

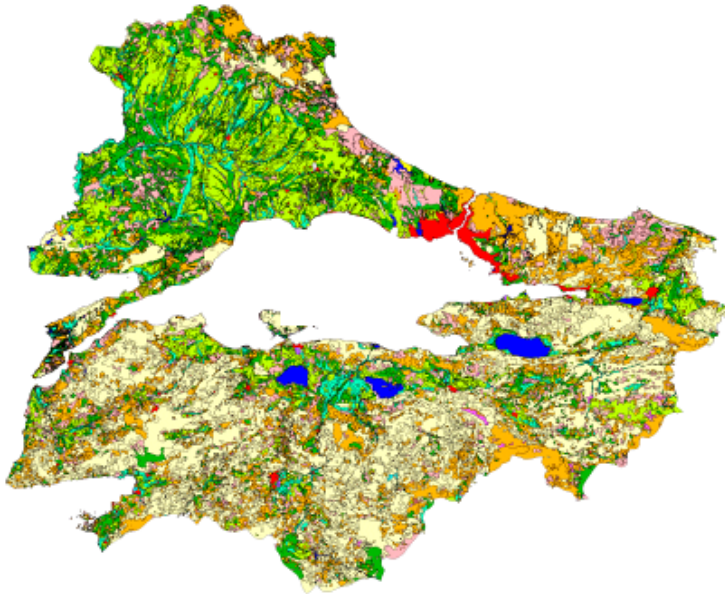
Soil Maps of Turkey

Another Large Project Completed Using TNTmips

1:25,000 series

The Turkish General Directorate of Rural Services used TNTmips to convert 5560 1:25,000 scale soil maps covering the nation to digital form. This work was conducted in the Soil and Water Resources group of the National Information Center. HAT - Geographical Information Systems and Trade, Inc., MicroImages independent Reseller in Turkey, provided technical support for this project.

- Paper maps were scanned
- Raster converted and edited into vector form
- All maps edited to reconcile edge inconsistencies
- Vector maps styled, labeled, and distributed with TNTAtlas and TNTserver.
- Digital mapping data is also provided for sale separately.



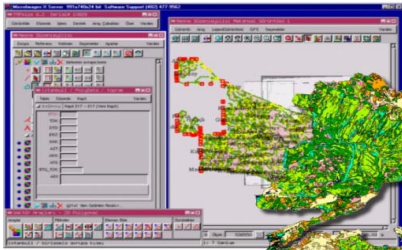
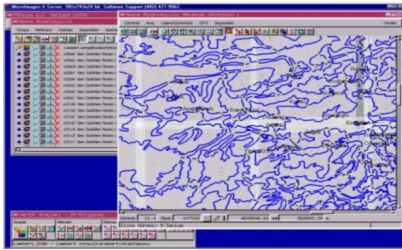
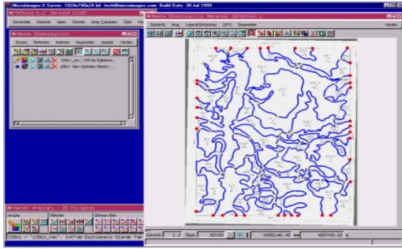
This project and the use of these maps was colorfully illustrated in an HAT color brochure in both English and Turkish. The 3 pages of this brochure discussing this project and entitled GENERAL DIRECTORATE of RURAL SERVICES are attached.



The complete brochure illustrating many HAT projects complete with the TNT products can be reviewed at www.hatgis.com.tr/dosyalar/brosur/HatBrochure.pdf.

OUR REFERENCES

GENERAL DIRECTORATE OF RURAL SERVICES

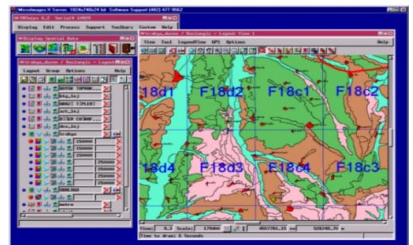
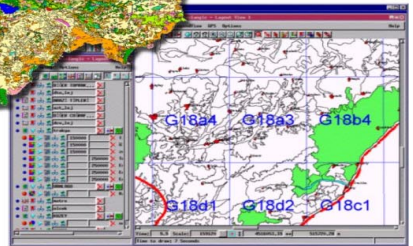


The Soil and Water Resources National Information Center was established in 1999 by the General Directorate of Rural Services (GDRS) to create the database of national soil and water resources and to use Geographic Information Systems (GIS) and Remote Sensing (RS) techniques in planning and analyzing natural resources and to provide speed and flexibility to the users and decision makers. Our support to the center has continued after we provided the software and the A0 scanner. Our service to the General Directorate of Rural Services is shown in three projects carried out by UBM:

- Turkey Soil Database (5560 map sheets),
- Rural and Agricultural Infrastructure Database,
- establishment of Land Use and Land Cover using Remote Sensing techniques.

Turkish Soil Database Project

In accordance with the contracts for these projects, HAT, Inc. took on responsibility for providing the necessary technologies to GDRS and producing solutions directed to agency needs. In the first phase of the project, basic education was given to the UBM personnel, necessary software and hardware were provided, and digitizing the Turkish Soil Maps, at 1:25000 scale, was started.



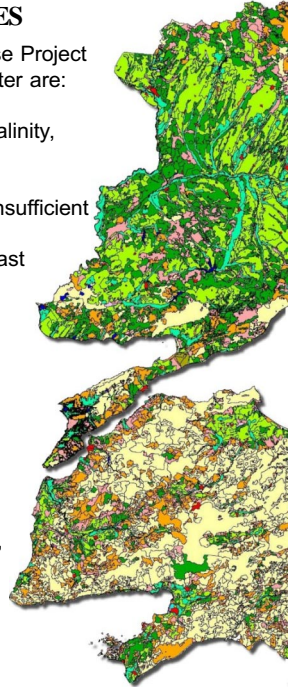
The pilot project, which is completed, covered an area that contains 254 map sheets at 1:25000 scale and provided education in Geographic Information Systems, Database Management and Remote Sensing for 20 personnel. After the education stage, production of digital maps and the soil database was begun. In 2001, the digitizing process was completed for all of Turkey.

It is significant that the project is the first one approved and completed by a government agency.

GENERAL DIRECTORATE OF RURAL SERVICES

The types of basic data used for the National Soil Database Project of the Soil and Water Resources National Information Center are:

1. Large Soil Groups
2. Soil Characteristics: depth, slope, drainage, structure, salinity, alkalinity
3. Other Soil Characteristics: salty areas, alkaline areas, stony areas, rocky areas, insufficient drainage areas, bad drainage areas
4. Land Types: bare rocks and rubble, riverbed, floods, coast sand dunes, land sand dunes, marshy places and swamps, permanent snow covered areas
5. Erosion Degrees: water erosion, wind erosion
6. Land Use Potential: Classes and Sub-classes I, II, III, IV, V, VI, VII and VIII Class areas, damaged areas, soil insufficiency, drainage disorder or flood damage, climate limitations
7. Current Land Use
8. Other Geographic Data: rivers, dams, lakes, ponds, seas, settlement areas, industrial areas, tourist areas, islands and small islands, airports, national parks, farms, cemeteries, coal mines

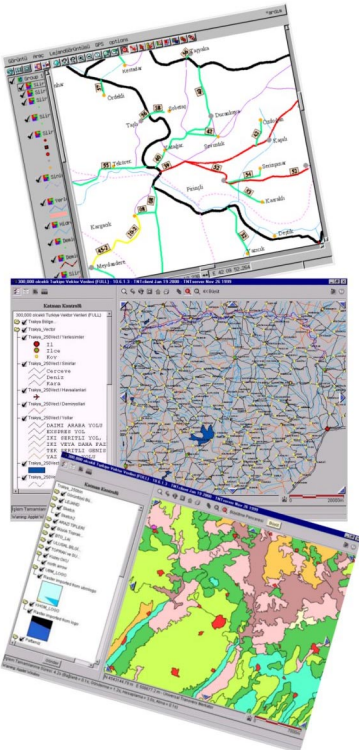


Construction of Rural Infrastructure Database

The Soil and Water Resources National Information Center started the 1:250000 scale Rural Infrastructure Project in June 2000 after the success of the Turkish Soil Database Project. At this stage, a contract has been signed with GDRS to create current data, and 71 map sheets at a scale of 1:250000, which were prepared by the General Command of Mapping, have been digitized. After this process, settlement units, hydrological data and rural road networks were updated and corrected using satellite images.

These data, produced by HAT, Inc., will be the basic data for producing rural infrastructure service maps in digital form of 83000 settlements for which GDRS is responsible. The

Rural Infrastructure Database to be produced in this way will be served to the users over the Internet and intranet. The spatial data production stage and ORACLE database integration stage have been completed for the project.



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Updating the Turkish Soil Database Using Remote Sensing Techniques

The General Directorate of Rural Services has started the Using Remote Sensing Techniques to Establish Land Use and Land Cover Project to facilitate the update of the Turkish Soil Database in the future. In the project, Ankara is the pilot province and two Landsat-7, one IKONOS, and five IRS satellite images, which were acquired on different dates, have been obtained for the study area. In order to be completely in step with the European Union on the subject of soil and water resources, the study uses a scale of 1:25000 to develop the CORINE Land Cover Study, which has been completed for most of Europe at 1:100000 scale. In the pilot project, 48 map sheets were produced at a scale of 1:25000 (with 5-meter spatial resolution) according to the list below:

1. Urban and Rural Built-Up Areas (settlement areas, non-residential urban areas, urban green areas, parks and sport fields, communication and transportation, open areas, etc.)
2. Agricultural Areas (permanent/fixed crops, planted agricultural fields, other/mixed agricultural fields)
3. Pasture Areas (grassland, bush and shrubbery, grassland-bush-shrubbery mixed, meadow planted)
4. Forest Areas
5. Arid Areas
6. Water Resources (lakes, streams and canals, reservoirs)
7. Wetlands

Our technical support is still continuing for the projects mentioned above in order to serve up the Turkish Soil Resources Database, the rural infrastructure and service maps, to prepare and manage the rural and agricultural infrastructure database relations, and to protect and secure the data.

GDRS is selling the data (Turkish soil database, settlement units and inventory of rural infrastructure) they produced to government agencies and private companies. It is hoped that the project will recover all the investments and other expenses by the end of 2001 with the income obtained from these sales.

