Soil classification and user-friendly soilmaps

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Soil names from the soil classification systems are too complicated to decipher for most of our soil map users. To reach out to potential users of soil information, apart from people working with soil erosion related issues, we translated WRB unit names into user friendly map information, that shows soil quality and limiting soil properties on farmland.

Soil classification system

During the 1990's we started using a new soil classification system, WRB, a soil reference base, that also functions as a platform for communication between pedologists from all over the world. WRB is adapted as our national classification system, and we have developed an adjusted version of the system that is now used as basis for our soil mapping units. After our soil data base was correlated into WRB units, we were able to make WRB-maps which became available on the internet along with our previous thematic maps.

Soil index based on WRB qualifiers

The soil index is a well-known method for rating soils, but our approach is to only use WRB qualifiers as input. We knew there existed many potential users of soil information apart from people working with soil erosion related issues. For instance, there had been increasing conflicts of interest between agriculture and developers of infrastructure, housing and commercial areas. In Norway only 3 % of the land area is in agricultural use, and only a smaller part is located in areas where climatic conditions are suitable for growing cereals for human consumption. Good agricultural soils are therefore a scarce resource in Norway and we should protect the most productive areas from soil sealing. We have

Example of WRB unit name
Soil profile: Umbric Stagnic Cutanic Albeluvisol (Anthric, Abruptic, Ruptic, Eutric, Epiarenic, Endosiltic, Gelistagnic)
Soil mapping unit: Umbric Stagnic Albeluvisol (Abruptic, Epiarenic)
The soil mapping unit shows the soil information observed in the field, but you have to be an expert to read the information.
Foto: Siri Svendgård-Stokke / NIBIO

the information about where these areas are located and it's our responsibility to bring this information to the rest of society. We had to convert the WRB-map into a more user-friendly map with an easy to

understand legend. The procedure we chose was to develop a soil index based on WRB qualifiers.

All mapped soil types are given a string of WRB qualifiers that apply to the soil

· The qualifiers are grouped into 8 soil index factors, each representing an important soil property.

· Each qualifier is rated according to the degree of limitation they represent for agricultural use of the soil

· For each factor, a value is calculated based on the qualifier ratings.

· The resulting index is a number between 0 and 100, and the most limiting properties are indicated by letters.

Soil maps based on the soil index

Based on the soil index, the soil resourse map units (showed at the right side) are classified into 4 soil resource classes. Class 1 (brown colour) has no limitations for agricultural uses and class 4 (light yellow) has soil properties that severely restrict the use of the soil. On the internet you can also get information about the most limiting soil properties, by clicking on the soil polygons.

Other maps show specific soil properties which affect the management of the soil, like soil drainage properties. Together with different crop growers and specialists we have developed similar soil indexes for a wide range of crops - suitability maps for grains, grass, potatoes and 21 types of vegetables.
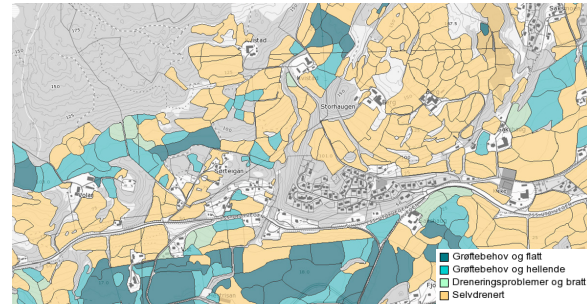
Soil quality

The soil quality is, together with the climate, of vital importance for the growth potential, the risk of erosion and the runoff/loss of fertilizers and plant protection chemicals. Data on soil quality can hence be used in soil protection matters, as a tool in agricultural planning and in the aim towards a reduced environmental hazard caused by agriculture.

Agricultural Soil Quality is especially meant as a tool for land use planners and consultants with little or no soil science background. Its purpose is to identify and locate the best agricultural areas, and prevent them from being turned into highways, shopping malls etc. It is also a political goal in Norway to reduce the yearly loss of agricultural areas to soil sealing. The
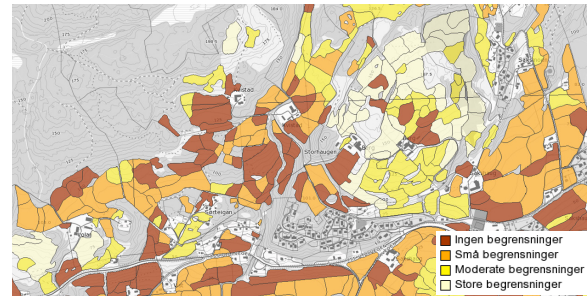
Soil resource maps show based on the limitations for agricultural use.
Map: Kilden / NIBIO

Soil drainage, shows natural drainage properties in combination with slope. Map: Kilden / NIBIO
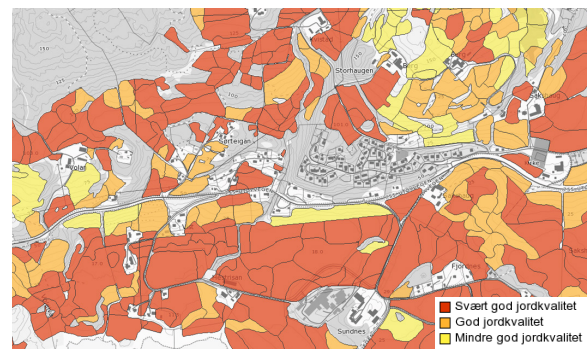
Agricultural soil quality combines the soil resource classes with terrain properties such as slope, and it divides the agricultural areas into three classes, high (red colour), medium (orange) and low (yellow) soil quality. Map: Kilden / NIBIO

Norwegian government has decided that this map is obligatory in processes which imply irreversible loss of farmland.

Rising soil awareness

Presenting soil information as simple, user-frendly and freely accessible soil maps will increase the use and demand for soil data, and hopefully also increase the awareness of soils and the importance of high quality agricultural land.

The soil quality map and other soil maps are freely accessible from NIBIO's web-site: www.kilden.nibio.no