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An example of how geology-geomorphology affects life of a province: Zonguldak (NW Turkey)

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The Zonguldak province, which is a coastal settlement, has been suffering from many geo-environmental problems sourced by mining activities and geology-geomorphology of the area. Among mining related problems, aesthetic degradation resulting from existence of mining facilities within settlement areas, comes first. Coverage of building sidings with coal dust especially in the city center, where coal is being transported with open top railway cars to the harbor for departure with ships, is another unwanted view. Disposal of mining waste is also an important problem since these wastes are being dumped along coast very close to city center besides municipal wastes. Although their number has dropped, it is possible to add depressions formed at the surface as a result of subsidence of the abandoned coal galleries, to the mining related problems. Also in the literature, there are studies which relate some health problems encountered in the province to coal mining and geologic environment. These are cytogenetic damage in peripheral lymphocytes and pheumoconiosis, goiter and cancer.

Earthquakes (the province has been outlined as I. and II. level earthquake region because of its rather close location to North Anatolian Fault Zone), and frequent floods (coastal and river) and landslides (cover 13% of the total surface area of the province) are the other geo-environmental problems of the province. In this study, special attention has been given to landslides, especially to the deep ones considering severity of their effect. Using stepwise forward conditional logistic regression technique, land-

slide susceptibility map for the province is produced. Slope gradient, volcanic and sedimentary rocks of Eocene, clastic and carbonate units of Cretaceous are found to be the most important independent variables responsible for landslide formation in the province. In this study, a geo-hazard reconnaissance map on which besides landslides, areas prone to flood, earthquake and subsidence are shown, has been produced to provide guidance for both existing settlement areas to take necessary preventive measures and for new developing areas to avoid the problematic areas.