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Assessing groundwater quality of Cr(VI) impacted water bodies along climate gradient from Central- East Mediterranean to Oman.

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Freshwater resources are directly linked to both ecological services and human development, while water quality has been recognized as a water management problem with great sensitivity to climatic variability and change as early as the 1980's. Specifically, groundwater quantity and quality can be directly affected through changes in precipitation, evapotranspiration, recharge rates, and indirectly through changes in land use, irrigation and other human activities. In the present collaborative research within the frame of the ERANETMED CrITERIA project, we assess real situation data from case study areas following a gradient from relatively wet to dry conditions. A common feature of the studied groundwater bodies is the presence of geogenic Cr(VI) which is linked to ophiolitic rock occurrences. Water samples were collected from central and eastern Mediterranean countries including Italy, Greece, Cyprus and Turkey. The effect of dry climate conditions on groundwater quality was also examined by using Oman as the arid end member. The quality characteristics of the studied water bodies have been assessed using a standardized sampling protocol within the same time frame. From a climate change perspective an overview of the present conditions and possible future changes has been assessed based on CORDEX experiment simulations under RCPs 4.5 and 8.5 after further downscaling over the case study areas providing high spatial resolution information. From the inter-comparison of the results among the case studies, the contrast of the diverse needs on water management in the Mediterranean can be drawn, while possible common messages related to the projected future changes on water resources can be identified.