



**SUBAQUEOUS
DELTA MORPHOLOGY
BRITANNIA BEACH, HOWE SOUND**
BY
DAVID B. PRIOR¹ AND BRIAN D. BORNHOLD²

¹COASTAL STUDIES INSTITUTE,
LOUISIANA STATE UNIVERSITY,
BATON ROUGE, LOUISIANA

²GEOLOGICAL SURVEY OF CANADA,
PACIFIC GEOSCIENCE CENTRE,
SIDNEY, BRITISH COLUMBIA

AUGUST 1984

SIDE SCAN SONAR SURVEYS OFF BRITANNIA BEACH REVEAL COMPLEX BOTTOM MORPHOLOGY ON THE SMALL SUBAQUEOUS DELTAS FORMED BY BRITANNIA CREEK AND THE TWO CREEKS IN MINATY BAY. THE FJORD-SIDE DELTAS HAVE BUILT OUTWARDS TOWARDS THE CENTRE OF HOWE SOUND, WHERE THE WATER DEPTH IS 270 m. THE AVERAGE INCLINATION OF THE SUBAQUEOUS DELTA SLOPES IS 9°.

THREE DISTINCTIVE TYPES OF BOTTOM FEATURES ARE IDENTIFIED. NUMEROUS ELONGATE CHUTES OR NARROW GULLIES INCISE THE STEEPER DELTA SLOPES (13°) TO A WATER DEPTH OF 200 m, WITH DEBRIS FANS AND BLOCKS AT THEIR DOWNSLOPE ENDS. THE LOWER DELTA SLOPES, INCLINED AT 7.5°, SHOW COMPLEX SYSTEMS OF CLOSELY-SPACED ARCUATE SCARPS CAUSED BY SHALLOW, ROTATIONAL, SUCCESSIVE SLIDING OF SURFACE SEDIMENTS. AT ONE LOCALITY SLIDING IS CONFINED WITHIN A BROAD TROUGH BOUNDED BY SHEAR PLANES. IN THE FLOOR OF HOWE SOUND THE FLAT BOTTOM IS LITTERED WITH LARGE SEDIMENT BLOCKS FORMING A LOBATE DEPOSITIONAL AREA.

THE BOTTOM FEATURES REPRESENT A SUITE OF SEDIMENT TRANSPORT PROCESSES INVOLVED IN DELTA PROGRADATION. MASS MOVEMENT OF SEDIMENT DOWN THE CHUTES CAUSES LOCALISED DEPOSITION AND LOADING ON THE LOWER SLOPES. LOAD-RELATED SLIDING TRANSFERS BLOCKS OF SEDIMENT BEYOND THE DELTA OUT ONTO THE FJORD FLOOR. THE ENTIRE MASS TRANSPORT PROCESS ASSEMBLAGE EXTENDS MORE THAN 2 km FROM THE SHORELINE.