Geophysical Research Abstracts
Vol. 19, EGU2017-13687, 2017
EGU General Assembly 2017

Geomorphological map of a coastal stretch of north-eastern Gozo (Maltese archipelago, Mediterranean Sea)

Mauro Soldati (1), Anton Micallef (2,5), Sara Biolchi (3), Alessandro Chelli (4), Alessandro Cuoghi (1), Stefano Devoto (3), Christopher Gauci (5), Kevin Graff (6), Federico Lolli (1), Matteo Mantovani (7), Giuseppe Mastronuzzi (8), Luca Pisani (5), Mariacristina Prampolini (1), Brian Restall (5), Thomas Roulland (6), Michael Saliba (9), Lidia Selmi (1), and Vittoria Vandelli (1)

(1) Università di Modena e Reggio Emilia, Dipartimento di Scienze Chimiche e Geologiche, Modena, Italy, (2) Euro-Mediterranean Centre on Insular Coastal Dynamics, University of Malta, Msida, Malta, (3) Department of Mathematics and Geosciences, University of Trieste, Trieste, Italy , (4) Department of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, Italy, (5) Institute of Earth Systems, University of Malta, Msida, Malta, (6) Laboratory Géophen, UMR LETG 6554 CNRS, University of Caen Normandie, Caen, France, (7) Institute for Hydrogeological Research and Protection (IRPI), National Research Council (CNR), Padua, Italy, (8) Department of Earth and Geoenvironmental Sciences, University of Bari "Aldo Moro", Bari, Italy, (9) Environment & Resources Authority, Marsa, Malta

Geomorphological investigations carried out along the north-eastern coast of the Island of Gozo (Malta) have led to the production of a detailed geomorphological map. Field surveys, accompanied by aerial photo-interpretation, were carried out within the framework of the EUR-OPA Major Hazards Agreement Project "Developing Geomorphological mapping skills and datasets in anticipation of subsequent Susceptibility, Vulnerability, Hazard and Risk Mapping" (Council of Europe). In particular, this geomorphological map is the main output of a 'Training Course on Geomorphological Mapping in Coastal Areas' held within the Project in November 2016.

The study area selected was between Ramla Bay and Da let Qorrot Bay on the Island of Gozo (67 km^2), part of the Maltese archipelago in the central Mediterranean Sea. From a geological viewpoint, the stratigraphic sequence includes Late Oligocene (Chattian) to Late Miocene (Messinian) sedimentary rocks. The hard limestones of the Upper Coralline Limestone Formation, the youngest lithostratigraphic unit, dominate the study area. Underlying this formation, marls and clays belonging to the Blue Clay Formation extensively outcrop. The oldest lithostratigraphic unit observed in the study area is the Globigerina Limestone Formation, a fine-grained limestone. The lithostructural features of the outcropping units clearly condition the morphography of the landscape.

The coast is characterised by the alternation of inlets and promontories. Worthy of notice is the large sandy beach of Ramla Bay partly backed by dunes. From a geomorphological perspective, the investigated coastal stretch is characterised by limestone plateaus bounded by steep structural scarps which are reshaped by gravitational and/or degradation processes, and milder slopes in Blue Clays at their foot comprising of numerous rock block deposits (*rdum* in Maltese) and active or abandoned terraced fields used for agricultural purposes.

Landforms and processes related to structural, gravitational, coastal, alluvial and karst processes were mapped. Particular attention was devoted to the recognition and classification of landslides of different type (in particular block slides and earth flows/slides) which affect large sectors of the north-eastern coast of Gozo. In most cases, landslide accumulations reach the coastline and cover shore platforms. In addition, wide portions of the plateau areas are affected by rock spreading related to the presence of limestones overlying clayey terrains.

The climatic conditions, the dense joint systems and the karstification of limestone determine a temporary superficial drainage pattern. Temporary streambeds (*wieden* in Maltese) were identified in correspondence of V-shaped valleys once occupied by permanent water courses. Karst processes widely affect the Upper Coralline Limestone Formation resulting in caves, diffuse solution pools, grooves and furrows.

The geomorphological map output represents a baseline document on which to undertake, first the landslide susceptibility mapping, subsequently the hazard mapping and finally the risk mapping, a critical part of the wider-scoped risk management process of this and similar coastal areas.