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Investigation of Seismicity Risk Analysis in Konya with GIS

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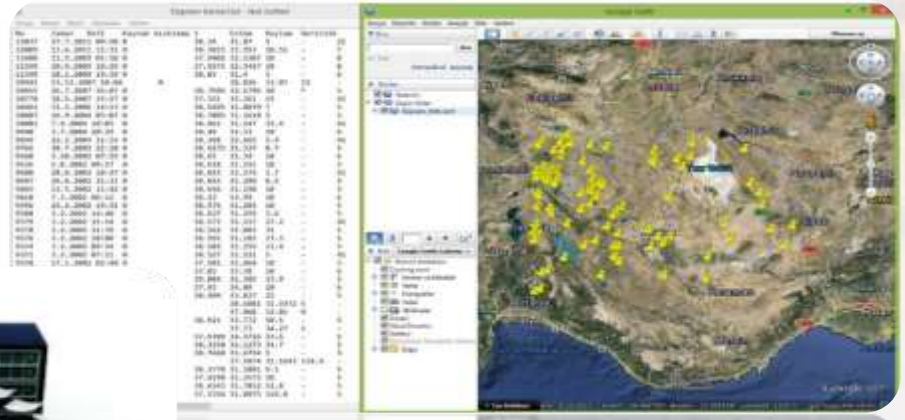
1.INTRODUCTION

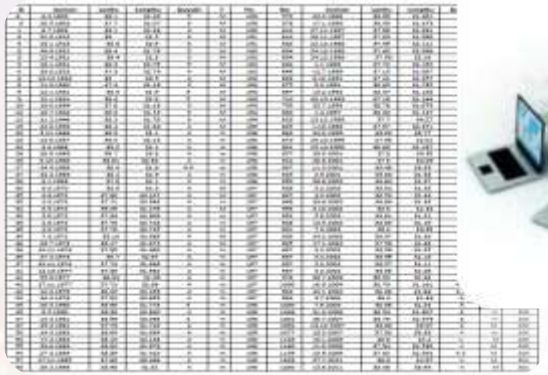
- In recent years, growing population and urbanization have largely increased the impact of natural hazards both in industrialized and developing countries such **Turkey**.
- **Turkey** is situated on an active earthquake zone with shortest return periods and earthquakes caused loss of lives in the history.
- Therefore, it becomes necessary to prepare landslide susceptibility, and hazard or risk maps.
- Many different methods and techniques have been suggested and used.
- Before and after natural disasters has attracted significant attentions among researchers and practitioners of disaster management.

1.INTRODUCTION

- In this regard, advanced technologies, GIS, have become important new tools in disaster management.
- Using Geographic Information System (GIS) as the **basic analysis tool** for landslide hazard mapping can be effective for spatial data management and manipulation.
- In this study, between the years **1900-2015** seismicity risk analysis performed in boundaries of the Konya province examining the earthquake epicenter point with GIS.
- In addition, the analysis performed with **open and closed source** software separately, it has been revealed comparison and differences between software.

2. MATERIALS AND METHODS



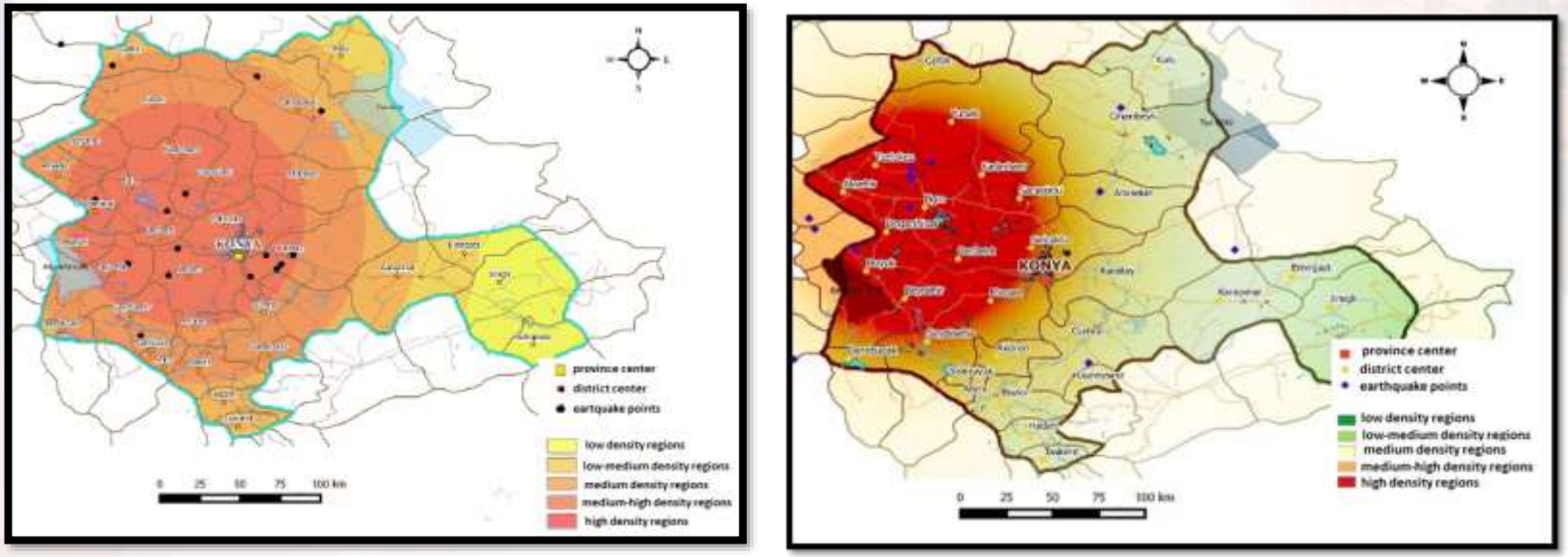


Earthquake center points between 1900 and 2015 from the AFAD database.

2. MATERIALS AND METHODS

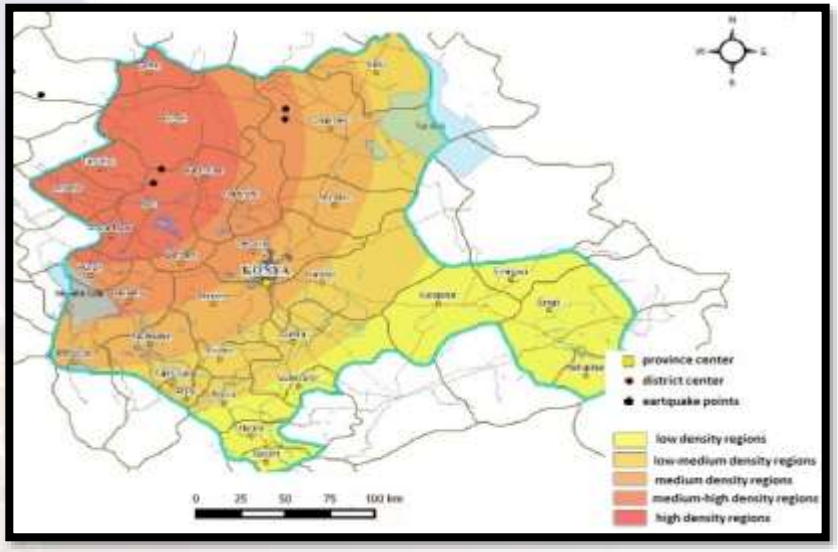
- The saved files have been converted to KML format online from maps data site.
- These files converted into KML format are opened in Global Mapper 16 program and converted into shapefile format.
- As a basemap, Konya region from the geofabric data of Open Street Map has been downloaded free in .shp format.
- In this study, ArcGIS and Quantum GIS software were used for Kernel Density Analysis.
- ArcGIS is commercial software and QGIS is open source software.

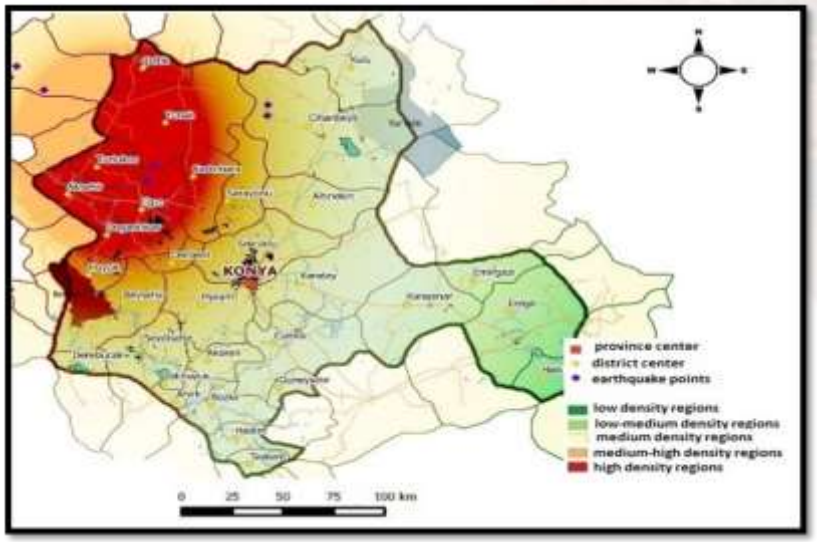
3. RESULTS AND DISCUSSION



ArcGIS Quantum GIS - Konya 1900-1950 Seismicity Map

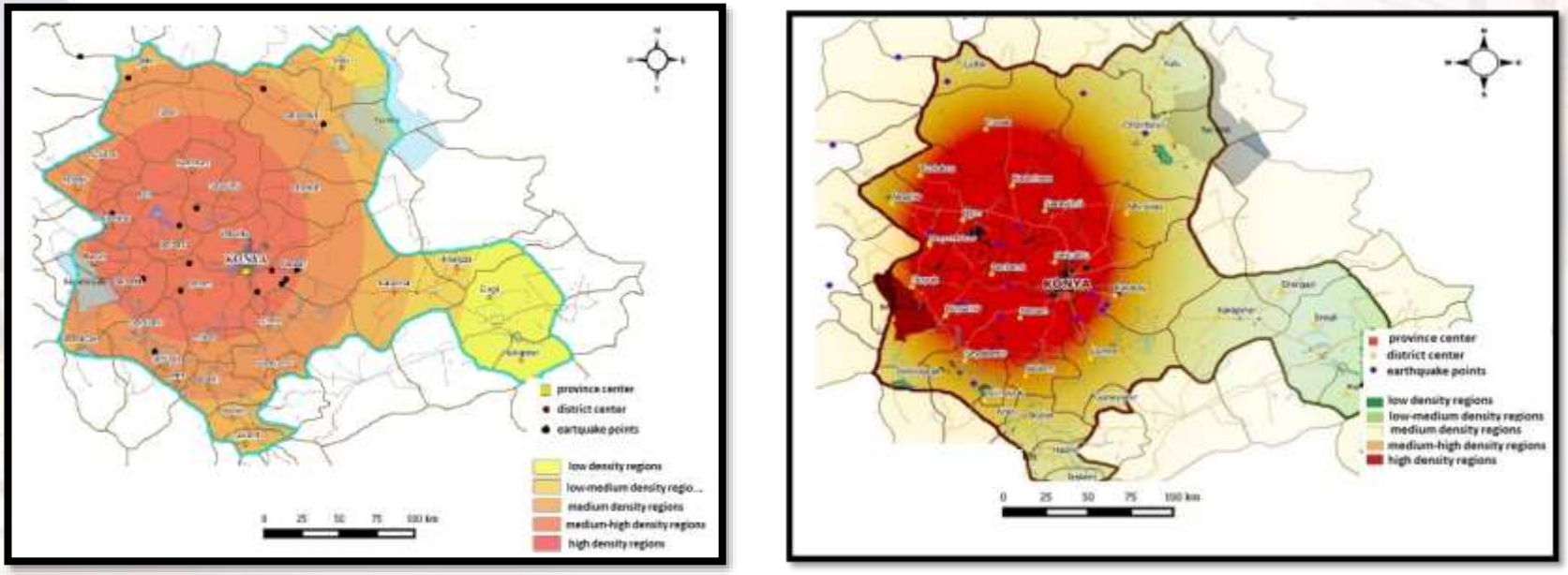
3. RESULTS AND DISCUSSION





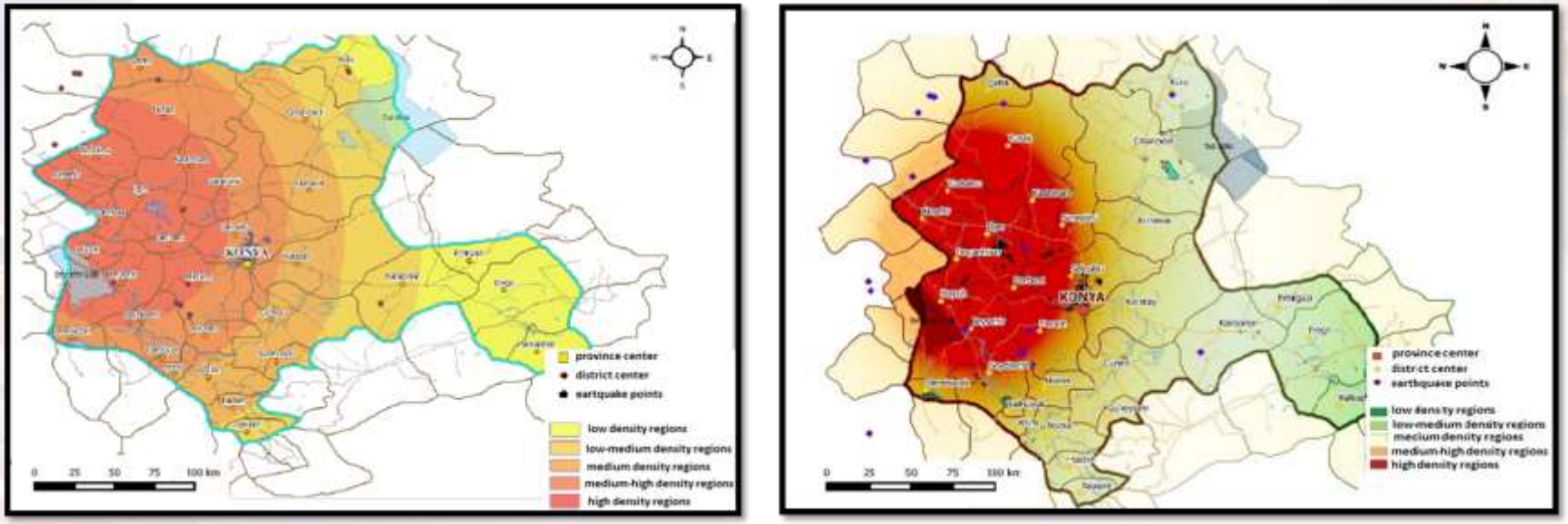
ArcGIS Quantum GIS - Konya 1950-1970 Seismicity Map

3. RESULTS AND DISCUSSION



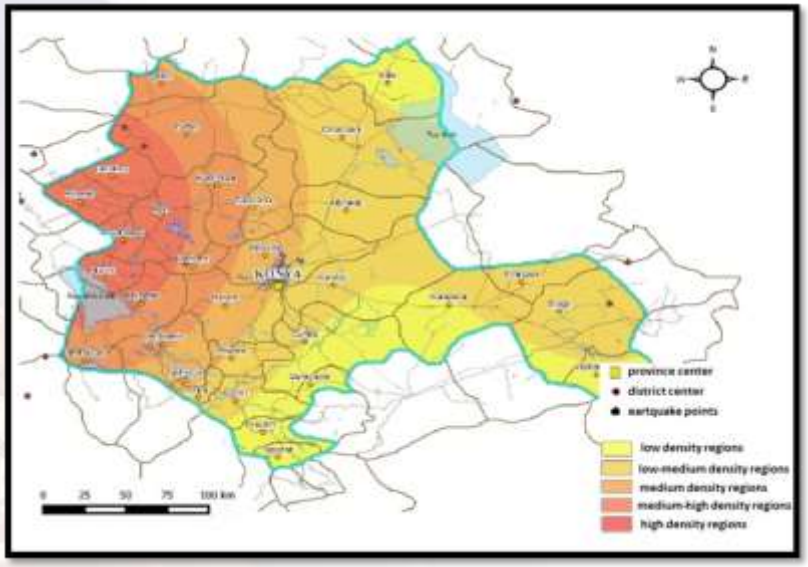
ArcGIS Quantum GIS - Konya 1970-1980 Seismicity Map

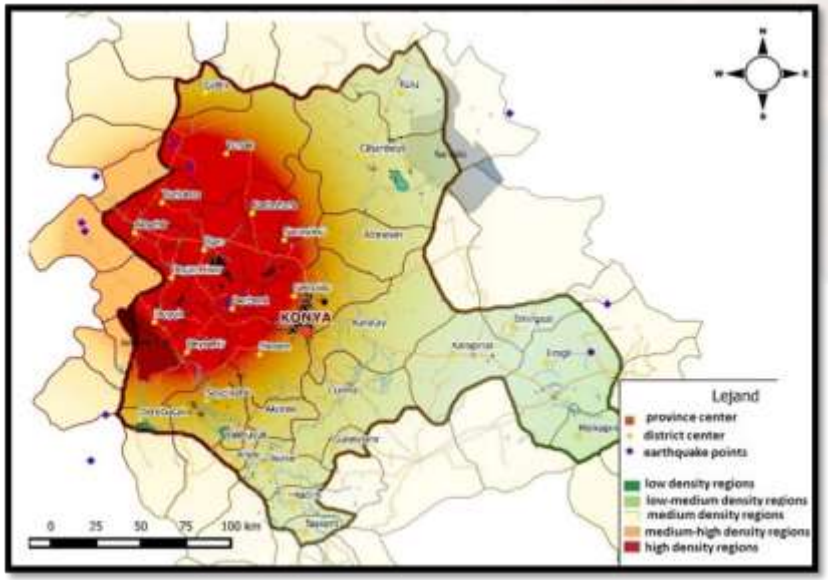
3. RESULTS AND DISCUSSION



ArcGIS Quantum GIS - Konya 1980-1990 Seismicity Map

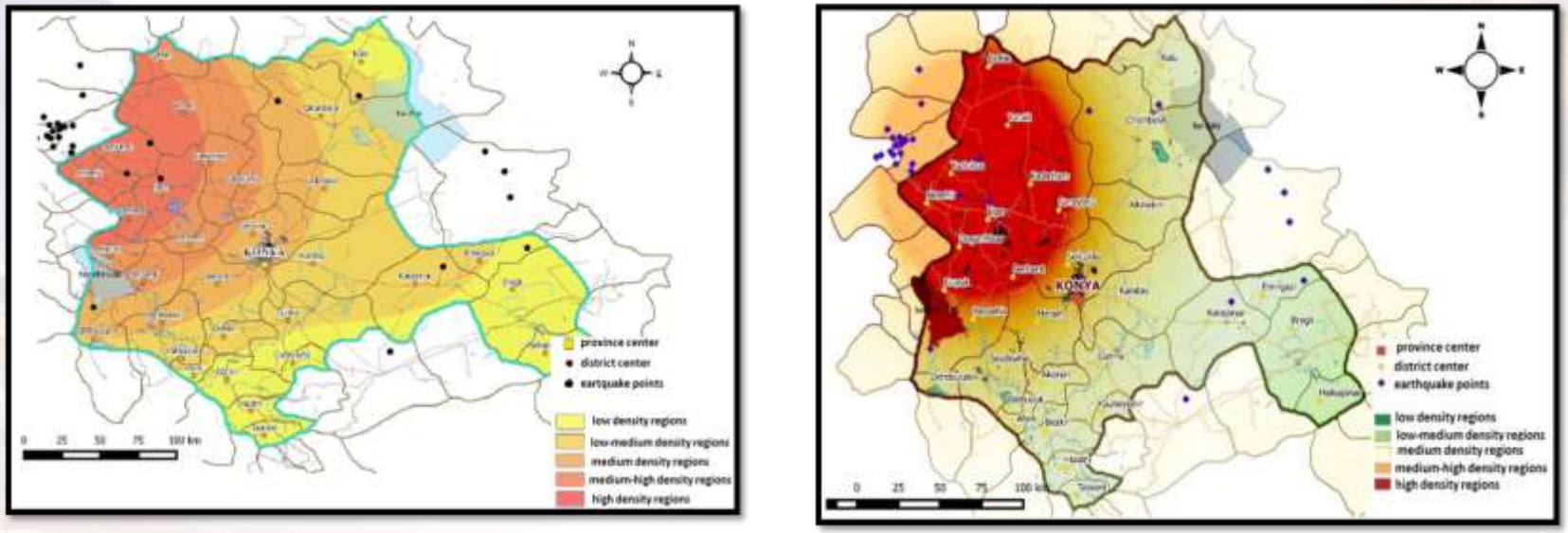
3. RESULTS AND DISCUSSION





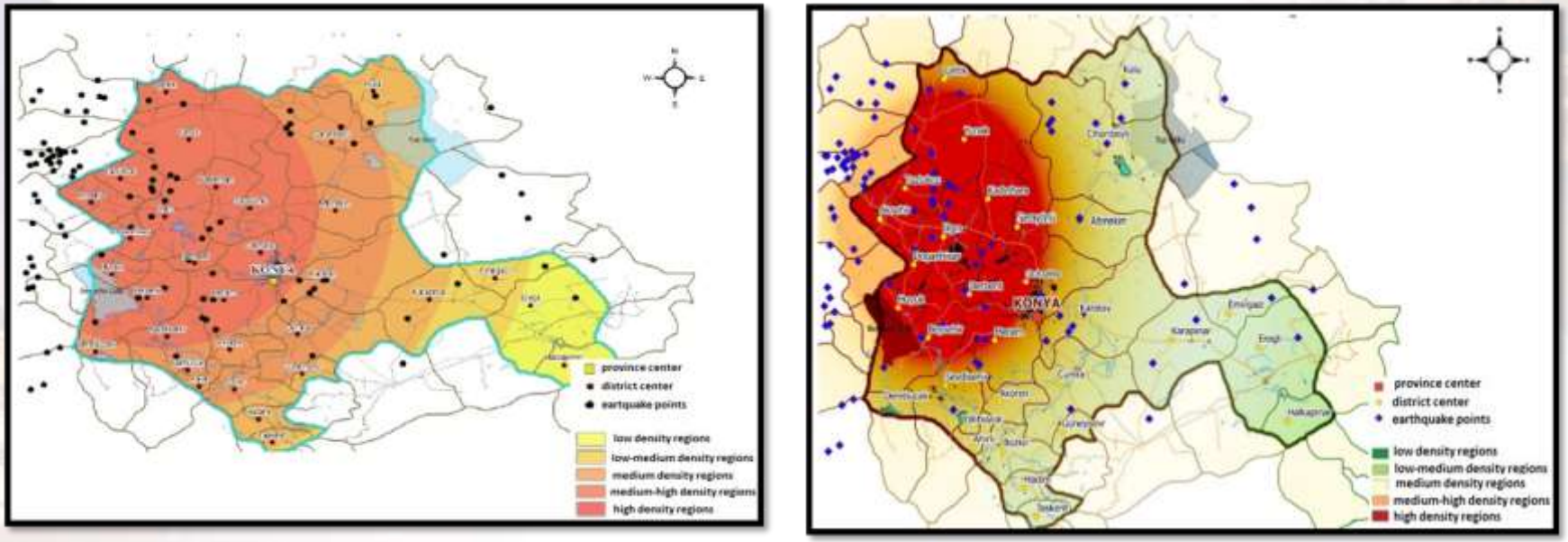
ArcGIS Quantum GIS - Konya 1990-2000 Seismicity Map

3. RESULTS AND DISCUSSION



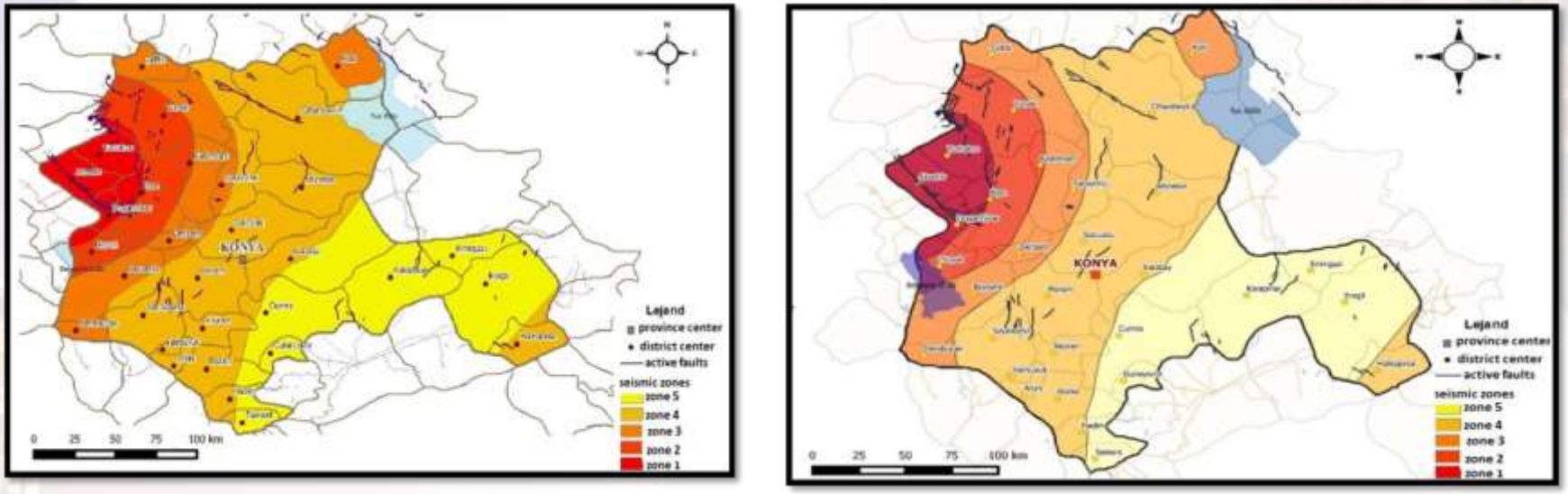
ArcGIS Quantum GIS - Konya 2000-2015 Seismicity Map

3. RESULTS AND DISCUSSION



ArcGIS Quantum GIS - Konya 1900-2015 Seismicity Map

3. RESULTS AND DISCUSSION



ArcGIS Quantum GIS - Konya 1900-2015 Earthquake Hazard Zones Map

4. CONCLUSION

- According to the density analysis carried out in Konya province borders, it is seen that seismicity is higher in the West of Konya. When the district borders of Konya are considered, **Aksehir, Tuzlukcu, Ilgin, Doganhisar and Huyuk** districts are defined as **"High Dangerous Regions"** in comparison with other districts.
- It has been seen that the dangerous regions determined in the earthquake region maps created with the active faults and the earthquake external center points are used and the determined dangerous regions have consistent results with each other.

4. CONCLUSION

- It has also been seen that it gives consistent results in maps prepared according to Kernel Density Distribution in different GIS software.
- There is no difference in **ease of use** between QGIS and ArcGIS.
- QGIS is a constantly renewing platform.
- It has been seen that different analysis tools can be added to the basic version for free.
- In cartographic mapping production, the transition between color tones has been found to be softer in QGIS software.
- With QGIS software, it seems that accurate and consistent results are obtained without paying any license free.

4. CONCLUSION

- In addition, QGIS is continually **updated** and can be installed and uninstalled on demand, so that the computer runs unnecessarily, it runs more quickly, and different analysis tools can be added to the basic version easily and continuously if needed.
- In ArcGIS, the most basic version is very **expensive** and **limited**.

THANK YOU FOR YOUR ATTENTION..