The purpose of this paper is to further assist in the understanding of the geological processes involved in submarine mass movements and to show their potential impact on human activity with the aim of stimulating incentive for further research. The main goal of the presentation is to give a regional overview of the variety, distribution deformation processes, cause and triggering mechanisms of the submarine gravitative mass movements that have been found in the Corinth Gulf. The Corinth Gulf is located within the Aegean micro-plate and is characterized by high seismicity. Offshore seismic surveys have shown that the seabed is characterized by unstable conditions. Three main types of mass movements were identified in the acoustically stratified layers of Quaternary deposits: (i) sliding of masses on a basal planar or concave shear surface with disintegration of the sediment fabric into mass flows, (ii) slow downslope creep and (iii) turbidity flows. The sliding is associated with active or inactive deltas fronts with an average slope gradient of about 6° and fault escarpments with gradient ranging from 12° to 30°. The slides affect the upper 5-10m of well-layered Holocene sediment and take place on bedding planes with gradients from 1° to 6°. The creeping affects the upper 5 to 10m and forms on planes with gradients from 1° to 4°. The turbidity flows are occurring in the mouth of rivers and submarine canyons. Detailed studies in the coastal zone witch were carried out immediately after a destructive earthquake of 6.2R, which occurred on June, 1995 have shown that: (i) the coastal sediments are stable under gravitational stresses and cyclic loading stresses
induced by the 6.2R earthquake. (ii) The dominant instability mechanism that caused the sediment failure was due to liquefaction of subsurface layers. The liquefaction was caused by elevated pore pressure enhanced perhaps, by the presence of gas. The creeping observed in the upper layers is considered to have been caused by the deformation of the underlying sediments. This can be attributed to the partial loss of sediment strength due to either the remoulding or excess pore fluid pressure caused by the cyclic loading induced by the earthquake.

Historical observations give evidence that: (i) coastal mass movements like those described above have also occurred in the past, (ii) mass movements have been triggered by earthquakes or heavy rain and (iii) the frequency occurrence of mass movements all over the Corinth Gulf graben may be once in every two or three years. These mass movements have caused destruction to the coastal infrastructure and also to offshore submarine cables.

The review of the state of the art on the existing knowledge suggests, that in the past three decades, there have been great scientific and engineering advances in the recognition of mass movements on the seafloor and of the basic geological processes involved. There is however, a lack of scientific knowledge related to the prediction of the reactivation of existing mass movements and to the identification of slopes prone to failure. This knowledge could be acquired by the continuous monitoring of the changes in the physical and mechanical properties of the sediments. The study of the continuous changes in the sediment properties is hindered mainly by the high cost of monitoring in the unfriendly ocean environment.

Taking the aforementioned into consideration, and bearing in mind that the Gulf of Corinth is a semi-enclosed embayment characterized by calm sea conditions, the Gulf would therefore, be an ideal natural laboratory for the further advancement of present day knowledge on mass movement processes and slope stability prediction.