CHAPTER 2

PROBLEM

2.1. General Description

Currently in Ecuador the unique source of information where mariners can extract some detail about the nature of the seabed is the nautical chart. However, this information, in the best case, was obtained through a systematic but usually unguided sampling of the seabed. In other cases, only random samples have been obtained during oceanographic surveys. Regardless of which method was used, the information is limited to point data. The seabed data from the systematic method have usually been obtained at the intersection of grids built on the survey area at spacing that varies from 1500 meters to 2000 meters. Commonly in this approach, the sampling is carried out up to the depth of 40 meters. Giving this limitation, the information about the nature of the seabed shown on the Ecuadorian nautical charts is typically sparse and therefore of only limited use for anchoring purpose (figure 2).

The surficial sediment found in the continental shelf and in other near shore environment is characterized by high spatial and temporal variability both its configuration and its sediment distribution or heterogeneity (Reineck and Singh, 1973). This variability exists in both the short and long term; short term changes are related to the interaction of hydrodynamic, biological, and biogeochemical process acting on the seafloor, while long-term changes are the result of global changes in the sea level and alteration of the regional sediment erosion, transport and deposition patterns (Jackson, D.R. and Richardson, M.D., 2007).

A hydrographic survey over an anchorage area has to be done in such way that allows the hydrographic office to identify all hazards to navigation and also describe the nature of the seafloor. Multibeam echosounders allow hydrographers to achieve a full bathymetric coverage of the seafloor and identify potential hazards. This device was mainly developed in order to
establish the morphology of the seafloor, however since the 1950s considerable research has been conducted in order to understand how information about the seafloor can be extracted from the acoustic energy generated by an echosounder and returning after interaction with the seafloor.

**FIGURE 2.-** NATURE OF THE SEAFLOOR INFORMATION SHOWN ON A ECUADORIAN NAUTICAL CHART