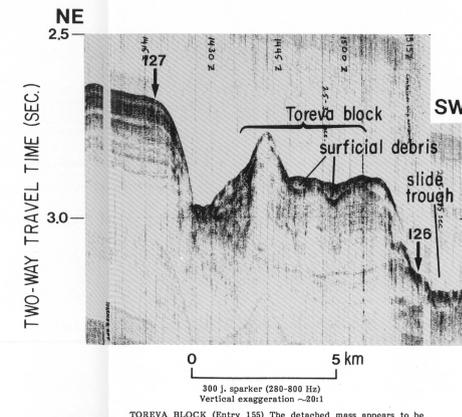
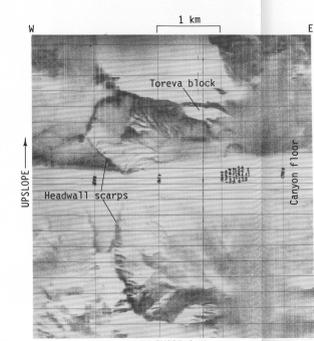


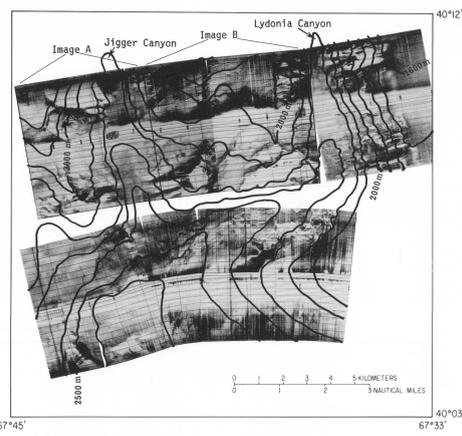
COMPOUND SLUMP with INTRATrustal DEFORMATION (Entry 149) Intratrustal deformation located about 90 m deep in the section has apparently led to suprajacent failure in the form of two incipient slumps (arrows). Although rotational displacement is not expressed here, the depressed head and elevated toe of a slump is evident. In this instance, as in so many illustrated here, a number of different style elements are involved in a single mass movement. The most clearly distinguished formal element determines the name ascribed to the whole.



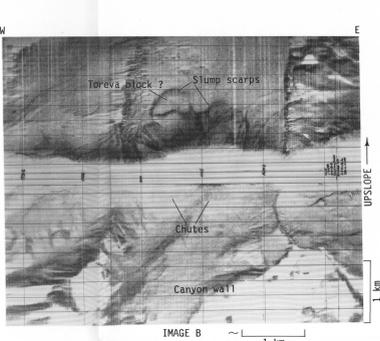
TOREVA BLOCK (Entry 156) The detached mass appears to be broken up. It shows slight evidence of rotational displacement, particularly at the southwest side. Given the high vertical exaggeration and the peak at the inferred head of the slide, the feature could just as well be called a block slide or a slab slide, particularly since the direction of transport is unknown. It probably moved along a path oblique to the seismic profile.



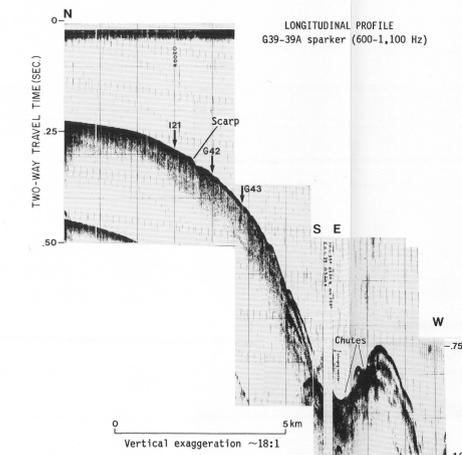
RUBBLE SLIDE; TOREVA BLOCKS (Entry 156) SeaMARC sonar image A shows large amphitheatric excavations along west flank of canyon. The large size and well-defined perimeters with associated Toreva block suggest failure of cohesive sediment; acoustic blurring near the canyon floor suggests that rubble partly fills the opening of the amphitheatres as well as the canyon floor.



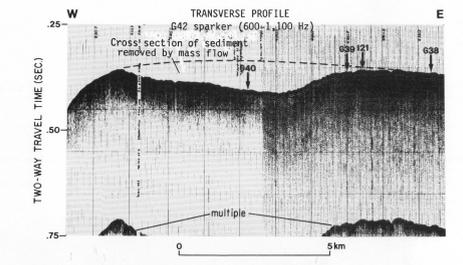
SeaMARC sidescan sonar image mosaic shows relationships of features in image A and image B to Jigger and Lydonia Canyons. Bathymetry in meters. These features are difficult to interpret as they incorporate a variety of style elements. The generally acute outline of the rim or headwall scarps indicates slumping, as does the inferred Toreva block morphology. A Toreva block may form the floor of the largest amphitheatric in image B. The scarping or streamlines along the floors of the excavations suggest the passage of relatively fine fragmented material. The more pronounced relief in image A suggests cohesive blocks of rubble formed as a large slump block broke apart; the indistinct scarps, truncated surface forms, and wide chutes flanked by eroded walls shown in image B suggest that slumps fed debris flows.



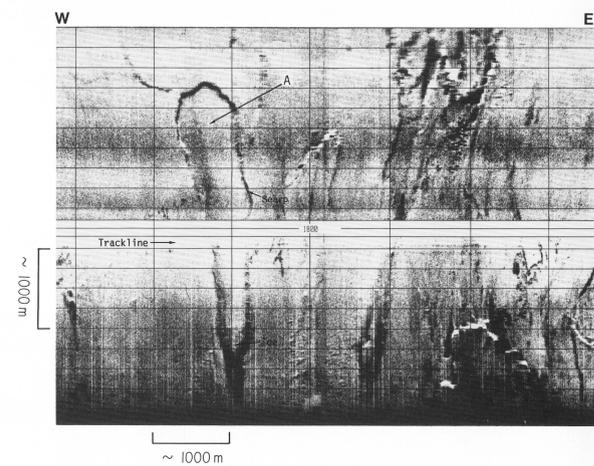
COLLAPSE SLUMPS; DEBRIS FLOWS (Entry 158) SeaMARC sonar image B shows amphitheatric slump scarps that face or open into long chutes extending down the canyon wall. Lack of distinct deposits with toe morphology and presence of streamlines converging into chutes implies that slumps were converted into debris flows.



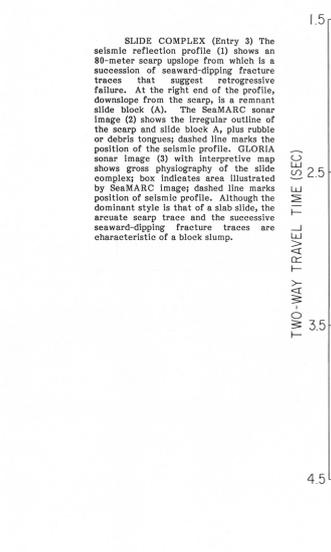
DEBRIS FLOW (Entry 159) This feature is clearly represented in transverse profile by the scarp, or excavation; a mantle of residual debris may be present, as suggested in longitudinal profile by the irregular surface downlope from the poorly defined 15-meter-high scarp. A maximum thickness of about 70 m of sediment has been displaced. The downslope end of the excavation is lost among one or more steep downslope-trending chutes; presumably most of the debris was funneled down the chutes or ridges therein.



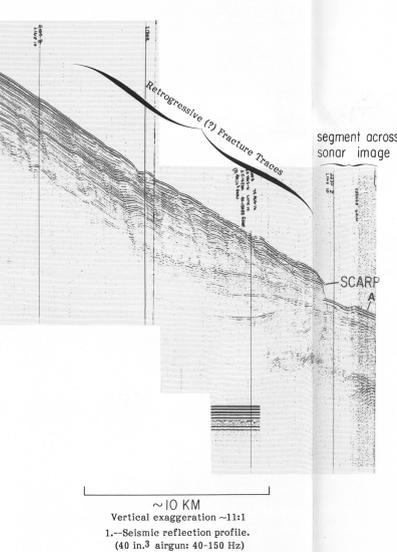
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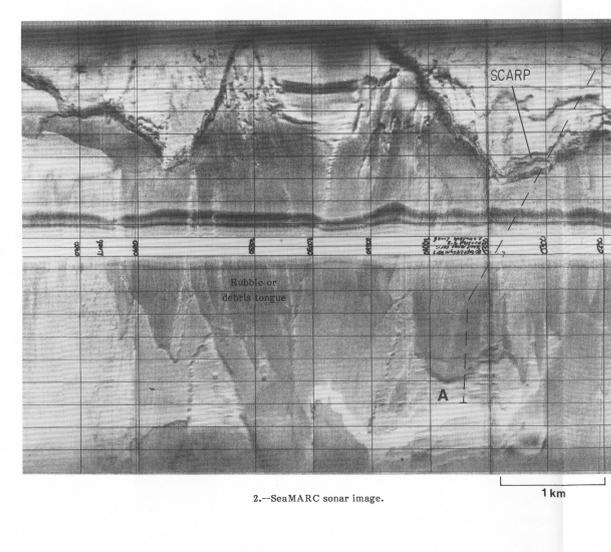
DEBRIS FLOW (Entry 117) SeaMARC sonar image shows an unusually well-defined individual mass movement (A). Relief of scarp at track line crossing is 10 m actual thickness of displaced mass is unknown. The acoustically dark toe implies smooth, finely comminuted debris. Core sample of main mass indicates a breccia composed of Eocene, Santonian, and Pleistocene claystone fragments in a Pleistocene matrix.



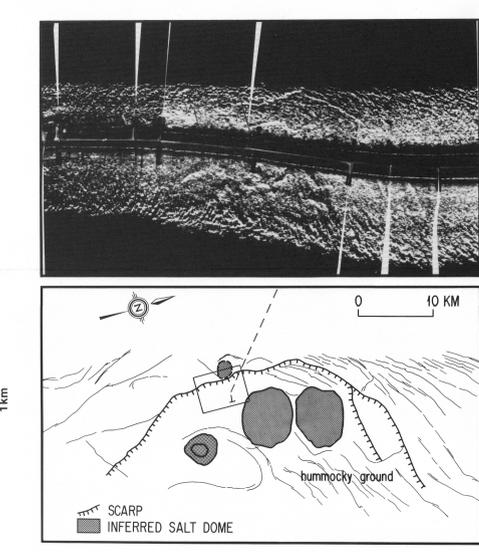
SLIDE COMPLEX (Entry 3) The seismic reflection profile (1) shows an 80-meter scarp upslope from which is a succession of seaward-dipping fracture traces that suggest retrogressive failure. At the right end of the profile, downslope from the scarp, is a remnant slide block (A). The SeaMARC sonar image (2) shows the irregular outline of the scarp and slide block A, plus rubble or debris tongues; dashed line marks the position of the seismic profile. GLORIA sonar image (3) with interpretive map shows gross physiography of the slide complex; box indicates area illustrated by SeaMARC images; dashed line marks position of seismic profile. Although the dominant style is that of a slab slide, the acute scarp trace and the successive seaward-dipping fracture traces are characteristic of a block slump.



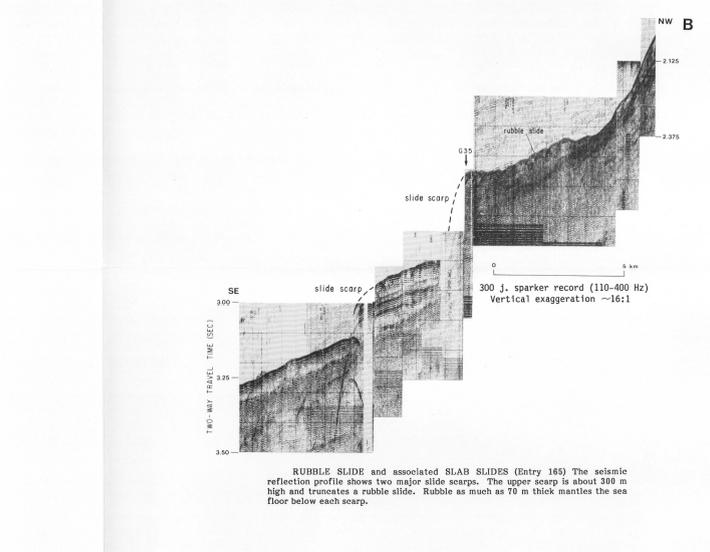
SCARP (Entry 1) Seismic reflection profile. (40 in. J. airgun; 40-150 Hz)



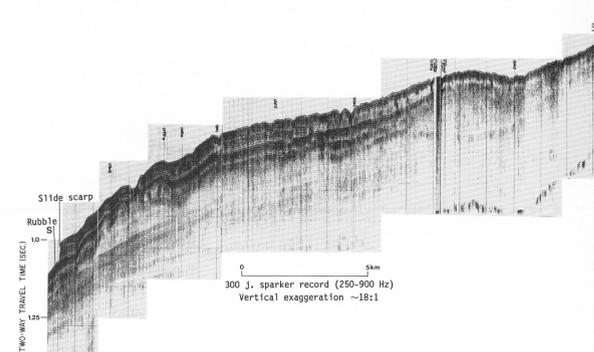
SCARP (Entry 1) SeaMARC sonar image.



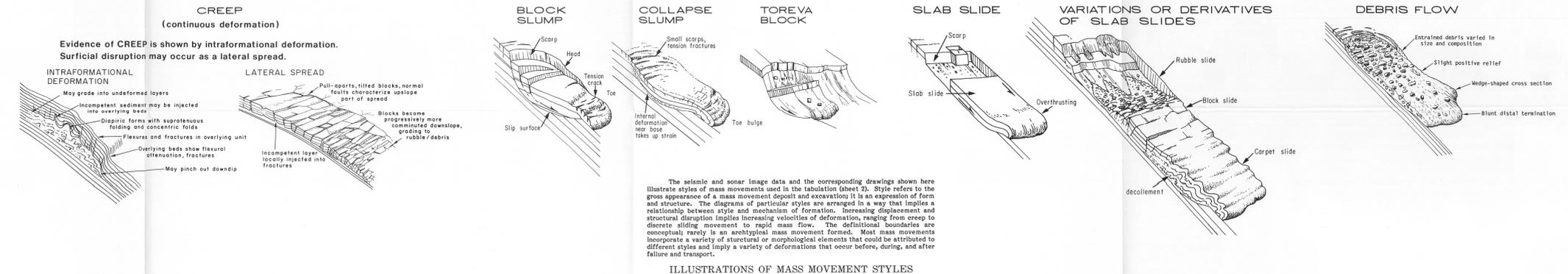
SCARP (Entry 1) GLORIA sonar image and interpretive map.



RUBBLE SLIDE and associated SLAB SLIDES (Entry 165) The seismic reflection profile shows two major slide scarps. The upper scarp is about 300 m high and truncates a rubble slide. Rubble as much as 70 m thick mantles the sea floor below each scarp.



CREEP and associated SLAB and RUBBLE SLIDE (Entry 118) The seismic profile shows detached structures indicative of intratrustal deformation. The upper 35-meter-thick unit shows evidence of layer-parallel extension with increasing structural relief downlope. The unit is terminated by a scarp fronted by rubble at the left end of the profile. The tilted notched surface and the basal detachment suggest a lateral spread generated by creep.



ILLUSTRATIONS OF MASS MOVEMENT STYLES

MAP AND TABULATION OF QUATERNARY MASS MOVEMENTS ALONG THE UNITED STATES-CANADIAN ATLANTIC CONTINENTAL SLOPE FROM 32°00' TO 47°00' N. LATITUDE

By
J.S. Booth, D.W. O'Leary, Peter Popenoe, J.M. Robb and B.A. McGregor
1988