

### 4.8.3. GEOLOGIC AND GEOMORPHOLOGIC INVESTIGATIONS, ENGINEERING GEODYNAMICS

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National territory of Serbia and Montenegro was subject of complex geological investigations for different research and applied purposes. Investigations were predominantly carried out in 1965-1989.

*Basic (regional) geological investigations* were performed during one century-period, and their results are contained within numerous publications and research papers. Reason for so significant interest is in very complex geological relationships and presence of geological formations at the area.

Numerous geologists were the authors of *Basic geological map (scale 1:100,000)* of the national territory. Investigations were performed in the period 1962-1990 and obtained results were obtained for the whole territory. The next step was compiling of *thematic geological maps*, containing almost half of the territory (Fig. 4.8.3.1.).

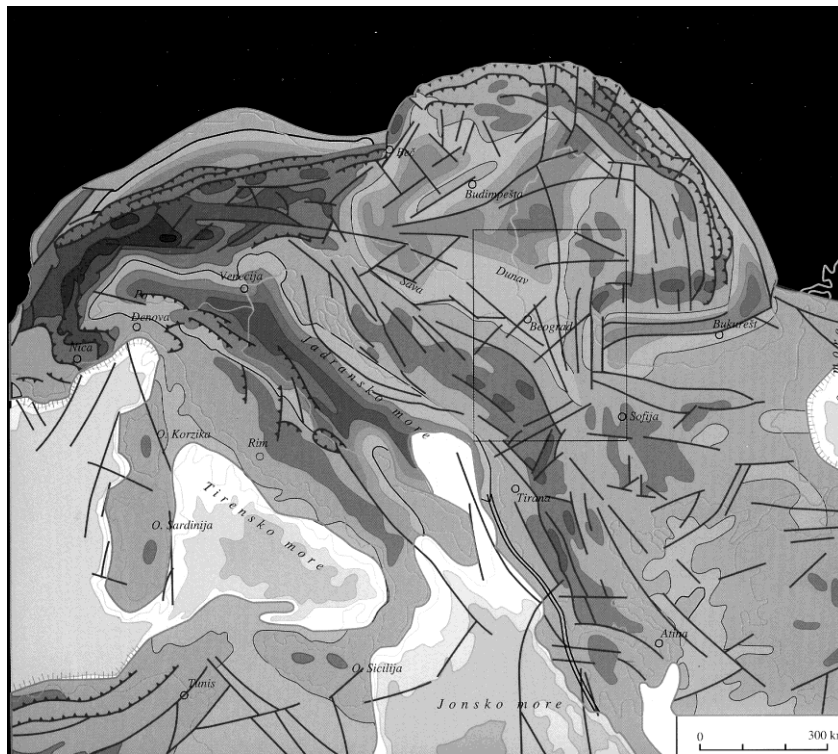
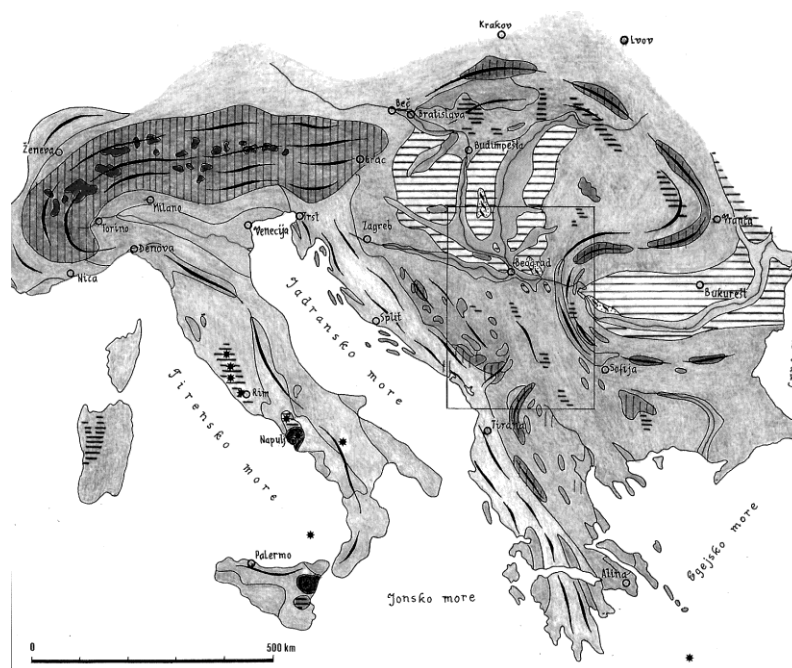


Fig. 4.8.3.1. Neotectonic map of Serbia and Montenegro with adjoining territories  
(Geological Atlas of Serbia, 1997)

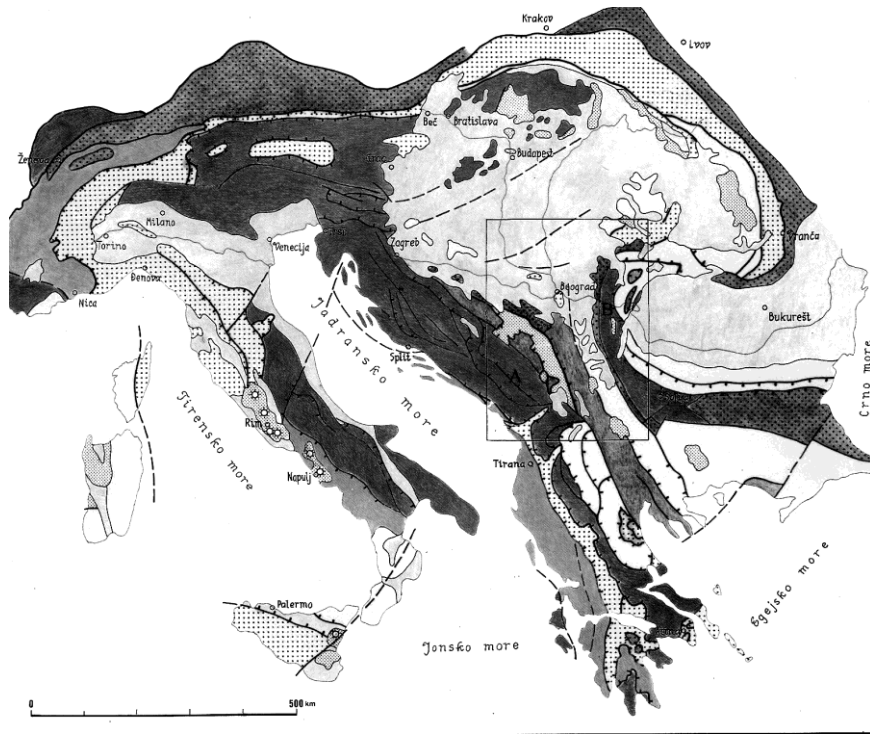
*Geomorphologic investigations* were carried out not only, for scientific, but also for applied purposes (Fig. 4.8.3.2.). Several parts of the territory interesting from the viewpoint of seismotectonic activity were studied. Various forms of relief were distinguished and their relationships analyzed, while some characteristics were determined by morphometric procedures. Analysis of relief energy, but also of strike of slopes and partial hydraulic gradient were performed. As a result, neotectonic relationships, that is – relatively uplifting or sinking tectonic blocks were outlined. The next stage is defining concrete seismic hazard related to distinguished dislocations.

Within fundamental exploration, almost 60% territory of Serbia and Montenegro has been investigated and presented as Basic engineering-geological map and Basic hydrogeological map. Besides, geological, engineering-geological and hydrogeological (1:300,000) maps were published, as well as geological, engineering-geological, hydrogeological, geomagnetic, seismological map, etc. It is important to note that numerous studies are also available (Study of terrain stability of Serbia, Analysis of water supply on the basis of groundwater, Prognosis and evaluation of risk related to terrain instability of Serbia, etc.).

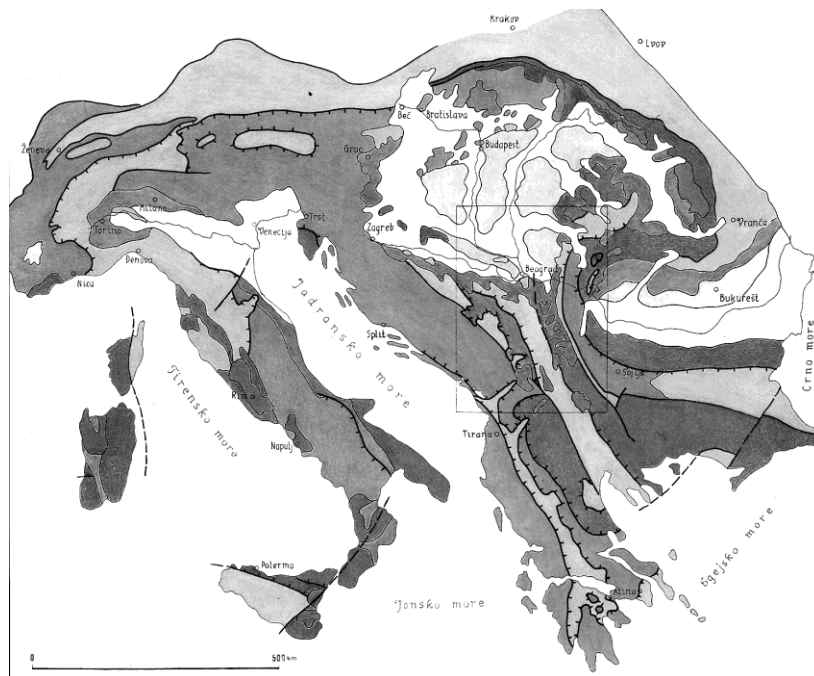
Particularly important information has been acquired during the stages of *regional engineering-geological and hydrogeological exploration* (Fig. 4.8.3.3), presented in voluminous studies, reports and maps 1:200,000, for 15 regions. By this exploration, performed during the period 1968-1984, the whole territory of Serbia and Montenegro was covered (Fig. 4.8.3.4.).



**Fig. 4.8.3.2. Geomorphologic map of Serbia and Montenegro with adjoining territories (Geological Atlas of Serbia, 1997)**



**Fig. 4.8.3.3. Hydrogeological map of Serbia and Montenegro with adjoining territories (Geological Atlas of Serbia, 1997)**



**Fig. 4.8.3.4. Engineering-geological map of Serbia and Montenegro with adjoining territories (Geological Atlas of Serbia, 1997)**

**In detailed engineering-geological and hydrogeological investigations numerous localities interesting for land-use planners and other concrete users, are included. Special attention is directed to karst groundwater sources, as well as objects of engineering-geodynamics (landslides, slope stability, liquefaction, seismic activity, etc.).**

**Results of engineering-geological exploration in urban environment are very important part of land-use and urbanistic plans. Besides, for planning and constructing of various structures and communication networks, detailed engineering-geological situation of the study area is required.**

**Problem of water supply is seriously considered, and it can be concluded that features of majority of important karst, alluvion and Neogene aquifers.**

**At the territory of Serbia and Montenegro, intensive seismological investigations started after Skopje earthquake in 1963, particularly during periods of Montenegro (1979) and Kopaonik (1980) earthquake. Significant development in this exploration was made within international project "Study of seismic activity of Balkan peninsula" (UNDP/UNESCO, 1974).**

**Exploration for needs of protection of the endangered environment, from the viewpoint of unsuitable effects of some geological factors, were performed predominantly within making basics for land-use and urbanistic plans and protection measures at endangered localities carrying out. During the time, they become more voluminous, and recommendations for protection are of high quality. That is related particularly to contaminated sources and harmful effects formed in geodynamically active areas.**