GIS-based desert soil database for the ARO project: the Israeli soil profiles

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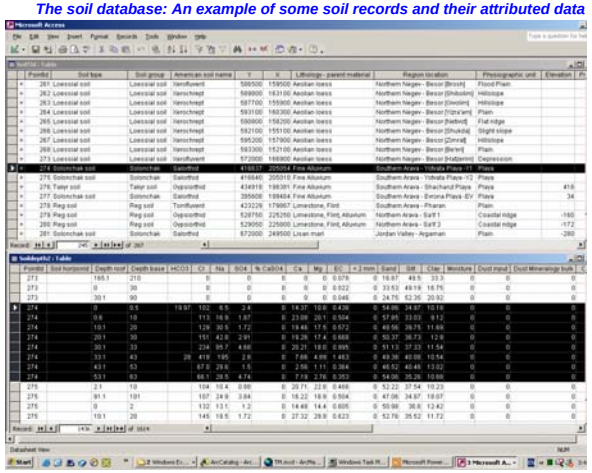
Summary

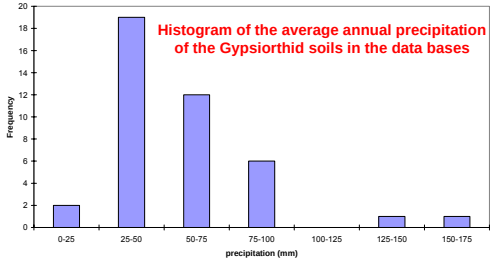
We established a GIS-based soil database, with its main first entries from two arid areas: the Negev desert, in southern Israel, and the southwestern deserts of the USA. These two areas served to illustrate the diversity of available data qualities, potential available entries from our own research, and from other sources that had diverse goals in mind when originally conducted. These efforts guided us in the construction of the structure of the GIS platform of the database and the details of entries to each parameter.

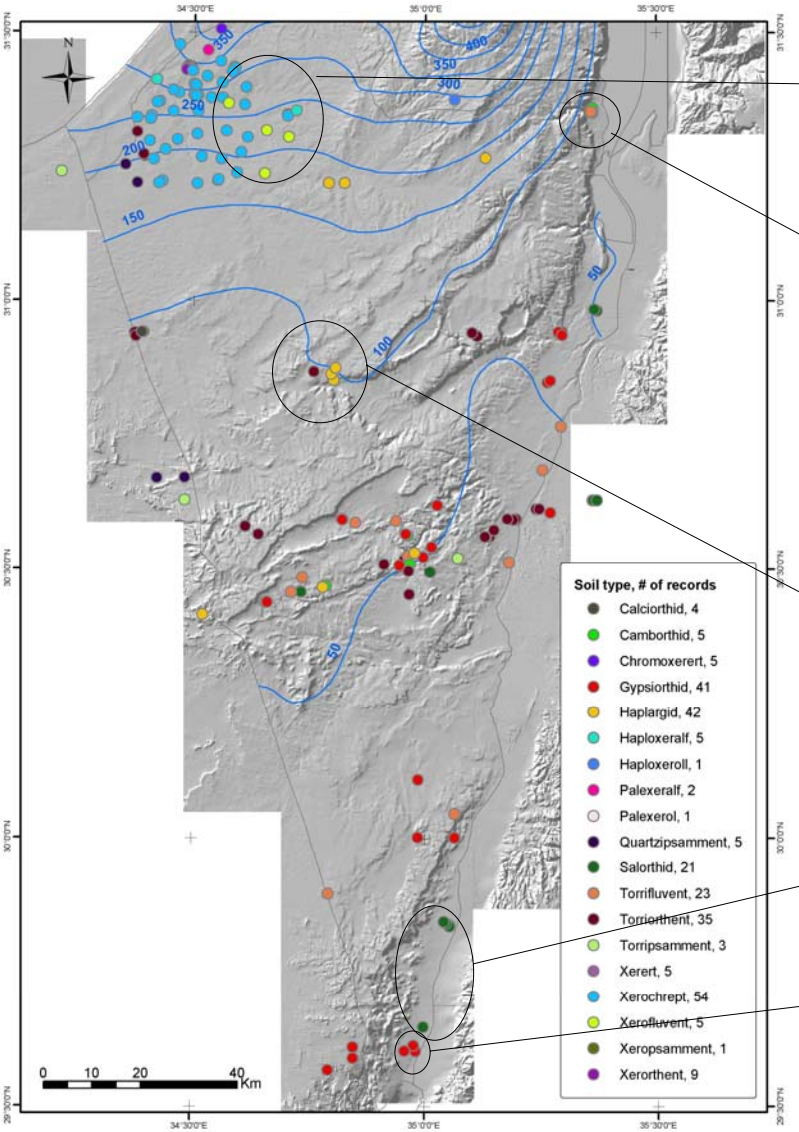
The soil database consists of two linked tables: (1) The main table, in which each record represents one soil profile, with general soil profile fields (location, climate parameters, topography parameters, etc.). (2) The horizons table, in which each record represents one soil horizon, with entry fields of horizon characteristics such asd color, grain size, chemistry, etc.). The database includes over 300 soil records distributed over the entire Negev desert. In addition to various uses of the data base as is (e.g., Amit et al., 2006), the challange is to combine it with remotely sensed data, such as lithology, mineralogy, roughness, and clast coverage percentage.

The soil database: An example of some soil records and their attributed data



Simple data extraction from the database. In the future we will conduc correlations between soil profiles characteristics and environmental parameters.





Spatial distribution of the soil entries into the desert soil database from the Negev desert, presented on a DTM and the average annual precipitation (mm)

Northern Negev: Calcic soils developed in Late Pleistocene loess

Judean Desert, near Dead Sea:
Gypsic Reg soil developed in late Pleistocene alluvium

Central Negev Highland:
Fluvial secondary loess (left) and calcic soil in aeolian loess (right)

Southern Negev (Arava valley):
Salic and gypsic soils developed in playa sediments

Southern Negev (Shehoret sequence):
Salic and gypsic soils developed in 60 ka alluvial fan

Sponsor
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