Mapping of the Gessoso-Solfifera layer and Messinian Erosional Surface in the Northern and Central Adriatic Sea

Alessandra Lanzoni¹, Anna Del Ben¹, Forlin Edy², and Busetti Martina²

¹University of Trieste, DMG, department of Mathematics and Geoscience, Trieste, Italy (alessandralanzoni.tl@gmail.com)
²OGS, National Institute of Oceanography and Applied Geophysics, Trieste, Italy

Since the discovery of widespread Salt and Gypsum deposits of the Mediterranean Sea in the early ‘50s, a large number of scientists tried to unravel the mystery related to this huge deposition of evaporites. Evidence of the later so-called “Messinian Salinity Crisis” (MSC) are largely distributed all around the Mediterranean Basin and widely studied. Although gypsum deposits were recognized in some peripheral or marginal basins (e.g. Sorbas Basin in Spain, Northern Apennines in Italy), mechanism of their deposition and formation are still uncertain. Particularly, the so-called Gessoso-Solfifera formation (GS Fm) was recognized in the ‘50s by Selli in several outcrops in Northern Apennines and it is nowadays well known and mapped in the on-shore outcrops. A regional analysis in the Adriatic Sea is still incomplete, even though a large amount of data is available (2D multichannel seismic lines, boreholes, exploration reports). In the Adriatic Sea, the MSC event can be recognized in the 2D seismic lines as actual thin deposit (maximum GS Fm thickness of about 120 ms TWT) or Messinian erosional surface (MES). In both cases, a strong and clear reflector at the Pliocene base is picked and calibrated by the boreholes reaching its depth. Along the main part of the available seismic profiles it is sometimes very hard to ascribe this strong reflector to the MES or to the presence of a thin gypsum layer.

Calibration of 2D seismic lines with boreholes, also integrated by physical properties derived from geophysical well logs and core data) of the Plio-Quaternary sediments, allowed a detailed seismic facies analysis useful for this purpose. A structural map of the Plio-Quaternary base describes the Plio-Quaternary deformation that affected the study area mainly as Apennine foreland. The thickness map of the GS Fm describes the subsidence and the erosional effect occurred during the MSC. Both these maps are here presented as a first result of a regional study, that intends cover the whole Adria offshore.