



Quantification of Tectonic and Seismotectonic Zoning In Iran

Ahmad Zamani (1) and Sedigheh Farahi Ghasreaboonasr (2)

(1) (zamani_a_geol@yahoo.com), (2) (farahi_sedigheh@yahoo.com)

Construction of tectonic and seismotectonic zoning maps is one of the basic topics in Earth Sciences which has drawn the attention of researchers in this field. Conventional tectonic zoning maps of different forms have been constructed in the past utilizing limited number of data gathered from field observations, aerial photographs, satellite images, and etc. . . . But large uncertainty involved in conventional maps based on non-quantitative and subjective analysis and failure to interpret accurately a large amount of data "by eye" are not useful for in depth analysis of geological processes. In order to alleviate these deficiencies, large amount of surface and subsurface data parameters have been analyzed using multivariate statistical methods to construct automated numerical tectonic zoning maps of Iran. This new approach of self-organized mapping could not only be constructed according to the user's point of view but also on-line evaluation and adjustment of these maps are possible. This research is an extension of self-organized mapping or numerical pattern recognition. For this purpose large amount of updated data parameters have been utilized to construct new numerical tectonic zoning maps of Iran.

Because data acquisition is very difficult, advanced statistical method of data reduction has been applied to reduce the number of data parameters. Selected data parameters not only preserve the overall features of initial data, but also produced maps that are similar to the original ones. Finally, statistical methods also were used to determine the correlation between data parameters and degree of importance that each parameter possesses for construction of numerical tectonic zoning maps. It is important to recognize that the automated self-organized tectonic zones generated by the multivariate statistical methods are based purely on the geological, geophysical and geomorphological data parameters used. So correspondences and deficiencies between the automated numerical tectonic zones and a given zone based on conventional method must receive careful thought.