0,92	0,10	0,72	4,4	1,7
SW32:5B	01,38	01,04	08,65	10,03	06,23	72,66	2,26	2,26	1,04	0,00	0,83	0,0	3,9
SW33:1T	00,19	00,93	12,62	61,78	18,74	85,75	2,54	2,61	0,59	0,12	1,10	0,0	0,4
SW33:1B	00,26	02,36	24,15	39,90	12,86	20,47	2,33	2,21	0,80	-0,14	0,65	0,0	1,2
SW33:2T	00,00	01,28	79,97	13,94	00,70	03,14	1,58	1,58	0,41	0,00	1,03	0,0	0,0
SW33:2B	00,00	01,28	78,88	13,92	01,28	04,64	1,59	1,59	0,41	0,00	1,07	0,0	0,0
SW33:3T	00,29	17,54	65,64	06,87	00,44	09,21	1,42	1,35	0,54	-0,13	1,00	0,0	0,0
SW33:3B	00,35	20,07	58,27	05,81	00,35	15,14	1,38	1,27	0,61	-0,18	0,76	0,0	0,0
SW33:4T	08,04	07,51	09,12	05,63	05,09	64,61	1,24	1,30	1,60	0,0	0,39	4,5	2,2
SW33:4B	SOLID	SUBSTRATE											
SW33:5T	06,08	02,53	10,30	29,56	18,07	33,45	2,49	2,30	1,11	-0,16	0,93	5,4	0,0
SW33:5B	SOLID	SUBSTRATE											

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median size ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW34:1T	00,19	10,56	48,18	23,80	09,60	07,68	1,74	1,93	0,85	0,23	0,82	0,0	1,1
SW34:1B	00,37	05,19	52,96	19,44	06,48	15,56	1,69	1,89	0,74	0,27	0,75	0,0	1,6
SW34:2T	00,59	27,87	65,81	02,37	00,40	02,96	1,30	1,17	0,64	-0,21	0,43	0,0	0,0
SW34:2B	01,62	24,37	67,36	03,40	00,59	02,66	1,34	1,20	0,63	-0,22	0,48	0,0	1,4
SW34:3T	00,22	08,50	76,06	09,62	00,22	05,37	1,51	1,51	0,42	0,00	1,37	3,6	0,6
SW34:3B	01,55	11,92	67,10	10,10	00,52	08,81	1,48	1,48	0,46	0,00	1,54	0,0	1,0
SW34:4T	02,87	02,87	09,57	15,79	06,70	62,20	2,23	2,06	1,03	-0,16	0,97	0,0	1,9
SW34:4B	SOLID	SUBSTRATE											
SW34:5T	00,84	00,63	03,37	34,32	28,84	32,00	2,85	2,90	0,72	0,10	0,60	0,0	0,0
SW34:5B	SOLID	SUBSTRATE											
SW35:1T	03,79	01,47	12,63	17,68	10,53	53,89	2,29	2,23	1,07	-0,10	0,96	0,0	1,1
SW35:1B	02,56	01,03	04,36	10,00	20,51	61,54	3,06	2,64	1,04	-0,40	0,97	0,0	0,0
SW35:2T	00,64	00,96	04,81	09,29	12,50	71,79	2,83	2,62	1,02	-0,20	0,52	0,0	0,0
SW35:2B	00,21	00,41	03,70	14,17	13,96	67,56	2,84	2,85	0,78	0,00	0,67	0,0	1,9

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW35:3T	00,58	21,64	59,06	03,31	03,90	11,50	1,37	1,25	0,63	-0,19	1,12	0,0	1,0
SW35:3B	00,71	27,79	67,43	02,48	00,35	01,24	1,31	1,18	0,63	-0,21	0,44	0,0	0,6
SW35:4T	00,00	00,87	44,35	44,06	05,51	05,22	2,05	2,05	0,73	0,00	0,41	0,0	1,1
SW35:4B	00,21	00,64	35,47	43,16	07,91	12,61	2,17	2,11	0,74	-0,10	0,58	0,0	1,2
SW35:5T	00,00	00,56	26,67	59,63	10,00	03,15	2,36	2,23	0,67	-0,18	0,75	0,0	0,8
SW35:5B	00,24	01,94	29,85	39,32	09,22	19,42	2,21	2,13	0,77	-0,10	0,62	0,0	0,9
SW36:1T	00,00	00,67	03,03	28,96	06,40	60,94	2,55	2,56	0,47	0,00	1,43	0,0	2,0
SW36:1B	00,28	00,56	03,61	03,33	04,44	87,78	2,50	2,44	1,13	-0,10	0,45	0,0	0,0
SW36:2T	00,79	21,47	54,19	03,66	01,31	18,59	1,34	1,21	0,64	-0,20	0,63	0,0	0,0
SW36:2B	00,76	03,36	29,77	21,97	07,48	36,64	1,93	2,04	0,84	0,14	0,71	0,0	0,0
SW36:3T	02,32	01,54	06,56	06,65	03,09	79,92	1,94	1,78	1,2	-0,13	0,77	4,7	2,0
SW36:3B	SOLID	SUBSTRATE											
SW36:4T	02,51	36,87	55,31	03,35	00,28	01,68	1,18	1,07	0,71	-0,15	0,34	0,0	0,7
SW36:4B	03,77	37,92	52,08	03,96	00,38	01,89	1,14	1,03	0,73	-0,13	0,34	0,0	0,0

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW36:5T	00,16	18,26	74,84	05,59	00,16	00,99	1,42	1,36	0,50	-0,11	0,87	0,0	0,7
SW36:5B	00,19	16,54	77,38	04,94	00,19	00,76	1,43	1,40	0,46	0,00	0,91	0,0	0,0
SW37:1T	00,00	01,16	72,83	21,97	02,31	01,73	1,66	1,76	0,59	0,23	0,54	0,0	0,0
SW37:1B	00,00	01,50	75,38	17,12	01,80	04,20	1,62	1,70	0,51	0,16	0,74	0,0	0,0
SW37:2T	00,32	19,55	68,27	05,13	01,60	05,13	1,40	1,32	0,56	-0,15	0,94	0,0	0,0
SW37:2B	01,31	22,31	66,67	04,99	01,57	03,15	1,37	1,25	0,62	-0,20	0,78	0,0	0,0
SW37:3T	00,00	04,65	10,47	01,16	01,16	82,56	1,39	1,22	0,68	-0,16	1,26	0,0	5,5
SW37:3B	00,28	16,71	77,72	02,79	00,28	02,23	1,41	1,38	0,46	-0,10	0,85	0,0	0,5
SW37:4T	01,23	00,41	01,65	04,13	05,76	86,83	2,80	2,46	1,18	-0,29	0,85	0,0	1,3
SW37:4B	00,76	00,38	03,41	03,79	09,47	82,20	3,06	2,60	1,10	-0,42	0,62	5,4	4,4
SW37:5T	00,32	00,96	03,22	10,29	07,07	78,14	2,63	2,60	0,91	0,00	0,68	0,0	0,6
SW37:5B	01,08	00,72	14,08	55,96	08,30	19,86	2,43	2,35	00,57	-0,14	1,08	4,3	1,7
SW38:1T	01,93	33,70	57,73	04,97	00,28	01,38	1,24	1,11	0,70	-0,17	0,40	0,0	0,6
SW38:1B	04,78	33,97	53,59	05,26	00,72	01,67	1,19	1,07	0,75	-0,17	0,47	0,0	0,0

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW38:2T	02,03	24,35	55,65	12,17	02,32	03,48	1,39	1,27	0,72	-0,18	0,87	0,0	0,5
SW38:2B	SOLID	SUBSTRATE											
SW38:3T	04,93	03,52	26,06	17,25	09,86	38,38	1,86	2,03	0,97	0,17	1,09	3,8	1,5
SW38:3B	SOLID	SUBSTRATE											
SW38:4T	00,37	07,72	40,44	34,56	09,93	06,99	1,95	2,01	0,84	0,10	0,76	0,0	0,0
SW38:4B	00,51	06,63	37,50	33,93	11,48	09,95	2,01	2,05	0,86	0,00	0,75	0,0	0,7
SW38:5T	00,28	05,38	43,91	31,44	07,65	11,33	1,88	1,99	0,80	0,14	0,66	0,0	0,0
SW38:5B	00,49	04,62	32,60	27,98	10,46	23,84	2,01	2,08	0,86	0,10	0,69	0,0	0,6

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW A:1T	07,97	02,39	14,34	68,13	01,99	05,18	2,33	2,07	0,74	-0,36	1,29	39,67	0,45
SW A:1B	02,01	00,80	13,64	78,71	02,81	02,01	2,41	2,39	0,45	-0,10	1,04	23,14	0,38
SW A:2T	00,39	00,39	00,79	68,90	26,77	02,76	2,68	2,81	0,61	0,21	0,46	32,06	1,43
SW A:2B	00,00	00,00	02,31	63,08	25,38	09,23	2,68	2,81	0,62	0,21	0,45	32,72	0,91
SW A:3T	00,00	00,47	02,84	69,19	14,22	13,27	2,58	2,59	0,44	0,00	0,93	26,57	0,73
SW A:3B	00,79	00,39	03,15	54,72	20,87	20,08	2,65	2,77	0,62	0,19	0,55	19,83	1,31
SW A:4T	00,40	00,40	00,40	41,27	27,38	30,16	2,82	2,92	0,68	0,15	0,35	08,11	1,16
SW A:4B	00,39	00,39	01,16	51,16	22,48	24,42	2,70	2,83	0,63	0,20	0,42	10,78	1,99
SW A:5T	00,00	00,00	00,00	11,54	05,13	83,33	2,72	2,86	0,62	0,21	0,41	00,00	1,91
SW A:5B	00,00	00,39	00,77	50,19	14,67	33,98	2,63	2,73	0,55	0,18	0,59	00,00	2,27
SW B:1T	00,79	00,40	01,58	57,31	13,04	26,88	2,59	2,63	0,47	0,10	0,80	19,64	1,53
SW B:1B	00,79	00,40	01,98	57,71	22,53	16,60	2,67	2,79	0,62	0,20	0,46	24,77	3,62
SW B:2T	01,19	00,00	01,58	64,43	19,76	13,04	2,63	2,73	0,56	0,18	0,56	23,61	1,73
SW B:2B	00,79	00,40	03,57	64,68	11,90	18,65	2,56	2,56	0,43	0,00	1,17	19,53	1,04

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW B:3T	00,39	00,39	02,76	58,27	22,83	15,35	2,67	2,79	0,62	0,20	0,46	21,47	1,67
SW B:3B	00,39	00,39	10,55	82,42	03,53	02,73	2,45	2,45	0,40	0,00	0,99	23,24	0,58
SW B:4T	00,00	00,00	01,98	89,33	06,72	01,98	2,53	2,53	0,37	0,00	0,66	25,42	0,72
SW B:4B	00,40	00,40	03,56	66,01	13,44	16,21	2,57	2,57	0,43	0,02	1,01	20,29	2,08
SW B:5T	00,00	00,00	00,40	47,39	24,91	27,31	2,76	2,88	0,65	0,20	0,38	04,67	2,00
SW B:5B	00,40	00,00	01,19	36,11	24,60	37,70	2,83	2,91	0,68	0,14	0,34	13,40	5,98
SW B:6T	00,40	00,00	00,40	35,20	22,81	41,20	2,81	2,92	0,67	0,15	0,35	00,00	2,45
SW B:6B	00,39	00,39	00,39	30,08	21,48	47,27	2,84	2,92	0,68	0,13	0,34	00,00	2,71
SW C:1T	02,37	00,40	02,37	49,80	17,00	28,06	2,62	2,73	0,60	0,18	1,04	07,12	3,00
SW C:1B	44,05	04,37	03,97	28,97	08,33	10,32	0,18	1,06	1,73	0,51	0,26	34,57	1,86
SW C:2T	00,00	00,00	00,80	09,96	07,98	81,27	2,86	2,92	0,70	0,10	0,33	00,00	2,39
SW C:2B	00,00	00,00	01,25	19,37	12,50	66,88	2,79	2,89	0,68	0,15	0,35	00,00	3,71
SW C:3T	01,18	03,90	01,18	31,37	16,08	49,80	2,66	2,77	0,70	0,16	1,48	06,92	2,44
SW C:3B	07,78	00,78	03,89	52,14	11,67	23,74	2,49	2,46	0,53	-0,10	2,97	19,48	2,31

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW C:4T	00,00	00,00	01,57	46,06	09,84	42,52	2,59	2,62	0,45	0,10	0,87	00,00	2,79
SW C:4B	00,00	00,40	01,99	47,41	11,16	39,04	2,59	2,64	0,49	0,10	0,76	04,72	3,30
SW C:5T	03,08	03,46	05,77	70,38	10,77	06,54	2,49	2,49	0,45	0,00	2,44	08,30	1,77
SW C:5B	03,43	01,47	06,37	68,14	11,76	08,82	2,50	2,50	0,42	0,00	2,13	23,97	1,10
SW C:6T	00,00	00,40	03,98	70,52	12,75	12,35	2,56	2,56	0,42	0,00	0,96	18,48	1,04
SW C:6B	00,40	00,40	02,41	53,82	16,47	26,51	2,62	2,72	0,56	0,18	0,57	25,31	1,13
SW C:7T	01,18	00,00	01,97	63,39	14,96	18,50	2,59	2,64	0,49	0,10	0,76	16,82	1,92
SW C:7B	00,00	00,40	02,38	73,02	10,32	13,89	2,55	2,55	0,40	0,00	0,95	19,63	2,61
SW C:8T	00,00	00,00	01,22	28,16	20,41	50,20	2,84	2,92	0,69	0,13	0,34	00,00	2,69
SW C:8B	01,20	00,80	02,00	31,60	19,60	44,80	2,75	2,85	0,70	0,15	0,78	11,23	1,53
SW D:1T	00,44	00,88	03,98	69,03	10,18	15,49	2,54	2,54	0,42	0,00	1,23	00,00	2,51
SW D:1B	00,79	00,39	03,15	43,31	11,02	41,34	2,58	2,63	0,52	0,11	1,11	00,00	4,23
SW D:2T	00,80	00,40	02,79	75,30	09,56	11,16	2,54	2,54	0,40	0,00	0,91	00,00	1,83
SW D:2B	02,39	00,40	01,99	54,98	21,12	19,13	2,65	2,77	0,62	0,19	0,76	38,28	2,25

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW D:3T	00,79	00,00	01,19	44,05	10,32	43,65	2,59	2,64	0,48	0,10	0,77	12,60	5,05
SW D:3B	00,00	00,40	03,98	85,26	03,98	06,37	2,50	2,50	0,37	0,00	0,32	27,69	1,57
SW D:4T	00,79	00,79	02,37	50,20	09,09	36,76	2,55	2,55	0,43	0,00	1,32	06,16	2,95
SW D:4B	00,00	00,40	10,84	83,13	04,42	01,20	2,46	2,46	0,40	0,00	0,95	19,17	0,76
SW D:5T	00,00	00,00	01,98	18,25	07,54	72,22	2,65	2,77	0,64	0,19	0,66	00,00	3,96
SW D:5B	00,00	00,00	01,20	70,12	20,32	08,37	2,64	2,74	0,54	0,18	0,59	15,65	2,72
SW D:6T	01,52	00,00	01,52	46,21	28,03	22,73	2,77	2,88	0,68	0,16	0,36	04,54	3,15
SW D:6B	00,53	00,53	03,19	55,85	17,55	22,34	2,62	2,72	0,57	0,17	0,65	14,99	2,61
SW E:1T	00,00	00,00	02,15	61,80	05,58	30,47	2,53	2,53	0,38	0,00	0,77	00,00	2,92
SW E:1B	00,00	00,00	02,78	78,17	07,54	11,51	2,53	2,53	0,38	0,00	0,81	05,09	2,16
SW E:2T	00,40	00,40	02,00	72,40	10,80	14,00	2,56	2,56	0,40	0,00	0,96	03,56	1,43
SW E:2B	00,39	00,00	02,35	73,73	10,59	12,94	2,55	2,55	0,40	0,00	0,95	12,32	1,35
SW E:3T	00,39	00,39	01,96	48,44	09,38	39,45	2,57	2,57	0,43	0,00	0,97	10,62	2,03
SW E:3B	00,00	00,39	08,66	87,40	02,36	01,18	2,46	2,46	0,38	0,00	0,88	20,71	0,98

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW E:4T	00,39	00,39	02,71	55,04	08,91	32,56	2,55	2,55	0,42	0,00	1,00	09,63	2,83
SW E:4B	00,00	00,00	03,97	89,29	05,16	01,59	2,51	2,51	0,37	0,00	0,38	20,79	0,45
SW E:5T	00,00	00,40	02,80	68,40	14,00	14,40	2,58	2,59	0,43	0,00	0,93	06,17	1,05
SW E:5B	00,40	00,40	01,59	85,66	07,57	04,38	2,53	2,53	0,38	0,00	0,77	17,33	1,03
SW E:6T	01,17	00,39	01,17	57,81	19,14	20,31	2,64	2,75	0,58	0,19	0,53	11,12	1,50
SW E:6B	01,60	00,40	03,60	40,00	20,80	33,60	2,69	2,81	0,68	0,17	0,81	15,98	0,86
SW E:7T	00,40	00,40	09,49	86,17	01,58	01,98	2,45	2,45	0,39	0,00	0,98	17,76	1,91
SW E:7B	00,39	00,00	01,96	84,81	05,84	07,00	2,53	2,53	0,37	0,00	0,58	17,16	1,00
SW E:8T	00,00	00,39	03,91	42,58	09,77	43,36	2,56	2,59	0,48	0,10	1,17	00,00	3,57
SW E:8B	02,12	00,42	04,66	41,95	08,47	42,37	2,52	2,52	0,47	0,00	1,77	09,47	5,13
SW E:9T	01,58	00,40	06,32	62,06	03,95	25,69	2,46	2,46	0,41	0,00	1,19	13,67	2,60
SW E:9B	00,00	00,39	07,45	78,82	04,31	09,02	2,48	2,48	0,39	0,00	0,83	12,39	1,63
SW E:10T	00,00	00,39	04,30	54,30	13,28	27,73	2,58	2,63	0,50	0,10	0,97	03,54	1,04
SW E:10B	00,79	00,79	07,91	64,03	13,83	12,65	2,53	2,53	0,46	0,00	1,51	14,16	3,32

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Org C
SW F:1T	00,00	00,40	04,42	59,84	04,42	30,92	2,50	2,50	0,39	0,00	0,95	0,00	2,70
SW F:1B	03,95	01,19	05,53	66,40	05,14	17,79	2,46	2,46	0,42	0,00	2,64	08,87	1,60
SW F:2T	00,40	00,40	03,59	70,92	07,17	17,53	2,52	2,52	0,40	0,00	0,90	06,14	1,80
SW F:2B	00,39	00,39	02,73	73,83	08,98	13,67	2,54	2,54	0,40	0,00	0,90	15,95	1,64
SW F:3T	00,79	00,39	04,33	57,87	07,09	29,53	2,51	2,51	0,41	0,00	1,37	13,15	1,70
SW F:3B	00,41	00,41	17,48	78,05	02,03	01,63	2,40	2,34	0,49	-0,12	0,78	21,13	0,78
SW F:4T	00,79	00,40	05,56	58,73	04,37	30,16	2,48	2,48	0,40	0,00	1,21	11,04	1,00
SW F:4B	00,00	00,00	00,82	95,08	03,28	00,82	2,51	2,51	0,35	0,00	0,32	22,98	0,84
SW F:5T	00,00	00,40	01,61	14,46	02,41	81,12	2,51	2,51	0,44	0,00	1,56	00,00	3,90
SW F:5B	00,80	00,40	12,00	82,80	02,40	01,60	2,43	2,43	0,40	0,00	1,05	20,17	0,67
SW G:1T	00,40	00,40	01,98	73,02	09,02	14,68	2,54	2,54	0,39	0,00	0,91	16,54	1,48
SW G:1B	00,00	00,42	01,69	45,99	13,08	38,82	2,62	2,71	0,54	0,17	0,61	02,28	1,66
SW G:2T	00,00	00,00	00,51	04,57	03,05	91,08	2,78	2,87	0,70	0,14	0,48	00,00	8,67
SW G:2B	00,00	00,00	01,57	28,74	13,78	55,91	2,71	2,84	0,65	0,20	0,40	00,00	2,38

Station number	% VCS	% CS	% MS	% FS	% VFS	% Mud	Median ϕ	Mean grain size ϕ	Sorting ϕ	Skewness ϕ	Kurtosis ϕ	% CaCO ₃	% Orig C
SW G:3T	01,58	01,19	02,37	54,94	17,39	22,53	2,61	2,71	0,58	0,17	1,00	07,55	2,30
SW G:3B	00,28	00,00	01,69	84,83	04,78	08,43	2,52	2,52	0,37	0,00	0,38	24,12	1,11
SW G:4T	00,00	00,00	01,20	23,51	03,98	71,31	2,56	2,56	0,41	0,00	0,96	00,00	5,28
SW G:4B	00,00	00,00	03,19	90,04	04,38	02,39	2,51	2,51	0,37	0,00	0,32	22,59	1,34
SW G:5T	00,40	00,40	02,79	62,15	10,36	23,90	2,55	2,55	0,42	0,00	0,96	11,16	3,52
SW G:5B	00,40	00,40	01,99	33,47	05,98	57,77	2,55	2,55	0,43	0,00	1,32	23,93	0,77
SW G:6T	00,40	00,40	07,20	88,80	02,80	00,40	2,47	2,47	0,38	0,00	0,83	08,08	2,73
SW G:6B	00,78	00,78	10,16	83,98	02,73	01,56	2,45	2,45	0,40	0,00	1,06	19,32	1,26
SW G:7T	03,20	00,80	07,20	52,40	05,20	31,20	2,44	2,43	0,46	0,00	2,32	10,90	3,28
SW G:7B	00,39	00,00	02,76	87,40	07,84	01,57	2,53	2,53	0,38	0,00	0,77	19,68	0,71
SW G:8T	00,00	00,00	03,17	11,69	01,59	83,60	2,43	2,37	0,54	-0,12	1,05	00,00	1,74
SW G:8B	NOT RECORDED												
SW H:1T	00,00	00,40	03,57	34,52	06,35	55,16	2,53	2,53	0,44	0,00	1,41	2,61	2,94
SW H:1B	00,40	00,40	06,02	57,43	05,22	30,52	2,49	2,49	0,41	0,00	1,30	08,17	3,44

APPENDIX II

SECTIONS ACROSS THE CHANNEL OF THE SWARTKOPS ESTUARY

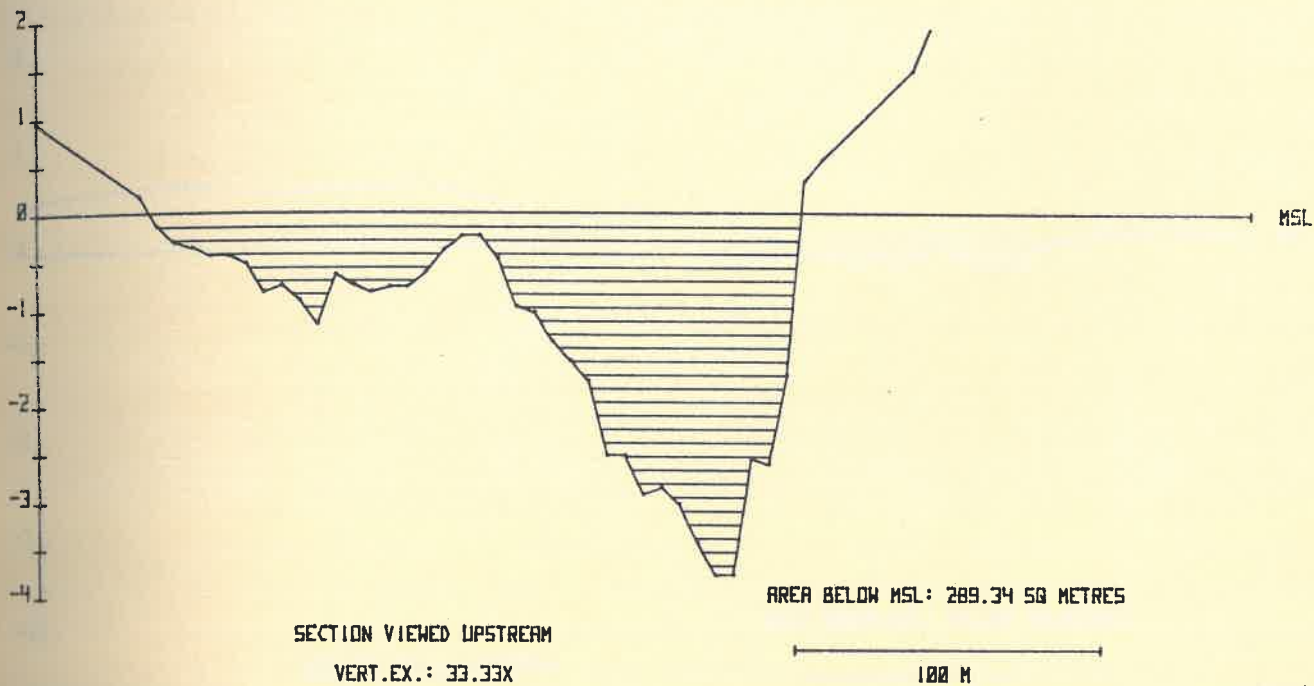
Sections were surveyed at one kilometre intervals along the length of the estuary (fig 4-1). The survey datum is MSL and was obtained from beacons surveyed for the City Engineer (1971). All datum levels used were related to this MSL. All sections are viewed up-estuary. The 1971 sections were also obtained from the City Engineer's (1971) report. The 1903 sections were part of a feasibility study of a harbour development scheme. Cross-sectional areas are given on the bottom right and are compared to each other in table 4.1.

Note: Section 2 is longer than a page width and it is presented in two parts.

SECTION 1

SWARTKOPS ESTUARY

MAY 1983

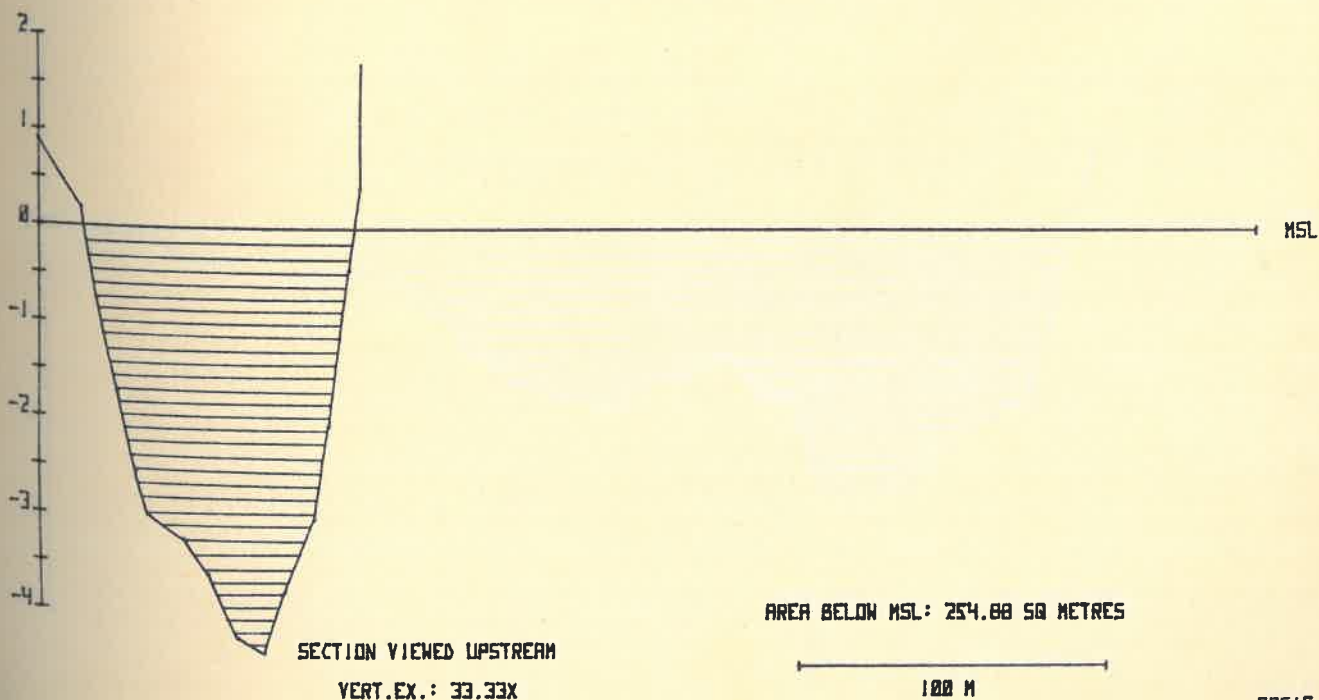


RDSIE

SECTION 1

SWARTKOPS ESTUARY

OCT 1981

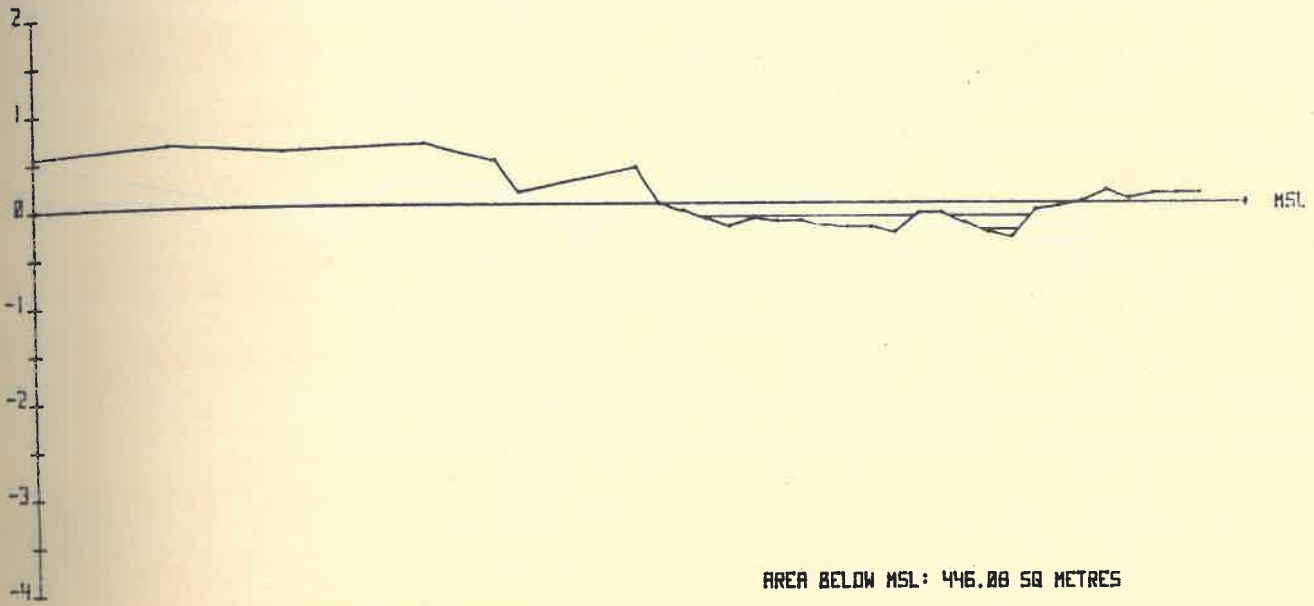


RDSIE

SECTION 2

SWARTKOPS ESTUARY

MAY 1903



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

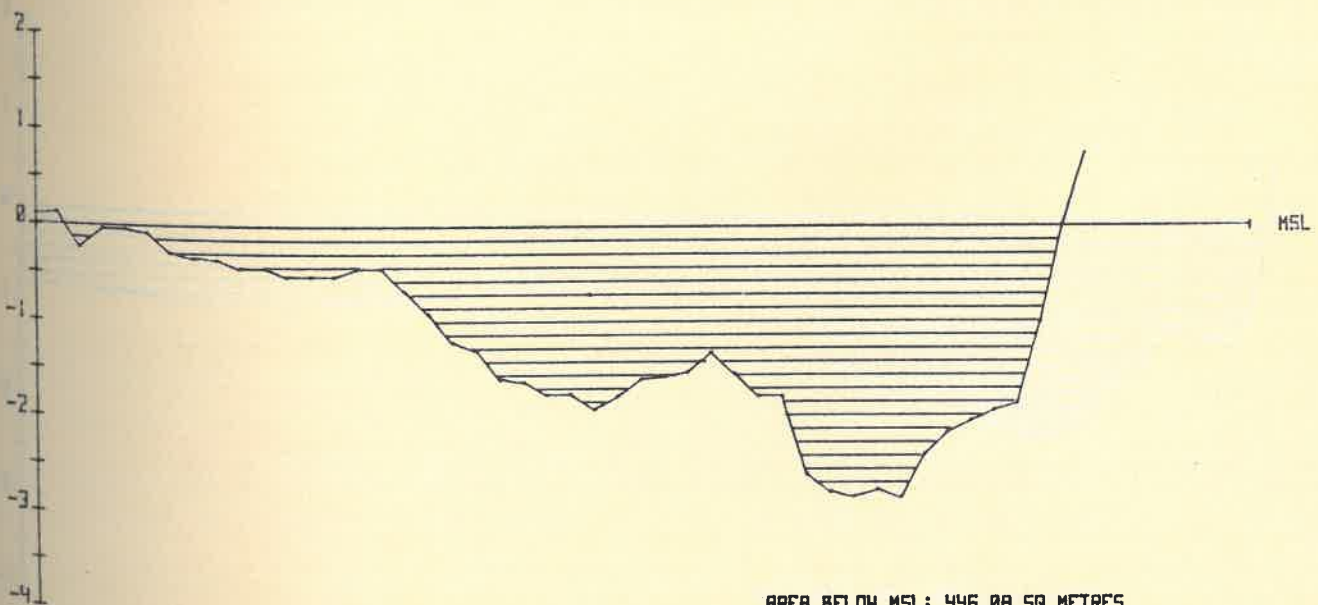
AREA BELOW MSL: 446.00 SQ METRES

100 M

RO51E

SECTION 2 CONT.

SWARTKOPS ESTUARY



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 446.00 SQ METRES

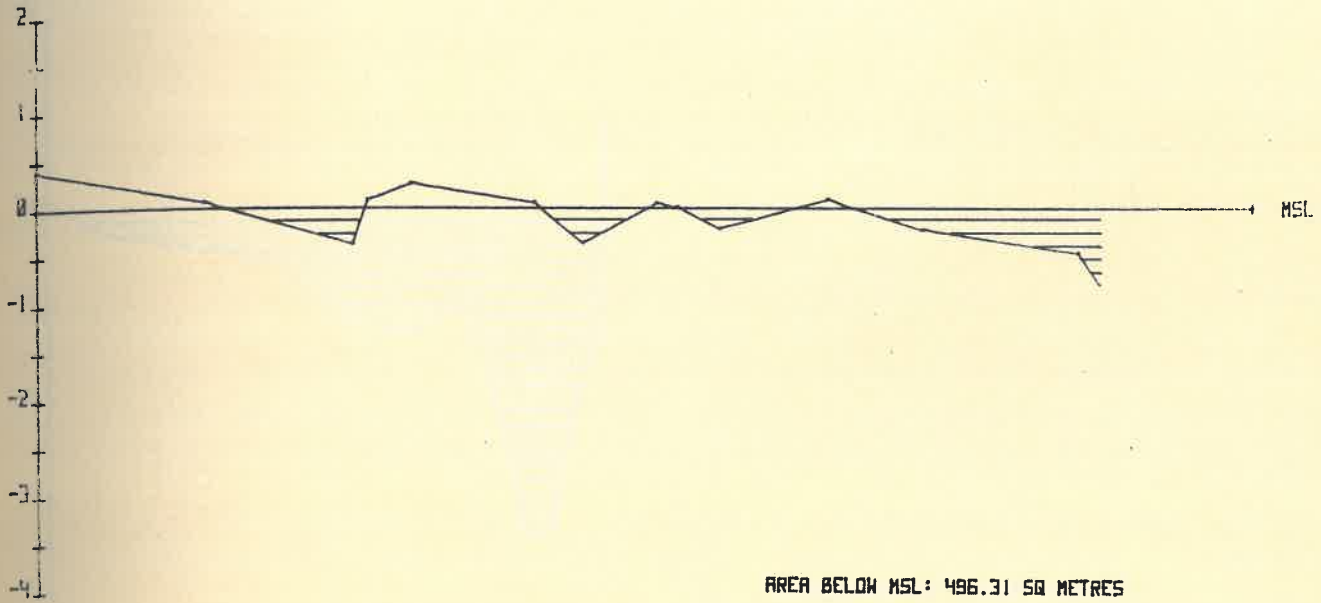
100 M

RO51E

SECTION 2

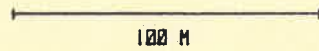
SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT.EX. : 33.33X

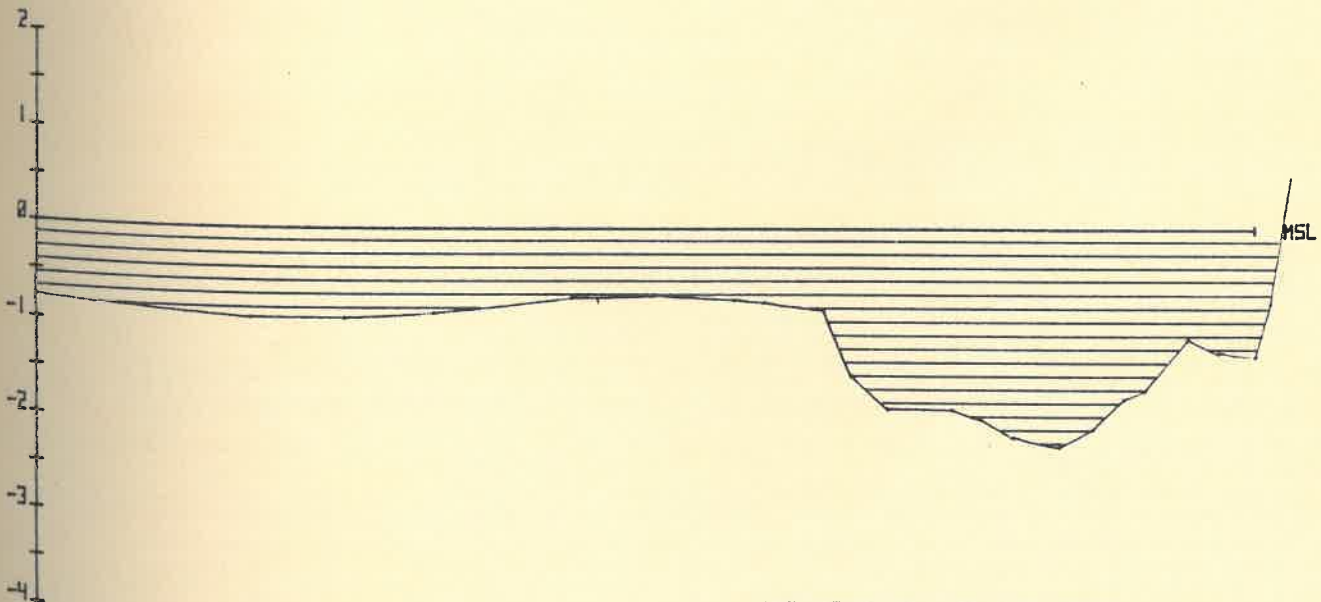
AREA BELOW MSL : 496.31 SQ METRES



ROSIE

SECTION 2 CONT

NOV 80



SECTION VIEWED UPSTREAM
VERT.EX. : 33.33X

AREA BELOW MSL : 496.31 SQ METRES

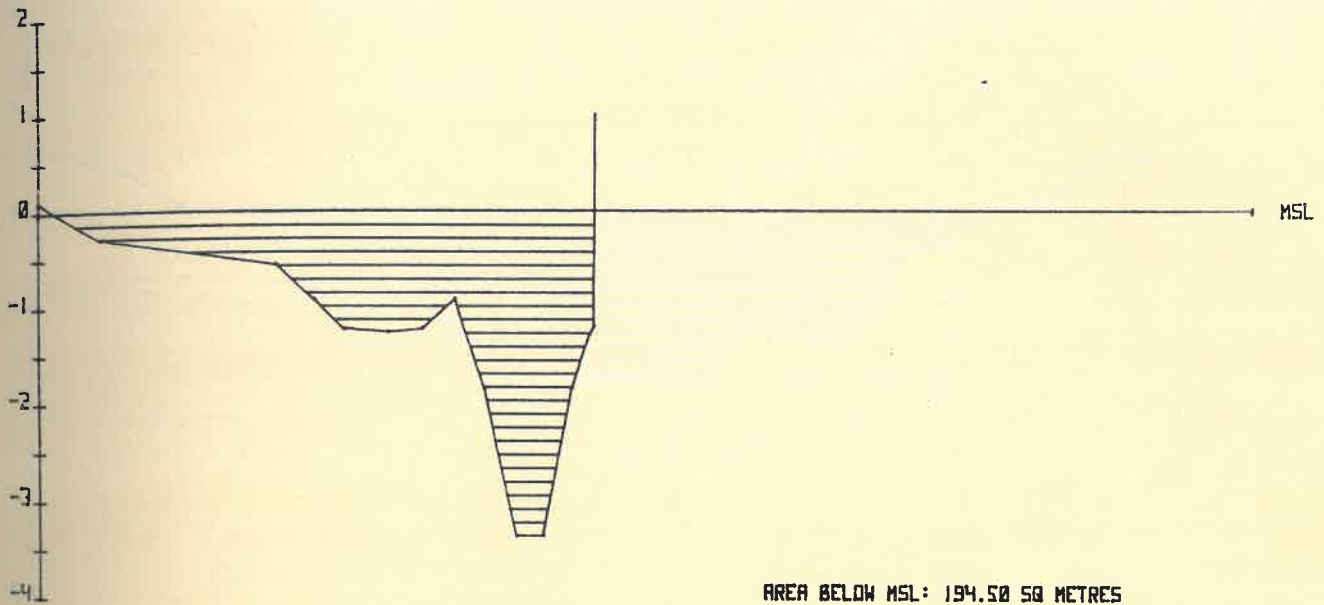


ROSIE

SECTION 2

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM

VERT. EX.: 33.33X

AREA BELOW MSL: 194.50 SQ METRES



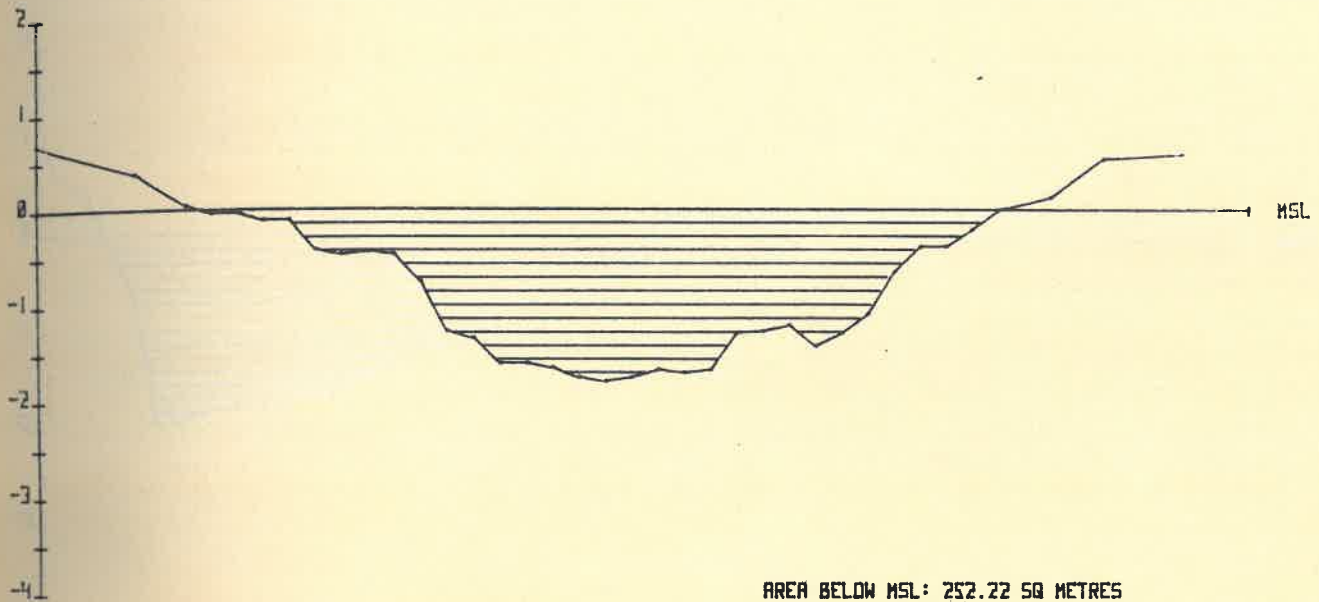
100 M

RDSIE

SECTION 3

SWARTKOPS ESTUARY

MAY 1903



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 252.22 SQ METRES

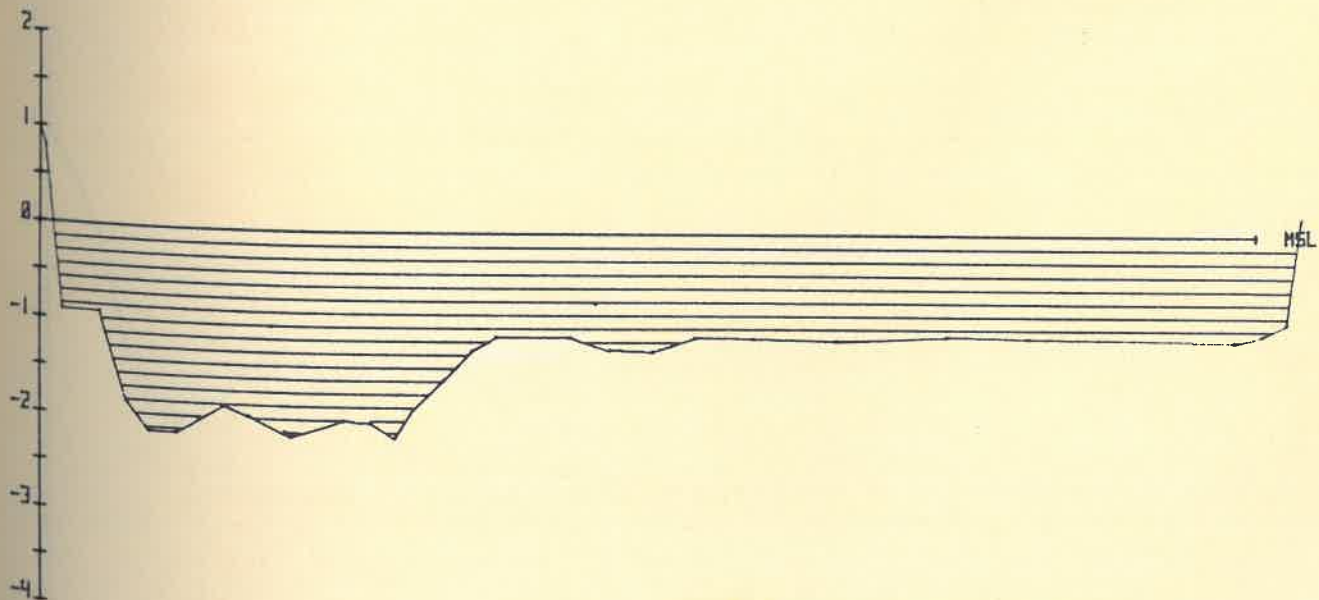
100 M

ROSIE

SECTION 3

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 535.28 SQ METRES

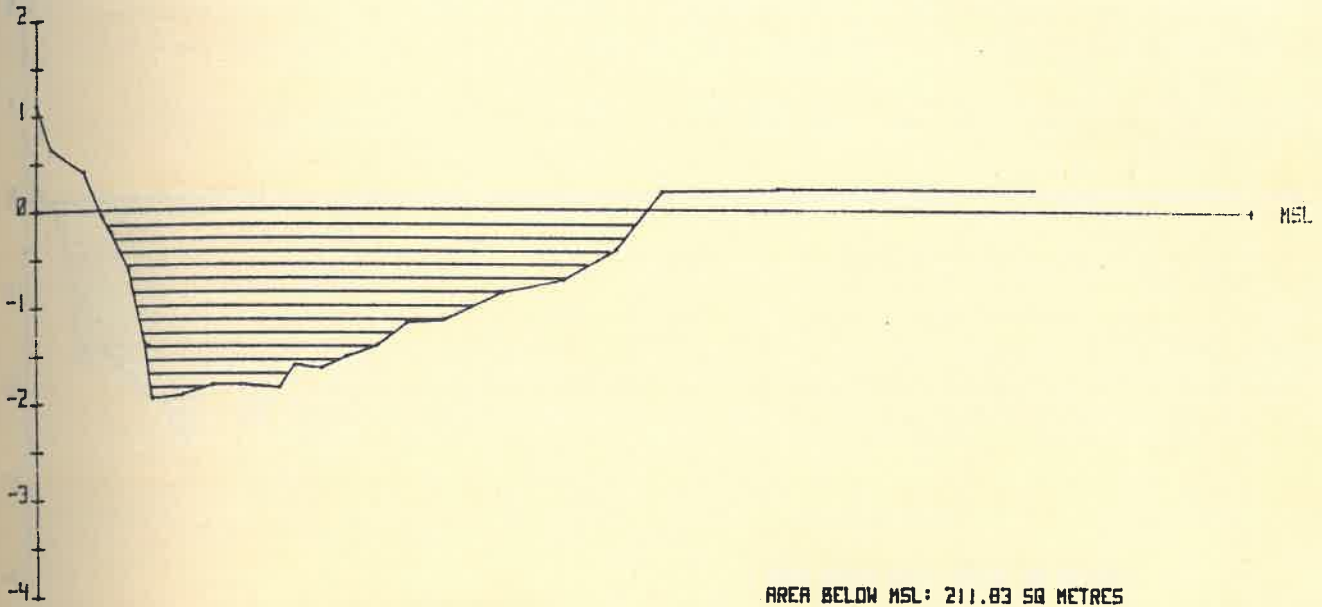
100 M

ROSIE

SECTION 3

SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 211.83 SQ METRES

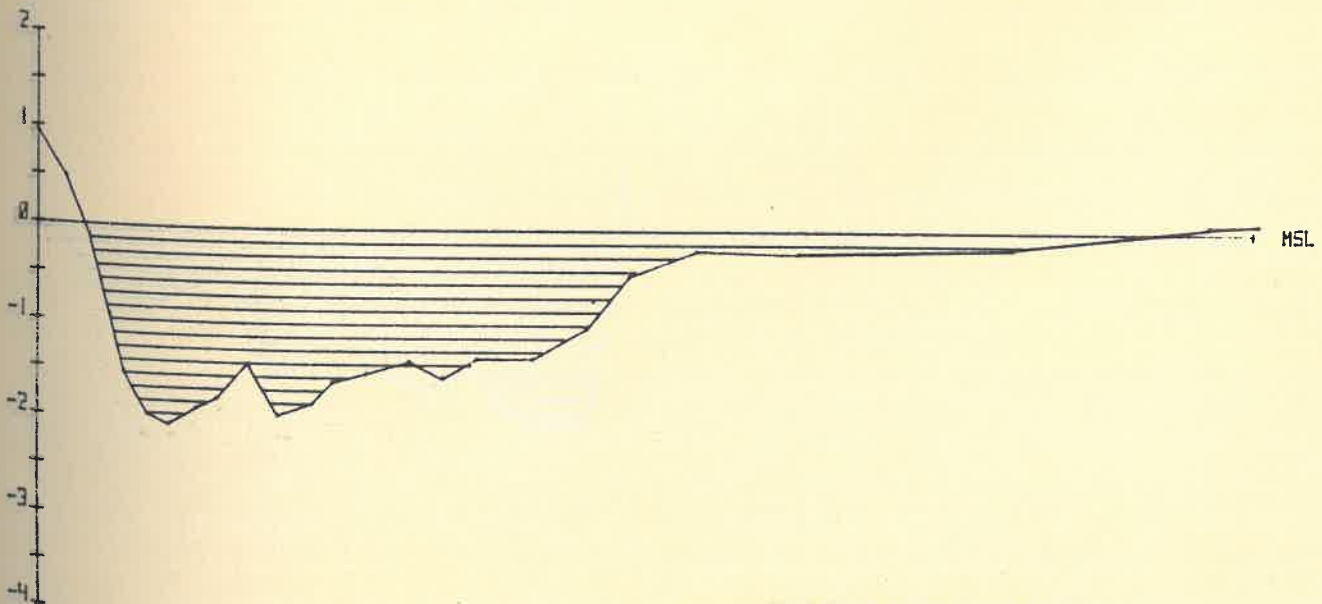
100 M

ROSIE

SECTION 3

SWARTKOPS ESTUARY

MAY 1981



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 286.16 SQ METRES

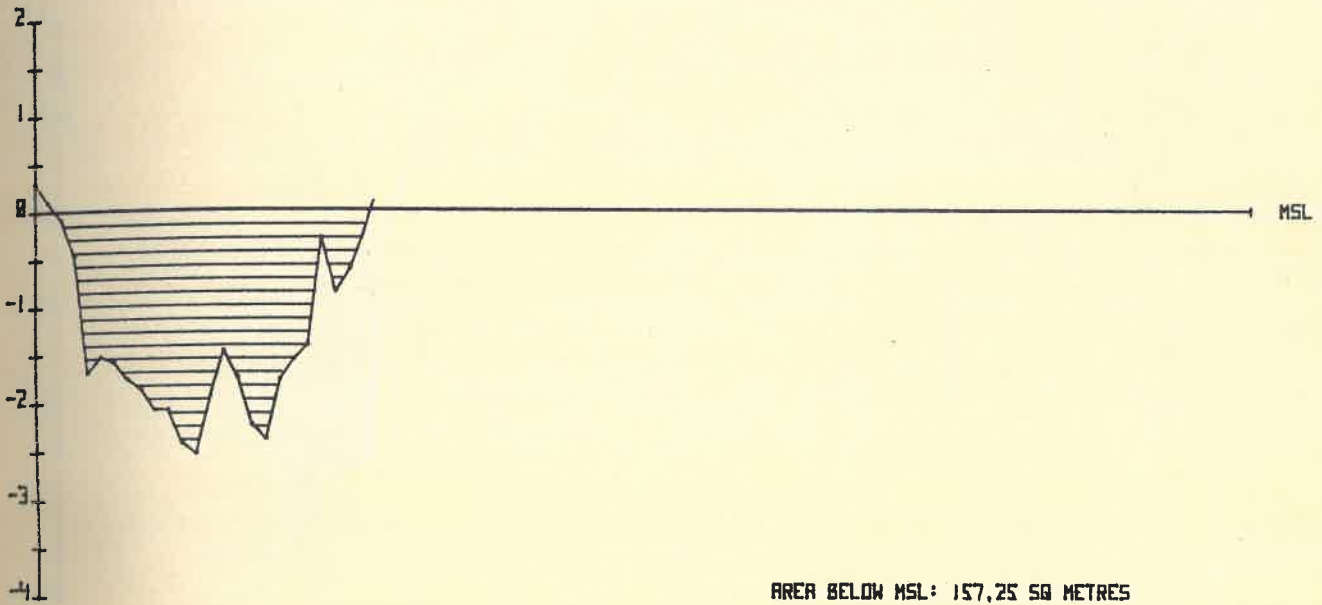
100 M

ROSIE

SECTION 4

SWARTKOPS ESTUARY

MAY 1903



SECTION VIEWED UPSTREAM
VERT.EX.: 33.33X

AREA BELOW MSL: 157.25 SQ METRES

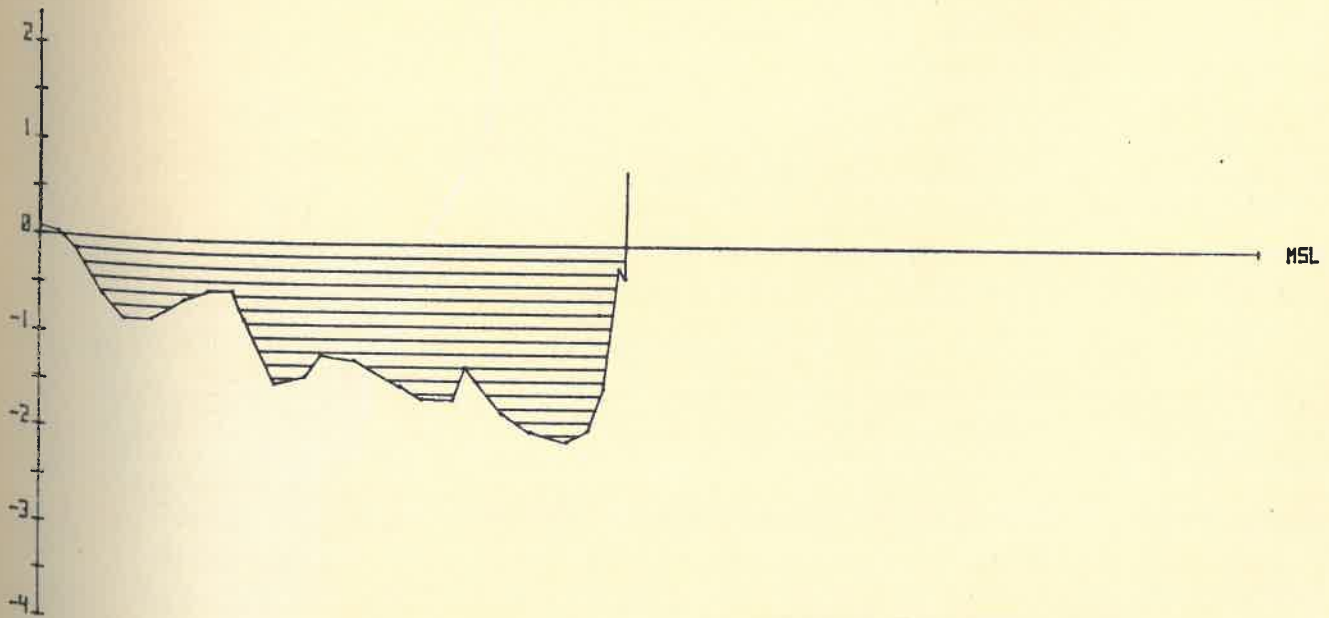
100 M

ROSIE

SECTION 4

SWARTKOPS ESTUARY

NOV 00



SECTION VIEWED UPSTREAM
VERT.EX.: 33.33X

AREA BELOW MSL: 215.83 SQ METRES

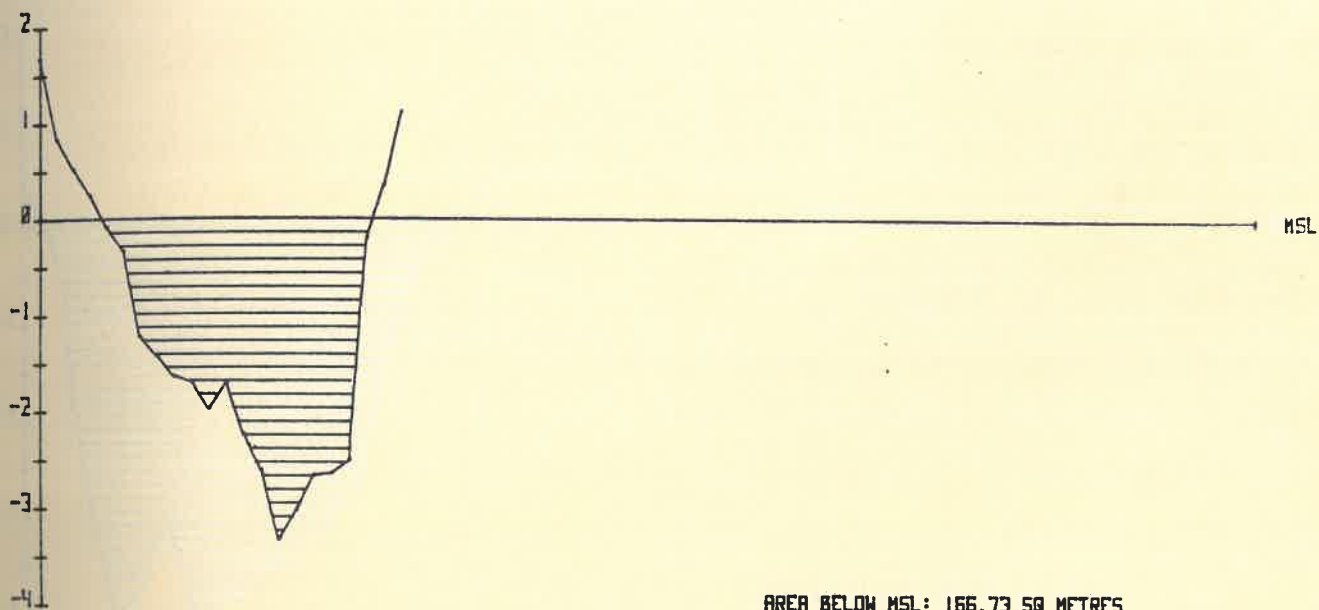
100 M

ROSIE

SECTION 5

SWARTKOPS ESTUARY

MAY 1903



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

AREA BELOW MSL : 166.73 SQ METRES

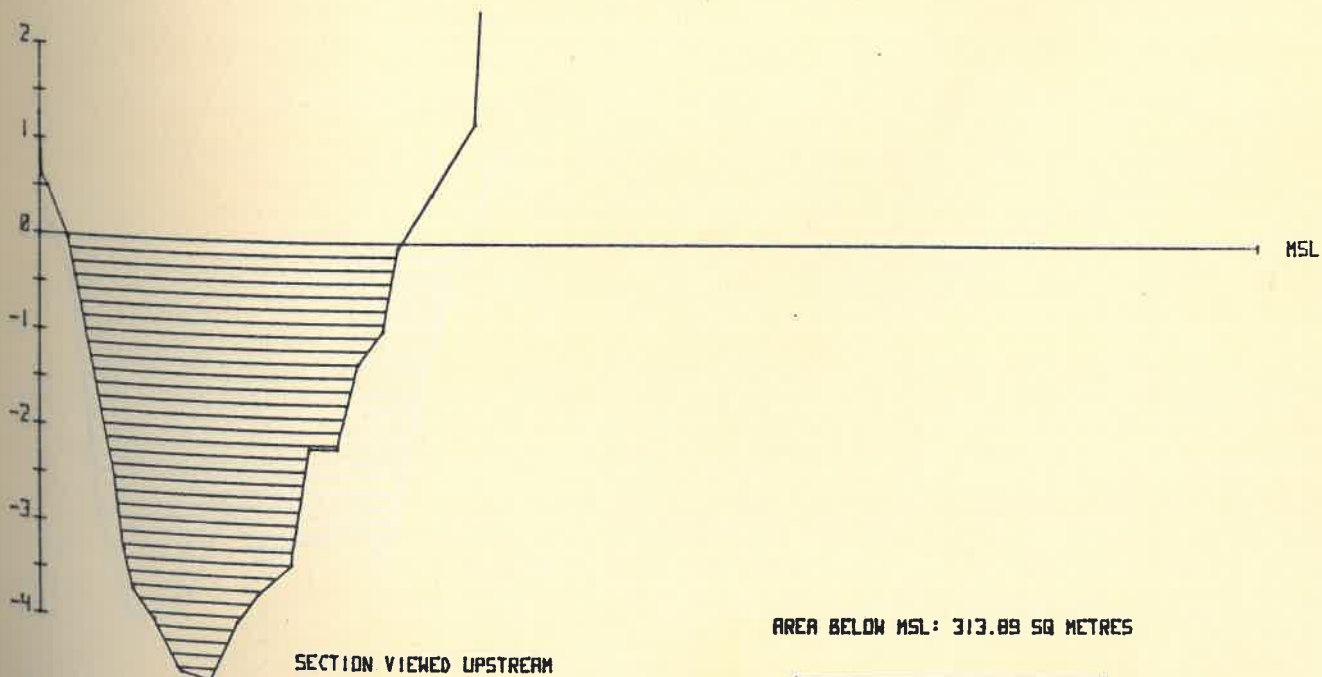
100 M

RDSIE

SECTION 5

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

AREA BELOW MSL : 313.89 SQ METRES

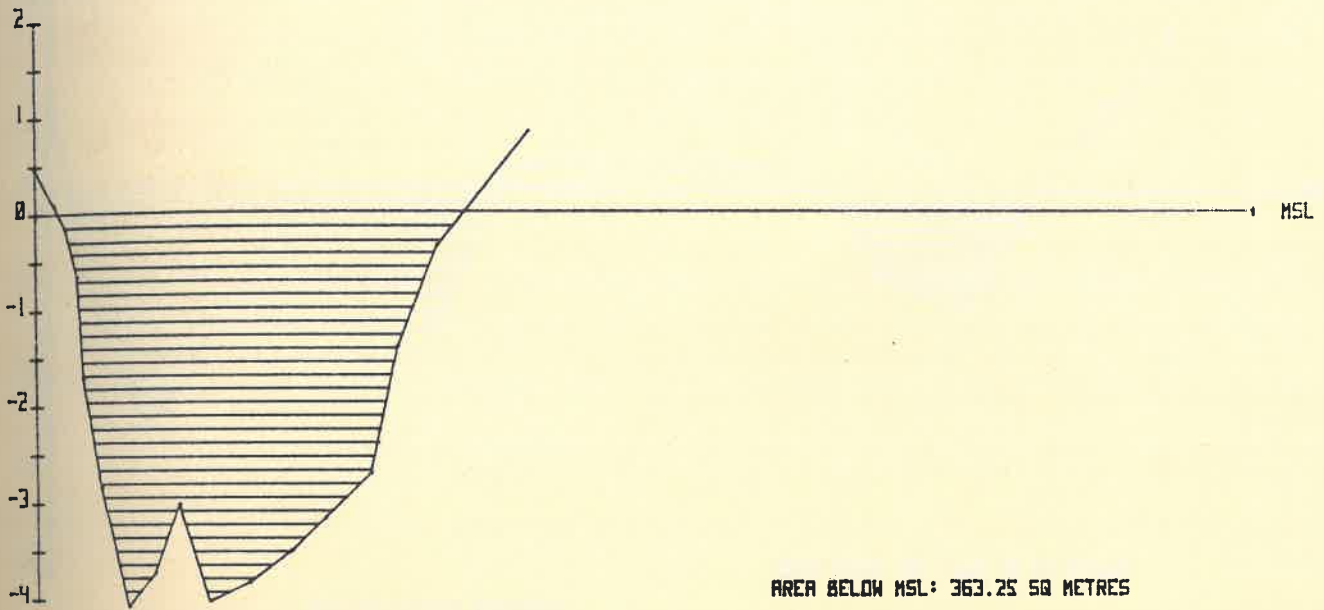
100 M

RDSIE

SECTION 5

SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

AREA BELOW MSL: 363.25 SQ METRES

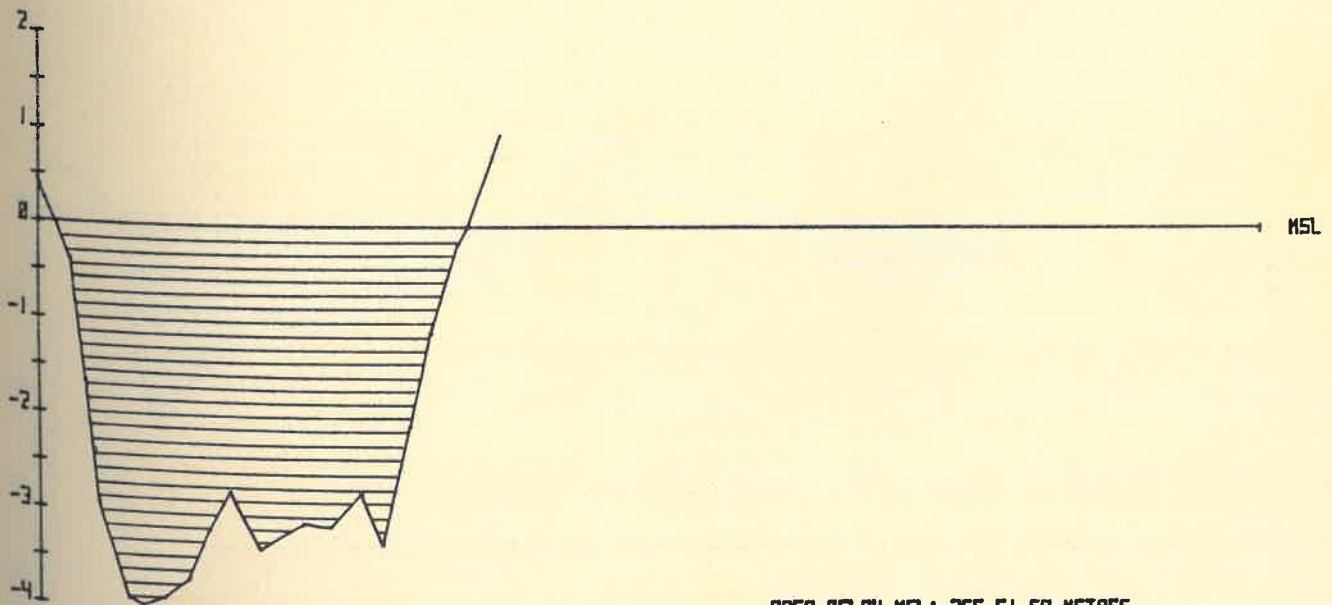
100 M

RODIE

SECTION 5

SWARTKOPS ESTUARY

OCT 1981



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

AREA BELOW MSL: 365.51 SQ METRES

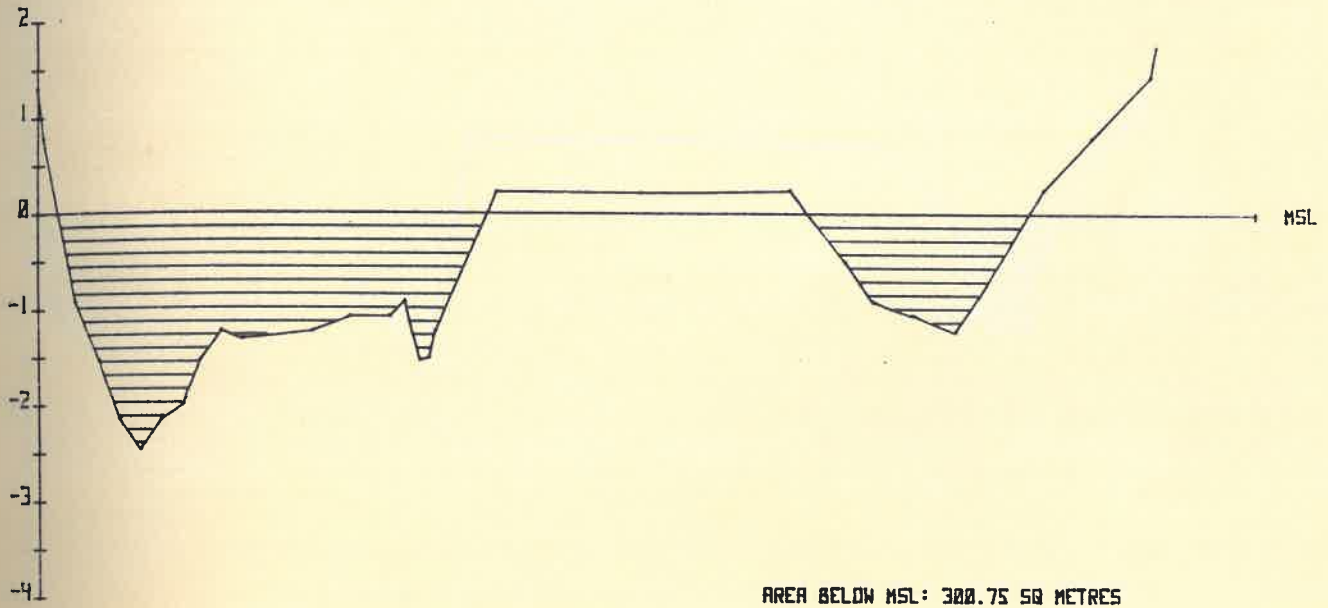
100 M

RODIE

SECTION 6

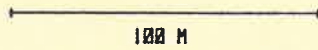
SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

AREA BELOW MSL : 300.75 SQ METRES



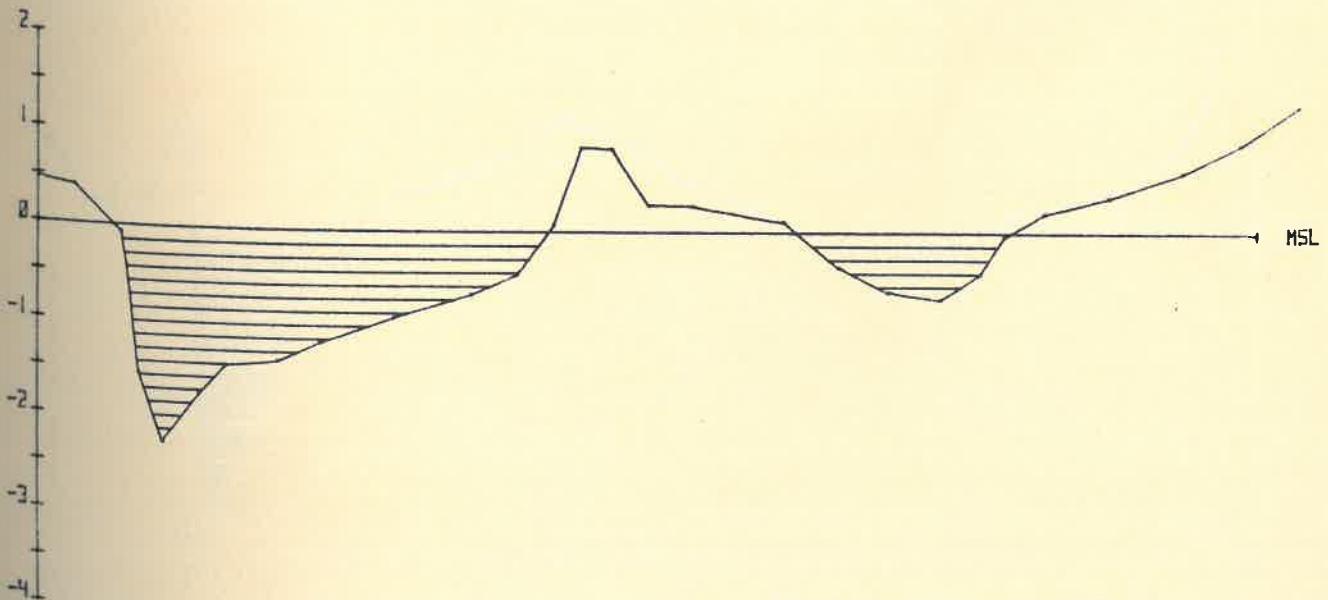
100 M

RDSJE

SECTION 6

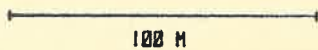
SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

AREA BELOW MSL : 181.88 SQ METRES



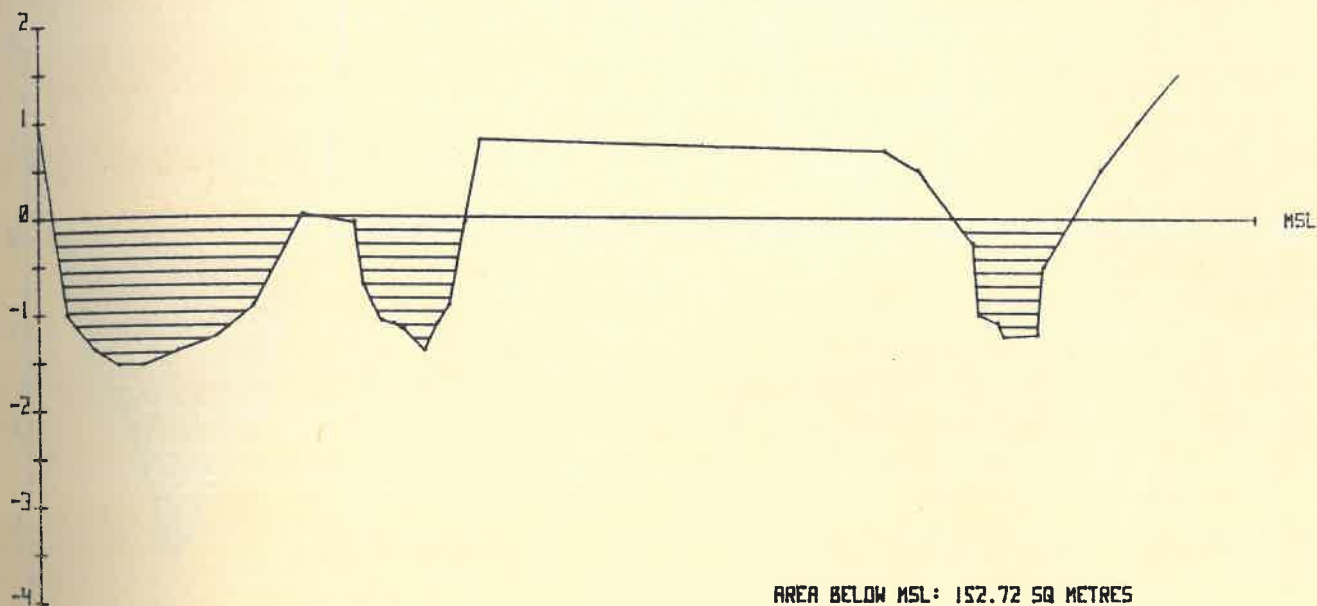
100 M

RDSJE

SECTION 7

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 152.72 SQ METRES

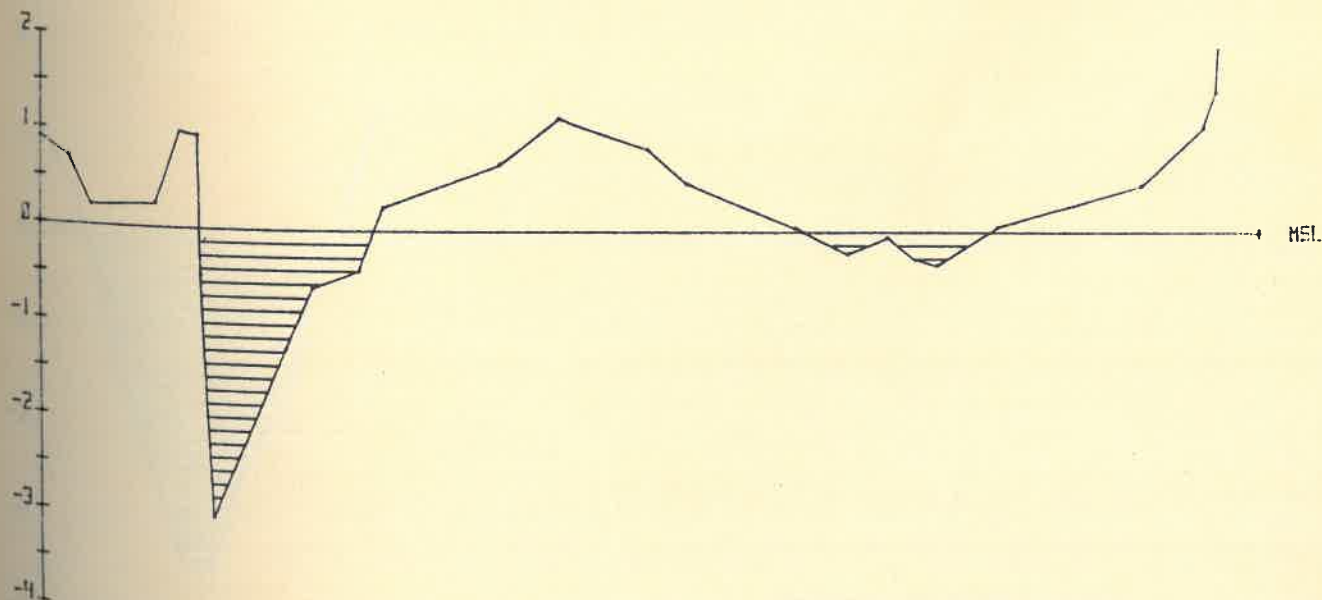
100 M

RDSIE

SECTION 7

SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 85.68 SQ METRES

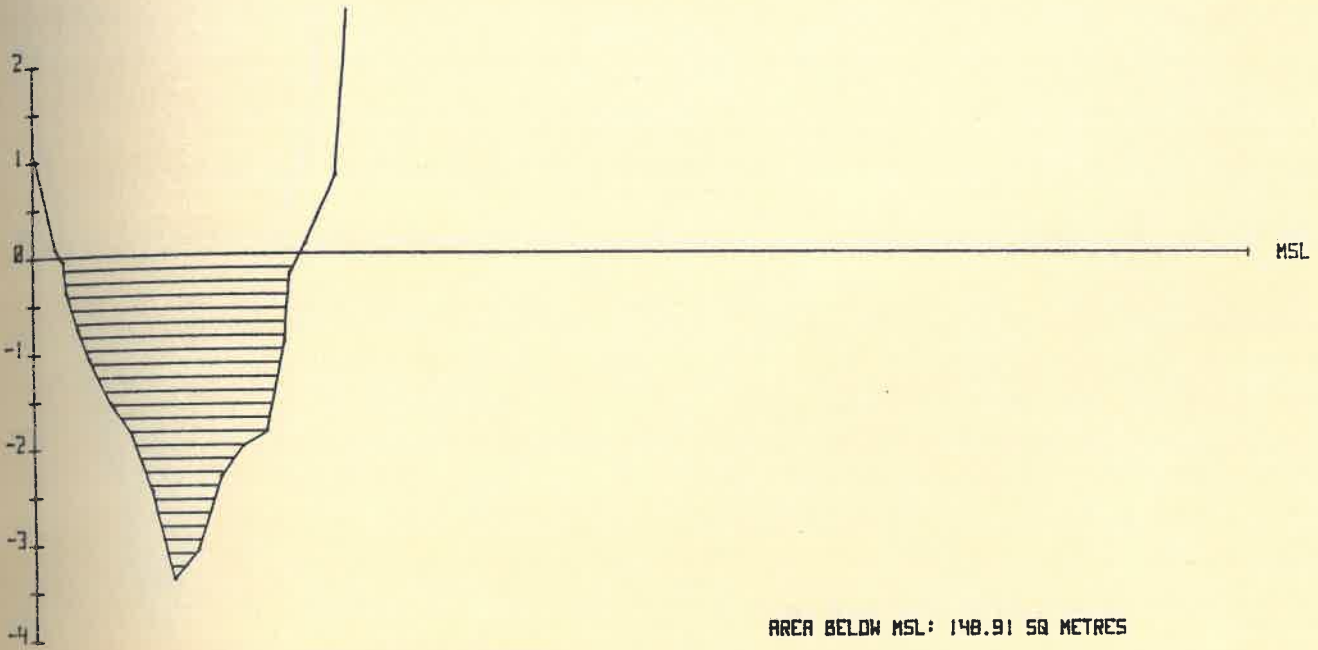
100 M

RDSIE

SECTION 8

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 148.91 SQ METRES

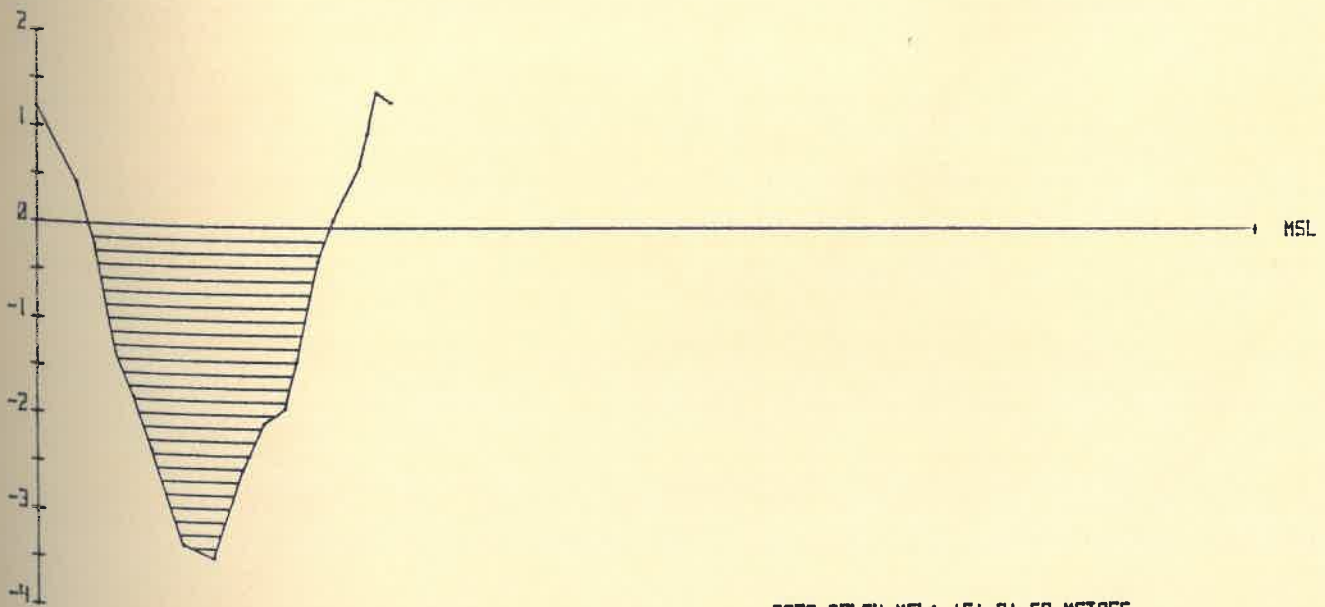
100 M

RDSIE

SECTION 8

SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 161.81 SQ METRES

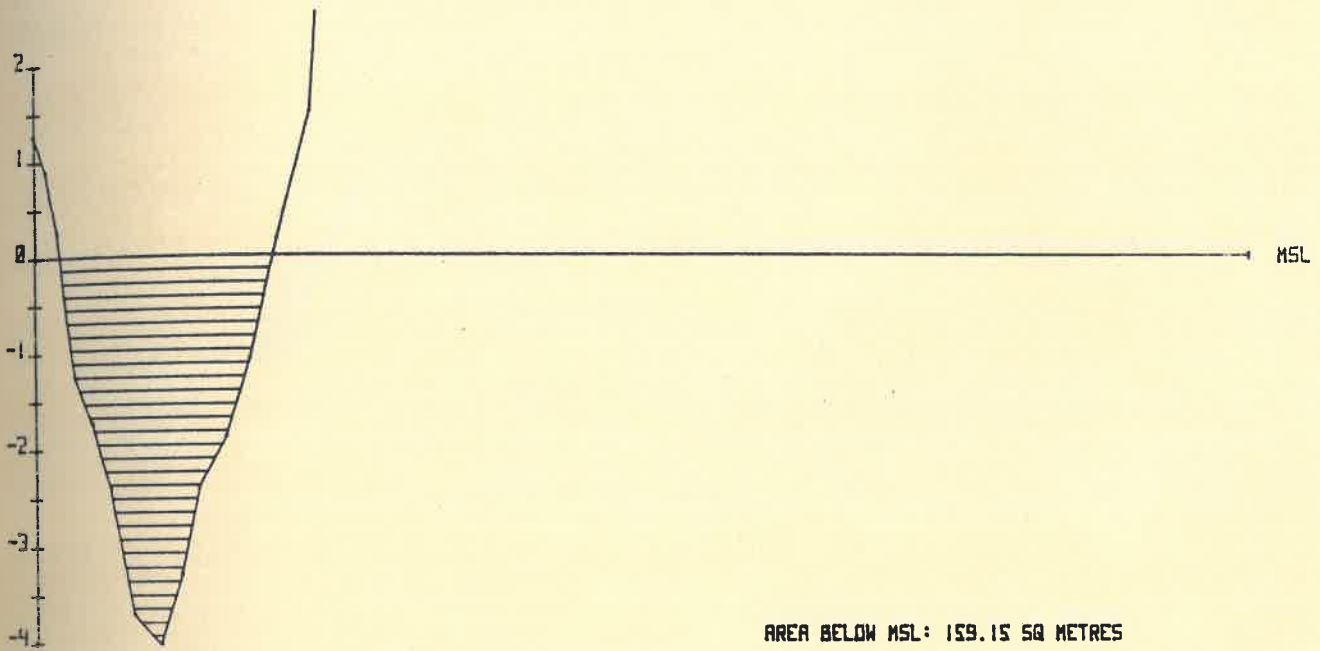
100 M

RDSIE

SECTION B

SWARTKOPS ESTUARY

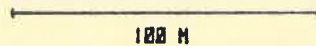
MAY 1981



SECTION VIEWED UPSTREAM

VERT. EX. : 33.33X

AREA BELOW MSL : 159.15 SQ METRES



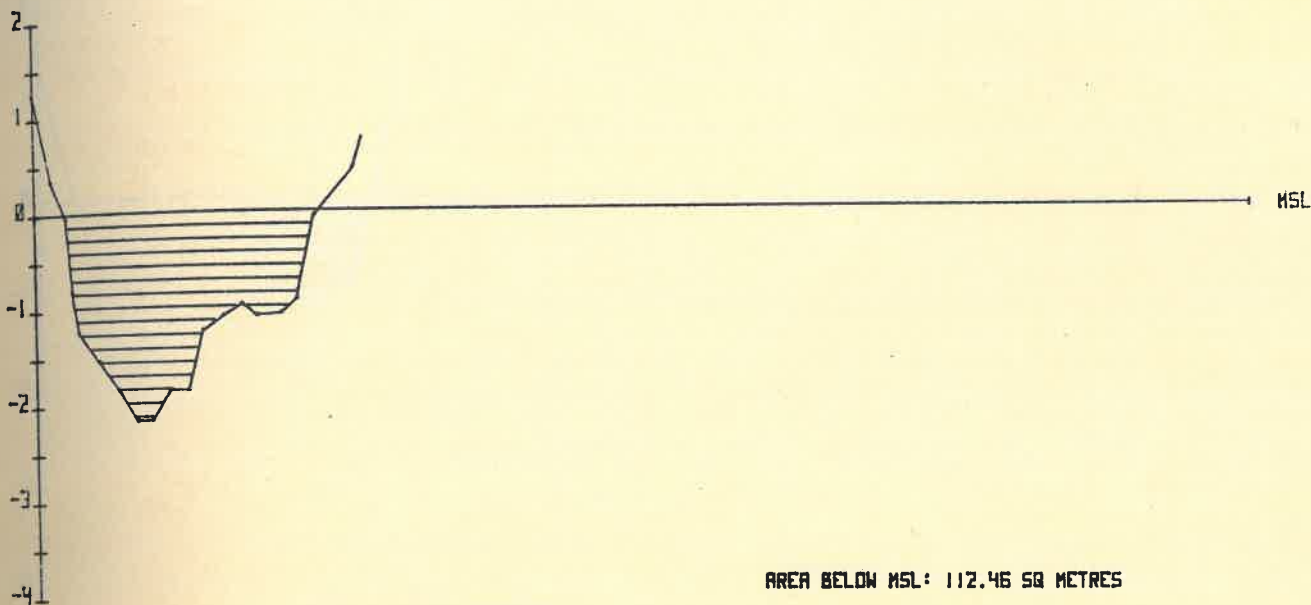
100 M

RDSIE

SECTION 9

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT.EX.: 33.33X

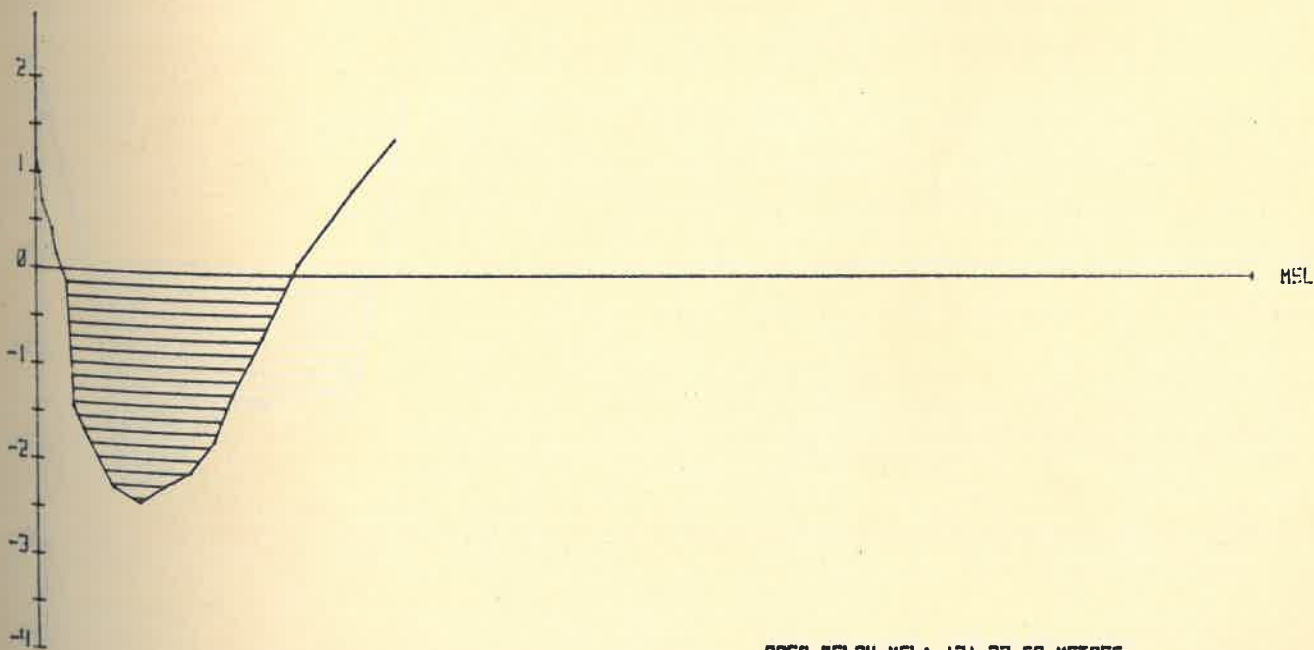
100 M

RDSIE

SECTION 9

SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT.EX.: 33.33X

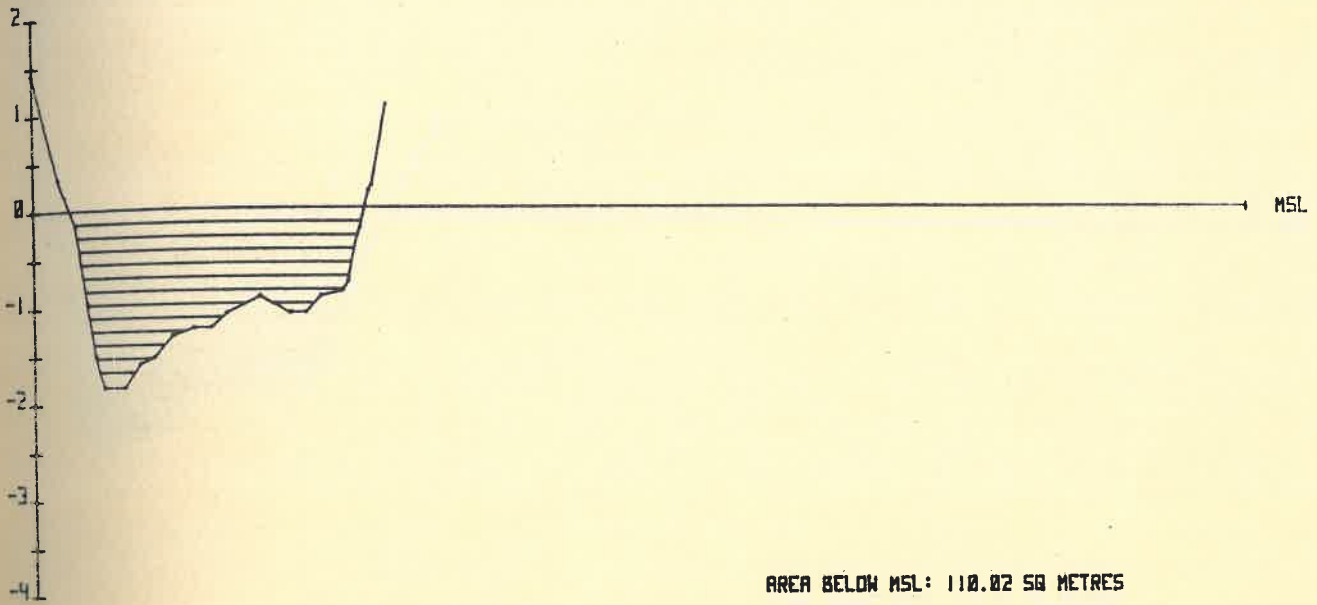
100 M

RDSIE

SECTION 10

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

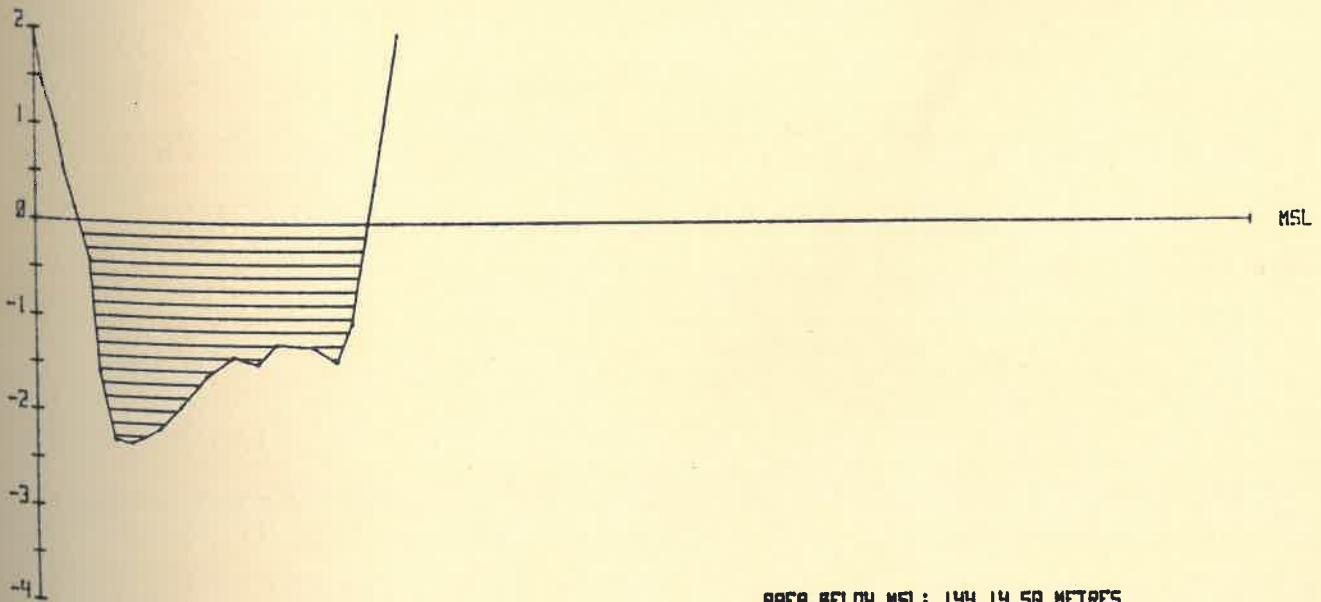
AREA BELOW MSL: 110.02 SQ METRES

ROSIE

SECTION 10

SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

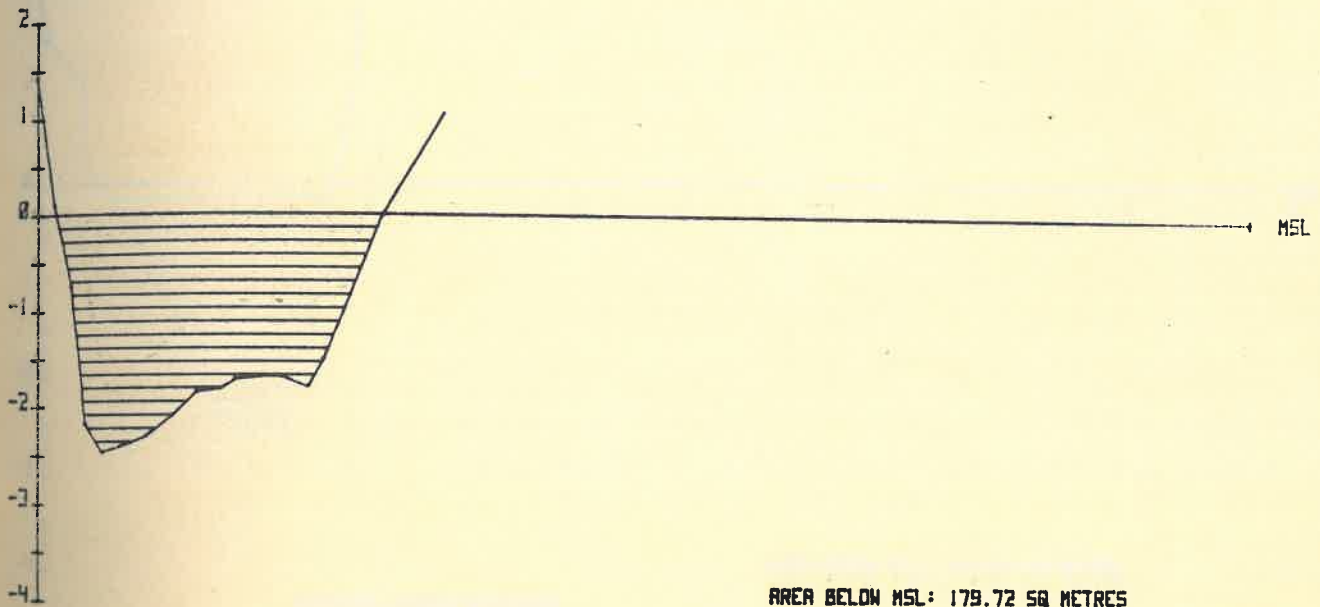
AREA BELOW MSL: 144.14 SQ METRES

ROSIE

SECTION 10

SWARTKOPS ESTUARY

MAY 1981



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

AREA BELOW MSL : 179.72 SQ METRES

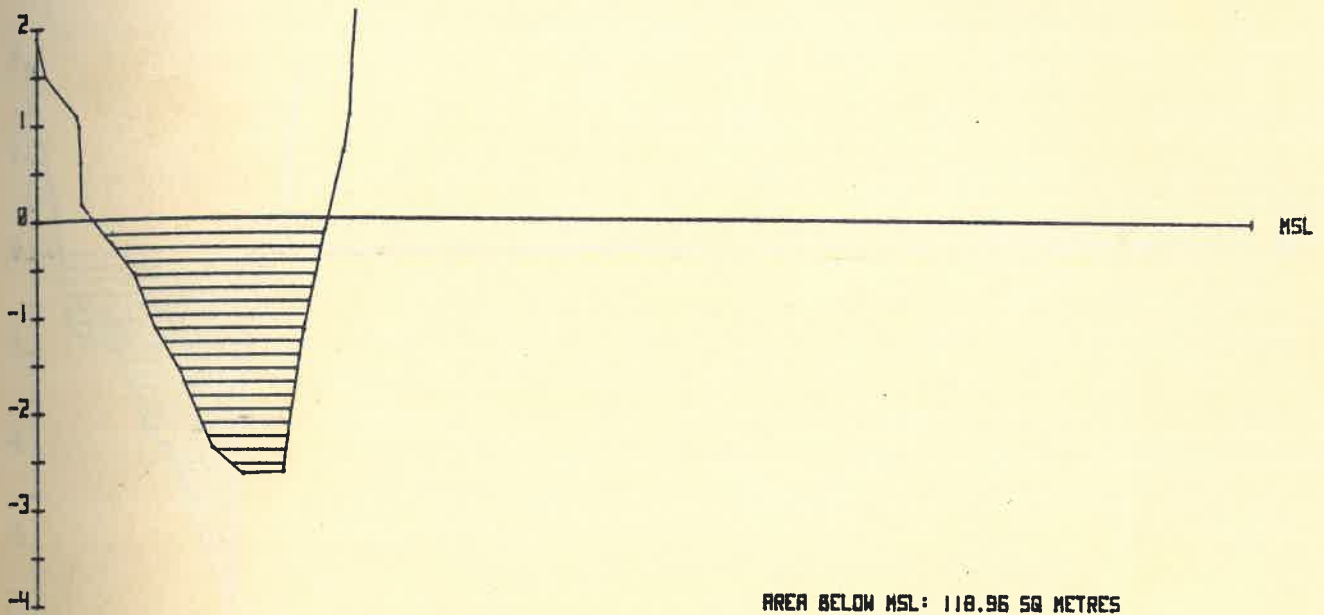
100 M

ROSIE

SECTION 11

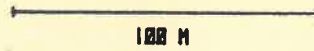
SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 118.96 SQ METRES

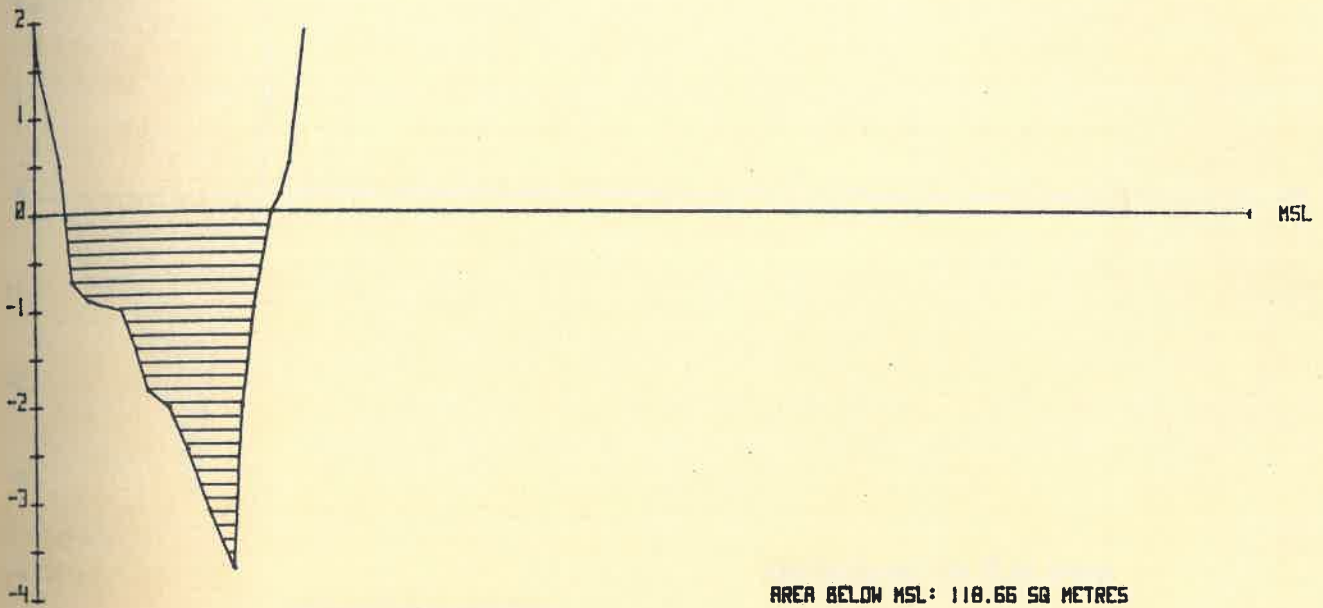


R051E

SECTION 12

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 118.66 SQ METRES

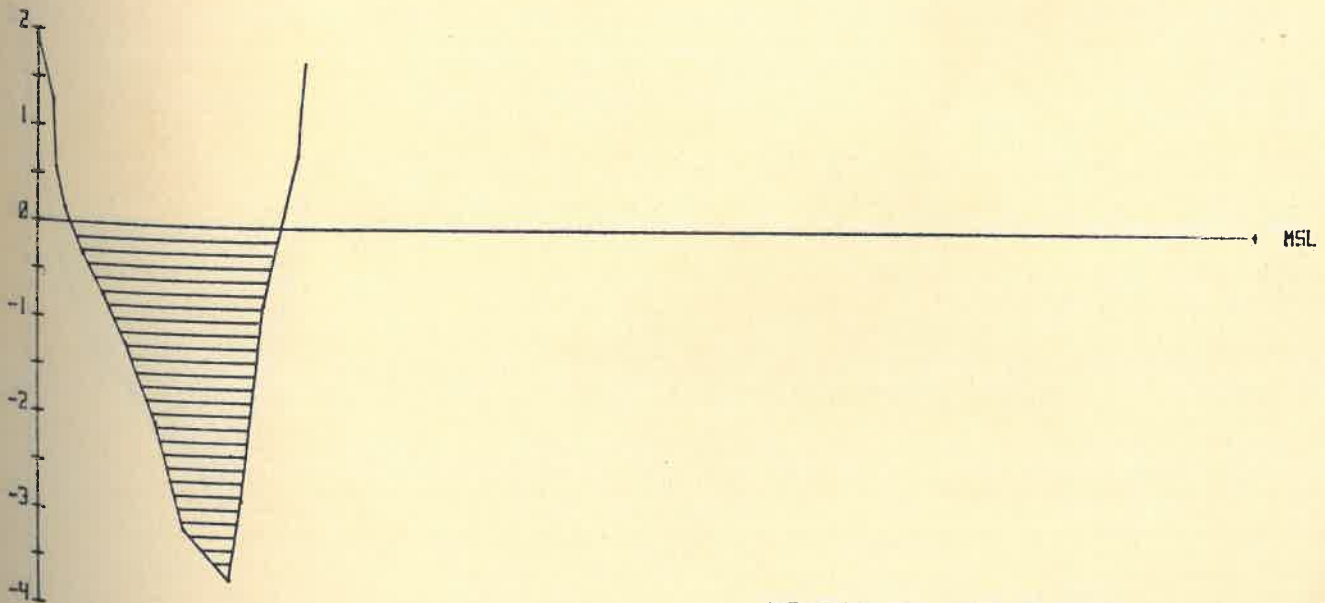
100 M

RDSIE

SECTION 12

SWARTKOPS ESTUARY

NOV 80



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 130.91 SQ METRES

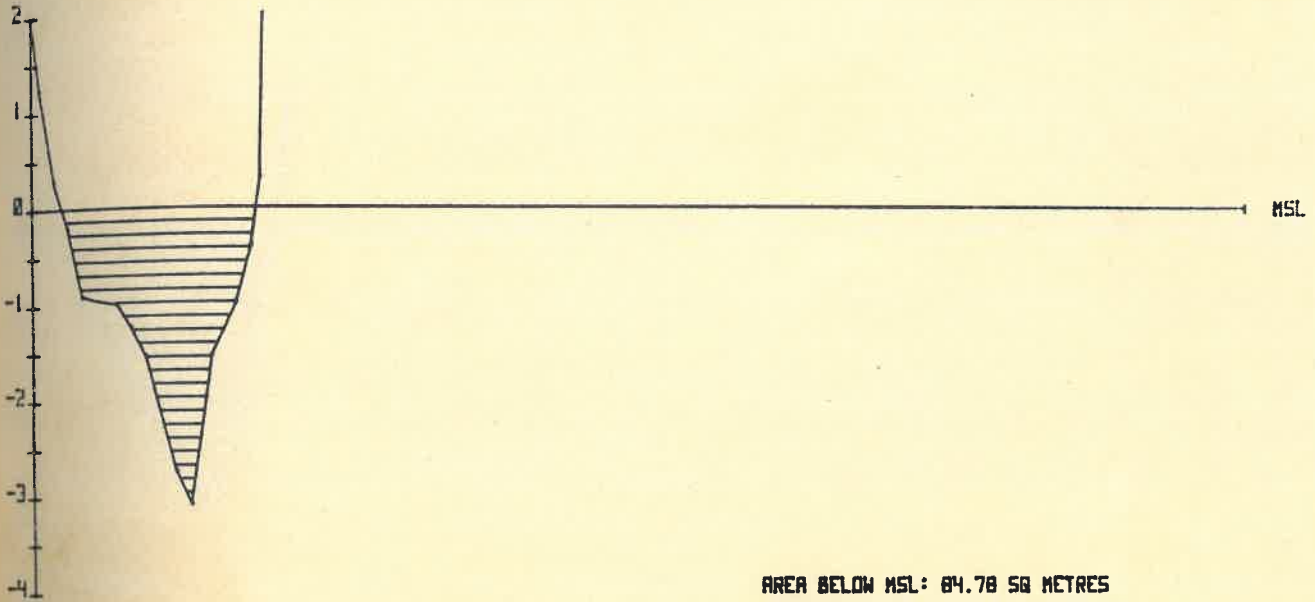
100 M

RDSIE

SECTION 13

SWARTKOPS ESTUARY

DEC 71



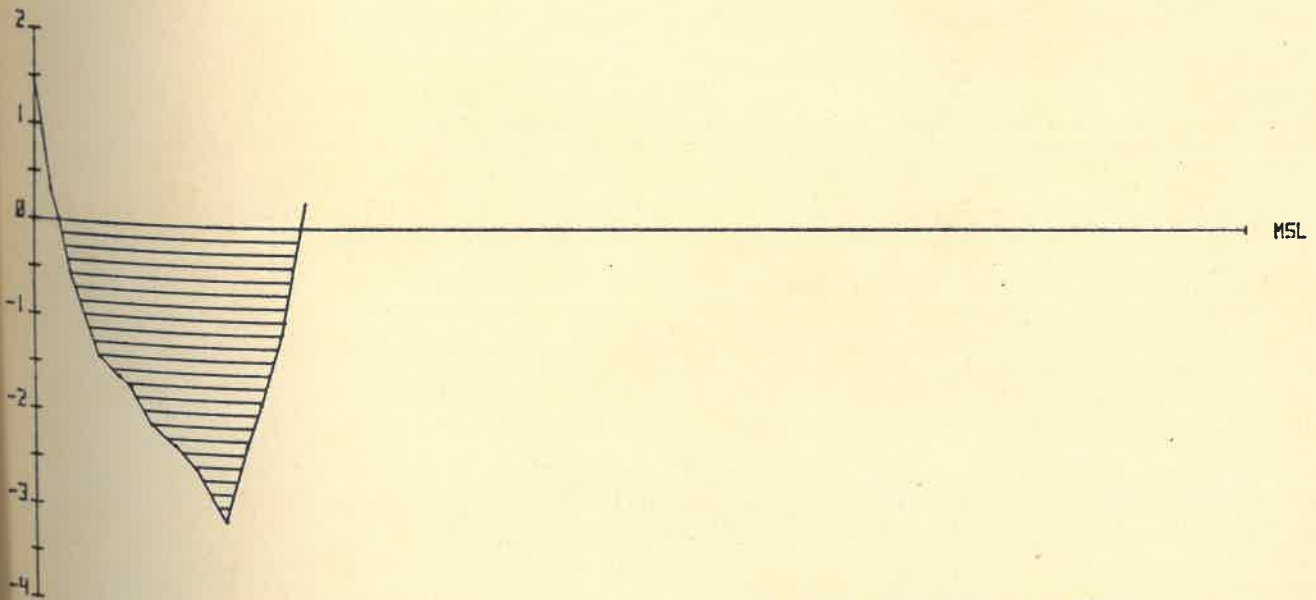
SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

RDSIE

SECTION 13

SWARTKOPS ESTUARY

MAR 80



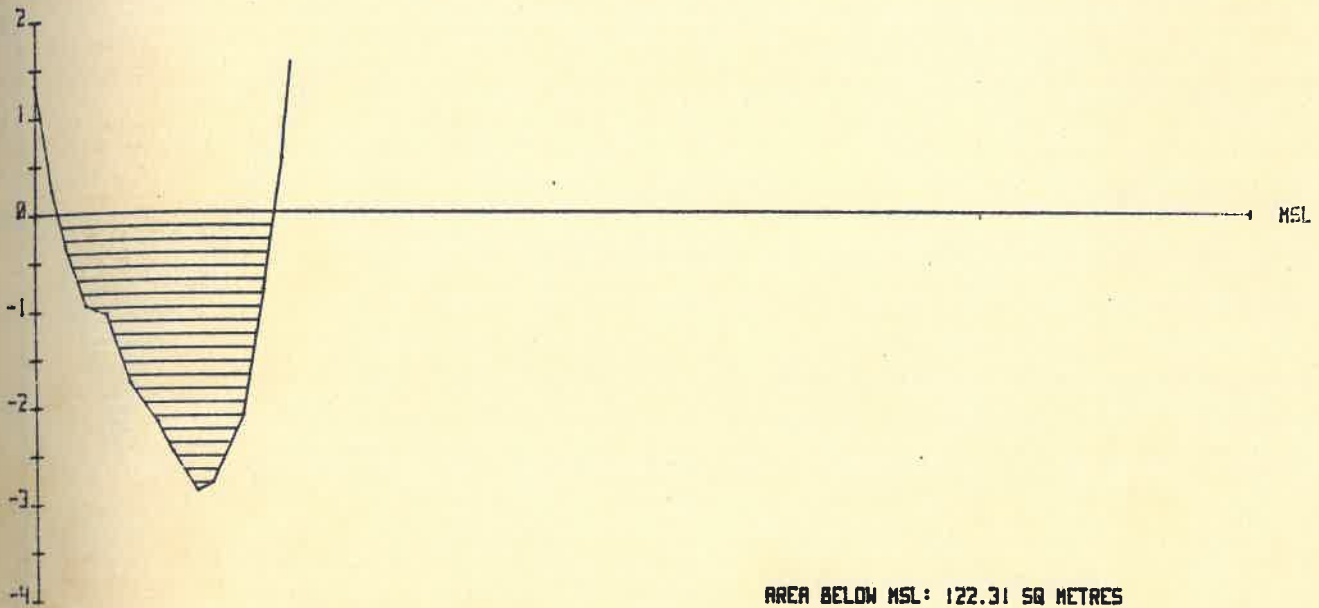
SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

RDSIE

SECTION 13

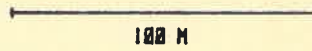
SWARTKOPS ESTUARY

MAY 1981



SECTION VIEWED UPSTREAM
VERT.EX.: 33.33X

AREA BELOW MSL: 122.31 SQ METRES

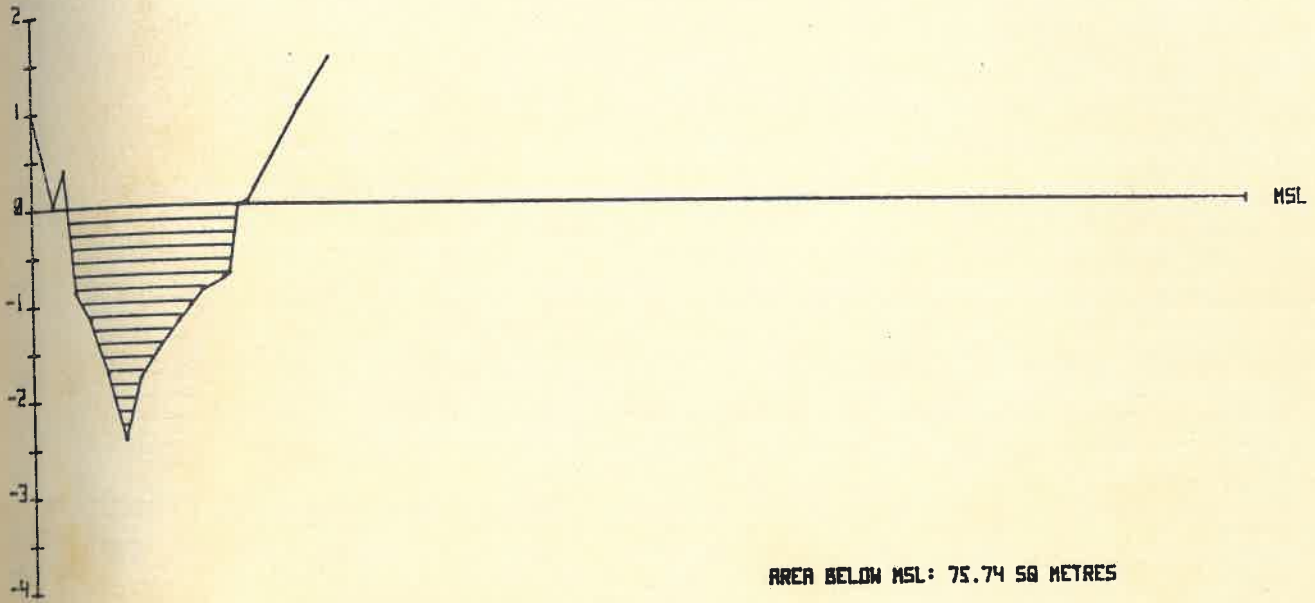


ROSIE

SECTION 14

SWARTKOPS ESTUARY

DEC 71



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 75.74 SQ METRES

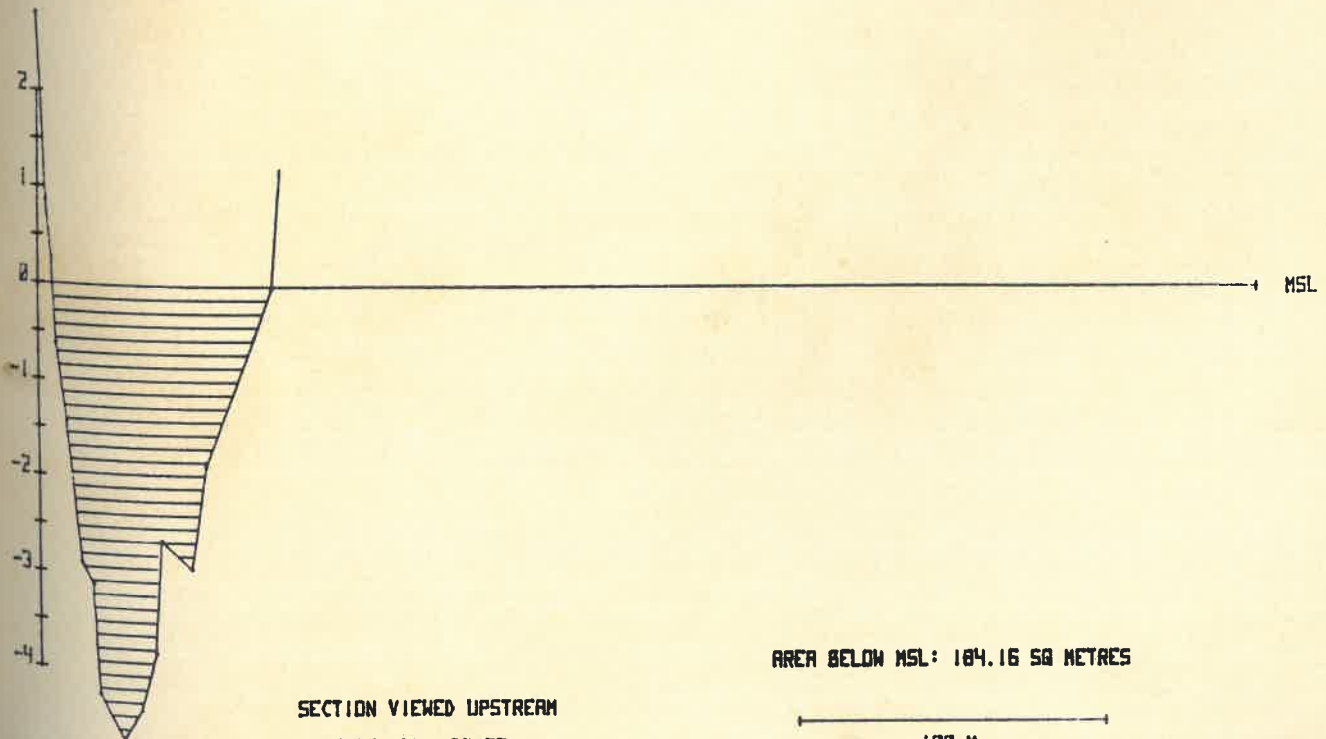
100 M

RDSIE

SECTION 14

SWARTKOPS ESTUARY

MAR 81



SECTION VIEWED UPSTREAM
VERT. EX.: 33.33X

AREA BELOW MSL: 104.16 SQ METRES

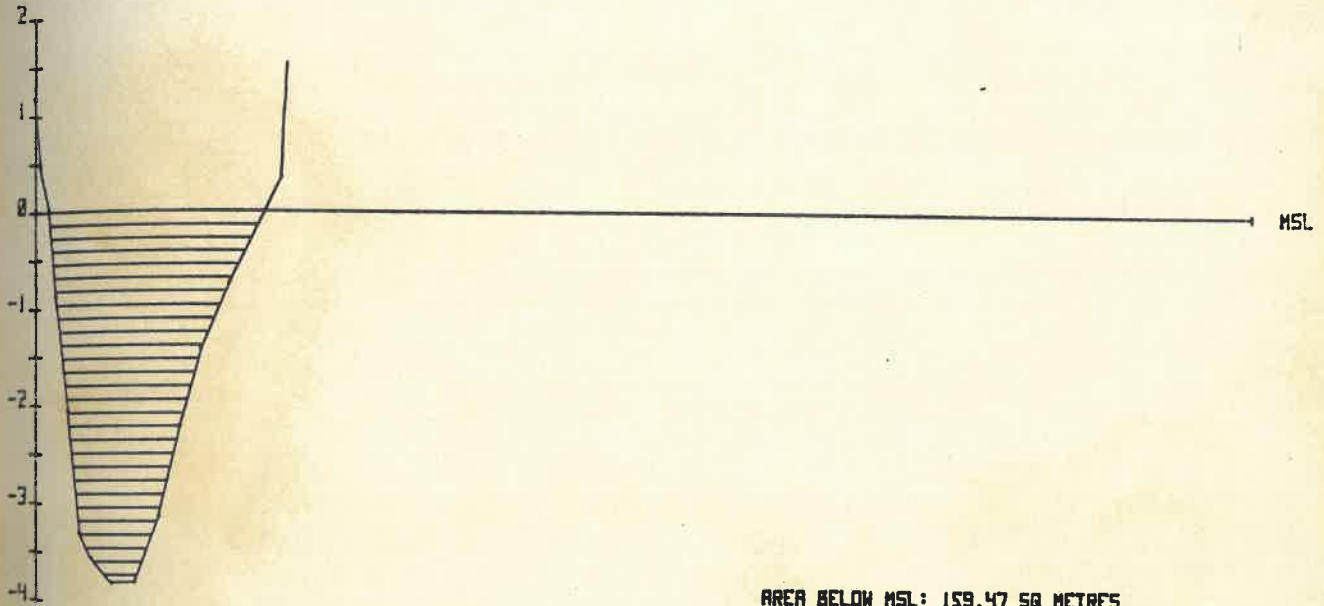
100 M

RDSIE

SECTION 14

SWARTKOPS ESTUARY

MAY 1981



SECTION VIEWED UPSTREAM
VERT. EX. : 33.33X

AREA BELOW MSL : 159.47 SQ METRES

100 M

ROSIE